City of Morden
Public Water System Annual Report 2024

This report is available online at the City of Morden website www.mymorden.ca as of March 24th, 2025.

Email Town address info@mymorden.ca

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 City of Morden website, indicating how users can acquire copies of the report.

City of Morden
Annual Water System Operation Report 2024

Where does our water come from?
The City 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 City 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 City of Morden is committed to meeting or exceeding these new standards set by the province to provide the best tap water possible to the City of Morden.

What type of treatment do we use?
Due to the high hardness count (400- 900 Mg/l) of Morden's raw water supply we use a Lime- Soda Ash softening process followed by filtration, UV disinfection and chlorination. 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 City of 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.
In 2016 the City of Morden added UV light disinfection as an added barrier of disinfection to treat pathogens- bacteria that are resistant to chlorine.

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 to help prevent tooth decay. This process is monitored by Manitoba Health, Seniors and Active Living. As of March 15, 2011, the optimum level of Fluoride in drinking water is 0.7 ppm with a range of 0.5 to 0.9 ppm. This optimal level acknowledges the fact that consumers are getting other sources of Fluoride such as toothpastes and mouthwashes etc. While there is naturally occurring Fluoride in our source water and is taken into account while the final total amount is kept as close to .7ppm as possible.

How much water storage do we have?
When the new water plant was built in 1998 a 500,000-gal reservoir was built underneath it. Another underground reservoir with a capacity of 880,000 gal was constructed and put in service in May 2014. In addition to these reservoirs the Morden WTP has a standpipe with a design capacity of 400,000 gal. The total storage is available is 1.78 million gals which is sufficient to address the City of Morden's water storage needs for years to come. The standpipe condition, however, is deteriorated and replacement is needed in the coming couple of years.

What is the "distribution system"?
The system is a network of underground pipes that supply water to all areas of City. The chart shown below identifies the type and length of watermain piping in service.

Type of Waterline	Total Meters
Asbestos cement	33,651
Ductile iron	1,251
Plastic	51,115

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

How is water disinfected?
The treated water from the sand filters passes through the UV disinfection process before further disinfection with the Chlorine prior to entering the storage reservoir, from where it is pumped to the distribution. The UV disinfection system is maintained regularly to make sure effective disinfection. The chlorine residuals are monitored continuously to make sure that chlorine residual is maintained through the entire distribution system at required level of 0.2mg/l. Below is the log of UV disinfection maintenance.

UV Maintenance Log			
Model # TROJANUVSWIFT Component Serial# TL140116813001			
UV1		UV2	
Date		Date	Description Of Service
Jan-24	Reference sensor checked passed	Feb-24	Reference sensor checked passed
Mar-24	Reference sensor checked passed	Mar-24	Sent duty sensor TL080116373004 in for recalibration
Apr-24	Reference sensor checked passed	Mar-24	Sent reference sensor TL210316627001 in for recalibration
Jun-24	Reference sensor checked passed	May-24	Reference sensor checked passed
Aug-24	Reference sensor checked passed	Jun-24	Replaced lamps, seals and 1 lime away coupling.
Oct-24	Reference sensor checked passed	Jul-24	Reference sensor test passed
Dec-24	Reference sensor checked passed	Sep-24	Reference sensor checked passed
		Nov-24	Reference sensor checked passed

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, Haleoacetic acid, Fluoride tests, Turbidity and chlorine residuals.

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. Please see Table-1.

Disinfectant testing is done daily on the treated water leaving the water plant and 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. Please see Table-1.

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. Please see Table-2.

Haloacetic Acid testing: The Office of Drinking Water initiated a Haloacetic Acid testing program in 2016. Haloacetic Acid is a disinfection by- product formed by a reaction with Chlorine. Testing is done at the same time as THMs on a quarterly basis. Please see Table-2

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 accredited lab.

Detailed General Chemistry: A detailed chemical analysis is performed annually for the parameters included in the Drinking Water Quality Guidelines (Table-3). The analysis is normally completed for the parameters with a MAC limit. See Appendix-A for general chemistry test results.

Manganese Testing: Manganese testing is performed quarterly. Table-3 provides results of manganese testing.

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

As a result of the testing as shown in the tables below, the Office of Drinking Water has determined that "The City of Morden has been fulfilling its obligations with regard to chemical, bacteriological and disinfection monitoring and reporting" except for the THM's.

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

Table-1

BI-WEEKLY BACTERIAL TESTS

Date	#1 Raw	#2 Treated	#3 Distribution @PWG	#4 Dist. @PVWC	#5 Dist. @Morden Rec.	#6 Dist. @ Civic centre	#7 Dist. @ Fire Hall
Jan 08 /2024	Result	Result	Result	Result	Result	Result	Result
Chlorine Free	0	0.98	0.27	0.81	0.54	0.74	0.47
Chlorine Total	0	1.45	0.67	1.43	1.04	1.23	1.07
Total Coliforms	9	<1	<1	<1	<1	<1	<1
E. Coli	0	<1	<1	<1	<1	<1	<1
Turbidity	6.23	0.13	0.23	0.18	0.32	0.22	0.32
Jan 22 / 2024	Result	Result	Result	Result	Result	Result	Result
Chlorine Free	0	0.93	0.25	0.31	0.39	0.63	0.36
Chlorine Total	0	1.52	.80	1.02	0.89	1.04	.91
Total Coliforms	3	<1	<1	<1	<1	<1	<1
E. Coli	<1	<1	<1	<1	<1	<1	<1
Turbidity	6.57	0.15	0.40	0.32	0.20	0.22	0.24
Feb 5 / 2024	Result	Result	Result	Result	Result	Result	Result
Chlorine Free	0	1.10	0.87	1.04	0.51	0.74	0.71

Chlorine Total	0	1.67	1.38	1.77	1.05	1.14	1.14
Total Coliforms	11	<1	<1	<1	<1	<1	<1
E. Coli	<1	<1	<1	<1	<1	<1	<1
Turbidity	7.90	0.22	0.28	0.27	0.25	0.27	0.29
Feb 20/2024	Result	Result	Result	Result	Result	Result	Result
Chlorine Free	0	0.97	0.49	0.91	0.55	0.78	0.67
Chlorine Total	0	1.11	1.01	1.40	0.98	1.26	1.11
Total Coliforms	9	<1	<1	<1	<1	<1	<1
E. Coli	1	<1	<1	<1	<1	<1	<1
Turbidity	7.03	0.25	0.37	0.21	0.27	0.23	0.27
Mar 18 / 2024	Result	Result	Result	Result	Result	Result	Result
Chlorine Free	0	1.08	0.79	0.76	0.57	0.42	0.46
Chlorine Total	0	1.58	1.20	1.32	1.03	0.83	0.98
Total Coliforms	88	<1	<1	<1	<1	<1	<1
E. Coli	<1	<1	<	<1	<1	<1	<1
Turbidity		0.19	0.28	0.32	0.33	0.39	0.42
April 02/2024	Result	Result	Result	Result	Result	Result	Result
Chlorine Free	0	1.15	0.52	0.98	0.55	0.87	0.50
Chlorine Total	0	1.47	1.00	1.53	1.17	1.40	0.99
Total Coliforms	16	<1	<1	<1	<1	<1	<1
E. Coli	<1	<1	<1	<1	<1	<1	<1
Turbidity		0.22	0.44	0.30	0.40	0.39	0.65
April 15/2024	Result	Result	Result	Result	Result	Result	Result
Chlorine Free	0	1.10	0.95	1.15	0.70	0.90	0.60
Chlorine Total	0	1.65	1.44	1.57	1.20	1.37	1.04
Total Coliforms	24	<1	<1	<1	<1	<1	<1
E. Coli	1	<1	<1	<1	<1	<1	<1
Turbidity		0.25	0.98	0.34	0.26	0.42	0.41
April 29/2024	Result	Result	Result	Result	Result	Result	Result
Chlorine Free	0	1.15	0.34	1.25	0.69	0.79	0.49
Chlorine Total	0	1.65	0.82	1.69	1.07	1.26	0.91
Total Coliforms	29	<1	<1	<1	<1	<1	<1
E. Coli	<1	<1	<1	<1	<1	<1	<1
Turbidity		0.38	0.65	0.28	0.42	0.48	0.60
May 13/ 2024	Result	Result	Result	Result	Result	Result	Result
Chlorine Free	0	0.97	0.37	1.35	0.70	0.84	0.61
Chlorine Total	0	1.48	0.81	1.69	1.08	1.11	0.97
Total Coliforms	70	<1	<1	<1	<1	<1	<1
E. Coli	1	<1	<1	<1	<1	<1	<1
Turbidity		0.22	0.41	0.27	0.26	0.36	0.26
May 27 / 2024	Result	Result	Result	Result #5 @ PWC	Result	Result	Result
Chlorine Free	0	1.06	1.14	0.89	1.16	1.02	0.91
Chlorine Total	0	1.55	1.55	1.34	1.58	1.49	1.36
Total Coliforms	<200	<1	<1	<1	<1	<1	<1
E. Coli	144	<1	<1	<1	<1	<1	<1
Turbidity		0.18	0.23	0.30	0.26	0.24	0.36
June 11 / 2024	Result	Result	Result	Result	Result Camp Site # 69	Result	Result
Chlorine Free	0	1.19	0.31	0.46	0.96	0.63	0.45
Chlorine Total	0	1.75	0.78	0.88		1.11	0.90

Total Coliforms E. Coli Turbidity	298.7 <1	<1 <1 0.16	<1 <1 0.23	<1 <1 0.23	1.55 <1 <1 0.31	<1 <1 0.23	<1 <1 0.23
June24 / 2024 Chlorine Free Chlorine Total Total Coliforms E. Coli Turbidity	Result 0 0 2419.6 2.0	Result 1.19 1.67 <1 <1 0.20	Result 0.26 0.86 <1 <1 0.25	Result 0.71 1.27 <1 <1 0.31	Result Camp Site # 69 1.05 1.49 <1 <1 0.37	Result 0.68 1.12 <1 <1 0.39	Result 0.35 0.83 <1 <1 0.40
July 8/ 2024 Chlorine Free Chlorine Total Total Coliforms E. Coli Turbidity	Result 0 0 601.5 2.0	Result 1.05 1.45 <1 <1 0.16	Result 0.44 0.80 <1 <1 0.33	Result 0.99 1.51 <1 <1 0.31	Result Camp Site # 74 0.63 0.96 <1 <1 0.27	Result 0.47 0.92 <1 <1 0.30	Result 0.50 0.98 <1 <1 0.35
July 22/ 2024 Chlorine Free Chlorine Total Total Coliforms E. Coli Turbidity	Result 0 0 1986.3 2.0	Result 1.21 1.63 <1 <1 0.12	Result 0.64 1.13 <1 <1 0.39	Result 0.64 1.09 <1 <1 0.20	Result Camp Site # 68 0.86 1.47 <1 <1 0.25	Result 0.67 1.06 <1 <1 0.24	Result 0.53 0.93 <1 <1 0.43
Aug 06/ 2024 Chlorine Free Chlorine Total Total Coliforms E. Coli Turbidity	Result 0 0 1011.3 3	Result 1.17 1.63 <1 <1 0.16	Result 0.54 0.91 <1 <1 0.32	Result 0.82 1.33 <1 <1 0.17	Result Camp Site # 69 1.12 1.53 <1 <1 0.24	Result 0.91 1.37 <1 <1 0.18	Result 0.53 0.94 <1 <1 0.30
Aug 19 / 2024 Chlorine Free Chlorine Total Total Coliforms E. Coli Turbidity	Result 0 0 791.5 <1	Result 1.12 1.53 <1 <1 0.17	Result 0.45 0.83 <1 <1 0.36	Result 0.58 1.05 <1 <1 0.26	Result Camp Site # 68 0.96 1.44 <1 <1 0.23	Result 0.78 1.19 <1 <1 0.29	Result 0.70 1.18 <1 <1 0.23
Sept 03 / 2024 Chlorine Free Chlorine Total Total Coliforms E. Coli Turbidity	Result 0 0 920.8 1	Result 1.02 1.35 <1 <1 0.20	Result 0.31 0.70 <1 <1 0.46	Result 1.04 1.58 <1 <1 0.12	Result Camp Site # 69 0.95 1.37 <1 <1 0.25	Result 0.64 0.99 <1 <1 0.20	Result 0.41 0.83 <1 <1 0.45
Sept 16 / 2024 Chlorine Free Chlorine Total	Result 0 0	Result 1.07 1.48	Result 0.25 0.61	Result 0.92 1.46	Result Camp Site # 69 0.99 1.37	Result 0.32 0.68	Result 0.53 0.94

Total Coliforms	727	<1	<1	<1	<1	<1	<1
E. Coli	1	<1	<1	<1	<1	<1	<1
Turbidity		0.16	0.35	0.35	0.42	0.38	0.36
Oct 01 / 2024	Result	Result	Result	Result	Result	Result	Result
Chlorine Free	0	0.99	0.40	0.82	0.91	0.23	0.32
Chlorine Total	0	1.42	0.82	1.30	1.33	0.66	0.68
Total Coliforms	755.6	<1	<1	<1	<1	<1	<1
E. Coli	6.2	<1	<1	<1	<1	<1	<1
Turbidity		0.19	0.27	0.23	0.28	0.36	0.30
Oct 15 / 2024	Result	Result	Result	Result	Result	Result	Result
Chlorine Free	0	1.09	0.35	1.07	0.40	0.75	0.47
Chlorine Total	0	1.47	0.81	1.54	0.83	1.21	0.93
Total Coliforms	185	<1	<1	<1	<1	<1	<1
E. Coli	1	<1	<1	<1	<1	<1	<1
Turbidity		0.18	0.31	0.21	0.27	0.24	0.23
Oct 24 / 2024	Result	Result	Result	Result	Result	Result	Result
Chlorine Free	0	1.01	0.63	0.57	0.31	0.67	0.57
Chlorine Total	0	1.41	1.10	1.24	0.81	1.09	0.97
Total Coliforms	70.9	<1	<1	<1	<1	<1	<1
E. Coli	2	<1	<1	<1	<1	<1	<1
Turbidity	-	0.18	0.28	0.14	0.25	0.32	0.35
Nov 12 / 2024	Result	Result	Result	Result	Result	Result	Result
Chlorine Free	0	1.13	0.79	1.23	0.67	0.92	0.72
Chlorine Total	0	1.61	1.29	1.79	1.14	1.41	1.21
Total Coliforms	113.7	<1	<1	<1	<1	<1	<1
E. Coli	<1	<1	<1	<1	<1	<1	<1
Turbidity		0.17	0.33	0.38	0.22	0.25	0.32
Nov 25 / 2024	Result	Result	Result	Result	Result	Result	Result
Chlorine Free	0	1.23	1.08	1.18	0.61	0.97	0.71
Chlorine Total	0	1.69	1.58	1.70	1.08	1.21	1.20
Total Coliforms	248.1	<1	<1	<1	<1	<1	<1
E. Coli	32.3	<1	<1	<1	<1	<1	<1
Turbidity	-	0.21	0.31	0.14	0.27	0.40	0.39
Dec 11 / 2024	Result	Result	Result	Result	Result	Result	Result
Chlorine Free	0	1.32	0.155	0.70	0.36	0.84	0.43
Chlorine Total	0	1.80	0.49	1.17	0.83	1.27	0.86
Total Coliforms	10.9	<1	<1	<1	<1	<1	<1

E. Coli Turbidity	<1 -	<1 0.17	<1 0.27	<1 0.18	<1 0.22	<1 0.23	<1 0.39
Dec 19 / 2024	Result	Result	Result	Result	Result	Result	Result
Chlorine Free Chlorine Total Total Coliforms E. Coli Turbidity	0 0 17.1 <1 -	1.18 1.64 <1 <1 0.23	0.71 1.22 <1 <1 0.27	0.78 1.31 <1 <1 0.13	0.45 0.94 <1 <1 0.23	0.75 1.23 >1 <1 0.31	0.51 1.00 <1 <1 0.31

Table-2

Trihalomethane Test Results

February 2024	Fire Hall	Public Works Garage
THM Preserved:		
• Bromodichloromethane mg/l • Bromoform mg/l • Dibromochloromethane mg/l • Chloroform mg/L	0.0208 <0.0010 0.0056 0.0777	0.0207 <0.0010 0.0047 0.0808
• THMs mg/l	**0.104**	**0.106**
Sample Location	**Civic Center**	**Rec Center**
• Total Haloacetic Acid ug/L	53.2	58.3

June 05/ 2024	Fire Hall	Public Works Garage
THM Preserved:		
• Bromodichloromethane mg/l	0.0183	0.0192
• Bromoform mg/l	<0.0010	<0.0010
• Dibromochloromethane mg/l	0.0057	0.0032
• Chloroform	0.0992	0.130
• THMs mg/l	**0.123**	**0.152**
Sample Location	**Civic Center**	**Rec Center**
• Total Haloacetic Acid ug/L	**84.1**	70.2

Aug 13 / 2024	Fire Hall	Public Works Garage
THM Preserved:		
• Bromodichloromethane mg/l	0.0243	0.0233
• Bromoform mg/l	<0.0010	<0.0010
• Dibromochloromethane mg/l	0.0043	0.0039
• Chloroform	0.162	0.164
• THMs mg/l	**0.191**	**0.191**
Sample Location	**Civic Center**	**C.S. # 67**
• Total Haloacetic Acid ug/L	**84.7**	79.8

Nov 12 / 2024	Fire Hall	Public Works Garage
THM Preserved:		
• Bromodichloromethane mg/l	0.0208	0.0178
• Bromoform mg/l	<0.0010	<0.0010
• Dibromochloromethane mg/l	0.0042	0.0014
• Chloroform	0.128	0.133
• THMs mg/l	**0.153**	**0.152**
Sample Location	**Civic Center**	**Rec Center**
• Total Haloacetic Acid ug/L	**80.8**	78.6

Table-3

Manganese Test Results

Analyte	Units	Aesthetic Limit	Max Limit
Manganese	µg/L	20	120

Date	Raw	Treated	Public Works	Fire Hall	Civic Center	Rec Center	Camp Site # 69
Feb 05	1130	7.85	7.04	6.62	6.92	7.04	-
June 04	549	1.53	-	3.36	-	-	-
Aug 13	844	-	2.42		1.34	-	1.49
Nov 12	926	-	5.03	4.68	-	3.06	-

How well Morden complied with standards and license during 2024?
The table below provides the city's compliance with the license/standards.

Parameter	Monitoring Requirement	Quality Standard	Performance
Total Coliform	Biweekly sampling program with each set of samples consisting of one raw, one treated and a minimum of 5 distribution samples	Less than one total coliform bacteria detectable per 100 mL in all treated and distributed water	100% Compliance
E. coli		Less than one E. coli bacteria detectable per 100 mL in all treated and distributed water	100% Compliance
Chlorine Residuals			
Free chlorine (treated water)	Treated water – Continuous sampling (online monitoring) of water entering the distribution system following 20 minutes of contact time. A confirmatory sample to be taken daily at the online analyzer sampling or effluent point	A free chlorine residual of at least 0.5 mg/L in water entering the distribution system following a minimum contact time of 20 minutes.	100% Compliance
Free chlorine (distribution system)	At the same times and location(s) as bacteriological distribution sampling	A free chlorine residual of at least 0.1 mg/L at all times at any point in the water distribution system	100% Compliance
Total chlorine (treated water)	One sample per day of water entering the distribution system following at least 20 minutes of contact time		100% Compliance
Total chlorine (distribution system)	At the same times and location(s) as bacteriological distribution sampling		
Ultraviolet Disinfection	Continuous monitoring of UV dosage for each operating UV unit	95% of water produced per month is disinfected within validated conditions.	1 Incident below 95% of produced water disinfected within validated conditions.

Turbidity	One raw water sample per day Continuous (online monitoring) sampling of the effluent from each operating particulate filter A confirmatory sample to be taken daily at the online turbidity analyzer sampling or effluent point	Less than or equal to 0.3 NTU in 95% of the measurements in a month of the effluent from each operating filter Not exceed 0.3 NTU for more than 12 consecutive hours of filter operation Not exceed 1.0 NTU for any measurement	3 Incidents below 95% of the measurements taken within the month. 100% Compliance 100% Compliance
Total trihalomethanes (THMs)	Two preserved samples taken on a quarterly basis during February, May, August and November, every year at the furthest points in the distribution system.	Less than or equal to 0.10 mg/L as locational running annual average of quarterly samples	**Non-compliant (results below)**
Total Haloacetic Acids (HAAs)	Two preserved samples taken on a quarterly basis during February, May, August and November, every year at the furthest points in the distribution system.	Less than or equal to 0.08 mg/L as locational running annual average of quarterly samples	**63** % Compliance **(results below)**
Arsenic	One raw and one treated sample taken every year	Less than or equal to 0.01 mg/L	100% Compliance
Lead	As per instructions of the Drinking Water Officer	Less than or equal to 0.005 mg/L	100% Compliance
Manganese	One raw and one treated water sample every year. One distribution sample taken on a quarterly basis during February, May, August and November	Less than or equal to 0.12 mg/L	100% Compliance
Total Microcystins	One raw water sample in August every year and event-based testing as per ODW guidelines	Less than or equal to 0.0015 mg/L	100% Compliance

How do we plan to meet Standards for Trihalomethanes? (THM's)
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 0.1 mg/l based on a running average of quarterly samples.
The City of Morden is currently exceeding this standard based on the running average of our quarterly samples with results of 0.157 and 0.147 mg/l, which are above the regulated limit.

The City of Morden through assistance from Water Services Board and Associated Engineering is exploring the best option for future upgrades to Morden Water treatment Plant to address THM issues. The City has also budgeted for the ultrasonic algae treatment for lake Minnewasta in 2025 to improve the raw water quality and to reduce the organic content in the raw water. The work is in progress to construct new Standpipe with provision for a THM air stripping system for removal of THMs before pushing water into the distribution system. City is hopeful that these projects will bring the THM levels within the limits.

Haloacetic acids are currently below regulatory guidelines.

Does City have a Lead testing program?
In March 2019, Health Canada lowered the national guideline for lead in drinking water from a maximum acceptable concentration of 0.01 milligrams per litre (mg/L) to 0.005 mg/L based on a sample of water taken at the consumer tap. Manitoba adopted this new guideline as a drinking water quality standard in 2020.
City conducted lead monitoring in 2022 and 2023. The test results are presented in the Table-4 and Table-5 below. The test results are within the prescribed limits.

Table-4

LEAD TESTING 2022		
Test site ID#	Date sampled	Test Results
1	July 25 2022	0.004190
2	July 25 2022	0.001230
3	July 25 2022	0.000119
4	July 25 2022	0.000835
5	July 25 2022	0.001050
6	July 25 2022	0.000665
7	July 25 2022	0.001800
8	July 25 2022	0.000429
9	July 25 2022	0.001340
10	Oct 17 2022	0.0007700
11	Oct 17 2022	0.0001800
12	Oct 17 2022	0.0005800
13	Oct 17 2022	0.0006750
14	Oct 17 2022	0.0001650

15	Oct 17 2022	0.0001130
16	Oct 17 2022	0.0001830
17	Oct 17 2022	0.0001430
18	Oct 17 2022	0.0005130
19	Oct 17 2022	0.0002940
20	Oct 20 2022	0.0001370
21	Oct 20 2022	0.0003730
22	Nov 28 2022	0.000517
23	Nov 28 2022	0.001480
24	Nov 28 2022	0.000528
25	Nov 28 2022	0.002230
26	Nov 28 2022	0.000059
27	Nov 28 2022	0.000470
28	Nov 28 2022	0.000087
29	Dec 12 2022	0.001480
30	Dec 12 2022	0.000414

Table-5

Lead Testing-2023		
Site #	Date Sampled	Results
1	July 26 2023	0.00048
2	July 26 2023	0.00126
3	July 26 2023	0.00086
4	July 26 2023	0.00157
5	July 26 2023	0.00108
6	July 26 2023	0.00057
7	July 26 2023	0.00103
8	July 26 2023	0.00447
9	Oct 24 2023	0.00088
10	Oct 24 2023	0.00044
11	Oct 24 2023	0.00230
12	Oct 24 2023	0.00019
13	Oct 24 2023	0.00271
14	Oct 24 2023	0.00031
15	Oct 24 2023	0.00074
16	Oct 24 2023	0.00022
17	Oct 24 2023	0.00019
18	Oct 24 2023	0.00073
19	Oct 24 2023	0.00277

20	Oct 24 2023	0.00189
21	Oct 24 2023	0.00039
22	Oct 24 2023	0.00198
23	Oct 24 2023	0.00083
24	Oct 24 2023	0.00022
25	Oct 24 2023	0.00139
26	Oct 24 2023	0.00083
27	Oct 24 2023	0.00076
28	Oct 24 2023	0.00144
29	Oct 24 2023	0.00031
30	Oct 24 2023	0.00148
31	Oct 24 2023	0.00076
32	Oct 24 2023	0.00032
33	Oct 24 2023	0.00024
34	Oct 24 2023	0.00018

Does the City of Morden have certified trained personnel?
The water plant is a Level III Water Treatment Facility. We currently have one Certified Level III WT / Level II Distribution operator and one Level II WT / Level I Distribution Operator and one Level I operator working at the water treatment plant.

The distribution system is a Level II facility. Public Works has 4 operators, who have Water Distribution Class II, Wastewater Collection II, and Wastewater treatment class I. One of the operators in Public Works also has Water Treatment Class III. One also has Wastewater Treatment II. Public Works also has 1 operator-in-training, who has Level I Distribution and Level I Wastewater Collection.

The facility classification and operator certification fall under the Environment Act's Water and Wastewater Facility operators Regulation

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 2024?
There was one precautionary boil water advisories during the planned replacement of water main on 6th Street Block 400. Tests were sent away when completed. They came back good, and the advisories were rescinded.

Were there any major expenses incurred in 2024?

Following major expenses were incurred in 2024.

- Distribution pumps replaced.
- Chlorine injection system for south reservoir upgraded.
- Chlorine injection system for north reservoir. upgraded
- Following mag-meters were replaced:
    - Clarifier Train # one and two
    - Filter To Clear Well
    - Backwash
- Effluent filter cell valves were replaced, and air actuators upgraded with electric actuators.
- Upgrade of SCADA system in progress.
- Soda ash day tank was replaced with a stainless-steel tank.
- Upgrade lime feed injection system to peristaltic pumps.
- Renewal of 240m of DI pipe with HDPE pipe on 6th Street Block 400.

Future system expansion or expenses expected?

City has budgeted for following upgrades/renewals in 2024.

- Ultrasonic algae treatment to improve raw water quality.
- Preliminary design for Pembina River to Dead Horse Creek water diversion to augment raw water supply was competed and stakeholder consultation is in progress.
- Standpipe upgrade with TRS system is in progress and expected to be commissioned by end of 2025.
- City has signed a revised agreement with PVWC for more allocation of treated water.

In addition to the above initiatives City has received funding from MWSB to study the feasibility of a 2nd reservoir upstream of the lake. MWSB will be requesting proposals for the study in 2025. City will continue to invest in the water infrastructure to ensure the sustainability of Morden water supply.

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

For general questions during business hours , call the City of Morden office from 9:00 a.m. to 4:30 p.m. or email info@mymorden.ca

Annexure-A

ALS Canada Ltd.

right solutions.
right partner.

CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	: **WP2414346**	Page	: 1 of 12
Client	: **Manitoba Conservation & Climate**	Laboratory	: ALS Environmental - Winnipeg
Contact	: RETIRED Melanie Betsill	Account Manager	: Sheriza Rajack-Ahamed
Address	: 14 Fultz Boulevard Winnipeg MB Canada R3Y 0L6	Address	: 1329 Niakwa Road East, Unit 12 Winnipeg, Manitoba Canada R2J 3T4
Telephone	: 204 945 5776	Telephone	: +1 204 255 9720
Project	: Morden - PWS - 145.00	Date Samples Received	: 05-Jun-2024 11:01
PO	: ----	Date Analysis Commenced	: 05-Jun-2024
C-O-C number	: ----	Issue Date	: 13-Jun-2024 20:03
Sampler	: ----		
Site	: Morden - PWS 145.00 Op Id: 16133		
Quote number	: 2024 WTP Chemistry		
No. of samples received	: 10		
No. of samples analysed	: 10		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Gerry Vera	Analyst	Organics, Winnipeg, Manitoba
Lee McTavish		Inorganics, Winnipeg, Manitoba
Lee McTavish		Metals, Winnipeg, Manitoba
Oleksandr Busel		Inorganics, Winnipeg, Manitoba
Oleksandr Busel		Metals, Winnipeg, Manitoba
Sanja Risticevic	Department Manager - LCMS	LCMS, Waterloo, Ontario

Summary of Guideline Breaches by Sample

SampleID/Client ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
MORDEN 1 - RAW	Water	Colour, true	May interfere with disinfection; removal is important to ensure effective treatment.	CDWG	AO	27.2 CU	15 CU
	Water	Solids, total dissolved [TDS]	Based on taste; TDS above 500 mg/L results in excessive scaling in water pipes, water heaters, boilers and appliances; TDS is composed of calcium, magnesium, sodium, potassium, carbonate, bicarbonate, chloride, sulphate and nitrate.	CDWG	AO	627 mg/L	500 mg/L
	Water	Turbidity	For systems that use groundwater, turbidity should generally be below 1.0 NTU. Filtration systems should be designed and operated to reduce turbidity levels as low as reasonably achievable and strive to achieve a treated water turbidity target from individual filters of less than 0.1 NTU.	CDWG	AO	8.72 NTU	1 NTU
	Water	Manganese, total	Based on taste and staining of laundry and plumbing fixtures.	CDWG	AO	549 µg/L	20 µg/L
	Water	Manganese, total	Health Basis of MAC: Effects on neurological development and behaviour; deficits in memory, attention, and motor skills. Other: Formula-fed infants (where water containing manganese at levels above the MAC is used to prepare formula) may be especially at risk.	CDWG	MAC	549 µg/L	120 µg/L
	Water	Aluminum, total	The OG value is established to minimize the potential for the distribution system and to avoid other operational and aesthetic issues. It takes treatment achievability into consideration.	CDWG	OG	211 µg/L	100 µg/L
MORDEN 2 -TREATED	Water	Solids, total dissolved [TDS]	Based on taste; TDS above 500 mg/L results in excessive scaling in water pipes, water heaters, boilers and appliances; TDS is composed of calcium, magnesium, sodium, potassium, carbonate, bicarbonate, chloride, sulphate and nitrate.	CDWG	AO	530 mg/L	500 mg/L
MORDEN 3 - DISTRIBUTION @ FIRE HALL	Water	Trihalomethanes [THMs], total	Health basis of MAC: Liver effects (fatty cysts) (chloroform classified as possible carcinogen). Other: Kidney and colorectal cancers.	CDWG	MAC	0.123 mg/L	0.1 mg/L
MORDEN 3 - DISTRIBUTION @ CIVIC CENTRE	Water	Haloacetic acids, total [HAA5]	Health basis of MAC: Liver cancer (DCA); DCA is classified as probably carcinogenic to humans. Other: Other organ cancers (DCA, DBA, TCA); liver and other organ effects (body, kidney and testes weights) (MCA).	CDWG	MAC	84.1 µg/L	80 µg/L
MORDEN 3 - DISTRIBUTION @ PWG	Water	Trihalomethanes [THMs], total	Health basis of MAC: Liver effects (fatty cysts) (chloroform classified as possible carcinogen). Other: Kidney and colorectal cancers.	CDWG	MAC	0.152 mg/L	0.1 mg/L

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.
Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key : LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	no units
%	percent
% T/cm	% transmittance per centimetre
µg/L	micrograms per litre
µS/cm	microsiemens per centimetre
AU/cm	absorbance units per centimetre
CU	colour units (1 cu = 1 mg/l pt)
meq/L	milliequivalents per litre
mg/L	milligrams per litre
NTU	nephelometric turbidity units
pH units	pH units

>: greater than.
<: less than.
Red shading is applied where the result or the LOR is greater than the Guideline Upper Limit (or lower than the Guideline Lower Limit, if applicable).
For drinking water samples, Red shading is applied where the result for E.coli, fecal or total coliforms is greater than or equal to the Guideline Upper Limit.

Analytical Results Evaluation

Matrix: **Drinking Water**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID: MORDEN 1 - RAW	MORDEN 2 -TREATED	MORDEN 3 - DISTRIBUTION @ FIRE HALL	MORDEN 3 - DISTRIBUTION @ CIVIC CENTRE	MORDEN 3 - DISTRIBUTION @ PWG	MORDEN 3 - DISTRIBUTION @ REC CENTRE	MORDEN 3 - DISTRIBUTION @ FIRE HALL
				Sampling date/time: 04-Jun-2024 14:10	04-Jun-2024 14:00	04-Jun-2024 13:25	04-Jun-2024 13:40	04-Jun-2024 13:10	04-Jun-2024 13:45	04-Jun-2024 13:25
				Sub-Matrix: Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water
				WP2414346-001	WP2414346-002	WP2414346-003	WP2414346-004	WP2414346-005	WP2414346-006	WP2414346-007
Physical Tests										
Absorbance, UV (@ 254nm)	----	E404/WP	AU/cm	0.310	0.0860	----	----	----	----	----
Alkalinity, bicarbonate (as CaCO3)	----	E290/WP	mg/L	168	41.2	----	----	----	----	----
Alkalinity, carbonate (as CaCO3)	----	E290/WP	mg/L	<1.0	<1.0	----	----	----	----	----
Alkalinity, hydroxide (as CaCO3)	----	E290/WP	mg/L	<1.0	<1.0	----	----	----	----	----
Alkalinity, total (as CaCO3)	----	E290/WP	mg/L	168	41.2	----	----	----	----	----
Colour, true	----	E329/WP	CU	27.2	<5.0	----	----	----	----	----
Conductivity	----	E100/WP	µS/cm	924	829	----	----	----	----	----
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/WP	mg/L	387	189	----	----	----	----	----
Langelier index (@ 4°C)	----	EC105A/WP	-	0.624	-0.870	----	----	----	----	----
Langelier index (@ 60°C)	----	EC105A/WP	-	1.37	-0.111	----	----	----	----	----
pH	----	E108/WP	pH units	8.22	7.60	----	----	----	----	----
Solids, total dissolved [TDS]	----	E162-L/WP	mg/L	627	530	----	----	----	----	----
Turbidity	----	E121/WP	NTU	8.72	<0.10	----	----	----	----	----
Transmittance, UV (@ 254nm)	----	E404/WP	% T/cm	49.0	82.0	----	----	----	----	----
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/WP	mg/L	0.278	0.0112	----	----	----	----	----
Bromide	24959-67-9	E235.Br-T/WP	mg/L	0.013	<0.010	----	----	----	----	----
Chloride	16887-00-6	E235.Cl-L/WP	mg/L	15.8	23.2	----	----	----	----	----
Fluoride	16984-48-8	E235.F/WP	mg/L	0.276	0.644	----	----	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3-L/WP	mg/L	0.934	1.07	----	----	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2-L/WP	mg/L	0.0443	<0.0010	----	----	----	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4/WP	mg/L	310	320	----	----	----	----	----
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L/WP	mg/L	11.9	7.43	----	----	----	----	----
Carbon, total organic [TOC]	----	E355-L/WP	mg/L	11.4	6.63	----	----	----	----	----
Ion Balance										

Analytical Results Evaluation

Matrix: **Drinking Water**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID	MORDEN 1 - RAW	MORDEN 2 -TREATED	MORDEN 3 - DISTRIBUTION @ FIRE HALL	MORDEN 3 - DISTRIBUTION @ CIVIC CENTRE	MORDEN 3 - DISTRIBUTION @ PWG	MORDEN 3 - DISTRIBUTION @ REC CENTRE	MORDEN 3 - DISTRIBUTION @ FIRE HALL
				Sampling date/time	04-Jun-2024 14:10	04-Jun-2024 14:00	04-Jun-2024 13:25	04-Jun-2024 13:40	04-Jun-2024 13:10	04-Jun-2024 13:45	04-Jun-2024 13:25
				Sub-Matrix	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water
					WP2414346-001	WP2414346-002	WP2414346-003	WP2414346-004	WP2414346-005	WP2414346-006	WP2414346-007
Ion Balance											
Anion sum	----	EC101A/WP	meq/L		10.3	8.25	----	----	----	----	----
Cation sum (total)	----	EC101A/WP	meq/L		10.3	8.14	----	----	----	----	----
Ion balance (cations/anions)	----	EC101A/WP	%		100	98.7	----	----	----	----	----
Ion balance (APHA)	----	EC101A/WP	%		<0.010	-0.671	----	----	----	----	----
Total Metals											
Aluminum, total	7429-90-5	E420/WP	µg/L		211	21.1	----	----	----	----	----
Antimony, total	7440-36-0	E420/WP	µg/L		0.51	0.46	----	----	----	----	----
Arsenic, total	7440-38-2	E420/WP	µg/L		3.39	0.74	----	----	----	----	----
Barium, total	7440-39-3	E420/WP	µg/L		28.8	8.78	----	----	----	----	----
Beryllium, total	7440-41-7	E420/WP	µg/L		<0.020	Not Detected	----	----	----	----	----
Bismuth, total	7440-69-9	E420/WP	µg/L		<0.050	Not Detected	----	----	----	----	----
Boron, total	7440-42-8	E420/WP	µg/L		109	80	----	----	----	----	----
Cadmium, total	7440-43-9	E420/WP	µg/L		0.0453	0.0201	----	----	----	----	----
Calcium, total	7440-70-2	E420/WP	µg/L		84500	43600	----	----	----	----	----
Cesium, total	7440-46-2	E420/WP	µg/L		0.051	0.022	----	----	----	----	----
Chromium, total	7440-47-3	E420/WP	µg/L		0.51	<0.50	----	----	----	----	----
Cobalt, total	7440-48-4	E420/WP	µg/L		0.72	0.17	----	----	----	----	----
Copper, total	7440-50-8	E420/WP	µg/L		10.0	43.9	----	----	----	----	----
Iron, total	7439-89-6	E420/WP	µg/L		281	<10	----	----	----	----	----
Lead, total	7439-92-1	E420/WP	µg/L		0.217	<0.050	----	----	----	----	----
Lithium, total	7439-93-2	E420/WP	µg/L		61.5	58.9	----	----	----	----	----
Magnesium, total	7439-95-4	E420/WP	µg/L		42800	19400	----	----	----	----	----
Manganese, total	7439-96-5	E420/WP	µg/L		549	1.53	----	----	----	----	3.36
Molybdenum, total	7439-98-7	E420/WP	µg/L		6.39	6.49	----	----	----	----	----
Nickel, total	7440-02-0	E420/WP	µg/L		7.46	2.26	----	----	----	----	----
Phosphorus, total	7723-14-0	E420/WP	µg/L		210	<50	----	----	----	----	----
Potassium, total	7440-09-7	E420/WP	µg/L		8820	8860	----	----	----	----	----

Analytical Results Evaluation

Matrix: **Drinking Water**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID	MORDEN 1 - RAW	MORDEN 2 -TREATED	MORDEN 3 - DISTRIBUTION @ FIRE HALL	MORDEN 3 - DISTRIBUTION @ CIVIC CENTRE	MORDEN 3 - DISTRIBUTION @ PWG	MORDEN 3 - DISTRIBUTION @ REC CENTRE	MORDEN 3 - DISTRIBUTION @ FIRE HALL
				Sampling date/time	04-Jun-2024 14:10	04-Jun-2024 14:00	04-Jun-2024 13:25	04-Jun-2024 13:40	04-Jun-2024 13:10	04-Jun-2024 13:45	04-Jun-2024 13:25
				Sub-Matrix	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water
					WP2414346-001	WP2414346-002	WP2414346-003	WP2414346-004	WP2414346-005	WP2414346-006	WP2414346-007
Total Metals											
Rubidium, total	7440-17-7	E420/WP	µg/L		3.35	3.19	----	----	----	----	----
Selenium, total	7782-49-2	E420/WP	µg/L		3.61	3.13	----	----	----	----	----
Silicon, total	7440-21-3	E420/WP	µg/L		7830	3800	----	----	----	----	----
Silver, total	7440-22-4	E420/WP	µg/L		<0.010	Not Detected	----	----	----	----	----
Sodium, total	7440-23-5	E420/WP	µg/L		52300	95100	----	----	----	----	----
Strontium, total	7440-24-6	E420/WP	µg/L		408	218	----	----	----	----	----
Sulfur, total	7704-34-9	E420/WP	µg/L		113000	114000	----	----	----	----	----
Tellurium, total	13494-80-9	E420/WP	µg/L		<0.20	<0.20	----	----	----	----	----
Thallium, total	7440-28-0	E420/WP	µg/L		0.041	0.020	----	----	----	----	----
Thorium, total	7440-29-1	E420/WP	µg/L		<0.10	Not Detected	----	----	----	----	----
Tin, total	7440-31-5	E420/WP	µg/L		<0.10	0.17	----	----	----	----	----
Titanium, total	7440-32-6	E420/WP	µg/L		5.58	<0.30	----	----	----	----	----
Tungsten, total	7440-33-7	E420/WP	µg/L		Not Detected	<0.10	----	----	----	----	----
Uranium, total	7440-61-1	E420/WP	µg/L		9.97	0.339	----	----	----	----	----
Vanadium, total	7440-62-2	E420/WP	µg/L		5.60	3.00	----	----	----	----	----
Zinc, total	7440-66-6	E420/WP	µg/L		14.6	61.7	----	----	----	----	----
Zirconium, total	7440-67-7	E420/WP	µg/L		0.43	Not Detected	----	----	----	----	----
Volatile Organic Compounds [THMs]											
Bromodichloromethane	75-27-4	E611B/WP	mg/L		----	----	0.0183	----	0.0192	----	----
Bromoform	75-25-2	E611B/WP	mg/L		----	----	<0.0010	----	<0.0010	----	----
Chloroform	67-66-3	E611B/WP	mg/L		----	----	0.0992	----	0.130	----	----
Dibromochloromethane	124-48-1	E611B/WP	mg/L		----	----	0.0057	----	0.0032	----	----
Trihalomethanes [THMs], total	----	E611B/WP	mg/L		----	----	0.123	----	0.152	----	----
Volatile Organic Compounds [THMs] Surrogates											
Bromofluorobenzene, 4-	460-00-4	E611B/WP	%		----	----	88.2	----	88.5	----	----
Difluorobenzene, 1,4-	540-36-3	E611B/WP	%		----	----	103	----	101	----	----

Analytical Results Evaluation

Matrix: **Drinking Water**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID	MORDEN 1 - RAW	MORDEN 2 -TREATED	MORDEN 3 - DISTRIBUTION @ FIRE HALL	MORDEN 3 - DISTRIBUTION @ CIVIC CENTRE	MORDEN 3 - DISTRIBUTION @ PWG	MORDEN 3 - DISTRIBUTION @ REC CENTRE	MORDEN 3 - DISTRIBUTION @ FIRE HALL
				Sampling date/time	04-Jun-2024 14:10	04-Jun-2024 14:00	04-Jun-2024 13:25	04-Jun-2024 13:40	04-Jun-2024 13:10	04-Jun-2024 13:45	04-Jun-2024 13:25
				Sub-Matrix	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water
					WP2414346-001	WP2414346-002	WP2414346-003	WP2414346-004	WP2414346-005	WP2414346-006	WP2414346-007
Haloacetic Acids											
Dibromoacetic acid	631-64-1	E750/WT	µg/L		----	----	----	<1.00	----	<1.00	----
Dichloroacetic acid	79-43-6	E750/WT	µg/L		----	----	----	37.6	----	31.2	----
Monobromoacetic acid	79-08-3	E750/WT	µg/L		----	----	----	<1.00	----	<1.00	----
Monochloroacetic acid	79-11-8	E750/WT	µg/L		----	----	----	4.22	----	3.25	----
Trichloroacetic acid	76-03-9	E750/WT	µg/L		----	----	----	42.3	----	35.8	----
Haloacetic acids, total [HAA5]	n/a	E750/WT	µg/L		----	----	----	84.1	----	70.2	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results Evaluation

Matrix: **Drinking Water**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID	MORDEN 3 - DISTRIBUTION @ CIVIC CENTREE	MORDEN 3 - DISTRIBUTION @ REC CENTRE	MORDEN 3 - DISTRIBUTION @ PWG	----	----	----	----
				Sampling date/time	04-Jun-2024 13:40	04-Jun-2024 13:45	04-Jun-2024 13:10	----	----	----	----
				Sub-Matrix	Drinking Water	Drinking Water	Drinking Water	----	----	----	----
					WP2414346-008	WP2414346-009	WP2414346-010	--------	--------	--------	--------
Total Metals											
Aluminum, total	7429-90-5	E420/WP	µg/L		----	----	15.4	----	----	----	----
Antimony, total	7440-36-0	E420/WP	µg/L		----	----	0.49	----	----	----	----
Arsenic, total	7440-38-2	E420/WP	µg/L		----	----	0.74	----	----	----	----
Barium, total	7440-39-3	E420/WP	µg/L		----	----	12.2	----	----	----	----
Beryllium, total	7440-41-7	E420/WP	µg/L		----	----	<0.020	----	----	----	----
Bismuth, total	7440-69-9	E420/WP	µg/L		----	----	Not Detected	----	----	----	----
Boron, total	7440-42-8	E420/WP	µg/L		----	----	76	----	----	----	----
Cadmium, total	7440-43-9	E420/WP	µg/L		----	----	<0.0050	----	----	----	----
Calcium, total	7440-70-2	E420/WP	µg/L		----	----	47500	----	----	----	----
Cesium, total	7440-46-2	E420/WP	µg/L		----	----	0.020	----	----	----	----
Chromium, total	7440-47-3	E420/WP	µg/L		----	----	<0.50	----	----	----	----
Cobalt, total	7440-48-4	E420/WP	µg/L		----	----	0.16	----	----	----	----
Copper, total	7440-50-8	E420/WP	µg/L		----	----	1.83	----	----	----	----
Iron, total	7439-89-6	E420/WP	µg/L		----	----	27	----	----	----	----
Lead, total	7439-92-1	E420/WP	µg/L		----	----	0.074	----	----	----	----
Lithium, total	7439-93-2	E420/WP	µg/L		----	----	57.8	----	----	----	----
Magnesium, total	7439-95-4	E420/WP	µg/L		----	----	18000	----	----	----	----
Manganese, total	7439-96-5	E420/WP	µg/L		3.34	1.75	1.67	----	----	----	----
Molybdenum, total	7439-98-7	E420/WP	µg/L		----	----	6.38	----	----	----	----
Nickel, total	7440-02-0	E420/WP	µg/L		----	----	1.54	----	----	----	----
Phosphorus, total	7723-14-0	E420/WP	µg/L		----	----	<50	----	----	----	----
Potassium, total	7440-09-7	E420/WP	µg/L		----	----	8920	----	----	----	----
Rubidium, total	7440-17-7	E420/WP	µg/L		----	----	3.47	----	----	----	----
Selenium, total	7782-49-2	E420/WP	µg/L		----	----	3.09	----	----	----	----
Silicon, total	7440-21-3	E420/WP	µg/L		----	----	3800	----	----	----	----
Silver, total	7440-22-4	E420/WP	µg/L		----	----	Not Detected	----	----	----	----
Sodium, total	7440-23-5	E420/WP	µg/L		----	----	93800	----	----	----	----

Analytical Results Evaluation

Matrix: **Drinking Water**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID	MORDEN 3 - DISTRIBUTION @ CIVIC CENTREE	MORDEN 3 - DISTRIBUTION @ REC CENTRE	MORDEN 3 - DISTRIBUTION @ PWG	----	----	----	----
				Sampling date/time	04-Jun-2024 13:40	04-Jun-2024 13:45	04-Jun-2024 13:10	----	----	----	----
				Sub-Matrix	Drinking Water	Drinking Water	Drinking Water	----	----	----	----
					WP2414346-008	WP2414346-009	WP2414346-010	--------	--------	--------	--------
Total Metals											
Strontium, total	7440-24-6	E420/WP	µg/L		----	----	222	----	----	----	----
Sulfur, total	7704-34-9	E420/WP	µg/L		----	----	112000	----	----	----	----
Tellurium, total	13494-80-9	E420/WP	µg/L		----	----	<0.20	----	----	----	----
Thallium, total	7440-28-0	E420/WP	µg/L		----	----	<0.010	----	----	----	----
Thorium, total	7440-29-1	E420/WP	µg/L		----	----	Not Detected	----	----	----	----
Tin, total	7440-31-5	E420/WP	µg/L		----	----	0.13	----	----	----	----
Titanium, total	7440-32-6	E420/WP	µg/L		----	----	<0.30	----	----	----	----
Tungsten, total	7440-33-7	E420/WP	µg/L		----	----	<0.10	----	----	----	----
Uranium, total	7440-61-1	E420/WP	µg/L		----	----	0.345	----	----	----	----
Vanadium, total	7440-62-2	E420/WP	µg/L		----	----	2.72	----	----	----	----
Zinc, total	7440-66-6	E420/WP	µg/L		----	----	<3.0	----	----	----	----
Zirconium, total	7440-67-7	E420/WP	µg/L		----	----	Not Detected	----	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Summary of Guideline Limits

Analyte	CAS Number	Unit	CDWG AO	CDWG MAC	CDWG OG
Physical Tests					
Absorbance, UV (@ 254nm)	----	AU/cm	--	--	--
Alkalinity, bicarbonate (as CaCO3)	----	mg/L	--	--	--
Alkalinity, carbonate (as CaCO3)	----	mg/L	--	--	--
Alkalinity, hydroxide (as CaCO3)	----	mg/L	--	--	--
Alkalinity, total (as CaCO3)	----	mg/L	--	--	--
Colour, true	----	CU	**15 CU**	--	--
Conductivity	----	µS/cm	--	--	--
Hardness (as CaCO3), from total Ca/Mg	----	mg/L	--	--	--
Langelier index (@ 4°C)	----	-	--	--	--
Langelier index (@ 60°C)	----	-	--	--	--
pH	----	pH units	--	--	**7 - 10.5 pH units**
Solids, total dissolved [TDS]	----	mg/L	**500 mg/L**	--	--
Transmittance, UV (@ 254nm)	----	% T/cm	--	--	--
Turbidity	----	NTU	**1 NTU**	--	--
Anions and Nutrients					
Ammonia, total (as N)	7664-41-7	mg/L	--	--	--
Bromide	24959-67-9	mg/L	--	--	--
Chloride	16887-00-6	mg/L	**250 mg/L**	--	--
Fluoride	16984-48-8	mg/L	--	**1.5 mg/L**	--
Nitrate (as N)	14797-55-8	mg/L	--	**10 mg/L**	--
Nitrite (as N)	14797-65-0	mg/L	--	**1 mg/L**	--
Sulfate (as SO4)	14808-79-8	mg/L	**500 mg/L**	--	--
Organic / Inorganic Carbon					
Carbon, dissolved organic [DOC]	----	mg/L	--	--	--
Carbon, total organic [TOC]	----	mg/L	--	--	--
Ion Balance					
Anion sum	----	meq/L	--	--	--
Cation sum (total)	----	meq/L	--	--	--
Ion balance (APHA)	----	%	--	--	--
Ion balance (cations/anions)	----	%	--	--	--
Total Metals					
Aluminum, total	7429-90-5	µg/L	--	**2900 µg/L**	**100 µg/L**
Antimony, total	7440-36-0	µg/L	--	**6 µg/L**	--
Arsenic, total	7440-38-2	µg/L	--	**10 µg/L**	--
Barium, total	7440-39-3	µg/L	--	**2000 µg/L**	--
Beryllium, total	7440-41-7	µg/L	--	--	--

Analyte	CAS Number	Unit	CDWG AO	CDWG MAC	CDWG OG				
Total Metals - Continued									
Bismuth, total	7440-69-9	µg/L	--	--	--				
Boron, total	7440-42-8	µg/L	--	**5000 µg/L**	--				
Cadmium, total	7440-43-9	µg/L	--	**7 µg/L**	--				
Calcium, total	7440-70-2	µg/L	--	--	--				
Cesium, total	7440-46-2	µg/L	--	--	--				
Chromium, total	7440-47-3	µg/L	--	**50 µg/L**	--				
Cobalt, total	7440-48-4	µg/L	--	--	--				
Copper, total	7440-50-8	µg/L	**1000 µg/L**	**2000 µg/L**	--				
Iron, total	7439-89-6	µg/L	**300 µg/L**	--	--				
Lead, total	7439-92-1	µg/L	--	**5 µg/L**	--				
Lithium, total	7439-93-2	µg/L	--	--	--				
Magnesium, total	7439-95-4	µg/L	--	--	--				
Manganese, total	7439-96-5	µg/L	**20 µg/L**	**120 µg/L**	--				
Molybdenum, total	7439-98-7	µg/L	--	--	--				
Nickel, total	7440-02-0	µg/L	--	--	--				
Phosphorus, total	7723-14-0	µg/L	--	--	--				
Potassium, total	7440-09-7	µg/L	--	--	--				
Rubidium, total	7440-17-7	µg/L	--	--	--				
Selenium, total	7782-49-2	µg/L	--	**50 µg/L**	--				
Silicon, total	7440-21-3	µg/L	--	--	--				
Silver, total	7440-22-4	µg/L	--	--	--				
Sodium, total	7440-23-5	µg/L	**200000 µg/L**	--	--				
Strontium, total	7440-24-6	µg/L	--	**7000 µg/L**	--				
Sulfur, total	7704-34-9	µg/L	--	--	--				
Tellurium, total	13494-80-9	µg/L	--	--	--				
Thallium, total	7440-28-0	µg/L	--	--	--				
Thorium, total	7440-29-1	µg/L	--	--	--				
Tin, total	7440-31-5	µg/L	--	--	--				
Titanium, total	7440-32-6	µg/L	--	--	--				
Tungsten, total	7440-33-7	µg/L	--	--	--				
Uranium, total	7440-61-1	µg/L	--	**20 µg/L**	--				
Vanadium, total	7440-62-2	µg/L	--	--	--				
Zinc, total	7440-66-6	µg/L	**5000 µg/L**	--	--				
Zirconium, total	7440-67-7	µg/L	--	--	--				
Volatile Organic Compounds [THMs]									
Bromodichloromethane	75-27-4	mg/L		--					
Bromoform	75-25-2	mg/L		--					
Chloroform	67-66-3	mg/L		--					
Dibromochloromethane	124-48-1	mg/L		--					

Analyte	*CAS Number*	*Unit*	CDWG AO	CDWG MAC	CDWG OG				
Volatile Organic Compounds [THMs] - Continued									
Trihalomethanes [THMs], total	----	mg/L		**0.1 mg/L**					
Bromofluorobenzene, 4-	460-00-4	%		--					
Difluorobenzene, 1,4-	540-36-3	%		--					
Haloacetic Acids									
Dibromoacetic acid	631-64-1	µg/L		--					
Dichloroacetic acid	79-43-6	µg/L		--					
Haloacetic acids, total [HAA5]	n/a	µg/L		**80 µg/L**					
Monobromoacetic acid	79-08-3	µg/L		--					
Monochloroacetic acid	79-11-8	µg/L		--					
Trichloroacetic acid	76-03-9	µg/L		--					

Please refer to the General Comments section for an explanation of any qualifiers detected.

Key:

CDWG Canada Guidelines for Canadian Drinking Water Quality (JAN, 2023)

AO Aesthetic Objective

MAC Maximum Acceptable Concentrations

OG Operational Guidance