

# Town of Snow Lake

## Annual Water System Operation Report 2025

The Town of Snow Lake, Manitoba strives to provide high quality drinking water in sufficient quantity to meet the needs of the public. It is our goal to do so in a safe and cost-effective manner while remaining in compliance with regulatory requirements governing the provision of drinking water.

### **Where do we get our water from?**

Not only is Snow Lake a great recreational water resource but water quality information has shown that with treatment, the lake is the best source for a drinking water supply for our town.

We draw our water from approximately 200 meters offshore and it is then pumped up to the Snow Lake Water Treatment Plant for treatment.

### **Why do we treat our water?**

We treat our water to ensure that safe and pleasing water is supplied to the homes and businesses in Snow Lake. In addition, Provincial Regulations have set health-based drinking water standards for all public water systems. The Town of Snow Lake is committed to meeting or exceeding the water quality standards set by the province while attempting to provide the best tap water in Northern Manitoba.

### **What type of water treatment do we use?**

Snow Lake's high-quality water allows us to maintain a simpler treatment process than places with lower quality source waters. Treatment is done through an ActiFlo System. The process consists of enhanced coagulation, flocculation followed by filtration. These processes are designed to clarify the water and remove microbial contaminants, such as bacteria and organic materials that are naturally found in surface water.

### **Why or how do we disinfect our water?**

The final step in the treatment of safe water is disinfection. Disinfection is the selective destruction or inactivation of disease carrying organisms in the water. The Drinking Water Safety Act and supporting Regulations require that water is disinfected before it leaves the water treatment facility and that an adequate amount of disinfection residual is maintained all the way to the final tap in our distribution

Our treated water is disinfected using two methods. The first step in the disinfection process is Ultraviolet (UV) Light. The water passes by the UV light after it is filtered. The UV light is designed to inactivate (kill) microscopic parasites commonly found in surface water such as Cryptosporidium and Giardia Lamblia that can cause illness such as Beaver Fever. The second step in the disinfection process is Chlorination. Chlorination is relatively ineffective against Cryptosporidium and Giardia and is added to kill bacteria and viruses that are commonly found in surface water such as rivers and lakes. An adequate

amount of chlorine is added as the water enters the storage reservoir to ensure an effective kill and to provide disinfectant residual in the 8 kms of water lines in Snow Lake's distribution system. A residual indicates that disinfection has been done and ensures chlorine availability to do more disinfection if the need arise.

### **Are any other chemicals added to our water? Why?**

In addition to chlorine (sodium hypochlorite), we add a Coagulant (Hydrex 3253) and a Polymer (Hydrex 3613) as well as pH adjuster (sodium hydroxide) to the water.

A positively charged coagulant is added so the negatively charged particles in the raw (untreated) water are attracted together to form heavier particles which will readily settle out. The coagulant is slightly acidic which aids in TOC (Total Organic Carbon) removal. Sodium hydroxide is added to the water to protect our distribution system from corrosion. A Polymer is added to aid in the flocculation process.

### **How much water storage do we have?**

Two water cells were built under the new water treatment facility to provide enough volume to allow adequate contact time for the chlorine. Each of these cells holds 294 cubic meters of water. From these cells the treated water flows by gravity as required to 2 wet wells (storage wells) beneath the distribution building and each of these wells has a capacity of 175 cubic meters.

This gives us a total of 938 cubic meters of water storage. This represents approximately 2 days supply under normal consumption rates when full. The entire system is designed so that water is always moving and never gets stale.

### **What is the Distribution System?**

The water distribution system is the network of underground pipes used to convey the treated water from the water distribution facility to the homes and businesses in Snow Lake. Wherever possible the piping is interconnected (looped) to ensure that fresh, safe water is continuously supplied. We carry out regular maintenance in the distribution system such as seasonal line flushing to help keep the lines clean.

### **Is our water tested? What for? When?**

Water tests are taken on a regular basis to ensure that the water is safe and to monitor how the treatment facility is performing. We test the water at the Water Treatment Plant and at various locations and times throughout the distribution system. It is also a regulatory requirement that all water test results be submitted to the Provincial Office of Drinking Water for review.

**Bacterial Testing:** We test the raw water (untreated lake water), the treated water (leaving the water treatment facility) and the water in the distribution system (within the Town of Snow Lake) every two weeks for the presence of total coliform and E coli bacteria. If these bacteria are present in the water, it is an indication that disease causing organisms may also be present.

**Disinfectant testing:** We test the chlorine level in the treated water every day to ensure that the water leaving the water treatment plant which provides necessary information to make dosage adjustments at the water treatment plant. Chlorine levels are also tested in the distribution system every time we take bi-weekly water samples for bacterial analysis.

**Ultraviolet Disinfection:** The operation of the U/V system is monitored daily. The U/V bulbs are changed according to hourly accumulation, and the sensors are calibrated bi-annually.

**Turbidity Testing:** Turbidity is a measurement of the clarity of water. NTU (nephelometric turbidity units) We use turbidity to tell us how well our treatment system is working to remove particles and other contaminants that can cause the water to look cloudy and affect our disinfection process. Turbidity is tested daily at various points in the treatment plant. It is tested where the raw water enters the plant, the clarifier, and after the filters.

**General Chemistry:** One raw water and one treated water sample taken every year. (parameter list provided by the Office of Drinking Water)

**Total Metals:** One sample is taken at the same time as general chemistry, at a mid-point in the distribution system.

**Manganese:** Monitoring is included in the general chemistry and total metals analysis.

**Trihalomethane (THM's) Testing:** Trihalomethanes are formed when chlorine reacts with naturally occurring organic matter in the water. Studies have revealed a link between high levels of THM's and cancer. In Manitoba, the guideline for trihalomethanes (THMs) in drinking water is a maximum acceptable concentration (MAC) of 0.100 mg/L (100 µg/L), based on a locational running annual average of quarterly samples taken at points in the distribution system with the highest potential for THM levels. We test THM levels in the distribution system on a quarterly basis every other year, following our operating license.

**Haloacetic Acids (HAA's) Testing:** Haloacetic Acids are another disinfection byproduct formed with naturally occurring organic matter in the water. Studies have revealed a link between high levels of HAA's and cancer. In Manitoba, the standard for Haloacetic Acids (HAAs) in drinking water, as outlined in the Drinking Water Quality Standards Regulation, is 0.08 milligrams per liter (mg/L), with compliance measured at the consumer's tap. We also test HAA levels in the distribution system on a quarterly basis every other year, following our operating license.

**Total Microcystins:** One sample is collected from the raw water sampling point every year in August.

**Lead Sampling:** As per ODW-OG-17 Residential Lead Monitoring Program. A minimum of 20 residential tap water samples collected throughout the year, with 2/3 of the samples being collected between June and October. In Manitoba, the drinking water guideline for lead, adopted in 2020, is a maximum acceptable concentration of 0.005 milligrams per liter (mg/L) or 5 micrograms per liter (µg/L), based on a sample taken at the consumer's tap.

### What are the results of the tests?

| Testing Parameters         | Standard                         | Snow Lake Water Plant Performance                                        | Did we meet the standard? |
|----------------------------|----------------------------------|--------------------------------------------------------------------------|---------------------------|
| Bacterial                  | 0 Total Coliforms (TC)           | TC 100%                                                                  | YES                       |
| Bacterial                  | 0 E.coli (EC)                    | EC 100%                                                                  | YES                       |
| Chlorine leaving WTP       | 0.5 mg/L                         | 100%                                                                     | YES                       |
| Chlorine in Piping Network | 0.1 mg/L                         | 100%                                                                     | YES                       |
| Turbidity                  | 0.3 NTU*                         | 100%                                                                     | YES                       |
| Trihalomethanes (THMs)     | 0.1 mg/L average over 4 samples  | No samples will be taken in 2025, next sampling results will be for 2026 | 0.0782 mg/l               |
| Haloacetic Acids (HAAs)    | 0.08 mg/L average over 4 samples | No samples will be taken in 2025, next sampling results will be for 2026 | 0.0462 mg/l               |

### Total Metals Results

| Metals Parameter | Snow Lake Treated Water Concentration (mg/L) | MAC/AO Maximum Acceptable Concentration/Aesthetic Objective (mg/L) | Are we less than the MAC/AO? |
|------------------|----------------------------------------------|--------------------------------------------------------------------|------------------------------|
| Antimony         | <0.000037                                    | 0.006                                                              | YES                          |
| Arsenic          | 0.00029                                      | 0.01                                                               | YES                          |
| Barium           | 0.00746                                      | 1                                                                  | YES                          |
| Boron            | 0.013                                        | 5                                                                  | YES                          |
| Cadmium          | 0.0000044                                    | 0.007                                                              | YES                          |
| Chromium         | 0.000063                                     | 0.05                                                               | YES                          |
| Selenium         | 0.000048                                     | 0.01                                                               | YES                          |
| Uranium          | 0.0000077                                    | 0.02                                                               | YES                          |
| Lead             | 0.000410                                     | 0.005                                                              | YES                          |

|           |         |       |     |
|-----------|---------|-------|-----|
| Iron      | 0.093   | 0.1   | YES |
| Manganese | 0.00998 | 0.12  | YES |
| Zinc      | 0.0068  | 5.0   | YES |
| Strontium | 0.0343  | 7.0   | YES |
| Sodium    | 12.2    | 200.0 | YES |
| Aluminum  | 0.0032  | 2.9   | YES |

#### General Chemistry Results (Treated and Raw)

| Physical Test                                       | LOR    | Unit     | Results Treated | Results Raw |
|-----------------------------------------------------|--------|----------|-----------------|-------------|
| Absorbance, UV (@ 254nm)                            | 0.0050 | AU/cm    | 0.0400          | 0.379       |
| Alkalinity, bicarbonate (as CaCO <sub>3</sub> )     | 2.0    | mg/L     | 17.0            | 54.9        |
| Alkalinity, carbonate (as CaCO <sub>3</sub> )       | 2.0    | mg/L     | <2.0            | <2.0        |
| Alkalinity, hydroxide (as CaCO <sub>3</sub> )       | 2.0    | mg/L     | <2.0            | <2.0        |
| Alkalinity, phenolphthalein (as CaCO <sub>3</sub> ) | 2.0    | mg/L     | <2.0            | <2.0        |
| Alkalinity, total (as CaCO <sub>3</sub> )           | 2.0    | mg/L     | 17.00           | 54.9        |
| Colour, true                                        | 5.0    | CU       | <5.0            | 33.1        |
| Conductivity                                        | 2.0    | µS/cm    | 19.5            | 126         |
| Hardness (as CaCO <sub>3</sub> ), from total Ca/Mg  | 0.50   | mg/L     | 62.6            | 61.7        |
| Langelier index (@ 15°C)                            | 0.010  | -        | -2.21           | -0.590      |
| Langelier index (@ 20°C)                            | 0.010  | -        | -2.13           | -0.515      |
| Langelier index (@ 25°C)                            | 0.010  | -        | -2.06           | -0.442      |
| Langelier index (@ 4°C)                             | 0.010  | -        | -2.38           | -0.767      |
| Langelier index (@ 60°C)                            | 0.010  | -        | -1.61           | 0.005       |
| Langelier index (@ 77°C)                            | 0.010  | -        | -1.40           | 0.207       |
| pH                                                  | 0.10   | pH units | 6.80            | 7.91        |
| pH @ 15°C (WSER)                                    | 0.10   | pH units | ---             | ---         |
| Solids, total dissolved [TDS]                       | 3.0    | mg/L     | 114             | 81.1        |
| Solids, total suspended [TSS]                       | 3.0    | mg/L     | ---             | ---         |
| Turbidity                                           | 0.10   | NTU      | 0.23            | 1.17        |
| pH, saturation (@ 4°C)                              | 0.010  | pH units | 9.18            | 8.68        |

|                                          |        |            |         |         |
|------------------------------------------|--------|------------|---------|---------|
| Transmittance, UV (@ 254nm)              | 1.0    | % T/cm     | 91.2    | 41.8    |
| pH, saturation (@ 15°C)                  | 0.010  | pH units   | 9.01    | 8.50    |
| pH, saturation (@ 20°C)                  | 0.010  | pH units   | 8.93    | 8.42    |
| pH, saturation (@ 25°C)                  | 0.010  | pH units   | 8.86    | 8.35    |
| pH, saturation (@ 60°C)                  | 0.010  | pH units   | 8.41    | 7.90    |
| pH, saturation (@ 77°C)                  | 0.010  | pH units   | 8.20    | 7.70    |
| Ammonia, total (as N)                    | 0.0050 | mg/l       | 0.0068  | 0.0106  |
| Ammonia, un-ionized (as N), 15° C (WSER) | 0.0010 | mg/l       | -----   | -----   |
| Bromide                                  | 0.010  | mg/l       | <0.0010 | 0.017   |
| Chloride                                 | 0.10   | mg/l       | 5.51    | 3.0     |
| Fluoride                                 | 0.020  | mg/l       | 0.042   | 0.043   |
| Nitrate (as N)                           | 0.0050 | mg/l       | 0.0218  | 0.0051  |
| Nitrite (as N)                           | 0.0010 | mg/l       | <0.0010 | <0.0010 |
| Phosphorus, total                        | 0.020  | mg/l       | -----   | -----   |
| Sulphate (as SO4)                        | 0.30   | mg/l       | 60.9    | 2.59    |
| Carbon, dissolved organic [DOC]          | 0.50   | mg/l       | 3.74    | 14.3    |
| Coliforms, thermotolerant [fecal]        | 1      | MPN/100 ml | -----   | -----   |
| Anion sum                                | 0.10   | meq/l      | 1.77    | 1.24    |
| Cation sum (total)                       | 0.10   | meq/l      | 1.75    | 1.40    |
| Ion balance (cation/anions)              | 0.01   | %          | 98.9    | 113     |
| Ion balance (APHA)                       | 0.010  | %          | -0.568  | 6.06    |

**Results from Treated water Lead samples taken September 25, 2025**

| Location of sample        | Date of sample     | Results of sample | Above or Below the acceptable concentration<br>0.005 mg/l |
|---------------------------|--------------------|-------------------|-----------------------------------------------------------|
| <b>148 Crystal Street</b> | September 25, 2025 | 0.00148 mg/l      | Below                                                     |
| <b>139 Lipsey Drive</b>   | September 25, 2025 | 0.000947 mg/l     | Below                                                     |
| <b>217 Copper Road</b>    | September 25, 2025 | 0.00244 mg/l      | Below                                                     |
| <b>219 Copper Road</b>    | September 25, 2025 | 0.00110 mg/l      | Below                                                     |

|                             |                    |               |       |
|-----------------------------|--------------------|---------------|-------|
| <b>225 Copper Road</b>      | September 25, 2025 | 0.000696 mg/l | Below |
| <b>187 Magilvray Avenue</b> | September 25, 2025 | 0.00283 mg/l  | Below |
| <b>141 Willow Crescent</b>  | September 25, 2025 | 0.00189 mg/l  | Below |
| <b>569 Lakeshore Drive</b>  | September 25, 2025 | 0.00326 mg/l  | Below |
| <b>575 Lakeshore Drive</b>  | September 25, 2025 | 0.000202 mg/l | Below |
| <b>100 Larch Street</b>     | September 25, 2025 | 0.00208 mg/l  | Below |
| <b>148 Willow Crescent</b>  | September 25, 2025 | 0.000212 mg/l | Below |
| <b>150 Willow Crescent</b>  | September 25, 2025 | 0.00309 mg/l  | Below |
| <b>578 Lakeshore Drive</b>  | September 25, 2025 | 0.00239 mg/l  | Below |
| <b>589 Lakeshore Drive</b>  | September 25, 2025 | 0.00121 mg/l  | Below |
| <b>602 Lakeshore Drive</b>  | September 25, 2025 | 0.000557 mg/l | Below |
| <b>591 Lakeshore Drive</b>  | September 25, 2025 | 0.000287 mg/l | Below |
| <b>592 Lakeshore Drive</b>  | September 25, 2025 | 0.000522 mg/l | Below |
| <b>594 Lakeshore Drive</b>  | September 25, 2025 | 0.000220 mg/l | Below |
| <b>604 Lakeshore Drive</b>  | September 25, 2025 | 0.000485 mg/l | Below |
| <b>169 Cedar Avenue</b>     | September 25, 2025 | 0.00109 mg/l  | Below |

#### Results from Microcystins samples taken September 25, 2025

| Location of Sample | Date of Sample     | Results of Sample | Above or Below the acceptable concentration 1.5 µg/L |
|--------------------|--------------------|-------------------|------------------------------------------------------|
| Raw water          | September 25, 2025 | <0.15 µg/L        | Below                                                |
| Treated water      | September 25, 2025 | <0.15 µg/L        | Below                                                |

#### Testing that will be happening in 2026 as per our Operating License for Public Water System.

- Bi-weekly Bacterial testing.
- **Total Metals**, including Manganese; Sample will be taken on April 9, 2025.
- **General Chemistry**, including Manganese; Samples will be taken on April 9, 2025 (1 raw and 1 treated)
- **Lead**; Samples to be taken between June – October. (20 samples from locations different from 2025)
- **Total Microcystins**; 1 raw water sample to be taken in August

Test results are on file at the Water Treatment Plant.

#### Were there any emergencies, regulatory compliance issues or other operational issues to report for 2025?

There were numerous water line repairs made and BWA advisories in 2025.

#### WATER LINE REPAIRS

- 121 Lipsey Street – Leaking service line/ replaced water and sewer lines. June 21, 2025.
- 524 Lakeshore – Leaking service line/ repaired. August 28, 2025
- 176 Poplar Avenue – Leaking service line/repaired. August 23, 2025.
- 106 Larch Street – Leaking service line/repaired. September 19, 2025.
- 52 English Drive – Leaking service line/repaired. January 24, 2025.
- 588 Lakeshore Drive – Leaking service line/repaired. October 6, 2025
- 586 Lakeshore Drive – Bent curb-stop/repaired. September 18, 2025
- 204 Jasper Avenue – Plugged sewer/replaced water and sewer lines. November 14, 2025

#### **BOIL WATER ADVISORY'S ISSUED**

- February 3, 2025 – Due to loss of pressure from isolating a broken water line in front of 52 English Drive. The line was excavated; the break was repaired and service restored to the trailer court. The boil water advisory was rescinded March 3, 2025
- March 19, 2025 – Due to a mechanical failure of the raw water flow meter causing improper chemical dosing of the water. The flow meter was repaired. The boil water advisory was rescinded April 25, 2025
- June 28, 2025 – Due to a loss of pressure caused by a power surge/outage that caused a communication switch to fail resulting in a drop in pressure of the distribution system below our allowable limit. The ethernet switch was replaced. The boil water advisory was rescinded August 18, 2025
- October 3, 2025 - Due to a loss of pressure. The boil water advisory was rescinded October 9, 2025.
- December 29, 2025 – Due to a mechanical breakdown of the Polymer mixer resulting in an unsatisfactory mix which caused turbidity to go higher than the allowable limit of our license. The boil water advisory was rescinded January 16, 2026

#### **Were there any Major expenses incurred in 2025?**

Regular operating costs including Hydro, water treatment chemicals & sand for the clarifier, wages, lab supplies, bacterial analysis lab fees, sample shipping costs and regular maintenance costs including, valves, actuators, repairing unit heaters, replacement U/V parts and calibration equipment, chemical dosing pump rebuild kits, new pH readers and buffers for calibrating, electrical services(Norman Consulting), generator servicing (Cummins), new Ethernet switches for the water plant and distribution building as well as control programing services (Shreem).

Numerous water meters and Aqua-Flo's were repaired in 2025, and we will continue to work on this throughout 2026.

In August of 2025 we were fortunate to hire new Utility operator Ethan Bieniarz. Ethan has moved here to Snow Lake and is a welcomed addition to the team. Since his hiring he has had training in; Wastewater

Treatment level 1. His training will continue throughout the next few years with the next being Water Treatment Level 1.

#### **Future system expansion or expenses expected in 2025?**

To reduce the risk of mechanical and electrical failures in the years to come we will be purchasing critical spares, bringing in Cummins to service our generators, we are planning to bring in Shreem Instrumentation and Controls to go through our SCADA System, make repairs and suggest upgrades for our PLC controls. We also plan to purchase new sand and activated charcoal for maintaining the filters.

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

For general questions during regular business hours, call the town of Snow Lake at 204-358-2551 or send an email to [snowlake@mymts.net](mailto:snowlake@mymts.net)

To report an issue with your water supply, call the Utilities Operator on-call phone at 204-358-0127.