

Public Water System 2025 Annual Report

March 20, 2026

Lac du Bonnet Water Treatment Facility

Town of Lac du Bonnet

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Introduction:

The 2025 Annual Report on the Lac du Bonnet Water Treatment Facility summarizes the Utilities' ability to produce safe potable water to all users of the facility.

1. Description of the water system:

The Lac du Bonnet Public Water System (LDBPWS), consisting of raw water conveyance, treatment, storage, and distribution, was constructed in 1976. A major expansion of the Water Treatment Plant (WTP) was completed in 2003 to increase the reservoir capacity, change the treatment process to ballasted flocculation followed by UV disinfection and to provide a new distribution pumping system. The water treatment plant operates year-round to service the Town of Lac du Bonnet via a piped distribution system. The WTP also services non-resident customers through a bulk fill station. The Lac du Bonnet water system provides potable drinking water to a population of 1064 residents (2016 Census) as well as 1366 bulk card users in the rural areas around the town of Lac du Bonnet. Treated water produced at our facility not only meets but exceeds all health and aesthetic objectives to date as stated in the *Guidelines for Canadian Drinking Water Quality*.

1.1 Water supply source + Intake Structures

The water source for the LDBPWS is the Winnipeg River. A barrel style intake screen is located approximately 30 meters from the shore and raw water is conveyed to a wet well via a 250 mm pipe. Raw water from the wet well is pumped to the WTP by submersible intake pumps (IP-1/2, each rated at 19 L/s) through a 150 mm dia. pipeline. The pipeline between the pumphouse and WTP is 519 m long. The pumps operate in a duty / standby configuration, and a 25-kW diesel generator allows one pump to operate under power outages. The pumps are called to start based on the level in the reservoir at the WTP and communication to the WTP is through telemetry. The wet well is covered by a superstructure that houses the diesel generator and electrical panels. The diesel generator located over the wet well provides a potential contamination risk to the raw water. This risk has been mitigated by curbing the access hatch that provides access to the wet well. The pumphouse is located between residential properties located on the Winnipeg River. The Winnipeg River system is used for recreational purposes and there are no other methods of source protection.

1.2 Water Treatment Process

The treatment processes include chemically assisted ballasted flocculation and filtration, UV disinfection and chlorination. The chemically assisted ballasted flocculation process at the Lac du Bonnet Water Treatment Plant (LDB WTP) uses a multi barrier treatment process to treat the raw water from the river; the raw water comes out of the river with an average turbidity between 6-15 nephelometric turbidity units (NTU). The chemically assisted ballasted flocculation process at the LDB WTP is an Actiflo ACP 300 followed by two Dusenflo 400 filters. The equipment was provided by John Meunier (now Veolia). The process is designed to meet the Drinking

Water Quality Standards Regulation 41/2007 (DWQSR) turbidity requirement of 0.3 NTU 95% of the time and always less than 1 NTU. The process also satisfies the DWQSR requirement for a filtration barrier for a surface water source and can provide 2 log reductions for Giardia and Cryptosporidium so long as it meets the DWQSR turbidity requirement (demonstrated by online monitoring), is designed in accordance with Ten State Standards and has an effective filter cleaning system.

It then flows through the UV system using ultraviolet lights to neutralize or deactivate bacteria and works with the filtration to get 3 log reduction. From this point the finished product flows into the Clear well at which point the water is chlorinated(disinfected) by sodium hypochlorite (liquid chlorine) pumped by a metering pump. It is then monitored and tested twice daily for chlorine residuals. In accordance with the Drinking Water Safety Regulation 40/2007, the Lac du Bonnet Water Treatment plant operator must ensure a disinfectant residual of at least:

* 0.5 mg/L of free chlorine is detectable at the point where water enters the distribution system, after a minimum contact time of 20 minutes.

*0.1 mg/L of free chlorine is detectable at all times at any point in the distribution system.

1.3 Water storage reservoirs:

The reservoirs contain treated water to be supplied to the residents and other users at all times, they consist of 3 chambers beneath the plant and one exterior reservoir directly south of the plant. The exterior chamber holds 1,246,000L, chamber 1 beneath the plant holds 278,000 L, chamber 2 beneath the plant holds, 99,600 L, and chamber 3 holds 91,000 L, to come to a total of 1,714,600 L of treated water. The water used is replenished every day and we have just over two days' supply based on history's worst-case scenario.

1.4 Distribution System

The distribution system consists of 4 turbine pumps at the treatment facility. One is the Jockey pump which maintains consistent pressure in low demand situations and is smaller than duty pumps 1+2. Both duty pumps 1 and 2 are the same size but alternate pumping water only as required and jointly for higher demands. The 4th pump is a 60HP fire pump that can maintain pressure from the lowest to the highest demands. All pumps have variable frequency drives so when the distribution system requires more water the pumps moderately increase in speed and when the system requires less, they gradually decrease in speed to ensure proper pressures and flow with minimal hammer.

The underground distribution system consists of many different sizes and types of piping including High Density Polyethylene, PVC (series 160 and C900 Blue Brute) and Copper, and sizes vary from 3/4" up to 10" in diameter.

1.5 Number of Connections, types of users and population served

There are 544 connections to our distribution system. Users consist of commercial, home, and bulk fill users. The population served to date is 1064 as well as 1366 bulk card users.

1.6 Classification and certification

The classification of Lac du Bonnet treatment facility is a Level 2 Water Treatment system and the distribution system Level 1 Distribution system.

Certification of operators is as follows for 2024.

Darcy Henderson Level 2 Water Treatment
 Level 1 Distribution

Jen Bellin Level 2 Water Treatment
 Level 1 Distribution

Derrick Martin Level 2 Water Treatment
 Level 1 Distribution

- The operator in charge holds all required licenses for the safe operation of this facility. Operators must attend other courses and conferences to maintain CEU'S (continuing education units). And apply for a license renewal every 5 years. They must obtain a certain limit of CEU's to be able to renew their license. The facility classification and operator certification fall under the Manitoba Conservation Water and Wastewater Facility Operators Regulation (Manitoba Regulation 77/2003) made under Environment Act (Manitoba).

2. Disinfection system in use

2.1 Type of disinfection system

The Lac du Bonnet Water Treatment Plant uses two disinfection systems that include, a UV Disinfection system and a Chlorination System to meet government regulations. At this point filtration and UV give a 3-log 99.9% reduction of crypto and giardia.

A single UV disinfection unit is located downstream of the filters for disinfection of the treated water. The purpose of the UV disinfection process is inactivation of pathogens. A Wedeco (B-120) low pressure UV Disinfection System is used at the LDB WTP. The UV system is validated by OEVGW for 40 mJ/cm². No redundancy is provided for the UV disinfection process. UV intensity is monitored and tracked by the SCADA system. The UV dose is function of intensity and exposure time. The measured UV intensity multiplied by the known exposure time (flow and

vessel geometry) gives an indication of the delivered dose. If the measured UV intensity is below that required to provide the design dose, an alarm is generated.

The second disinfection system is chlorination. The Water plant uses sodium hypochlorite at a 12% solution which is added to the water after the UV system. A metering pump is used to inject the chlorine into the system at a specific dosage rate to maintain optimal free chlorine values in the reservoirs. Our reservoirs hold just over two days' supply and far exceed 20-minute contact time of chlorine which gets our 4-log (99.99%) reduction of viruses. If one of these pumps fail, we carry a back-up pump on hand that could be quickly installed to maintain the system.

The Water Treatment system has a multi-barrier alarm system that notifies the operator if the free chlorine limits reach a certain level. This alarm is set above the regulation limit; this would signal the plant to shut down and allow the operator to get to the plant and correct the dosage to maintain compliance with the drinking water regulations. Alarm Set points for chlorine are a low alarm for 0.65mg/L and a high of 1.5mg/L.

In the event of a power outage, the water plant has a back-up generator to ensure uninterrupted and continuous power to the water treatment plant and keep the distribution system pressurized to not only treat the water but to also supply safe drinking water at all times.

2.2 Equipment monitoring requirements and redundancy program:

Chlorine residuals are monitored by an online analyzer every minute 24 hours a day, 365 days a year. Manual readings are taken twice daily from sample point by analyzer and bi-weekly in the distribution system as per our operating license requirements. These readings are recorded on monthly chlorination forms which are sent to the drinking water officer for review at the end of every month.

As required by our Operating Licence PWS-08-168-03, the Lac du Bonnet Water treatment operators ensure continuous disinfection is maintained at the plant by keeping stock of all spare parts for the chlorinator pump plus one complete back up chlorinator pump ready to use at all times.

2.3 Disinfectant residual overall performance and results

For 2025, the Lac du Bonnet Water Treatment facility has had some issues with SCADA recording data. All manual tests have been within license parameters and regulatory requirements regarding monitoring disinfection residuals leaving the facility. These issues have been corrected with some improvements still to be made.

3. List of water quality standards:

The province of Manitoba has adopted several water quality standards from the *Guidelines for Canadian drinking water quality*, developed by Health Canada. The parameters are health-based,

and they express the Maximum Acceptable Concentrations (MAC) for drinking water. Concentration values in excess constitute a health-related issue and require corrective actions.

Parameters

	<u>Quality Standard</u>
Total coliform and E. coli	Less than one E. coli and total coliform bacteria detectable per 100 mL in all treated and distributed water
Chlorine residuals	* A free chlorine residual of at least 0.5mg/L in water entering the distribution system following a min. contact time of 20 minutes * A free chlorine residual of at least 0.1mg/L at all times at any point in the distribution system
Ultraviolet Disinfection	95% of water produced per month is disinfected within validated conditions.
Total Trihalomethanes	Less than or equal to 0.10mg/L as locational annual average of quarterly samples as an annual
Total Haloacetic Acids	Less than or equal to 0.08mg/L as locational annual average of quarterly samples
Turbidity	Less than or equal to 0.3 NTU in 95% of the measurements in a month of the effluent from each operating particulate filter Not exceed 0.3 NTU for more than twelve consecutive hours of filter operation or for two consecutive daily measurements Not exceed 1.0 NTU for any continuous or daily measurement
Lead	Less than or equal to 0.005mg/L.
Manganese	Less than or equal to 0.12mg/L
Total Microcystins	Less than or equal to 0.0015mg/L

3.1 Disinfection Monitoring and reporting

Regulatory Requirements PWS Performance

Free chlorine residual entering distribution system	> 0.5 mg/L	100%
Frequency of testing entering distribution system	Daily	100%
Free Chlorine residual in distribution system	>0.1 mg/L	100%
Frequency of testing in distribution system	Bi-weekly	100%
Report Submissions	Monthly	100%

Ultraviolet Light

Ultraviolet Light Monitoring	Continuous	100%
Frequency of Testing	Daily	100%
Report Submissions	Monthly	100%

3.2 Bacteriological Monitoring and reporting

	Regulatory requirement	PWS Performance
Number of raw/incoming water samples	27	27
Number of treated water samples	27	27
Number of distribution water samples	27	27
Frequency of testing	Bi-weekly	100%
Total Coliform present in samples	0 TC per 100ml	100%
E. Coli present in samples	0 EC per 100ml	100%

The Public Water System has met their regulatory requirements for 2025. There were no issues with bi-weekly samples this year.

Chart of the Bi-Weekly samples of 2025

Month	Raw	Treated	Distribution
January	>1 TC & E-coli	<1 TC / <1 E-coli	<1 TC / <1 E-coli
February	>1 TC & E-coli	<1 TC / <1 E-coli	<1 TC / <1 E-coli
March	>1 TC & E-coli	<1 TC / <1 E-coli	<1 TC / <1 E-coli
April	>1 TC & E-coli	<1 TC / <1 E-coli	<1 TC / <1 E-coli
May	>1 TC & E-coli	<1 TC / <1 E-coli	<1 TC / <1 E-coli
June	>1 TC & E-coli	<1 TC / <1 E-coli	<1 TC / <1 E-coli
July	>1 TC & E-coli	<1 TC / <1 E-coli	<1 TC / <1 E-coli
August	>1 TC & E-coli	<1 TC / <1 E-coli	<1 TC / <1 E-coli
September	>1 TC & E-coli	<1 TC / <1 E-coli	<1 TC / <1 E-coli
October	>1 TC & E-coli	<1 TC / <1 E-coli	<1 TC / <1 E-coli
November	>1 TC & E-coli	<1 TC / <1 E-coli	<1 TC / <1 E-coli
December	>1 TC & E-coli	<1 TC / <1 E-coli	<1 TC / <1 E-coli

3.3 Physical Monitoring and Reporting

Chemically assisted, rapid gravity filtration process	Regulatory requirement < 0.3 NTU in at least 95% Of the samples taken per Month	PWS performance 100%
	Not to exceed 0.3 NTU for more than twelve continuous hours were continuous measurements are taken.	100%
Frequency of testing	Continuous	100%
Report Submissions	Monthly	100%

Monthly Averages for Chlorine, Filter #1 & Filter # 2 Turbidity

Month	Average Free Chlorine (mg/L)	Average Filter #1 Turbidity (NTU)	Average Filter # 2 Turbidity (NTU)
January	1.119 mg/L	0.039 NTU	0.031 NTU
February	0.990 mg/L	0.042 NTU	0.032 NTU
March	0.929 mg/L	0.057 NTU	0.043 NTU
April	0.896 mg/L	0.066 NTU	0.048 NTU
May	0.989 mg/L	0.067 NTU	0.051 NTU
June	1.050 mg/L	0.073 NTU	0.056 NTU
July	1.041mg/L	0.078 NTU	0.055 NTU
August	1.065 mg/L	0.081 NTU	0.058 NTU
September	0.936 mg/L	0.083 NTU	0.057 NTU
October	1.037 mg/L	0.083 NTU	0.055 NTU
November	0.972 mg/L	0.067 NTU	0.050 NTU
December	1.062 mg/L	0.069 NTU	0.056 NTU

3.4 Disinfection By-products Monitoring and Reporting

2025 was an exclusion year for THM's and HAA's for the Town of Lac Du Bonnet. In 2026, we will be submitting quarterly samples in February, May, June and November for THM's and HHA's as a part of our ongoing monitoring of the performance of the treatment facility along with annual chemical sampling.

3.5 Residential Lead Monitoring Program

In 2019, Health Canada lowered the national guideline for lead in drinking water from a 0.01 mg/L to 0.005 mg/L based on a sample of water taken at the consumer tap. Manitoba adopted the new national guidelines for lead in drinking water in 2020 and began implementing Residential Lead Monitoring Programs across the province. Lac du Bonnet was selected to begin monitoring in 2023.

In 2025, twenty residential samples were collected and tested. Eighteen of the twenty samples were below the lead standard of 0.005 mg/L with 2 samples exceeding the lead standard. Two additional samples per resident were collected and both test results were below the lead standard.

Sample Location	RTD Results (mg/L)	30MS - 1 of 2 Results (mg/L)	30MS - 2 of 2 Results (mg/L)	Lead Standard (mg/L)
#1	0.00294			0.005
#2	0.004950			0.005
#3	0.000944			0.005
#4	0.001390			0.005
#5	0.003550			0.005
#6	0.001510			0.005
#7	0.001000			0.005
#8	0.000154			0.005
#9	0.005900	0.00123	0.00228	0.005
#10	0.000426			0.005
#11	0.007250	0.000939	0.00315	0.005
#12	0.000967			0.005
#13	0.001540			0.005
#14	0.000282			0.005
#15	0.001530			0.005
#16	0.000296			0.005
#17	0.001116			0.005
#18	0.004570			0.005
#19	0.000603			0.005
#20	0.000540			0.005

Although lead is not present in the water produced by the WTP, it can enter the water as it passes through a lead service line (the pipe that connects a building to the water main) and/or plumbing systems and fixtures that contain lead. Buildings constructed before 1950 may have a lead service line and those constructed before 1990 may have lead solder or brass plumbing fixtures.

3.6 Water Chemistry Analyses

The operators did submit an annual water sample from the Lac du Bonnet PWS for chemical analyses for 2025. This action fulfills the general chemistry monitoring requirement outlined in our Operating license. The report (attached) indicated that the treated water met all health-related guidelines as stipulated in health Canada's Guidelines for Canadian Drinking Water Quality. (http://www.hc-sc.gc.ca/ewh-semt/water-eau/drink-potb/guide/index_e.html),

Parameter	Water Quality Standard	Town of LDB Raw water	Town of LDB Treated water	Town of LDB Distribution
Hardness	80- 100 mg/L	49.4.0 mg/L	50.9 mg/L	
pH	7.00 – 10.5pH	7.60	7.19	
Total Microcystin	<0.0015 mg/L	<0.00015 mg/L		
Total Dissolved Solids	500 mg/L	59.8 mg/L	87.4 mg/L	
Nitrate	10 mg/L	0.063 mg/L	0.0539 mg/L	
Aluminum	2.9 mg/L	0.0669 mg/L	0.0539 mg/L	0.0511 mg/L
Arsenic	0.01 mg/L	0.00097 mg/L	0.00027 mg/L	0.0003 mg/L
Antimony	0.006 mg/L	0.00006 mg/L	0.000053 mg/L	0.000066 mg/L
Barium	2 mg/L	0.00865 mg/L	0.0084 mg/L	0.00842 mg/L
Boron	5 mg/L	0.0057 mg/L	0.0087 mg/L	0.0073 mg/L
Copper	2 mg/L	0.0017 mg/L	0.00263 mg/L	0.0122 mg/L
Cadmium	0.007 mg/L	0.0000036 mg/L	0.0000014 mg/L	0.000001 mg/L
Chromium	0.05 mg/L	0.00022 mg/L	0.000093 mg/L	0.0002 mg/L
Lead	0.005 mg/L	0.000103 mg/L	0.000055 mg/L	0.000416 mg/L
Manganese	0.12 mg/L	0.00631 mg/L	0.00057 mg/L	0.00064 mg/L
Selenium	0.05 mg/L	0.000092 mg/L	0.00003 mg/L	0.000043 mg/L
Uranium	0.02 mg/L	0.000095 mg/L	0.0000016 mg/L	0.0000016 mg/L
Chloride	250 mg/L	2.05 mg/L	24.3 mg/L	
Zinc	5 mg/L	0.0061 mg/L	0.0059 mg/L	0.0048 mg/L

*The Annual Chemistry attached is in ug/L which is 1000 times smaller than mg/L. In the chart above we have converted everything to mg/L for convenience of keeping all measurements in the same units.

4. Water System Incidents and corrective actions

This year, in all circumstances where the SCADA report showed non-compliance issues, all subsequent reviews showed raw data that the system was compliant. The issues were momentary and were a result of deficient SCADA programming rather than a problem with the water treatment process.

On December 22, 2025, the UV system started to lose wattage, this led to the UV system under dosing the water. This problem with the UV system continues and is currently being addressed. The water treatment plant is still meeting the standards since turbidity remains within the standard and chlorine provides disinfection.

The jockey pump was taken offline earlier in the year because of a turbidity issue. Currently waiting for reports on what direction to go for repair or replacement/upgrade. The other duty pumps have taken the extra load for a short time.

5. Drinking water safety orders and actions taken:

In 2025, no drinking water safety orders were issued for the Lac du Bonnet Public Water System.

6. Boil Water advisories issued and actions taken in response

In 2025 there were five boil water advisories.

On January 15, the distribution line to The Forestry department failed causing a water break. A temporary fix was put in place as the line would have to be moved to make way for the new Personal Care Home. Rescinded Feb. 5, 2025.

On March 7, the work to remove a meter box and relocate the forestry line commenced. The new line was installed, disinfected, tested and put into commission. Rescind May 9, 2025.

On April 29, Lac House was put on a Boil Water Advisory as part of the line relocation for the Forestry Department. Rescinded May 5, 2025.

On Nov 25, a boil water advisory was issued for a portion of lake Ave and Wood as an issue with an abandoned water line ruptured. The distribution was depressurized. for inspection causing a boil water advisory to be issued. Rescinded Nov 28.

On Dec 12, a boil water advisory was issued for the end of Lake Ave. for the repair of the abandoned water line. Rescinded Dec. 17, 2025.

7. Warnings issued, or charges laid on the system in accordance with The Drinking Water Safety Act

In 2025, no charges laid or warnings were received by the Lac du Bonnet Public water system.

8. System expansion and/or increased production

The Manitoba Water Services Board (MWSB) has informed the Town of Lac du Bonnet that MWSB received approval to fund the Town's Water Treatment Plant Upgrades with 50% funding up to a maximum of \$1.85M (\$3.7M total project cost). In addition, MWSB previously received approval to fund upgrades to the Raw Water Supply Line at 50% funding up to a maximum of \$200K (\$400K total project cost). Pre-project meetings have begun with MWSB, and the initial engineering design process is projected to start by May 2026.

The upgrades include replacement of the chemical room, overhaul and upgrade the current Actiflo Water Plant, repairs to the bulk truck fill system and filling area and upgrades to the distribution system, which may include pump and pipe upgrades.

The immediate priorities for the WTP are repairs or replacement of the UV system and required upgrades to the SCADA system to ensure Water License requirements are met.

9. System Upgrades Performed

During 2025, we improved our distribution lines in 2 areas in town. The water main at the end of Lake Avenue and Wood Street was improved, an abandoned service line was removed and the main line shortened. The forestry line was moved along Highway 11 to make way for the new PCH.

10. Summary:

The Water Treatment Plant's SCADA system provides accurate online monitoring of turbidity throughout the water treatment process and entering the distribution system. The SCADA system accurately monitors the Free Chlorine residuals entering the distribution system as well. This SCADA system takes online readings every minute to generate the best accuracy in its reporting. The treatment process removes 99.9% of harmful pathogens and the two-step disinfection takes care of the rest. We strive to remove as many harmful minerals and metals from the water as possible through the treatment process. We perform all bi-weekly sampling as well as any other samples required in our license.

If you wish to obtain a copy of this report you can visit our website at www.townoflacdubonnet.com and download it or visit the Town Office and request a copy of the report.