

Thorndale Drinking Water System

2023 Summary Report



Presented to Council March 25, 2024

Table of Contents

Summary Report

Background.....	3
Thorndale Water System Description.....	3
Legislation.....	3
Safe Drinking Water Act.....	4
Standard of Care, Section 19, Safe Drinking Water Act.....	4
Ontario Regulation 170/03: Drinking Water Systems Regulation.....	4
Drinking Water Quality Management Standard (DWQMS)	5
Ontario Regulation 435/07: Financial Plans	5
Non-Compliances with Legislation	5
Testing Results	7
Permit to Take Water	7
Production Well Maintenance	12
Water Usage	13

Background

The delivery of potable water in Ontario is regulated by the Ministry of Environment, Conservation and Parks (MECP) under the Safe Drinking Water Act. On June 1, 2003 O. Reg. 170/03 came into effect. This regulation prescribes requirements for owners and operators of municipal drinking water systems.

Among the obligations, O. Reg. 170/03 prescribes the need for all owners of licensed water works to produce a Summary Report with the following information:

- The list of requirements of the Act, regulations and the system's approval. It must also note any order that the system failed to meet at any time during the period covered by the report and specify the duration of the failure and describe the measures taken to correct the situation.
- Summary of quantities of water used for the period covered by the report.
- The Summary Report must be presented and accepted by Council by March 31st of each year.

This Regulation also requires the owner to produce an Annual Report that includes the following:

- A system description
- Summary of any adverse water quality reports and corrective actions
- Summary of all required testing results
- Description of any major expenses incurred to install, repair or replace required equipment
- The Annual Report must be completed by February 28th of each year and available to the public.

The Thorndale Drinking Water System – 2023 Annual Report was made available to Council on February 12 for information purposes.

Thorndale Water System Description

The Thorndale Drinking Water System services approximately 1,800 people via approximately 721 service connections. There are an estimated 19.29 kilometres of watermains located within the village of Thorndale; the oldest being 48 years old. There are 92 municipal hydrants and 8 private property fire hydrants providing fire protection including 120 valves of various sizes throughout the system to control water flow. Water is supplied to the village from the Thorndale Water Treatment Facility through a network of wells, reservoirs, and an elevated storage tank. The treatment process and distribution system are monitored on-line, 24 hours per day by licenced municipal operators through a SCADA (System Control and Data Acquisition) system. The water treatment facility and water distribution system are both owned and operated by the Municipality of Thames Centre.

Legislation

The following are the primary pieces of legislation that directly affect the operation of the Thorndale Drinking Water System.

Safe Drinking Water Act

The Safe Drinking Water Act's (SDWA) purpose is to protect human health through the control and regulation of drinking-water systems and drinking-water testing. The Act also has the benefit of gathering in one place all legislation and regulations relating to the treatment and distribution of drinking water.

Highlights of the Act address:

- Accreditation of operating authorities
- Municipal drinking water systems
- Drinking water testing
- Inspections, Compliance and Enforcement

Standard of Care, Section 19, Safe Drinking Water Act

The Standard of Care defines the legal responsibility of the owner and operating authority of a municipal drinking water system. It requires that the owners and operating authorities exercise the level of care, diligence and skill with regard to a municipal drinking water system that a reasonably prudent person would be expected to exercise in a similar situation. Owners and operating authorities must exercise this due diligence honestly, competently and with integrity. Based on the definition of owner in the SDWA, the Municipality of Thames Centre is considered the owner of the Thorndale Drinking Water System.

The three key messages identified for Municipal Councillors are as follows:

It is Your Duty: The Standard of Care is for individuals who have oversight responsibilities for municipal drinking water systems that can extend to Municipal Councillors. There are legal consequences for negligence of financial penalties up to imprisonment for individuals, corporations or both.

Be Informed: Ask questions; Get answers. Councillors do not have to be an expert in drinking water operations, but they do need to be informed about them. Council decisions can have an impact on public health. Councillors should seek advice from those with expertise and act prudently on that advice.

Be Vigilant: Complacency can pose one of the greatest risks to drinking water systems. It is critical that Councillors never take drinking water safety for granted or assume all is well with the drinking water systems under their care and direction. The health of the community depends on diligent and prudent oversight of its drinking water systems.

Ontario Regulation 170/03: Drinking Water Systems Regulation

The Drinking Water Systems Regulation (O. Reg. 170/03) regulates municipal and private water systems that provide water to year-round residential developments. This regulation stipulates treatment equipment usage, operational checks and sampling, chemical and microbiological testing requirements, corrective actions, and reporting requirements.

Drinking Water Quality Management Standard (DWQMS)

The purpose of this Standard is to assist owners and operating authorities in the effective management and operation of their municipal residential drinking water systems. This Standard outlines the requirements for a Quality Management System (QMS) to ensure high quality drinking water. In the development of a QMS, the Operating Authority must create an Operational Plan; this document defines the QMS and will be subject to internal and external audits for accreditation. As referenced in the Standard, the QMS must be embraced by all those with active rolls in the water system, from front line staff to the highest level of management.

Environmental Services staff have developed and implemented a QMS specific to Thames Centre's two drinking water systems. Certification was originally obtained on September 10, 2010. Recertification was successfully achieved in 2013, 2016, 2019, and 2022. The next external certification audit will be carried out in the spring of 2025.

Ontario Regulation 435/07: Financial Plans

O. Reg. 453/07 requires all owners of a municipal residential drinking water systems to prepare a Financial Plan that details the system's financial information projected forward for at least six years. The Financial Plan must include income statements (which set out revenues and expenses), as well as balance sheets (which include financial assets, non-financial assets, total liabilities, cash flow, etc.).

The Financial Plan must then be formally approved by the owner of the municipal system through a resolution of the municipal council. The Financial Plan requires regular updates before every Operating License renewal application (every 5 years). Council report ES-017-11 was submitted and approved by Council on June 13, 2011. This report formed the foundation for the Financial Plan that was then submitted to the Ministry of the Environment, Conservation and Parks (MECP). On May 25, 2020, through council report PW-004-20 the five-year renewal application of the Long Range Financial Plan was presented to Council for acceptance and subsequently submitted to the Province.

Non-Compliances with Legislation

Schedule 22 of Ontario Regulation 170/03 requires that all non-compliance with applicable legislation be discussed in the Summary Report. The Thorndale Drinking Water System has extensive requirements for monitoring and reporting of water quantity and quality. These requirements include proper documentation, analytical testing, adverse incident reporting, corrective actions, and calibration of flow meters and online continuous water quality monitoring instrumentation. The Ministry of the Environment, Conservation and Parks (MECP) completed their annual drinking water system inspection on June 15, 2023 for the period of June 1, 2022 to June 15, 2023. The following "**Non-Compliance/Non-Conformance Items**" section has been taken from the Ministry Drinking Water Inspection Report for the Thorndale Drinking Water System dated July 13, 2023.

Non-Compliance/Non-Conformance (Legislative):

- 1) The owner was not in compliance with the conditions associated with the maximum flow rate or the rated capacity conditions in the Municipal Drinking Water Licence issued under Part V of the SDWA. The MDWL, Schedule C, Condition 1.1 identifies "Rated Capacity" as the maximum daily volume of treated water that flows from the

treatment subsystem to the distribution system. The rated capacity for the Thorndale Drinking Water System is 630 m³/day. Condition 1.3 allows for temporary exceedances of the Rated Capacity for the purposes of fighting a large fire or for the maintenance of the drinking water system.

Required Action(s):

By August 31, 2023, the system owner shall provide a written plan to the inspecting officer. At minimum, the plan shall include:

- 1) Actions taken by the system owner to mitigate water usages with respect to Rated Capacity exceedance events
- 2) Corrective actions with timelines to prevent future Rated Capacity exceedances.

Action(s) Taken by staff:

The following plan was submitted to the inspecting officer on August 11, 2023.

- 1) Actions taken to mitigate water usage with respect to Rated Capacity exceedance events.
 - a) System auto flushers were turned off and the fire department was notified that training on fire hydrants would be suspended until further notice.
 - b) Municipal staff frequently patrolled Thorndale and spoke with residents about the Lawn Watering By-law (044-2003) and handed out an information sheet. These patrols were also conducted on Saturdays and Sundays.
 - c) Social media posts were made reminding people about the Lawn Watering By-law and encouraged to conserve water. The information sheet was posted on the municipal website.
- 2) Corrective Actions to prevent future Rated Capacity exceedances.
 - a) Working with Stantec Engineering, Thames Centre submitted an application on July 17, 2023 to the MECP to amend the MDWL and DWWP for an increase to the capacity of the Thorndale Water Plant. A response email was received from the MECP on July 26, 2023 requesting further clarification on some items. A response to those questions was sent on August 2, 2023.
 - b) Thames Centre will be updating the current Lawn Watering By-Law to allow by-law enforcement officers to issue immediate fines through the Municipal Fees and Charges By-law instead of the Provincial Offences Act.

The MECP inspecting officer responded on August 11, 2023 that the information provided 'satisfied the Actions Required identified in the 2023/2024 inspection report'. On October 18, 2023 the MECP approved the amendment to the Thorndale MDWL increasing the Rated Capacity from 630 m³/day to 1641.6 m³/day.

Non-Compliance/Non-Conformance (Best Management Practices):

The Thorndale DWS is equipped with two continuous process analyzers that monitor free chlorine residual. One analyzer monitors the concentration of chlorine in water entering the water tower and one monitors water exiting the water tower. Operations staff advised that high and low alarm setpoints were included in SCADA but, data from these analyzers is not recorded. Test results for these process analyzers are not required to be recorded under O.Reg. 170/03. However, if a process analyzer indicates that inadequately disinfected water is being directed to the users of the system, the observation must be reported under Schedule 16-4 of O. Reg. 170/03.

Recommended Action(s):

With respect to the continuous chlorine analyzers installed at the water tower, it is recommended that the chlorine test results are recorded at least every 15 minutes, and that the test results are reviewed by a certified operator within 72 hours of the test.

Action(s) Taken:

The inlet and outlet chlorine analyzers at the Thorndale Elevated Storage Tank (EST) were added to the SCADA logger data and trending on September 19, 2023. The results are recorded every minute and reviewed by a licenced operator every 24 hours.

A copy of the MECP 2023 Thorndale Drinking Water System Inspection Report is attached.

Testing Results

Summary of reports made to the Ministry under subsection 18(1) of the Safe Drinking-Water Act or Schedule 16-4 of O.Reg.170/03:

ADVERSE WATER QUALITY INCIDENTS (AWQI)

Table A: *Adverse Water Quality Incidences (AWQI)*

AWQI #	DATE 2023	LOCATION	PARAMETER	RESULT	MECP CRITERIA	CORRECTIVE ACTION
There were no Adverse Water Quality Incidences in 2023.						

Permit to Take Water, Drinking Water Works Permit, and Municipal Drinking Water Licence

The Thorndale Drinking Water System has restrictions on instantaneous flow rates (peak flow rates) and maximum daily flow volumes. These limits are identified in the Amended PTTW No. 5082AP2RUV, the Drinking Water Works Permit 059-201, and the Municipal Drinking Water Licence 059-101.

The permitted flow rates and daily volumes were exceeded fifty-four (54) times in 2023. The maximum rated capacity (630 m3 per day) of the Thorndale Water Facility was exceeded 12 times. This was caused by residential usage. On October 18, 2023 the

MECP approved an increase to the maximum rated capacity from 630 m3 per day to 1641.6 m3 per day.

Well #2 pump was upgraded in November 2022 from a 7.5 hp pump to a 20 hp pump. While the PTTW allowed Well #2 to flow at 22 l/s the DWWP restricted the well's flow to 10.5 l/s. October 18, 2023 the MECP approved an increase to Well #2's flow rate from 10.5 l/s to 22 l/s in the DWWP. During the approval period, staff continued to run and test Well #2 as a backup in case there were any issues with Well #1.

DATE 2023	DWWP # 059-201 Exceedances Well #1 maximum allowable flow: 8.33 l/s	DURATION	EXPLANATION / CORRECTIVE ACTION
Jan 4	9.31 l/s	26 minutes	Drawdown step test performed by water operators
Nov 30	9.43 l/s	30 minutes	Drawdown step test performed by water operators

DATE 2023	DWWP # 059-201 Exceedances Well #2 maximum allowable flow: 10.5 l/s	DURATION	EXPLANATION / CORRECTIVE ACTION
Jan 10	18.48 l/s	14 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
Jan 12	14.69 l/s	104 minutes	Drawdown step test performed by water operators
Jan 17	16.45 l/s	14 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
Jan 20	16.32 l/s	13 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
Jan 24	16.13 l/s	51 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
Jan 31	16.31 l/s	13 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
Feb 7	16.61 l/s	29 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
Feb 14	16.56 l/s	16 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP

Feb 21	16.17 l/s	43 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
Feb 28	16.64 l/s	30 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
Mar 7	16.73 l/s	28 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
Mar 14	16.60 l/s	20 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
Mar 21	16.24 l/s	40 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
Mar 28	16.53 l/s	12 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
April 4	16.67 l/s	17 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
April 11	16.16 l/s	14 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
April 18	16.14 l/s	10 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
April 25	16.54 l/s	19 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
May 2	16.35 l/s	15 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
May 9	16.75 l/s	16 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
May 16	16.35 l/s	16 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
May 23	16.56 l/s	32 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
May 30	16.45 l/s	51 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
June 6	16.08 l/s	57 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
June 13	16.81 l/s	20 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
June 20	16.73 l/s	32 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP

June 27	16.71 l/s	33 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
July 4	16.59 l/s	14 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
July 11	16.54 l/s	18 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
July 18	16.55 l/s	17 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
July 25	16.80 l/s	8 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
Aug 8	16.69 l/s	18 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
Aug 15	16.72 l/s	37 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
Aug 22	16.80 l/s	19 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
Aug 29	16.91 l/s	27 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
Sept 5	16.80 l/s	23 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
Sept 12	16.92 l/s	17 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
Sept 19	17.27 l/s	12 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
Sept 26	16.70 l/s	16 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP
Oct 5	17.15 l/s	11 minutes	Ran well to take microbiological sample / application to increase well 2 capacity in DWWP

DATE 2023	MDWL # 059-101 Exceedances Rated Capacity: 630 m3/day	DURATION	EXPLANATION / CORRECTIVE ACTION
May 27	723 m3	24 hr period	Residential usage / turned off auto flushers and application to increase the rated capacity in the MDWL

May 28	648 m3	24 hr period	Residential usage / public education, by-law enforcement and an application to increase the rated capacity in the MDWL
May 29	711 m3	24 hr period	Residential usage / public education, by-law enforcement and an application to increase the rated capacity in the MDWL
May 30	712 m3	24 hr period	Residential usage / public education, by-law enforcement and an application to increase the rated capacity in the MDWL
May 31	704 m2	24 hr period	Residential usage / public education, by-law enforcement and an application to increase the rated capacity in the MDWL
June 1	677 m3	24 hr period	Residential usage / public education, by-law enforcement and an application to increase the rated capacity in the MDWL
June 2	782 m3	24 hr period	Residential usage / public education, by-law enforcement and an application to increase the rated capacity in the MDWL
June 3	718 m3	24 hr period	Residential usage / public education, by-law enforcement and an application to increase the rated capacity in the MDWL
June 4	747 m3	24 hr period	Residential usage / public education, by-law enforcement and an application to increase the rated capacity in the MDWL
June 5	676 m3	24 hr period	Residential usage / public education, by-law enforcement and an application to increase the rated capacity in the MDWL
June 10	779 m3	24 hr period	Residential usage / public education, by-law enforcement and an application to increase the rated capacity in the MDWL
August 11	633 m3	24 hr period	Residential usage / public education, by-law enforcement and an application to increase the rated capacity in the MDWL

Chart 1: Well #1 Flow Rate (litres/second)

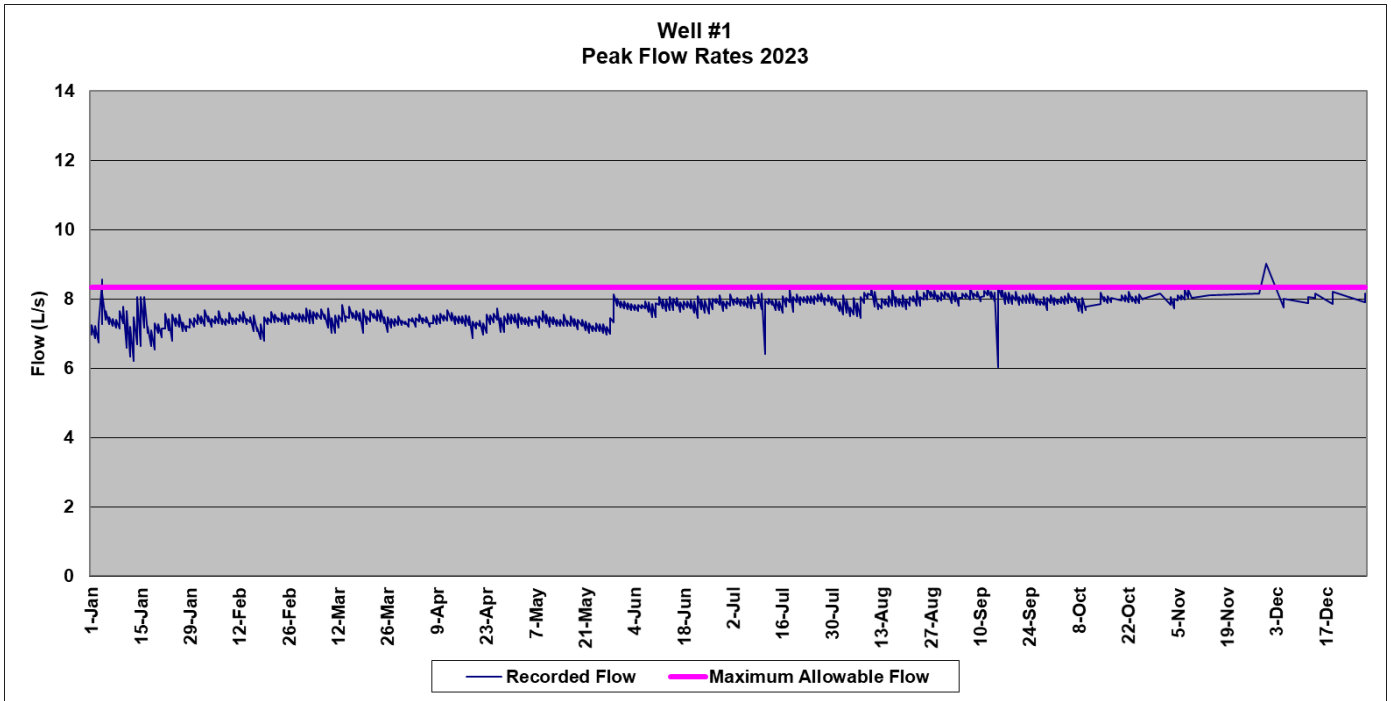
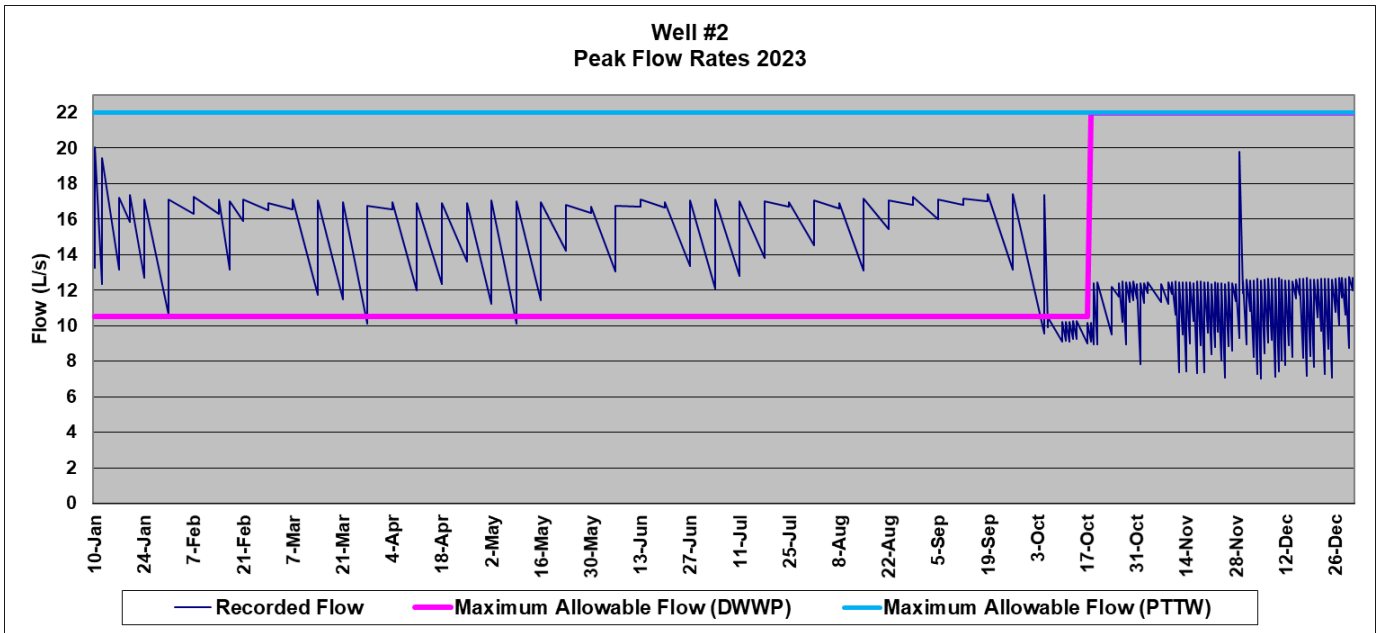


Chart 2: Well #2 Flow Rate (litres/second)



Thorndale’s previous Drinking Water Works Permit (DWWP) allowed Well #2 to flow at a maximum rate of 10.5 l/s. Thorndale’s Permit to Take Water (PTTW) allows Well #2 to flow at a maximum of 22 l/s. On October 18, 2023, the MECP approved an update that aligned the DWWP with the PTTW and allowed a maximum flow rate change from 10.5 l/s to 22 l/s for Well #2.

Production Well Maintenance

Routine (weekly) well inspections conducted by Thames Centre staff, in accordance with the Thames Centre - Well Inspection and Maintenance Plan, indicate all drinking water supply wells were in compliance. Wells are maintained in accordance with O. Reg. 903, (made under the Ontario Water Resources Act).

Table B: *Production Well Maintenance Summary*

PRODUCTION WELL	OUT OF SERVICE DURATION	REASON FOR MAINTENANCE	CORRECTIVE ACTION / RESULTS (data collected from Inspection Report)
No well maintenance was conducted in 2023.			

Water Usage

From January 1 to December 31, 2023, the Thorndale Water Distribution System received a total of 137,942 m³ of water from Thorndale Water Treatment Facility. This compares to 140,292 m³ from the previous year (a decrease of 1.7%).

Chart 3: *Thorndale DWS – 2023 Monthly Water Consumption (m³)*

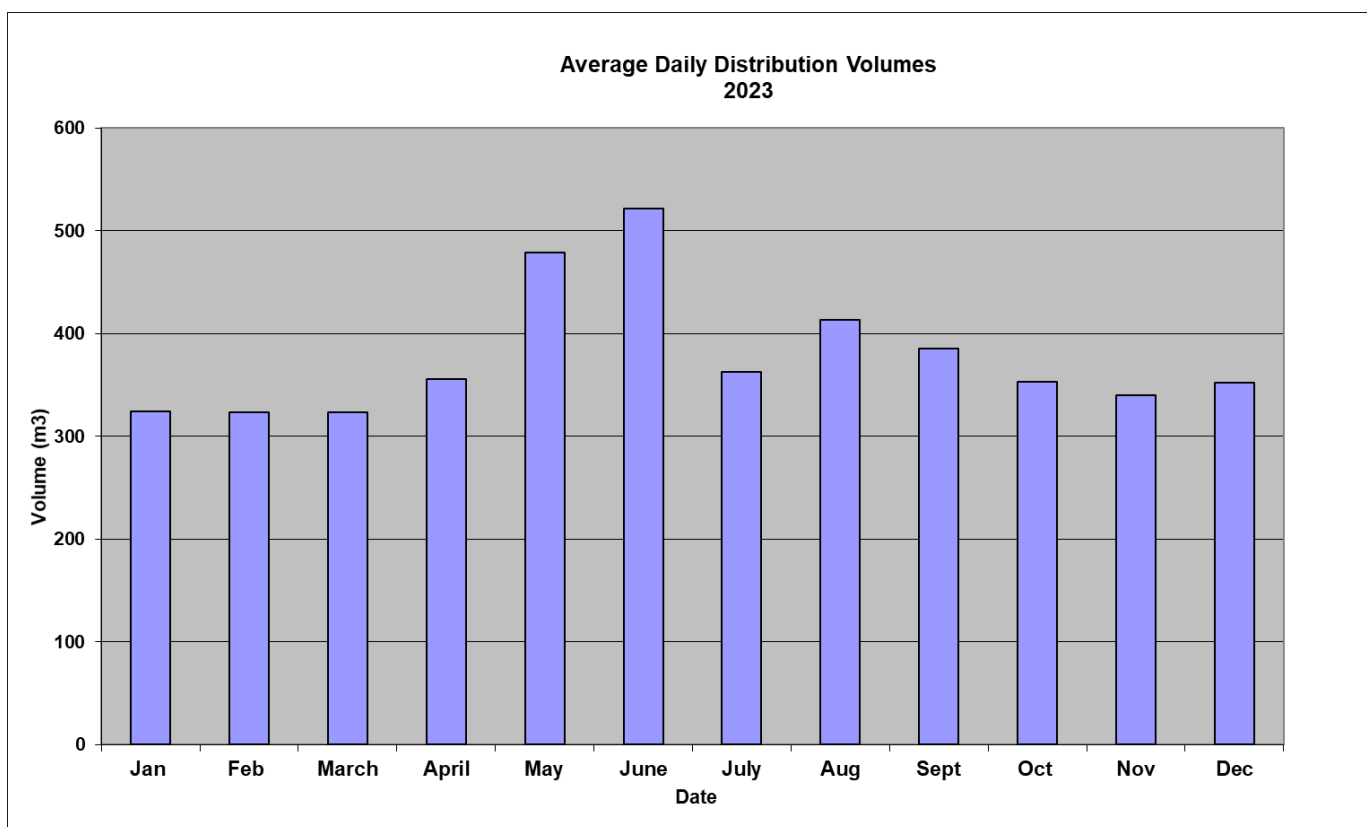
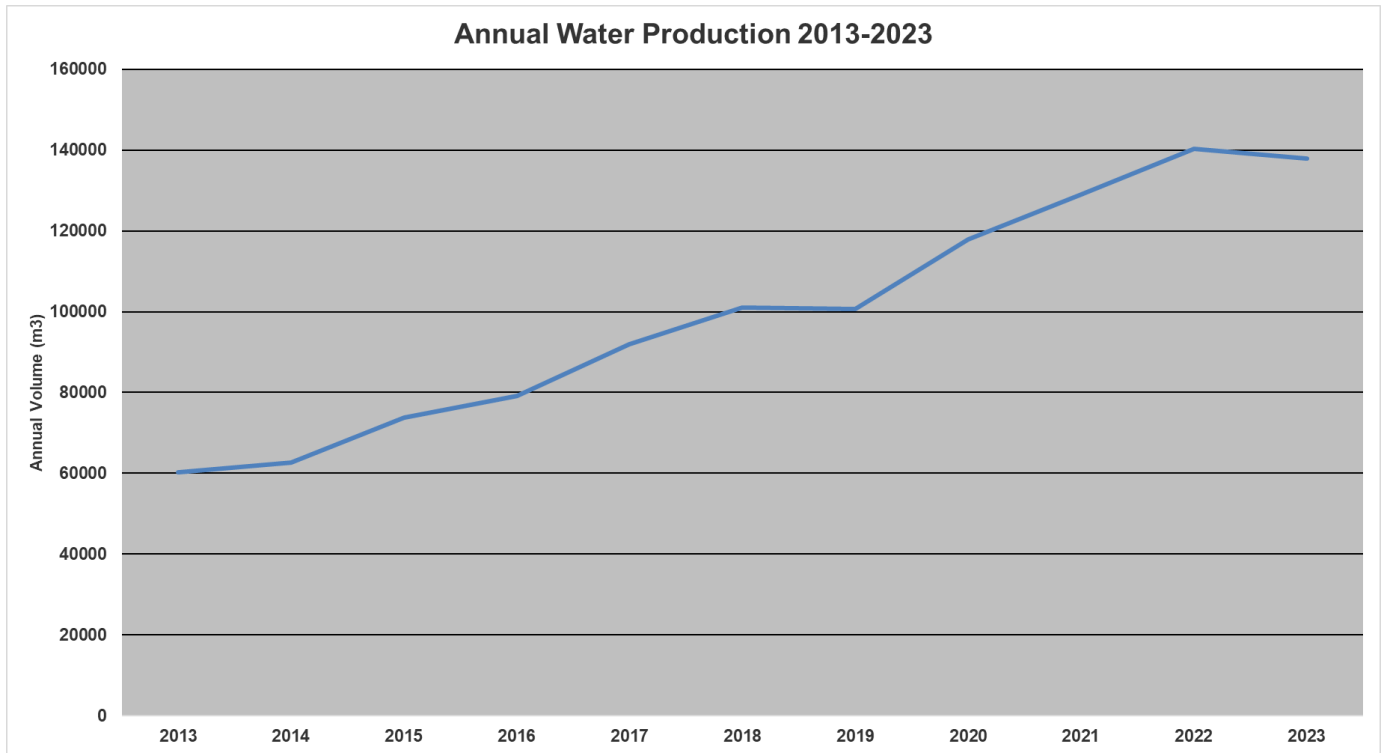


Chart 4: Thorndale DWS - Annual Water Consumption (m3), 2013 – 2023



This report is presented based on recorded information taken by licenced water operators and to the best of my knowledge is complete and accurate.

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