Corporation of the Town of Perth

Drinking Water System

2023 Summary Report

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2023 DWS Summary Report

DWS Summary Report Overview

A Summary Report, as per Ontario Regulation 170/03, Schedule 22 must be prepared for each drinking water system in the province of Ontario. The report must be provided no later than March 31 to members of Municipal Council.

Free copies are available on our website, and paper copies available upon request. Notices of availability on our website and/or through media releases.

The DWS Summary report will cover a period for the preceding calendar year, January 01 to December 31, 2023.

The completion and presentation of this report will also fulfill the requirement for a compliance report to be produced in accordance applicable regulations.

Section 1 contains,

- any failures during the reporting periods to achieve the requirements of the Safe Drinking Water Act, associated drinking water regulations and guidelines, any approvals, any operating licences or permits, or any orders applicable to the Perth DWS system;
- duration of the failure, and measures taken to correct the failure;
- any priority concerns that might lead to failures to meet the operating requirements.

Section 2 contains,

- summary of quantities and flow rates of water taken from the Tay River, in addition to water production and process wastewater generation.

Supplemental Perth DWS information sources would include, but not limited to,

- The Town of Perth Water Treatment Plant year end documentation,
- The Town of Perth Water Distribution year end documentation,
- The Town of Perth DWS Annual Report, Infrastructure Report, Water Taking report.

Supplemental government legislation sources would include, but limited to,

- Safe Drinking Water Act, 2002
- Ontario Regulation 170/03, Drinking Water Systems
- Ontario Regulation 169/03, Ontario Drinking Water Quality Standards
- Ontario Regulation 128/04, Certification of Drinking Water System Operators and Water Quality Analysts

It is noted to ensure currency, up to date documents can be reviewed at http://www.e-laws.gov.on.ca.

Supplemental government support documentation is available at the Ministry of the Environment and Climate Change's Drinking Water Ontario website, https://www.ontario.ca/page/drinking-water.

Ontario Regulation 170/03, Schedule 22 – Summary Reports for Municipalities

Section 22-1

- as a large municipal residential system, the Town of Perth is required to complete and submit a Summary Report.

Section 22-2 (1)

- requires the Summary Report is prepared in accordance with the regulation by no later than March 31, covering a period for the preceding calendar year.
- as the drinking water system is owned by the municipality, the Summary Report is required to be given to the members of the municipal council by March 31 of each year

Section 22-2 (2)

- *The report must,*
  - *a) list the requirements of the Act, the regulations, the system's approval, drinking water works permit, municipal drinking water licence, and any orders applicable to the system that were not met at any time during the period covered by the report; and*
  - b) *for each requirement referred to in clause (a) that was not met, specify the duration of the failure and the measures that were taken to correct the failure*.
- Please refer to Section 1 of the Summary Report for this information

Section 22-2 (3)

- *The report must also include the following information for the purpose of enabling the owner of the system to assess the capability of the system to meet existing and planned uses of the system:*
  - *a) A summary of the quantities and flow rates of the water supplied during the period covered by the report, including monthly average and maximum daily flows.*
  - *b) A comparison of the summary referred to in paragraph 1 to the rated capacity and flow rates approved in the system's approval, drinking water works permit or municipal drinking water licence, or if the system is receiving all of its water from another system under an agreement pursuant to subsection 5 (4), to the flow rates specified in the written agreement.*
- Please refer to Section 2 of the Summary Report for this information

Section 22-2 (4)

- *If a report is prepared for a system that supplies water to a municipality under the terms of a contract, the owner of the system shall give a copy of the report to the municipality by March 31*
- Some services of the Perth DWS are located in Tay Valley Township, and as such, the Perth DWS Summary Report is forwarded to the Municipality by March 31.

DWS Information

Drinking-Water System Number	220001272
Drinking-Water System Name:	Perth Drinking Water System
Drinking-Water System Owner:	Perth, The Corporation of the Town of

Period being reported:	Jan 01, 2023 to Dec 31, 2023
Latest MOECC Inspection	January 18, 2023
Previous MECP Inspection	Jan 2021 (document review); Jan 2022 (on-site)

Drinking-Water System Category:	Large Municipal Residential System (LMRS)
Drinking Water System Facilities	• Class III Water Treatment Subsystem, • Class I Water Distribution Subsystem

Municipal Drinking Water Licence (MDWL)	160-101
Licence Issue Date	July 26, 2021
Licence Revision Date (most recent)	July 26, 2021 (issue #7)
Licence Expiry Date	July 25, 2026

Drinking Water Works Permit	160-201
DWWP Issue Date	July 26, 2021 (Issue #3)
DWWP Expiry Date	July 25, 2026

Permits to Take Water	7770-A8HKRH
PTTW Issue Date	March 29, 2016
PTTW Expiry Date	March 31, 2026
Water Taking Location	Tay River
Financial Plan Number (under O. Reg. 453/07)	160-301
Financial Plan Issue Date	June 01, 2021
Accredited Operating Authority	The Corporation of the Town of Perth
Operating Authority No.	160-OA1
Operational Plan No.	160-401

SECTION 1 – FAILURE TO MEET REQUIREMENTS

1.1. Adverse Water Quality Incident reports (Drinking Water System)

1.1.1 AWQI #162870 (WD sampling adverse result)
August 02, 2023 – received lab notification of a July 31, 2023 water distribution sample result of 1 Total Coliform. Resampling was done August 08 with results of 0 total coliform.

1.2. Ministry Orders

1.2.1 Drinking Water System
- No MOE orders issued.

1.2.2 Water Treatment Subsystem
- No MOE orders issued.

1.2.3 Water Distribution Subsystem
- No MOE orders issued.

1.3. Notifications to MECP regarding operational issues

1.3.1 WTP treatment operation continuing without fluoride addition

Some operational issues with the fluoride feeder continued during the initial portion of 2023. The unit was put back into service on April 17, but had times during May-August where shutdown was required to make repairs or operational adjustments.

Government authorities (MECP, MOH) were kept aware of the situation and given status updates of any work.

1.4. MECP Identified Known Failures to Meet Requirements

1.4.1 January 18, 2023 MECP DWS Inspection

A MECP DWS was conducted on January 18, 2023, which covered a period from January 09, 2022 to January 11, 2023. This was a focused inspection, with the Inspector's report released February 22, 2023. The following were identified non-compliance/ non-conformance issues (known failures to meet requirements) contained in the inspection report,

- The owner/operating authority was not in compliance with the requirement to prepare Form 1 documents as required by their Drinking Water Works Permit during the inspection period. This was related to documentation

associated with water distribution work. Required timeframes were set to develop and implement specific action plans as set out by the MECP inspector, including training for staff to ensure proper documentation is completed in accordance to the Town's DWS Drinking Water Works Permit.

1.4.2 January 2024 MECP DWS Inspection

As of January 22, 2024, there has not been a MECP DWS inspection conducted covering operations from January 12, 2023 to current. The MECP has the opportunity to make the inspection announced (Inspector schedules a date ahead of arrival), or unannounced (where the Inspector may just arrive on-site without notice).

1.5. MECP identified areas for possible improvement

In the MECP Inspection Report, dated February 22,2023, some areas for improvement and other recommendations were as follows,

- The need to review and update equipment listed or omitted in the DWWP through a Directors Notification submission
- A reminder to include the Tay Valley Township waterworks number with any samples taken from their distribution system and submitted on their behalf for lead sampling
- Consider seeking proper relief from MECP requirement to report loss of coagulant use for short periods of time (< 10 min)

The Drinking Water System Infrastructure Review Report outlines operational and infrastructure areas for possible improvement, with some identified by MECP. Any corrective actions taken, being done, or to be considered, is included in the report.

1.6. Additional concerns meeting potential compliance or operational requirements

The Drinking Water System Infrastructure Review Report, to be presented to Town of Perth Municipal Council, highlights abilities to maintain operational abilities, along with immediate, short term, and long term DWS operational needs.

In the report, significant issues or areas of concern that might be viewed as potential impact items to operations were listed. These lists contained issues identified by operational staff and management which might,

- pose potential risk with inability to meet compliance and/or operational requirements,
- help prevent equipment failure or down time,
- assist with more efficient operations.

Section 2 of the Infrastructure Report provided detailed assessment of the drinking water system abilities, including

- water treatment ability
- water pumping capacity
- process wastewater residue management ability
- process automation computer system capability
- water storage ability, and
- drinking water system staffing requirements

Section 3 of the Infrastructure Report outlined,

- work completed in 2023,
- immediate and short-term needs, and
- long term (2 to 5 year) operational needs forecasting.

SECTION 2 – SUMMARY OF PLANT FLOWS

2.1. Raw Water (Source water)

Individual daily RW flow expressed in Liters/day (1000 L = 1 m^3) can be found in the Town's 2023 Annual Record of Water Taking (Permit to Take Water) report.

The table below (RW-1) gives the monthly average RW flow, monthly single day max and min flows, and the monthly total RW intake flow volume. A comparison of the single day maximum of the month to the PTTW allowable volume of 9092 m^3 is shown.

Table RW-1

2023 Raw Water Volumes					
	Average Daily Flow (m^3)	Minimum Daily Flow (m^3)	Maximum Daily Flow (m^3)	TOTAL FLOW (m^3)	Daily Maximum % of PTTW Allowable Volume (9092 m^3)
January	2726.3	2338	3140	84516	34.5%
February	2779.2	2367	3172	77818	34.9%
March	2788.3	2589	3641	86438	40.0%
April	2907.9	2474	4648	87238	51.1%
May	2921.7	2527	3654	90574	40.2%
June	3214.0	2600	3771	96420	41.5%
July	3253.0	2692	4408	100844	48.5%
August	2876.2	2273	3461	89161	38.1%
September	3003.9	2516	3771	90117	41.5%
October	2945.6	2066	4789	91315	52.7%
November	2609.7	2138	3445	78290	37.9%
December	2686.3	2176	3108	83276	34.2%
ANNUAL TOTALS	avg 2892.69	Min 2066	Max 4789	Total 1,056,007	

2.1.1. Average Daily Raw Water Flow:

The monthly average of daily average raw water flow was 2892.7 m^3 in 2023, or approximately 31.8% of the PTTW. It was slightly higher in 2022 at 32.7%.

The daily average in 2020 was 2982 m^3, followed by 2932 m^3 in 2021, and 2977 m^3 in 2022. Overall, there appears a relatively similar daily average water intake over recent years, however lower than previous years prior to 2020.

2.1.2 Maximum Raw Water Flow:

The maximum day flow for 2024 was on Oct 03 (4789 m^3), during hydrant flushing. The second highest maximum flow day also occurred during hydrant flushing 4786 m^3 (Oct 04). Hydrant flushing accounts typically of the higher intake (raw water) flow times during a typical year, as indicated by,

- Spring flushing (Apr 24-28) had an average day flow of 3754.8 m^3 (max 4648.5)
- Fall flushing (October 3-6) had an average day flow of 4350.8 m^3 (max 4789.0)

Excluding hydrant flushing times, some maximum day flow volumes were June 21 at 3771 m^3; July 04 at 3981 m^3; and May 31 at 3654 m^3. Most higher intake flows can be attributed to maintenance or repair work. On July 11, a high raw volume flow day of 4408 m^3 was the result of an issue with the splash pad at Colon Farms running continually overnight.

2.2. Service Water (Treated Discharged Water)

Below are the Treated Water monthly volumes, noting the high daily flow volume in April and October can be attributed to Hydrant Flushing week(s). Water main breaks can also be associated with high treated water flows.

2023 Treated Water Volumes Discharged to Town					
	Average Daily Flow (m^3)	Minimum Daily Flow (m^3)	Maximum Daily Flow (m^3)	TOTAL FLOW (m^3)	Daily Maximum % of Design flow (9090 m^3)
January	2602.8	2240	2941	80686	32.3%
February	2641.8	2476	2862	73970	31.5%
March	2671.5	2502	3247	82816	35.7%
April	2790.5	2332	4287	83714	48.3%
May	2814.3	2409	3506	87244	38.6%
June	3113.6	2537	3697	93408	40.7%
July	3154.3	2566	3781	97783	41.6%
August	2788.7	2450	3107	86450	34.2%
September	2852.1	2489	3180	85563	35.0%
October	2770.7	2243	4784	85893	52.6%
November	2444.9	2256	2760	73348	30.4%
December	2486.5	2325	2664	77082	29.3%
ANNUAL TOTALS	avg 2760.98	Min 2240	Max 4784	Total 1,007,957	

Table TW-1

2.2.1. Average Daily Service Water Flow:

Annual service water daily average flow

Year	2018	2019	2020	2021	2022		2023
Annual avg flow m^3	3072	3011	2896	2787	2872		2761

The service water daily average water flow was 2760.98 m^3 in 2023. Over 5 years (2018-2022), the average daily service water flow was 2928 m^3, making 2023 service water volumes slightly lower to recent years. Some of the lower daily average flows can be attributed to the loss of two significant industrial water users.

2.2.2. Service Water Discharge:

Annual service water total flow

Year	2018	2019	2020	2021	2022		2023
Annual avg flow m^3	1,122,056	1,099,316	1,060,407	1,017,774	1,049,000		1,007,957

In 2023, the total discharge amount was 1,007,957 m^3 to the Town. Over 5 years (2018-2022), the average annual water discharged was 1,069,705 m^3, making 2023 annual service water discharging slightly lower to previous years.

The downward trending of annual service water discharging is significant as it directly equates to revenue generation. The annual service water volume is relevant to doing future financial projections of future water service revenues.

2.3. Plant process water

The WTP Process Wastewater Residue Management involves two individual treatment processes, direct Geo Bag system deployment, and a separate pre-treatment Backwash Equalization Tank (BET) system.

Sludge from the settling tanks is typically dense enough for direct processing and sending to the Geotubes (solids collection geo membrane bags). The geo membrane captures the solids, and allows “cleaned” water to pass through. The water is discharged back to the Tay River.

Filter backwash wastewater is directed to a “geo membrane pre-treatment” system, or Backwash Equalization Tanks (BET). The backwash wastewater contains a higher percentage of water, opposed to solids. The BET system allows time for sludge separation through sedimentation, and supernatant removal. The BET supernatant is discharged to the Tay River, with sludge directed to the Geotubes for treatment. Backwash wastewater is dechlorinated prior to entering the BETs.

The accumulation of “clean wastewater” from non-process water sources (such as roof drains, work sinks, analyzer bypass flows, engine and pump coolant water) continues to fill BET(s) and use up residue processing time and resources. As mentioned in previous DWS Summary Reports, a feasibility study should be considered to explore options to divert this water away from the process residue management system and possibly to sanitary sewer discharges.

2.3.1. Waste Volumes

Annual total Geo-tube influent flow

Year	2018	2019	2020	2021	2022		2023
Annual total flow m^3	14,250	13,528	12,867	15,244	15,124		15,148

In 2023, a total volume of 15,148 m^3 was directed to the Geo-tubes (solids collection membrane bags). It is noted the volume being generated annually can be influenced by many uncontrollable operational factors, such as raw water conditions and rainfall accumulation (overabundance or lack of).

Annual total filter backwash wastewater generation

Year	2017	2018	2019	2020	2021	2022	2023
Annual total flow m^3 (est)	9,155	11,391	10,934	10,377	15,936	9,906	9,569

Backwash wastewater generation for 2023 was estimated at 9,569 m^3. This volume appears back into normal range expectations. The higher volume in 2021 was attributed to GAC removal and replacement media “cleaning” through repeated backwashes. Of note, with no air scour in 2016, normal annual backwash volumes were significantly higher and estimated at 14,131 m^3.

Appendix

4.1 Appendix Table 1 – Summary of Flows January 1, 2023 to December 31, 2023

Perth Water Treatment Plant

PTTW maximum allowable flow rate: **9,092 m^3/ day**

	Raw water (m^3)		Discharge (Service) Water (m^3)	
Month	**Monthly Daily Average Flow**	**Monthly Total Flow**	**Monthly Daily Average Flow**	**Monthly Total Flow**
January	2726.3	84516	2602.8	80686
February	2779.2	77818	2641.8	73970
March	2788.3	86438	2671.5	82816
April	2907.9	87238	2790.5	83714
May	2921.7	90574	2814.3	87244
June	3214.0	96420	3113.6	93408
July	3253.0	100844	3154.3	97783
August	2876.2	89161	2788.7	86450
September	3003.9	90117	2852.1	85563
October	2945.6	91315	2770.7	85893
November	2609.7	78290	2444.9	73348
December	2686.3	83276	2486.5	77082
Year Average	2892.69	88,000.6	2760.98	83996.4
Year Total		1,056,007		1,007,957

4.2 Appendix Table 2 – Historical Average Daily Treated Water Flow (m^3)

	2023	2022	2021	2020	2019	2018	2017
JANUARY	2603	2570	2491	2762	2972	2982	2,381
FEBRUARY	2642	2773	2670	2750	3036	2890	2,454
MARCH	2672	3008	2630	2704	3047	2961	2,491
APRIL	2791	2835	2409	2555	3038	2983	2,586
MAY	2814	3293	3030	2938	3049	3363	2,495
JUNE	3114	3188	3154	3347	3062	3268	2,836
JULY	3154	3191	2993	3635	3469	3602	2,796
AUGUST	2789	3208	3498	3223	3228	3269	2,837
SEPTEMBER	2852	2728	2890	2981	2902	2947	2,886
OCTOBER	2771	2728	2774	2805	2912	2982	2,830
NOVEMBER	2445	2455	2486	2513	2707	2840	2,568
DECEMBER	2487	2491	2417	2534	2711	2776	2,681
MAXIMUM	**3,154**	**3,293**	**3,498**	**3,635**	**3,469**	**3,602**	**2,886**
MINIMUM	**2,445**	**2,455**	**2,409**	**2,513**	**2,707**	**2,776**	**2,381**
AVERAGE	**2,761**	**2,872**	**2,787**	**2,896**	**3,011**	**3,072**	**2,654**