



Town of Perth Drinking Water System

DWS # 220001272

2023 Annual Report



Drinking-Water System Number:	220001272
Drinking-Water System Name:	Perth Drinking Water System
Drinking-Water System Owner:	The Corporation of the Town of Perth
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 1, 2023 to Dec 31, 2023

<p><u>Complete if your Category is Large Municipal Residential or Small Municipal Residential</u></p> <p>Does your Drinking-Water System serve more than 10,000 people? Yes [] No [x]</p> <p>Is your annual report available to the public at no charge on a web site on the Internet? Yes [x] No []</p> <p>Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>The 2023 Summary Report will be prepared and forwarded to the Town of Perth Municipal Council by March 30, 2024. Paper copies will be available at the Water Treatment Plant and electronic copies available on the municipal website.</p> </div>	<p><u>Complete for all other Categories.</u></p> <p>Number of Designated Facilities served:</p> <div style="border: 1px solid black; padding: 2px; width: 100px; margin: 5px 0;">20-25</div> <p>Did you provide a copy of your annual report to all Designated Facilities you serve? Yes [] No [] Available on Website</p> <p>Number of Interested Authorities you report to:</p> <div style="border: 1px solid black; padding: 2px; width: 100px; margin: 5px 0;">n/a</div> <p>Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes [] No [] n/a</p>
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List all Drinking-Water Systems (if any), which receive all of their drinking water from your system:

Drinking Water System Name	Drinking Water System Number
Tay Valley Township	260097682

Did you provide a copy of your annual report to all Drinking-Water System owners that are connected to you and to whom you provide all of its drinking water?

Yes [x] No []



Indicate how you notified system users that your annual report is available, and is free of charge.

- Public access/notice via the web
- Public access/notice via Government Office
- Public access/notice via a newspaper
- Public access/notice via Public Request
- Public access/notice via a Public Library
- Public access/notice via other method

Describe your Drinking-Water System

Water Treatment Subsystem

The Water Treatment Plant is a Class III facility and was constructed in 1964 replacing the old Plant on Leslie Street, which was built in 1897. The water source is the Tay River, with the intake located at the Links O' Tay Golf Course. At the plant, conventional filtration practices are followed using a multiple barrier approach, including disinfection at various points in the process.

The surface water, or raw water, flows into the plant's intake wells, pretreated as required, and then onward to the raw water wells. The raw water's quantity and quality is monitored in order for proper chemical dosages to occur. Raw water pretreatment consists of double screening for solids, and disinfection when needed with chlorine dioxide. Water is then subject to the clarification process, involving coagulation, flocculation, and sedimentation stages. Clarified water is then directed to the filtration process, where filter beds consisting of granular activated carbon and sand, further removes suspended solids. The filtered water's turbidity is continuously monitored and the filters are regenerated (backwashed) when required. Filter effluent water is directed to the clearwell for primary disinfection.

In the clearwell, the initial primary disinfection occurs as filter effluent water is exposed to the disinfecting agent, Sodium Hypochlorite. The treated water then passes to the reservoir, where further contact time is allowed to occur with the disinfectant. Prior to entering the reservoir, calcium hydroxide (lime) is added for pH adjustment, and fluoride (as recommended by the Ministry of Health). The underground reservoir at the plant has a storage capacity of approximately 750,000 gallons (3,000,000 liters). It remains there until demand requires it in the distribution system. Before pumping the water directly into the distribution system, secondary disinfection occurs (sodium Hypochlorite) to bring the free chlorine residual up to a level required to maintain a residual throughout the distribution system.

A process wastewater residue management system is used to reduce solids and dechlorinate the wastewater prior to discharge back into the Tay River. Wastewater sludge is directed to a treatment system involving geo membranes. Sedimentation tank sludge goes directly to treatment, while backwash wastewater is given settling time so supernatant water can be decanted off prior to sludge treatment. Any wastewater from the geo membrane dewatering process or backwash settling process is sent back to the Tay River.

Water Distribution Subsystem

The distribution subsystem is comprised of approximately 40 km of water mains constructed primarily of cast, PVC and ductile iron pipe ranging in diameter from 100 mm to 400mm. The system serves a population of approximately 6000, supplies approximately 2400 service connections, and has approximately 270 hydrant installations. A hydrant flushing program occurs twice a year, to help maintain the system integrity and proper operations.

An elevated tank, with storage capacity of 945 m³, provides system pressure and storage. A water mixing system helps ensure adequate disinfection is maintained while water is stored in the tank. The system is checked on a weekly basis to ensure that drinking water remains safe, free of bacteria and disinfected.



List all water treatment chemicals used over this reporting period

Poly-Aluminum Chloride (PAX XL-6 - coagulant) Activated Carbon (GAC – filter beds) Sodium Hypochlorite (Primary disinfection) Sodium Hypochlorite (Secondary Disinfection) Calcium Hydroxide (Lime – pH adjustment) Sodium Silicofluoride (Fluoride) Polymer (Geo-tube process sludge) Hydrochloric Acid (Chlorine Dioxide) Sodium Chlorite (Chlorine Dioxide) Sodium Hypochlorite (Chlorine Dioxide) Calcium Thiosulphate (CAPTOR – dechlorination)
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Were any significant expenses incurred to?

- Install required equipment
- Repair required equipment
- Replace required equipment

Please provide a brief description and a breakdown of monetary expenses incurred

- Low Lift Pump #3 – full pump replacement, motor overhaul done
- BET supernatant discharge pump – removal, repair, and refurbishing
- Fluoride volumetric feeder - full reconstruction completed
- Fluoride volumetric feeder – digital scale installed to incorporate into SCADA operations
- Lime volumetric feeder - full reconstruction completed

- Purchase of various pumps - chemical dosing, gear style sampling, chemical transfer
- Purchase of monitoring equipment – differential pressure transmitters
- Floc drive controllers – upgraded to more advanced units for better SCADA monitoring
- Settling tank (#1) sludge removal - chains replaced, broken scrapper flights replaced
- Geo bags – efforts to upgrade heat trace cable system to link into SCADA monitoring
- Back-up stationary generator upgrades – battery charging system, link into SCADA monitoring

- Filter #1 wall refurbishing work finished
- Continued SCADA upgrades -better facilitate process automation, implement security measures
- Interior WTP building plaster and painting

- Elevated tank safety upgrades completed
- New water main heater cable Rogers Rd bridge
- Repairs and maint work to water mains, replacement of mains on Mary St.

Provide details on the notices submitted in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre

Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
Aug 02, 2023	AWQI 162870 –				
	<ul style="list-style-type: none"> • July 31 WD sample tested with Total Coliform count of 1 CFU/100 mL • Aug 02 reported to SAC 			Resampled Aug 08 (above and below location) - results of 0 CFU/100 mL	Date resolved Aug 09 2023

Microbiological testing done under the Schedule 10, 11 or 12 of Regulation 170/03, during this reporting period.

	Number of Samples	Range of E.Coli Or Fecal Results (min #)-(max #)	Range of Total Coliform Results (min #)-(max #)	Number of HPC Samples	Range of HPC Results (min #)-(max #)
Raw	51	0 - 444	20 - 3480	n/a	n/a
Treated	52	Absent in all Samples	Absent in all Samples	52	<10 - 80
Distribution	208	Absent in all Samples	Absent – 1 CFU/100mL	208	<10 - 160

Operational testing done under Schedule 7, 8 or 9 of Regulation 170/03 during the period covered by this Annual Report.

	Number of Grab Samples	Range of Results (min #)-(max #)	Unit of Measure
Free Chlorine Residual (Primary Disinfection)	8760	0.62 – 1.80	mg/L
Free Chlorine Residual (Secondary Disinfection – WTP Effluent)	8760	1.19 – 2.34	mg/L
Free Chlorine Residual (Secondary Disinfection – Water Distribution)	437	0.21 – 1.79	mg/L
Turbidity (Filter #1)	8760	0.02 – 0.37	NTU
Turbidity (Filter #2)	8760	0.02 – 0.36	NTU
Fluoride (WTP Effluent)	**	0.17 – 0.93	mg/L

NOTE: For continuous monitors use 8760 as the number of samples.

*Note:** Fluorination operations off for portion of year due to equipment failures*

Summary of additional testing and sampling carried out in accordance with the requirement of an approval, order or other legal instrument.

Date of legal instrument issued	Parameter	Date Sampled	Result	Unit of Measure
MDWL 160-101 Sched C, sec 4.4	TSS (Residue Mgmt) (Phase I) (Geo-bag discharges) Annual Average Concentration limit (15 mg/L)	Annual Avg.	4.97	mg/L
		(12 Jan 2023)	(3.33)	
		(15 Feb 2023)	(3.00)	
		(10 Mar 2023)	(4.00)	
		(13 Apr 2023)	(3.00)	
		(12 May 2023)	(3.00)	
		(14 Jun 2023)	(9.33)	
		(10 Jul 2023)	(3.00)	
		(09 Aug 2023)	(7.33)	
		(13 Sep 2023)	(3.00)	
		(17 Oct 2023)	(3.00)	
		(14 Nov 2023)	(10.33)	
		(12 Dec 2023)	(7.33)	

MDWL 160-101 Sched C, sec 4.4	TSS (Residue Mgmt) (Phase II) (BET supernatant) Annual Average Concentration limit (15 mg/L)	Annual Avg. (12 Jan 2023) (16 Feb 2023) (10 Mar 2023) (14 Apr 2023) (12 May 2023) (14 Jun 2023) (11 Jul 2023) (09 Aug 2023) (13 Sep 2023) (17 Oct 2023) (10 Nov 2023) (13 Dec 2023)	4.97 (5.33) (3.33) (3.67) (4.33) (3.33) (9.67) (13.33) (3.00) (3.00) (4.00) (3.00) (3.67)	mg/L
MDWL 160-101 Sched C, sec 4.4	Total Chlorine Residual (Residue Mgmt) (Phase I)	Annual Avg. (Monthly Range)	0.001 (0.00-0.01)	mg/L
MDWL 160-101 Sched C, sec 4.4	Total Chlorine Residual (Residue Mgmt) (Phase II)	Annual Avg. (Monthly Range)	0.002 (0.00-0.01)	mg/L
MDWL 160-101 Sched C, sec 4.1	Chlorate	16 Jan 2023 03 Apr 2023 10 Jul 2023 03 Oct 2023	0.16 0.12 0.18 0.12	mg/L mg/L mg/L mg/L
MDWL 160-101 Sched C, sec 4.1	Chlorite	16 Jan 2023 03 Apr 2023 10 Jul 2023 03 Oct 2023	<0.01 <0.01 0.01 <0.01	mg/L mg/L mg/L mg/L

Summary of Inorganic parameters tested during this reporting period or the most recent sample results

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	10 Jul 2023	<0.0001	mg/L	N
Arsenic	10 Jul 2023	0.0002	mg/L	N
Barium	10 Jul 2023	0.028	mg/L	N
Boron	10 Jul 2023	0.012	mg/L	N
Cadmium	10 Jul 2023	<0.000015	mg/L	N
Chromium	10 Jul 2023	<0.0010	mg/L	N
Mercury	10 Jul 2023	0.00006	mg/L	N
Selenium	10 Jul 2023	<0.001	mg/L	N
Uranium	10 Jul 2023	<0.00005	mg/L	N
Nitrite	16 Jan 2023 03 Apr 2023 10 Jul 2023 03 Oct 2023	<0.1 <0.05 <0.05 <0.05	mg/L mg/L mg/L mg/L	N
Nitrate	16 Jan 2023 03 Apr 2023 10 Jul 2023 03 Oct 2023	<0.1 0.16 <0.05 <0.05	mg/L mg/L mg/L mg/L	N
Sodium	10 Jul 2023	9.6	mg/L	N
*Lead <i>Done along with Sched 15.1</i>				

*only for drinking water systems testing under Schedule 15.2; this includes large municipal non-residential systems, small municipal non-residential systems, non-municipal seasonal residential systems, large non-municipal non-residential systems, and small non-municipal non-residential systems

Summary of lead testing under Schedule 15.1 during this reporting period

(applicable to the following drinking water systems; large municipal residential systems, small municipal residential systems, and non-municipal year-round residential systems)

Location Type	Number of Samples	Range of Lead Results (min#) – (max #)	Unit of Measure	Number of Exceedances
Plumbing	n/a			
Distribution	4	0.00002 - 0.00079	mg/L	0

The Municipality Distribution staff did record pH and Alkalinity of two separate sampling times (winter and summer).

Period	Number of Distribution Samples	Range of pH results (min#)–(max #)	Range of Alkalinity Results (min#)-(max #)	Temperature Range (min#)-(max #)
Winter (March 27, 2023)	4	7.09 – 7.79	80-82	7.8 – 10.7
Summer (September 28, 2023)	4	7.28 – 7.83	58-64	19.1 – 20.6

The Municipality also conducted non-regulatory Inorganic Parameter Testing as part of a self-initiated drinking water quality assurance program.

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Copper	16 Jan 2023	<0.002	mg/L	N
	10 July 2023	0.002		
Iron	16 Jan 2023	<0.005	mg/L	N
	10 July 2023	<0.005		
Manganese	16 Jan 2023	0.005	mg/L	N
	10 July 2023	0.012		
Lead (WTP discharge)	04 Jul 2023	0.00002	mg/L	N
Lead (WD sample)	10 Jul 2023	0.0006	mg/L	N
Sulphate	16 Jan 2023	8.0	mg/L	N
	03 Apr 2023	9.0		
	10 Jul 2023	7.0		
	03 Oct 2023	7.0		
Chloride	16 Jan 2023	23.9	mg/L	N
	03 Apr 2023	26.8		
	10 Jul 2023	25.6		
	03 Oct 2023	24.3		
Aluminum	10 Jul 2023	0.03	mg/L	N
Calcium	03 Oct 2023	21.7	mg/L	N

Summary of Organic parameters sampled during this reporting period or the most recent sample results

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
THM (Total Trihalomethanes) (NOTE: show latest annual average)	Annual Average 16 Jan 2023 03 Apr 2023 10 Jul 2023 03 Oct 2023	47.25 (41) (37) (67) (44)	µg/L	N
HAA (Haloacetic Acids)	Annual Average 16 Jan 2023 03 Apr 2023 10 Jul 2023 03 Oct 2023	21.10 (18.3) (25.6) (23.6) (16.9)	µg/L	N
Alachlor	10 Jul 2023	<0.3	µg/L	N
Atrazine + N-dealkylated metabolites	10 Jul 2023	<0.5	µg/L	N
Azinphos-methyl	10 Jul 2023	<1	µg/L	N
Benzene	10 Jul 2023	<0.5	µg/L	N
Benzo(a)pyrene	10 Jul 2023	<0.006	µg/L	N
Bromoxynil	10 Jul 2023	<0.5	µg/L	N
Carbaryl	10 Jul 2023	<3	µg/L	N
Carbofuran	10 Jul 2023	<1	µg/L	N
Carbon Tetrachloride	10 Jul 2023	<0.2	µg/L	N
Chlorpyrifos	10 Jul 2023	<0.5	µg/L	N
Diazinon	10 Jul 2023	<1	µg/L	N
Dicamba	10 Jul 2023	<1.0	µg/L	N
1,2-Dichlorobenzene	10 Jul 2023	<0.5	µg/L	N
1,4-Dichlorobenzene	10 Jul 2023	<0.5	µg/L	N
1,2-Dichloroethane	10 Jul 2023	<0.5	µg/L	N
1,1-Dichloroethylene (vinylidene chloride)	10 Jul 2023	<0.5	µg/L	N
Dichloromethane (methylene chloride)	10 Jul 2023	<5	µg/L	N
2-4 Dichlorophenol	10 Jul 2023	<0.2	µg/L	N
2,4-Dichlorophenoxy acetic acid (2,4-D)	10 Jul 2023	<1.0	µg/L	N
Diclofop-methyl	10 Jul 2023	<0.9	µg/L	N
Dimethoate	10 Jul 2023	<1	µg/L	N
Diquat	10 Jul 2023	<5	µg/L	N
Diuron	10 Jul 2023	<5	µg/L	N
Glyphosate	10 Jul 2023	<25	µg/L	N
Malathion	10 Jul 2023	<5	µg/L	N
MCPA (2-methyl-4-chlorophenoxyacetic acid)	10 Jul 2023	<10	µg/L	N
Metolachlor	10 Jul 2023	<3	µg/L	N
Metribuzin	10 Jul 2023	<3	µg/L	N
Monochlorobenzene	10 Jul 2023	<0.5	µg/L	N
Paraquat	10 Jul 2023	<1	µg/L	N
Pentachlorophenol	10 Jul 2023	<0.2	µg/L	N
Phorate	10 Jul 2023	<0.3	µg/L	N
Picloram	10 Jul 2023	<5.0	µg/L	N
Polychlorinated Biphenyls (PCB)	10 Jul 2023	<0.05	µg/L	N
Prometryne	10 Jul 2023	<0.1	µg/L	N
Simazine	10 Jul 2023	<0.5	µg/L	N



Terbufos	04 Jul 2022	<0.5	µg/L	N
Tetrachloroethylene	04 Jul 2022	<0.5	µg/L	N
2,3,4,6-Tetrachlorophenol	04 Jul 2022	<0.2	µg/L	N
Triallate	04 Jul 2022	<10	µg/L	N
Trichloroethylene	04 Jul 2022	<0.5	µg/L	N
2,4,6-Trichlorophenol	04 Jul 2022	<0.2	µg/L	N
Trifluralin	04 Jul 2022	<0.5	µg/L	N
Vinyl Chloride	04 Jul 2022	<0.2	µg/L	N

The Municipality also conducted non-regulatory Organic Parameter Testing as part of a self-initiated drinking water quality assurance program.

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
THM (WTP discharge)	Annual Average	33.50	µg/L	N
	16 Jan 2023	(30)		
	03 Apr 2023	(25)		
	10 Jul 2023	(49)		
	03 Oct 2023	(30)		

List any Inorganic or Organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards.

Parameter	Result Value	Unit of Measure	Date of Sample