

The Corporation of the Town of Perth  
80 Gore Street East  
Perth  
Ontario  
K7H 1H9



Revision Number 1  
Date: January 23, 2023

# **Town of Perth Drinking Water System**

**DWS # 220001272**

**2022 Annual Report**



<b>Drinking-Water System Number:</b>	220001272
<b>Drinking-Water System Name:</b>	Perth Drinking Water System
<b>Drinking-Water System Owner:</b>	The Corporation of the Town of Perth
<b>Drinking-Water System Category:</b>	Large Municipal Residential
<b>Period being reported:</b>	January 1, 2022 to Dec 31, 2022

<p><b><u>Complete if your Category is Large Municipal Residential or Small Municipal Residential</u></b></p> <p><b>Does your Drinking-Water System serve more than 10,000 people? Yes [ ] No [ x ]</b></p> <p><b>Is your annual report available to the public at no charge on a web site on the Internet? Yes [ x ] No [ ]</b></p> <p><b>Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.</b></p> <div style="border: 1px solid black; padding: 5px;"> <p>The 2022 Summary Report will be prepared and forwarded to the Town of Perth Municipal Council by March 31 2022. Paper copies will be available at the Water Treatment Plant and electronic copies available on the municipal website.</p> </div>	<p><b><u>Complete for all other Categories.</u></b></p> <p><b>Number of Designated Facilities served:</b></p> <div style="border: 1px solid black; padding: 2px; width: fit-content;">20-25</div> <p><b>Did you provide a copy of your annual report to all Designated Facilities you serve? Yes [ ] No [ ] Available on Website</b></p> <p><b>Number of Interested Authorities you report to:</b> <div style="border: 1px solid black; padding: 2px; width: fit-content;">n/a</div></p> <p><b>Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes [ ] No [ ] n/a</b></p>
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**Note: For the following tables below, additional rows or columns may be added or an appendix may be attached to the report**

**List all Drinking-Water Systems (if any), which receive all of their drinking water from your system:**

<b>Drinking Water System Name</b>	<b>Drinking Water System Number</b>
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 our 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, 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 m<sup>3</sup>, provides system pressure and storage. In the fall of 2007 upgrades to the tank included installation of a water mixing system to 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)

**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**

- Fluoride machine complete reconstruction under way
- Cleaning and inspection of inside facility raw intake lines and wells
- Backup LLP2/LLP3 motor (10 HP) purchased
- Floc drive controller replacement(s)
- Filter #2 wall refurbishing work finished
  
- BET tank cleaning, BET tank signal transmission line work
- Geo bag dosing shed hopper sludge pump purchasing (replacement and backup)
- Geo bag outside heat trace upgrades (electrical work, trace line replacements)
  
- Continued SCADA programming upgrades to better facilitate process automation.
- Outside WTP building infrastructure work to front façade and entranceway
  
- Repairs and maint work to water mains, replacement of mains on lower Foster St and Church 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
2022.01.22	AWQI 157703 – operational issue with Filter 2 alarms discovered disarmed during filter operations - (no adverse test)			None needed	N/A
2022.12.19	AWQI 161012 – coagulant feed loss due to operational issue and time needed for SCADA automatic shutdown process – (no adverse test)			None needed	N/A

**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 #)
<b>Raw</b>	52	2 - 150	100 - 3720	n/a	n/a
<b>Treated</b>	52	Absent in all Samples	Absent in all Samples	52	<10 - 30
<b>Distribution</b>	208	Absent in all Samples	Absent in all Samples	208	<10 - 420

**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
<b>Free Chlorine Residual</b> (Primary Disinfection)	8760	0.60 – 1.68	mg/L
<b>Free Chlorine Residual</b> (Secondary Disinfection – WTP Effluent)	8760	1.02 – 2.92	mg/L
<b>Free Chlorine Residual</b> (Secondary Disinfection – Water Distribution)	408	0..19 – 1.81	mg/L
<b>Turbidity</b> (Filter #1)	8760	0.02 – 0.59	NTU
<b>Turbidity</b> (Filter #2)	8760	0.03 – 3.00	NTU
<b>Fluoride</b> (WTP Effluent)	**	0.20 – 0.83	mg/L

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

*Note:\*\* Fluorination operations off for significant 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
<b>MDWL 160-101</b> <b>Sched C, sec 4.4</b>	<b>TSS</b> (Residue Mgmt) (Phase I) (Geo-bag discharges)  <b>Annual Average</b> Concentration limit (15 mg/L)	<b>Annual Avg.</b>	<b>4.42</b>	mg/L
		(12 Jan 2022)	(3.00)	
		(15 Feb 2022)	(4.00)	
		(09 Mar 2022)	(3.00)	
		(13 Apr 2022)	(3.00)	
		(17 May 2022)	(3.00)	
		(14 Jun 2022)	(3.33)	
		(12 Jul 2022)	(12.67)	
		(10 Aug 2022)	(3.67)	
		(06 Sep 2022)	(3.00)	
		(12 Oct 2022)	(3.00)	
		(16 Nov 2022)	(4.00)	
		(12 Dec 2022)	(7.33)	

<b>MDWL 160-101 Sched C, sec 4.4</b>	<b>TSS (Residue Mgmt) (Phase II) (BET supernatant)  Annual Average Concentration limit (15 mg/L)</b>	<b>Annual Avg.</b> (11 Jan 2022) (16 Feb 2022) (09 Mar 2022) (13 Apr 2022) (18 May 2022) (14 Jun 2022) (12 Jul 2022) (10 Aug 2022) (06 Sep 2022) (12 Oct 2022) (16 Nov 2022) (12 Dec 2022)	<b>8.92</b> (3.33) (6.00) (3.00) (3.00) (3.00) (16.33) (39.67) (3.67) (6.00) (3.00) (6.67) (12.33)	mg/L
<b>MDWL 160-101 Sched C, sec 4.4</b>	<b>Total Chlorine Residual (Residue Mgmt) (Phase I)</b>	<b>Annual Avg.</b> (Monthly Range)	<b>0.004</b> (0.00-0.01)	mg/L
<b>MDWL 160-101 Sched C, sec 4.4</b>	<b>Total Chlorine Residual (Residue Mgmt) (Phase II)</b>	<b>Annual Avg.</b> (Monthly Range)	<b>0.002</b> (0.00-0.01)	mg/L
<b>MDWL 160-101 Sched C, sec 4.1</b>	<b>Chlorate</b>	10 Jan 2022 04 Apr 2022 04 Jul 2022 11 Oct 2022	0.15 0.12 0.02 0.20	mg/L mg/L mg/L mg/L
<b>MDWL 160-101 Sched C, sec 4.1</b>	<b>Chlorite</b>	10 Jan 2022 04 Apr 2022 04 Jul 2022 11 Oct 2022	<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
<b>Antimony</b>	04 Jul 2022	<0.0001	mg/L	N
<b>Arsenic</b>	04 Jul 2022	0.0002	mg/L	N
<b>Barium</b>	04 Jul 2022	0.028	mg/L	N
<b>Boron</b>	04 Jul 2022	0.010	mg/L	N
<b>Cadmium</b>	04 Jul 2022	<0.000015	mg/L	N
<b>Chromium</b>	04 Jul 2022	0.002	mg/L	N
<b>Mercury</b>	04 Jul 2022	<0.00002	mg/L	N
<b>Selenium</b>	04 Jul 2022	<0.001	mg/L	N
<b>Uranium</b>	04 Jul 2022	<0.00005	mg/L	N
<b>Nitrite</b>	10 Jan 2022 04 Apr 2022 04 Jul 2022 11 Oct 2022	<0.1 <0.1 <0.1 <0.1	mg/L mg/L mg/L mg/L	N
<b>Nitrate</b>	10 Jan 2022 04 Apr 2022 04 Jul 2022 11 Oct 2022	<0.1 <0.1 <0.1 <0.1	mg/L mg/L mg/L mg/L	N
<b>Sodium</b>	04 Jul 2022	9.9	mg/L	N
<b>*Lead</b> <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
<b>Plumbing</b>	n/a			
<b>Distribution</b>	4	0.00012 - 0.00020	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 #)
<b>Winter</b> (March 25, 2022)	4	7.26 – 8.60	70-74	6.2 – 7.0
<b>Summer</b> (September 14, 2021)	4	7.10 – 7.34	58-63	20.6 – 21.3

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
<b>Fluoride</b> <i>Done along with Sched 7.0</i>	04 Jul 2022	0.4	mg/L	N
<b>Copper</b>	10 Jan 2022 04 July 2022	<0.002 <0.002	mg/L	N
<b>Iron</b>	10 Jan 2022 04 July 2022 11 Oct 2022	<0.005 0.010 <0.005	mg/L	N
<b>Manganese</b>	10 Jan 2022 04 July 2022 11 Oct 2022	0.016 0.009 0.004	mg/L	N
<b>Lead</b> (WTP discharge)	04 Jul 2022	<0.00002	mg/L	N
<b>Lead</b> (WD sample)	04 Jul 2022	0.00034	mg/L	N
<b>Sulphate</b>	10 Jan 2022 04 Apr 2022 04 Jul 2022 11 Oct 2022	8.0 8.0 7.0 6.0	mg/L	N
<b>Chloride</b>	10 Jan 2022 04 Apr 2022 04 Jul 2022 11 Oct 2022	23.7 26.6 23.8 19.4	mg/L	N
<b>Aluminum</b>	04 Jul 2022	0.02	mg/L	N
<b>Magnesium</b>	10 Jan 2022	5.57	mg/L	N
<b>Hardness (as CaCO3)</b>	11 Oct 2022	70	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
<b>THM</b> (Total Trihalomethanes) (NOTE: show latest annual average)	<b>Annual Average</b> 10 Jan 2022 04 Apr 2022 04 Jul 2022 11 Oct 2022	<b>36.5</b> (23) (30) (49) (44)	µg/L	N
<b>HAA</b> (Haloacetic Acids)	<b>Annual Average</b> 10 Jan 2022 04 Apr 2022 04 Jul 2022 11 Oct 2022	<b>26.53</b> (15.5) (24.7) (37.5) (28.4)	µg/L	N
<b>Alachlor</b>	04 Jul 2022	<0.3	µg/L	N
<b>Atrazine + N-dealkylated metabolites</b>	04 Jul 2022	<0.5	µg/L	N
<b>Azinphos-methyl</b>	04 Jul 2022	<1	µg/L	N
<b>Benzene</b>	04 Jul 2022	<0.5	µg/L	N
<b>Benzo(a)pyrene</b>	04 Jul 2022	<0.006	µg/L	N
<b>Bromoxynil</b>	04 Jul 2022	<0.5	µg/L	N
<b>Carbaryl</b>	04 Jul 2022	<3	µg/L	N
<b>Carbofuran</b>	04 Jul 2022	<1	µg/L	N
<b>Carbon Tetrachloride</b>	04 Jul 2022	<0.2	µg/L	N
<b>Chlorpyrifos</b>	04 Jul 2022	<0.5	µg/L	N
<b>Diazinon</b>	04 Jul 2022	<1	µg/L	N
<b>Dicamba</b>	04 Jul 2022	<1	µg/L	N
<b>1,2-Dichlorobenzene</b>	04 Jul 2022	<0.5	µg/L	N
<b>1,4-Dichlorobenzene</b>	04 Jul 2022	<0.5	µg/L	N
<b>1,2-Dichloroethane</b>	04 Jul 2022	<0.5	µg/L	N
<b>1,1-Dichloroethylene</b> (vinylidene chloride)	04 Jul 2022	<0.5	µg/L	N
<b>Dichloromethane</b> (methylene chloride)	04 Jul 2022	<5	µg/L	N
<b>2-4 Dichlorophenol</b>	04 Jul 2022	<0.2	µg/L	N
<b>2,4-Dichlorophenoxy acetic acid</b> (2,4-D)	04 Jul 2022	<10	µg/L	N
<b>Diclofop-methyl</b>	04 Jul 2022	<0.9	µg/L	N
<b>Dimethoate</b>	04 Jul 2022	<1	µg/L	N
<b>Diquat</b>	04 Jul 2022	<5	µg/L	N
<b>Diuron</b>	04 Jul 2022	<5	µg/L	N
<b>Glyphosate</b>	04 Jul 2022	<25	µg/L	N
<b>Malathion</b>	04 Jul 2022	<5	µg/L	N
<b>MCPA</b> (2-methyl-4-chlorophenoxyacetic acid)	04 Jul 2022	<10	µg/L	N
<b>Metolachlor</b>	04 Jul 2022	<3	µg/L	N
<b>Metribuzin</b>	04 Jul 2022	<3	µg/L	N
<b>Monochlorobenzene</b>	04 Jul 2022	<0.5	µg/L	N
<b>Paraquat</b>	04 Jul 2022	<1	µg/L	N
<b>Pentachlorophenol</b>	04 Jul 2022	<0.2	µg/L	N
<b>Phorate</b>	04 Jul 2022	<0.3	µg/L	N
<b>Picloram</b>	04 Jul 2022	<5	µg/L	N
<b>Polychlorinated Biphenyls</b> (PCB)	04 Jul 2022	<0.05	µg/L	N
<b>Prometryne</b>	04 Jul 2022	<0.1	µg/L	N
<b>Simazine</b>	04 Jul 2022	<0.5	µg/L	N
<b>Terbufos</b>	04 Jul 2022	<0.5	µg/L	N
<b>Tetrachloroethylene</b>	04 Jul 2022	<0.5	µg/L	N





<b>2,3,4,6-Tetrachlorophenol</b>	04 Jul 2022	<b>&lt;0.2</b>	µg/L	N
<b>Triallate</b>	04 Jul 2022	<b>&lt;10</b>	µg/L	N
<b>Trichloroethylene</b>	04 Jul 2022	<b>&lt;0.5</b>	µg/L	N
<b>2,4,6-Trichlorophenol</b>	04 Jul 2022	<b>&lt;0.2</b>	µg/L	N
<b>Trifluralin</b>	04 Jul 2022	<b>&lt;0.5</b>	µg/L	N
<b>Vinyl Chloride</b>	04 Jul 2022	<b>&lt;0.2</b>	µg/L	N

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

<b>Parameter</b>	<b>Sample Date</b>	<b>Result Value</b>	<b>Unit of Measure</b>	<b>Exceedance</b>
<b>THM (WTP discharge)</b>	<b>Annual Average</b>	<b>22.75</b>	µg/L	N
	10 Jan 2022	(13)		
	04 Apr 2022	(21)		
	04 Jul 2022	(30)		
	11 Oct 2022	(27)		

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

<b>Parameter</b>	<b>Result Value</b>	<b>Unit of Measure</b>	<b>Date of Sample</b>