

ANNUAL REPORT

ONTARIO REGULATION 170/03
SECTION 11

THORNTON DRINKING WATER SYSTEM



Where Town and Country Meet

**FOR THE PERIOD:
JANUARY 1, 2022 – DECEMBER 31, 2022**

*Prepared for the Corporation of the Township of Essa
by the Ontario Clean Water Agency*



**ONTARIO CLEAN WATER AGENCY
AGENCE ONTARIENNE DES EAUX**

This report was prepared in accordance with the requirements of [O.Reg 170/03, Section 11, Annual reports](#) for the following system and reporting period:

Drinking Water System Number:	220006945
Drinking Water System Name:	Thornton (Glen Avenue) Drinking Water System
Drinking Water System Owner:	The Corporation of the Township of Essa
Drinking Water System Category:	Large Municipal Residential
Reporting Period:	January 1, 2022 to December 31, 2022

Does your Drinking Water System serve more than 10,000 people?

No

Is your Annual Report available to the public at no charge on a website on the Internet?

Yes

Note: If a large municipal residential system serves more than 10,000 people, the owner of the system shall ensure that a copy of every report prepared under this section is available to the public at no charge on a website on the Internet. O. Reg. 170/03, Section 11. (10)

Location where Summary Report required under O. Reg 170/03, Schedule 22 will be available for inspection. (O. Reg 170/03, Section 11.(6)(5)):

- Hard copy available for public viewing at the Township of Essa Municipal Office at 5786 Simcoe County Road 21, Utopia, Essa Township, ON, L0M1T0
- <http://www.essatownship.on.ca>

Note: this is required for large municipal residential systems or small municipal residential systems.

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
N/A	N/A

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?

N/A

How system users are notified that the annual report is available, and is free of charge:

Public access/notice via the web

<input checked="" type="checkbox"/>	Public access/notice via Government Office
<input type="checkbox"/>	Public access/notice via a newspaper
<input checked="" type="checkbox"/>	Public access/notice via Public Request
<input type="checkbox"/>	Public access/notice via a Public Library
<input type="checkbox"/>	Public access/notice via other method: _____

Description of Drinking Water System (O.Reg 170/03, Section 11.(6)(a)):

The Thornton (Glen Avenue) Drinking water system is classified as a Large Municipal Residential Drinking Water System servicing an approximate population of 1,550 persons via 519 residential service connections on Glen Avenue in the Hamlet of Thornton, Township of Essa. The system is comprised of one pumphouse which draws water from four groundwater wells.

Raw water supplied from the wells to the Glen Avenue pumphouse is treated with sodium hypochlorite for disinfection. Treated water is pumped to two (2) fused glass-lined bolted steel above-ground storage tanks. Water is then pumped from the storage tanks to the distribution system using four high lift pumps. The pumphouse is also equipped with a standby diesel generator to provide power in the event of a power failure.

List of water treatment chemicals used by the system during the reporting period (O.Reg 170/03, Section 11.(6)(a)):

- Sodium Hypochlorite 12% Solution

Significant expenses were incurred to:

<input checked="" type="checkbox"/>	Install required equipment
<input checked="" type="checkbox"/>	Repair required equipment
<input checked="" type="checkbox"/>	Replace required equipment
<input type="checkbox"/>	No significant expenses were incurred

Description of major expenses during the reporting period to install, repair or replace required equipment (O.Reg 170/03, Section 11.(6)(e)):

- Distribution watermain swabbing
- Distribution service line repairs, curb stop inspections and meters repairs/installations
- Highlift pump rebuilds, maintenance
- Distribution fire hydrant repair and replacement
- Reservoir pressure transducer pit sump pump install
- Stand-by diesel generator repairs
- Increase existing stand pipe capacity (installation and commissioning)
- Hydrant replacements

Summary of any reports/notices submitted to the Ministry and/or Spills Action Centre in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 during the reporting period, including a description of any corrective actions taken under Schedule 17 or 18 (O. Reg 170/03, Section 11.(6)(b),(d):

Incident Date (yyyy/mm/dd)	Parameter/ Notice of	Result & Unit	Summary of Reporting, Corrective Actions & Resolution
N/A	N/A	N/A	N/A

Table 1. Microbiological testing done under the Schedule 11 of Regulation 170/03 during this reporting period (O.Reg 170/03, Section 11.(6)(c)).

Location	Number of Samples	Range of E. Coli or Fecal Results		Range of Total Coliform Results		Number of HPC Samples	Range of HPC Samples	
		Min.	Max.	Min.	Max.		Min.	Max.
RW ^{1A} , Well 1	52	0	0	0	35	0	N/A	N/A
RW ^{1A} , Well 2	52	0	0	0	0	0	N/A	N/A
RW ^{1A} , Well 3	52	0	0	0	2	0	N/A	N/A
RW ^{1A} , Well 4	52	0	0	0	4	0	N/A	N/A
Treated Water	52	0	0	0	0	52	<10	20
Distribution	120 ^{1B}	0	0	0	0	52	<10	10

Note: HPC = Heterotrophic Plate Count

Note: Units for E.Coli or Fecal Results are cfu/100 mL, units for Total Coliform Results are cfu/100 mL, units for HPC results are cfu/1mL

^{1A}RW = Raw Water

^{1B}O.Reg 170/03 Schedule 10-2.(1)(2)(3) requires that a system that serves 100,000 people or less, at least eight distribution samples, plus one additional distribution sample for every 1,000 people served by the system, are taken every month, with at least one of the samples being taken in each week and that each of the samples taken is tested for E.Coli, Total Coliforms. At least 25 percent of the samples required must be tested for general bacteria population expressed as colony counts on heterotrophic plate count (HPC). As of 2022, the population of Thornton is 1,550 persons, confirmed by the owner on November 12th, 2021 and thus requires at the minimum 9 monthly distribution samples

Table 2. Operational testing done under Schedule 7 of Regulation 170/03 during the period covered by this Annual Report (O. Reg 170/03, Section 11.(6)(c)).

Parameter & Location	Number of Samples	Range of Results	
		Min.	Max.
Turbidity, Raw Water, Well 1 (Grab) [NTU] ^{2A}	12	0.10	0.53
Turbidity, Raw Water, Well 2 (Grab) [NTU] ^{2A}	12	0.20	0.84
Turbidity, Raw Water, Well 3 (Grab) [NTU] ^{2A}	12	0.08	0.86
Turbidity, Raw Water, Well 4 (Grab) [NTU] ^{2A}	12	0.14	0.82
Free Chlorine Residual, On-line [mg/L]-TW ^{2B}	8760	0.94	2.19
Free Chlorine Residual, Distribution [mg/L]- DW ^{2C}	364	0.77	1.79

Note: The number of samples used for continuous monitoring units is 8760.

^{2A}O.Reg 170/03 Schedule 7-3.(1)(1.1) requires a raw water sample be taken at least once every month from each well that is supplying water to the system and tested for turbidity.

^{2B}O.Reg 170/03 Schedule 7-2.(1) requires a drinking water system that provides chlorination for primary disinfection to sample and test for free chlorine residual with continuous monitoring equipment in the treatment process at or near a location where the intended contact time has just been completed.

^{2C}O.Reg 170/03 Schedule 7-2.(3) requires a large municipal residential system that provides secondary disinfection to take at least seven distribution samples each week and immediately tested for free chlorine residual, if the system provides chlorination and does not provide chloramination

Table 3. Summary of additional testing and sampling results carried out in accordance with the requirement of an approval, municipal drinking water licence or order (including OWRA) or other legal instrument. (O. Reg 170/03, Schedule 11.(6)(c))

Legal Instrument & Issue Date (yyyy/mm/dd)	Sample Location & Parameter	Sampling Frequency	Allowable Result	Actual Result
N/A	N/A	N/A	N/A	N/A

Table 4. Summary of Inorganic parameters tested during this reporting period or the most recent sample results (O.Reg 170/03, Schedule 11.(6)(c))

Parameter & Location	Sample Date (yyyy/mm/dd)	Sample Result	Maximum Allowable Concentration (MAC)	Exceedance of MAC
Antimony: Sb (µg/L) - TW	2021/01/26	<MDL 0.9	6.0	No
Arsenic: As (µg/L) - TW	2021/01/26	0.2	10.0	No
Barium: Ba (µg/L) - TW	2021/01/26	84.2	1000.0	No
Boron: B (µg/L) - TW	2021/01/26	35.0	5000.0	No
Cadmium: Cd (µg/L) - TW	2021/01/26	<MDL 0.003	5.0	No
Chromium: Cr (µg/L) - TW	2021/01/26	0.62	50.0	No

Parameter & Location	Sample Date (yyyy/mm/dd)	Sample Result	Maximum Allowable Concentration (MAC)	Exceedance of MAC
Mercury: Hg (µg/L) - TW	2021/01/26	<MDL 0.01	1.0	No
Selenium: Se (µg/L) - TW	2021/01/26	0.05	50.0	No
Uranium: U (µg/L) - TW	2021/01/26	0.539	20.0	No
Fluoride (mg/L) - TW	2018/07/17 ^{4B}	0.22	1.5	No
Nitrite (mg/L) – TW	2022/01/13	<MDL 0.003	1.0	No
Nitrite (mg/L) – TW	2022/04/19	<MDL 0.003	1.0	No
Nitrite (mg/L) – TW	2022/07/20	<MDL 0.003	1.0	No
Nitrite (mg/L) – TW	2022/10/17	<MDL 0.003	1.0	No
Nitrate (mg/L) – TW	2022/01/13	1.64	10.0	No
Nitrate (mg/L) – TW	2022/04/19	1.75	10.0	No
Nitrate (mg/L) – TW	2022/07/20	1.59	10.0	No
Nitrate (mg/L) - TW	2022/10/17	1.85	10.0	No

Parameter & Location	Sample Date (yyyy/mm/dd)	Sample Result	Aesthetic Objective (AO)	Exceedance	
				AO	> 20 mg/L
Sodium: Na (mg/L) – TW	2018/07/17 ^{4C}	33.6	200	No	Yes ^{4D}
Sodium: Na (mg/L) – TW	2018/07/24 ^{4C}	37.0	200	No	Yes ^{4D}

Note: MDL = Minimum Detection Limit, TW = Treated Water

^{4A}Inorganic Parameters (Schedule 23) are required to be tested every 36 months for a large municipal residential system, if the system obtains water from a raw water source that is ground water (O. Reg 170/03 Schedule 13-2(b)). The last set of samples was collected and tested in 2021, the next set of samples is scheduled to be collected and tested in 2024.

^{4B}Fluoride is reportable every 60 months. The most recent Fluoride samples were tested in 2018, the next set of samples is scheduled to be tested in 2023.

Note: There is no regulatory Maximum Allowable Concentration (MAC) Sodium. The aesthetic objective (AO) for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.

^{4C}Sodium is reportable every 60 months. The most recent Sodium samples were tested in 2018, the next set of samples is scheduled to be tested in 2023.

^{4D}On July 17, 2018 adverse water quality incident #140921 was reported to the Spills Action Centre, Ministry of Health and Ministry of the Environment, Conservation, and Parks for a treated water sodium exceedance of 33.6 mg/L. A resample was taken on July 24, 2018 as per the corrective actions outline in O.Reg170/03 Schedule 17(3) and resample results were 37.0 mg/L. No further actions advised. Notice of incident resolution sent on August 1, 2018.

Table 5: Summary of lead testing under Schedule 15.1 during this reporting period (O.Reg 170/03, Section 11.(6)(g))

Location/Type & Parameter	Number of Samples ^{5A}	Range of Results		Number of Lead Exceedances (MAC = 10 µ/L)
		Min.	Max.	
Period: January 1 to April 15				
Plumbing – Lead (µg/L) ^{5B}	N/A	N/A	N/A	0
Distribution – Lead (µg/L) ^{5C}	N/A	N/A	N/A	0
Distribution – Alkalinity (mg/L as CaCO ₃)	4	212	224	N/A
Distribution – pH	2	7.55	7.60	N/A
Period: June 15 to October 15				
Plumbing – Lead (µg/L) ^{5B}	N/A	N/A	N/A	0
Distribution – Lead (µg/L) ^{5C}	N/A	N/A	N/A	0
Distribution – Alkalinity (mg/L as CaCO ₃)	2	209	210	N/A
Distribution – pH	2	7.41	7.46	N/A
Period: December 15 to 31				
Plumbing – Lead (µg/L) ^{5B}	N/A	N/A	N/A	0
Distribution – Lead (µg/L) ^{5C}	N/A	N/A	N/A	0
Distribution – Alkalinity (mg/L as CaCO ₃)	N/A	N/A	N/A	N/A
Distribution - pH	N/A	N/A	N/A	N/A

Note: this is required for large municipal residential systems, small municipal residential systems or non-municipal year-round residential system. (O.Reg 170/03, Section 11.(6)(g))

^{5A}The number of sampling points for the system is based on the population served by the system. The number of people served by the system is 1,550 persons (as confirmed with the Owner on November 12, 2021) and therefore requires two (2) distribution sampling points per sampling period.

^{5B}Plumbing samples are not applicable as this system qualifies for the plumbing exemption per O. Reg 170/03 Schedule 15.1-5 (9) (10).

^{5C}This system follows a reduced sampling schedule (O.Reg 170/03, Section 15.1.5). Distribution lead samples are collected every 36 months. The most recent set of distribution lead samples were collected within the winter period of December 15, 2020 to April 15, 2021 and summer period of June 15, 2021 to October 15, 2021. The next set of distribution lead samples is scheduled to be collected within the winter period of December 15, 2023 to April 15, 2024 and summer period of June 15, 2024 to October 15, 2024.

Table 6: Summary of Organic parameters sampled during this reporting period or the most recent sample results (O.Reg 170/03, Section 11.(6)(c)).

Parameter & Location	Sample Date (yyyy/mm/dd)	Sample Result	Maximum Allowable Concentration (MAC)	Exceedance of MAC
Alachlor (µg/L) - TW	2021/01/26	<MDL 0.02	5.0	No
Atrazine + N-dealkylated metabolites (µg/L) - TW	2021/01/26	<MDL 0.01	5.0	No
Azinphos-methyl (µg/L) - TW	2021/01/26	<MDL 0.05	20.0	No
Benzene (µg/L) - TW	2021/01/26	<MDL 0.32	1.0	No
Benzo(a)pyrene (µg/L) - TW	2021/01/26	<MDL 0.004	0.01	No
Bromoxynil (µg/L) - TW	2021/01/26	<MDL 0.33	5.0	No
Carbaryl (µg/L) - TW	2021/01/26	<MDL 0.05	90.0	No
Carbofuran (µg/L) - TW	2021/01/26	<MDL 0.01	90.0	No
Carbon Tetrachloride (µg/L) - TW	2021/01/26	<MDL 0.17	2.0	No
Chlorpyrifos (µg/L) - TW	2021/01/26	<MDL 0.02	90.0	No
Diazinon (µg/L) - TW	2021/01/26	<MDL 0.02	20.0	No
Dicamba (µg/L) - TW	2021/01/26	<MDL 0.2	120.0	No
1,2-Dichlorobenzene (µg/L) - TW	2021/01/26	<MDL 0.41	200.0	No
1,4-Dichlorobenzene (µg/L) - TW	2021/01/26	<MDL 0.36	5.0	No
1,2-Dichloroethane (µg/L) - TW	2021/01/26	<MDL 0.35	5.0	No
1,1-Dichloroethylene (µg/L) - TW	2021/01/26	<MDL 0.33	14.0	No
Dichloromethane (Methylene Chloride) (µg/L) - TW	2021/01/26	<MDL 0.35	50.0	No
2,4-Dichlorophenol (µg/L) - TW	2021/01/26	<MDL 0.15	900.0	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (µg/L) - TW	2021/01/26	<MDL 0.19	100.0	No
Diclofop-methyl (µg/L) - TW	2021/01/26	<MDL 0.4	9.0	No
Dimethoate (µg/L) - TW	2021/01/26	<MDL 0.06	20.0	No
Diquat (µg/L) - TW	2021/01/26	<MDL 1.0	70.0	No
Diuron (µg/L) - TW	2021/01/26	<MDL 0.03	150.0	No
Glyphosate (µg/L) - TW	2021/01/26	1.0	280.0	No
Malathion (µg/L) - TW	2021/01/26	<MDL 0.02	190.0	No
Metolachlor (µg/L) - TW	2021/01/26	<MDL 0.01	50.0	No

Parameter & Location	Sample Date (yyyy/mm/dd)	Sample Result	Maximum Allowable Concentration (MAC)	Exceedance of MAC
Metribuzin (µg/L) - TW	2021/01/26	<MDL 0.02	80.0	No
Monochlorobenzene (Chlorobenzene) (µg/L) - TW	2021/01/26	<MDL 0.3	80.0	No
Paraquat (µg/L) - TW	2021/01/26	<MDL 1.0	10.0	No
PCB (µg/L) - TW	2021/01/26	<MDL 0.04	3.0	No
Pentachlorophenol (µg/L) - TW	2021/01/26	<MDL 0.15	60.0	No
Phorate (µg/L) - TW	2021/01/26	<MDL 0.01	2.0	No
Picloram (µg/L) - TW	2021/01/26	<MDL 1.0	190.0	No
Prometryne (µg/L) - TW	2021/01/26	<MDL 0.03	1.0	No
Simazine (µg/L) - TW	2021/01/26	<MDL 0.01	10.0	No
Terbufos (µg/L) - TW	2021/01/26	<MDL 0.01	1.0	No
Tetrachloroethylene (µg/L) - TW	2021/01/26	<MDL 0.35	10.0	No
2,3,4,6-Tetrachlorophenol (µg/L) - TW	2021/01/26	<MDL 0.2	100.0	No
Triallate (µg/L) - TW	2021/01/26	<MDL 0.01	230.0	No
Trichloroethylene (µg/L) - TW	2021/01/26	<MDL 0.44	5.0	No
2,4,6-Trichlorophenol (µg/L) - TW	2021/01/26	<MDL 0.25	5.0	No
2-methyl-4- chlorophenoxyacetic acid (MCPA) (µg/L) - TW	2021/01/26	<MDL 0.12	100.0	No
Trifluralin (µg/L) - TW	2021/01/26	<MDL 0.02	45.0	No
Vinyl Chloride (µg/L) - TW	2021/01/26	<MDL 0.17	1.0	No
Trihalomethane: Total Annual Average (µg/L) - DW	4 Quarters of 2022	21.5	100.00	No
Haloacetic Acid: Total Annual Average (µg/L) - DW	4 Quarters of 2022	13.2	80.00	No

Note: TW = Treated Water, DW = Distribution Water, MDL = Minimum Detection Limit, MAC = Maximum Allowable Concentration, HAA = Haloacetic Acids

^{6A}Organic Parameters (Schedule 24) are required to be tested every 36 months for a large municipal residential system, if the system obtains water from a raw water supply that is ground water (O. Reg 170/03 Schedule 13-4.(1b)). The last set of samples was collected and tested in 2021, the next set of samples is scheduled to be collected and tested in 2024.

Table 7: List of Inorganic or Organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards for the reporting period.

Parameter	Result Value	Unit of Measure	Date of Sample
N/A	N/A	N/A	N/A