PRONTO EAST
DRINKING WATER SYSTEM
WATERWORKS # 260007491

ANNUAL & SUMMARY
REPORTS 2019

Introduction

This Annual and Summary Report has been prepared in accordance with both Schedule 22 and section 11 of Ontario Regulation 170/03. In this manner, the requirements by regulation for each report have been consolidated into a single document. This Report is intended to brief the ownership and consumers of the Pronto East Drinking Water System on the system's performance over the past calendar year January 1 to December 31, 2019.

This report encompasses all elements as required by O. Reg. 170/03. Each section explains what is required for the category Small Municipal Residential DWS (as it pertains to the Pronto East DWS) and how limits were met or if shortfalls were revealed. The last section contains a list of tables and definition of terms identified in this report.

System Description

The Pronto East Water Treatment Plant is rated as a Class 1 Water Treatment subsystem and is categorized under O. Reg. 170/03 as a Small Municipal Residential system. The raw water supply for the Pronto East subdivision of the Township of the North Shore is obtained from the North Channel of Lake Huron.
The water treatment plant is supplied by pumps located in the shore well. Located within the water treatment plant building are raw water strainers, filtration units, associated chemical systems (sodium hypochlorite), ultra-violet irradiation units (UV), pressure tanks, instrumentation, and control systems. The water treatment plant is located in the Pronto East subdivision. The design capacity of the water treatment plant is 80m^3/day.

The Pronto East WTP is supplied with raw water from Lake Huron through a 32-meter long, 300 mm diameter polyethylene intake pipe with a screened intake structure. The raw water flows into the wet well by gravity.

Raw water is pumped via one of the three high lift pumps to the treatment plant, where a strainer removes the larger objects. Sodium hypochlorite is added for primary disinfection before entering the static mixer, with the dosage paced to flow. The water then gets distributed into a header assembly and flows into two trains of (6) ultra-filtration membrane units. An alternate injection for sodium hypochlorite has been added immediately after UV, prior to the pressure tanks and contact main to assist in DPB (Disinfection Byproduct) control.

The water then flows into another header assembly and into (6) ultra-violet (UV) irradiation contactors. Six pressure tanks provide storage and flow balancing for the pumps. The water is then routed through a contact loop, ensuring adequate contact time for the disinfection process, prior to discharge to the distribution system.

Chemicals

Chemicals utilized at the Pronto East Treatment plant during 2019 include:

- Sodium Hypochlorite for primary and secondary disinfection

2019 Expenditures

During the year of 2019, expenses were incurred to maintain treatment and distribution functions:

- ESA services
- Pressure tanks
- Strainer housing
- Pressure transmitter
- Chlorine analyzer
- Turbidity Analyzers
- DQWMS External Audits (SAI Global)

2019 Drinking Water System Changes

Form 1 – Record of Watermains Authorized as a Future Alteration

- n/a

Form 2 – Record of Minor Modification or Replacements

- Pressure tanks
- Filter train turbidimeters

Form 3 – Record of addition, modification or replacement of equipment discharging a contaminant of concern to the atmosphere

- n/a

Water Quality

Microbiological Sampling and Testing

Sampling is conducted weekly for the DWS at the frequencies and locations identified by Schedule 11 of O. Reg. 170/03 for Small Municipal Residential Systems.

Table 1: Microbiological sampling requirements

Location	Sample Analysis	# samples	Frequency
Raw	EC, TC	1 sample	monthly
Treated	N/A	0	-
Distribution	EC, TC, HPC (25%)	1 sample	bi-weekly

Pronto East's raw and treated water samples are collected from WTP sample sink that is equipped with pump from the raw water header. Distribution samples are collected from either of the two sampling stations and from residential dwelling during the winter months.

Table 1a: Microbiological Sample Results

Type	# samples	EC (range)	TC (range)	# samples	HPC (range)
Raw	22	0 - 2	0 - 22	-	-
Distribution	51	0	0	49	0 - 2000

Distribution samples are collected more frequent (weekly) than required by regulation.

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Operational Checks and Testing

Operational testing is completed as per Schedules 6 & 7 of O. Reg. 170/03 for Small Municipal Residential Systems. These checks and testing are completed on site at the water treatment facility by licensed operators. Continuous monitoring analyzers (collecting 5-minute readings) are utilized for measurement of filter turbidity and chlorine residuals.

Table 2: Monthly Filter Turbidity Results

Month	Train 1	Train 2	Train 3		
	Avg (NTU)	Avg (NTU)	Avg (NTU)	Range (NTU)	Monthly Filter Efficiency
January	0.034	0.051	0.024	0.016 - 0.350	99.89
February	0.071	0.074	0.069	0.013 - 0.700	95.00
March	0.028	0.049	-	0.004 - 0.700	99.48
April	0.028	0.036	-	0.023 - 0.093	100.0
May	0.026	0.035	-	0.023 - 0.048	100.0
June	0.028	0.036	-	0.023 - 0.093	100.0
July	0.025	0.037	-	0.016 - 0.138	97.69
August	0.032	0.026	-	0.016 - 0.363	99.48
September	0.045	0.019	-	0.016 - 0.048	100.0
October	0.046	0.017	-	0.013 - 0.700	99.45
November	0.034	0.016	-	0.013 – 0.116	94.50
December	0.025	0.016	-	0.013 – 0.029	100.0

Filter Efficiency is monitored by tracking the turbidity readings above and below 0.10 NTU during filter run time. Pronto East DWS requires filter compliance each month above 99%, the required limit for membrane filtration to achieve necessary filtration credits for primary disinfection. AWQI's have been reported when efficiency less than 99% (see Table 7 on page 7).

Pronto DWS upgrades during 2019 included replacement membranes during quarter one. The new setup consists of two trains of 6 units replacing the old three trains of three household units.

Table 3: Treated Chlorine Residuals

Month	Average Chlorine Residual (mg/L)	Chlorine Residual Range (mg/L)
January	1.11	0.02 – 3.14
February	1.93	0.20 – 5.00
March	1.60	0.01 – 4.65
April	1.72	0.50 – 3.59
May	1.19	0.50 – 3.34
June	0.97	0.16 – 1.71
July	1.17	0.48 – 2.07
August	1.10	0.02 – 3.08
September	1.34	0.22 – 4.89
October	1.42	0.00 – 3.65
November	1.39	0.06 – 3.68
December	1.10	0.18 – 3.12

Chlorine residuals are continuously-monitored and data is recorded as real time

Chemical Sampling and Testing

Schedule 13 of O. Reg. 170/03 outlines chemical sampling regiments for Small Municipal Residential systems. Schedules 23 (inorganics) and 24 (organics) are collected every 60 months as well as sodium and fluoride. This system requires quarterly sampling for Nitrites/Nitrates and THM's. Schedule 15.1 outlines the requirements for semi-annual lead testing (2 periods per year). Pronto East's lead sampling follows the reduced sampling requirements every third year.

Table 4: Schedule 23 - Inorganics

Parameter	Sample Date	Result Value (µg/L)	Units	MAC
Antimony	07-Jun-19	<0.60	µg/L	6
Arsenic	07-Jun-19	<1.0	µg/L	10
Barium	07-Jun-19	13	µg/L	1000
Boron	07-Jun-19	<50	µg/L	5000
Cadmium	07-Jun-19	<0.10	µg/L	5
Chromium	07-Jun-19	<1.0	µg/L	50
Fluoride	16-Oct-19	0.041	mg/L	1.5
Mercury	07-Jun-19	<0.10	µg/L	1
Selenium	07-Jun-19	<1.0	µg/L	50
Sodium	16-Oct-19	7.23	mg/L	20
Uranium	07-Jun-19	<2.0	µg/L	20

All results for inorganic parameters are within the maximum acceptable concentrations (MAC) of the Ontario Drinking Water Quality Standards as defined in O. Reg. 169/03.

Table 5: Nitrite/ Nitrate Results

Date	MAC	21-Feb-19	12-Jun-19	23-Sep-19	09-Dec-19
Unit	mg/L	mg/L	mg/L	mg/L	mg/L
Nitrite	1.0	<0.010	<0.010	<0.010	<0.050
Nitrate	10.0	0.187	0.134	0.092	<0.050

All quarterly results for Nitrites and Nitrates are well below ODWS.

Table 5a: THM/HAA Results

Date	MAC	Q1	Q2	Q3	Q4	RAA
Unit	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
THM	100	73.1	113	74.6	55.2	78.98
HAA	80	160	102	73.0	38.0	93.25

ODWS established a MAC of 80 for HAAs effective January 1, 2020.

Table 6: Schedule 24 - Organics

Parameter	Date	Result	Unit	ODWS
Alachlor	07-Jun-19	<0.10	µg/L	5
Atrazine + N-dealkylated metobolites	07-Jun-19	<0.20	µg/L	5
Azinphos-methyl	07-Jun-19	<0.10	µg/L	20
Benzene	07-Jun-19	<0.50	µg/L	1
Benzo(a)pyrene	07-Jun-19	<0.010	µg/L	0.01
Bromoxynil	07-Jun-19	<0.20	µg/L	5
Carbaryl	07-Jun-19	<0.20	µg/L	90
Carbofuran	07-Jun-19	<0.20	µg/L	90
Carbon Tetrachloride	07-Jun-19	<0.20	µg/L	2
Chlorpyrifos	07-Jun-19	<0.10	µg/L	90
Diazinon	07-Jun-19	<0.10	µg/L	20
Dicamba	07-Jun-19	<0.20	µg/L	120
1,2-Dichlorobenzene	07-Jun-19	<0.50	µg/L	200
1,4-Dichlorobenzene	07-Jun-19	<0.50	µg/L	5
1,2-Dichloroethane	07-Jun-19	<0.50	µg/L	5
1,1-Dichloroethylene (vinylidene chloride)	07-Jun-19	<0.50	µg/L	14
Dichloromethane	07-Jun-19	<5.0	µg/L	50
2-4 Dichlorophenol	07-Jun-19	<0.30	µg/L	900
2,4-Dichlorophenoxy acetic acid	07-Jun-19	<0.20	µg/L	100
Diclofop-methyl	07-Jun-19	<0.20	µg/L	9
Dimethoate	07-Jun-19	<0.10	µg/L	20
Diquat	07-Jun-19	<1.0	µg/L	70
Diuron	07-Jun-19	<1.0	µg/L	150
Glyphosate	07-Jun-19	<5.0	µg/L	280
Malathion	07-Jun-19	<0.10	µg/L	190
2-Methyl-4-Chlorophenoxyacetic Acid (MCPA)	07-Jun-19	<0.20	µg/L	100
Metolachlor	07-Jun-19	<0.10	µg/L	50
Metribuzin	07-Jun-19	<0.10	µg/L	80
Monochlorobenzene	07-Jun-19	<0.50	µg/L	80
Paraquat	07-Jun-19	<1.0	µg/L	10
Pentachlorophenol	07-Jun-19	<0.50	µg/L	60
Phorate	07-Jun-19	<0.10	µg/L	2
Picloram	07-Jun-19	<0.20	µg/L	190
Polychlorinated Byphenols (PCB)	07-Jun-19	<0.035	µg/L	3
Prometryne	07-Jun-19	<0.10	µg/L	1
Simazine	07-Jun-19	<0.10	µg/L	10
Terbufos	07-Jun-19	<0.20	µg/L	1
Tetrachloroethylene	07-Jun-19	<0.50	µg/L	10
2,3,4,6-Tetrachlorophenol	07-Jun-19	<0.50	µg/L	100
Triallate	07-Jun-19	<0.10	µg/L	230
Trichloroethylene	07-Jun-19	<0.50	µg/L	5
2,4,6-Trichlorophenol	07-Jun-19	<0.50	µg/L	5
Trifluralin	07-Jun-19	<0.10	µg/L	45
Vinyl Chloride	07-Jun-19	<0.20	µg/L	1

All results for the required organic sampling of schedule 24 are below the MAC.

Table 6a: Organics - Sampling exceeding half MAC

Date of Sample	Parameter	Result Value
20-Mar-2019	THM	73.1
26-Mar-2019	HAA	160
12-Jun-2019	THM	113
12-Jun-2019	HAA	102
26-Sept-2019	THM	74.6
26-Sept-2019	HAA	73.0
09-Dec-2019	THM	55.2

Lead Sampling: The maximum acceptable concentration for lead in drinking water is 10µg/L. This applies to water at the point of consumption since lead is only present as a result of corrosion of lead solder, lead containing brass fittings or lead pipes which are found close to or in domestic plumbing and the service connection to buildings.

Table 7: Community Lead Sampling Results

Location Type	Number of Samples	Range of Lead Results (min#) – (max #)	Number of Exceedances
Plumbing	11	0 – 6.7	0
Distribution	2	0	0

Lead samples are collected during the two prescribed periods each year (Dec 15 – Mar15 and June 15 – Oct 15). Sample results revealed zero exceedances during year 2019.

Compliance

Adverse Water Quality Incidents

During 2019, the Pronto East DWS reported 15 incidents of adverse water quality.

Table 7: Adverse Water Quality Incidents

Date	Incident Reported
01-Mar-2019	February filter compliance not met (<99% efficiency)
07-Mar-2019	Loss of distribution pressure (planned upgrades)
17-Mar-2019	Failure to meet CT (low chlorine residual)
17-Mar-2019	Failure to meet CT (low chlorine residual)
17-Mar-2019	Loss of distribution pressure
21-Mar-2019	Failure to meet CT (low chlorine residual)
03-Jul-2019	Loss of distribution pressure
01-Aug-2019	July filter compliance not met (<99% efficiency)
05-Oct-2019	Failure to meet CT (low chlorine residual)
27-Oct-2019	Failure to meet CT (low chlorine residual)
29-Oct-2019	Failure to meet CT (low chlorine residual)
30-Oct-2019	Failure to meet CT (low chlorine residual)
31-Oct-2019	Failure to meet CT (low chlorine residual)
09-Nov-2019	Failure to meet CT (low chlorine residual)
03-Dec-2019	November filter compliance not met (<99% efficiency)

Note: All AWQI events were resolved with corrective actions at the time of incident.

Annual Drinking Water System Inspection

The annual DWS inspection took place on October 31, 2019 by MECP Drinking Water inspector Shelley Baggio. Three non-conformances and two Tadditional recommendations and best practice were identified.
he DWS received a final inspection rating of 93.53 %.

The following table identifies any non-compliance with requirement of the Act, the regulations, the system's approval, drinking water works permit, municipal drinking water license and any orders applicable to the system that were not met at any time during the period covered by the report.

Table 9: Non-compliances identified during Annual DWS Inspection

Non-compliance	Records did not indicate that treatment equipment was operated in a manner that achieved the design capabilities required by regulation and MDWL issued under part V of the SWDA.
Action	Develop a plan to determine the cause of low chlorine residuals and timeline to address including short-term and long-term solutions.
Corrective Actions	Action plan under review and development by Operating Authority.
Non-compliance	UV sensors were not calibrated as required
Action	Obtain a reference UV sensor and conduct 6-month verifications
Corrective Actions	A separate sensor has been purchased and labelled; PM's created for 6-month verifications
Non-compliance	Logbook entries were not sufficient to meet requirements of O. Reg 128
Action	Training required for all staff for record keeping as required by regulation
Corrective Actions	Planned training sessions are scheduled to ensure staff complete required documentation as per O. Reg. 128

Flows

The Permit to Take Water authorizes the municipality to draw water from Lake Huron at a rate not to exceed 100m³/d. The maximum daily volume taken was 65.8 m³, 66% of the permit limit.

Municipal Drinking Water Licence: 272-102 specifies a maximum intake capacity of 80m³/d. The max flow rate reported was 58.4 m³/d, 73 % of the rated capacity.

The Pronto East WTP treated and distributed a total of 7.1 ML (7,081 m3) during the year of 2019. The average day treated flow demand was 19.4 m³/d, and maximum day flow was XX m³/d on November 10, 2019.

Chart 1: Five-year Production History

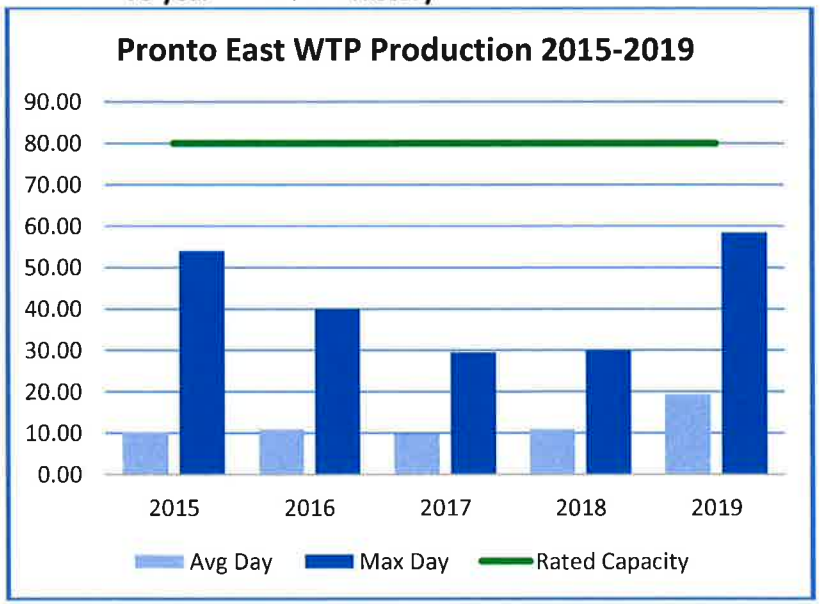
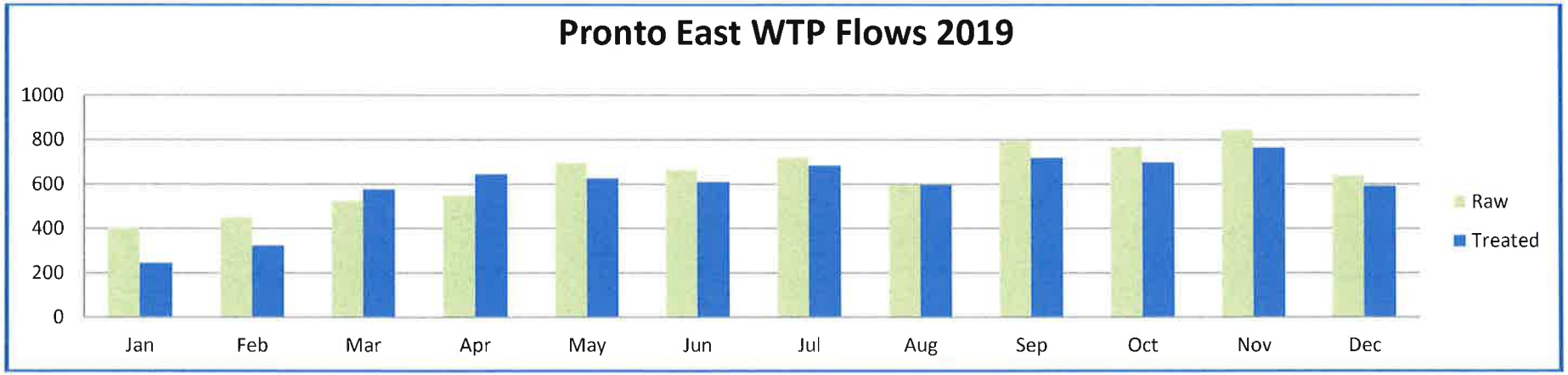


Table 10: Raw and Treated Water Production 2019

2019	Raw Water Production					Treated Water Production			
Month	Raw Water (m^3)	Minimum Day (m^3/d)	Maximum Day (m^3/d)	Average Day (m^3/d)	% Max. Flow Day of PTTW	Treated Water (m^3)	Minimum Day (m^3/d)	Maximum Day (m^3/d)	Average Day (m^3/d)
January	406.7	11.2	15.3	13.1	15.2	243.6	5.0	12.9	7.8
February	453.4	10.1	42.6	16.2	42.3	323.8	6.9	19.8	11.6
March	527.0	5.7	23.5	19.0	23.3	577.8	4.7	27.6	19.6
April	553.1	13.7	22.4	19.4	22.2	644.2	16.6	25.4	21.5
May	697.7	19.9	27.9	22.5	27.7	626.3	19.7	25.0	20.2
June	666.1	19.1	26.5	22.2	26.3	609.9	19.6	24.0	20.3
July	723.2	10.1	33.7	23.3	33.4	674.3	13.1	31.4	22.1
August	596.2	9.1	34.2	19.2	33.9	598.0	12.2	30.9	19.3
September	795.0	24.9	29.7	26.5	29.4	719.6	22.5	27.2	24.0
October	770.0	19.6	40.6	24.7	40.3	697.2	19.7	36.5	22.5
November	747.2	17.0	65.7	27.2	65.3	764.3	15.2	57.4	25.5
December	640.2	19.2	30.2	20.7	30.0	591.1	15.6	27.3	19.1

Chart 2: Pronto East WTP Flows 2019



Report Availability

Annual Report

Section 11 of O. Reg. 170/03 defines that this Annual Report must be given, without charge, to every person who requests a copy. Effective steps must also be taken to advise users of water from the system that copies of the report are available, without charge, and of how a copy may be obtained. This Annual Report shall be made available for inspection by the public at the Township Office.

Township of the North Shore
1375 Hwy 19, P.O. Box 107,
Algoma Mills, ON
P0R 1A0

Summary Report

This Summary report for the Pronto East Drinking Water System for the period of January 1st to December 31st, 2019 has been prepared in accordance to Schedule 22 of O. Reg. 170/03. In accordance with Schedule 22 of O. Reg. 170/03, this Summary Report has been provided to council of the Township of the North Shore.

Tables, Definition of Terms

Appendix A: List of Tables/ Charts

Appendix B: Definition of Terms

Acronym	Definition
AWQI	Adverse water quality incident
DBP	Disinfection Byproduct (THM, HAA)
DM	Dual Media
DWS	Drinking water system
EC	E. Coli
GUDI	Groundwater under direct influence of surface water
HAA	Haloacetic acids
HPC	Heterotrophic plate count
MAC	Maximum Acceptable Concentration
m^3	Cubic metres
m^3/d	Cubic metres per day
mg/L	Milligram per litre (part per million)
ML	Megalitre (1000 m^3)
NTU	Nephelometric turbidity unit
ODWS	Ontario Drinking Water Standards
O. Reg. 190/03	Ontario Regulation 190/03
PTTW	Permit to take water
SCADA	Supervisory control and data acquisition
TC	Total coliforms
THM	Trihalomethane
µg/L	Microgram per litre (part per billion)
WD	Water distribution
WT	Water treatment
WTP	Water treatment plant