









SAULT STE. MARIE  
DRINKING WATER SYSTEM  
WATERWORKS # 260006685

ANNUAL & SUMMARY  
REPORTS 2019

## Introduction

This Annual and Summary Report has been prepared in accordance with both Section 11 and Schedule 22 of Ontario Regulation 170/03. The requirements of the regulation for each report have been consolidated into a single document. This Report is intended to brief the owner and consumers of the Sault Ste. Marie 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 Large Municipal Residential DWS (as it pertains to the Sault Ste. Marie 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.

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## System Description

PUC Services Inc. operates, maintains and manages the Sault Ste. Marie drinking water system on behalf of the Public Utilities Commission of the City of Sault Ste. Marie. The PUC Services Inc. business office is located at 500 Second Line East. Regular business hours are 09:00 to 16:30, Monday to Friday. The telephone number is (705) 759-6500. The PUC Water Treatment Operations Control Centre is located at the A.S. Boniferro Water Filtration Plant, 2059 Second Line West.

Certified operators at this facility monitor and control all aspects of water production and quality, using a computerized control system.

Water for Sault Ste. Marie is obtained from two principle sources: surface water from Lake Superior and ground water from six deep wells. Raw water from the intake at Gros Cap is pumped to the water treatment plant where a process of filtration and chlorination prepares the water for consumption. Water from the deep wells is chlorinated prior to being pumped to the distribution system. Blended phosphates are applied to all water supplies and pH is adjusted at the surface water supply and East wells for corrosion control. On a typical day our customers consume approximately 30,000 cubic metres of water. Three water storage reservoirs located in the distribution system hold up to 52,000 cubic metres of water providing a reserve supply of drinking water in addition to supply for fire protection.

## Chemicals

Chemicals utilized in the Sault Ste. Marie Drinking Water Treatment facilities during 2019 include:

SSM WTP:

- Aluminum sulfate for coagulation
- Chlorine gas for disinfection
- Blended phosphates for corrosion control
- Soda ash for pH stabilization

Goulais Pump Station:

- Chlorine gas for disinfection
- Blended phosphates for corrosion control

Steelton Pump Station:

- Chlorine gas for disinfection
- Blended phosphates for corrosion control

Shannon Pump Station:

- Chlorine gas for disinfection
- Blended phosphates for corrosion control
- Carbon dioxide gas for pH stabilization

Lorna Pump Station:

- Chlorine gas for disinfection
- Blended phosphates for corrosion control
- Carbon dioxide gas for pH stabilization

## 2019 Expenditures

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

SSM WTP:

- Installed new filtrate valves

Goulais Pump Station:

- Well 1 and 2 rehabilitation including well motors, column pipe and drive shaft
- Well House roof replacement

Steelton Pump Station:

- Chlorine feed system

Shannon Pump Station:

- Carrier water control valve and piping and chlorine feed system

Zone 2 Booster Station

- Completed design and procured equipment (pumps, motors, Motorized Control Centre, back-up generator)  
- two-year project

Distribution System:

- Repairs were made to 85 water main breaks.

## 2019 Drinking Water System Changes

Form 1 – Record of Watermains Authorized as a Future Alteration

- Greenfield Subdivision Phase 5
- East Side Subdivision Phase 2
- Black Road Hydrant installations and replacements
- McNabb Street Reconstruction
- Bay Street Reconstruction
- John Street Aqueduct
- Watermain through Former St. Mary's Paper
- Ruth Street Reconstruction
- Second Line Watermain Extension
- Leo Avenue Reconstruction

Form 2 – Record of Minor Modification or Replacements

- Filtrate valves for all four dual media filters
- Filter #4 turbidity analyzer
- Chlorination equipment upgrades at Shannon, Goulais, and Steelton Wells
- Goulais well motors

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 10 of O. Reg. 170/03 for Large Municipal Residential Systems.

**Table 1: Microbiological sampling requirements**

Location	Sample Analysis	# samples	Frequency
Raw	EC / TC	each source	weekly
Treated	EC / TC / HPC	each source	weekly
Distribution	EC / TC/ HPC-25%	83 samples	monthly

The raw and treated samples in Sault Ste. Marie are collected from each of the wells in production (Goulais 1 & 2, Steelton, and Shannon) and the WTP surface water source. Lorna Wells are not used for regular production but available in the event demand requires higher source water flow. Distribution samples are collected from 26 locations throughout the system.

**Table 1a: Microbiological Sample Results**

SSM WTP	# samples	EC (range)	TC (range)	# HPC samples	HPC (range)
Raw	52	0	0 - 29	-	-
Treated	52	0	0	52	0 – 5
Distribution	1230	0	0 - 1	392	0 – 38

*Well samples are collected only during weeks of production*

Goulais 1	# samples	EC (range)	TC (range)	# HPC samples	HPC (range)
Raw	49	0	0	-	-
Treated	47	0	0	47	0 - 2

Goulais 2	# samples	EC (range)	TC (range)	# HPC samples	HPC (range)
Raw	50	0	0	-	-
Treated	48	0	0	48	0 - 3

Steelton	# samples	EC (range)	TC (range)	# HPC samples	HPC (range)
Raw	52	0	0	-	-
Treated	52	0	0	52	0 - 1

Shannon	# samples	EC (range)	TC (range)	# HPC samples	HPC (range)
Raw	51	0	0	-	-
Treated	51	0	0	50*	0 - 3

*\*HPC lab error*

### Operational Checks and Testing

Operational testing is completed in accordance with Schedule 7 of O. Reg. 170/03 for Large Municipal Residential Systems. These checks and testing are completed on site at the water treatment facility by licensed operators. Continuous monitoring analyzers are utilized for measurement of filter turbidity and chlorine residuals.

**Table 2: Monthly Filter Turbidity Results (SSM WTP)**

Month	Turbidity Range (NTU)				Monthly Filter Efficiency
	Filter #1	Filter #2	Filter #3	Filter #4	%
Jan	0.01 - 0.16	0.01 - 0.26	0.01 - 0.06	0.03 - 0.09	100
Feb	0.02 - 0.09	0.01 - 0.19	0.01 - 0.11	0.03 - 0.23	100
Mar	0.01 - 0.31	0.01 - 0.57	0.01 - 0.06	0.03 - 0.11	99.9
Apr	0.01 - 0.10	0.02 - 0.62	0.01 - 0.06	0.03 - 0.97	99.9
May	0.01 - 0.46	0.02 - 0.68	0.01 - 0.41	0.03 - 0.64	99.3
Jun	0.02 - 0.18	0.01 - 0.81	0.01 - 0.08	0.03 - 0.17	99.9
Jul	0.02 - 0.07	0.02 - 0.11	0.01 - 0.09	0.01 - 0.15	100
Aug	0.01 - 0.06	0.02 - 0.05	0.01 - 0.06	0.01 - 0.07	100
Sep	0.02 - 0.06	0.02 - 0.06	0.02 - 0.06	0.02 - 0.06	100
Oct	0.02 - 0.06	0.02 - 0.06	0.02 - 0.06	0.02 - 0.06	100
Nov	0.02 - 0.07	0.02 - 0.12	0.02 - 0.07	0.02 - 0.11	100
Dec	0.02 - 0.33	0.02 - 0.93	0.02 - 0.32	0.02 - 0.27	99.8

Filter turbidity is monitored on SCADA in real time. Filter efficiency is calculated by tracking the readings in five-minute intervals above and below 0.30 NTU during filter run time.

**Sault Ste. Marie maintained filter compliance each month above 95%**, the required limit for dual media filtration to achieve necessary filtration credits for primary disinfection.

**Table 3: Chlorine Residuals (Production Sites)**

Month	WTP (mg/L)	Goulais (mg/L)	Steelton (mg/L)	Shannon (mg/L)
Jan	1.08 - 1.43	0.59 - 1.45	0.70 - 1.13	0.33 - 1.12
Feb	0.82 - 1.55	0.68 - 1.29	0.85 - 1.15	0.25 - 1.36
Mar	1.13 - 1.37	0.67 - 1.37	0.89 - 1.14	0.48 - 1.04
Apr	1.09 - 1.66	0.77 - 1.26	0.82 - 1.09	0.46 - 1.02
May	1.10 - 1.47	0.55 - 2.07	0.37 - 1.21	0.58 - 1.03
Jun	1.11 - 1.42	0.40 - 1.35	0.85 - 1.18	0.20 - 1.16
Jul	1.18 - 1.43	0.53 - 2.09	0.76 - 1.16	0.43 - 1.57
Aug	1.10 - 1.44	0.76 - 1.51	0.85 - 1.25	0.48 - 1.29
Sep	1.13 - 1.31	0.81 - 2.47	0.98 - 1.19	0.64 - 1.64
Oct	0.97 - 1.48	0.71 - 1.36	0.95 - 1.30	0.53 - 1.65
Nov	1.15 - 1.52	0.92 - 1.30	0.84 - 1.19	0.55 - 1.24
Dec	0.98 - 1.44	0.70 - 1.36	0.89 - 1.26	0.50 - 0.98

Chlorine residuals are continuously monitored and tracked in real time in SCADA and recorded in five-minute intervals for reporting purposes.

### Chemical Sampling and Testing

Schedule 13 of O. Reg. 170/03 outlines chemical sampling requirements for Large Municipal Residential systems. Annual sampling of Schedule 23 (inorganics) and 24 (organics) is collected every 12 months as well as quarterly sampling for Nitrites/Nitrates, THM's and HAA's. Sodium and fluoride are required to be sampled every 60 months.

**Table 4: Schedule 23 - Inorganics**

Parameter	WTP	Goulais #1	Goulais #2	Steelton	Shannon	MAC
Antimony	<0.60	<0.60	<0.60	<0.60	<0.60	6
Arsenic	<1.0	<1.0	<1.0	<1.0	2.4	10
Barium	<10	38	38	38	57	1000
Boron	<50	<50	<50	<50	202	5000
Cadmium	<0.10	<0.10	<0.10	<0.10	<0.10	5
Chromium	<1.0	1.7	1.6	1.7	<1.0	50
*Fluoride	0.024	0.035	0.035	0.046	0.208	1.5
Mercury	<0.10	<0.10	<0.10	<0.10	<0.10	1
Selenium	<1.0	<1.0	<1.0	<1.0	<1.0	50
*Sodium	3.64	11.8	11.9	9.72	35.2	20
Uranium	<2.0	<2.0	<2.0	<2.0	9.3	20

Table 4 results reported in µg/L except for \*Fluoride and Sodium (mg/L)

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, with the exception of sodium for the Shannon well.

Sodium has an aesthetic objective (AO) of 200 mg/L but has a limit of 20 mg/L for medical reasons and would require notifications if exceeded.

**Table 5: Nitrate/Nitrite Results (mg/L)**

Q	Nitrite Nitrate	WTP	Goulais #1	Goulais #2	Steelton	Shannon	MAC
Q1	NO <sub>2</sub>	<0.010	<0.010	<0.010	<0.010	<0.010	1.0
	NO <sub>3</sub>	0.359	0.985	0.986	0.914	<0.020	10
Q2	NO <sub>2</sub>	<0.010	<0.010	<0.010	<0.010	<0.010	1.0
	NO <sub>3</sub>	0.381	1.020	1.020	1.000	<0.020	10
Q3	NO <sub>2</sub>	<0.010	<0.010	<0.01	<0.010	<0.010	1.0
	NO <sub>3</sub>	0.340	0.991	0.985	1.010	<0.020	10
Q4	NO <sub>2</sub>	<0.010	<0.010	<0.010	<0.010	<0.010	1.0
	NO <sub>3</sub>	0.340	0.965	0.970	0.870	<0.020	10
	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L

**Table 5a: THM/HAA Results**

Q	Parameter	Sub 4	Sub 15	Average	MAC
Q1	THM	8.5	<4.0	6.25	100
	HAA	8.2	5.4	6.8	80
Q2	THM	7.1	<4.0	3.75	100
	HAA	6.3	4.0	5.15	80
Q3	THM	11.2	9.6	10.4	100
	HAA	10.2	7.3	8.75	80
Q4	THM	11.2	<4.0	7.6	100
	HAA	9.4	<2.2	5.8	80
RAA	THM	9.5	5.4	7.0	100
	HAA	8.5	4.7	6.7	80
	Unit	µg/L	µg/L	µg/L	µg/L

Running annual average (RAA) is calculated by using the average results tested each quarter.

**All quarterly results for Nitrites, Nitrates THM's and HAA's are well below MAC.**

Table 6: Schedule 24 Organics – WTP

Parameter	Date	Result	Unit	MAC
Alachlor	04-Feb-19	<0.10	µg/L	5
Atrazine + N-dealkylated metabolites	04-Feb-19	<0.20	µg/L	5
Azinphos-methyl	04-Feb-19	<0.10	µg/L	20
Benzene	04-Feb-19	<0.50	µg/L	1
Benzo(a)pyrene	04-Feb-19	<0.010	µg/L	0.01
Bromoxynil	04-Feb-19	<0.20	µg/L	5
Carbaryl	04-Feb-19	<0.20	µg/L	90
Carbofuran	04-Feb-19	<0.20	µg/L	90
Carbon Tetrachloride	04-Feb-19	<0.20	µg/L	2
Chlorpyrifos	04-Feb-19	<0.10	µg/L	90
Diazinon	04-Feb-19	<0.10	µg/L	20
Dicamba	04-Feb-19	<0.20	µg/L	120
1,2-Dichlorobenzene	04-Feb-19	<0.50	µg/L	200
1,4-Dichlorobenzene	04-Feb-19	<0.50	µg/L	5
1,2-Dichloroethane	04-Feb-19	<0.50	µg/L	5
1,1-Dichloroethylene (vinylidene chloride)	04-Feb-19	<0.50	µg/L	14
Dichloromethane	04-Feb-19	<5.0	µg/L	50
2-4 Dichlorophenol	04-Feb-19	<0.30	µg/L	900
2,4-Dichlorophenoxy acetic acid	04-Feb-19	<0.20	µg/L	100
Diclofop-methyl	04-Feb-19	<0.20	µg/L	9
Dimethoate	04-Feb-19	<0.10	µg/L	20
Diquat	04-Feb-19	<1.0	µg/L	70
Diuron	04-Feb-19	<1.0	µg/L	150

Parameter	Date	Result	Unit	MAC
Glyphosate	04-Feb-19	<5.0	µg/L	280
Malathion	04-Feb-19	<0.10	µg/L	190
2-Methyl-4-Chlorophenoxyacetic Acid (MCPA)	04-Feb-19	<0.20	µg/L	100
Metolachlor	04-Feb-19	<0.10	µg/L	50
Metribuzin	04-Feb-19	<0.10	µg/L	80
Monochlorobenzene	04-Feb-19	<0.50	µg/L	80
Paraquat	04-Feb-19	<1.0	µg/L	10
Pentachlorophenol	04-Feb-19	<0.50	µg/L	60
Phorate	04-Feb-19	<0.10	µg/L	2
Picloram	04-Feb-19	<0.20	µg/L	190
Polychlorinated Byphenols (PCB)	04-Feb-19	<0.035	µg/L	3
Prometryne	04-Feb-19	<0.10	µg/L	1
Simazine	04-Feb-19	<0.10	µg/L	10
Terbufos	04-Feb-19	<0.20	µg/L	1
Tetrachloroethylene	04-Feb-19	<0.50	µg/L	10
2,3,4,6-Tetrachlorophenol	04-Feb-19	<0.50	µg/L	100
Triallate	04-Feb-19	<0.10	µg/L	230
Trichloroethylene	04-Feb-19	<0.50	µg/L	5
2,4,6-Trichlorophenol	04-Feb-19	<0.50	µg/L	5
Trifluralin	04-Feb-19	<0.10	µg/L	45
Vinyl Chloride	04-Feb-19	<0.20	µg/L	1

All results are below the ODWS MAC and half MAC as per O. Reg. 169/03.



Table 7: Schedule 24 Organics – Goulais Pump Station

Parameter	Goulais 1	Goulais 2	Unit	MAC
Alachlor	<0.10	<0.10	µg/L	5
Atrazine + N-dealkylated metabolites	<0.20	<0.20	µg/L	5
Azinphos-methyl	<0.10	<0.10	µg/L	20
Benzene	<0.50	<0.50	µg/L	1
Benzo(a)pyrene	<0.010	<0.0050	µg/L	0.01
Bromoxynil	<0.20	<0.20	µg/L	5
Carbaryl	<0.20	<0.20	µg/L	90
Carbofuran	<0.20	<0.20	µg/L	90
Carbon Tetrachloride	<0.20	<0.20	µg/L	2
Chlorpyrifos	<0.10	<0.10	µg/L	90
Diazinon	<0.10	<0.10	µg/L	20
Dicamba	<0.20	<0.20	µg/L	120
1,2-Dichlorobenzene	<0.50	<0.50	µg/L	200
1,4-Dichlorobenzene	<0.50	<0.50	µg/L	5
1,2-Dichloroethane	<0.50	<0.50	µg/L	5
1,1-Dichloroethylene (vinylidene chloride)	<0.50	<0.50	µg/L	14
Dichloromethane	<5.0	<5.0	µg/L	50
2-4 Dichlorophenol	<0.30	<0.30	µg/L	900
2,4-Dichlorophenoxy acetic acid	<0.20	<0.20	µg/L	100
Diclofop-methyl	<0.20	<0.20	µg/L	9
Dimethoate	<0.10	<0.10	µg/L	20
Diquat	<1.0	<1.0	µg/L	70
Diuron	<1.0	<1.0	µg/L	150

Parameter	Goulais 1	Goulais 2	Unit	MAC
Glyphosate	<5.0	<5.0	µg/L	280
Malathion	<0.10	<0.10	µg/L	190
2-Methyl-4-Chlorophenoxyacetic Acid (MCPA)	<0.20	<0.20	µg/L	100
Metolachlor	<0.10	<0.10	µg/L	50
Metribuzin	<0.10	<0.10	µg/L	80
Monochlorobenzene	<0.50	<0.50	µg/L	80
Paraquat	<1.0	<1.0	µg/L	10
Pentachlorophenol	<0.50	<0.50	µg/L	60
Phorate	<0.10	<0.10	µg/L	2
Picloram	<0.20	<0.20	µg/L	190
Polychlorinated Byphenols (PCB)	<0.035	<0.035	µg/L	3
Prometryne	<0.10	<0.10	µg/L	1
Simazine	<0.10	<0.10	µg/L	10
Terbufos	<0.20	<0.20	µg/L	1
Tetrachloroethylene	<0.50	<0.50	µg/L	10
2,3,4,6-Tetrachlorophenol	<0.50	<0.50	µg/L	100
Triallate	<0.10	<0.10	µg/L	230
Trichloroethylene	<0.50	<0.50	µg/L	5
2,4,6-Trichlorophenol	<0.50	<0.50	µg/L	5
Trifluralin	<0.10	<0.10	µg/L	45
Vinyl Chloride	<0.20	<0.20	µg/L	1

*All results are below the ODWS MAC and half MAC as per O. Reg. 169/03.*  
 Dates Sampled: Goulais 1 – Feb 20, 2019, Goulais 2 – May 7, 2019

Table 8: Schedule 24 Organics – Shannon & Steelton Pump Stations

Parameter	Steelton	Shannon	Unit	MAC
Alachlor	<0.10	<0.10	µg/L	5
Atrazine + N-dealkylated metabolites	<0.20	<0.20	µg/L	5
Azinphos-methyl	<0.10	<0.10	µg/L	20
Benzene	<0.50	<0.50	µg/L	1
Benzo(a)pyrene	<0.0050	<0.0050	µg/L	0.01
Bromoxynil	<0.20	<0.20	µg/L	5
Carbaryl	<0.20	<0.20	µg/L	90
Carbofuran	<0.20	<0.20	µg/L	90
Carbon Tetrachloride	<0.50	<0.20	µg/L	2
Chlorpyrifos	<0.10	<0.10	µg/L	90
Diazinon	<0.10	<0.10	µg/L	20
Dicamba	<0.20	<0.20	µg/L	120
1,2-Dichlorobenzene	<0.50	<0.50	µg/L	200
1,4-Dichlorobenzene	<0.50	<0.50	µg/L	5
1,2-Dichloroethane	<0.50	<0.50	µg/L	5
1,1-Dichloroethylene (vinylidene chloride)	<0.50	<0.50	µg/L	14
Dichloromethane	<5.0	<5.0	µg/L	50
2-4 Dichlorophenol	<0.30	<0.30	µg/L	900
2,4-Dichlorophenoxy acetic acid	<0.20	<0.20	µg/L	100
Diclofop-methyl	<0.20	<0.20	µg/L	9
Dimethoate	<0.10	<0.10	µg/L	20
Diquat	<1.0	<1.0	µg/L	70
Diuron	<1.0	<1.0	µg/L	150

Parameter	Steelton	Shannon	Unit	MAC
Glyphosate	<5.0	<5.0	µg/L	280
Malathion	<0.10	<0.10	µg/L	190
2-Methyl-4-Chlorophenoxyacetic Acid (MCPA)	<0.20	<0.20	µg/L	100
Metolachlor	<0.10	<0.10	µg/L	50
Metribuzin	<0.10	<0.10	µg/L	80
Monochlorobenzene	<0.50	<0.50	µg/L	80
Paraquat	<1.0	<1.0	µg/L	10
Pentachlorophenol	<0.50	<0.50	µg/L	60
Phorate	<0.10	<0.10	µg/L	2
Picloram	<0.20	<0.20	µg/L	190
Polychlorinated Byphenols (PCB)	<0.035	<0.035	µg/L	3
Prometryne	<0.10	<0.10	µg/L	1
Simazine	<0.10	<0.10	µg/L	10
Terbufos	<0.20	<0.20	µg/L	1
Tetrachloroethylene	<0.50	<0.50	µg/L	10
2,3,4,6-Tetrachlorophenol	<0.50	<0.50	µg/L	100
Triallate	<0.1	<0.10	µg/L	230
Trichloroethylene	<0.50	<0.50	µg/L	5
2,4,6-Trichlorophenol	<0.50	<0.50	µg/L	5
Trifluralin	<0.10	<0.10	µg/L	45
Vinyl Chloride	<0.20	<0.20	µg/L	1

**All results are below the ODWS MAC and half MAC as per O. Reg. 169/03.**  
 Dates Sampled: Steelton and Shannon Wells - Aug 20, 2019  
 Lorna Wells: not operated to the distribution system – no samples required

**Lead Program:**

The challenge of reducing the occurrence of lead in drinking water is shared across communities throughout North America. Testing water for lead, using filters and replacing lead service lines is a shared responsibility between customers and utilities. PUC implemented new water treatment processes in 2015 to reduce lead levels. PUC is committed to a multi-barrier approach and to community leadership in all these areas.

**Lead Testing**

Algoma Public Health and the Sault Ste. Marie Innovation Centre assist PUC in determining where to offer lead testing by identifying addresses where there are people most at risk from lead and with lead service lines. PUC contacts these customers directly to offer lead testing. Customer participation is voluntary. Customers may also request tap water testing for lead at any time. PUC provides tap water lead testing free of charge.

The Ontario Drinking Water Standard for lead is 10 µg/L. This applies to water at the point of consumption since lead is only present as a result of corrosion of lead solder, leaded brass or lead pipes which are found close to or in domestic plumbing and the service connection to building. Lead testing results from 2019 are summarized in Table 9.

In 2019, PUC conducted routine lead testing in samples from plumbing at 37 Residential/Non-Residential addresses and concurrently tested 8 nearby locations in the distribution system. Testing was performed according to criteria in Schedule 15.1 of Ontario Regulation 170/03. Customers participate in the testing program on a voluntary basis and the proportion of homes with lead service lines varies. These limitations in the sample method contribute to variation in results between years.

**Table 9: 2019 Community Lead Sampling Results**

Location Type	Number of Sample Locations	Range of Lead Results (min#) – (max #)	Number of Location Exceedances
Community Lead Tests	37	0 – 16.3	3
Distribution Samples	8	0 – 1.4	0

**In 2019, 3 of 37 plumbing locations or 8.1% of the tested under the community lead testing program exceeded the ODWS.**

PUC also repeated tests at 32 additional premises with detectable lead results pre-dating 2019. Monitoring of repeat tests over several years helps guide adjustments to water treatment for corrosion control to further reduce lead uptake in the drinking water. Lead levels at 19 of the 32 addresses were less than the MAC of 10µg/L. Since implementing corrosion control in 2015, there is a general trend of improvement in lead levels, however some premises remain above 10 µg/l.

**Free Filter Program**

PUC offers free point of use filters certified for lead reduction to premises with elevated lead levels as an interim measure until lead service pipes are replaced. Initially, PUC offered free filters when results exceeded 10 µg/L. In 2018, anticipating that Health Canada might lower lead guidelines, PUC began offering free filters when results exceeded 5 µg/L.

**Service Replacement**

PUC increased its budget for service replacement five-fold for 2019. PUC replaces lead services on the municipal right of way at no charge. Replacement of services on private property is a customer responsibility. PUC offers service replacement for customers using proven construction methods including trenching and horizontal drilling. PUC completed 16 lead service replacements in 2019 including two private side services. One customer replaced their own service without assistance from PUC.

**Financial Assistance.**

PUC is responsive to customer needs and helps customers afford service line replacement by offering a 5-year interest free loan for service replacement. In addition, families with limited income may qualify for no-charge lead service replacement through a collaborative effort between PUC and the District of Sault Ste. Marie Social Services Board.

## Compliance

### Adverse Water Quality Incidents

During 2019, the Sault Ste. Marie DWS reported one incident of adverse water quality.

**Table 10: Adverse Water Quality Incidents**

Date	Incident Reported
2019-09-25	Presence of total coliform (distribution)

On Sept 25 and 26 resamples were collected as required by regulation and all results were non-detect.

### Annual Drinking Water System Inspection

The annual DWS inspection took place on January 15, 2019 by the Ministry of the Environment, Conservation and Parks (MECP) Drinking Water Inspector. There were zero non-conformances, zero recommendations and best practices identified.

### Ministry of the Environment, Conservation and Parks

#### - Risk Assessment Process

Maximum Question Rating: 561

**Table 11: MECP Risk Assessment Rating**

Inspection Module	Non-Compliance Rating
Source	0/14
Capacity Assessment	0/30
Treatment Processes	0/89
Operations Manuals	0/28
Logbooks	0/14
Certification and Training	0/42
Water Quality Monitoring	0/124
Reporting and Corrective Actions	0/87
Treatment Process Monitoring	0/133
<b>TOTAL</b>	<b>0/561</b>

**Inspection Risk Rating 0.0%**

**The DWS received a final inspection rating of 100%**

## Flows

Municipal Drinking Water Works Permit: 216-201 specifies maximum rated flows for the following sites:

**Table 12: Permit to Take Water**

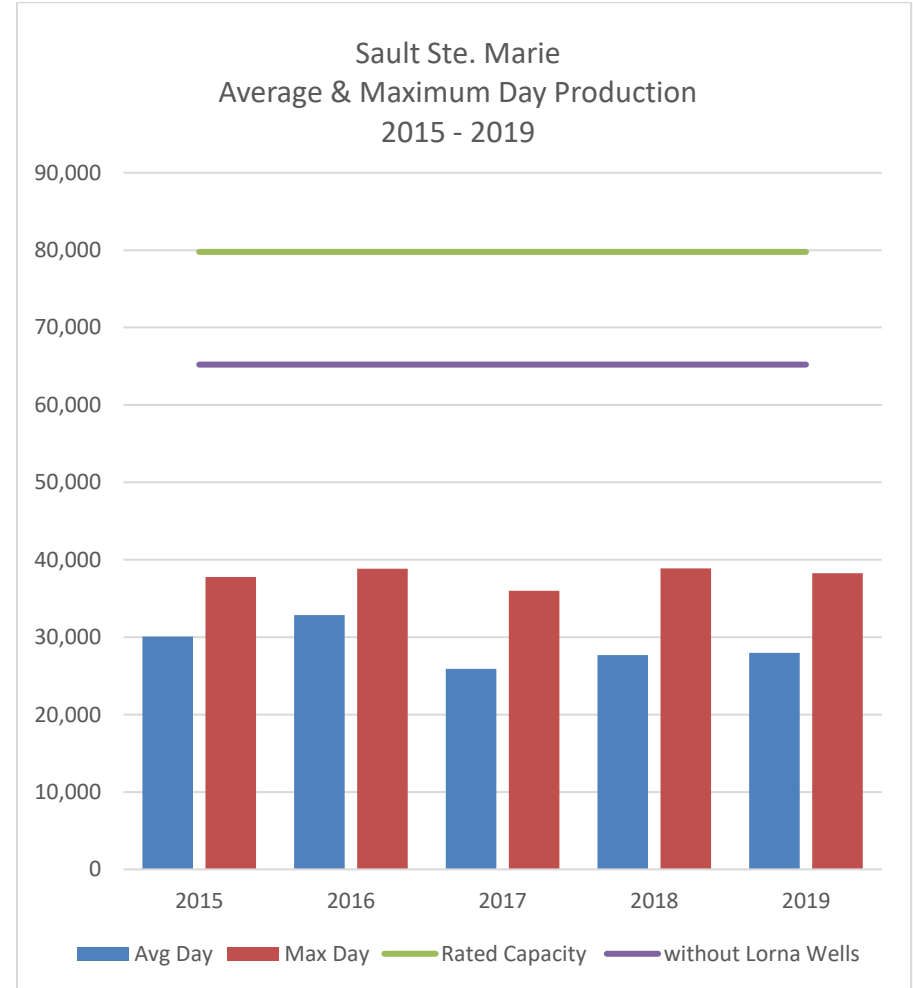
Facility	Permit to Take Water
Gros Cap Pump Station	75,000 m <sup>3</sup> /d
Goulais Pump Station	10,013 m <sup>3</sup> /d
Steelton Pump Station	8,208 m <sup>3</sup> /d
Shannon Pump Station	7,000 m <sup>3</sup> /d
Lorna Pump Station	14,558.4 m <sup>3</sup> /d

The Water Treatment Plant is currently rated at 40,000 m<sup>3</sup>/d based on provincial requirements for primary disinfection. The total available capacity for the Sault Ste. Marie is rated at 79,779 m<sup>3</sup>/d. Lorna pump station was not used in 2019 but remains available for emergency demand if needed.

**The Sault Ste. Marie WTP and production Wells treated a total of 10,199,484 m<sup>3</sup> of water during the year of 2019.**

**The average daily treated flow was 27,927 m<sup>3</sup>, and the maximum daily flow was 38,287 m<sup>3</sup> on July 26, 2019.**

**Chart 1: Five Year Flow Comparison**

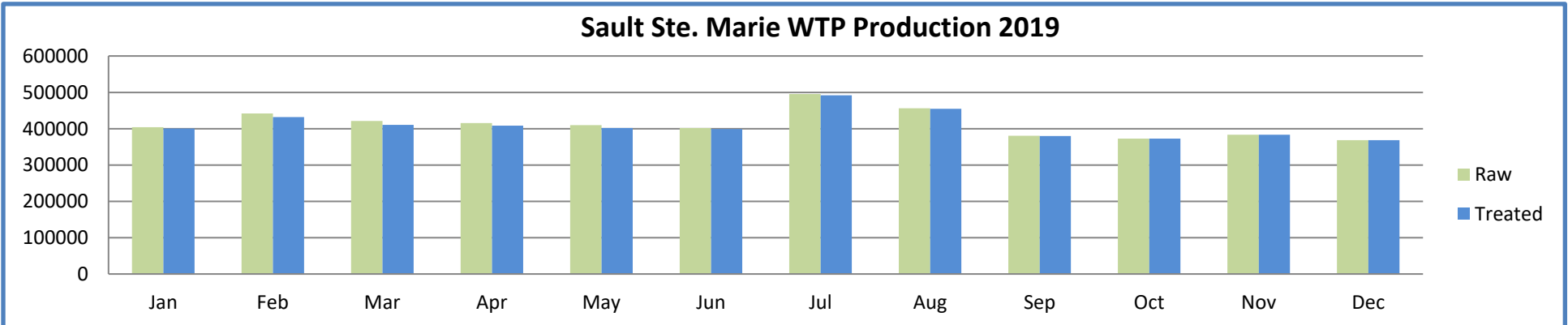


Capacity available production without Lorna Wells – 65,221 m<sup>3</sup>/d

**Table 13: WTP Raw and Treated Water Production 2019**

2019	Raw Water Production				Treated Water Production				
Month	Monthly Raw Water (m <sup>3</sup> )	Minimum Day (m <sup>3</sup> /d)	Maximum Day (m <sup>3</sup> /d)	Average Day (m <sup>3</sup> /d)	Monthly Treated Water (m <sup>3</sup> )	Minimum Day (m <sup>3</sup> /d)	Maximum Day (m <sup>3</sup> /d)	Average Day (m <sup>3</sup> /d)	% Max. Flow Day of rated Capacity
January	403,766	10,751	17,806	13,200	400,421	7,776	17,001	12,988	42.5
February	441,766	12,019	21,443	15,748	431,839	11,664	21,898	15,387	54.7
March	421,376	9,985	18,247	13,797	410,556	9,287	21,693	13,468	54.2
April	415,683	11,676	16,469	13,852	408,075	10,117	15,965	13,636	39.9
May	409,884	11,719	16,129	13,200	402,150	9,310	15,500	12,916	38.8
June	402,079	11,929	15,636	13,429	399,021	9,579	16,182	13,329	40.5
July	495,084	11,444	20,037	16,030	491,997	8,790	21,831	15,940	54.6
August	456,224	12,601	17,232	14,661	454,968	10,938	19,754	14,581	49.4
September	380,427	10,880	14,010	12,660	380,043	9,450	16,397	12,716	41.0
October	372,469	9,755	16,391	11,950	372,401	5,447	16,391	12,022	41.0
November	383,455	4,080	16,663	12,803	383,023	7,414	15,603	12,777	39.0
December	368,313	4,080	15,171	11,826	368,010	4,624	15,383	11,901	38.5

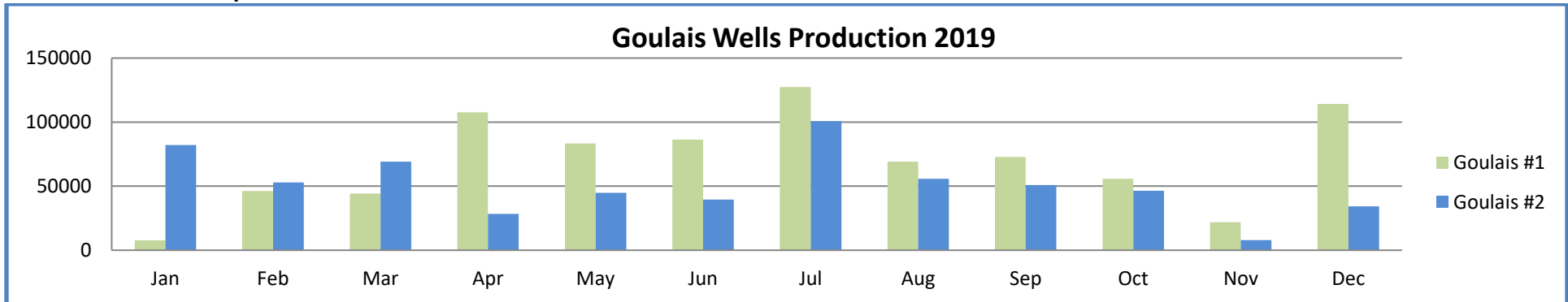
**Chart 2: Sault Ste. Marie WTP Production 2019**



**Table 14: Goulais Treated Water Production 2019**

2019	Goulais Well #1 Production					Goulais Well #2 Production				
Month	Monthly Total Volume (m <sup>3</sup> )	Minimum Day (m <sup>3</sup> /d)	Maximum Day (m <sup>3</sup> /d)	Average Day (m <sup>3</sup> /d)	% Max Flow Day of PTTW	Monthly Total Volume (m <sup>3</sup> )	Minimum Day (m <sup>3</sup> /d)	Maximum Day (m <sup>3</sup> /d)	Average Day (m <sup>3</sup> /d)	% Max Flow Day Of PTTW
January	7,614	0	2,713	233	41.1	82,209	1,078	2,952	2,665	27.1
February	46,299	0	4,908	1,600	74.3	52,858	0	3,088	1,941	49.0
March	44,144	0	5,085	1,421	77.0	69,067	0	3,155	2,198	50.8
April	107,650	0	5,097	3,648	77.2	28,417	0	3,177	886	50.9
May	83,386	0	5,097	2,710	77.2	44,727	0	3,188	1,423	50.9
June	86,343	0	5,042	2,896	76.3	39,578	0	3,249	1,302	50.4
July	127,341	0	5,215	4,264	78.9	100,688	2,622	3,239	3,092	52.1
August	69,109	0	5,069	2,240	76.7	55,848	0	3,266	1,776	50.6
September	72,862	0	5,085	2,460	77.0	50,882	0	3,271	1,665	50.8
October	55,792	0	5,972	1,690	90.4	46,367	0	3,285	1,605	59.6
November	21,936	0	5,160	297	78.1	7,855	0	3,411	696	51.5
December	114,159	0	5,248	3,634	79.4	34,278	0	3,138	1,155	52.4

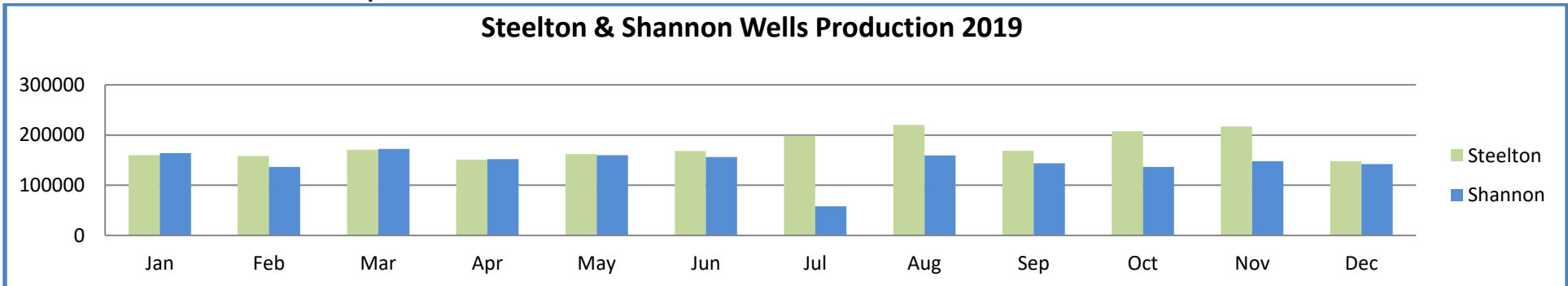
**Chart 3: Goulais Pump Station Production 2019**



**Table 15: Steelton & Shannon Treated Water Production 2019**

2019	Steelton Well Production					Shannon Well Production				
Month	Monthly Total Volume (m <sup>3</sup> )	Minimum Day (m <sup>3</sup> /d)	Maximum Day (m <sup>3</sup> /d)	Average Day (m <sup>3</sup> /d)	% Max Flow Day of PTTW	Monthly Total Volume (m <sup>3</sup> )	Minimum Day (m <sup>3</sup> /d)	Maximum Day (m <sup>3</sup> /d)	Average Day (m <sup>3</sup> /d)	% Max Flow Day of PTTW
January	159,807	4,000	6,983	5,155	85.1	163,702	4,583	6,000	5,281	85.7
February	158,044	5,000	6,998	5,641	85.3	136,660	0	7,000	4,897	100.0
March	170,519	4,418	6,000	5,506	73.1	171,999	4,774	6,002	5,542	85.7
April	150,853	4,000	5,660	5,028	69.0	152,017	4,890	5,660	5,067	80.9
May	161,648	4,812	6,000	5,216	73.1	159,876	4,811	5,875	5,157	83.9
June	167,956	3,903	7,999	5,600	97.5	156,052	4,295	6,000	5,202	85.7
July	198,122	4,408	7,499	6,391	91.4	58,223	0	6,465	1,878	92.4
August	220,185	5,000	8,001	7,057	97.5	159,473	4,017	6,500	5,136	92.9
September	168,382	4,370	6,999	5,613	85.3	143,834	3,988	5,000	4,794	71.4
October	207,642	5,000	8,000	6,698	97.5	136,649	2,691	5,037	4,408	72.0
November	216,688	4,621	8,001	7,222	97.5	147,965	4,000	5,889	4,932	84.1
December	147,663	3,650	6,994	4763	85.2	142,015	4,000	6,491	4,584	92.7

**Chart 4: Steelton & Shannon Pump Station Production 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 PUC Services Office.

PUC Services Inc.  
500 Second Line East  
Sault Ste. Marie, ON  
P6A 6P2

### Summary Report

This Summary report for The Sault Ste. Marie Drinking Water System for the period of January 1st to December 31<sup>st</sup>, 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 the Public Utilities Commission of the City of Sault Ste. Marie.

## Tables, Definition of Terms

### Appendix A: List of Tables/ Charts

<b>Table 1:</b>	Microbiological sampling requirements
<b>Table 1a:</b>	Microbiological Sample Results
<b>Table 2:</b>	Monthly Filter Turbidity Results
<b>Table 3:</b>	Chlorine Residuals
<b>Table 4:</b>	Schedule 23 – Inorganics
<b>Table 5:</b>	Nitrite/ Nitrate Results
<b>Table 5a:</b>	THM/ HAA Results
<b>Table 6:</b>	Schedule 24 Organics – WTP
<b>Table 7:</b>	Schedule 24 Organics – Goulais Pump Station
<b>Table 8:</b>	Schedule 24 Organics – Steelton & Shannon Pumps Stations
<b>Table 9:</b>	Community Lead Sampling Requirements and Results
<b>Table 10:</b>	Adverse Water Quality Incidents
<b>Table 11:</b>	MECP Risk Assessment Rating
<b>Table 12:</b>	Permit to Take Water
<b>Table 13:</b>	WTP Raw and Treated Water Production 2019
<b>Table 14:</b>	Goulais Treated Water Production 2019
<b>Table 15:</b>	Steelton & Shannon Treated Water Production 2019
<b>Chart 1:</b>	Five-year Production Comparison
<b>Chart 2:</b>	Sault Ste. Marie WTP Production 2019
<b>Chart 3:</b>	Goulais Pump Station Production 2019
<b>Chart 4:</b>	Steelton & Shannon Pump Station Production 2019

### Appendix B: Definition of Terms

Acronym	Definition
<b>AWQI</b>	Adverse water quality incident
<b>CT Value</b>	Product of disinfectant concentration and contact time (mg-min/L)
<b>DM</b>	Dual Media
<b>DWS</b>	Drinking water system
<b>EC</b>	E. Coli
<b>HAA</b>	Haloacetic acids
<b>HPC</b>	Heterotrophic plate count
<b>MAC</b>	Maximum Acceptable Concentration
<b>MECP</b>	Ministry of the Environment, Conservation and Parks
<b>m<sup>3</sup></b>	Cubic metres
<b>m<sup>3</sup>/d</b>	Cubic metres per day
<b>mg/L</b>	Milligram per litre (part per million)
<b>ML</b>	Megalitre (1000 m <sup>3</sup> )
<b>NTU</b>	Nephelometric turbidity unit
<b>ODWS</b>	Ontario Drinking Water Standards
<b>O. Reg. 170/03</b>	Ontario Regulation 170/03
<b>PLC</b>	Programmable logic controller
<b>PTTW</b>	Permit to take water
<b>SCADA</b>	Supervisory control and data acquisition
<b>SSM</b>	Sault Ste. Marie
<b>TC</b>	Total coliforms
<b>THM</b>	Trihalomethane
<b>µg/L</b>	Microgram per litre (part per billion)
<b>WD</b>	Water distribution
<b>WT</b>	Water treatment
<b>WTP</b>	Water treatment plant