SAULT STE. MARIE DRINKING WATER SYSTEM WATERWORKS # 260006685

ANNUAL & SUMMARY REPORTS 2024

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 (DWS) on the performance of the system over the past calendar year from January 1 to December 31, 2024.

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 definitions of terms identified in this report.

System Description

PUC Services Inc. operates, maintains, and manages the Sault Ste. Marie drinking water system on behalf of the City's Public Utilities Commission. 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.

PUC certified operators monitor and control all aspects of water production and quality, using a computerized control system.

Water for Sault Ste. Marie is obtained from two principal 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 it passes through a process of filtration and disinfection. Water from the deep wells is also disinfected prior to being pumped to the distribution system. pH stabilization and blended phosphate are added for corrosion control to mitigate lead.

On a typical day our customers use approximately 30,000,000 litres of water. Three water storage reservoirs that hold up to 52,000,000 litres of water (or 1-2 days-average consumption).

Chemicals

Chemicals utilized in the Sault Ste. Marie drinking water treatment facilities during 2024 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

2024 Expenditures

During the year of 2024, expenses were incurred to maintain and replace various treatment and distribution assets:

SSM Water Treatment:

- WTP security fence
- WTP LED lighting
- Control room ceiling girder repairs
- Critical spares (chlorine analyzers, turbidimeters, chemical feed pumps, chlorinator parts)
- Well stations chlorine alarm flashing light upgrades
- Aluminum Sulphate system upgrade (new day tank and level transmitter)
- ESA
- SAI Global external audits

Distribution System:

- Repairs for 32 watermain repairs
- CIPP and SIPP watermain lining projects (Ravina, Sisson, Orion, Wireless, and Haviland/ Manitou and Corey)
- Reconstructions for Stanley, Spruce, Queen (Elgin to March) and phase 2 Eastside subdivision
- New looped watermains Wright Street to Connaught Ave
- Two new auto-flush stations (Dell & Garden Ave.)

Drinking Water System Changes

Form 1 – Record of watermains authorized as a future alteration

- Eastside Subdivision – Phase 2
- Queen Street – Elgin to March
- Stanley Street Reconstruction
- Spruce Street Reconstruction
- CIPP – Ravina, Sisson, Orion, Wireless and Haviland
- SIPP – Manitou and Corey

Form 2 – Record of minor modification or replacements

- Replacement 150mm gate valve (B10-40) McCrea St
- Replacement 150mm gate valve (B10-41) McCrea St
- Replacement 250mm gate valve (F06-8) Peoples Rd
- Replacement 150mm gate valve (B10-42) Churchill Blvd
- Replacement 100mm gate valve (D07-61) Wilcox Ave
- Replacement 150mm gate valve (E06-7) Wellington St W
- Replacement 100mm gate valve (D07-2) Bloor St W
- Addition of 150mm gate valve Ontario Ave
- Replacement Treated Turbidimeter (WTP)
- Replacement Phosphate Pumps (Goulais)

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 are sampled and available in the event of increased water demand. Distribution samples are collected from 14 locations throughout the system. In total 1,164 microbiological samples were collected in the DWS.

Table 2: Microbiological Sample Results

Site	Type	# samples	EC (range)	TC (range)	# HPC	HPC (range)
WTP	Raw	52	0 - 1	0 - 1190	-	-
	Treated	52	0	0	52	0 - 3
Goulais #1	Raw	52	0	0	-	-
	Treated	52	0	0	52	0
Goulais #2	Raw	52	0	0	-	-
	Treated	52	0	0	52	0 - 10
Steelton	Raw	52	0	0	-	
	Treated	52	0	0	52	0 - 2
Shannon	Raw	52	0	0	-	-
	Treated	52	0	0	52	0 - 5
Lorna #1 *	Raw	4	0	0 - 2420	-	-
	Treated	-	-	-	-	-
Lorna #2 *	Raw	4	0	0	-	-
	Treated	-	-	-	-	-
Various Locations	Distribution	1,164	0	0	402	0 - 11

Lorna Wells are flushed and sampled to be available for production if required but not operated to the system in 2024.

Operational Checks and Testing

Operational testing is completed as per 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. Data summaries for turbidity and chlorine are summarized in tables 2 and 3.

Table 3: Monthly Filter Turbidity Results (SSM WTP)

Month	Filter #1		Filter #2		Filter #3		Filter #4		Monthly Compliance
	Average NTU	Range NTU	Average NTU	Range NTU	Average NTU	Range NTU	Average NTU	Range NTU	%
Jan	0.02	0.02 - 0.16	0.02	0.02 -0.18	0.02	0.02 - 0.33	0.02	0.02 - 0.14	100
Feb	0.02	0.02 - 0.05	0.02	0.02 - 0.05	0.02	0.01 - 0.05	0.02	0.02 - 0.05	100
Mar	0.02	0.02 - 0.06	0.02	0.02 - 0.06	0.02	0.01 - 0.04	0.02	0.02 - 0.05	100
Apr	0.02	0.02 - 0.09	0.02	0.02 - 0.08	0.02	0.01 - 0.06	0.02	0.02 - 0.07	100
May	0.02	0.02 - 0.06	0.03	0.02 - 0.22	0.02	0.01 - 0.06	0.02	0.02 - 0.06	100
Jun	0.02	0.02 - 0.06	0.03	0.02 - 0.07	0.02	0.01 - 0.04	0.02	0.02 - 0.06	100
Jul	0.02	0.02 - 0.05	0.03	0.02 - 0.05	0.02	0.02 - 0.05	0.02	0.02 - 0.06	100
Aug	0.02	0.02 - 0.42	0.03	0.02 - 0.05	0.02	0.02 - 0.05	0.02	0.02 - 0.05	100
Sep	0.02	0.02 - 0.06	0.03	0.02 - 0.05	0.02	0.02 - 0.04	0.02	0.02 - 0.06	100
Oct	0.02	0.02 - 0.05	0.03	0.02 - 0.05	0.03	0.02 - 0.06	0.02	0.02 - 0.05	100
Nov	0.02	0.02 - 0.05	0.03	0.02 - 0.08	0.02	0.02 - 0.10	0.02	0.02 - 0.05	100
Dec	0.02	0.02 - 0.06	0.03	0.02 - 0.08	0.02	0.02 - 0.05	0.02	0.02 - 0.07	100

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 4: Chlorine Residuals (Production Sites)

Production Site	WTP		Goulais Well		Steelton Well		Shannon Well	
Month	Average (mg/L)	Range (mg/L)	Average (mg/L)	Range (mg/L)	Average (mg/L)	Range (mg/L)	Average (mg/L)	Range (mg/L)
Jan	1.24	1.03 - 1.05	1.26	0.94 - 1.38	1.00	0.68 - 1.40	0.88	0.53 - 1.01
Feb	1.26	1.09 - 1.40	1.24	0.91 - 1.37	0.97	0.61 - 1.45	0.89	0.60 - 0.99
Mar	1.22	0.90 - 1.51	1.20	0.99 - 1.44	0.97	0.64 - 1.03	0.83	0.53 - 1.45
Apr	1.20	1.05 - 1.36	1.18	0.88 - 1.46	0.97	0.90 - 1.00	0.82	0.47 - 0.92
May	1.21	1.05 - 1.38	1.18	0.93 - 1.39	0.94	0.79 - 1.03	0.81	0.63 - 0.89
Jun	1.23	0.82 - 1.64	1.24	0.91 - 1.49	0.91	0.65 - 1.11	0.84	0.60 - 1.03
Jul	1.25	0.91 - 1.40	1.24	0.96 - 1.46	0.92	0.76 - 1.12	0.82	0.62 - 0.95
Aug	1.24	1.05 - 1.37	1.30	0.59 - 1.66	0.94	0.80 - 1.11	0.83	0.59 - 1.01
Sep	1.24	1.06 - 1.33	1.33	1.09 - 1.59	0.97	0.86 - 1.13	0.92	0.60 - 1.56
Oct	1.25	1.06 - 1.42	1.27	1.07 - 1.49	0.99	0.83 - 1.05	0.89	0.63 - 1.18
Nov	1.21	0.96 - 1.39	1.28	1.04 - 1.66	0.98	0.84 - 1.07	0.88	0.51 - 0.98
Dec	1.22	1.07 - 1.37	1.22	1.07 - 1.43	0.99	0.80 - 1.06	0.94	0.58 - 1.36

Chlorine residuals are continuously monitored and tracked in real time in SCADA. ***Minimum residuals were maintained at all times consistent with primary disinfection requirements.***

Chemical Sampling and Testing

Schedule 13 of O. Reg. 170/03 outlines chemical sampling requirements for Large Municipal Residential systems. Sample collection for schedule 23 (inorganics) and 24 (organics) is required every 12 months and quarterly sampling for nitrites/nitrates, THM's and HAA's. Sodium and fluoride are required to be sampled every 60 months. Lorna wells were not sampled as they were not operated for production of water to distribution system in year 2024.

Table 5: Schedule 23 - Inorganics (µg/L)

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	2.3	25
Barium	<10	39	38	40	62	1,000
Boron	<50	<50	<50	<50	200	5,000
Cadmium	<0.10	<0.10	<0.10	<0.10	<0.10	5
Chromium	<1.0	1.8	1.7	1.4	<1.0	50
Mercury	<0.10	<0.100	<0.100	<0.100	<0.100	1
Selenium	<1.0	<1.0	<1.0	<1.0	<1.0	10
Uranium	<2.0	<2.0	<2.0	<2.0	8.9	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 6: Fluoride and Sodium Results (mg/L)

Parameter	WTP	Goulais #1	Goulais #2	Steelton	Shannon	MAC
Fluoride	<0.05	<0.05	<0.02	<0.05	0.208	1.5
*Sodium	3.2	10.2	10.1	10.9	34.4	20

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 7: Nitrate/Nitrite Results (mg/L)

Q	Nitrite Nitrate	WTP	Goulais #1	Goulais #2	Steelton	Shannon	MAC (mg/L)
Q1	NO_2	<0.01	<0.01	<0.01	<0.01	<0.01	1.0
	NO_3	0.326	0.898	0.892	0.865	<0.02	10
Q2	NO_2	<0.01	<0.010	<0.010	<0.01	<0.01	1.0
	NO_3	0.371	0.977	0.943	0.881	<0.02	10
Q3	NO_2	<0.01	<0.01	<0.01	<0.01	<0.01	1.0
	NO_3	0.35	0.961	0.971	0.904	<0.02	10
Q4	NO_2	<0.01	<0.010	<0.01	<0.01	<0.01	1.0
	NO_3	0.321	0.94	0.893	0.806	<0.02	10

All quarterly results are well below ODWS MAC.

Table 8: Disinfection Byproducts THM/HAA Results (µg/L)

THM	Q1	Q2	Q3	Q4	MAC
Q Average	4.85	7.5	12.2	7.9	100
RAA	Running Annual Average (µg/L)			8.11	100
HAA	Q1	Q2	Q3	Q4	MAC
Q Average	5.29	6.14	11.71	<5	80
RAA	Running Annual Average (µg/L)			7.04	80

All quarterly results for THMs and HAAs are well below ODWS MAC.

Table 9: Schedule 24 Organics – WTP

Parameter	Date	Result	Unit	MAC
Alachlor	13-Mar-24	<0.05	µg/L	5
Atrazine + N-dealkylated metabolites	13-Mar-24	<0.14	µg/L	5
Azinphos-methyl	13-Mar-24	<0.100	µg/L	20
Benzene	13-Mar-24	<0.50	µg/L	5
Benzo(a)pyrene	13-Mar-24	<0.005	µg/L	0.01
Bromoxynil	13-Mar-24	<0.05	µg/L	5
Carbaryl	13-Mar-24	<0.050	µg/L	90
Carbofuran	13-Mar-24	<0.0250	µg/L	90
Carbon Tetrachloride	13-Mar-24	<0.20	µg/L	5
Chlorpyrifos	13-Mar-24	<0.10	µg/L	90
Diazinon	13-Mar-24	<0.0250	µg/L	20
Dicamba	13-Mar-24	<0.10	µg/L	120
1,2-Dichlorobenzene	13-Mar-24	<0.50	µg/L	200
1,4-Dichlorobenzene	13-Mar-24	<0.50	µg/L	5
1,2-Dichloroethane	13-Mar-24	<0.50	µg/L	5
1,1-Dichloroethylene (vinylidene chloride)	13-Mar-24	<0.50	µg/L	14
Dichloromethane	13-Mar-24	<1.0	µg/L	50
2-4 Dichlorophenol	13-Mar-24	<0.30	µg/L	900
2,4-Dichlorophenoxy acetic acid	13-Mar-24	<0.05	µg/L	100
Diclofop-methyl	13-Mar-24	<0.10	µg/L	9
Dimethoate	13-Mar-24	<0.050	µg/L	20
Diquat	13-Mar-24	<1.0	µg/L	70
Diuron	13-Mar-24	<0.05	µg/L	150
Glyphosate	13-Mar-24	<0.20	µg/L	280
Malathion	13-Mar-24	<0.0250	µg/L	190
2-Methyl-4-Chlorophenoxyacetic Acid (MCPA)	13-Mar-24	<0.00005	µg/L	100
Metolachlor	13-Mar-24	<0.025	µg/L	50
Metribuzin	13-Mar-24	<0.10	µg/L	80
Monochlorobenzene	13-Mar-24	<0.50	µg/L	80
Paraquat	13-Mar-24	<1.0	µg/L	10
Pentachlorophenol	13-Mar-24	<0.50	µg/L	60
Phorate	13-Mar-24	<0.250	µg/L	2
Picloram	13-Mar-24	<0.10	µg/L	190
Polychlorinated Byphenols (PCB)	13-Mar-24	<0.03	µg/L	3
Prometryne	13-Mar-24	<0.025	µg/L	1
Simazine	13-Mar-24	<0.10	µg/L	10
Terbufos	13-Mar-24	<0.50	µg/L	1
Tetrachloroethylene	13-Mar-24	<0.50	µg/L	30
2,3,4,6-Tetrachlorophenol	13-Mar-24	<0.50	µg/L	100
Triallate	13-Mar-24	<0.100	µg/L	230
Trichloroethylene	13-Mar-24	<0.50	µg/L	5
2,4,6-Trichlorophenol	13-Mar-24	<0.50	µg/L	5
Trifluralin	13-Mar-24	<0.10	µg/L	45
Vinyl Chloride	13-Mar-24	<0.50	µg/L	2

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

Table 10: Schedule 24 Organics – Goulais Wells sampled – June 24, 2024

Parameter	Goulais 1	Goulais 2	Unit	MAC
Alachlor	<0.05	<0.05	µg/L	5
Atrazine + N-dealkylated metabolites	<0.14	<0.14	µg/L	5
Azinphos-methyl	<0.100	<0.100	µg/L	20
Benzene	<0.50	<0.50	µg/L	5
Benzo(a)pyrene	<0.005	<0.005	µg/L	0.01
Bromoxynil	<0.05	<0.05	µg/L	5
Carbaryl	<0.050	<0.050	µg/L	90
Carbofuran	<0.025	<0.0250	µg/L	90
Carbon Tetrachloride	<0.20	<0.20	µg/L	5
Chlorpyrifos	<0.10	<0.10	µg/L	90
Diazinon	<0.025	<0.0250	µg/L	20
Dicamba	<0.10	<0.10	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	<50	µg/L	14
Dichloromethane	<1.0	<1.0	µg/L	50
2-4 Dichlorophenol	<0.20	<0.20	µg/L	900
2,4-Dichlorophenoxy acetic acid	<0.05	<0.05	µg/L	100
Diclofop-methyl	<0.100	<0.100	µg/L	9
Dimethoate	<0.05	<0.050	µg/L	20
Diquat	<1.0	<1.0	µg/L	70
Diuron	<0.05	<0.050	µg/L	150
Glyphosate	0.62	<0.50	µg/L	280
Malathion	<0.0250	<0.0250	µg/L	190
2-Methyl-4-Chlorophenoxyacetic Acid (MCPA)	<0.00005	<0.00005	µg/L	100
Metolachlor	<0.0250	<0.0250	µg/L	50
Metribuzin	<0.100	<0.100	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	<0.250	<0.250	µg/L	2
Picloram	<0.10	<0.10	µg/L	190
Polychlorinated Byphenols (PCB)	<0.030	<0.030	µg/L	3
Prometryne	<0.0250	<0.0250	µg/L	1
Simazine	<0.100	<0.100	µg/L	10
Terbufos	<0.50	<0.50	µg/L	1
Tetrachloroethylene	<0.50	<0.50	µg/L	30
2,3,4,6-Tetrachlorophenol	<0.50	<0.50	µg/L	100
Triallate	<0.100	<0.100	µg/L	230
Trichloroethylene	<0.50	<0.50	µg/L	5
2,4,6-Trichlorophenol	<0.20	<0.20	µg/L	5
Trifluralin	<0.10	<0.10	µg/L	45
Vinyl Chloride	<0.50	<0.50	µg/L	2

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

Table 11: Schedule 24 Organics – Shannon & Steelton Wells Aug 21,28, 2024

Parameter	Goulais 1	Goulais 2	Unit	MAC
Alachlor	<0.05	<0.05	µg/L	5
Atrazine + N-dealkylated metabolites	<0.14	<0.14	µg/L	5
Azinphos-methyl	<0.100	<0.100	µg/L	20
Benzene	<0.50	<0.50	µg/L	5
Benzo(a)pyrene	<0.005	<0.005	µg/L	0.01
Bromoxynil	<0.05	<0.05	µg/L	5
Carbaryl	<0.050	<0.050	µg/L	90
Carbofuran	<0.025	<0.0250	µg/L	90
Carbon Tetrachloride	<0.20	<0.20	µg/L	5
Chlorpyrifos	<0.10	<0.10	µg/L	90
Diazinon	<0.025	<0.0250	µg/L	20
Dicamba	<0.10	<0.10	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	<50	µg/L	14
Dichloromethane	<1.0	<1.0	µg/L	50
2-4 Dichlorophenol	<0.20	<0.20	µg/L	900
2,4-Dichlorophenoxy acetic acid	<0.05	<0.05	µg/L	100
Diclofop-methyl	<0.100	<0.100	µg/L	9
Dimethoate	<0.05	<0.05	µg/L	20
Diquat	<1.0	<1.0	µg/L	70
Diuron	<0.05	<0.050	µg/L	150
Glyphosate	0.62	<0.50	µg/L	280
Malathion	<0.0250	<0.0250	µg/L	190
2-Methyl-4-Chlorophenoxyacetic Acid (MCPA)	<0.00005	<0.00005	µg/L	100
Metolachlor	<0.0250	<0.0250	µg/L	50
Metribuzin	<0.100	<0.100	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	<0.250	<0.250	µg/L	2
Picloram	<0.10	<0.10	µg/L	190
Polychlorinated Byphenols (PCB)	<0.030	<0.030	µg/L	3
Prometryne	<0.0250	<0.0250	µg/L	1
Simazine	<0.100	<0.100	µg/L	10
Terbufos	<0.50	<0.50	µg/L	1
Tetrachloroethylene	<0.50	<0.50	µg/L	30
2,3,4,6-Tetrachlorophenol	<0.50	<0.50	µg/L	100
Triallate	<0.100	<0.100	µg/L	230
Trichloroethylene	<0.50	<0.50	µg/L	5
2,4,6-Trichlorophenol	<0.20	<0.20	µg/L	5
Trifluralin	<0.10	<0.10	µg/L	45
Vinyl Chloride	<0.50	<0.50	µg/L	2

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

Lead Sampling:
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, brass containing lead fittings or lead pipes which are found close to or in domestic plumbing and the service connection to buildings.

In July 2017, the required number of lead samples was reduced to 22 residential/non-residential plumbing and 8 distribution points as per Municipal Drinking Water License #216-101, Schedule C, 5.0, Table 1.

Table 12: Community Lead Sampling Results

Location Type	Number of Sample Locations	Range of Lead Results (ug/L)	Number of Location Exceedances
Plumbing – Residential and Non-Residential	21	0 - 11.6	1
Distribution	9	0 - 1.2	0

In 2024, 1 of 21 plumbing locations or 5% of the tested homes exceeded the ODWS. Tests were done in homes with record of lead or suspected lead pipe – this is a small subset of homes in Sault Ste. Marie.

As part of PUC's lead service line replacement program, 6 additional addresses were sampled with zero exceedances. A total of two service lines were replaced in 2024 – on the municipal side, private side, or both.

Providing clean, safe, and reliable drinking water is a responsibility that PUC takes very seriously. Unfortunately, the challenge of reducing the occurrence of lead in drinking water is something communities across North America are faced with. In Sault Ste. Marie, PUC employs a robust community water sampling program that monitors lead levels in drinking water.

For the program to function efficiently, PUC partnered with the SSM Innovation Centre and Algoma Public Health to develop a system that would focus lead testing on homes with suspected lead service pipes and that may have occupants that would be especially sensitive to lead exposure (ex. infants or expecting mothers). While it is beyond PUC's authority to replace lead services on a homeowner's property, if a home is found to have a lead service the PUC offers programs to consumers that will protect them from lead exposure.

The preferred option provided to homeowners is an interest-free loan to help them replace their lead service lines. When an owner replaces their lead service line, PUC will replace the public portion of the service at no charge to the owner. PUC will offer service pipelining when pandemic restrictions are eased and as an affordable alternative to replacement. Another option the PUC provides to consumers is to issue tap-mounted water filters (certified for lead reduction) at no charge to the homeowner until the service can be replaced or changes to water treatment processes can be shown to satisfactorily reduce lead concentrations.

In accordance with drinking water regulations PUC implemented a Corrosion Control Plan (as part of the Water Quality Improvement Project) that is designed to reduce lead uptake in drinking water. PUC continues to evaluate the long-term changes to the distribution system and water quality after implementing the corrosion control plan.

Compliance

Adverse Water Quality Incidents

During 2024, the Sault Ste. Marie DWS reported two incidents of adverse water quality.

Table 13: Adverse Water Quality Incidents

Date	Incident Reported
2024-05-04	Loss of distribution pressure (water outage)
2024-06-05	Presence of total coliforms (Sub 13, Sub 17)

Dryland Pump Station experienced a booster pump failure causing a temporary water outage for 8 residents, a BWA implemented until two sets of microbiological samples were collected with results - non-detect for EC, TC.

Sampling in June revealed the presence of total coliforms at two routine sample collection locations. Resamples confirmed results non-detect and safety of the water supply.

Annual Drinking Water System Inspection

The annual DWS inspection took place on February 8, 2024. There were zero non-compliances, zero recommendations and best practices identified.

Ministry of Environment, Conservation, and Parks - Risk Assessment Process

Maximum Question Rating: 546

Table 14: MECP Risk Assessment Rating

Inspection Module	Non Compliance Rating
Operations Manuals	0/28
Other Inspection Findings	0/424
Reporting & Corrective Actions	0/35
Treatment Processes	0/35
Water Quality Monitoring	0/24
TOTAL	**0/546**

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 raw water supplies listed in Table 12.

Table 15: Permit to Take Water

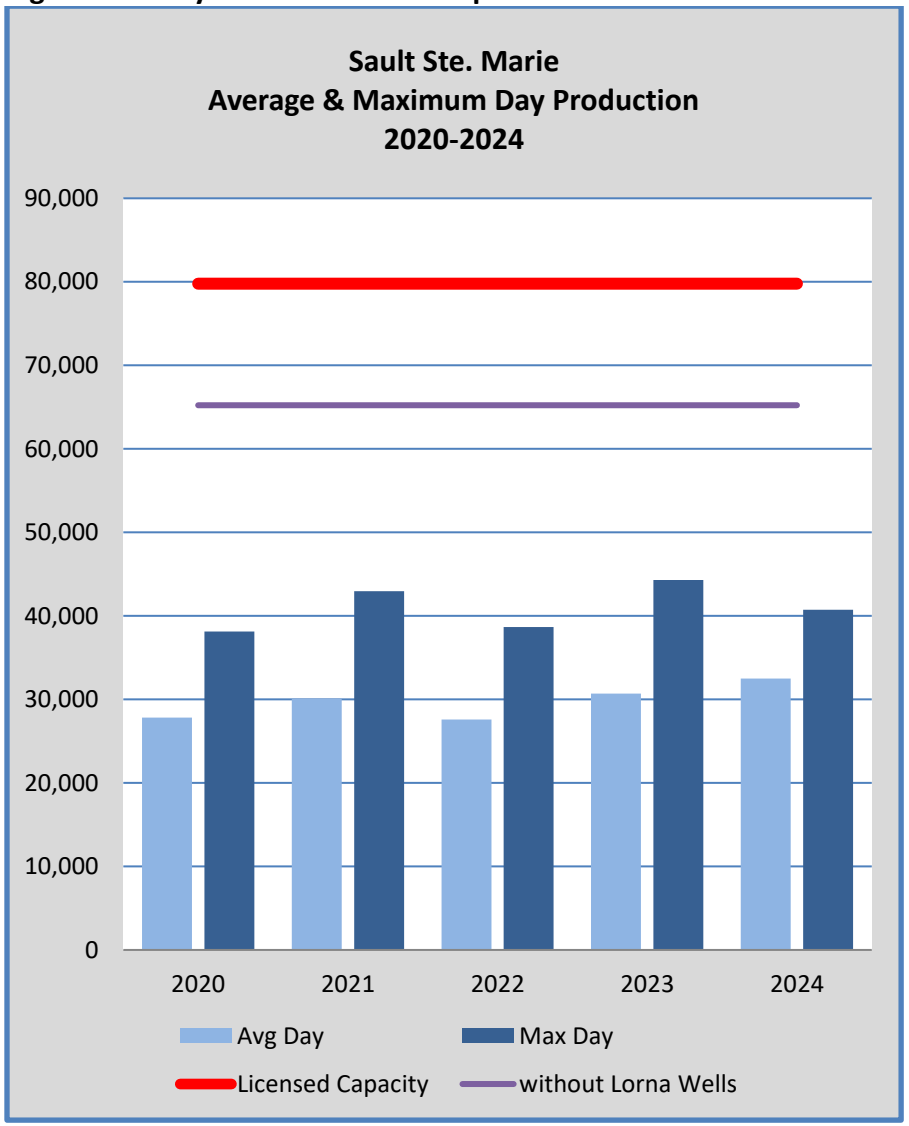
Facility	Permit to Take Water
Gros Cap Pump Station	75,000 m^3/d
Goulais Wells	10,013 m^3/d
Steelton Well	8,208 m^3/d
Shannon Well	7,000 m^3/d
Lorna Wells	14,558.4 m^3/d

$1m^3$ = 1,000 L

Water treatment capacity is less than the available raw water supply. The water treatment plant is currently rated at 40,000 m^3/d based on regulatory requirements for primary disinfection. The maximum capacity for the Sault Ste. Marie DWS is 79,779 m^3/d. Lorna wells remains available for emergency demand if needed.

The Sault Ste. Marie WTP and production wells treated a total of 11,859,119 m^3 of water during the year 2024.
The average daily treated flow was 32,480 m^3, and the maximum daily flow was 40,723 m^3 on August 2, 2024.

Figure 1: Five-year Production Comparison



Capacity available production without Lorna wells – 65,221 m^3/d

Table 16: WTP Raw and Treated Water Production 2024

2024	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)	Treated Water (m^3)	Minimum Day (m^3/d)	Maximum Day (m^3/d)	Average Day (m^3/d)	% Max. Flow Day of rated Capacity
January	498,227	14,496	17,763	16,072	495,140	12,613	19,226	15,972	48.1
February	479,020	15,288	17,881	16,518	473,747	13,147	19,221	16,336	48.1
March	495,776	15,215	17,812	15,993	490,837	12,479	17,615	15,833	44.0
April	482,896	14,550	18,068	16,097	477,399	12,923	20,331	15,913	50.8
May	519,817	15,717	17,833	16,768	511,879	13,142	20,325	16,512	50.8
June	542,060	15,800	19,784	18,069	536,269	14,483	22,527	17,876	56.3
July	594,815	16,977	20,298	19,188	588,536	15,075	23,697	18,985	59.2
August	623,227	19,785	22,113	20,104	604,298	16,551	23,064	19,493	57.7
September	578,024	17,935	20,601	19,267	552,012	14,855	20,929	18,400	52.3
October	559,243	17,852	18,264	18,040	533,820	14,714	19,615	17,220	49.0
November	516,354	14,828	18,241	17,212	496,241	11,579	20,808	16,541	52.0
December	500,182	15,555	16,283	16,135	482,286	10,685	18,197	15,588	45.5

Figure 2: Sault Ste. Marie WTP Production 2024

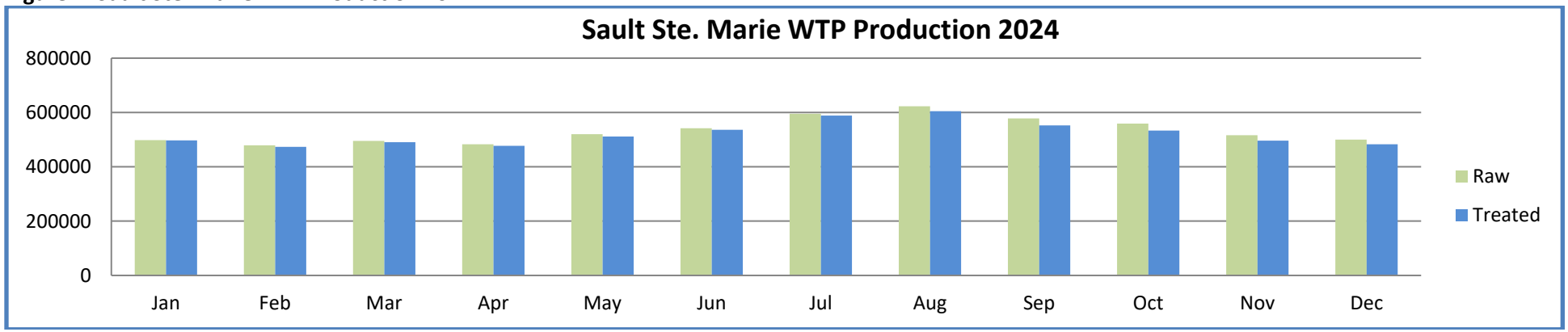


Table 17: Goulais Wells Production 2024

2024	Goulais Well #1 Production					Goulais Well #2 Production				
Month	Total Volume (m^3)	Minimum Day (m^3/d)	Maximum Day (m^3/d)	Average Day (m^3/d)	% Max Flow Day of PTTW	Total Volume (m^3)	Minimum Day (m^3/d)	Maximum Day (m^3/d)	Average Day (m^3/d)	% Max Flow Day Of PTTW
January	141,620	1,668	6,003	4,562	90.9	16,608	0	3,008	536	88.3
February	146,218	3,906	6,008	5,032	90.9	8,352	0	1,849	288	54.3
March	160,103	2,751	6,010	5,158	91.0	17,662	0	2,893	570	84.9
April	140,191	1,609	5,985	4,670	90.6	22,742	0	3,020	758	88.6
May	131,064	0	6,000	4,228	90.8	29,561	0	3,332	954	97.8
June	142,020	2,444	5,993	4,731	90.7	45,683	0	3,017	1,523	88.6
July	150,531	0	6,003	4,856	90.9	35,728	0	3,034	1,153	89.1
August	152,024	1,323	6,006	4,904	90.9	48,326	0	3,025	1,559	88.8
September	119,369	0	5,995	3,976	90.8	46,325	0	3,041	1,544	89.3
October	143,613	1,751	5,805	4,633	87.9	11,216	0	1,998	362	58.6
November	88,268	0	5,998	2,942	90.8	43,979	0	3,043	1,466	89.3
December	121,058	0	6,005	3,869	90.9	36,264	0	3,043	1,209	89.3

Figure 3: Goulais Wells Production 2024

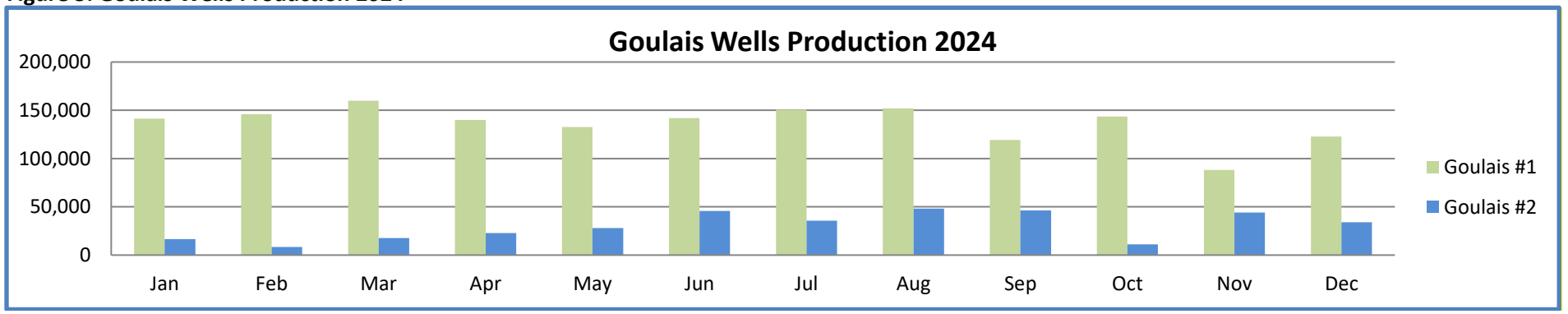
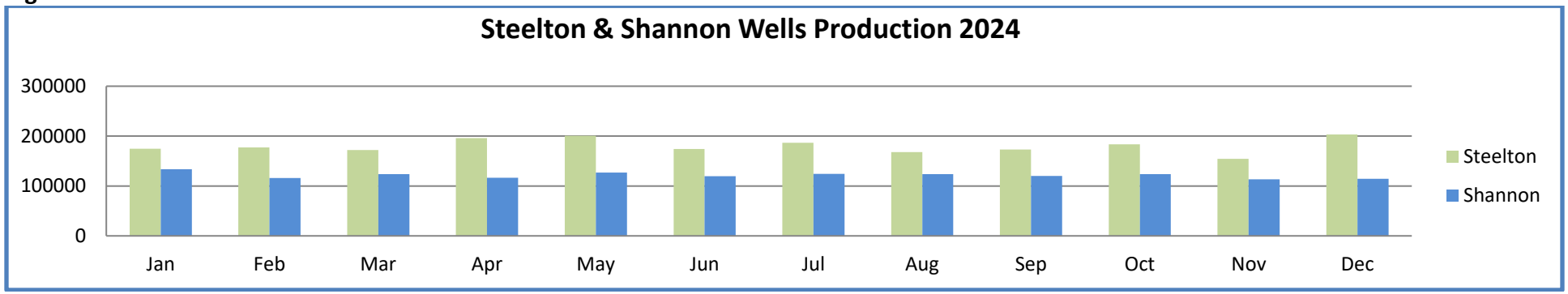


Table 18: Steelton & Shannon Wells Production 2024

2024	Steelton Well Production					Shannon Well Production				
Month	Total Volume (m^3)	Minimum Day (m^3/d)	Maximum Day (m^3/d)	Average Day (m^3/d)	% Max Flow Day of PTTW	Total Volume (m^3)	Minimum Day (m^3/d)	Maximum Day (m^3/d)	Average Day (m^3/d)	% Max Flow Day of PTTW
January	174,768	4,970	6,998	5,638	85.3	133,547	3,500	5,705	4,308	81.5
February	177,146	4,999	7,234	6,108	88.1	115,843	3,843	4,000	3,995	57.1
March	171,943	4,704	6,999	5,547	85.3	123,723	3,833	4,001	3,991	57.2
April	195,726	5,010	7,002	6,524	85.3	116,538	0	5,000	3,885	71.4
May	200,534	4,999	8,001	6,469	97.5	127,042	3,776	5,000	4,098	71.4
June	174,058	4,327	7,544	5,802	91.9	119,738	3,793	4,001	3,991	57.2
July	186,784	4,729	7,556	6,025	92.1	124,467	3,873	4,368	4,015	62.4
August	167,714	3,722	7,896	5,410	96.2	123,897	3,876	4,021	3,997	57.4
September	173,028	3,415	7,083	5,768	86.3	119,981	3,983	4,001	3,999	57.2
October	183,448	4,501	6,999	5,918	85.3	123,998	3,997	4,003	4,000	57.2
November	154,294	4,001	7,996	5,143	97.4	113,213	0	4,167	3,774	59.5
December	203,426	4,998	8,000	6,548	97.5	114,258	0	4,000	3,802	57.1

Figure 4: Steelton & Shannon Wells Production 2024



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 31st, 2024 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

Appendix B: Definition of Terms

Acronym	Definition
DWS	Drinking water system
EC	E. Coli
HAA	Haloacetic acids
HPC	Heterotrophic plate count
MAC	Maximum Acceptable Concentration
MECP	Ministry of the Environment, Conservation and Parks
m^3	Cubic metres (1,000 L)
m^3/d	Cubic metres per day
mg/L	Milligram per litre (part per million)
ML	Megalitre (1,000 m^3)
NTU	Nephelometric turbidity unit
ODWS	Ontario Drinking Water Standards
O. Reg. 170/03	Ontario Regulation 170/03
PTTW	Permit to take water
SCADA	Supervisory control and data acquisition
SSM	Sault Ste. Marie
TC	Total coliforms
THM	Trihalomethane
µg/L	Microgram per litre (part per billion)
WTP	Water treatment plant