



— Township of —

SEVERN

Wastewater Treatment and Collection System
Coldwater
2023 Annual Report

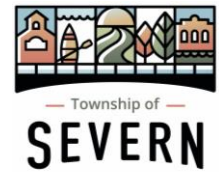
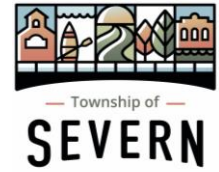


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Introduction

The Township of Severn prepared the 2023 annual summary report for the Coldwater Water Pollution Control Plant (WPCP).

This report summarizes notable operating events, repairs and maintenance, non-compliance issues, effluent quality, sludge quantity, and flow data for 2023. This report is based on operating data collected and compiled by the Township of Severn.

Summary of Monitoring Requirements

Table 7 and 8 lists the parameters that must be monitored, and the monitoring frequency as stated in Amended Certificate of Approval (C of A) No. 3832-6S2QCH, issued by the Ministry of the Environment, Conservation and Parks (MECP) on March 6, 2009.

Raw Sewage Quality

Table 1 illustrates the monthly and annual average raw sewage quality results.

Table 1: 2023 Monthly Raw Influent Quality

Month	CBOD5 (mg/L)	TSS (mg/L)	Total Phosphorus (mg/L)	TKN (mg/L)
January	109	105	2.78	25.8
February	76	84	2.49	24.6
March	46	57	1.86	18.3
April	55	65	1.71	17.3
May	54	84	2.46	22.2
June	83	83	2.69	23.7
July	48	52	2.29	24.5
August	88	84	2.97	28.0

September	128	109	3.67	34.5
October	94	120	3.55	32.6
November	70	86	2.19	23.3
December	45	49	1.59	17.2
Average	75	81	2.52	24.3

Effluent Quality

Tables 2, 3 and 4 illustrate the monthly and annual average effluent quality results.

Table 2: 2023 Monthly Average Effluent Quality

Month	TKN (as Nitrogen) (mg/L)	Alkalinity (as CaCO ₃) (mg/L)	Temperature (°C)	Unionized Ammonia (as Nitrogen) (mg/L)	Nitrite (as Nitrogen) (mg/L)	Nitrate (as Nitrogen) (mg/L)
January	1.4	179	9.8	0.005	0.05	18.44
February	1.0	141	9.0	0.001	0.26	19.23
March	0.6	141	10.3	0.001	0.03	16.56
April	0.6	188	10.8	0.001	0.76	11.61
May	0.6	127	13.8	0.001	0.03	19.16
June	0.7	95	15.6	0.001	0.11	22.95
July	0.6	149	19.8	0.001	0.03	15.94
August	0.7	109	19.9	0.001	0.03	21.54
September	0.7	80	19.0	0.001	0.03	27.93
October	0.9	145	15.4	0.002	0.07	20.23
November	0.6	148	13.1	0.001	0.03	19.68
December	1.3	176	12.3	0.001	0.11	14.98
Average	0.8	140	14.1	0.01	0.13	19.02

Table 3: 2023 Monthly Average Effluent Quality

Month	Effluent ADF	CBOD		TSS		Total Phosphorus	
	<i>m³/day</i>	<i>mg/L</i>	<i>kg/d</i>	<i>mg/L</i>	<i>kg/d</i>	<i>mg/L</i>	<i>kg/d</i>
Effluent Objective		10	9.21	10	9.21	0.3	0.28
Effluent Limit		15	13.8	15	13.8	0.5	0.46
January	887	3.8	3.37	9.8	8.69	0.13	0.11
February	832	2.8	2.32	8.3	6.90	0.10	0.08
March	943	2.0	1.88	10.0	9.43	0.07	0.06
April	1104	2.3	2.53	5.3	5.85	0.06	0.06
May	776	2.0	1.55	6.0	4.65	0.05	0.03
June	671	3.3	2.21	7.5	5.03	0.03	0.02
July	904	2.0	1.80	3.8	3.43	0.03	0.02
August	622	2.0	1.24	4.0	2.48	0.03	0.01
September	538	2.8	1.50	3.0	1.61	0.04	0.02
October	731	2.2	1.60	3.6	2.63	0.04	0.02
November	712	2.0	1.42	4.5	3.20	0.04	0.02
December	882	3.3	2.91	5.8	5.11	0.04	0.03

Table 4: 2023 Monthly Average Effluent Quality

Month	Total Ammonia (Nitrogen)				pH	E. Coli
	mg/L	kg/d	mg/L	kg/d		
	May 15 - Oct 15		Oct 16 - May 14			
Effluent Objective	1.00	0.92	3.00	2.76		
January			0.8	0.70	7.56	2
February			0.2	0.16	7.58	5
March			0.1	0.09	7.58	4
April			0.1	0.11	7.53	2
May	0.1	0.07			7.42	16
June	0.1	0.06			7.28	1.5
July	0.1	0.09			7.30	2
August	0.1	0.06			7.66	2
September	0.1	0.05			7.35	2
October	0.3	0.21			7.66	2
November			0.1	0.07	7.70	1.5
December			0.1	0.08	7.52	2

Influent Flows

The rated capacity of the Coldwater WPCP is 921 m³/day (average daily flow) with a peak flow rate of 3,420 m³/day, as listed in the C of A.

Table 5: Summary of Influent Flows

Month	Total Monthly Flow (m ³)	Average Daily Flow (m ³ /day)	Average Daily Flow (% of Rated Capacity)	Peak Daily Flow (m ³ /day)	Peak Daily Flow (% of Rated Capacity)	Peak Daily Flow (% of Rated Peak Flow)
January	22763	734	80%	1745	189%	51%
February	19493	696	75%	1164	126%	34%
March	23498	758	82%	1359	148%	40%
April	29081	909	99%	1532	166%	45%
May	17829	575	62%	890	97%	26%
June	16100	537	58%	1591	173%	47%
July	21039	679	74%	1218	132%	36%
August	13994	451	49%	659	72%	19%
September	10426	348	38%	423	47%	12%
October	18181	586	64%	1227	133%	36%
November	17104	570	62%	776	84%	23%
December	20823	672	73%	827	90%	24%
Average	19194	626	68%	1118	121%	33%
Max	29081	909	99%	1745	189%	51%
Total	230331					

Figure 1: Coldwater WPCP 2023 monthly flow total values are in (m3)

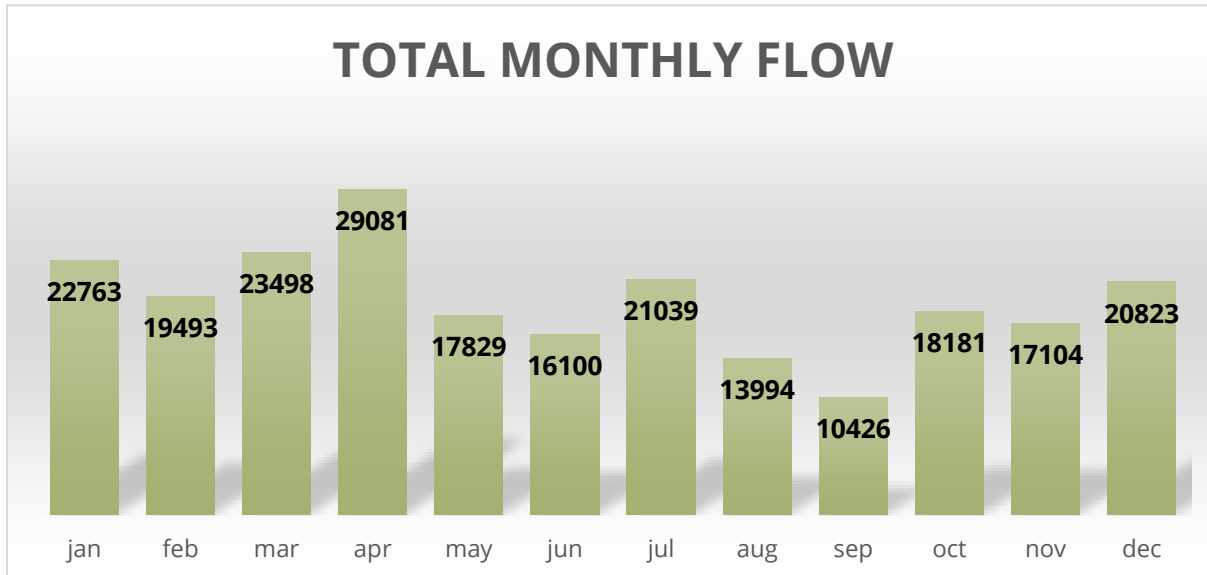
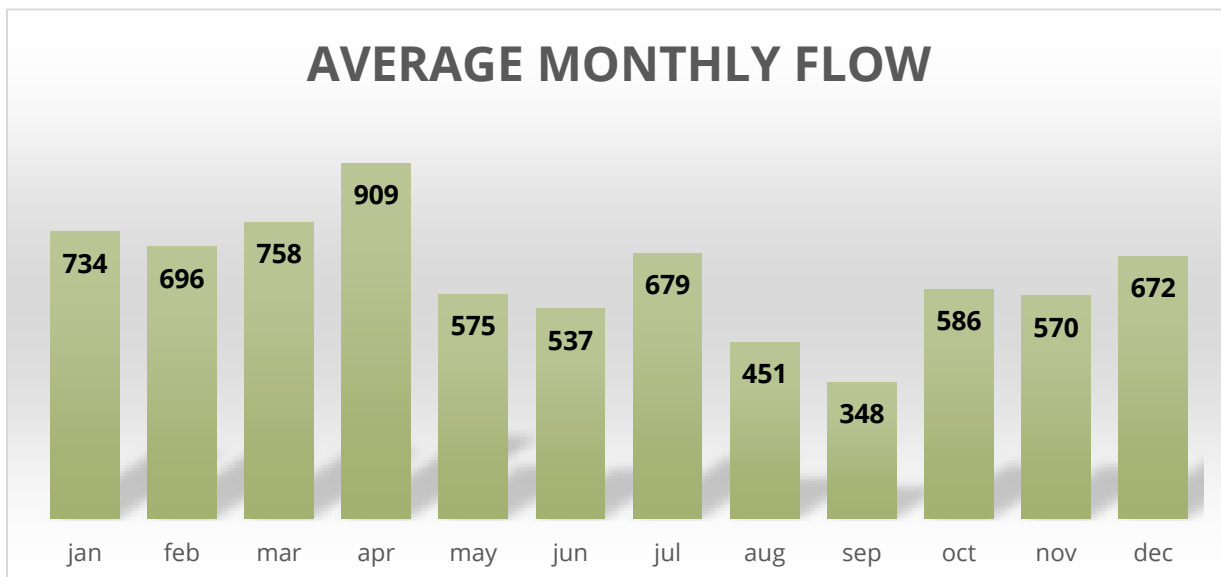


Figure 2: Coldwater WPCP 2023 average monthly flow total values are in (m3)



Sludge Analysis

The results of the sludge analysis are summarized in Table 6.

Table 6: Sludge Analysis

Parameter	Limits	Annual Average	
		Sludge Concentration (mg/L)	Metal Concentration (mg/kg)
Total Solids		18340.0	
Ammonia +		11.6	
TKN		720.6	
Nitrate + Nitrite		22.6	
Phosphorus		400.6	
Arsenic	170	0.1	7
Cadmium	34	0.01	1
Cobalt	340	0.031	2
Chromium	2,800	1.036	54
Copper	1,700	5.69	330
Mercury	11	0.019	1
Potassium		37.25	
Molybdenum	94	0.083	5
Nickel	420	0.740	37
Lead	1,100	0.225	13
Selenium	34	0.100	7
Zinc	4,200	8.08	489
E. Coli (cfu/1g)	< 2,000,000	56663	

Operational Issues and Corrective Actions

There was one operational objective exceedances in 2023.

- In March of 2023 total suspended solids averaged 10mg/L for the month. Although the objective was not exceeded the monthly average of Kg/d were exceeded. Limits for TSS are 10 mg/L or 9.21 kg/d. March average lab results were 10 mg/L or 9.43 kg/d.

There was one operational objective exceedances in 2023.

Maintenance Summary

All maintenance that was completed in 2023 on major structures, apparatus and/or mechanical equipment is summarized below.

Water Pollution Control Plant

The following is a list of preventative and emergency maintenance completed at the WPCP in 2023.

- All critical alarms were tested monthly.
- All floats were inspected and cleaned monthly.
- The backup generator was tested monthly under load.
- The blowers and air compressor were serviced yearly to check belts, alignment, motor function, and lubrication.
- Replaced U.V. bulbs and sleeves.
- Inspection performed on sludge storage tank.
- Pumps were replaced as needed.
- Environmental Assessment started for plant expansion.



Collection System

The following is a list of preventative and emergency maintenance completed on the collection system in 2023.

- Sewage Pump stations were cleaned to remove grease, grit, and other debris.
- All sewage pumping station alarms were tested monthly.
- All floats in the sewage pumping stations were inspected and cleaned monthly.
- Debris was removed from several pumps in the sewage pumping stations as warranted.
- Approximately 25% of manholes were inspected.
- All generators were serviced.
- Flushed approximately 1631 m of sewer main.
- Inspected 1427 m of sewer main by video camera to identify any necessary repairs.

Summary of Effluent Quality Assurance or Control Measures

Tables 7 and 8 summarize which parameters are analyzed by the accredited laboratory; SGS Lakefield Research, Aquatic Laboratories, or Caduceon Laboratories, and which parameters are analyzed in-house.

Table 7: Summary of Monitoring Requirements

Source	Parameter	Required	Method
Raw Influent	CBOD ₅	Monthly	SGS Lakefield or Caduceon
	Total Suspended Solids	Monthly	SGS Lakefield or Caduceon
	Total Phosphorus	Monthly	SGS Lakefield or Caduceon
	Total Kjeldahl	Monthly	SGS Lakefield or Caduceon

***Note: SGS Lakefield & Caduceon are both MECP approved accredited laboratories*

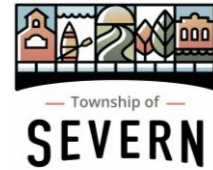


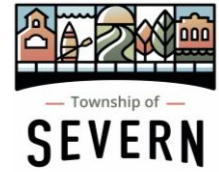
Table 8: Summary of Monitoring Requirements

Source	Parameter	Required	Method
Final Effluent	Flow	Daily	SGS Lakefield or Caduceon
	CBOD5	Weekly	SGS Lakefield or Caduceon
	Total Suspended Solids	Weekly	SGS Lakefield or Caduceon
	Total Phosphorus	Weekly	SGS Lakefield or Caduceon
	Total Ammonia	Weekly	SGS Lakefield or Caduceon
	Nitrate	Weekly	SGS Lakefield or Caduceon
	E. Coli	Weekly	SGS Lakefield or Caduceon,
	Total Chlorine Residual	Weekly	N/A (UV disinfection)
	pH	Weekly	In House Grab Sample
	Temperature	Weekly	In House Grab Sample
	Unionized Ammonia	Weekly	SGS Lakefield or Caduceon

***Note: SGS Lakefield & Caduceon are both MECP approved accredited laboratories*

In-house tests are conducted by licensed operators for monitoring purposes. Standard Methods are used by the operators and the test results are utilized for process control.

All in-house monitoring equipment is calibrated based on the manufacturer's recommendations.



Efforts and Results in Meeting Effluent Objectives of Certificate of Approval

The WPCP is operated and maintained such that all effluent quality objectives are strived for. Objectives and limits are based on a monthly average. There was one TSS objective exceedance in March 2023, as noted in operational exceedances. This exceedance did not meet the compliance limits of the C of A.

Sludge Volume and Disposal

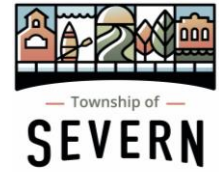
Table 9 below summarizes the sludge volume generated in 2023, the anticipated volume to be generated next year, and the sludge disposal location.

Table 9: Sludge Generated and Disposal

Sludge Generated in 2023 (m3)	Anticipated Volume for 2024 (m3)	Sludge Disposal Location
336	1200	NASM Plan 24303. Martin Con.7 Lot 8-9 Springwater
432		Rohe's 9 Lagoon
768		ROHES Lagoon 9 and 7

Summary of Calibration and Maintenance on Effluent Monitoring Equipment

Magnetic flow meters were calibrated by a qualified contractor on April 13 & 19, 2023.



All in-house monitoring equipment is calibrated based on manufacturer's recommendations.

Summary of By-Pass, Spills or Abnormal Discharge Events

There were no bypasses, spills, or abnormal discharge events in 2023.