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SEVERN

Wastewater Treatment and Collection System
Coldwater
2022 Annual Report

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Introduction

The Township of Severn prepared the 2022 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 2022. This report is based on operating data collected and compiled by the Township of Severn.

Summary of Monitoring Requirements

Table 6 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: 2022 Monthly Raw Influent Quality

Month	CBOD5 (mg/L)	TSS (mg/L)	Total Phosphorus (mg/L)	TKN (mg/L)
January	93	107	2.69	24.8
February	84	104	3.00	27.0
March	65	71	2.14	21.0
April	62	83	2.29	22.9
May	90	96	3.07	31.1
June	97	106	2.89	28.9
July	128	103	2.92	27.4
August	196	122	4.57	43.0
September	185	112	4.21	43.0
October	128	99	4.01	39.6
November	92	96	2.82	25.7
December	108	92	3.41	30.7
Average	111	99	3.17	30.4

Effluent Quality

Tables 2 and 3 illustrate the monthly and annual average effluent quality results. All exceedances of limits and objectives are outlined in section 10.

Table 2: 2022 Monthly Average Effluent Quality

Month	TKN <i>(as Nitrogen)</i> (mg/L)	Alkalinity <i>(as CaCO₃)</i> (mg/L)	Temperature (°C)	Unionized Ammonia <i>(as Nitrogen)</i> (mg/L)	Nitrite <i>(as Nitrogen)</i> (mg/L)	Nitrate <i>(as Nitrogen)</i> (mg/L)
January	1.1	151	8.0	0.001	1.27	23.95
February	1.1	147	10.1	0.006	4.40	20.44
March	2.7	209	9.5	0.012	1.97	12.30
April	3.0	236	11.5	0.023	2.35	10.07
May	0.6	140	16.0	0.001	0.09	26.58
June	1.0	115	18.6	0.001	0.05	28.08
July	0.9	80	21.6	0.001	0.11	34.10
August	0.5	67	22.5	0.001	0.11	35.04
September	2.0	77	20.4	0.001	0.09	36.28
October	2.5	89	16.1	0.001	0.03	36.85
November	2.2	120	12.4	0.001	0.04	27.50
December	2.3	179	10.1	0.030	0.08	18.01

Table 3: 2022 Monthly Average Effluent Quality - Continued

Month	Effluent ADF	CBOD ₅		TSS		Total Phosphorus		Total Ammonia (Nitrogen)				pH	E. Coli
	m ³ /day	mg/l	kg/d	mg/l	kg/d	mg/l	kg/d	mg/L	kg/d	mg/L	kg/d		
								May 15 - Oct 15	Oct 16 - May 14				
Effluent Objective		10	9.21	10	9.21	0.3	0.28	1	0.92	3	2.76	-	
Effluent Limit		15	13.8	15	13.8	0.5	110	--	--	--	--	-	<200
January	497	4.5	2.24	7.0	3.48	0.10	0.05	--	--	0.1	0.05	7.5	3
February	630	3.3	2.08	5.0	3.15	0.06	0.04	--	--	0.9	0.57	7.5	41
March	1051	3.8	3.99	8.6	9.04	0.11	0.12	--	--	1.9	2.00	7.5	5
April	918	3.3	3.03	6.8	6.24	0.06	0.06	--	--	2.5	2.30	7.5	3
May	622	2.0	1.24	5.4	3.36	0.05	0.03	0.1	0.06		--	7.5	2
June	500	2.0	1.00	5.5	2.75	0.06	0.03	0.1	0.05		--	7.5	2
July	350	2.0	0.70	3.8	1.33	0.05	0.02	0.1	0.04	--	--	7.3	2
August	352	2.4	0.84	3.8	1.34	0.08	0.03	0.1	0.04	--	--	7.2	2
September	352	2.0	0.70	4.8	1.70	0.06	0.02	0.1	0.04	--	--	7.3	1
October	405	2.5	1.01	6.8	2.75	0.09	0.04	0.1	0.04	--	--	7.3	2
November	522	2.2	1.15	5.6	2.92	0.07	0.04	--	--	0.1	0.05	7.5	2
December	665	2.3	1.53	8.0	5.32	0.08	0.05	--	--	2.9	1.93	7.7	3.5

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 4: Summary of Influent Flows

Month	Total Monthly Flow (m ³)	Average Daily Flow (m ³ /day)	Average Daily Flow (Percentage of Rated Capacity)	Peak Daily Flow (m ³ /day)	Peak Daily Flow (Percentage of Rated Capacity)	Peak Daily Flow (Percentage of Rated Peak Flow)
January	13034	420	46%	516	56%	15%
February	13730	490	53%	838	91%	25%
March	28027	904	98%	1796	195%	53%
April	24007	800	87%	1075	117%	31%
May	13920	449	49%	731	79%	21%
June	12052	402	44%	578	63%	17%
July	9385	303	33%	348	38%	10%
August	9443	305	33%	388	42%	11%
September	8975	299	32%	410	45%	12%
October	10293	332	36%	495	54%	14%
November	12315	411	45%	714	78%	21%
December	16262	525	57%	1485	161%	43%
Average	14287	470	51%	781	85%	23%
Max	28027	904	98%	1796	195%	53%
Total	171443					

Figure 1: Coldwater WPCP 2022 Monthly Flow totals (m3)

Coldwater WPCP Monthly Flows Totals (m3)

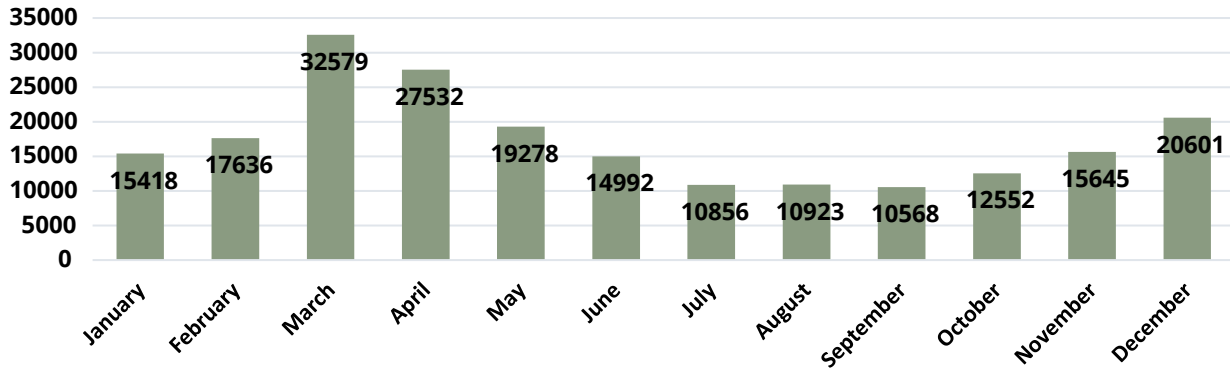
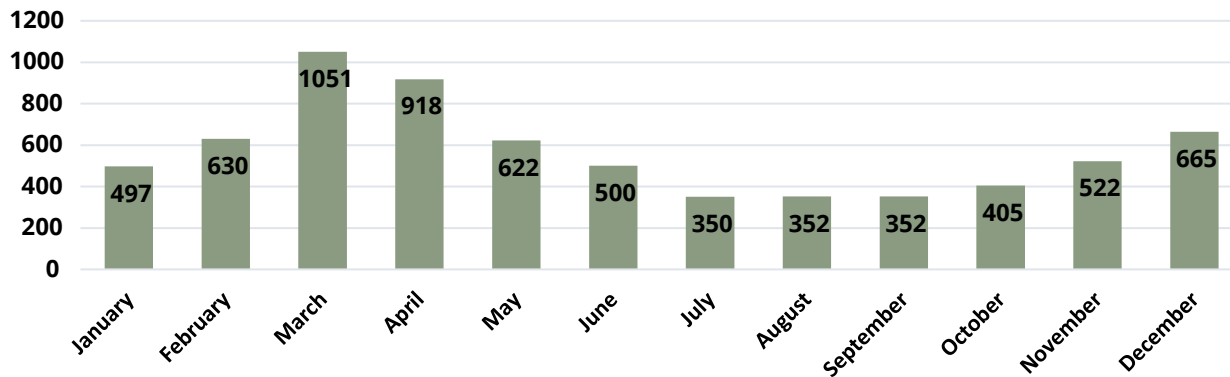


Figure 2: Coldwater WPCP 2022 Average Daily Flow (m3)

Coldwater WPCP Average Daily Flows(m3)



Sludge Analysis

The results of the sludge analysis are summarized in Table 5.

Table 5: Sludge Analysis

Parameter	Limits	Annual Average	
Units	Metal Concentration	Sludge Concentration (mg/L)	Metal Concentration
Total Solids	--	14142	--
Ammonia +	--	3	--
TKN	--	610	--
Nitrate + Nitrite	--	27	--
Phosphorus	--	392	--
Arsenic	170	0.1	7
Cadmium	34	0.02	1
Cobalt	340	0.028	2
Chromium	2,800	0.638	45
Copper	1,700	4.7	333
Mercury	11	0.01	0.73
Potassium	--	50	--
Molybdenum	94	0.596	42
Nickel	420	0.343	24
Lead	1,100	0.175	12
Selenium	34	0.100	7
Zinc	4,200	7.6	534
E. Coli (cfu/1g)	<2,000,000	65571	

1-Limits for metal concentration in sludge are listed in MECP publication "Guideline for the Utilization of Bio solids and other wastes on Agricultural Lands" as referenced in the Certificate of Approval No. 7383-4LAHXD

Operational Issues and Corrective Actions

There were no operational objective exceedances in 2022. Operational exceedances are outlined in section 10. There were NO corrective actions in 2022.

Maintenance Summary

All maintenance that was completed in 2022 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 2022.

- 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.
- Replaced 2 pumps in the SBR treatment system.
- Environmental Assessment started for plant expansion.

Collection System

The following is a list of preventative and emergency maintenance completed on the collection system in 2022.

- 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.
- Flushed approximately 3754 m of sewer main.
- Inspected 1775 m of sewer main by video camera to identify any necessary repairs.

- Approximately 25% of the manholes were inspected.
- Installed second pump and pipe work at Community Center pump station.
- Generators were serviced by Total Power.

Summary of Effluent Quality Assurance or Control Measures

Table 7 summarizes which effluent parameters are analyzed by the accredited laboratory, SGS Lakefield Research, Aquatic Laboratories or Caduceon Laboratories, and which parameters are analyzed in-house.

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

Table 6: Summary of Monitoring Requirements

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

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

Table 7: Summary of Monitoring Requirements

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

Source	Parameter	Required	Method
Final Effluent	Flow	Daily	SGS Lakefield or Caduceon
	CBOD ₅	Weekly	SGS Lakefield or Caduceon
	Total Suspended Solids	Weekly	SGS Lakefield or Caduceon
	Total Phosphorus	Weekly	SGS Lakefield or Caduceon
	Total Ammonia Nitrogen	Weekly	SGS Lakefield or Caduceon
	Nitrate Nitrogen	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

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. All effluent quality parameters were maintained within the compliance limits of the C of A.

Sludge Volume and Disposal

Table 8 below summarizes the sludge volume generated in 2022, the anticipated volume to be generated next year, and the sludge disposal location.

Table 8: Sludge Generated and Disposal

Sludge Generated in 2022 (m ³)	Anticipated Volume for 2023 (m ³)	Sludge Disposal Location
546	1200	NASM Plan 24760. Hoffman Con.3 Lot 9 Oro-Medonte
1248.80		ROHES Lagoon 9 and 7

Summary of Complaints

There were no complaints in 2022 in the Municipal system.

Summary of Calibration and Maintenance on Effluent Monitoring Equipment

Magnetic flow meters were calibrated by a qualified Contractor on March 23, 2022.

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 2022.