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**SEVERN**

Wastewater Treatment and Collection System

# **West Shore 2021 Annual Report**

# Table of Contents

Introduction .....	2
Summary of Monitoring Requirements.....	2
Raw Sewage Quality .....	2
Effluent Quality .....	3
Influent Flows.....	6
Sludge Analysis .....	8
Operational Issues and Corrective Actions .....	9
Maintenance Summary .....	9
Wastewater Treatment Plant .....	9
Collection System .....	9
Summary of Effluent Quality Assurance or Control Measures .....	10
Efforts and Results in Meeting Effluent Objectives of Certificate of Approval .....	11
Sludge Volume and Disposal.....	11
Summary of Complaints .....	11
Summary of Calibration and Maintenance on Effluent Monitoring Equipment.....	12
Summary of By-Pass, Spills or Abnormal Discharge Events .....	12

# Introduction

The Township of Severn prepared the 2021 annual summary report for the West Shore Wastewater Treatment Plant (WWTP).

This report summarizes notable operating events, repair and maintenance, non-compliance issues, effluent quality, sludge quantity and flow data for 2021. 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 the Certificate of Approval (C of A) No. 6791-62EJW5, issued by the Ministry of the Environment, Conservation and Parks (MECP) on June 29, 2004.

## Raw Sewage Quality

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

Table 1: 2021 Monthly Raw Influent Quality

	CBOD5 (mg/L)	TSS (mg/L)	Total Phosphorus (mg/L)	TKN (mg/L)
January	138	152	3.56	38.3
February	157	260	7.38	66.4
March	125	265	7.47	68
April	103	120	5.86	53.8
May	87	180	5.15	49.3
June	99	235	7.06	60.6
July	149	145	6.40	52.9
August	55	66	2.98	25.8
September	109	153	4.51	45.3
October	303	330	6.83	61.7
November	126	193	4.47	40.6
December	198	173	4.31	41.4
Average	137	189	5.49	50.3

## Effluent Quality

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

Table 2: 2021 Monthly Average Effluent Quality

	TKN (as Nitrogen)	Alkalinity (as CaCO <sub>3</sub> )	Temperature (°C)	Unionized Ammonia (as Nitrogen)	Nitrite (as Nitrogen)	Nitrate (as Nitrogen)
January	1.3	105	10.8	0.008	0.08	12.43
February	2.6	86	9.9	0.010	0.10	13.73
March	1.6	115	10.2	0.010	0.10	12.90
April	1.0	115	8.9	0.010	0.10	12.58
May	1.2	118	14.0	0.010	0.13	10.70
June	0.9	104	17.5	0.010	0.12	6.58
July	1.1	115	18.8	0.010	0.10	3.83
August	1.0	103	17.4	0.008	0.29	2.86
September	1.5	83	17.5	0.008	0.10	8.64
October	1.1	110	17.5	0.002	0.05	7.79
November	0.6	123	14.1	0.011	0.05	13.04
December	0.07	139	11.4	0.002	0.16	10.91

Table 3: 2021 Monthly Average Effluent Quality - Continued

	Effluent ADF	CBOD5		TSS		Total Phosphorus		Total Ammonia (Nitrogen)				pH	E. Coli
	m3/day	mg/	kg/d	mg/	kg/d	mg/l	kg/d	mg/L	kg/d	mg/l	kg/d		CFU/100m
								May 1 – Nov.	Dec. 1 – Apr.				
Objective		5.0		5.0		0.12		2.0		5.0		6 - 9.5	
Limit		10.0		10.0		0.15		3.0		7.0		6 - 9.5	<200
January	782	2.8	2.19	3.0	2.35	0.08	0.06	--	--	0.11	0.09	7.28	19
February	723	3.3	2.39	3.8	2.75	0.11	0.08	--	--	1.00	0.72	7.33	22
March	950	3.0	2.85	3.4	3.23	0.07	0.07	--	--	0.49	0.47	7.14	16
April	833	3.0	2.50	3.0	2.50	0.05	0.04	--	--	0.06	0.05	7.05	5
May	762	3.0	2.29	3.8	2.90	0.08	0.06	0.09	0.07	--	--	7.18	7
June	648	3.0	1.94	3.0	1.94	0.09	0.06	0.11	0.07	--	--	7.32	7
July	783	3.0	2.35	3.0	2.35	0.08	0.06	0.16	0.13	--	--	7.40	8.5
August	690	2.8	1.93	2.8	1.93	0.07	0.05	0.12	0.08	--	--	7.50	3.5
September	741	2.2	1.63	2.4	1.78	0.05	0.04	0.82	0.61	--	--	7.56	1.6
October	758	2.0	1.52	2.0	1.52	0.05	0.04	0.10	0.08	--	--	7.55	2
November	806	2.8	2.26	2.2	1.77	0.05	0.04	0.10	0.03	--	--	7.54	2
December	925	3.0	2.78	2.5	2.78	0.07	0.06	--	--	0.30	0.28	7.55	2

## Influent Flows

The rated capacity of the West Shore WWTP is 1,390 m<sup>3</sup>/day (ADF - average daily flow), with a peak flow rate of 4,768 m<sup>3</sup>/day, as listed in the C of A.

As shown in Table 4 and Figures 1 & 2, all flows were below the ADF rated capacity and the peak flow capacity of the plant during 2021.

Table 4: Summary of Influent Flows

	Total Monthly Flow (m <sup>3</sup> )	Average Daily Flow (m <sup>3</sup> /day)	Average Daily Flow (Percentage of Rated Capacity)	Peak Daily Flow (m <sup>3</sup> /day)	Peak Daily Flow (Percentage of Rated Capacity)	Peak Daily Flow (Percentage of Rated Peak Flow)
January	24251	782	56%	1103	79%	23%
February	20241	723	52%	939	68%	20%
March	29439	950	68%	1323	95%	28%
April	24975	833	60%	1058	76%	22%
May	23608	762	55%	1151	83%	24%
June	19432	648	47%	841	61%	18%
July	24276	783	56%	1031	74%	22%
August	21404	690	50%	806	60%	17%
September	22223	741	53%	1160	83%	24%
October	23510	758	55%	894	64%	19%
November	24185	806	58%	1031	74%	22%
December	28666	925	67%	1329	96%	28%
Average	23850	783	56%	1055	76%	22%

Figure 1: West Shore 2021 Total Monthly Flow (m3)

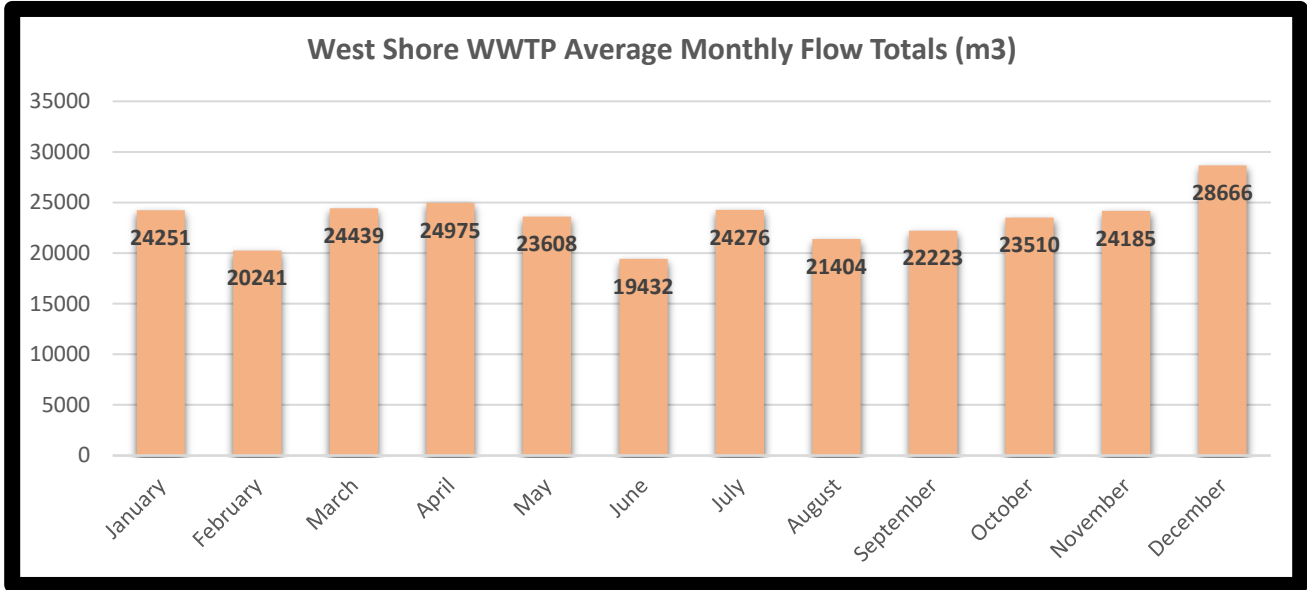
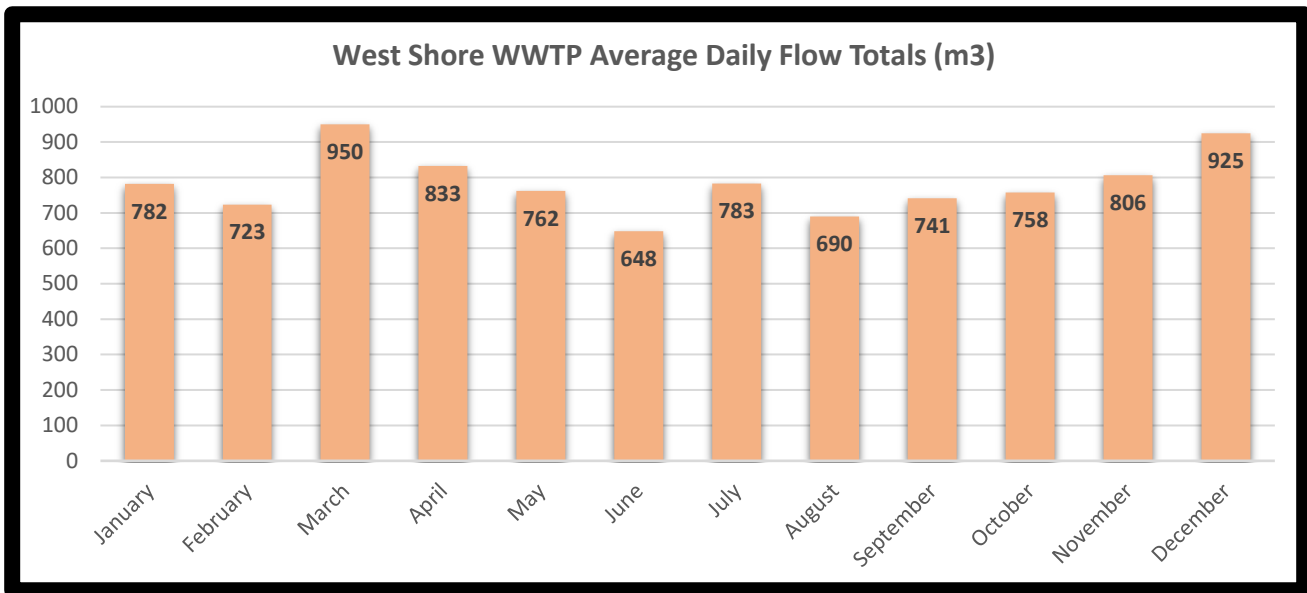


Figure 2: West Shore 2021 Average Daily Flow (m3)



## Sludge Analysis

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

Table 5: Sludge Analysis

Parameter	Limits	Annual Average	
Units	Metal Concentration (mg/kg)	Sludge Concentration (mg/L)	Metal Concentration
Total Solids	-	11124	-
Ammonia +	-	28.3	-
TKN	-	614	-
Nitrate + Nitrite	-	39	-
Phosphorus	-	324	-
Arsenic	170	0.1	10
Cadmium	34	0.023	2
Cobalt	340	0.02	2
Chromium	2800	0.15	13
Copper	1700	3.1	276
Mercury	11	0.003	0
Potassium	-	44	-
Molybdenum	94	0.89	55
Nickel	420	0.14	13
Lead	1100	0.1	10
Selenium	34	0.1	10
Zinc	4,200	4.8	434
E.Coli (cfu/1 gm)	<2,000,000	500011	

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 issues in 2021 as outlined in section 10. There were NO corrective actions in 2021.

## Maintenance Summary

All maintenance completed in 2021 on major structures, apparatus and/or mechanical equipment is summarized below.

### Wastewater Treatment Plant

The following is a list of preventative and emergency maintenance completed at the WWTP in 2021:

- All critical alarms were tested on a monthly basis.
- All floats were inspected and cleaned on a monthly basis.
- The backup generator was tested monthly under load.
- The blowers and air compressor were serviced yearly to check belts, alignment, motor function and lubrication. The standby blower was run once a week.
- Equalization and reject tanks were drawn down and cleaned as needed.
- Plant headworks and Parkson filter headworks were drawn down and cleaned as needed.
- Replaced Parkson filter air feed tubes.
- Maintained filter media.

### Collection System

The following is a list of preventative and emergency maintenance completed on the sewer system in 2021:

- Sewage pump stations were cleaned to remove grease, grit and other debris.
- All sewage pumping station alarms were tested on a monthly basis.
- All floats in the sewage pumping stations were inspected and cleaned on a monthly basis.
- Debris was removed from several pumps in the sewage pumping stations as warranted.

- Flushed approximately 7353 m of sewer main.
- Inspected 4447 m of sewer main by video camera to identify any necessary repairs.
- Approximately 25% of the manholes were inspected. Repairs were made as required.
- Replaced Timberline Ave. pump station electrical panel and new pumps installed.
- Replaced main pump station valve chamber valves.

## Summary of Effluent Quality Assurance or Control Measures

Table 1 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.

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.

Table 6: Summary of Monitoring Requirements

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

Source	Parameter	Required Frequency	Method
Raw Influent	CBOD5	Monthly	SGS Lakefield or
	Total Suspended Solids	Monthly	SGS Lakefield or
	Total Phosphorus	Monthly	SGS Lakefield or
	Total Kjeldahl	Monthly	SGS Lakefield or
Final Effluent	Flow	Daily	SGS Lakefield or
	CBOD5	Weekly	SGS Lakefield or
	Total Suspended Solids	Weekly	SGS Lakefield or
	Total Phosphorus	Weekly	SGS Lakefield or
	Total Ammonia Nitrogen	Weekly	SGS Lakefield or
	Total Kjeldahl Nitrogen	Weekly	SGS Lakefield or
	Nitrate	Weekly	SGS Lakefield or
	Nitrite	Weekly	SGS Lakefield or
	E.Coli	Weekly	SGS Lakefield or
	PH	Weekly	In House Grab Sample

	Alkalinity	Weekly	SGS Lakefield or
	Temperature	Weekly	SGS Lakefield or
	Unionized Ammonia	Weekly	SGS Lakefield or

## Efforts and Results in Meeting Effluent Objectives of Certificate of Approval

The WWTP is operated and maintained such that all effluent quality objectives are strived for. Objectives and limits are based on a monthly average. There were no operating issues during the 2021 reporting period.

## Sludge Volume and Disposal

Table 7 below summarizes the sludge volume generated in 2021, the anticipated volume to be generated next year, and the sludge disposal location.

Table 7: Sludge Generated and Disposal

Sludge Generated in 2021 (m3)	Anticipated Volume for 2022 (m3)	Sludge Disposal Location
832	--	NASM #24760 Lot 10, 11SD Corners Farm
2707	--	ROHES Lagoon
3539	4000(m3)	--

## Summary of Complaints

The following summarizes the complaints received in 2021 and the steps taken to address the complaints:

- One sewer blockage complaint was received on May 26, 2021. Collection system inspected and plumber cleared blockage.
- September 16, 2021, one sewer back-up complaint was received. Caused from sewer flushing. Notified customer to install backflow device.

# **Summary of Calibration and Maintenance on Effluent Monitoring Equipment**

Magnetic flow meters were calibrated by a certified technician on March 1, 2021.

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 2021.