



Township of
SEVERN

Wastewater Treatment and Collection System

West Shore 2020 Annual Report

Table of Contents

Summary of Monitoring Requirements.....	2
Raw Sewage Quality	2
Effluent Quality	3
Influent Flows.....	6
Sludge Analysis	7
Operational Issues and Corrective Actions	8
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 2020 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 2020. 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: 2020 Monthly Raw Influent Quality

	CBOD5 (mg/L)	TSS (mg/L)	Total Phosphorus (mg/L)	TKN (mg/L)
January	120	151	3.35	50.4
February	132	140	3.22	36.7
March	118	138	3.13	32.4
April	245	138	2.72	27.7
May	87	132	2.69	31.7
June	198	130	3.29	30.5
July	183	217	4.84	47.8
August	243	199	4.9	48.6
September	230	186	4.81	50.4
October	219	170	4.59	50.1
November	169	192	3.43	32.6
December	169	152	3.92	44.2
Average	176	162	3.74	39.9

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: 2020 Monthly Average Effluent Quality

	TKN (as Nitrogen)	Alkalinity (as CaCO ₃)	Temperature (°C)	Unionized Ammonia (as Nitrogen)	Nitrite (as Nitrogen)	Nitrate (as Nitrogen)
January	1.5	121	8.5	0.003	0.53	14.8
February	4.1	122	8.8	0.010	1.78	9.49
March	2.6	128	9.4	0.015	1.99	9.72
April	2.6	114	9.3	0.004	0.34	12.76
May	1.1	85	11.6	0.002	0.17	14.15
June	1.0	95	14.6	0.026	0.08	9.07
July	1.5	103	18.1	0.001	0.04	3.67
August	0.8	97	19.5	0.001	0.04	5.65
September	0.7	106	18.7	0.001	0.04	5.28
October	0.9	115	15.4	0.001	0.03	7.02
November	0.6	110	12.4	0.001	0.03	11.63
December	0.6	136	10.7	0.001	0.05	10.29

Table 3: 2020 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	794	4.8	3.80	7.6	6.03	0.09	0.07			0.5	0.40	7.70	4.7
February	609	2.5	1.52	5.3	3.23	0.10	0.06			3.1	1.89	7.30	2.0
March	1086	2.5	2.72	4.0	4.34	0.08	0.09			2.1	2.28	7.60	3.3
April	801	2.0	1.60	2.2	1.76	0.04	0.03			1.3	1.04	7.26	4.4
May	696	2.0	1.39	2.0	1.39	0.04	0.03	0.3	0.21			7.60	2.0
June	646	2.3	1.49	2.3	1.49	0.05	0.03	0.1	0.07			7.40	2.3
July	600	2.2	1.32	2.0	1.20	0.07	0.04	0.1	0.06			7.26	2.0
August	615	2.3	1.42	2.8	1.72	0.06	0.04	0.1	0.06			7.35	2.0
September	649	2.0	1.30	2.2	1.43	0.05	0.03	0.1	0.07			7.26	36.2
October	676	2.0	1.35	2.0	1.35	0.05	0.03	0.1	0.07			7.50	2.0
November	651	2.0	1.30	2.5	1.63	0.04	0.03	0.1	0.07			7.58	2.0
December	721	2.2	1.59	2.0	1.44	0.03	0.02			0.1	0.07	7.40	2.0

Influent Flows

The rated capacity of the West Shore WWTP is 1,390 m³/day (ADF - average daily flow), with a peak flow rate of 4,768 m³/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 2020.

Table 4: Summary of Influent Flows

	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	24614	794	57	1250	90	26
February	17657	609	44	684	49	14
March	24969	1086	78	1362	98	29
April	24030	801	58	1052	76	22
May	21579	696	50	876	63	18
June	19380	646	47	873	63	18
July	18600	600	43	740	53	15
August	19056	615	44	793	57	17
September	19472	649	47	787	57	17
October	20948	676	49	895	64	19
November	19534	651	47	875	63	18
December	22337	721	52	849	61	18
Average	21015	712	51	920	66	19

Figure 1: West Shore 2020 Total Monthly Flow (m3)

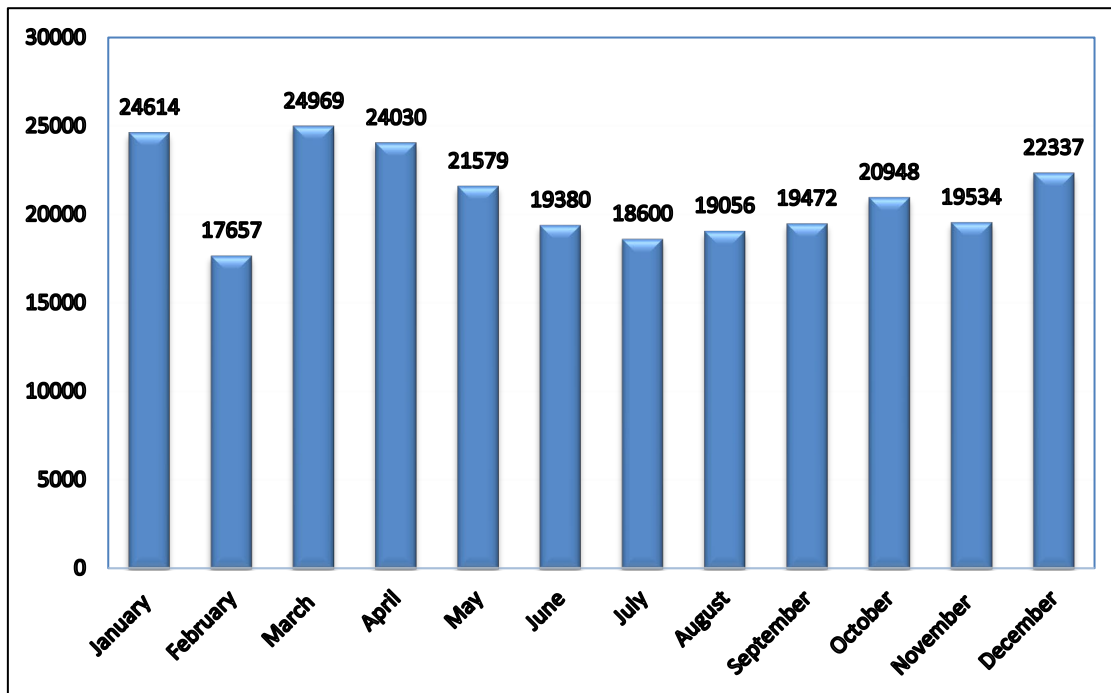
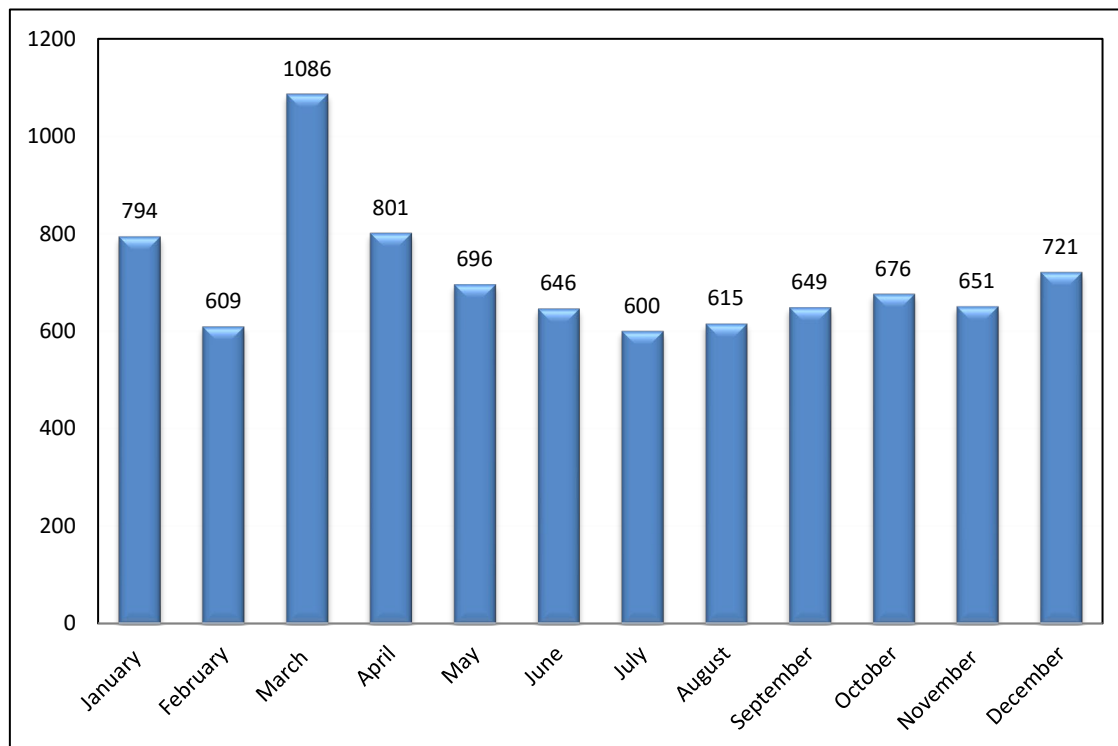


Figure 2: West Shore 2020 Average Daily Flow (m3)



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	-	16246	-
Ammonia +	-	9.1	-
TKN	-	743.5	-
Nitrate + Nitrite	-	38	-
Phosphorus	-	420	-
Arsenic	170	0.1	6.51
Cadmium	34	0.01	0.58
Cobalt	340	0.03	1.76
Chromium	2800	0.21	12.33
Copper	1700	4.5	273
Mercury	11	0.004	0.22
Potassium	-	47.71	-
Molybdenum	94	0.07	4.1
Nickel	420	0.21	12.90
Lead	1100	0.1125	7.14
Selenium	34	0.1	6.51
Zinc	4,200	6.6	404
E.Coli (cfu/1 gm)	<2,000,000	111779	

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 two operational issues in 2020 as outlined in section 10. There were NO corrective actions in 2020.

Maintenance Summary

All maintenance completed in 2020 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 2020:

- 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 2020:

- 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 12200 m of sewer main.
- Inspected 3628 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 Aldershott pump station electrical panel, pumps and upgraded pump chamber.

- Replaced Wood Ave. pump station electrical panel.

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 two operating issues during the 2020 reporting period, as follows:

The TSS monthly effluent objective of 5mg/L was exceeded in January and February. January average was 7.6mg/L and February was 5.3mg/L. All other effluent quality parameters were maintained within the compliance limits of the C of A.

Sludge Volume and Disposal

Table 7 below summarizes the sludge volume generated in 2020, the anticipated volume to be generated next year, and the sludge disposal location.

Table 7: Sludge Generated and Disposal

Sludge Generated in 2020 (m3)	Anticipated Volume for 2021 (m3)	Sludge Disposal Location
1024	--	NASM #24224 Home Farm Field Lot 14&15
540	--	NASM #24364 Home Farm Field Lot 20
1564	2200(m3)	--

Summary of Complaints

The following summarizes the complaints received in 2020 and the steps taken to address the complaints:

- One sewer blockage complaint was received on October 26, 2020. Collection system inspected and plumber cleared blockage
- April 6, 2020 one sewer blockage complaint was received. Plumber cleared blockage and Township repaired cleanout.

Summary of Calibration and Maintenance on Effluent Monitoring Equipment

Magnetic flow meters were calibrated by a certified technician on March 3, 2020.

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 2020