Corporation of the City of Quinte West

Trenton Wastewater Treatment Plant

2022 Annual Performance Report

A Natural Attraction

Executive Summary

The Trenton Wastewater Treatment Plant (WWTP), MOE Identifier number: 110000775, is located at 25 Couch Crescent in the City of Quinte West. It is rated as a Class III facility and has a rated Average Daily Flow (ADF) capacity of 15,900 m^3/d, and a Peak Flow Rate capacity of 51,100 m^3/d. The facility is described as a conventional activated sludge treatment plant, with Tertiary treatment consisting of two shallow-bed sand media filters. The facility and associated main Sewage Pumping Station lifecycle upgrades have been completed as of 2020. The next phase upgrade will be undertaken once, either the facility is operating in the range of its Rated Capacity, or the Ministry mandates Effluent compliance criteria the facility is not designed to meet.

The annual reporting requirements as per Environmental Compliance Approval (ECA) number 6269-BTVJ8Q, issued on October 21, 2020, have been listed below. In accordance with Condition 10, a performance report shall be prepared and submitted to the *Water Supervisor* 90 days following the end of the period being reported upon. The following is a list of the information to be included in this annual report in accordance with the applicable ECA's:

a) *A summary and interpretation of all Influent and Imported Sewage monitoring data, and a review of the historical trend of the sewage characteristics and flow rates;*

b) *A summary and interpretation of all Final Effluent monitoring data, including concentration, flow rates, loading and a comparison to the design objectives and compliance limits in this Approval, including an overview of the success and adequacy of the Works;*

c) *A summary of any deviation from the monitoring schedule and reasons for the current reporting year and a schedule for the next reporting year;*

d) *A summary of all operating issues encountered and corrective actions taken;*

e) *A summary of all normal and emergency repairs and maintenance activities carried out on any major structure, equipment, apparatus or mechanism forming part of the Works;*

f) *A summary of any effluent quality assurance or control measure undertaken;*

g) A summary of the calibration and maintenance carried out on all Influent, Imported Sewage and Final Effluent monitoring equipment to ensure that the accuracy is within the tolerance of that equipment as required in this Approval or recommended by the manufacturer;

h) A summary of efforts made to achieve the design objectives in this Approval, including an assessment of the issues and recommendations for proactive actions if any are required under the following situations:

a. When any of the design objectives is not achieved more than 50% of the time in a year, or there is an increasing trend in deterioration of Final Effluent quality;

b. When the Annual Average Daily Influent Flow reaches 80% of the Rated Capacity;

i) A tabulation of the volume of sludge generated, and outlined of anticipated volumes to be generated in the next reporting period and a summary of the locations to where the sludge was disposed;

j) A summary of any complaints received and any steps taken to address the complaints;

k) A summary of all Bypasses, Overflows, other situations outside Normal Operating Conditions and sills within the meaning of Part X of EPA and abnormal discharge events;

l) A summary of all Notices of Modifications to Sewage Works completed under Paragraph 1.d. Of Condition 10, including a report on status of implementation of all modifications;

m) A summary of efforts made to achieve conformance with Procedure F-5-1 including but not limited to projects undertaken and completed in the sanitary sewer system that result in overall Bypass/Overflow elimination including expenditures and proposed projects to eliminate Bypass/Overflows with estimated budget forecast for the year following that for which the report is submitted; and

n) Any changes or updates to the schedule for the completion of construction and commissioning operation of major process(es)/equipment groups in the Proposed Works.

Summary and Interpretation of Monitoring Data

Final Effluent parameter monitoring - with Limits								
Month	**[CBOD5]** *(mg/L)*	**[TSS]** *(mg/L)*	**[TP]** *(mg/L)*	**GMD E.Coli** *(cfu/100mL)*	**Acute Lethality RBT** *(% Mortality)*	**Acute Lethality DM** *(% Mortality)*	**pH - MIN**	**pH - MAX**
	Limit: 25.0mg/L; Objective: 15.0mg/L	*Limit: 25.0mg/L; Objective: 15.0mg/L*	*Limit: 0.30mg/L; Objective: 0.15mg/L*	*Limit: 200 cfu/100mL; Object.: 100 cfu/100mL*	Non-lethal	Non-lethal	*Limit: 6.0*	*Limit: 9.5*
January	3.50	3.00	0.03	18.6	0	0	6.57	7.03
February	2.33	3.00	0.04	5.8			6.65	7.22
March	2.80	4.00	0.03	2.0			6.93	7.45
April	2.25	3.00	0.03	5.8	0	0	7.38	7.64
May	2.20	2.20	0.03	2.0			7.23	7.57
June	3.00	2.50	0.06	2.0			7.21	7.59
July	2.25	4.25	0.11	2.0	0	0	7.21	7.90
August	2.40	3.40	0.08	5.4			7.32	7.85
September	2.00	2.25	0.08	1.7			7.46	8.10
October	2.00	2.50	0.06	2.0	0	0	6.69	8.02
November	2.00	2.00	0.05	1.5			6.70	7.42
December	2.89	3.89	0.07	1.7			7.11	7.51

Final Effluent parameter monitoring - without Limits			
	Total Ammonia Nitrogen (TAN) (mg/L)	**Unionized Ammonia** (mg/L)	**Temperature - Avg** (deg.C)
January	5.13	0.011	11.46
February	5.98	0.010	10.96
March	10.38	0.033	11.55
April	10.70	0.081	13.85
May	2.96	0.020	16.54
June	0.10	0.001	19.75
July	0.13	0.001	21.57
August	0.10	0.001	22.93
September	0.15	0.003	21.78
October	0.10	0.001	19.00
November	0.10	0.001	16.65
December	0.15	0.001	14.01

Monthly Average Effluent Waste Loadings

Month	**CBOD5** *(kg/d)*	**Total Suspended Solids** *(kg/d)*	**Total Phosphorus** *(kg/d)*
	Limit: 397.5 kg/d	*Limit: 397.5 kg/d*	*Limit: 4.77 kg/d*
January	34.0	29.2	0.29
February	29.5	38.0	0.51
March	40.9	58.4	0.44
April	27.9	37.2	0.37
May	25.8	25.8	0.35
June	32.8	27.4	0.66
July	20.5	38.6	1.00
August	21.3	30.2	0.71
September	15.7	17.7	0.63
October	16.7	20.9	0.50
November	19.0	19.0	0.47
December	35.1	47.3	0.85

Raw Sewage Monthly Average Concentrations

	Monthly Average BOD5 Concentration *(mg/L)*	**Monthly Average Total Suspended Solids Concentration** *(mg/L)*	**Monthly Average Total Phosphorus Concentration** *(mg/L)*	**Monthly Average Total Kjeldahl Nitrogen Concentration** *(mg/L)*	**Total Ammonia Nitrogen** *(mg/L)*	**pH**
January	162.8	246.8	2.5	22.0	19.9	7.5
February	142.0	232.3	2.9	21.7	19.8	7.4
March	128.0	186.2	2.1	19.2	16.3	7.5
April	196.0	225.5	2.4	21.1	15.8	7.7
May	185.2	252.4	2.6	24.6	20.4	8.2
June	220.8	242.8	2.4	24.8	20.5	7.8
July	270.3	373.3	4.6	41.0	22.1	7.8
August	180.6	310.8	3.8	35.3	25.1	8.0
September	214.5	291.0	4.1	29.6	26.6	8.1
October	160.5	283.5	4.6	36.1	28.8	7.7
November	179.8	255.8	3.4	33.8	29.0	7.4
December	155.8	250.0	3.3	33.4	30.6	7.2

	Facility Influent Flow Monitoring			**Facility Effluent Flow Monitoring**		
Month	**Average Daily Influent Flow** *(cu.m/day)*	**Month Max Daily Influent Flow** *(cu.m/day)*	**Total Influent Flow** *(cu.m/month)*	**Average Daily Effluent Flow** *(cu.m./day)*	**Month Max Daily Effluent Flow** *(cu.m./day)*	**Total Effluent Flow** *(cu.m./month)*
	Rated Capacity: 15,900 cu.m./day	*Peak Rated Capacity: 51,100 cu.m./day*				
January	9043.1	10389.0	280336.6	9,723.5	10,946.0	301,430.0
February	11901.8	22520.5	333251.7	12,678.5	23,773.0	354,997.0
March	13695.9	19684.3	424573.4	14,611.0	21,046.0	452,940.0
April	11724.0	14028.0	351718.6	12,383.8	14,527.0	371,513.0
May	10769.5	16390.9	333854.0	11,740.1	17,597.0	363,942.0
June	9141.6	13570.1	274246.9	10,946.0	14,682.0	328,380.0
July	8054.2	10849.8	249679.8	9,092.1	12,269.0	281,854.0
August	7272.3	9848.0	225440.5	8,890.4	10,572.0	275,603.0
September	6939.1	8877.6	208171.8	7,872.8	10,253.0	236,183.0
October	7474.0	11488.0	231695.5	8,366.0	11,190.0	259,345.0
November	8148.7	14508.4	244460.8	9,498.1	14,473.0	284,942.0
December	11338.6	26015.4	351495.8	12,149.4	25,471.0	376,632.0
	Annual Avg Daily = 9,625 cu.m./day	**Annual Max = 26,015 cu.m./day**	**Total Influent = 3,508,925 cu.m.**	**Annual Avg = 10,663 cu.m./day**	**Annual Max = 25,471 cu.m./day**	**Total Effluent = 3,887,761 cu.m.**

Summary of Bypass, Spill, or Abnormal Discharge Event(s)

Month	Date	Duration	Event Type	Volume (cu.m)
June	Jun 21	48 mins	Digester Gas Spill - Scheduled - Maintenance	Cannot be quantified accurately, natural vent to atmosphere
December	Dec 23	49 hrs 35 mins	Unplanned partial Tertiary Bypass as a result of wet weather event	10,425
	Dec 24	4 hrs	Pump station power outage due to a significant weather event. Wastewater was diverted to storm sewer.	~ 2

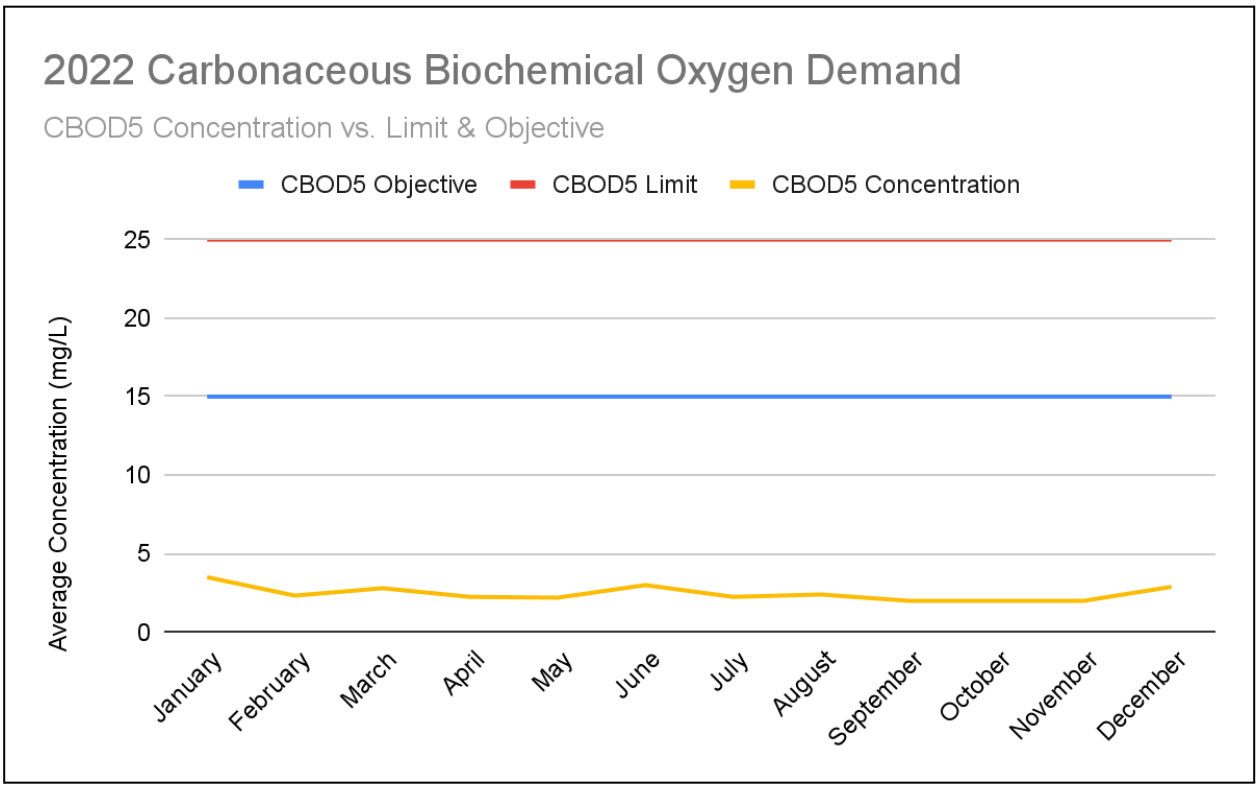
Summary of Operating Problems throughout Monitoring Period

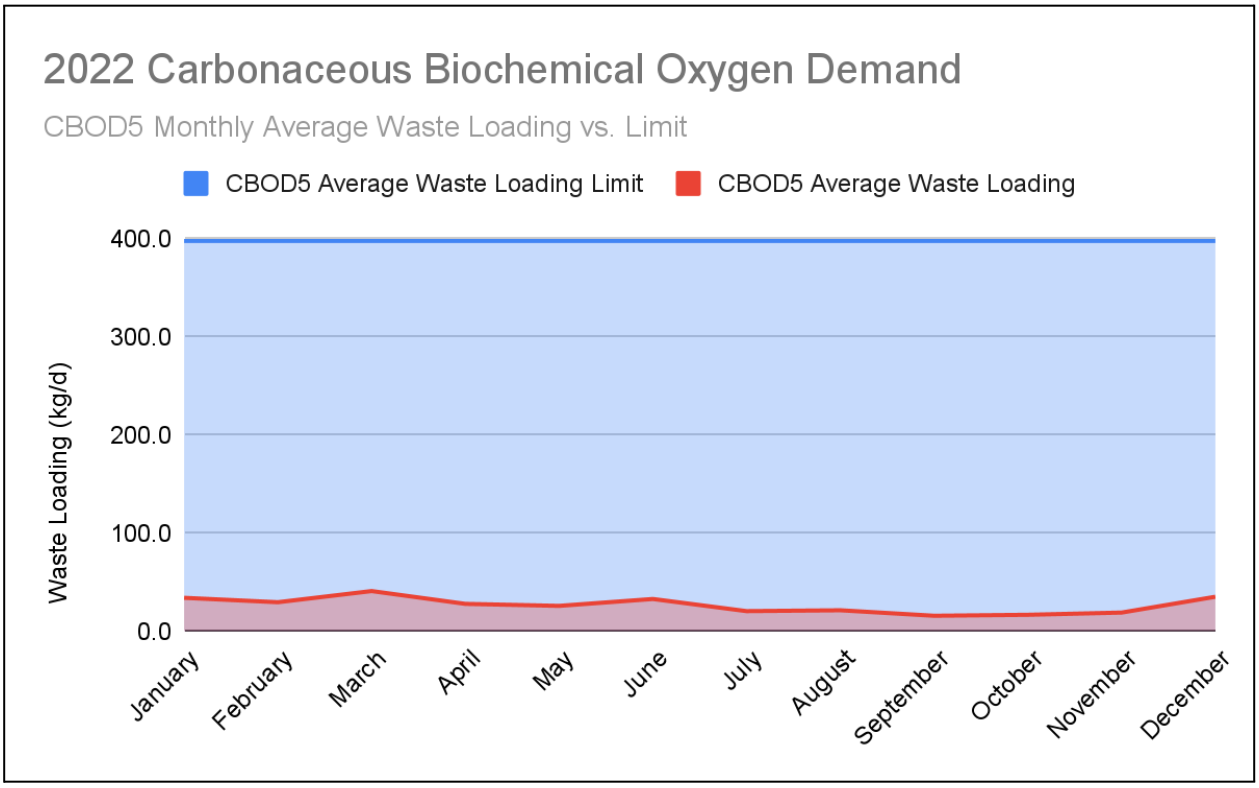
Outside of those reportable events identified above, no substantial operating problems presented themselves throughout the reporting period. Five (5) sampling events were facilitated to satisfy Condition 9(2) of the ECA. In each event, sample results measured below the Effluent Objective.

Analysis of Final Effluent Monitoring Dataset

Carbonaceous Biochemical Oxygen Demand (CBOD5) / Biochemical Oxygen Demand (BOD5)

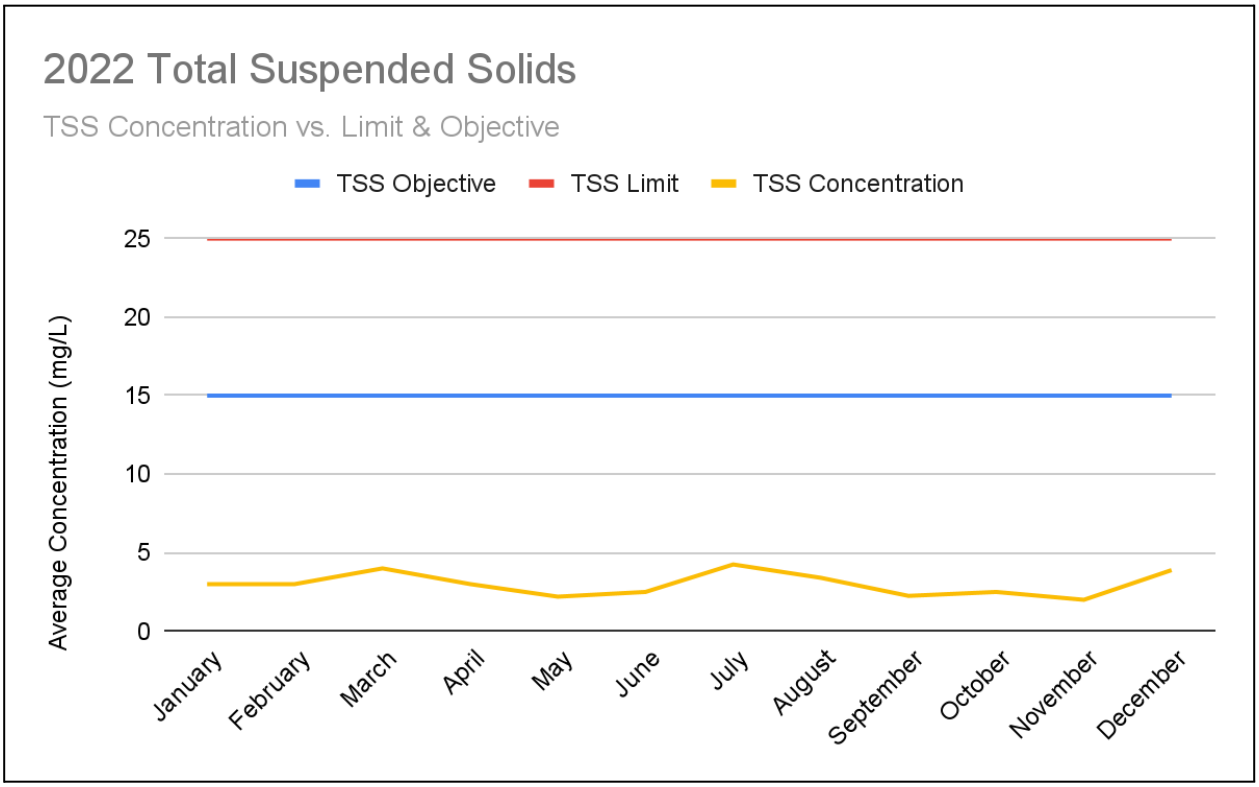
It is apparent in the following Figures that the facility operated well to remove BOD in the wastewater stream throughout the reporting period. The highest monthly average concentration of CBOD5 in the Final Effluent was measured in January, with a calculated monthly average concentration of 3.5 mg/L; 23% of the Effluent Objective.

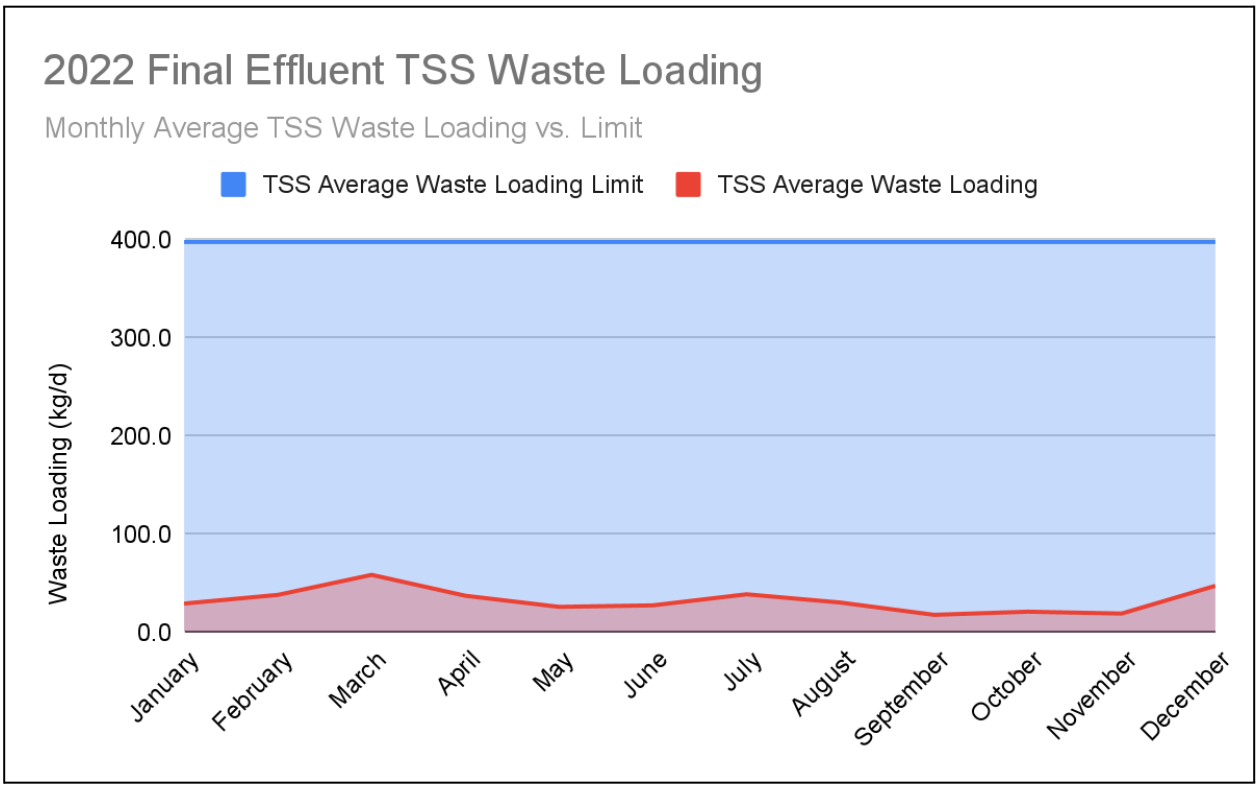

2022 Carbonaceous Biochemical Oxygen Demand
CBOD5 Concentration vs. Limit & Objective
CBOD5 Objective
CBOD5 Limit
CBOD5 Concentration
Average Concentration (mg/L)
25
20
15
10
5
0
January
February
March
April
May
June
July
August
September
October
November
December


2022 Carbonaceous Biochemical Oxygen Demand
CBOD5 Monthly Average Waste Loading vs. Limit
CBOD5 Average Waste Loading Limit
CBOD5 Average Waste Loading
Waste Loading (kg/d)
400.0
300.0
200.0
100.0
0.0
January
February
March
April
May
June
July
August
September
October
November
December

Total Suspended Solids (TSS)

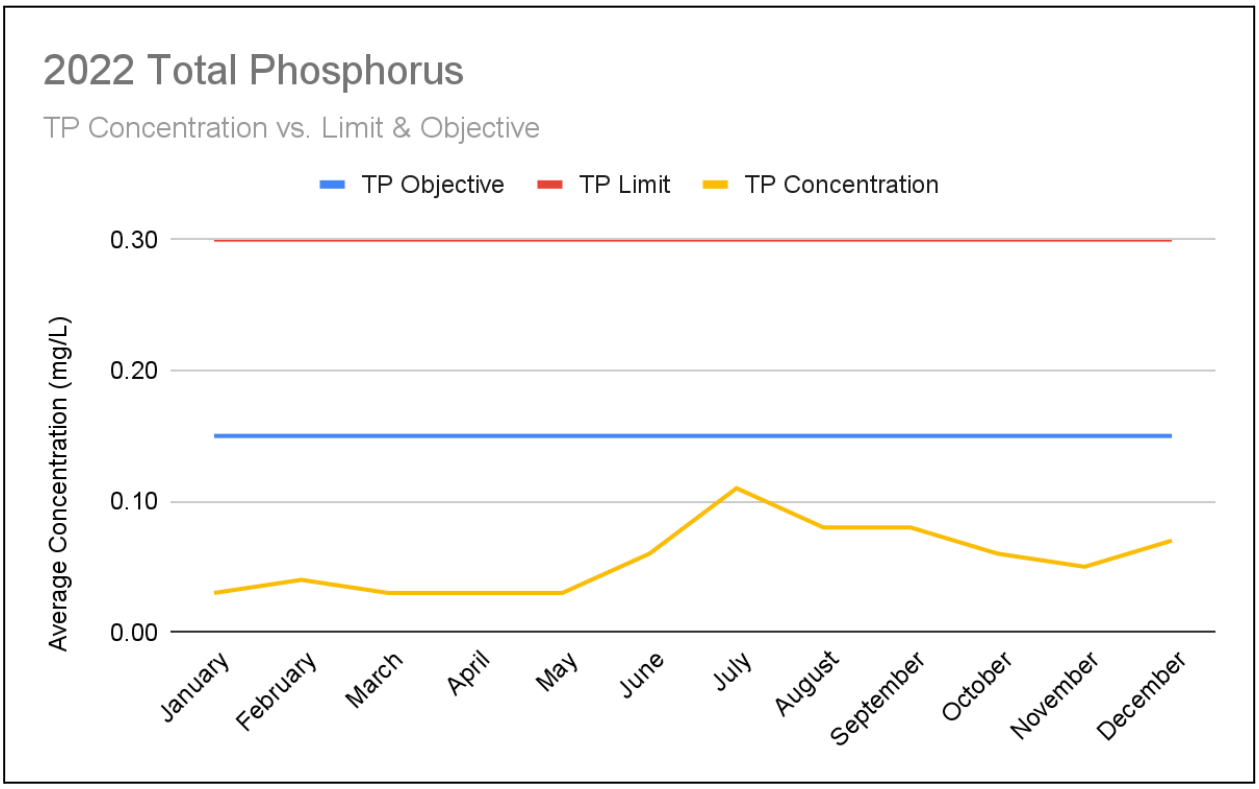
The following figures depict monthly average TSS concentrations and loadings in relation to their respective Objectives and Limits. It is clear from the charts below that the facility performed quite well over the reporting period.

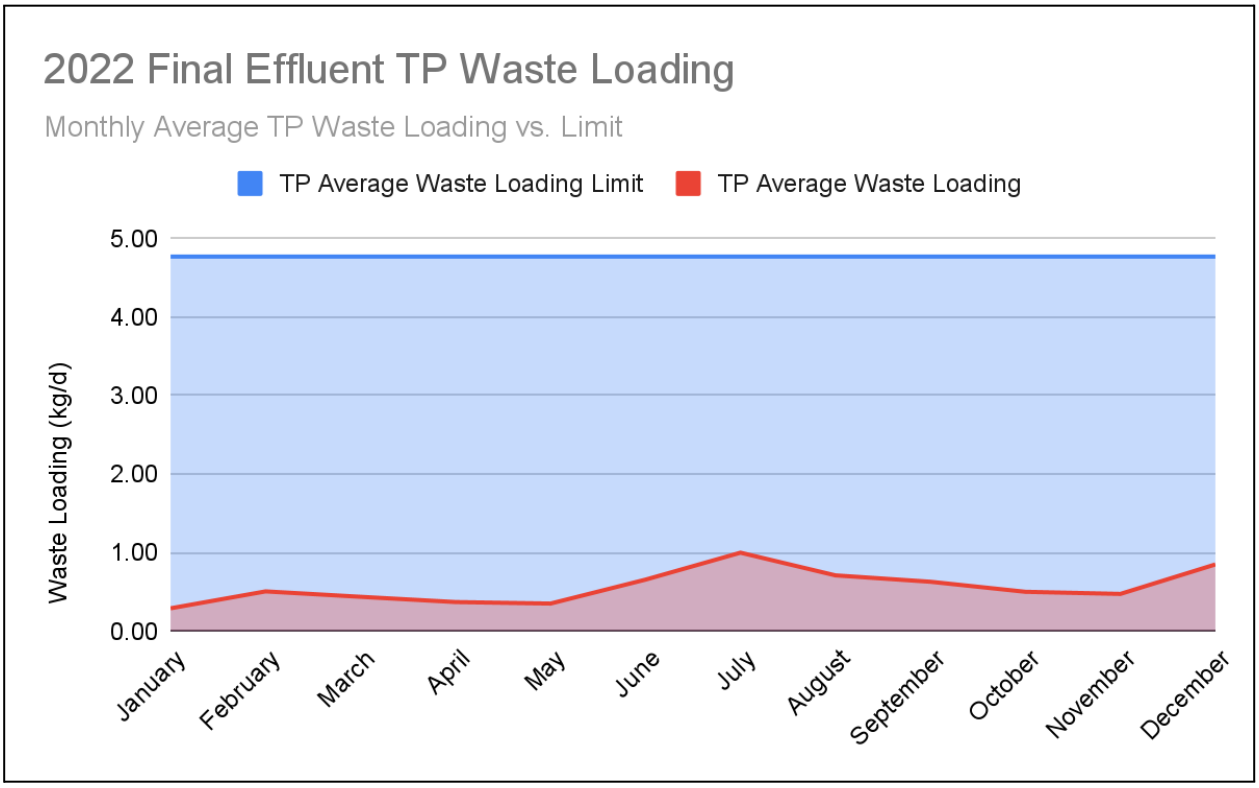




Total Phosphorus (TP)

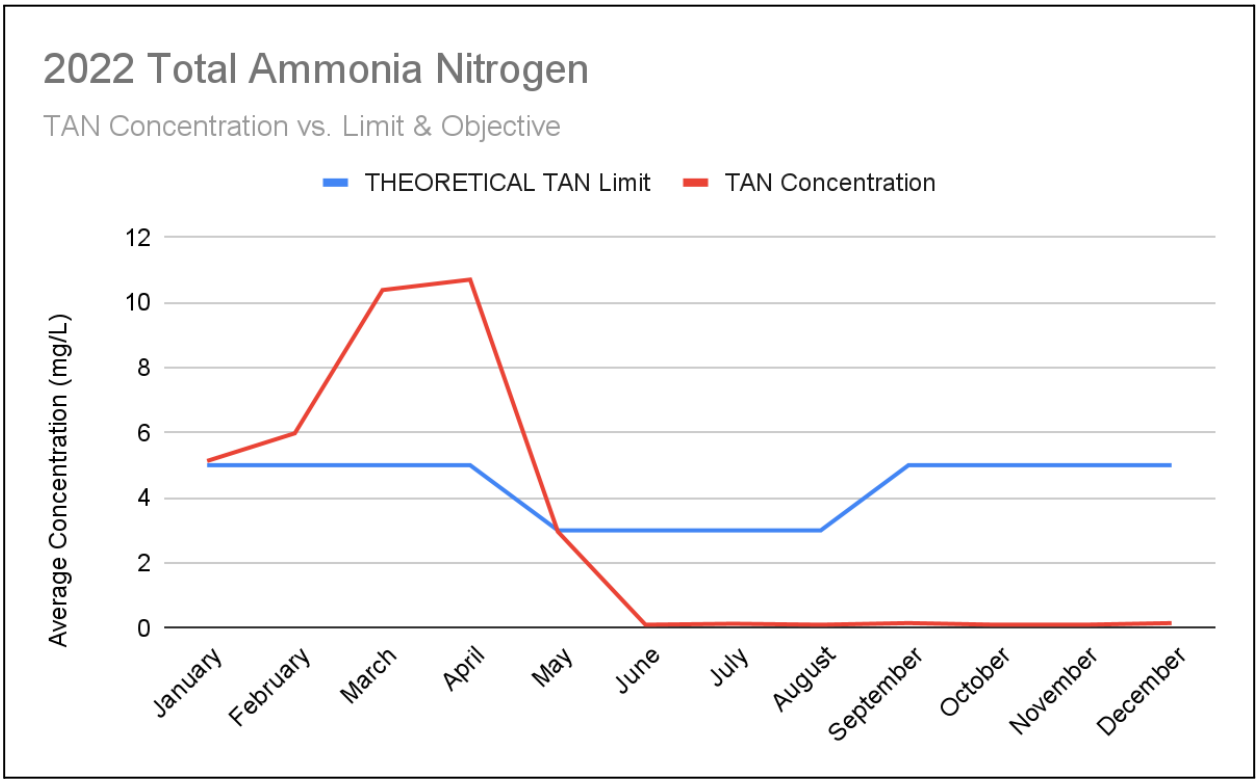
The following two figures depict monthly average TP concentrations and loadings in relation to their respective effluent Limits and Objectives. The annual average coagulant dosage in 2022 was calculated to be 60.8 mg/L. This is an increase of 20% from the 2021 average dosage of 52.7 mg/L. From the figures below you can see that the monthly TP concentration was well below the Operating Objective and Limit.


2022 Total Phosphorus
TP Concentration vs. Limit & Objective
TP Objective
TP Limit
TP Concentration
Average Concentration (mg/L)
0.30
0.20
0.10
0.00
January
February
March
April
May
June
July
August
September
October
November
December


2022 Final Effluent TP Waste Loading
Monthly Average TP Waste Loading vs. Limit
TP Average Waste Loading Limit
TP Average Waste Loading
Waste Loading (kg/d)
5.00
4.00
3.00
2.00
1.00
0.00
January
February
March
April
May
June
July
August
September
October
November
December

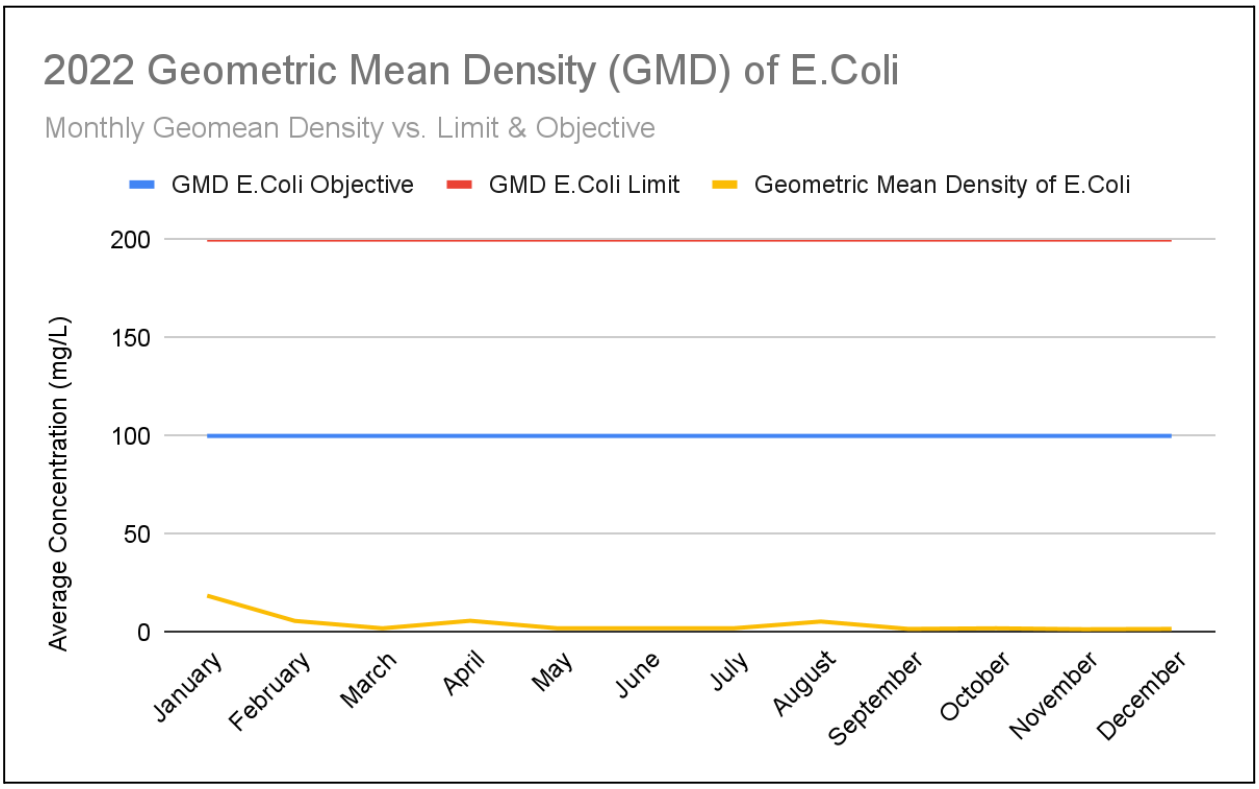
Total Ammonia Nitrogen (TAN) - Ammonia (NH_3) / Ammonium (NH_4^+)

As the facility is not designed to nitrify, there are no Effluent Limits established by the ECA. The annual average Un-ionized ammonia concentration is calculated to be 0.014 mg/L with a maximum calculated concentration of 0.123 mg/L on April 12, 2022 when the nitrification process was inhibited by colder temperatures.



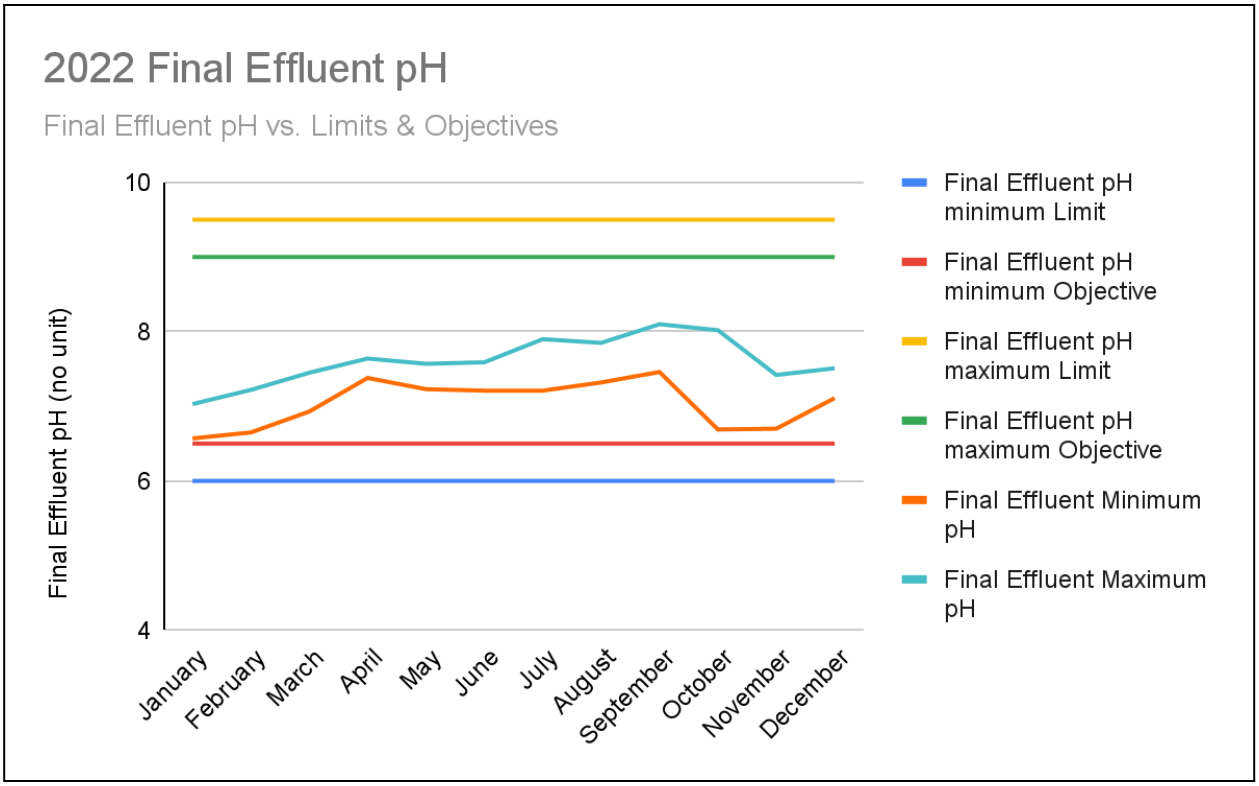
Geometric Mean Density of E. Coli

The facility UV irradiation disinfection system is capable of treating a Peak Hydraulic Flow of 79,000 cu.m/day, and an Average Daily Flow of 23,200 cu.m/day. There are two banks of lamps set up to operate in a duty/standby configuration, and power will ramp up as flows increase or effluent UV transmittance drops. Apparent in the figure below is that this system continues to perform quite well by providing reliable disinfection.



Final Effluent pH

Approximately 253 samples were collected of the Final Effluent throughout the reporting period, and pH measurement taken. As illustrated in the following figure, the Final Effluent pH was consistently measured between the allowable Limits identified in Schedule B and C of the ECA. Effluent pH measurements are performed by the Operators on a Daily basis, normally Monday to Friday. It is important to note that pH measurements used to determine compliance with the ECA have no quality assurance/ quality control (QA/QC) measures in place, other than routine calibration procedures of the pH probe.



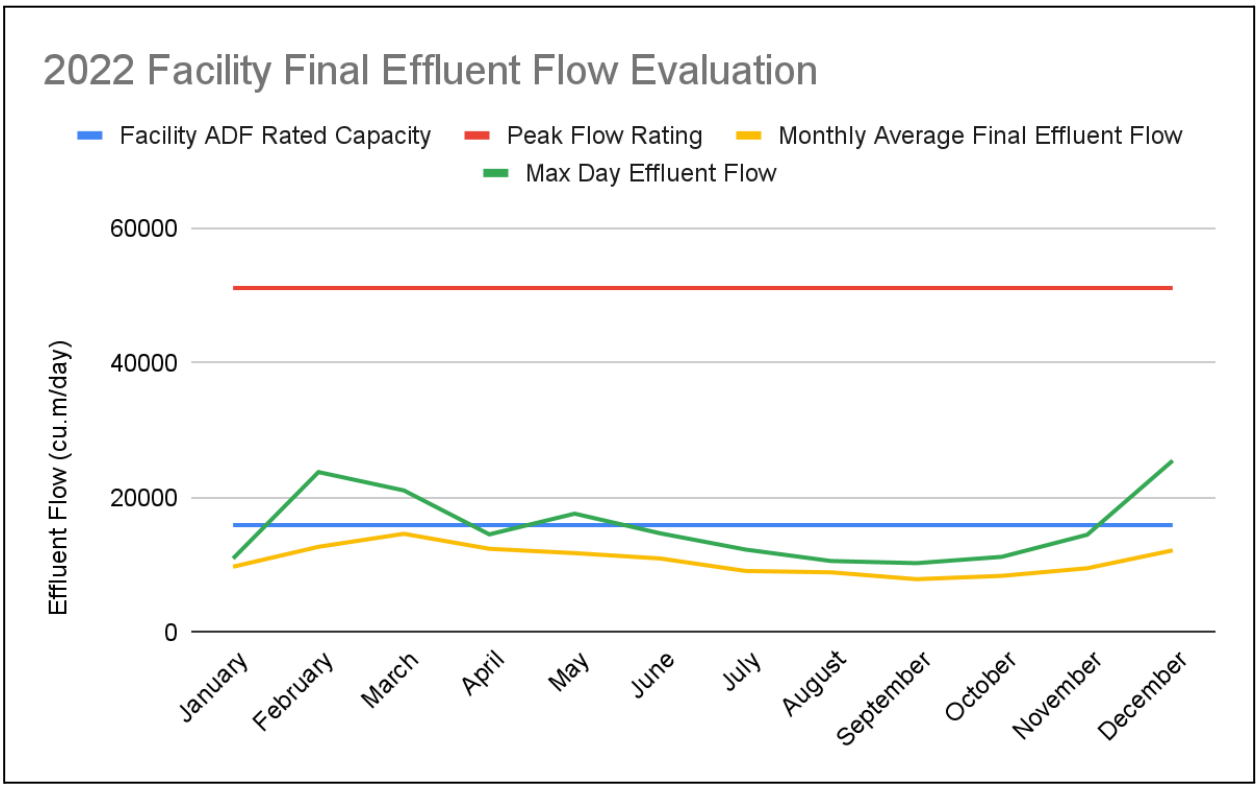
Acute Lethality to Rainbow Trout and Daphnia Magna

The City contracts all Acute Lethality testing to *Aquatox Testing and Consulting Inc*. Quarterly sample results yield 0% Mortality at 100% Effluent concentration tested in accordance with Procedure for pH stabilization during the Testing of Acute Lethality of Wastewater Effluent to Rainbow Trout.

Final Effluent Flows

In 2022, an estimated 819 mm of total precipitation was measured at the Environment Canada Belleville, ON monitoring station. In those months where rainfall totals exceeded the monthly average rainfall total of approximately 68 mm of rain, the facility measured a corresponding increase in Influent flows, and consequently Effluent Flows.

The 3-year average daily flow is 10,549 m^3/d and the 5-year average daily flow is 11,654 m^3/d, trends show effluent flows increased from 2021 to 2022.



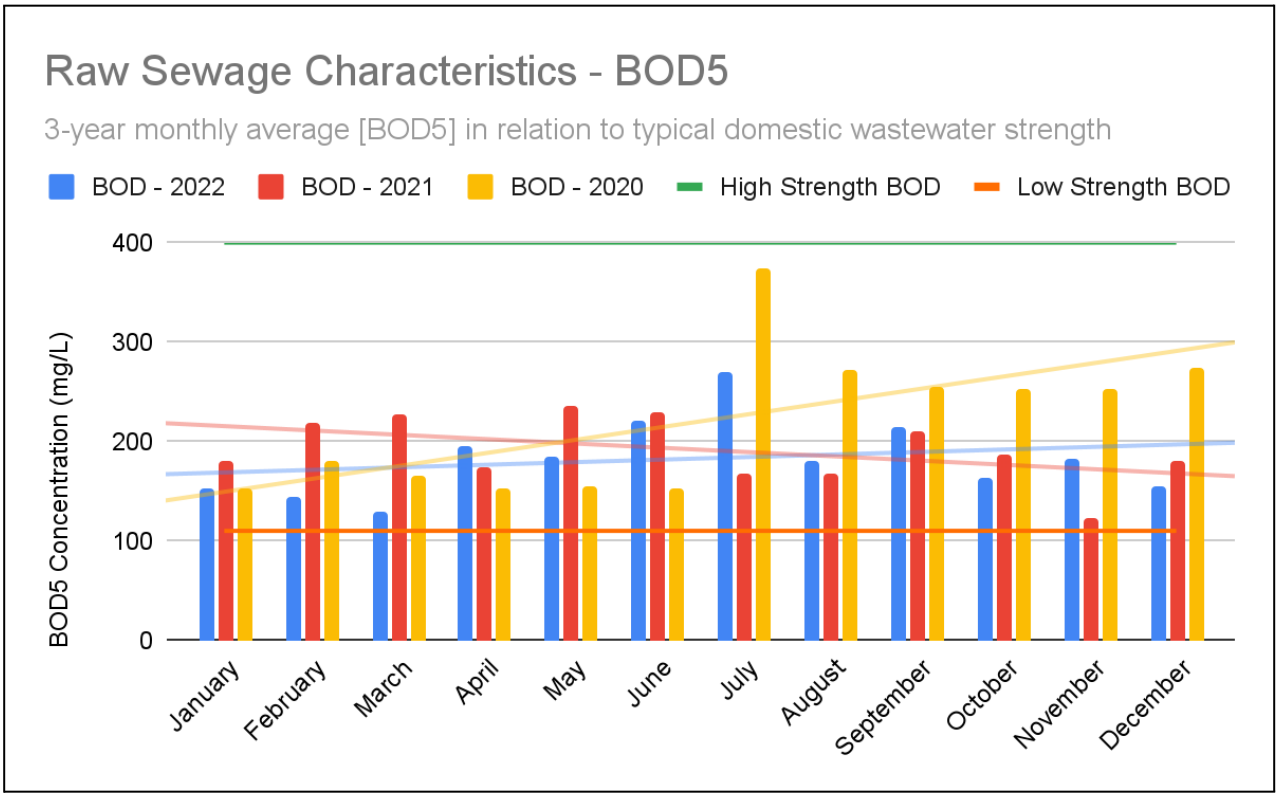
Raw Sewage Characterization

Raw sewage concentrations tend to share an inverse relationship with influent flows, meaning that when influent flows are low (during drought conditions), raw sewage concentrations of measured contaminants, tend to be higher. Outlined in the chart below are monthly average concentrations measured in raw sewage over the last three years along with associated trendlines. Also plotted on the chart are the typical high and low strengths for the associated contaminants in raw wastewater, as measured in a sample of untreated domestic wastewater. The author of this report referenced an online publication that refers to the Metcalf and Eddy Inc. *Wastewater Engineering and Treatment Reuse* manual for these figures (Metcalf and Eddy Inc. 20). Further, it is important to note that the Trenton WWTP received a significant amount of its raw sewage supply from an Industrial source in 2020 and into 2021, therefore the strengths identified in the charts should only be used as a general reference point.

The following sections and charts will provide a description of the raw sewage characteristics and flow rates.

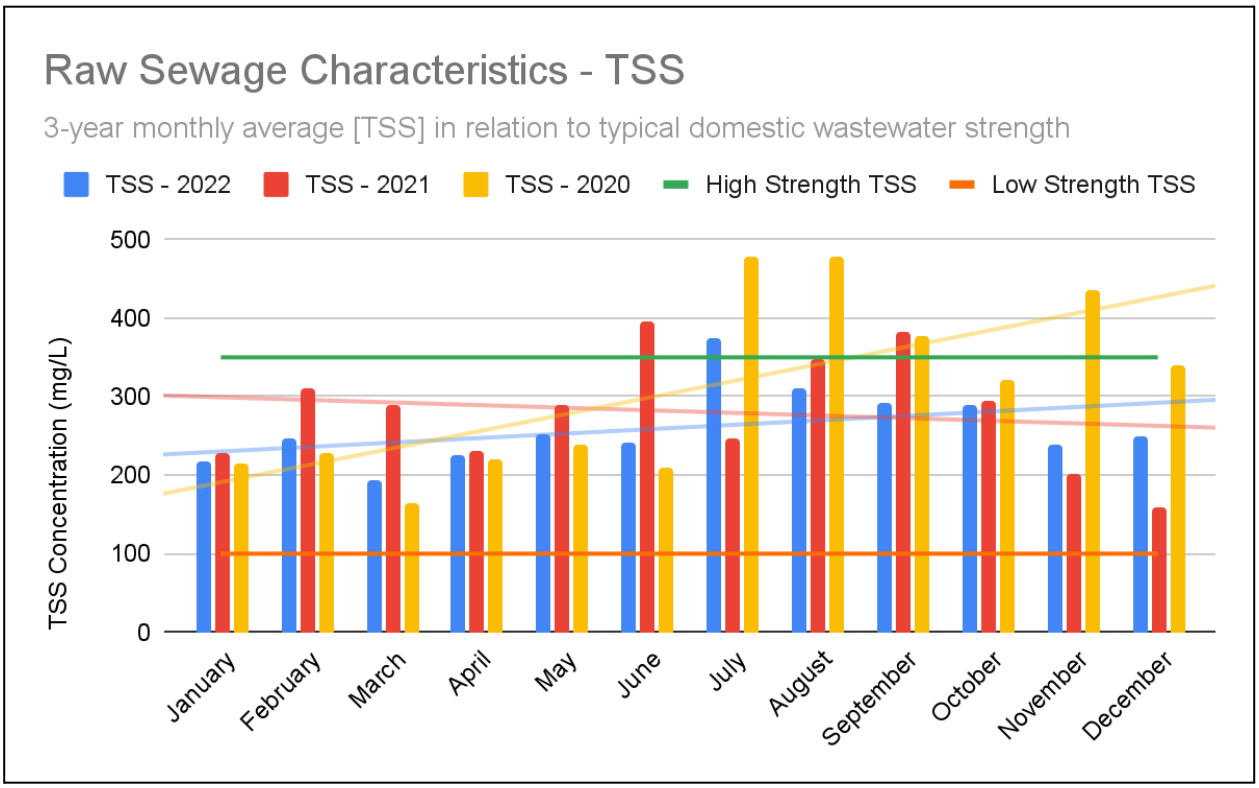
Raw Sewage Biological Oxygen Demand (BOD5)

In review of the chart below, it is apparent that raw sewage characteristics tend to trend upward in 2020, downward in 2021, and remain fairly stable in 2022. It is likely that these trends were impacted by seasonal temperatures and associated Influent flows. Of note, in 2021 industrial operations have decreased and two of the largest food manufacturing industries connected to the Trenton Wastewater Collection System (WWCS) have ceased operations completely. These industries may have played a role in the characteristics of BOD5 concentrations.



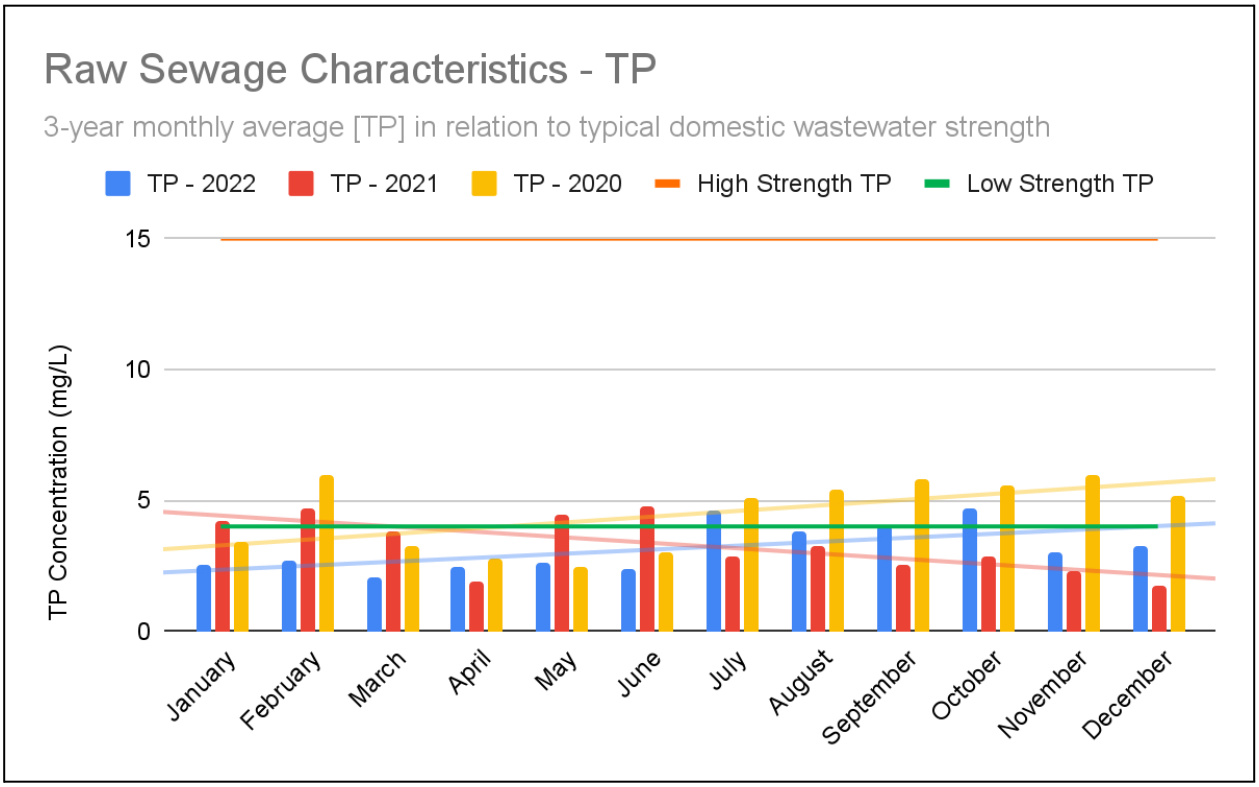
Raw Sewage Total Suspended Solids (TSS)

The characteristics for raw sewage TSS concentrations share a similar relationship with BOD5 characteristics in terms of trending. It is likely that these trends were impacted by seasonal temperatures and associated Influent flows. In 2021, industrial operations have decreased as previously described in the raw sewage BOD5 characteristics. These industries may have also played a role in the characteristics of TSS concentrations.



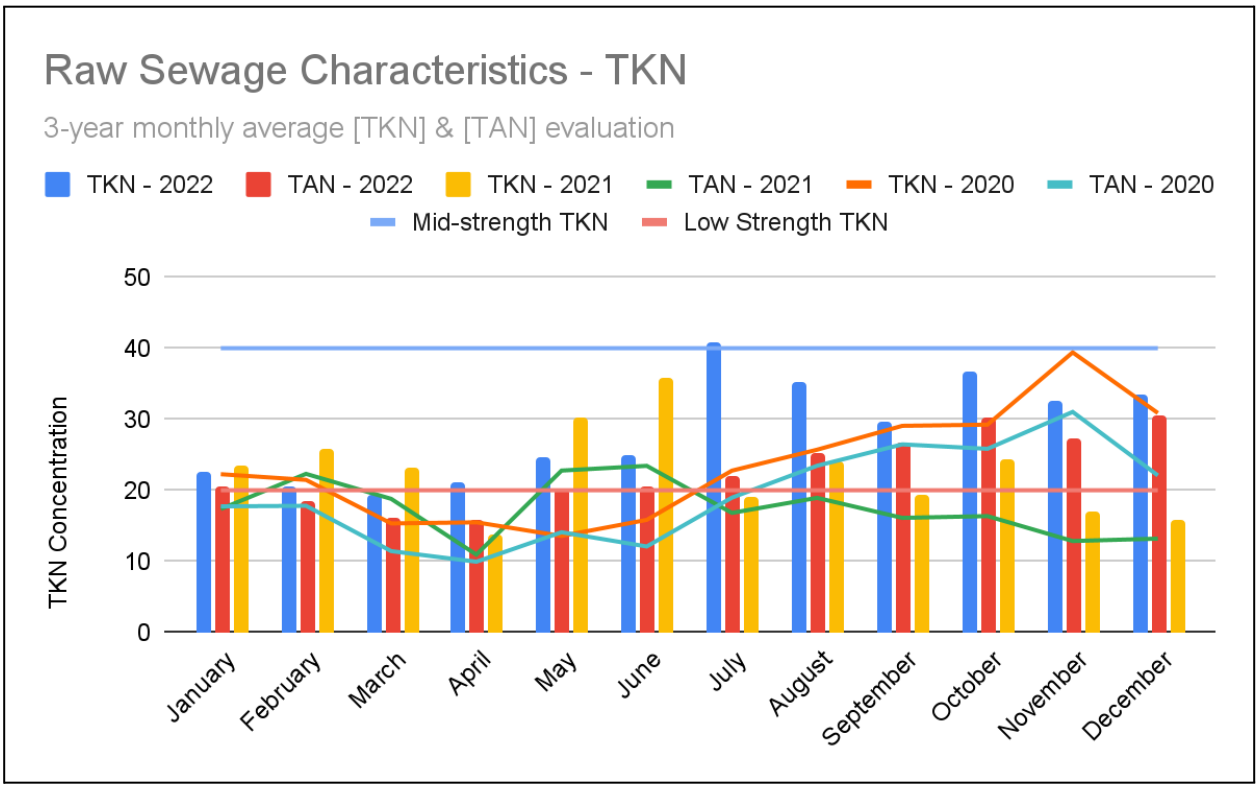
Raw Sewage Total Phosphorus (TP)

Generally speaking, TP concentrations trended higher in 2020 and 2022, than they did in 2021. It is likely that seasonal influent flows impacted the monthly average concentrations. Further, TP concentrations in raw sewage tend to range in the low strength area according to Metcalf and Eddy, as discussed in previous sections. It is also likely that these trends were impacted by industrial associated Influent flows. In 2021, industrial operations have decreased as previously described in the raw sewage BOD5 characteristics. These industries may have played a role in the characteristics of TP concentrations.



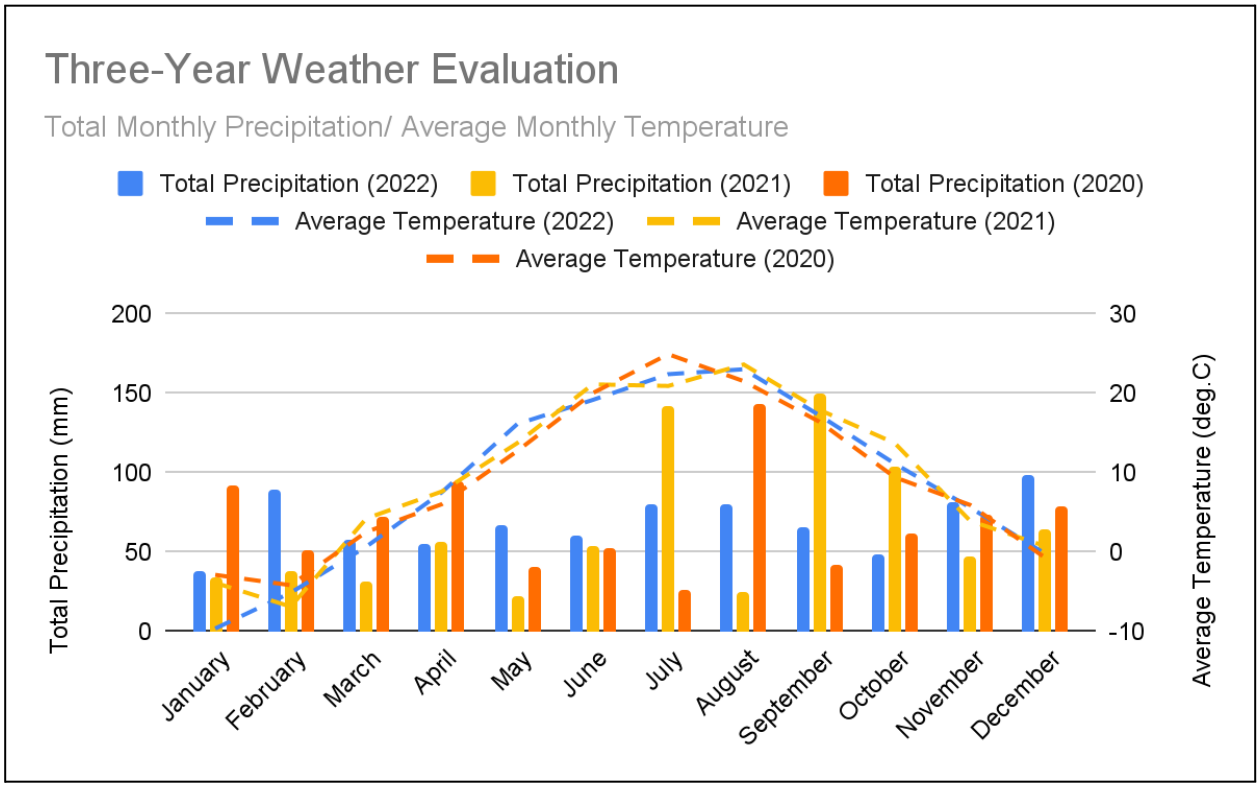
Total Kjeldahl Nitrogen (TKN) / Total Ammonia Nitrogen (TAN)

Total Kjeldahl Nitrogen (TKN) is the sum of organic nitrogen, and Total Ammonia Nitrogen (TAN) - Total Ammonia Nitrogen is the sum of Ammonia and Ammonium. Over the past three years, TAN has accounted for an average 82%, 78%, and 80% of the raw sewage TKN in 2020, 2021, and 2022 respectively. This indicates a generally stable relationship between TKN and TAN. According to Metcalf and Eddy, the TKN is considered to be in the range of low - mid-strength concentration.



Facility Influent Flow Evaluation

The following three charts provide a visual representation of weather patterns in relation to monthly average temperatures, a 3-year evaluation of the monthly average influent flows in relation to the total precipitation measured at Environment Canada Belleville, ON monitoring station, and a close look at the 2022 monthly average Influent flows in relation to the total precipitation measured at the Belleville, ON monitoring station, respectively. It is important to note that the Environment Canada website identified a number of months as being 'estimated' total precipitation amounts as some days were not captured. Therefore, these figures should be considered as such. The chart below provides an indication that while generally seasonal temperatures remained stable, the total amount of precipitation measured in the three years didn't necessarily follow the same pattern year after year though were fairly similar with total annual precipitation amount of 827 mm in 2020, 770 mm in 2021 and 819 mm in 2022.

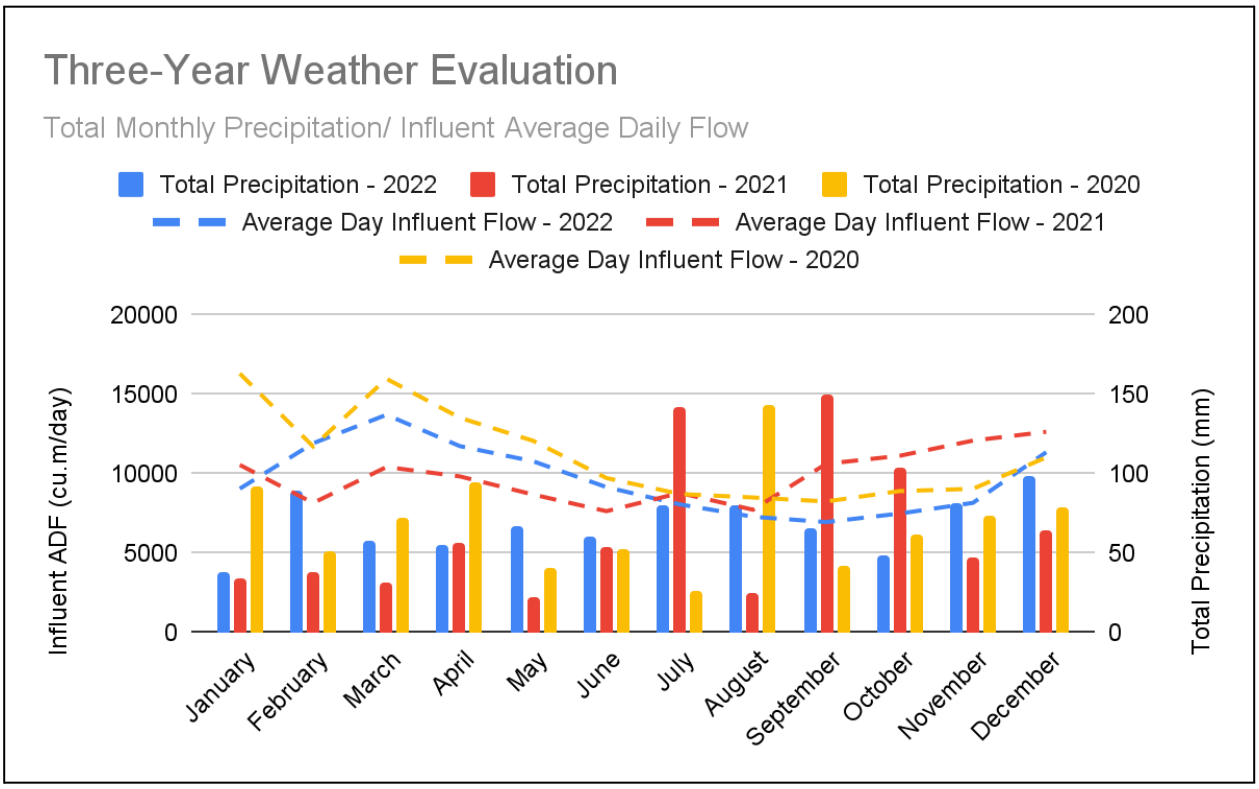


The following chart provides a depiction of how Inflow & Infiltration (I&I) may be impacting the Trenton facility as, generally speaking, Influent flows are trending in the same fashion to the corresponding weather patterns. Outlined below are assessments of the Influent Annual Average Daily Flow over the last three years:

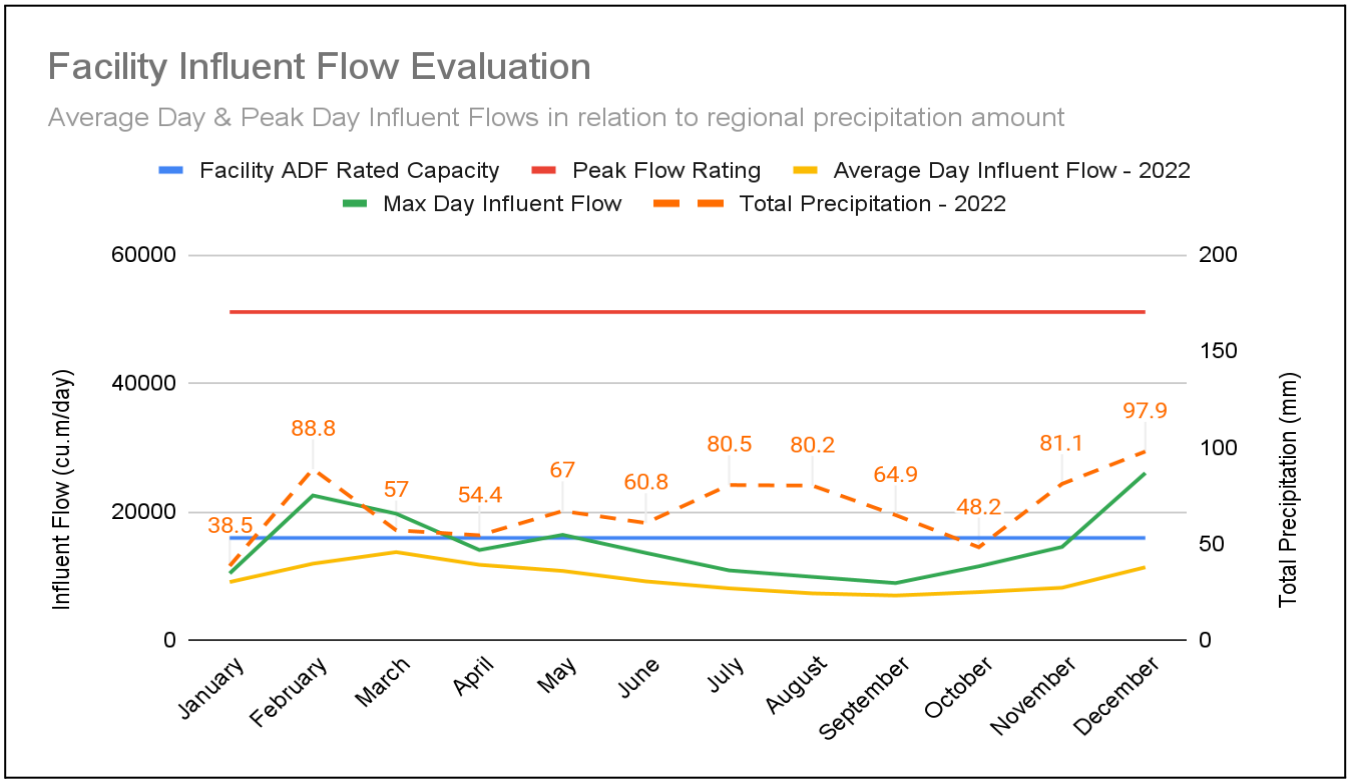
2020 - Influent AADF = 11,142 cu.m/day; 70% of Rated Capacity

2021 - Influent AADF = 9,854 cu.m/day; 62% of Rated Capacity

2022 - Influent AADF = 9,613 cu.m/day; 60% of Rated Capacity



The facility operated at 60% of its Rated Capacity over the reporting period which is a marked improvement over the last three years. The Owner has spent several million dollars over the last six years to upgrade its WWTP and Wastewater Collection System (WWCS) infrastructure which is being realized in the Influent flows in an effort to extend the lifespan of the facility and reduce sources of I&I in the WWCS.



Imported Sewage

In 2022, a total of 1,056 cu.m. of biosolids were hauled from the Frankford WWTP and dewatered at the Trenton WWTP. Please refer to the Frankford WWTP Annual Performance Report for biosolids characteristics. Generally speaking, this material does not enter the treatment process and has no bearing on the overall effluent quality.

Summary of Maintenance performed throughout Reporting Period

The City continues to support an active Preventative Maintenance (PM) program to ensure the facility is maintained in a fit state of repair. Outside of Preventative Maintenance, the following Reactive Maintenance activities were completed by staff, or outside contractors as identified:

- Electrical control panel replacement was completed at Louis St. PS, including portable generator quick connect and additional alarming capability.
- Electrical control panel replacement was completed at Sidney St. PS, including portable generator quick connect and additional alarming capability.
- Electrical control panel replacement was completed at Chester Rd. PS, including portable generator quick connect and additional alarming capability.
- Anaerobic Digester gas pressure relief valve replacement
- Aerzen blower motor bearings replaced
- New fan motor in head works scrubber
- New seals in plant effluent water pump
- Completed cleaning and inspection of biosolids holding tank
- Electrical utility substation maintenance at TWWTP and Dundas Pump station
- Replaced overhead cabling for traveling backwash bridges
- Rebuild of TWAS and WAS rotary lobe pumps
- Annual replacement of lead bank UV bulbs
- Rebuild of digester gas booster pump
- Carbon replacement in facility air scrubbers
- Shuter St sanitary sewer replacement
- Lorne St sanitary sewer replacement
- Hillside Meadows oversizing sewer
- West End trunk sewer design

Biosolids Management Summary

Date Hauled	Volume Hauled (cu.m.)	Biosolids Destination
January	556	DES Storage & GFL Storage (Smith's)
February	868	DES Storage & GFL Storage (Smith's)
March	384	GFL Storage (Smith's)
April	800	GFL Storage (Smith's)
April 28	520	Land Application - NASM Plan #24980
May 13-16	280	Land Application - NASM Plan #24306
May 13-17	1240	Land Application - NASM Plan #23401
May 18	1026	Land Application - NASM Plan #24658
June 21-22	828	Land Application - NASM Plan #23401
August 3-5	1190	Land Application - NASM Plan #23796
August 8-17	440	GFL Storage (Smith's)
September 22-28	1480	Land Application - NASM Plan #24787
September 28	6.29	GFL Storage (Smith's)
October 29- Nov 2	988	Land Application - NASM Plan #23513
December	132	GFL Storage (Smith's)
Total Volume of liquid sludge generated and land applied = 10,738 cu.m.		
Estimated Sludge generated in 2023 - 11,000 cu.m.		

Summary of Effluent Quality Assurance and Control Measures

The City collects samples from Raw Sewage stream, Aeration Tanks, Secondary Clarifiers and Final Effluent on a routine basis throughout the week. The City satisfies its regulatory compliance requirements by submitting a set of samples to an accredited laboratory, SGS Canada Inc. on a weekly basis, normally on Tuesday's throughout the Reporting Period. These sample results are manually entered into a spreadsheet and evaluated for compliance with the ECA. In addition to these samples, Operators perform in-house analysis for Total Suspended Solids, pH, temperature, alkalinity, dissolved reactive phosphorus, and Final Effluent Dissolved Oxygen. Sample results are entered into a spreadsheet for facility evaluation and process optimization. On an annual basis, the spectrophotometer is calibrated by a third party. Operators calibrate other instrumentation, such as the bench top pH meter, regularly.

Monitoring Schedule

As mentioned in the previous section, the facility sampled in accordance with the ECA every Tuesday. In 2023, the facility will collect samples in accordance with the ECA, every Wednesday each week.

Final Effluent Monitoring Equipment Calibration and Maintenance

Works Orders are generated on an annual basis to calibrate the facility Influent and Effluent Flow Meters. This calibration is completed by a third party contractor. The following figures are copies of the Calibration Certificates.

Tower Electronics Canada Inc.
Instrument Calibration Certificate

Customer:
The City of Quinte West
7 Creswell Drive
PO Box 490
Trenton, ON K8V 5R6

Calibration by:
Dan Matchett

Standards:
Siemens Magflo S/N NIST Cal Due April 2023
Rosemount 8732 MagMeter Reference Cal Due April 2023
Fluke 289 S/N 96220182 NIST Cal Due April 2023
Precision Digital S/N 1604-0199055-NIST Cal Due April 2023

Instrument Type
Magnetic Flow Meter

Method of verification
In Line Flow to Flow with Velocity comparison.

Meter Information

Date of Test:	2022-08-11
Calibration Due:	Aug-23
Location:	Dundas SPS
Meter Under Test	FM1
Client Tag:	QW00005644
Manufacturer:	Siemens
Model:	MAG6000
Serial Number:	081802H064
Totalizer As Found:	3648626M3
Totalizer As Left:	3648626M3
Allowable Error:	15%
Programming Parameters:	
DN Size:	500.000
Cal Factor:	281.4464
Zero Cal:	0
Qmax:	1500LPS
Operating Time(Days):	2974
Flow Direction:	Positive

Flow Test

Velocity	Current Output mA			Frequency Output khz		
M/S	Theoretical	Actual	Deviation%	Theoretical	Actual	Deviation%
0.000	4.000	4.000	0.000	0.000	0.000	0.000
0.342	4.939	4.960	-0.430	0.587	0.596	-1.566
0.671	5.845	5.910	-1.094	1.153	1.192	-3.244
1.727	8.747	8.770	-0.266	2.967	2.975	-0.280
3.561	13.787	13.750	0.267	6.117	6.101	0.257
	Average Error%		-0.305	Average Error%		-0.967
	Result:		PASS	Result:		Pass

Totalizer Test

Start Totalizer 1	13.000	L
End Totalizer 1	191.000	L
Totalizer Difference	178.000	L
Volume Simulated	178.000	L
Error%	0.000	
Result:	PASS	

Sensor Verification

Coil Resistance	101.85	Ohms
HiPot Test	Open	Ohms
Result:	PASS	

Comments:
Unit passes verification

Tower Electronics Canada Inc
2687 Hwy 40
K0K 3M0
Wooler On
Canada

Email: Dan@Tecanada.ca
Website: www.tecanada.ca

Calibrations Service Sales
Temporary and Permanent Meter Installations
Instrumentation For Flow Level Pressure.

Tower Electronics Canada Inc.
Instrument Calibration Certificate

Customer:
The City of Quinte West
7 Creswell Drive
PO Box 490
Trenton, ON K8V 5R6

Calibration by:
Dan Matchett

Standards:
Siemens Magflo S/N NIST Cal Due April 2023
Rosemount 8732 MagMeter Reference Cal Due April 2023
Fluke 289 S/N 96220182 NIST Cal Due April 2023
Precision Digital S/N 1604-0199055-NIST Cal Due April 2023

Instrument Type
Magnetic Flow Meter

Method of verification
In Line Flow to Flow with Velocity comparison.

Meter Information

Date of Test:	2022-08-11
Calibration Due:	Aug-23
Location:	Dundas SPS
Meter Under Test	FM2
Client Tag:	QW00005642
Manufacturer:	Siemens
Model:	MAG6000
Serial Number:	081802H064
Totalizer As Found:	2986122M3
Totalizer As Left:	2986122M3
Allowable Error:	15%
Programming Parameters:	
DN Size:	400.000
Cal Factor:	136.9221
Zero Cal:	0
Qmax:	1000LPS
Operating Time(Days):	2624
Flow Direction:	Positive

Flow Test

Velocity	Current Output mA			Frequency Output khz		
M/S	Theoretical	Actual	Deviation%	Theoretical	Actual	Deviation%
0.000	4.000	4.000	0.000	0.000	0.000	0.000
0.157	4.432	4.460	-0.628	0.270	0.278	-2.878
0.380	5.045	5.080	-0.682	0.653	0.684	-4.483
1.267	7.483	7.530	-0.629	2.177	2.206	-1.330
3.557	13.776	13.800	-0.174	6.110	6.133	-0.375
	Average Error%		-0.423	Average Error%		-1.813
	Result:		PASS	Result:		Pass

Totalizer Test

Start Totalizer 1	8.000	L
End Totalizer 1	122.000	L
Totalizer Difference	114.000	L
Volume Simulated	114.000	L
Error%	0.000	
Result:	PASS	

Sensor Verification

Coil Resistance	101.9	Ohms
HiPot Test	Open	Ohms
Result:	PASS	

Comments:
Unit passes verification

Tower Electronics Canada Inc
2687 Hwy 40
K0K 3M0
Wooler On
Canada

Email: Dan@Tecanada.ca
Website: www.tecanada.ca

Calibrations Service Sales
Temporary and Permanent Meter Installations
Instrumentation For Flow Level Pressure.

Tower Electronics Canada Calibration Certificate

Customer:
The City of Quinte West
7 Creswell Drive
PO Box 490
Trenton, ON K8V 5R6

Calibration by:
Dan Matchett

Standards:
Fluke 289 S/N 96220182 NIST Cal Due Apr 2023
Reed RTV

Instrument Type
Magnetic Flow Meter

Method of verification
Temperature based calculation of velocity of sound in water.

Units: M3/S
Zero: 0.00
Span: 0.926
Totalizer: M3

Meter Information

Date:	2022-08-09
Location:	Trenton WWTP
Meter Under Test	Final Effluent Meter
Client Tag:	QW00002704
Manufacturer:	Accusonics
Model:	7510+
Serial Number:	1468
Totalizer As Found:	1265803M3
Totalizer As Left:	1265803M3

Programming Parameters:

185VDC	Pulse Mode
Cal Factor	1.000
Temp (°C)	22.025
Calibration Due:	Aug-23

Water Temperature(C): 22.9

Velocity Vs Temperature Verification

Path	Theroctical V-Sound (m/s)	Meter V-Sound (m/s)	Error%
1	1485.89	1490	0.276
2	1485.89	1492	0.409
3	1485.89	1490	0.276
4	1485.89	1490	0.276
	Average Error%		0.309
	Result:		PASS

Output Test

Current Simulation mA	Reference Reading	Error%
4	4.001	0.006
8	8.001	0.006
12	12.001	0.006
16	16.000	0.000
20	19.996	-0.025
	Average Error%	-0.001
	Result:	PASS

Comments:
Using Gaussian integration the meter calculates the water temperature base on path length and observed velocity. Only one temperature corresponds to one velocity at a given path length.
Unit passes verification.

Tower Electronics Canada
2587 Hwy 40
K0K 3M0
Wooler On
Canada

Email: Dan@Tecanada.ca
Website: www.tecanada.ca

Calibrations Service Sales
Temporary and Permanent Meter Installations
Instrumentation For Flow Level Pressure.

Notice of Modifications

There were no 'Notice of Modifications' forms submitted to the Ministry during this Reporting Period. All maintenance performed throughout the reporting period was not subject to the LOF requirements.

Summary of complaints received throughout the reporting period

There were no complaints received by City staff regarding the Trenton WWTP throughout the reporting period.

Procedure F-5-1 compliance

The City will continue to consult its Asset Management Planning modeling tools in conjunction with Capital Planning exercises to determine reconstruction projects. Notably, in 2022, Lorne Street and Shuter Street sanitary sewer replacements were completed as a result. Rehabilitation projects planned for 2023 were in the process of being finalized at the time of this report.

As outlined in Summary of Bypass, Spill, or Abnormal Discharge Event(s), one (1) bypass was reported at the Trenton Wastewater Treatment Plant itself during the reporting period, which is an improvement from the previous year.