Operational Reports 2023

Annual Performance Report

Picton Wastewater Treatment Plant

TheCounty
PRINCE EDWARD COUNTY ♣ ONTARIO

Water and Wastewater Services
The Corporation of the County of Prince Edward
Office: 37 Church Street, Picton, ON K0K 2T0
Mailing: 332 Picton Main Street, Picton, ON K0K 2T0
T: 613.476.2148 | F: 613.476.9120
compliance@pecounty.on.ca | www.thecounty.ca

2023 Annual Wastewater Performance Report

The Corporation of the County of Prince Edward
Picton Wastewater Treatment Facility
MECP Identifier No. 120000667
Environmental Compliance Approval No. 5464-AKATW7

Monitoring and Analytical Data

Condition 11.4(a) and (f)

Summary of all monitoring data and analytical data collected relative to the works during the reporting period as per Condition 11.4(a) and 11.4(f).

Table 1(a-c): Effluent Quality: Compliance Parameters

Table 1a: Carbonaceous Biochemical Oxygen Demand, Total Suspended Solids and Total Phosphorus, Effluent Quality Assessment, 2023

Parameters	Carbonaceous Biochemical Oxygen Demand	Total Suspended Solids	Total Phosphorus	
	Monthly Mean Concentration			Waste Loading
ECA Limit	10 mg/L	10 mg/L	0.27 mg/L	1.63 kg/d
ECA Objective	5 mg/L	5 mg/L	0.15 mg/L	n/a
Month	mg/L	mg/L	mg/L	kg/d
January	3.20	3.40	0.06	0.28
February	2.00	3.25	0.06	0.23
March	2.00	2.25	0.05	0.23
April	2.00	2.00	0.04	0.18
May	2.00	3.60	0.06	0.27
June	2.00	2.00	0.06	0.16
July	2.25	2.25	0.06	0.18
August	2.00	4.40	0.04	0.15
September	3.50	2.00	0.08	0.17
October	2.00	2.40	0.06	0.11
November	2.00	2.25	0.05	0.10
December	3.50	2.50	0.03	0.12

Note: *Environmental Compliance Approval No. 5464-AKATW7 Conditions 6 & 7 stipulate Final Effluent Design Objectives and Compliance Limits. There were no Compliance or Objective exceedances during 2023.*

Table 1b: Total Ammonia Nitrogen (TAN) Effluent Quality Assessment, 2023

Parameter	Total Ammonia Nitrogen	
	Monthly Mean Concentration	
ECA Limit	0.8 mg/L May - October	1.5 mg/L November - April
ECA Objective	0.6 mg/L May - October	1.2 mg/L November - April
Month	mg/L	mg/L
January		< 0.10
February		< 0.10
March		< 0.10
April		< 0.10
May	< 0.10	
June	< 0.10	
July	< 0.10	
August	< 0.10	
September	< 0.10	
October	< 0.10	
November		< 0.10
December		< 0.10

Table 1c: *Escherichia coli*, Toxicity and pH Effluent Quality Assessment, 2023

Parameter	*Escherichia coli*	Toxicity		pH	
	Mean Geometric Density	Rainbow Trout	*Daphnia Magma*	6.0	9.5
ECA Limit	200CFU/100mL	Non-toxic Effluent (50%)			
Month	CFU/100mL	% Mortality		Min	Max
January	1.70	0	0	7.80	8.20
February	1.68			8.10	8.30
March	1.93			8.10	8.30
April	1.68	0	0	7.10	8.30
May	2.33			7.10	7.70
June	1.63			7.50	7.70
July	1.78	0	0	7.40	7.60
August	1.58			7.40	7.90
September	1.68			6.70	7.10
October	1.58	0	0	6.70	7.30
November	1.68			7.40	8.10
December	1.68			7.60	7.80

Tables 1 a – c show detailed results of compliance monitoring parameters noted in Environmental Compliance Approval No. 5464-AKATW7 against associated compliance objectives, limits and ranges. There were no instances of non-compliance with compliance limits or exceedances of compliance objectives.

Table 2: Effluent Quality Operational Monitoring Data, 2023

Month	Total Kjeldahl Nitrogen	Unionized Ammonia	Unionized Ammonia @ 15^{O}C	Nitrite	Nitrate
	mg/L	mg/L	mg/L	mg/L	mg/L
January	0.90	0.001	0.004	0.03	11.65
February	0.50	0.002	0.003	0.03	12.45
March	1.40	0.002	0.004	0.03	11.19
April	0.50	0.001	0.002	0.03	10.06
May	0.50	0.001	0.002	0.03	10.12
June	1.00	0.001	0.001	0.03	11.52
July	0.50	0.001	0.001	0.03	7.26
August	0.50	0.001	0.001	0.03	8.10
September	0.50	0.001	0.001	0.03	13.07
October	0.50	0.001	0.001	0.03	15.58
November	0.70	0.001	0.001	0.03	19.65
December	0.50	0.001	0.001	0.03	11.80

Effluent monitoring samples are collected in addition to those required by the Environmental Compliance Approval No. 5464-AKATW7 for operational efficiency determination and effluent quality monitoring.

Table 3: Influent Quality Monitoring Data, 2023

Month	Biochemical Oxygen Demand	Carbonaceous Biochemical Oxygen Demand	Total Suspended Solids	Total Phosphorus	Total Kjeldahl Nitrogen
	Monthly Mean Concentration				
	mg/L	mg/L	mg/L	mg/L	mg/L
January	69.80	55.00	82.00	1.13	7.84
February	98.00	77.50	96.00	1.64	13.70
March	150.50	97.75	162.25	2.08	10.95
April	159.75	132.75	266.50	2.27	13.25
May	91.80	73.60	118.00	1.71	9.38
June	68.25	64.25	96.75	1.48	11.80
July	108.25	93.50	161.00	2.36	13.53
August	124.60	102.60	138.40	1.79	13.44
September	96.50	81.00	113.00	1.82	17.75
October	55.60	41.60	67.80	2.37	13.38
November	57.75	48.50	95.25	2.08	17.85
December	71.75	64.25	70.00	0.90	8.98

Influent monitoring samples are collected in addition to those required by the Environmental Compliance Approval No. 5464-AKATW7 to determine treatment efficiency.

Effluent Quality Interpretations

Carbonaceous Biochemical Oxygen Demand (CBOD)

Influent

Sampling Frequency: Weekly
Sample Type: Composite
Environmental Compliance Approval Requirement: Weekly

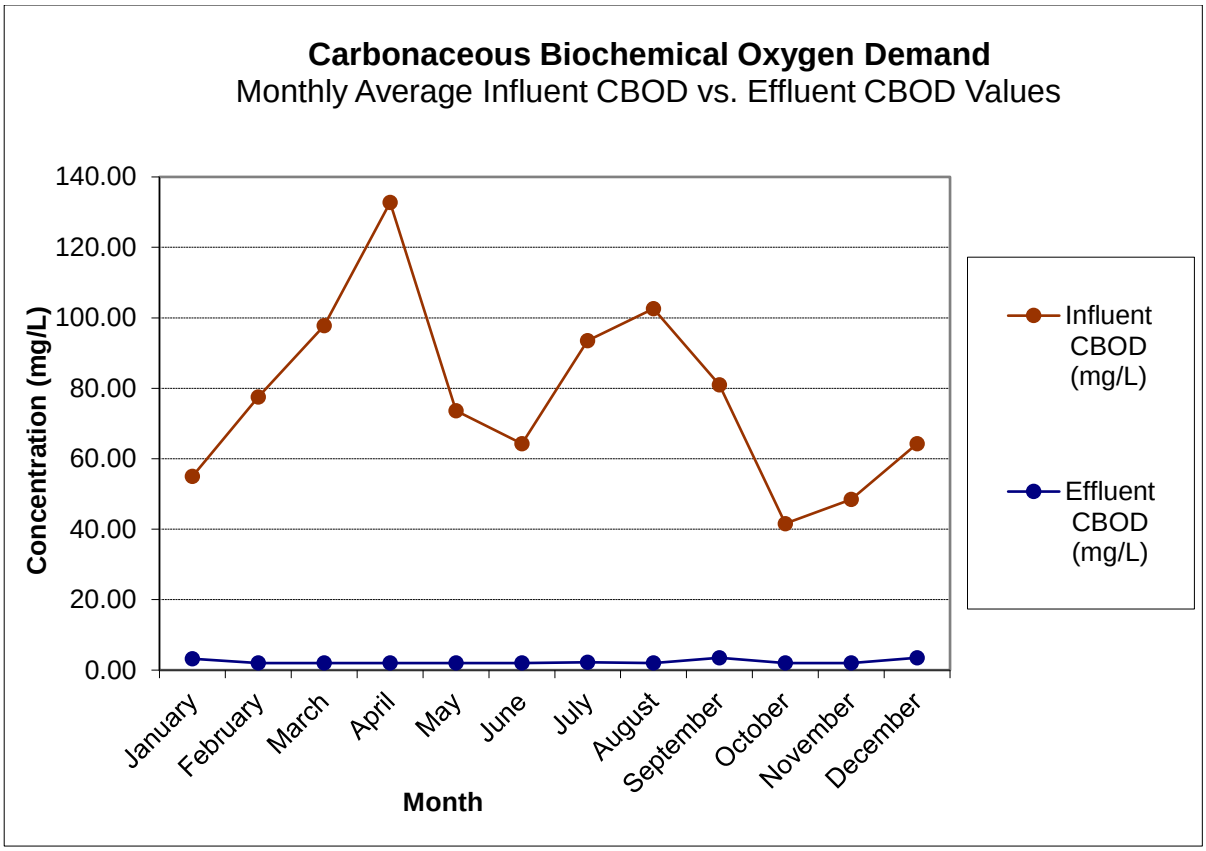
Effluent

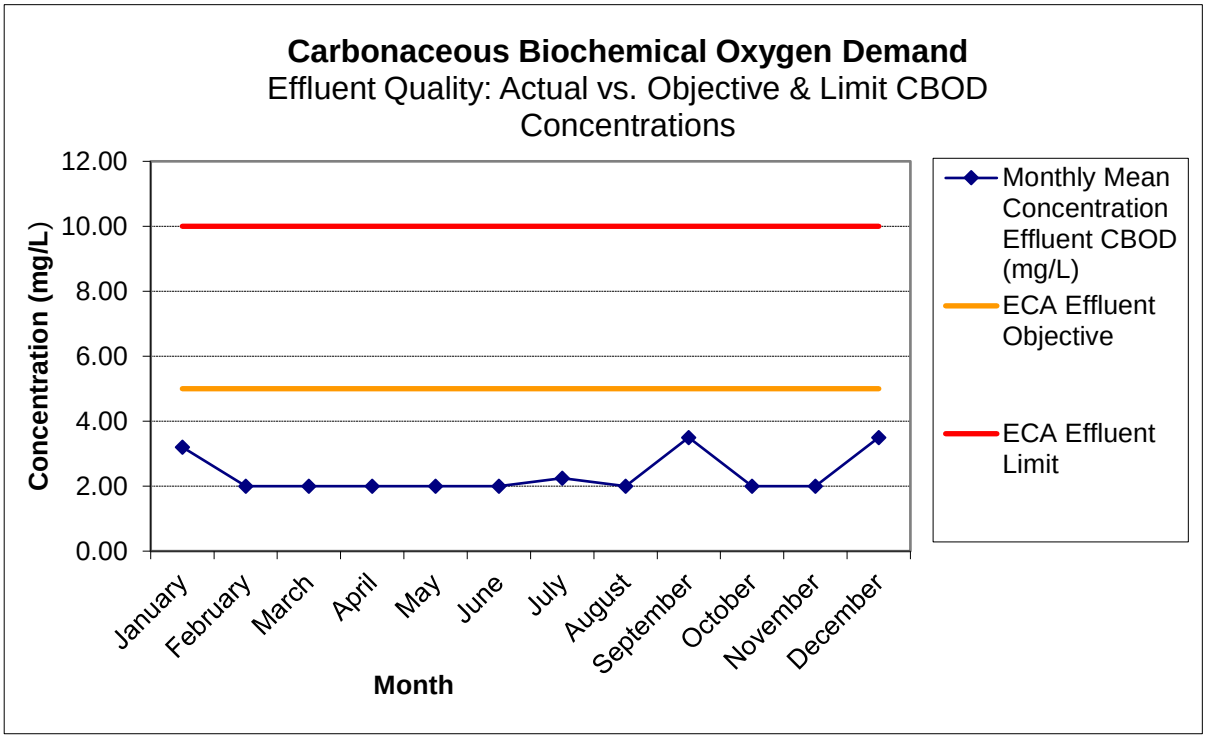
Sampling Frequency: Weekly
Sample Type: Composite
Environmental Compliance Approval Requirement: Weekly
Compliance Objective: 5mg/L
Compliance Limit: 10mg/L
Compliance Limit Exceedance: No

Table 4: Carbonaceous Biochemical Oxygen Demand Percent Removal Values, 2023

Month	Influent Carbonaceous Biochemical Oxygen Demand	Effluent Carbonaceous Biochemical Oxygen Demand	Percent Removal Carbonaceous Biochemical Oxygen Demand
	Monthly Mean Concentration		%
	mg/L	mg/L	
January	55.00	3.20	94.18
February	77.50	2.00	97.42
March	97.75	2.00	97.95
April	132.75	2.00	98.49
May	73.60	2.00	97.28
June	64.25	2.00	96.89
July	93.50	2.25	97.59
August	102.60	2.00	98.05
September	81.00	3.50	95.68
October	41.60	2.00	95.19
November	48.50	2.00	95.88
December	64.25	3.50	94.55

Table 4: Carbonaceous Biochemical Oxygen Demand analysis on both influent and effluent streams were collected as per Environmental Compliance Approval No. 5464-AKATW7 requirements. No exceedances of compliance objectives or limits were demonstrated in the 2023 operational year.


Carbonaceous Biochemical Oxygen Demand
Monthly Average Influent CBOD vs. Effluent CBOD Values
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
Concentration (mg/L)
January
February
March
April
May
June
July
August
September
October
November
December
Month
Influent CBOD (mg/L)
Effluent CBOD (mg/L)


Carbonaceous Biochemical Oxygen Demand
Effluent Quality: Actual vs. Objective & Limit CBOD Concentrations
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Concentration (mg/L)
January
February
March
April
May
June
July
August
September
October
November
December
Month
Monthly Mean Concentration Effluent CBOD (mg/L)
ECA Effluent Objective
ECA Effluent Limit

Total Suspended Solids (TSS)

Influent

Sampling Frequency: Weekly
Sample Type: Composite
Environmental Compliance Approval Requirement: Weekly

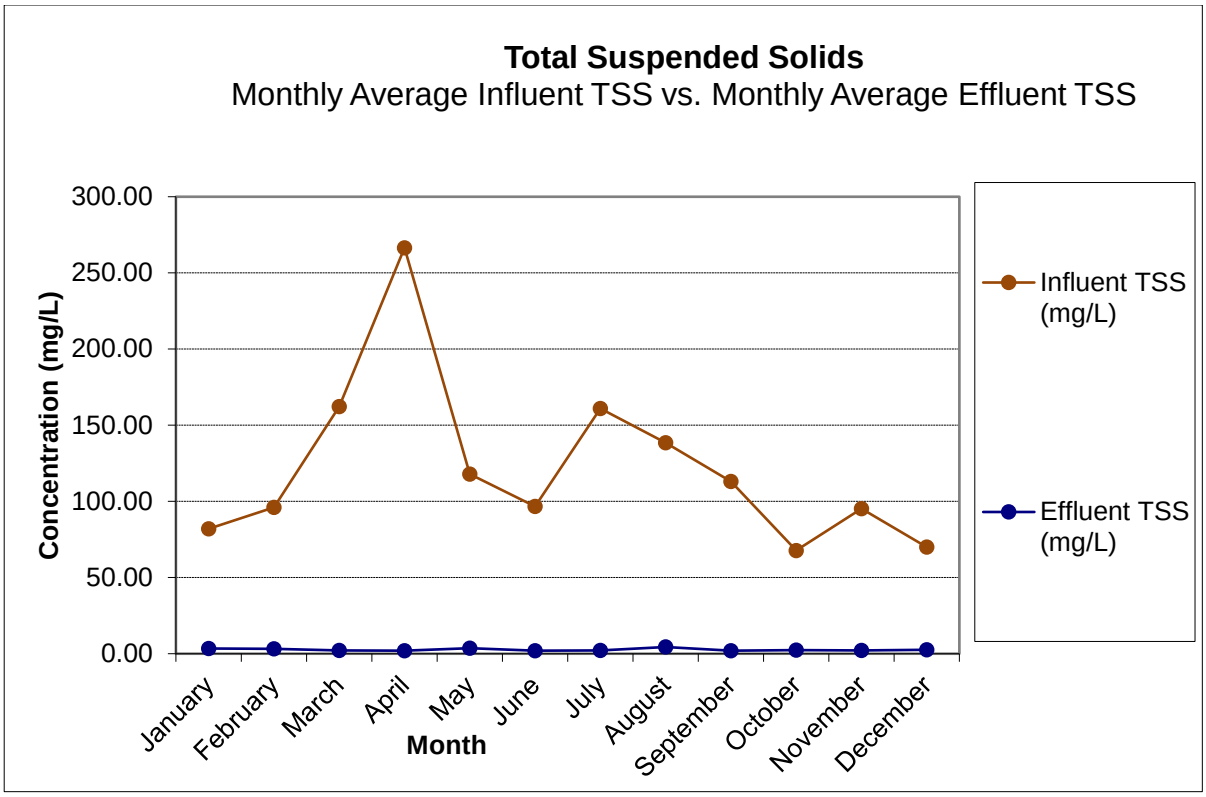
Effluent

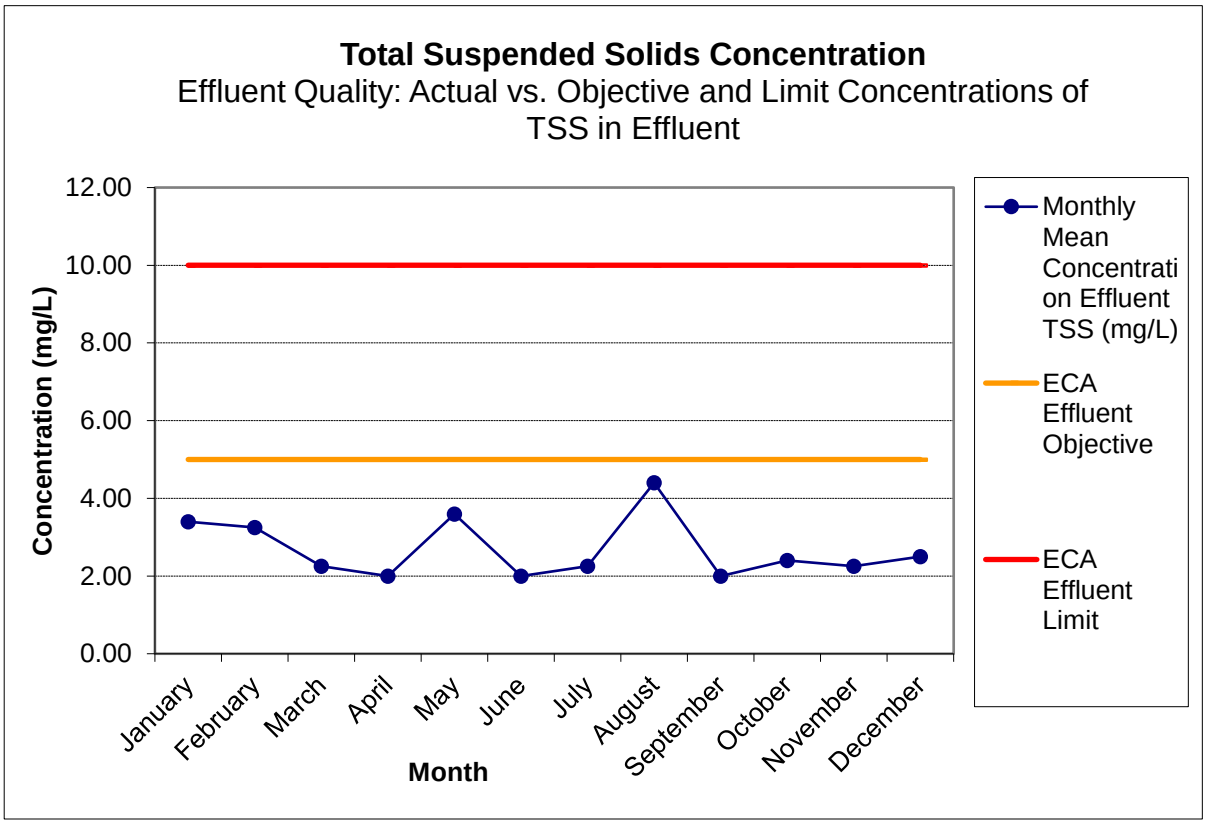
Sampling Frequency: Weekly
Sample Type: Composite
Environmental Compliance Approval Requirement: Weekly
Compliance Objective: 5mg/L
Compliance Limit Monthly Average Concentration: 10mg/L
Compliance Limit Monthly Average Daily Waste Loading: N/A
Compliance Limit Exceedance: No

Table 5: Total Suspended Solids Percent Removal Values, 2023

Month	Influent Total Suspended Solids	Effluent Total Suspended Solids	Percent Removal Total Suspended Solids
	Monthly Mean Concentration		%
	mg/L	mg/L	
January	82.00	3.40	95.85
February	96.00	3.25	96.61
March	162.25	2.25	98.61
April	266.50	2.00	99.25
May	118.00	3.60	96.95
June	96.75	2.00	97.93
July	161.00	2.25	98.60
August	138.40	4.40	96.82
September	113.00	2.00	98.23
October	67.80	2.40	96.46
November	95.25	2.25	97.64
December	70.00	2.50	96.43

Table 5: Influent and effluent Total Suspended Solids sampling during the 2023 operational year were collected as per Environmental Compliance Approval No. 5464-AKATW7 requirements. At no time were the compliance limits or objectives exceeded.


Total Suspended Solids
Monthly Average Influent TSS vs. Monthly Average Effluent TSS
300.00
250.00
200.00
150.00
100.00
50.00
0.00
Concentration (mg/L)
January
February
March
April
May
June
July
August
September
October
November
December
Month
Influent TSS (mg/L)
Effluent TSS (mg/L)


Total Suspended Solids Concentration
Effluent Quality: Actual vs. Objective and Limit Concentrations of TSS in Effluent
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Concentration (mg/L)
January
February
March
April
May
June
July
August
September
October
November
December
Month
Monthly Mean Concentration Effluent TSS (mg/L)
ECA Effluent Objective
ECA Effluent Limit

Total Phosphorus (TP)

Influent

Sampling Frequency: Weekly
Sample Type: Composite
Environmental Compliance Approval Requirement: Weekly

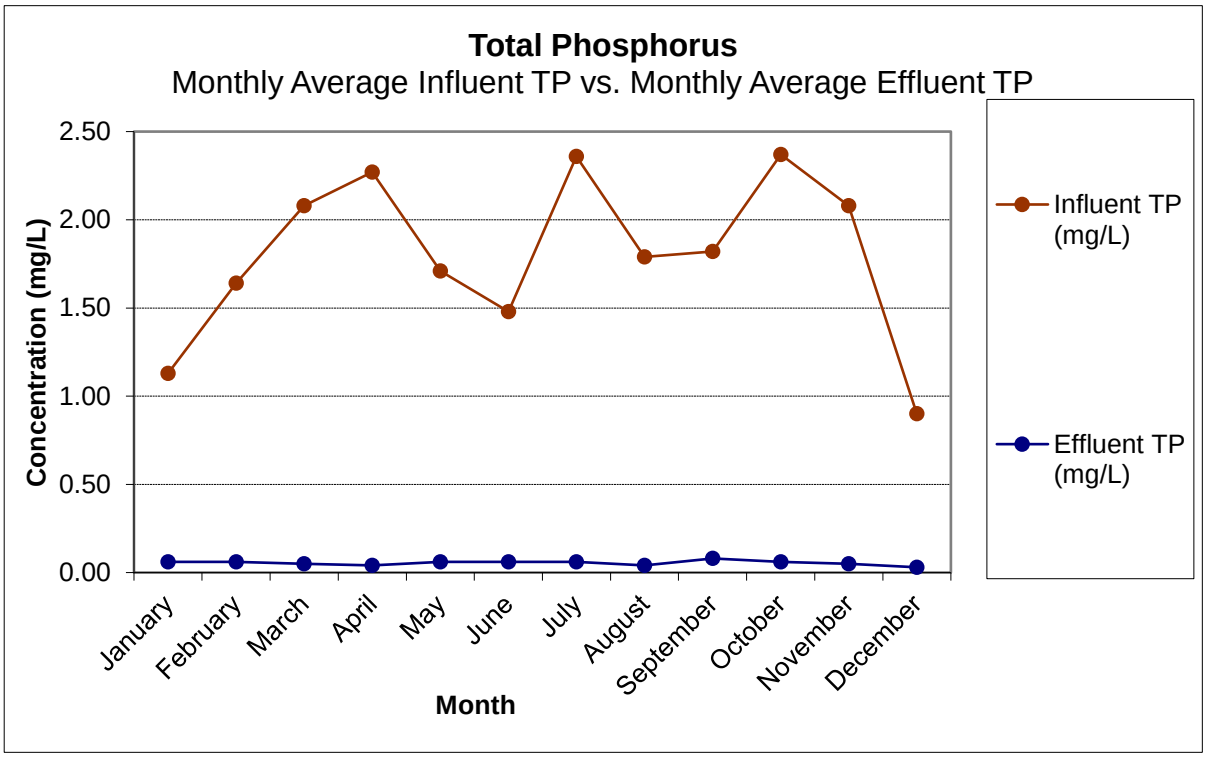
Effluent

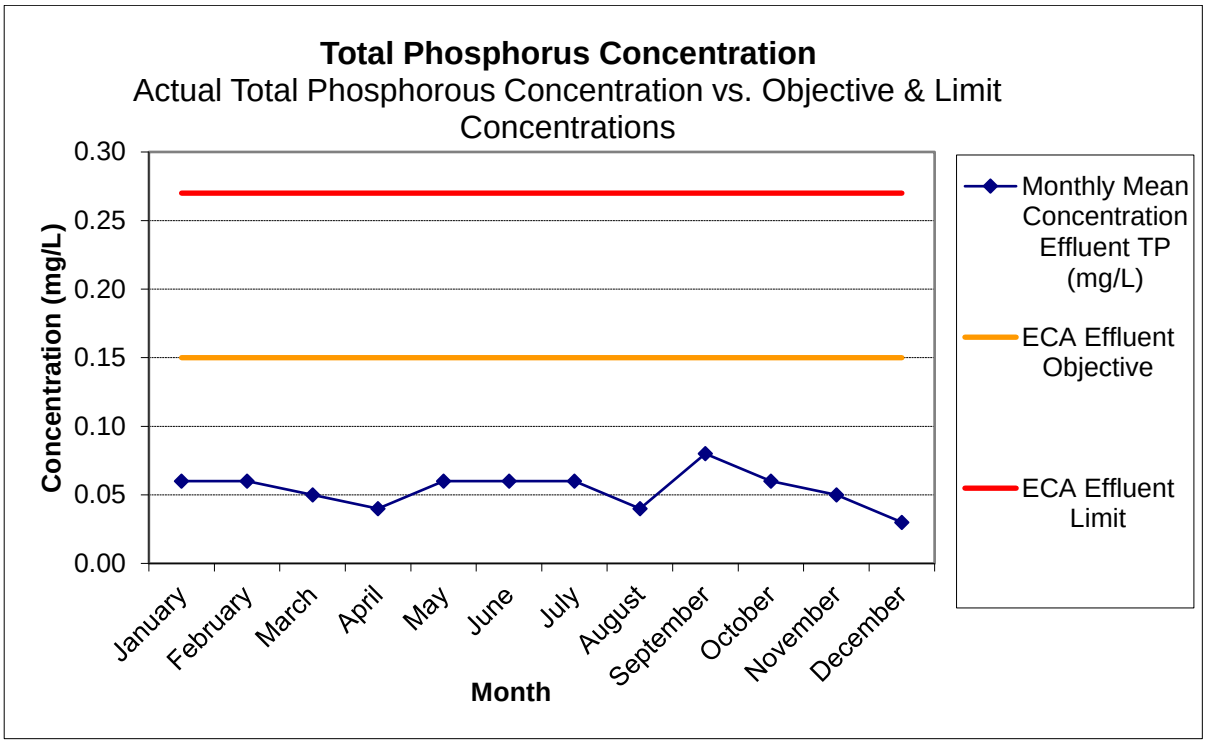
Sampling Frequency: Weekly
Sample Type: Composite
Environmental Compliance Approval Requirement: Weekly
Compliance Objective: 0.15mg/L
Compliance Limit Monthly Average Concentration: 0.27mg/L,
Compliance Limit Monthly Average Daily Waste Loading: 1.63kg/d
Compliance Limit Exceedance: No

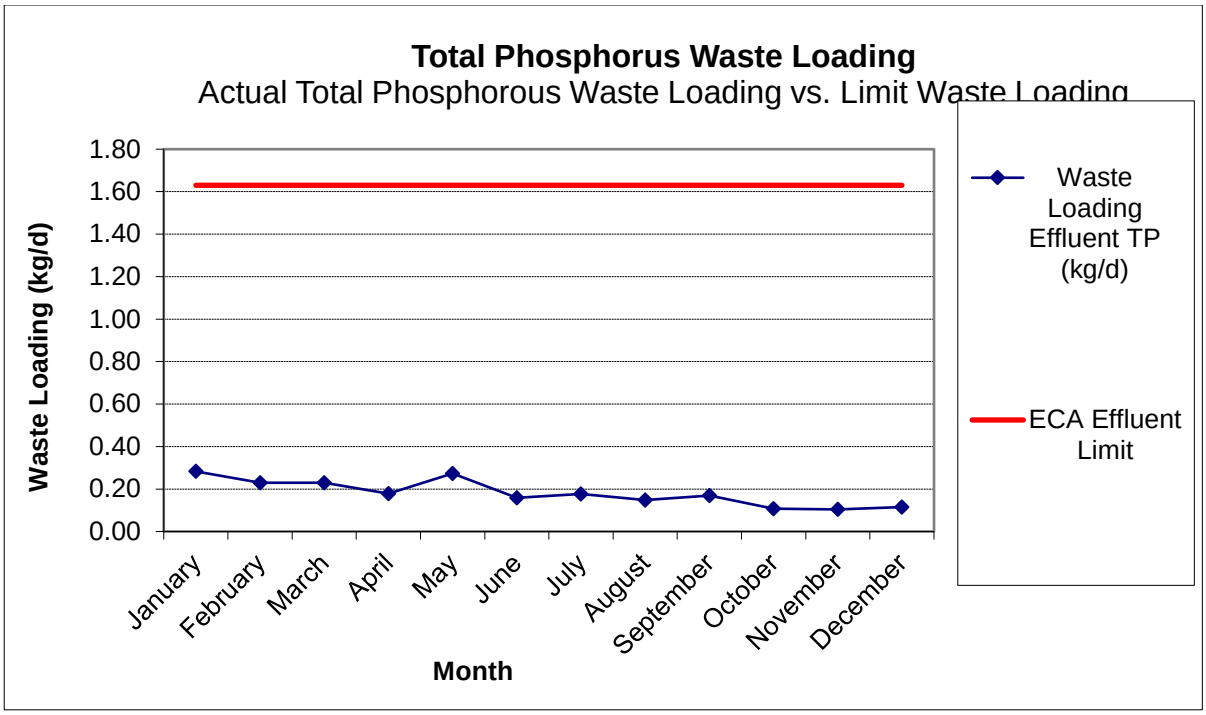
Table 6: Total Phosphorus Percent Removal Values, 2023

Month	Influent Total Phosphorus	Effluent Total Phosphorus	Percent Removal Total Phosphorus
	Monthly Mean Concentration		%
	mg/L	mg/L	
January	1.13	0.06	94.69
February	1.64	0.06	96.34
March	2.08	0.05	97.60
April	2.27	0.04	98.24
May	1.71	0.06	96.49
June	1.48	0.06	95.95
July	2.36	0.06	97.46
August	1.79	0.04	97.77
September	1.82	0.08	95.60
October	2.37	0.06	97.47
November	2.08	0.05	97.60
December	0.90	0.03	96.67

Table 6: Weekly Total Phosphorus sampling in both influent and effluent streams met Environmental Compliance Approval No. 5464-AKATW7 sampling requirements throughout the 2023 operational year. No exceedances of Environmental Compliance Approval limits or objectives were observed during the 2023 operational year for monthly average concentrations or monthly average waste loading.


Total Phosphorus
Monthly Average Influent TP vs. Monthly Average Effluent TP
Concentration (mg/L)
2.50
2.00
1.50
1.00
0.50
0.00
January
February
March
April
May
June
July
August
September
October
November
December
Month
Influent TP (mg/L)
Effluent TP (mg/L)


Total Phosphorus Concentration
Actual Total Phosphorous Concentration vs. Objective & Limit Concentrations
Concentration (mg/L)
0.30
0.25
0.20
0.15
0.10
0.05
0.00
January
February
March
April
May
June
July
August
September
October
November
December
Month
Monthly Mean Concentration Effluent TP (mg/L)
ECA Effluent Objective
ECA Effluent Limit


Total Phosphorus Waste Loading
Actual Total Phosphorous Waste Loading vs. Limit Waste Loading
Waste Loading (kg/d)
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
January
February
March
April
May
June
July
August
September
October
November
December
Month
Waste Loading Effluent TP (kg/d)
ECA Effluent Limit

pH

Influent

Sampling Frequency: Weekly (minimum)
Sample Type: Grab
Environmental Compliance Approval Requirement: N/A

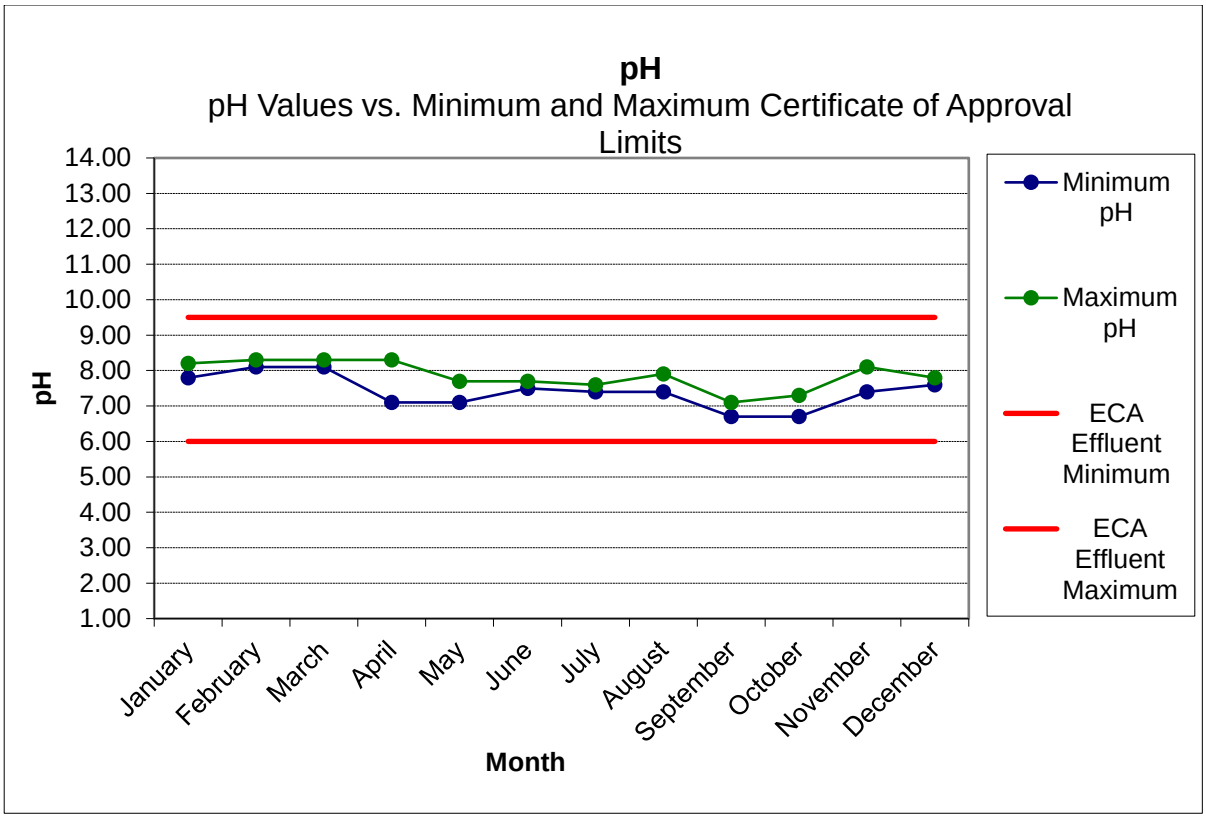
Effluent

Sampling Frequency: Weekly (minimum)
Sample Type: Grab
Environmental Compliance Approval Requirement: Weekly
Compliance Objective: Range 6-9.5
Compliance Limit: Range 6-9.5
Compliance Limit Exceedance: No

Table 7: pH Minimum and Maximum Values, 2023

Month	Minimum pH	Maximum pH
January	7.80	8.20
February	8.10	8.30
March	8.10	8.30
April	7.10	8.30
May	7.10	7.70
June	7.50	7.70
July	7.40	7.60
August	7.40	7.90
September	6.70	7.10
October	6.70	7.30
November	7.40	8.10
December	7.60	7.80

Table 7: The pH of the effluent was monitored on a weekly basis (at minimum) and was compared to Compliance Limits and Objectives dictated in Environmental Compliance Approval No. 5464-AKATW7. Additional monitoring samples are routinely collected for in-house laboratory analysis in addition to the results indicated here. No exceedances of Environmental Compliance Approval limits were observed during the 2023 operational year for pH.


pH
pH Values vs. Minimum and Maximum Certificate of Approval Limits
14.00
13.00
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
pH
January
February
March
April
May
June
July
August
September
October
November
December
Month
Minimum pH
Maximum pH
ECA Effluent Minimum
ECA Effluent Maximum

Disinfection: *Escherichia coli* (*E. coli*) Geometric Mean Density

Influent

Sampling Frequency: N/A
Environmental Compliance Approval Requirement: N/A

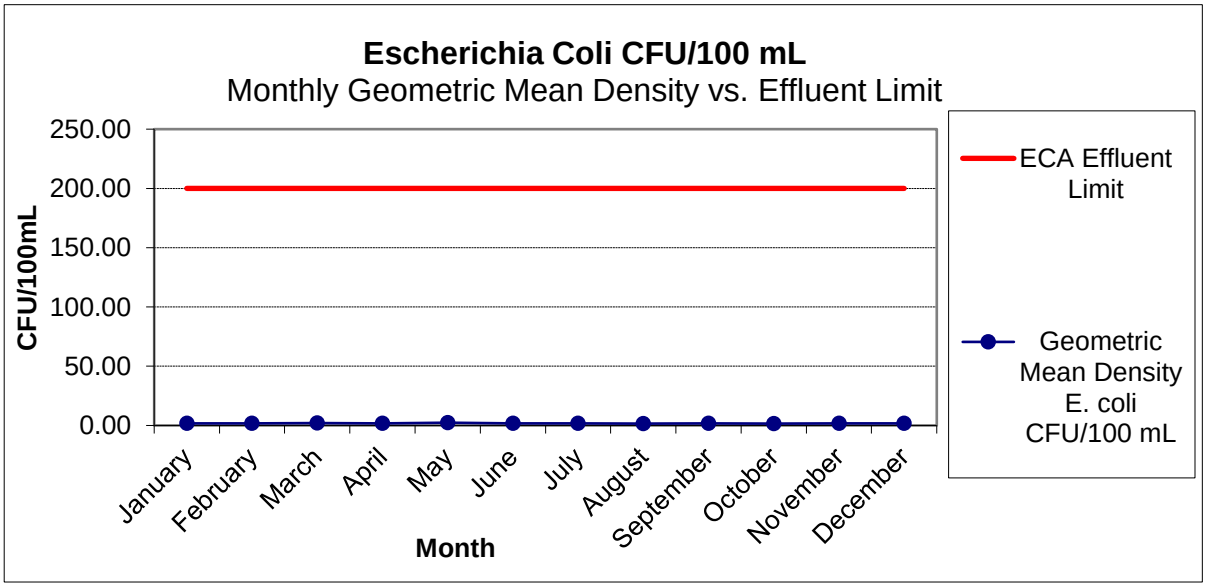
Effluent

Sampling Frequency: Weekly
Sample Type: Grab
Environmental Compliance Approval Requirement: Weekly
Compliance Objective: 200 CFU/100mL Geometric Mean Density
Compliance Limit: 200 CFU/100mL Geometric Mean Density
Compliance Limit Exceedance: No

Table 8: *Escherichia coli* Geometric Mean Density Values, 2023

Month	Geometric Mean Density
	CFU/100mL
January	1.70
February	1.68
March	1.93
April	1.68
May	2.33
June	1.63
July	1.78
August	1.58
September	1.68
October	1.58
November	1.68
December	1.68

Table 8: Disinfection efficiency by ultraviolet radiation is demonstrated by weekly final effluent grab samples analyzed for presence of *E. coli*. All Environmental Compliance Approval No. 5464-AKATW7 requirements were met during the 2023 operational year.



Nitrogen Removal

Total Ammonia Nitrogen (TAN)

Influent

Sampling Frequency: Weekly (Monitoring)
Sample Type: Composite
Environmental Compliance Approval Requirement: N/A

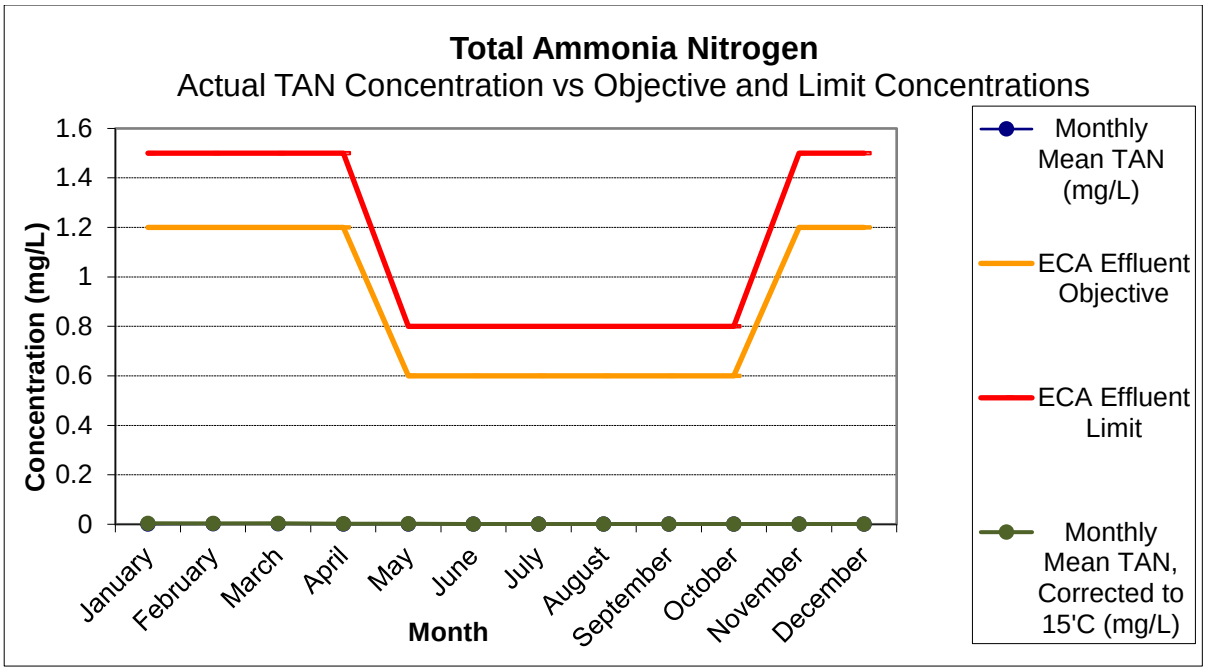
Effluent

Sampling Frequency: Weekly
Sample Type: Composite
Environmental Compliance Approval Requirement: Weekly
Compliance Objective: May–October 0.6mg/L, November–April 1.2mg/L
Compliance Limit: May–October 0.8mg/L, November–April 1.5mg/L
Compliance Limit Exceedance: No

Table 9: Total Ammonia Nitrogen Values, 2023

Month	Total Ammonia Nitrogen Concentration Effluent	Total Ammonia Nitrogen Concentration Effluent, Temperature Corrected to 15°C
	Monthly Mean	
	mg/L	mg/L
January	0.001	0.004
February	0.002	0.003
March	0.002	0.004
April	0.001	0.002
May	0.001	0.002
June	0.001	0.001
July	0.001	0.001
August	0.001	0.001
September	0.001	0.001
October	0.001	0.001
November	0.001	0.001
December	0.001	0.001

Table 9: Sampling of nitrogenous compounds in influent and effluent streams met Environmental Compliance Approval No. 5464-AKATW7 sampling requirements throughout the 2023 operational year. Additional monitoring samples were collected for process control and to determine removal efficiencies.


Total Ammonia Nitrogen
Actual TAN Concentration vs Objective and Limit Concentrations
Concentration (mg/L)
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
January
February
March
April
May
June
July
August
September
October
November
December
Month
Monthly Mean TAN (mg/L)
ECA Effluent Objective
ECA Effluent Limit
Monthly Mean TAN, Corrected to 15'C (mg/L)

Effluent Toxicity: Rainbow Trout and *Daphnia magna* Acute Mortality Testing

Influent

Sampling Frequency: N/A
Sample Type: N/A
Environmental Compliance Approval Requirement: N/A

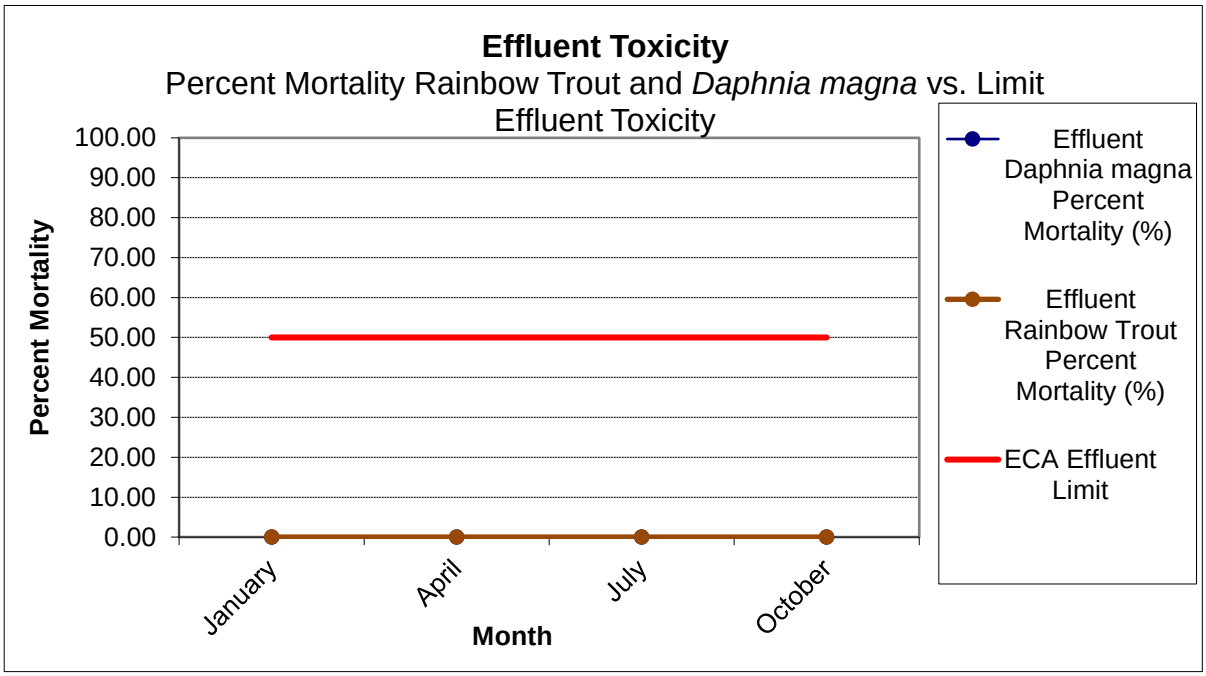
Effluent

Sampling Frequency: Quarterly
Sample Type: Grab
Environmental Compliance Approval Requirement: Monthly, reduced to quarterly after 12 consecutive non-toxic samples. (Condition satisfied.)
Compliance Objective: Non-toxic effluent
Compliance Limit: Non-toxic effluent (Percent Mortality <50%)
Compliance Limit Exceedance: No

Table 10: Effluent Toxicity Values, 2023

Month	Effluent *Daphnia magna* Percent Mortality	Effluent Rainbow Trout Percent Mortality
	%	%
January	0	0
April	0	0
July	0	0
October	0	0

Table 10: Toxicity sampling that was conducted during the 2023 operational year met Environmental Compliance Approval No. 5464-AKATW7 requirements. Verification of qualification for reduced quarterly sampling was provided by the Ministry of the Environment and Climate Change, Environmental Officer on November 1, 2012. No exceedances of Environmental Compliance Approval limits were observed during the 2023 operational year.



Effluent Quality Assurance and Control Measures

Condition 11.4(d)

Effluent analysis on all compliance and monitoring parameters listed in Environmental Compliance Approval No. 5464-AKATW7 is performed by accredited laboratories; SGS Lakefield and SGS London while Caduceon Environmental Laboratories serves as a back-up if required. Toxicity analysis for acute lethality testing on Rainbow Trout and *Daphnia magna* species are conducted by Nautilus Environmental. Sample collection and in-house laboratory analysis are performed by licensed wastewater operators.

Sampling for parameters outlined in Environmental Compliance Approval No. 5464-AKATW7 are collected at the required frequencies by defined methods and referenced against compliance limits and objectives. In the event of bypass or upset conditions, additional final effluent samples are collected as required. In-house and laboratory monitoring samples in addition to those listed in the Environmental Compliance Approvals and legislative instruments are collected and assessed for determination of treatment effectiveness and removal efficiencies. Ongoing evaluation of non-regulative monitoring samples will continue as a control measure for ensuring effluent quality and to assist in optimization of operational processes.

The system is also monitored by SCADA controls complete with alarming mechanisms in the event of operational problems. After hours the alarms are routed through an alarm company giving 24-hour monitoring of the system.

Capacity Assessment: Influent and Effluent Quantities

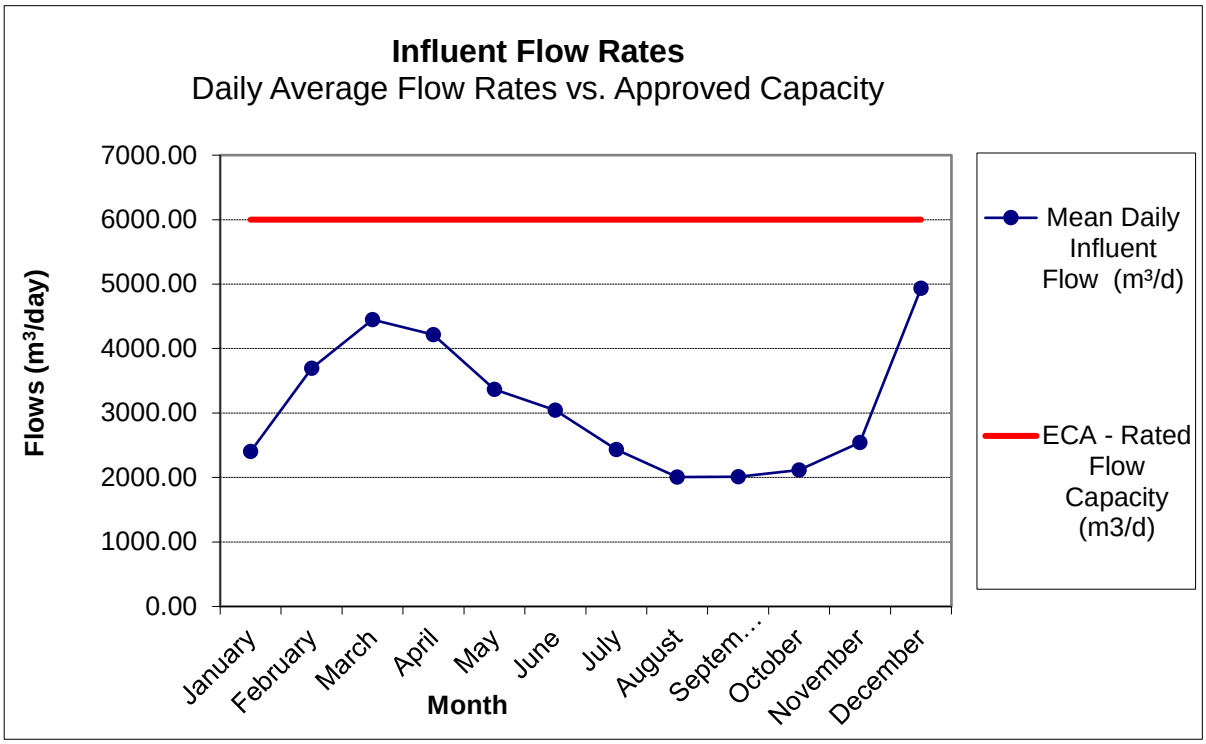
Based on the 2023 flow data, the Picton Wastewater Treatment Plant maintained operations within approved capacity requirements as per Environmental Compliance Approval No. 5464-AKATW7.

Table 11: Influent Quantity; Flow Data, 2023

Month	Approved Capacity (Rated Capacity) [1]	Monthly Average	Approved Capacity (Peak Daily Flow Rate) [2]	Monthly Peak Flow
	m^3/day	m^3/day	m^3/day	m^3/day
January	6000	2402.90	26400	2899.08
February	6000	3694.28	26400	8700.72
March	6000	4448.13	26400	6242.90
April	6000	4214.77	26400	5778.94
May	6000	3367.21	26400	4882.22
June	6000	3046.50	26400	3936.16
July	6000	2433.36	26400	2973.17
August	6000	2007.21	26400	2352.67
September	6000	2013.84	26400	4172.76
October	6000	2117.46	26400	2713.45
November	6000	2542.48	26400	5308.81
December	6000	4932.96	26400	16448.88
Annual	**6000**	**3101.76**	**26400**	**5534.15**

Note[1]: *As per ECA No. 5464-AKATW7, "Rated Capacity" is defined as the Annual Average Daily Flow for which the Sewage Treatment Plant is designed to handle. The Picton WWTP maintained an average daily flow within approved capacity requirements for the 2023 operational year.*

Note[2]: *As per ECA No. 5464-AKATW7, "Peak Flow Rate" is defined as the Peak Instananeous Flow Rate, Peak Hourly Flow Rate or Peak Daily Flow Rate for which the Sewage Treatment Plant or treatment process unit or equipment is designed to handle, as appropriate. The Picton WWTP maintained Peak Daily Flow Rate within approved capacity requirements for the 2023 operational year.*


Influent Flow Rates
Daily Average Flow Rates vs. Approved Capacity
Flows (m³/day)
7000.00
6000.00
5000.00
4000.00
3000.00
2000.00
1000.00
0.00
January
February
March
April
May
June
July
August
Septem…
October
November
December
Month
Mean Daily Influent Flow (m³/d)
ECA - Rated Flow Capacity (m3/d)

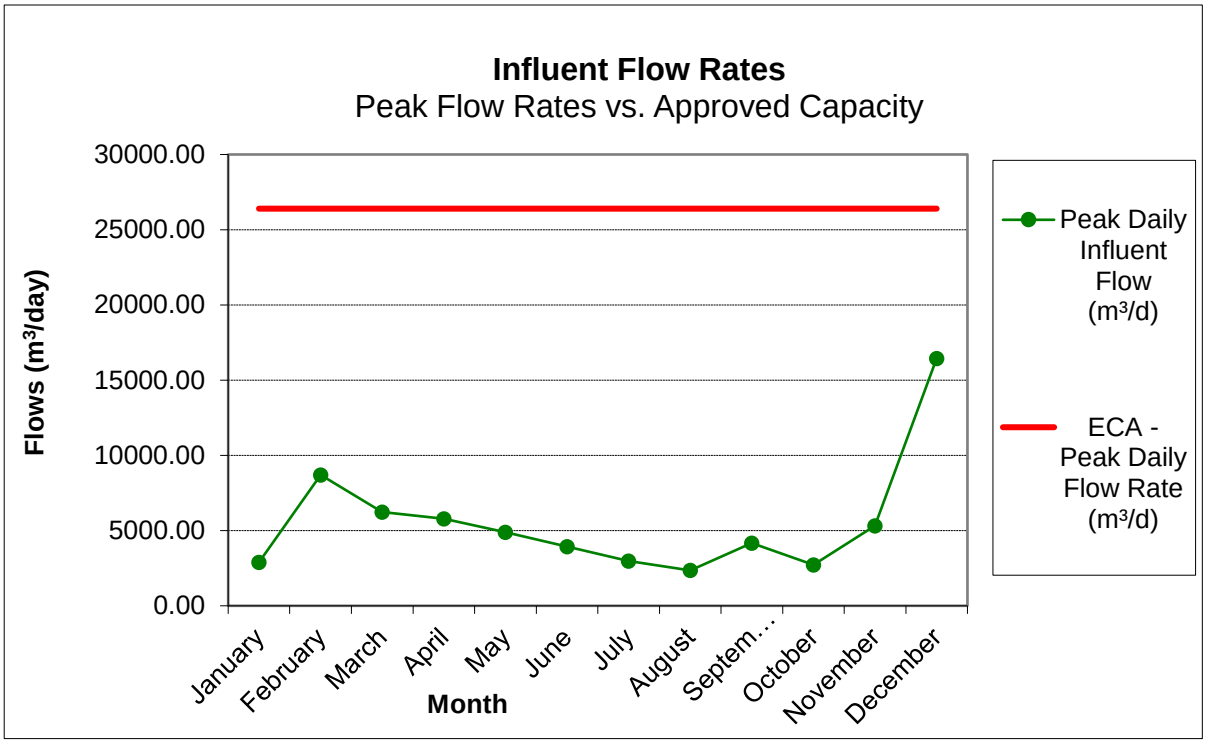

Influent Flow Rates
Peak Flow Rates vs. Approved Capacity
Flows (m³/day)
30000.00
25000.00
20000.00
15000.00
10000.00
5000.00
0.00
January
February
March
April
May
June
July
August
Septem…
October
November
December
Month
Peak Daily Influent Flow (m³/d)
ECA - Peak Daily Flow Rate (m³/d)

Table 12: Historical Influent Flows, 2014-2023

Year	Total Influent Flow	Annual Average Daily Flow
	m^3	m^3/day
2014	1146429.54	3140.90
2015	865255.04	2370.56
2016	977265.12	2670.12
2017	1308584.33	3585.16
2018	1142974.13	3131.44
2019	1195875.12	3276.37
2020	1023748.86	2793.59
2021	858004.49	2350.70
2022	1130953.94	3098.50
2023	1290722.78	3536.23

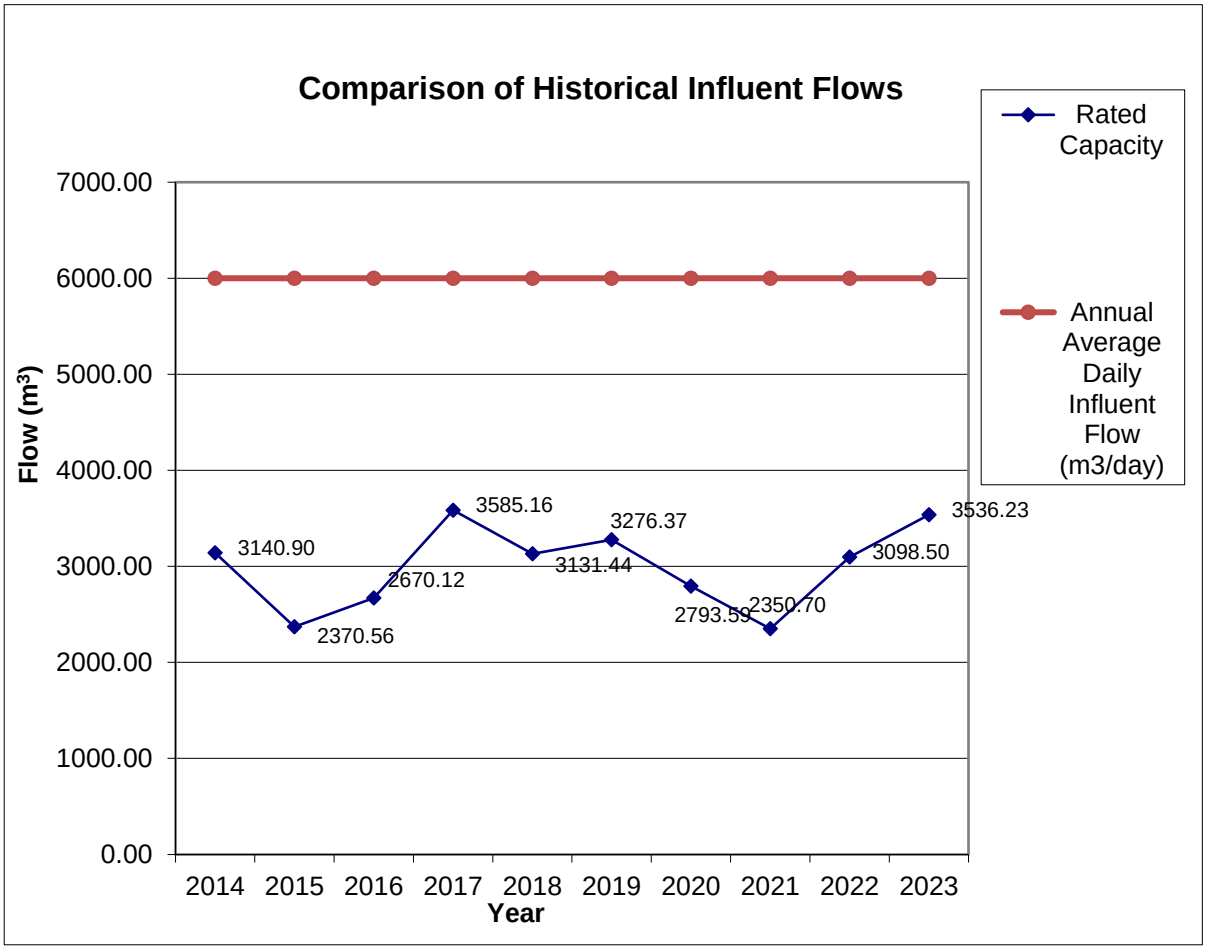
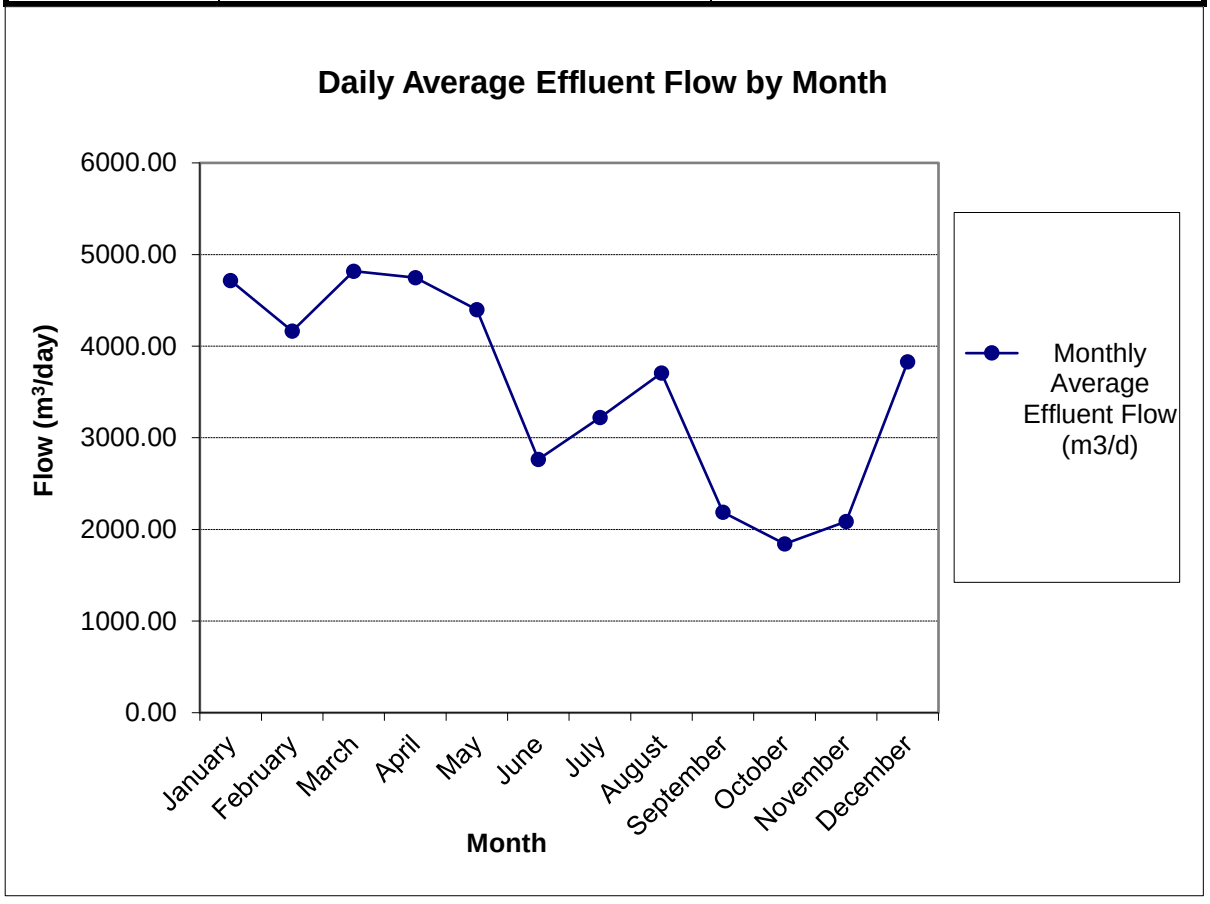


Table 13: Effluent Quantity Flow Data, 2023

Month	Monthly Average	Total Flow
	m^3/day	m^3
January	4715.74	146187.92
February	4163.32	116573.01
March	4818.85	149384.26
April	4748.30	142448.99
May	4398.63	136357.41
June	2763.99	82919.82
July	3221.46	99865.41
August	3707.18	114922.63
September	2186.36	65590.92
October	1842.05	57103.43
November	2088.12	62643.48
December	3827.38	118648.84



Event Summary

Condition 11.4(i)

Table 14: Event Summary, 2023

Date	Description
No events of bypass, spill, upset conditions or events outside of normal operating conditions have been identified for the 2023 operational year.	

Complaints and Customer Concerns

Condition 11.4(h)

Customer complaints and associated corrective actions for 2023 are outlined as follows:

- January 5, 2023: Sewage backup reported in a private residence. Plumber responded to the site and advised that there was a blockage on the municipal sewer. Staff investigated and determined that the sewer was operating as intended and that the affected sewer lateral was blocked by roots. Information was provided to prevent future occurrence.

- January 5, 2023: Call from a private resident stating that they had no sewer service. A contractor found the sewer lateral and discovered it to be broken at the sewer main. A new sewer lateral was installed from the property line to the sewer main. A clean out was also installed at the property line.

- January 23, 2023: Sewage backup reported in a private residence. Plumber responded to the site and advised that there was a blockage in the municipal sewer. Further inspection revealed that the sewer lateral was broken at the connection to the sewer main. A new sewer lateral was installed from the property line to the sewer main. A clean out was also installed at the property line.

- January 23, 2023: Sewage backup reported in a private residence. Plumber responded to the site and advised that there was a blockage on the municipal sewer. A contractor determined that there was a large build-up of grease in the sewer main due to level issues and poor condition of the sewer. The contractor flushed the sewer and was contracted to flush the sewer monthly to mitigate any further issues. Design of a new sewer main planned for 2024 with replacement occurring in 2025.

- February 9, 2023: Sewage backup reported in a private residence. Plumber responded to the site and advised that there was a blockage in the municipal sewer. Staff investigated and determined that the sewer was operating as intended and that the affected sewer lateral was blocked by roots. Information was provided to prevent future occurrence.

- March 10, 2023: Sewage backup reported in a private residence. Staff investigate and determined that the sewer was operating as intended. Further investigation found roots to be blocking the private lateral and removed them. Information was provided to prevent future occurrence.

- May 29, 2023: Sewage backup reported in a private residence. Plumber responded to the site and advised that there was a blockage in the municipal sewer. Staff investigated and determined that the sewer was operating as intended and referred the home owner to a contractor to address a potential lateral break.

- May 31, 2023: Sewage backup reported in a private residence. Plumber responded to the site and advised that there was a blockage in the municipal sewer. The sewer was inspected and determined to be filled with grease from a private residence. The home owner was notified and was working with the plumber to have the grease removed. The municipal sewer was flushed to remove any debris and normal sewer operation was restored.

- June 28, 2023: Sewage backup reported in a private residence. Plumber responded to the site and advised that there was a blockage in the municipal sewer. Further inspection revealed that the portions of the sewer main had collapsed. The sewer main in the affected area was replaced.

- July 7, 2023: Sewage backup reported in a private residence. Plumber responded to the site and advised that there was a blockage in the municipal sewer. Staff investigated and confirmed that the sewer was blocked. The sewer was inspected and flushed and normal operation was restored.

- July 17, 2023: A resident reported a sewer odour in a private residence. Staff investigated and determined that the sewer was operating as intended and referred the home owner to a plumber.

- July 18, 2023: A resident reported concerns involving a sinking manhole cover. The manhole cover was inspected and found be in a condition that does not require repairs at this time.
- August 24, 2023: Sewage backup reported in a private residence. Staff investigated and determined that the sewer was operating as intended and referred the home owner to a plumber.

- October 13, 2023: Sewage backup reported in a private residence. Staff attended the site and removed roots from the sewer lateral. The roots were determined to stem from a tree located on municipal property.

Overview of the Success and Adequacy of the Works, Operating Problems and Corrective Actions

Condition 11.4(a) and (b)

Analysis of sample results demonstrates compliance with Environmental Compliance Approval No. 5464-AKATW7 compliance limits and objectives. There were no exceedences of compliance objectives or limits.

Description of any operating problems encountered and corrective actions taken during 2023:

Date Discovered	Date Resolved	Affected Equipment or Process	Description of any Operating Problems Encountered	Corrective Actions	Who Completed Work
There were no operational problems encountered in 2023.					

Maintenance Summary

Condition 11.4(c)

Summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the works:

System	Date Completed	Equipment/Process	Description of Maintenance
SPT	Jan 11/23	Effluent Disinfection System	12000 hour service requirement for proper operation of the UV disinfection system. Full inspection of UV banks. Replacement of all UV lamps and sleeves.
SPT	Mar 28/23	Lighting	Replace all 750 watt high pressure sodium lighting fixtures with LED lighting fixtures for energy reduction (green initiative)
SPT	Mar 30/23	SPT-RAS Pumping	The RAS pumps VFD had challenging programming controls not suitable for emergency situations. A manual switch was put in place with a manual speed control for ease of operation in the event of loss of PLC
SPX	Mar 30/23	SPX- Rickerton SPS	A new generator was installed due to previous generator reaching end of life. HVAC and minor electrical upgrades were also performed to pump station that conform to TSSA, ESA.
SPX	Apr 3/23	SPX- Bridge ST SPS	A new generator was installed due to previous generator reaching end of life. HVAC and minor electrical upgrades were also performed to pump station that conform to TSSA, ESA.
SPX	Apr 20/23	SPX- Rickerton SPS	Replaced old check valves and isolation valves due to aging infrastructure.
SPT	May 19/23	SPT- Headworks Grit and Rag Removal Process	Failed bearings in gear reduction transfer case for auger conveyor system. Replaced with new gear reduction transfer case and returned auger conveyor back in service.
SPT	Jun 27/23	SPT- Effluent Water Pump	Annual servicing of effluent service water pump. The pump was removed from effluent weir. Pump cleaned of debris and returned to service. No major defects found.
SPT	Aug 2/23	SPT	Maintenance on high voltage electrical supply lines to the treatment plant, including switch gear, main transformer and main electrical switch.

SPX	Aug 24/23	SPX- Lalor Street SPS	Replacement of inlet grinder due to end of life of existing equipment.
SPT	Dec 20/23	SPT- Tertiary Treatment	Tertiary treatment air compressors were replaced with an external air dryer due to end of life. New external air dryer will increase life time and efficiency of filter backwashing equipment.

Additional routine preventative maintenance performed throughout the 2023 operational year:

Collection System: Pumping Stations

- Annual electrical work-orders
- Annual Health and Safety equipment work-orders (fire extinguishers, lifting devices, gas detection equipment, etc.)
- Annual wet well cleaning, inspection and maintenance
- Annual equipment maintenance, calibrations and inspections (generators, submersible pumps flow meters, et. al.)
- Annual lifting device inspections

Treatment System: Picton Wastewater Treatment Plant

- Annual electrical work-orders
- Annual Health and Safety equipment work-orders (fire extinguishers, lifting devices, gas detection equipment, etc.)
- Annual equipment maintenance, calibrations and inspections (blowers, compressors, generators, submersible pumps, flow meters, laboratory equipment, et. al.)
- Required cleaning and inspection of tanks (as necessary)
- Annual lifting device inspections
- Biosolids removal

Effluent Monitoring Equipment Maintenance and Calibration

Condition 11.4(e)

Evaluation of the calibration and maintenance procedures conducted on all monitoring equipment:

Calibration and maintenance conducted on all monitoring equipment have been performed according to the manufacturer's recommendations. All work performed is scheduled through a preventative maintenance task scheduler database which indicates when the calibration and maintenance is to be performed and includes the procedure in the report generated. Upon task completion, data is recorded in the database.

In addition to regular maintenance carried out by licensed operators, flow measuring devices at the Picton Wastewater Treatment and Collection Facilities are calibrated by a certified third party representative on an annual basis. Other operational equipment is submitted for third party review as required.

Table 15: Flow Measuring Equipment Calibrations, 2023

Equipment Location	Description	Calibrated By	Calibration Date
Picton WWTP	WAS Flow Meter (FIT 551)	Tower Electronics Canada Inc.	August 16, 2023
	RAS Flow Meter (FIT 550)		
	Septage Station (FIT 301)		
Hill Street PS	Hill St. PS Effluent (FIT 100)		
Lalor Street PS	Forcemain Flow (FIT 101)		
	Forcemain Flow (FIT 102)		
	Dissipation Chamber (FIT 701)		
Jasper Street PS	Jasper St. (FIT 101)		

Biosolids Management

Condition 11.4(g)

Tabulation of the volume of sludge generated in 2023 and an outline of the anticipated volumes to be generated in 2024:

All sludge generated during 2023 was land applied inside Prince Edward County by GFL Environmental Inc. The sludge volumes can be assessed as listed below in ***Table 16:*** *Biosolids Management Quantities*.

Table 16: Biosolids Management Quantities for Picton Wastewater Treatment Plant, 2023

Date	NASM #	Farmer/ Landowner	Township	Ward	Total Volume m^3
October 4-16, 2023	60858	Gary Parks	Prince Edward	Hallowell	2524
October 16-19, 2023	60858	Gary Parks	Prince Edward	Hallowell	1192
Total					3716

Outline of the proposed sludge handling methods in disposal areas to be utilized during 2024:

For 2024, biosolids will be handled and disposed of by GFL Environmental Inc. The disposal will occur at approved site(s) within the boundaries of Prince Edward County.

Operational Reports 2023

Annual Performance Report

Wellington Wastewater Treatment Plant

TheCounty
PRINCE EDWARD COUNTY ♣ ONTARIO

Water and Wastewater Services
The Corporation of the County of Prince Edward
Office: 37 Church Street, Picton, ON K0K 2T0
Mailing: 332 Picton Main Street, Picton, ON K0K 2T0
T: 613.476.2148 | F: 613.476.9120
compliance@pecounty.on.ca | www.thecounty.ca

2023 Annual Wastewater Performance Report

The Corporation of the County of Prince Edward
Wellington Wastewater Treatment Facility
MECP Identifier No. 120003165
Environmental Compliance Approval: ECA No. 0003-CGGME6

Monitoring and Analytical Data

Condition 11.4(a), (b) and (g) - (ECA No. 0003-CGGME6)

Summary of all monitoring data and analytical data collected relative to the works during the reporting period as per Condition 11.4(a) (b) and (g).

Table 1(a-b): Effluent Quality: Compliance Parameters

Table 1a: Carbonaceous Biochemical Oxygen Demand, Total Suspended Solids and Total Phosphorus, Effluent Quality Assessment, 2023

Parameters	CBOD		TSS		Total Phosphorus	
	Monthly Mean Concentration	Average Waste Loading	Monthly Mean Concentration	Average Waste Loading	Monthly Mean Concentration	Average Waste Loading
ECA Limits	25	37.5	25	37.5	1.0	0.75
ECA Objectives	15	37.5	15	37.5	0.5	0.75
Month	mg/L	kg/d	mg/L	kg/d	mg/L	kg/d
January	3.00	4.43	4.60	6.80	0.08	0.12
February	5.25	6.03	5.50	6.32	0.09	0.10
March	3.50	4.48	3.75	4.80	0.11	0.14
April	4.25	5.12	5.50	6.63	0.14	0.16
May	4.40	4.67	3.40	3.61	0.22	0.23
June	3.75	2.74	2.75	2.01	0.12	0.09
July	3.25	2.47	5.00	3.80	0.18	0.14
August	2.20	2.32	3.80	4.01	0.08	0.09
September	2.25	1.38	3.25	2.00	0.09	0.05
October	2.00	1.15	3.20	1.83	0.14	0.08
November	2.25	1.40	3.25	2.02	0.13	0.08
December	2.75	3.80	3.75	5.18	0.09	0.13
Annual Average Concentration	3.24	3.03	3.98	3.72	0.12	0.11

Note: *Schedule C of Environmental Compliance Approval Number:0003-CGGME6 indicates Annual Average Loading and Concentration Limits for compliance assessment of Carbonaceous Biochemical Oxygen Demand, Total Suspended Solids and Total Phosphorus against results achieved. There were no Compliance or Objective exceedances during 2023.*

Table1b: *Escherichia coli* and pH Effluent Quality Assessment, 2023

Parameters	E. coli	pH	
	Geometric Mean Density	6.0	9.5
Limits	200		
Month	CFU/100mL	Min	Max
January	3.10	7.50	7.70
February	2.91	6.50	7.30
March	2.63	6.90	7.40
April	2.00	7.20	7.50
May	17.46	7.40	7.90
June	3.72	6.90	7.50
July	5.03	6.70	7.00
August	4.05	7.40	7.80
September	4.06	7.50	7.70
October	2.30	6.30	7.40
November	11.57	6.60	7.00
December	11.65	6.60	7.40

Table 1c: Dechlorination Data, 2023

ECA Limits	Maximum Total Cl2 Residual	Mean Total Cl2 Residual
Limits	0.02	
Month	mg/L	mg/L
January	Using Ozone Disinfection	
February	Using Ozone Disinfection	
March	Using Ozone Disinfection	
April	Using Ozone Disinfection	
May	Using Ozone Disinfection	
June	Using Ozone Disinfection	
July	Using Ozone Disinfection	
August	Using Ozone Disinfection	
September	Using Ozone Disinfection	
October	Using Ozone Disinfection	
November	Using Ozone Disinfection	
December	Using Ozone Disinfection	

Tables 1 a – c: Show detailed results of compliance monitoring parameters noted in *Environmental Compliance Approval Number:* 0003-CGGME6 against associated compliance objectives, limits and ranges. *There were no Compliance or Objective exceedances during 2023.*

Table 2: Effluent Quality Operational Monitoring Data, 2023

Month	Total Ammonia Nitrogen	Unionized Ammonia	Total Kjeldahl Nitrogen	Nitrite	Nitrate
	mg/L	mg/L	mg/L	mg/L	mg/L
January	0.10	0.001	0.49	0.03	14.24
February	1.85	0.004	2.73	0.03	11.83
March	2.73	0.008	3.30	0.03	6.66
April	4.30	0.017	5.85	0.03	5.95
May	11.68	0.106	17.38	0.03	5.48
June	3.53	0.017	4.15	0.03	20.53
July	0.25	0.001	1.11	0.03	28.75
August	0.14	0.001	0.70	0.03	18.52
September	0.33	0.003	1.15	0.03	21.18
October	0.10	0.001	0.78	0.10	28.08
November	0.15	0.001	0.50	0.08	29.58
December	0.10	0.001	0.58	0.03	19.33

Effluent monitoring samples, in addition to those required by *Environmental Compliance Approval Number:* 0003-CGGME6, were collected and utilized for operational efficiency determination and effluent quality monitoring.

Table 3: Influent Quality Monitoring Data, 2023

Month	Biochemical Oxygen Demand	Carbonaceous Biochemical Oxygen Demand	Total Suspended Solids	Total Kjeldahl Nitrogen	Total Phosphorus
	mg/L	mg/L	mg/L	mg/L	mg/L
January	79.60	72.80	62.60	10.72	1.45
February	97.50	85.25	83.75	17.33	2.03
March	78.25	72.50	95.50	15.03	1.63
April	92.50	73.25	69.25	17.83	1.71
May	108.80	105.20	55.80	19.94	2.17
June	154.25	164.25	84.75	31.00	3.41
July	221.50	178.00	133.00	35.43	4.03
August	117.20	97.00	55.40	23.72	2.32
September	200.75	186.75	97.50	33.70	3.83
October	174.80	165.00	86.60	36.16	3.82
November	135.00	146.25	74.00	34.88	3.44
December	134.25	98.50	166.75	17.80	2.27

Influent monitoring samples, in addition to those required by *Environmental Compliance Approval Number:* 0003-CGGME6, were collected and utilized to determine treatment efficiency.

Carbonaceous Biochemical Oxygen Demand (CBOD)

Influent

Sampling Frequency: Monthly
Sample Type: Composite
Environmental Compliance Approval Requirement: N/A, monitoring only

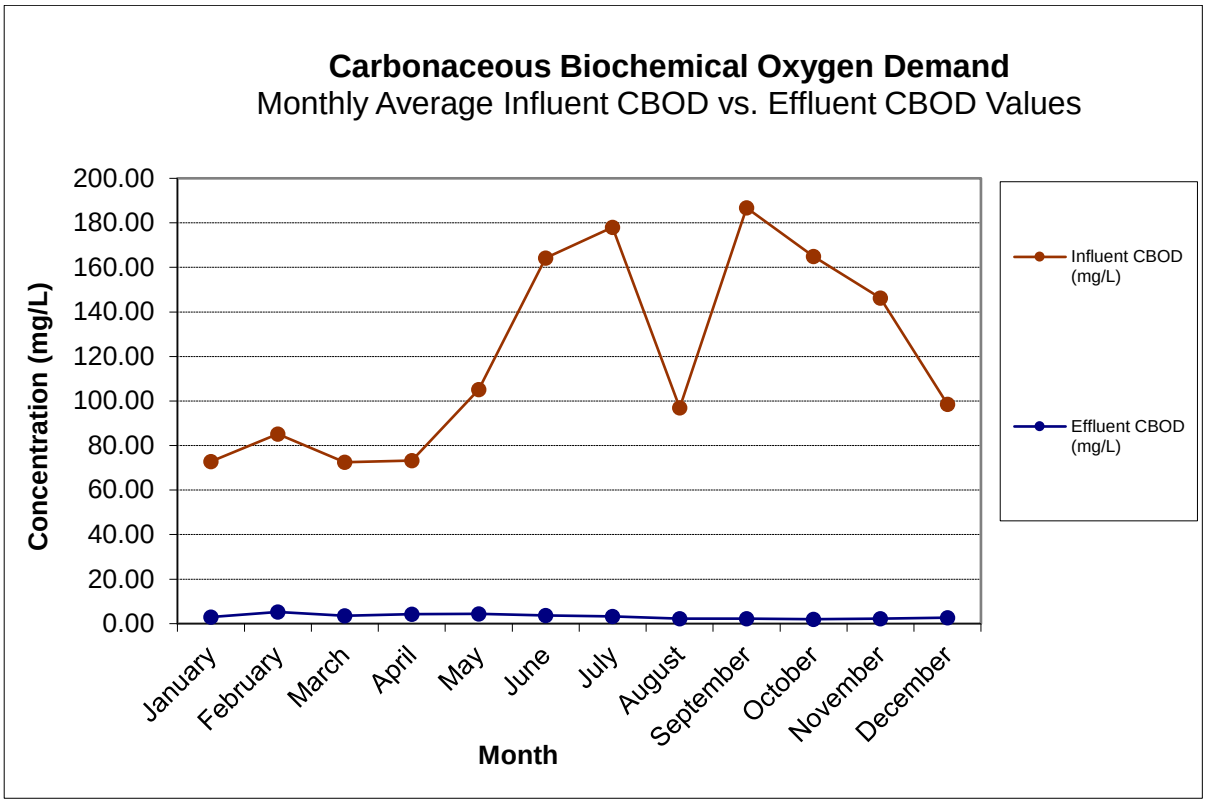
Effluent

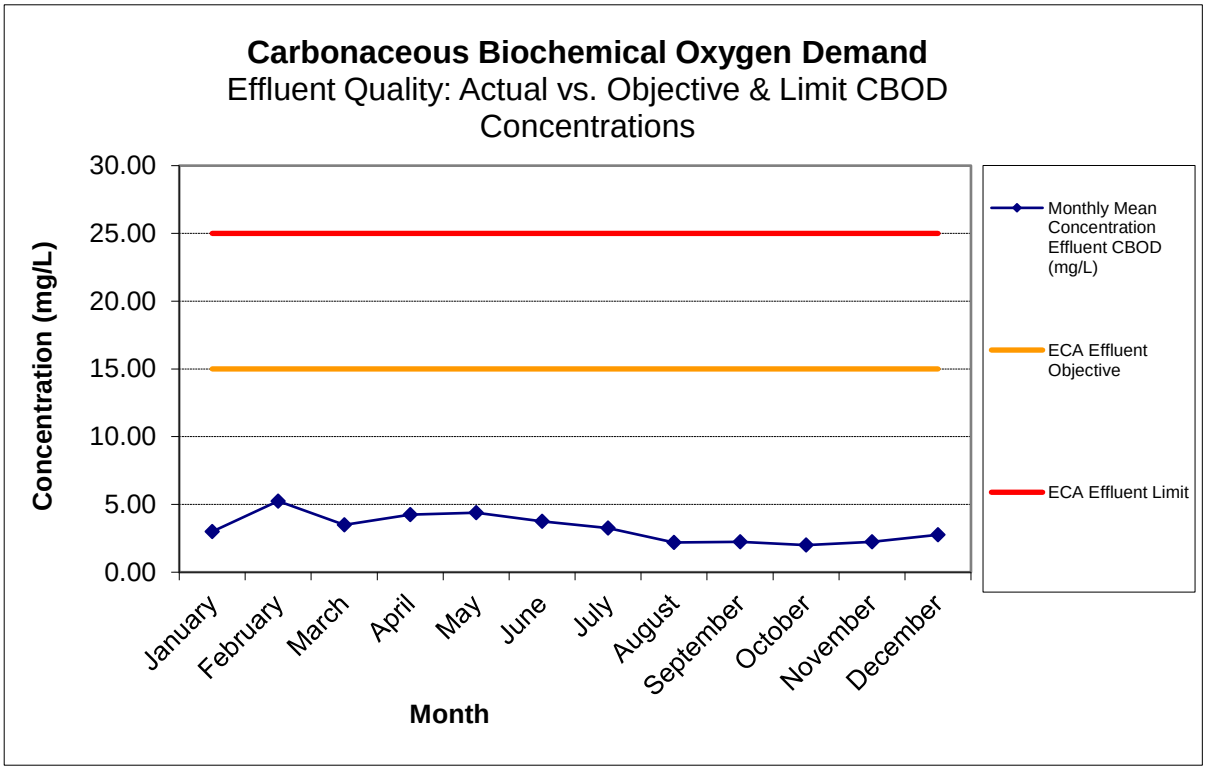
Sampling Frequency: Weekly
Sample Type: Composite
Environmental Compliance Approval Requirement: Weekly
Compliance Objective: 15mg/L
Compliance Limit Concentration: 25mg/L
Compliance Limit Loading: 37.5kg/d
Compliance Limit Exceedance: No

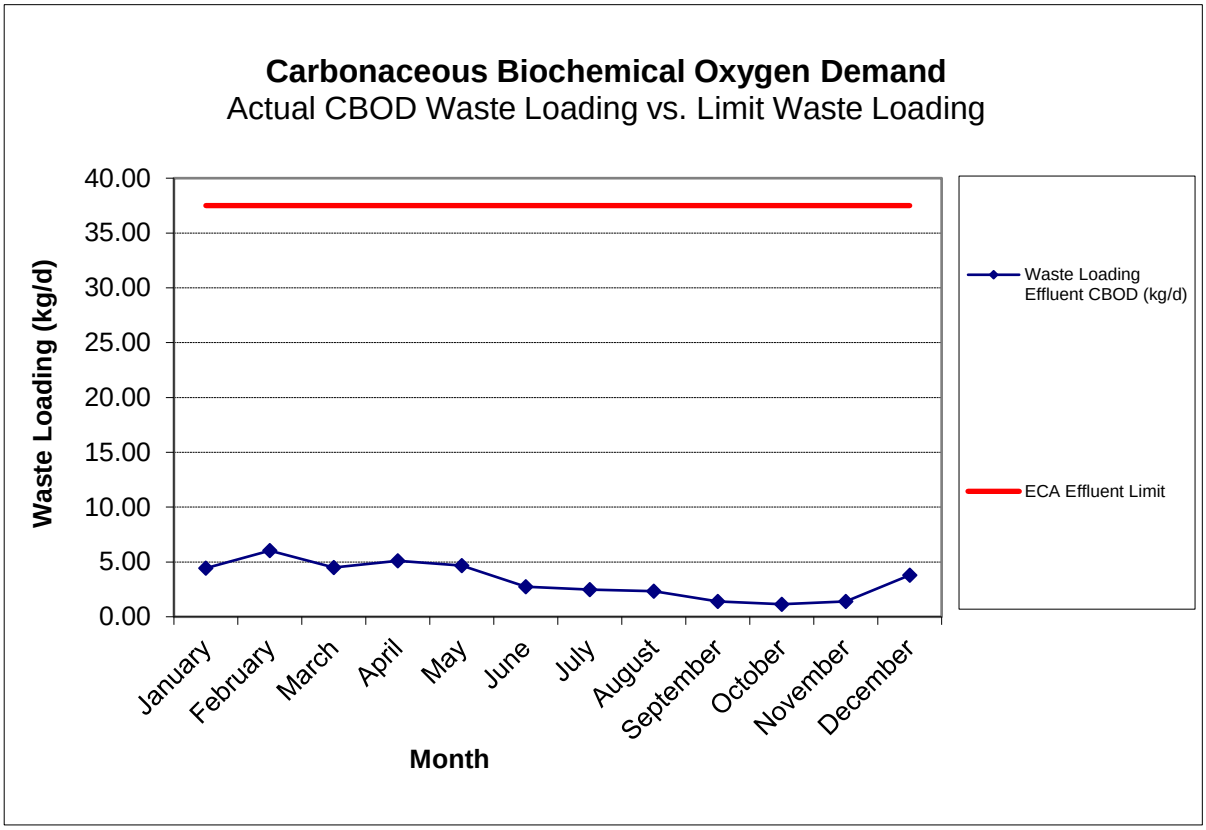
Table 4: Carbonaceous Biochemical Oxygen Demand Percent Removal Values, 2023

Month	Influent Carbonaceous Biochemical Oxygen Demand	Effluent Carbonaceous Biochemical Oxygen Demand	Percent Removal Carbonaceous Biochemical Oxygen Demand
	Monthly Mean Concentration		%
	mg/L	mg/L	
January	72.80	3.00	95.879
February	85.25	5.25	93.842
March	72.50	3.50	95.172
April	73.25	4.25	94.198
May	105.20	4.40	95.817
June	164.25	3.75	97.717
July	178.00	3.25	98.174
August	97.00	2.20	97.732
September	186.75	2.25	98.795
October	165.00	2.00	98.788
November	146.25	2.25	98.462
December	98.50	2.75	97.208

Table 4: Carbonaceous Biochemical Oxygen Demand analysis on both influent and effluent streams were collected as per *Environmental Compliance Approval Number:* 0003-CGGME6.


Carbonaceous Biochemical Oxygen Demand
Monthly Average Influent CBOD vs. Effluent CBOD Values
Concentration (mg/L)
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
January
February
March
April
May
June
July
August
September
October
November
December
Month
Influent CBOD (mg/L)
Effluent CBOD (mg/L)


Carbonaceous Biochemical Oxygen Demand
Effluent Quality: Actual vs. Objective & Limit CBOD Concentrations
Concentration (mg/L)
30.00
25.00
20.00
15.00
10.00
5.00
0.00
January
February
March
April
May
June
July
August
September
October
November
December
Month
Monthly Mean Concentration Effluent CBOD (mg/L)
ECA Effluent Objective
ECA Effluent Limit


Carbonaceous Biochemical Oxygen Demand
Actual CBOD Waste Loading vs. Limit Waste Loading
Waste Loading (kg/d)
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
January
February
March
April
May
June
July
August
September
October
November
December
Month
Waste Loading Effluent CBOD (kg/d)
ECA Effluent Limit

Total Suspended Solids (TSS)

Influent

Sampling Frequency: Monthly
Sample Type: Composite
Environmental Compliance Approval Requirement: Monthly

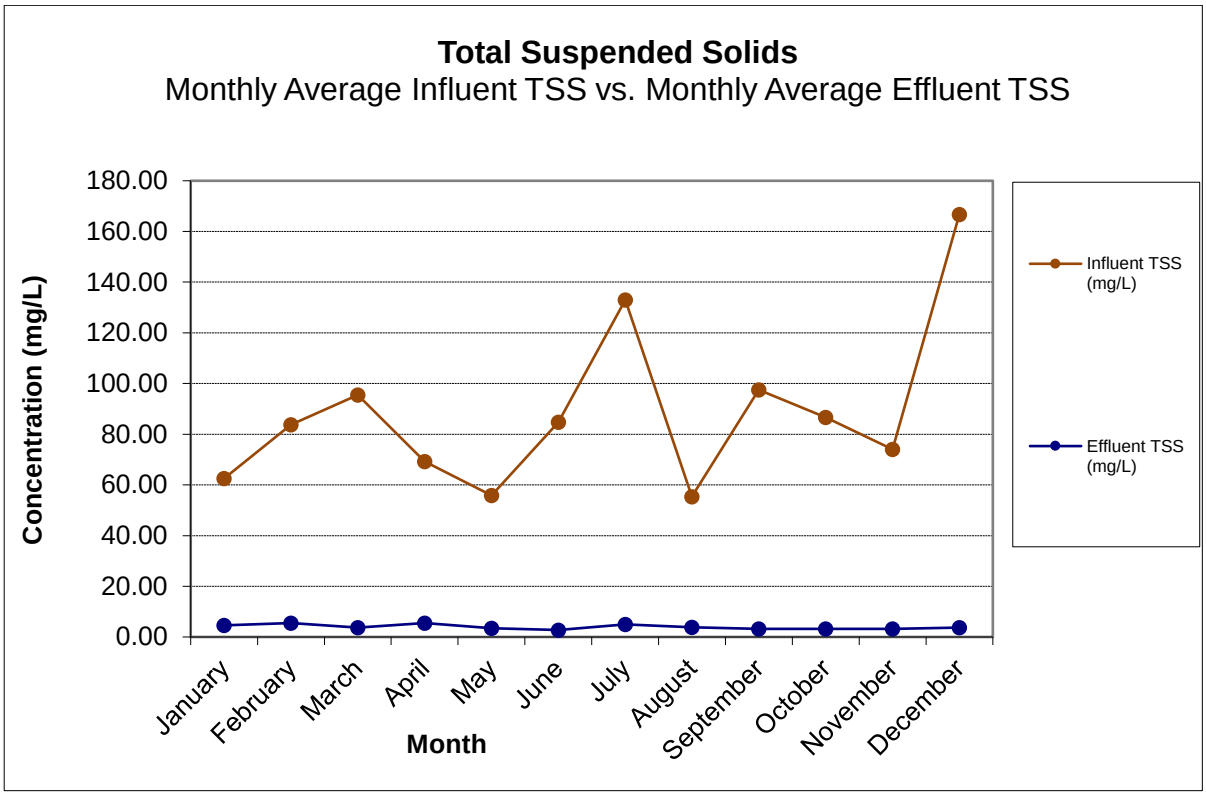
Effluent

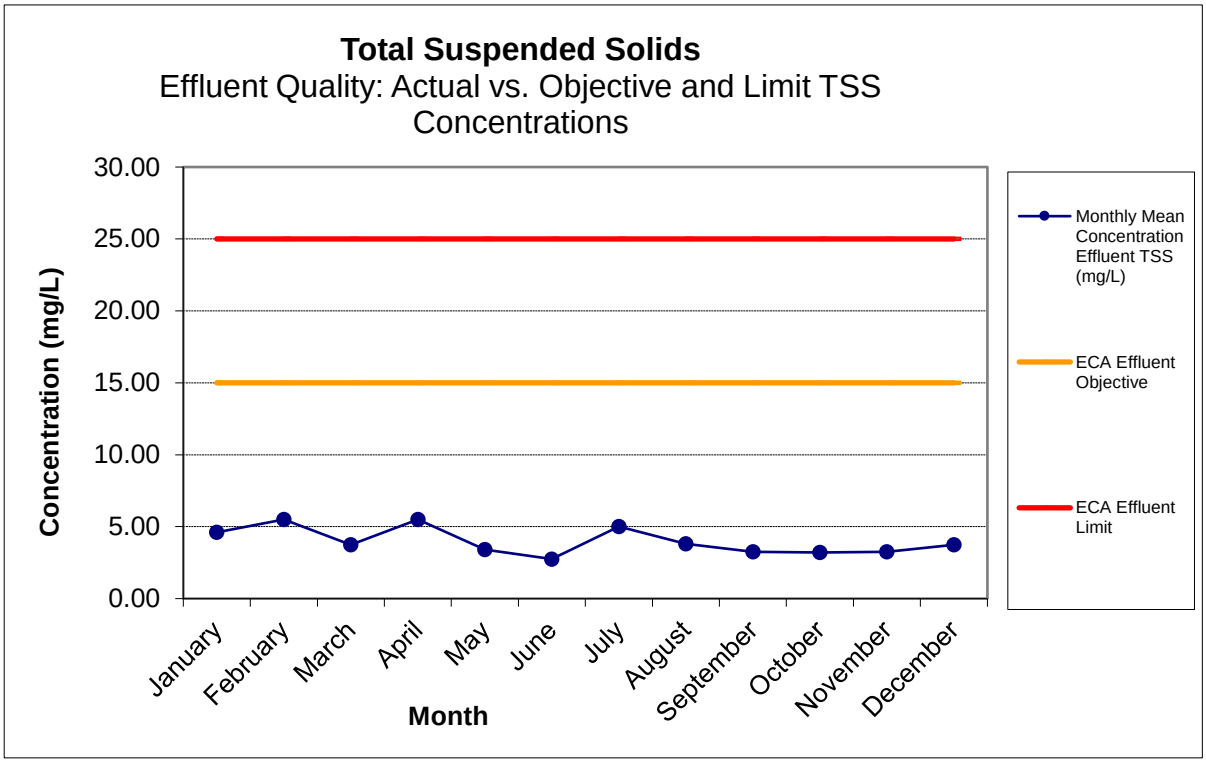
Sampling Frequency: Weekly
Sample Type: Composite
Environmental Compliance Approval Requirement: Weekly
Compliance Objective: 15mg/L
Compliance Limit Monthly Average Concentration: 25mg/L
Compliance Limit Monthly Average Daily Waste Loading: 37.5kg/d
Compliance Limit Exceedance: No

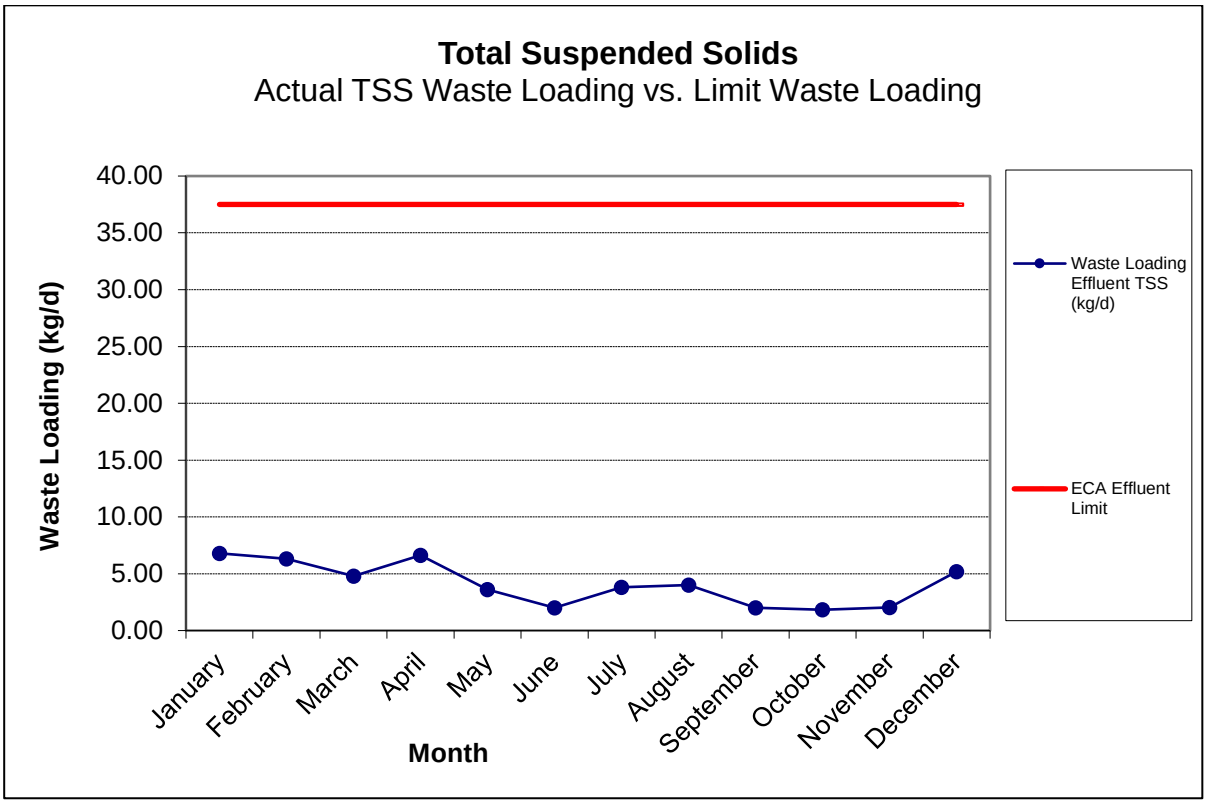
Table 5: Total Suspended Solids Percent Removal Values, 2023

Month	Influent Total Suspended Solids	Effluent Total Suspended Solids	Percent Removal Total Suspended Solids
	Monthly Mean Concentration		%
	mg/L	mg/L	
January	62.60	4.60	92.652
February	83.75	5.50	93.433
March	95.50	3.75	96.073
April	69.25	5.50	92.058
May	55.80	3.40	93.907
June	84.75	2.75	96.755
July	133.00	5.00	96.241
August	55.40	3.80	93.141
September	97.50	3.25	96.667
October	86.60	3.20	96.305
November	74.00	3.25	95.608
December	166.75	3.75	97.751

Table 5: Total Suspended Solids analysis on both influent and effluent streams were collected as per *Environmental Compliance Approval Number:* 0003-CGGME6.


Total Suspended Solids
Monthly Average Influent TSS vs. Monthly Average Effluent TSS
Concentration (mg/L)
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
January
February
March
April
May
June
July
August
September
October
November
December
Month
Influent TSS (mg/L)
Effluent TSS (mg/L)


Total Suspended Solids
Effluent Quality: Actual vs. Objective and Limit TSS Concentrations
Concentration (mg/L)
30.00
25.00
20.00
15.00
10.00
5.00
0.00
January
February
March
April
May
June
July
August
September
October
November
December
Month
Monthly Mean Concentration Effluent TSS (mg/L)
ECA Effluent Objective
ECA Effluent Limit


Total Suspended Solids
Actual TSS Waste Loading vs. Limit Waste Loading
Waste Loading (kg/d)
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
January
February
March
April
May
June
July
August
September
October
November
December
Month
Waste Loading Effluent TSS (kg/d)
ECA Effluent Limit

Total Phosphorus (TP)

Influent

Sampling Frequency: Monthly
Sample Type: Composite
Environmental Compliance Approval Requirement: Monthly

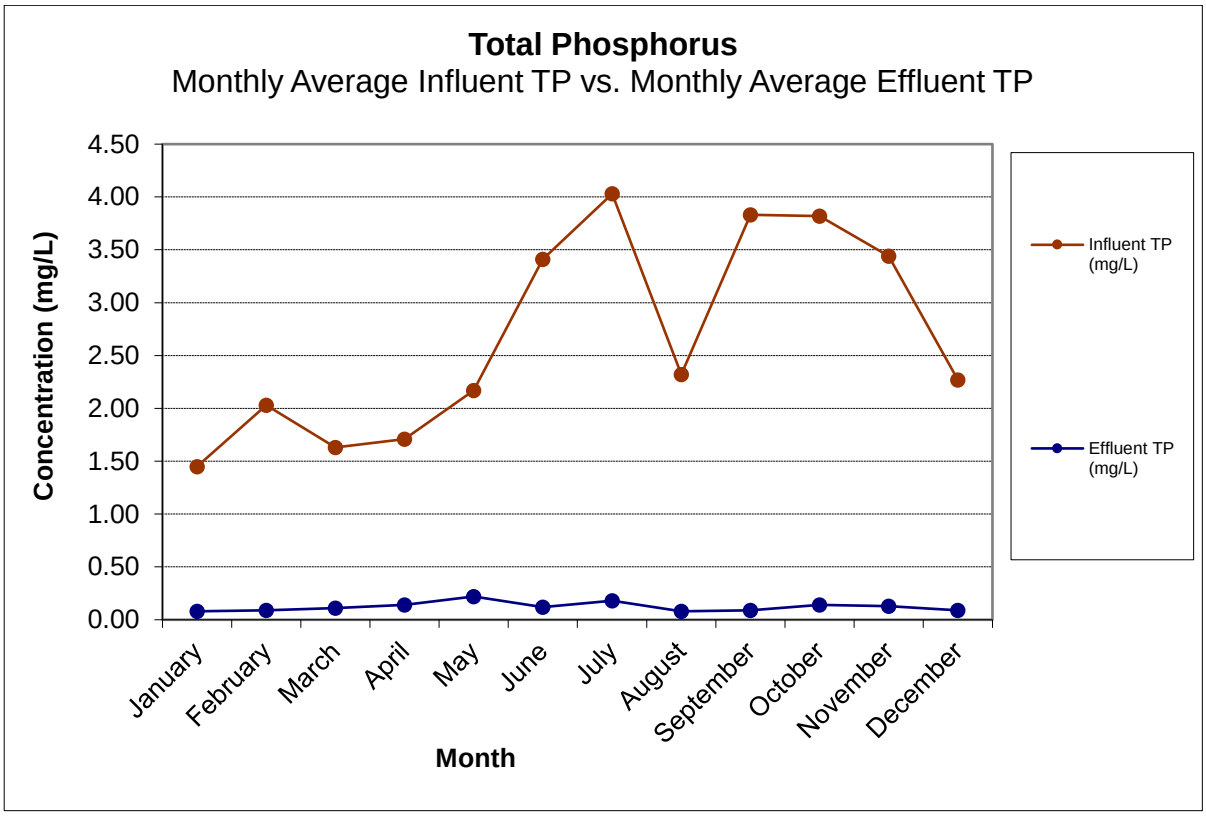
Effluent

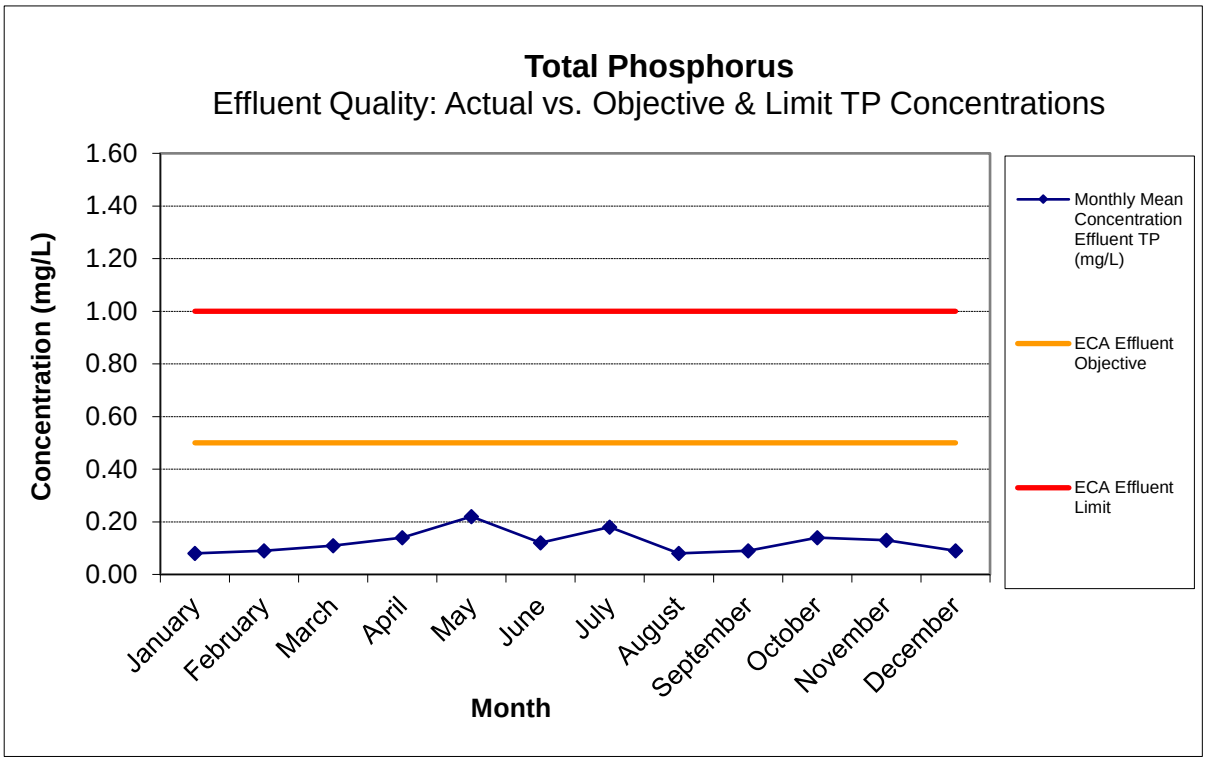
Sampling Frequency: Weekly
Sample Type: Composite
Environmental Compliance Approval Requirement: Weekly
Compliance Objective: 0.5mg/L
Compliance Limit Concentration: 1.0mg/L
Compliance Limit Loading: 0.75kg/d
Compliance Limit Exceedance: No

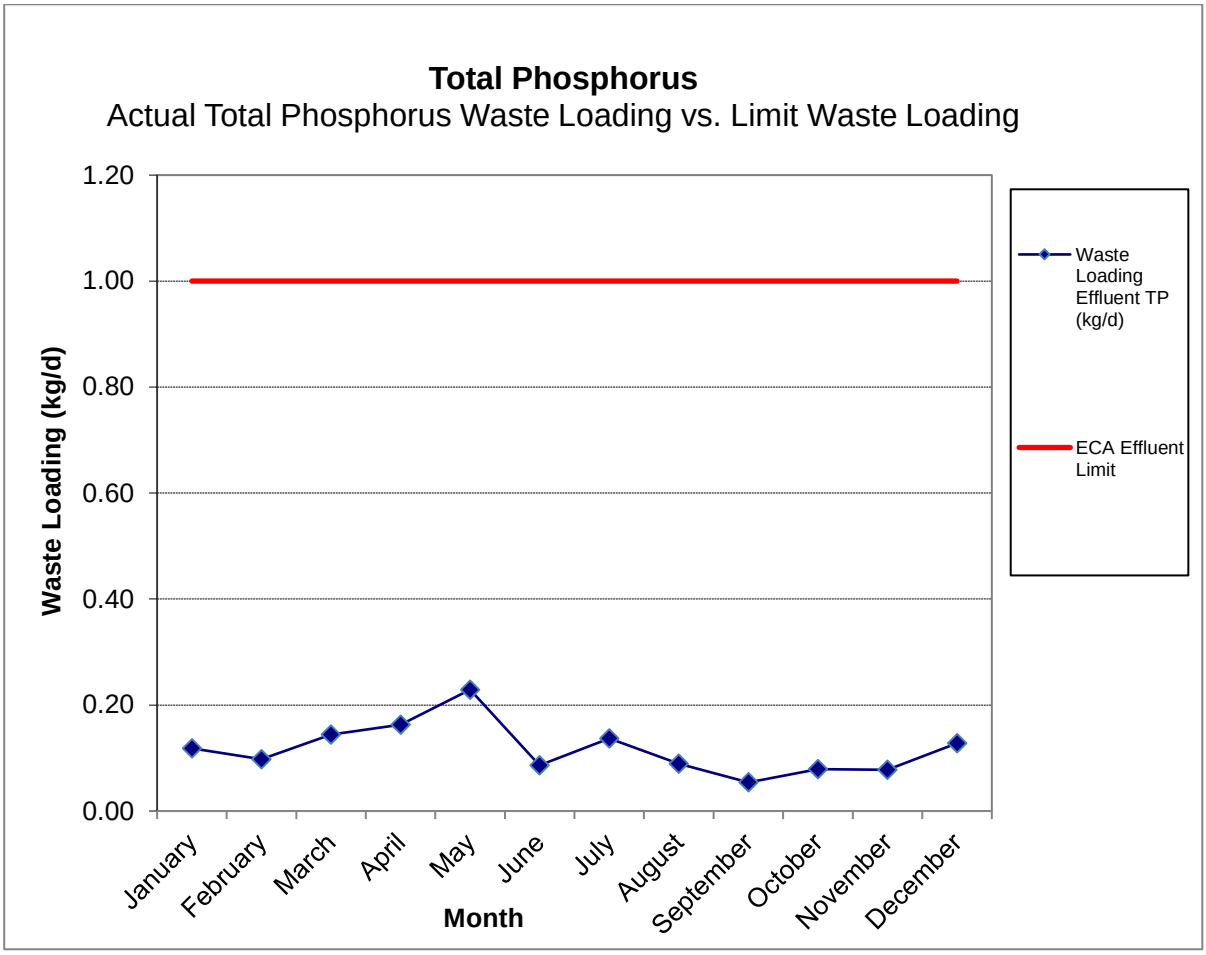
Table 6: Total Phosphorus Percent Removal Values, 2023

Month	Influent Total Phosphorus	Effluent Total Phosphorus	Percent Removal Total Phosphorus
	Monthly Mean Concentration		%
	mg/L	mg/L	
January	1.45	0.08	94.48
February	2.03	0.09	95.57
March	1.63	0.11	93.25
April	1.71	0.14	91.81
May	2.17	0.22	89.86
June	3.41	0.12	96.48
July	4.03	0.18	95.53
August	2.32	0.08	96.55
September	3.83	0.09	97.65
October	3.82	0.14	96.34
November	3.44	0.13	96.22
December	2.27	0.09	96.04

Table 6: Weekly Total Phosphorus sampling in both influent and effluent streams met the sampling requirements *of Environmental Compliance Approval Number:* 0003-CGGME6 throughout the 2023 operational year.


Total Phosphorus
Monthly Average Influent TP vs. Monthly Average Effluent TP
Concentration (mg/L)
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
January
February
March
April
May
June
July
August
September
October
November
December
Month
Influent TP (mg/L)
Effluent TP (mg/L)


Total Phosphorus
Effluent Quality: Actual vs. Objective & Limit TP Concentrations
Concentration (mg/L)
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
January
February
March
April
May
June
July
August
September
October
November
December
Month
Monthly Mean Concentration Effluent TP (mg/L)
ECA Effluent Objective
ECA Effluent Limit


Total Phosphorus
Actual Total Phosphorus Waste Loading vs. Limit Waste Loading
Waste Loading (kg/d)
1.20
1.00
0.80
0.60
0.40
0.20
0.00
January
February
March
April
May
June
July
August
September
October
November
December
Month
Waste Loading Effluent TP (kg/d)
ECA Effluent Limit

pH

Influent

Sampling Frequency: Weekly (minimum)
Sample Type: Grab
Environmental Compliance Approval Requirement: N/A

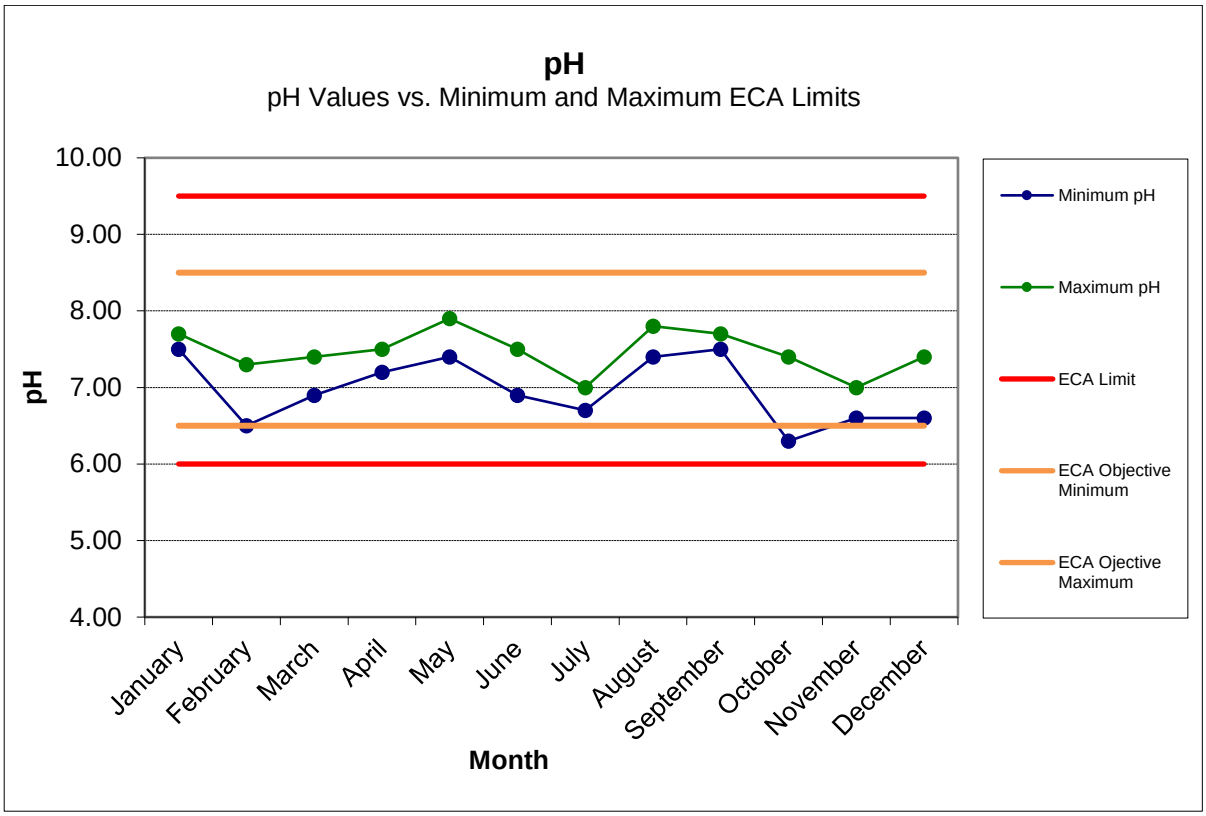
Effluent

Sampling Frequency: Weekly (minimum)
Sample Type: Grab
Environmental Compliance Approval Requirement: Weekly
Compliance Objective: Range 6.5 - 8.5
Compliance Limit: Range 6.0 - 9.5
Compliance Limit Exceedance: No

Table 7: pH Minimum and Maximum Values, 2023

Month	Minimum pH	Maximum pH
January	7.50	7.70
February	6.50	7.30
March	6.90	7.40
April	7.20	7.50
May	7.40	7.90
June	6.90	7.50
July	6.70	7.00
August	7.40	7.80
September	7.50	7.70
October	6.30	7.40
November	6.60	7.00
December	6.60	7.40

Table 7: The pH of the effluent was monitored on a weekly basis (at minimum) and was compared to Compliance Limits and Objectives dictated in Environmental Compliance Approval No. 0003-CGGME6. All values were within compliance limits. In regards to Compliance Objectives, the Minimum value for October dropped below the objective limit of 6.5. Additional monitoring samples are routinely collected for in-house laboratory analysis in addition to results indicated here. No exceedances of Environmental Compliance Approval limits were observed during the 2023 operational year for pH.


pH
pH Values vs. Minimum and Maximum ECA Limits
10.00
9.00
8.00
7.00
6.00
5.00
4.00
pH
January
February
March
April
May
June
July
August
September
October
November
December
Month
Minimum pH
Maximum pH
ECA Limit
ECA Objective Minimum
ECA Ojective Maximum

Disinfection: *Escherichia coli* (E. coli) Geometric Mean Density

Influent

Sampling Frequency: N/A
Environmental Compliance Approval Requirement: N/A

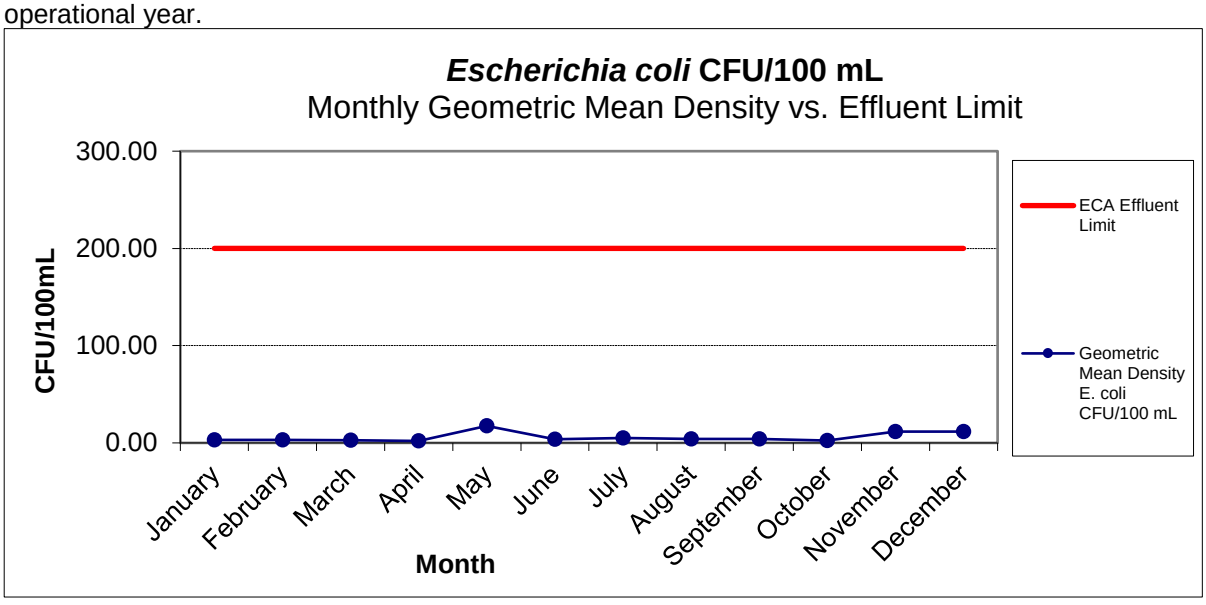
Effluent

Sampling Frequency: Weekly
Sample Type: Grab
Environmental Compliance Approval Requirement: Weekly
Compliance Objective: 200CFU/100mL Geometric Mean Density
Compliance Limit: 200CFU/100mL Geometric Mean Density
Compliance Limit Exceedance: No

Table 8: *Escherichia coli* Geometric Mean Density Values, 2023

Month	Geometric Mean Density	ECA Effluent Limit
	CFU/100mL	CFU/100mL
January	3.10	200
February	2.91	200
March	2.63	200
April	2.00	200
May	17.46	200
June	3.72	200
July	5.03	200
August	4.05	200
September	4.06	200
October	2.30	200
November	11.57	200
December	11.65	200

Table 8: Ozone Disinfection efficiency is demonstrated by weekly final effluent grab samples analyzed for presence of E. coli. All Environmental Compliance Approval requirements were met during the 2023 operational year.



Nitrogen Removal

Total Ammonia Nitrogen (TAN)

Influent

Sampling Frequency: N/A
Sample Type: N/A
Environmental Compliance Approval Requirement: N/A

Effluent

Sampling Frequency: Weekly
Sample Type: Composite
Environmental Compliance Approval Requirement: Weekly
Compliance Objective: N/A
Compliance Limit: N/A
Compliance Limit Exceedance: N/A

Unionized Ammonia

Influent

Sampling Frequency: N/A
Sample Type: N/A
Environmental Compliance Approval Requirement: N/A

Effluent

Sampling Frequency: Weekly (Calculation)
Sample Type: Calculation
Environmental Compliance Approval Requirement: Weekly (Calculation)
Compliance Objective: N/A
Compliance Limit: N/A
Compliance Limit Exceedance: N/A

Unionized Ammonia @ 15^{o}C

Influent

Sampling Frequency: Weekly
Certificate of Approval Requirement: N/A

Effluent

Sampling Frequency: Weekly
Environmental Compliance Approval Requirement: N/A – Required by Wastewater Systems Effluent Regulation
Compliance Objective: N/A
Compliance Limit: N/A
Compliance Limit Exceedance: N/A

Total Kjeldahl Nitrogen (TKN)

Influent

Sampling Frequency: Monthly
Sample Type: Composite
Environmental Compliance Approval Requirement: Monthly

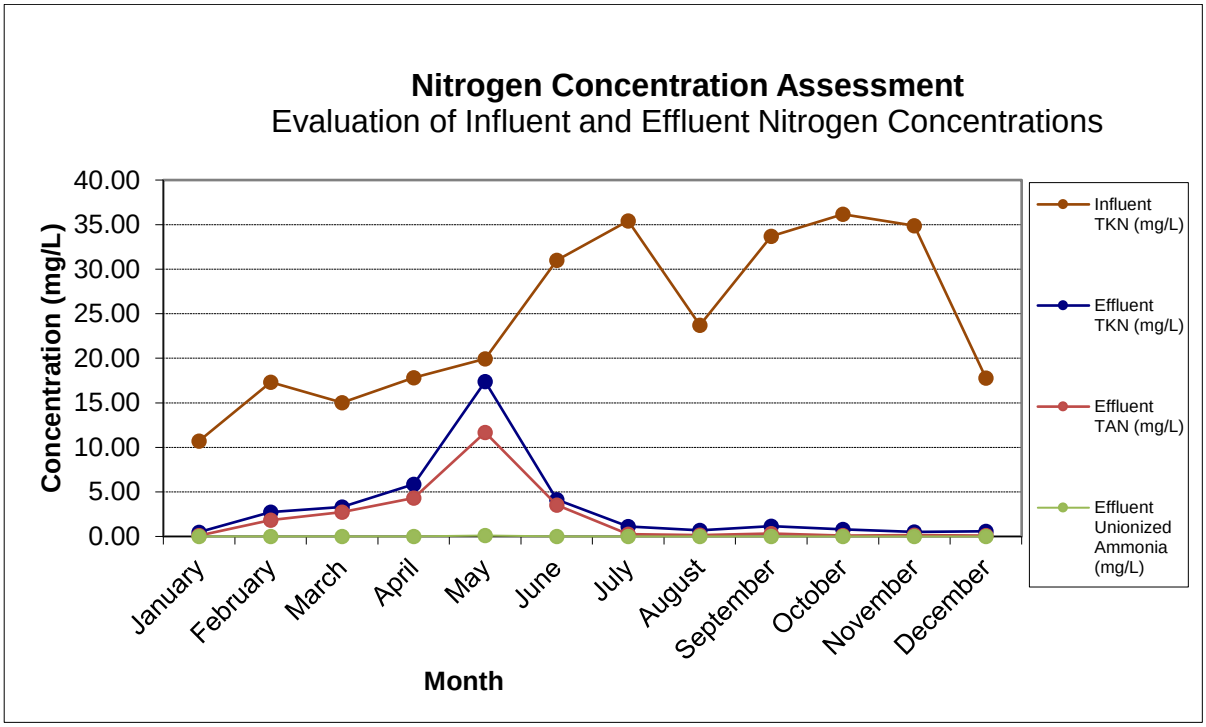
Effluent

Sampling Frequency: Weekly
Sample Type: Composite
Environmental Compliance Approval Requirement: N/A
Compliance Objective: N/A
Compliance Limit: N/A
Compliance Limit Exceedance: N/A

Table 9: Nitrogen Concentration Assessment Values, 2023

Month	Influent Total Kjeldahl Nitrogen (Individual Result)	Effluent Total Kjeldahl Nitrogen (Monthly Average)	Percent Removal Total Kjeldahl Nitrogen	Effluent Total Ammonia Nitrogen	Effluent Unionized Ammonia
	mg/L	mg/L	%	mg/L	mg/L
January	10.72	0.49	95.43	0.10	0.001
February	17.33	2.73	84.25	1.85	0.004
March	15.03	3.30	78.04	2.73	0.008
April	17.83	5.85	67.19	4.30	0.017
May	19.94	17.38	12.84	11.68	0.106
June	31.00	4.15	86.61	3.53	0.017
July	35.43	1.11	96.87	0.25	0.001
August	23.72	0.70	97.05	0.14	0.001
September	33.70	1.15	96.59	0.33	0.003
October	36.16	0.78	97.84	0.10	0.001
November	34.88	0.50	98.57	0.15	0.001
December	17.80	0.58	96.74	0.10	0.001

Table 9: Sampling of nitrogenous compounds in influent and effluent streams met or exceeded the sampling requirements in *Environmental Compliance Approval Number:* 0003-CGGME6 throughout the 2023 operational year. Additional monitoring samples were collected for process control and to determine removal efficiencies.



Effluent Quality Assurance and Control Measures

Condition 11.4 (e) - (ECA No. 0003-CGGME6)

Effluent analysis on all compliance and monitoring parameters listed in *Environmental Compliance Approval Number:* 0003-CGGME6 is performed by accredited laboratories; SGS Lakefield and SGS London while Caduceon Environmental Laboratories serves as a back-up if required. Sample collection and in-house laboratory analysis are performed by licensed wastewater operators.

Sampling for parameters outlined in *Environmental Compliance Approval Number:* 0003-CGGME6 are collected at the required frequencies by defined methods and referenced against compliance limits and objectives. In the event of bypass, overflow or events outside of normal operating conditions, additional samples shall be collected as required. In-house and laboratory monitoring samples in addition to those listed in the Environmental Compliance Approval and legislative instruments are collected and assessed for determination of treatment effectiveness and removal efficiencies. Ongoing evaluation of non-regulative monitoring samples will continue as a control measure for ensuring effluent quality and to assist in optimization of operational processes.

The system is also monitored by SCADA controls complete with alarming mechanisms in the event of operational problems. After hours the alarms are routed through an alarm company giving 24-hour monitoring of the system.

Capacity Assessment: Influent and Effluent Quantities

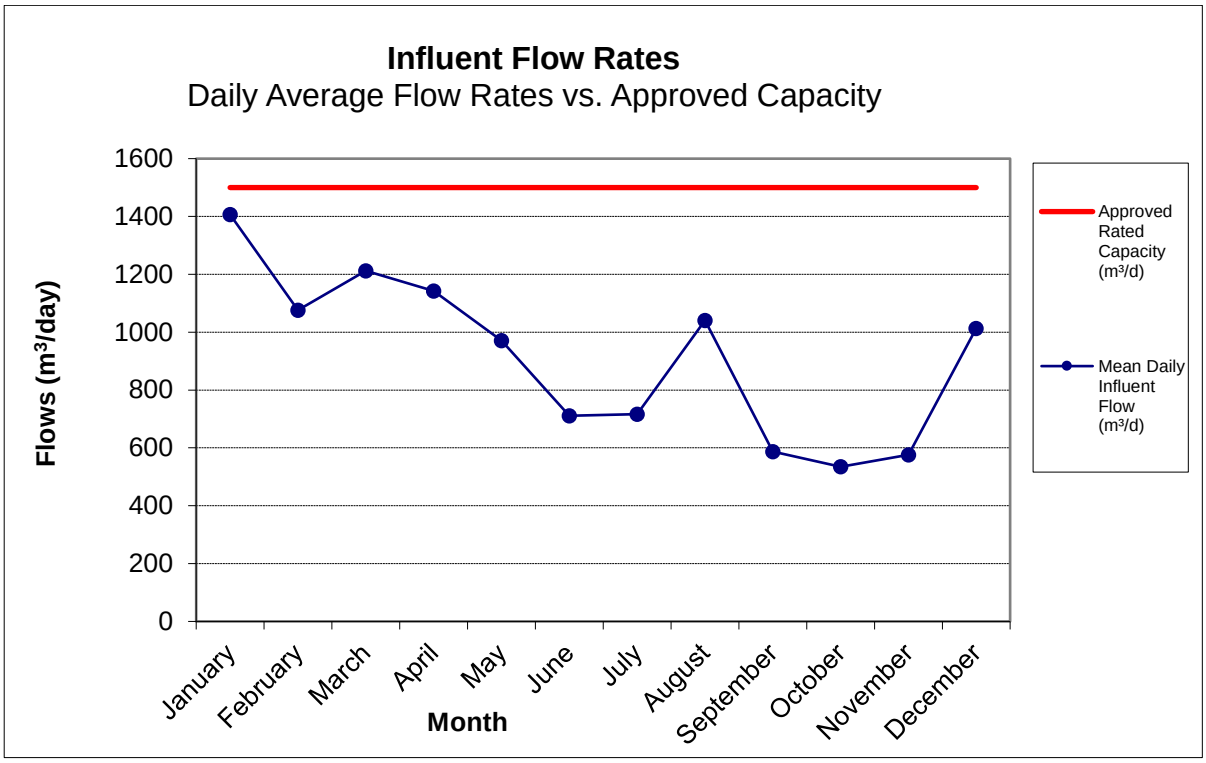
Based on the 2023 flow data, the Wellington Wastewater Treatment Plant maintained operations within approved capacity requirements as per Environmental Compliance Approval Number: 0003-CGGME6.

Table 10: Influent Quantity Flow Data, 2023

Month	Approved Capacity (Rated Capacity) [1]	Monthly Average	Approved Capacity (Peak Daily Flow Rate) [2]	Monthly Peak Flow
	m^3/day	m^3/day	m^3/day	m^3/day
January	1500	1406.64	4550	3256.46
February	1500	1075.90	4550	2664.55
March	1500	1212.45	4550	2588.91
April	1500	1142.63	4550	2359.65
May	1500	970.57	4550	2613.46
June	1500	710.91	4550	1038.74
July	1500	716.26	4550	987.65
August	1500	1041.27	4550	1969.55
September	1500	586.74	4550	779.62
October	1500	534.72	4550	648.22
November	1500	576.54	4550	856.70
December	1500	1012.83	4550	1292.04

Table 10, Note[1]: *As per Environmental Compliance Approval Number:* 0003-CGGME6*, "Rated Capacity" is defined as the Average Daily Flow for which the Works are approved to handle. The Wellington WWTP maintained an average daily flow within approved capacity requirements for the 2023 operational year.*

Table 10, Note[2]: *As per Environmental Compliance Approval Number:* 0003-CGGME6*, "Peak Daily Flow Rate" is defined as the largest volume of flow to be received during a one-day period for which the sewage treatment process unit or equipment is designed to handle. The Wellington WWTP maintained a peak daily flow within approved capacity requirements for the 2023 operational year.*


Influent Flow Rates
Daily Average Flow Rates vs. Approved Capacity
Flows (m³/day)
1600
1400
1200
1000
800
600
400
200
0
January
February
March
April
May
June
July
August
September
October
November
December
Month
Approved Rated Capacity (m³/d)
Mean Daily Influent Flow (m³/d)

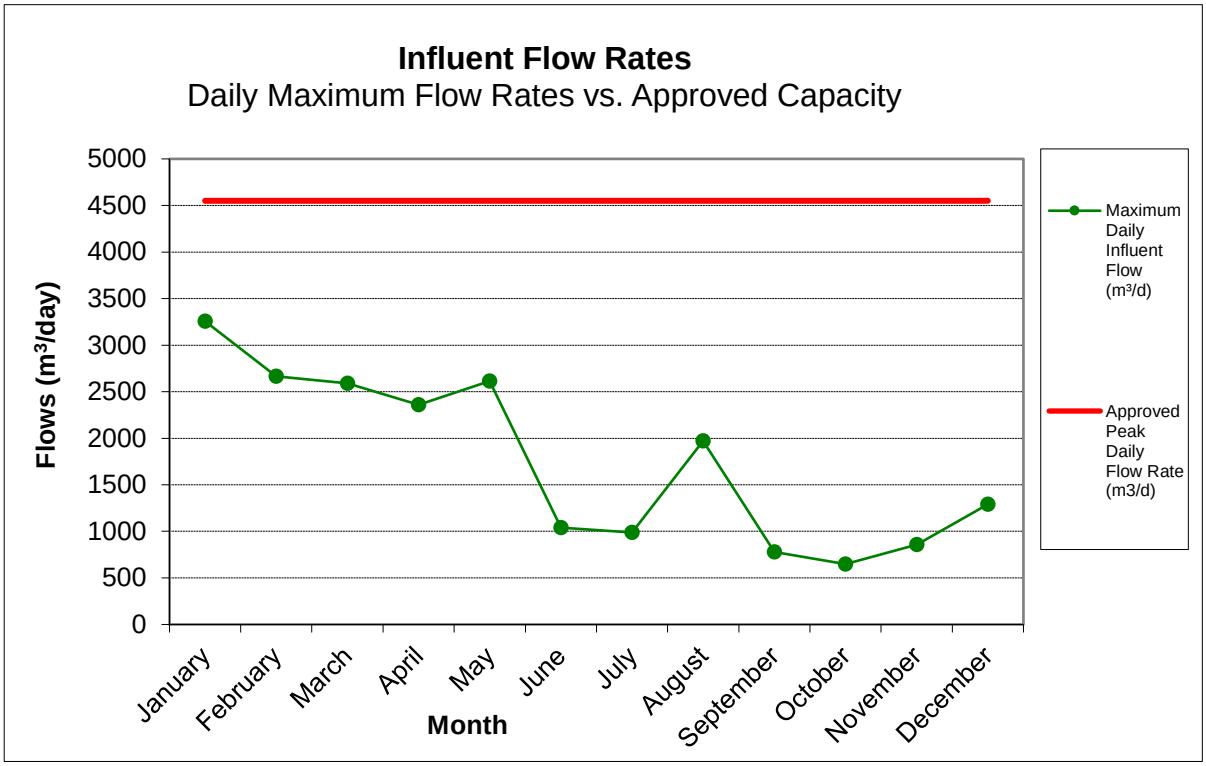

Influent Flow Rates
Daily Maximum Flow Rates vs. Approved Capacity
Flows (m³/day)
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
January
February
March
April
May
June
July
August
September
October
November
December
Month
Maximum Daily Influent Flow (m³/d)
Approved Peak Daily Flow Rate (m3/d)

Table 11: Historical Influent Flows, 2014-2023

Year	Total Influent Flow (m^3)	Annual Average Daily Influent Flow (m^3/day)	Approved Capacity (Rated Capacity) (m^3/d)
2014	227202.90	622.47	1500
2015	211378.46	579.12	1500
2016	258334.96	705.83	1500
2017	357710.82	980.03	1500
2018	296484.74	823.57	1500
2019	326159.21	893.59	1500
2020	299209.99	817.51	1500
2021	285158.43	781.26	1500
2022	306507.81	839.75	1500
2023	334367.12	916.07	1500

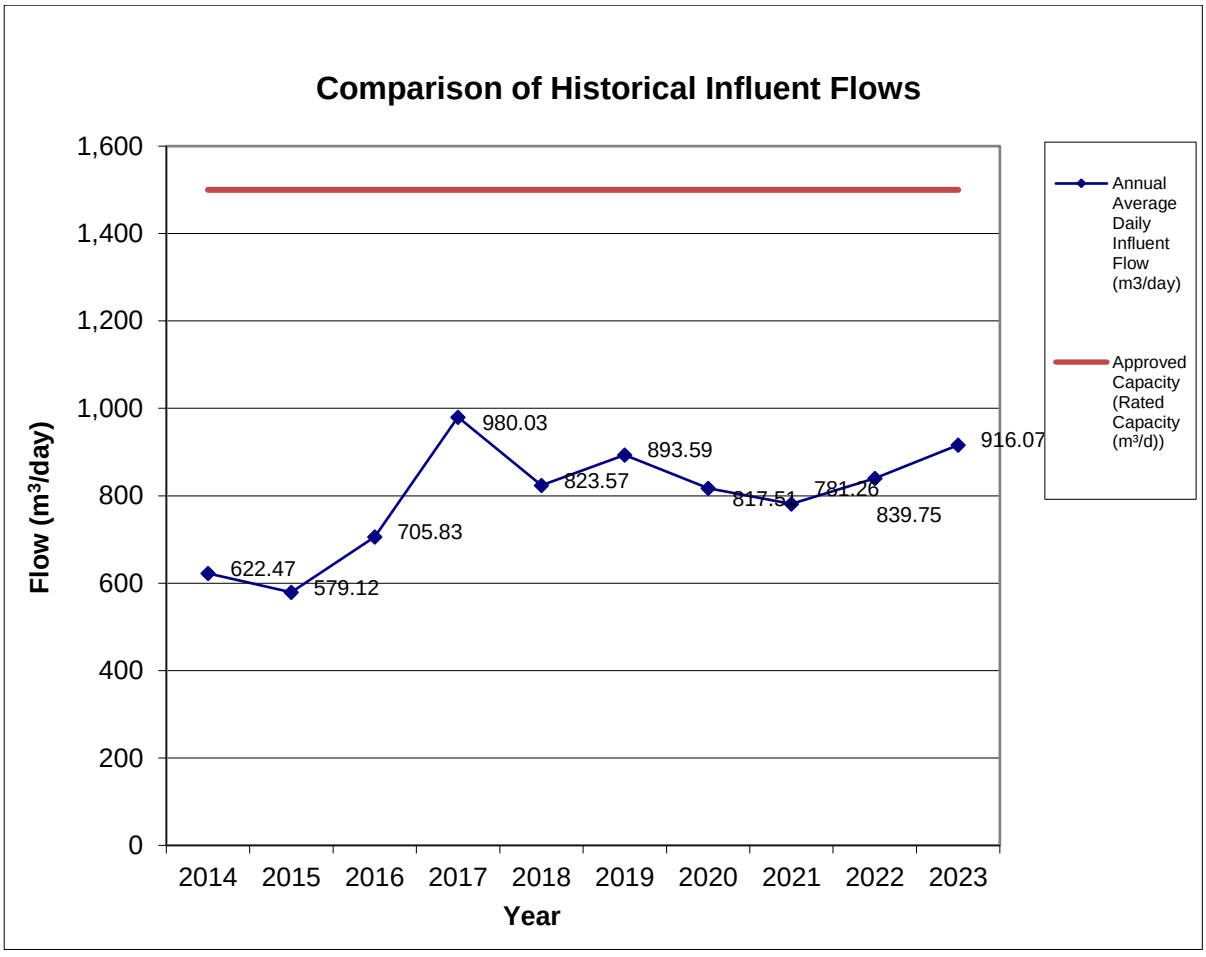
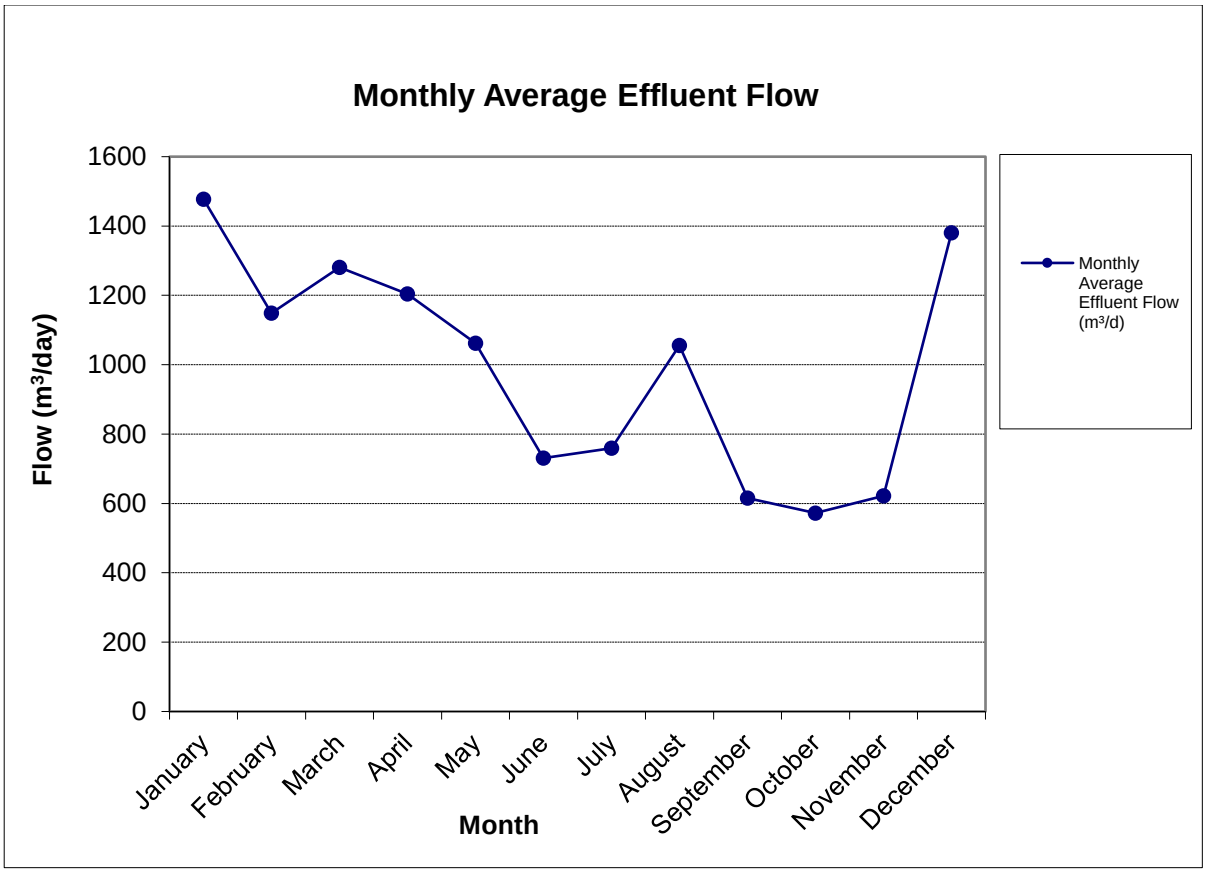


Table 12: Effluent Quantity Flow Data, 2023

Month	Monthly Average	Total Effluent Flow
	m^3/day	m^3
January	1477.47	45801.42
February	1148.94	32170.21
March	1281.07	39713.29
April	1204.17	36125.15
May	1061.99	32921.75
June	731.14	21934.08
July	759.40	23541.53
August	1055.68	32726.02
September	615.22	18456.65
October	572.34	17742.46
November	622.15	18664.41
December	1380.79	42804.38



Event Summary

Condition 11.4 (j) - (ECA No. 0003-CGGME6)

Table 13: Event Summary, 2023

Date	Description
July 19, 2023	On the morning of July 19, 2023 at 0922h, wastewater staff received a notification informing them that a member of the public had reported an issue regarding sewage leaking from a manhole. Staff responded to the area at 0942h and discovered a manhole spilling sewage onto the grass. The sewage had not entered a water course, catch basin or storm sewer. A third-party vacuum truck service was called to the site and arrived on the scene by 1042h. By approximately 1055h, the contents of the manhole were pumped out and a blockage (grease and rags) was removed. Wastewater staff observed that the manhole was flowing well at that time. The vacuum truck then removed all liquid on the nearby grass. The clean-up was completed by 1110h. It is estimated that approximately 10 gallons of sewage had spilled from the manhole. At 1129h, a follow-up phone call to the Spills Action Centre was made informing that the spill had been cleaned up.

Complaints and Customer Concerns

Condition 11.4 (i) - (ECA No. 0003-CGGME6)

Customer complaints and associated corrective actions from 2023 are outlined as follows:

There were no customer complaints in 2023.

Overview of the Success and Adequacy of the Works, Operating Problems and Corrective Actions

Condition 11.4(a), (b) and (c) - (ECA No. 0003-CGGME6)

Analysis of sample results demonstrates compliance with Environmental Compliance Approval No. 0003-CGGME6 compliance limits and objectives. There were no exceedences of compliance objectives or limits.

Description of any operating problems encountered and corrective actions taken during 2023:

Date Discovered	Date Resolved	Affected Equipment or Process	Description of any Operating Problems Encountered	Corrective Actions	Who Completed Work
There were no operational problems encountered in 2023.					

Maintenance Summary

Condition 11.4(d) - (ECA No. 0003-CGGME6)

Summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the works:

System	Date Completed	Equipment/Process	Description of Maintenance and Outcomes
Wellington WWTP	Feb 4/23	Ozone Disinfection	Container 2, pump # 2 seeing frequent blown fuses. Contactor hired to investigate and determined that fuses were undersized. The fuses were replaced with larger capacity fusing. A leak in the cooling system was also repaired.
Wellington WWTP	Feb 8/23	Ozone Disinfection	High temperature warnings on compressors occurring daily. Equipment supplier was contacted to investigate and determined that the air filter was damaged from excessive debris. The filter was replaced and compressors were returned to normal operation. Duct work was modified in order to inspect and maintain air filters.
Wellington WWTP	Feb 16/23	Ozone Disinfection	Booster pump #1 outlet pressures discovered to be dropping. Pump determined to be failing. Contractor hired and pump was replaced. System returned to normal operation.
Wellington Collection System	Dec 20/23	Effluent Flow Meter	Level transmitter for V Notch Weir failed along with MR200 Controller. New controller and level transmitter installed, tested and placed in service.
Wellington WWTP	Jan 7/23	Submersible Pump #3 - Pump Station 3	Pump not pumping at rated capacity. The pump was removed and sent for rebuild. The pump was reinstalled, tested and is now pumping at the rated capacity.
Wellington WWTP	Apr 12/23	Ozone Disinfection	Booster pump #2 outlet pressures discovered to be dropping. Pump determined to be failing. Contractor hired and pump was replaced. System returned to normal operation.
Wellington Collection System	May 8/23	Sewage Pump #1 - Wharf Street SPS	Pump not meeting specified capacity. New pump, pipework and check valves were installed and confirmed to meet specified capacity.
Wellington WWTP	Jul 12/23	Waste Activated Sludge	Waste activated sludge valve leaking. Contractor hired to repair valve. Valve was repaired and returned to normal operation.

Additional routine preventative maintenance performed throughout the 2023 operational year:

Collection System: Pumping Stations

- Annual electrical work-orders, as needed
- Annual Health and Safety equipment work-orders (fire extinguishers, lifting devices, gas detection equipment, etc.)
- Annual wet well cleaning, inspection and maintenance
- Annual equipment maintenance, calibrations and inspections (generators, flow meters, et. al.)

Treatment System: Wellington Wastewater Treatment Plant

- Annual electrical work-orders, As needed

- Annual Health and Safety equipment work-orders (fire extinguishers, lifting devices, gas detection equipment, etc.)
- Annual equipment maintenance, calibrations and inspections (blowers, flow meters, laboratory equipment, et. al.)
- Required cleaning and inspection of tanks (as necessary)
- Annual lifting device inspections
- Annual outfall inspection
- Annual contact chamber cleanout
- Annual digester cleanout
- Annual east and west storage tank cleanout
- Qzone Disinfection System - biannual preventative maintenance
- Biosolids removal

Effluent Monitoring Equipment Maintenance and Calibration

Condition 11.4 (f) - (ECA No. 0003-CGGME6)

Evaluation of the calibration and maintenance procedures conducted on all monitoring equipment:

Calibration and maintenance procedures conducted on all monitoring equipment have been performed according to the manufacturer's recommendations. All work performed is scheduled through a preventative maintenance task scheduler database which indicates when the calibration/maintenance is to be performed and includes the procedure in the report generated. Upon task completion, the data is recorded in the database.

In addition to regular maintenance carried out by licensed operators, flow measuring devices at the Wellington Wastewater Treatment Facility are calibrated by a certified third party representative and performed on an annual basis. Other operational equipment is submitted for third party review as required.

Table 14: Flow Measuring Equipment Calibrations, 2023

Equipment Location	Description	Calibrated By	Calibration Date
Wellington WWTP	Influent North Channel (FIT 201A)	Tower Electronics Canada Ltd	August 22, 2023
	Influent South Channel (FIT 201B)		August 22, 2023
	Final Effluent (FIT 202)		August 22, 2023

Biosolids Management

Condition 11.4 (i) - (ECA No. 0003-CGGME6)

Tabulation of the volume of sludge generated in 2023 and an outline of the anticipated volumes to be generated in 2024:

All sludge generated during 2023 was land applied inside of Prince Edward County by GFL Environmental Inc. The sludge volumes can be assessed as listed below in ***Table 15:*** *Biosolids Management Quantities*.

Table 15: Biosolids Management Quantities for Wellington Wastewater Treatment Plant, 2023

Date	NASM #	Farmer/ Landowner	Township	Ward	Total Volume m^3
October 18-19, 2023	60858	Gary Parks	Prince Edward	Hallowell	1260
Total					1260

Outline of the proposed sludge handling methods in disposal areas to be utilized during 2024:

For 2024, biosolids will be handled and disposed of by GFL Environmental Inc. The disposal will occur at approved site(s) within the boundaries of Prince Edward County.

Summary of Efforts to Comply with Procedure F-5-1

Condition 11.4 (l) - (ECA No. 0003-CGGME6)

Table 16: Summary of Efforts to Conform with Procedure F-5-1 in 2023

Date	Effort to Achieve Conformance
2023	In 2023, the wastewater equalization tank was constructed and placed in service. The equalization tank will assist with management of high flows during wet weather events.
2023	New aeration blower was purchased in 2023 to replace old blowers reaching end-of-life.

Table 17: Summary of Efforts and Projected Budget to Conform with Procedure F-5-1 in 2024

Date	Effort to Achieve Conformance	Budget
2024	Two new aeration blowers to be installed in 2024.	Operational Budget

Sample Schedule Deviations

Condition 11.4 (n) - (ECA No. 0003-CGGME6)

For the 2023 operational year, regularly scheduled samples were collected on Tuesdays. Additional samples were collected throughout the year in response to events outside of normal operating conditions. The table below outlines any deviations that occurred from the schedule and the reason for the deviation:

Table 18: Deviations from Sample Schedule

Scheduled Sample Date	Adjusted Sample Date	Rationale
December 26, 2023	December 27, 2023	Boxing Day

Regularly scheduled samples will be collected on Tuesdays for the 2024 operational year, unless affected by a statutory holiday. There are no projected deviations for 2024.

Updates/Change to Schedule for Proposed Works

Condition 11.4 (m) - (ECA No. 0003-CGGME6)

Table 19: Summary of Updates/Changes to Proposed Works

Proposed Works	Proposed Schedule	Considerations
Equalization Tank	2023	The equalization tank was constructed and placed in service in 2023.
New Sanitary Trunk Line along the Millennium Trail from Belleville Street to the Wastewater Treatment Facility with a new Sewage Pumping Station	2024	Tender has been awarded with work to be completed in 2024.
Class C EA Process for a new wastewater treatment facility.	2024	Class C Environmental Assessment is the starting point of the new Wellington Wastewater Treatment Facility targeted to be constructed in 2027.