



2023 ANNUAL WASTEWATER TREATMENT SYSTEM SUMMARY REPORT

Ingersoll Wastewater Treatment Plant

1. GENERAL INFORMATION

Oxford County (the County) prepares a report summarizing wastewater treatment operation and treated effluent discharge quality for every municipal wastewater treatment plant (WWTP) annually. The reports detail the latest effluent quality testing results and quantity statistics, and any non-compliance conditions that may have occurred for the previous year. They are available for review by the end of March on the County website at <http://www.oxfordcounty.ca/waterwastewater> or by contacting the Public Works Department.

All efforts have been made to ensure the information presented in this report is as accurate as possible.

If you have any questions or comments concerning the report, please contact the County at the address and phone number listed below or by email at wastewater@oxfordcounty.ca.

Wastewater Treatment Plant:	Ingersoll WWTP
Wastewater Treatment Plant Number:	110003969
Environmental Compliance Approval (ECA):	1614-A28P9L (September 16, 2015)
Reporting Period:	January 1, 2023 – December 31, 2023

Wastewater Treatment Plant Owner & Contact Information:
Oxford County Public Works Department - Wastewater Services
P.O. Box 1614
21 Reeve Street
Woodstock, ON N4S 7Y3
Telephone: 519-539-9800
Toll Free: 866-537-7778
Email: wastewater@oxfordcounty.ca

1.1 System Description

The Ingersoll WWTP is a Class IV rated treatment facility, as defined by Ontario Regulation (O.Reg.) 129/04, which provides wastewater treatment for residential, commercial, and industrial users in the Town of Ingersoll. It also provides treatment for septic tank waste, hauled waste, holding tank waste, and landfill leachate from within Oxford County. The nominally separated wastewater collection system includes five (5) sewage pumping stations, 88.3 kilometers of sanitary gravity sewers, 14.3 kilometers of sanitary forcemain sewers and 0.8 kilometers of sanitary low pressure sewers.

Since the completion of the WWTP upgrade in 2018, two treatment trains have been operational and have provided a treatment capacity of 12,945 m³/d. Both trains are conventional activated sludge plants consisting of primary and secondary treatment sharing an ultraviolet light disinfection system and a single discharge point into the Thames River. The Ingersoll WWTP utilizes anaerobic digestion followed by dewatering to produce stabilized biosolids. The biosolids are then transported to dedicated offsite storage prior to beneficial reuse on agricultural land.

Standby generators are available to run the onsite Ingersoll Main Lift Station and disinfection system in the event of a power failure.

The system is maintained by licensed wastewater system operators and licensed mechanics that operate, monitor, and maintain the treatment equipment, in accordance with the regulations, and collect samples as required by the ECA. Alarms automatically notify operators in the event of failure of critical operational requirements.

The Ingersoll WWTP is located at 56 McKeand Street, Ingersoll, Ontario, with the Facility description provided below.

Facility	Ingersoll WWTP
Design Capacity	12,945 m ³ /d
2023 Average Daily Flow	7,491 m ³ /d
2023 Maximum Daily Flow	24,646 m ³ /d
2023 Total Volume of Wastewater	2,731,507 m ³ /year
2023 Total Received Hauled Waste	12,010 m ³ /year (7,776 m ³ /year leachate)

1.2 Major Expenses

In 2023, the Ingersoll WWTP had forecasted operating and maintenance expenditures of approximately \$2,893,000.

In addition to regular operational and maintenance expenditures, Capital Improvement Projects for Ingersoll totaled \$1,107,000 for improvements to the wastewater collection system and the Ingersoll WWTP.

Capital Improvement Projects included:

- \$787,000 for Town of Ingersoll Sewer Projects
- \$98,400 for the replacement of general operating equipment
- \$95,100 for facilities improvements
- \$75,000 for Town of Ingersoll Sewer Relining
- \$50,000 for Town of Ingersoll Southwest Industrial Park
- \$1,000 for Town of Ingersoll Linear R/R CR Project

Capital Improvement Projects for all systems included:

- \$1,799,000 to develop Countywide SCADA Master Plan for all wastewater systems
- \$70,000 to develop Countywide Wastewater Servicing Master Plan for all wastewater systems
- \$38,000 for Development Charges Technical Study

2. SUMMARY AND INTERPRETATION OF MONITORING DATA

2.1. Effluent Quality Assurance and Control Measures

Sampling Procedure

Influent samples are collected monthly and effluent samples are collected weekly using a composite sampler over a 24-hour period. Raw sewage samples are collected at the main lift station located on-site; the sample is drawn after the lift station pumps and prior to the primary tanks of either plant. Effluent is sampled directly from the combined flow after it leaves the UV disinfection system prior to final discharge and represents the final treated effluent sample for the entire facility.

Laboratory and Field Testing

All samples that are reported for compliance purposes are analyzed at an accredited licensed laboratory except for pH, dissolved oxygen (DO), and temperature which are field collected. Laboratory analysis is performed by SGS Lakefield Research Ltd. All other in-house testing is done for process control, the results of which are not included in this report.

2.2 WWTP Performance and Effluent Quality

Final Effluent Compliance Limits

Compliance limits are defined as the maximum effluent concentrations permitted for a given parameter set by the Ministry of Environment, Conservation and Parks (MECP). Compliance limits are detailed within each WWTP ECA. The limits are determined to prevent impairment to the receiving water body quality. The Owner is legally obligated to operate and maintain the treatment system to ensure the compliance limits are achieved.

The Ingersoll WWTP provided effective treatment in 2023 and was 100% in compliance with all its regulatory limits for all effluent discharged from the WWTP.

Influent Streams and Effluent Streams

Approximately four times a week, the operator measures pH of both the influent and effluent streams.

There was no single pH result for the effluent outside the discharge limit of 6.0 – 9.5 in 2023.

Graphs of discharge parameters versus effluent discharge limits are included in this report in Appendix A.

Influent wastewater characteristics and effluent discharge values are presented in the tables below.

Influent Wastewater Characteristics (annual average)		
Parameter	Concentration (mg/L)	Loading (kg/d)
BOD ₅	156	1,167
Total Suspended Solids	202	1,512
Total Phosphorus	3.2	24
Total Kjeldahl Nitrogen	24	181

Effluent Parameter	Sample Frequency (when discharging)	ECA Effluent Limit (Monthly Average) (mg/L unless otherwise indicated)	Monthly Average Result Min-Max (mg/L unless otherwise indicated)	Percentage Removal
Carbonaceous Biochemical Oxygen Demand (CBOD ₅)	weekly	15	2.0 – 2.8	98.2 – 98.7
Total Suspended Solids (TSS)	weekly	15	4.0 – 8.8	95.6 – 98.0
Total Phosphorus (TP)	weekly	0.6	0.17 – 0.36	88.8 – 94.7
Total Ammonia Nitrogen (TAN) (May 1 to November 30)	weekly	2.0	0.1 – 0.2	----
Total Ammonia Nitrogen (TAN) (Dec. 1 to April 30)	weekly	6.0	0.2 – 1.2	--
pH any single sample	weekly	6.0 - 9.5	6.52 – 7.98	--
E. coli	weekly	200 organisms/100 mL (Monthly Geometric Mean Density)	7.0 – 33.2 organisms/100 mL (Monthly Geometric Mean Density)	--

2.3 Final Effluent Design Objectives

Final Effluent Design Objectives (objectives) are non-enforceable effluent quality values which the Owner is obligated to use best efforts to strive towards achieving on an ongoing basis.

These objectives are to be used as a mechanism to trigger corrective action proactively, and voluntarily, before environmental impairment occurs and before the compliance limits are exceeded.

There were no monthly average effluent objective failures in 2023.

All single sample effluent objective failures are listed below.

The following table presents the range of effluent discharge values vs. ECA Objectives.

Effluent Parameter	Sample Frequency	Monthly Average Objective Concentration (mg/L unless otherwise indicated)	Monthly Average Result Min-Max (mg/L unless otherwise indicated)
Carbonaceous Biochemical Oxygen Demand (CBOD ₅)	weekly	10	2.0 – 2.8
Total Suspended Solids (TSS)	weekly	10	4.0 – 8.8
Total Phosphorus (TP)	weekly	0.40	0.17 – 0.36
Total Ammonia Nitrogen (TAN) (May 1 to Nov. 30)	weekly	1.5	0.1 – 0.2
Total Ammonia Nitrogen (TAN) (Dec. 1 to April 30)	weekly	4.0	0.2 – 1.2
pH any single sample	weekly	6.5 - 9.0 pH	6.52 – 7.98
E. coli	weekly	100 colonies/100 mL (Monthly Geometric Mean Density)	7.0 – 33.2 colonies/100 mL (Monthly Geometric Mean Density)

Single sample results that failed to meet effluent objectives are provided in the following table.

Date	Parameter	Objective (mg/L unless otherwise indicated)	Result (mg/L unless otherwise indicated)
February 1, 2023	TSS	10	12
February 7, 2023	E. coli	100 colonies/100 mL	124 colonies/100 mL
April 19, 2023	E. coli	100 colonies/100 mL	123 colonies/100 mL
May 2, 2023	TSS	10	11
May 10, 2023	E. coli	100 colonies/100 mL	114 colonies/100 mL
May 23, 2023	E. coli	100 colonies/100 mL	194 colonies/100 mL

Date	Parameter	Objective (mg/L unless otherwise indicated)	Result (mg/L unless otherwise indicated)
May 30, 2023	TP	0.40	0.42
June 21, 2023	E. coli	100 colonies/100 mL	131 colonies/100 mL
December 11, 2023	TSS	10	11
December 15, 2023	TSS	10	11

3. OVERFLOWS, BYPASSING, UPSETS, SPILLS, AND ABNORMAL CONDITIONS

There were no overflows, bypassing, upsets, spills, or abnormal conditions in 2023.

There were no complaints in 2023.

4. MAINTENANCE OF WORKS

The operating and maintenance staff at the Ingersoll WWTP conducts regularly scheduled maintenance of the plant equipment. The Ingersoll WWTP utilizes a database known as Cartegraph to issue work orders and maintain records for regular maintenance and repair at the WWTP.

The Limited Operational Flexibility for modification to the WWTP was not used in 2023.

5. MONITORING EQUIPMENT MAINTENANCE AND CALIBRATION

The calibration of flow meters is conducted annually by JBF Controls Ltd. in accordance with the requirements of the ECA. The records are kept on-site at the Ingersoll WWTP.

All other operational monitoring equipment is calibrated by staff and records are kept on-site at the Ingersoll WWTP.

6. BIOSOLIDS PROGRAM

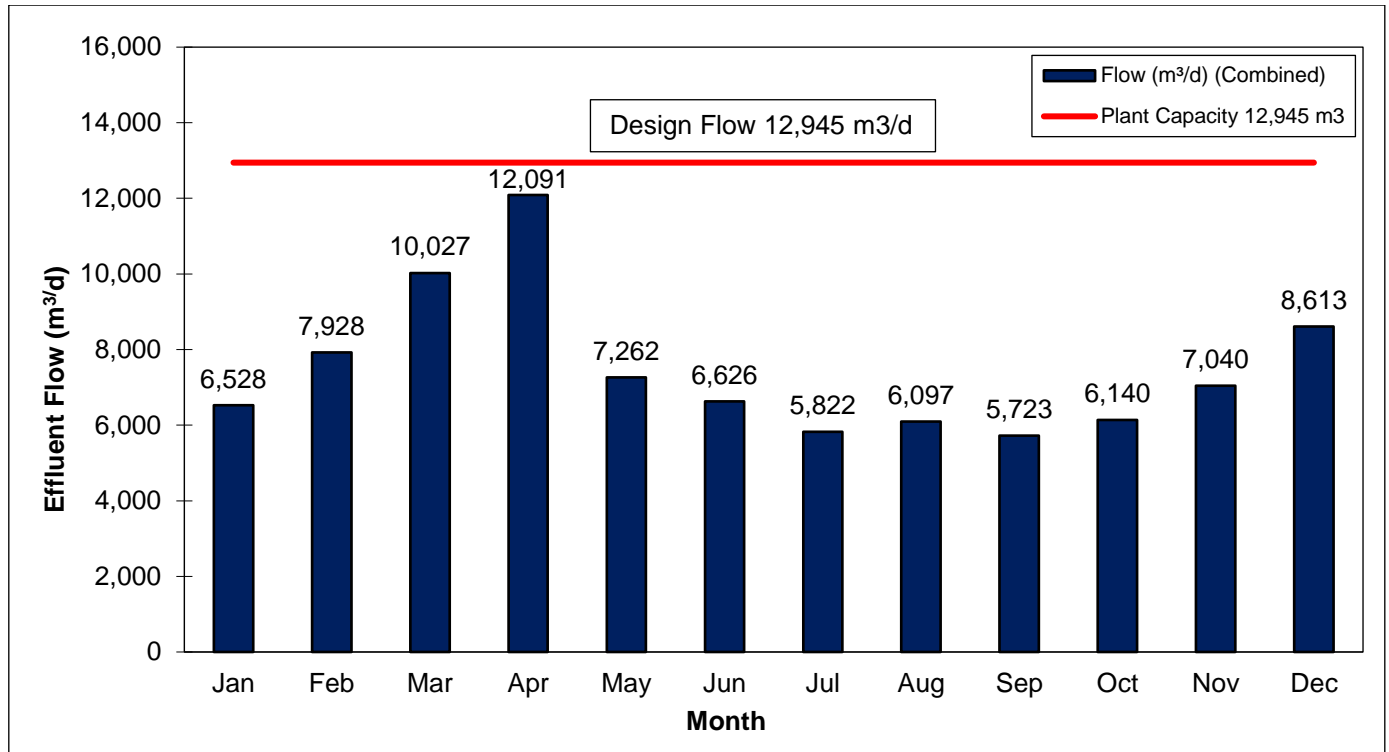
Biosolids are anaerobically digested and dewatered at the Ingersoll WWTP using an Alfa-Laval Centrifuge. The biosolids are then stored at the County Biosolids Centralized Storage Facility (BCSF) prior to land application. The sampling results and land application details are summarized in a separate Biosolids Annual report, available at: www.oxfordcounty.ca/Services-for-You/Water-Wastewater/Wastewater/Annual-reports.

7. INSPECTION, PILOTS, AND TRIALS

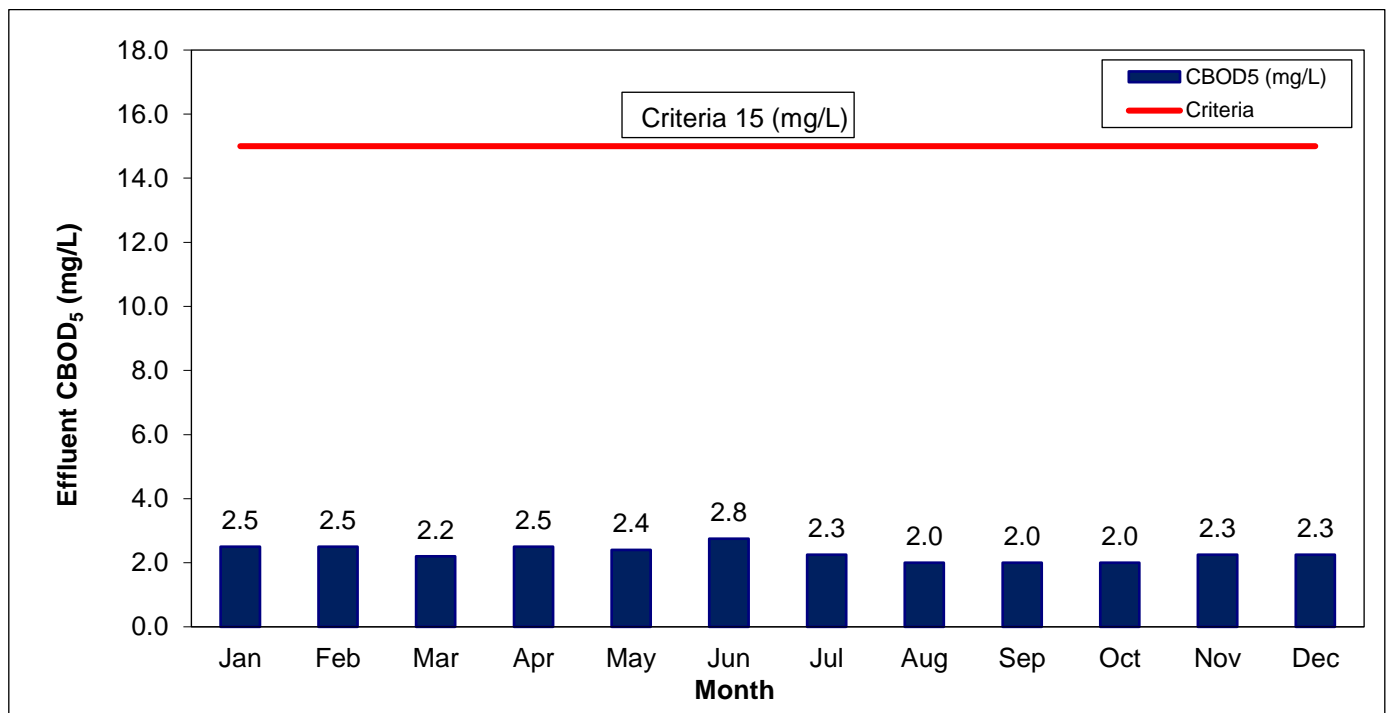
The MECP did not perform an inspection of the Ingersoll WWTP in 2023. The MECP inspections typically occur on a three-year schedule.

APPENDIX A: GRAPHS OF 2023 DISCHARGE PARAMETERS VS. EFFLUENT DISCHARGE LIMITS

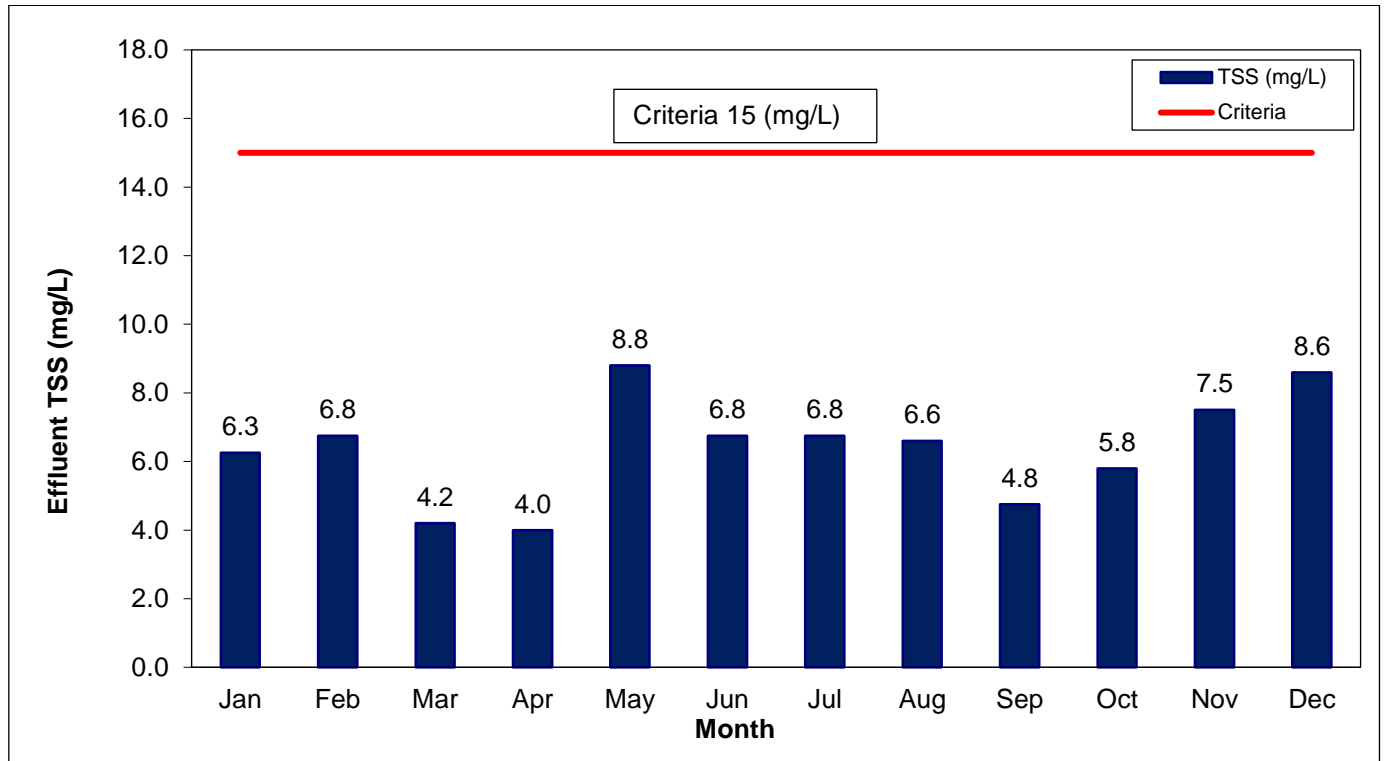
Ingersoll WWTP Monthly Average Daily Flow in Cubic Meters per Day, 2023



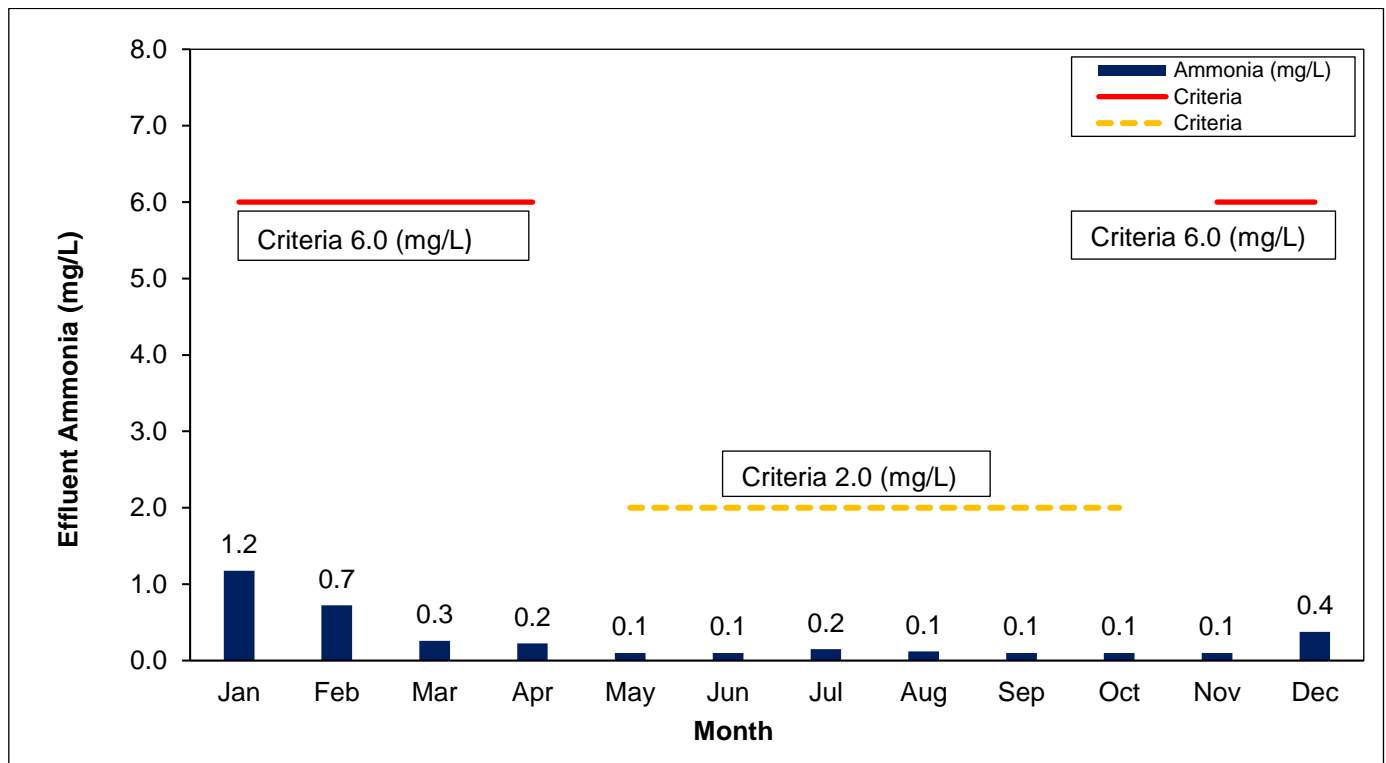
Ingersoll WWTP Effluent, Monthly Average CBOD₅ (mg/L), 2023



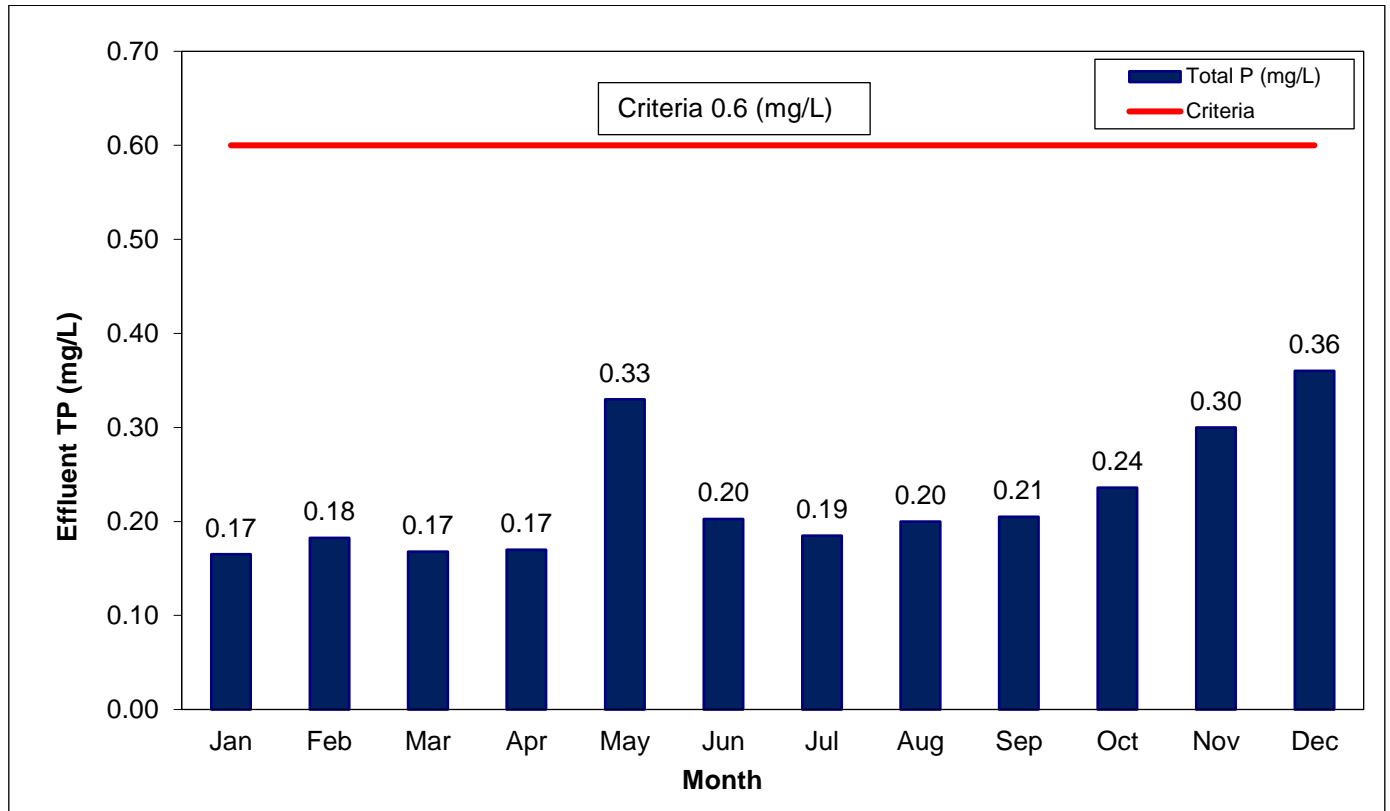
Ingersoll WWTP Effluent, Monthly Average TSS (mg/L), 2023



Ingersoll WWTP Effluent, Monthly Average Ammonia (mg/L), 2023



Ingersoll WWTP Effluent, Monthly Average Total Phosphorus (mg/L), 2023



Ingersoll WWTP Effluent, Monthly Geometric Mean Density E. coli (colonies/100 mL), 2023

