



2023 ANNUAL WASTEWATER TREATMENT SYSTEM SUMMARY REPORT

Tavistock 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:	Tavistock WWTP
Wastewater Treatment Plant Number:	110000720
Environmental Compliance Approval (ECA):	0095-CBJQUJ (March 17, 2022)
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 Tavistock WWTP is a Class I facility, as defined by Ontario Regulation (O.Reg.) 129/04. The Tavistock WWTP is a lagoon wastewater treatment system serving the Village of Tavistock. The separate wastewater collection system includes three (3) sewage pumping stations (SPS), 23.5 kilometers of sanitary gravity sewers, 2 kilometers of sanitary forcemain sewers and 0.2 kilometers of sanitary low pressure sewers. The Tavistock WWTP consists of three aerated lagoon cells, one polishing pond and an Intermittent Sand Filter (ISF). Cell 1 is equipped with Ares aerators, cell 2 and 3 are equipped with Mat Aerators, and there are an additional six 15 HP aspirating surface aerators in Cell 1 to provide the necessary dissolved oxygen for the lagoons.

There is also the provision for continuous aluminum sulphate addition for phosphorus removal. The wastewater is dosed with aluminum sulphate as it enters Cell 1 and as it enters Cell 2.

Effluent from Cell 1 overflows to Cell 2, then into Cell 3 and/or Cell 4 where it is pumped through the filter beds and/or stored prior to discharge.

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 WWTP is located at 381 William Street, Tavistock, Ontario. The Facility description is provided below.

Facility	Tavistock WWTP
Design Capacity	2,935 m ³ /d
2023 Average Daily Flow	2,069 m ³ /d
2023 Maximum Daily Flow	6,478 m ³ /d
2023 Total Volume of Wastewater	755,483 m ³ /year

1.2 Major Expenses

In 2023, the Tavistock WWTP had forecasted operating and maintenance expenditures of approximately \$1,746,000.

In addition to regular operational and maintenance expenditures, Capital Improvement Projects for Village of Tavistock totaled \$608,000 which included improvements to the wastewater collection systems and the Tavistock WWTP.

Capital Improvement Projects included:

- \$198,000 for Williams Street SPS Rehab
- \$110,000 for the Replacement of General Operating equipment
- \$50,000 for Sanitary Sewer Replacement

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

Raw sewage is sampled a minimum of once monthly for Biochemical Oxygen Demand (BOD₅), Total Suspended Solids (TSS), Total Kjeldahl Nitrogen (TKN), Total Phosphorus (TP), pH, and temperature. Automatic composite samplers are used to collect raw sewage samples from Chamber 3 as the flow enters Cell 1. Automated composite samples are also taken at the same time from a large food processor in Tavistock. The company can discharge significant loadings to the Tavistock WWTP and is subject to a surcharge agreement with the County.

Grab samples of final effluent are taken weekly during effluent discharge and tested for CBOD₅, TSS, TP, pH, temperature, dissolved oxygen (DO), nitrate nitrogen, nitrite nitrogen, ammonia nitrogen and un-ionized ammonia.

Laboratory and Field Testing

A licensed laboratory is used to evaluate all samples that are taken for compliance purposes with the exception of pH, temperature, and DO which are measured in the field. SGS Lakefield Research Ltd. performs all laboratory analyses. 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 Tavistock 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

On a weekly basis (minimum), the operator measures the pH of the effluent stream when discharging. There was no single pH result for the effluent outside the discharge limit of 6 – 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)
CBOD ₅	652	1,349
Total Suspended Solids	438	906
Total Phosphorus	15	32
Total Kjeldahl Nitrogen	59	123

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
CBOD ₅	weekly	15	2.0 – 3.0	99.5 - 99.7
TSS	weekly	15	2.2 – 5.0	99.1 - 99.5
TP (May-Nov.)	weekly	0.5	0.1	98.8 – 99.4
TP (Dec.-Apr.)	weekly	0.8	0.1	98.8 – 99.4
Total Ammonia Nitrogen (January)	weekly	7.0	2.1	-
Total Ammonia Nitrogen (February)	weekly	10.0	3.9	-

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
Total Ammonia Nitrogen (March)	weekly	8.5	0.8	-
Total Ammonia Nitrogen (April)	weekly	8.0	0.2	-
Total Ammonia Nitrogen (May-Nov.)	weekly	1.0	0.1 – 0.5	-
Total Ammonia Nitrogen (December)	weekly	3.0	-	-
pH any single sample	weekly	6.0 - 9.5	6.9 – 8.7	-

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.

All effluent discharge objectives listed in the ECA were met at the Tavistock WWTP in 2023, with the exception of the single samples listed in the table below.

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

Effluent Parameter	Sample Frequency (when discharging)	Monthly Average Objective Concentration (mg/L)	Monthly Average Result Min-Max (mg/L)
CBOD ₅	weekly	10	2.0 – 3.0
TSS	weekly	10	2.2 – 5.0
TP (May-Nov.)	weekly	0.3	0.1
TP (Dec.-Apr.)	weekly	0.5	0.1

Effluent Parameter	Sample Frequency (when discharging)	Monthly Average Objective Concentration (mg/L)	Monthly Average Result Min-Max (mg/L)
Total Ammonia Nitrogen (January)	weekly	6.0	2.1
Total Ammonia Nitrogen (February)	weekly	9.0	3.9
Total Ammonia Nitrogen (March)	weekly	7.5	0.8
Total Ammonia Nitrogen (April)	weekly	7.0	0.2
Total Ammonia Nitrogen (May-Nov.)	weekly	0.8	0.1 – 0.5
Total Ammonia Nitrogen (December)	weekly	1.5	-
pH any single sample	weekly	6.5 – 9.0	6.9 – 8.7

Tavistock WWTP effluent single samples that did not meet effluent objective concentrations in 2023 include the following:

Date	Parameter	Objective (mg/L)	Result (mg/L)
April 6, 2023	TSS	10	12
May 11, 2023	TAN	0.8	0.9
November 16, 2023	TAN	0.8	1.1
November 17, 2023	TAN	0.8	0.9

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

There were no overflows, bypasses, upsets, or spills from the Tavistock WWTP in 2023.

There were no complaints received in 2023.

Several projects were undertaken in 2023 to eliminate Bypass/Overflows in conformance with Procedure F-5-1:

- Infiltration grout repair on sanitary manholes #68 and #56, June 29,2023
- Repair to the 375mm valve chamber collector between Hope Street West and Woodstock Street South, November 2, 2023
- Class Environmental Assessment (EA) Study initiated in 2023, for expansion of the Williams Street Sewage Pumping Station (SPS). The Study will address existing state of good repair issues, capacity constraints and will ensure compliance with current health & safety standards while improving SPS capacity and reducing Inflow and Infiltration (I&I)

4. MAINTENANCE OF WORKS

The operating and maintenance staff at the Tavistock WWTP conducts regularly scheduled maintenance of the WWTP equipment. The WWTP utilizes a database system 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 Tavistock WWTP was not used in 2023.

5. MONITORING EQUIPMENT MAINTENANCE AND CALIBRATION

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

All other operational monitoring equipment calibration records are kept on-site at the Tavistock WWTP.

6. INSPECTION, PILOTS, AND TRIALS

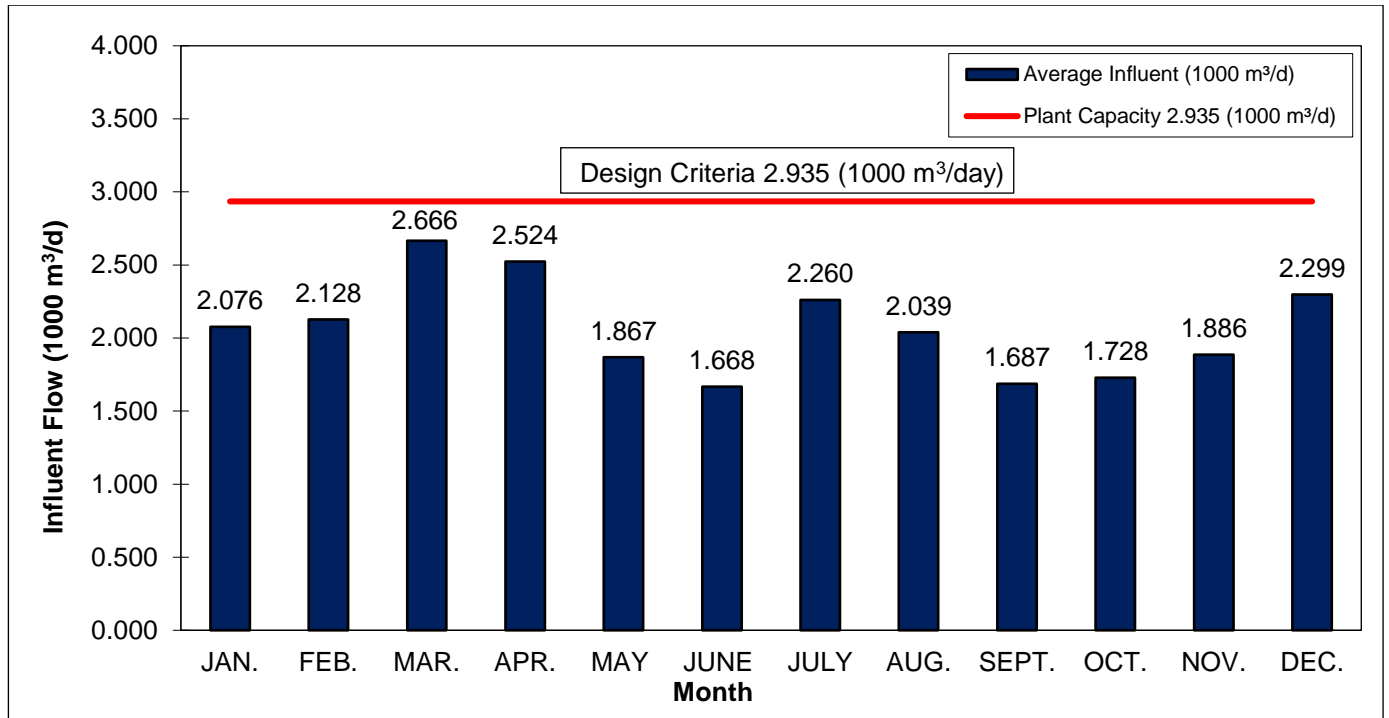
The MECP did not conduct an inspection of the Tavistock WWTP in 2023. The MECP inspections typically occur on a three-year schedule.

Municipal Class Environmental Assessment Study

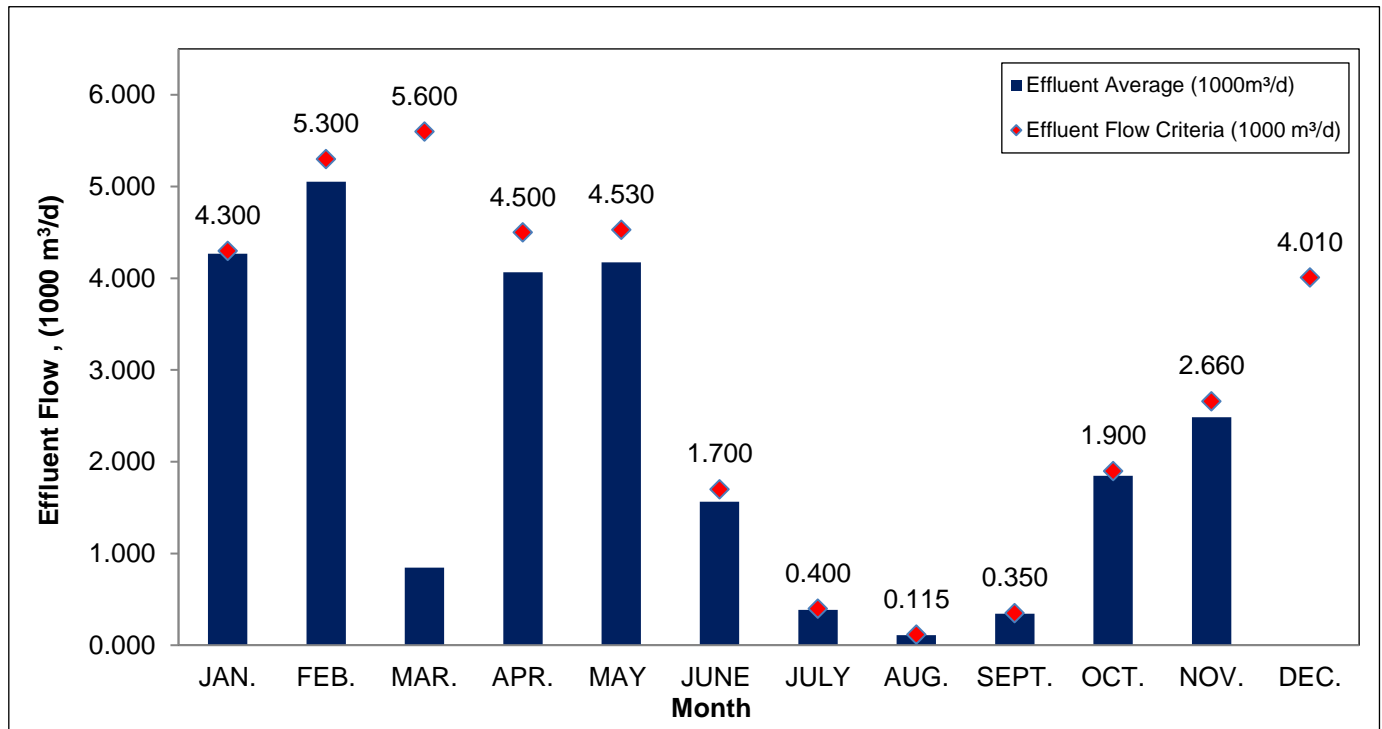
In response to future growth in the Village of Tavistock, and associated projected increases in Tavistock WWTP flow rates, the County initiated a Municipal Class EA Study for capacity expansion of the Tavistock WWTP which will commence in 2024. The study will determine the most cost-effective, environmentally sound, and sustainable approach to expand the Tavistock WWTP to meet the wastewater servicing needs of the community. The Class EA Study is underway and is expected to be completed in 2025.

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

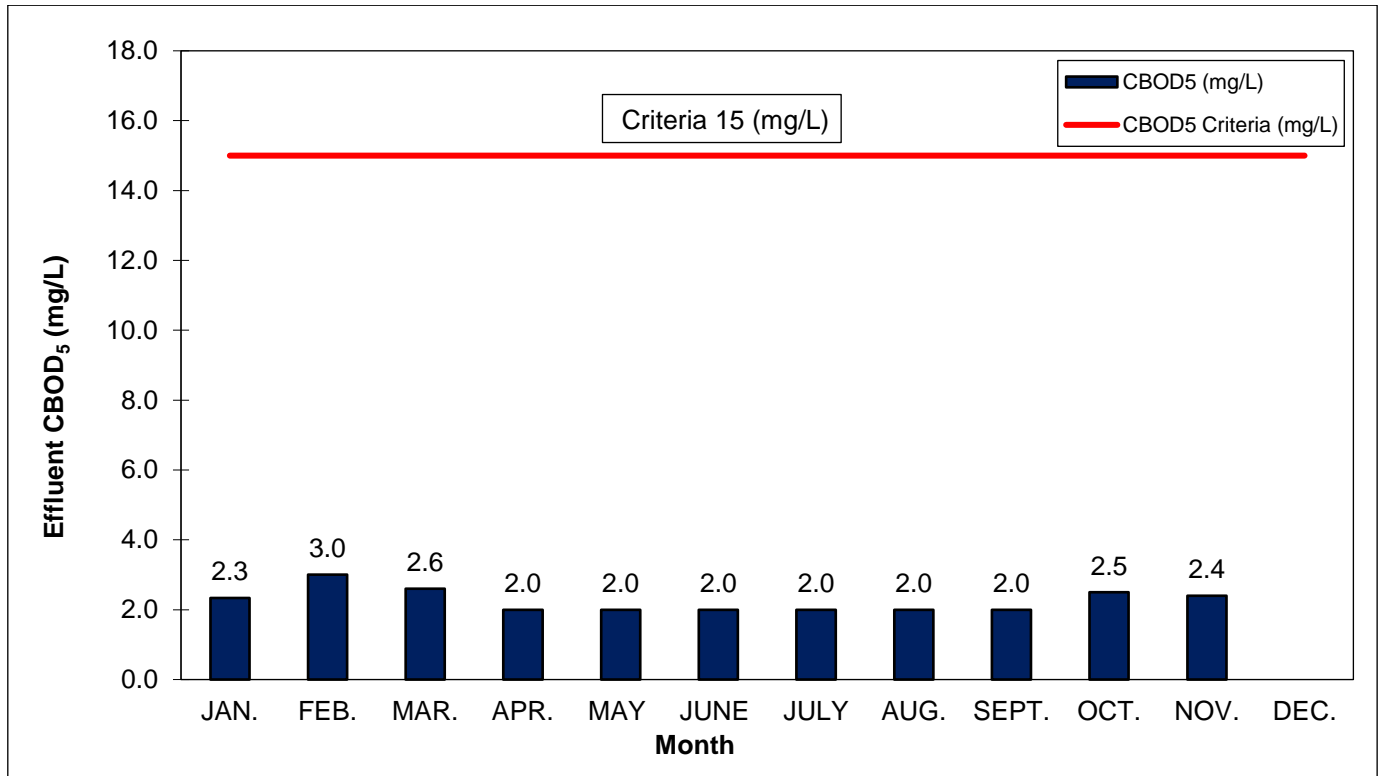
Tavistock WWTP Influent, Monthly Average Daily Flow (1000 m³/d), 2023



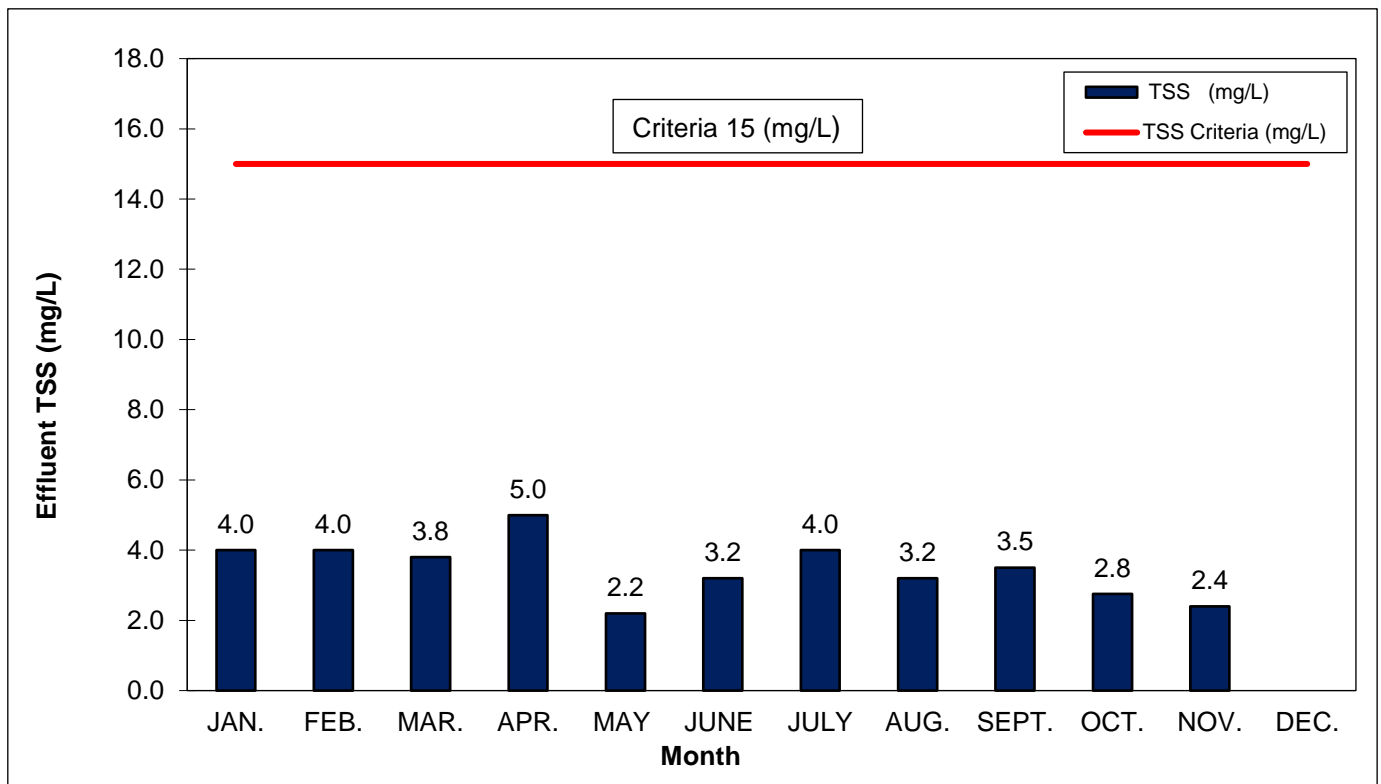
Tavistock WWTP Effluent, Monthly Average Daily Flow (1000 m³), 2023



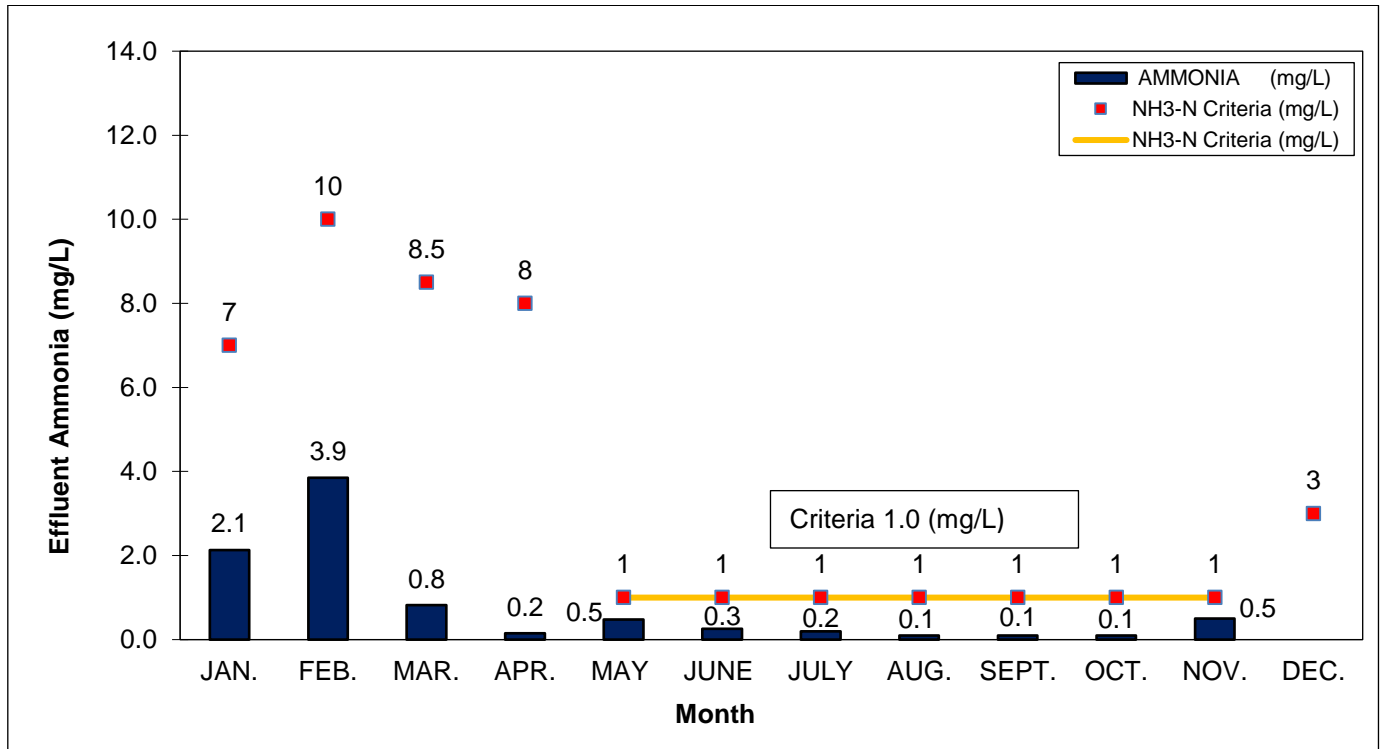
Tavistock WWTP Effluent, Monthly Average CBOD₅ (mg/L), 2023



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



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



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

