2025 ANNUAL WASTEWATER TREATMENT SYSTEM SUMMARY REPORT

Thamesford 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:	Thamesford WWTP
Wastewater Treatment Plant Number:	120002601
Environmental Compliance Approval (ECA):	8822-DDJHPP (March 18, 2025)
Reporting Period:	January 1, 2025 – December 31, 2025

Wastewater Treatment Plant Owner & Contact Information:

Oxford County Public Works Department - Wastewater Services
P.O. Box 1614
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Woodstock, ON N4S 7Y3
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1.1 System Description

The Thamesford WWTP is a Class II rated treatment facility, as defined by Ontario Regulation (O. Reg.) 129/04, which provides wastewater treatment for the Village of Thamesford. The Thamesford WWTP is an extended air activated sludge plant equipped with tertiary sand filters. The nominally separated wastewater collection system includes four (4) sewage pumping stations (SPS), 18.7 kilometers of sanitary gravity sewers, 1.1 kilometers of sanitary forcemain sewers and 0.6 kilometers of sanitary low-pressure sewers.

The incoming wastewater is screened and then treated in the extended aeration system. From there, the flow enters a secondary clarifier where the settled activated sludge is either returned or wasted and the supernatant flows to a sand filter, prior to disinfection and direct discharge to the Middle Thames River. Wasted biosolids are processed/stabilized in the aerobic digester and routinely transported to the Ingersoll or Woodstock WWTP for dewatering.

For purposes of calculating loading to the Middle Thames River, the treated effluent flow is measured at the Parshall flume located after the stilling well just before discharge to the re-aeration chamber and the Middle Thames River. The influent flow readings used to apportion the loading to the plant are from two meters: one on each lift station. The influent and all other meters are calibrated annually.

A standby generator is available to run the onsite lift stations and a blower 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 Thamesford WWTP is located at 10 Middleton Street, Thamesford, Ontario, with the Facility description provided below:

Facility	Thamesford WWTP
Design Capacity	2,500 m^3/d
2025 Average Daily Flow	595 m^3/d
2025 Maximum Daily Flow	1,188 m^3/d
2025 Total Volume of Wastewater	217,208 m^3/year

1.2 Major Expenses

In 2025, the Thamesford WWTP had forecast operating and maintenance expenditures of approximately $864,000.

Planning for major wastewater system expenses is included within Oxford County's Wastewater Services Master Plan and managed according to our Asset Management and Capital Replacement Program. In addition to regular operational and maintenance expenditures, Capital Improvement Projects for the Village of Thamesford were forecast at approximately $450,000 which included improvements to the wastewater collection system and the Thamesford WWTP.

Notable Thamesford Capital Improvement Projects included:

- $400,000 for design of headwork, screening and aeration upgrade.

Capital Improvement Projects for all systems included:

- $1,340,000 to develop Countywide Supervisory Control and Data Acquisition (SCADA) Master Plan for all wastewater systems.

2. SUMMARY AND INTERPRETATION OF MONITORING DATA

2.1 Effluent Quality Assurance and Control Measures

Sampling Procedure

Influent samples are taken from a sampling port located in-line after the influent pumps (monthly, at minimum). A 24-hour composite sampler is taking an influent sample every 15 minutes for a 24-hour period concurrent with effluent sampling.

In 2025, effluent samples were taken using a 24-hour composite sampler set to take a sample every 15 minutes for 24 hours (weekly, at minimum). Samples were drawn from a stilling well, prior to the Parshall flume, immediately before the discharge. Total residual chlorine (TRC) samples are taken from the stilling well prior to the Parshall flume. The stilling well follows the chlorination and de-chlorination chambers. The pH of the final effluent composite sample is also measured.

Following the Parshall flume, effluent flows through a discharge pipe and drops approximately 0.75 m into a discharge well, where dissolved oxygen (DO) concentration measurements are taken. The drop into the discharge well aerates the effluent prior to discharge to the Thames River, as reflected in the DO measurements recorded.

Laboratory and Field Testing

A licensed laboratory is used for analysis of any results used for determination of compliance except for TRC, DO, temperature and pH which are tested in the field. SGS Lakefield Research Ltd. performs all laboratory analyses. All other information generated in-house is used 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 the 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.

In 2025, the Thamesford WWTP provided effective treatment, with 978 samples out of 1,002 meeting compliance, or 97.6% compliance to its regulatory limits for all effluent discharged from the WWTP.

In January, repair work began on tertiary sand filter #2 and all secondary clarifier effluent was routed through tertiary sand filter #1. Dissolved oxygen concentrations slowly decreased over time in the final effluent, resulting in non-compliance:

- The Final Effluent Dissolved Oxygen Single Sample Concentration of at least 5 mg/L was not achieved on 5 occasions:
    - January 20/2025: concentration of 4.66 mg/L achieved
    - January 21/2025: concentration of 4.93 mg/L achieved
    - January 22/2025: concentration of 4.80 mg/L achieved
    - January 23/2025: concentration of 4.63 mg/L achieved
    - January 24/2025: concentration of 4.83 mg/L achieved

In reaction, operations made improvements to water recirculation through tertiary sand filter #1, which increased the dissolved oxygen concentrations in the final effluent above the minimum concentration limit of 5 mg/L.

In early May, a pump within the aeration tank became fouled with debris, decreasing the oxygen transfer efficiency and mixing within the secondary treatment process. This negatively impacted on the nitrification process resulting in a non-compliance:

- The Total Ammonia Nitrogen Monthly Average Effluent Concentration was 2.70 mg/L, which was above the ECA Total Ammonia Nitrogen Monthly Average Concentration of 2.0 mg/L.

In response, the mixing pump was removed and a spare unit installed. Several loads of activated sludge were brought in by vacuum truck from neighbouring WWTPs to help re-establish the population of nitrifying bacteria, and two submersible aerators were utilized to help improve the dissolved oxygen concentration and mixing within the tank. Nitrification was fully re-established by the end of the month.

All non-compliances were reported to the MECP at the time of the events.

Influent Streams and Effluent Streams

There was no single pH result for the effluent outside the discharge limit of 6.0 - 9.5 in 2025.

Staff test TRC in the treated effluent several times per week; well in excess of the required weekly testing frequency. All results met the single sample TRC limit of 0.02 mg/L or less in 2025.

The Thamesford WWTP met all its effluent loading limits required within the ECA.

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	248	148
Total Suspended Solids	218	130
Total Phosphorus	4.8	3
Total Kjeldahl Nitrogen	48.2	29
Oil and Grease	45	27

Effluent Parameter	**Sample Frequency**	**ECA Effluent Limit (Monthly Average)** (mg/L unless otherwise indicated)	**Monthly Average Result Min-Max** (mg/L otherwise indicated)	**Percentage Removal**
Carbonaceous Biochemical Oxygen Demand ($CBOD_5$) (May 1 to November 30)	weekly	10.0	2.0 – 5.3	97.9 – 99.2
Carbonaceous Biochemical Oxygen Demand ($CBOD_5$) (December 1 to April 30)	weekly	15.0	2.2 – 5.6	97.7 – 99.1
Total Suspended Solids (TSS) (May 1 to November 30)	weekly	10.0	2.0 – 7.8	96.4 – 99.1
Total Suspended Solids (TSS) (December 1 to April 30)	weekly	15.0	2.5 – 6.2	97.2 – 98.9
Total Phosphorus (TP) (May 1 to November 30)	weekly	0.20	0.03 – 0.17	96.5 – 99.4
Total Phosphorus (TP) (December 1 to April 30)	weekly	0.50	0.04 – 0.12	97.5 – 99.2
Total Ammonia Nitrogen (TAN) (May 1 to November 30)	weekly	2.0	0.1 – 2.67	--
Total Ammonia Nitrogen (TAN) (December 1 to April 30)	weekly	5.0	0.1 – 0.36	--
Total Residual Chlorine (any single sample)	weekly	0.02	0.00 – 0.01	--
E. coli	weekly	200 MPN*/100 mL (Monthly Geometric Mean Density)	1.0 – 82.5 MPN/100 mL (Monthly Geometric Mean Density)	--
pH (any single sample)	weekly	6.0 – 9.5	6.52 – 8.2	--

Effluent Parameter	Sample Frequency	ECA Effluent Limit (Monthly Average) (mg/L unless otherwise indicated)	Monthly Average Result Min-Max (mg/L otherwise indicated)	Percentage Removal
Dissolved Oxygen (any single sample)	weekly	5 and above	4.63 – 9.80	--

*MPN: Most Probable Number

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 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 WWTP ECA were met with the exception of the single sample and monthly average effluent objective exceedances that are summarized 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)
$CBOD_5$	weekly	5.0	2.0 – 5.6
TSS	weekly	5.0	2.0 – 7.8
TP	weekly	0.10	0.03 – 0.17
TAN (May 1 to November 30)	weekly	1.2	0.1 – 2.67
TAN (December 1 to April 30)	weekly	4.0	0.1 – 0.36
Total Residual Chlorine (any single sample)	weekly	non-detect	0.00 – 0.01
E. coli	weekly	150 MPN/100 mL (Monthly Geometric Mean Density)	1.0 – 82.5 MPN/100 mL (Monthly Geometric Mean Density)
pH (any single sample)	weekly	6.5 – 8.5	6.52 – 8.2

Effluent Parameter	Sample Frequency	Monthly Average Objective Concentration (mg/L unless otherwise indicated)	Monthly Average Result Min-Max (mg/L unless otherwise indicated)
Dissolved Oxygen (any single sample)	weekly	6.0	4.63 – 9.80

The WWTP had trouble meeting the $CBOD_5$, TSS and TAN objective concentrations in the spring. Colder temperatures and equipment issues impacted WWTP performance. In response, return and waste activate sludge pumping rates were adjusted, truckloads of activated sludge from neighboring WWTPs were brought in, and equipment issues were resolved.

In the fall, the WWTP had problems meeting the TSS and TP objective concentrations. Operators increased waste activated sludge pumping and coagulant dosage rates, tertiary sand filters were cleaned, and filter backwashing times were increased.

Thamesford effluent single samples that did not meet effluent objective concentrations in 2025 included the following:

Date	Parameter	Objective (mg/L)	Result (mg/L)
January 13, 2025	DO	6.0	5.44
January 16, 2025	DO	6.0	5.51
January 17, 2025	DO	6.0	5.43
January 20, 2025	DO	6.0	4.66
January 21, 2025	DO	6.0	4.93
January 22, 2025	DO	6.0	4.80
January 23, 2025	DO	6.0	4.63
January 24, 2025	DO	6.0	4.83
January 27, 2025	DO	6.0	5.44
January 28, 2025	TP	0.1	0.11
January 29, 2025	DO	6.0	5.54
February 3, 2025	DO	6.0	5.72
February 6, 2025	DO	6.0	5.45
February 18, 2025	$CBOD_5$	5.0	6.0
February 25, 2025	TSS	5.0	7.0
March 4, 2025	TSS	5.0	6.0
April 1, 2025	E. coli	150 MPN/100 mL	816 MPN/100 mL
April 4, 2025	E. coli	150 MPN/100 mL	2,420 MPN/100 mL

Date	Parameter	Objective (mg/L)	Result (mg/L)
April 8, 2025	$CBOD_5$	5.0	6.0
April 8, 2025	TSS	5.0	7.0
April 8, 2025	E. coli	150 MPN/100 mL	2,420 MPN/100 mL
April 15, 2025	$CBOD_5$	5.0	6.0
April 22, 2025	$CBOD_5$	5.0	10.0
April 22, 2025	TSS	5.0	7.0
April 29, 2025	TSS	5.0	10.0
April 29, 2025	TP	0.1	0.26
April 29, 2025	DO	6.0	5.69
May 6, 2025	$CBOD_5$	5.0	11.0
May 6, 2025	TSS	5.0	16.0
May 6, 2025	TP	0.1	0.31
May 6, 2025	TAN	1.2	13.1
May 16, 2025	$CBOD_5$	5.0	9.0
May 16, 2025	TSS	5.0	12.0
May 16, 2025	TP	0.1	0.3
May 16, 2025	TAN	1.2	13.2
May 20, 2025	$CBOD_5$	5.0	7.0
May 20, 2025	TSS	5.0	17.0
May 20, 2025	TP	0.1	0.3
May 20, 2025	TAN	1.2	14.8
May 26, 2025	TRC	non-detect	0.01
May 27, 2025	$CBOD_5$	5.0	6.0
May 28, 2025	$CBOD_5$	5.0	9.0
May 29, 2025	$CBOD_5$	5.0	9.0
June 10, 2025	TSS	5.0	6.0
June 24, 2025	$CBOD_5$	5.0	6.0
July 23, 2025	TRC	non-detect	0.01
July 29, 2025	E. coli	150 MPN/100 mL	345 MPN/100 mL

Date	Parameter	Objective (mg/L)	Result (mg/L)
August 19, 2025	E. coli	150 MPN/100 mL	816 MPN/100 mL
September 30, 2025	TP	0.1	0.15
October 21, 2025	TSS	5.0	7.0
October 21, 2025	TP	0.1	0.11
October 30, 2025	TSS	5.0	18.0
October 30, 2025	TP	0.1	0.5
November 4, 2025	TSS	5.0	9.0
November 4, 2025	TP	0.1	0.24
November 12, 2025	TP	0.1	0.12
November 18, 2025	TSS	5.0	6.0
November 18, 2025	TP	0.1	0.11
November 25, 2025	E. coli	150 MPN/100 mL	2,420 MPN/100 mL
December 1, 2025	TRC	non-detect	0.01
December 2, 2025	TP	0.1	0.15
December 4, 2025	TRC	non-detect	0.01
December 9, 2025	TSS	5.0	7.0
December 9, 2025	TP	0.1	0.19
December 17, 2025	TSS	5.0	6.0
December 17, 2025	TP	0.1	0.14
December 19, 2025	TP	0.1	0.11

Thamesford effluent monthly average concentrations that did not meet effluent monthly average objective concentrations in 2025 are listed in the following table:

Date	Parameter	Objective (mg/L)	Result (mg/L)
April 2025	$CBOD_5$	5.0	5.6
April 2025	TSS	5.0	6.2
May 2025	$CBOD_5$	5.0	5.3
May 2025	TSS	5.0	6.6
May 2025	TAN	1.2	2.67
October 2025	TSS	5.0	7.8

Date	Parameter	Objective (mg/L)	Result (mg/L)
October 2025	TP	0.1	0.17
November 2025	TP	0.1	0.14
December 2025	TSS	5.0	5.2
December 2025	TP	0.1	0.12

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

There were no overflows, bypasses, upsets, spills, or abnormal conditions at the Thamesford WWTP in 2025.

There was one complaint in 2025. On October 14, the County was emailed about the front gate to the WWTP being left open and concern about open access to the property. In response, all staff and contractors have been advised to close and secure the front gate while onsite at the WWTP.

There were no projects completed in 2025 to eliminate Bypass/Overflow events (in conformance with MECP Procedure F-5-1, meant to ensure all wastewater receives at minimum secondary treatment or greater, as the normal standard of treatment). In 2026, there are plans for pumps to be rebuilt at the Stanley Street SPS.

4. MAINTENANCE OF WORKS

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

The Limited Operational Flexibility for modifications to the Thamesford WWTP was not used in 2025.

5. MONITORING EQUIPMENT MAINTENANCE AND CALIBRATION

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

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

6. BIOSOLIDS PROGRAM

Thickened and partially aerobically digested liquid biosolids are transported to the Ingersoll or Woodstock WWTP for further treatment.

Biosolids are anaerobically digested and dewatered at the Ingersoll or Woodstock WWTP using Alfa-Laval Centrifuges. The biosolids are then stored at the Oxford 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/reports-and-policies.

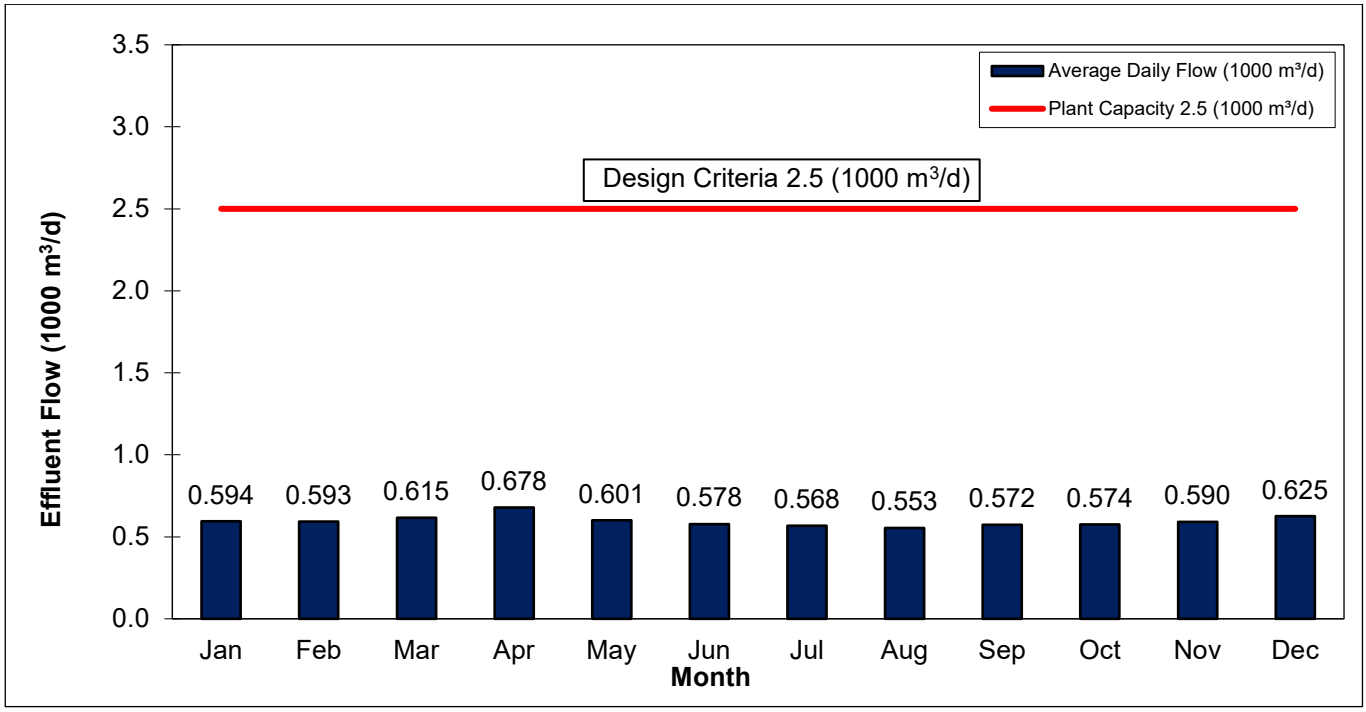
7. INSPECTION, PILOTS, AND TRIALS

WWTP Headworks and Aeration Upgrade

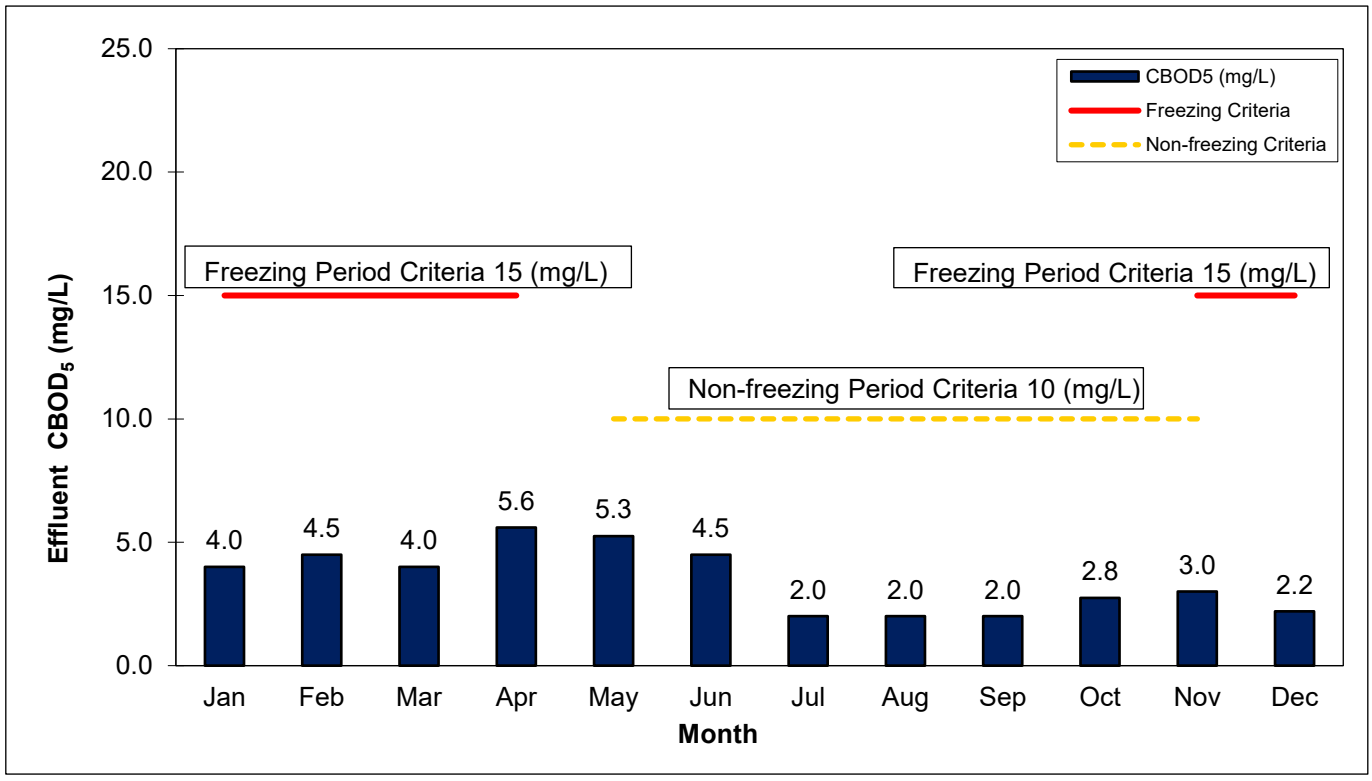
Construction will begin early in 2026, undertaking upgrades to the WWTP headworks and aeration system, to improve plant performance and reduce operational challenges. Improvements include a new headworks facility with fine screening and grit removal, and the replacement of the plug flow reactor process train aeration course bubble diffusers with fine bubble diffusers to improve the oxygen transfer rate efficiency and reduce power consumption. The project is expected to be completed in 2027.

APPENDIX A: GRAPHS OF 2025 DISCHARGE PARAMETERS VS. EFFLUENT DISCHARGE LIMITS

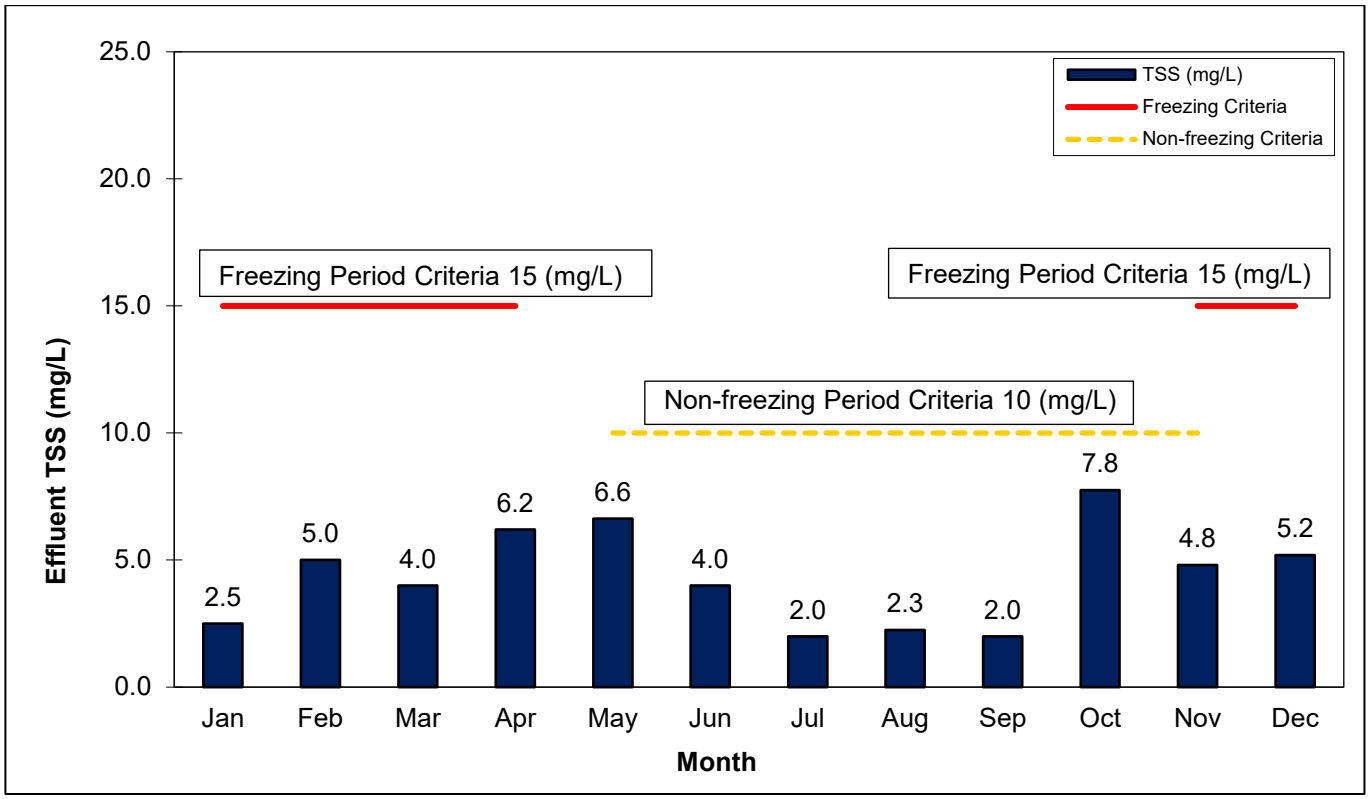
Thamesford WWTP Effluent, Monthly Average Daily Flow (1000m^3/d), 2025



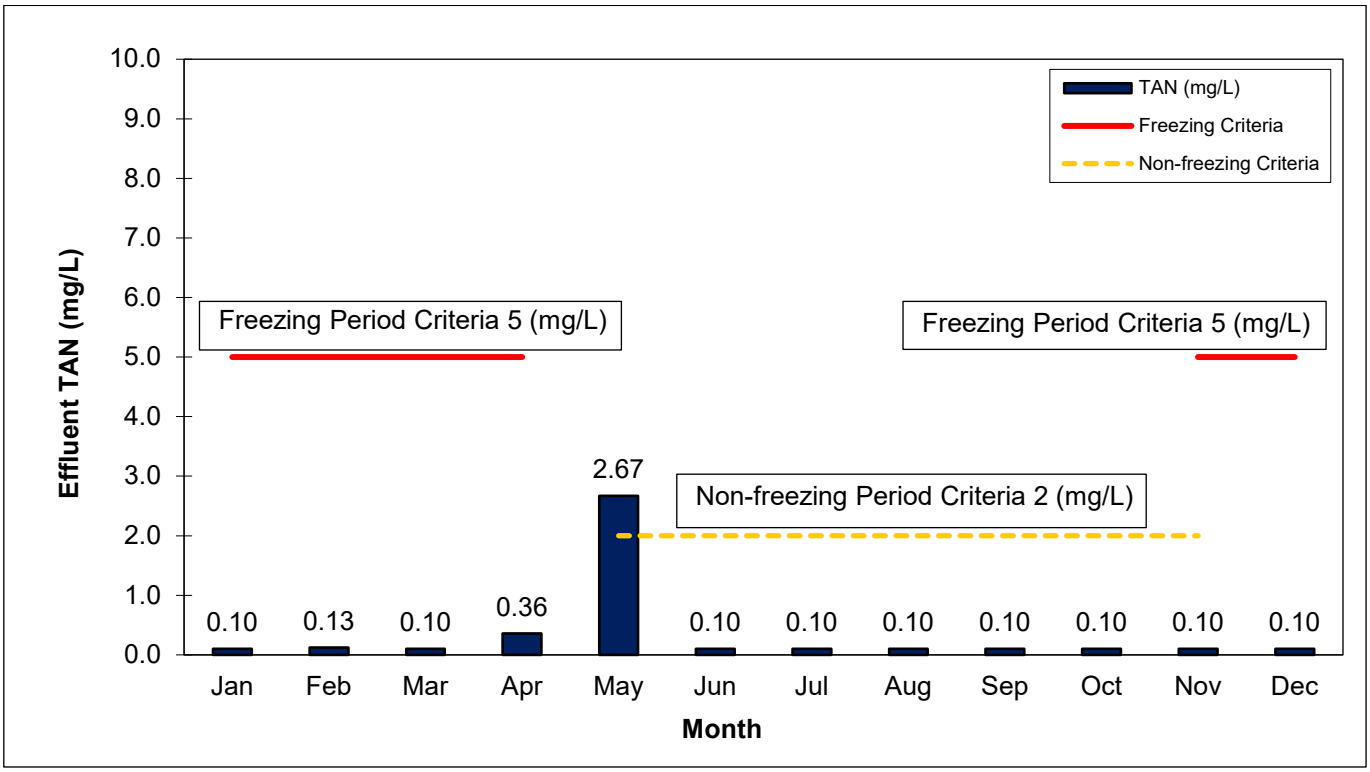
Thamesford WWTP Effluent, Monthly Average $CBOD_5$ (mg/L), 2025



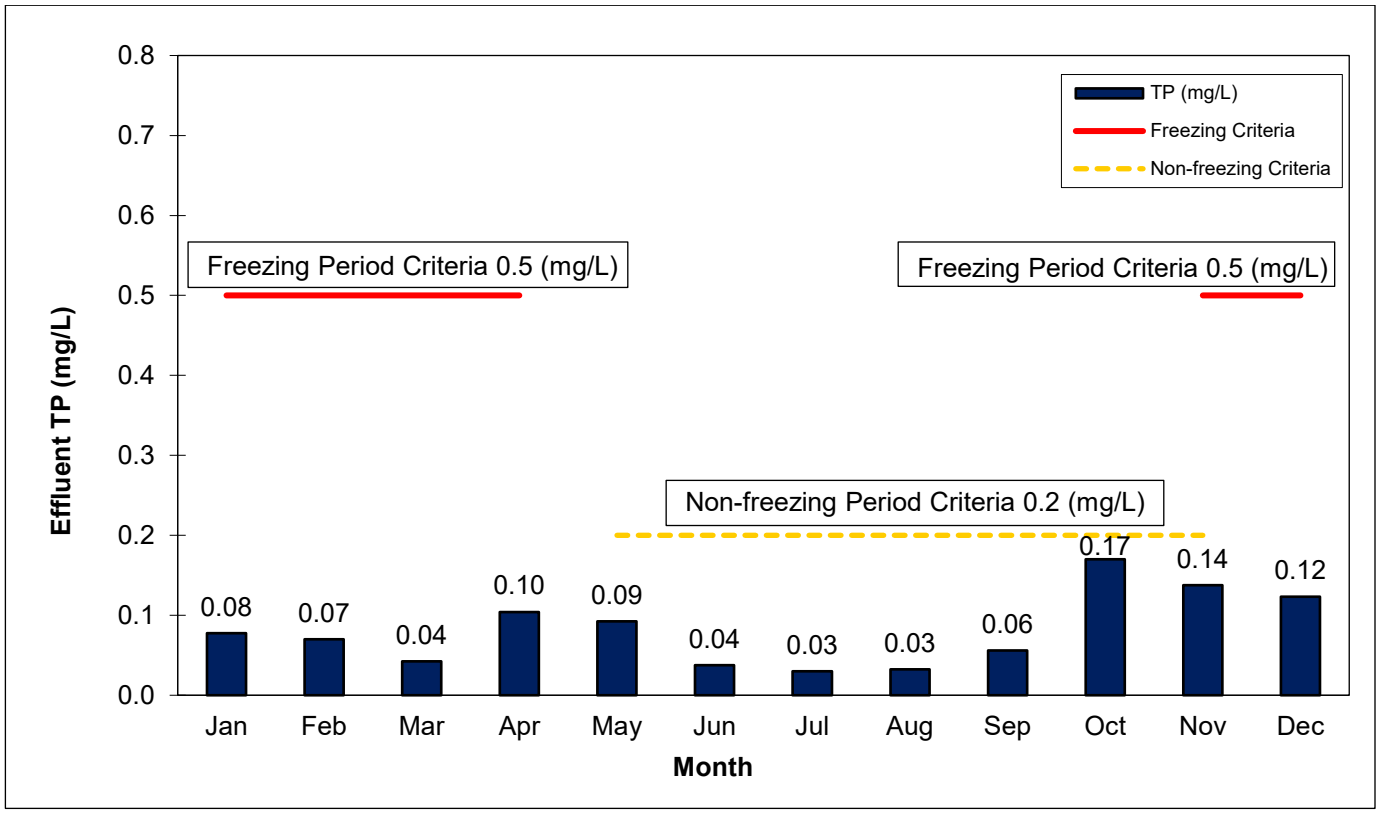
Thamesford WWTP Effluent, Monthly Average TSS (mg/L), 2025



Thamesford WWTP Effluent, Monthly Average TAN (mg/L), 2025



Thamesford WWTP Effluent, Monthly Average TP (mg/L), 2025



Thamesford WWTP Effluent, Monthly Geometric Mean Density E. coli (MPN100 mL), 2025