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2025 Annual Performance Report

Thornbury Wastewater Treatment Plant

Prepared by: Wastewater Operations

Date: March 30, 2026

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Executive Summary

This report has been prepared as required by Amended Environmental Compliance Approval Number A-500-9336415087 Version 1.0, Section 11 issued to the Thornbury Wastewater Treatment Plant on May 30, 2025.

Section 11 (4) requires the Owner to prepare performance reports on a calendar year basis and submit to the District Manager by March 31 of the calendar year following the period being reported upon. The report shall contain, but shall not be limited to, the following information pertaining to the reporting period:

a. Summary and interpretation of all Influent monitoring data, and a review of the historical trend of the sewage characteristics and flow rates;
b. Summary and interpretation of all Final Effluent monitoring data, including concentration, flow rates, loading and a comparison to the design objectives and compliance limits in this Approval, including an overview of the success and adequacy of the Works;
c. Summary of all operating issues encountered and corrective actions taken;
d. Summary of all normal and emergency repairs and maintenance activities carried out on any major structure, equipment, apparatus or mechanism forming part of the Works;
e. Summary of any effluent quality assurance or control measures undertaken;
f. Summary of the calibration and maintenance carried out on all Influent and Final Effluent monitoring equipment to ensure that the accuracy is within the tolerance of that equipment as required in this Approval or recommended by the manufacturer;
g. Summary of efforts made to achieve the design objectives in this Approval, including an assessment of the issues and recommendations for pro-active actions, if any are required under the following situations:

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

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

h. Tabulation of the volume of sludge generated, an outline of anticipated volumes to be generated in the next reporting period and a summary of the locations to where the sludge was disposed; a tabulation of the measured volume of sludge accumulated in the lagoon cells in five year intervals and the estimated volume in the interim years and when sludge was disposed of during the reporting period, a summary of disposal locations and volumes of sludge disposed at each location;
i. Summary of any complaints received and any steps taken to address the complaints;
j. Summary of all Bypasses, Overflows, other situations outside Normal Operating Conditions and spills within the meaning of Part X of EPA and abnormal discharge events;
k. Summary of all Notice of Modifications to Sewage Works completed under Paragraph 1.d. of Condition 10, including a report on status of implementation of all modification.

l. Summary of efforts made to achieve conformance with Procedure F-5-1 including but not limited to projects undertaken and completed in the sanitary sewage system that result in overall Bypass/Overflow elimination including expenditures and proposed projects to eliminate Bypass/Overflows with estimated budget forecast for the year following that for which the report is submitted;
m. Any changes or updates to the schedule for the completion of construction and commissioning operation of major process(es) / equipment groups in the Proposed Works
n. Summary of any deviation from the monitoring schedule and reasons for the current reporting year and a schedule for the next reporting year

All the requirements listed in Section 11 (4) have been met and will be further explored throughout the report.

Facility Information

The TWWP is a modification of the extended aeration treatment process. The original plant was a lagoon system constructed in 1975.

In 1993 the plant was extended to a mechanical facility utilizing the “Sutton Concept” for sludge disposal. The plant design included provision for phosphorus removal facilities and U.V. disinfection with continued use of existing outfall to the Beaver River on a continuous basis.

The Sutton process was developed in the early 1980’s following a research project which involved installing a package treatment facility in line with active lagoons.

The system provides nitrification and denitrification for the control of ammonia and hydrogen sulphide in waste stabilization lagoon effluents. A high nitrified effluent is obtained from an extended aeration activated sludge process which provides a high sludge and high solids level in the aeration cells (low F/Mv ratio).

The high concentration of nitrates in the secondary effluent prevents the reduction of sulphates to hydrogen sulphide in the lagoon.

The TWWTP is currently rated at 3,580 m^3/d operating under Amended Environmental Compliance Approval # A-500-9336415087 the new rated capacity 5,330 m^3/d will be available after the outfall is complete in 2026.

Monitoring and Compliance

Town Staff ensure that the sewage works and related equipment and appurtenances which are installed or used to achieve compliance are properly operated and maintained.

A. Interpretation of Monitoring and Analytical Data

A comprehensive interpretation of all monitoring and analytical data collected during the reporting period, in comparison to the effluent quality and quantity criteria, is outlined below:

Capacity Assessment with Historical Trending– Table No. 1

Year	2025	2024	2023	2022	2021
Average Day Flow (m^3/d)	2,761	2,411	2,659	2,431	2,567
Average Design Capacity (m^3/d)	3,580	3,580	3,580	3,580	3,580
% of capacity (based on average daily flows)	77%	67%	74%	70%	72%
Five Year Rolling Average	72%	74%	76%	76%	78%
Peak Day Flow (m^3/d)	12,690	7,482	9,218	6,928	9,118
Peak Design Capacity	7,196	7,196	7,196	7,196	7,196
Raw Sewage Total Flow (m^3)	1,007,845	882,294	970,402	887,130	937,066

Capacity rating is based on Annual Flow Data. There was no imported sewage hauled in.

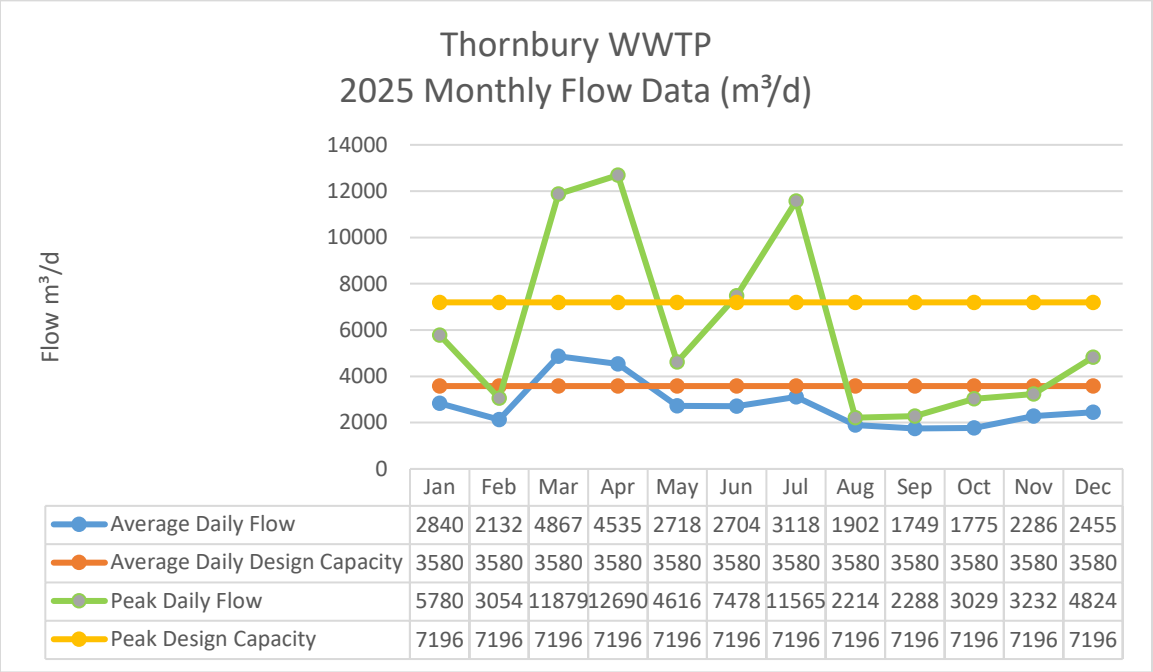
The rated capacity of 5,330 m^3/d will be available after outfall is constructed in 2026.

2025 Raw Sewage Loading Objectives (kg/d)

Table No. 2

Influent Parameter	Design	Annual Average Loading	% of Design	Was Design Exceeded?
BOD	537	228	43%	No
Total Suspended Solids	651	255	39%	No
Total Phosphorus	25	4.7	19%	No
Total Kjeldahl Nitrogen	86	44.8	52%	No

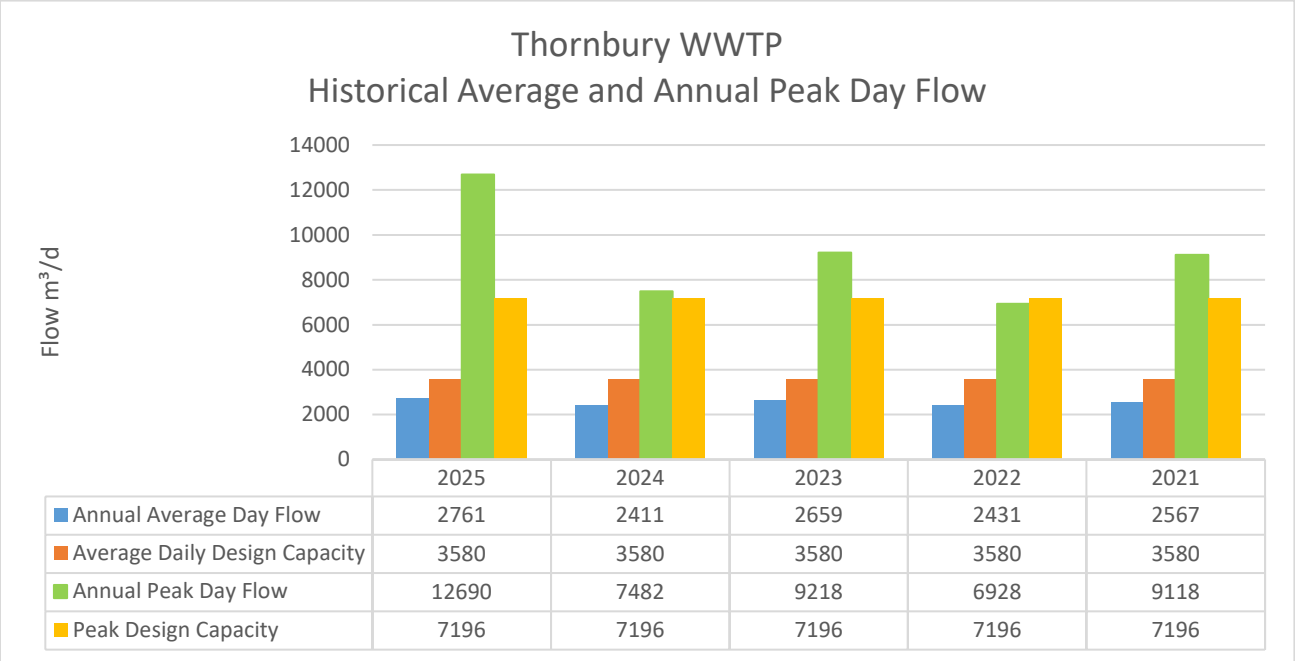
Chart No. 1: Thornbury Wastewater Treatment Plant 2025 Monthly Flow Data



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Daily Flow	2840	2132	4867	4535	2718	2704	3118	1902	1749	1775	2286	2455
Average Daily Design Capacity	3580	3580	3580	3580	3580	3580	3580	3580	3580	3580	3580	3580
Peak Daily Flow	5780	3054	11879	12690	4616	7478	11565	2214	2288	3029	3232	4824
Peak Design Capacity	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196

The Thornbury Wastewater Treatment Plant (TWWTP) Expansion Phase 1A to 5,330 m³/day began in 2023. Engineering and Contract Administration was performed by Arcadis Engineering and Construction was awarded to North American Construction. Project had substantial completion in October 2025. The rated capacity of 5,330 m³/d will be available after outfall is constructed in 2026.

Chart No 2: Thornbury WWTP Historical Average and Peak Day Flow



	2025	2024	2023	2022	2021
Annual Average Day Flow	2761	2411	2659	2431	2567
Average Daily Design Capacity	3580	3580	3580	3580	3580
Annual Peak Day Flow	12690	7482	9218	6928	9118
Peak Design Capacity	7196	7196	7196	7196	7196

The Annual Peak Day Flow is calculated using the average of the monthly Peak Day Flow events.

B. Summary and Interpretation of Final Effluent Monitoring Data

2025 Plant Performance

Table No. 3

Effluent Parameter Average Daily Effluent Flow 2,221	Annual Average Loading (kg/d)	Design (kg/d)	Was Design Exceeded?
CBOD	9.5	35.8	No
Total Suspended Solids	27.3	53.7	No
Total Phosphorus	0.54	1.07	No
Ammonia Freezing Period November 1 – March 31	0.52	17.9	No
Ammonia Non-Freezing Period April 1 – October 31	1.38	7.16	No

The Town receives regular laboratory analysis and monitors pH levels from discharge of an Industrial user. On occasion, the Industrial user is exceeding BOD, pH and Total Phosphorus limits outlined in the Town's Sewer Use By-law. The Industrial user is required to provide regular sampling data to the Town to demonstrate compliance with the limits outlined.

2025 Final Effluent Compliance Limits

Table No. 4

Final Effluent Parameter	Date Sampled	Average Monthly Effluent Conc'n result mg/L	Maximum Monthly Conc'n mg/L	Average Monthly Effluent Conc'n Limit mg/L	Average Monthly Effluent Conc'n Limit Met? Y/N	Average Monthly Effluent Conc'n Objective	Average Monthly Effluent Conc'n Objective Met? Y/N
CBOD5	January	4.4	7.0	10.0	Yes	5.0	Yes
	February	3.5	5.0	10.0	Yes	5.0	Yes
	March	2.0	3.0	10.0	Yes	5.0	Yes
	April	4.6	12.0	10.0	Yes	5.0	Yes
	May	3.5	8.0	10.0	Yes	5.0	Yes
	June	2.0	3.0	10.0	Yes	5.0	Yes
	July	2.4	4.0	10.0	Yes	5.0	Yes
	August	2.5	3.0	10.0	Yes	5.0	Yes
	September	2.4	4.0	10.0	Yes	5.0	Yes
	October	2.0	2.0	10.0	Yes	5.0	Yes
	November	2.0	2.0	10.0	Yes	5.0	Yes
	December	2.6	3.0	10.0	Yes	5.0	Yes

Final Effluent Parameter	Date Sampled	Average Monthly Effluent Conc'n result mg/L	Maximum Monthly Conc'n mg/L	Average Monthly Effluent Conc'n Limit mg/L	Average Monthly Effluent Conc'n Limit Met? Y/N	Average Monthly Effluent Conc'n Objective	Average Monthly Effluent Conc'n Objective Met? Y/N
Total Suspended Solids	January	23.4	44.0	15.0	No	5.0	No
	February	14.0	17.0	15.0	Yes	5.0	No
	March	9.0	14.0	15.0	Yes	5.0	No
	April	7.4	12.0	15.0	Yes	5.0	No
	May	6.1	11.0	15.0	Yes	5.0	No
	June	6.2	12.0	15.0	Yes	5.0	No
	July	4.6	7.0	15.0	Yes	5.0	Yes
	August	9.0	16.0	15.0	Yes	5.0	No
	September	9.2	28.0	15.0	Yes	5.0	No
	October	4.0	8.0	15.0	Yes	5.0	Yes
	November	5.0	2.0	15.0	Yes	5.0	Yes
	December	9.4	3.0	15.0	Yes	5.0	No

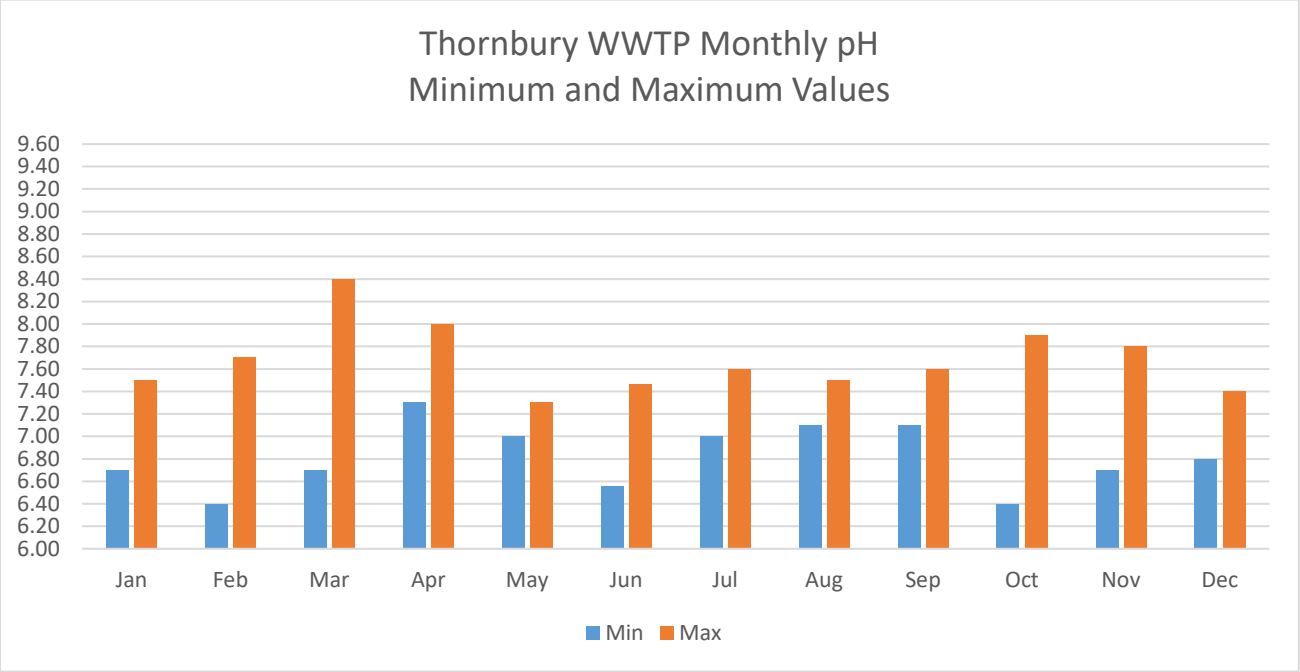
Final Effluent Parameter	Date Sampled	Average Monthly Effluent Conc'n result mg/L	Maximum Monthly Conc'n mg/L	Average Monthly Effluent Conc'n Limit mg/L	Average Monthly Effluent Conc'n Limit Met? Y/N	Average Monthly Effluent Conc'n Objective	Average Monthly Effluent Conc'n Objective Met? Y/N
Total Phosphorus	January	0.44	0.81	0.30	No	0.25	No
	February	0.22	0.35	0.30	Yes	0.25	Yes
	March	0.16	0.23	0.30	Yes	0.25	Yes
	April	0.07	0.12	0.30	Yes	0.25	Yes
	May	0.12	0.20	0.30	Yes	0.25	Yes
	June	0.12	0.16	0.30	Yes	0.25	Yes
	July	0.13	0.22	0.30	Yes	0.25	Yes
	August	0.20	0.24	0.30	Yes	0.25	Yes
	September	0.30	0.69	0.30	Yes	0.25	No
	October	0.11	0.19	0.30	Yes	0.25	Yes
	November	0.14	0.19	0.30	Yes	0.25	Yes
	December	0.17	0.31	0.30	Yes	0.25	Yes

Final Effluent Parameter	Date Sampled	Average Monthly Effluent Con'n result mg/L	Maximum Monthly Conc'n mg/L	Average Monthly Effluent Conc'n Limit mg/L	Average Monthly Effluent Conc'n Limit Met? Y/N	Average Monthly Effluent Conc'n Objective	Average Monthly Effluent Conc'n Objective Met? Y/N
Total Ammonia Nitrogen (Nov 1 to March 31)	January	0.16	0.30	5.0	Yes	3.0	Yes
	February	0.53	1.70	5.0	Yes	3.0	Yes
	March	0.10	0.10	5.0	Yes	3.0	Yes
	November	0.10	0.10	5.0	Yes	3.0	Yes
	December	0.10	0.10	5.0	Yes	3.0	Yes
	April	0.83	2.00	2.0	Yes	1.0	Yes
	May	0.66	2.10	2.0	Yes	1.0	Yes
	June	0.10	0.10	2.0	Yes	1.0	Yes
	July	0.16	0.40	2.0	Yes	1.0	Yes
	August	0.10	0.10	2.0	Yes	1.0	Yes
	September	0.10	0.10	2.0	Yes	1.0	Yes
	October	0.10	0.10	2.0	Yes	1.0	Yes

Final Effluent Parameter	Date Sampled	Result	Concentration Limit	Number of Exceedances	Was Objective Met?
Acute Lethality to Rainbow Trout and Daphnia Magna	March 5, 2025	0 Mortality	Non-acutely lethal (no more than 50% mortality)	0	Yes

Final Effluent Parameter	Date Sampled	Monthly Mean Geometric Density CFU/100 mL	Max Monthly Mean Geometric Density Limit	Max Monthly Effluent Conc'n Limit Met? Y/N	Monthly Mean Geometric Density Conc'n Objective	Monthly Mean Geometric Density Conc'n Objective Met? Y/N
E. coli	January	2.9	200 CFU/100 mL	Yes	100 CFU/100 mL	Yes
	February	3.1	200 CFU/100 mL	Yes	100 CFU/100 mL	Yes
	March	4.6	200 CFU/100 mL	Yes	100 CFU/100 mL	Yes
	April	5.4	200 CFU/100 mL	Yes	100 CFU/100 mL	Yes
	May	8.5	200 CFU/100 mL	Yes	100 CFU/100 mL	Yes
	June	3.2	200 CFU/100 mL	Yes	100 CFU/100 mL	Yes
	July	4.8	200 CFU/100 mL	Yes	100 CFU/100 mL	Yes
	August	1.0	200 CFU/100 mL	Yes	100 CFU/100 mL	Yes
	September	2.3	200 CFU/100 mL	Yes	100 CFU/100 mL	Yes
	October	1.0	200 CFU/100 mL	Yes	100 CFU/100 mL	Yes
	November	1.0	200 CFU/100 mL	Yes	100 CFU/100 mL	Yes
	December	1.0	200 CFU/100 mL	Yes	100 CFU/100 mL	Yes

Chart No. 3 – Thornbury WWTP Monthly pH Values



C. Summary of Operating Issues Encountered and Corrective Actions Taken

Thornbury WWTP has undergone a major expansion in 2025. Town Operators continued to work with contractors to deal with operating issues and whatever corrective actions were required to keep plant operating to the best of its capability. In 2025 a third clarifier and aeration tank, a second bar screen, RAS/WAS building with pumps, effluent pumps to reuse effluent were all added and UV equipment was replaced.

D. Summary of Normal and Emergency Repairs and Maintenance Activities Performed

- Annual inspection of all safety equipment
- Bi-annual inspection of all gas monitors
- Bi-annual vibration testing performed on all large pumps and air blowers
- All building ventilation was serviced
- Annual sample was collected for acute lethality analysis

In accordance with Condition (8) of the ECA, the Owner shall ensure that, at all times, the Works and the related equipment and appurtenances used to achieve compliance with this Approval are properly operated and maintained.

The Thornbury WWTP employs a planned maintenance program that ensures the sewage works and related equipment that are installed or used to achieve compliance are properly operated and maintained. Licensed Operators perform routine maintenance on all equipment including pumps, monitoring equipment, alarm systems, safety equipment, and other treatment components. Both routine and non-routine (emergency) maintenance activities are conducted in accordance with manufacturers' instructions.

E. Summary of Effluent Quality Assurance or Control Measures Undertaken

Effluent quality assurance is controlled by monthly effluent concentrations and waste loading calculations which are submitted to the Ministry of the Environment, Conservation and Parks (MECP) Owen Sound District Office.

The Town strives to operate within the ECA design objectives, however on occasion the Plant was unable to achieve the design objectives.

Table No. 6

Effluent Parameter	% Removal Efficiency (Annual Average)
CBOD5	96 %
Total Suspended Solids	89 %
Total Phosphorus	81 %
Total Ammonia Nitrogen (Nov 1 to Mar 31)	99 %
Total Ammonia Nitrogen (Apr 1 to Oct 31)	96 %

F. Summary of Calibration and Maintenance Carried Out on all Influent and Final Effluent Monitoring Equipment

The Town is required to provide a summary of the calibration and maintenance carried out on all Influent, Imported Sewage and Final Effluent monitoring equipment to ensure that the accuracy is within the tolerance of that equipment as required by the ECA or recommended by the manufacturer.

Calibration of the monitoring equipment was completed on May 7, 2025 and is available for review upon request. All calibration results received met the accuracy requirement.

G. Summary of Efforts Made to Achieve the Design Objectives

In cases where the facility did not meet design objectives, the MECP District Office was notified. The design objectives were achieved more than 50% of the operating year for all, except Total Suspended Solids which failed to meet the objective (9) nine out of the (12) twelve months.

To assist with meeting design objectives, in-house lab work was performed twice a week to monitor pH, suspended solids, and total phosphorus. The UV system is monitored daily to verify operation. Ongoing dialogue is being had with Industrial dischargers.

TWWTP Expansion Phase 1A to 5,330 m^3/day was completed in 2025. Engineering and contract administration was awarded to Arcadias/IBI Engineering and construction was awarded to North American Construction. Full capacity will not be available until the new outfall is built in 2026.

H. Volume of Sludge generated in 2025 / Anticipated Volumes in 2026

Sludge disposal incorporates the “Sutton concept” where a high sludge age and solids level combined with an increased concentration of nitrates in the secondary effluent, prevents the reduction of sulphates to hydrogen sulphide in the lagoon. There is approximately 9,000m³ left in the lagoon.

I. Summary of Complaints Received in 2025

There were (4) four odour complaints received in 2025. The complaints were related to the Thornbury WWTP where the winds were from the East/South/East and blowing towards the area of concern. There was also (1) one noise complaint from the new blowers that were installed. A noise study completed and recommendations are coming in 2026 to relieve some of the issues.

J. Summary of Bypasses, Overflow, or other situations outside Normal Operating Conditions

In accordance with Condition 11 of the ECA, this report must provide a summary of all Bypasses, Overflows, other situations outside Normal Operating Conditions and spills within the meaning of Part X of EPA and abnormal discharge events.

A by-pass refers to the diversion of sewage around one or more treatment processes, excluding Preliminary Treatment System, within the Sewage Treatment Plant with the diverted sewage flow being returned to the Sewage Treatment Plant treated train upstream of the Final Effluent sampling point(s) and discharged via the approved effluent disposal facilities. By-passes are prohibited except in certain situations and may be planned (i.e. for maintenance or research purposes) or unplanned (i.e. emergency situations or high flow conditions).

A plant overflow means a discharge to the environment from the sewage treatment facility at a location other than the plant outfall or into the plant outfall downstream of the final effluent sampling locations. Overflows are prohibited except in certain situations and special reporting, sampling, and recording requirements apply in the event of an overflow. Overflows may be generally the result of heavy rainfall or snow melt events, such that the system becomes hydraulically overloaded.

Spills are releases of pollutants into the natural environment from or out of a structure, vehicle or other container that is abnormal in quality or quantity considering all the circumstances of the discharge. Spills are generally the result of mechanical, electrical, automation or process failures. Abnormal discharge events include any other abnormal events not otherwise classified as a bypass, overflow, or spill.

There were (2) two by-passes, (1) one spill, and zero overflow events for the Thornbury WWTP during the reporting period.

Incident #1-GIO1AM on January 25, 2025, the temporary UV system failed due to pressure sensor freezing and shutting off UV bulbs. The effluent was fully treated except for UV disinfection. The estimated duration of 19 hours with an estimated volume of 1,700 cubic meters.

Incident #1-H4YWGY in January 2025, the TWWTP exceeded the compliance limits for Total Suspended Solids and Total Phosphorus. This was reported as a Spill to MECP.

Incident #1-IDB7SU on March 6, 2025, the temporary UV system failed due to incorrect water level and shutting off UV bulbs. The effluent was fully treated except for UV disinfection. The estimated duration of 2.5 hours with an estimated volume of 500 cubic meters.

K. Summary of Notice of Modifications to Sewage Works Completed

Notification of completed works was provided to the Office of the Ministry of Environment, Conservation and Parks on March 5, 2026. The notice advised that construction was completed with the exception of the final effluent structure which will be completed in 2026.

L. Summary of Efforts Made to Achieve Conformance with Procedure F-5-1

Not applicable

M. Changes or Updates to Schedule for Completion of Construction for Proposed Works

TWWTP Expansion Phase 1A to 5,330 m^3/day began in 2023. Engineering and Contract Administration was performed to Arcadis Engineering and Construction was awarded to North American Construction. The substantial completion was October 2025. The final effluent structure which will be completed in 2026.

N. Summary of Any Deviation from Monitoring Schedule and Schedule for Next Reporting Year

Raw samples are collected twice monthly and sent to an accredited laboratory for analysis. This enables a better understanding of incoming raw sewage flow loadings. The influent and effluent samples are taken with an automated composite sampler. The composite samplers are located at the plant headworks and effluent channel after U.V.

The monitoring schedule will continue in 2026.