



**The Corporation of the Township of Perth East**  
**2024 Annual Operations Report**  
**Milverton Water Pollution Control Plant**

Lot 5, Concession 3 Mill Street West  
Milverton, Ontario

**February 5, 2025**



**Ministry of the Environment, Conservation and Parks**

London Regional Office  
733 Exeter Road  
London, Ontario  
N6E 1L3

February 5, 2025

ATTN: Mr. Pierre Adrien, London District Manager

**Re: The Corporation of the Township of Perth East  
Milverton Water Pollution Control Plant, Annual Report 2024**

Please find enclosed the Township of Perth East's Milverton Wastewater Treatment Facility Annual Operations Report for the year 2024. The report is prepared in accordance with the annual report criteria as part of the Certificate of Approval # 6264-6EEP9N, issued September 8, 2005 which contains the following:

- a) A summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in condition 6, including an overview of the success and adequacy of the Works;
- b) A description of any operating problems encountered and corrective actions taken;
- c) A summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the Works;
- d) A summary of any effluent quality assurance or control measures undertaken in the reporting period;
- e) A summary of the calibration and maintenance carried out on all effluent monitoring equipment;
- f) A description of efforts made and results achieved in meeting the Effluent Objectives of Condition 5;
- g) A tabulation of the volume of sludge generated in the reporting period, 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;
- h) A summary of any complaints received during the reporting period and any steps taken to address the complaints;
- i) A summary of all By-pass, spills or abnormal discharge events;
- j) Any other information the District Manager requires from time to time.

We trust that the information provided herein is satisfactory to the requirements of the above referenced Certificate of Approval. Should there be any questions or comments regarding the contents of this report, please feel free to contact the undersigned.

Jake Collings, P. Eng.  
Township of Perth East  
Manager of Public Works  
[jcollings@pertheast.ca](mailto:jcollings@pertheast.ca)  
(519) 595-2800 x234

cc:// Neville Rising (MECP), Inspector  
Matt Gabel, Water/Wastewater Supervisor  
Michael Givens, CAO



## TABLE OF CONTENTS

Introduction.....	3
A) Summary & Interpretation of Monitoring Data.....	4
I. Carbonaceous Biological Oxygen Demand (CBOD <sub>5</sub> ).....	5
II. Total Suspended Solids (TSS).....	6
III. Total Phosphorus (TP).....	7
IV. Un-ionized Ammonia .....	8
V. Influent & Effluent Flows.....	9
B) Operating Problems & Corrective Actions.....	11
C) Maintenance Summary.....	11
D) Effluent Quality Assurance.....	12
E) Calibration of Effluent Monitoring Equipment.....	12
F) Efforts Made & Results Achieved.....	12
G) Sludge Generation.....	13
H) Complaints Received.....	13
I) By-Passes, Spills or Abnormal Discharge.....	13
J) Additional Information.....	13

## TABLES & FIGURES

Table 1 – Effluent Quality Monitoring Data and Regulatory Compliance Parameters.....	4
Table 2 – Influent and Effluent Flow Data.....	4
Table 3 – Influent Quality Monitoring Data.....	5
<hr/>	
Figure 1 – Monthly Average Effluent CBOD <sub>5</sub> Concentrations vs. CoA Limit .....	5
Figure 2 – Monthly Average Effluent TSS Concentrations vs. CoA Limit.....	6
Figure 3 – Monthly Average Effluent TP Concentrations vs. CoA Limit.....	7
Figure 4 – Monthly Average Effluent Un-ionized Ammonia Concentrations vs. CoA Limit.....	8
Figure 5 – Monthly Average Influent Flows vs. Rated Capacity.....	9
Figure 6 – Monthly Average Effluent Flows vs. Seasonal Effluent Discharge Limit.....	10



## INTRODUCTION

The Milverton Water Pollution Control Plant (WPCP) is located at Lot 5, Concession III Mill Street West in Milverton, ON. The WPCP operates under ECA number 6264-6EEP9N, and is rated as a Class 2 Facility. The facility is composed of a main sewage pumping station with a forcemain transferring raw sewage to a multi-cell lagoon system. Raw wastewater flows from the village of Milverton are directed to the treatment plant via a gravity collection system with the exception of flows captured in the east portion of village which utilizes a lift station. The raw sewage is processed through the system in accordance with all applicable laws, certificates and regulations.

The following is a list of the main treatment components:

### Main Sewage Pumping Station (SPS) & Forcemain:

- One (1) 8.5m<sup>3</sup> capacity wet well equipped with two (2) submersible pumps
- One (1) 200mm diameter forcemain from the SPS to the sewage treatment works
- One (1) 450mm diameter emergency overflow from the SPS wet well to the Boyle Drain
- One (1) 32 m<sup>3</sup> capacity alum storage tank equipped with two (2) chemical feed pumps

### Sewage Treatment Works (Multi-cell Lagoon System):

- Cell No. A1 with a capacity of 12,000m<sup>3</sup> equipped with a fine-pore aeration system receiving raw sewage from the main SPS
- Cell No. A2 with a capacity of 12,000m<sup>3</sup> equipped with a fine-pore aeration system operating in series with Cell No. A1, discharging to Cell No. S1
- Cell No. S1 with a capacity of 91,000m<sup>3</sup> for seasonal storage of effluent from Cell No. A2, and discharging to Cell No. S2
- Cell No. S2 with a capacity of 142,000m<sup>3</sup> receiving effluent from Cell No. S1 for seasonal storage, and discharging to the Boyle Drain during the discharge period
- Cell No. A3 with a capacity of 36,000m<sup>3</sup> equipped with a fine-pore aeration system (as needed) for Cells No. A1 or A2 are out of service or for effluent storage during periods where Cells No. S1 or S2 are being drawn down
- Outlet control structure S2 with one (1) 250mm diameter outfall
- Blower Building equipped with three (3) 493m<sup>3</sup>/hr. capacity blowers for aeration

The sewage works, including both the collection and treatment systems are owned and operated by the Township of Perth East.

The following information corresponds with the reporting parameters set forth under Section 6 of the aforementioned ECA (6264-6EEP9N).



## A) SUMMARY & INTERPRETATION OF MONITORING DATA

The following tables summarize the influent and effluent data relative to the limits and objectives provided in the C of A:

Table 1 - Effluent Quality Monitoring Data and Regulatory Compliance Parameters							
Year	Month	CBOD <sub>5</sub> (mg/L)	Total Suspended Solids (mg/L)	Total Phosphorus (mg/L)	Unionized Ammonia (mg/L)	pH	Temperature C
		<i>Limit: 15.0</i>	<i>Limit: 15.0</i>	<i>Limit: 1.0</i>	<i>Limit: 0.2</i>		
2024	January	2.3	3.4	0.6	0.03	8.6	3.7
	February	5.3	3.8	0.5	0.11	8.3	2.2
	March	20.9	14.7	0.4	0.02	9.2	7.8
	November	4.0	58.5	0.4	0.04	9.9	10.6
	December	10.3	11.3	0.6	0.03	8.2	2.0

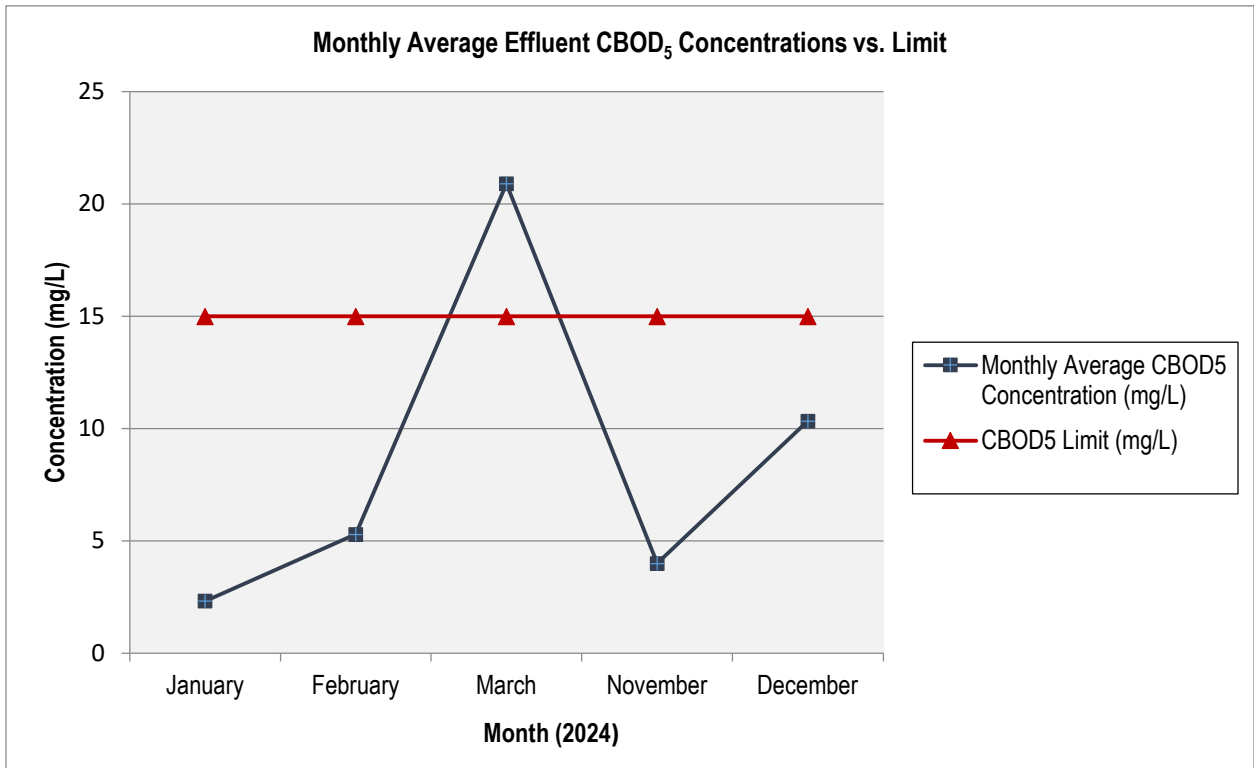
Table 2 - Influent and Effluent Flow Data							
Year	FLOW DATA (m <sup>3</sup> )						
	Month	EFFLUENT			INFLUENT		
		Average Daily Flow	Total Monthly Flow	Maximum Daily Flow	Average Daily Flow	Total Monthly Flow	Maximum Daily Flow
2024	January	584.03	18105	2033	929.73	28822	1510
	February	287.32	8332	335	717.01	20793	919
	March	1756.34	56356	2711	867.03	26878	1214
	April	No Discharge			892.35	26771	1594
	May				688.14	21332	859
	June				528.47	15854	673
	July				689.68	21380	1058
	August				551.21	17087	927
	September				473.40	14202	562
	October	464.86	14411	530			
	November	1995.73	59872	2533	508.64	15259	578
	December	2462.81	76347	2642	747.62	23176	1139



Table 3 - Influent Quality Monitoring Data					
Year	Month	CBOD5 (mg/L)	Total Suspended Solids (mg/L)	Total Phosphorus (mg/L)	Total Kjeldahl Nitrogen (TKN)
2024	January	182.0	144.0	4.5	40.2
	May	263.0	283.0	7.1	64.6
	September	212.0	200.0	6.2	59.2
	November	314.0	328.0	7.0	59.8

**I. Carbonaceous Biological Oxygen Demand (CBOD<sub>5</sub>)**

Throughout the reporting period, the monthly average Carbonaceous Oxygen Demand concentration did not exceed the effluent limit of 15.0 mg/L with the exception of the month of March. The average for the reporting year was 8.2 mg/L, which indicates the treatment was satisfactory for CBOD<sub>5</sub>. Figure 1 below details the CBOD<sub>5</sub> concentrations in relation to the compliance parameter limit.

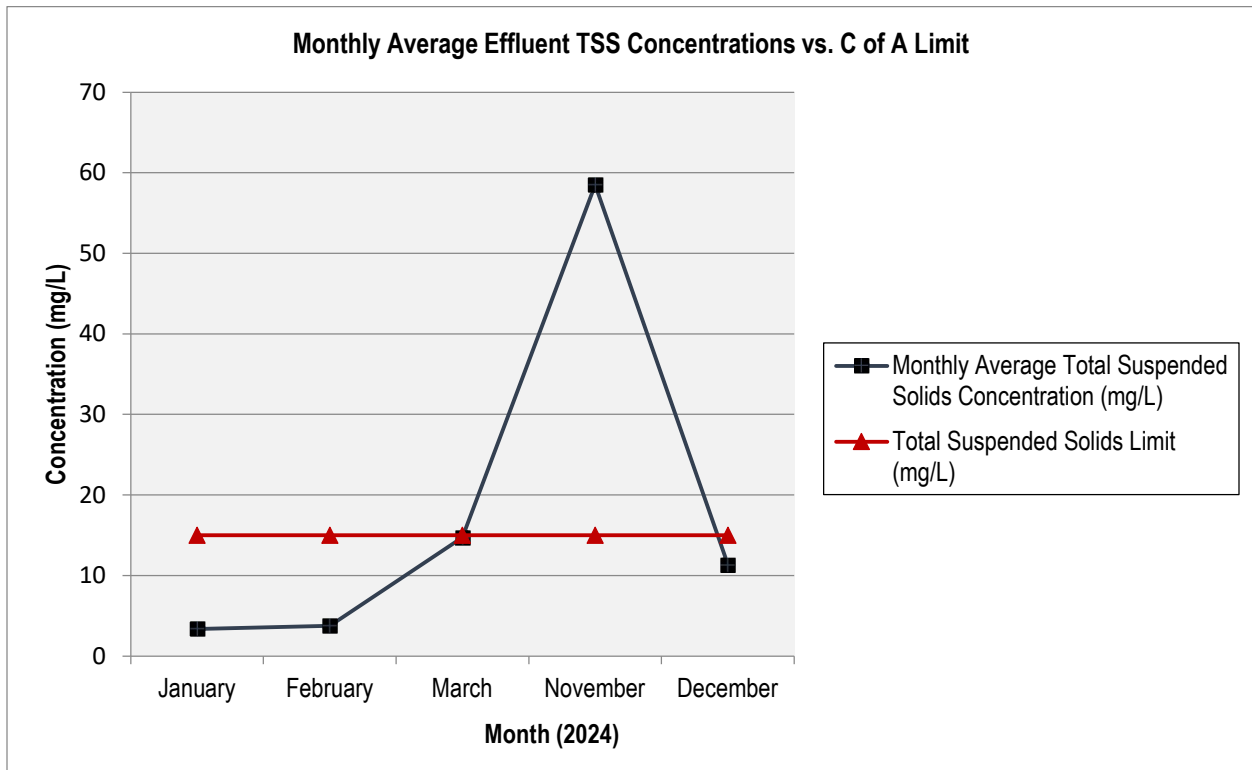


**Figure 1 – Monthly Average Effluent CBOD<sub>5</sub> Concentration vs. CoA Limit**



## II. Total Suspended Solids (TSS)

Throughout the reporting period, the monthly average Total Suspended Solids concentration did not exceed the effluent limit of 15.0 mg/L with the exception of the month of November with a concentration of 58.5 mg/L which is attributed to an outlier sample on November 4, 2024 at a concentration of 111mg/L. The cause of this outlier is thought to be due in part to the sample being the first of the fall discharge period which can cause disturbance of solids near the outlet chamber upon initial opening. Figure 2 below details the TSS concentrations in relation to the compliance parameter limit.

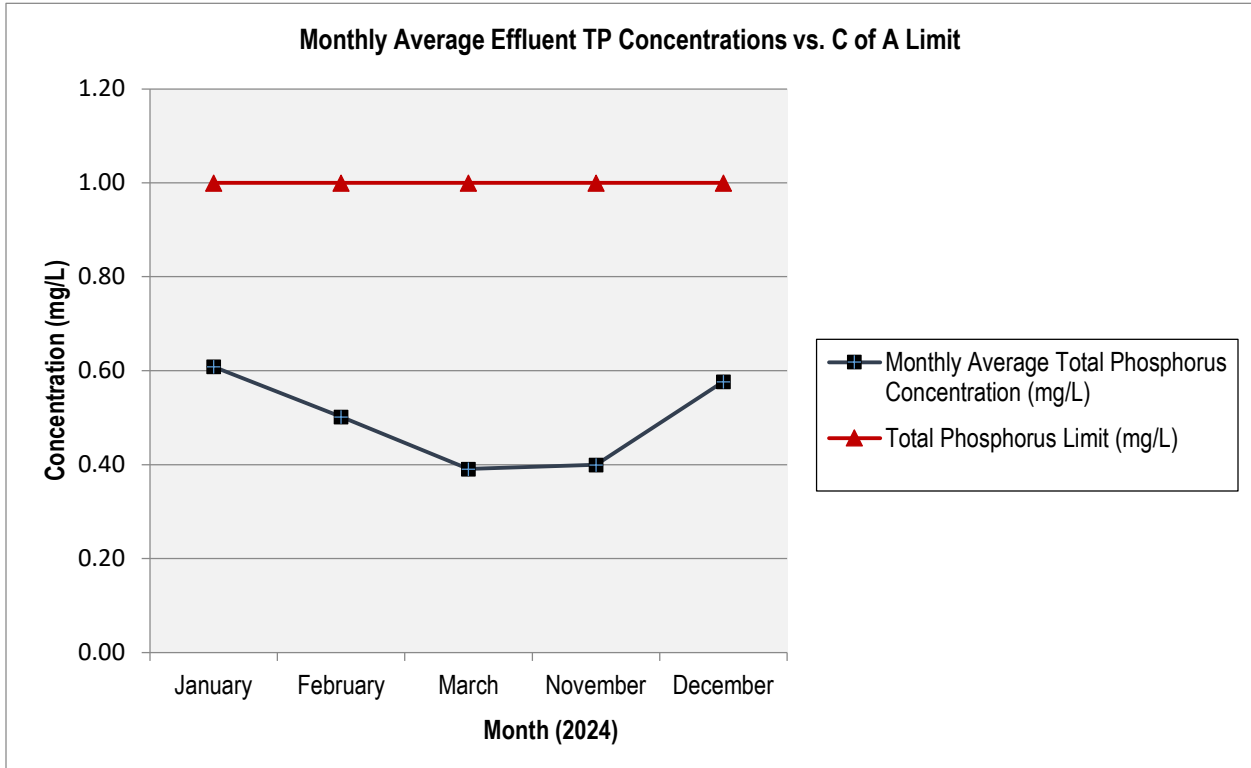


**Figure 2 – Monthly Average Effluent TSS Concentration vs. CoA Limit**



### III. Total Phosphorus (TP)

Throughout the reporting period, the monthly average Total Phosphorus concentration did not exceed the effluent limit of 1.0 mg/L. The average for the reporting year was 0.5 mg/L, which indicates treatment was effective for TP. Figure 3 below details the TSS concentrations in relation to the compliance parameter limit.



**Figure 3 – Monthly Average Effluent TP Concentration vs. CoA Limit**



#### IV. Un-ionized Ammonia (TP)

Throughout the reporting period, the monthly average Un-ionized Ammonia concentration did not exceed the effluent limit of 0.2 mg/L. The average for the reporting year was 0.04 mg/L, which indicates the treatment of un-ionized ammonia was effective. Figure 4 below details the average monthly concentrations in relation to the compliance parameter limit.

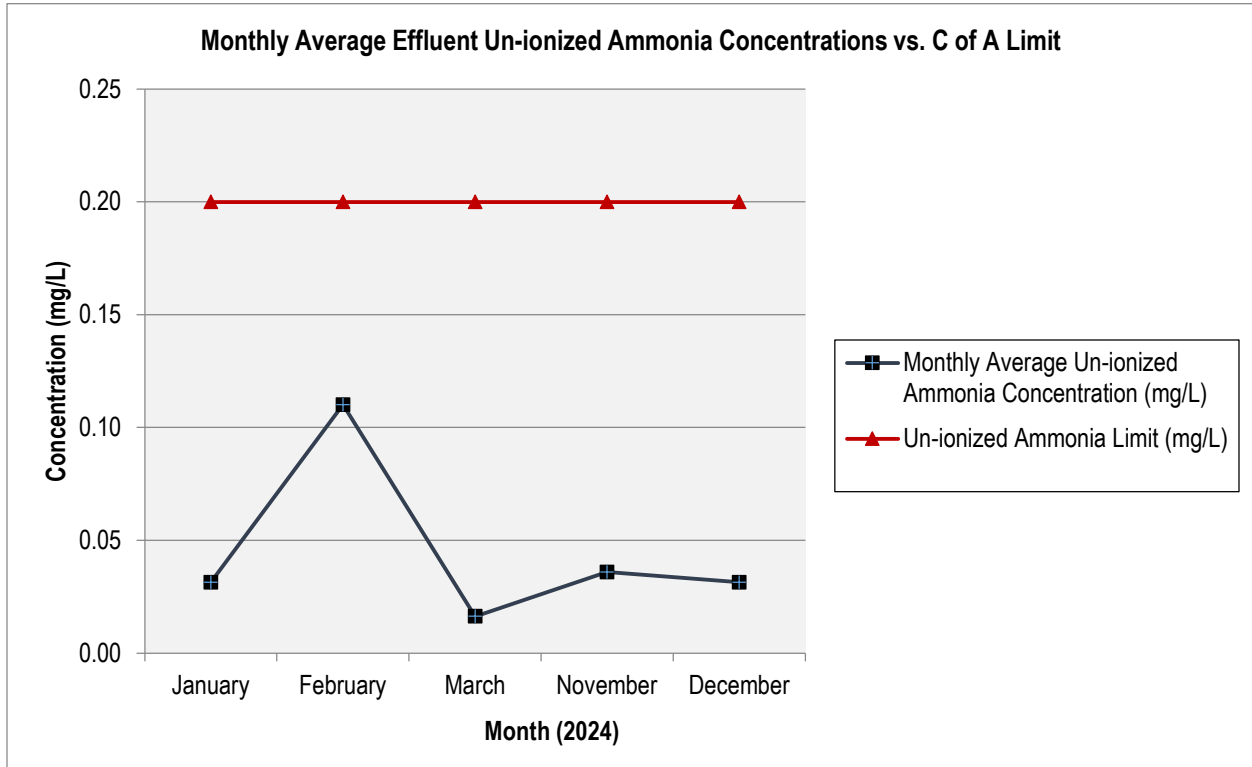


Figure 4 – Monthly Average Un-ionized Concentration vs. CoA Limit



### V. Influent & Effluent Flows

Table 2 above captures influent and effluent flows over the reporting period including average daily flow, total monthly flow and maximum daily flow. In review, the average daily raw sewage influent flow for the Milverton WPCP over the reporting period was calculated to be 672.04 m<sup>3</sup>/day. This average represents approximately 66% of the plants rated capacity of 1013m<sup>3</sup> average daily flow.

The maximum daily influent flow event over this reporting period occurred in the month of April and was recorded to be 1594 m<sup>3</sup>/day which exceeds the rated capacity by some margin. This continues to be a concern as the severity of peak flow events are forecasted to increase as climate change has seemingly resulted in more intense precipitation events. The Township has been approved for twinning of the primary forcemain in addition to the rehabilitation of the existing wet well to increase the peak flow capacity. This is set to occur in 2025.

Figure 5 below shows the monthly average influent flow against the plants rated capacity for the 2024 reporting year.

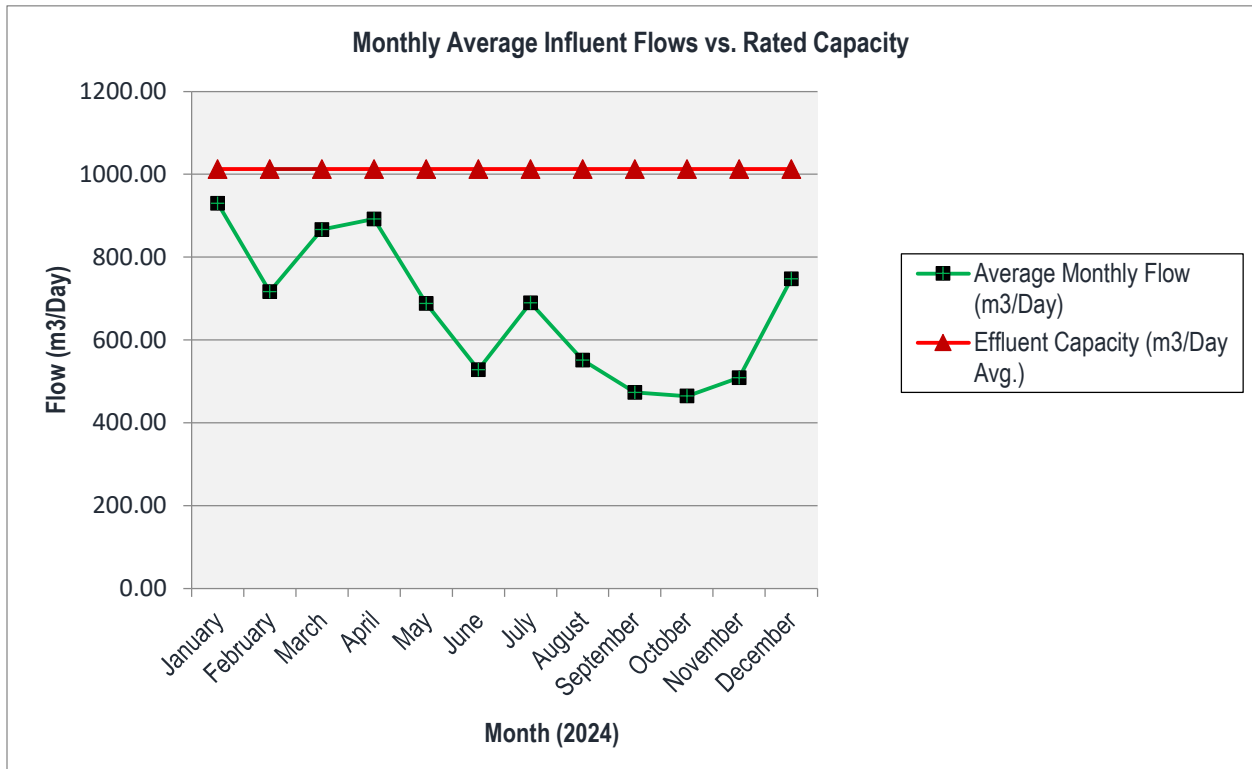
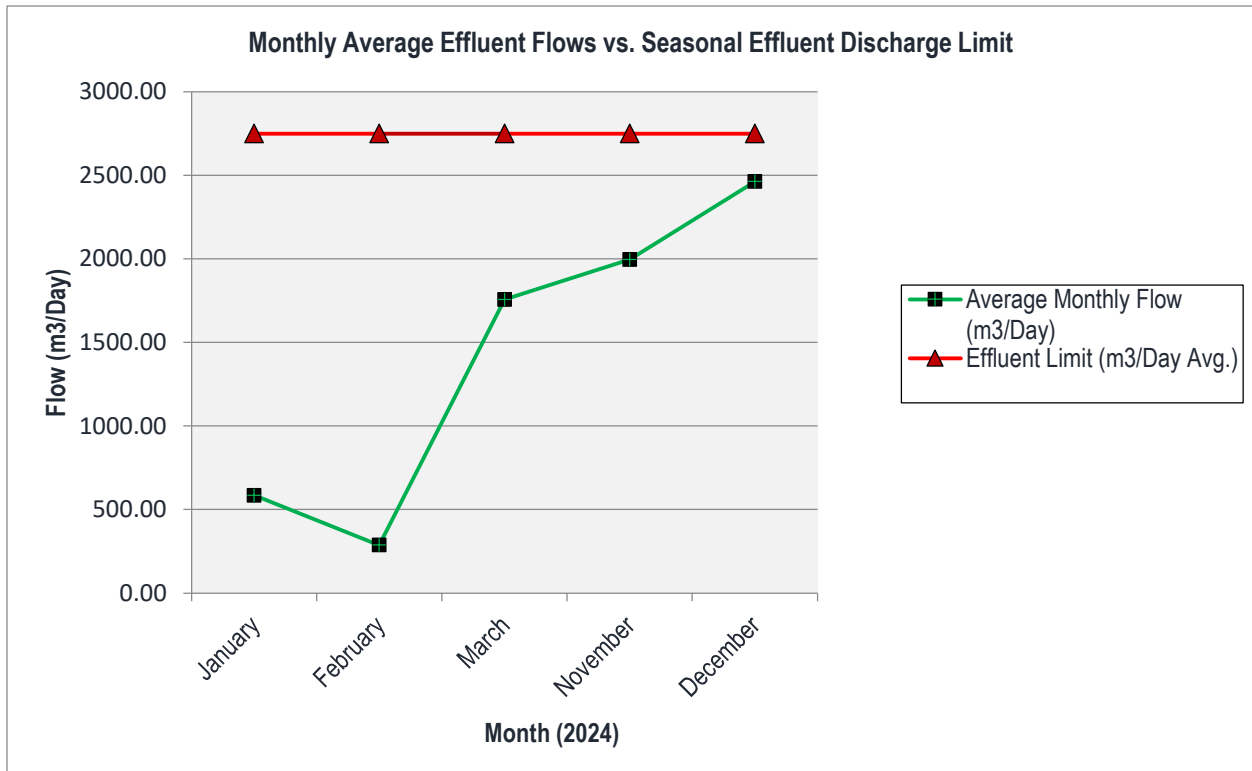


Figure 5 – Monthly Average Influent Flows vs. Rated Capacity



In terms of effluent flows, the seasonal discharge limit of 2750 m<sup>3</sup>/day was not exceeded over the reporting period. Figure 6 below outlines the monthly average effluent flow in comparison to the seasonal discharge limit. This represents approximately 52% of the effluent limit. It should be noted that the effluent is controlled by operations staff and can be adjusted as needed based on circumstances. This is of primary importance leading up to the end of the seasonal discharge period as enough capacity needs to be attained in the overall lagoon system to ensure storage is available for influent flows over the summer months when discharge is not permitted.

In 2024, staff faced operational issues with the outlet due to a partial blockage in the outlet structure. This led to a significantly reduced discharge up to the month of March at which time staff were able to remove the blockage. While the storage capacity was never reached over the summer months, staff were not in as comfortable a position as usual leading up to the fall discharge period. Increased maintenance and monitoring of the outlet structure is being implemented moving forward to ensure adequate storage capacity is available for the time period when discharge is not permitted.



**Figure 6 – Monthly Average Effluent Flows vs. Seasonal Discharge Limit**



## **B) OPERATING PROBLEMS & CORRECTIVE ACTION**

The Township of Perth East operating staff has made every effort to ensure that this lagoon facility operates in accordance with all applicable laws, certificates and regulations. Operations were continually monitored and modified in order to improve the treatment process as the nature of the raw sewage changes and the influent flows fluctuate.

The largest operating issue at the Milverton WPCP continues to be that of high flow events as a result of precipitation and/or melt events. In response to these events, the treatment plant is subject to peak influent flows in excess of the rated capacity which can lead to by-pass/ overflow events. As previously mentioned, the Township has been approved for twinning of the primary forcemain in addition to upgrading the existing wet well and piping to increase the peak flow capacity. This is set to occur in 2025 and is anticipated to greatly improve the issue. Furthermore, through the update of the Township's Water/ Wastewater Master Plan occurring in 2024/2025, the consultant and staff will examine the urgency around conducting an inflow & infiltration (I&I) study and the potential implications of such.

Staff additionally ran into an operational issue with the outlet structure which was partially blocked at the onset of 2024 leading to a significant reduction in effluent discharged. Staff were able to eliminate the blockage through a combination of water jetting and pressurization and normal discharge resumed in March of 2024.

## **C) MAINTENANCE SUMMARY**

The following is a list of the maintenance activities carried out during this reporting period on any of the plants major structures, equipment, apparatus, or mechanisms which form the integral parts of the treatment process.

- Monthly inspection carried out on backup generator; weekly checks
- Generators inspected and load tested as required by Sommers Generator Systems
- Raw sewage flow meter and lagoon effluent flow meter annual calibration completed
- Aeration cell diffusers removed, inspected, cleaned and repaired as required
- Blowers checked and maintained monthly; greased, oil & filter changes as required
- Raw sewage lift station wet wells cleaned by vacuum truck
- Raw sewage pumps pulled and inspected. Repaired as required
- General maintenance of Lagoon Facility grounds



## D) EFFLUENT QUALITY ASSURANCE

All samples are collected and tested as per the requirements of the Certificate of Approval.

Collected samples were delivered to a combination of ALS Global in Waterloo and SGS Canada Inc. in London, both CALA accredited laboratory. Both labs were responsible for performing the quality assurance and control checks.

Effluent quality monitoring is achieved by collecting bi-weekly grab samples during the seasonal discharge period (November 1<sup>st</sup> to March 31<sup>st</sup>) and analyzed for all parameters listed in the C of A. For the purpose of influent quality monitoring, grab samples are collected and sent to the lab for testing. Raw sewage samples are tested for CBOD<sub>5</sub>, total suspended solids, total phosphorus and total Kjeldahl nitrogen.

## E) CALIBRATION OF EFFLUENT MONITORING EQUIPMENT

Annual calibrations of influent and effluent flow meters for the year 2024 were conducted by SCG Flowmetrix. Calibrations were completed on all meters on May 8, 2024. Calibration of the temperature and pH meters are performed in-house according to manufacturer's instructions.

## F) EFFORTS MADE IN ACHIEVING EFFLUENT OBJECTIVES

Over the reporting period, operational staff made every effort to meet effluent objectives. In 2024, daily flows were generally less than the Rated Capacity of the Works with the exception of 35 days within the reporting period. This represents approximately 90% of the days in the calendar year. As previously mentioned, the Township is in the process of twinning the primary forcemain in addition to the upgrading of the existing wet well to increase the peak flow capacity. This is set to occur in 2025. Furthermore, through the update of the Township's Water/ Wastewater Master Plan occurring in 2024/25, the consultant and staff will examine the urgency around conducting an inflow & infiltration (I&I) study and the potential implications of such.

EFFLUENT PARAMETER	EFFLUENT LIMIT
Carbonaceous Biological Oxygen Demand (CBOD <sub>5</sub> )	Achieved 4 out of 5 months
Total Suspended Solids (TSS)	Achieved 4 out of 5 months
Total Phosphorus (TP)	Achieved 5 out of 5 months
Un-ionized Ammonia	Achieved 5 out of 5 months

In relation to the seasonal discharge criteria, the overall treatment generally met the effluent limits. One significant step the Township took to improve effluent quality was the replacement of all diffusers in both aeration cells. This occurred in the summer of 2023 and effluent results in 2024 were indicative that treatment efficacy improved substantially. Staff believe the increased aeration process is responsible for these improvements.



### **G) SLUDGE GENERATION**

No sludge was removed from the Milverton WPCP over the reporting period.

### **H) COMPLIANTS**

There were no complaints received regarding the overall operation of the Milverton WPCP and collection system during the reporting period.

### **I) BY-PASSES, SPILLS & ABNORMAL DISCHARGE**

There were no abnormal by-pass, spill or discharge events over the reporting period.

### **J) ADDITIONAL INFORMATION**

The District Manager did not request any additional information over the reporting period.