



**The Corporation of the Township of Perth East**  
**2022 Annual Operations Report**  
**Milverton Water Pollution Control Plant**

Lot 5, Concession 3 Mill Street West  
Milverton, Ontario

February 17, 2023



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

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

February 17, 2023

ATTN: Mr. Pierre Adrien, London District Manager

**Re: The Corporation of the Township of Perth East  
Milverton Water Pollution Control Plant, Annual Report 2022**

Please find enclosed the Township of Perth East's Milverton Wastewater Treatment Facility Annual Operations Report for the year 2022. 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 summary and interpretation of all monitoring data and comparison to effluent limits;
- A description of any operating problems and corrective actions taken;
- A summary of maintenance activities;
- A summary of effluent quality assurance measures;
- A summary of calibration methods and maintenance procedures for all monitoring equipment;
- A description of efforts made and results achieved in meeting Effluent Objectives;
- Sludge generation volume and disposal methods;
- A summary of any complaints received during the reporting period and actions taken to address the complaints;
- A summary of all by-pass, spill or abnormal discharge events;

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  
Operations Coordinator  
[jcollings@pertheast.ca](mailto:jcollings@pertheast.ca)  
(519) 595-2800 x249

cc:// Wes Kuepfer, Public Works Manager  
Neville Rising (MECP), Inspector  
Matt Gabel, Chief Operator  
Michael Givens, CAO



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## 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).



## ANNUAL REPORT

System Name:	Milverton Water Pollution Control Plant
System Owner:	The Corporation of the Township of Perth East
Certificate of Approval #:	6264-6EEP9N
Reporting Period:	January 1, 2022 to December 31, 2022

### 1. SUMMARY OF MONITORING DATA RELATIVE TO EFFLUENT LIMITS

The following tables summarize the influent and effluent flows and concentrations of parameters relative to the limits provided in the Certificate of Approval.

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>		
2022	January	5.1	4.4	0.6	0.13	7.5	6.1
	February	15.0	6.9	1.0	0.06	7.7	0.0
	March	13.5	26.2	0.7	0.12	7.9	4.0
	November	2.8	3.2	0.2	0.01	8.7	5.9
	December	6.6	5.6	0.3	0.06	8.7	4.8



**Table 2 - Influent and Effluent Flow Data**

FLOW DATA (m <sup>3</sup> )										
Year	Month	EFFLUENT			INFLUENT					
		Average Daily Flow	Total Monthly Flow	Maximum Daily Flow	Average Daily Flow	Total Monthly Flow	Maximum Daily Flow			
2022	January	2231.81	69186	2310	489.35	15170	570			
	February	1354.29	37920	2430	721.43	20200	1100			
	March	1750.65	54270	2750	1055.81	32730	1440			
	April	No Discharge			692.00	20760	810			
	May				650.32	20160	930			
	June				510.67	15320	600			
	July				448.39	13900	540			
	August				500.00	15500	700			
	September				486.67	14600	660			
	October				485.48	15050	550			
	November				413.00	12390	2570	528.33	15850	760
	December				2256.45	69950	2720	654.19	20280	1270

**Table 3 - Influent Quality Monitoring Data**

Year	Month	CBOD5 (mg/L)	Total Suspended Solids (mg/L)	Total Phosphorus (mg/L)	Total Kjeldahl Nitrogen (TKN)
2022	January	167.0	330.0	6.0	54.6
	May	242.0	269.0	6.8	68.3
	August	198.0	322.0	6.4	47.6
	November	190.0	155.0	5.7	50.3



## 2. INTERPRETATION OF DATA RELATIVE TO EFFLUENT LIMITS

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

Throughout the reporting discharge period, the monthly average CBOD<sub>5</sub> concentration did not exceed the effluent limit of 15.0mg/L, indicating that treatment was effective in this regard. In the month of February, the effluent met the limit of 15mg/L as a result of a significant spike in concentration of CBOD<sub>5</sub> for the February 14<sup>th</sup> sample.

Figure 1 below details the effluent CBOD<sub>5</sub> concentrations in relation to the compliance parameters and objectives.

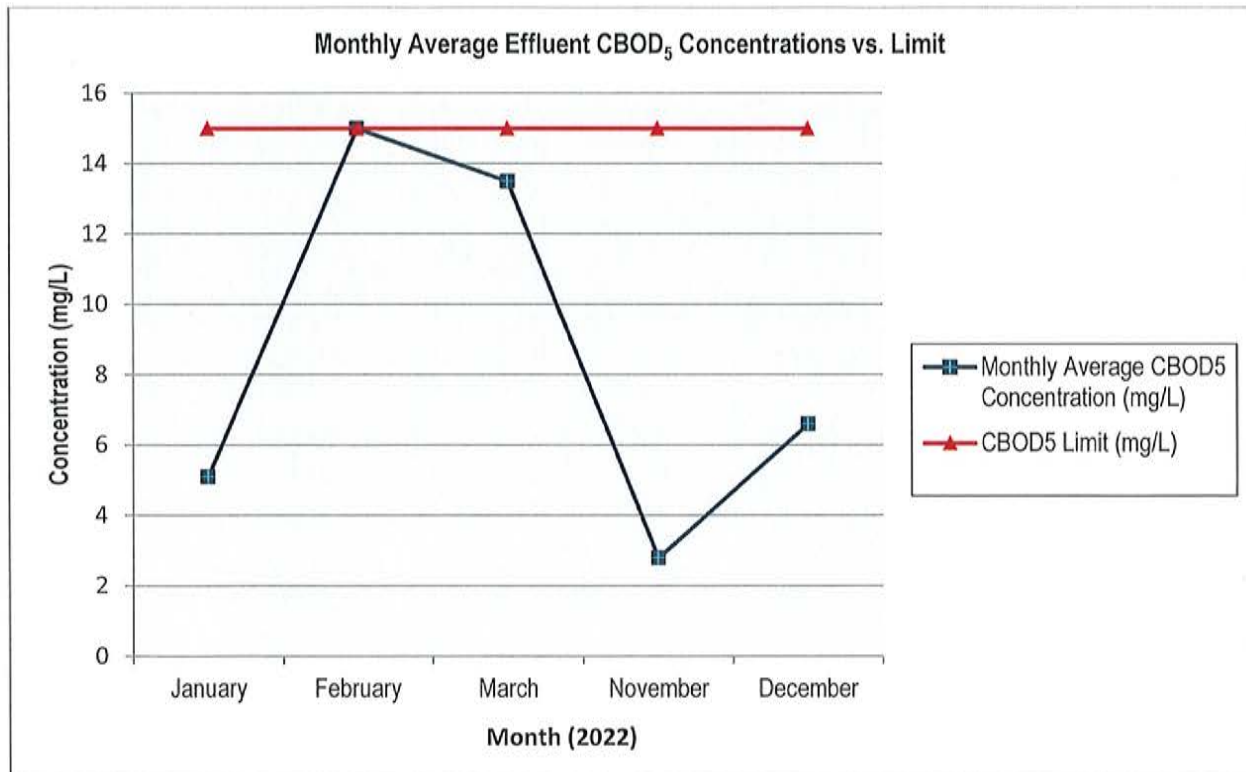


Figure 1 – Monthly Average Effluent CBOD<sub>5</sub> Concentrations vs. C of A Limit



## II. Total Suspended Solids (TSS)

Figure 2 below details the monthly effluent TSS concentrations in relation to the C of A Limit. The TSS concentrations were generally well below that of the effluent limit with the exception of the month of March. The final sample collected on March 28<sup>th</sup> resulted in a spike in the average concentration as the sample yielded a result of 40.4 mg/L. Discharging had already been halted in accordance with the seasonal schedule prior to receipt of the sample results so no action was taken.

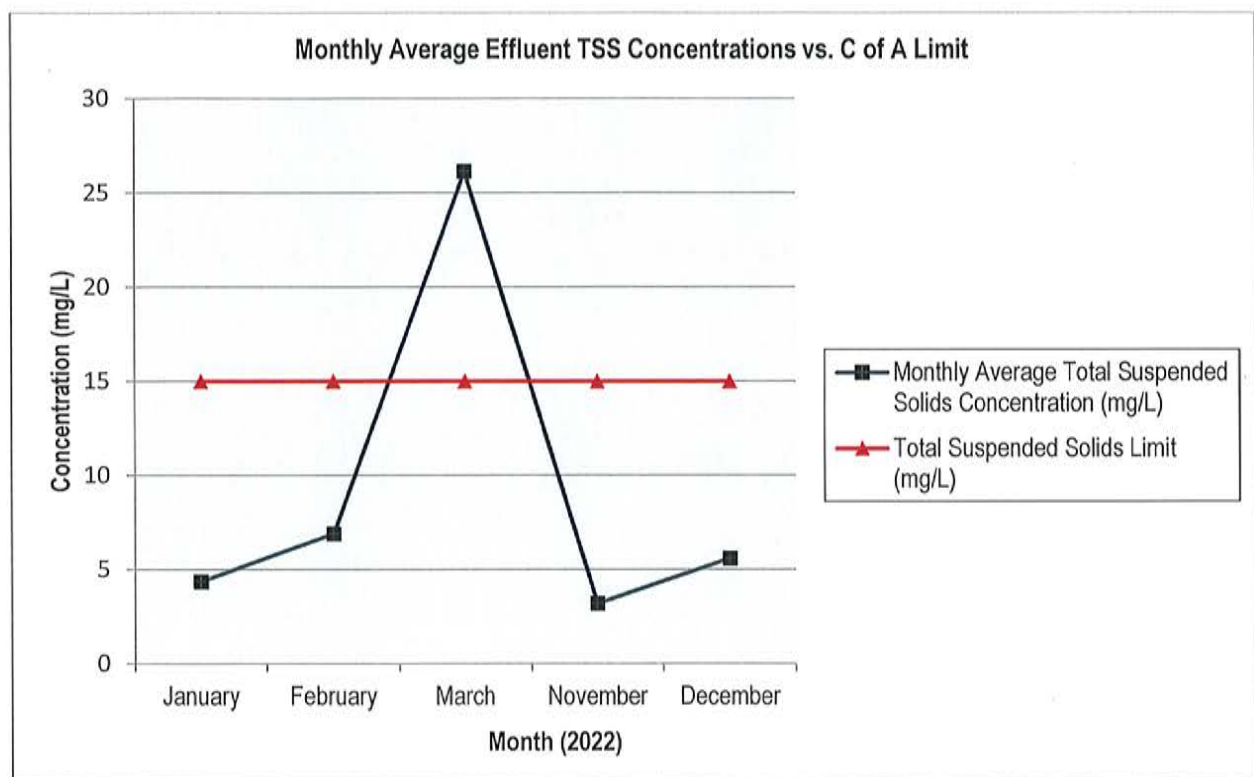


Figure 2 – Monthly Average Effluent TSS Concentrations vs. C of A Limit



### III. TOTAL PHOSPHORUS (TP)

Figure 3 below details the monthly effluent Total Phosphorus (TP) concentrations in relation to the compliance limit. The TP concentration was generally well below that of the effluent limit with the exception of the month of February where the limit was met.

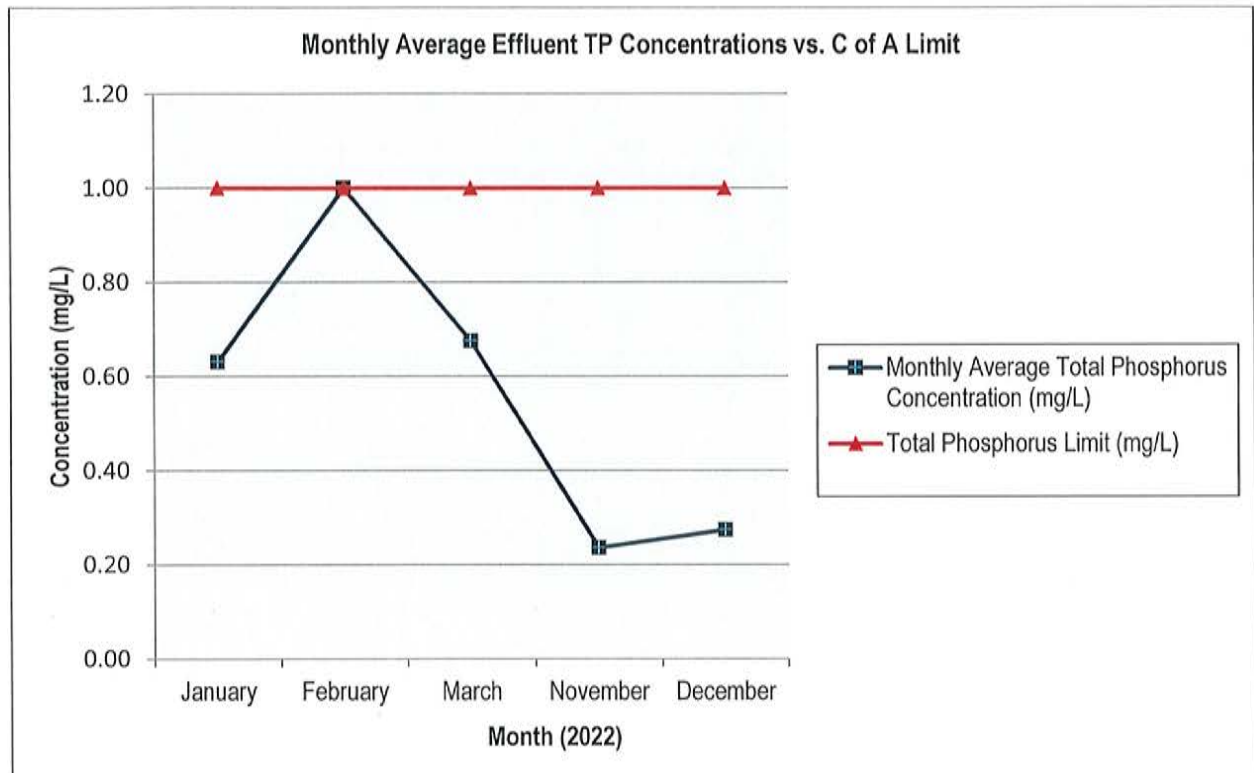


Figure 3 – Monthly Average Effluent TP Concentrations vs. C of A Limit



#### IV. UN-IONIZED AMMONIA

Figure 4 details the average monthly un-ionized ammonia concentrations of the effluent in relation to the compliance limit. The average monthly concentrations were consistently well below that of the limit.

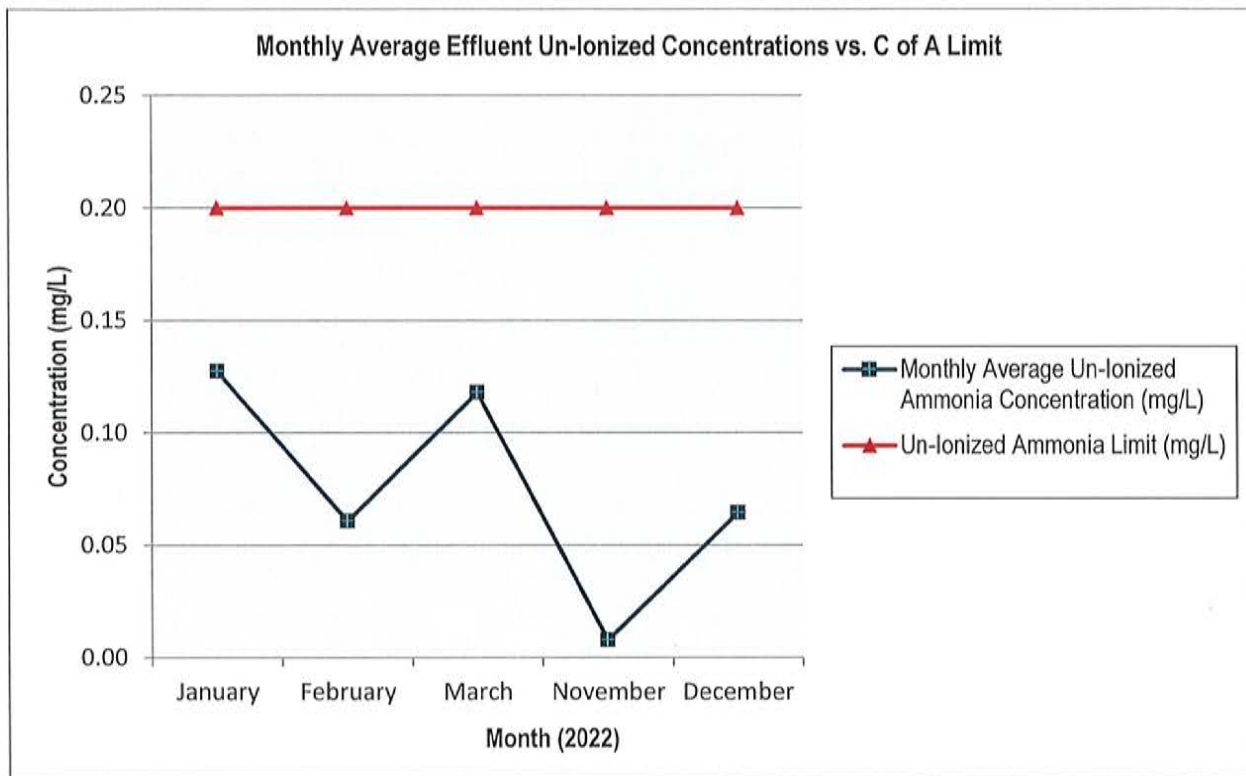


Figure 4 – Monthly Average Effluent Un-ionized Ammonia Concentrations vs. C of A Limit



### V. Milverton WPCP Influent & Effluent Flows

The average daily raw sewage influent flow for the Milverton WPCP from January 1, 2022 to December 31, 2022 was 601.42 m<sup>3</sup>/day. This average represents approximately 59% of the plants rated capacity of 1013m<sup>3</sup> average daily flow. In the month of March, influent flows actually exceeded the rated capacity by a small margin which can likely be attributed to a significant melting event coupled with precipitation.

The maximum daily flow event also took place in the month of March and was recorded as 1440 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. Currently the Township is investigating the best approach to address the issue of capacity for peak flows events.

Figure 5 below shows the monthly average influent flow against the plants rated capacity for the 2022 reporting year.

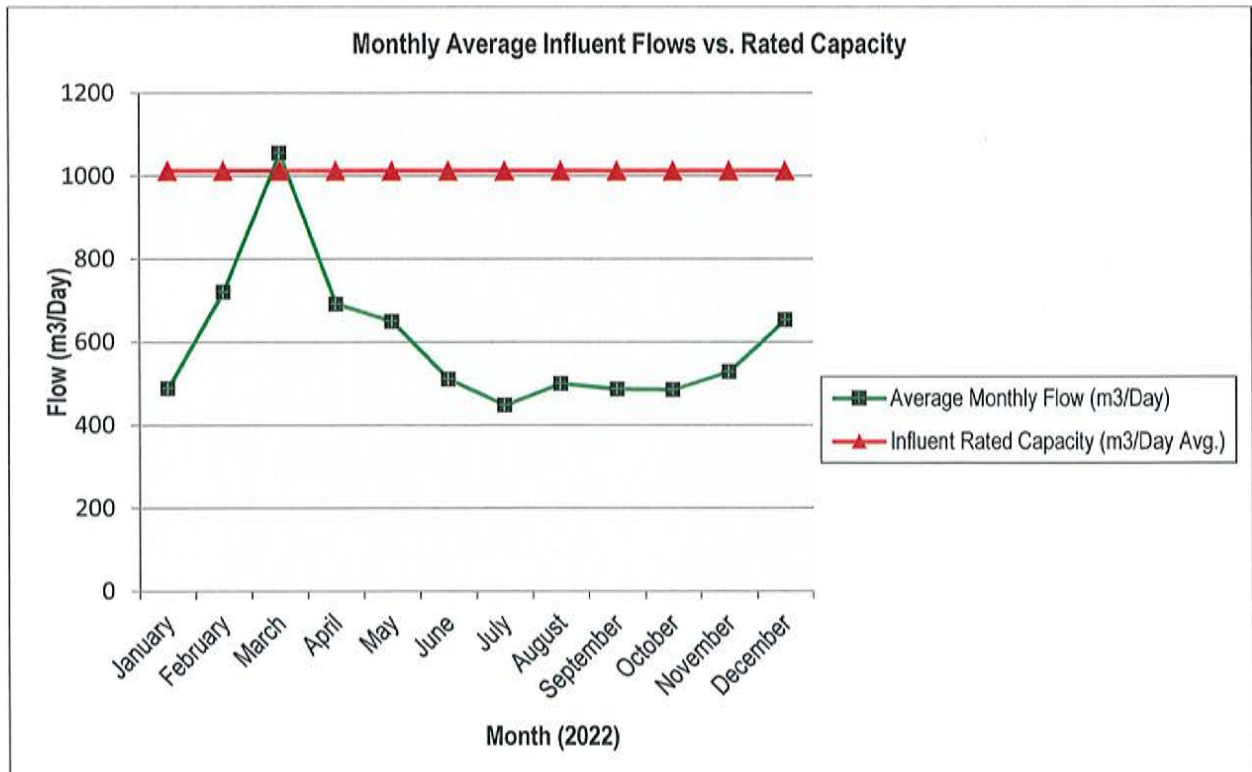


Figure 5 – Monthly Average Influent Flows vs. Rated Capacity



Figure 6 below shows the monthly average effluent flow against the discharge flow limit for the reporting period in 2022. Effluent flows never exceeded the discharge flow limit but did converge on and even met the limit for short durations.

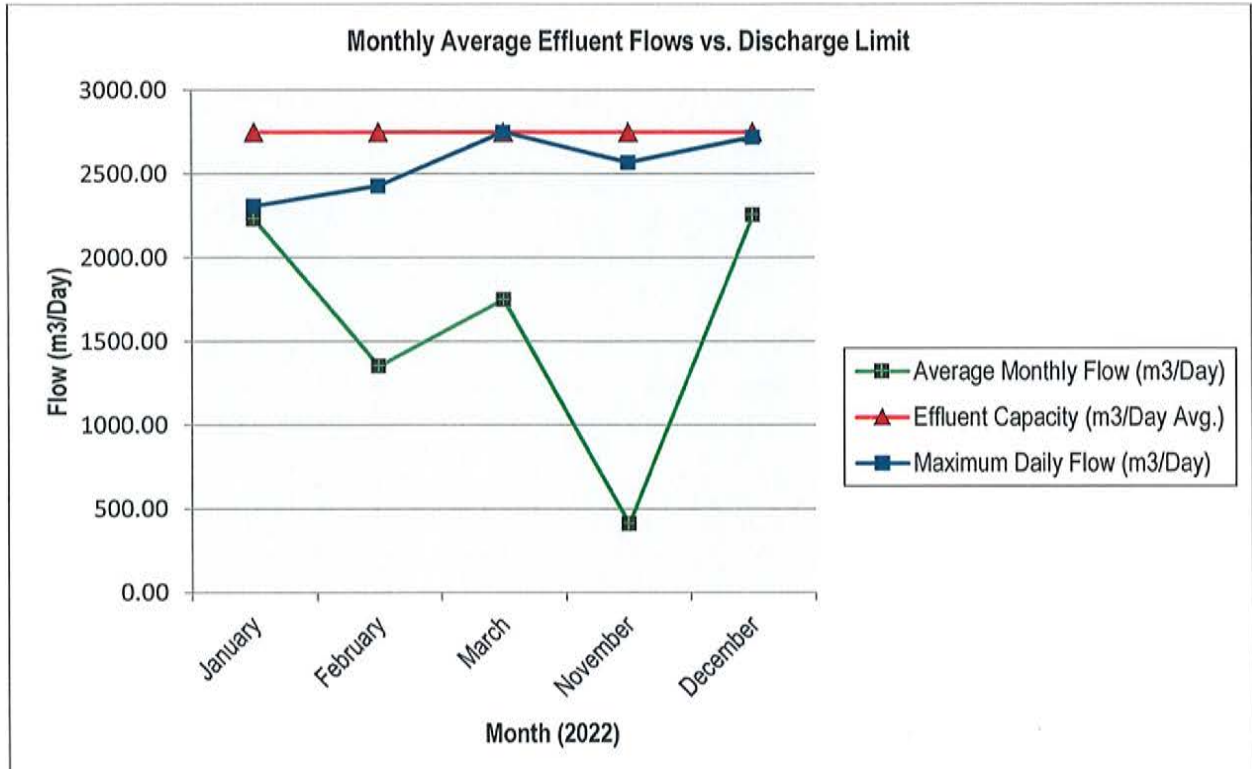


Figure 6 – Monthly Average Effluent Flows vs. Discharge Limit



### **3. DESCRIPTION OF OPERATING PROBLEMS AND CORRECTIVE ACTIONS**

There were no noteworthy operating problems identified over this reporting period.

### **4. SUMMARY OF MAINTENANCE CARRIED OUT ON MAJOR PLANT STRUCTURES**

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.

- Raw sewage flow meter and lagoon effluent flow meter annual calibration completed
- Aeration cell diffusers removed, inspected, cleaned and repaired as required
- Two diffusers replaced in Aeration Cell A1
- Blowers checked and maintained monthly; greased, oil & filter changes as required
- Raw sewage lift stations cleaned by vacuum truck
- Raw sewage pumps pulled and inspected. Repaired as required
- Diesel generators inspected and serviced through contractor
- Diesel generators operated under full loading
- General maintenance of Lagoon Facility grounds

### **5. EFFLUENT QUALITY ASSURANCE/ CONTROL MEASURES**

All collected samples were delivered to ALS Global in Waterloo a CAEAL accredited laboratory. The lab is responsible for performing the quality assurance and control checks.

Effluent quality monitoring is achieved by collecting bi-weekly during the discharge period (November 1<sup>st</sup> to March 31<sup>st</sup>) and analyzed for all parameters listed in the C of A and Federal Wastewater Effluent criteria.

For the purpose of influent quality monitoring, quarterly samples are collected and sent to the lab for testing. Raw sewage samples are tested for BOD<sub>5</sub>, total suspended solids, total phosphorus and total Kjeldahl nitrogen.

### **6. CALIBRATION & MAINTENANCE OF EFFLUENT MONITORING EQUIPMENT**

Annual calibrations of influent and effluent flow meters for the year 2022 were conducted by SCG Flowmetrix. A report outlining the calibrations is appended for reference in Appendix E.

Handheld pH and temperature meters are calibrated and replaced as per the manufacturers specifications.



## **7. EFFORTS MADE AND RESULTS ACHIEVED**

Effluent limits listed in ECA # 6264-6EEP9N Section 6 for the majority of parameters were met during the reporting period, save and except for the month of March where there was an exceedance in TSS. As previously mentioned this exceedance was due to March 28<sup>th</sup> sample which yielded a concentration of 40.4mg/L skewing the average. The discharge valve was closed on March 30<sup>th</sup> in accordance with the seasonal discharge schedule.

Over the aforementioned reporting period, the effluent was free from floating solids and any visible sheens, film, foam or discoloration indicative of the presence of oil or other substances.

## **8. SLUDGE GENERATION VOLUME & DISPOSAL METHODS**

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

## **9. SUMMARY OF COMPLAINTS RECEIVED**

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

## **10. SUMMARY OF BY-PASS, SPILL OR ABNORMAL DISCHARGE EVENTS**

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