Mildmay Water Pollution Control Plant

#110002194

2023 Summary Report
February 16, 2024
Prepared by Veolia Water
For the Municipality of South Bruce

Contents

C of A (#2042-8KYJH3) Reporting Requirements

Plant Description

The Mildmay Water Pollution Control Plant is an Extended Aeration plant with a rated capacity of 966 m3. The collection system consists of approximately 14 km of gravity sewers and 3 lift stations. The main lift station is located on the North side of Clarke St. just northeast of the intersection of Clarke and Elora Road. It is equipped with two (2) centrifugal vertical pumps, each having a capacity of 45.5L/s at 23 meters TDH; bypass fittings on the forcemain and provision for emergency overflow from the pumping station wet well to Otter Creek; equipped with one (1) diesel generator 100 kilowatt back up diesel. Sewage is pumped through a 200mm diameter forcemain from the sewage pumping station to the sewage treatment plant. This forcemain has three (3) air relief valve chambers.

Sewage Treatment Plant
A circular extended aeration plant, with an overall diameter of 23.5 m, having annular process compartments;

Preliminary Treatment
- Two (2) grit channels, each channel having dimensions of 7.6 m x 0.53 m;
- One (1) manually cleaned coarse bar screen.
- A 250 millimeter diameter bypass sewer between the exit of the grit channels and the chlorine contact chamber;

Secondary Treatment
- One (1) 962 m3 Aeration tank with two compartments, having a sidewater depth (SWD) of 4.0 m and equipped with coarse bubble diffusers;
- One (1) 13.5 m diameter secondary clarifier with a SWD of 3.0 m and equipped with side feed clarifier mechanism, scum baffle, removable mechanical scum skimmer and scum air lift;
- One (1) return/waste activated sludge pump rated at 22 L/s at 2.1 m TDH;

Phosphorus Removal
- One (1) 27.3 m3 chemical storage tank with an enclosure and containment tank; addition of phosphorus removal chemicals can be done at the headworks or at the entry of the aeration tank;

Back-up Chlorination System
- One (1) 28 m3 chlorine contact chamber with bypass and V-notch measuring weir;
- One (1) 45.4 kg/d gas chlorinator for effluent disinfection and if required, pre-chlorination of raw sewage;
- One (1) ultrasonic water level monitor in the chlorine contact chamber, connected to a level/flow integrator and flow recorder;
- One (1) controller taking a signal from the final effluent level/flow integrator to control a water supply flow to the chlorinator for the preparation of chlorine solution to be added to the chlorine contact chamber for disinfection of secondary treated effluent;

Blower Room

- Three (3) air blowers, each with a rated capacity of 12.2 m3 /min. at 55.2 kPa. One (1) of the three blowers is equipped with a Variable Frequency Drive that allows Operators to adjust blower speeds based on Dissolved Oxygen levels for energy conservation and process improvement.

Sludge Stabilization

- One (1) two-stage aerobic digester having a volume of 97 m3 in the first stage and 48 m3 in the second stage. The digester is equipped with a coarse bubble diffuser system and a decanting facility;
- One (1) blower with a capacity of 20.1 m3/min. at 60 kPa provides aeration and mixing of the digester. This blower is equipped with a Variable Frequency Drive that allows Operators to adjust blower speeds based on tank level for energy conservation and process improvement.

Sludge Storage

- a 466 m3 sludge holding tank equipped with one (1) submersible mixer, a diffused aeration system and decanting device;
- one (1) submersible sludge loading pump rated at 23 L/s at 15.4 m TDH;

Standby Power

- one (1) 100 kW diesel generator set and one (1) 908 L fuel tank;

Scum Well

- a scum well equipped with one (1) submersible pump rated at 3 L/s at a 5.2 m TDH;

Brewery Waste Holding Tank

- a brewery waste holding tank equipped with one (1) submersible pump rated at 3 L/s at a 5.2 m

Outfall

- one (1) 279 millimeter outside diameter polyethylene outfall sewer complete with outfall headwall, discharging to Otter Creek;

Miscellaneous

- all other controls, electrical equipment, instrumentation, piping, pumps, valves, heating and ventilation systems and appurtenances essential for the proper operation of the aforementioned *Works* ; all in accordance with the following submitted supporting documents:

Chlorination System

- Existing chlorination system has been retained for pre-chlorination of raw sewage, if required,

UV Disinfection System

- a 300 mm diameter pipe from the existing outlet box in the chlorine contact chamber to the outdoor UV disinfection channel;
- an outdoor 5.31 m x 0.6 m x 0.9 m depth concrete channel equipped with a UV disinfection unit with a *Peak Flow Rate* of 49.1 L/s, complete with level control weir;
- a 300 mm diameter outlet pipe from the UV disinfection channel to the existing outfall chamber.

VEOLIA WATER

Mildmay Wastewater Compliance Report 2023

Facility Classification: Class 2 Waste Water Treatment
Total Design Capacity: 966 m3/day
Receiving Waters: Otter Creek

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Minimum	Average	Maximum	Limit
Flow																	
Influent Total Flow (m3/mth)	15,716	13,892	16,722	16,967	13,713	9,909	10,820	12,056	10,118	11,747	11,111	14,342	157,113		13,093		
Influent Average Day Flow (m3/d)	507	496	539	566	442	330	349	389	337	379	370	463			430		966
Influent Max Day Flow (m3/d)	1,163	922	1,096	1,001	656	396	489	518	537	600	543	1,048				1,163	
Biochemical O2 Demand																	
Influent Average Raw CBOD (mg/L)	124	296	232	140	194	128	234	226	178	188	173	169			190	296	
Effluent Average CBOD (mg/L)	3	2	2	2	2	2	3	2	2	2	3	2			2	4	25
Eff. CBOD Loading (kg/d)	1.27	0.81	1.10	1.23	1.23	0.70	0.89	0.81	0.64	0.72	1.03	0.92			0.9		
Percent Removal	97.8	99.3	99.1	98.6	98.8	98.4	98.9	99.1	98.9	98.9	98.6	98.8			98.8	%	
Suspended Solids																	
Influent Average TSS (mg/L)	160	309	344	143	277	265	280	306	186	255	251	163			245	344	
Effluent Average TSS (mg/L)	5	4	4	5	4	4	3	3	3	2	5	4			4	8	25
Eff. SS Loading (kg/d)	2.31	1.41	2.19	2.71	2.19	1.22	1.00	1.21	0.82	0.72	2.00	1.83			1.6		
Percent Removal	96.9	98.9	98.8	96.9	98.4	98.7	98.9	99.0	98.7	99.2	98.0	97.5			98.3	%	
Phosphorus																	
Influent Average TP (mg/L)	2.84	4.39	4.96	2.51	4.34	4.34	5.06	5.57	3.71	6.65	8.81	1.94			4.59	8.81	
Effluent Average TP (mg/L)	0.24	0.20	0.17	0.21	0.28	0.29	0.26	0.46	0.34	0.25	0.21	0.29			0.26	0.48	1
Eff. Phosphorus Loading (kg/d)	0.12	0.08	0.09	0.12	0.14	0.10	0.09	0.18	0.11	0.09	0.09	0.13			0.1		
Percent Removal	91.7	95.4	96.7	91.8	93.5	93.3	94.9	91.8	90.8	96.3	97.6	85.3			93.3	%	
Nitrogen Series																	
Influent Average TKN (mg/L)	25.70	40.50	40.60	23.50	29.00	44.20	46.50	41.70	34.20	42.80	43.60	26.70			36.58		
Effluent Average NH3+NH4 (mg/L)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	2.10	0.10	0.10	0.10	0.10			0.25	4.10	8
Effluent Average Nitrate (mg/L)	18.53	19.45	16.95	13.05	13.93	10.60	12.55	11.05	17.25	17.97	22.20	17.45			16.01	23.4	
Effluent Average Nitrite (mg/L)	0.03	0.03	0.03	0.04	0.03	0.04	0.03	0.21	0.09	0.04	0.03	0.03			0.05	0.38	
pH																	
Influent Average pH	7.84	7.54	7.63	7.89	7.97	7.43	7.54	7.21	7.96	7.48	7.77	7.62		7.21	7.66	7.97	
Effluent Average pH	7.28	7.26	7.30	7.32	7.35	7.38	7.37	7.49	7.45	7.47	7.46	7.45		6.80	7.38	7.80	
UV Disinfection																	
Average UV Intensity	3.30	3.51	3.76	4.56	5.51	7.03	7.20	7.55	7.44	7.21	6.16	6.08			5.8	8.5	
Disinfection													Geometric Mean				
E.Coli Geo.Mean per 100mL	29	11	12	9	10	4	2	3	2	4	11	11	7		9	12	200

Note: Acute Lethality Sample was collected June 12, 2023. The results came back non lethal.

By-Passes

There were no by-passes in 2022.

Table 2 BYPASS AND OVERFLOW SUMMARY FOR 2023

	Primary Bypass			Secondary Bypass			Plant Overflows			Collection System Overflows		
MONTH	No. of Events (events)	Duration (hours)	Volume (1000m3)	No. of Events (events)	Duration (hours)	Volume (1000m3)	No. of Events (events)	Duration (hours)	Volume (1000m3)	No. of Events (events)	Duration (hours)	Volume (m3)
January	0			0			0			0		
February	0			0			0			0		
March	0			0			0			0		
April	0			0			0			0		
May	0			0			0			0		
June	0			0			0			0		
July	0			0			0			0		
August	0			0			0			0		
September	0			0			0			0		
October	0			0			0			0		
November	0			0			0			0		
December	0			0			0			0		
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0

Note: An 'Event' means an occurrence or occurrences of a bypass or overflow separated by a period of more than 12 hours between the occurrence(s) or the event(s) and the previous event, at each location.

Operating Problems

- During 2023 there were no operational issues that significantly impacted the quality of effluent.
- There are significant differences between “dry period” flows and “wet period” flows. This is not unusual for older collection systems.

Major Maintenance

In 2023 there were no Major Maintenance issues that had a significant impact on the quality of the Final Effluent.
Additional maintenance other than routine maintenance included:

January 4 - Replaced lamp, o-ring, nt and sleeve for the UV Unit
February 7 - Sommers Generators replaced the starter on the Elora St. Generator
February 8 - Replaced UV lamp on bank #5
June 1 - Re-built and installed scum collector for clarifier
September 20 - The spare Raw Sewage Pump was installed at the Elora Lift Station

QA/QC Measures

All required regulatory and C of A analyses were performed by E3 Lab Services. In addition, routine in house laboratory sampling was undertaken to ensure compliance and included, but was not limited to: 30 minute Settling, Suspended Solids, Final Effluent Total Phosphorus, pH, and temperature.

Effluent Monitoring Equipment

The following is a list of the monitoring equipment at the Water Pollution Control Plant for the final effluent:

- Hach Pocket Colorimeter 2 Phosphate – Total Phosphorus
- Hach HQ 40d– pH, Dissolved Oxygen
- Endress Hauser- Dissolved Oxygen, pH, Temperature
- Hach Pocket colorimeter 2 – Total Cl2 residual (for back-up in event of UV malfunction)
- Digital Scale for MLSS

Calibration and Service of Equipment

- May 2, 2023 - Calibration of gas detectors by Hetek
- July 12, 2023 – Annual inspection of lifting equipment.
- April 10, 2023 - Calibration of flow monitoring equipment by AMS Advance Meter Service
- November 21, 2023 - Calibration of gas detectors by Hetek

Effluent Objectives

1. Dissolved Phosphorus tests were used to indicate the required Alum dosage.
2. pH measurements were taken to ensure levels were between 6.0 and 9.0 and water quality.
3. Dissolved oxygen was measured to ensure that adequate aeration is being carried out.
4. Mixed liquor suspended solids and 30 minute settling tests are used to determine adequate microbiological populations and to set the sludge wasting rates.

Bio Solids Volume

The hauled Bio-Solids quantity in 2023 was approximately 1,050 m3. The volume of Biosolids hauled was the same as the 2022 volume.. Bio-Solids quantities are expected to be similar in 2024.
On June 26th, 690 m3 of biosolids were hauled to the SDR 15 North Carrick - Field 2 Lot 16 Conc 10 (NASM #22300)
On November 15th, 360 m3 of biosolids were hauled to the SDR 15 North Carrick - Field 1 Lot 16 Conc 10 (NASM #22300)

Customer Complaints

No complaints were known to have been received.

Information for the District Manager

No additional information was known to have been requested from the District Manager.

Recommendations

1. Consider adding standby power to Vincent St. Lift Station.
2. Replacement of Aeration tank Blowers