

2018 Lake Erie Industrial Park Sewage Lagoons Annual Report

Prepared for: Darryl Hagman, MECP Inspector, Hamilton District Office

Prepared by: Jessica Ignaszak, Water and Wastewater Technologist, Haldimand County

Date: February 27, 2019

Copy to: David Kohli, Project Manager, Veolia Water Canada
Jim Matthews, Compliance Supervisor, Haldimand County
Tyler Kelly, MECP Inspector, Hamilton District Office

1. Background

The Lake Erie Industrial Park (LEIP) sewage lagoons and pumping station are owned by Haldimand County and operated by Veolia Water. The 3-cell lagoon system operates under C of A # 3-0161-76-006 and has a nominal design flow of 657 m³/d with a total storage volume of 54,450 m³. The lagoon discharges into Centre Creek, which discharges into Lake Erie. Veolia Water operates the LEIP sewage lagoons in accordance with MOE Procedure F-5-1 "Determination of Treatment Requirements for Municipal and Private Sewage Treatment Works Discharging to Surface Waters."

2. Flows and Loadings

Table 1 summarizes the 2018 LEIP flows and loadings and compares to typical results.

Parameter	2017	2018	
Average Daily Influent Flow (m ³ /d)	617	703	
Peak Daily Influent Flow (m ³ /d)	1,416	1,399	
Average Influent BOD ₅ (mg/L)	42	56	
Average Influent TSS (mg/L)	108	158	
Average Influent TKN (mg/L)	2.7	3.1	
Average Influent TP (mg/L)	0.7	0.8	
Ratios			
Parameter	2017	2018	Typical*
Peak Day / Annual Average Flow	2.3	2.0	2.0 – 3.0
Influent TSS/BOD ₅	2.6	2.8	0.8 – 1.2
Influent TKN/BOD ₅	0.1	0.1	0.1 – 0.2
Notes: *Results are for typical residential wastewater and are identified in Metcalf and Eddy, Wastewater Treatment and Reuse (4 th Edition).			

2.1. Loading Observations

- The average day flow of 703 m³/d exceeds the design flow of 657 m³/d;
- The increase in flow from 2017 to 2018 may be a result of industry production changes and from significant precipitation events;
- LEIP sewage lagoons receive primarily industrial wastewater which accounts for lower than expected influent BOD₅, TSS, TKN and TP concentrations;
- Average TSS has increased significantly in 2018.

3. Performance

Table 2 is a summary of the discharge quality compared to the design objectives and guidelines, as defined in Table 1 of Procedure F-5-1 (Seasonal Lagoon with TP removal by batch chemical dosage), for the spring and fall discharge periods.

Table 2 – Summary of Discharge Quality Compared to C of A Objectives and Guidelines			
Annual Average Discharge Quality			
Parameter	Average Concentration (mg/L)	Design Objective (mg/L)	Guideline (mg/L)
cBOD5	3.2	15	25
TSS	5.1	20	25
Total Phosphorous	0.06	0.5 to 1.0	

Table 3 is a summary of the number of days discharged and the total volume discharged.

Table 3 – Summary of Discharge Period	
Spring Discharge	
Parameter	Actual Result
Days of Discharge	36 days
Volume Discharged	115,318 m ³
Fall Discharge	
Parameter	Actual Result
Days of Discharge	29 days
Volume Discharged	119,069 m ³

3.1. Effluent Observations

- The annual average discharge quality met the objectives and guidelines;
- The effluent from the works was essentially free of floating and settling solids and did not contain oil or any other substance in amounts sufficient to create a visible film, sheen, foam or discoloration on the receiving waters;
- The actual discharge data is summarized in Table 5 (spring discharge) and Table 6 (fall discharge).

4. Operational Issues

- Severe flow restrictions through the main pumping station forcemain to the lagoon inlet distribution chamber continued in 2018. Plans are underway to replace the forcemain in 2019.

5. Sludge Volume

In October 2009, County staff profiled the depth of sludge over a cross-section of the three (3) lagoon cells. The results of the study are summarized in Table 4.

Table 4 – Summary of Lagoon Sludge Volumes and Depths		
Lagoon Cell	Total Sludge Volume (m3)	Average Sludge Depth (mm)
Cell #1	2,317	85
Cell #2	5,234	190
Cell #3	3,591	76

6. Facility Activities in 2018

- Assimilative capacity study on receiving water (Centre Creek) as part of the Municipal Class Environmental Assessment;
- Two (2) new submersible pumps and their associated isolation valves and check valves were purchased in 2018. Installation is expected to occur in the Spring of 2019.

7. Planned Activities for 2019

- Continuation of Municipal Class Environmental Assessment;
- New pump station pumps, isolation valves and check valves will be installed in the Spring following the replacement of the main pumping station forcemain to the lagoon inlet distribution chamber.

8. Bypasses, Overflows and Spills

- There were no reported bypasses, spills or overflows for 2018.

9. Reported Complaints

- There were no complaints for 2018.

10. Summary of Discharge Data

- Table 5 contains all spring discharge data
- Table 6 contains all fall discharge data

11. Calibration Reports

- See attached

12. Maintenance Activities

Routine preventative maintenance was performed on the lagoons and pumping station equipment during the reporting period. This includes tasks such as:

- vegetation control and inspection of lagoon cell berms;
- the removal, inspection and servicing of submersible pumps;
- the inspection, testing and servicing of the back-up generator system;
- See attached for the complete annual maintenance report.

Table 5 - Summary of Spring Discharge Data

Date	Discharge Flow m³/d	CBOD (mg/l)	TSS (mg/l)	Phosphorous (mg/l)	pH (SU)	Ammonia (mg/l)
21-Mar-18	2,130.38	4	3.0	0.02	7.77	0.04
22-Mar-18	3,405.46					
23-Mar-18	3,362.60					
24-Mar-18	3,319.62					
25-Mar-18	2,917.54					
26-Mar-18	2,758.61				8.01	
27-Mar-18	2,885.84	2	2.0	0.03	7.97	0.07
28-Mar-18	3,188.85					
29-Mar-18	3,125.73					
30-Mar-18	3,040.78					
31-Mar-18	2,740.78					
1-Apr-18	2,536.45					
2-Apr-18	2,273.64					
3-Apr-18	3,837.74					
4-Apr-18	3,716.90	2.8	11.0	0.09	7.62	0.26
5-Apr-18	3,622.36					
6-Apr-18	3,611.56					
7-Apr-18	3,529.72					
8-Apr-18	3,445.04					
9-Apr-18	3,408.09					
10-Apr-18	3,427.59					
11-Apr-18	2,999.10	4	3.0	0.02	7.98	0.28
12-Apr-18	2,830.27					
13-Apr-18	2,460.82					
14-Apr-18	3,219.29					
15-Apr-18	3,318.47					
16-Apr-18	3,545.10					
17-Apr-18	3,832.50					
18-Apr-18	3,446.42	4	11.0	0.10	8.13	0.22
19-Apr-18	3,790.78					
20-Apr-18	3,781.90					
21-Apr-18	3,732.06					
22-Apr-18	3,671.02					
23-Apr-18	3,564.94					
24-Apr-18	3,431.58					
25-Apr-18	1,406.25	4	4.0	0.06	7.99	0.03

Table 6 - Summary of Fall Discharge Data

Date	Discharge Flow m³/d	CBOD (mg/l)	TSS (mg/l)	Phosphorous (mg/l)	pH (SU)	Ammonia (mg/l)
1-Nov-18	5,190.5					
2-Nov-18	5,202.9					
3-Nov-18	5,148.4					
4-Nov-18	5,138.9					
5-Nov-18	5,377.8				7.94	
6-Nov-18	5,586.6					
7-Nov-18	5,614.3	2	2.0	0.04	8.31	0.17
8-Nov-18	5,624.9					
9-Nov-18	5,622.9				7.82	
10-Nov-18	5,645.3					
11-Nov-18	5,639.5					
12-Nov-18	4,109.3				8.04	
13-Nov-18	2,386.3					
14-Nov-18	2,361.5	4	5.0	0.04	8.25	1.16
15-Nov-18	2,158.0					
16-Nov-18	2,575.3				8.20	
17-Nov-18	3,078.7					
18-Nov-18	3,850.5					
19-Nov-18	3,818.5				8.22	
20-Nov-18	3,812.6					
21-Nov-18	4,477.3	2	5.0	0.08	8.36	0.75
22-Nov-18	5,721.3					
23-Nov-18	5,153.2				8.23	
24-Nov-18	4,041.9					
25-Nov-18	3,299.3					
26-Nov-18	2,679.0				8.29	
27-Nov-18	2,204.8					
28-Nov-18	957.4	4	5.0	0.14	8.26	0.35