

2018 Oswego Park Sewage Lagoons Annual Report

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1. Background

The two-cell Oswego Park sewage lagoons and pumping station are owned by Haldimand County and operated by Veolia Water. The lagoons operate under C of A # 3670-7DWPBZ and have a nominal design flow of 85 m³/d with a total storage volume of 45,650 m³. The lagoons can be discharged at a specific daily flow rate for March, April, May, November and December depending on receiving stream flow according to the C of A Discharge Period requirements. The effluent is discharged into Oswego Creek.

2. Per Capita Flows and Loadings

Table 1 summarizes the 2018 Oswego Park per capita flows and loadings and compares to typical results

Table 1 – Oswego Park Per Capita Flows and Loadings			
Parameter	2017	2018	
Population	210***	210***	
Average Daily Influent Flow (m ³ /d)	105	70	
Peak Daily Influent Flow (m ³ /d)	643	636	
Average Influent BOD ₅ (mg/L)	155	181	
Average Influent TSS (mg/L)	108	145	
Average Influent TKN (mg/L)	52	52	
Average Influent TP (mg/L)	6.0	6.2	
Per Capita Flows and Loadings			
Parameter	2017	2018	Typical
Per Capita Wastewater Flow (L/person/day)	500	333	350 – 500* 332**
Per Capita BOD ₅ Loading (g/person/day)	78	60	80*
Per Capita TSS Loading (g/person/day)	54	48	90*
Per Capita TKN Loading (g/person/day)	26	17	13*
Ratios			
Peak Day / Annual Average Flow	6.1	9.1	2.0 – 3.0
Influent TSS/BOD ₅	0.7	0.8	0.8 – 1.2
Influent TKN/BOD ₅	0.3	0.3	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).			
**Grand River Conservation Authority, “2017 Watershed Overview of Wastewater Treatment Plant Performance”, July, 2018.			

Loading Observations

- 2018 Influent flow (69.6 m³/d) is 82% of Nominal Design flow compared to 2017 (105 m³/d) which is 124% of design. This was due to dryer summer months in 2018 and instantaneous wet weather events compared to 2017.
- The peak day to annual average flow ratio indicates system inflow;
- Per capita wastewater flows of 333 L/person/d is close to the GRCA value for 2017;
- Per capita BOD₅ loading is lower than 2017 and lower than typical;
- Per capita TSS loading is similar to 2017 and significantly lower than typical;
- TKN loading has decreased from 2017 and is closer to typical;
- Inconsistencies in loadings could potentially be a result of current sampling practices;
- Data is based on 1 grab sample per month.

3. Performance

Table 2 is a summary of the discharge quality compared to the C of A objectives and limits for the spring and fall discharge periods.

Table 2 – Summary of Discharge Quality Compared to C of A Objectives and Limits			
Spring Discharge (March, April and May)			
Parameter	Average Concentration (mg/L) unless otherwise stated	Objective (mg/L)	Limit (mg/L)
cBOD ₅	3.2	20	25
TSS	7.5	20	25
Total Phosphorous	0.11	0.8	1.0
pH (Range)	(6.90 – 8.90)	6.5 – 9.0	6.0 – 9.5
Total Ammonia Nitrogen	2.42	N/A	N/A
Fall Discharge (November and December)			
Parameter	Average Concentration (mg/L) unless otherwise stated	Objective (mg/L)	Limit (mg/L)
cBOD ₅	9.7	20	25
TSS	8.0	20	25
Total Phosphorous	0.23	0.8	1.0
pH (Range)	(7.94 – 9.27)	6.5 – 9.0	6.0 – 9.5
Total Ammonia Nitrogen	1.77	N/A	N/A

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

Table 3 – Summary of Discharge Period			
Spring Discharge (March, April and May)			
Parameter	Days	Max. Flow Rate	Max. Flow Rate Limit
March	13	509 m ³ /d	510 m ³ /d
April	30	919 m ³ /d	940 m ³ /d
May	30	194 m ³ /d	195 m ³ /d
Total Volume Discharged		34,691 m ³	

Fall Discharge (November and December)			
Parameter	Days	Max. Flow Rate	Max. Flow Rate Limit
November	N/A	N/A m ³ /d	30.0 m ³ /d
December	24	129.0 m ³ /d	130.0 m ³ /d
Volume Discharged	2,914 m ³		
Notes: Discharge up to the maximum day flow rate is dependant on a minimum flow rate in the receiving stream. If this requirement is not met, discharge cannot be commenced.			

Effluent Observations

- The spring discharge quality objectives and limits were achieved for all parameters;
- The fall discharge quality objectives and limits were achieved for all parameters;
- The maximum allowable daily discharge flow rate was not exceeded at any time.

4. Operational Issues

- Wet weather events can cause surcharging of the pumping station wet-well and subsequently the collection system due to inadequate sizing of the force main resulting in pumper trucks being required to assist with conveying the sewage to the lagoons. A capital project has been identified to rectify these issues with the pump station including the forcemain. These events were determined to be non-reportable by MECP.

5. Sludge Volume

In August 2016, County staff profiled the depth of sludge over a cross-section of the two (2) lagoon cells. The results of the study are summarized in Table 4.

Lagoon Cell	Lagoon Volume (m ³)	Estimated Sludge Volume (m ³)	Average Sludge Depth (mm)
Cell #1	25,450	732	64
Cell #2	20,200	827	56

6. Facility Activities in 2018

- Vegetation management around lagoons and routine inspections of the berms were conducted;
- MECP inspection was conducted on May 4, 2018.

7. Planned Activities for 2019

- No significant activities are planned for 2019.

8. Bypasses, Overflows and Spills

- There were no bypasses, overflows or spills in 2018.

9. Summary of Discharge Data

- Table 5 contains all spring discharge data.

- Table 6 contains all Fall discharge data.

10. Calibration Reports

- See attached

11. 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 portable back-up generator;
- See attached for the complete annual maintenance report.

Table 5 - Summary of Spring Discharge Data

Date	Discharge Flow m ³ /d	CBOD (mg/l)	TSS (mg/l)	Phosphorous (mg/l)	pH (SU)	Ammonia (mg/l)
19-Mar-18	136.3	4	7.0	0.11	7.39	4.41
20-Mar-18	245.4					
21-Mar-18	351.8	2	2.0	0.04	8.38	4.08
22-Mar-18	506.0					
23-Mar-18	506.2				8.40	
24-Mar-18	509.1					
25-Mar-18	506.8					
26-Mar-18	507.7				8.03	
27-Mar-18	508.1					
28-Mar-18	508.1	2	3.0	0.05	6.85	3.82
29-Mar-18	507.4				8.37	
30-Mar-18	508.7					
31-Mar-18	507.3					
1-Apr-18	519.4					
2-Apr-18	665.1				8.26	
3-Apr-18	780.2					
4-Apr-18	772.8	2	7.0	0.06	8.36	3.07
5-Apr-18	755.0					
6-Apr-18	755.4				8.22	
7-Apr-18	746.5					
8-Apr-18	729.8					
9-Apr-18	764.3				8.58	
10-Apr-18	790.4					
11-Apr-18	786.9	4.1	3.0	0.07	8.33	2.96
12-Apr-18	785.5					
13-Apr-18	781.7				8.14	
14-Apr-18	780.6					
15-Apr-18	787.3					
16-Apr-18	770.6				7.10	
17-Apr-18	761.2					
18-Apr-18	768.2	5.4	11.0	0.06	8.67	2.18
19-Apr-18	768.9					
20-Apr-18	767.4				8.84	
21-Apr-18	762.2					
22-Apr-18	755.0					
23-Apr-18	754.6				8.24	
24-Apr-18	754.9					
25-Apr-18	752.8	4	13.0	0.20	8.43	2.03
26-Apr-18	785.5				7.39	
27-Apr-18	874.0					
28-Apr-18	919.1					
29-Apr-18	913.8					
30-Apr-18	863.5					
1-May-18	194.0					
2-May-18	192.9	2	17.0	0.29	8.60	1.74
3-May-18	187.3					
4-May-18	193.3					
5-May-18	194.0					
6-May-18	193.8					
7-May-18	192.2				8.90	
8-May-18	193.6					
9-May-18	191.9					
10-May-18	193.4	5.5	10.0	0.16	7.48	0.36

11-May-18	193.8				8.20	
12-May-18	192.8					
13-May-18	194.0					
14-May-18	194.0				7.99	
15-May-18	194.0					
16-May-18	194.0	2	4.0	0.09	7.09	1.28
17-May-18	193.7					
18-May-18	192.0				7.07	
19-May-18	193.2					
20-May-18	192.2				7.54	
21-May-18	194.0					
22-May-18	192.8				7.74	
23-May-18	194.0	2	4.0	0.07	7.03	0.99
24-May-18	192.2					
25-May-18	193.2				8.25	
26-May-18	193.7					
27-May-18	192.0					
28-May-18	194.0				6.99	
29-May-18	192.3					
30-May-18	111.0	3.8	9.0	0.13	8.18	2.09

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)
4-Dec-18	44.7				7.94	
5-Dec-18	126.2	7.1	7.0	0.19	8.03	2.34
6-Dec-18	124.7					
7-Dec-18	125.9				8.01	
8-Dec-18	127.6					
9-Dec-18	126.2					
10-Dec-18	127.7				8.42	
11-Dec-18	128.5					
12-Dec-18	128.4	11.4	11.0	0.33	8.66	2.38
13-Dec-18	128.9					
14-Dec-18	125.7				8.15	
15-Dec-18	122.7					
16-Dec-18	128.7					
17-Dec-18	129.0				8.72	
18-Dec-18	129.0					
19-Dec-18	129.0	9.6	6.0	0.20	8.86	1.67
20-Dec-18	129.0					
21-Dec-18	129.0				8.93	
22-Dec-18	129.0					
23-Dec-18	129.0					
24-Dec-18	128.3				9.07	
25-Dec-18	124.3					
26-Dec-18	129.0					
27-Dec-18	63.1	10.8	8.0	0.18	9.27	0.67