



Sunderland Water Pollution Control Plant
2017 Annual Performance Report





The Regional Municipality of Durham

Sunderland Water Pollution Control Plant 2017 Annual Performance Report

Environmental Compliance Approval (ECA): 9252-8CUNBZ Dated June 28, 2012

Amendment to ECA: 9252-8CUNBZ Dated June 28, 2017

The Sunderland Water Pollution Control Plant (WPCP) 2017 Annual Performance Report provides staff, stakeholders and customers an overview of the performance of the Sunderland WPCP in 2017. Further, this report fulfills the annual reporting requirements of the Ontario Ministry of the Environment and Climate Change (MOECC). This report demonstrates the commitment of ensuring that the WPCP continues to deliver wastewater services to our customers in an environmentally responsible manner.

Water Pollution Control Plant Process Description

General

The Sunderland WPCP located in the Community of Sunderland in the Township of Brock is owned and operated by the Regional Municipality of Durham (Region). The plant is operated according to the terms and conditions of the ECA and its amendment. This MOECC Class One wastewater treatment plant is designed to treat wastewater at a rated capacity of 632 cubic metres per day (m³/d) and utilizes a seasonal wastewater stabilization lagoon system. The Sunderland WPCP has a service population of 1,352 residents.

Raw Influent

Wastewater is collected through 7.7 km of sanitary sewers in the Sunderland service area and is conveyed to the treatment facility by a single sanitary sewage pumping station located on River Street.

Lagoon Treatment

The Sunderland WPCP is a two cell lagoon system where the wastewater enters a retention stabilization lagoon and overflows into an exfiltration cell giving a combined retention time of approximately 182.5 days. The ECA permits two seasonal discharges per year. Spring discharge is for 20 days in May and fall discharge is for 20 days in November. Prior to and during discharge to the Beaver River, samples are collected to verify the effluent meets the limits established in the ECA.

Environmental Compliance Approval

Under Condition 9 (4) of ECA #9252-8CUNBZ the Region must produce an annual performance report that must contain the following information:

- a) **Summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Condition 5, including an overview of the success and adequacy of the works**

The raw wastewater flowing into the plant is analyzed for its chemical and physical composition. Monitoring of the raw wastewater is performed in accordance with the conditions in the ECA. Table 2 summarizes the raw wastewater characteristics during the reporting period.



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The Sunderland WPCP effluent was determined to be compliant with the approval limits during the reporting period. The plant operated at 86.2% of its rated capacity and received a maximum daily flow of 1,306 m³/d on May 6, 2017. The total treated effluent discharged to the Beaver River in 2017 was calculated to be 142,919 m³.

b) Description of any operating problems encountered and corrective actions taken

No operating problems were encountered in 2017.

c) Summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the works

- The construction of a maintenance lagoon began in October of 2017.

d) Summary of any effluent quality assurance or control measures undertaken in the reporting period

In-house lab test results are compared to the results of the Regional Environmental Laboratory on comparable samples to determine the in-house accuracy. Results were found to be within a comparable range.

e) Summary of the calibration and maintenance carried out on all effluent monitoring equipment

- Calibration of the influent flow meter located at River Street Pumping Station was conducted in May and November, 2017.
- Temperature and pH are monitored in the field, all other routine process control tests are performed at the Lake Simcoe WPCP laboratory in Beaverton. All monitoring and laboratory equipment is calibrated and maintained according to manufacturer's specifications.

f) Estimate of sludge settling capacity of the lagoons and its annual depletion

The annual depletion of the sludge settling capacity is negligible. There was no removal of solids from the lagoons in 2017. The construction of a maintenance lagoon began in October, 2017.

g) Efforts made and results achieved in meeting the effluent objectives of Condition 4

- The Regional strives to achieve the best effluent quality at all times consistently remaining well below ECA limits.
- All effluent objectives were met in 2017 except for the objective of 10 mg/L for cBOD₅ was exceeded once during spring discharge and the maximum objective for pH of 8.0 was exceeded 9 times during the spring discharge. The pH results ranged between 8.1 and 8.3. Due to the nature of wastewater treatment in a lagoon system pH is a difficult parameter to control.
- Best efforts will continue to be applied to maintain results below objectives.

h) Summary of any complaints received during the reporting period and any steps taken to address the complaint

A summary of complaints received from the public is administered through a central database.

A dust complaint was received from a neighbouring property in the summer during construction of the maintenance lagoon.



i) Summary of all By-pass, Spill or Abnormal Discharge Events

No by-passes, spills or abnormal discharges occurred during the reporting period.

j) Status Update of the Initial Effluent Characterization

The initial effluent characterization report was submitted in April 2016.

k) Information Required by MOECC District Manager

No additional information was requested.

MOECC Inspection

This plant was last inspected by the MOECC in January 2015.



Table 1 Raw Influent Flows

Month	Total Flow to Plant - metered at the River Street Pumping Station m ³	Average Daily Flow m ³ /d	Maximum Daily Flow m ³ /d
January	16,984	548	685
February	15,944	569	856
March	20,069	647	868
April	22,403	747	982
May	24,151	779	1,306
June	19,440	648	933
July	16,708	539	709
August	12,833	414	451
September	11,733	391	499
October	11,417	368	408
November	13,978	466	525
December	13,239	427	501
Total	198,899		
Annual Average	16,575	545	
Minimum	11,417		
Maximum	24,151		1306
ECA Limit		632*	
Met Compliance		Yes	

*Annual average daily flow



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Table 2 Raw Influent Analyses

Month	CBOD ₅ avg. conc. mg/L	BOD ₅ avg. conc. mg/L	TSS avg conc. mg/L	TP avg conc. mg/L	TP loading kg/d	TAN avg. conc. mg/L	pH min.	pH max.	Temp. Degrees Celsius avg.
January	90	111	135	3.3	1.8	16.7	7.0	7.6	10.0
February	101	128	152	4.1	2.3	21.2	7.0	7.5	9.7
March	74	93	107	3.0	1.9	15.7	7.2	7.7	8.7
April	52	62	120	2.5	1.8	14.5	7.9	8.2	10.2
May	53	66	100	2.7	2.1	14.1	8.0	8.1	11.7
June	72	104	100	3.0	1.9	16.7	7.1	8.2	13.9
July	87	113	157	3.8	2.1	18.9	6.9	7.3	15.8
August	101	123	112	4.5	1.8	27.8	7.0	7.5	9.7
September	102	118	136	4.6	1.8	21.5	7.0	7.5	9.7
October	99	135	164	4.7	1.7	26.3	7.0	7.5	9.7
November	78	120	151	4.1	1.9	25.0	7.0	7.5	9.7
December	130	154	149	5.2	2.2	25.5	7.0	7.5	9.7
Average	87	111	132	3.8	2.1	20.3			11
Minimum	52	62	100	2.5	1.7	14.1	6.9		8.7
Maximum	130	154	164	5.2	2.3	27.8		8.2	15.8
Sampling Frequency Requirement Met	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes



Table 3 Calculated Effluent Flows

Month	Effluent Flow m ³
January	
February	
March	
April	
May	77,427
June	
July	
August	
September	
October	
November	65,492
December	
Total	142,919
Annual Average	71,459
Minimum	65,492
Maximum	77,427



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Table 4 Final Effluent Analyses

Month	CBOD ₅ avg. conc. mg/L	BOD ₅ avg. conc. mg/L	TSS avg. conc. mg/L	TP avg. conc. mg/L	TP loading kg/d	TP loading kg/ month
January						
February						
March						
April						
May	6.7	7.3	7.6	0.11	0.5	8.6
June						
July						
August						
September						
October						
November	1.6	3.4	4.2	0.08	0.4	5.1
December						
Total						13.7**
Average	4.1	5.4	5.9	0.09	0.4	2.0
Minimum	1.6	3.4	4.2	0.08	0.4	5.1
Maximum	6.7	7.3	7.6	0.11	0.5	8.6
ECA Limit	10*		15*	0.3*		69**
ECA Objective	10		15	0.5		
LSPRS				0.25*		58**
Within Compliance	Yes		Yes	Yes		Yes
Sampling Frequency Requirement Met	Yes		Yes	Yes		Yes

*Annual Average Concentration

** Total Annual Loading (kg/year)



Table 4 Final Effluent Analyses continued

Month	TAN avg. conc. mg/L	Un-ionized ammonia avg. conc. mg/L	pH min.	pH max.	Temp. °C avg.
January					
February					
March					
April					
May	8.53	0.25	8.1	8.3	12.9
June					
July					
August					
September					
October					
November	4.84	0.01	7.2	7.9	4.6
December					
Average	6.68	0.13			8.8
Minimum	4.84	0.01	7.2		4.6
Maximum	8.53	0.25		8.3	12.9
ECA Limit			6.0	9.5	
ECA Objective			6.5	8.0	
Within Compliance					
Sampling Frequency Requirement Met	Yes		Yes	Yes	Yes