



Township of Southgate

Dundalk Wastewater Treatment Plant

2020 Annual Report Rev.2

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Dundalk Wastewater Treatment Plant 2020 Annual Report

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Overview:

The Dundalk Wastewater Treatment Plant (WWTP) provided treatment in 2020 with an annual average influent daily flow of 1,161 m³/day, a 4.99% increase over the 2019 average influent daily flow of 1,114 m³/day.

Project Description:

The Dundalk WWTP is a four-cell waste stabilization pond facility flowing into an aeration cell pond with a chemical feed system and a flocculation tank with tertiary treatment consisting of sand filters.

Plant Facts:

Facilities: Waste Stabilization Ponds with Tertiary Treatment

Design Capacity: 1832 m³/day

Receiver Water: Foley Drain/Grand River

Environmental Compliance

Approval: 5657-9D9LYE

Effluent Requirements:

	Ideal	Maximum	Maximum
Effluent Parameter	Concentration Objective	Monthly Average Concentration (MAC)	Monthly Average Loading
COBD5	5.0 mg/L	10.0 mg/L	18.32 kg/day
Total Suspended Solids (TSS)	5.0 mg/L	10.0 mg/L	18.32 kg/day
Total Phosphorous	0.30 mg/L + 5 degrees Celsius stream temperature 0.60 mg/L - 5 degrees Celsius stream temperature	0.40 mg/L + 5 degrees Celsius stream temperature 0.80 mg/L - 5 degrees Celsius stream temperature	0.73 mg/L + 5 degrees Celsius stream temperature 1.47 mg/L - 5 degrees Celsius stream temperature
Dissolved Oxygen	5.0 mg/L	4.0 mg/L	
Unionized Ammonia	0.05 mg/L	0.1 mg/L	
pH	6.5 to 8.5 at all times	6.0 to 9.5 at all times	

Sampling Requirements:

Sampling Criteria for this system is in accordance with Ministry Policy for the Environmental Compliance Approval (ECA) No. 5657-9D9LYE

Final Effluent:

A grab sample is taken twice a month and tested for CBOD, Suspended Solids, Total Phosphorus, Total Ammonia Nitrogen, Ecoli, pH and temperature.

On site testing is performed twice a week on final effluent for Total Ammonia to determine Unionized Ammonia through lab testing, pH, temperature and Dissolved Oxygen.

Raw Sewage:

A grab sample is taken monthly and tested for BOD, Suspended Solids, Total Kjeldahl Nitrogen and Total Phosphorus.

Effluent Flows:

The total effluent flow treated in 2020 was 425,922 m³. The annual average daily flow was 1,084 m³/day, which results in a -2.69% decrease of total effluent over 2019.

Raw Sewage Quality:

- Annual average raw sewage BOD concentration to the lagoon system was 88.5 mg/l.
- Annual average raw sewage suspended solids (TSS) concentration to the lagoon system was 270.9 mg/l.
- Annual average raw total phosphorus was 3.10 mg/l concentration to the lagoon system.
- Annual average Total Kjeldahl Nitrogen (TKN) concentration was 33.0 mg/l.

Plant Performance and Effluent Quality:

- Annual average effluent CBOD concentration was 3.2 mg/l.
- Annual average effluent total suspended solids (TSS) concentration was 4.5 mg/l day with a removal efficiency of 98.29% with an annual monthly average loading of 8.8 kg/day.
- Annual average effluent total phosphorus concentration was 0.04 mg/l day with a removal efficiency of 97.75% with an annual monthly average loading of 0.1 kg/day.
- Annual average effluent concentration for Ammonia-nitrogen was 3.66 mg/l.
- Annual average Unionized Ammonia was 0.020777 mg/l.
- Annual average pH was 7.17.
- Annual monthly average Ecoli was 40 with the low being 2 and the high being 105.
- The summary for 2020 of the data for the systems plant operation performance is enclosed in this report.

Maintenance and Calibration Activities:

Regular monthly preventative maintenance and calibration of test equipment and flow meters are performed by municipal staff and outside certified suppliers.

Third party annual calibrations were performed on November 17,2020.

There were no by-pass events to report.

There were 8 operator shutdowns in 2020:

Please reference below table for shutdowns and limit exceedances for 2020.

2020 Wastewater Effluent parameters compliance exceedances and Shutdowns									
	Monthly Average Effluent Concentration				Monthly Average Effluent Loading (t)			Lagoon Shutdown Duration	Comments
	COBDS	TSS	TP	Unionized Ammonia	pH	COBDS	TSS	TP	
	Limit	Limit	Limit	Limit	Limit	Limit	Limit	Limit	
	10.0 mg/day	10.0 mg/L	0.4 mg/L - > 5°C 0.8 mg/L - < 5°C	0.05 mg/L - daily testing 0.1 mg/L - shutdown	< 6.0 or > 9.5	18.32 kg/day	18.32 kg/day	0.4 kg/L - > 5°C 0.8 kg/L - < 5°C	
JAN									
FEB				0.054					9 days 3 days over 0.05 mg/L 6 days over 0.1 mg/L
MAR				> 0.1					31 days 31 days over 0.1 mg/L
APR				> 0.1					30 days 30 days over 0.1 mg/L
MAY				0.043					4 days 4 days over 0.1 mg/L
JUN					8.78				14 days 14 days over 9.5
JUL					> 9.5				31 days 31 days over 9.5
AUG					7.77				4 days 4 days over 9.5
SEP									5 days raise water levels for sludge testing
OCT									
NOV		10		0.051					7 days 3.5 days for ammonia over 0.1 mg/L 3.5 days for TSS average
DEC		7.3 mg/L							16 days 11.5 days for TSS average of 10 mg/L 4 days for ammonia over 0.1 mg/L 0.5 days over 0.05 mg/L
Note: If daily testing for unionized ammonia occurs on a Friday we shut down for the weekend.									

No loading exceedances

Discussion:

The Environmental Assessment is still ongoing for the Dundalk Sewage Works, to determine technologies to meet effluent compliance objectives and limits and expansion to meet future development needs-

In the summer of 2020 Southgate had the Ontario Clean Water Agency (OCWA) contracted to come in with 2 boats and dose batch lagoon cells 2,3 &4 with Clarion A 510p to assist with algae growth and high pH values-

OCWA conducted a sludge assessment and sampling for lagoon Cells 1,2,3 &4 in the summer/fall of 2020. Triton Engineering finalized the report and based on the sludge deposition, removal is not recommended at this time. A contingency plan and recommendations for future monitoring has also been included in the report.

Two pumps were replaced. Influent Pump #2 and Backwash Pump #6.

The influent and effluent chart recorders were replaced with digital chart recorders.

Township of Southgate - Village of Dundalk

2020 General Wastewater Information

Plant # : 0-101006-67

ECA # : 5657-9D9LYE

Population: 2431 (Village of Dundalk)

Flows

	<u>Design</u>		<u>2020</u>	<u>2019</u>	<u>2018</u>	<u>2017</u>	<u>2016</u>
Capacity:	208,500						
Influent Average Daily:	-	m ₃	1,161	1,114	1,105	1,168	986
Annual Influent Flow:	668,600	m ₃	425,922	405,664	401,279	424,727	360,118
Influent Maximum Daily:	-	m ₃	4,510	3,989	9,022	6,362	4,820
Effluent Average Daily:	1,832	m ₃	1,087	1,315	1,355	1,230	1,090
Annual Effluent Flow:	-	m ₃	396,688	407,659	404,853	420,598	334,685
% Discharge vs. Total Capacity:	-		59.3%	61.0%	60.6%	62.9%	50.1%
Influent Increase 2020 over 2019:	-		4.99%	1.09%	-5.52%	17.94%	35.44%
Effluent Increase 2020 over 2019:	-		-2.69%	0.69%	-3.74%	25.67%	-14.13%

Township of Southgate
Loading Report - Dundalk Wastewater Plant

Municipality:	Township of Southgate	Year: 2020
Plant:	Dundalk Wastewater Treatment Lagoons & Collection System	
Plant # :	0-101006-67	
Works # :	110001471	
System Description :	Faculative Lagoons & Sand Filters	

Month	Loading Influent			Effluent Loading		
	BOD kg/day	SS kg/day	T Phos. kg/day	Effluent CBOD kg/day	Effluent SS kg/day	Effluent T Phos. kg/day
January	134.4	344.0	3.8	5.3	5.3	0.05
February	89.8	269.3	2.9	7.3	6.5	0.08
March	PS	PS	PS	PS	PS	PS
April	60.9	347.8	0.3	PS	PS	PS
May	31.5	212.0	0.2	4.8	4.8	0.03
June	82.7	278.2	3.7	7.4	7.4	0.05
July	55.1	170.6	1.8	PS	PS	PS
August	72.8	162.8	2.5	7.2	8.4	0.17
September	83.2	208.0	4.2	6.4	6.4	0.04
October	140.0	425.6	6.5	2.5	3.0	0.03
November	126.5	456.4	4.4	6.5	18.1	0.13
December	155.2	290.0	4.2	6.4	15.6	0.13
Total	1032.0	3164.6	34.6	53.8	78.9	0.71
Average	86.0	263.7	2.9	6.0	8.8	0.08
Maximum	155.2	456.4	6.5	7.4	21.7	0.17

PS = Plant Shutdown

Township of Southgate
Performance Report - Dundalk Wastewater Plant

Municipality: Township of Southgate
Plant: Dundalk Wastewater Treatment Lagoons & Collection System
Plant #: 0-101006-67
Works #: 110001471
System Description: Faculative Lagoons & Sand Filters

Year: 2020
Receiver: Foley Drain - Grand River
Design Average Day Flow (m3): 1832

Month	Flows			Effluent Total Flow m3	Discharge Duration Days	Bio-Chemical Oxygen Demand			Suspended Solids			Phosphorus			E Coli average Effluent Count	Temperature < 5 C. or > 5 C.	Nitrogen Series			Loading		
	Total Flow m3	Avg. Flow m3	Max. Flow m3			Avg. Raw BOD mg/l	Avg Effluent CBOD mg/l	Percent Removal	Avg. Raw SS mg/l	Avg. Effluent SS mg/l	Percent Removal	Avg. Raw T. Phos mg/l	Avg. Effluent T. Phos mg/l	Percent Removal			TKN mg/l	Avg. Effluent NH3 + NH4 mg/l	Unionized Ammonia mg/l	Effluent CBOD kg/day	Effluent SS kg/day	Effluent T Phos. kg/day
January	49607	1600.00	4474.00	55021	31	84.0	3.0	96.43%	215.0	3.0	98.60%	2.40	0.03	98.75%	61	0.5	22.0	7.76	0.008271	5.3	5.3	0.1
February	23658	816.00	1010.00	33113	20.5	110.0	4.5	95.91%	330.0	4.0	98.79%	3.50	0.05	98.57%	105	0.5	31.0	10.90	0.054507	7.3	6.5	0.1
March	62261	2008.00	4510.00	0	0	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
April	43485	1449.00	2056.00	0	0	42.0	PS	PS	240.0	PS	PS	0.20	PS	PS	PS	0.0	24.8	PS	PS	PS	PS	PS
May	33702	1087.00	1347.00	43305	27	29.0	3.0	89.66%	195.0	3.0	98.46%	0.20	0.02	90.00%	2	12.7	23.7	2.96	0.043000	4.8	4.8	0.0
June	22553	752.00	1412.00	39425	16	110.0	3.0	97.27%	370.0	3.0	99.19%	4.90	0.02	99.59%	2	19.8	46.8	0.02	0.005380	7.4	7.4	0.0
July	20328	656.00	897.00	0	0	84.0	PS	PS	260.0	PS	PS	2.80	PS	PS	PS	0.0	34.0	PS	PS	PS	PS	PS
August	26580	857.00	1682.00	64842	27	85.0	3.0	96.47%	190.0	3.5	98.16%	2.90	0.07	97.59%	59	21.9	25.4	0.11	0.001189	7.2	8.4	0.2
September	24973	832.00	1188.00	52981	25	100.0	3.0	97.00%	250.0	3.0	98.80%	5.10	0.02	99.61%	18	16.9	50.1	0.18	0.002663	6.4	6.4	0.0
October	34712	1120.00	2721.00	26198	31	125.0	3.0	97.60%	380.0	3.5	99.08%	5.80	0.03	99.48%	82	10.0	52.4	0.50	0.005211	2.5	3.0	0.0
November	39107	1304.00	1869.00	49825	23	97.0	3.0	96.91%	350.0	10.0	97.14%	3.40	0.06	98.24%	11	4.4	27.2	4.3	0.051475	6.5	18.1	0.1
December	44956	1450.00	2636.00	31978	15	107.0	3.0	97.20%	200.0	7.3	96.35%	2.90	0.06	97.93%	19	0.5	25.7	6.20	0.077630	6.4	15.6	0.1
Total	425922			396688	215.5																	
Average	35494	1161		33057		88.5	3.2	96.05%	270.9	4.5	98.29%	3.10	0.04	97.75%	40	7.9	33.0	3.66	0.027703	6.0	8.8	0.1
Maximum	62261	2008	4510	64842		125.0	4.5		380.0	10.0		5.80	0.07		105	21.9	52.4	10.90	0.077630	7.4	21.7	0.2

PS = Plant Shutdown

Township of Southgate
Annual Report - Dundalk Wastewater Plant

Plant: Dundalk Wastewater Treatment Lagoons & Collection System
 Works: 110001471
 Year: 2020
 Location Type: **Final Effluent Discharge Report**

Month	Discharge Duration Days	Total Effluent m3	Total Coagulant Used (kg)	Average Coagulant Dosage (mg/l)	Average CBOD mg/l	Average SS mg/l	Average T. Phos. mg/l	Average NH3 + NH4 as N (mg/l)	E Coli average Count	Average pH Reports	Average Temp. C	Average D.O. mg/l
January	31	55021	1.55	18.3	3.0	3.0	0.03	7.76	61	7.02	0.50	13.32
February	20.5	33113	1.03	20.1	4.5	4.0	0.05	10.90	105	7.64	0.50	11.86
March	0	0	0.00	0.0	PS	PS	PS	PS	PS	PS	PS	0.00
April	0	0	0.00	0.0	PS	PS	PS	PS	PS	8.00	0.00	0.00
May	27	43305	1.35	20.3	3.0	3.0	0.02	2.96	2	7.81	12.70	9.25
June	16	39425	0.80	13.2	3.0	3.0	0.02	0.02	2	8.78	19.80	7.63
July	0	0	0.00	0.0	PS	PS	PS	PS	PS	0.00	0.00	0.00
August	27	64842	1.35	13.5	3.0	3.5	0.07	0.11	59	7.77	21.90	8.01
September	25	52981	1.25	15.3	3.0	3.0	0.02	0.18	18	8.03	16.90	8.68
October	31	26198	1.55	38.5	3.0	3.5	0.03	0.50	82	8.04	10.00	10.63
November	23	49825	1.15	15.0	3.0	10.0	0.06	4.33	11	7.78	4.40	12.71
December	15	31978	0.75	15.2	3.0	7.3	0.06	6.20	19	7.96	0.50	13.68
Total	215.5	396688	10.78									
Average		33057	0.90	14.12	3.17	4.48	0.04	3.66	40	7.17	7.93	7.98
Maximum		64842			4.5	10	0.07	10.9	105	8.78	21.90	13.68

PS = Plant Shutdown

Township of Southgate - Village of Dundalk
Annual Report - Dundalk Wastewater Plant

Plant: Dundalk Wastewater Treatment Lagoons & Collection System
Works: 110001471
Classification: Class 1 Wastewater Collection & Class 1 Wastewater Treatment
Receiver: Foley Drain to Grand River

Year: 2020
Population Served: 2431

Raw Sewage Parameters		January	February	March	April	May	June	July	August	September	October	November	December	Summary
	Average	84	110	PS	42	29	110	84	85	100	125	97	107	88
BOD	Minimum	84	110	PS	42	29	110	84	85	100	125	97	107	88
mg/l	Maximum	84	110	PS	42	29	110	84	85	100	125	97	107	88
Suspended Solids	Average	215	330	PS	240	195	370	260	190	250	380	350	200	271
	Minimum	215	330	PS	240	195	370	260	190	250	380	350	200	271
mg/l	Maximum	215	330	PS	240	195	370	260	190	250	380	350	200	271
	Average	22	31	PS	24.8	23.7	46.8	34.0	25.4	50.1	52.4	27.2	25.7	33.0
TKN	Minimum	22.0	31.0	PS	24.8	23.7	46.8	34.0	25.4	50.1	52.4	27.2	25.7	33.0
mg/l	Maximum	22.0	31.0	PS	24.8	23.7	46.8	34.0	25.4	50.1	52.4	27.2	25.7	33.0
Total Phosphorus	Average	2.43	3.5	PS	0.25	0.22	4.85	2.84	2.91	5.06	5.79	3.44	2.88	3.11
	Minimum	2.43	3.50	PS	0.25	0.22	4.85	2.84	2.91	5.06	5.79	3.44	2.88	3.11
mg/l	Maximum	2.43	3.50	PS	0.25	0.22	4.85	2.84	2.91	5.06	5.79	3.44	2.88	3.11

PS = Plant Shutdown

Township of Southgate - Village of Dundalk
Annual Report - Dundalk Wastewater Plant

Plant: Dundalk Wastewater Treatment Lagoons & Collection System
Works: 110001471
Classification: Class 1 Wastewater Collection & Class 1 Wastewater Treatment
Receiver: Foley Drain to Grand River

Year: 2020
Population Served: 2431

Final Effluent Parameters		January	February	March	April	May	June	July	August	September	October	November	December	Summary
	Average	3.0	4.5	PS	PS	3.0	3.0	PS	3.0	3.0	3.0	3.0	3.0	3.2
	Minimum	3.0	4.0	PS	PS	3.0	3.0	PS	3.0	3.0	3.0	3.0	3.0	3.0
CBOD														
mg/l	Maximum	3.0	5.0	PS	PS	3.0	3.0	PS	3.0	3.0	3.0	3.0	3.0	5.0
Suspended	Average	3.0	4.0	PS	PS	3.0	3.0	PS	3.5	3.0	3.5	10.0	6.5	4.4
Solids	Minimum	3.0	3.0	PS	PS	3.0	3.0	PS	3.0	3.0	3.0	4.0	3.0	3.0
mg/l	Maximum	3.0	5.0	PS	PS	3.0	3.0	PS	4.0	3.0	4.0	16.0	10.0	16.0
	Average	7.8	10.9	PS	PS	2.8	0.0	PS	0.1	0.2	0.5	4.3	6.1	3.63
	Minimum	6.55	10.20	PS	PS	2.13	0.01	PS	0.01	0.10	0.17	3.68	5.43	0.01
NH3 + NH4														
mg/l	Maximum	8.97	11.60	PS	PS	3.44	0.03	PS	0.20	0.25	0.83	4.98	6.83	11.60
	Average	10.45	14.15	PS	PS	3.40	0.06	PS	0.85	1.00	1.35	5.80	9.05	5.12
	Minimum	9.80	13.10	PS	PS	2.80	0.06	PS	0.70	0.90	1.00	4.80	8.10	0.06
TKN														
mg/l	Maximum	11.10	15.20	PS	PS	4.00	0.06	PS	1.00	1.10	1.70	6.80	10.00	15.20
Total	Average	0.04	0.05	PS	PS	0.03	0.02	PS	0.07	0.02	0.03	0.06	0.07	0.04
Phosphorus	Minimum	0.03	0.04	PS	PS	0.01	0.02	PS	0.02	0.01	0.02	0.06	0.04	0.01
mg/l	Maximum	0.04	0.06	PS	PS	0.04	0.02	PS	0.12	0.02	0.03	0.06	0.09	0.12
	Average	61.00	104.50	PS	PS	2.00	2.00	PS	59.00	18.00	82.00	11.00	27.50	41
	Minimum	2	76	PS	PS	2	2	PS	12	12	26	2	1	1
Ecoli														
	Maximum	120	133	PS	PS	2	2	PS	106	24	138	20	54	138
pH Lab Results (In-house testing not included)	Average	7.00	7.64	PS	PS	8.00	8.84	PS	7.99	8.03	8.04	8.15	7.99	7.96
	Minimum	6.90	7.15	PS	PS	7.87	8.04	PS	7.98	8.02	7.97	8.14	7.66	6.90
	Maximum	7.10	8.12	PS	PS	8.13	9.63	PS	7.99	8.04	8.11	8.16	8.31	9.63
	Average	13.15	11.35	PS	PS	9.05	7.60	PS	8.15	8.40	9.60	12.15	13.55	10.33
	Minimum	10.90	10.10	PS	PS	6.60	7.00	PS	7.50	7.20	6.80	10.30	13.00	6.60
DO														
mg/l	Maximum	15.40	12.60	PS	PS	11.50	8.20	PS	8.80	9.60	12.40	14.00	14.10	15.40
Unionized	Average	0.007429	0.076195	PS	PS	0.051600	0.006550	PS	0.001900	0.003050	0.008400	0.074050	0.082950	0.034680
Ammonia	Minimum	0.003127	0.007850	PS	PS	0.003300	0.001200	PS	0.000100	0.000400	0.000200	0.018000	0.045500	0.000100
mg/l	Maximum	0.011730	0.144539	PS	PS	0.099900	0.011900	PS	0.003700	0.005700	0.016600	0.130100	0.120400	0.144539

PS = Plant Shutdown