



**CANA WASTEWATER TREATMENT PLANT
2022 ANNUAL REPORT**

DOCUMENT:

Cana Wastewater Treatment Plant Annual Report

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1 EXECUTIVE SUMMARY

Cana Wastewater Treatment Plant (WWTP) operates under Ministry of the Environment, Conservation and Parks, ECA number 4021-9WUKDE. The facility was compliant with all conditions outlined in condition 7 of the above-mentioned ECA and are briefly described in the following sections of this report.

The sewage works has a rated capacity of 125 m³/d, and a maximum day design flow of 200 m³/d. The average flow through the plant was 62.7 m³/day in 2022.

2 PLANT OVERVIEW

The following is a process overview and description of the treatment steps taken at the Cana WWTP

2.1 RAW SEWAGE PUMPING STATION

A pre-cast concrete wet well accepts sewage flows from the existing sewer system for the Cana Subdivision. The wet well has two pumps which discharge into the preliminary treatment unit.

2.2 PRELIMINARY TREATMENT UNIT

Preliminary treatment involves the removal of large particles and floating debris such as wood, rags, and plastics from the raw sewage. This is accomplished with a manual bar screen installed inside a splitter box.

2.3 SECONDARY TREATMENT UNIT

As the sewage flows through the splitter box and bar screen, it then discharges into the two Sequencing Batch Reactors. Each reactor is essentially an activated sludge process with aeration and settling taking place in the same tank. The decanted effluent from the SBR is then stabilized in a Post Equalization Tank. The sludge that settles out in the SBR is then pumped directly to the Digester.

2.4 POST EQUALIZATION TANK

The Post Equalization Tank collects the decanted water from the Sequencing Batch Reactors and discharges to the tertiary filter system.

2.5 CHEMICAL DOSING SYSTEMS

Phosphorus removal is accomplished using Aluminum Sulfate, which is injected directly into the splitter box during pump cycles.

2.6 TERTIARY FILTRATION UNIT

The discharge of the post equalization tanks goes into a continuous backwash up-flow sand filter to polish the water before going through the ultraviolet disinfection system. filtrate then passes through one of the two UV disinfection units.

2.7 ULTRAVIOLET (UV) DISINFECTION

The filtrate then passes through one of the two UV disinfection units. Each unit can handle the maximum flow of 200 m³/day.

2.8 OUTFALL

The treated effluent from the plant is discharged into a 27.9-meter-long pipe into an existing creek which flows into Colonel By Lake.

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2.9 BUILDING AND CONTROL ROOM

There is one building that houses the tertiary filtration unit, chemical dosing systems, blowers, and all associated electrical equipment.

2.10 DIGESTER UNIT

The waste sludge generated from the SBRs is pumped into the digester for stabilization and storage. The digester supernatant is returned to the influent manhole and the sludge is hauled approximately every 30 days to Ravensview WWTP in the City of Kingston for further treatment.

2.11 STANDBY EQUIPMENT

A diesel generator on the property of the Cana WWTP provides backup electrical supply in case of power outages. This generator is directly connected to both the Cana Water and Cana Wastewater facilities and is capable of fully powering both systems in the event of a power outage.

3 OPERATION

Staff continue to optimize the plant process to ensure continuous and reliable operations. Cana WWTP did not exceed any of the limits set out in the ECA throughout the calendar year. All required samples were collected and sent to a third-party laboratory for testing.

4 BIO-SOLIDS MANAGEMENT

There were 10 loads, totaling 260 m³ in volume, of sludge collected and brought to Ravensview WWTP. The sludge was discharged at the septage facility. We anticipate approximately the same quantity of sludge for 2023.

5 MAINTENANCE

Staff continue to use our preventative maintenance program in accordance with manufacture's recommendations.

Additional Maintenance completed this year:

- Routine equipment maintenance took place throughout the plant.

6 CAPITAL WORKS

- There was no capital work required for the plant this year.

7 EQUIPMENT CALIBRATIONS

All of the treatment facility flow meters are calibrated annually by third party contractors. Calibration records are available upon request.

8 COMPLAINTS

In the 2022 reporting year, the Cana WWTP received no official complaints regarding the facility or treatment process.

9 BYPASS SUMMARY

There were no bypass events in the system this year.

For further information about this report or any questions regarding accessibility, contact Tim Bourne at tbourne@utilitieskingston.com or call 613-546-1181 Ext 2190.

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10 PLANT PERFORMANCE RESULTS

Table 1 – Effluent Objective

Effluent Parameter	Objective	Limits
CBOD5	5.00 mg/L (Monthly Average)	10.00 mg/L (Monthly Average)
Total Suspended Solids	5.00 mg/L (Monthly Average)	10.00 mg/L (Monthly Average)
Total Phosphorus	0.10 mg/L (Monthly Average)	0.20 mg/L
Total Ammonia Nitrate (Winter)	2.00 mg/L (October to March)	4.00 mg/L
Total Ammonia Nitrate (Summer)	1.00 mg/L (April to September)	2.00 mg/L
E. Coli	100 CFU/100mL	200 CFU/100mL

Note: pH maintained between 6.5 to 8.5 at all times

Table 2 – Final Effluent Results

Month	CBOD5 (mg/L)	Total Suspended Solids (mg/L)	Total Phosphorus (mg/L)	Total Ammonia Nitrogen (mg/L)	pH	E Coli (CFU/100 mL)	Acute Lethality (Pass or Fail)
January	3.00	3.30	0.11	0.24	7.96	0	N/A
February	3.00	2.90	0.13	1.18	7.9	0	N/A
March	3.00	5.70	0.17	0.2	7.87	1	N/A
April	3.00	4.60	0.14	0.25	7.9	1	Pass
May	3.00	3.40	0.09	0.07	7.98	0	N/A
June	3.00	3.90	0.10	0.04	7.95	1	N/A
July	3.00	3.00	0.11	0.02	8.02	0	N/A
August	3.00	2.10	0.13	0.03	8.02	1	N/A
September	3.60	3.60	0.15	0.04	8.01	1	Pass
October	3.00	2.90	0.13	0.07	8.03	1	N/A
November	3.00	5.60	0.13	0.12	7.96	1	N/A
December	2.00	4.70	0.12	0.72	7.76	0	N/A
Annual Average	2.97	3.81	0.13	0.25	7.95	0.58	N/A

Table 3 – Upstream Surface Water Monitoring

Date	CBOD (mg/L)	Total Suspended Solids (mg/L)	Total Phosphorus (mg/L)	Total Ammonia Nitrate (mg/L)	Nitrate Nitrogen (mg/L)	E. Coli (CFU/100 mL)	pH
May 4, 2023	Under 3.00	10.00	0.15	0.02	0.20	1500	7.85
September 13, 2023	Under 3.00	12.00	0.06	Under 0.01	Under 0.1	0	7.94

Table 4 – Downstream Surface Water Monitoring

Date	CBOD (mg/L)	Total Suspended Solids (mg/L)	Total Phosphorus (mg/L)	Total Ammonia Nitrate (mg/L)	Nitrate Nitrogen (mg/L)	E. Coli (CFU/100 mL)	pH
May 4, 2023	4.00	22.00	0.20	0.05	0.20	2900	8.16
September 13, 2023	Under 3.00	4.00	0.29	0.04	6.60	800	8.08

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Table 5 – Reportable Bypasses

Date	Start Time	Duration (hours)	Volume (m3)	Reason	Precipitation (mm)
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No bypass events to report for 2022

Table 6 – Reportable Bypass Sampling

Date	Start Time	Duration (hours)	Volume (m3)	Reason	Precipitation (mm)
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No bypass events to report for 2022

Table 7 – Annual Plant Flows

Parameter	2019	2020	2021	2022
Average (m3/day)	100.05	70.10	60.00	62.70
Maximum (m3/day)	243.00	110.50	97.00	160.00
Design (m3/day)	125.00	125.00	125.00	125.00
Max Daily Flow (m3/day)	200.00	200.00	200.00	200.00
Daily/Design (%)	80.04	56.08	48.00	50.16

Table 8 – Monthly Plant Flows

Month	Minimum Flow (m3/day)	Rated Capacity Flow (m3/day)	Maximum Flow (m3/day)	Average Flow (m3/day)	Total Flow (m3/month)
January	38.0	125	70.0	56.0	1,746
February	35.2	125	135.6	67.8	1,832
March	57.0	125	160.0	103.0	3,179
April	58.0	125	132.0	92.8	2,785
May	48.0	125	101.0	77.0	2,375
June	37.9	125	112.0	73.8	2,213
July	35.0	125	75.0	46.0	1,438
August	22.0	125	45.0	31.0	967
September	25.0	125	83.0	33.0	1,001
October	22.0	125	79.0	40.0	1,230
November	32.0	125	94.0	56.0	1,685
December	37.0	125	130.0	76.0	2,350
Annual Average	37.3	125	101.4	62.7	1,900