

2024

**2024 Annual Cardinal WPCP Summary
Report to Council.docx**



**Prepared by: Eric Wemerman
For: CAO and Council
1/21/2025**

Introduction

Under Environmental Compliance Approval (ECA) # 3-0341-94-957 issued by the Ministry of Environment, Conservation and Parks (MECP), Edwardsburgh/Cardinal is required to report annually on values/parameters listed in the ECA for the Cardinal Water Control Pollution Plant (WPCP). The annual report covers the period of January 1st to December 31st, 2024 and is submitted to Municipal Council and MECP by the March 31st deadline. The report is also made available for public viewing on the Township website.

The facility is normally staffed with a licensed operator Monday thru Friday, with walkthrough inspections performed twice daily and by the rotational on-call operator on weekends and holidays. The wastewater treatment process is operated via a Supervisory Control and Data Acquisition (SCADA) system, monitored by a 3rd party security company which notifies the on-call operator to respond to alarms or customer complaints. Routine in-house and external laboratory sampling is performed to monitor the effectiveness of the treatment process and to ensure system is operating as designed.

Executive Summary

In 2024 the average daily flow into the Cardinal WPCP was 1,044 m³/day or 43 % of the rated capacity for the system. The maximum daily flow recorded was 3144 m³/day. The highest flows occur during periods of heavy rain and snow melt. Ongoing efforts including Cured-In-Place Pipe Work (CIPP) and complete rehabilitation of sanitary mains have decreased peak flow rates as shown in this report. No exceedances of monthly effluent criteria or annual loading rates occurred in 2024. A total of 700 m³ of biosolids were removed in 2024, an increase of approximately 6 % from 2023.

One notice was made to the Spills Action Centre, Leeds & Grenville Health Unit, South Dundas and MECP for a peak flow rate exceedance due to intense precipitation. Operational issues and corrective actions for 2024 have been summarized in this report. The report summarizes monthly flow, influent/effluent chemical results, and percent removal efficiencies. Long term comparison of final effluent results versus objectives and compliance limits demonstrate the Cardinal WPCP is operating within the prescribed ECA.

Common Acronyms

WPCP: Water Pollution Control Plant

MECP: Ministry of Environment, Conservation, Parks

CIPP: Cured in Place Pipework

SCADA: Supervisory Control and Data Acquisition

SBR: Sequential Batch Reactor

ATAD: Auto-Thermophilic Aerobic Digester

WAS: Waste Activated Sludge

IECBL: Industrial Electrical Contractors Brockville

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Process Summary

The Cardinal Waste Water Collection system includes four sanitary lift stations, four forcemains and pipework ranging in size from 200 mm to 450 mm comprised of clay, PVC and CIPP lined main. Influent enters the Cardinal Water Control Pollution Plant via gravity where it is diverted to two continuous flow bar screens. The bar screens remove larger debris and transfer it into a Rotopac compactor. The compactor compresses and dewateres the solids prior to disposal. The influent then passes through a circular vortex grit chamber. Higher density grit, (typically sand), settles and is pumped to a grit dewatering screw. A bin containing grit and compacted debris is removed by a 3rd party company.

Aluminum sulfate is injected, (for phosphorus control), into the influent stream prior to alternately entering one of two Sequential Batch Reactors (SBR's). The SBR's normally operate in five stages. Idle (not filling), static fill (filling but not aerating), aerated fill (aerated and filling), React (Aeration but not filling), settle (60 minutes) and decant (draining SBR). During high flow conditions, the SBRs may transition to a simultaneous stage (fill-settle and fill decant).

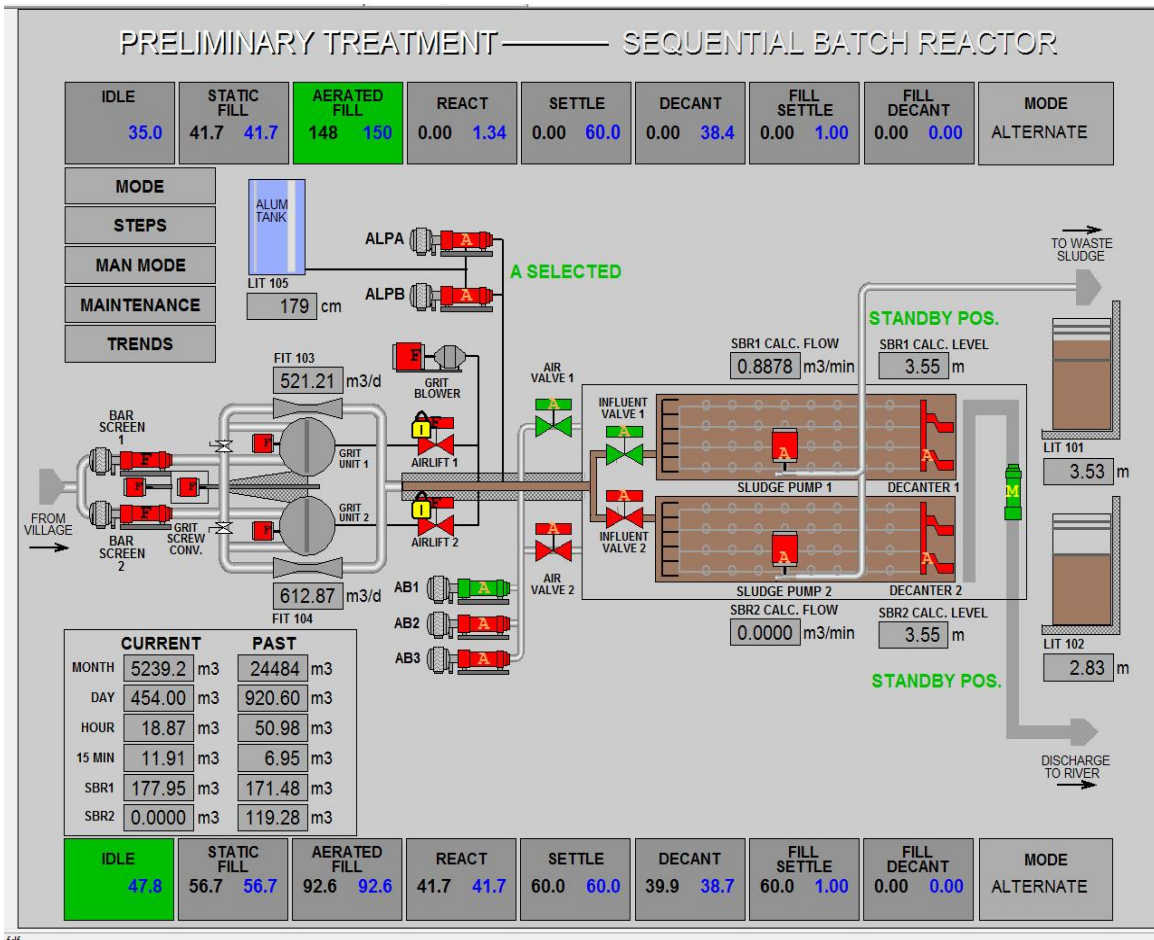
Under normal operations, influent is directed to only one of the two SBR basins at a time. The aeration or aerobic stage, followed by an anaerobic stage, provides a suitable environment for microorganisms to reduce Biochemical Oxygen Demand (BOD), Nitrates and Ammonia below ECA limits and objectives. The settle period allows for the separation of solids and supernatant liquid to ensure effluent total suspended solids is below an annual average of 25 mg/L. Effluent then passes through a Trojan UV 3000B system for disinfection and sterilization of pathogenic micro-organisms.

Waste activated sludge is removed daily from the sequential batch reactors by a process called wasting and transferred into an un-thickened holding tank. A gravity belt thickener is utilized 2 to 3 times per week to thicken the sludge. The thickened sludge is processed into a holding tank. The sludge is then batch treated, (2 to 3 times per week), through the auto-thermophilic aerobic digesters, (ATADs), and pumped into the land application holding tanks. Semi-annually, the digested sludge is hauled away by GFL Environmental

Inc. and applied to a licensed land application site under the authority of Certificate of Approval # 5948-7JRMAJ (issued January 9, 2021) and Approval of Amended NASM, (non-agricultural source material), Plan – 23296 as per regulation 267/03. This is anticipated to remain the same for the 2025 reporting period.

Process Schematic

Schematic drawing showing the process of the Cardinal Water Control Pollution Plant.



System Approvals

<u>System</u>	<u>Environmental Compliance Approval</u>	<u>Renewal Date</u>
Cardinal Water Pollution Control Plant	3-0341-94-957	N/A
Township of Edwardsburgh/Cardinal Sewage Collection System	155-W601	June 15, 2026

Staffing and Licensing

The table below lists the licensed operational staff at the end of the 2024 calendar year.

<u>Name</u>	<u>Position</u>	<u>License #</u>	<u>Type</u>	<u>Class</u>
Eric Wemerman	Chief Operator	64873	WWT	II
		80295	WWC	II
Aaron Campbell	Assistant Chief Operator	81927	WWT	II
		96033	WWC	II
Stephen Campbell	Operator	18529	WWT	II
		76515	WWC	II
Mark Simzer	Operator	93002	WWT	II
		104866	WWC	II
Tyler Selleck	Operator	113844	WWT	II
Jarrett Crich	Operator in Training	OT126392	WWT	OIT
		OT126393	WWC	OIT
Wayne Lefebvre	Public Works Operator	17953	WWC	I

Tabulation of Monitoring Data

Effluent quality obtained leaving the facility met or was better than the effluent objectives set forth in Condition 6 of the Certificate of Approval. A summary of annual concentrations and loadings versus objectives and compliance can be found in the appendices of this report. Effluent and totalized flow trending from 1997 to 2024 versus compliance and objective limits can be found on pages 14 to 16.

There were no occurrences of non-compliance with respect to Condition 7, 8,9 or 10 of the Certificate of Approval as demonstrated in Appendix A, B and C of this report.

Preventative Maintenance Program

Routine and scheduled maintenance was performed based on maintenance and lubrication schedules developed by design consultants and reviewed and modified by operations staff as needed. Routine maintenance is completed in house by Environmental Staff.

Preventative Maintenance Program

<u>Service Provider</u>	<u>System Component</u>	<u>Frequency</u>
Capital Controls	Process control equipment.	Annual
Trojan UV	UV 3000 B System	Annual
GAL Power	Generators	Semi-annual
Schneider Electric	SCADA System	Semi-annual
Claude Bourck Plumbing	Backflow Preventors	Annual
Dundee Marine	Outfall pipework	Bi-annual
Electrical Safety Authority	Electrical compliance.	Annual
Clean Water Works	Pressure cleaning and vacuuming sanitary pumping stations and sewer mains	Annual
Environmental Services	Routine maintenance & lubrication schedule	Weekly

2024 Capital Projects

<u>Project</u>	<u>Cost</u>	<u>Completion Date</u>
Boiler Replacement	\$20,899.35	March 13, 2024

Cardinal WPCP Operational Problems and Maintenance

The following operational problems and maintenance activities occurred at the Cardinal WPCP in 2024.

<u>Date</u>	<u>System Component</u>	<u>Operational Problem</u>	<u>Corrective Action/Maintenance</u>
January 8, 2024	Compressor	Water in air lines	Replaced air dryer unit.
January 10, 2024	Gas Detection	Sensor failed calibration	Capital Controls replaced gas sensor.
January 11, 16, 2024	Bio Filter	Preventative Maintenance	Topped up Bio filter media in all tanks.
January 15, 2024	Air Handling Unit	Temperature Sensor failed	Replaced temperature sensor.
January 18, 2024	SCADA	SCADA trending improvement.	Added peak flow rate to SCADA display.
January 23, 2024	Compressor	Preventative Maintenance	Changed oil and filter.

<u>Date</u>	<u>System Component</u>	<u>Operational Problem</u>	<u>Corrective Action/Maintenance</u>
February 13, 2024	Generator	Preventative Maintenance	Semi-annual servicing.
February 14, 2024	Security	Aging system.	Replaced and added security cameras.
February 14, 2024	Backflow Preventers	Preventative Maintenance	Annual inspection and testing.
February 20, 2024	Boiler	Purge air flow fault	Boiler repaired.
February 22, 2024	ATAD	Auto/Off/Hand switch sticking	Heat Exchanger switch replaced.
February 29, 2024	Effluent Temperature sensor	Abnormal trending	Capital controls re-calibrated. Purchased spare converter unit.
March 12, 2024	Rotopac	Plugging up	Replaced water supply line and solenoid valve.
March 14, 2024	Decanter # 1	Position Switch failed	Replaced position switch.
March 14, 2024	Gravity Belt Thickener	Wash water pump stopped working.	IECBL serviced overload relay.
March 14, 2024	Blowers	Preventative Maintenance	Replaced SBR blower belts.
March 26, 2024	Backflow Preventers	Valve ceased	Boiler room backflow preventer replaced.
March 27, 2024	UV System	Preventative Maintenance	Trojan UV completed annual servicing.
April 15, 2024	Decanter # 1	Preventative Maintenance	Replaced VFD for decanter # 1.
May 28, 2024	Biosolids tank valves	Preventative Maintenance	Rebuilt Dezurik valve.
May 30, 2024	Air Handling System	Preventative Maintenance	Cleaned air filters.
June 11, 2024	Air Handling System	Preventative maintenance	Replaced belts.
June 18, 2024	Effluent Temperature	Abnormal readings	Signal converted replaced.
June 24, 2024	Ceiling Lighting	Preventative maintenance	Upgraded four light fixtures to LED.
June 25, 2024	Flow meter	Display keypad malfunction	Replaced keypad board.
July 22, 2024	Generator	Preventative Maintenance	Semi-annual servicing.

<u>Date</u>	<u>System Component</u>	<u>Operational Problem</u>	<u>Corrective Action/Maintenance</u>
July 30, 2024	Generator	Preventative Maintenance	Five-year maintenance.
August 4, 2024	Vessel 2 Foam Cutter	Fuse failure	Replaced fuses and placed online.
August 26, 2024	Polymer Pump	Preventative maintenance	Replaced pump kit assembly.
August 27, 2024	Sludge pump VFD	Loss of power	Repaired power supply wiring.
August 27, 2024	ATAD Vessel Gear Boxes	Preventative maintenance	Replaced oil in gear boxes.
September 18, 2024	Generator Fuel tanks	Inspection	Annual fuel tank inspections.
September 24, 2024	Ceiling Lighting	Preventative maintenance	Seven light fixtures replaced with LED.
September 24, 2024	Sludge pump VFD #1	Preventative maintenance	Replaced VFD.
October 15, 2024	Polymer Pump	Preventative maintenance	Replaced pump
October 30, 2024	Ceiling	Preventative maintenance	Replaced ceiling tiles.
November 15, 2024	Gravity Belt Thickener	Gear Box noisy	Replaced oil and inspected bearings.
November 20, 2024	WAS Pump # 2	Pump leakage while running.	Replaced pump fittings.
November 20, 2024	SCADA	Preventative Maintenance	Schneider Electric serviced SCADA.
November 26, 2024	Influent channel	Preventative maintenance.	Cleaned influent channels.
November 26, 2024	Flooring	None	Re-painted floors.
November 27, 2024	Samplers	Preventative Maintenance	Replaced pump tubing in influent sampler.
November 27, 2024	Alum pump #1	Minor oil drip leak	Took apart- no issue identified.
December 2, 2024	Biofilters	Preventative maintenance	Cleaned biofilter sprayers.
December 3, 2024	UV System	Preventative maintenance.	Replaced all 64 lamps.
December 17, 2024	Generator	Oil drip leak	Valve cover gasket replaced.

<u>Date</u>	<u>System Component</u>	<u>Operational Problem</u>	<u>Corrective Action/Maintenance</u>
December 18, 2024	Ceiling Lighting (pump room).	Preventative maintenance	Upgraded four light fixtures to LED.
December 19, 2024	Flooring	None	Basement pump room floor painted.

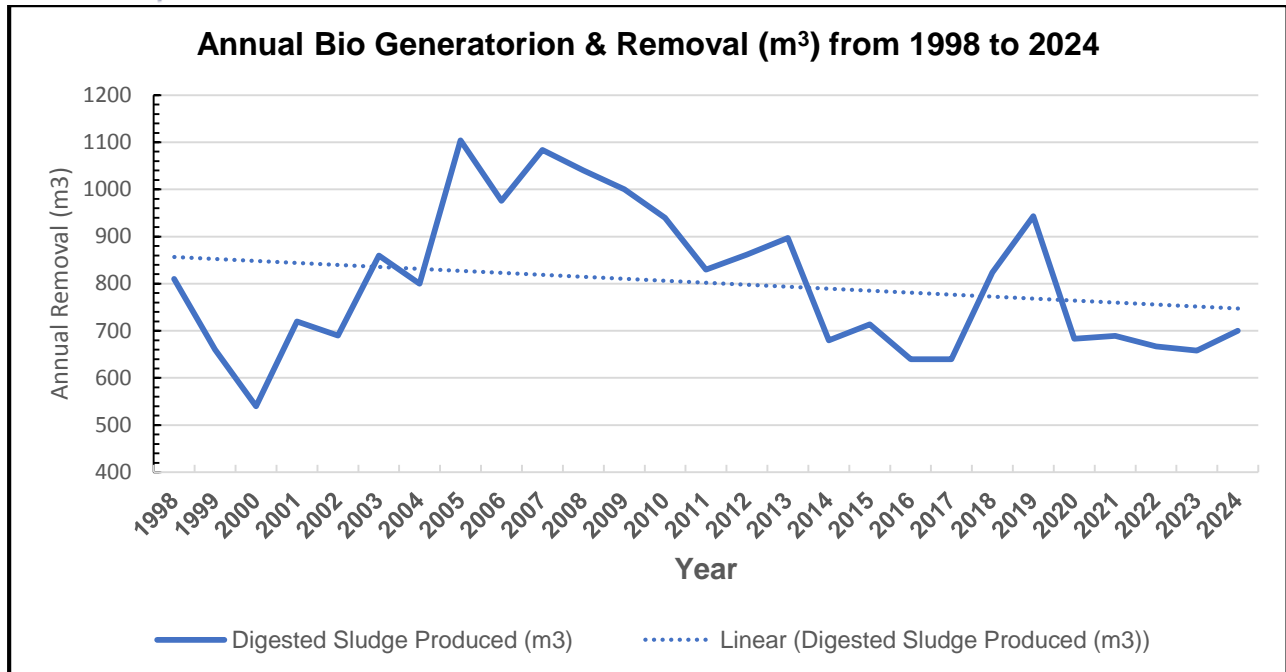
2024 Spills Action Centre Reporting

The following reports were made to the Spills Action Centre in 2024:

<u>Date</u>	<u>Reference #</u>	<u>Volume (m³)</u>	<u>Corrective Action</u>
August 17, 2024	1-9YL8VV	4.11	Peak flow rate exceedance for 5 minutes due to intense precipitation. Reports made to Health Unit, Spills Action Centre and South Dundas. Samples collected. Full treatment maintained.

Bio-Solids Generation and Removal

The total amount of bio-solids treated at the WPCP and removed by GFL Environmental Inc in 2024 was 700 m³ compared to 658 m³ in 2023. Biosolids were transported to GFL digestors in Iroquois for further processing. The graph below summarizes total annual bio-solids generation from 1998 to 2024.



Calibration and Maintenance Procedures

The calibration and maintenance schedules implemented at this facility appear adequate for ensuring that equipment and instrumentation remain in optimal condition. Capital Controls is contracted to conduct both annual and emergency calibrations for the equipment used in the treatment and collection system.

The table below summarizes annual calibration activities that were completed in 2024.

<u>Date</u>	<u>Process</u>	<u>Company</u>	<u>Result</u>
January 8, 2024	North Channel Flume	Capital Controls	Passed
January 8, 2024	South Channel Flume	Capital Controls	Passed
January 8, 2024	LIT Thickened Sludge Tank level	Capital Controls	Passed
January 8, 2024	LIT Un-thickened Sludge Tank level	Capital Controls	Passed

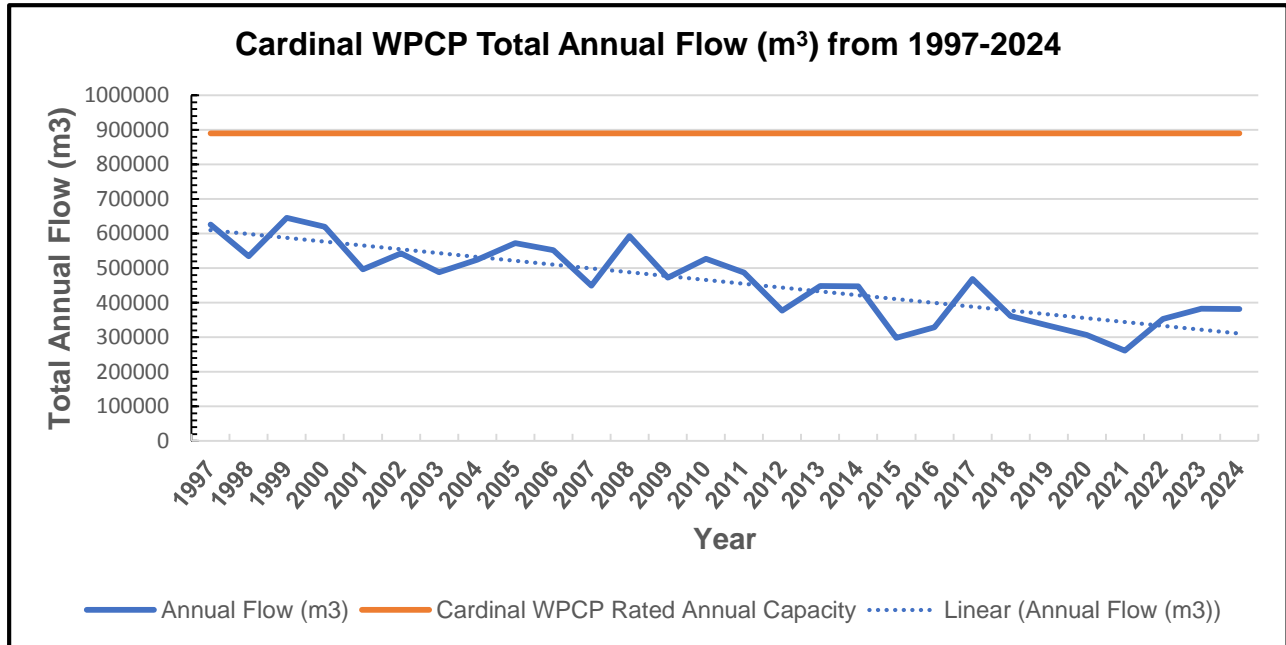
<u>Date</u>	<u>Process</u>	<u>Company</u>	<u>Result</u>
January 8, 2024	AMC 1400 Gas Monitors	Capital Controls	Passed
January 8, 2024	Carbon Monoxide Gas Monitors	Capital Controls	Passed
January 10, 2024	Effluent Temperature Sensor	Capital Controls	Passed
February 29, 2024	Effluent Temperature Sensor	Capital Controls	Passed
June 18, 2024	Effluent Temperature Sensor	Capital Controls	Passed
January 10, 2024	Effluent pH	Capital Controls	Passed
June 18, 2024	Vessel 1 Temperature Sensor	Capital Controls	Passed
June 18, 2024	Vessel 2 Temperature Sensor	Capital Controls	Passed
June 18, 2024	Dissolved Oxygen Sensor	Capital Controls	Passed

Evaluation of Performance and Reliability

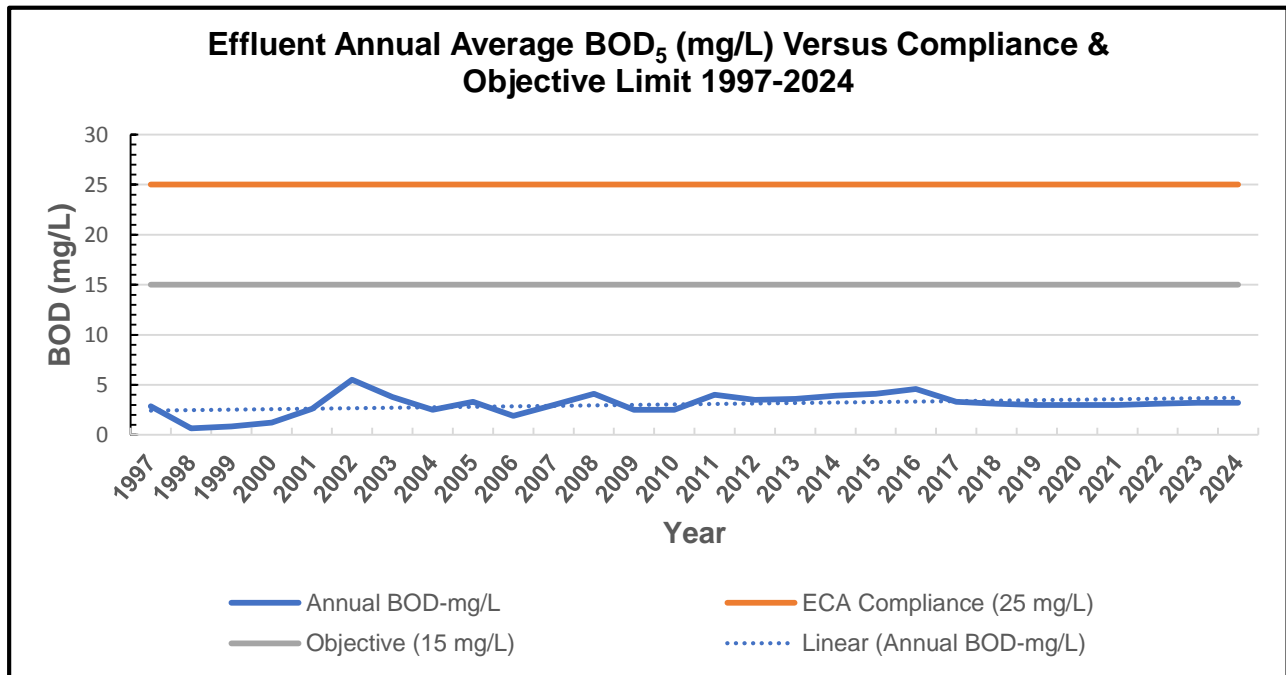
The facility is being operated and maintained to produce high-quality effluent that is demonstrated by the overall results achieved in 2024. Extraneous flows are being addressed through Cured in Place Pipe work and complete replacement of sanitary sewers and manholes. The graphs on page 14-16 shows the total influent flow have steadily decreased since 1997 and effluent quality analysis for Biochemical Oxygen Demand, Total Suspended Solids and Total Phosphorus remain well below compliance limits established in the ECA. Appendices A to D summarizes monthly flow, influent/effluent results, and sludge processing data for 2024.

It is anticipated the volume of biosolids generated will remain consistent in 2025 compared to the 2024 reporting period.

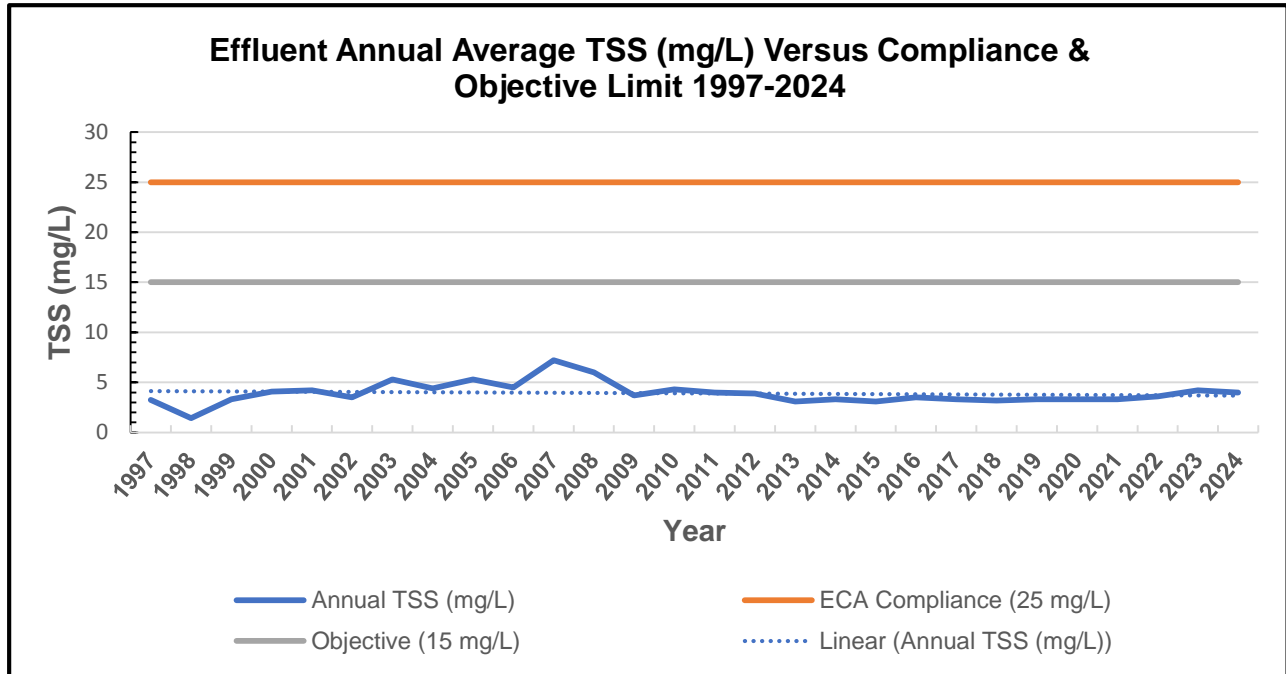
Cardinal WPCP Total Annual Flow



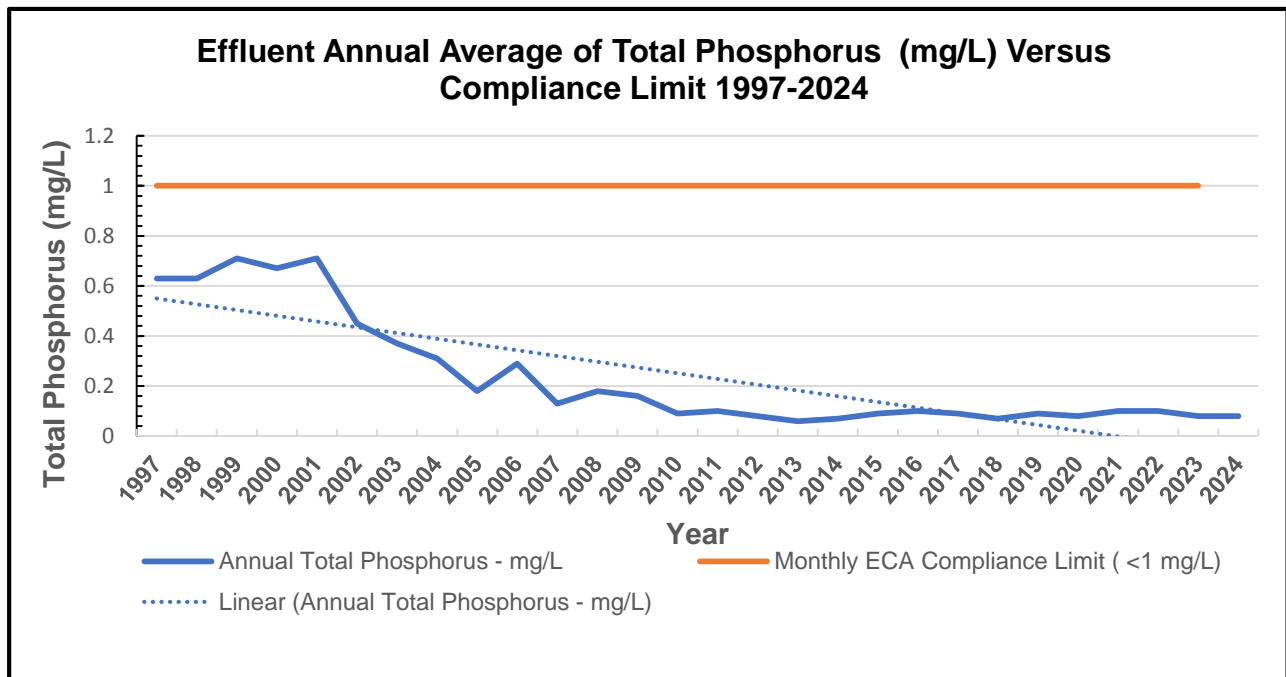
Effluent Biochemical Oxygen Demand (BOD) Performance Summary



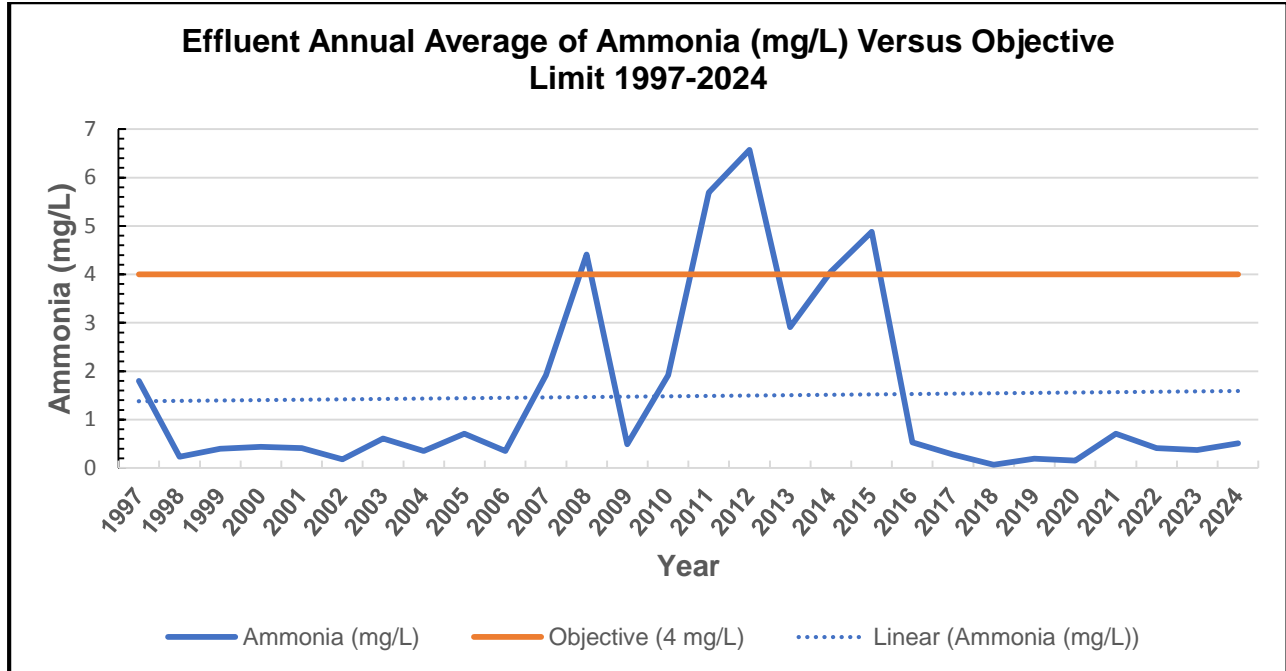
Effluent Total Suspended Solids Performance Summary



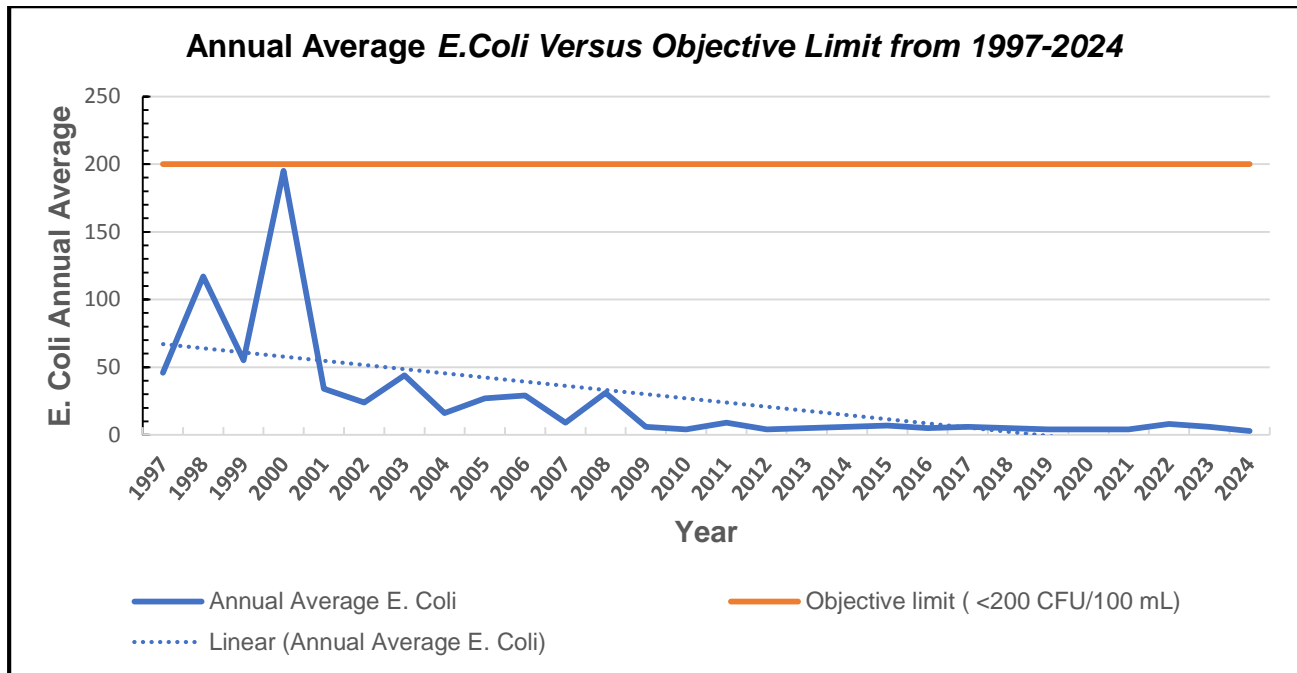
Effluent Total Phosphorus Performance Summary



Effluent Annual Ammonia Summary



Effluent E.Coli Summary



Regular assessment and striving for improvement will endeavor to ensure continued high performance, efficiency, and reliability of this facility.

Appendix A

2024 Annual Monitoring & Performance Report

2024				
ANNUAL AVERAGE EFFLUENT CONCENTRATIONS				
<u>Parameters</u>	<u>Units</u>	<u>Objectives</u>	<u>Compliance</u>	<u>Actual</u>
BOD ₅	mg/L	15.0	25.0	3.2
Suspended Solids	mg/L	15.0	25.0	4.0
Total Phosphorus	mg/L	<1.0	1.0	0.08
Am & Am Nitrogen	mg/L	4.0		0.51
<i>E. Coli</i>	cfu/100 mL	<200/100 mL		3.0
CBOD ₅	mg/L	15		3.1
ANNUAL AVERAGE EFFLUENT LOADING				
<u>Parameters</u>	<u>Units</u>	<u>Objectives</u>	<u>Compliance</u>	<u>Actual</u>
CBOD ₅	kg/day	36		3.24
BOD ₅	kg/day	36.6	61	3.41
Suspended Solids	kg/day	36.6	61	4.38
Total Phosphorus	kg/day	<2.4	2.4	0.09
Am & Am Nitrogen	kg/day	9.8		0.53

“**Annual average concentration**” means the arithmetic mean of the monthly average concentrations of a contaminant in the effluent calculated for a particular calendar year.”

“**Annual average loading**” means the value obtained by multiplying the annual average concentration of a contaminant by the average daily flow over the same calendar year.”

Total Phosphorus: Non-Compliance is deemed to have occurred when the monthly average concentration is greater than 1.0 mg/L based on all composite (and spot sampling).

Appendix B

2024 Monthly Average Loadings

MONTHLY AVERAGE EFFLUENT LOADING						
<u>Month</u>	<u>BOD₅</u>	<u>Annual Compliance</u>	<u>Total Suspended Solids</u>	<u>Annual Compliance</u>	<u>Total Phosphorus</u>	<u>Annual Compliance</u>
	kg/day	kg/day	kg/day	kg/day	kg/day	kg/day
January	3.13	61.0	5.22	61.0	0.08	2.4
February	3.18	61.0	4.24	61.0	0.06	2.4
March	4.32	61.0	4.32	61.0	0.10	2.4
April	4.78	61.0	5.42	61.0	0.10	2.4
May	2.94	61.0	2.94	61.0	0.07	2.4
June	2.44	61.0	2.85	61.0	0.05	2.4
July	3.00	61.0	3.40	61.0	0.07	2.4
August	8.37	61.0	13.25	61.0	0.34	2.4
September	3.21	61.0	4.27	61.0	0.09	2.4
October	1.63	61.0	2.06	61.0	0.04	2.4
November	1.52	61.0	1.64	61.0	0.05	2.4
December	2.43	61.0	2.92	61.0	0.07	2.4

Appendix C

2024 Monthly Flow & Average Effluent Concentrations

2024	FLOWS			BIOCHEMICAL OXYGEN DEMAND			SUSPENDED SOLIDS			PHOSPHORUS			AMMONIA			CHEMICAL BIOLOGICAL DEMAND			<i>E.Coli</i>
	Total Flow	Avg Day Flow	Max Day Flow	AVG RAW	AVG EFF	REMOVAL	AVG RAW	AVG EFF	REMOVAL	AVG RAW	AVG EFF	REMOVAL	AVG RAW	AVG EFF	REMOVAL	AVG RAW	AVG EFF	REMOVAL	AVG EFF Geomean
Units	m ³	m ³	m ³	mg/L	mg/L	%	mg/L	mg/L	%	mg/L	mg/L	%	mg/L	mg/L	%	mg/L	mg/L	%	Cfu/100mL
Month																			
January	32,336	1043	1727	45	3.0	93%	50	5.0	90%	1.70	0.07	96%	14.92	0.08	99%	31.40	3.00	90%	2.3
February	30,746	1060	1533	46	3.0	93%	66	4.0	94%	1.82	0.06	97%	14.50	0.09	99%	24.00	3.00	88%	2.8
March	44,601	1439	2358	42	3.0	93%	95	3.0	97%	1.68	0.07	96%	10.19	0.10	99%	33.25	3.00	91%	2.4
April	47,823	1594	2548	55	3.0	95%	82	3.4	96%	1.61	0.06	96%	10.75	0.06	99%	24.60	3.00	88%	2.0
May	28,000	903	1108	81	3.3	96%	140	3.3	98%	2.41	0.07	97%	17.50	0.13	99%	48.50	3.00	94%	2.8
June	24,402	813	1210	124	3.0	98%	162	3.5	98%	2.61	0.06	98%	17.90	0.39	98%	64.75	3.00	95%	4.4
July	31,012	1000	1604	121	3.0	98%	106	3.4	97%	2.12	0.07	97%	16.08	0.15	99%	44.80	3.00	93%	2.0
August	54,045	1743	3144	75	4.8	94%	59	7.6	87%	1.78	0.19	89%	10.42	0.45	96%	35.00	4.20	88%	5.3
September	32,053	1068	1715	73	3.0	96%	106	4.0	96%	1.76	0.09	95%	16.95	0.10	99%	40.25	3.00	93%	2.8
October	16,809	542	658	116	3.0	97%	160	3.8	98%	3.22	0.08	98%	27.18	*2.71	90%	83.60	3.00	96%	3.2
November	15,173	506	698	131	3.0	98%	207	3.3	98%	3.23	0.10	97%	29.58	1.63	94%	96.00	3.00	97%	3.0
December	25,159	812	1140	93	3.00	97%	181	3.6	98%	2.63	0.09	97%	17.32	0.23	99%	68.00	3.00	96%	2.5
TOTAL	382,159																		
AVERAGE		1044		84	3.2	96%	118	4.0	96%	2.21	0.08	96%	16.9	0.51	98%	49.5	3.10	92%	3.0
MAXIMUM			3144	131	4.8		207	7.6		3.23	0.19		29.6	2.71		95.5	4.20		5.3
OBJECTIVE				15.0			15.0						4.0						<200
COMPLIANCE	Maximum Annual average: 2438 m ³ /day			25.0			25.0			<1.00						15			
	Peak flow Rate: 8900 m ³ /day																		

*Aeration times extended in October due to low flow conditions to improve nitrification and Ammonia removal.

Appendix C

2024 Monthly Influent- Effluent Concentrations

2024 Month	Influent Dissolved Reactive Phosphorus	Effluent Dissolved Reactive Phosphorus	Influent TKN	Effluent TKN	Influent Nitrite	Effluent Nitrite	Influent Nitrate	Effluent Nitrate	Influent Alkalinity	Effluent Alkalinity	Effluent Total Coliform	Effluent Fecal Strep	Influent pH (Composite)	Effluent pH (Composite)	Influent pH	Effluent pH	Effluent Temperature
January	0.76	0.03	18.38	0.86	0.14	0.19	0.93	8.14	241	176	13	4	7.63	7.72	7.13	7.00	13.0
February	0.49	0.03	18.60	0.95	0.18	0.17	1.15	8.08	263	176	12	3	7.73	7.64	7.48	6.94	11.5
March	0.27	0.03	15.33	0.88	0.63	0.31	3.04	7.37	226	184	16	4	7.66	7.62	6.98	6.96	10.0
April	0.57	0.03	15.52	0.82	0.26	0.19	2.42	6.51	236	188	10	3	7.77	7.69	7.13	6.95	5.9
May	0.42	0.02	21.93	1.03	0.07	0.07	0.35	7.93	212	153	23	8	7.52	7.44	7.08	6.83	8.1
June	1.05	0.02	23.68	1.33	0.06	0.17	1.40	5.89	232	141	32	12	7.58	7.25	7.21	6.78	19.5
July	0.46	0.03	20.46	1.08	0.07	0.08	0.27	6.88	237	157	10	2	7.67	7.49	7.51	6.85	21.9
August	0.46	0.07	14.45	1.56	0.12	0.07	2.27	6.08	257	191	24	6	7.74	7.47	7.57	6.96	21.8
September	0.26	0.04	19.9	0.90	0.07	0.14	0.24	7.01	237	162	17	3	7.75	7.73	7.66	6.92	23.9
October	0.91	0.02	31.24	3.28	0.05	0.10	0.11	3.62	191	127	36	4	7.59	7.61	7.64	6.79	24.6
November	1.10	0.04	33.23	2.58	0.05	0.18	0.22	6.48	177	111	29	4	7.31	7.36	6.97	6.77	22.6
December	1.01	0.03	24.26	1.20	0.07	0.07	0.89	7.68	190	133	22	6	7.29	7.17	7.60	6.86	18.2
Minimum	0.26	0.02	14.45	0.82	0.05	0.07	0.11	3.62	177	111	10	2	7.29	7.17	6.97	6.77	5.9
Maximum	1.10	0.07	33.23	3.28	0.63	0.31	3.04	8.14	263	191	36	12	7.77	7.73	7.66	7.00	24.6
Average	0.65	0.03	21.42	1.37	0.15	0.15	1.11	6.81	225	158	20	5	7.60	7.52	7.33	6.88	16.8
Average % Removal	95%		94%		-		-		30%								

- Nitrification process converts Ammonia to Nitrite/Nitrates which shows in the effluent results. The SBR process removed 98% of the influent ammonia.
- The SBR process removed 95% of Dissolved Reactive Phosphorus and 94% of Total Kjeldahl Nitrogen.
- Effluent Total Coliform and Fecal Strep remained low.

Appendix D

2024 Sludge Processing Performance Summary

2024										
Month	Waste Activated Sludge	Thickened Waste Activated Sludge			Digested Sludge			Volatile Solids	Reactor Temperatures	
	Volume (m ³)	Volume (m ³)	TS %	VS %	Volume (m ³)	TS %	VS %	% Reduction	R 1 °C	R 2 °C
January	333.83	56.9	4.16	62.2	73.5	3.39	50.2	34	33.1	56.5
February	277.12	53.4	4.34	64.4	63.5	3.51	51.8	35	33.3	61.2
March	323.38	56.6	4.20	63.8	77.6	3.35	50.2	37	32.4	57.3
April	264.53	54.5	4.29	61.3	66.2	3.43	47.7	38	35.4	56.9
May	190.45	43.8	4.02	61.2	46.3	3.37	47.5	35	40.8	57.5
June	161.91	40.4	4.08	63.7	49.4	3.32	48.7	38	45.1	63.4
July	222.56	58.5	3.69	58.8	69.1	3.33	45.4	30	44.3	64.8
August	238.08	58.2	3.75	59.0	71.7	3.50	46.7	26	40.7	64.1
September	216.74	53.9	3.80	54.4	61.2	3.21	48.6	25	35.9	62.2
October	313.39	61.7	3.94	59.2	71.6	3.53	46.7	29	31.5	58.2
November	318.59	63.6	4.06	65.9	78.4	3.37	54.1	32	29.0	57.5
December	315.74	60.5	4.23	66.1	73.9	3.23	53.7	38	28.4	57.6
Total	3176.32	661.9			802.4					
Average	264.69	55.16	4.05	61.65	66.87	3.38	49.28	33%	35.81	59.75

2024 Auto-Thermophilic Aerobic Vessel # 2 Digester Results

2024 Month	Total Solids mg/L	pH @25 C	Nitrate (N) mg/L	Total Ammonia mg/L	TKN mg/L	Total Phosphorus mg/L	Arsenic mg/L	Cadmium mg/L	Chromium mg/L	Cobalt mg/L	Copper mg/L	Lead mg/L	Mercury mg/L	Molybdenum mg/L	Nickel mg/L	Selenium mg/L	Zinc mg/L	Total Coliform Cfu/100 mL	Fecal Strep Cfu/100 mL	E. Coli Cfu/100 mL
January	43500	8.16	1.2	2.00	3450	1220	0.2	0.03	4.03	0.16	8.70	2.4	0.004	0.34	1.05	0.3	23.2	<1000	<1000	<1000
February	42800	8.32	1.1	1920	3030	1100	0.3	0.04	4.60	0.12	7.85	1.2	0.006	0.34	1.10	0.3	22.2	<1000	<1000	<1000
March	41400	8.53	1.5	2470	4040	1280	0.2	0.03	4.54	0.12	8.22	0.8	0.003	0.30	1.02	0.2	21.8	<1000	<1000	<1000
April	40700	8.39	0.6	2150	4110	1230	0.2	0.03	3.76	0.09	5.95	0.6	0.004	0.22	0.87	0.2	17.2	<1000	28000	<1000
May	41100	8.72	3.3	1600	4420	1580	0.3	0.04	4.97	0.09	7.25	0.7	0.004	0.29	1.11	0.3	21.8	<1000	<1000	<1000
June	39100	8.63	1.8	2510	4040	1370	0.3	0.04	4.48	0.06	7.75	0.6	0.002	0.30	0.99	0.3	21.2	<1000	<1000	<1000
July	47500	8.50	0.9	2640	4180	1360	0.2	0.03	4.22	0.12	10.4	1.6	0.005	0.33	0.99	0.3	24.6	<1000	<1000	<1000
August	41900	8.53	1.1	2560	3130	1170	0.2	0.03	3.99	0.08	8.70	0.7	0.002	0.37	0.91	0.3	24.1	<1000	<1000	<1000
September	39800	8.39	0.2	1910	3740	1320	0.2	0.04	3.72	0.09	7.77	0.7	0.004	0.28	0.84	0.3	24.0	<1000	<1000	<1000
October	41000	8.32	0.9	1720	2610	1020	0.2	0.04	3.18	0.09	5.75	0.9	0.006	0.20	0.72	0.2	20.3	<1000	3000	<1000
November	40100	7.95	1.5	2050	3350	1090	0.2	0.03	2.60	0.08	7.22	0.6	0.004	0.22	0.61	0.2	20.4	<1000	13000	<1000
December	33500	7.91	2.5	871	3410	1240	0.2	0.04	2.65	0.10	7.80	0.8	0.004	0.27	0.68	0.2	24.4	<1000	17000	<1000
Minimum	33500	7.91	0.2	2.00	2610	1020	0.20	0.03	2.60	0.06	5.75	0.60	0.002	0.20	0.61	0.20	17.20	<1000	<1000	<1000
Maximum	47500	8.72	3.3	2640	4420	1580	0.30	0.04	4.97	0.16	10.40	2.40	0.006	0.37	1.11	0.30	24.60	<1000	28000	<1000
Average	41033	8.00	1.38	1867	3626	1248	0.23	0.04	3.90	0.10	7.78	0.97	0.004	0.29	0.91	0.26	22.10	<1000	5750	<1000

Hauled Biosolids Sample Results

2024	Total Solids mg/L	pH @25 C	Nitrate (N) mg/L	Total Ammonia mg/L	TKN mg/L	Total Phosphorus mg/L	Arsenic mg/L	Cadmium mg/L	Chromium mg/L	Cobalt mg/L	Copper mg/L	Lead mg/L	Mercury mg/L	Molybdenum mg/L	Nickel mg/L	Selenium mg/L	Zinc mg/L	Total Coliform Cfu/100 mL	Fecal Strep Cfu/100 mL	E. Coli Cfu/100 mL
April 24, 2024	27300	7.66	0.6	3040	3930	1220	0.2	<0.03	2.82	0.09	5.25	0.5	0.003	0.22	0.70	0.2	18.6	10000	2000	<1000
April 24, 2024	19400	7.69	0.8	2370	4090	1260	0.2	<0.03	3.12	0.10	5.95	0.6	0.003	0.24	0.78	0.2	17.6	20000	3000	<1000
October 3, 2024	7270	7.98	<0.1	2090	2190	219	<0.1	<0.03	0.67	<0.03	1.17	<0.1	<0.002	<0.18	0.23	<0.1	4.15	2000	<1000	<1000
October 3, 2024	6710	7.94	<0.1	2210	2410	203	<0.1	<0.03	0.57	<0.03	0.89	<0.1	<0.002	<0.18	0.21	<0.1	3.44	1000	<1000	<1000
Minimum	6710	7.66	<0.1	2090	2190	203	<0.1	<0.03	0.57	<0.03	0.89	<0.1	<0.002	<0.18	0.21	<0.1	3.44	1000	1000	<1000
Maximum	27300	7.98	0.8	3040	4090	1260	0.2	<0.03	3.12	0.10	5.95	0.6	0.003	0.24	0.78	0.2	18.6	20000	3000	<1000
Average	15170	7.82	0.4	2428	3155	726	0.15	<0.03	1.80	0.06	3.32	0.33	0.0025	0.21	0.48	0.15	10.95	8250	1750	<1000

- Biosolids transported (by GFL) to a GFL Facility in Iroquois Ontario (12 Bath Road) for processing.
- Monthly grab sample is collected from Vessel # 2 Digester (post Hygenization)
- Two sets of biosolid samples are collected during spring and fall removal.
- Monthly laboratory results are provided to GFL prior to hauling biosolids.