Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Aaron Todd
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March 28, 2025

Re: 2024 Annual Performance Report for the Cainsville Lagoons System

Attached is the 2024 Annual Performance Report for the Cainsville Lagoons located at 30 Shaver St. in the County of Brant. This report has been completed in accordance with:

- Condition No. 10(6)(a)-(k) cited in Environmental Compliance Approval #2829-D5VNWT dated November 19, 2024 and issued to the Corporation of the County of Brant.

This report was prepared by the Ontario Clean Water Agency on behalf of the County of Brant based on the information we have in our records. The report covers the period from January 1, 2024 to December 31, 2024.

Sincerely,

Meagan Lowden
Process and Compliance Technician
Ontario Clean Water Agency

Cc.
Andrea Bazzard – Director of Environmental Services, County of Brant
Matthew D'Hondt – Solid Waste/Wastewater Operations Manager – County of Brant
Ivanna Okroukh – Water Inspector – MECP
Lisa Williamson – Water Supervisor – MECP
Maegan Garber – Safety, Process and Compliance Manager, OCWA
Sam Sianas – Regional Hub Manager, OCWA
Ben Madill – Senior Operations Manager, OCWA

2024 ANNUAL PERFORMANCE REPORT

CAINSVILLE LAGOONS SYSTEM

30 SHAVER STREET, CAINSVILLE

MECP ENVIRONMENTAL COMPLIANCE APPROVAL #2829-D5VNWT

PREPARED BY: ONTARIO CLEAN WATER AGENCY

PREPARED FOR: MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS

ON BEHALF OF: THE COUNTY OF BRANT

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INTRODUCTION

The Cainsville Lagoons System (Lagoons) is located at 30 Shaver Street in Cainsville, Ontario. The Lagoons consist of two primary sewage stabilization treatment lagoon cells. Stabilization lagoon Cell #1 (northwest lagoon) has a maximum holding capacity of 7,050 m^3 and stabilization lagoon cell #2 (southwest lagoon) has a maximum holding capacity is 6,772m^3. Raw sewage enters the site through a manhole containing a Palmer-Bowlus Flume with flow recording and a continuous chemical addition system and then flows to a distribution manhole. Flows can be subdivided to feed cell# 1, cell# 2 or both. Two (2) 5 horsepower subsurface aerator units are installed with one unit per primary cell. Flow entering either primary cell progressively fills and overflows into the effluent polishing lagoon cell # 3 which has a maximum holding capacity of 37,155 m^3. Final effluent is discharged semi-annually with a Spring discharge (March 15 to April 30) and a Fall discharge (October 15 to December 15) to Fairchild Creek through an effluent outfall consisting of a concrete sewer pipe and a partial flume equipped with flow measurement device.

PLANT FACTS

Environmental Compliance Approval: 2829-D5VNWT (Dated November 19, 2024)
Rated Capacity: 250 m^3/day
Receiving Water: Fairchild Creek (semi-annually)

The Lagoons System is operated in accordance with provincial regulations following a detailed sampling schedule as required in accordance with Environmental Compliance Approval (ECA) #2829-D5VNWT dated November 19, 2024. The following report is presented such that it corresponds with ECA #2829-D5VNWT Section 10(6)(a) through (k).

SECTION A - MONITORING DATA

As outlined in the ECA #2829-D5VNWY Section 10(6)(a) the following is a summary and interpretation of all monitoring data and a comparison to the effluent limits and objectives outlined in Table 1 and 2 of this report respectively, including an overview of the success and adequacy of the Cainsville Lagoons.

(I) EFFLUENT LIMITS/OBJECTIVES

TABLE 1 – EFFLUENT LIMITS

Effluent Limits		
Final Effluent Parameter	**Maximum Concentration (mg/L)**	**Maximum Waste Loading* (kg/d)**
$CBOD_5$	30.0	Spring: 152.1 kg/day (March 15-April 30) Fall:12.3 kg/day (Oct 15-Nov 30)
Total Suspended Solids	40.0	-
Total Phosphorus	0.80	-
pH of the effluent maintained between 6.0 and 9.5, inclusive at all times		

*Maximum waste loading includes loading from the contingency discharge as well

TABLE 2 – EFFLUENT OBJECTIVES

Effluent Objectives	
Effluent Parameter	**Concentration Objective (mg/L)**
$CBOD_5$	25.0
Suspended Solids	30.0
Total Phosphorus	0.50
Unionized Ammonia (UA)	0.10
Acute Toxicity (AT)	Non-lethal to rainbow trout and daphnia magna

As specified in the ECA, Section 8A, Special Operations – Seasonal Discharge, the spring discharge will not commence earlier than March 15th and terminate no later than April 30th, however, incorporates a contingency measure if discharge cannot be completed within the normal discharge window. The Fall discharge will not commence earlier than October 15th and terminate no later than December 15th. Additional monitoring and sampling is required should the Spring contingency be utilized, as per Table 5 below.

(II) LAGOONS SAMPLING PROCEDURES

Samples are collected from the Lagoons in accordance with the frequencies outlined in Tables 3, 4 and 5 below utilizing a grab sampling procedure and a flume reading, when required. Samples of the final effluent from the Lagoons are collected from the outlet at least five (5) times during each seasonal discharge (Spring and Fall). Analysis of these parameters is conducted at SGS Lakefield Analytical in Lakefield, Ontario. Lakefield Analytical is a member of the Canadian Association for Laboratory Accreditation Incorporated, certificate # 1999.

TABLE 3 – INFLUENT SAMPLING REQUIREMENTS (FROM THE INLET MANHOLE)

Parameters	Sample Type	Frequency
BOD_5	Grab	Monthly
Total Suspended Solids	Grab	Monthly
Total Phosphorus	Grab	Monthly
Total Kjeldahl Nitrogen	Grab	Monthly
pH	Grab	Monthly
Temperature	Grab	Monthly

TABLE 4 - EFFLUENT SAMPLING REQUIREMENTS (PRIOR TO THE RECEIVING STREAM, IN NORMAL DISCHARGE SITUATIONS)

Parameters	Sample Type	Frequency
Flow Rate	Flume	Daily during discharge
$CBOD_5$	Grab	5 times during discharge
Total Suspended Solids	Grab	5 times during discharge
Total Phosphorus	Grab	5 times during discharge
Total Ammonia Nitrogen	Grab	5 times during discharge
Hydrogen Sulphide	Grab	Once prior to discharge
E-coli	Grab	5 times during discharge
Dissolved Oxygen	Grab	5 times during discharge
pH	Grab	5 times during discharge
Temperature	Grab	5 times during discharge

TABLE 5- ADDITIONAL EFFLUENT MONITORING FOR CONTINGENCY (EXTENDED SPRING) DISCHARGES

Parameters	Sample Type	Frequency
Flow Rate	Flume	Daily During Discharge
$CBOD_5$	(Grab)	(2 times per week)
Total Suspended Solids	(Grab)	(2 times per week)
Total Ammonia Nitrogen	(Grab)	(2 times per week)
Total Phosphorus	(Grab)	(2 times per week)
Acute Toxicity (AT)	(Grab)	(1 times per week)
Hydrogen Sulphide	(Grab)	(2 times/week, prior to discharge)
E.coli	(Grab)	(2 times/week, prior to discharge)

(III) PLANT PERFORMANCE

(IV) FLOW DATA

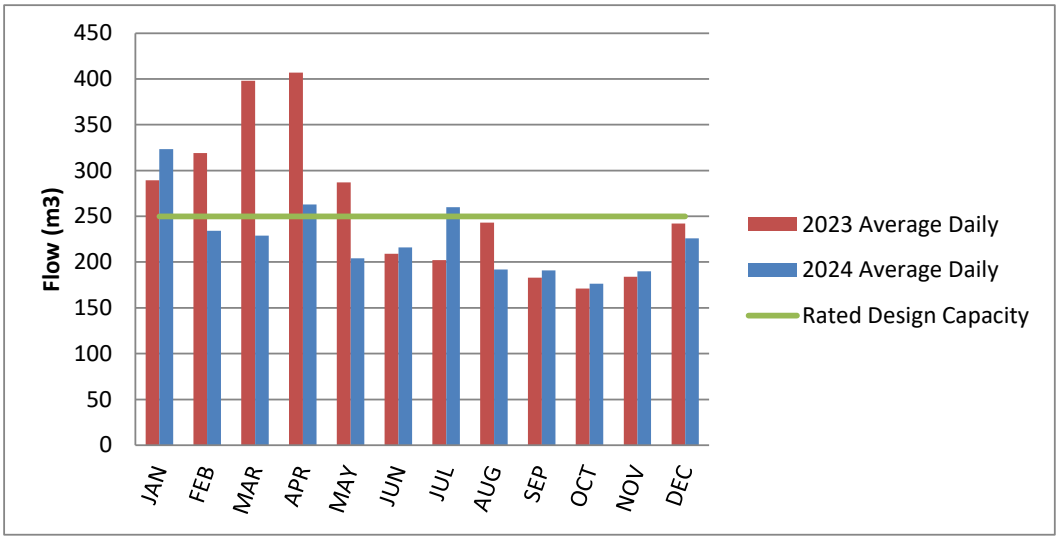
Section 8 (2) of ECA #2829-D5VNWT states that the owner shall ensure that the average daily sewage flow into the sewage treatment plant does not exceed an annual daily average 250m^3/day in one (1) calendar year. The annual daily average flow for 2024 was 225m^3/day which is 90% of the approved annual daily flow.

The following Table 6 shows the average daily flow, the peak monthly flow and the total flow for 2024. Graph 1 shows the 2023 and 2024 average influent flow in comparison to the design capacity. Graph 2 shows the comparison from 2023 to 2024 for monthly peak day influent flows. Graph 3 shows a comparison of the 2023 and 2024 total monthly flows. The influent average daily flow and the total monthly flows are comparable from 2023 to 2024, except for February, March and April of 2023. The significant increase from February to April 2023 was caused by a buildup of sediment in the influent flume, as detailed in the 2023 Annual Report.

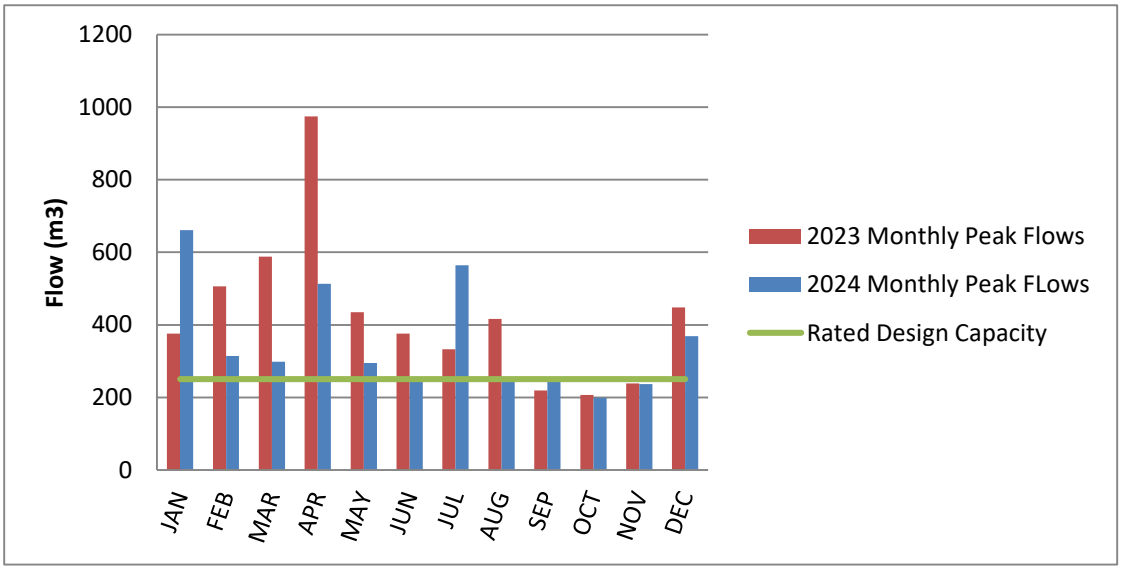
TABLE 6– INFLUENT FLOW DATA

	Average Daily Flow (m^3/d)	Peak Monthly Flow (m^3/d)	Total Month Flow (m^3)
January	324	661	10 028
February	234	314	6 779
March	229	298	7 104
April	263	513	7 897
May	204	295	6 327
June	216	254	6 467
July	260	564	8 045
August	192	245	5 758
September	191	245	5 757
October	177	199	5 473
November	190	237	5 694
December	226	369	7 015
TOTAL	**--**	**--**	**82 343**
Average	**225**	**--**	**--**

GRAPH 1 – 2023 AND 2024 AVERAGE DAILY INFLUENT FLOW



GRAPH 2 – 2023 AND 2024 MONTHLY PEAK DAY INFLUENT FLOWS



GRAPH 3 – 2023 AND 2024 TOTAL MONTHLY INFLUENT FLOWS

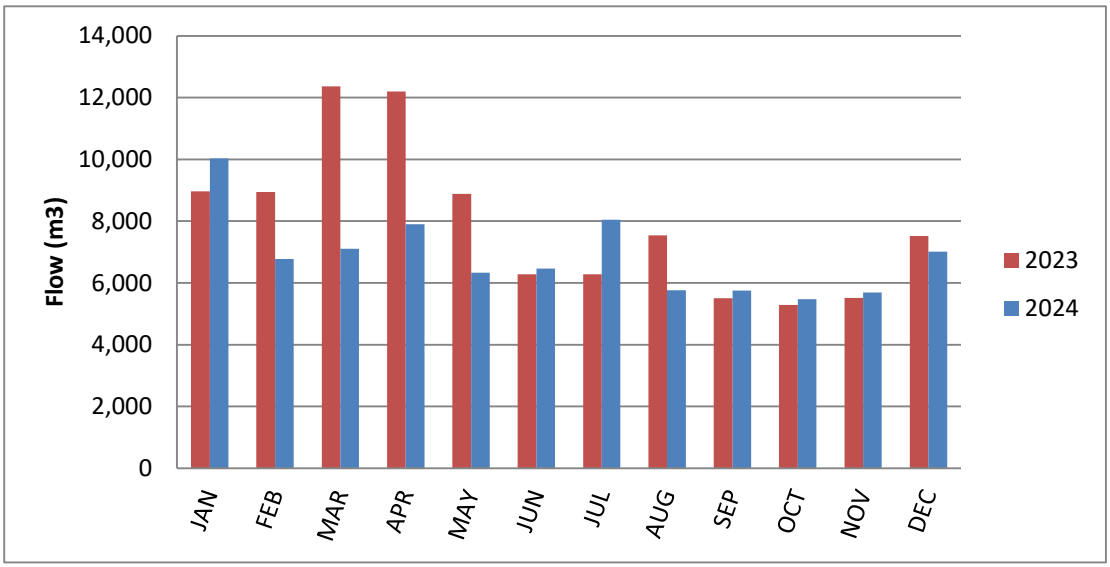


Table 7 below summarizes the raw influent monthly concentrations for 2024. The influent sampling program at the Lagoons requires a monthly grab sample to be collected from the Inlet Manhole. In June, the measured parameters were abnormally high due to a discharge event that occurred during the monthly raw influent grab sample, the investigation into the source was inconclusive and appeared to subside by the end of business day. These sample results are not typical when compared to the rest of the influent sample results for the reporting period and are considered outliers. The June sample results had no negative impact on the treatment of the lagoons when comparing influent data to the fall discharge event data.

TABLE 7 –INFLUENT MONTHLY CONCENTRATIONS

Month	$CBOD_5$ (mg/L)	BOD_5 (mg/L)	Total Suspended Solids (mg/L)	Total Phosphorus (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Field pH	Field Temp (°C)
January	132	145	85	3.60	37.3	8.02	11.2
February	323	264	162	3.94	51.7	7.92	12.3
March	223	215	86	1.57	19.2	8.01	17.4
April	128	127	137	3.97	30.9	7.94	13.3
May	122	195	117	3.89	53.9	7.81	15.3
June	682	1130	1960	21.50	120.0	7.56	18.0
July	71	116	98	2.14	26.3	7.80	21.8
August	81	106	134	3.40	45.8	8.03	19.2
September	147	271	133	5.87	53.2	7.89	22.3
October	117	126	85	3.42	33.6	7.99	15.1
November	114	114	283	2.29	34.0	8.03	17.1
November	192	236	197	4.19	48.0	8.02	15.9
December	133	134	149	3.26	32.2	7.88	16.9
Average	**190**	**245**	**279**	**4.85**	**45.1**	**7.92**	**16.6**

-The sampling program at the lagoons requires a grab sample therefore the samples collected are only representative of what is entering the facility at that moment.

Table 8 below compares the 2023 influent concentrations to the 2024 influent concentrations

TABLE 8 –COMPARISON OF INFLUENT DATA 2023 TO 2024

Parameter	2023	2024	% difference
$CBOD_5$	160	190	+18.7
BOD_5	177	245	+38.4
Total Suspended Solids	145	279	+92.4
Total Phosphorus	4.18	4.85	+16.0
Total Kjeldahl Nitrogen	31	45.1	+45.4

The raw sewage strength entering the Lagoons in 2024 was higher than 2023 with the most noticeable increase in the total suspended solids concentration. Given the increase in influent strength, the treatment at the Lagoons was not negatively impacted. Operations staff will continue to monitor the influent strength throughout the 2025 reporting period.

(A) SPRING DISCHARGE EVENT

ECA # 2829-D5VNWT states that the spring discharge of the Lagoons is to commence no earlier than March 15th and terminate no later than April 30th. The Spring discharge event began on March 18, 2024 with an estimated total volume of 40,000m^3 in the three cells to be discharged. The discharge event was terminated on April 29, 2024. A total volume of 46,143m^3 was discharged from the Lagoons during this time period.

At the end of the discharge event on April 29, 2024, given the Lagoon continued to receive influent, it is estimated that there was approximately 6,600m^3 remaining in the three cells of the Lagoons. With a total available capacity of 50,977m^3, it was estimated that after the Spring discharge event there remained 178 days of storage capacity in the Lagoons (assuming annual average daily capacity of 250m^3/day of influent and not accounting for summer evaporation). This storage capacity was determined to be adequate until the commencement of the Fall discharge period which is permitted on October 15th.

The Tables below outline the data collected from the 2024 Spring discharge event. There were no ECA limit exceedances during the event. However, there was one objective exceedance for unionized ammonia that occurred due to high pH and temperature readings, thus causing the unionized ammonia concentration to exceed the objective of 0.1mg/L.

Tables 9, 10 and 11 below show the data collected from the 2024 Spring discharge event.

TABLE 9 –SPRING 2024 PRE-DISCHARGE RESULTS

	Date	$CBOD_5$ mg/L	TSS mg/L	TP mg/L	TAN mg/L	H_2S mg/L	E.coli cfu/100mL	pH	Temp °C
Cell #1	07-Mar	64.0	43.0	0.31	9.3	<0.02	1080	7.59	6.20
Cell #2	07-Mar	8.0	7.0	0.07	8.7	<0.02	24	7.89	4.40
Cell #3	07-Mar	11.0	5.0	0.05	5.2	<0.02	2	7.80	6.40

TABLE 10 –SPRING 2024 DISCHARGE RESULTS

Percent (%) Draw-down	Date	Flow m^3/d	Vol. Remain m^3	$CBOD_5$ mg/L	$CBOD_5$ kg/d	TSS mg/L	TSS kg/d	TP mg/L	TP kg/d	TAN mg/L	TAN kg/d	E.coli cfu/100mL
Discharge Limits				**30**		**40**		**0.8**				
Discharge Objectives				**25**		**30**		**0.5**				
Start Discharge	18-Mar-24	945.22	<4	3.78	12	11.34	<0.03	0.028	3.4	3.4	3.2	<2
Sample #2 (11.7%)	25-Mar-24	598.75	4	2.40	2	1.20	<0.03	0.018	3.0	3.0	1.8	<2
Sample #3 (25.1%)	01-Apr-24	726.62	<4	2.91	3	2.18	<0.03	0.022	3.1	3.1	2.2	<2
Sample #4 (42.4%)	08-Apr-24	1050.60	<4	4.20	3	3.15	<0.03	0.032	3.4	3.4	3.5	<2
Sample #5 (55.4%)	12-Apr-24	1613.10	<4	6.45	2	3.23	<0.03	0.048	2.7	2.7	4.3	<1
Sample #6 (70.3%)	16-Apr-24	1428.20	<2	2.86	<2	2.86	<0.03	0.043	3.0	3.0	4.2	<2
Sample #7 (82.3%)	19-Apr-24	1747.90	<4	6.99	3	5.24	<0.03	0.052	2.5	2.5	4.3	<2
Sample #8 (99.2%)	21-Apr-24	1565.60	3	4.70	5	7.83	<0.03	0.047	0.7	0.7	1.1	<2
End Discharge (110.8%)	29-Apr-24	377.57	<4	1.51	8	3.02	<0.03	0.011	0.5	0.5	0.2	10

TABLE 11 –SPRING 2024 DISCHARGE RESULTS (CONTINUED)

% Draw-down	Date	pH	Dissolved Oxygen (mg/L)	Temp (°C)	Unionized Ammonia (mg/L)
Discharge Limits		**6.0-9.5**			
Discharge Objectives		**6.0-8.5**			**0.1**
Start Discharge	18-Mar-24	7.95	10.38	9.3	0.05
Sample #2 (11.7%)	25-Mar-24	8.33	11.60	7.7	0.09
Sample #3 (25.1%)	01-Apr-24	8.00	10.89	10.0	0.05
Sample #4 (42.4%)	08-Apr-24	8.07	10.62	12.1	0.08
Sample #5 (55.4%)	12-Apr-24	7.90	9.60	13.0	0.05
Sample #6 (70.3%)	16-Apr-24	8.29	11.60	15.9	0.16
Sample #7 (82.3%)	19-Apr-24	8.04	9.59	12.8	0.06
Sample #8 (99.2%)	21-Apr-24	8.15	10.98	13.8	0.02
End Discharge (110.8%)	29-Apr-24	7.87	7.95	15.1	0.01

(B) FALL DISCHARGE EVENT

The fall discharge event commenced on October 16, 2024 with an estimated total volume of 35,000m^3 in the three cells to be discharged. The discharge event was terminated on December 13, 2024. A total volume of 33,875m^3 was discharged from the Lagoons during this time period. At the end of the discharge event, given the Lagoons continued to receive influent during the event, it is estimated that there was approximately 7,000m^3 remaining in the three cells of the Lagoons. With a total available capacity of 50,977m^3, it was estimated that after the fall discharge event there remained 176 days of storage capacity in the Lagoons (assuming annual average daily capacity of 250m^3/day of influent and not accounting for summer evaporation).

The Tables below show the data collected from the 2024 fall discharge event. There were two ECA objective exceedances and one ECA limit exceedance during the event. The sample collected on December 13, 2024 exceeded the total suspended solids objective and limit with a result of 42 mg/L. This was the final sample prior to the shutdown of the Lagoons discharge. This exceedance was caused by the low operating level in the polishing cell at the end of the discharge event. Due to the low operating level, solids from the sludge blanket

were carried over to the effluent resulting in elevated TSS concentrations. The MECP's Notification of Non-Compliance can be found in *Appendix B*. Additionally, the objective for unionized ammonia was also exceeded during the fall discharge event which occurred due to higher ammonia concentrations.

TABLE 12 – FALL 2024 PRE DISCHARGE

	Date	$CBOD_5$ mg/L	TSS mg/L	TP mg/L	TAN mg/L	H_2S mg/L	E.coli cfu/100mL	pH	Temp °C
Cell #1	03-Oct-24	4.0	6.0	<0.03	0.7	<0.02	56	7.63	22.8
Cell #2	03-Oct-24	11.0	8.0	0.05	6.2	<0.02	188	7.77	22.5
Cell #3	03-Oct-24	13.0	7.0	<0.03	0.4	<0.02	54	8.29	22.8

TABLE 13 – FALL 2024 DISCHARGE RESULTS

Percent (%) Draw-down	Date	Flow m^3/d	$CBOD_5$ mg/L	$CBOD_5$ kg/d	TSS mg/L	TSS kg/d	TP mg/L	TP kg/d	TAN mg/L	TAN kg/d
Discharge Limits			**30**	**152.1**	**40**		**0.8**			
Discharge Objectives			**25**		**30**		**0.5**			
Start Discharge	16-Oct-24	556.4	<4	2.23	<2	1.11	<0.03	0.02	0.1	0.06
Sample #2 (12.0%)	22-Oct-24	690.3	<4	2.76	5	3.45	<0.03	0.02	0.2	0.14
Sample #3 (27.7%)	28-Oct-24	878.7	<4	3.51	<2	1.76	<0.03	0.03	0.1	0.09
Sample #4 (38.1%)	01-Nov-24	945.2	<4	3.78	3	2.84	<0.03	0.03	0.5	0.47
Sample #5 (48.4%)	05-Nov-24	854.5	<4	3.42	2	1.71	<0.03	0.03	0.8	0.68
Sample #6 (56.0%)	08-Nov 24	1149.1	4	1.21	3	0.91	<0.03	0.01	2.2	0.67
Sample #7 (65.2%)	12-Nov-24	832.0	<4	3.33	2	1.66	<0.03	0.02	2.4	2.00
Sample #8 (77.4%)	18-Nov-24	640.2	4	2.56	7	4.48	<0.03	0.02	3.7	2.37
End Discharge (94.5%)	13-Dec-24	66.5	6	0.40	42	2.79	0.19	0.01	11.6	0.77

TABLE 14 – FALL 2024 DISCHARGE RESULTS CONTINUED

Percent (%) Draw-down	Date	E.coli 100mL/cfu	pH	Dissolved Oxygen mg/L	Temp °C	Unionized Ammonia mg/L
Discharge Limits			**6.0-9.5**			
Discharge Objectives			**6.0-8.5**			**0.1**
Start Discharge	16-Oct-24	30	8.35	11.39	15.0	0.006
Sample #2 (12.0%)	22-Oct-24	76	8.23	9.58	11.6	0.007
Sample #3 (27.7%)	28-Oct-24	58	8.14	9.66	15.3	0.004
Sample #4 (38.1%)	01-Nov-24	76	7.77	9.36	15.6	0.008
Sample #5 (48.4%)	05-Nov-24	48	7.99	9.85	17.7	0.020
Sample #6 (56.0%)	08-Nov 24	2	7.64	8.38	14.5	0.020
Sample #7 (65.2%)	12-Nov-24	22	8.01	10.95	10.0	0.040
Sample #8 (77.4%)	18-Nov-24	28	7.68	9.20	13.0	0.040
End Discharge (94.5%)	13-Dec-24	46	7.88	5.83	5.0	0.108

Table 15 and 16 below show the effluent limits maximum concentrations, and maximum waste loadings comparisons for the spring and fall discharge events. The average concentrations and loadings from both events in 2024 were well below the limits set in ECA# 2829-D5VNWT (dated November 19, 2024) Section (7)(1) Table 2.

TABLE 15– EFFLUENT LIMITS MAXIMUM CONCENTRATION COMPARISONS

	Max. Concentration (mg/L)	Spring Discharge Event (avg)	Fall Discharge Event (avg)
$CBOD_5$	30	3.67	4.22
TSS	40	4.44	7.56
TP	0.8	0.03	0.05
pH	6.0-9.5	7.87-8.33	7.64-8.35

TABLE 16– EFFLUENT LIMITS OF $CBOD_5$ WASTE LOADINGS COMPARISONS

	Max. Waste Loading (kg/d)	Average Waste Loadings Spring Discharge Event (kg/d)	Average Waste Loadings Fall Discharge Event (kg/d)
Spring Discharge	152.1	3.98	--
Fall Discharge	12.3	--	2.58

SECTION B – FAIRCHILD CREEK MONITORING

There were no requirements to monitor Fairchild Creek during the spring discharge event of 2024 since the event did not extend beyond April 30th, as per section 8(A) Special Operations-Seasonal Discharge of ECA # 2829-D5VNWT and therefore cannot be compared to the Provincial Water Quality Objectives (PWQO).

SECTION C - OPERATING PROBLEMS ENCOUNTERED

There were no operational problems encountered in 2024.

SECTION D - MAINTENANCE

(I) UPGRADES

There were no upgrades completed at the Cainsville Lagoons in 2024.

(II) MAINTENANCE

The following maintenance was performed at the Cainsville Lagoons in 2024:

TABLE 17– MAINTENANCE

Date	Maintenance
09-Feb-24	Alliance on site switching alarms to new system
29-Apr-24	Contractor on site replacing discharge valve of cell #2
02-May-24	ESA Inspection
31-Oct-24	Aerator #2 in cell #2 not running, reset breaker, still tripped out. Taken out of service for repairs. The aerator shaft had seized and is expected to be back in service Spring 2025.
10-Dec-24	Contractor's on site repairing north side of berm on cell #3

(III) ALARMS

The following after hour alarms occurred at the Lagoons in 2024:

TABLE 18– AFTER HOUR ALARMS

Date	Alarm	Actions Taken
13-Jan-24	Chemical Pump Fault	Power dip – reset chemical pumps and aerator. No other issues found.
25-May-24	Chemical Pump Fault	Power dip – reset chemical pumps and aerator. No other issues found.
15-Jun-24	Chemical Pump Fault	Power dip – reset chemical pumps and aerator. Aerator #2 wouldn't restart, taken out of service. Electrician fixed breaker on aerator #2 and reset on June 18th, working fine and place back into service.
30-Jun-24	Chemical Pump Fault	Power dip – reset chemical pumps and aerator. No other issues found.
24-Jul-24	Chemical Pump Fault	Power dip – reset chemical pumps and aerator. No other issues found.

SECTION E - EFFLUENT QUALITY ASSURANCE

Three (3) control measures have been incorporated at the Cainsville Lagoons System in order to assist with effluent quality assurance for the discharge events. These control measures are discussed below.

(I) IN HOUSE TESTING

In house laboratory testing is conducted on the effluent for total suspended solids, total phosphorous, pH, temperature and dissolved oxygen to determine the effluent quality during the discharge periods.

(II) CHEMICAL DOSING SYSTEM

A continuous Clar+Ion A505P dosing system is utilized at the Lagoons to assist with phosphorus removal and promote solids settling. The chemical phosphorus removal is achieved through the settling of the metal phosphate precipitate with the sludge thus

reducing the total phosphorus concentrations and promoting sludge settling to reduce total suspended solids concentrations.

The chemical dosing system is installed in a building that includes two chemical storage tanks, one chemical delivery pump, associated piping and appurtenances. Chemical is dosed into the manhole immediately upstream of the metering chamber and the distribution manhole. The chemical injection is flow paced based on feedback from the Lagoons influent flow meter.

(III) SUBSURFACE AERATOR SYSTEM

Two (2) 5 horsepower Subsurface Aerator Units were installed in 2015, one in each of the primary cells. The system was commissioned on July 30, 2015. Historically, the Lagoons cells required batch dosing of Alum to increase settling and in turn, decrease $CBOD_5$. Since the installation of the aerators, it is evident that the $CBOD_5$ concentrations have decreased and there has not been a necessity to batch dose the Lagoons prior to the discharge events.

SECTION F - CALIBRATIONS

Bi-annual calibrations of the influent and effluent flow meters are required at the Lagoons. Calibrations are scheduled prior to each discharge event. Calibrations were complete in 2024 on March 15 and October 11, 2024; on the influent and effluent discharge meters. Calibration reports can be found in *Appendix A*. All other instrumentation at the facility (pH, DO meters) is verified and/or calibrated by OCWA operators as per manufacturer's instructions.

SECTION G - EFFLUENT OBJECTIVES

There was one objective exceedance during the 2024 spring discharge event for unionized ammonia that occurred due to high pH and temperature readings, which caused the exceedance of the objective of 0.1mg/L. Operations staff closely monitored the in house testing results throughout the discharge event, to ensure the ammonia results were low in order for the unionized ammonia calculation to achieve the ECA objective.

There were two objective exceedances during the 2024 Fall discharge for unionized ammonia and total suspended solids. The unionized ammonia objective exceedance occurred due to the higher ammonia concentration reported for the final sample collected on December 13, 2024. Refer to Table 13 and 14. Ammonia concentrations will continue to be closely monitored, prior to, and during the 2025 spring discharge. The total suspended solids objective (30mg/L) was also exceeded on the final sample of the fall discharge due to the low operating level in the polishing cell.

Effluent pH was maintained within the specified ranges, inclusive, at all times from the Works as noted in Table 14 above. There were no visible signs of free floating and settleable solids, sheen, film, or discoloration from the effluent entering the receiving waters.

The average daily sewage flow did not exceed the annual daily average capacity of 250m^3/day.

SECTION H –VOLUME OF SLUDGE GENERATED

The sludge in the lagoons is allowed to settle out within the cells and remains on the bottom of the Lagoons until dredging. Based on incoming flows and total suspended solids concentrations the estimated sludge generated during the reporting period was 22,630 kg. The 2025 sludge production estimated to be the same.

No Lagoon cells were cleaned out in 2024. Cell #1 was dredged in 2012 and Cell #2as dredged in 2017.An ECA amendment application was submitted to the MECP on November 15, 2022 requesting revisions to the dredging frequency requirements. The MECP updated the Cainsville Lagoons System ECA (#2829-D5VNWT) and removed the dredging frequency clause. Going forward the cells will be dredged based on findings from sediment surveys which are completed on a bi-yearly basis. The last surveys were completed in July 2023 which found that cell#1 had a slightly higher sediment level than cell #2. This is expected based on the previous schedule of dredging. The cells have a higher accumulation of sediment around their inlets and outlets, which correlates with the direction and velocity of flow through the system. The 2023 sediment surveys did not indicate the need for dredging at that time. Based on historical trends, it is estimated that cell #1 may require dredging within the next 2-4 years and cell #2 may require dredging in 6-8 years. The next sediment surveys will be completed in 2025 and will provide a more accurate dredging timeline.

SECTION I - SUMMARY OF COMPLAINTS RECEIVED

The Lagoons did not receive any complaints during 2024

SECTION J - SUMMARY OF BY-PASS EVENTS

The Lagoons were not involved in any extended contingency discharges, spills, by-passes or emergency discharge events during the 2024 reporting period.

SECTION K – OTHER INFORMATION

There is no additional information to report for the Cainsville Lagoons System for 2024.

APPENDIX A

CALIBRATION RECORDS

Industrial Technical Services
5080 Timberlea Blvd, Unit 35,
Mississauga, ON L4W 4M2
Ph: 905-275-2717 Fax: 905-275-2724
www.itsinstruments.com

Certificate No: 36108-001

Certificate Of Calibration

Customer:
Ontario Clean Water Agency
120 Race Street, Paris, ON N3L 3X2
Phone: (519) 442-3255
Fax: (519) 442-2616

Cal. Date: March 15, 2024
Due Date: September, 2024

Instrument Identification:
Description: Flow Indicator/Transmitter
Manufacturer: Milltronics
Model No: OCMIII
Serial No: N/Av
Range: 0 to 50 l/s / 0 to 27.6399 cm
Tolerance: ± 2% FS
Tag No: N/Av
Location: Cainsville Lagoon - Effluent Discharge

Program Parameters

PAR	SETTING	
	Entry	Description
P0	0	English
P1	0	Centimetres
P2	0	Celsius
P3	0	Exponential Device
P4	1	Ratiometric
P5	0	liters/second
P6	50	Flow@Max Head (l/s)
P7	27.63999	Maximum Head (cm)
U0	1.58	Parshall Flume
P13	0	Off
P14	0	Display Lighting (On)
P15	0	Relay 1 (Not in service)
P18	0	Relay 2 (Not in service)
P21	0	Relay 3 (Not in service)
P24	0	mA Assignment (Flow rate)
P26	0	mA Span (4 to 20)

PAR	SETTING	
	Entry	Description
P27	10	mA - Damping (Seconds)
P28	0	Don't track Emulator
P29	60	Fail Safe Time (Seconds)
P30	0	Hold Last Value
P32	4	Totalizer Value (x10)
P33	2	4 Decimal Places
P34	0	Never Print
P36	0	1 Sec Measurement Interval
P37	5	Baud 9600
P38	0	Site Number (None)
P39	2	15 min - Data Logging rate
P42	0	Head Determine (by OCM III)
P45	0	Low Flow Cut Off (cm)
P46	69.36129	Range at Zero Head (cm)
P47	39.86	Blanking Distance (cm)

Test Report:

AS FOUND		
Reference	*Instrument*	*Error*
cm	cm	%FS
0.0	0.00	0.00

AS LEFT		
Reference	*Instrument*	*Error*
cm	cm	%FS
0.0	0.00	0.00

Standards Used:

Asset No	*Manufacturer*	*Calibration Date*	*Due Date*
RUL001	Starrett	June 20, 2023	June 20, 2024

	Yes	No		Yes	No
Passed:	✓		*As found in tolerance:*	✓	
Failed:			*As left in tolerance:*	✓	
Calibration Sticker applied?	✓		*Repair performed:*		✓
Restricted Use:			*Adjustment performed:*		✓

Comments: None.

Performed By: A. Shah, Technician — *Issue Date:* March 15, 2024
Reviewed By ITS: C. Ramnarine, Service Manager — *Date:* March 15, 2024
Reviewed By Customer: _____

Industrial Technical Services
5080 Timberlea Blvd, Unit 35,
Mississauga, ON L4W 4M2
Ph: 905-275-2717 Fax: 905-275-2724
www.itsinstruments.com

Certificate No: 36948-001

Certificate Of Calibration

Customer:
Ontario Clean Water Agency
120 Race Street, Paris, ON N3L 3X2
Phone: (519) 442-3255
Fax: (519) 442-2616

Cal. Date: October 11, 2024
Due Date: April, 2025

Instrument Identification:
Description: Flow Indicator/Transmitter
Manufacturer: Milltronics
Model No: OCMIII
Serial No: N/Av
Range: 0 to 50 l/s / 0 to 27.6399 cm
Tolerance: ± 2% FS
Tag No: N/Av CMMS#386839
Location: Cainsville Lagoon - Effluent Discharge

Program Parameters

PAR	SETTING	
	Entry	Description
P0	0	English
P1	0	Centimetres
P2	0	Celsius
P3	0	Exponential Device
P4	1	Ratiometric
P5	0	liters/second
P6	50	Flow@Max Head (l/s)
P7	27.63999	Maximum Head (cm)
U0	1.58	Parshall Flume
P13	0	Off
P14	0	Display Lighting (On)
P15	0	Relay 1 (Not in service)
P18	0	Relay 2 (Not in service)
P21	0	Relay 3 (Not in service)
P24	0	mA Assignment (Flow rate)
P26	0	mA Span (4 to 20)

PAR	SETTING	
	Entry	Description
P27	10	mA - Damping (Seconds)
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P29	60	Fail Safe Time (Seconds)
P30	0	Hold Last Value
P32	4	Totalizer Value (x10)
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P34	0	Never Print
P36	0	1 Sec Measurement Interval
P37	5	Baud 9600
P38	0	Site Number (None)
P39	2	15 min - Data Logging rate
P42	0	Head Determine (by OCM III)
P45	0	Low Flow Cut Off (cm)
P46	69.36129	Range at Zero Head (cm)
P47	39.86	Blanking Distance (cm)

Test Report:

AS FOUND		
Reference	*Instrument*	*Error*
cm	cm	%FS
0.0	0.00	0.00

AS LEFT		
Reference	*Instrument*	*Error*
cm	cm	%FS
0.0	0.00	0.00

Standards Used:

Asset No	*Manufacturer*	*Calibration Date*	*Due Date*
RUL001	Starrett	December 20, 2024	December 20, 2025

	Yes	*No*
Passed:	✓	
Failed:		
Calibration Sticker applied?	✓	
Restricted Use:		

	Yes	*No*
As found in tolerance:	✓	
As left in tolerance:	✓	
Repair performed:		✓
Adjustment performed:		✓

Comments: None.

Performed By: A. Shah, Technician — *Issue Date:* March 15, 2024

Reviewed By ITS: C. Ramnarine, Service Manager — *Date:* March 15, 2024

Reviewed By Customer: _____

Industrial Technical Services certifies that calibration was done using test equipment which are certified and traceable to NRC and/or NIST.
Our quality system complies with the requirements of ISO 9001:Current Version.

APPENDIX B

LETTER TO MECP ON FALL DISCHARGE TSS EXCEEDANCE

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Southwest Region – Paris Cluster
120 Race St, Paris ON N3L 3X2

NOTIFICATION OF NON-COMPLIANCE

December 30th, 2024

Ivanna Okroukh
Ministry of the Environment, Conservation and Parks
1 Stone Road West. 4th Floor
Guelph, Ontario
N1G 4Y2

Dear Ms. Okroukh,

RE: Notification of Non-Compliance with ECA Effluent Limits

This is a notification of non-compliance with an effluent limit for the Cainsville Lagoon submitted in accordance with the terms and conditions of Environmental Compliance Approval 2829-D5VNWT dated November 19th, 2024, and provisions of the *Ontario Water Resources Act* and *Environmental Protection Act*. This written notice confirms the verbal notification provided on December 23rd, 2024 at 13:25pm via voicemail.

The following effluent limit was exceeded:

Parameter	Date of Non-Compliance (yyyy-mm-dd)	Type of Limit	Type of Sample	Result (Specify Units)	ECA Effluent Limit
Total Suspended Solids	2024-12-13	Daily Concentration	Discharge, Effluent, Grab	42 mg/L	40 mg/L

In accordance with the ECA, samples are collected at approximately 10% drawdown increments, with a minimum requirement of five samples during the discharge period. The Fall discharge of the lagoon is permitted as early as October 15th to December 15th. The TSS exceedance on December 13th was on the final shut down sample. Historically, near the end of the discharge period, the low liquid level in the polishing cell can expose the sludge layer and cause an

increase in the effluent TSS concentrations . The elevated TSS levels in the final sample are suspected to have been caused by the low level. As per the Table below, all other samples collected during the discharge period met the compliance limits specified in the ECA.

Upon completion of the Fall discharge, there is sufficient storage in the lagoon until the 2025 Spring discharge. The complete results of the Fall discharge sampling are included in the table below.

Lab Analysis of Fall Discharge Samples:

% Draw-down	Date	$CBOD_5$ (mg/l)	$CBOD_5$ (kg/d)	TSS (mg/l)	TSS (kg/d)	TP (mg/l)	TP (kg/d)	TAN (mg/l)	TAN (kg/d)	E.Coli (100mL/cfu)
Discharge Limits		**30**	**152.1**	**40**		**0.8**				
Discharge Objectives		**25**		**30**		**0.5**				
Start Discharge	16-Oct-24	4	2.23	2	1.11	0.03	0.02	0.1	0.06	30
Sample #2	22-Oct-24	4	2.76	5	3.45	0.03	0.02	0.2	0.14	76
Sample #3	28-Oct-24	4	3.51	2	1.75	0.03	0.03	0.1	0.09	58
Sample #4	01-Nov-24	4	3.78	3	2.84	0.03	0.03	0.5	0.47	76
Sample #5	05-Nov-24	4	3.42	2	1.71	0.03	0.03	0.8	0.68	48
Sample #6	08-Nov-24	4	1.21	3	0.91	0.03	0.01	2.2	0.67	2
Sample #7	12-Nov-24	4	3.33	2	1.66	0.03	0.02	2.4	2.00	22
Sample #8	18-Nov-24	4	2.56	7	4.48	0.03	0.02	3.7	2.37	28
End Discharge	13-Dec-24	6	0.40	42	2.79	0.19	0.01	11.6	0.77	46

Should you have any questions or concerns please do not hesitate to contact me.

Sincerely,

Meagan Lowden
Ontario Clean Water Agency
Process and Compliance Technician

Southwest Region - Paris Cluster
C-226-387-1292

Cc/ Matthew D'Hondt – County of Brant
Ben Madill – Senior Operations Manager, OCWA
Maegan Garber- Safety, Process, and Compliance Manager, OCWA
Sam Sianas- Regional Hub Manager, OCWA