Brechin/Lagoon City Sewage Treatment Plant

Annual Wastewater Performance Report

Prepared For: The Township of Ramara

Reporting Period of January 1st – December 31st, 2023

Issued: March 28, 2024
Revision: 0

Operating Authority:

OCWA
ONTARIO CLEAN WATER AGENCY
AGENCE ONTARIENNE DES EAUX

Table of Contents

List of Tables

Appendicies

Appendix I Performance Assessment Report
Appendix II Annual Calibration Reports
Appendix III Biosolids Summary

Background:

The Environmental Compliance Approval (ECA) No. 1114-745MQT issued on June 6th, 2007 was revoked and replaced by ECA No. 8497-8D3TU7 issued on June 28th, 2012. The Ontario Clean Water Agency was the operating authority during the reporting period January 1st-December 31st, 2023.

The Brechin/Lagoon City Sewage Works complies with all requirements of the regulating authorities and operates under:

- Environmental Compliance Approval (ECA) No. 8497-8D3TU7 issued June 28, 2012
- Environmental Compliance Approval (CLI-ECA) No. 147-W601 issued April 5, 2023

Environmental Certificate of Approval (ECA) No. 8497-8D3TU7 Section 9(5) requires the Performance Report to contain the following:

a) *Summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Condition 5, including on overview of the success and adequacy of the sewage Works;*

b) *a description of any operating problems encountered and corrective actions taken;*

c) *a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the Works;*

d) *a summary of any effluent quality assurance or control measures undertaken in the reporting period;*

e) *a summary of the calibration and maintenance carried out on all effluent monitoring equipment;*

f) *a description of efforts made and results achieved in meeting the Design Objectives of Condition 4;*

g) *a tabulation of the volume of sludge generated in the reporting period, an outline of anticipated volumes to be generated in the next reporting period and a summary of the locations to where the sludge was disposed;*

h) *a summary of any complaints received during the reporting period and any steps taken to address the complaints;*

i) *a summary of all By-pass, spill or abnormal discharge events;*

j) *Status update of the initial effluent characterization as per Condition 8 subsection (1) until it has been completed and the required report has been submitted; and*

k) *any other information the District Manager requires from time to time*

Environmental Compliance Approval (CLI-ECA) No. 147-W601 issued April 5, 2023 Section 4.6 requires the Performance Report to contain the following:

a) *A summary of all required monitoring data along with an interpretation of the data and any conclusion drawn from the data evaluation about the need for future modifications to the Authorized System or system operations.*

b) *A summary of any operating problems encountered and corrective actions taken.*

c) *A summary of all calibration, maintenance and repairs carried out on any major structure, Equipment, apparatus, mechanism, or thing forming part of the Municipal Sewage Collection System.*

d) *A summary of complaints related to the Sewage Works received during the reporting period and nay steps taken to address the complaints.*

e) *A summary of Alterations to the Authorized System within the reporting period that are authorized by this Approval including a list of Alterations that pose a Significant Drinking Water Threat.*

f) *A summary of all Collection System Overflow(s) and Spill(s) of Sewage, including:*
i) Dates;
ii) Volumes and durations
iii) If applicable, loading for total suspended solids, BOD, total phosphorus, and total Kjeldahl nitrogen, and sampling results for E. coli;
iv) Disinfection, if any; and
v) Any adverse impact(s) and corrective actions, if applicable.

g) *A summary of efforts made to reduce Collection System Overflows, Spills, STP Overflows, and/or STP Bypasses, including items, as applicable:*
i) A description of projects undertaken and completed in the Authorized System that result in overall overflow reduction or elimination including expenditures and proposed projects to eliminate overflows with estimated budget forecast for the year following that for which the report is submitted.
ii) Details of the establishment and maintenance of a PPCP, including a summary of project progresses compared to the PPCP's timelines.
iii) An assessment of the effectiveness of each action taken.
iv) An assessment of the ability to meet Procedure F-5-1 or Procedure F-5-5 objectives (as applicable) and if able to meet the objectives, an overview of next steps and estimated timelines to meet the objectives.
v) Public reporting approach including proactive efforts.

This report will show that the Ontario Clean Water Agency has made every attempt to achieve its goals through its operational performance. This performance was enhanced through the use of an electronic process data collection database, an electronic maintenance and work order database, an electronic operational excellence database, a training program focused on providing the right skills to staff - also captured and tracked by the use of an electronic database and a multi-skilled, flexible workforce.

This report will show that the requirements of the facility ECA including effluent monitoring and reporting requirements were consistently met and that effluent quality was consistently within ECA requirements.

ECA No. 8497-8D3TU7 Condition 9(5)(a)

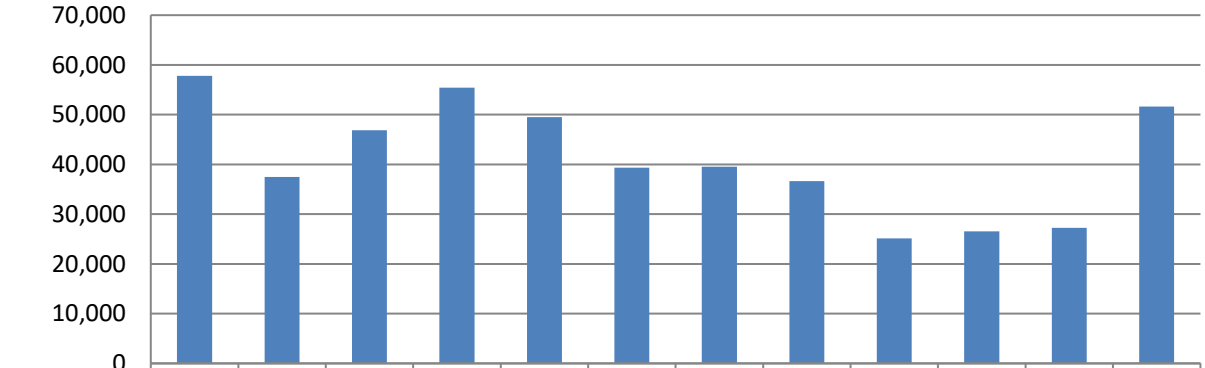
Summary of Influent Flow Data

Environmental Compliance Approval (ECA) No. *8497-8D3TU7*, issued for the Brechin/Lagoon City WWTP Condition 9(5)(a) requires a Summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Condition 5, including on overview of the success and adequacy of the sewage Works.

Condition *4(2)(b) of the (ECA) No. 8497-8D3TU7 indicates best efforts are to be made to operate at the rated capacity of the works. The rated capacity for the Brechin/Lagoon City Wastewater Treatment Plant is 2,273 m³/day and the annual average daily influent flow was 1,351.32 m³/day or 59.45 % of the rated capacity.*

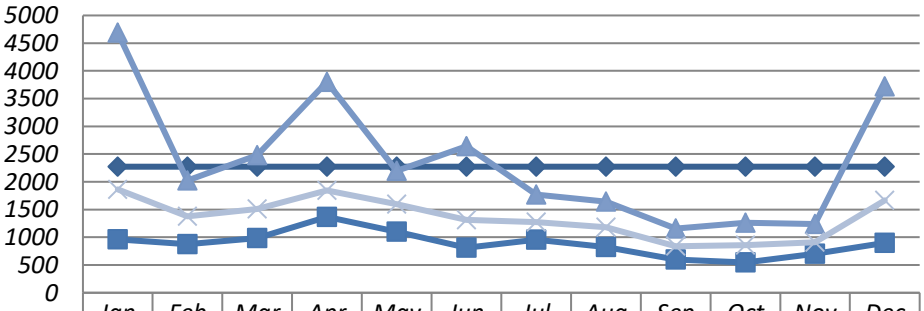
The total Influent flow in 2023 was 493,230.30 m³

Graph 1: 2023 Influent Flow Monthly Totals



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flow (m³)	57,774	37,457	46,859	55,431	49,529	39,370	39,518	36,649	25,160	26,575	27,249	51,660

Graph 2: 2023 Influent Daily Minimum, Maximum and Average Flows



	Jan	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*
Rated Capacity (m³/day)	*2273*	*2273*	*2273*	*2273*	*2273*	*2273*	*2273*	*2273*	*2273*	*2273*	*2273*	*2273*
Min (m³/day)	*961*	*875*	*986*	*1368*	*1100*	*810*	*954*	*825*	*599*	*546*	*704*	*897*
Max (m³/day)	*4687*	*2026*	*2480*	*3802*	*2198*	*2643*	*1771*	*1642*	*1157*	*1261*	*1239*	*3722*
Avg (m³/day)	*1864*	*1378*	*1512*	*1848*	*1598*	*1312*	*1275*	*1182*	*839*	*857*	*908*	*1666*

Note: The above table shows exceedances in maximum flows during January, March, April, June and December. The spikes in flows were due to weather events/snowmelt in correlation with significant inflow and infiltration during these weather events. However, the average daily flow for the works was below the rated capacity.

Brechin Lagoon City Sewage Works Historical Flows

Table 1: Historical Sewage Flows and Generation Rates

Year	Number of Connections*	Equivalent Population**	Average Daily Flow (m³/day)	Maximum Daily Flow (m³/day)	Rated Capacity (m³/day)	Sewage Generation Rate (L/cap/day)
2013	1159	2408	1341	3204	2273	557
2014	1159	2414	1641	5094	2273	681

2015	1162	2414	1262	3313	2273	523
2016	1165	2420	1255	4735	2273	517
2017	1170	2431	1566	4213	2273	644
2018	1174	2439	1430	4260	2273	586
2019	1175	2441	1481	3686	2273	607
2020	1179	2650	1393	3462	2273	526
2021	1179	2650	1257	3995	2273	474
2022	1140	2391	1165	3853	2273	487
2023	1142	2395	1351	4687	2273	564
3 Year Average		2564	1272	3995	2273	508

*The number of connections were recalculated by the Township of Ramara, the number of connections in 2023 reflect the number that will be used going forward.
**Based on estimated service connections in Lagoon City and Brechin: 1000 and 152 single family dwellings. The estimated population in Lagoon City: 2,000 (based on a population density of 2.0 persons per dwelling), and the estimated population in Brechin: 395 (based on a population density of 2.6 persons per dwelling). Assumptions made on location of new developments for 2023 connections for population estimation.
Note: This calculation was completed based on current connections in the system, growth within the collection system has not been considered.
Note: Typically, the system is well under the design capacity, significant inflow and infiltration during wet weather events skew the reserve capacity results.

Hydraulic Reserve Capacity
In accordance with the MECP Procedure D-5-1, the reserve capacity is calculated by the following formula:
Hydraulic Reserve Capacity= Design Flow- Committed Flow

The design flow is equal to the maximum permissible flow approved by the Amended Environmental Compliance Approval. (ECA) No. 8497-8D3TU7 maximum permissible flow is: 2273 m³/day. The committed flow is equal to the total expected flow by the existing and proposed connections based on the previous 3-year average daily flow.

The built-out service area of the Brechin/Lagoon City Sewage Works has a total of 1269 units. The three-year (2021-2023) average sewage generation rate is: 508 L/cap/day. With the current population of 2395 there is a projection of 1,217 m³/day of committed sewage flow. The estimated hydraulic reserve capacity for the Brechin Lagoon City Sewage Works in 2023 is 1056 m³/day.

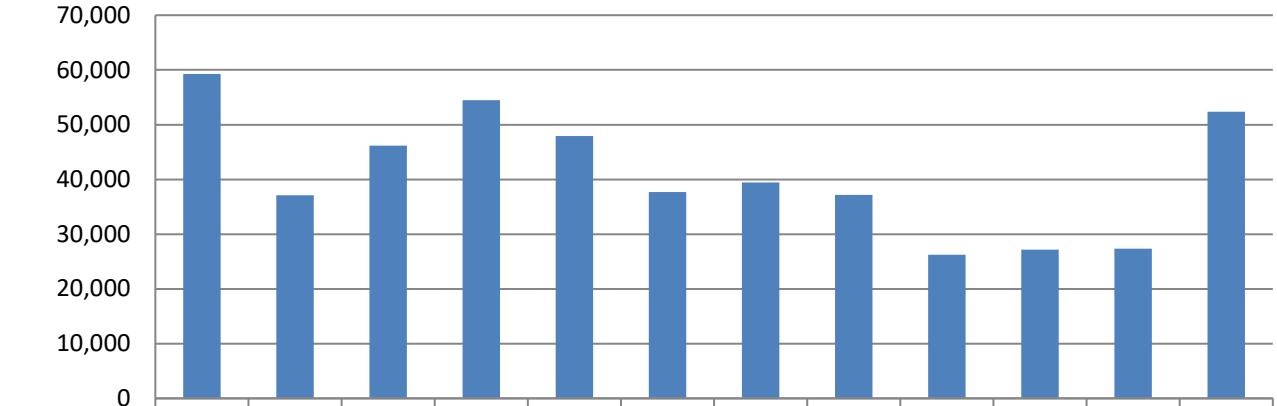
Summary of Effluent Flow Data

Environmental Compliance Approval (ECA) No. *8497-8D3TU7*, issued for the Brechin/Lagoon City WWTP Condition 9(5)(a) requires a summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Condition 5, including on overview of the success and adequacy of the sewage Works.

Condition 4(2)(b) of the (ECA) No. *8497-8D3TU7* indicates best efforts are to be made to operate at the rated capacity of the works. The rated capacity for the Brechin/Lagoon City Wastewater Treatment Plant is 2,273 m³/day and the annual average daily effluent flow was 1,349.12m³/day or 59.4 % of the rated capacity

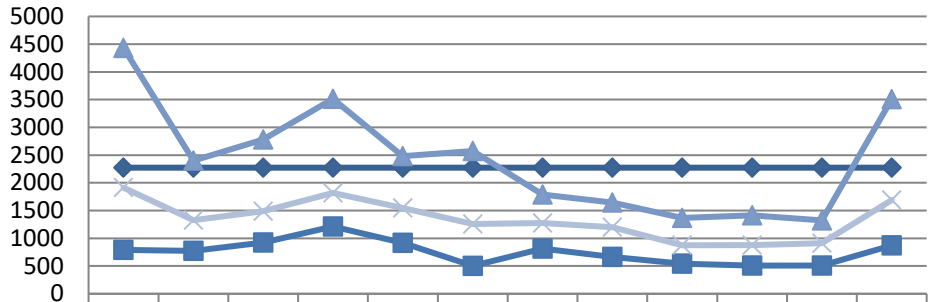
The total effluent flow in 2023 was 492 430 m³

Graph 3: 2022 Effluent Flow Monthly Totals



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flow (m3)	59,285	37,128	46,191	54,499	47,907	37,712	39,449	37,171	26,222	27,193	27,324	52,349

Graph 4: 2023 Effluent Daily Minimum, Maximum and Average Flows



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rated Capacity (m^3/day)	2273	2273	2273	2273	2273	2273	2273	2273	2273	2273	2273	2273
Min (m^3/day)	788	774	924	1212	915	503	814	666	542	506	508	872
Max (m^3/day)	4432	2398	2782	3513	2479	2571	1787	1647	1368	1413	1323	3505
Avg (m^3/day)	1912	1326	1490	1817	1545	1257	1273	1199	874	877	911	1689

Note: The above table shows exceedances in maximum flows during January through June and December. The spikes in flows were due to weather events/snowmelt in correlation with significant inflow and infiltration during these weather events. However, the average daily flow for the works was below the rated capacity.

Summary of Sampling Frequency

ECA No. *8497-8D3TU7* Condition 7(3) describes the requirement for sample collection at the following locations, frequencies and by means of the specified sample type and analyzed for each parameter listed and all results recorded:

Table 2: Minimum Raw Sewage Sampling Requirements

Influent Sampling Point		
Parameters	**Sample Type**	**Frequency**
BOD5	8 Hour Daytime Composite	Monthly
Total Suspended Solids	8 Hour Daytime Composite	Monthly
Total Phosphorus	8 Hour Daytime Composite	Monthly
Total Kjeldahl Nitrogen	8 Hour Daytime Composite	Monthly

Table 3: Minimum Effluent Sampling Requirements

Final Effluent Sampling Point		
Parameters	**Sample Type**	**Frequency**
CBOD5	24-Hour Composite	Weekly
Total Suspended Solids	24-Hour Composite	Weekly
Total Phosphorus	24-Hour Composite	Weekly
Total Ammonia Nitrogen	24-Hour Composite	Weekly
Nitrates	24-Hour Composite	Weekly
pH	Grab/Probe	Weekly
Temperature	Grab/Probe	Weekly
E. coli	Grab	Weekly

Final Effluent Parameter Summary

The following tables provide a summary of the monitoring data for the Brechin/Lagoon City WWTP compared to the effluent limits and objectives outlined in Condition 4 and 5 of ECA No. *8497-8D3TU7*.

A summary of the Final Effluent and Raw Sewage monitoring data is contained in Appendix I of this report.

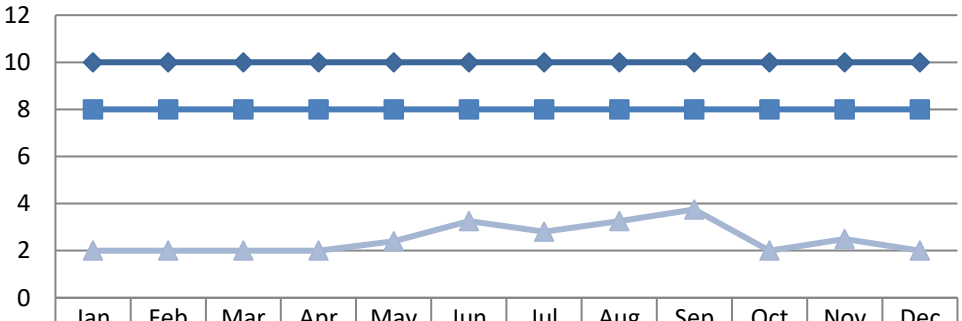
Carbonaceous Biochemical Oxygen Demand (CBOD5)

ECA No. *8497-8D3TU7* sets the CBOD5 monthly average concentration limit at 10.00 mg/L and the objective at 8.0 mg/L. The monthly CBOD5 average concentration results throughout 2023 were in compliance with the limits and objectives outlined in ECA No. *8497-8D3TU7*.

CBOD5 Monthly Average Concentration

The monthly CBOD5 average concentration limit and monthly concentration objective were met each month in 2023.

Graph 5: 2023 Monthly CBOD5 Final Effluent Concentration Comparisons



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit (mg/L)	10	10	10	10	10	10	10	10	10	10	10	10
Objective (mg/L)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Avg (mg/L)	2.0	2.0	2.0	2.0	2.4	3.3	2.8	3.3	3.8	2.0	2.5	2.0

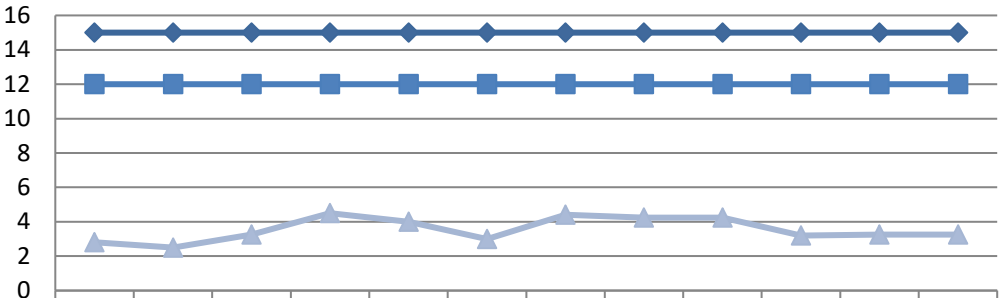
Total Suspended Solids (TSS)

ECA No. *8497-8D3TU7* sets the TSS monthly average concentration limit at 15.0 mg/L and the objective at 12.0 mg/L. The monthly TSS average concentration results throughout 2023 were in compliance with the limits and objectives outlined in ECA No. *8497-8D3TU7*.

Total Suspended Solids Monthly Average Concentration

The monthly TSS monthly average concentration limit and monthly concentration objective were met each month in 2023.

Graph 6: 2023 Monthly TSS Final Effluent Concentration Comparisons



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit (mg/L)	15	15	15	15	15	15	15	15	15	15	15	15
Objective (mg/L)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Avg (mg/L)	2.8	2.5	3.3	4.5	4.0	3.0	4.4	4.3	4.3	3.2	3.3	3.3

Total Phosphorus (TP)

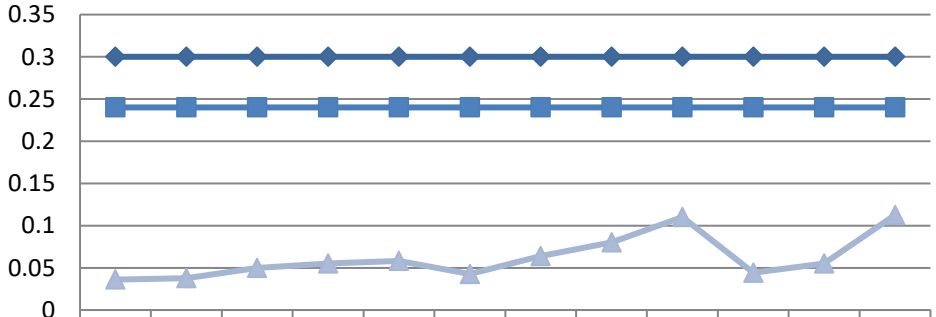
ECA No. *8497-8D3TU7* sets the TP monthly concentration limit at 0.30 mg/L, the objective at 0.24mg/L and the annual average waste loading at 249 kg/year. The monthly TP average concentration results and annual average waste loading results throughout 2023 were in compliance with the limits and objectives outlined in ECA No. *8497-8D3TU7*.

Condition 5(2) of ECA No*. 8497-8D3TU7* lists the Lake Simcoe Phosphorus Reduction Strategy effluent limits. These limits are set at an annual average concentration of 0.15 mg/L and annual average loading of 124 kg/Year.

Total Phosphorus Monthly Average Concentration

The monthly TP average concentration limit and monthly concentration objective were met each month in 2023.

Graph 7: 2023 Monthly Total Phosphorus Final Effluent Concentration Limit Comparisons



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit (mg/L)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Objective (mg/L)	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Avg (mg/L)	0.04	0.04	0.05	0.06	0.06	0.04	0.06	0.08	0.11	0.04	0.06	0.11

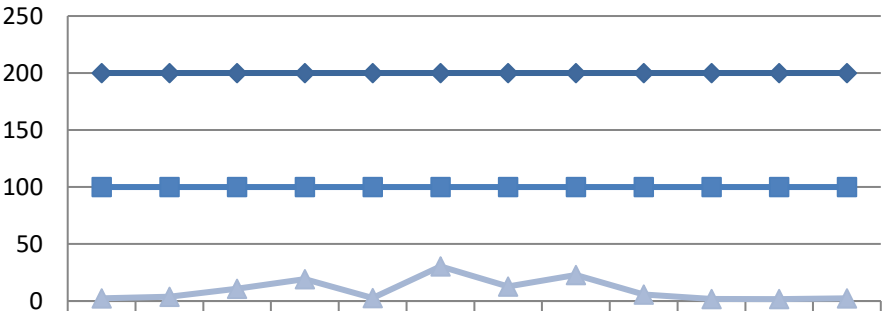
Table 4: 2023 Annual Average Concentration and Loading

Parameters	2023 Annual Average Concentration (mg/L)	Lake Simcoe Annual Average Concentration Limit /Objective	2023 Annual Average Loading (Kg/year)	Annual Loading Limit (Kg/year)	Lake Simcoe Annual Concentration Limit/Objective (mg/L)	Compliant (Y/N)
Total Phosphorus	0.06	0.15	30.53	249	124	Yes

E. Coli

ECA No. *8497-8D3TU7*sets the monthly geometric mean density of E. Coli at 200 cfu/100mL and an objective of 100 cfu/100ml. The monthly geomean limit was met each month in 2023. The monthly geomean objective was met every month in 2023.

Graph 9: 2023 Monthly E. Coli Final Effluent Geometric Mean Comparisons

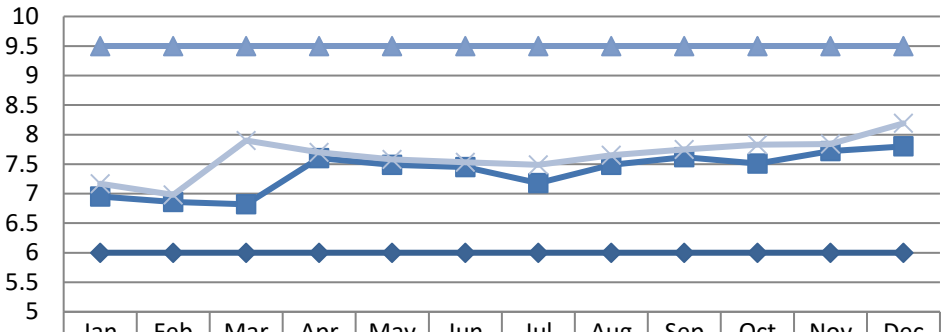


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit (mg/L)	200	200	200	200	200	200	200	200	200	200	200	200
Objective (mg/L)	100	100	100	100	100	100	100	100	100	100	100	100
Geomean (cfu/100mL)	2.5	3.7	10.8	19.3	2.6	30.4	12.7	22.8	5.8	1.7	1.7	2.4

pH

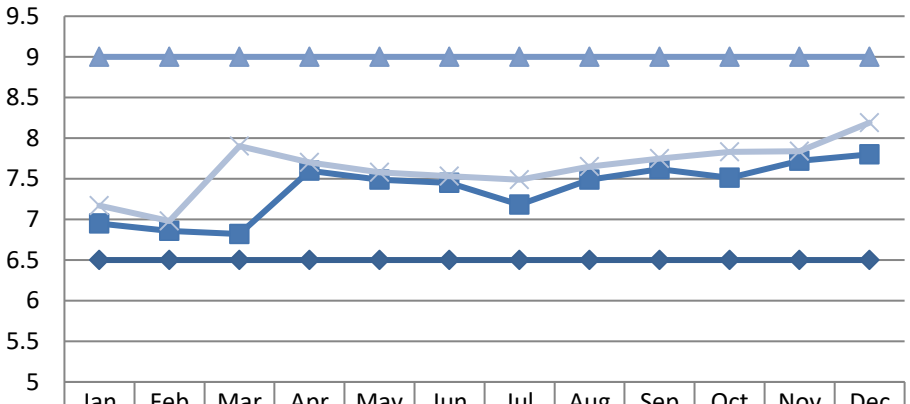
ECA No. *8497-8D3TU7* has a pH compliance limit within the range of 6.0 to 9.5 and an objective within the range of 6.5-9.0, inclusive, at all times. The pH of the final effluent ranged from 6.69-7.71 throughout 2023 which is within the ECA compliance limit at all times.

Graph 10: 2023 Monthly pH Final Effluent Concentration Limit Comparisons



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Min Limit	6	6	6	6	6	6	6	6	6	6	6	6
Min Result	6.95	6.86	6.82	7.60	7.49	7.45	7.18	7.49	7.62	7.51	7.72	7.80
Max Limit	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5
Max Result	7.17	6.98	7.90	7.70	7.58	7.53	7.49	7.65	7.75	7.83	7.84	8.19

Graph 11: 2023 Monthly pH Final Effluent Concentration Objectives Comparisons



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Min Objective	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Min Result	6.95	6.86	6.82	7.60	7.49	7.45	7.18	7.49	7.62	7.51	7.72	7.80
Max Objective	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Max Result	7.17	6.98	7.90	7.70	7.58	7.53	7.49	7.65	7.75	7.83	7.84	8.19

Summary of Septage Received

The Brechin/Lagoon City Wastewater Treatment Plant accepts septage from licensed haulers. See Table 4 for summary of volumes received in 2023.

Table 5: Monthly Septage Volumes

Month	Volume (m^3)
January	23.47
February	5.68
March	35.39
April	0.00
May	56.78
June	77.60
July	30.28
August	7.57

September	0.00
October	0.00
November	30.28
December	227.12
Total	494.19

ECA No. 8497-8D3TU7 Condition 9(5)(b) – Description of Operating Problems

ECA *#8497-8D3TU7* Condition 9(5)(b) states that the annual performance report shall contain "*a description of any operating problems encountered and corrective actions taken."*

The following details describe all operating problems encountered during the reporting period and the corrective actions taken:

Table 6: Brechin Lagoon City WWTP Operational Challenges

Month	Challenges	Corrective Actions
January	Elevated flows	Adjust plant flows
February	Polymer pump dosing issue	Replace pump
March	Power failure	Monitor backup power
April	Elevated flows	Adjust plant flows
	Plant 1 clarifier pulley failure	Replace failed bearing
July	Plugged syphon on clarifier	Clean and re-prime
August	Pumping Station #4, Pump #1 failure.	Electrician contacted to reset/test pump #1.
September	Level alarms at Pump Station 2	Hydro one attended site and addressed voltage issues
	Low basin alarm	Adjust plant flow
	Plant 1 screw pump not starting	Technician troubleshoot and repair control program
October	Sludge settling and weed growth in basins	Clean basin 2/3
	High water at Pump Station 2	Reset and test pumps
November	Low basin alarm	Adjust plant flow
	Elevated flows	Adjust flows and monitor facility
December	Elevated flows	Adjust flows and monitor facility

ECA No. 8497-8D3TU7 Condition 9(5)(c) – Summary of Maintenance

ECA No. *8497-8D3TU7* Condition 11(4)(e) states that the annual performance report shall contain *summary of all maintenance carried out on any major structure, equipment, apparatus or mechanism forming part of the Works."*

Routine maintenance and operation of the Brechin/Lagoon City Wastewater Treatment Plant and Sewage Pumping Stations in 2023 consisted of the following:

- Pumps station 2 pumps and piping replaced
- Replace meter chamber sump pump float
- Replace Alum Tank level sensor
- Repair digester tank butterfly valves
- Purchase Spare aerator
- Repair failed aerator
- Replace valve chamber shorted out receptacle.
- Install new polymer mixing system
- Adjusted chemical dosages
- Adjusted the speed of the screw conveyor to match incoming flows
- Attended to Hydro failures
- Blew out and restarted return activated sludge siphons
- Changed the oil and filters in the digester blowers
- Cleaned secondary clarifiers
- Collected samples as per the ECA
- Conducted settleability tests of the MLSS
- Decanted the digesters to aeration basin
- De-iced mechanical aerators
- Exercised generators
- Flushed chemical pumps and lines
- Greased bearings of screw conveyor
- Observed speciation of microorganisms in MLSS with a microscope
- Mixed polymer solutions
- Performed routine maintenance and repair of pumps
- Pulled and cleaned or replaced UV bulbs
- Pump Stations Cleaned
- Respond to emergency alarms
- Wasted sludge as required to maintain appropriate MLSS concentration

ECA No. 8497-8D3TU7Condition 9(4)(d) – Summary of Effluent Quality Assurance or Control Measures Undertaken

ECA No. *8497-8D3TU7*Condition 9(4)(d) states that the annual performance report shall contain *"a summary of effluent quality assurance or control measures undertaken in the reporting period."*

Effluent control measures include in-house sampling and testing for operational parameters such as suspended solids, soluble phosphorus, and dissolved oxygen. In-house testing provides real time results which are then evaluated to determine if process changes are necessary to enhance operational performance. All in-house sampling and analysis are performed by certified operations staff utilizing approved methods and protocols for sampling, analysis and recording as specified in the Ministry's Procedure F-10-1, "Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works", the Ministry's publication, "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" and the publication, "Standard Methods for the Examination of Water and Wastewater".

All final effluent samples collected during the reporting period to meet ECA sampling requirements were submitted to SGS Lakefield Research Ltd. laboratory for analysis, with the exception of pH, temperature and unionized ammonia. SGS Lakefield Research has been deemed accredited by the Canadian Association for

Laboratory Accreditation (CALA), meeting strict provincial guidelines including an extensive quality assurance/quality control program. By choosing this laboratory, the Ontario Clean Water Agency is ensuring appropriate control measures are undertaken during sample analysis. The pH and temperature parameters were analyzed in the field at the time of sample collection by certified operators, to ensure accuracy and precision of the results obtained. The unionized ammonia was calculated using the total ammonia nitrogen concentration, pH and temperature as required by the facility Environmental Compliance Approval.

Effluent quality assurance is maintained in several ways. Laboratory samples are sent to an accredited laboratory (SGS Canada Inc. - Lakefield) for analysis of all effluent parameters. Sampling calendars issued to the operator which denote frequency of sampling. Calendars are used as a tracking mechanism throughout the month to ensure all required samples are collected. These calendars are submitted to the Process Compliance Technician at the end of each month for review. Raw and effluent samples are collected as per the Amended Environmental Compliance Approval and the results are reviewed on a regular basis to ensure compliance with the site's objectives and limits.

Work orders illustrating all scheduled and preventative maintenance to be completed are issued to the operator and/or mechanic. OCWA conducts internal audits of the facility and develops Action Plans to ensure deficiencies are identified.

ECA No. 8497-8D3TU7Condition 9(4)(e) – Summary of Calibration and Maintenance

ECA No. *8497-8D3TU7* Condition 9(4)(e) states that the annual performance report shall contain *"a summary of the calibration and maintenance carried out on all effluent monitoring equipment."*

Calibrations on effluent monitoring equipment were performed by Flowmetrix Technical Services Inc. on June 21, 2023 for equipment located at the Brechin/ Lagoon City Wastewater Treatment Plant. Please see Appendix II: Calibration Reports.

Table 7: Brechin/Lagoon City WWTP – Summary of Equipment Calibrations – 2023	
Collection Monitoring Equipment	Date of Completion
Pump Station #4 Flow Meter	June 21, 2023
Pump Station #8 Flow Meter	June 21, 2023
Influent Monitoring Equipment	Date of Completion
Influent Flow Meter	June 21, 2023
Final Effluent Monitoring Equipment	Date of completion
Final Effluent Flow Meter	June 21, 2023
Online pH meter	June 21, 2023

ECA No. 8497-8D3TU7 Condition 9(4)(f) – Description of Efforts Made

OCWA uses a number of best efforts to achieve the Effluent Objectives. Effluent quality assurance and control measures include in-house sampling and testing for operational parameters such as suspended solids, phosphorus, dissolved oxygen, etc. In-house testing provides real time results which are then used to enhance process and operational performance. OCWA also collects raw sewage and effluent samples as per the ECA and reviews these results on a regular basis to ensure compliance with the ECA objectives and limits.

OCWA uses a computerized maintenance management system which generates work orders to ensure maintenance of equipment is proactively performed. In addition, OCWA provides regular status reports to the Owner which includes operational data, equipment inventory, financial statements, maintenance activities and capital improvement recommendations.

OCWA has developed comprehensive manuals detailing operations, maintenance, instrumentation and emergency procedures. To ensure facilities are operated in compliance with applicable legal requirements, facility staff have access to a network of operational compliance and support experts at the cluster, region and corporate level.

Table 8: Efforts Made to Meet the Effluent Objectives of Condition 9
1. Sampling effluent as per the ECA.
2. Visual Inspection of the effluent while performing rounds.
3. Annual calibration of the pH meter.
4. Annual calibration of the flow meters.
5. Performing preventative maintenance activities in accordance with work order schedules.
6. Monitoring treatment processes through regular in-house checks and review of lab results.
7. Sludge monitoring of primary clarifiers & adjustments to syphon rates based on tank levels to reduce solids carryover.
8. Visual review of microbiological activity of activated sludge to ensure appropriate F/M ratio and control filamentous.

The Brechin/Lagoon City WWTP was able to consistently meet the Effluent Objectives throughout 2023.

Carbonaceous Biochemical Oxygen Demand (CBOD5)

ECA No. *8497-8D3TU7*sets the CBOD5 monthly average concentration objective at 8.0 mg/L.

Table 9: Monthly CBOD5 Final Effluent Concentration Objective Comparisons

Monthly Average	Average Concentration (mg/L)	Concentration Objective Target (mg/L)	Objective Achieved
January	2.0	8.0	Yes
February	2.0	8.0	Yes
March	2.0	8.0	Yes
April	2.0	8.0	Yes
May	2.4	8.0	Yes
June	3.25	8.0	Yes
July	2.8	8.0	Yes
August	3.25	8.0	Yes
September	3.75	8.0	Yes
October	2.0	8.0	Yes
November	2.5	8.0	Yes
December	2.0	8.0	Yes

Total Suspended Solids (TSS)

ECA No*. 8497-8D3TU7* sets the TSS monthly average concentration objective at 12.0 mg/L.

Table 10: Monthly TSS Final Effluent Concentration Objective Comparisons

Month	Average Concentration (mg/L)	Concentration Objective Target (mg/L)	Objective Achieved
January	2.8	12.0	Yes
February	2.5	12.0	Yes
March	3.25	12.0	Yes
April	4.5	12.0	Yes
May	4.0	12.0	Yes
June	3.0	12.0	Yes
July	4.4	12.0	Yes
August	4.25	12.0	Yes
September	4.25	12.0	Yes
October	3.2	12.0	Yes
November	3.25	12.0	Yes
December	3.25	12.0	Yes

Total Phosphorus (TP)

ECA No. *8497-8D3TU7* sets the TP monthly average concentration objective at 0.24 mg/L.

Table 11: Monthly TP Final Effluent Concentration Objective Comparisons

Month	Average Concentration (mg/L)	Concentration Objective Target (mg/L)	Objective Achieved
January	0.04	0.24	Yes
February	0.04	0.24	Yes
March	0.05	0.24	Yes
April	0.06	0.24	Yes
May	0.20	0.24	Yes
June	0.05	0.24	Yes
July	0.06	0.24	Yes
August	0.08	0.24	Yes
September	0.11	0.24	Yes
October	0.04	0.24	Yes
November	0.06	0.24	Yes
December	0.11	0.24	Yes

E.Coli

ECA No. *8497-8D3TU7* sets the monthly E. Coli geometric mean objective at 100 cfu/100mL.

Table 12: Monthly E. Coli Final Effluent Concentration Objective Comparisons

Month	Geometric Mean (cfu/100mL)	Concentration Objective Target (cfu/100mL)	Objective Achieved
January	21.1	100	Yes
February	21.4	100	Yes
March	18.9	100	Yes
April	50.4	100	Yes
May	5.7	100	Yes
June	6.8	100	Yes
July	8.6	100	Yes
August	2.0	100	Yes
September	1.3	100	Yes
October	2.0	100	Yes
November	2.8	100	Yes
December	3.1	100	Yes

pH

The pH of the effluent ranged from 6.82– 8.19 throughout 2023 which is within the ECA design objectives of 6.50 to 9.00, inclusive, at all times.

Table 13: Monthly pH Final Effluent Concentration Objective Comparisons

Month	Minimum	Maximum
January	6.95	7.17
February	6.86	6.98
March	6.82	7.90
April	7.60	7.70
May	7.49	7.58
June	7.45	7.53
July	7.18	7.49
August	7.49	7.64
September	7.62	7.75
October	7.51	7.83
November	7.72	7.84
December	7.80	8.19

Unionized Ammonia

The concentration of un-ionized ammonia is calculated using the total ammonia nitrogen, along with field pH and temperature using the methodology stipulated in “Ontario’s Provincial Water Quality Objectives” dated July 1994, as amended. The following are the results for the calculated unionized ammonia.

Table 14: Weekly Final Effluent pH, Temperature and Calculated Un-ionized Ammonia

Date	Total Ammonia Nitrogen: NH3 + NH4+ as N [mg/L]	Field pH	Field temp 'C	Un-ionized Ammonia
01/04/2023	0.1	7.11	7.11	0.0002
01/11/2023	0.1	7.17	6.3	0.0002
01/16/2023	1.0	7.04	5.1	0.0014
01/23/2023	1.7	6.95	6.5	0.0021
01/30/2023	1.0	6.96	5.1	0.0011
02/08/2023	4.4	6.86	5.7	0.0042
02/14/2023	1.6	6.98	6.9	0.0022
02/21/2023	2.3	6.89	6.3	0.0025
02/27/2023	2.6	6.87	4.6	0.0023
03/07/2023	1.8	6.87	6.3	0.0019
03/13/2023	2.7	6.82	5.9	0.0024
03/20/2023	1.7	6.93	5.7	0.0019
03/27/2023	1.4	7.90	14.8	0.0293
04/05/2023	0.8	7.60	16.3	0.0095
04/11/2023	1.7	7.60	19.3	0.0251
04/17/2023	0.1	7.70	21.5	0.0022
04/24/2023	0.1	7.60	5.6	0.0005
05/03/2023	0.1	7.58	6.3	0.0005
05/08/2023	0.1	7.52	7.7	0.0005
05/15/2023	0.1	7.52	9.2	0.0006
05/23/2023	0.1	7.53	9.6	0.0006
05/29/2023	0.1	7.49	11.3	0.0006
06/07/2023	0.1	7.51	12.1	0.0007
06/12/2023	0.1	7.45	12.1	0.0006
06/19/2023	0.05	7.53	13.0	0.0004
06/26/2023	0.1	7.46	15.7	0.0017
07/06/2023	5.7	7.41	16.9	0.0459
07/11/2023	1.6	7.18	16.0	0.0071
07/17/2023	0.04	7.28	15.5	0.0002
07/24/2023	2.8	7.36	16.2	0.0191
07/31/2023	1.8	7.49	15.9	0.0161
08/08/2023	6.4	7.49	16.6	0.0605
08/14/2023	6.8	7.54	15.4	0.0659
08/21/2023	6.1	7.60	16.0	0.0708
08/28/2023	6.3	7.65	15.3	0.0778
09/05/2023	10.3	7.62	17.4	0.1388
09/11/2023	6.6	7.70	16.4	0.0991
09/18/2023	4.9	7.75	14.5	0.0715
09/25/2023	2.8	7.73	14.5	0.0391
10/03/2023	2.6	7.51	8.0	0.0133

10/10/2023	6.2	7.61	11.7	0.0532
10/17/2023	0.3	7.64	11.5	0.0027
10/23/2023	2.8	7.83	9.7	0.0340
10/30/2023	2.9	7.74	10.2	0.0298
11/06/2023	2.9	7.72	8.8	0.0256
11/14/2023	2.4	7.72	7.6	0.0192
11/20/2023	3.0	7.82	6.5	0.0277
11/27/2023	3.5	7.84	6.0	0.0325
12/07/2023	2.7	7.86	5.6	0.0254
12/11/2023	1.9	7.80	6.7	0.0170
12/18/2023	1.5	7.88	6.0	0.0153
12/27/2023	0.0	8.19	6.7	0.0022

Temperature

The final effluent temperature ranged from 4.6°C to 21.5°C.

Additional Parameters

The parameters listed below are collected as per ECA or regulatory requirements or for process optimization.

Influent Samples

Influent sampling is completed in order to make the necessary process adjustments to stay within the Final Effluent Objectives and limits set in the ECA.

Table 15: Monthly Influent Sample Result Concentration Averages

Month	Biochemical Oxygen Demand - BOD5 (mg/L)	Total Suspended Solids – TSS (mg/L)	Total Kjeldahl Nitrogen – TKN (mg/L)	Total Phosphorus – TP (mg/L)
January	14.0	88.0	5.3	0.41
February	83.0	92.0	18.6	1.79
March	121.0	162.0	17.1	1.85
April	20.0	19.0	7.6	0.58
May	30.0	276.0	7.0	0.89
June	45.0	70.0	15.9	1.55
July	26.0	48.0	11.8	0.96
August	165.0	181.0	20.2	2.29
September	139.0	122.0	24.6	2.79
October	206.0	207.0	31.4	3.67
November	122.0	127.0	19.3	1.89
December	92.0	97.0	18.4	2.31

ECA No. 8497-8D3TU7 Condition 9(5)(g) – Summary of Biosolids

The total volume of sludge generated in 2023 was 1035 m^3 which was slightly lower than the amount of sludge generated in 2022. Wessuc Inc. has been contracted to haul, land apply the Biosolids on their approved sites. Monthly sludge sampled are collected & tested for metals listed in the Ontario Guidelines for Sewage Biosolids Utilization on Agricultural Lands. There is enough storage to store sludge at the Brechin/ Lagoon City WWTP for the rest of the year.

Table 16: Monthly Sludge Generation Volumes

Month	Volume (m^3)
January	0
February	0
March	0
April	0
May	495
June	0
July	0
August	0
September	0
October	540
November	0
December	0
Total	1035

The anticipated volume of biosolids for the next reporting period is not expected to be significantly different from this reporting period. There are no expected changes in the current sludge handling methods that are currently utilized. Refer to Appendix III: Biosolids Summary

ECA #8497-8D3TU7 Condition 9(5)(h) – Community Complaints

During the 2023 reporting period there was no community complaints received.

ECA #8497-8D3TU7 Condition 9(5)(i) – Summary of all Bypass, Spill or Abnormal Discharge Events

During the 2023 reporting period there was no Bypasses, spills and abnormal discharge events.

ECA #8497-8D3TU7 Condition 9(5)(j) – Status Update of the Initial Effluent Characterization as per Condition 8 subsection (1) until it has been completed and the required report has been submitted.

The initial effluent characterization was submitted as per Condition 8 Section (1). No updates occurred during the reporting period.

ECA #8497-8D3TU7 Condition 9(5)(k)- any other information the *District Manager* requires from time to time.

The District Manager has not requested any additional information be included in this report.

ECA #147-W601 Condition 4.6.9 – Summary of Efforts Made to Reduce Overflows, Spills and Bypasses.

a) A description of projects undertaken and completed in the Authorized System that result in overall overflow reduction or elimination including expenditures and proposed projects to eliminate overflows with estimated budget forecast for the year following that for which the report is submitted.

- Approved budget to begin I&I investigations in 2024.

b) Details of the establishment and maintenance of a PPCP, including a summary of project progresses compared to the PPCP's timelines.

The Ramara Sanitary Sewage Collection system does not contain combined sewers and therefore is not required to complete a Pollution Prevention and Control Plan (PPCP).

c) An assessment of the effectiveness of each action taken.

Nothing to report at this time.

d) An assessment of the ability to meet Procedure F-5-1 or Procedure F-5-5 objectives (as applicable) and if able to meet the objectives, an overview of next steps and estimated timelines to meet the objectives.

Not applicable.

e) Public reporting approach including proactive efforts.

The Township of Ramara utilizes their website and social media platforms to post Media Releases. Residents have the ability to subscribe to receive Media Releases from the Township of Ramara to an email address. They Township of Ramara also distributes a quarterly publication as well as randomized campaigns that bring awareness to the Sewer Use Bylaw and other information related to municipal sewer use such as sump pump connections.

Appendix I

Performance Assessment Report

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Performance Assessment Report

From 1/1/2023 to 12/31/2023

1617 LAGOON CITY WASTEWATER TREATMENT PLANT 120002255

	1 / 2023	2/ 2023	3/ 2023	4/ 2023	5/ 2023	6/ 2023	7/ 2023	8/ 2023	9/ 2023	10/ 2023	11/ 2023	12/ 2023	<--Total-->	<--Avg-->	<--Max-->	<-Criteria->
Flows																
Raw Flow: Total - Raw m³/d	57,773.60	37,457.10	46,859.40	55,431.10	49,529.00	39,370.00	39,518.30	36,649.20	25,159.50	26,574.70	27,248.80	51,659.60	493,230.30			0.00
Raw Flow: Avg - Raw m³/d	1,863.66	1,337.75	1,511.59	1,847.70	1,597.71	1,312.33	1,274.78	1,182.23	838.65	857.25	908.29	1,666.44		1,351.32		2,273.00
Raw Flow: Max - Raw m³/d	4,687.40	2,026.30	2,479.50	3,802.40	2,197.60	2,642.80	1,770.70	1,642.20	1,157.40	1,261.30	1,238.70	3,722.40			4,687.40	0.00
Raw Flow: Count - Raw m³/d	31.00	28.00	31.00	30.00	31.00	30.00	31.00	31.00	30.00	31.00	30.00	31.00	365.00			0.00
Eff. Flow: Total - Final Effluent m³/d	59,285.28	37,127.87	46,191.42	54,499.17	47,906.93	37,712.24	39,448.85	37,170.80	26,221.96	27,192.52	27,324.25	52,349.15	492,430.44			0.00
Eff. Flow: Avg - Final Effluent m³/d	1,912.43	1,326.00	1,490.05	1,816.64	1,545.38	1,257.07	1,272.54	1,199.06	874.07	877.18	910.81	1,688.68		1,349.12		2,273.00
Eff. Flow: Max - Final Effluent m³/d	4,432.20	2,397.77	2,782.35	3,512.74	2,479.08	2,571.48	1,786.82	1,646.64	1,368.27	1,413.41	1,323.05	3,504.72			4,432.20	0.00
Eff Flow: Count - Final Effluent m³/d	31.00	28.00	31.00	30.00	31.00	30.00	31.00	31.00	30.00	31.00	30.00	31.00	365.00			0.00
Carbonaceous Biochemical Oxygen Demand: CBOD																
Eff: Avg cBOD5 - Final Effluent mg/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.40	< 3.25	< 2.80	< 3.25	< 3.75	< 2.00	< 2.50	< 2.00		< 2.48	< 3.75	10.00
Eff: # of samples of cBOD5 - Final Effluent	5.00	4.00	4.00	4.00	5.00	4.00	5.00	4.00	4.00	5.00	4.00	4.00	52.00			0.00
Loading: cBOD5 - Final Effluent kg/d	< 3.825	< 2.652	< 2.980	< 3.633	< 3.709	< 4.085	< 3.563	< 3.897	< 3.278	< 1.754	< 2.277	< 3.377		< 3.35	< 4.09	
Biochemical Oxygen Demand: BOD5																
Raw: Avg BOD5 - Raw mg/L	14.00	83.00	121.00	20.00	30.00	45.00	26.00	165.00	139.00	206.00	122.00	92.00		88.58	206.00	0.00
Raw: # of samples of BOD5 - Raw	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	12.00			0.00
Percent Removal: BOD5 - Raw %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00
Total Suspended Solids: TSS																
Raw: Avg TSS - Raw mg/L	88.00	92.00	162.00	19.00	276.00	70.00	48.00	181.00	122.00	207.00	127.00	97.00		124.08	276.00	0.00
Raw: # of samples of TSS - Raw	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	12.00			0.00
Eff: Avg TSS - Final Effluent mg/L	< 2.80	< 2.50	3.25	4.50	4.00	< 3.00	4.40	4.25	< 4.25	< 3.20	3.25	3.25		< 3.56	< 4.50	15.00
Eff: # of samples of TSS - Final Effluent	5.00	4.00	4.00	4.00	5.00	4.00	5.00	4.00	4.00	5.00	4.00	4.00	52.00			0.00
Loading: TSS - Final Effluent kg/d	< 5.355	< 3.315	4.843	8.175	6.182	< 3.771	5.599	5.096	< 3.715	< 2.807	2.960	5.488		< 4.80	< 8.17	
Percent Removal: TSS - Raw %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00
Total Phosphorus: TP																
Raw: Avg TP - Raw mg/L	0.41	1.79	1.85	0.58	0.89	1.55	0.96	2.29	2.79	3.67	1.89	2.31		1.75	3.67	0.00
Raw: # of samples of TP - Raw	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	12.00			0.00
Eff: Avg TP - Final Effluent mg/L	< 0.04	< 0.04	0.05	0.06	0.06	0.04	< 0.06	0.08	0.11	< 0.04	0.06	0.05		< 0.06	< 0.11	0.30
Eff: # of samples of TP - Final Effluent	5.00	4.00	4.00	4.00	5.00	4.00	5.00	4.00	4.00	5.00	4.00	4.00	52.00			0.00
Loading: TP - Final Effluent kg/d	< 0.069	< 0.050	0.075	0.100	0.090	0.053	< 0.081	0.096	0.096	< 0.039	0.050	0.076		< 0.08	< 0.10	249.000
Percent Removal: TP - Raw %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00
Nitrogen Series																
Raw: Avg TKN - Raw mg/L	5.30	18.60	17.10	7.60	7.00	15.90	11.80	20.20	24.60	31.40	19.30	18.40		16.43	31.40	0.00
Raw: # of samples of TKN - Raw	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	12.00			0.00
Eff: Avg TAN - Final Effluent mg/L	< 0.78	2.73	1.90	< 0.68	< 0.10	< 0.45	2.46	6.40	6.15	2.96	2.95	< 1.55		< 2.36	< 6.40	
Eff: # of samples of TAN - Final Effluent	5.00	4.00	4.00	4.00	5.00	4.00	5.00	4.00	4.00	5.00	4.00	4.00	52.00			0.00
Loading: TAN - Final Effluent kg/d	< 1.492	3.613	2.831	< 1.226	< 0.155	< 0.566	3.130	7.674	5.376	2.596	2.687	< 2.617		< 3.18	< 7.67	
Eff: Avg NO3-N - Final Effluent mg/L	7.95	7.22	7.43	7.96	11.16	15.53	7.40	10.54	13.28	10.33	10.47	9.52		9.90	15.53	0.00
Eff: # of samples of NO3-N - Final Effluent	5.00	4.00	4.00	4.00	5.00	4.00	5.00	4.00	4.00	5.00	4.00	4.00	52.00			0.00
Eff: Avg NO2-N - Final Effluent mg/L	0.08	0.15	0.25	0.25	0.11	< 0.30	0.30	0.60	0.23	0.50	0.33	0.50		0.30	0.60	0.00
Eff: # of samples of NO2-N - Final Effluent	5.00	4.00	4.00	4.00	5.00	4.00	5.00	4.00	4.00	5.00	4.00	4.00	52.00			0.00
Disinfection																
Eff: GMD E. Coli - Final Effluent cfu/100mL	19.97	21.38	18.94	50.42	5.33	6.82	5.59	2.00	1.41	2.00	2.83	3.13				200.00
Eff: # of samples of E. Coli - Final Effluent	5.00	4.00	4.00	4.00	5.00	4.00	5.00	4.00	4.00	5.00	4.00	4.00	52.00			0.00

Appendix II

Calibration Reports

ROSEMOUNT
Verification Report

SCG FLOWMETRIX

AS FOUND CERTIFICATION

FORWARD FLOW DIRECTION

PASS

CLIENT DETAIL

CUSTOMER	OCWA – Kawartha Lakes Hub
CONTACT	Nick Leroux
	Senior Operations Manager
	123 East St S
	Bobcaygeon ON, K0M 1A0
	P. 705-623-7278
	E. nleroux@ocwa.com

VER. BY - FM Art Pencilo

Quality Management Standards Information - Reference equipment and instrumentation used to conduct this verification test is found in our AC-QMS document at the time this test was conducted.

EQUIPMENT DETAIL

[MUT] MANUFACTURER	Rosemount
MODEL	8712
CONVERTER SERIAL NUMBER	08060245142
PLANT ID	Lagoon City STP
METER ID	Final Effluent Flow
FIT ID	NA
CLIENT TAG	NA
OTHER	NA
GPS COORDINATES	N 44°33.467 W 079°12.436
VERIFICATION DATE	June 21st 2023
CAL. FREQUENCY	Annual
CAL. DUE DATE	June 2024

PROGRAMMING PARAMETERS

DIAMETER (DN)	mm	300
F.S. FLOW - MAG	LPS	859.000
F.S. RANGE - O/P	LPS	600.000
TUBE CAL. FACTOR		1108905010807005

FORWARD TOTALIZER INFORMATION

AS FOUND	1837919	M3
AS LEFT	82.26	M3
DIFFERENCE	-1837836.74	M3

TEST CRITERIA

AS FOUND CERTIFICATION TEST	Yes
FORWARD FLOW DIRECTION	Yes
ALLOWABLE [%] ERROR	5

COMPONENTS TESTED

CONVERTER DISPLAY	yes
mA OUTPUT	yes
TOTALIZER	yes
ACCURACY BASED ON [% o.r.]	yes

VERIFICATOR CAL. FACTOR [16-digits] 1000015010000000

ERROR DOCUMENTED IN THIS REPORT; BASED ON % o.r.

FLOW TUBE SIMULATION

			0	3	10	30	ft/s
DISPLAY			0.00	3.00	10.00	30.00	ft/s
MUT Reading			0.00	3.00	10.00	30.00	ft/s
MUT % Error			n/a	0.00	0.00	0.00	%
mA OUTPUT			4.000	5.600	9.333	20.000	mA
MUT Reading	4	mA	3.999	5.781	9.940	20.025	mA
MUT % Error	20	mA	-0.02	3.23	6.50	0.12	%
TOTALIZER						30.00	ft/s
TEST Accumulation						2000.00	ft
TIME						66.63	seconds
CALC. Velocity						30.02	ft/s
% Error						0.06	%

QUALITY MANAGEMENT STANDARDS INFO.

[QMS] INFORMATION	IDENT.	ID #
[REFERENCE] FTS	ROS	1
PROCESS METER	PM	12
ANALOG METER	AM	n/a
STOP WATCH	SW	Yes

*All values are for "As Found" values.

COMMENTS

Totalizer reset after verification.

RESULTS

TEST	AVG % o.r.	PASS FAIL
DISPLAY	0.00	PASS
mA OUTPUT	3.29	PASS
TOTALIZER	0.06	PASS

This report reflects the test results of the overall accuracy for the above flow converter using the specified manufacturers flow tube simulator to within the specified tolerance as identified within this report.

v-Notch Weir
Verification/Calibration Report

SCG FLOWMETRIX

AS FOUND CERTIFICATION

PASS

CLIENT DETAIL

CUSTOMER OCWA – Kawartha Lakes Hub
CONTACT Nick Leroux
Senior Operations Manager
123 East St S
Bobcaygeon ON K0M 1A0
P: 705-623-7278
E: nleroux@ocwa.com

VER. BY - FM Art Pencilo

Quality Management Standards Information - Reference equipment and instrumentation used to conduct this verification test is found in our AC-QMS document at the time this test was conducted.

EQUIPMENT DETAIL

[MUT] MANUFACTURER	Greyline
MODEL	OCF-IV
CONVERTER SERIAL NUMBER	17849
PLANT ID	Lagoon City
METER ID	Influent Flow
FIT ID	NA
CLIENT TAG	NA
OTHER	NA
GPS COORDINATES	N 44°33.467 W 079°12.436
VERIFICATION DATE	June 21st 2023
CAL. FREQUENCY	Annual
CAL. DUE DATE	June 2024

PROGRAMMING PARAMETERS

NOTCH ANGLE (ϕ)	inches	45
EMPTY DISTANCE, TX to notch	m	0.662
TRANSDUCER (TX), to sump flo	m	0.78
SUMP LEVEL, zero flow	m	0.118
MAX. HEAD	m	0.300
BLANKING DISTANCE	m	0.362
DEAD ZONE	m	0.000
MAX. FLOW	M3/H	101.4
F.S. RANGE - O/P	M3/H	101.4

TOTALIZER

AS FOUND	125280	M3
AS LEFT	125280	M3
DIFFERENCE	0	M3

TEST CRITERIA

AS FOUND CERTIFICATION TEST	Yes
ALLOWABLE [%] ERROR	15

COMPONENTS TESTED

CONVERTER DISPLAY	yes
mA OUTPUT	yes
TOTALIZER	no
ACCURACY BASED ON [% o.r.]	yes

Ultrasonic Sensor is not installed high enough, to ensure full scale flow conditions

ERROR DOCUMENTED IN THIS REPORT, BASED ON % o.r.

AS FOUND TEST RESULTS

		0.0	3.1	17.7	48.7	100.0	% F.S. Range
		0.000	0.075	0.150	0.225	0.300	m
REF. FLOW RATE		0.0	3.2	17.9	49.4	101.4	M3/H
MUT [Reading]		0.4	3.1	17.8	49.0	100.5	M3/H
MUT [Difference]		0.4	0.0	-0.2	-0.4	-0.9	M3/H
MUT [% Error]		0.0	-0.9	-0.9	-0.9	-0.9	%
mA OUTPUT		4.000	4.500	6.828	11.794	20.000	mA
MUT [Reading]	min. 4.000 mA	4.000	4.503	6.836	11.811	20.025	mA
MUT [Difference]	max. 20.000 mA	0.000	0.003	0.008	0.017	0.025	mA
MUT [% Error]		0.00	0.07	0.11	0.14	0.12	%
TOTALIZER - REF. FLOW RATE							
TOTALIZER [MUT]							
TEST TIME							
CALC. TOTALIZER							
ERROR							

COMMENTS

-Results based on Internal Simulation not actual flow.

QUALITY MANAGEMENT STANDARDS INFO.

[QMS] INFORMATION	IDENT.	ID #
[REFERENCE] LEVEL	Sim. BOARD	n/a
PROCESS METER	PM	2
STOP WATCH	SW	n/a

RESULTS

TEST	AVG % o.r.	PASS FAIL
DISPLAY	-0.87	PASS
mA OUTPUT	0.09	PASS
TOTALIZER	N/A	N/A

This report reflects the test results of the overall accuracy for the above flow converter using the specified manufacturers flow tube simulator to within the specified tolerance as identified within this report.

SCG FLOWMETRIX

ABB

ABB MEASUREMENT & ANALYTICS | TEST REPORT

ABB Ability™
Verification for measurement devices

Verification Report for:

WaterMaster

Measurement made easy

Measurement & Analytics Service

Installation Details	
Meter Owner	Brechin Lagoon City
Machine Name	PS4
Medium	

Customer Details	
Site Address	Lagoon City WWTP
Telephone	
Email	

Operator Details	
Date and Time	21-06-2023 14:43:24
Operator's Name	Admin
Operator's Signature	

Overall Status - Passed

Sensor Information

Sensor Serial No.	5022909
Sensor SAP/ERP No.	3K220000196136
Sensor Type	WM Full Bore
Sensor Size	DN 200
Q3	1000.000 m³/hr
Calibration Accuracy	OIML Class 2
Sensor Calibration Factors	113.841 %, -0.550 mm/s
Date of Manufacture	07:50:17 05/12/2013
Run Hours	67530hrs 35mins
Sensor User Span/Zero	-100.000 %; 0.000 mm/s
User Flow Cutoff/Hysteresis	0.000 %; 20.000 %
Coil Current	180.000 mA
Coil Inductance	99.756 mH
Coil / Loop Resistance	32.430 Ohm

Transmitter Information

Transmitter Serial No	9023016
Transmitter SAP/ERP No.	3K220000382532
Application Version	V01.06.00 03/03/15
MSP Version	01.00.00
Date of Manufacture	12:54:55 17/10/2016
Run Hours	85580hrs 29mins
Tx Gain Adjustment	0.081 %
OIML Accuracy Alarms	OFF
Mains Freq	50.000 Hz
Qmax	1000.000 m³/hr
Pulses/Unit	50.000
FS Freq	5000.000 Hz
Pulses Limit Freq	100.000 Hz
Meter Mode	Forward Only

Summary Verification of the Sensor

Summary of Results

Coil Group	PASS
Electrode Group	PASS
Sensor Group	PASS
Transmitter Signal	PASS
Transmitter Driver	PASS
Configuration	PASS

Sensor Data

Coil Inductance Shift	-0.298 %
Cable Length	0 m
Electrode Backoff Voltage	-0.941 V
Electrode Differential Voltage	0.161 V

Pipe Status **Full Pipe**

Summary Verification of the Transmitter

Output Group

Current Output 31/32 **PASS**

Applied	Measured	Result
4 mA	3.992 mA	PASS
12 mA	11.972 mA	PASS
20 mA	19.983 mA	PASS

Pulse Output 41/42 **NOT EXECUTED**

Applied	Measured	Result
5250 Hz		
2625 Hz		

Pulse Output 51/52 **NOT EXECUTED**

Applied	Measured	Result
5250 Hz		
2625 Hz		

Totalizer Information

	Start	End	Difference
Forward	2800889.937 m³	2800889.961 m³	0.023 m³
Reverse	416.848 m³	416.848 m³	0.000 m³
Net	2884134.426 m³	2884134.446 m³	0.020 m³

Comments (Installation, Grounding etc.)

Verified current using DMM-22

Verification Certificate has been generated by ABB Ability™ Verification for measurement devices "Licensed software testing" variant (ABB WaterMaster VDF Version 03.19).

ABB Ability™ Verification for measurement devices Version 03.94.05

SCG FLOWMETRIX

AS FOUND CERTIFICATION

FORWARD FLOW DIRECTION

PASS

CLIENT DETAIL	
CUSTOMER	OCWA – Kawartha Lakes Hub
CONTACT	Nick Leroux
	Senior Operations Manager
	123 East St S
	Bobcaygeon ON, K0M 1A0
	P: 705-623-7278
	E: nleroux@ocwa.com

VER. BY - FM Art Pencilo

Quality Management Standards Information - Reference equipment and instrumentation used to conduct this verification test is found in our AC-QMS document at the time this test was conducted.

EQUIPMENT DETAIL	
[MUT] MANUFACTURER	Krohne
MODEL	IFC 300
SERIAL NUMBER	A08 03059
FUSE	Lighting Panel #14
PLANT ID	Brechin Community Park
METER ID	Pump Station #08
FIT ID	N/A
CLIENT TAG	N/A
OTHER	N/A
GPS COORDINATES	N 44°32.760 W 079°10.769
VERIFICATION DATE	June 21st 2023
CAL. FREQUENCY	Annual
CAL. DUE DATE	June 2024

PROGRAMMING PARAMETERS		
DIAMETER (DN)	mm	150
F.S. FLOW - MAG	LPS	160.1
F.S. RANGE - O/P	LPS	60.000
CAL. k-FACTOR	GK	2.97280
Zero Offset Flow	LPS	0.0000

FORWARD TOTALIZER INFORMATION		
AS FOUND	702554.7	M3
AS LEFT	702560.3	M3
DIFFERENCE	5.6	M3

TEST CRITERIA	
AS FOUND CERTIFICATION TEST	Yes
FORWARD FLOW DIRECTION	Yes
ALLOWABLE [%] ERROR	15

COMPONENTS TESTED	
CONVERTER DISPLAY	yes
mA OUTPUT	yes
TOTALIZER	Yes
ACCURACY BASED ON [% o.r.]	yes

ERROR DOCUMENTED IN THIS REPORT; BASED ON % o.r.

FLOW TUBE SIMULATION

				0.0		0.5	1.0	2.0	m/s
				0.0		5.0	10.0	20.0	% F.S. Flow
				0.0		13.3	26.7	53.4	% F.S. Range
REF. FLOW RATE				0.000		8.01	16.01	32.02	LPS
MUT [Reading]				0.004		7.9	15.8	31.7	LPS
MUT [Difference]				0.004		-0.095	-0.212	-0.325	LPS
MUT [% Error]				n/a		-1.19	-1.33	-1.01	%
mA OUTPUT				4.000		6.135	8.270	12.540	mA
MUT [Reading]	min.	4.000	mA	4.001		6.118	8.230	12.456	mA
MUT [Difference]	max.	20.000	mA	0.001		-0.017	-0.040	-0.084	mA
MUT [% Error]				0.03		-0.28	-0.48	-0.67	%
TOTALIZER - REF. FLOW RATE								32.025	LPS
TOTALIZER [MUT]								2	M3
TEST TIME								63.82	SECONDS
CALC. TOTALIZER								2.044	M3
ERROR								-2.19	%

COMMENTS

QUALITY MANAGEMENT STANDARDS INFO.		
[QMS] INFORMATION	IDENT.	ID #
[REFERENCE] FTS	KRO	1
PROCESS METER	PM	AZ
ANALOG METER	AM	N/A
STOP WATCH	SW	YES

RESULTS		
TEST	AVG % o.r.	PASS FAIL
DISPLAY	-1.18	PASS
mA OUTPUT	-0.35	PASS
TOTALIZER	-2.19	PASS

This report reflects the test results of the overall accuracy for the above flow converter using the specified manufacturers flow tube simulator to within the specified tolerance as identified within this report.

pH
Verification/Calibration Report

FLOWMETRIX

[MUT] AS FOUND **FAIL**

[MUT] AS LEFT **PASS**

CUSTOMER	OCWA – Kawartha Lakes Hub	[MUT] MANUFACTURER	ABB
CONTACT	Nick Leroux	MODEL	AX460/600010/STD
	Senior Operations Manager	SERIAL NUMBER	3K22000652669
	123 East St S	CLIENT TAG	n/a
	Bobcaygeon ON, K0M 1A0	LOCATION	Lagon City STP
	P: 705-623-7278	OTHER	Final Effluent Flow
	E: nleroux@ocwa.com	GPS COORDINATES	N 44°33.467 W 079°12.436
VER. BY	Art Pencilo	TOLERANCE [pH]	0.1
Quality Management Standards Information - Standards, reference equipment, and instrumentation used to conduct this test outlining the lot#, and expiry date is found in our current QMS document.		VERIFICATION DATE	June 21st 2023
		CAL. FREQUENCY	Annual
		CAL. DUE DATE	June 2024

pH VERIFICATION
NIST TRACEABLE (BUFFERS)

BEFORE CALIBRATION

REFERENCE BUFFER			[MUT] READINGS			
pH BUFFER	TEMP. ° C	pH CORRECTED	pH	TEMP. ° C	pH - ERROR DIFF.	PASS FAIL
4.01	14.8	4.00	4.33	14.8	0.33	FAIL
7.01	14.8	7.04	7.04	14.8	0.00	PASS
					RESULT	**FAIL**

AFTER CALIBRATION

REFERENCE BUFFER			[MUT] READINGS			
pH BUFFER	TEMP. ° C	pH CORRECTED	pH	TEMP. ° C	pH - ERROR DIFF.	PASS FAIL
4.01	14.8	4.00	4.00	16.2	0.00	PASS
7.01	14.8	7.04	7.00	16.2	-0.04	PASS
					RESULT	**PASS**

COMMENTS

Slope: 90.0%

[QMS] INFORMATION	ITEM	ID #
[REFERENCE]		
4.01 BUFFER	pHBUFF4	1
7.01 BUFFER	pHBUFF7	1
TEMPERATURE REF.	DDTEMP	1

NIST Traceable Buffers were used to confirm the overall accuracy of this instrument. "AS FOUND" readings and "AS FOUND" readings are reported within this report. A temperature device was used to measure and record the buffer temperature to correct for pH values due to the effects related to buffer temperature.

Appendix III

Biosolids Summary

Biosolids Quality Report

Facility: LAGOON CITY WASTEWATER TREATMENT PLANT

Solids & Nutrients

Period: 01/01/2023 to 12/31/2023

Works: 1617 / Digestor Type: Aerobic

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Solids & Nutrients | **Metals & Criteria** | **Last 4 Samples**

Facility Works Number: 120002255
Receiver: Wetland area draining to Lake
Facility Owner: Municipality: The Township of Ramara
Service Population: 2420
Facility Classification: Class 2 Wastewater Treatment
Total Design Capacity:

Note: all parameters in this report are derived from the Bslq Station

Month	Hauled Vol. (m^3)	Total Solids (mg/L)	Volatile Solids (mg/L)	Total Phosphorus (mg/L)	Total Ammonia Nitrogen (mg/L)	Nitrate as N (mg/L)	Nitrite as N (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Ammonia + Nitrate (mg/L)	Potassium (mg/L)
Parameter Short Name	HauledVol	TS	VS	TP	NH3p_NH4p_N	NO3-N	NO2-N	TKN	Calculation in Report	K
T/S	IH Month.Total	Lab Published Month Mean	Lab Published Month Mean	Lab Published Month Mean	Lab Published Month Mean	Lab Published Month Mean	Lab Published Month Mean	Lab Published Month Mean	- no T/S	Lab Published Month Mean
Jan		23,000.00	17,800.00	500.00	11.50	0.30	0.20	904.00	5.90	54.00
Feb		26,800.00	14,700.00	660.00	8.00	0.30	0.20	809.00	4.15	78.00
Mar		10,900.00	6,070.00	460.00	2.60	0.30	1.20	583.00	1.45	54.00
Apr		25,900.00	14,900.00	510.00	9.00	0.30	0.30	640.00	4.65	48.00
May	495.00	21,800.00	11,700.00	443.00	7.10	0.30	0.20	561.00	3.70	47.00
Jun		27,000.00	14,100.00	561.00	24.00	3.00	4.00	518.00	13.50	47.00
Jul		29,200.00	16,800.00	513.00	30.90	3.00	3.00	852.00	16.95	43.00
Aug										
Sep		2,710.00	1,660.00	43.00	14.60	3.00	3.00	126.00	8.80	15.00
Oct	540.00	33,100.00	17,400.00	632.00	25.00	3.00	3.00	915.00	14.00	51.00
Nov		39,300.00	20,600.00	653.00	6.70	3.00	3.00	863.00	4.85	66.00
Dec		36,000.00	19,200.00	689.00	16.70	3.00	3.00	588.00	9.85	51.00
Average	517.50	25,064.55	14,084.55	514.91	14.19	1.77	1.92	669.00	7.98	50.36
Total	1,035.00	275,710.00	154,930.00	5,664.00	156.10	19.50	21.10	7,359.00	87.80	554.00

Biosolids Quality Report

Facility: LAGOON CITY WASTEWATER TREATMENT PLANT

Metals & Criteria

Period: 01/01/2023 to 12/31/2023

Works: 1617 / Digestor Type: Aerobic

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Solids & Nutrients | **Metals & Criteria** | **Last 4 Samples**

Note: all parameters in this report are derived from the Bslq Station

Month	Arsenic (mg/L)	Cadmium (mg/L)	Cobalt (mg/L)	Chromium (mg/L)	Copper (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Lead (mg/L)	Selenium (mg/L)	Zinc (mg/L)
Parameter Short Name	As	Cd	Co	Cr	Cu	Hg	Mo	Ni	Pb	Se	Zn
T/S	Lab Published Month Mean	Lab Published Month Mean	Lab Published Month Mean	Lab Published Month Mean	Lab Published Month Mean	Lab Published Month Mean	Lab Published Month Mean	Lab Published Month Mean	Lab Published Month Mean	Lab Published Month Mean	Lab Published Month Mean
Jan	0.10	0.01	0.03	0.29	4.10	0.00	0.05	0.25	0.20	0.10	10.00
Feb	0.20	0.02	0.04	0.37	5.20	0.01	0.08	0.35	0.20	0.10	13.00
Mar	0.10	0.01	0.03	0.26	3.70	0.01	0.05	0.23	0.10	0.10	9.00
Apr	0.20	0.01	0.02	0.26	3.30	0.00	0.05	0.22	0.20	0.10	9.00
May	0.10	0.01	0.03	0.23	3.10	0.01	0.05	0.22	0.10	0.10	8.00
Jun	0.20	0.02	0.03	0.31	4.00	0.01	0.06	0.28	0.20	0.10	10.00
Jul	0.10	0.02	0.03	0.29	4.40	0.01	0.06	0.27	0.20	0.10	11.00
Aug											
Sep	0.10	0.01	0.01	0.02	0.40	0.00	0.05	0.04	0.10	0.10	1.00
Oct	0.20	0.02	0.04	0.35	5.10	0.01	0.06	0.31	0.20	0.10	13.00
Nov	0.20	0.02	0.04	0.46	5.20	0.01	0.06	0.33	0.20	0.10	14.00
Dec	0.20	0.02	0.05	0.60	5.60	0.01	0.06	0.38	0.30	0.10	15.00

Average	0.15	0.01	0.03	0.31	4.01	0.01	0.06	0.26	0.18	0.10	10.27
Max. Permissible Metal Concentrations (mg/kg of Solids)	170.00	34.00	340.00	2,800.00	1,700.00	11.00	94.00	420.00	1,100.00	34.00	4,200.00
Metal Concentrations in Sludge (mg/kg)	6.17	0.57	1.27	12.48	159.95	0.23	2.29	10.45	7.25	3.99	409.85