Brechin/Lagoon City WWTP

Works # 120002255

Annual Wastewater Performance Report

Prepared For: The Township of Ramara

Reporting Period of January 1st – December 31st, 2020

Issued: March 24, 2021

Revision: 0

Operating Authority:

OCWA

ONTARIO CLEAN WATER AGENCY
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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The Environmental Compliance Approval (ECA) No. 1114-745MQT issued on June 6th, 2007 was revoked and replaced by ECA No. 8497-8D3TU7 issued on June 28th, 2012. Condition 9 (5) in ECA No. 8497-8D3TU7 state the requirements for annual performance reports. The 2020 performance report has been prepared following the conditions of ECA No. 8497-8D3TU7, 9 (5).During the reporting period, January 1st, 2020-August 31st, 2020 the Township of Ramara was the operating authority. From September 1st, 2020-December 31st, 2020 the Ontario Clean Water Agency was the operating authority.

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 charachterization 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; and

This report will show that the Ontario Clean Water Agency and the Township of Ramara 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)

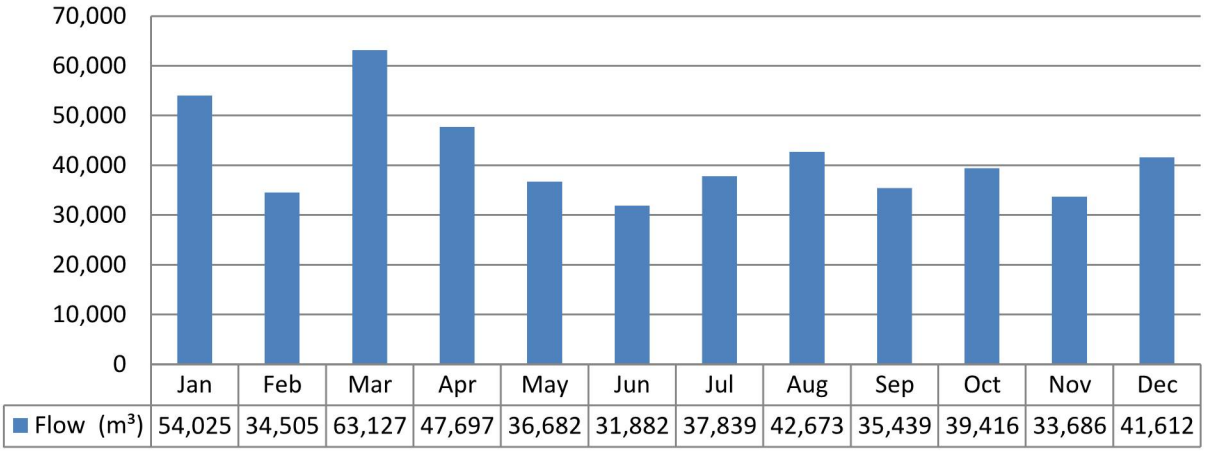
Summary of Influent Flow Data

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 achieve a 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 1,392.65 m³/day or 61.2 % of the rated capacity*

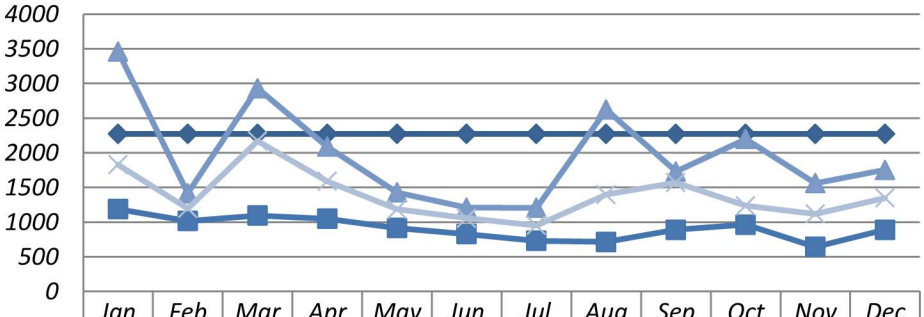
The total Influent flow in 2020 was 498 581.8 m³

Graph 1: 2020 Influent Flow Monthly Totals



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flow (m³)	54,025	34,505	63,127	47,697	36,682	31,882	37,839	42,673	35,439	39,416	33,686	41,612

Graph 2: 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)	1188	1017	1096	1049	915	828	731	716	891	963	644	892
Max (m³/day)	3462	1416	2931	2089	1429	1209	1208	2624	1730	2200	1562	1754
Avg(m³/day)	1830	1197	2171	1589	1185	1057	954	1398	1571	1236	1118	1349

Note: The above table shows exceedances in maximum flows during January, March and August. The spikes in flows were due to weather events/snowmelt. However, the average daily flow for the works was below the rated capacity.

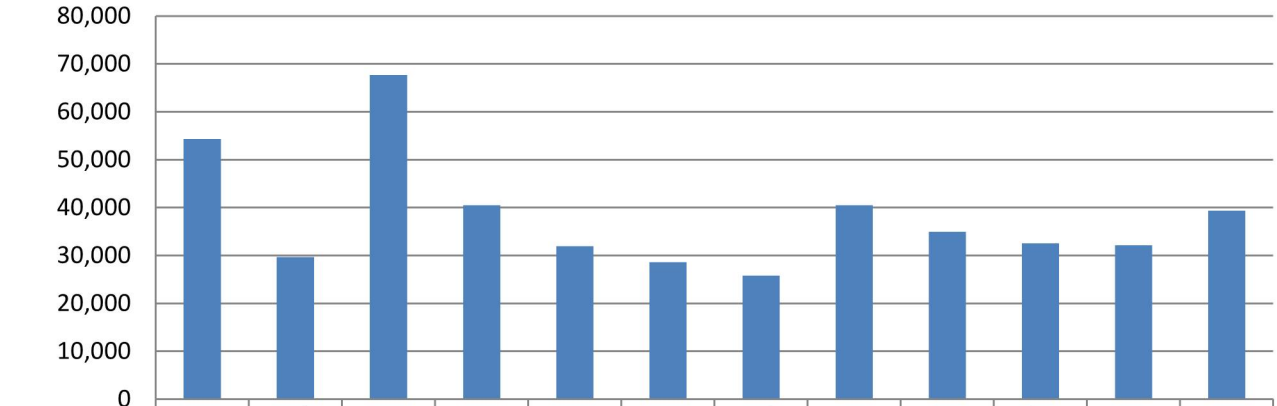
Summary of Effluent Flow Data

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 achieve a 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 1,209.17 m³/day or 53.2 % of the rated capacity*

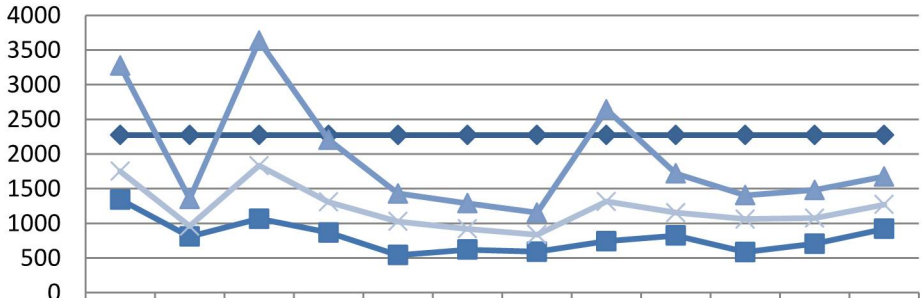
The total effluent flow in 2020 was 457 893.3 m³

Graph 3: 2020 Effluent Flow Monthly Totals



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flow (m3)	54,306	29,650	67,676	40,497	31,934	28,590	25,801	40,473	34,915	32,564	32,144	39,342

Graph 4: Effluent 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)	1343	811	1067	868	542	621	590	742	823	586	706	921
Max (m3/day)	3275	1353	3635	2206	1430	1289	1153	2641	1720	1406	1480	1675
Avg(m3/day)	1750	960	1831	1307	1026	921	837	1316	1154	1061	1075	1272

Note: The above table shows exceedances in maximum flows during January, March and August. The spikes in flows were due to weather events/snowmelt. 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 1: 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 2: 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.

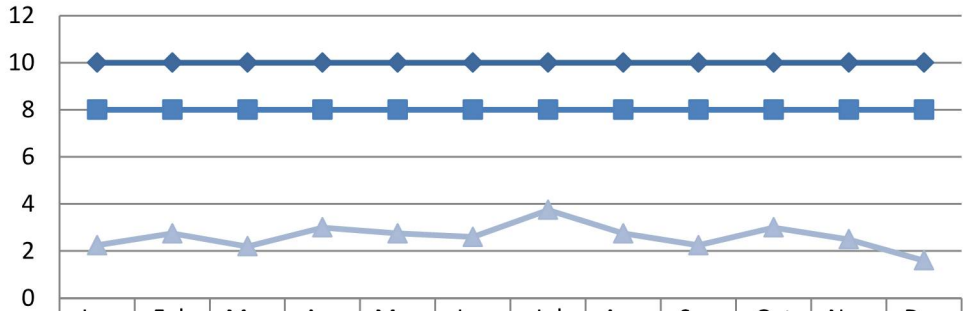
Carbonaceous Biochemical Oxygen Demand (CBOD5)

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 2020 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 2020.

Graph 5: 2020 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)	2.3	2.8	2.2	3.0	2.8	2.6	3.8	2.8	2.3	3.0	2.5	1.6

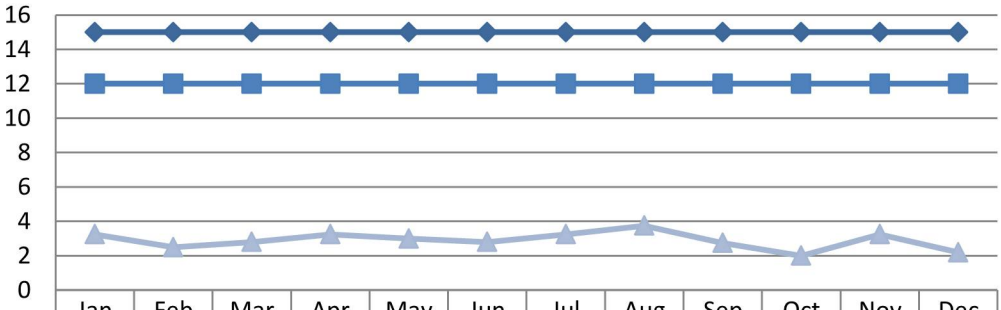
Total Suspended Solids (TSS)

ECA No. *8497-8D3TU7* sets the TSS annual monthly concentration limit at 15.0 mg/L and the objective at 12.0 mg/L. The monthly Total Suspended Solids average concentration results throughout 2020 were in compliance with the limits and objectives outlined in ECA No. *8497-8D3TU7*.

Total Suspended Solids Monthly Average Concentration

The monthly Total Suspended Solids monthly average concentration limit and monthly concentration objective were met each month in 2020.

Graph 6: 2020 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)	3.3	2.5	2.8	3.3	3.0	2.8	3.3	3.8	2.8	2.0	3.3	2.2

Total Phosphorus (TP)

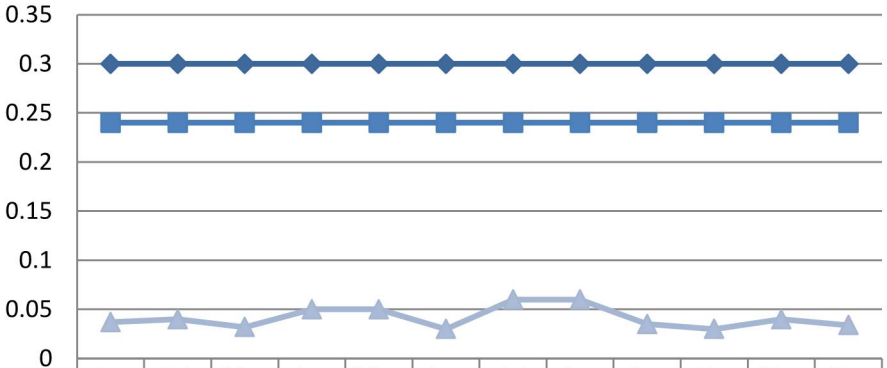
ECA No. *8497-8D3TU7* sets the TP monthly concentration limit at 0.30 mg/L and the annual average waste loading at 249 kg/year. The monthly Total Phosphorus average concentration results and annual average waste loading results throughout 2020 were in compliance with the limits and objectives outlined 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 Total Phosphorus monthly average concentration limit and monthly concentration objective were met each month in 2020.

Graph 7: 2020 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	0.03	0.05	0.05	0.03	0.06	0.06	0.04	0.03	0.04	0.03

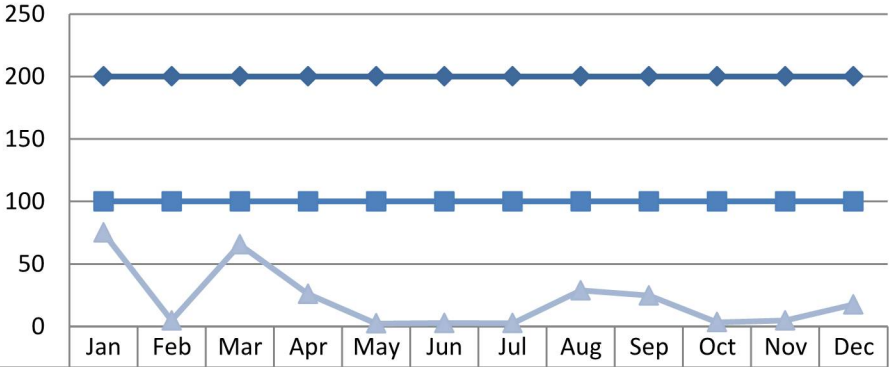
Table 3: 2020 Annual Average Concentration and Loading

Parameters	2020 Annual Average Concentration (mg/L)	Lake Simcoe Annual Average Concentration Limit /Objective	2020 Annual Average Loading (Kg/year)	Annual Loading Limit (Kg/year)	Lake Simcoe Annual Concentration Limit/Objective (mg/L)	Compliant (Y/N)
Total Phosphorus	0.04	0.15	18.32	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 and objective was met each month in 2020.

Graph 9: 2020 Monthly E. Coli Final Effluent Geometric Mean Comparisons

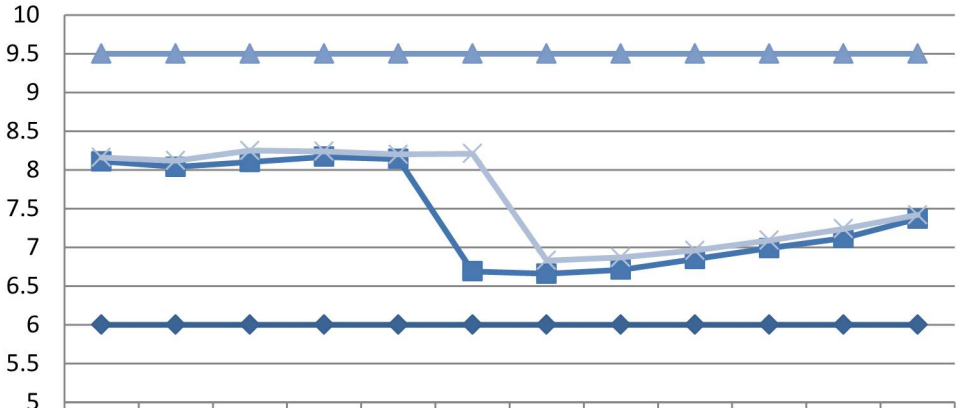


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit (mg/L)	200	200	200	200	200	200	200	200	200	200	200	200
Objective (mg/L)	100	100	100	100	100	100	100	100	100	100	100	100
Geomean (cfu/100mL)	75.1	4.9	65.6	26.0	2.4	2.7	2.6	28.9	24.8	3.4	4.9	17.7

pH

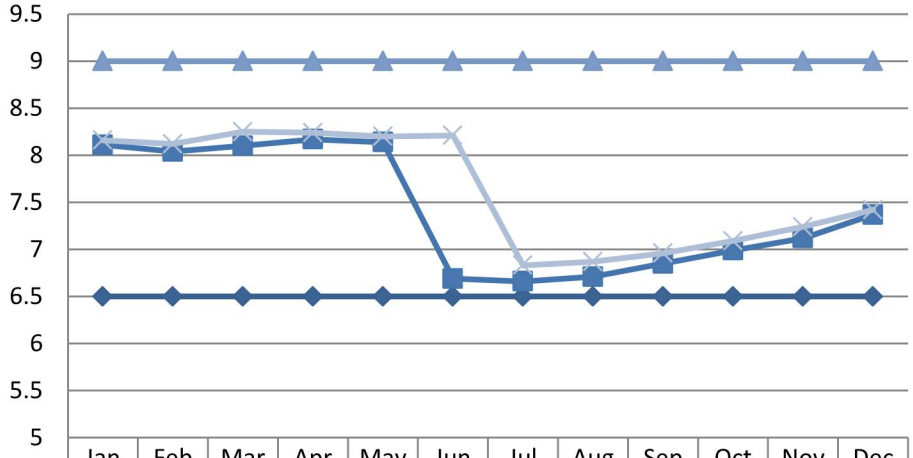
ECA No. *8497-8D3TU7* has a pH compliance limit within the range of 6.0 to 9.5 and an objective within the range of 6.5-9.0, inclusive, at all times. The pH of the final effluent ranged from 6.66 –8.25 throughout 2020 which is within the ECA compliance limit at all times.

Graph 10: 2020 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	8.11	8.04	8.10	8.17	8.14	6.69	6.66	6.71	6.85	6.99	7.12	7.37
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	8.16	8.12	8.25	8.24	8.20	8.21	6.83	6.87	6.96	7.09	7.24	7.42

Graph 11: 2020 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	8.11	8.04	8.10	8.17	8.14	6.69	6.66	6.71	6.85	6.99	7.12	7.37
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	8.16	8.12	8.25	8.24	8.20	8.21	6.83	6.87	6.96	7.09	7.24	7.42

Summary of Septage Received

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

Table 4: Monthly Septage Volumes

Month	Volume (m^3)
January	4.54
February	18.91
March	32.16
April	N/A
May	N/A
June	N/A
July	N/A
August	N/A
September	88.80
October	15.14
November	11.71
December	31.95
Total	203.21

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 5: Brechin Lagoon City WWTP Operational Challenges

Month	Challenges	Corrective Actions
January	Aerator Fault	North cable replaced.
	High flows due to weather event	Startup clarifier #2.
	UV Intensity Issue	UV bulbs pulled and cleaned & hardware inspected.
	Cold /Freezing- Ongoing Environmental Challenge	Winter specific maintenance i.e. de-icing aerators.
	Pump Station #2 Pump Fault	Remove debris from pump/station.
	Pump Station #4 Pump Fault	Pump repaired, power cable replaced.
	UV Intensity Issue	Replace bulbs.
	Low return activated sludge rate	Blow out line and re-prime siphon.
March	High flows due to snow melt	Startup clarifier #2.
	Low return activated sludge rate	Blow out line and re-prime siphon.
April	Damaged sewer main	Contractor repaired main.
	Low return activated sludge rate	Blow out line and re-prime siphon.

May	Low return activated sludge rate	Blow out line and re-prime siphon.
June	Blocked Sewer	Contractor cleared sewer.
	Low return activated sludge rate	Blow out line and re-prime siphon.
July	Pump Station #2 Pump Fault	Remove debris from pump/station.
	Aeartor Failure	Replace aerator with refurbished aerator. Send aerator out for repair.
	Low return activated sludge rate	Blow out line and re-prime siphon
August	Aerator fault	New starter & overload installed motor & cable replaced.
	Generator failed to exercise	Replace battery.
September	Pump Station #5 Pump Fault	Reset fault.
	UV Intensity Issue	Clean UV modules.
October	Generator Alarm	Low coolant level, top up coolant.
November	Higher operating level in Basin #1	Grit channel plug degraded, repair hole in grit channel to stop flow.
	Return activated sludge thick.	Screw pump speed reduced.
December	Pumping Station #2-Pump Fault	Remove decries from pump/station.
	Low return activated sludge rate	Unblock line, blow out line and re-prime siphon.

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 2020 consisted of the following:

- 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 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
- Repair and replace aerator
- 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 04 & 08, 2020 for equipment located at the Brechin/ Lagoon City Wastewater Treatment Plant. Please see Appendix II: Calibration Report.

Table 6: Brechin/Lagoon City WWTP – Summary of Influent and Final Effluent Monitoring Equipment – 2020	
Collection Monitoring Equipment	Date of Completion
Pump Station #4 Flow Meter	June 04, 2020
Pump Station #8 Flow Meter	June 08, 2020
Influent Monitoring Equipment	Date of Completion
Influent Flow Meter	June 08, 2020
Final Effluent Monitoring Equipment	Date of completion
Final Effluent Flow Meter	June 08, 2020
Online pH meter	June 08, 2020

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 7: 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 pumping volume based on tank levels to reduce solids carryover to the secondary clarifiers.
8. Increase dissolved oxygen (DO) set point to aerations tanks to help with filamentous control.
9. 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 2020.

Carbonaceous Biochemical Oxygen Demand (CBOD5)

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

Table 8: Monthly CBOD5 Final Effluent Concentration Objective Comparisons

Monthly Average	Average Concentration (mg/L)	Concentration Objective Target (mg/L)	Objective Achieved
January	2.25	8.0	Yes
February	2.75	8.0	Yes
March	2.20	8.0	Yes
April	3.00	8.0	Yes
May	2.75	8.0	Yes
June	2.60	8.0	Yes
July	3.75	8.0	Yes
August	2.75	8.0	Yes
September	2.25	8.0	Yes
October	3.00	8.0	Yes
November	2.50	8.0	Yes
December	1.60	8.0	Yes

Total Suspended Solids (TSS)

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

Table 9: Monthly TSS Final Effluent Concentration Objective Comparisons

Month	Average Concentration (mg/L)	Concentration Objective Target (mg/L)	Objective Achieved
January	3.25	12.0	Yes
February	2.50	12.0	Yes
March	2.80	12.0	Yes
April	3.25	12.0	Yes
May	3.00	12.0	Yes
June	2.80	12.0	Yes
July	3.25	12.0	Yes
August	3.75	12.0	Yes
September	2.75	12.0	Yes
October	2.00	12.0	Yes
November	3.25	12.0	Yes
December	2.20	12.0	Yes

Total Phosphorus (TP)

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

Table 10: 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	0.03	0.24	Yes
April	0.05	0.24	Yes
May	0.05	0.24	Yes

June	0.03	0.24	Yes
July	0.06	0.24	Yes
August	0.06	0.24	Yes
September	0.04	0.24	Yes
October	0.03	0.24	Yes
November	0.04	0.24	Yes
December	0.03	0.24	Yes

E.Coli

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

Table 11: Monthly E. Coli Final Effluent Concentration Objective Comparisons

Month	Geometric Mean (cfu/100mL)	Concentration Objective Target (cfu/100mL)	Objective Achieved
January	75.06	100	Yes
February	4.86	100	Yes
March	65.62	100	Yes
April	26.00	100	Yes
May	2.38	100	Yes
June	2.70	100	Yes
July	2.63	100	Yes
August	28.91	100	Yes
September	24.77	100	Yes
October	3.36	100	Yes
November	4.86	100	Yes
December	17.65	100	Yes

pH

The pH of the effluent ranged from 6.66– 8.25 throughout 2020 which is within the ECA design objectives of 6.50 to 9.00, inclusive, at all times.

Table 12: Monthly pH Final Effluent Concentration Objective Comparisons

Month	Minimum	Maximum
January	8.11	8.16
February	8.04	8.12
March	8.10	8.25
April	8.17	8.24
May	8.14	8.20
June	6.69	8.21
July	6.66	6.83
August	6.71	6.87
September	6.85	6.96
October	6.99	7.09
November	7.12	7.24
December	7.37	7.42

Unionized Ammonia

Unionized ammonia has an objective of 0.1mg/L (100 ug/L). Using total ammonia nitrogen, along with field pH and temperature, the following are the results for the monthly calculated unionized ammonia averages. The final unionized ammonia average was less than the objective each month.

Table 13: 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
01/08/2020	0.1	8.11	6.4	0.0018
01/16/2020	0.5	8.15	6.6	0.0098
01/20/2020	0.1	8.16	3.1	0.0015
01/29/2020	0.1	8.13	6.1	0.0018
02/04/2020	0.1	8.11	6.1	0.0017
02/10/2020	1.6	8.12	2.9	0.0219
02/18/2020	2.2	8.04	4.6	0.0288
02/24/2020	0.6	8.04	4.9	0.0080
03/04/2020	0.1	8.14	14.2	0.0034
03/09/2020	0.2	8.1	11.1	0.0050
03/16/2020	0.4	8.25	11	0.0138
03/23/2020	0.9	8.24	6.0	0.0207
03/30/2020	0.2	8.21	7.9	0.0050
04/08/2020	0.2	8.21	8.9	0.0054
04/14/2020	0.1	8.24	8.2	0.0027
04/20/2020	0.6	8.18	8.3	0.0144
04/27/2020	0.1	8.17	9.3	0.0025
05/06/2020	0.1	8.19	10.5	0.0029
05/11/2020	0.2	8.2	8.5	0.0051
05/19/2020	0.1	8.14	11.5	0.0028
05/25/2020	0.1	8.15	16.5	0.0041
06/03/2020	0.1	8.19	15.1	0.0041
06/08/2020	0.1	8.21	16.8	0.0048
06/15/2020	0.1	6.81	15.6	0.0002
06/22/2020	0.1	6.69	20.1	0.0002
06/29/2020	0.1	6.72	20.1	0.0002
07/08/2020	0.1	6.66	21.9	0.0002
07/13/2020	0.1	6.71	21.8	0.0002
07/20/2020	0.2	6.77	22.6	0.0006
07/27/2020	8.8	6.83	22.9	0.0290
08/04/2020	4.1	6.87	20.1	0.0121
08/12/2020	0.3	6.84	21.3	0.0009
08/17/2020	3.5	6.81	20.8	0.0095
08/24/2020	1.9	6.71	21.9	0.0044
09/02/2020	0.1	6.93	20.1	0.0003

09/08/2020	0.1	6.85	18.9	0.0003
09/14/2020	0.1	6.96	18.7	0.0003
09/21/2020	0.1	6.96	15.9	0.0003
09/28/2020	0.1	6.91	19.7	0.0003
10/05/2020	0.1	7	14.9	0.0003
10/13/2020	0.1	6.99	15	0.0003
10/22/2020	0.1	7.05	13.8	0.0003
10/26/2020	0.1	7.09	13.2	0.0003
11/05/2020	0.1	7.23	10.4	0.0003
11/09/2020	0.1	7.12	13.8	0.0003
11/16/2020	0.2	7.22	10.9	0.0007
11/23/2020	0.1	7.24	9.1	0.0003
12/03/2020	0.1	7.37	8.8	0.0004
12/08/2020	0.1	7.42	7.9	0.0004
12/14/2020	0.1	7.4	9.1	0.0004
12/21/2020	0.1	7.38	8.4	0.0004
12/29/2020	0.7	7.38	7.2	0.0025

Temperature

The final effluent temperature ranged from 2.9°C to 22.9°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 14: 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	51.0	63.0	16.4	1.10
February	46.0	143.0	8.5	0.77
March	41.0	85.0	8.2	0.82
April	46.0	209.0	11.0	0.90
May	57.0	148.0	25.7	2.23
June	69.0	98.0	14.0	1.31
July	69.0	60.0	11.8	1.30
August	100.0	163.0	22.1	2.44
September	69.0	83.0	15.6	1.48
October	115.0	147.0	31.0	3.70
November	56.0	63.0	10.8	1.10
December	74.0	89.00	20.4	1.58

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

The total volume of sludge generated in 2020 was 1, 035 m^3 which was slightly higher than the amount of sludge generated in 2019. Wessuc Inc. has been contracted to haul, land apply the Biosolids on their approved sites. Monthly sludge sampled are collected to 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 15: Monthly Sludge Generation Volumes

Month	Volume (m^3)
January	N/A
February	N/A
March	N/A
April	N/A
May	495.00
June	N/A
July	N/A
August	N/A
September	540.00
October	N/A
November	N/A
December	N/A
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

ECA #8497-8D3TU7 (5)(h) states that the annual performance report shall contain: *"a summary of any complaints received and any steps taken to address the complaints."*

During the 2020 reporting period there was no community complaints received.

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

Table 16 summarizes all Bypasses, spills and abnormal discharge events that occurred in 2020. All were reported to MOH and MECP.

Table 16: 2020 Summary of Events as per Condition 9(5)(i)

Date 2020	Type of Event	Total Estimated Volume (m3)	Disinfect (Y/N)	Samples Collected (Y/N)	Reason
August 3	127A Manhole Overflow	~50	N	N **Duration of event was too short to collect samples**	Hydro failure, generator at SPS #4 started but failed to transfer.

<u>ECA #8497-8D3TU7 Condition 9(5)(j)</u> – 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.

<u>ECA #8497-8D3TU7 Condition 9(5)(k)-</u> 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.

Appendix I

Performance Assessment Report

Ontario Clean Water Agency

Facility: [1617] Lagoon City Water Pollution Control Plant
Works: [120002255]

	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	<--Total-->	<--Avg.-->	<--Max.-->	<--Criteria-->
Flows:																
Raw Flow: Total - Raw (m^3)	54,025.0	34,504.5	63,126.7	47,696.8	36,682.3	31,882.0	37,838.7	42,673.0	35,438.7	39,416.2	33,685.5	41,612.4	498,581.8			
Raw Flow: Avg - Raw (m^3/d)	1,830.0	1,197.5	2,171.4	1,589.2	1,185.2	1,056.6	953.9	1,398.3	1,627.9	1,235.8	1,117.9	1,349.0		1,392.7		
Raw Flow: Max - Raw (m^3/d)	3,462.1	1,416.4	2,931.4	2,088.5	1,428.8	1,208.6	1,207.7	2,624.0	1,730.4	2,199.6	1,562.4	1,754.4			3,462.1	
Eff. Flow: Total - Eff (m^3)	54,306.5	29,649.7	67,676.1	40,497.3	31,933.7	28,590.3	25,800.9	40,473.1	34,915.4	32,564.1	32,144.2	39,342.1	457,893.2			
Eff. Flow: Avg - Eff (m^3/d)	1,750.1	959.6	1,831.1	1,307.2	1,026.4	920.5	837.0	1,316.0	1,154.1	1,060.7	1,075.5	1,271.9		1,209.2		
Eff. Flow: Max - Eff (m^3/d)	3,275.4	1,353.1	3,635.2	2,206.0	1,430.0	1,288.8	1,153.2	2,641.4	1,720.0	1,405.6	1,480.3	1,675.4			3,635.2	
CBOD:																
Eff: Avg cBOD5 - Eff (mg/L)	2.3	2.8	2.2	3.0	2.8	2.6	3.8	2.8	2.3	3.0	2.5	1.6		2.6	3.8	10
Eff: # of samples of cBOD5 - Eff (mg/L)	4	4	5	4	4	5	4	4	4	4	4	5	51			
Loading: cBOD5 - Eff (kg/d)	3.94	2.64	4.03	3.92	2.82	2.39	3.14	3.62	2.60	3.18	2.69	2.03		3.08	4.03	
Biochemical Oxygen Demand: BOD5:																
Raw: Avg BOD5 - Raw (mg/L)	51.0	46.0	41.0	46.0	57.0	69.0	69.0	100.0	69.0	115.0	56.0	74.0		66.1	115.0	
Raw: # of samples of BOD5 - Raw (mg/L)	1	1	1	1	1	1	1	1	1	1	1	1	12			
Total Suspended Solids: TSS:																
Raw: Avg TSS - Raw (mg/L)	63.0	143.0	85.0	209.0	148.0	98.0	60.0	163.0	83.0	147.0	63	89		112.6	209.0	
Raw: # of samples of TSS - Raw (mg/L)	1	1	1	1	1	1	1	1	1	1	1	1	12			
Eff: Avg TSS - Eff (mg/L)	3.25	2.50	2.80	3.25	3.00	2.80	3.25	3.75	4.00	2.00	3.25	2.20		3.004	4.000	15
Eff: # of samples of TSS - Eff (mg/L)	4	4	5	4	4	5	4	4	4	4	4	5	51			
Loading: TSS - Eff (kg/d)	5.69	2.40	5.13	4.25	3.08	2.58	2.72	4.94	4.62	2.12	3.50	2.80		3.65	5.69	
Percent Removal: TSS - Raw (mg/L)	94.84	98.25	96.71	98.44	97.97	97.14	94.58	97.70	95.18	98.64	94.84	97.53			98.64	
Total Phosphorus: TP:																
Raw: Avg TP - Raw (mg/L)	1.11	0.77	0.82	0.90	2.23	1.31	1.30	2.44	1.48	3.70	1.10	1.58		1.562	3.700	
Raw: # of samples of TP - Raw (mg/L)	1	1	1	1	1	1	1	1	1	1	1	1	12			
Eff: Avg TP - Eff (mg/L)	0.03	0.04	0.03	0.05	0.05	0.03	0.06	0.06	0.03	0.03	0.04	0.03		0.04	0.06	0.3
Eff: # of samples of TP - Eff (mg/L)	4	4	5	4	4	5	4	4	4	4	4	5	51			
Loading: TP - Eff (kg/d)	0.05	0.04	0.05	0.07	0.05	0.03	0.05	0.08	0.03	0.03	0.04	0.04		0.05	0.08	
Percent Removal: TP - Raw (mg/L)	97.30	94.81	96.34	94.44	97.76	97.71	95.38	97.54	97.97	99.19	96.36	98.10			99.19	
Nitrogen Series:																
Raw: Avg TKN - Raw (mg/L)	16.4	8.5	8.2	11.0	25.7	14.0	11.8	22.1	15.6	31	10.8	20.4		16.3	31.0	
Raw: # of samples of TKN - Raw (mg/L)	1	1	1	1	1	1	1	1	1	1	1	1	12			
Eff: Avg TAN - Eff (mg/L)	0.20	1.13	0.32	0.25	0.13	0.08	2.30	2.45	0.10	0.10	0.13	0.20		0.61	2.45	
Eff: # of samples of TAN - Eff (mg/L)	4	4	5	4	4	5	4	4	4	4	4	5	51			
Loading: TAN - Eff (kg/d)	0.35	1.08	0.59	0.33	0.13	0.07	1.93	3.22	0.12	0.11	0.13	0.25		0.69	3.22	
Eff: Avg NO3-N - Eff (mg/L)	7.63	9.29	6.08	9.90	15.05	14.92	20.23	13.43	16.63	15.75	14.57	7.66		12.59	20.23	
Eff: # of samples of NO3-N - Eff (mg/L)	4	4	5	4	4	5	4	4	4	4	4	5	51			
Eff: Avg NO2-N - Eff (mg/L)	0.21	0.14	0.17	0.39	0.23	0.27	0.74	1.42	0.27	0.54	1.02	2.10		0.62	2.10	
Eff: # of samples of NO2-N - Eff (mg/L)	4	4	5	4	4	5	4	4	4	4	4	5	51			
Disinfection:																
Eff: GMD E. Coli - Eff (cfu/100mL)	75.06	4.86	65.62	26.00	2.38	2.70	2.63	28.91	24.76	3.36	4.86	17.64		21.565	75.060	200.0
Eff: # of samples of	4	4	5	4	4	5	4	4	4	4	4	5	51			

Appendix II

Calibration Reports

Flowmetrix
Technical Services Inc.

Western Office
2088 Jetstream Road
London, Ontario
N5V 3P6

Eastern Office
1602 Old Wooler Road
Wooler, Ontario
K0K 3M0

ABB WATERMASTER
Verification Report

AS FOUND CERTIFICATION

PASS

CLIENT DETAIL	
CUSTOMER	Township of Ramara
CONTACT	Dave Readman Manager of Environmental Services PO Box 130 Brechin, ON P: 705-484-5374 x287 E: dreadman@ramara.ca
VER. BY - FM	Michael Jorrin

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

EQUIPMENT DETAIL	
[MUT] MANUFACTURER	ABB
MODEL	WaterMaster
SERIAL NUMBER	3K220000196136
PLANT ID	Lagooon City
METER ID	Pump Station #4 Flow
FIT ID	NA
CLIENT TAG	NA
OTHER	NA
GPS COORDINATES	N 44°33.235 W 079°12.681
VERIFICATION DATE	June 4th 2020
CAL. FREQUENCY	Annual
CAL. DUE DATE	June 2021

SENSOR INFORMATION

Q3	m3/h	1000
CALIBRATION ACCURACY		OIML Class 2
SENSOR CAL. ACCURACY	%	113.8
	mm/sec	-0.55
	~	11
DATE OF MANUFACTURE		17 Oct 2016
RUN HOURS	d/h/m	1335/19/25

TRANMITTER INFORMATION

APPLICATION VERSION		v01.06.00	03/03/15
MSP VERSION		01.00.00	
DATE OF MANUFACTURE		17 Oct 2016	
RUN HOURS	d/h/m	1222/2/39	
ALLOWABLE TOLERANCE	%	15.0	

CURRENT OUTPUT

OUTPUT TEST	4.00 20.00	READING mA	ERROR %	PASS FAIL
4.0 mA	4.00	N/A	N/A	N/A
12.0 mA	12.00	N/A	N/A	N/A
20.0 mA	20.00	N/A	N/A	N/A

PULSE OUTPUT

OUTPUT TEST		READING mA	ERROR %	PASS FAIL
OUTPUT 1, Hz	100	N/A	N/A	N/A
OUTPUT 1, Hz	50	N/A	N/A	N/A
OUTPUT 2, Hz	100	N/A	N/A	N/A
OUTPUT 2, Hz	50	N/A	N/A	N/A

VERIFICATION HISTORY

OIML Accuracy Alarms	0	

TOTALIZER INFORMATION

FORWARD	1569002.91	m3
REVERSE	416.85	m3
NET	1568586.06	m3

SENSOR DATA

COIL CURRENT	179.9	mA
COIL INDUCTANCE	99.7	mH
COIL SHIFT	-0.4	%
COIL/LOOP RESISTANCE	32	ohm

TRANSMITTER DATA

TX GAIN - ADJUSTMENT	0	%

VeriMASTER INFORMATION

VERSION	01.00.01
LIMIT VERSION	01.00.01

CONFIGURATION SETTINGS

MAINS/FREQUENCY		50	Hz
QMAX		1000	m3/h
PULSES/UNIT		50	
PULSES LIMIT FREQUENCY		100	Hz
SENSOR USER	SPAN	-100	%
	ZERO	0	mm/s
USER FLOW	CUTOFF	0	%
	HYSTERESIS	20	%
METER MODE		Forward Flow	

COMMENTS

QUALITY MANAGEMENT STANDARDS INFO.

[QMS] INFORMATION	IDENT.	ID #
[REFERENCE] FTS	ABBWM	1
PROCESS METER	PM	1

The information contained within this report was produced by "VeriMASTER - Flow Meter Verification Report". The AS LEFT information is the same as the AS FOUND information within this report. If changes have been made relative to the accuracy of the calibration, an AS LEFT certificate will be issued.

Flowmetrix
Technical Services Inc.

Western Office
2088 Jetstream Road
London, Ontario
N5V 3P6

Eastern Office
1602 Old Wooler Road
Wooler, Ontario
K0K 3M0

Krohne
Verification Report

AS FOUND CERTIFICATION

FORWARD FLOW DIRECTION

PASS

CLIENT DETAIL	
CUSTOMER	Township of Ramara
CONTACT	Dave Readman
	manager of Environmental Services
	PO Box 130
	Brechin, ON
	P: 705-484-5374 x287
	E: dreadman@ramara.ca
VER. BY - FM	Michael Jorrin

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

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 8th 2020
CAL. FREQUENCY	Annual
CAL. DUE DATE	June, 2021

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	526789.4	M3
AS LEFT	526794.7	M3
DIFFERENCE	5.3	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**		**8.006**	**16.012**	**32.025**	LPS
MUT [Reading]				0.004		7.902	15.900	31.713	LPS
MUT [Difference]				0.004		-0.104	-0.112	-0.312	LPS
MUT [% Error]				n/a		-1.30	-0.70	-0.97	%
mA OUTPUT				**4.000**		**6.135**	**8.270**	**12.540**	mA
MUT [Reading]	min.	4.000	mA	4.000		6.131	8.255	12.453	mA
MUT [Difference]	max.	20.000	mA	0.000		-0.004	-0.015	-0.087	mA
MUT [% Error]				0.00		-0.06	-0.18	-0.69	%
TOTALIZER - REF. FLOW RATE								**32.025**	LPS
TOTALIZER [MUT]								3	M3
TEST TIME								82.15	SECONDS
CALC. TOTALIZER								2.631	M3
ERROR								-1.19	%

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	-0.99	PASS
mA OUTPUT	-0.23	PASS
TOTALIZER	-1.19	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.

Flowmetrix
Technical Services Inc.

Western Office
2088 Jetstream Road
London, Ontario
N5V 3P6

Eastern Office
1602 Old Wooler Road
Wooler, Ontario
K0K 3M0

v-Notch Weir
Verification/Calibration Report

AS FOUND CERTIFICATION

PASS

CLIENT DETAIL	
CUSTOMER	Township of Ramara
CONTACT	Dave Readman Manager of Environmental Services PO Box 130 Brechin, ON P: 705-484-5374 x287 E: dreadman@ramara.ca
VER. BY - FM	Michael Jorrin

Quality Management Standards Information - Reference equipment and instrumentation used to conduct this verification test is found in our AC-

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 8th 2020
CAL. FREQUENCY	Annual
CAL. DUE DATE	June 2021

PROGRAMMING PARAMETERS		
NOTCH ANGLE (ϕ)	inches	45
EMPTY DISTANCE, TX to notch	m	0.662
TRANSDUCER (TX), to sump flo	m	1.54
SUMP LEVEL, zero flow	m	0.878
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

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

TOTALIZER		
AS FOUND	113028	M3
AS LEFT	113028	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	

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

AS FOUND TEST RESULTS

				0.0	**4.9**	**31.9**	**60.3**	**100.0**	**% F.S. Range**
				0.000	0.090	0.190	0.245	0.300	**m**
REF. FLOW RATE				**0.0**	**5.0**	**32.4**	**61.1**	**101.4**	M3/H
MUT [Reading]				0.0	4.3	33.7	59.9	98.2	M3/H
MUT [Difference]				0.0	-0.7	1.3	-1.2	-3.2	M3/H
MUT [% Error]				#DIV/0!	-14.0	4.1	-2.0	-3.2	%
mA OUTPUT				**4.000**	**4.789**	**9.107**	**13.643**	**20.000**	mA
MUT [Reading]	min.	4.000	mA	4.000	4.699	9.155	12.519	20.024	mA
MUT [Difference]	max.	20.000	mA	0.000	-0.090	0.048	-1.124	0.024	mA
MUT [% Error]				0.00	-1.87	0.52	-8.24	0.12	%
TOTALIZER - REF. FLOW RATE									
TOTALIZER [MUT]									
TEST TIME									
CALC. TOTALIZER									
ERROR									

COMMENTS

-Results based on Internal Simulation not actual flow.
-Head Level was verified with a 1 point live flowrate.

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	-3.75	PASS
mA OUTPUT	-1.89	PASS
TOTALIZER	N/A	N/A

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Flowmetrix
Technical Services Inc.

Western Office
2088 Jetstream Road
London, Ontario
N5V 3P6

Eastern Office
1602 Old Wooler Road
Wooler, Ontario
K0K 3M0

ROSEMOUNT
Verification Report

AS FOUND CERTIFICATION

FORWARD FLOW DIRECTION

PASS

CLIENT DETAIL	
CUSTOMER	Township of Ramara
CONTACT	Dave Readman Manager of Environmental Services PO Box 130 Brechin, ON P: 705-484-5374 x287 E: dreadman@ramara.ca
VER. BY - FM	Michael Jorrin

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

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 8th 2020
CAL. FREQUENCY	Annual
CAL. DUE DATE	June 2021

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
VERIFICATOR CAL. FACTOR [16-digits]		1000015010000000

FORWARD TOTALIZER INFORMATION		
AS FOUND	5.38	M3
AS LEFT	253.85	M3
DIFFERENCE	248.47	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

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	4.000	5.602	9.343	20.027	mA
MUT % Error	20	mA	0.00	0.04	0.10	0.14	%
TOTALIZER						30.00	ft/s
TEST Accumulation						2800.11	ft
TIME						93.19	seconds
CALC. Velocity						30.05	ft/s
% Error						0.16	%

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

RESULTS

TEST	AVG % o.r.	PASS FAIL
DISPLAY	0.00	PASS
mA OUTPUT	0.09	PASS
TOTALIZER	0.16	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

[MUT] AS FOUND **FAIL**

[MUT] AS LEFT **PASS**

CUSTOMER	Township of Ramara	[MUT] MANUFACTURER	ABB
CONTACT	Dave Readman	MODEL	AX460/600010/STD
	Manager of Environmental Services	SERIAL NUMBER	3K22000652669
	PO Box 130	CLIENT TAG	n/a
	Brechin, ON	LOCATION	Lagon City STP
	P: 705-484-5374 x287	OTHER	Final Effluent Flow
	E: dreadman@ramara.ca	GPS COORDINATES	N 44°33.467 W 079°12.436
VER. BY	*Michael Jorrin*	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

VERIFICATION DATE	June 08, 2020
CAL. FREQUENCY	Annual
CAL. DUE DATE	June-2021

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	24.0	4.01	4.33	22.5	0.32	FAIL
7.01	24.0	7.01	7.65	22.4	0.64	FAIL
					RESULT	**FAIL**

AFTER CALIBRATION

REFERENCE BUFFER			[MUT] READINGS			
pH BUFFER	TEMP. ° C	pH CORRECTED	pH	TEMP. ° C	pH - ERROR DIFF.	PASS FAIL
4.01	24.0	4.01	4.05	22.5	0.04	PASS
7.01	24.0	7.01	7.00	22.3	-0.01	PASS
					RESULT	**PASS**

mv offset/Assymetry	0.4
Slope	-61

COMMENTS

[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 Data Summary

Ontario Clean Water Agency
Biosolids Quality Report - Liquid
Digestor Type: Aerobic
Solids and Nutrients

Facility: BRECHIN LAGOON CITY WASTEWATER TREATMENT FACILITY
Works: 120002255
Period: 01/01/2020 to 12/31/2020
Facility Name: *BREHCIN LAGOON CITY WASTEWATER TREATMENT FACILITY*
Facility Owner: *The Township of Ramara*
Facility Classification: *Class 2 Wastewater Treatment*
Receiver: *Lake Simcoe*

Month	Total Sludge Hauled (m3)	Avg. Total Solids (mg/L)	Avg. Volatile Solids (mg/L)	Avg. Total Phosphorus (mg/L)	Ammonia (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)	TKN (mg/L)	Potassium (mg/L)
Site	**Site Name**								
Station	**Bslq Station only**								
Parameter Short Name	**HauledVol**	**TS**	**VS**	**TP**	**NH3p_NH4p_N**	**NO3-N**	**NO2-N**	**TKN**	**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**	**Lab Published Month Mean**
Jan		28,500.000		290.000	9.800	0.300	0.600	830.000	37.000
Feb		25,100.000		460.000	2.500	0.700	0.800	689.000	43.000
Mar		19,900.000		470.000	4.500	0.500	0.700	482.000	47.000
Apr		19,300.000		410.000	5.400	0.300	0.500	452.000	37.000
May	495.000	24,100.000		580.000	4.700	0.300	0.400	656.000	48.000
Jun		25,400.000		420.000	13.300	0.700	2.500	836.000	38.000
Jul		25,500.000		470.000	12.800	0.300	0.900	756.000	43.000
Aug		21,300.000		630.000	7.600	0.500	0.300	554.000	44.000
Sep	540.000	37,200.000	19,100.000	1,100.000	9.900	0.300	0.300	776.000	78.000
Oct		24,500.000	14,000.000	600.000	10.300	0.300	0.400	964.000	52.000
Nov		19,200.000	10,500.000	330.000	2.700	1.200	0.300	432.000	32.000
Dec		29,100.000	16,600.000	470.000	12.000	0.300	0.500	1,060.000	49.000
Average	517.500	24,925.000	15,050.000	519.167	7.958	0.475	0.683	707.250	45.667
Total	1,035.000	299,100.000	60,200.000	6,230.000	95.500	5.700	8.200	8,487.000	548.000

Ontario Clean Water Agency
Biosolids Quality Report - Liquid
Digestor Type: Aerobic
Metals and Criteria

Facility: BRECHIN LAGOON CITY WASTEWATER TREATMENT FACILITY
Works: 120002255
Period: 01/01/2020 to 12/31/2020
Note: all parameters in this report will be 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)
Site	**Brechin Lagoon City WWTF**										
Station	**Bslq Station only**										
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	0.100	0.009	0.020	0.240	2.300	0.006	0.050	0.150	0.100	0.100	6.300
Feb	0.100	0.013	0.030	0.410	3.500	0.007	0.050	0.250	0.200	0.100	10.000
Mar	0.100	0.014	0.030	0.430	3.800	0.005	0.050	0.230	0.200	0.100	10.000
Apr	0.100	0.010	0.020	0.310	2.900	0.005	0.050	0.210	0.100	0.100	8.000
May	0.200	0.017	0.040	0.440	4.200	0.006	0.050	0.280	0.200	0.100	13.000
Jun	0.100	0.011	0.030	0.310	2.700	0.003	0.050	0.200	0.100	0.100	8.000
Jul	0.100	0.015	0.030	0.370	3.800	0.006	0.050	0.230	0.200	0.100	11.000
Aug	0.100	0.018	0.040	0.420	4.500	0.005	0.050	0.280	0.200	0.100	13.000
Sep	0.200	0.032	0.060	0.750	7.000	0.008	0.090	0.450	0.300	0.100	20.000
Oct	0.200	0.016	0.030	0.410	4.100	0.006	0.060	0.280	0.200	0.100	12.000
Nov	0.100	0.010	0.020	0.280	2.600	0.003	0.050	0.120	0.100	0.100	7.000
Dec	0.100	0.012	0.020	0.410	3.200	0.005	0.050	0.200	0.200	0.100	9.000
Average	0.125	0.015	0.031	0.398	3.717	0.005	0.054	0.240	0.175	0.100	10.608
Max. Permissible Metal Concentrations (mg/kg of Solids)	170	34	340	2800	1700	11	94	420	1100	34	4200
Metal Concentrations in Sludge (mg/kg)	5.01	0.590	1.240	15.980	149.110	0.220	2.170	9.630	7.020	4.010	425.610

Twelve Month Average: January 2020 - December 2020
Biosolids Summary -Brechin Lagoon City WWTF

Metals	Maximum Acceptable Concentration (mg/kg)	2020 Average
As	170	0.125
Cd	34	0.015
Co	340	0.031
Cr	2,800	0.398
Cu	1,700	3.717
Hg	11	0.005
Mo	94	0.054
Ni	420	0.240
Pb	1,100	0.175
Se	34	0.100
Zn	4,200	10.608
E.coli	Maximum Acceptable Concentration (CFU/g)	407,264
	2,000,000	