

March 27, 2023

Trevor Dagilis  
District Manager  
Ministry of the Environment, Conservation and Parks  
Drinking Water and Environmental Compliance Division  
Kingston Offices

Dear Trevor Dagilis;

Re: Madoc Sewage Lagoons - Annual Report for 2022

---

Attached please find the annual performance report for Madoc Sewage Lagoons for the operating year 2022, prepared by the Ontario Clean Water Agency on behalf of the Corporation of the Municipality of Centre Hastings.

This report is submitted in accordance with Section 11 of the Environmental Compliance Approval (ECA) 1652-BRKT58 (issued August 14, 2020) for the Madoc Sewage Lagoons. This report is also submitted in accordance with Section 8 of ECA number 7572-BQXR8E (issued August 6<sup>th</sup>, 2020) for the Madoc Hwy#7 and McDonald Pumping Stations and ECA No. ECA No. 5465-BQXPQY Section 4 Condition 2 for the Madoc Stormwater Management Facility.

The purpose of this report is to provide a performance record for future references and to provide a compliance record for all the terms and conditions outlined in the Environmental Compliance Approval.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Natalie Iezzi  
Process & Compliance Technician, OCWA  
Kawartha Trent  
Ontario Clean Water Agency

cc: Amber Coupland, Sr. Operations Manager, Ontario Clean Water Agency  
Sarah Young, Environmental Officer, MECP  
Moir Lake Cottager's Association

# Madoc Wastewater Lagoon

## Annual Report

Reporting period of January 1, 2022 – December 31, 2022

Prepared For: Corporation of the Municipality of Centre Hastings

Prepared By:  **Ontario Clean Water Agency**  
**Agence Ontarienne Des Eaux**

This report is submitted in accordance with Conditions 11(5)(a) through 11(5)(l) of Environmental Compliance Approval No. 1652-BRKT58 Conditions 11(4)(a) through 11(4)(l), Condition 8 of ECA No. 7572-BQXR8E and ECA No. 5465-BQXPQY Condition 4 (2)(a) through (e) .

Condition 11(4) of ECA No. 1652-BRKT58, Condition 8 of ECA number 7572-BQXR8E states and Condition 4(2) of ECA No. 5465-BQXPQY , *“The Owner shall prepare performance reports on a calendar year basis and submit to the District Manager by March 31 of the calendar year following the period being reported upon...”*

## **Facility Introduction**

The Ontario Clean Water Agency (OCWA) operates and maintains the Madoc Wastewater Treatment Plant (Madoc Lagoons) and Pumping Stations on behalf of the Municipality of Centre Hastings.

For the 2022 reporting period, the Municipality of Centre Hastings operated the Stormwater Management Facility.

The Madoc Lagoon facility is a Class 1 Wastewater Treatment Plant.

The facility's design flow is 1,008m<sup>3</sup>/day. The average day raw flow for the year 2022 was 658.77m<sup>3</sup>/day.

The Madoc Wastewater Lagoons, Pump Stations and Stormwater Management Facility complies with all requirements of the regulating authorities and operates under:

- Environmental Compliance Approval No. 1652-BRKT58 (issued August 14<sup>th</sup>, 2020)
- Environmental Compliance Approval No. 7572-BQXR8E (issued August 6<sup>th</sup>, 2020) for the Madoc Hwy#7 and McDonald Pumping Stations
- Environmental Compliance Approval No. 5465-BQXPQY (issued August 6<sup>th</sup>, 2020) for the Madoc Stormwater Facility

## **Discharge Requirements**

The Madoc Lagoons operate on seasonal retention and seasonal discharge cycle with continuous alum feed for phosphorous removal, discharging in Spring and Fall.

Discharge periods are defined in ECA No. 1652-BRKT58 as follows:

- Spring discharge commencing not earlier than April 1 and terminating not later than May 20
- Fall discharge commencing not earlier than November 1 and terminating not later than December 15

Discharge shall normally take place over a minimum of 21 days.

## **2022 Performance Report for the Madoc Sewage Lagoons**

During the 2022 reporting period the Ontario Clean Water Agency operated under the Environmental Compliance Approval (ECA) number 1652-BRKT58 (issued August 14<sup>th</sup>, 2020).

<b>Environmental Compliance Approval (ECA) No. 1652-BRKT58 Condition 11(4) &amp; Condition 8 ECA No. 7572-BQXR8E -</b>		<b>Page #</b>
a	ECA No. 1652-BRKT58 Condition 11(4)(a)- A summary and interpretation of all Influent, Imported Sewage monitoring data, and a review of the historical trend of the sewage characteristics and flow rates.	5
b	ECA No. 1652-BRKT58 Condition 11(4)(b)- A summary and interpretation of all Final Effluent monitoring data, including concentration, flow rates, loading and a comparison to the design objectives and compliance limits in this Approval, including an overview of the success and adequacy of the Works;	7
c	ECA No. 1652-BRKT58 Condition 11(4)(c)- A summary of all operating issues encountered and corrective actions taken;	11
d	ECA No. 1652-BRKT58 Condition 11(4)(d)- A summary of all normal and emergency repairs and maintenance activities carried out on any major structure, equipment, apparatus or mechanism forming part of the Works;	11
e	ECA No. 1652-BRKT58 Condition 11(4)(e)- a summary of any effluent quality assurance or control measures undertaken	12
f	ECA No. 1652-BRKT58 Condition 11(4)(f)- a summary of the calibration and maintenance carried out on all Influent, Imported Sewage and Final Effluent monitoring equipment to ensure that the accuracy is within the tolerance of that equipment as required in this Approval or recommended by the manufacturer	12
g	ECA No. 1652-BRKT58 Condition 11(4)(g) – a summary of efforts made to achieve the design objectives in this Approval, including an assessment of the issues and recommendations for pro-active actions if any are required under the following situations: I. when any of the design objectives is not achieved more than 50% of the time in a year, or there is an increasing trend in deterioration of Final Effluent quality; II. when the Annual Average Daily Influent Flow reaches 80% of the Rated Capacity	13
h	ECA No. 1652-BRKT58 Condition 11(4)(h)- a tabulation of the measured volume of sludge accumulated in the lagoon cells in five year intervals and the estimated volume in the interim years and when sludge was disposed of during the reporting period, a summary of disposal locations and volumes of sludge disposed at each location	13
i	ECA No. 1652-BRKT58 Condition 11(4)(i)- a summary of any complaints received and any steps taken to address the complaints	14
j	ECA No. 1652-BRKT58 Condition 11(4)(j) – a summary of all Bypasses, Overflows, other situations outside Normal Operating Conditions and spills within the meaning of Part X of EPA and abnormal discharge events	14
k	ECA No. 1652-BRKT58 Condition 11(4)(k)– a summary of all Notice of Modifications to Sewage Works completed under Paragraph I.d.of Condition 10, including a report on status of implementation of all modification	14
l	ECA No. 1652-BRKT58 Condition 11(4)(l)– a summary of efforts made to achieve conformance with Procedure F-5-1 including but not limited to projects undertaken and completed in the sanitary sewer system that result in overall Bypass/Overflow elimination including expenditures and proposed projects to eliminate Bypass/Overflows with estimated budget forecast for the year following that for which the report is submitted and a summary of efforts made to achieve conformance with Procedure F-5-5 and establish /maintain a Pollution Prevention and Control Plan (PPCP).	14

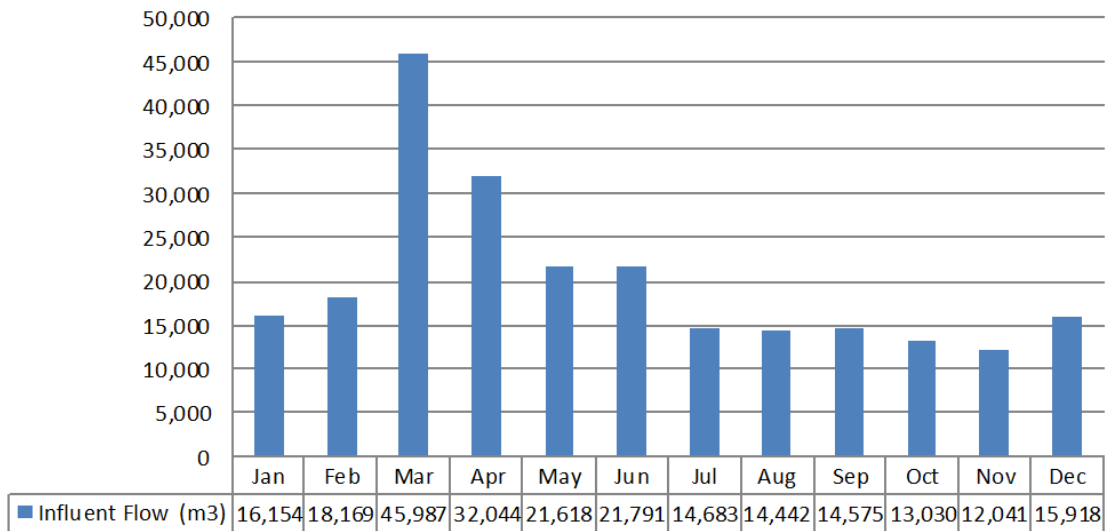
	Wastewater Effluent System Regulations	14
a	ECA No. 7572-BQXR8E Condition 8(3)(a)- A summary of all operating issues encountered and corrective actions taken;	15
b	ECA No. 7572-BQXR8E Condition 8(3)(b) - A summary of all normal and emergency repairs and maintenance activities carried out on any major structure, equipment, apparatus or mechanism forming part of the Works;	15
c	ECA No. 7572-BQXR8E Condition 8(3)(c)- A summary of the calibration and maintenance carried out on all monitoring equipment;	16
d	ECA No. 7572-BQXR8E Condition 8(3)(d)- A summary of any complaints received and any steps taken to address the complaints	16
e	ECA No. 7572-BQXR8E Condition 8(3)(e)- A summary of all Bypasses, Overflows, other situations outside Normal Operating Conditions and spills within the meaning of Part X of EPA and abnormal discharge events	16
f	ECA No. 7572-BQXR8E Condition 8(3)(f)- A summary of all Notice of Modifications to Sewage Works completed under Paragraph I.d.of Condition 10, including a report on status of implementation of all modification	16
g	ECA No. 7572-BQXR8E Condition 8(3)(g)- A summary of efforts made to achieve conformance with Procedure F-5-1 including but not limited to projects undertaken and completed in the sanitary sewer system that result in overall Overflow elimination including expenditures and proposed projects to eliminate Overflows with estimated budget forecast for the year following that for which the report is submitted	17
a	ECA No. 5465-BQXPQY Condition 4(2)(a)—A description of any operating problems encountered and corrective actions taken	17
b	ECA No. 5465-BQXPQY Condition 4(2)(b)—A summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the Works, including an estimate of the quantity of any materials removed from the Works	17
c	ECA No. 5465-BQXPQY Condition 4(2)(c)—A summary of any complaints received and any steps taken to address the complaints	18
d	ECA No. 5465-BQXPQY Condition 4(2)(d)—A summary of all spill or abnormal discharge events	18
e	ECA No. 5465-BQXPQY Condition 4(2)(e)—Any other information the District Manager requires from time to time	18
<b>APPENDICES</b>		
I - Annual Summary 2022		

**ECA No. 1652-BRKT58 Condition 11(4)(a)**

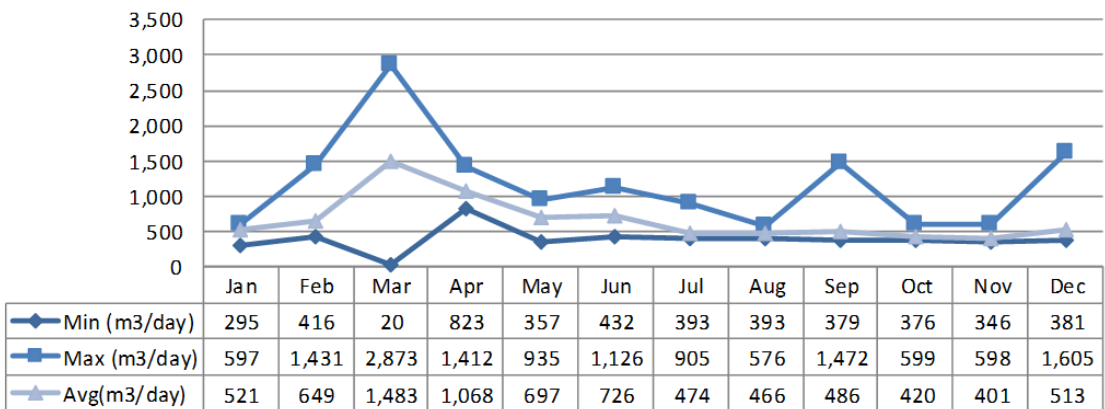
*A summary and interpretation of all Influent, Imported Sewage monitoring data, and a review of the historical trend of the sewage characteristics and flow rates.*

The Environmental Compliance Approvals require that everything practicable be undertaken to operate the Sewage Treatment Plant so that the annual average daily influent is within the Rated Capacity. The Rated Capacity of the Madoc Sewage Lagoons is 1,008m<sup>3</sup>/day and the 2022 annual average daily influent flow was 658.77 m<sup>3</sup>/day or 65.4% of the Rated Capacity. The total Influent flow in 2022 was 240,452m<sup>3</sup>.

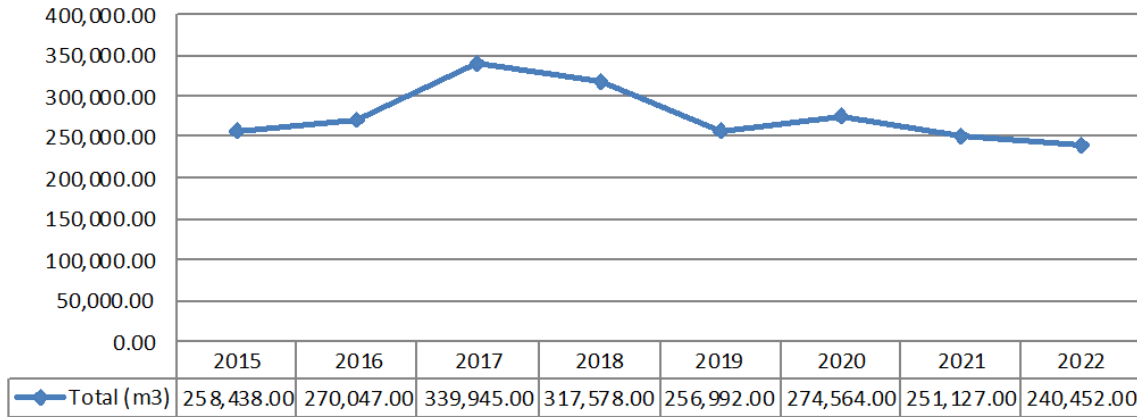
**Graph 1: 2022 Influent Monthly Flow Totals**



**Graph 2: 2022 Influent Daily Minimum, Maximum and Average Flows**



**Graph 3: 2015 – 2022 Historical Influent Flows for the Madoc Sewage Lagoons**



Based on the historical flows from 2015 to 2022 the total influent flow for the Madoc Sewage Lagoons has maintained a steady trend with a slight peak in 2017 and 2018.

Table 1 reviews the historical trend of the influent sewage characteristics for the Madoc Sewage Lagoons, as required by Environmental Compliance Approval Condition 11(4)(a) of ECA No. 1652-BRKT58.

**Table 1: Historical Average Influent Sewage Characteristics for the Madoc Sewage Lagoons**

Year	BOD5 (mg/L)	TSS (mg/L)	Phosphorus (mg/L)	TKN (mg/L)
2015	179.00	183.66	4.67	--
2016	217.25	181.33	5.04	--
2017	159.41	165.91	3.48	--
2018	183.27	193.09	3.73	--
2019	209.75	204.17	4.30	38.50
2020	186.58	208.25	4.04	46.54
2021	222.42	264.75	5.06	51.78
2022	201.33	224.83	4.92	47.89

Table 1 shows the Biochemical Oxygen Demand and Total Phosphorus annual average has maintained a steady trend from 2017-2022. TSS has shown a slight increase in concentration that could be contributed to the work in the collection system which eliminated the amount of infiltration and could potentially increase raw sewage concentrations. TKN was not a required sample parameter until after the issuance of the previous ECA No. 5744-BF4RBB in 2019 and therefore there is little historical data to compare to.

### **Imported Sewage**

Imported Sewage is sewage that is hauled to the sewage lagoons by licensed waste treatment system operators.

The requirement to sample Imported Sewage monthly (when sewage is received at facility) was added as a condition of the previous ECA No. 5744-BF4RBB issued in 2019.

**Sample Results**

ECA No. 5744-BF4RBB require a grab sample to be collected monthly and upon receiving Imported Sewage and analyzed for BOD5, Total Suspended Solids, Total Phosphorus and Total Kjeldahl Nitrogen.

**Table 2: Historical Average Septage Characteristics for the Madoc Sewage Lagoons**

Year	BOD (mg/L)	TSS (mg/L)	Phosphorus (mg/L)	TKN (mg/L)
2015	--	--	--	--
2016	--	--	--	--
2017	--	--	--	--
2018	--	--	--	--
2019	654.00	226.00	27.10	361.00
2020	494.00	95.00	17.10	162.65
2021	1407.80	4459.60	64.86	507.80
2022	1583.75	2101.25	36.00	304.75

Table 2 shows the Biochemical Oxygen Demand, Total Suspended Solids, Phosphorus, and TKN annual average for 2019-2022. Previous to the issuance of the previous ECA No. 5744-BF4RBB in 2019 there were no sampling parameters for septage thus there is little historical data available for comparison. The reporting year 2022 shows an increase in BOD but a significant decrease in the remaining parameters from the previous reporting year.

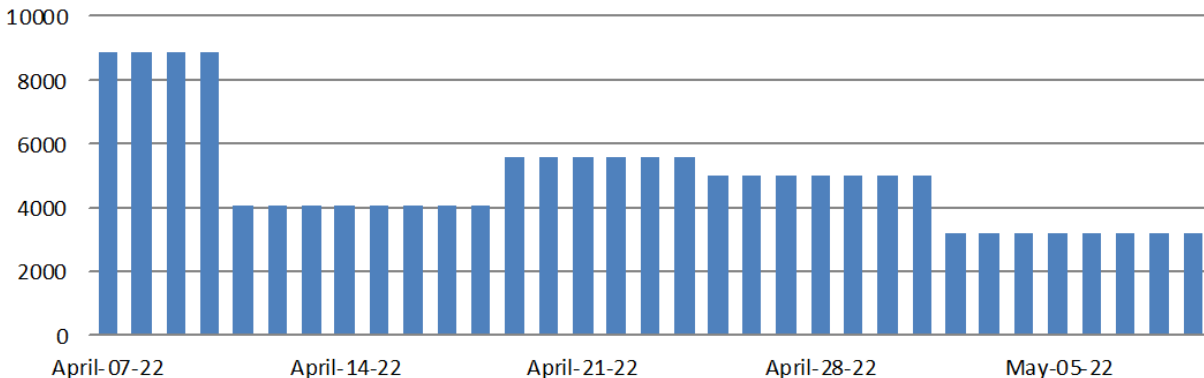
**ECA No. 1652-BRKT58 Condition 11(4)(b)**

*A summary and interpretation of all Final Effluent monitoring data, including concentration, flow rates, loading and a comparison to the design objectives and compliance limits in this Approval, including an overview of the success and adequacy of the Works;*

**2022 Spring Lagoon Discharge**

The 2022 spring discharge commenced on April 7<sup>th</sup> and was terminated on May 9<sup>th</sup>. The Ministry of the Environment, Conservation and Parks was notified prior to commencement of the discharge and on the day the discharge ended. A total effluent volume of 161,666m<sup>3</sup> was discharged during the 33 day discharge period. The Spring 2022 discharge remained in compliance with ECA No. 1652-BRKT58 which was issued in August 2020.

**Graph 4: 2022 Spring Discharge Effluent Flow Totals**





All analytical effluent concentration results were below the maximum concentrations as specified in the facility ECA No. 1652-BRKT58 which remained in effect for the 2022 Spring discharge. A summary of the discharge data is provided in a table below.

<b>Table 3: 2022 Spring Discharge Final Effluent Compliance Limits</b>						
Effluent Parameters	Average Effluent Concentration Limit (mg/L)	Average Effluent Concentration Objective (mg/L)	Average Effluent Concentration (mg/L)	Average Effluent Loading Limit (kg/d)	Average Effluent Loading (kg/d)	Compliant (Y/N)
<b>CBOD<sub>5</sub></b>	<b>30.0</b>	25.0	6.57	<b>122</b>	32.19	Y
<b>Total Suspended Solids</b>	<b>30.0</b>	25.0	10.02	<b>122</b>	49.08	Y
<b>Total Phosphorus</b>	<b>0.50</b>	0.30	0.07	<b>4</b>	0.342	Y
<b>pH</b>	<b>6.0-9.5</b>	6.5-8.5	7.40-8.10	--	--	Y

The results in Table 3 show that the annual average concentrations of cBOD<sub>5</sub>, Total Suspended Solids, Total Phosphorus, and the annual average effluent waste loadings were in compliance with the ECA No. 1652-BRKT58 during the 2022 Spring Seasonal Discharge.

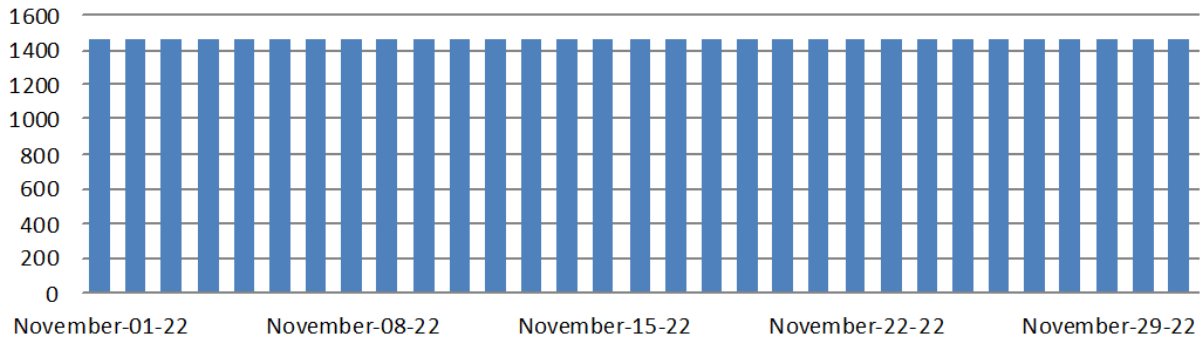
Table 4 includes additional samples taken upstream and downstream during the discharge in an effort to monitor water quality further from the point of discharge. Based on the results in table 4, the lagoon discharge has little impact to no impact on the receiving stream.

<b>Table 4: 2022 Spring Discharge Upstream &amp; Downstream Results</b>		
Parameters	Average Spring Concentration- <b>Upstream</b> (mg/L)	Average Spring Concentration- <b>Downstream</b> (mg/L)
<b>CBOD<sub>5</sub></b>	4.60	4.50
<b>Total Suspended Solids</b>	5.10	4.30
<b>Total Phosphorus</b>	0.03	0.03

## 2022 Fall Lagoon Discharge

The 2022 fall discharge commenced on November 1<sup>st</sup> and was terminated on December 1<sup>st</sup>. The Ministry of the Environment, Conservation and Parks was notified prior to commencement of the discharge and on the day the discharge ended. A total effluent volume of 45,353 m<sup>3</sup> was discharged during the 31 day discharge period. The 2022 Fall discharge remained in compliance with the requirements of ECA No. 1652-BRKT58 which was issued August 14<sup>th</sup>, 2020.

**Graph 5: 2022 Fall Discharge Effluent Flow Totals**



All analytical effluent concentration results were below the maximum concentrations as specified in the facility ECA No. 1652-BRKT58. A summary of the discharge data is provided in a table below.

**Table 5: 2022 Fall Discharge - Final Effluent Compliance Limits**

Effluent Parameters	Average Effluent Concentration Limit (mg/L)	Average Effluent Concentration Objective (mg/L)	Average Effluent Concentration (mg/L)	Average Effluent Loading Limit (kg/d)	Average Effluent Loading (kg/d)	Compliant (Y/N)
<b>CBOD<sub>5</sub></b>	<b>30.0</b>	25.0	2.87	<b>122</b>	4.20	Y
<b>Total Suspended Solids</b>	<b>30.0</b>	25.0	3.44	<b>122</b>	5.03	Y
<b>Total Phosphorus</b>	<b>0.50</b>	0.30	0.03	<b>4</b>	0.04	Y
<b>pH</b>	6.0-9.5	6.5-8.5	8.0-8.4	--	--	Y

The results in Table 5 show that the annual average concentrations of cBOD<sub>5</sub>, Total Suspended Solids, Total Phosphorus, and the annual average effluent waste loadings were in compliance with the ECA No. 1652-BRKT58 during the 2022 Fall Seasonal Discharge issued August 14<sup>th</sup>, 2020.

Table 6 includes additional samples taken downstream and upstream of the final effluent discharge in an effort to monitor water quality further from the point of discharge. Based on the results in table 6, the lagoon discharge has little impact to no impact on the receiving stream.

<b>Table 6: 2022 Fall Discharge - Upstream and Downstream Results</b>		
<b>Parameters</b>	<b>Average Fall Concentration- Upstream (mg/L)</b>	<b>Average Fall Concentration- Downstream (mg/L)</b>
<b>CBOD<sub>5</sub></b>	4.00	4.00
<b>Total Suspended Solids</b>	4.00	3.40
<b>Total Phosphorus</b>	0.03	0.03

### Summary of Effluent Monitoring and Recording Results

A summary of the monitoring data collected at the Madoc Lagoons during the reporting period is attached in **Appendix I**. The Annual Summary attached to this report provides flow data, raw sewage and final effluent analytical results.

ECA No. 1652-BRKT58 requires to collect a minimum of five (5) effluent samples during the discharge period twice per week at the beginning of the seasonal discharge, at 25%, 50%, 75% drawdown and at the end of the seasonal discharge. A total of eight (8) effluent samples were collected during the fall discharge period.

<b>Table 7: Influent - Minimum Sampling Schedule</b>		
<b>Parameters</b>	<b>Sample Type</b>	<b>Minimum Frequency</b>
<b>BOD<sub>5</sub></b>	4 hour composite	Monthly
<b>Total Suspended Solids</b>	4 hour composite	Monthly
<b>Total Phosphorus</b>	4 hour composite	Monthly
<b>Total Kjeldahl Nitrogen</b>	4 hour composite	Monthly

<b>Table 8: Imported Sewage (Septage) - Minimum Sampling Schedule</b>		
<b>Parameters</b>	<b>Sample Type</b>	<b>Minimum Frequency</b>
<b>BOD<sub>5</sub></b>	Grab	Monthly
<b>Total Suspended Solids</b>	Grab	Monthly
<b>Total Phosphorus</b>	Grab	Monthly
<b>Total Kjeldahl Nitrogen</b>	Grab	Monthly

<b>Table 9: Lagoon Content - Minimum Sampling Schedule</b>		
<b>Parameters</b>	<b>Sample Type</b>	<b>Minimum Frequency</b>
<b>cBOD<sub>5</sub></b>	Grab*	Once
<b>Total Suspended Solids</b>	Grab*	Once
<b>Total Phosphorus</b>	Grab*	Once
<b>Total Kjeldahl Nitrogen</b>	Grab*	Once

pH	Grab*	Once
----	-------	------

\*ECA No. 1652-BRKT58 states that a minimum of three (3) grab samples from the surface, middle and bottom of the liquid portion at a location representative of the cell content, collected and composited as one sample.

Note: as per ECA No. 1652-BRKT58 each cell in which the content is scheduled for discharge in the seasonal discharge period should be sampled at least seven days prior to a scheduled discharge.

Table 10: Final Effluent - Minimum Sampling Schedule		
Parameters	Sample Type	Minimum Frequency
cBOD5	Grab	Five per discharge season
Total Suspended Solids	Grab	Five per discharge season
Total Phosphorus	Grab	Five per discharge season
Total Ammonia Nitrogen	Grab	Five per discharge season
Total Kjeldahl Nitrogen	Grab	Five per discharge season
Nitrate as Nitrogen	Grab	Five per discharge season
Nitrite as Nitrogen	Grab	Five per discharge season
<i>E. coli</i>	Grab	Five per discharge season

The required number of raw sewage and final effluent samples were collected at the specified locations and frequencies during the reporting period as per ECA No. 1652-BRKT58 Condition 9 (Schedule D).

#### **ECA No. 1652-BRKT58 Condition 11(4)(c)**

*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 11: 2022 Operational Challenges	
Challenges	Corrective Actions
No Operating Challenges experienced for the reporting period	N/A

#### **ECA No. 1652-BRKT58 Condition 11(4)(d)**

*A summary of all normal and emergency repairs and maintenance activities carried out on any major structure, equipment, apparatus or mechanism forming part of the Works;*

OCWA uses a Work Maintenance System (WMS). WMS is a maintenance tracking system that can generate work orders as well as give summaries of completed and scheduled work. During the year, the operating authority at the facility generates scheduled work orders on a weekly, monthly and annual basis. The service work is recorded in the work order history. This ensures routine and preventive

maintenance is carried out and assets are maintained to manufacturer’s and/or industry standards. Emergency and capital repair maintenance is completed and added to the system.

Preventative Maintenance/Weekly Work Orders Completed	79
Operational Maintenance Work Orders Completed	26
Capital Maintenance Work Orders Completed	10

Capital projects are listed and provided to the Municipality of Centre Hastings in the form of a “Capital Forecast”. This list is developed by facility staff and provides recommendations for facility components requiring upgrading or improvement. Annual and Emergency repair/maintenance is listed below:

• Annual Diesel Inspection
• Annual Wet Well Clean-outs
• Annual Flow Meter Calibrations
• Heater Unit Replaced

**ECA No. 1652-BRKT58 Condition 11(4)(e)**

*A summary of any effluent quality assurance or control measures undertaken*

Effluent quality assurance is maintained in several ways. All final effluent samples collected during the reporting period to meet ECA sampling requirements were submitted to SGS Lakefield Research Ltd. laboratory for analysis. 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. Sampling calendars issued to the operators denoting frequency of sampling and these calendars are submitted to the Process Compliance Technician at the end of each month. Raw and effluent samples are collected as per the Environmental Compliance Approval and the results are reviewed on a regular basis to ensure compliance with the site’s objectives and limits.

**ECA No. 1652-BRKT58 Condition 11(4)(f)**

*A summary of the calibration and maintenance carried out on all Influent, Imported Sewage and Final Effluent monitoring equipment to ensure that the accuracy is within the tolerance of that equipment as required in this Approval or recommended by the manufacturer*

As stated earlier, the Ontario Clean Water Agency's maintenance activities are based on a computerized Work Management System (WMS) using the Maximo application. The WMS is a proactive maintenance system, based on detailed risk assessment with respect to process.

The WMS database automatically populates work orders and schedules for the calibration and maintenance of a wide variety of equipment. The WMS also automatically tracks each individual maintenance event, calibration of all meters and certification of all devices.

Calibration and maintenance of the onsite flow measuring devices are calibrated by a certified third party qualified technician and performed on annual basis.

**Flow meter and Chart Recorder**

Calibration Date: June 7, 2022  
 Work Performed By: Tower Electronics Inc.  
 Provided in Appendix II

**ECA No. 1652-BRKT58 Condition 11(4)(g)**

*A summary of efforts made to achieve the design objectives in this Approval, including an assessment of the issues and recommendations for pro-active actions if any are required under the following situations:*  
 i) when any of the design objectives is not achieved more than 50% of the time in a year, or there is an increasing trend in deterioration of Final Effluent quality;  
 ii) when the Annual Average Daily Influent Flow reaches 80% of the Rated Capacity

<b>Table 12: Efforts Made to Meet the Effluent Objectives of Condition 6</b>
Sampling effluent as per ECA
Visually inspecting effluent when performing rounds. during spring/fall discharge
Ensuring correct alum dosage
Ensuring proper operation of Pump Stations
Perform inspection of lagoon quality during operation
Collected lagoon PH, temp, D.O, and conductivity during discharges
Calibrating pH/DO probes during spring/fall discharge
Annual calibration of influent/effluent flow meters

**ECA No. 1652-BRKT58 Condition 11(4)(h)**

*A tabulation of the measured volume of sludge accumulated in the lagoon cells in five year intervals and the estimated volume in the interim years and when sludge was disposed of during the reporting period, a summary of disposal locations and volumes of sludge disposed at each location*

<b>Madoc Lagoons</b>		
<b>Year</b>	<b>Measured Volume of Sludge Accumulated (5 year intervals) (m<sup>3</sup>)</b>	<b>Estimated Volume (=Total influent flow*0.3% + previous estimated sludge volume)</b>
<b>2018</b>	1,760	
<b>2019</b>		2474
<b>2020</b>		3069
<b>2021</b>		3549
<b>2022</b>		4170

*\*\*Note that the average wastewater facility produces 0.2%-0.4% sludge annually*

The Madoc Sewage Lagoons had a third party service remove approximately 6,400m<sup>3</sup> of sludge from the North Cell in the Fall of 2018 leaving approximately 4,710 m<sup>3</sup> of sludge remaining.

**ECA No. 1652-BRKT58 Condition 11(4)(i)**

*A summary of any complaints received and any steps taken to address the complaints*

During the 2022 reporting period there was no community complaints received for the Madoc Sewage Lagoons.

**ECA No. 1652-BRKT58 Condition 11(4)(j)**

*A summary of all Bypasses, Overflows, other situations outside Normal Operating Conditions and spills within the meaning of Part X of EPA and abnormal discharge events*

During the 2022 reporting period there was no bypass, spills, other situations outside normal operating conditions, or abnormal discharge events for the Madoc Sewage Lagoons.

**No. 1652-BRKT58 Condition 11(4)(k)**

*A summary of all Notice of Modifications to Sewage Works completed under Paragraph I.d. of Condition 10, including a report on status of implementation of all modification*

In the reporting year 2022 there were no Pre-Authorized Modifications to Municipal Sewage Works per the Limited Operational Flexibility- Protocol as per ECA No. 1652-BRKT58 Condition 11(4)(j) .

<b>Table 13: Summary of Modification to Sewage Works- Summary of Modifications</b>	
<b>Equipment</b>	<b>Emergency Operational Modification</b>
<i>Not Applicable for 2022</i>	

**ECA No. 1652-BRKT58 Condition 11(4)(l)**

*a summary of efforts made to achieve conformance with Procedure F-5-1 including but not limited to projects undertaken and completed in the sanitary sewer system that result in overall Bypass/Overflow elimination including expenditures and proposed projects to eliminate Bypass/Overflows with estimated budget forecast for the year following that for which the report is submitted and a summary of efforts made to achieve conformance with Procedure F-5-5 and establish /maintain a Pollution Prevention and Control Plan (PPCP).*

During the 2022 reporting period there were no incidents of a bypass or overflow within the sanitary sewer system and therefore no proposed projects to eliminate bypasses or overflows are forecasted for the 2022 reporting period for the Madoc Sewage Lagoons.

**Wastewater System Effluent Regulations (WSER)**

The Wastewater Systems Effluent Regulations (WSER) is a federal wastewater regulation under the Fisheries Act that was released in July 2012 but not in effect until January 1, 2013.

These regulations apply to a wastewater system that:

- Is designed to collect an average daily volume (ADV) of 100m<sup>3</sup> or more of influent, or
- Collects an average daily volume (ADV) of 100m<sup>3</sup> or more of influent during any calendar year.

An owner or operator must calculate, for each calendar year, the Average Daily Volume of effluent deposited via the system’s final discharge point according to the following formula:

$$\text{Sum of daily effluent volumes deposited (m3)} \div \text{number of days in that calendar year (365 days)}$$

**Note:** The formula uses the number of days in the calendar year not the number of days discharging.

Sampling and reporting requirements are dependent on the system type and its annual average daily volume of effluent. In 2022, the Madoc Sewage Lagoons deposited approximately 207,019 m<sup>3</sup> of seasonal effluent volumes.

The Monthly Monitoring Reports (due 14 days after the end of each quarter) were submitted to Environment Canada as required. The Madoc Sewage Lagoons met all of the quality standards in 2022.

**Monitoring Report**

**Effluent Monitoring Data:** Madoc Wastewater Treatment Lagoon

**System Type:** Intermittent    **Reporting Period:** Annually    **Avg Daily Effluent:** 567.17

**Averaging Period:** Annually    **Reporting Period:** January - December    **Reporting Year:** 2022

Was effluent deposited in this reporting period? Yes

For each month indicated, was effluent deposited?

January:	No	February:	No	March:	No
April:	Yes	May:	Yes	June:	No
July:	No	August:	No	September:	No
October:	No	November:	Yes	December:	Yes

# of days effluent was deposited? (days)	Total Volume of Effluent deposited? (m <sup>3</sup> )	Average CBOD (mg/L)	Average SS (mg/L)
		Limits	
		25	25
59	207,019	4.89	6.63

**2022 Performance Report for the Madoc Hwy#7 and McDonald Pumping Stations**

During the reporting period of 2022, the Environmental Compliance Approval (ECA) No. 7572-BQXR8E for the Madoc Hwy#7 and McDonald Pumping Stations was issued August 6<sup>th</sup>, 2020.

**ECA No. 7572-BQXR8E Condition 8(3)(a)**

*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 14: 2022 Hwy#7 and McDonald Pumping Station Operational Challenges	
Challenges	Corrective Actions
Not Applicable for 2022	

**ECA No. 7572-BQXR8E Condition 8(3)(b)**

*A summary of all normal and emergency repairs and maintenance activities carried out on any major structure, equipment, apparatus or mechanism forming part of the Works;*



OCWA uses a Work Maintenance System (WMS). WMS is a maintenance tracking system that can generate work orders as well as give summaries of completed and scheduled work. During the year, the operating authority at the facility generates scheduled work orders on a weekly, monthly and annual basis. The service work is recorded in the work order history. This ensures routine and preventive maintenance is carried out and assets are maintained to manufacturer’s and/or industry standards. Emergency and capital repair maintenance is completed and added to the system.

Preventative Maintenance/Weekly Work Orders Completed	11
Operational Maintenance Work Orders Completed	0
Capital Maintenance Work Orders Completed	0

Capital projects are listed and provided to the Municipality of Centre Hastings in the form of a “Capital Forecast”. This list is developed by facility staff and provides recommendations for facility components requiring upgrading or improvement. Annual and Emergency repair/maintenance is listed below:

- |  |
|--|
| <ul style="list-style-type: none"> <li>• Annual Wet Well Clean-outs</li> </ul> |
| <ul style="list-style-type: none"> <li>• Inspect electrical panels</li> </ul>  |

**ECA No. 7572-BQXR8E Condition 8(3)(c)**

*A summary of the calibration and maintenance carried out on all monitoring equipment*

There are no required calibration and maintenance carried out in the reporting year 2022.

**ECA No. 7572-BQXR8E Condition 8(3)(d)**

*A summary of any complaints received and any steps taken to address the complaints*

During the 2022 reporting period there was no community complaints received for the Madoc Hwy#7 and McDonald Pumping Stations.

**ECA No. 7572-BQXR8E Condition 8(3)(e)**

*A summary of all Bypasses, Overflows, other situations outside Normal Operating Conditions and spills within the meaning of Part X of EPA and abnormal discharge events*

During the 2022 reporting period there was no bypass, spills, other situations outside normal operating conditions, or abnormal discharge events for the Madoc Hwy#7 and McDonald Pumping Stations.

**ECA No. 7572-BQXR8E Condition 8(3)(f)**

*A summary of all Notice of Modifications to Sewage Works completed under Paragraph 1.d. of Condition 10, including a report on status of implementation of all modification*

In the reporting year 2022 there were no Pre-Authorized Modifications to Municipal Sewage Works per the Limited Operational Flexibility- Protocol as per ECA No. 7572-BQXR8E Condition 8(3)(f).

Table 16: Summary of Modification to Sewage Works- Summary of Modifications	
Equipment	Emergency Operational Modification
<i>Not Applicable for 2022</i>	

**ECA No. 7572-BQXR8E Condition 8(3)(g)**

*a summary of efforts made to achieve conformance with Procedure F-5-1 including but not limited to projects undertaken and completed in the sanitary sewer system that result in overall overflow elimination including expenditures and proposed projects to eliminate overflows with estimated budget forecast for the year following that for which the report is submitted.*

During the 2022 reporting period there were no incidents of a bypass or overflow within the sanitary sewer system and therefore no proposed projects to eliminate bypasses or overflows are forecasted for the 2022 reporting period for the Madoc Hwy#7 and McDonald Pumping Stations.

## 2022 Performance Report for the Madoc Stormwater Management Facility

During the reporting period of 2022, the Environmental Compliance Approval (ECA) No. 5465-BQXPQY for the Stormwater Management Facility was issued August 6<sup>th</sup>, 2020. The Madoc Stormwater Management Facility was operated by the Municipality of Centre Hastings for the annual reporting year 2022.

**ECA No. 5465-BQXPQY Condition 4(2)(a)**

*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 17: 2022 Stormwater Management Facility Operational Challenges	
Challenges	Corrective Actions
<i>None to report for the 2022 reporting year.</i>	

**ECA No. 5465-BQXPQY Condition 4(2)(b)**

*A summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the Works, including an estimate of the quantity of any materials removed from the Works;*

In the reporting year of 2022, the following maintenance was performed on any major structure, equipment, apparatus or mechanism as part of the works. During the annual inspection it was determined that there was no requirement for the catch basin to be cleaned out for the year 2022.

- Annual Inspection of the works

**ECA No. 5465-BQXPQY Condition 4(2)(c)**

*A summary of any complaints received and any steps taken to address the complaints*

During the 2022 reporting period there was no community complaints received for the Madoc Stormwater Management Facility.

**ECA No. 5465-BQXPQY Condition 4(2)(d)**

*A summary of all spill or abnormal discharge events*

During the 2022 reporting period there was spills or abnormal discharge events for the Madoc Stormwater Management Facility.

**ECA No. 5465-BQXPQY Condition 4(2)(e)**

*Any other information the District Manager requires from time to time*

During the 2022 reporting period there was no further information required for the District Manager for the Madoc Stormwater Management Facility.

**Appendix I**

**Annual Summary  
for the  
Madoc Sewage Lagoons**

**2022**

**5829 MADOC WASTEWATER TREATMENT LAGOON 110001051**

	1 / 2022	2 / 2022	3 / 2022	4 / 2022	5 / 2022	6 / 2022	7 / 2022	8 / 2022	9 / 2022	10 / 2022	11 / 2022	12 / 2022	<-Total-->	<-Avg-->	<-Max-->	<-Criteria-->
<b>Flows</b>																
Raw Flow: Total - Raw m <sup>3</sup> /d	16,154.00	18,169.00	45,987.00	32,044.00	21,618.00	21,791.00	14,683.00	14,442.00	14,575.00	13,030.00	12,041.00	15,918.00	240,452.00			0.00
Raw Flow: Avg - Raw m <sup>3</sup> /d	521.10	648.89	1,483.45	1,068.13	697.35	726.37	473.65	465.87	485.83	420.32	401.37	513.48		658.77		
Raw Flow: Max - Raw m <sup>3</sup> /d	597.00	1,431.00	2,873.00	1,412.00	935.00	1,126.00	905.00	576.00	1,472.00	599.00	598.00	1,605.00			2,873.00	0.00
Raw Flow: Count - Raw m <sup>3</sup> /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 - Eff m <sup>3</sup> /d	0.00	0.00	0.00	131,158.00	30,508.00	0.00	0.00	0.00	0.00	0.00	43,890.00	1,463.00	207,019.00			0.00
Eff. Flow: Avg - Eff m <sup>3</sup> /d	0.00	0.00	0.00	5,464.92	3,389.78	0.00	0.00	0.00	0.00	0.00	1,463.00	1,463.00		3,234.67		
Eff. Flow: Max - Eff m <sup>3</sup> /d	0.00	0.00	0.00	8,875.00	4,972.00	0.00	0.00	0.00	0.00	0.00	1,463.00	1,463.00			8,875.00	0.00
Eff Flow: Count - Eff m <sup>3</sup> /d	0.00	0.00	0.00	24.00	9.00	0.00	0.00	0.00	0.00	0.00	30.00	1.00	64.00			0.00
<b>Carbonaceous Biochemical Oxygen Demand: CBOD</b>																
Eff: Avg cBOD5 - Eff mg/L	0.00	0.00	0.00	7.14	6.00	0.00	0.00	0.00	0.00	0.00	2.75	3.00		4.89	7.14	25.00
Eff: # of samples of cBOD5 - Eff	0.00	0.00	0.00	7.00	3.00	0.00	0.00	0.00	0.00	0.00	8.00	1.00	19.00			0.00
Loading: cBOD5 - Eff kg/d	0.000	0.000	0.000	39.035	20.339	0.000	0.000	0.000	0.000	0.000	4.023	4.389		16.95	39.04	0.000
<b>Biochemical Oxygen Demand: BOD5</b>																
Raw: Avg BOD5 - Raw mg/L	131.00	126.00	42.00	164.00	86.00	94.00	260.00	180.00	307.00	480.00	284.00	262.00		201.33	480.00	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
<b>Total Suspended Solids: TSS</b>																
Raw: Avg TSS - Raw mg/L	150.00	187.00	120.00	130.00	66.00	144.00	275.00	365.00	475.00	261.00	280.00	245.00		224.83	475.00	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 - Eff mg/L	0.00	0.00	0.00	9.71	10.33	0.00	0.00	0.00	0.00	0.00	2.88	4.00		6.63	10.33	25.00
Eff: # of samples of TSS - Eff	0.00	0.00	0.00	7.00	3.00	0.00	0.00	0.00	0.00	0.00	8.00	1.00	19.00			0.00
Loading: TSS - Eff kg/d	0.000	0.000	0.000	53.088	35.028	0.000	0.000	0.000	0.000	0.000	4.206	5.852		24.54	53.09	0.000
Percent Removal: TSS - Raw %	0.00	0.00	0.00	92.53	84.34	0.00	0.00	0.00	0.00	0.00	98.97	98.37			98.97	0.00
<b>Total Phosphorus: TP</b>																
Raw: Avg TP - Raw mg/L	3.64	4.66	1.74	2.66	3.38	2.95	6.99	5.48	8.74	5.29	7.99	5.52		4.92	8.74	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 - Eff mg/L	0.00	0.00	0.00	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.03	0.03		0.05	0.07	0.00
Eff: # of samples of TP - Eff	0.00	0.00	0.00	7.00	3.00	0.00	0.00	0.00	0.00	0.00	8.00	1.00	19.00			0.00
Loading: TP - Eff kg/d	0.000	0.000	0.000	0.390	0.237	0.000	0.000	0.000	0.000	0.000	0.044	0.044		0.18	0.39	0.000
Percent Removal: TP - Raw %	0.00	0.00	0.00	97.31	97.93	0.00	0.00	0.00	0.00	0.00	99.62	99.46			99.62	0.00
<b>Nitrogen Series</b>																
Raw: Avg TKN - Raw mg/L	44.00	48.20	16.50	26.80	25.90	40.30	66.40	52.80	70.10	57.40	71.00	55.30		47.89	71.00	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 - Eff mg/L	0.00	0.00	0.00	12.47	6.53	0.00	0.00	0.00	0.00	0.00	0.70	2.60		6.06	12.47	8.00
Eff: # of samples of TAN - Eff	0.00	0.00	0.00	7.00	3.00	0.00	0.00	0.00	0.00	0.00	8.00	1.00	19.00			0.00
Loading: TAN - Eff kg/d	0.000	0.000	0.000	68.155	22.147	0.000	0.000	0.000	0.000	0.000	1.024	3.804		23.78	68.16	0.000
Eff: Avg NO3-N - Eff mg/L	0.00	0.00	0.00	0.06	0.08	0.00	0.00	0.00	0.00	0.00	0.12	0.23		0.12	0.23	0.00
Eff: # of samples of NO3-N - Eff	0.00	0.00	0.00	7.00	3.00	0.00	0.00	0.00	0.00	0.00	8.00	1.00	19.00			0.00
Eff: Avg NO2-N - Eff mg/L	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.04	0.05		0.04	0.05	0.00
Eff: # of samples of NO2-N - Eff	0.00	0.00	0.00	7.00	3.00	0.00	0.00	0.00	0.00	0.00	8.00	1.00	19.00			0.00
<b>Disinfection</b>																
Eff: GMD E. Coli - Eff cfu/100mL	0.00	0.00	0.00	66.77	14.12	0.00	0.00	0.00	0.00	0.00	3.24	48.00				200.00
Eff: # of samples of E. Coli - Eff	0.00	0.00	0.00	7.00	3.00	0.00	0.00	0.00	0.00	0.00	8.00	1.00	19.00			0.00

**Appendix II**

**Calibration Reports**

**for the**

**Madoc Wastewater System**

**2022**

## Tower Electronics Canada Inc. Calibration Certificate

**Customer:**

Justin Cassidy, O & M Team Lead  
 OCWA Trent Valley Hub  
 C:613-921-0513

**Meter Information**

Date: 2022-06-08  
 Location: Alum Shack  
 Meter Under Test: CR  
 Client Tag: OCWA 159774  
 Manufacturer: Chessell  
 Model: 392  
 Serial Number: US21975-001  
 Acceptable Error%: 5.000  
 Calibration Due: Jun-23

**Calibration by:**

Dan Matchett

**Standards:**

Practical Instruments 820 PIE CAL NIST CAL Due April 2023

**Instrument Type**

Chart Recorder

**Method of verification**

Current Input

Unit Configuration					
	Units	Display Min	Pen Min	Display Max	Pen Max
Channel 1	PPM	0	0	5	100
Channel 2	PPM	0	0	5	50
Channel 3	not used				
Channel 4	not used				

**Display Readings**

Input	Channel 1			Channel 2			Channel 3			Channel 4		
	Calc	Actual	Error%	Calc	Actual	Error%	Calc	Actual	Error%	Calc	Actual	Error%
4mA	0.00	0.00	0.00	0.00	0.00	0.00						
8mA	1.25	1.25	0.00	1.25	1.25	0.00						
12mA	2.50	2.50	0.00	2.50	2.50	0.00						
16mA	3.75	3.75	0.00	3.75	3.75	0.00						
20mA	5.00	5.00	0.00	5.00	5.00	0.00						
	Error%		0.00	Error%		0.00	Error%			Error%		
	Result:		PASS	Result:		PASS	Result:			Result:		

**Chart Readings**

Input	Channel 1			Channel 2			Channel 3			Channel 4		
	Calc	Actual	Error%	Calc	Actual	Error%	Calc	Actual	Error%	Calc	Actual	Error%
4mA	0.00	0.00	0.00	0.00	0.00	0.00						
8mA	25.00	25.00	0.00	12.50	12.50	0.00						
12mA	50.00	50.00	0.00	25.00	25.00	0.00						
16mA	75.00	75.00	0.00	37.50	37.50	0.00						
20mA	100.00	100.00	0.00	50.00	50.00	0.00						
	Error%		0.00	Error%		0.00	Error%			Error%		
	Result:		PASS	Result:		PASS	Result:			Result:		

**Comments:**

Unit passes verification.

## Tower Electronics Canada Inc. Calibration Certificate

**Customer:**

Justin Cassidy, O & M Team Lead  
 OCWA Trent Valley Hub  
 C:613-921-0513

**Meter Information**

Date of Test: 2022-06-08  
 Location: Madoc Lagoon  
 Meter Under Test: Lagoon Influent  
 Client Tag: OCWA# 105012  
 Manufacturer: Miltronics  
 Model: OCMIII  
 Serial Number: 05020C022466  
 Totalizer As Found: 2575510m3  
 Totalizer As Left: 2575514m3  
 Acceptable Error: 15%

**Calibration by:**

Dan Matchett

**Standards:**

Fluke 289 S/N 96220182 NIST Cal Due April 2023

**Instrument Type**

Open Channel

**Programming Parameters:**

Max Flow 3005.6 CMD  
 Max Head 0.350  
 Primary Device 3" Parshall Flume

**Calibration Due:**

Jun-23

**Method of verification**

Head Simulation

**Units:** CMD  
**Zero:** 0.00  
**Span:** 3005.60  
**Totalizer:** M3

Flow Test					
Head Applied	Sim Flow	Meter Display	Current Output	Disp Error%	mA Error %
0.000	0.000	0.000	4.181	0.000	4.525
0.120	573.789	516.700	6.913	1.899	2.006
0.200	1264.596	1281.000	10.959	0.546	2.116
0.300	2367.909	2250.000	16.272	3.923	2.007
0.350	3005.604	3022.000	20.192	0.546	0.960
Average Error%				1.38	2.32
Result:				PASS	PASS

Totalizer Test		
Sim Flow Rate	3005.604	CMD
Start Totalizer	2575514.000	M3
End Totalizer	2575518.000	M3
Volume Simulated	4.000	M3
Time(Seconds)	113.900	
Calculated Totalizer(MUT)	3.962	
Error%	0.953	
Result:	PASS	

**Comments:**

Unit passes verification.



# Tower Electronics Canada Calibration Certificate

**Customer:**

Justin Cassidy, O & M Team Lead  
 OCWA Trent Valley Hub  
 C:613-921-0513

**Meter Information**

Date: 2022-06-08  
 Location: Madoc Lagoon  
 Meter Under Test: Parshall Chart Rec  
 Client Tag: OCWA# 105014  
 Manufacturer: ABB  
 Model: Series 4000  
 Serial Number: 88C24069  
 Acceptable Error%: 15.000  
**Calibration Due:** Jun-23

**Calibration by:**

Dan Matchett

**Standards:**

Practical Instruments 820 PIE CAL NIST CAL Due April 2023

**Instrument Type**

Chart Recorder

**Method of verification**

Current Input

Unit Configuration					
	Units	Display Min	Pen Min	Display Max	Pen Max
Channel 1	%		0		100
Channel 2	not used				
Channel 3	not used				
Channel 4	not used				

**Display Readings**

Input	Channel 1			Channel 2			Channel 3			Channel 4		
	Calc	Actual	Error%	Calc	Actual	Error%	Calc	Actual	Error%	Calc	Actual	Error%
4mA												
8mA												
12mA												
16mA												
20mA												
	Error%			Error%			Error%			Error%		
	Result:			Result:			Result:			Result:		

**Chart Readings**

Input	Channel 1			Channel 2			Channel 3			Channel 4		
	Calc	Actual	Error%	Calc	Actual	Error%	Calc	Actual	Error%	Calc	Actual	Error%
4mA	0.00	0.00	0.00									
8mA	25.00	25.00	0.00									
12mA	50.00	53.00	6.00									
16mA	75.00	78.00	4.00									
20mA	100.00	100.00	0.00									
	Error%			Error%			Error%			Error%		
	Result: PASS			Result:			Result:			Result:		

**Comments:**

Unit passes verification. Unit only has pen output, no digital display.

## Tower Electronics Canada Inc. Calibration Certificate

---

**Customer:**

OCWA - Deloro Hub  
Derek Chapman

**Meter Information**

Date: 2022-06-08  
Location: Madoc Lagoon  
Meter Under Test: Lagoon Outflow  
Client Tag: OCWA # 105005  
Manufacturer: Greyline  
Model: DFM 6.1  
Serial Number: 75364  
Totalizer As Found: 1341146.9m3  
Totalizer As Left: 1341161.1m3  
Acceptable Error: 15%

**Calibration by:**

Dan Matchett

**Standards:**

Fluke 289 S/N 96220182 NIST Cal Due April 2023

**Programming Parameters:**

Pipe ID: 250mm  
Cal Factor: 0.903  
Low Flow Setting: 30LPS

**Instrument Type**

Doppler Flow Meter

**Calibration Due:**

Jun-23

**Method of verification**

Volumetric comparison

Volumetric Standard:

Pump station wet well  
I.D 3.665 M  
Change in Head During Test: 1.1 M

**Units:** LPS  
**Zero:** 0.00  
**Span:** 200.00  
**Totalizer:** M3

<b>Flow Test</b>	Value	Unit
Meter Under Test Totalizer Start	1341146.900	M3
Meter Under Test Totalizer Stop	1341161.100	M3
Total Volume of Test	14.200	M3
Calculated Volume:	13.740	M3
Error %	3.348	
Result:	PASS	

<b>Output Test(mA/Hz):</b>		
Current Output Simulated	Current Meter	Error%
4.000	4.003	0.075
20.000	19.999	-0.005
Average Error %		0.070
Result:		PASS

**Comments:**

Unit passes verification.  
11.45m3 per 1m drop