Ontario Clean Water Agency
Agence Ontarienne Des Eaux

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March 30 2022

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

Dear Trevor Dagilis;

Re: Tweed Lagoons - Annual Report for 2021

Attached please find the annual performance report for the Tweed Lagoons for the operating year 2021, prepared by the Ontario Clean Water Agency.

Please note that a new Environmental Compliance Approval (ECA) #9608-9ZLJ2E was issued on September 22, 2015 and the new ECA#3047-BXASWW was issued April 21st, 2021. This report is submitted in accordance with Conditions 10(5)(a) through 10(5)(i) of ECA#9608-9ZLJ2E and with Conditions 11(4)(a) through 11(5)(m).

This report is submitted in accordance with Section 10&11 of the Environmental Compliance Approval (ECA) number 9608-9ZLJ2E (issued September 22, 2015) and ECA#3047-BXASWW (April 21st, 2021) for the Tweed Sewage Lagoons. This report is submitted in accordance with Section 8 of ECA number 6083-BZEHY9 (issued April 21st, 2021) for the Tweed Jamieson St and River St Pumping Stations.

The purpose of this report is to provide a performance record for future references, to ensure that the Ministry is made aware of problems as they arise, 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 contact me.

Sincerely,

Natalie Iezzi
Process and Compliance Technician
Kawartha-Trent
Ontario Clean Water Agency

cc: Amber Coupland, Senior Operations Manager, OCWA
Gloria Raybone, CAO/Clerk, Municipality of Tweed
Sarah Young, Environmental Officer, MECP

Tweed Wastewater Lagoon

Annual Report

Reporting period of January 1, 2021 – December 31, 2021

Prepared For: Municipality of Tweed

Prepared By: Ontario Clean Water Agency
Agence Ontarienne Des Eaux

This report is submitted in accordance with Conditions 10(5)(a) through 10(5)(l) of Environmental Compliance Approval No. # 9608-9ZLJ2E and in accordance with Conditions 11(4)(a) through 11(4)(m) of Environmental Compliance Approval No. #3047-BXASWW. This report is also submitted in accordance with Environmental Compliance Approval No. # 6083-BZEHY9 Condition 8(3)(a) through 8(3)(g) for the Jamieson and River Street Pump Stations.

Condition 10(5) of Environmental Compliance Approval No. # 9608-9ZLJ2E states, *"The Owner shall prepare and submit a performance report to the Water Supervisor on an annual basis, within ninety (90) days following the end of the period being reported upon..."*, Condition 11(4) of ECA No.#3047-BXASWW and Condition 8(3) of ECA No. #6083-BZEHY9 states, *"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 Tweed Wastewater Treatment Plant (Tweed Lagoons) and Pumping Stations on behalf of the Municipality of Tweed.
The Tweed Lagoon facility is a Class 1 Wastewater Treatment Plant.

The facility's design flow is 1210m^3/day prior to completion of construction to the works for the 2021 reporting year. The average day raw flow for the year 2021 was 664.64 m^3/day.

The Tweed Wastewater Lagoons, and Pump Stations complies with all requirements of the regulating authorities and operates under:

- Environmental Compliance Approval No. 9608-9ZLJ2E (issued September 22, 2015)
- Environmental Compliance Approval No. 3047-BXASWW (issued April 21, 2021)
- Environmental Compliance Approval No. 6083-BZEHY9 (issued April 21, 2021) for the Jamieson SPS and River St SPS

Discharge Requirements

The Tweed 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. 9608-9ZLJ2E as follows:

- Spring discharge commencing not earlier than April 1 and terminating not later than May 7.
- Fall discharge commencing not earlier than November 1 and terminating not later than December 15

Discharge periods are defined in ECA No. 3047-BXASWW prior to completion of the proposed works is as follows:

- Spring discharge commencing after the liquid surface in the lagoon has become substantially free of ice cover and not earlier than March 15th, and terminating not later than May 7th, and using reasonable efforts to maximize the discharge rate to coincide with the spring freshet and elevated flows in the receiver;
- Fall discharge commencing not earlier than November 1 and terminating not later than December 7

Discharge periods are defined in ECA No. 3047-BXASWW upon completion of the proposed works is as follows:

- Spring discharge commencing not earlier than March 15th, continuing for not less than 30 days, terminating not later than April 30th and using reasonable efforts to maximize the discharge rate to coincide with the spring freshet and elevated flows in the receiver
- Fall discharge commencing not earlier than November 1st, continuing for not less than 30 days and terminating not later than December 15th
- Maximum allowable discharge rate shall not exceed 126 l/s during each seasonal discharge period
- Discharge volume shall not exceed 10,890 m3/day during each seasonal period
- In stream dilution ratio relative to the effluent must at all times be greater than 100:1

During the 2021 reporting period the Ontario Clean Water Agency operated under the Environmental Compliance Approval (ECA) 9608-9ZLJ2E (issued September 22, 2015) and ECA number No. 3047-BXASWW (issued April 21, 2021).

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Background

The Environmental Compliance Approval (ECA) ECA No. 9608-9ZLJ2E issued on September 22nd, 2015 was revoked and replaced by ECA No. 3047-BXASWW issued on April 21st, 2021. Condition 11 (4) in ECA No. 3047-BXASWW discusses the requirements for annual performance reports. Since the reporting requirements in the new ECA satisfy the reporting requirements of Condition 10 (5) of the former ECA, the 2021 performance report has been prepared following the conditions of ECA No. 3047-BXASWW, 11 (4).

The Environmental Compliance Approval (ECA) No. 3047-BXASWW, for the Tweed Lagoons, Condition 11(4) states, *"...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. The reports shall contain, but shall not be limited to, the following information pertaining to the reporting period:*

a) summary and interpretation of all Influent monitoring data, and a review of the historical trend of the sewage characteristics and flow rates;

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;

c) a summary of all operating issues encountered and corrective actions taken;

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;

e) a summary of any effluent quality assurance or control measures undertaken;

f) a summary of the calibration and maintenance carried out on all Influent 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;

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;

h) a tabulation of the volume of sludge generated, 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; 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;

i) a summary of any complaints received and any steps taken to address the complaints;

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;

k) *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.*

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).*

m) *any changes or updates to the schedule for the completion of construction and commissioning operation of major process(es) / equipment groups in the Proposed Works.*

The above information is incorporated in the following report format and submitted to the MECP District Manager of the Kingston District Office of the Ministry of the Environment, Conservation and Parks as per the requirements of the Environmental Compliance Approval (ECA) No. 9608-9ZLJ2E and ECA No. 3047-BXASWW.

During the period of 2021, the Ontario Clean Water Agency (OCWA) operated the Tweed Lagoons and the Jamieson & River Street Sewage Pumping Station on behalf of the Corporation of the Municipality of Tweed. OCWA's goals have remained consistent during this period and remain consistent with the following priorities:

- provide quality assurance, safety and environmental compliance of facility operations;
- assist our clients in achieving compliance;
- provide advice on up-to-date technology in Operations and Maintenance service delivery.

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

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

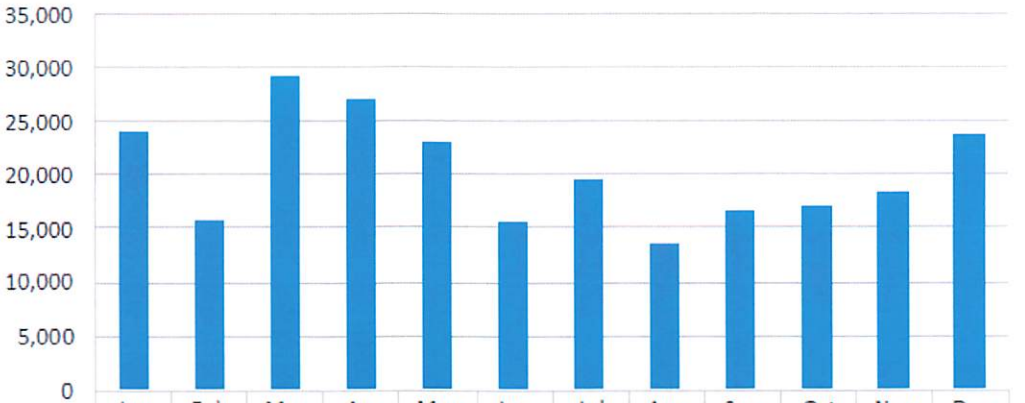
Summary and Interpretation of Monitoring Data and Analytical Results

ECA No. 3047-BXASWW 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.

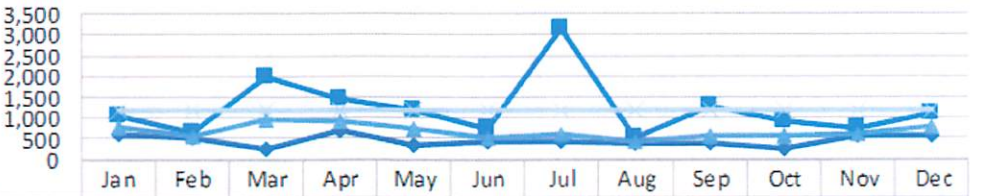
The Environmental Compliance Approvals require that everything practicable be undertaken to operate the Sewage Treatment Plant so that the annual average daily influent is within the Rated Capacity. The Rated Capacity of the Tweed Sewage Lagoons is 1210m^3/day and the 2021 annual average daily influent flow was 664.64 m^3/day or 54.9% of the Rated Capacity. The total Influent flow in 2021 was 242,989 m^3.

Graph 1: 2020 Influent Monthly Flow Totals



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Influent Flow (m3)	23,966	15,676	29,250	27,163	22,969	15,471	19,501	13,550	16,492	16,997	18,225	23,729

Graph 2: 2021 Influent Daily Minimum, Maximum and Average Flows



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Min (m3/day)	600	510	237	711	357	437	437	374	373	227	549	541
Max (m3/day)	1,075	631	1,990	1,477	1,175	723	3,168	497	1,292	901	730	1,091
Avg(m3/day)	773	559	943	905	740	515	629	437	549	548	607	765
Rated Capacity (m3)	1210	1210	1210	1210	1210	1210	1210	1210	1210	1210	1210	1210

The Maximum rated capacity was exceeded in the reporting year 2021, however the Daily Annual Average remained under the rated capacity.

Graph 3: 2015 – 2021 Historical Influent Flows for the Tweed Sewage Lagoons

	2015	2016	2017	2018	2019	2020	2021
Avg (mg/L)	936.95	927.32	1149.71	901.20	868.66	790.64	665.72

Based on the historical flows from 2015 to 2021 the total influent flow for the Tweed Sewage Lagoons has maintained a steady downward trend with a slight peak in 2017.

Table 1 reviews the historical trend of the influent sewage characteristics for the Tweed Sewage Lagoons, as required by Environmental Compliance Approval Condition 11(4)(a) of ECA No. 3047-BXASWW.

Table 1: Historical Average Influent Sewage Characteristics for the Tweed Sewage Lagoons

Year	BOD5 (mg/L)	TSS (mg/L)	Phosphorus (mg/L)	TKN (mg/L)
2015	169.69	179.23	2.63	---
2016	121.83	184.58	2.88	25.82
2017	89.17	130.33	1.80	19.40
2018	144.20	206.73	2.77	23.81
2019	115.00	247.17	2.56	25.35
2020	116.92	167.83	2.14	21.56
2021	180.04	380.97	2.87	26.33

Table 1 shows the Biochemical Oxygen Demand, Total Suspended Solids and Total Phosphorus annual average has maintained a steady trend from 2017-2021.

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 ECA No. 3047-BXASWW issued in 2021.

Sample Results

ECA No. 3047-BXASWW 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 Tweed Sewage Lagoons

Year	BOD (mg/L)	TSS (mg/L)	Phosphorus (mg/L)	TKN (mg/L)
2015	--	--	--	--
2016	--	--	--	--
2017	--	--	--	--
2018	--	--	--	--
2019	--	--	--	--
2020	--	--	--	--
2021	3590	17265	114	464

Table 2 shows the Biochemical Oxygen Demand, Total Suspended Solids, Phosphorus, and TKN annual average for 2019-2021. Previous to the issuance of ECA No. 3047-BXASWW in 2021 there were no sampling parameters for septage thus there is little historical data available for comparison.

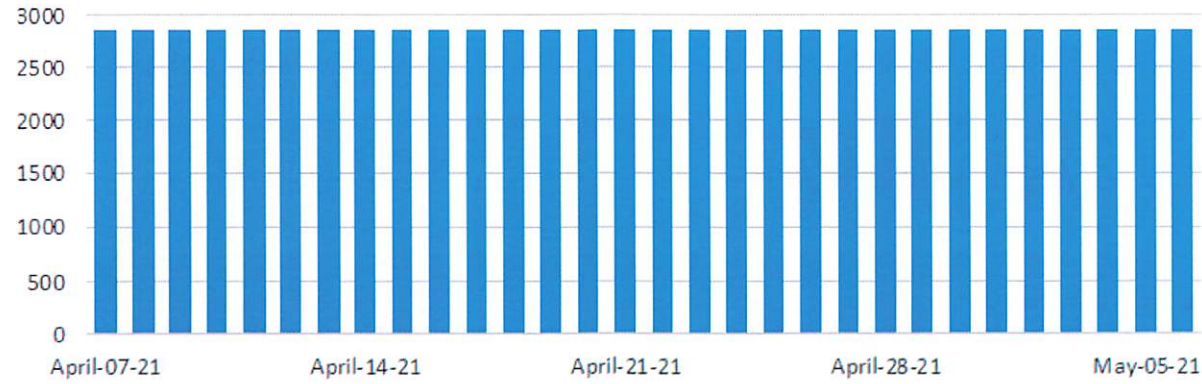
ECA No. 3047-BXASWW Condition 11(4)(b)

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;

2021 Spring Lagoon Discharge

The 2021 spring discharge commenced on March 25th, 2021 and was terminated on May 6th, 2021. The Ministry of the Environment, Conservation and Parks was notified verbally prior to commencement of the discharge and on the day the discharge ended. A total effluent volume of 122,636m^3 was discharged during the 42 day discharge period. The Spring 2021 discharge remained in compliance with ECA No. 9608-9ZLJ2E which was issued in September 2015 and remained in compliance until April 21st, 2021.

Graph 4: 2021 Spring Discharge Effluent Flow Totals



All analytical effluent concentration results were below the maximum concentrations as specified in the facility ECA No. 9608-9ZLJ2E which remained in effect for the 2021 Spring discharge as the ECA No. 3047-BXASWW did not come into effect until April 21st, 2021. A summary of the discharge data is provided in a table below.

Table 3: 2021 Spring Discharge Final Effluent Compliance Limits

Effluent Parameters	Average Effluent Concentration **Limit** (mg/L)	Average Effluent Concentration **Objective** (mg/L)	Average Effluent Concentration (mg/L)	Compliant (Y/N)
$CBOD_5$	**25.0**	20.0	8.50	Y
Total Suspended Solids	**25.0**	20.0	14.94	Y
Total Phosphorus	**1.00**	0.80	0.09	Y
pH	**6.0-9.5**	6.5-8.5	8.10-8.20	Y
Acute Lethality	**50%**	50%	0%	Y

The results in Table 3 show that the annual average concentrations of $cBOD_5$, Total Suspended Solids, Total Phosphorus, Acute Lethality and the annual average effluent waste loadings were in compliance with ECA No. 9608-9ZLJ2E and ECA No. 3047-BXASWW during the 2021 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 to no impact on the receiving stream.

Table 4: 2021 Spring Discharge Upstream & Downstream Results

Parameters	Average Spring Concentration- **Upstream** (mg/L)	Average Spring Concentration- **Downstream** (mg/L)
$CBOD_5$	4.40	4.50
Total Suspended Solids	3.14	7.50
Total Phosphorus	<0.03	0.03

2021 Fall Lagoon Discharge

The fall discharge did not occur in 2021 due to the construction of a new (third) Lagoon Cell, adding additional storage and treatment to the lagoon facilities. Therefore, no samples were required to be taken during the discharge season. It is suspected that Spring 2022 will be the first seasonal discharge under the new ECA No. 3047-BXASWW and with the proposed works having been completed, there will be a different set of limits and objectives in place for the 2022 spring discharge.

Summary of Effluent Monitoring and Recording Results

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

ECA No.3047-BXASWW Schedule D 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. These sampling requirements include those of ECA No. 9608-9ZLJ2E which was in place for the Spring 2021 discharge as the newly issued ECA No. # 3047-BXASWW was not formally received until May 5th, 2021.

Table 5: Influent - Minimum Sampling Schedule		
Parameters	**Sample Type**	**Minimum Frequency**
BOD5	4 hour composite	Monthly
Total Suspended Solids	4 hour composite	Monthly
Total Phosphorus	4 hour composite	Monthly
Total Kjeldahl Nitrogen	4 hour composite	Monthly

Table 6: Imported Sewage (Septage) - Minimum Sampling Schedule		
Parameters	**Sample Type**	**Minimum Frequency**
BOD5	Grab	Monthly
Total Suspended Solids	Grab	Monthly
Total Phosphorus	Grab	Monthly
Total Kjeldahl Nitrogen	Grab	Monthly

Table 7: Lagoon Content - Minimum Sampling Schedule		
Parameters	**Sample Type**	**Minimum Frequency**
CBOD5	Grab*	Once
Total Suspended Solids	Grab*	Once
Total Phosphorus	Grab*	Once
Total Kjeldahl Nitrogen	Grab*	Once
Ph	Grab*	Once
Hydrogen Sulphide	Grab*	Once

*ECA No.3047-BXASWW 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. 3047-BXASWW 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 8: 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
E. coli	Grab	Five per discharge season
Dissolved Oxygen	Grab	Five per discharge season
Hydrogen Sulphide (if odour is present)	Grab	Five per discharge season

Table 9: Acute Lethality - Minimum Sampling Schedule		
Parameters	**Sample Type**	**Minimum Frequency**
Acute Lethality: Field pH, un-ionized ammonia, Acute lethality to Rainbow Trout and Daphnia magna	Grab*	Once at the start of each 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. 9608-9ZLJ2E Condition 6(1) and ECA No. 3047-BXASWW Condition 9 (Schedule D).

ECA No. 3047-BXASWW 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 10: 2021 Lagoon Operational Challenges	
Challenges	*Corrective Actions*
New lagoon construction	Due to the new cell being constructed there was only a Spring discharge and no Fall discharge for the reporting year 2021.

ECA No. 3047-BXASWW 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	60
Operational Maintenance Work Orders Completed	24
Capital Maintenance Work Orders Completed	12

Capital projects are listed and provided to the Municipality of Tweed 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

ECA No. 3047-BXASWW 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. 3047-BXASWW 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: May 19, 2021
Work Performed By: Tower Electronics Inc.

ECA No. 3047-BXASWW 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

Table 11: Efforts Made to Meet the Effluent Objectives of Condition 6
Sampling effluent as per ECA
Visually inspecting effluent when performing rounds. during spring/fall discharge
Ensuring that alum is being dosed
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. 3047-BXASWW 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

As per ECA No. 3047-BXASWW Condition 11(4)(h) Sludge volume is to be measured every five (5) years, but may be estimated in the interim years. A summary of disposal locations and volumes of sludge disposed of must also be provided if sludge was disposed of during the reporting period. In 2008 12,880m^3 of sludge was hauled offsite from the cells of the Tweed Lagoons. The Tweed Sewage Lagoons has approximately 9,319m^3 of sludge remaining in the existing cells.

ECA No. 3047-BXASWW Condition 11(4)(i)

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

During the 2021 reporting period there was no community complaints received for the Tweed Sewage Lagoons.

ECA No. 3047-BXASWW 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 2021 reporting period there was a reported spill on May 12th, 2021 at the new Lagoon Cell. A rock came loose and hit a forcemain during construction and created a lesion in the pipe, emitting raw sewage. It was appropriately reported, pumped with a vacuum truck and repaired. See ***Appendix III*** for notification.

No. 3047-BXASWW Condition 11(4)(k)

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

In the reporting year 2021 there were no Pre-Authorized Modifications to Municipal Sewage Works per the Limited Operational Flexibility- Protocol as per ECA No. 3047-BXASWW Condition 11(4)(j) .

Table 12: Summary of Modification to Sewage Works- Summary of Modifications	
Equipment	**Emergency Operational Modification**
Not Applicable for 2021	

ECA No. 3047-BXASWW 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 2021 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 Tweed 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 100m3 or more of influent, or
- Collects an average daily volume (ADV) of 100m3 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:

Sum of daily effluent volumes deposited (m3) ÷ 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 2021, the Tweed Sewage Lagoons deposited approximately 122,636 m^3 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 Tweed Sewage Lagoons met all of the quality standards in 2021.

Monitoring Report

Effluent Monitoring Data: *Tweed Wastewater Treatment Lagoon*

System Type: Intermittent **Reporting Period**: Annually **Avg Daily Effluent**: 335.98

Averaging Period: Annually **Reporting Period**: January - December **Reporting Year**: 2021

Was effluent deposited in this reporting period? Yes

For each month indicated, was effluent deposited?

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

# of days effluent was deposited? (days)	Total Volume of Effluent deposited? (m^3)	Average CBOD (mg/L)	Average SS (mg/L)
		Limits	
		25	25
42	122,636	8.50	14.94

During the reporting period of 2021, the Environmental Compliance Approval (ECA) No. 6083-BZEH79 for the Tweed Jamieson and River Street Pumping Stations was issued April 21st, 2021.

ECA No. 6083-BZEH79 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 13: 2021 Hwy#7 and McDonald Pumping Station Operational Challenges	
Challenges	*Corrective Actions*
Not Applicable for 2021	

ECA No. 6083-BZEH79 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	54
Operational Maintenance Work Orders Completed	0
Capital Maintenance Work Orders Completed	0

Capital projects are listed and provided to the Municipality of Tweed 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 Wet Well Clean-outs
- Inspect electrical panels
- Annual Diesel Inspection

ECA No. 6083-BZEH79 Condition 8(3)(c)

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

Table 14: Jamieson and River Street SPS - Flow Meter Calibration Results – 2021				
Flow Meter Description and Location		Date of Calibration Report	Tag ID	Passed Calibration Y/N
Flowmeter Raw Sewage	Jamieson SPS	May 19 2021	A605EC16000	Y
Flowmeter Raw Sewage	River Street SPS	May 19 2021	A605EB1600	Y
Chart Recorder Flow/Wet Well	River Street SPS	May 19 2021	172131	Y

ECA No. 6083-BZEH79 Condition 8(3)(d)

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

During the 2021 reporting period there was no community complaints received for the Tweed Jamieson and River Street Pumping Stations.

ECA No. 6083-BZEH79 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 2021 reporting period there was no bypass, spills, other situations outside normal operating conditions, or abnormal discharge events for the Tweed Jamieson and River Street Pumping Stations.

ECA No. 6083-BZEH79 Condition 8(3)(f)

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

In the reporting year 2021 there were no Pre-Authorized Modifications to Municipal Sewage Works per the Limited Operational Flexibility- Protocol as per ECA No. 6083-BZEH79 Condition 8(3)(f).

Table 15: Summary of Modification to Sewage Works- Summary of Modifications	
Equipment	**Emergency Operational Modification**
Not Applicable for 2021	

ECA No. 6083-BZEH79 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 2021 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 Tweed Jamieson and River Street Pumping Stations.

Appendix I

Annual Summary
for the
Tweed Sewage Lagoons

2021

Facility: [5062] TWEED WASTEWATER TREATMENT LAGOON **Works: [120000952]**

	01/2021	02/2021	03/2021	04/2021	05/2021	06/2021	07/2021	08/2021	09/2021	10/2021	11/2021	12/2021	<--Total-->	<--Avg.-->	<--Max.-->
Flows:															
Raw Flow: Total - Raw (m^3)	23966.00	15676.00	29250.00	27163.00	22969.00	15471.00	19501.00	13550.00	16492.00	16997.00	18225.00	23729.00	242989.00		
Raw Flow: Avg - Raw (m^3/d)	773.10	559.86	943.55	905.43	740.94	515.70	629.06	437.10	549.73	548.29	607.50	765.45		664.64	
Raw Flow: Max - Raw (m^3/d)	1075.00	631.00	1990.00	1477.00	1175.00	723.00	3168.00	497.00	1292.00	901.00	730.00	1091.00			3168.00
Eff. Flow: Total - Effluent Combined (m^3)			19964.00	85560.00	17112.00								122636.00		
Eff. Flow: Avg - Effluent Combined (m^3/d)			2852.00	2852.00	2852.00									2852.00	
Eff. Flow: Max - Effluent Combined (m^3/d)			2852.00	2852.00	2852.00										2852.00
Carbonaceous Biochemical Oxygen Demand: CBOD:															
Eff: Avg cBOD5 - Effluent Combined (mg/L)			14.000	6.000	5.500									8.500	14.000
Eff: # of samples of cBOD5 - Effluent Combined (mg/L)			2	6	2								10		
Loading: cBOD5 - Effluent Combined (kg/d)			39.928	17.112	15.686									24.242	39.928
Biochemical Oxygen Demand: BOD5:															
Raw: Avg BOD5 - Raw (mg/L)	105	119	361	135	67.5	177	132	146	646	160	62	50		180.04167	646
Raw: # of samples of BOD5 - Raw (mg/L)	1	1	1	1	2	1	1	1	1	1	1	1	13		
Total Suspended Solids: TSS:															
Raw: Avg TSS - Raw (mg/L)	171	211.1	314	160	556.56	75	200	208	2080	214	260	122		380.97167	2080
Raw: # of samples of TSS - Raw (mg/L)	1	1	1	1	2	1	1	1	1	1	1	1	13		
Eff: Avg TSS - Effluent Combined (mg/L)			13.000	16.833	15.000									14.944	16.833
Eff: # of samples of TSS - Effluent Combined (mg/L)			2	6	2								10		
Loading: TSS - Effluent Combined (kg/d)			37.076	48.009	42.780									42.622	48.009
Percent Removal: TSS - Effluent Combined (mg/L)			95.860	89.479	97.305										97.305
Total Phosphorus: TP:															
Raw: Avg TP - Raw (mg/L)	2.52	3.12	2.89	1.65	2.165	1.28	3.2	2.84	7	3.22	2.74	1.87		2.8745833	37.960
Raw: # of samples of TP - Raw (mg/L)	1	1	1	1	2	1	1	1	1	1	1	1	13		
Eff: Avg TP - Effluent Combined (mg/L)			0.100	0.087	0.085									0.091	0.100
Eff: # of samples of TP - Effluent Combined (mg/L)			2	6	2								10		
Loading: TP - Effluent Combined (kg/d)			0.285	0.247	0.242									0.258	0.285
Percent Removal: TP - Effluent Combined (mg/L)			96.540	94.747	96.074										96.540
Nitrogen Series:															
Raw: Avg TKN - Raw (mg/L)	24.7	34.5	31.3	18.1	19.15	11.9	29.9	32.5	53.7	27.9	21.8	10.6		26.3375	53.7
Raw: # of samples of TKN - Raw (mg/L)	1	1	1	1	2	1	1	1	1	1	1	1	13		
Eff: Avg TAN - Effluent Combined (mg/L)			6.250	7.467	8.000									7.239	8.000
Eff: # of samples of TAN - Effluent Combined (mg/L)			2	6	2								10		
Loading: TAN - Effluent Combined (kg/d)			17.825	21.295	22.816									20.645	22.816
Eff: Avg NO3-N - Effluent Combined (mg/L)				0.660	0.350									0.505	0.660
Eff: # of samples of NO3-N - Effluent Combined (mg/L)				3	2								5		
Eff: Avg NO2-N - Effluent Combined (mg/L)				0.263	0.190									0.227	0.263
Eff: # of samples of NO2-N - Effluent Combined (mg/L)				3	2								5		
Disinfection:															
Eff: GMD E. Coli - Effluent Combined (cfu/100mL)			289.828	192.701	4.000									162.176	289.828
Eff: # of samples of E. Coli - Effluent Combined (cfu/100mL)			2	6	2								10		
Eff:TKN (mg/L)			7.97	9.45										8.71	9.45
Eff: # of samples of TKN (mg/L)			3	2									5		
Eff: Acute Lethality (%)			0%											0%	0%
Eff: # of samples of Acute Lethality (%)			1										1		
Eff: Hydogen Sulphide (mg/L)			0.02											0.02	0.02
Eff: # of samples of Hydrogen Sulphide (mg/L)			2	3									5		

Appendix II

Cell Content Lab Results
for the
Tweed Sewage Lagoons

2021

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

Works #: 120000952
Project : PO#017018

18-March-2021

OCWA-Trent Valley (Tweed Lagoon)
Attn : Amber Bevan

P.O. Box 20157, 131 St. Paul St.
Belleville, ON
K8N 5V1, Canada

Phone: 613-472-2131
Fax:

Date Rec. : 12 March 2021
LR Report: **CA12533-MAR21**

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: Cell CelN-North Cell Contents	6: Cell CelS-South Cell Contents
Sample Date & Time					10-Mar-21 08:20	10-Mar-21 08:20
Temperature Upon Receipt [°C]	—	—	—	—	12.0	12.0
Field pH [no unit]	—	—	—	—	7.7	7.6
Carbonaceous Biochemical Oxygen Demand [(CBOD5) mg/L]	12-Mar-21	16:07	17-Mar-21	14:59	29	19
Total Suspended Solids [mg/L]	15-Mar-21	14:54	16-Mar-21	13:40	58	36
Phosphorus (total) [mg/L]	12-Mar-21	19:30	15-Mar-21	13:28	0.33	0.20
Hydrogen Sulphide [mg/L]	15-Mar-21	14:30	18-Mar-21	11:22	0.04	—
Sulphide [mg/L]	15-Mar-21	14:30	16-Mar-21	10:07	0.22	—
Temperature @ pH [°C]	12-Mar-21	14:35	18-Mar-21	08:03	19.8	—
Conductivity [uS/cm]	12-Mar-21	14:35	18-Mar-21	08:03	1260	—

Note: Hydrogen Sulphide (H2S) calculated from field pH, lab temperature and lab conductivity.

Carrie Greenlaw
Project Specialist,
Environment, Health & Safety

OnLine LIMS

0002433850

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

Works #: 120000952
Project : PO#017018

19-March-2021

OCWA-Trent Valley (Tweed Lagoon)
Attn : Amber Bevan

P.O. Box 20157, 131 St. Paul St.
Belleville, ON
K8N 5V1, Canada

Phone: 613-472-2131
Fax:

Date Rec. : 15 March 2021
LR Report: **CA13332-MAR21**

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: Cell CelS-South Cell Contents
Sample Date & Time					15-Mar-21 11:00
Temperature Upon Receipt [°C]	---	---	---	---	11.0
Field Conductivity [uS/cm]	---	---	---	---	13.30
Field pH [no unit]	---	---	---	---	7.1
Field Temperature [celcius]	---	---	---	---	4.4
Hydrogen Sulphide [mg/L]	17-Mar-21	12:00	19-Mar-21	10:33	1.2
Sulphide [mg/L]	17-Mar-21	12:00	19-Mar-21	10:30	1.8

Note: Hydrogen Sulphide (H2S) calculated from field pH, field temperature and field conductivity.

Carrie Greenlaw
Project Specialist,
Environment, Health & Safety

OnLine LIMS

0002435893

Appendix III

Spill Notification
for the
Tweed Sewage Lagoons

2021

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

District Manager
Ministry of Environment and Climate Change
Trevor.Dagilis@ontario.ca

May 14, 2021

Re: Notification of Spill – Tweed Lagoons

This is a written notification of Spill submitted in accordance with terms and conditions the Ontario Water Resources Act, Environmental Protection Act and the current Environmental Compliance Approval Number #047-BXASWW, Section 11(2).

This written notice confirms the verbal notifications provided to Peter Zin at the Spills Action Center on May 12th, 2021, REF# 1-FI0NH.

Details:

The spill that occurred on May 12th, 2021 at the Tweed Lagoons, new cell construction site consisted of raw sewage from a forcemain. The spill was caused by a rock coming loose and hitting the forcemain, puncturing it and releasing raw sewage into the construction hole. The substance did not leave the construction hole. The corrective actions that were taken are as followed; the forcemain was isolated and the leak was stopped and the sewage was hauled to the lagoon offsite by a hauler, until such a time that the puncture was fixed. Since the forcemain was isolated a hauler continued to remove sewage from the River St. Pumping Station to maintain operations for the municipality. The punctured forcemain was fixed and the pumps were turned back on by 13:00 and hauling offsite ceased at 13:20 on May 13th, 2021.

The Ontario Clean Water Agency was not involved with the construction operations, managing or otherwise, however, OCWA reported the event to SAC as our assistance was requested and we wanted to ensure due diligence as ORO of the system.

If you have any questions or concerns, do not hesitate to contact me.

Sincerely,

Amber Coupland
OCWA Operations Manager

CC:

Gloria Raybone, CAO/Clerk-Treasurer, Municipality of Tweed
Natalie Iezzi, Process and Compliance Technician, OCWA
Sarah Young, Environmental Officer, MECP Belleville
Cindy Spencer, Regional Hub Manager, OCWA
Wes Henneberry, Safety, Process & Compliance Manager, OCWA