
Tweed Wastewater Lagoon

Annual Report

Reporting period of January 1, 2015 – December 31, 2015

Prepared For: Corporation of the Municipality of Tweed

Prepared By:



Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Facility Introduction

The Ontario Clean Water Agency (OCWA) operates and maintains the Tweed Wastewater Treatment Facility (Tweed Lagoons) on behalf of the Municipality of Tweed.

The facility is a Class 1 Wastewater Treatment Facility. The facility's design flow is 1210m³/day. The average day raw flow for the year 2015 was 937m³/day.

The Tweed Wastewater Treatment Facility complies with all requirements of the regulating authorities and operates under:

- Certificate of Approval 2-0274-69-741526 dated Aug 20, 1974. River St (no.1) and the Jamieson St (no.2) sewage pumping stations and the two-cell seasonal retention waste stabilization ponds.
- Certificate of Approval 3-0796-93-006 dated Aug 18,1993, for the installation of a continuous feed phosphorous removal system at the River St pumping station
- Certificate of Approval 3-0446-94-006 dated July 26, 1994, replacement of check valves at the Jamieson Street sewage pumping station
- Environmental Compliance Approval (ECA) #9608-9ZLJ2E Issued September 22, 2015.
 - **Please note:** The Municipality was not in receipt of this ECA until October 14, 2015 subsequent to the 2015 fall discharge

Sampling Requirements and Effluent Limits

Sampling requirements and effluent limits are not defined in the facility's Certificates of Approval and are derived from the following Ministry of the Environment (MOE) Procedures:

MOE Procedure F-5-1 Secondary Treatment

For Seasonal retention waste stabilization pond with Total Phosphorus removal by continuous chemical alum dosage

BOD5 - **30mg/L** (annual average)

SS - **40mg/L** (annual average)

MOE Procedure F-10 Sampling to be conducted on a routine basis

Effluent samples to be collected at least once per month during discharge periods.

BOD5 / Suspended Solids / Total Phosphorus / Ammonia plus ammonium nitrogen (NH₃ + NH₄)

During discharge OCWA exceeds the Ministries guidelines and collects a minimum of three effluent samples for the following parameters: BOD5, SS, TP, NH₃ + NH₄ as N, NO₂ + NO₃ as N, TKN and Fecal Coliform.

The Tweed Lagoons operate on seasonal retention and seasonal discharge, discharging in Spring and Fall. The lagoons have the capability of being discharged through each cell independently or simultaneously. The decision to determine whether to discharge one cell at a time or both cells simultaneously will depend upon a number of factors, such as design capacity, environmental conditions and retention time.

Prior to discharging the lagoons, OCWA collects samples of lagoon contents from both the north and south cell and sends them to an accredited laboratory to be analyzed for BOD5, SS, TP, TKN, pH and H₂S. Once the results have been received, they are reviewed to confirm that they are below 25mg/L BOD5, 30mg/L SS, and 1mg/L Total P. (Although MOE Procedure F 5-1 stipulates guidelines of 30mg/L BOD and 40mg/L SS, OCWA strives to exceed these guidelines).

This document states that recreational waterways shall have effluents not exceeding a total phosphorus concentration of 1.0 mg/L, however, it is understood that more stringent limits may be adopted. Since it is understood that the Bay of Quinte has adopted a total phosphorus limit of 0.50mg/L (as part of the Bay of Quinte Remedial Action Plan), the more stringent value shall prevail.

Regardless of the mode of discharge, the mitigating factor for allowing any discharge will be compliant effluent lagoon results. The lagoon(s) are not being allowed to discharge if effluent results are not in compliance.

2015 Spring Lagoon Discharge

The spring discharge for the 2015 Tweed Lagoons commenced on April 20th for a period of 24 days terminating on May 13th. A total effluent volume of 142,692.00m³ was discharged. The Ministry of the Environment was notified verbally prior to commencement of both discharges and on the day the discharges ended. We are pleased to report that all analytical effluent met the MOE Guidelines F-5 through F-10. A summary of the discharge data is provided below.

Effluent Parameter	CofA Average Effluent Seasonal Concentration Limit (mg/L)	Sample Location	2015 Average Effluent Seasonal Concentration (mg/L)
BOD₅ (mg/L)	25	Upstream	<4.00
		Effluent	6.00
		Downstream	<4.00
Total Suspended Solids (mg/L)	30	Upstream	5.00
		Effluent	7.00
		Downstream	5.50
Total Phosphorus (mg/L)	0.5	Upstream	<0.03
		Effluent	0.04
		Downstream	<0.03
Fecal Coliform (cfu/100ml)		Upstream	46.0
		Effluent	524
		Downstream	37.5
CBOD₅ (mg/L)		Effluent	5.25
Total Ammonia Nitrogen (mg/L)		Effluent	6.0
Total Kjeldahl Nitrogen (mg/L)		Effluent	7.2
Nitrate (mg/L)		Effluent	0.71
Nitrite (mg/L)		Effluent	0.25



2015 Fall Lagoon Discharge

The fall discharge for the 2015 Tweed Lagoons commenced on October 14th for a period of 43 days terminating on November 25th. A total effluent volume of 190,447m³ was discharged. The Ministry of the Environment was notified verbally prior to commencement of both discharges and on the day the discharges ended. We are pleased to report that all analytical effluent met the MOE Guidelines F-5 through F-10. A summary of the discharge data is provided below.

Effluent Parameter	CofA Average Effluent Seasonal Concentration Limit (mg/L)	Sample Location	2015 Average Effluent Seasonal Concentration (mg/L)
BOD ₅ (mg/L)	25	Upstream	<4.00
		Effluent	6.86
		Downstream	<4.00
Total Suspended Solids (mg/L)	30	Upstream	3.00
		Effluent	19.00
		Downstream	3.29
Total Phosphorus (mg/L)	0.5	Upstream	<0.03
		Effluent	0.11
		Downstream	<0.03
Fecal Coliform (cfu/100ml)		Upstream	250.0
		Effluent	4508.6
		Downstream	370.9
CBOD ₅ (mg/L)		Effluent	5.71
Total Ammonia Nitrogen (mg/L)		Effluent	2.60
Total Kjeldahl Nitrogen (mg/L)		Effluent	0.64
Nitrate (mg/L)		Effluent	0.11
Nitrite (mg/L)		Effluent	0.03

Wastewater System Effluent Regulations

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:

$$\text{Sum of daily effluent volumes deposited (m}^3\text{)} \div \text{number of days in that calendar year (365 days)}$$

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 2015 The Tweed Wastewater Treatment Lagoon deposited approximately 912.7m³ of daily effluent volumes.

The Annual Monitoring Report (due by February 14 each year) was submitted to Environment Canada on February 9, 2016. The Tweed Lagoon met all of the quality standards in 2015.

Monitoring Report			
Effluent Monitoring Data:	<u>Tweed Wastewater Treatment Lagoon</u>		
System Type: Intermittent	Reporting Period: Annually	Avg Daily Effluent: 912.7	
Averaging Period: Annually	Reporting Period: January - December	Reporting Year: 2015	
Was effluent deposited in this reporting period? Yes			
For each month indicated, was effluent deposited?			
January:	No	February:	No
April:	Yes	May:	Yes
July:	No	August:	No
October:	Yes	November:	Yes
		March:	Yes
		June:	No
		September:	No
		December:	No
# of days effluent was deposited? (days)	Total Volume of Effluent deposited? (m³)	Average CBOD (mg/L)	Average SS (mg/L)
		Limits	
		25	25
67	333139.0	5.4	12.2