
Memorandum

PWC-C 9-2024

Subject: Receipt of Written Warning under the Wastewater Systems Effluent Regulation

Date: August 13, 2024

To: Public Works Committee

From: Dawn MacArthur, B.Sc., C.Chem.

This memorandum is to inform Council that a written warning has been issued to Niagara Region for contraventions of the Wastewater Systems Effluent Regulation (WSER) that occurred at the Niagara Falls wastewater treatment plant (WWTP).

The written warning is cautionary and does not carry any fines or penalties but is intended to bring this matter to the attention of the Niagara Region and outline potential consequence should Niagara Region fail to take corrective action.

Background

Niagara Region wastewater systems are regulated both under Provincial and Federal regulations. Federally, the *Wastewater Systems Effluent Regulation* (WSER) applies to Niagara Region's facilities and is enforced by Environment and Climate Change Canada.

Under the WSER, effluent from a wastewater system must meet conditions related to biochemical oxygen demand (CBOD), suspended solids (TSS), residual chlorine (TRC), ammonia, and toxicity¹.

The recent written warning cited the following contraventions:

- 26 instances of CBOD exceedances since 2021
- 21 instances of TSS exceedances since 2021
- 1 instance of an acute toxicity exceedance that occurred on March 4, 2024 with a test result of 60% mortality

¹ The toxicity of effluent is determined by acute toxicity lab testing using rainbow trout. If greater than 50% of the fish die during the test period, the effluent is considered toxic.

Why is Niagara Falls WWTP in Contravention with the WSER?

CBOD Exceedances

CBOD is primarily removed from wastewater during the secondary treatment process. The secondary treatment equipment at the plant has passed its useful life expectancy which results in frequent breakdowns and equipment out-of-service regularly. This impacts the plant's ability to remove CBOD effectively. Despite ongoing repair and maintenance efforts, CBOD removal was reduced by an average of 30% in 2023 due to the state of deterioration of the secondary treatment process.

A capital project is already underway to replace the current secondary treatment system. Until the completion of the capital upgrades in approximately Q2 2025, enhanced maintenance and upkeep of the equipment will be required.

TSS Exceedance

TSS exceedances are attributed to two main factors at the plant: (1) the underperforming secondary treatment process equipment as described above, and (2) current construction of the new secondary treatment system requires rehabilitation of the four (4) final clarifiers. To do this, they are being taken out of service on a rotating basis, leaving only three (3) final clarifiers in operation at any given time. This reduces the plant's ability to remove solids by approximately 25%. Construction of the final clarifiers is anticipated to be complete by Q4 2024.

Acute Toxicity Failure

Determining the cause of acute toxicity failure is challenging as there can be many undetectable sources of toxicity in wastewater. However, typically for wastewater effluent, toxicity failure occurs from three causes: ammonia, poor effluent quality, or chemical usage (either from something put in the sewer upstream of the plant, or from chemicals used within the plant).

Based on the toxicity results from the failure on March 4, 2024, it is likely that poor effluent quality is the primary cause of the failure, with ammonia as a contributing factor.

Failure of the acute toxicity test is also attributed to the degradation of the secondary treatment process.

Corrective Actions

The following actions have been completed or are currently underway to address the full range of exceedances noted in the written warning from Environment and Climate Change Canada:

- A capital project is underway to replace the secondary treatment process. The new equipment is anticipated to come online in Q2 of 2025.
- Maintenance efforts will continue to support the existing secondary treatment equipment to the extent possible.
- A polymer is being added in the primary and secondary clarifiers to optimize settling of solids and TSS removal.
- Hauled sewage receiving has been restricted to domestic sewage from sources within the City of Niagara Falls boundaries only. Specifically, barring winery waste helps to reduce CBOD and TSS loading to the facility.
- Additional toxicity testing is being completed on polymers utilized in the process as a precaution to ensure there is no toxicity occurring from their use.
- Process staff are investigating the feasibility of using an additive that may be applied at Niagara Falls WWTP to reduce ammonia levels.

Summary

Staff are working hard to remain in compliance with all applicable regulations and work co-operatively with regulatory authorities. Degradation of existing treatment equipment continues to hinder staff's ability to meet the regulatory requirements for CBOD and TSS. Many efforts have been and will continue to be taken to achieve compliance.

Staff will respond to the ECCC warning with a letter outlining all corrective actions that have or are being taken to demonstrate Niagara Region's actions and due diligence.

Respectfully submitted and signed by

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Supervisor, Wastewater Compliance and Enforcement

Appendices

Appendix 1 Written Warning - Niagara Falls WWTP Contraventions of the
Wastewater Systems Effluent Regulation