Q1 2024 Quarterly Progress Report
Niagara Falls Water Board
Order on Consent R9-20170906-129

Prepared for submission to:
New York State Department of Environmental Conservation Region 9
270 Michigan Avenue
Buffalo, New York 14203

Prepared by:
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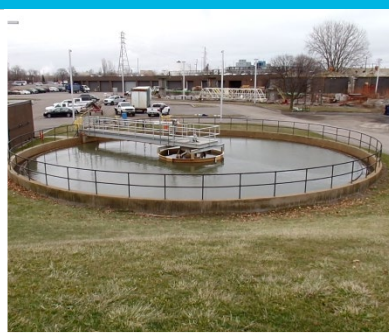
April 30, 2024



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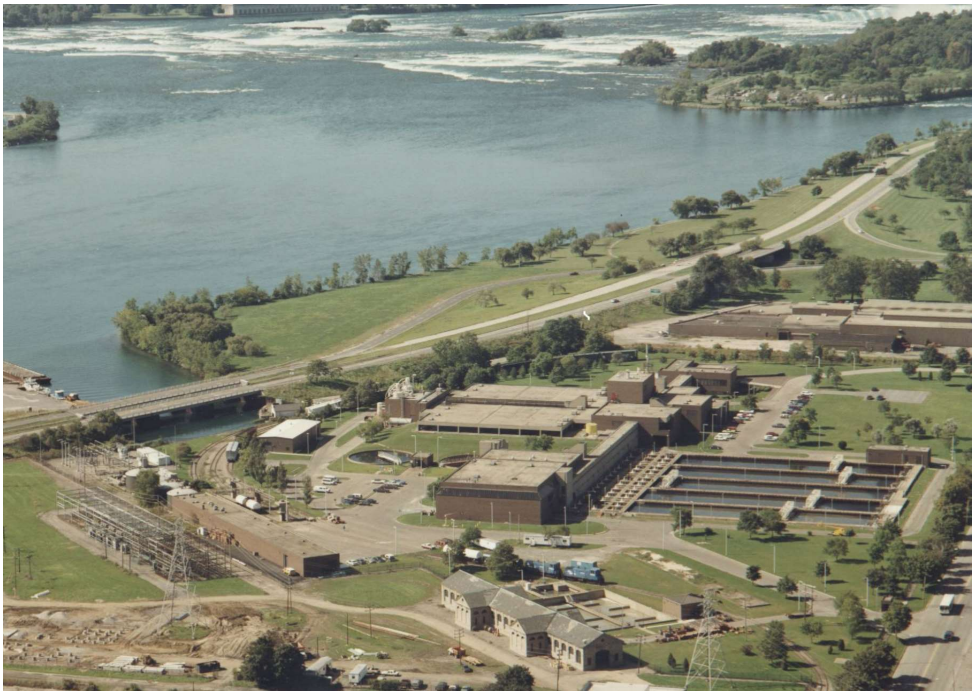

NIAGARA FALLS WATER BOARD

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Executive Summary

This document is the twenty fifth (25th) quarterly progress report for the Niagara Falls Water Board (NFWB) Order on Consent R9-20170906-129 (Consent Order) as originally required by Schedule A Item 15 of the Consent Order. This progress report covers the period from January 1, 2024 through March 31, 2024.

During the past quarter, the NFWB has properly operated the wastewater treatment plant (WWTP) and has met all State Pollution Discharge Elimination System (SPDES) permit requirements with two exceptions for alpha-BHC (alpha-Hexachlorocyclohexane) in January and February 2024. Solids processing (settling, thickening, dewatering) during this period has functioned as intended. Primary effluent is clean which has allowed the WWTP's activated carbon filters to efficiently process the plant's influent flow. Dewatering throughput during this period has kept up with incoming solids, compared to influent solids loadings. The WWTP was operated free of odors during the past quarter.

Maintenance activities during the reporting period have been ongoing, and as of the end of the quarter major treatment systems and components are functional. The WWTP is undertaking a number of capital upgrades and improvements that are within the capability of the WWTP's maintenance staff and/or contractors awarded service contracts. In addition to the projects being undertaken by the WWTP's staff and outside contractors, project planning, design, and construction of $27 million in major capital upgrades are taking place. Projects 2, 4, 6, 7, 8, 9, and 11 have been completed and work continues on Projects 1, 3, 5 and 10. Project 6 was reopened in Q4 2023 by the addition of sodium hypochlorite storage tank upgrades to the existing Project 6 scope. This work includes replacement of Tank 216 along with some sodium hypochlorite pump, piping, and secondary containment upgrades. Project 12 is expected to go out for Request for Proposal in the near future.

The NFWB has met all scheduled requirements of the Consent Order as identified in Schedule A of the Consent Order. Specific submissions during the past quarter include:

- The twenty fourth (24th quarterly report for the fourth quarter of 2023 (Q4 2023) was submitted January 31, 2024 to the New York State Department of Environmental Conservation (NYSDEC) and posted on the NFWB's website (Consent Order Item 15).

The NFWB is committed to working cooperatively and openly with the NYSDEC to improve the Niagara Falls WWTP and operate it to the best of its capability.

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1. WWTP Performance

This section discusses the operation of the NFWB WWTP during the reporting period of January 1, 2024 through March 31, 2024. In the following sections, Treatment Plant Operations, Solids Removal Performance, and Treatment Plant Equipment Readiness are discussed.

1.1 Treatment Plant Operations

Mr. Dennis Kirkland serves as Acting Chief Operator of the wastewater treatment plant as of January 4, 2022. Until such time as Mr. Kirkland achieves the necessary operator's license, Mr. Fred Kasper (New York State Grade 4 licensed Operator 12489) is serving as the licensed plant operator. Mr. Kasper spends four hours per day on average at the facility on a Monday through Friday basis and assists Mr. Kirkland with his duties.

During the reporting period there were two (2) reported SPDES permit excursions related to a low-level detection of alpha-BHC in January and February 2024. This is a surprise after having no BHC violations in Q4 2023 after implementing reduced discharge limits for the three SIUs known to contribute BHCs to the WWTP. The BHC trends are being monitored by the NFWB. During Q1 2024 solids processing has kept up with the incoming solids, and equipment maintenance and repair activities have been conducted as promptly as possible.

Sodium hypochlorite consumption has remained low during Q1 2024 (5,700 gallons per day average) and is consistent with the overall 2023 average of 5,700 gallons per day. The practice of chlorinating the primary effluent was stopped on January 26, 2023 due to issues with the filters and reduced sulfide generation (see additional discussion below). Chlorination of the filter backwash water continues to be practiced.

The following operational considerations were noted during Q1 2024:

- Cascades has continued to discharge relatively low amounts of both total suspended solids (TSS) and soluble organic carbon (SOC) during Q1 2024. Q1 2024 average total suspended solids (TSS) and soluble organic carbon (SOC) discharges from Cascades were 822 lbs./day and 756 lbs./day; respectively. For comparison, their Q4 2023 suspended solids loadings were 2,500 lbs./day (TSS) (down from 6,000 lbs./day in Q3 2023) and soluble organic carbon loadings averaged 811 lbs./day (SOC) (down slightly from 850 lbs./day in Q3 2023). Sludge processing improvements at the Cascades facility in Q4 2023 and Q1 2024 has resulted in further decreases in their TSS discharges. Reductions in solids and organic carbon discharges from Cascades are believed to be responsible for the reduced consumption of sodium hypochlorite in 2023 relative to 2021 and 2022; and also for the greatly reduced sludge quantities produced at the NFWB WWTP.

- Carbon filter backwash numbers have remained low (approx. 25 to 35 per day) and all backwash water continues to be directed to the head of the plant where it is retreated through the sedimentation basins and activated carbon.
- The facility's odor scrubber that serves the odor control building suffered a catastrophic failure of the blower on August 3, 2023. The new blower and carbon adsorber were installed and made operational during Q1 2024. With the blower back in service, the carbon bed effluent wet well static pressure relative to the Odor Control Building interior space is again being maintained in a negative pressure, meaning that sulfide odors from the wet well no longer enter into the odor Control Building interior.
- Construction on Sedimentation Basin 2 (Project 1) continues and as of the end of Q1 2024 the facility is using Sedimentation Basins Nos. 1, 3, 4 and 5.
- In late November 2023, the NFWB potable water treatment plant (WTP) began discharging its solids generated in sedimentation basins and filter backwash to the sewer which transports the material to the WWTP for treatment. The solids result from the use of an alum coagulant at the WTP. Thus far with four months of operational experience the WTP solids have not caused any issues at the WWTP.

1.2 Solids Removal Performance

A solids balance for January, February, and March 2024 is presented in Table 1. The data is based upon effluent flow meter measurements and influent/effluent total suspended solids sample results generated by the facility. The data shows that the quantity of solids sent to the landfill has exceeded the amount of solids removed from the wastewater plus chemical solids added (ferric chloride and lime).

Influent suspended solids have continued to be lower than historical averages. The trend of lower influent solids began in November 2021 and appears to correlate with major reductions in suspended solids discharged from Cascades. During the past quarter influent suspended solids loadings averaged 188 dry tons per month (DTPM) compared to the 2023 annual average of 195 DTPM.

1.3 Treatment Plant Equipment Readiness

During the reporting period there were several treatment plant equipment breakdowns that required maintenance staff to repair or replace equipment. Minor repairs have been made this past quarter for pumps, belt filter presses, and sedimentation basin equipment to address issues that have arisen. Although these repairs may have kept equipment out of service for periods of time during the past quarter, it has not significantly affected the plant performance. In general, a sufficient number of sedimentation basins with fully functional sludge removal equipment have been available to treat all incoming flows. As of the close of Q1 2024, the following can be said regarding treatment equipment operability:

- Four (4) Main Pumps are operational.

- Three (3) Intermediate Pumps are operational and control/drive issues are being monitored. Intermediate Pump #1 was formally taken out of service and its suction side valve was removed and replaced with a blind flange in Q3 2023. The suction side valve, which would not close, will be replaced. The pump motor and DC magnetic drive were sent out for rebuilding in Q4 2023 and have been received back at the WWTP as of the end of Q1 2024 and are awaiting installation by plant maintenance staff. The pump housing (volute, impeller, bearings, etc.) was removed and inspected and a spare pump housing (available at the facility) was installed in Q4 2023. A new valve and coupler were ordered and the coupler was received in Q1 2024, but the WWTP is still awaiting delivery of the valve. Upon completion of the rebuilding of Intermediate Pump #1 the pump should function like new. The facility expects to continue rebuilding the Intermediate Pump DC motors and drives throughout 2024, sending one set each out at a time for refurbishment. A new project to evaluate the intermediate pump controls and priming issues is expected to be bid out for engineering services in Q2 2024.
- Four of the five sedimentation basins are functional, with Sedimentation Basin No. 2 out of service for construction. During the past quarter, two (2) sedimentation basins have been used for flows up to 40 mgd, three (3) basins used for flows between 40 mgd and 60 mgd, and four (4) basins for flows over 60 mgd.
- Twenty-seven (27) activated carbon filters are functional, with Filter 27 requiring replacement activated carbon which should occur in Q2 2024. In late December 2023, the facility contracted with Carbon Activated to remove and dispose of all activated carbon in the Spent Tank, and to change activated carbon in four (4) filters (Filters 9, 14, 23 and 24). This work was completed in Q1 2024. The Spent Carbon tank is now completely empty and drained of all water.
- The filter backwash system is functional including two backwash pumps and two blowers.
- Three (3) belt filter presses and related equipment (sludge and polymer feed pumps) are operational.
- Two (2) pugmills, two (2) lime feed systems, and two (2) lime storage silos are fully functional.

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Table 1

Q1 2024 NFWB WWTP Solids Balance

Month & Year	Average Daily Flow	Average Influent TSS	Average Effluent TSS	TSS Removed (Dry)	Ferric Chloride Added to Wastewater (Dry)	Lime Added to Sludge (Dry)	Total Solids (Dry) (TSS + Lime + Ferric)	Solids Content of Landfilled Sludge	Total Solids (Wet)	Solids Landfilled (DRY)	% Landfilled
	mgd	mg/l	mg/l	Tons/day	Tons/day	Tons/day	Tons/day	%	Tons/day	Tons/day	%
Jan-24	31.4	53.0	6.5	6.1	1.46	1.04	8.6	25.5%	33.7	13.7	160%
Feb-24	22.5	61.1	5.8	5.2	1.20	1.19	7.6	22.7%	33.4	9.8	129%
Mar-24	22.6	63.4	7.1	5.3	1.25	0.93	7.5	22.3%	33.6	9.45	126%

NOTES: mgd million gallons per day
TSS Total Suspended Solids

[1] % Greater than or equal to 100 indicates all incoming solids plus all chemicals added are removed and sent to landfill.

2. Deliverables and Routine Communications

This section presents a listing and discussion of deliverables prepared by the NFWB for submission to the NYSDEC. In addition, other related written communications between the NYSDEC and the NFWB are also discussed.

2.1 Deliverables Status

All deliverables required under the consent order have been submitted to the NYSDEC in accordance with the schedule in the Consent Order. Deliverables submitted during the past quarter are listed in Table 2.

Table 2
NFWB Submissions to NYSDEC per Schedule A of the Consent Order

Date	Prepared By	Consent Order Schedule A Items	Comment
January 31, 2024	AECOM	Item 15	The twenty fourth quarterly progress report for the fourth quarter of 2024 (Q4 2024) was submitted.

2.1.1 Existing WWTP Optimization Efforts

The plant is using Sedimentation Basin No. 5 as a "normal" treatment basin and will continue to direct filter backwash water to the head of the plant for retreatment through the sedimentation basins and carbon filters. In light of the five years of successful operation of the WWTP in this mode, the NFWB will not be pursuing separate treatment of backwash water in Sedimentation Basin 5 using alternative chemistry due to the high capital cost of implementing new chemical storage and feed systems for this purpose (coagulant plus flocculant storage and feed systems).

2.2 Deliverables in Next Quarter

All deliverables required under the Consent Order have been submitted. No other deliverables are pending or due under the consent order other than this quarterly report.

2.3 Routine Communications in Past Quarter

There were no significant communications with the NYSDEC in the past quarter.

2.4 Unresolved Issues/Delays

There are no unresolved issues or delays.

3. Capital Improvement Program

In this section, progress on WWTP capital upgrades is discussed. Capital upgrades are proceeding on several fronts. Projects that are within the capability of in-house maintenance staff are being undertaken as quickly as possible. Additionally, outside contractors selected for WWTP work (Mechanical Contractor – Danforth, Electrical Contractor – Ferguson Electric) are being utilized for larger projects. Lastly, design and construction are underway to perform a number of capital upgrades that are necessary to stabilize the operation of the existing treatment plant. Each of these items is discussed in this section.

3.1 In-House Capital Upgrades Completed/Underway

This category of projects includes work being undertaken by plant maintenance staff or outside contractors without the need for extensive design and engineering documents. This work is generally considered repair and/or replace in kind and therefore NYSDEC approval is not generally required prior to performing the work. At this time all work slated to be performed in-house has been performed.

3.2 Capital Improvement Projects

A schedule for the ongoing capital projects is shown in Figure 1. Note that the NFWB has sought and obtained approval from the NYSDEC to upgrade certain chemical bulk storage facilities under the existing Project 6 engineering services agreement, therefore Project 6 (effluent disinfection upgrades) was reopened in Q4 2024 to facilitate engineering and eventual construction of sodium hypochlorite improvements to Tank 216 and its secondary containment system.

Figure 1

Capital Projects Estimated Construction Schedule

ESTIMATED CONSTRUCTION SCHEDULE

NFWB CAPITAL IMPROVEMENT PROJECTS

Updated: 4/5/24

TASK DESCRIPTION	PLAN START	PLAN END
Project #1: Sed. Basin Upgrades (CPL) - CA/CI Approved (10-26-20)		
Design and Bidding	5/22/2019	10/1/2020
Mobilization	11/1/2020	2/1/2021
Construction (Phase 1)	3/1/2021	6/30/2022
Construction (Phase 2)	7/1/2022	2/3/2023
Construction (Phase 3)	3/1/2023	2/3/2024
Construction (Phase 4)	3/1/2024	11/30/2024
Project #3 Polymer and Grit (Arcadis) - CA/CI Approved (10-26-20)		
Design and Bidding	5/30/2019	10/1/2020
Updated Design	12/1/2023	3/31/2024
Construction	11/1/2020	3/31/2024
Project #5 Electrical System Improvements (EI Team)		
Design and Bidding	4/25/2019	2/1/2022
Construction	3/1/2022	9/31/2024
Project #10 SCADA Improvements (Kaman) - CA Services Not Required		
Design and Bidding	6/1/2019	12/1/2019
Construction	1/1/2020	11/30/2024
Project #12 Int. Pump Improvements (GHD)		
Design	3/23/2022	8/23/2022 (RFP Pending)