

Q3 2024 Quarterly Progress Report Niagara Falls Water Board Order on Consent R9-20170906-129

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

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October 31, 2024



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Table of Contents

	Table of Contentsi
	Executive Summary ES-1
1.	WWTP Performance1-1
	1.1. Treatment Plant Operations1-1
	1.2. Solids Removal Performance1-2
	1.3. Treatment Plant Equipment Readiness1-3
2.	Deliverables and Routine Communications2-1
	2.1. Deliverables Status2-1
	2.1.1.Existing WWTP Optimization Efforts2-1
	2.2. Deliverables in Next Quarter2-1
	2.3. Routine Communications in Past Quarter2-1
	2.4. Unresolved Issues/Delays
3.	Capital Improvement Program3-1
	3.1. In-House Capital Upgrades Completed/Underway
	3.2. Capital Improvement Projects
	Figures

Figure 1 – Capital Projects Schedule	3-2

Tables

Table 1 – NFWB WWTP Solids Balance		1-4
Table 2 - NFWB Submissions to NYSDEC	per Schedule A of the Consent Order	2-1

October 31, 2024

Executive Summary

This document is the twenty seventh (27th) 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 July 1, 2024 through September 30, 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 August and September 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 substantially 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 with a few exceptions that affect redundancy. 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 sixth (26th) quarterly report for the second quarter of 2024 (Q2 2024) was submitted July 31, 2024 to the New York State Department of Environmental Conservation (NYSDEC) and posted on the NFWB's website (Consent Order Item 15).

In May 2024 the NFWB and NYSDEC entered into Order on Consent R9-20230411-13, which also pertains to the WWTP. This major development must be noted here though it does not require quarterly reports or an Onsite Environmental Monitor (OEM) in connection with its requirements. The schedule in the new Order on Consent may be regarded as providing a roadmap for future improvements to the WWTP facility. The new Order on Consent is posted to the NFWB website, like these quarterly reports, and should be consulted for further details.

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.

October 31, 2024

1. WWTP Performance

This section discusses the operation of the NFWB WWTP during the reporting period of July 1, 2024 through September 30, 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 Chief Operator of the wastewater treatment plant as of January 4, 2022. During Q2 2024, Mr. David Conti (New York State Grade 4 Licensed Operator #14329) has assumed the role as the licensed Grade 4 plant operator. Mr. Conti's principal work location is at the WWTP where he is responsible for plant operations and maintenance. Mr. Conti will serve as the licensed plant operator. This change was previously reviewed and approved by Mr. Robert Locey (NYSDEC Region 9) on October 27, 2023 via email.

During Q3 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 increased substantially during Q3 2024 averaging 12,400 gallons per day, an increase from 7,400 gallons per day average in Q2 2024. The increase is believed to be the result of seasonal warming of the influent wastewater. The practice of chlorinating the primary effluent was stopped on January 26, 2023 due to issues with the filters and reduced sulfide generation. Chlorination of the filter backwash water continues to be practiced during long washes and is included in the above totals.

The following operational considerations were noted during Q3 2024:

- Cascades has continued to discharge relatively low amounts of both total suspended solids (TSS) and soluble organic carbon (SOC) during Q3 2024. Q3 2024 average total suspended solids (TSS) and soluble organic carbon (SOC) discharges from Cascades were 2,159 lbs./day and 898 lbs./day; respectively. These values are both higher than Q2 2024 when TSS and SOC were 1,167 lbs./day and 709 lbs./day, respectively. Sludge processing improvements at the Cascades facility have resulted in significant decreases in their TSS discharges, although they do occasionally experience elevated 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 (continuing into 2024) relative to 2021 and 2022; and also, for the greatly reduced sludge quantities produced at the NFWB WWTP. During Q3 2024 the NFWB allowed Cascades to reduce their monitoring frequency from every day to 4 times per week
- Carbon filter backwash numbers have remained low (approx. 35 to 45 per day). During Q3 2024 filter backwash water was redirected back to the head of the plant where it is retreated through the sedimentation basins and activated carbon. This was done after it was

October 31, 2024

determined that the Rapid Mix Tank mixers would be out of service for some time due to long lead times associated with purchasing new impellers and one new mixer. The Rapid Mix Tanks are being used without mechanical mixing. The mixers are expected to be reinstalled in the Rapid Mix Tanks in late Q4 2024 or possibly Q1 2025.

- Construction on Sedimentation Basin 2 (Project 1) continues and as of the end of Q3 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 WTP solids result from the use of an alum coagulant at the WTP. With ten months of operational experience it is believed that the WTP solids result in higher sludge blankets in the thickeners (sludge is less dense) and cause the belt filter presses to run "sloppier" which produces a wetter/sticky sludge cake. While not ideal, these conditions have been managed by running additional belt filter press hours at reduced sludge throughput rates.
- During July 2024, Main Pump #1 suffered an electrical failure of its variable frequency drive. A spare has been ordered and is expected to be on-site in Q3 2024 when it will be installed.
- During September 2024 the grit screw conveyor installed as part of capital Project #3 was sheared and options for repair or replacement were being evaluated. As a result, only one grit classifier is being operated to service both the online sedimentation basins and the rapid mix tanks.
- The NFWB's activated carbon supplier, Carbon Activated Corporation, was onsite during the month of September 2024 and topped up activated carbon levels in Filters 1, 3, 6, 15, 17, 19, 22, 25, and 28. In addition, Carbon Filter 27 was filled with activated carbon. Carbon Filter 27 has been out of service for quite some time while awaiting delivery of activated carbon. Approximately 460,000 pounds of GAC was replaced in September 2024 which amounts to approximately 12% of the facility's GAC. In addition to these filters, Filter 8 and likely one additional filter are expected to have their GAC changed in Q4 2024.

1.2 Solids Removal Performance

A solids balance for July, August, and September 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 generally 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 147 dry tons per month (DTPM) which is below the 2023 annual average of 195 DTPM.

October 31, 2024

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 Q3 2024, the following can be said regarding treatment equipment operability:

- Three (3) Main Pumps are operational. Main Pump 1 is awaiting delivery of a replacement VFD.
- 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.
- Both Rapid Mix Tank mixers are out of service and replacement parts are on order. As of the end of Q3 2024, influent flow is routed through the Rapid Mix Tanks without the benefit of mechanical mixing.
- The East Rapid Mix Tank grit pump is out of service with undetermined electrical issues. The West Rapid Mix Tank Grit pump is being used to service both the East and West Rapid Mix Tanks along with the sedimentation basins.
- The grit screw servicing the north grit classifier (primarily used for the sedimentation basin grit tanks) is out of service and as a result only one grit classifier (South) is operational. As of the close of Q3 2024 options/quotes for repair or replacement of the screw conveyor are being evaluated. In the meantime, the South Grit Classifier is being used to service both the Sedimentation Tanks and the Rapid Mix Tanks.
- Four (4) Intermediate Pumps are operational and control/drive issues are being monitored.
- Twenty-eight (28) activated carbon filters are functional.
- Filter backwash pump 2B experienced a VFD failure and is presently out of service. This happened the last week of September 2024 and replacement options are being evaluated.
- Thickened sludge pump #1 is out of service with VFD control issues. The problem will be addressed as part of the belt filter press control upgrades associated with capital project #3.
- Belt Filter Press #1 is out of service with hydraulic issues that result in belt tracking issues. As of the close of Q3 2024 the situation is being evaluated.
- Two (2) pugmills, two (2) lime feed systems, and two (2) lime storage silos are fully functional.

October 31, 2024

Table 1

Q3 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	%
Jul-24	23.1	70.6	13.5	5.5	1.22	2.24	9.0	29.3%	30.6	9.5	106%
Aug-24	21.0	61.9	10.2	4.5	1.37	1.86	7.8	27.6%	28.1	6.6	85%
Sep-24	21.5	58.7	10.6	4.3	1.36	2.59	8.3	29.7%	27.8	10.67	129%

NOTES: mgd

1

TSS

million gallons per day

Total Suspended Solids

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

October 31, 2024

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.

Date Prepared By		Consent Order Schedule A Items	Comment	
July 31, 2024	AECOM	ltem 15	The twenty sixth quarterly progress report for the second quarter of 2024 (Q2 2024) was submitted.	

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

2.1.1 Existing WWTP Optimization Efforts

The plant is using Sedimentation Basin No. 5 as a "normal" treatment basin for processing of influent wastewater, and carbon filter backwash water is directed to the head of the plant for retreatment. In light of the six 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

The NYSDEC conducted its annual compliance audit of the WWTP on September 26, 2024.

2.4 Unresolved Issues/Delays

There are no unresolved issues or delays.

October 31, 2024

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.

October 31, 2024

Figure 1

Capital Projects Estimated Construction Schedule

ESTIMATED CONST	RUCTION SCH	EDULE			
NFWB CAPITAL IMPROVE	EMENT PROJECTS	6			
Updated: 10/4/2024			2022	2023	2024
TASK DESCRIPTION	PLAN START	PLAN END	JEMAMJJASOND	JFMAMJJASOND	JFMAMJJASOND
Designed #4: Oad Design Lines		Ammround (40.26.20)			
Project #1: Sed. Basin Upg	rades (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	5/30/2025			
Project #3 Polymer and Gri	t (Arcadis) - CA/CI A	pproved (10-26-20)			
Design and Bidding	5/30/2019	10/1/2020			
Updated Design	12/1/2023	3/31/2024			
Construction	11/1/2020	12/31/2024			
Project #5 Electrical System	n Improvements (El '	Гeam)			
Design and Bidding	4/25/2019	2/1/2022			
Construction	3/1/2022	12/31/2024			
Project #10 SCADA Improv	ements (Kaman) - CA	A Services Not Required			
Design and Bidding	6/1/2019	12/1/2019			
Construction	1/1/2020	11/30/2024			
Project #12 Int. Pump Impro	ovements (GHD)				
Design	3/23/2022	8/23/2022 (RFP Pending)			
			J F M A M J J A S O N D	JFMAMJJASOND	JFMAMJJASOND

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