

Q3 2023 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
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Buffalo, New York 14203

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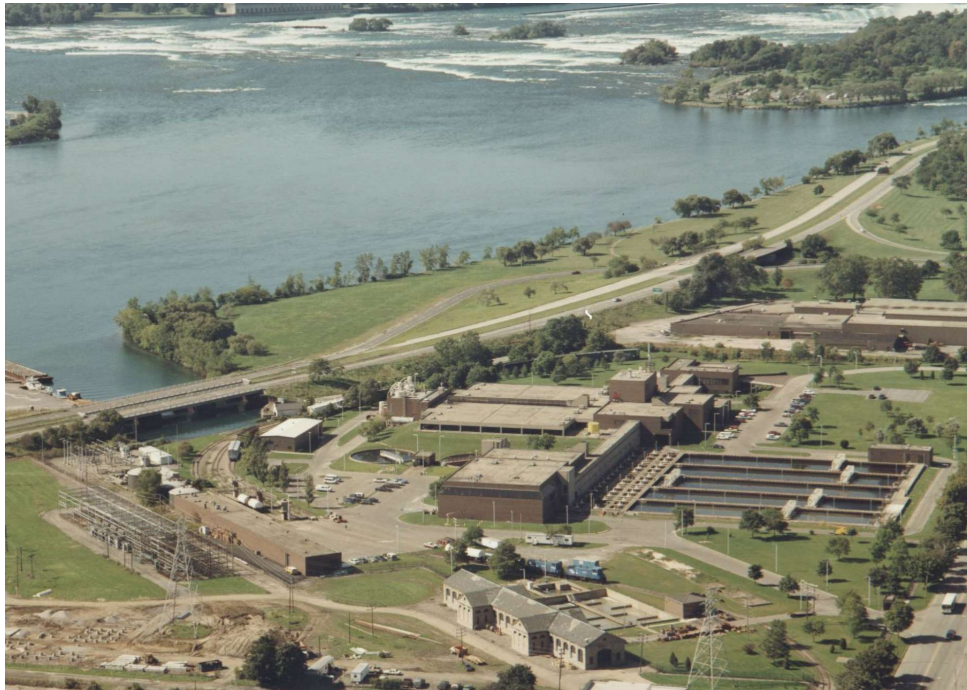
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October 31, 2023



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Executive Summary

This document is the twenty third (23rd) 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, 2023 through September 30, 2023.

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 one (1) exception for alpha-BHC (alpha-Hexachlorocyclohexane) in August 2023. 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 significant 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 will be 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 second (22nd) quarterly report for the second quarter of 2023 (Q2 2023) was submitted July 31, 2023 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 July 1, 2023 through September 30, 2023. 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. Until such time as Mr. Kirkland achieves the necessary operator's license, Mr. Fred Kasper (New York State Grade 4 licensed Operator 12489) had been serving as the licensed plant operator. During Q3 2023, Mr. Kasper was unable to continue in this role (Effective September 6, 2023) and the NFWB is actively seeking a replacement.

During the reporting period there were one (1) reported SPDES permit excursions related to a low-level detection of alpha-BHC in each month. This is an ongoing issue since the facility's SPDES permit limits for alpha-BHC were lowered on October 29, 2021 and is being addressed through the hiring of a consultant in October 2022. It is expected that industrial BHC discharges to the WWTP will be reduced via lowered discharge limits imposed upon permitted industrial users. 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 Q3 2023 (6,100 gallons per day average) but has seen an increase in September 2023 to 8,300 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 Q3 2023:

- Cascades has continued to discharge relatively low amounts of both total suspended solids (TSS) and soluble organic carbon (SOC) during Q3 2023. Q3 2023 suspended solids loadings from Cascades averaged 6,000 lbs./day (TSS) and soluble organic carbon loadings (averaged 850 lbs./day (SOC). The suspended solids discharges from Cascades were not unduly affecting the WWTP sludge processing operations and the NFWB gravity thickener was generally overflowing clean. Reductions in solids and organic carbon discharges from Cascades are believed to be responsible for the reduced consumption of sodium hypochlorite relative to the summers of 2021 and 2022.
- 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.

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- The facility's odor scrubber that serves the odor control building suffered a catastrophic failure of the blower on August 3, 2023. Quotes for a new blower are being solicited and replacement is expected in Q4 2023.
- Sedimentation Basin 3 construction began in March 2023 and continued throughout Q3 2023 and the basin was not available to the WWTP for use. Completion of Sedimentation Basin 3 is expected in Q4 2023. During Q3 2023 Sedimentation Basins Nos. 1, 2, 4 and 5 have been used.

1.2 Solids Removal Performance

A solids balance for July, August, and September 2023 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 a significant industrial user. During the past quarter influent suspended solids loadings averaged 198 dry tons per month (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 Q3 2023, the following can be said regarding treatment equipment operability:

- Four (4) Main Pumps are operational. Pump #4's variable frequency drive (VFD) has been replaced with a new VFD and the rental drive has been returned. Main Pump #3 is currently experiencing electrical issues that may be related to debris in the impeller. An internal inspection of the pump volute and impeller is planned for Q4 2023.
- Three (3) Intermediate Pumps are operational and control/VFD 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 housing (volute, impeller, bearings, etc.), motor, and DC magnetic drive will all be sent out for rebuilding in Q4 2023. Upon completion of the rebuilding the suction side valve, pump housing, motor and drive will all be reinstalled and

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the pump should function like new. A new project to evaluate the rest of the intermediate pumps, motors, drives, and controls is expected to be bid out for engineering services in Q4 2023.

- Four of the five sedimentation basins are functional, with Sedimentation Basin No. 3 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. The damaged 2" filter underdrain air bleed was repaired this past quarter.
- The filter backwash system is functional including two backwash pumps and two blowers.
- Two (2) belt filter presses and related equipment (sludge and polymer feed pumps) are operational. One belt filter press (#1) is not being operated due to drain issues that lead to flooding of the maintenance shop. Drain cleaning is expected to take place in Q4 2024 to address this.
- Two (2) pugmills, two (2) lime feed systems, and two (2) lime storage silos are fully functional.

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Table 1

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-23	23.4	87.8	9.4	7.7	1.16	1.76	10.6	21.5%	49.2	10.9	103%
Aug-23	22.4	70.7	9.3	5.7	1.07	1.18	8.0	23.0%	34.7	11.8	148%
Sep-23	19.4	51.4	10.5	3.3	0.90	1.24	5.5	23.4%	23.3	6.77	124%

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.

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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
July 31, 2023	AECOM	Item 15	The twenty second quarterly progress report for the second quarter of 2023 (Q2 2023) was submitted.

2.1.1 Existing WWTP Optimization Efforts

The plant is using Sedimentation Basin No. 5 as a 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. This will likely continue until such time as all five (5) sedimentation basins are completed under Capital Project 1.

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.

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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 – Mollenberg Betz, 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) is expected to be reopened in Q4 2024 to facilitate engineering and eventual construction of sodium hypochlorite improvements to Tank 216 and its secondary containment system.

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Figure 1
Capital Projects Estimated Construction Schedule

ESTIMATED CONSTRUCTION SCHEDULE														
NFWB CAPITAL IMPROVEMENT PROJECTS														
Updated: 10/17/23														
TASK DESCRIPTION	PLAN START	PLAN END	2022				2023				2024			
			J	F	M	A	M	J	J	A	S	O	N	D
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 #2 GPS Rehab (GHD) - CA/CI Services Approved (12-16-19)														
Design and Bidding	6/3/2019	6/27/2020												
Construction	7/1/2020	3/31/2023												
Project #3 Polymer and Grit (Arcadis) - CA/CI Approved (10-26-20)														
Design and Bidding	5/30/2019	10/1/2020												
Construction	11/1/2020	6/1/2023												
Project #4 Carbon (AECOM) - CA/CI Approved (11-25-19)														
Design and Bidding	5/22/2019	2/22/2020												
Construction	3/1/2020	9/1/2020												
Project #5 Electrical System Improvements (EI Team)														
Design and Bidding	4/25/2019	2/1/2022												
Construction	3/1/2022	6/1/2023												
Project #6 Effluent Disinfection (AECOM) - CA Services (Approved Previously)														
Design and Bidding	6/25/2019	2/1/2020												
Construction	3/1/2020	4/1/2021												
Project #7 HVAC Improvements (EI Team) - CA/CI Services Approved (9-28-20)														
Design and Bidding	4/25/2019	1/1/2021												
Construction	2/1/2021	6/1/2023												
Project #8 Replacement of Blower Equipment (In House) - CA Services by AECOM and CPL														
Design and Bidding	2/1/2019	6/1/2019												
Construction	7/1/2019	2/1/2020												
Project #9 Replacement of Process Piping (JMD) - CA/CI Services Approved (9-28-20)														
Design and Bidding	10/26/2019	3/26/2021												
Construction	4/1/2021	3/1/2022												
Project #10 SCADA Improvements (Kaman) - CA Services Not Required														
Design and Bidding	6/1/2019	12/1/2019												
Construction	1/1/2020	11/1/2024												
Project #11 WWTP Additional Piping (JMD) CA/CI Services Approved (9-28-20)														
Design and Bidding	10/1/2019	3/26/2021												
Construction	4/1/2021	2/1/2023												
Project #12 Int. Pump Improvements (GHD)														
Design	3/23/2022	8/23/2022 (RFP Pending)												
			J	F	M	A	M	J	J	A	S	O	N	D

