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Q4 2022 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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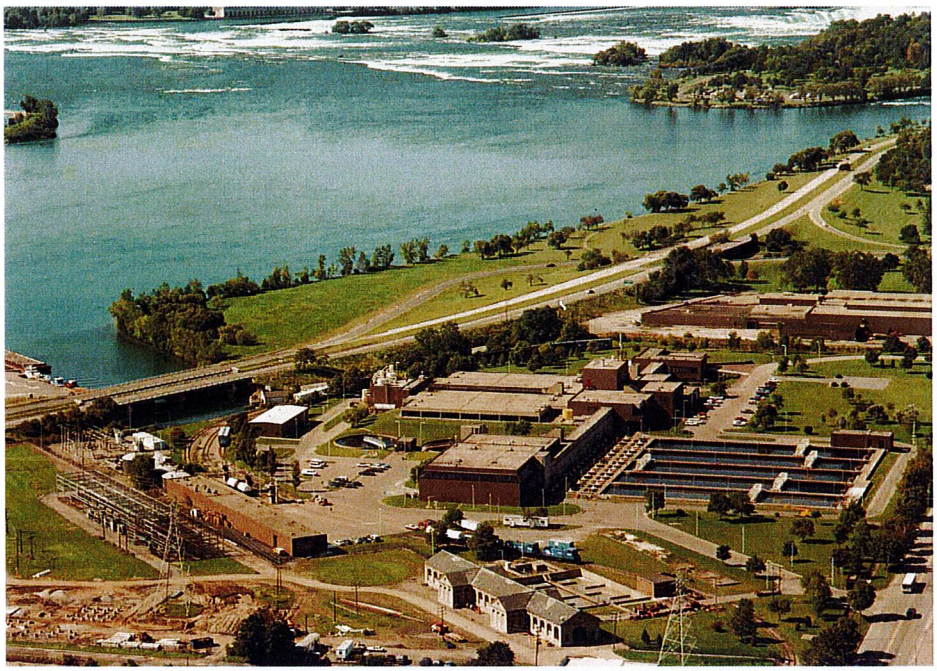
1 John James Audubon Parkway, Suite 210
Amherst, New York 14228

January 31, 2023

Q4 2022 Quarterly Progress Report

Niagara Falls Water Board Order on Consent R9-20170906-129



NIAGARA FALLS WATER BOARD

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Table of Contents

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January 31, 2023

Executive Summary

This document is the twentieth (20th) 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 October 1, 2022 through December 31, 2022.

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 November and December 2022. 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. Engineering contracts are in place for eleven (11) of the twelve (12) capital projects (Projects 1, 2, 3, 4, 5, 6, 7, 9,10, 11, and 12) and one (1) of the capital projects has been completed by plant maintenance staff with assistance from an outside contractor under the mechanical services contract (Project 8). Construction of capital Projects No. 4 (GAC Changeout), No. 6 (Effluent Disinfection), No. 8 (Replacement of Blower Equipment) and No. 9 (Process Piping) are complete. Construction is underway on Projects 1, 2, 3, 5 (portions), 7, 10, and 11.

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 nineteenth (19th) quarterly report for the third quarter of 2022 (Q3 2022) was submitted October 31, 2022 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 October 1, 2022 through December 31, 2022. 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) is serving as the licensed plant operator. Mr. Kasper spends 4 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 reported SPDES permit excursions related to a low-level detection of alpha-BHC in November and December of 2022. 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 dropped significantly due to the onset of cold weather and averaged 9,600 gallons per day during the past quarter. December's sodium hypochlorite usage averaged 6,000 gallons per day. The practice of chlorinating the primary effluent was resumed on September 12, 2022, following completion of that portion of capital project No. 11. Chlorination of the filter backwash water continues to be practiced.

There were several developments with the WWTP operations that proved difficult to manage during Q4 2022. In particular, the following operational issues were noted:

- High solids discharge from the Cascades facility during Q4 caused the sedimentation basins to experience floating sludge. It appears that the combination of ferric chloride and anionic polymer that the WWTP uses does not promote settling of the Cascades sludge and instead results in a buoyant and less dense sludge.
- Related to the prior point, the WWTP gravity thickeners do not settle and thicken efficiently with the addition of Cascades solids. As a result, the in-service gravity thickener was frequently overflowing solids back to the head of plant during Q4 2022, and a much thinner sludge must be processed through the belt filter presses. The poor gravity thickener performance results in poor performance of the belt filter presses (reduced solids capture and clogged belts) and requires sludge flow rates to the belt filter presses to be reduced which in-turn requires an increased number of operating hours for the belt filter presses.
- The WWTP experienced an unusual odor at the plant influent channel which also carried through into the sludge dewatering processes on two occasions lasting between 1 and 3 days

during the month of December (12/5/22 through 12/7/22 and 12/29/22 through 12/30/22). The odor is characterized as having a solvent/chemical nature. The industrial pretreatment group was informed each time, but no industrial contributor or other source could be identified.

- Primary polymer addition was increased during Q4 to attempt to rectify the poor solids settling and thickening that was observed in the sedimentation basins and gravity thickeners.
- Likely related to some of the above factors, the carbon filters have struggled during the past quarter as evidenced by shorter run times which has resulted in an increased number of filter backwashes per day. The number of filter backwashes throughout December 2022 were in the 60 to 80 per day range compared to 30 to 40 per day when the filters are operating properly. All backwash water continues to be directed to the head of the plant where it is retreated through the sedimentation basins and carbon. The filters' poor performance ultimately resulted in the occurrence of 100-foot weir overflow on December 31, 2022 as a result of high influent flow rates associated with precipitation and snow melt over a multi-day period.

As of the end of Q4 the plant continues to work through these issues. Additionally, Sedimentation Basin 4 continues to be under construction and not available to the WWTP for use. Sedimentation Basin No. 5 is being operated without the benefit of automation, monitoring (sprocket motion monitors, and tipping pole monitoring), submersible pumps, or floatables control baffle. Sedimentation Basin 5 is being used to treat influent flow, while filter backwash continues to be directed to the head of plant.

1.2 Solids Removal Performance

A solids balance for October, November, and December 2022 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 equaled the amount of solids removed from the wastewater plus chemical solids added (ferric chloride and lime). Two of the months that experienced reduced performance were likely related to the amount of solids being discharged by Cascades combined with poor performance of the thickeners and belt filter presses.

Influent suspended solids have continued to be lower than historical averages although October and December 2022 saw a significant uptick in incoming solids. 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. For example, during the period January through October of 2021 influent TSS averaged 415 dry tons per month (DTPM) versus the period November 2021 through December 2022 when influent suspended solids averaged 203 DTPM. However, for the past quarter the influent suspended solids were 251, 161, and 349 DTPM, respectively.

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 Q4 2022, the following can be said regarding treatment equipment operability:

- Four (4) Main Pumps are operational, although one of the main pumps (No. 4) is now equipped with a temporary (rental) variable frequency drive (VFD) due to a VFD failure in this pump during the past quarter. The failed VFD has been sent out for evaluation and repair and/or replacement if not repairable.
- Four (4) Intermediate Pumps are operational and control/VFD issues are being monitored. A project to evaluate the intermediate pumps, motors, drives, and controls has been awarded and that project is underway.
- Four of the five sedimentation basins are functional, with Sedimentation Basin No. 4 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-eight (28) activated carbon filters are functional.
- The filter backwash system is functional including two backwash pumps and two blowers. The leak in the air scour pipeline was repaired under the IDIQ contracts in Q4 2022.
- Three (3) belt filter presses and related equipment (sludge and polymer feed pumps) are operational although there have been interruptions in belt press operation as a result of Capital Project No. 11 (replacement of the underground sludge pipelines to/from the Thickened Sludge Pump Building).
- Two (2) pugmills, two (2) lime feed systems, and two (2) lime storage silos are fully functional.

Table 1

Q4 2022 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	%
Oct-22	23.3	90.8	7.6	8.1	1.35	2.07	11.5	21.3%	54.1	10.4	90%
Nov-22	24.0	58.6	6.5	5.2	1.36	2.67	9.2	18.7%	49.4	9.6	103%
Dec-22	29.0	101.0	5.0	11.6	1.50	1.44	14.6	22.7%	64.1	10.63	73%

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
October 31, 2022	AECOM	Item 15	The nineteenth quarterly progress report for the third quarter of 2022 (Q3 2022) 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.

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.

Figure 1

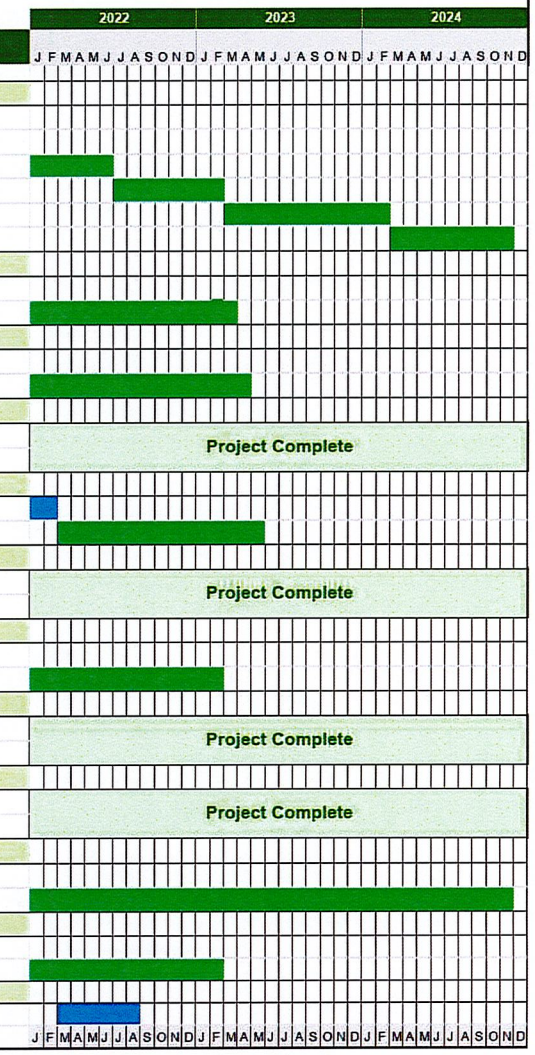
Capital Projects Estimated Construction Schedule

ESTIMATED CONSTRUCTION SCHEDULE

NFWB CAPITAL IMPROVEMENT PROJECTS

Updated: 1 - 18 -23

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 #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	4/1/2023
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	5/1/2023
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	2/1/2023
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



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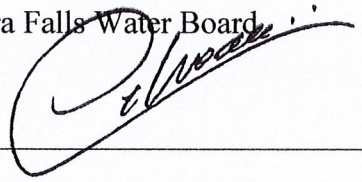
I certify under penalty of law that the letter from John T. Kolaga, Esq., Rupp Baase Pfalzgraf Cunningham LLC, and the enclosed Q4 2022 Quarterly Progress Report, Niagara Falls Water Board Order on Consent R9-20170906-129 prepared by AECOM dated January 31, 2023, was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Niagara Falls Water Board



Name: Dr. Abderrahman Zehraoui

Title: Executive Director

Date: January 25 2023