# Q4 2021 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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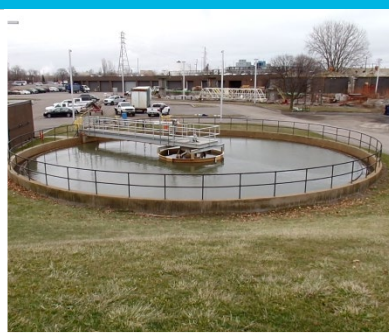
January 31, 2022



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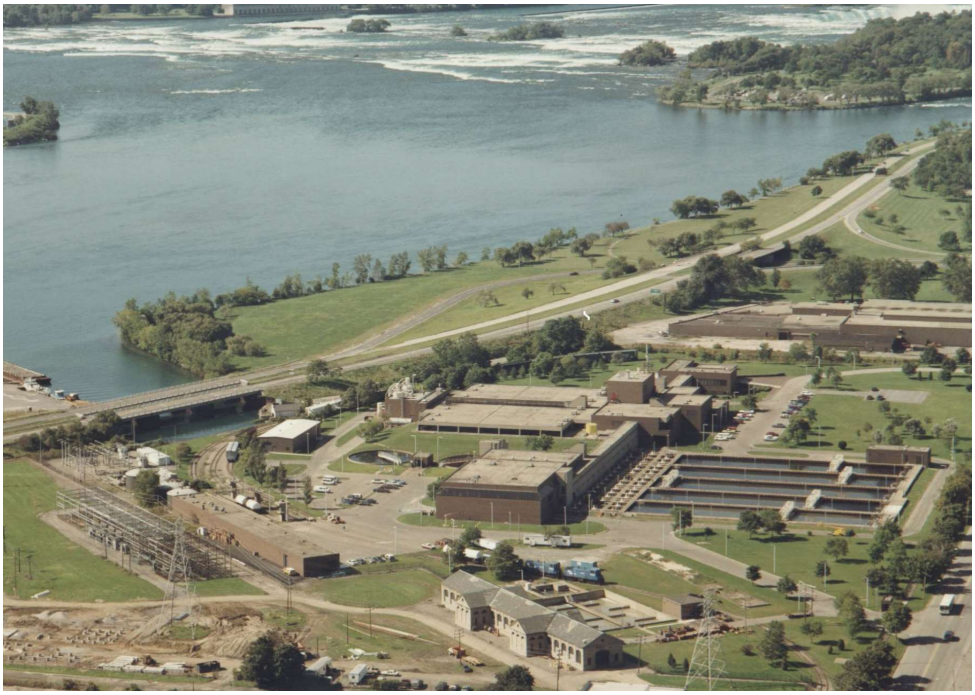

NIAGARA FALLS WATER BOARD

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## Executive Summary

This document is the sixteenth (16th) 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, 2021 through December 31, 2021.

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 minor exception. 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 eight (8) of the nine (9) capital projects (Projects 1, 2, 3, 4, 5, 6, 7 and 9) 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) and No. 6 (Effluent Disinfection) are complete. Construction is underway on Projects 1, 2, 3, and 9, and will be underway soon on Projects 5 and 7.

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 fifteenth (15th) quarterly report for the third quarter of 2021 (Q3 2021) was submitted October 31, 2021 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, 2021 through December 31, 2021. In the following sections, Treatment Plant Operations, Solids Removal Performance, and Treatment Plant Equipment Readiness are discussed.

### 1.1 Treatment Plant Operations

Mr. Robert Dunn serves as the Chief Operator of the wastewater treatment plant. Until such time as Mr. Dunn 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. Dunn with his duties. During the reporting period there were no reported SPDES permit excursions. This marks a consecutive 43-month period with no SPDES permit excursions. 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 finally returned to "normal" levels of approximately 5,000 to 10,000 gallons per day after seeing an extended period of abnormally high consumption. At this time the NFWB believes that the excessive use of sodium hypochlorite witnessed over the past several years was the result of a particular industrial wastewater discharger. The practice of chlorinating the primary effluent was discontinued due to an issue with the sodium hypochlorite pipeline to the primary effluent channel, however the replacement pipeline should be ready to be placed in service in Q1 2022. Chlorination of the filter backwash water continues to be practiced. Another operational modification which continues to be practiced is to stage a number of the off-line carbon filters in an empty condition. The number of filters being left empty has been maintained at 12 filters. This practice is believed to increase the filter run time and therefore reduce the number of filter backwashes per day. As a result of these practices, the number of filter backwashes per day remains at approximately 30 to 40 backwashes 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 carbon filters. The plant has operated continuously in this mode without any incidence of 100-foot weir flow since the practice was initiated on February 3, 2020. Sedimentation Basin No. 5 is currently under construction to install new chain and flight sludge collectors as part of capital project number 1.

### 1.2 Solids Removal Performance

A solids balance for October, November, and December 2021 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 met or exceeded the amount of solids removed from the wastewater plus chemical solids added (ferric chloride and lime). Results near or greater than 100% generally indicate the plant is operating as intended. Note that there appears to be an issue with the influent sample collection as the influent

TSS appears to be lower than normal during the past 3 quarters which is biasing the solids removal calculation to be much higher than 100%. For Q1 through Q3 of 2021 the influent TSS averaged 149 mg/l; versus in Q4 2021 the influent TSS averaged 61 mg/l. This will be evaluated in Q1 2022.

### 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 2021, the following can be said regarding treatment equipment operability:

- Four (4) Main Pumps are operational. Two printed circuit boards were replaced in Main Pump 3 and 4 variable frequency drives (VFD) during Q4 2021 and is believed to have resolved the control/VFD issues that were encountered. As a result, the rental VFD that was brought on site in Q3 2021 will be discontinued and returned in Q1 2022.
- 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 put out for proposal and engineering quotes will be obtained in Q1 2022.
- Four of the five sedimentation basins are functional, with Sedimentation Basin No. 5 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. During Q4 2021, funds were made available to replace the activated carbon in two (2) filters. The carbon has been purchased in 2021 and the work will be completed in Q1 2022.
- The filter backwash system is functional including two backwash pumps and two air scour 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.

**Table 1**

**Q4 2021 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-21 | 26.1 | 70.0 | 16.7 | 5.8 | 1.52 | 2.59 | 9.9 | 24.5% | 40.4 | 11.8 | 119% |
| Nov-21 | 24.0 | 61.7 | 10.8 | 5.1 | 1.46 | 2.24 | 8.8 | 24.7% | 35.6 | 14.3 | 163% |
| Dec-21 | 25.0 | 51.1 | 9.5 | 4.3 | 1.43 | 1.38 | 7.2 | 24.8% | 28.9 | 13.19 | 184% |

**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, 2021 | AECOM | Item 15 | The fifteenth quarterly progress report for the third quarter of 2021 (Q3 2021) was submitted. |
| December 20, 2021 | AECOM | Item 10 | Chlorine dioxide alternative oxidant study report |

#### 2.1.1 Existing WWTP Optimization Efforts

The chlorine dioxide alternative oxidizer/disinfectant study report was submitted to the NYSDEC in Q4 2021.

### 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

A site visit by the NYSDEC to perform the WWTP annual inspection/compliance review was conducted on December 21, 2021 and no significant concerns regarding WWTP operations were noted.

### 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: (12-1-21)*

| TASK DESCRIPTION | PLAN START | PLAN END |
|---|---|---|
| **Project #1: Sedimentation Basin Upgrades (CPL) - CA/CI Services 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 | 1/1/2022 |
| Construction (Phase 2) | 2/1/2022 | 2/3/2023 |
| Construction (Phase 3) | 3/1/2023 | 2/3/2024 |
| Construction (Phase 4) | 3/1/2024 | 11/30/2024 |
| **Project #2 Gorge Pumping Station Rehab (GHD) - CA/CI Services Approved (12-16-19)** | | |
| Design and Bidding | 6/3/2019 | 6/27/2020 |
| Construction | 7/1/2020 | 7/1/2022 |
| **Project #3 Screens and Grit Transport (Arcadis) - CA/CI Services Approved (10-26-20)** | | |
| Design and Bidding | 5/30/2019 | 10/1/2020 |
| Construction | 11/1/2020 | 2/1/2022 |
| **Project #4 Activated Carbon Replacement (AECOM) - CA/CI Services 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) - CA/CI Services Approved (9-28-20)** | | |
| Design and Bidding | 4/25/2019 | 10/1/2020 |
| Construction | 11/1/2020 | 11/1/2022 |
| **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 | 11/1/2022 |
| **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 | 5/1/2022 |
| **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 | 5/1/2022 |
| **Project #99 WWTP Protective Measures - Project on Hold** | | |
| Design and Bidding | 1/1/2019 | 7/1/2020 |
| Construction | 8/1/2020 | 6/1/2021 |