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Q3 2018 Quarterly Progress Report
Niagara Falls Water Board
Order on Consent R9-20170906-129

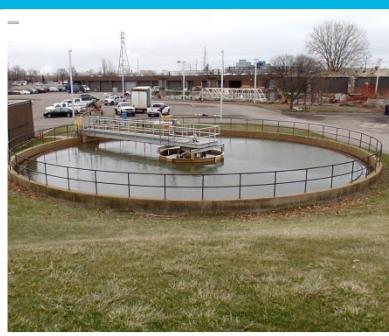
Prepared for submission to:

New York State Department of Environmental Conservation Region 9
270 Michigan Avenue
Buffalo, New York 14203

Prepared by:

AECOM
257 West Genesee Street, Suite 400
Buffalo, New York 14202

October 31, 2018



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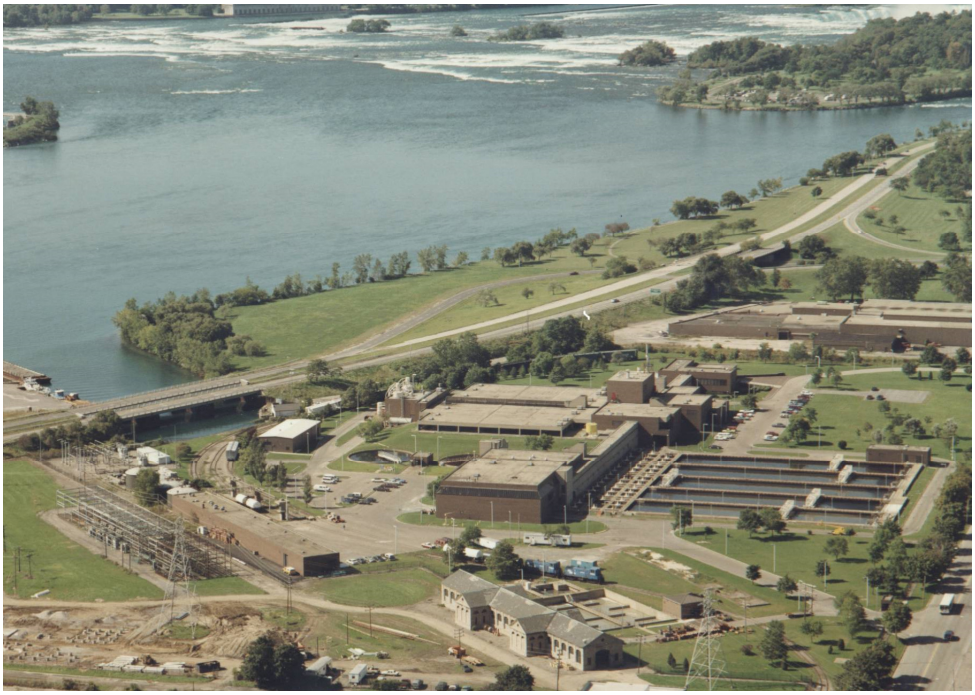

NIAGARA FALLS WATER BOARD

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October 31, 2018

Executive Summary

This document is the third required quarterly progress report for the Niagara Falls Water Board (NFWB) Order on Consent R9-20170906-129 (Consent Order) as required by Schedule A Item 15 of the Consent Order. This progress report covers the period from July 1, 2018 through September 30, 2018. The next quarterly progress report covering the period October 1, 2018 through December 31, 2018 is due January 31, 2019.

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. Solids processing (settling, thickening, dewatering) during this period has functioned as intended so that the WWTP is not accumulating solids. Primary effluent is clean (minimal suspended solids) which has allowed the WWTP's activated carbon filters to process all plant influent without any bypasses occurring at the WWTP. Dewatering throughput during this period has kept up with incoming solids, which has allowed gravity thickener overflow to be substantially free of solids. With the warm weather of the past quarter, plant operations staff have successfully managed to operate the WWTP in an as odor free manner as possible.

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 for $27 million in major capital upgrades is taking place. In August the NFWB submitted a New York State Consolidated Funding Application (CFA) and an application for listing on the New York State Environmental Facilities Corporation's Intended Use Plan (NYS EFC IUP). A request for proposal (RFP) for engineering services was issued this past quarter and engineering proposals have been received and are being reviewed. Engineering contracts are expected to be awarded in Q4 2018.

The NFWB has met all scheduled requirements of the Consent Order as identified in Schedule A. Specific submissions due during the past quarter have been submitted to the NYSDEC in accordance with the schedule identified in the Consent Order. Specific submissions and/or milestones achieved include:

- The second quarterly report for the second quarter of 2018 (Q2 2018) was submitted July 31, 2018 to the NYSDEC and posted on the NFWB's website.
- An update/revision to Consent Order Item 12 (wet weather recording) was submitted on August 30, 2018 to the NYSDEC. This update made slight revisions to the previously submitted Item 12 report that was due on March 19, 2018. The change was necessary because an error was determined to exist in the March 19, 2018 submission pertaining to the measured flow passing through the Falls Street Tunnel Outfall 003.

- An engineering report that addresses Consent Order Item 5d (improvements to the facility's sedimentation basin traveling bridge and chain and flight equipment) was prepared and submitted to the NYSDEC on September 19, 2018.
- A consolidated work plan that addresses Consent Order Item 6 (alternatives to the use of ferric chloride), Item 7 (management of Sedimentation Basin 5 effluent), and Item 10 (oxidizer addition to carbon filter influent) was prepared and submitted to the NYSDEC on September 19, 2018. As discussed with the NYSDEC, the Item 10 work plan submitted on September 19, 2018 replaces the version submitted on June 19, 2018 that the NYSDEC had not yet accepted.
- An updated Wet Weather Operating Plan that addresses Consent Order Item 8 was prepared and submitted to the NYSDEC on September 19, 2018.
- An engineering evaluation that addresses Consent Order Item 9 (effluent disinfection process) was prepared and submitted to the NYSDEC on September 19, 2018.
- An engineering evaluation that addresses Consent Order Item 14 (relocation of Outfalls 001 and 003) was prepared and submitted to the NYSDEC on September 19, 2018. With the NYSDEC's approval, this report was submitted as a draft.
- The planned thickened sludge piping system upgrades described previously in the NFWB's Schedule A Item 4d submittal, are fully complete. The items completed in this most recent quarter were punch list items.

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. To that end, we have had an open dialogue with the NYSDEC through numerous meetings and discussions. Project status update meetings and discussions have been held between the NFWB and the NYSDEC on the following dates:

- July 19, 2018 Conference call with NYSDEC regarding planned capital upgrades.
- August 8, 2018 a teleconference with NYSDEC and NYS EFC and the NFWB was held to discuss grant applications and New York State funding.
- August 9, 2018 meeting with NYSDEC regarding Consent Order, capital upgrades, Consent Order Item 10 submission, LaSalle SSO consent order, and SPDES permit modifications.
- September 7, 2018 meeting with NYSDEC regarding Consent Order Items 6, 7, and 10 consolidation into a single work plan.
- A number of email communications regarding amendments to Schedule A of the Consent Order.
- A number of email communications regarding capital projects upgrades at the WWTP and funding applications being prepared by the NFWB.
- A number of email communications regarding the LaSalle Consent Order and BHC discharge limits.

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1. WWTP Performance

This section discusses the operation of the NFWB WWTP during the reporting period of July 1, 2018 through September 30, 2018. 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. Kenneth Maving (New York State 4A licensed Operator 7598) is serving as the licensed plant operator. Mr. Maving spends at least 4 hours per day on average at the facility on a Monday through Friday basis and assists Mr. Dunn with his duties. The NFWB has hired one (1) operations staff during the past quarter and is currently at full staffing. The plant continues to invest considerable time and effort into training the operations staff. SOS's and the chief operator are being provided with individual training by Mr. Tim Lockhart (NYS Class 4A License Number 7816). The plant's operations capabilities continue to improve. During the reporting period there have not been any SPDES permit excursions. Solids processing has kept up with the incoming solids, and equipment maintenance and repair activities have been conducted in a prompt and efficient manner.

During the past quarter the WWTP has operated in "summer mode". Wastewater temperatures entering the carbon filters have been elevated which resulted in increased sulfide generation within the carbon filters. In response the plant implemented a number of measures to mitigate/manage the presence of sulfide and the potential for odors including:

- Routine inspections of sedimentation basins and gravity thickeners to observe for bubbling, odors, floating sludge, etc.
- Routine skimming of sedimentation basins to remove floating sludge & scum.
- Sodium hypochlorite was added to the backwash water for all backwashes of the carbon filters. This helps to control sulfide odors in Sedimentation Basin 5, and helps to satisfy the chlorine demand of Sedimentation Basin 5 effluent. This practice will continue for the foreseeable future, although sodium hypochlorite dosages will be decreased as wastewater temperatures decrease and sulfide levels drop.

These measures have been successful in minimizing plant odors, but the effluent turbidity has been elevated during this past quarter. With increased sulfide concentrations exiting the carbon filters, chlorination of the effluent results in a turbid effluent characterized by a greyish/white turbid appearance. Unfortunately there are no means in place to prevent this from occurring with existing plant technology.

During the past quarter Sedimentation Basin 5 was successfully taken off line, dewatered, and extensive repairs were performed. The basin was off-line from July 9 through July 31, 2018. This

represents the second successful draining undertaken in Sedimentation Basin 5, without incident, since the signing of the Consent Order. Repairs that were performed during the time Sedimentation Basin 5 was out of service included the following:

- Tank drain valve replacement,
- Replacement of all submerged components of the traveling bridge with newly fabricated stainless steel components (scum blade, sludge blade, stanchions, cables, pins, hardware, wheels)
- Adjustment of chain and flight chains,
- Adjustment of grit screw drive chain,
- Repair of scum skimmer pipe,
- Repair work to sludge screw, and
- Sludge pump seal water pipe repaired.

All work was performed successfully with NYSDEC concurrence and permission. Throughout the event the NYSDEC was informed of all activities and approved the work, provided it was performed under the supervision of the Onsite Environmental Monitor. The plant functioned successfully throughout the draining, cleaning, and repair of the basin without any adverse effects and without any detriment to the facility's effluent discharge.

Other operational improvements implemented during the past quarter include:

- All filter backwash water continues to be dosed with sodium hypochlorite to help clean the underdrain and gravel layers of bacterial growth, and to potentially reduce sulfide generation.
- Routine use of the sludge judge has been implemented to monitor for any buildup of solids in the sedimentation tanks and gravity thickeners.
- The impact of the portable mixer installed in the effluent sample head tank on June 28, 2018, and the other changes made to the effluent monitoring station prior to May 2018 appear to have resulted in an increase in the WWTP's reported effluent TSS concentration. Average effluent TSS concentration from January through April 2018 was 7.6 mg/l, and from May through September 2018 was 13.1 mg/l. The changes that have been made to the effluent monitoring station are believed to make the effluent sample more representative of actual plant effluent.

On September 20, 2018 a failure of a circuit breaker in Power Center #3 resulted in a power failure that shut down the sodium hypochlorite feed pumps, the plant water pumping system, and all filter valve actuators (although filtration proceeded with the filters that were on-line at the time of the power failure). The net result was a loss of chlorination that resulted in sulfide odors at the outfall. Power was out from approximately 11 AM until 6:30 PM when temporary power was restored using a large portable rental generator. Sodium hypochlorite delivery was resumed at approximately 6

PM using the NFWB's generator as a temporary power source. There were no permit violations as a result of the power failure. The NYSDEC was notified and visited the site at the time of the power outage to perform an inspection. A replacement circuit breaker was ordered and expedited to the site. Full repair was completed on September 24, 2018. Temporary power was used from September 20th through the 24th to power all equipment connected to Power Center #3.

1.2 Solids Removal Performance

A solids balance for July, August, and September 2018 is presented in Table 1. According to the data provided in Table 1 the WWTP has removed and landfilled more solids than were present in the plant influent. The calculations indicate that, during this time period, there has been no net accumulation of solid materials in the treatment plant. The calculations are consistent with observations of the plant performance and sludge judge testing, both of which attest to the fact that solids removal and dewatering is being performed efficiently.

Because the solids balance continues to show more solids being removed and disposed of during most months, an evaluation is being undertaken to improve the accuracy of the solids balance. The two (2) items being evaluated and results as of the end of September 2018 include:

- **Effluent Flow Measurement at the Chlorine Contact Tank** – In Table 1, the flow used to calculate the TSS removed during treatment is the value obtained from the effluent flow meter (as totalized by SCADA) which is located at the Chlorine Contact Tank. This same flow meter is used for SPDES permit reporting of plant influent and effluent flows. During this past quarter there was a perception by the team responsible for operating the WWTP that the recorded flow values from the effluent flow meter may be low. Flow monitoring data for all WWTP monitored locations stored in the SCADA system have been reviewed and a comparison of the sum of Main Pumps plus the Gorge Pumping Station flow meters indicates that the effluent flow meter may be low by approximately 5 million gallons per day, regardless of the effluent flow. Since both the Main Pumps and the Gorge Pumping Station flow meters are magnetic flow meters they are believed to be accurate. Because of this apparent discrepancy, as of September 21, 2018 the sum of the daily flows measured at "Main Pumps" plus "Gorge Force Main" flow is being reported as the WWTP's influent and effluent flow. Note that Main Pumps includes the plant sewer flow which is estimated to be 0.5 mgd. Being 0.5 mgd high is believed to be a better measurement of plant flows than the effluent flow meter which is presumed to be low by approximately 5 mgd. As a result of this change, influent/effluent flows reported as of September 21, 2018 will tend to be higher by approximately 5 mgd. When considering the solids balance reported in Table 1, this change will result in a net increase the amount of solids removed in the WWTP, and a decrease in the % landfilled. Further evaluation of the effluent flow meter continues so that the source/reason for the discrepancy can be determined.

October 31, 2018

Table 1

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 [1]
	mgd	mg/l	mg/l	Tons/day	Tons/day	Tons/day	Tons/day	%	Tons/day	Tons/day	%
Jul-18	19.2	116	10.5	8.42	1.45	1.76	11.63	23%	52.17	12.00	103%
Aug-18	21.1	145	17.2	11.21	1.43	1.58	14.22	23%	61.84	17.97	126%
Sep-18	23.5	215	13.3	19.71	1.42	1.85	22.98	23%	99.91	18.62	81%

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 being removed and sent to landfill. Polymer weight added to wastewater (primary & dewatering), although a relatively minor component, is not accounted for in the spreadsheet.

- **Influent TSS Values as Measured in the Main Wet Well Influent Sample -** The influent wastewater TSS sample is collected from the Main Wet Well. The plant sewer discharges into the Main Wet Well and includes flows from the gravity thickener overflow and the scum sump pit underflow. Both of these sources contain solids, especially the scum sump pit. These sources will elevate the measured influent TSS, and result in the influent sample being non-representative of the actual influent TSS loadings. There are provisions to collect the influent sample from the side of the Main Wet Well (East or West) that is not receiving the plant sewer flows. However this requires the ability to isolate the plant sewer from the other wet well (i.e. the one not being sampled from). It is known that the plant sewer valves cannot be closed completely and therefore the influent sample can be contaminated with recycled solids. Plans are being made to construct access platforms to allow servicing of the plant sewer valves. This work should be completed in Q4 2018 or Q1 2019. It should be noted that the FEMA project that is in design now will include provisions to move the sample point out into the front yard of the WWTP in the influent junction structure which is upstream of the plant sewer point of addition. The FEMA project is not expected to be complete until late 2020. The effect of correcting this issue is the reverse of the effluent flow measurement issue discussed above, meaning that reducing the influent TSS concentration will result in a decrease in the total solids and an increase in the percent landfilled.

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 the equipment. In general the frequency and severity of equipment breakdown is diminishing, which is believed to be the result of improved plant operations and maintenance capabilities. A number of the repairs have been proactively performed. Equipment repairs this past quarter have included:

- Sedimentation Basin 1 through 4 repairs continue to be an ongoing issue, but this past quarter saw a reduction in the frequency of breakdown repairs and an increase in the number of proactive (preventative) repairs. In the past quarter repairs have been made to grit screws, chains and flights (alignment adjustments), scum rake adjustments, and valve replacements in pump gallery (proactive). Proactively the plant has replaced all submerged components of Sedimentation Basin 3 traveling bridge (stanchions, pins, scum blade, sludge blade, cables, and wheels) with components fabricated from stainless steel for improved longevity. The same parts have been ordered for Sedimentation Basin 2 and will be done proactively in Q4 2018. These upgrades are necessary to preserve equipment readiness until major basin upgrades are undertaken in 2019 and subsequent years.
- Sedimentation Basin 5 saw its first equipment breakdown since being put back on line in October 2017. The problem was discovered in Q2 2018 and repairs were made in Q3 2018. The work included: drain valve replacement, replacement of all submerged components of the traveling bridge (stanchions, pins, scum blade, sludge blade, cables, wheels), grit screw

chain adjustment, sludge screw repairs (bearing, bushing, stub shaft, wall piece), and sludge pump seal water pipe repairs. The submerged components of the traveling bridge are fabricated from stainless steel for improved longevity. All work in Sedimentation Basin 5 has been approved by the NYSDEC, overseen by the Onsite Environmental Monitor, and progress updates reported to the NYSDEC via email.

- The valve actuator on backwash pump 1B inlet was replaced and the pump is available for backwashing.
- The valve actuator on carbon bed #13 backwash valve was replaced, returning this filter to service.
- All six (6) sludge scraper blades (doctor blades) on the three (3) belt filter presses were preventatively replaced this past quarter to improve belt press operation.
- The MCC bucket on the North Gravity Thickener was rebuilt, and hopefully will eliminate nuisance tripping of the motor starter for the thickener plow motor.
- The North Gravity Thickener was taken out of service and cleaned proactively. Sludge thickening was switched to the South Gravity Thickener.
- The sludge conveyor belt from Belt Filter Presses #1 and #2 was determined to have rollers that are in need of replacement. The rollers have been ordered and repairs will be undertaken in Q4 2018.
- The carbon in the odor control scrubber was replaced after it was determined that the air discharge was a source of sulfide odors. (NOTE: A complaint was received from the nearby Marriott hotel on August 22, 2018). In addition to the carbon used for this change, additional carbon (sufficient for 3 subsequent changes) has been ordered and will be stocked for future use.
- Lime silo radar sensing equipment has been installed and started up. The system provides an accurate indicator of lime levels remaining in the silo.

Although these repairs may have kept equipment out of service for brief periods of time during the past quarter, it has not adversely 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. Additionally, sufficient belt filter presses have been available for dewatering such that solids accumulation in the treatment plant has not occurred. As of the close of the third quarter of 2018, the following can be said regarding treatment equipment operability:

- Four (4) Main Pumps are operational.
- Three (3) Intermediate Pumps (#2, #3, and #4) are operational. The #1 intermediate pump is inoperable and the pump is unable to be isolated due to an inoperable valve. A plan to assess this pump will be developed in the near future. NOTE – The WWTP has excess pump capacity in its Intermediate Pumping Station, and therefore immediate repairs to this pump are not critical.

- Sedimentation Basins 1 through 4 are fully functional and available for service with the following exceptions:
    - Sedimentation Basin 2 was taken out of service as of the end of Q3 2018 for replacement of the submerged components of the traveling bridge. The work will be completed in Q4 2018.

  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. When backwashing to the head of plant (i.e. when Sedimentation Basin 5 was out of service) , these flows are somewhat reduced (3 basins put online at 35 mgd, 4 basins at 55 mgd) or as needed to allow the filters to be backwashed without the potential for 100 foot weir overflow.
- Twenty six (26) activated carbon filters are functional, with two (2) filters out of service due to inoperable valve actuators. A high priority has been assigned to returning these filters to service. During the past quarter new valve actuators for these two filters were ordered and received, but unfortunately the closing time for these replacement actuators was incorrect and the valve actuators could not be made to work properly. The actuator gearing (which affects valve open/close timing) is being evaluated and options to make the new actuators function as intended are being evaluated.
- The filter backwash system is functional including two backwash pumps and one new air scour blower/piping system.
- Three (3) belt filter presses are fully functional and capable of operating simultaneously, along with four (4) thickened sludge pumps, and three (3) polymer feed pumps (with spare polymer pump on the shelf).
- Two (2) pugmills, two (2) lime feed systems, and two (2) lime storage silos are fully functional.

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

Figure 1 presents a Microsoft Project schedule showing the status of all seventeen (17) items listed in Schedule A of the Consent Order. The due date and the percent complete for each item is also listed in Figure 1. In the past quarter the items listed in Table 2 were submitted to the NYSDEC to meet the Consent Order Schedule A requirements.

In addition to the above Consent order milestone submissions, the following items that were committed to in prior submissions were achieved during the past quarter:

- The planned thickened sludge piping system upgrades described previously in the NFWB's Schedule A Item 4d submittal are fully complete. The following punch list items were completed in Q3 2018:
    - Four (4) custom fabricated ductile iron spool pieces were installed.
    - Pipe supports were grouted and bolted in place.
- Controls for TSP#4 were completed allowing remote operation of TSP#4.

2.2 Deliverables Discussion

In addition to the above submittals prepared and submitted this past quarter, work is well underway on the following Consent order deliverables:

- Consent Order Item 1
- Consent Order Item 11

2.3 Deliverables in Next Quarter

During the fourth quarter of 2018 (October 1, 2018 through December 31, 2018) there are no submittals (per Schedule A of the Consent Order) due to the NYSDEC.

2.4 Routine Communications in Past Quarter

During the past quarter the correspondence items listed in Table 3 were submitted to the NYSDEC by the NFWB. The written communications listed below in Table 4 were received from the NYSDEC during the reporting period:

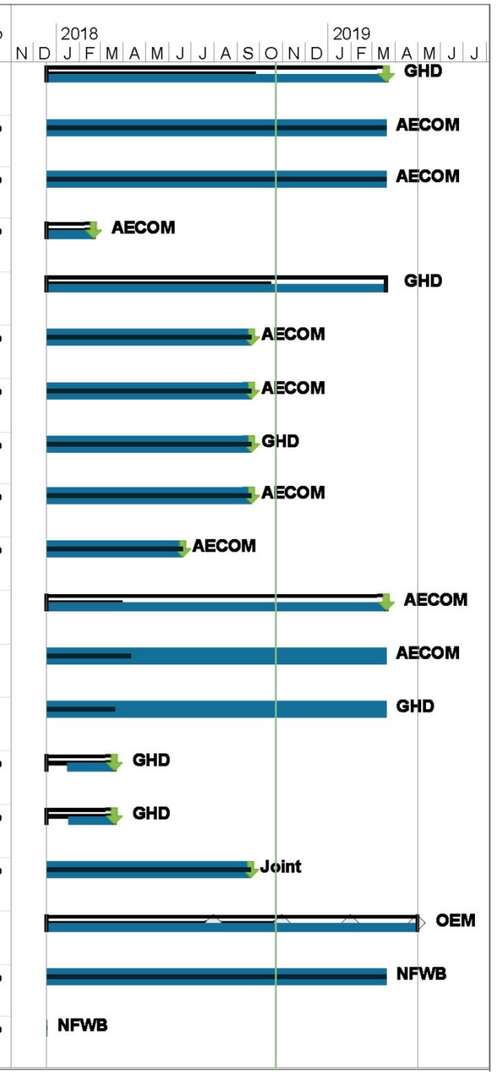
2.5 Unresolved Issues/Delays

To avoid project delays, the NFWB requests the following assistance or information from the NYSDEC:

- Any insight that the NYSDEC can provide regarding the proposed $20 million New York State grant would be appreciated to guide the NFWB as they move forward with capital improvement planning and grant application preparation.
- Response to the NFWB's request to modify the compliance schedule for the LaSalle Sanitary Sewer Overflow Consent Order.
- The NYSDEC has indicated that changes to the facility's SPDES permit (beyond the BHC issue) are being contemplated by the NYSDEC. No definitive insight into the changes has yet been provided. The NFWB requests that insight into any changes to the facility's SPDES permit be provided as soon as possible so that appropriate capital improvement planning can be performed.

Figure 1
Consent Order Schedule Milestone Status

ID	Item No.	Task Name	Lead Firm	Support Firm	Duration	Start	Finish	Deadline	DEC Submittal Date	DEC Approval Date	% Comp
1	1	O&M Procedures & Documentation Submittals	GHD	AECOM	326 days	Tue 12/19/17	Tue 3/19/19	Tue 3/19/19			62%
19	2	Operation as per Approved Plans	AECOM	NFWB	326 days	Tue 12/19/17	Tue 3/19/19	NA	2018-02-01	2018-03-15	100%
20	3	Sedimentation Basin Dewatering Procedures	AECOM	NFWB	326 days	Tue 12/19/17	Tue 3/19/19	NA	2018-02-01	2018-03-15	100%
21	4	Excess Solids Work Plan Submittal	AECOM	NFWB	45 days	Tue 12/19/17	Mon 2/19/18	Mon 2/19/18	2018-02-15	2018-03-15	100%
38	5	Improve Sedimentation Basin TB and C&F Reliability	GHD	AECOM	326 days	Tue 12/19/17	Tue 3/19/19	NA			66%
46	6	Ferric chloride Alternative Evaluation Work Plan Submittal	AECOM	GHD	197 days	Tue 12/19/17	Wed 9/19/18	Wed 9/19/18	2018-09-18		100%
47	7	Sedimentation Basin 5 Alternative Evaluation Work Plan Submittal	AECOM	GHD	197 days	Tue 12/19/17	Wed 9/19/18	Wed 9/19/18	2018-09-18		100%
48	8	WWOP Update Submittal	GHD	AECOM	197 days	Tue 12/19/17	Wed 9/19/18	Wed 9/19/18	2018-09-18		100%
49	9	Disinfection Improvement Recommendation Submittal	AECOM	GHD	197 days	Tue 12/19/17	Wed 9/19/18	Wed 9/19/18	2018-09-18		100%
50	10	Carbon System Oxidizer Evaluation Work Plan Submittal	AECOM	GHD	131 days	Tue 12/19/17	Tue 6/19/18	Tue 6/19/18	2018-06-19		100%
51	11	Treatment Process Alternative Report Submittal	AECOM	GHD	326 days	Tue 12/19/17	Tue 3/19/19	Tue 3/19/19			23%
52	11a	Optimize WWTP & Collection System Capture/Treat	AECOM	GHD	326 days	Tue 12/19/17	Tue 3/19/19	NA			25%
53	11b	Identify Upgrades Necessary for 95% & 97% Capture	GHD	AECOM	326 days	Tue 12/19/17	Tue 3/19/19	NA			20%
54	12	GPS & FST CSO and SSO Documentation Submittal	GHD	AECOM	65 days	Tue 12/19/17	Mon 3/19/18	Mon 3/19/18	2018-03-18		100%
58	13	NYAlert CSO & SSO Reporting Documentation Submittal	GHD	AECOM	65 days	Tue 12/19/17	Mon 3/19/18	Mon 3/19/18	2018-03-18		100%
62	14	Outfall 001 & 003 Relocation Evaluation Submittal	Joint	Joint	196 days	Tue 12/19/17	Tue 9/18/18	Tue 9/18/18	2018-09-18		100%
63	15	Quarterly Report Progress Submitals	OEM	Joint	356 days	Tue 12/19/17	Tue 4/30/19	NA			62%
74	16	Sedimentation Basin 5 Dewatering Restrictions	NFWB	GHD	326 days	Tue 12/19/17	Tue 3/19/19	NA			100%
75	17	Update Operating Plans & Staff Direction	NFWB	Joint	1 day	Tue 12/19/17	Tue 12/19/17	NA			100%



Project: NFWB Consent Order
Date: Tue 10/23/18

Summary Progress, Task, Split, Milestone, Summary, Project Summary, Inactive Task, Inactive Milestone, Inactive Summary, Manual Task, Duration-only, Manual Summary Rollup, Manual Summary, Start-only, Finish-only, External Tasks, External Milestone, Deadline, Progress, Manual Progress

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

Date	Prepared By	Consent Order Schedule A Items	Comment
July 31, 2018	AECOM	Item 15	Q2 2018 Progress Report
August 30, 2018	GHD	Item 12	An update/revision to wet weather recording procedures was submitted to the NYSDEC.
September 19, 2018	GHD	Item 5d	An engineering report regarding improvements to the facility's sedimentation basin traveling bridge and chain and flight equipment was submitted to the NYSDEC.
September 19, 2018	AECOM	Items 6, 7, 10	A consolidated work plan that addresses alternatives to the use of ferric chloride, management of Sedimentation Basin 5 effluent, and oxidizer addition to carbon filter influent was submitted. The Item 10 work plan submitted on September 19, 2018 replaces the version submitted on June 19, 2018.
September 19, 2018	GHD	Item 8	An updated Wet Weather Operating Plan was submitted to the NYSDEC.
September 19, 2018	AECOM	Item 9	An engineering evaluation that addresses the effluent disinfection process was prepared and submitted to the NYSDEC.
September 19, 2018	AECOM	Item 14	An engineering evaluation that addresses relocation of Outfalls 001 and 003 was submitted to the NYSDEC.

Table 3
NFWB Communications to NYSDEC

Date	Prepared By	Purpose
July 30, 2018	AECOM	Email request to install piping to allow Sedimentation Basin 5 submersible pump discharge to be directed to the head of plant as an alternate discharge location, with provisions to valve the flow to either head of plant or to the chlorine contact tank.
August 24, 2018	Rupp Baase	Letter regarding proposed breakdown of NFWB capital projects into two funding groups, one group to be funded by New York state, and the other to be funded by NFWB.
August 28, 2018	Rupp Baase	Email with comments on proposed revisions to Schedule A of Consent Order.
September 10, 2018	AECOM	Email regarding wet weather update and request for NYSDEC to consider whether the NYSDEC would like to update the informal agreement regarding wet weather flow management as it relates to 100 foot weir overflows. Specifically, in light of the fact that primary effluent quality is significantly improved from the events surrounding July 29, 2017; we would like the NYSDEC to consider whether discharge of 100 foot weir flow to the chlorine contact tank is favored over overflows in the collection system.
September 27, 2018	NFWB	Email requesting permission to put Sedimentation Basin 3 in service in a partially functional state in order to process anticipated wet weather flows.

Table 4
Communications Received from NYSDEC

Date	Delivered To	Purpose
July 9, 2018	Rupp Baase	Letter granting approval to take Sedimentation Basin 5 out of service to perform repairs.
August 10, 2018	AECOM	Email approving request to install piping to allow Sedimentation Basin 5 submersible pump discharge to be directed to the head of plant as an alternate discharge location, with provisions to valve the flow to either head of plant or to the chlorine contact tank.
August 14, 2018	Rupp-Baase	Email with proposed revisions to Schedule A of Consent Order.
September 10, 2018	AECOM	Email acknowledging request to consider 100 foot weir flows versus overflows in the collection system.
September 21, 2018	Rupp Baase	Proposed revisions to SPDES permit pertaining to BHCs and other minor matters.
September 27, 2018	NFWB	Email approving NFWB request to put Sedimentation Basin 3 in service in a partially functional state in order to process anticipated wert weather flows.

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 fast as possible. Additionally, outside contractors selected for WWTP work (Mechanical Contractor – Mollenberg Betz, Electrical Contractor – Ferguson Electric) are being utilized for larger projects. Lastly, planning is underway to perform a number of capital upgrades that are necessary to stabilize the operation of the existing treatment plant. Each of these items are 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. During the past quarter, the following projects are proceeding and/or were completed:

- Thickened Sludge Pump Building piping replacement – Wiring and related work to enable remote control of Thickened Sludge Pump (TSP) #4 from the belt filter press control panel was completed this past quarter. Work included:
    - Existing PLC panels IP3 and IP4 were modified to include necessary I/O cards and programming to enable pump control,
    - New wiring between IP3 and the Belt Filter Press Control Panel was installed, and
    - New wiring between IP4 and the TSP#4 variable frequency drive was installed.
- A 1.5 inch diameter water line to the thickened sludge pump building for process water (potable water protected by backflow preventer) has been installed and placed into service. The water line is used for pump seal water, and replaces a temporary garden hose water line that was being used for this service. Process (potable) water for seal water has been found to be a much more reliable, higher quality water source for pump seal water and has resulted in significantly improved pump seal life. This has been found to improve the reliability of the thickened sludge pumps.
- Pipe materials have been ordered and received to construct a 12” diameter pipeline to convey flows from the Sedimentation Basin 5 submersible pump to the plant sewer manhole located just west of the scum building. The flow in the plant sewer is returned to the Main Plant Wet Well (i.e. “head-of-plant). Valving also was ordered and received to allow directing this flow to either the chlorine contact tank or the head-of-plant. Additional materials still need to be ordered (pipe supports) and installation is expected in Q4 2018.
- Lime Silo Level Monitoring Systems – Installation of a new radar based lime level measurement system was completed in each of the two lime silos. The system enables plant operators to better monitor lime levels so that deliveries can be scheduled. This new

continuous level monitoring system replaces an inoperable 3-point discrete level monitoring system (low, middle, and high level).

- A new overhead garage door was installed in the sludge building. Having a functional door has allowed Modern to utilize dump trucks and semi-tractor trailers for sludge hauling which results in improved sludge hauling efficiency. In addition, the ability to close the door during winter months will help retain heat in the sludge building and minimize the potential for equipment freeze up.
- New shoes for the grit classifier screws have been installed. New tail shafts have been ordered with installation expected in Q4 2018. Once the two grit classifiers are fully overhauled, the plant will attempt to routinely operate the two existing grit pumps that service the rapid mix tanks. This will be in addition to the classifier's routine use for processing grit from the five sedimentation basins.
- Sedimentation Basin 2, 3, and 5 Traveling Bridge Work - Replacement of all underwater components of the traveling bridge for Sedimentation Basins 3 and 5 has been performed. Components to perform the same work on Sedimentation Basin 2 have been ordered and this work will be completed in Q4 2018. Fabrication was performed by Mollenberg Betz under the contract maintenance services contract. Once done, all 4 traveling bridges that remain in service (Sedimentation Basins 2, 3, 4, and 5) will have had this work performed.
- Planning is underway to specify two new ferric chloride feed pumps that will replace the existing ferric chloride feed pumps. The new pumps will be VFD controlled and will eventually be flow paced to allow variable chemical feed addition in response to changes in the plant influent flow. The current pumps, although functional, no longer have the ability to adjust the ferric chloride output rate. This work is part of Consent Order Item 6.
- Replacement effluent disinfection pumps (2) to pump sodium hypochlorite have been ordered and will replace the existing sodium hypochlorite pumps.
- Plans are being developed to be able to deliver sodium hypochlorite to the primary effluent channel (at the Scum Building) so that filter influent can be chlorinated, as a means of reducing sulfide generation. Existing sodium hypochlorite pipelines that may be useful for this purpose have been identified and will be pressure tested. Additional piping that is necessary to construct is being identified. One of the existing sodium hypochlorite feed pumps that is slated to be removed from service (per prior bullet item) will be utilized for this purpose. This system will be constructed using in-house resources and should be operational in Q4 2018. This work is part of Consent Order Item 10.
- LED lighting improvements have been completed in the filters and the plant exterior.
- Grit screw #1 has been returned from the machine shop and reinstalled.
- Painting throughout the plant is continuing including the influent channel and screenings area along with pipe painting and stenciling is planned.

3.2 Capital Improvement Projects

Longer term capital projects that are necessary to stabilize the operation of the treatment plant have been identified and are listed in Table 5. The capital projects are all necessary assuming the plant technology will remain as it is for the next several years. The total value of the capital projects identified is $27 million dollars. These projects have been incorporated into the NFWB's 5-year capital improvement program (CIP). It should be noted that the projects listed in Table 5 are consistent with Engineering Report developed by GHD and was used in support of the NFWB's funding/grant applications. Table 5 is derived from Table 4-1 of Engineering Report titled Engineering Report – Wastewater Treatment Plant and Gorge Pumping Station Rehabilitation, GHD, July 2018.

The projects listed in Table 5 are necessary to stabilize and optimize the operation of the existing WWTP. Many of the projects address equipment that is near the end of its useful life and would be necessary regardless of future technology changes at the WWTP. The projects listed in Table 5 do not include any efforts to relocate the plant outfall or to change the treatment technology at the WWTP. The NFWB believes that decisions about whether to proceed in these directions will not be made until the required studies specified in Schedule A of the Consent Order are complete (Consent Order Items 6, 7, 10, and 11).

Engineering Requests for Proposal (RFPs) were solicited this past quarter for the nine (9) projects listed in Table 5. The proposals were due September 17, 2018 and are in the process of being reviewed by the NFWB. Award of engineering projects is expected to occur in Q4 2018.

3.3 Grant Application Status

Clark Patterson Lee (CPL) has been tasked with preparing grant applications on behalf of the NFWB to ensure that the NFWB makes maximum usage of available state and federal funding opportunities. The grant applications being prepared are consistent with the projects listed in Table 5. Although the State of New York has offered $20 million in assistance to the NFWB, the terms of that assistance are not fully available from the State. The NFWB is hopeful that the promised funding will be made available to the NFWB to perform the projects listed in Table 5. While the means and methods of obtaining grant funding as it relates to the promised $20 million is unknown, the NFWB has prepared and submitted the following documents in the past quarter:

- **Consolidated Funding Application (CFA):** Submission completed August 24, 2018.
- **Listing on the New York State Intended Use Plan:** Submission completed August 24, 2018.

Table 5
Planned Capital Upgrades

Project Group	Alternative	Description	Cost
1	2B	Primary Scum Removal and Treatment Improvements – Restore Scum Pumping and Install Fine Screen	$1,020,000
	4C	Sedimentation Basin Improvements – Replacement of Traveling Bridges with Chain and Flight Equipment	$8,680,000
	10C	Sedimentation Basin Isolation Plate Replacement – Replacement of Both Isolation Plate Guides	$140,000
	19C	Sedimentation Basin No. 5 Effluent Management Improvements - Submersible Pumping System Upgrades	$550,000
2	7C	Gorge Pumping Station Rehabilitation – Comprehensive Gorge Pumping Station Rehabilitation	$4,110,000
3	3B	Screenings and Grit Transport Equipment Improvements - Replacement in Kind	$560,000
	5C	Polymer Equipment Upgrades – Replacement and Upgrade of Polymer Equipment	$820,000
	14C	Dewatering Equipment Control Upgrades – Comprehensive Dewatering System Control Upgrades	$740,000
4	8B	Granular Activated Carbon Replacement – Replacement with Recycled Reactivated Carbon	$1,500,000
	9B	Carbon Filter Support Gravel Replacement – Replacement of Support Gravel	$500,000
5	1B	Electrical System Improvements - Complete Critical Repairs	$2,360,000
	17B	Lighting Improvements – Needs Assessment and Lighting Improvements	$250,000
6	6B	Disinfectant Dosage and Location Optimization – Optimize Sodium Hypochlorite Dosage and Location	$650,000
	11B	Chemical Coagulant Optimization - Alternate Coagulant	$1,500,000
	12B	Minimization of Sulfide Formation - Oxidant Addition	$1,500,000
7	13B	Heating and Ventilation Improvements – Replacement of Critical Heating and Ventilation Equipment	$1,160,000
8	15B	Backwash Blower Equipment Improvements – Replacement of Blower Equipment	$300,000
9	16C	Thickened Sludge Building Waterline Replacement – Replacement of Plant Waterline and Process Waterline	$140,000
	18B	Interior Process Piping Replacement – Needs Assessment and Piping Improvements	$500,000
		Total Project Cost (Rounded)	**$27,000,000**