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Q1 2019 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
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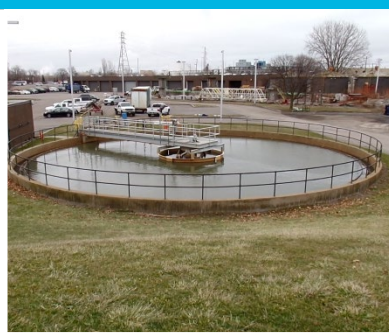
April 30, 2019



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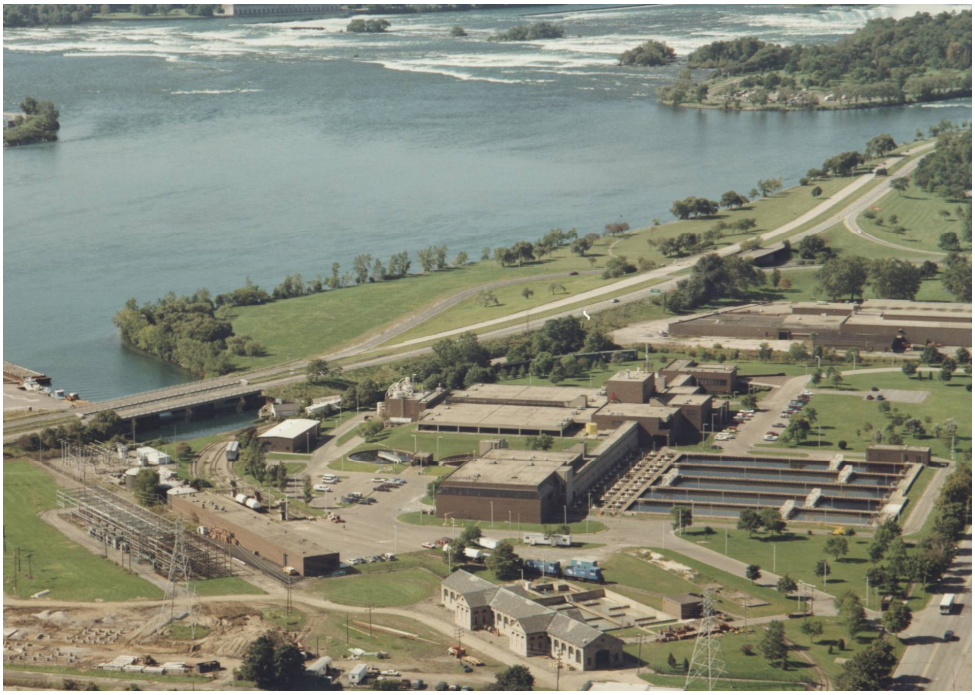

NIAGARA FALLS WATER BOARD

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Niagara Falls Water Board Order on Consent R9-20170906-129
Q1 2019 Quarterly Progress Report

April 30, 2019

Executive Summary

This document is the fifth 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 January 1, 2019 through March 31, 2019. The next quarterly progress report covering the period April 1, 2019 through June 30, 2019 is due July 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 efficiently process the plant's influent flow. This quarter the plant was in winter mode, with frequent snow and temperatures at or below normal seasonal levels. Due to reduced wastewater temperature, sulfide generation in the carbon filters has dropped to typical winter levels of less than 5 mg/l. Dewatering throughput during this period has kept up with incoming solids, which has allowed gravity thickener overflow to be substantially free of solids. 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 and design for $27 million in major capital upgrades is taking place. Contracts are in place for seven (7) of the nine (9) capital projects (Projects 1, 2, 3, 4, 5, 7 and 9) and one (1) of the capital projects is being undertaken by plant maintenance staff with assistance from an outside contractor under the mechanical services contract (Project 8).

The NFWB has met all scheduled requirements of the Consent Order as identified in Schedule A of the Consent Order. Specific submissions due during the past quarter that have been submitted include:

- The plant's computerized operation and maintenance manual (COMM) was presented to the NYSDEC in a presentation on March 13, 2019 in advance of the March 19, 2019 deadline (Consent Order Item 1).
- The CSO increased wet weather capture evaluation was completed and submitted to the NYSDEC on March 19, 2019 (Consent Order Item 11B).
- A status report on the Alternative Treatment Technology Evaluation was submitted to the NYSDEC on February 19, 2019, and has been designated as Part 1 of Item 11 of the Consent Order.
- The fourth quarterly report for the fourth quarter of 2018 (Q4 2018) was submitted January 31, 2019 to the 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. 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:

- January 4, 2019 meeting at NYSDEC offices re: LaSalle Consent Order.
- January 16, 2019 meeting at NFWB to discuss Consent Order progress and increased wet weather capture (Consent Order Item 11B), and to tour the ongoing biological treatability studies.

Niagara Falls Water Board Order on Consent R9-20170906-129
Q4 2018 Quarterly Progress Report

April 30, 2019

1. WWTP Performance

This section discusses the operation of the NFWB WWTP during the reporting period of January 1, 2019 through March 31, 2019. 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. During the past quarter a vacancy was created in the operations staff due to the resignation of one (1) operations staff. The NFWB is in the process of interviewing to fill the vacant operator position.

The four (4) SOSs and the Chief Operator continue to be 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. This makes a consecutive 15 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 in a prompt and efficient manner.

During the past quarter, the WWTP was in winter mode of operation. Wastewater influent temperatures have bottomed out at 47 to 48^{o}F and sulfide concentrations exiting the filters have dropped to less than 5 mg/l. With the drop in sulfide generation the sodium hypochlorite demand of the plant effluent has also dropped. As a result of installing new sodium hypochlorite pumps and completion of repairs to sodium hypochlorite tank T-216, the plant's ability to chlorinate the effluent and add sodium hypochlorite to filter backwash water has improved. In addition, the practice of chlorinating the plant's primary effluent was instituted as of March 20, 2019. By the end of Q1 2019 this practice has resulted in dramatic changes in the plant's operation, performance, and effluent quality. However, it is too early to tell whether the plant's current performance will continue, as the wastewater temperature increases.

Relating to sodium hypochlorite storage and delivery the following process improvements were implemented in Q1 2019:

- Internal repairs to fiberglass storage tank T-216 were completed in Q1 2019 and the tank was returned to service following the repairs (fill pipe replacement, fill pipe standoffs replacement, and fill pipe wear plate replacement).
- Two (2) new smaller capacity sodium hypochlorite pumps have been installed and placed into service. One pump is used for effluent disinfection, and the other is used for primary

effluent chlorination. The new effluent disinfection pump is better suited for chemical feed during winter months when chlorine demand is typically at its lowest level. The existing pumps were too large to reliably deliver sodium hypochlorite at the lower seasonal dosages.

- The second new sodium hypochlorite pump is being used to deliver sodium hypochlorite to the scum building where it is added to the primary effluent channel. The flow then passes through the intermediate pumping station and is delivered to the carbon filters. A HACH CL17 total residual chlorine (TRC) analyzer is installed in the carbon filter influent channel to monitor TRC levels. An initial target set point of 1.5 mg/l has been established.
- Because of the above improvements, by the end of Q1 2019, the reliability of sodium hypochlorite addition to the carbon filter backwash water has improved.
- The two steps identified above (primary effluent disinfection and consistent chlorine addition to backwash water) are critical components of the existing WWTP optimization efforts (CO Items 6, 7, 10).

During the past quarter, Sedimentation Basin 5 was successfully taken off line, dewatered, and repairs were performed. The basin was determined to have an issue with the traveling bridge that was interfering with its normal course of travel. The basin was off-line from January 18, 2019 through January 24, 2019. During this time the basin was drained and the problem was determined to be the result of two of the stanchion pins coming out of their mounts. As a result, the sludge rake was no longer connected to the bridge and was being dragged. This caused the traveling bridge to go out of alignment and stop moving. The root cause of the pins falling out was determined to be the capture nut loosening up and falling off the threaded pin. The problem has been corrected in Sedimentation Basin 5, and because the same design was utilized in Sedimentation Basins 2 through 4, all other basins were also corrected during the past quarter. This represents the fourth successful draining undertaken in Sedimentation Basin 5, without incident, since the signing of the Consent Order. All work in Sedimentation Basin 5 was performed successfully with NYSDEC concurrence and permission. 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:

- National Vacuum completed cleaning of the East Main Pump Wet Well in January 2019. Main Pump Wet Well cleaning has been identified as an annual maintenance activity and is performed in late December/early January each year, typically.
- The activated carbon in the backwash wet well odor control scrubber was changed by the plant's maintenance and operations staff. The effort was conducted using in-house resources with carbon that was specifically purchased for this purpose (Darco H2S), at considerable cost savings over the use of an outside contractor. The spent odor control carbon was then processed with lime and disposed of with the plant's dewatered sludge.
- Operations staff have begun to process settled grit from the bottom of the rapid mix tanks using the grit pumps, cyclone separator and grit washer. At this time, the plant is running

two grit cyclones full time, one being used for the rapid mix tanks and the other being used for Sedimentation Basins 1 through 5 grit processing.

- A new dewatering polymer was begun to be used for the belt filter presses. The new polymer was jar tested and determined to require less polymer than the prior polymer. The unit cost of the new polymer is higher, but based upon the lower dose; savings in overall polymer cost are expected. The new dewatering polymer is Praestol 859BS supplied by Solenis.
- A 12" diameter aboveground pipeline to convey flows from the Sedimentation Basin 5 submersible pump to the head of plant via the plant sewer manhole located just west of the Scum Building has been operating this past quarter. The purpose of diverting this flow is to take some of the Sedimentation Basin 5 discharge and return it to the head of the plant for additional treatment. By removing this flow from the Chlorine Contact Tank, the plant effluent quality may be improved.

  The 12" diameter aboveground pipe is not capable of conveying the full capacity of the submersible pump due to the 8" buried gravity sewer from the Scum Building to the Plant Sewer manhole acting as a bottleneck. It is estimated that 1,000 gpm are being directed to the head of plant and the remainder of the flow (estimated at 1,500 gpm) continues to be directed to the Chlorine Contact Tank. The NFWB is evaluating options to convey additional flow to the plant sewer via a path that bypasses the 8" buried gravity sewer. This effort is also part of the efforts to optimize the performance of the existing WWTP (Consent Order Item 6, 7, 10).

1.2 Solids Removal Performance

A solids balance for January, February, and March 2019 is presented in Table 1. The data is based upon effluent flow meter measurements. The data shows that the amount of solids sent to the landfill is equal to or exceeds the amount of influent solids minus effluent solids plus chemical usage (ferric chloride & lime). In addition to the solids balance results, plant observations and sludge judge testing of the sedimentation basins, indicate that the majority of solids present in the influent is being captured and disposed of in the landfill. Solids are not being stored in the sedimentation basins or gravity thickeners.

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. The frequency and severity of equipment breakdown is diminishing, and a number of the repairs have been proactively performed. Significant equipment repairs this past quarter have included:

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
	mgd	mg/l	mg/l	Tons/day	Tons/day	Tons/day	Tons/day	%	Tons/day	Tons/day	%
Jan-19	27.0	107	9.7	10.9	1.49	2.77	15.2	26%	58.4	19.85	131%
Feb-19	31.8	108	12.1	12.7	1.58	3.05	17.3	27%	64.1	18.74	108%
Mar-19	27.5	141	11.7	14.8	1.56	2.54	18.9	27%	69.9	19.95	106%

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.

- Installation of pressure gauges and new check valves on the 15 sludge and grit pumps associated with Sedimentation Basins 1 through 5 has been completed. The gauges have helped to improve pump operation, troubleshooting and maintenance practices.
- Work on overhead garage doors and associated electric openers in the sludge and grit building was completed in Q1 2019. This facilitates efficient sludge and grit removal operations, while allowing the areas to be heated above freezing conditions.
- The remaining scum skimmer brackets have been installed on Sedimentation Basins 1, 4, and 5. The brackets are an improvement from the original design, which were prone to break due to a weak point inherent in the bracket design. At this time the brackets have been replaced on all five (5) sedimentation basins.
- An HDPE wear strip in Sedimentation Basin #3 chain and flight sludge collector was discovered to have come loose and was replaced.
- The tail shaft and shoes on both grit washers have been replaced. This work has enabled the facility to dedicate one grit cyclone/washer to serving the rapid mix tanks, and the other to be used for the five (5) sedimentation basins. A leak in the inlet fitting at the cyclone unit on the south grit classifier was also repaired this past quarter.
- Belt filter press # 1 experienced a drive failure. Two (2) of the three (3) drive gears were replaced along with a new drive and motor. The new drive and motor utilizes a variable frequency drive (VFD) rather than a mechanical speed adjustment wheel. Speed control is now achieved with a VFD. BFP #1 was out of service for approximately 1 week to facilitate these repairs and upgrades. The new VFD, motor, and drive were all on-hand in anticipation of this occurring.
- Belt filter press #3 had its wash water pump replaced, utilizing an available spare pump.
- New bearings in both dewatered sludge pug mills were installed at the non-drive end. Stub shafts in both pugmills at the non-drive end were also replaced with new stub shafts. Unfortunately, this newer bearing design has not been an improvement over the prior bearings. Maintenance staff are working to identify a more suitable replacement bearing that will provide increased service life.
- Carbon Filter #11 had its fiberglass trough repaired.
- The MCC bucket and VFD for thickened sludge pump #2 was repaired and placed back in service. Thickened sludge pump #2 was out of service for approximately one month while the problem was diagnosed, parts ordered, and the repair performed. Three other thickened sludge pumps were available during this time, so operation of three (3) belt filter presses was not interrupted.
- Planning work on the Gorge Pumping Station hydropneumatic tank shutdown continues. The main hurdle at this time is obtaining DEC permission to bypass the pumping station

while repairs are performed. Once the inlet valve is replaced allowing tank isolation, repairs to the Warrick level control system will be performed.

- The operation of the "snow plow blades" that were installed on each end of the traveling bridges has been tested. While the plows were found to be helpful in managing small snow accumulations, the bridges experienced numerous shutdowns this past quarter as a result of snow accumulation. In addition, the bridges are routinely shut down during periods of high winds, and ice accumulation. Maintenance staff has been evaluating the condition of the racks, rails and structural supports for these same components, and are making plans to address a number of issues such as loose rail splice bolts, misaligned rails, bent rack supports and other issues. Hopefully these measures will improve the operation of the bridges until such time as they are replaced by chain and flight scraper systems. The NFWB should have one (1) basin completed in Q2 2019 and will use the results to determine if it is worthwhile to perform the same repairs on the other basins while awaiting conversion of the sedimentation basins to chain and flight sludge removal systems.
- A number of nuisance power "trip" shutdowns at the Gorge Pumping Station occurred in December 2018 and continued into Q1 2019. Each of these trips resulted in brief overflows at the Gorge Pumping Station until the pumps were restarted. A concerted effort was made to diagnose the cause of these shutdowns and the following measures were taken:
    - The power supply for the wet well level controllers was switched from building power to uninterruptible power supply (UPS) power. This was done because it was determined that whenever there was a "blip" in the power supply it would result in a loss of power to the level controllers. When this occurred, the gorge pumps would shut down because the logic interpreted the loss of level to the wet wells being empty.
    - The automatic switchgear that switches between two independent power supplies in the event of a loss of a power in one or the other feeders was evaluated and it was determined that one of the potential relays (detects reduced or loss of voltage) was faulty. The relay was replaced.
    - Following implementation of these two measures, the auto transfer switch was placed back in service on February 28, 2019, and the system has functioned as intended and there have not been any further nuisance trips that resulted in shutdown of the gorge pumps.
- Main Pump #1 and #2 had repairs made to their couplings under warranty. At this time all main pumps have had their couplers repaired. Main pump #1 experienced sheared pins that were replaced on March 18, 2019. No cause was determined and it has not happened again.

- The automatic composite sampler at the effluent sample building stopped working and had to be replaced. While the sampler was out of service manual compliance samples were collected by the operations staff.

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 first quarter of 2019, 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 #3 grit screw is out of service since January 22, 2019 and work is underway to repair it. It appears that the wall bearing is damaged and it will require replacement. Until the screw area is completely cleaned of all debris and grit the full extent of the repairs is not known. It is expected that the grit screw will be repaired in Q2 2019. In the meantime, the lack of a functional grit screw does not affect the plant performance or effluent quality. The basin continues to be used as needed for wet weather flow relief.

  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. Icing conditions this past quarter has hampered the plant's ability to keep sedimentation basins empty and off line. At times, basins have had to be kept half full and/or kept in service in order to prevent ice from damaging the basin's mechanical equipment. Now that freezing temperatures are done, the plant will resume the use of two (2) basins for curtailing wet weather flows.
- Twenty eight (28) activated carbon filters are functional, although two carbon filters are in need of carbon replenishment and are only used during wet weather and only if necessary. These filters should be topped off with activated carbon in Q2 2019.

- 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 eighteen (18) items listed in the recently revised 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.

2.1.1 Pilot Scale Biological Treatment Systems

The two (2) pilot scale biological treatment systems continue to be operated by AECOM personnel. Extensive sample collection and analysis is being performed on influent, effluent, and in-process samples. The NYSDEC has requested and is receiving weekly data updates on both treatment systems via email. The two systems are:

- **Membrane BioReactor (MBR)** – Suez (formerly Zenon) 10 square foot pilot scale membrane biological reactor system complete with aerobic and anoxic biological treatment tanks.
- **Moving Bed BioReactor (MBBR)** – World Water Works moving bed bioreactor pilot plant with two aerobic vessels in series followed by a clarifier. The MBBR uses a dumped (loose) plastic media to support fixed film operation. The media fills approximately 1/3rd of the reactor volume, so there is also a suspended growth biomass component present.

During the past quarter, the suppliers of both systems (Suez and World Water Works) have visited the NFWB WWTP to tour existing facilities. Each vendor was also provided with existing WWTP reference drawings showing tank dimensions, available space, etc. AECOM is working with the two vendors to determine how best to fit the alternative treatment technologies into the existing WWTP.

Based upon communications with the NYSDEC this past quarter the two pilot scale facilities are expected to operate through July 15, 2019, and the Alternative Treatment Technology evaluation report will be submitted October 31, 2019 (Consent Order Item 11 Part 2).

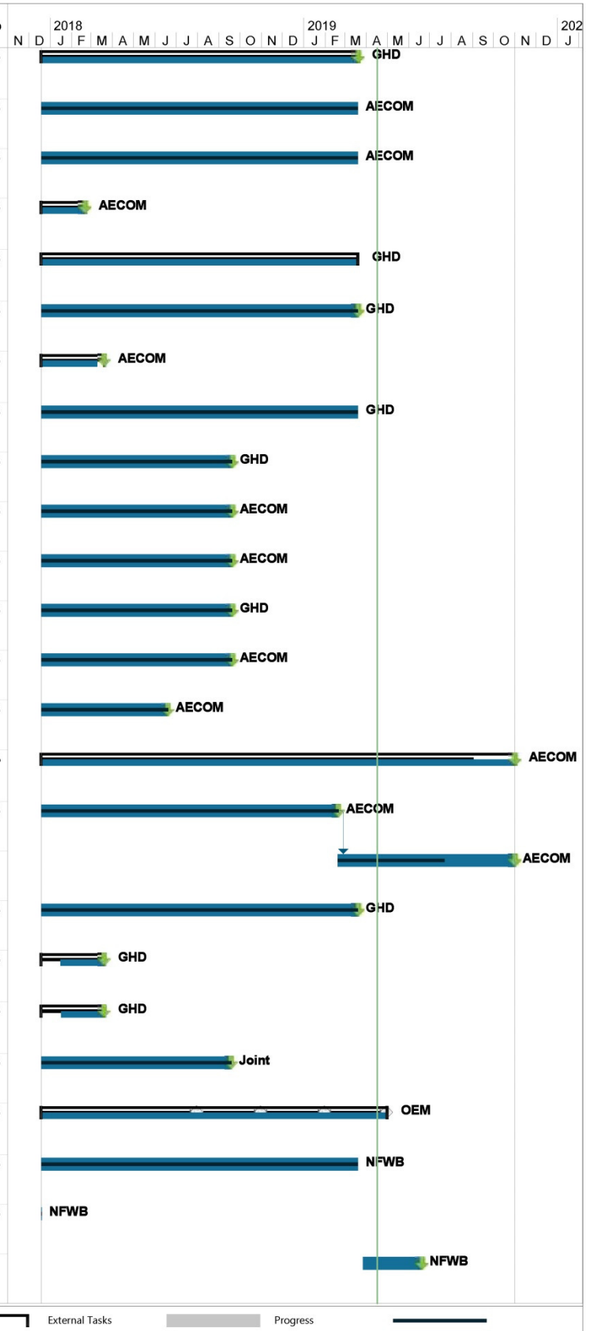
2.2 Deliverables Discussion

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 11, Part 2.

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	3/13/2019		100%
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			100%
39	5a	Revise O&MM and SOP's related to Sedimentation Basin Repairs	GHD	AECOM	326 days	Tue 12/19/17	Tue 3/19/19	Tue 3/19/19	3/13/2019		100%
40	5b	Sludge Collection Equipment Damage Prevention Submittal	AECOM	GHD	65 days	Tue 12/19/17	Mon 3/19/18	Mon 3/19/18	2018-03-19		100%
44	5c	Suspend Sedimentation Basin Usage Upon Malfunction	GHD	AECOM	326 days	Tue 12/19/17	Tue 3/19/19	NA	2018-03-19		100%
45	5d	Recommendations for Equipment Improvement Submittal	GHD	AECOM	197 days	Tue 12/19/17	Wed 9/19/18	Wed 9/19/18	2018-09-18		100%
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	2019-01-09	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	2019-01-09	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	2019-01-09	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	2019-01-09	100%
51	11	Treatment Process Alternative Report Submittal	AECOM	GHD	488 days	Tue 12/19/17	Thu 10/31/19	Thu 10/31/19			70%
52	11a.1	Treatment Process Alternative Evaluation - Part 1	AECOM	GHD	306 days	Tue 12/19/17	Tue 2/19/19	Tue 2/19/19	2019-02-19		100%
53	11a.2	Treatment Process Alternative Evaluation - Part 2	AECOM	GHD	183 days	Tue 2/19/19	Thu 10/31/19	Thu 10/31/19			60%
54	11b	Identify Upgrades Necessary for 95% & 97% Capture	GHD	AECOM	326 days	Tue 12/19/17	Tue 3/19/19	Tue 3/19/19	2019-03-18		100%
55	12	GPS & FST CSO and SSO Documentation Submittal	GHD	AECOM	65 days	Tue 12/19/17	Mon 3/19/18	Mon 3/19/18	2018-03-19		100%
59	13	NYAlert CSO & SSO Reporting Documentation Submittal	GHD	AECOM	65 days	Tue 12/19/17	Mon 3/19/18	Mon 3/19/18	2018-03-19		100%
63	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%
64	15	Quarterly Report Progress Submitals	OEM	Joint	356 days	Tue 12/19/17	Tue 4/30/19	NA			100%
75	16	Sedimentation Basin 5 Dewatering Restrictions	NFWB	GHD	326 days	Tue 12/19/17	Tue 3/19/19	NA			100%
76	17	Update Operating Plans & Staff Direction	NFWB	Joint	1 day	Tue 12/19/17	Tue 12/19/17	NA			100%
77	18	Work Plan and Schedule for Table 4.1 in July 24, 2018 Engineering Report	NFWB		61 days	Wed 3/27/19	Wed 6/19/19	Wed 6/19/19			0%



Project: NFWB Consent Order
Date: Wed 4/17/19

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

2.3 Deliverables in Next Quarter

During the second quarter of 2019 (April 1, 2019 through June 30, 2019) there is one submittal (per Schedule A of the Consent Order) due to the NYSDEC:

- Consent Order Item 18- Capital Improvements Work Plan and Schedule (due June 19, 2019).

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:

- A written response regarding whether the NYSDEC prefers that the NFWB direct overflows from Outfall 003 (Falls Street Tunnel) to the Gorge Pumping Station (Outfall 006), in accordance with Alternative 4 of the Alternative Outfall Evaluation Report submitted September 19, 2018 (CO Item 14), is requested.
- Unless advised otherwise, the NFWB assumes that the WebEx seminar and presentation made on March 13, 2019 by the NFWB to the NYSDEC constitutes submission of the Computerized Operation and Maintenance Manual (COMM) that was due March 19, 2019.
- Approval of the work on the Gorge Hydropneumatic Tank from the NYSDEC should be received soon, if the work is to be completed prior to the onset of warmer weather conditions.

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

Date	Prepared By	Consent Order Schedule A Items	Comment
January 31, 2019	AECOM	Item 15	Q4 2018 Progress Report
February 19, 2019	AECOM	Item 11 Part 1	Part 1 – Status report update on Alternative WWTP Evaluation
March 13, 2019	GHD	Item 1	Computerized O&M Manual
March 19, 2018	GHD	Item 11B	Wet Weather Additional CSO Capture Evaluation

Table 3
NFWB Communications to NYSDEC

Date	Prepared By	Purpose
Various	Rupp Baase	Several email discussions regarding use of a portion of $6.5 million in DASNY funding (of original $20 million funding) for use in diverting FST flows to the GPS and for protective measures (flooding) at the WWTP under contract 68.
February 19, 2019	AECOM	Submission of alternative treatment plant status report (Part 1) and requesting extension of final report (Part 2) until October 31, 2019.
Various	AECOM	Email communications from AECOM to NYSDEC regarding wet weather treatment capacity requirements of alternative wastewater treatment plant evaluation.
Various	NFWB	Several email and written communications regarding SPDES permit renewal submissions (Mixing Zone Analysis).
Various	NFWB	Several email communications regarding the Gorge Pumping Station hydropneumatic tank repairs and the need for a shut-down to effect the repairs.
March 27, 2019	Rupp Baase	Letter memorializing certain items of progress related to Consent Order.

Table 4
Communications Received from NYSDEC

Date	Delivered To	Purpose
January 9, 2019	Rupp Baase	Conditional approval of Consent Order Items 6,7,10 Work Plan, and Consent Order Item 9 Engineering Report.
January 24, 2019	Rupp Baase	Letter regarding decision to exercise its "enforcement discretion" not to pursue enforcement regarding any 2018 deadlines in the LaSalle SSO Consent Order and its intention to formally revise the LaSalle SSO Consent Order in the future to memorialize anticipated revisions to the Consent Order following a flow study and I/I assessment in 2019.
March 14, 2019	Rupp Baase	Approval of NFWB request to split Item 11 into Part 1 - Interim Report and Part 2 – Final Report for the alternative treatment technology evaluation. Part 1 was submitted February 19, 2019 and Part 2 is due October 31, 2019.

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 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:

- **Ferric Chloride Feed Pumps –**Two (2) new ferric chloride feed pumps have been placed in service to deliver ferric chloride coagulant to the primary influent. The new pumps are VFD controlled and will eventually be flow paced to allow variable chemical feed addition automatically in response to changes in the plant influent flow. At present the pump speed is adjusted manually. The pumps were placed into service on January 7, 2019 and have proven themselves to be much more reliable than the prior diaphragm pumps. The pumps enable the WWTP to maintain a consistent ferric chloride feed that is manually adjusted based upon the flow. All work was completed using in-house Maintenance staff.
- **Effluent Disinfection –** A new (smaller) replacement effluent disinfection pump to pump sodium hypochlorite to the chlorine contact tank (via the flow exiting the backwash wet well pipeline) was installed as of March 20, 2019. This pump is being used to deliver sodium hypochlorite during low chlorine demand periods, whereas the larger pumps are used during high chlorine demand periods. Double basket strainers have been installed in the suction piping between the storage tank and the pumps to remove any debris that may harm or plug the pump. The addition of the strainers, along with internal repairs to tank T-216, should prevent debris from plugging the pumps. Currently the pump speed is manually adjusted; although as part of the effluent disinfection system (Consent Order Item 6), it will be automatically controlled based upon flow and total residual chlorine analyses. All work was completed using in-house Maintenance staff.
- **Primary Effluent Disinfection -** A new peristaltic sodium hypochlorite pump has been installed as of March 20, 2019 to enable delivery of sodium hypochlorite to the primary effluent channel (at the Scum Building) so that carbon filter influent can be chlorinated in order to reduce sulfide generation. This work is part of Consent Order Item 10.

Aboveground piping was installed to make the connection between existing pipes, and a diffusor was constructed in the Scum Building primary effluent channel. The pump suction piping is connected to the same newly installed double basket strainers. Additionally, a HACH CL17 total residual chlorine analyzer was installed along with a dedicated sample pump to feed sample to the analyzer. The CL17 monitors the TRC in the carbon filter influent channel and is monitored to maintain a constant TRC in the filter influent. The target set point for the chlorine residual is 1.5 mg/l TRC. All work was completed using in-house Maintenance staff.

- **Check Valves and Pressure Gauges in Sludge Pump Gallery -** NFWB Maintenance staff replaced check valves in the pump gallery on all 15 sludge and grit pumps. The work includes check valve replacement along with installation of a pressure gauge (discharge pressure) in an isolation diaphragm/ring. The existing check valves were original (40 years old) and were in need of replacement. The pressure gauge will improve plant operations and maintenance capabilities. This past quarter all remaining sedimentation basins had check valves and pressure gauges installed.
- **18" Diameter Pipe at Sedimentation Basin 5 -** Mollenberg Betz has completed the replacement of an 18" diameter pipe that delivers carbon bed backwash to the furthest east window in Sedimentation Basin 5. The pipe was severely deteriorated with rust and in the event it failed, it would flood the Sludge Pump Gallery.
- **Traveling Bridge Rack and Rail Improvements –** Operation of the traveling bridges is becoming increasingly difficult due to a number of issues including the rack, rail, and hold down hardware. There are a number of places where rail splices are loose, rack mounts are bent, and rail mounting hardware is out of tolerance. Maintenance staff is in the process of ordering materials in order to start making these improvements with the hope that traveling bridge reliability can be improved while awaiting the installation of chain and flight upgrades. One sedimentation basin will be upgraded and the results monitored before a decision is made whether to proceed with additional basins.
- **Gorge Pumping Station Hydropneumatic Tank Refurbishment –** The hydropneumatic tank that serves as a surge arrestor on the Gorge Force Main is currently experiencing several issues. The force main isolation valve is inoperable and the tank's water level controls are also inoperable. In order to repair the latter it is necessary to replace the isolation valve. Planning is underway by the Maintenance Department along with assistance from Mollenberg Betz to perform this work.. Because the work will require shut down of the Gorge Pumping Station, coordination and approval by the NYSDEC is required. As of the end of Q1 2019, NYSDEC approval has yet to be obtained. This work will be done using in-house staff and the Maintenance service contract (Mollenberg-Betz). The NFWB hopes to complete this work prior to the onset of warmer weather, as bypass of the Gorge Pumping Station directly to the River will be required.
- **Air Scour Blower Rebuild –** Planning and work is underway to rebuild the second air scour blower and place it into service using the newly installed high-loop. This second blower will

provide needed redundancy for the blower used for filter backwash air scour. This work constitutes Project 8 and will be done using in-house staff and the Maintenance service contract (Mollenberg-Betz). Work includes:

- Rebuilding the blower and motor,
- Blast and paint the blower stand,
- New belts,
- Aligning the blower, motor, and stand,
- Anchoring the blower stand upon grout pads,
- Rebuilding and setting set points for the pressure control valve and pressure relief valve,
- Replacing high temperature and high pressure protective switches,
- Cleaning, calibrating, and replacing pneumatic sensor tubing for the pressure transmitter,
- Cleaning, calibrating, and replacing the pneumatic sensor tubing for the flowmeter including verifying orifice specifications,
- Replacement of the check valve,
- Replacement of the electrically actuated loader valve, and
- Piping and connections to the existing high loop (newly installed as part of the first blower installation).

Completion of the second blower installation should be done by late Q2 2019 or possibly early Q3 2019.

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 understands 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).

At this time, contracts are in place with the selected engineering firms and work has begun on design. Additionally, following NYSDEC approval of the effluent disinfection engineering report (Consent Order Item 9) this past quarter, the NFWB will be moving ahead with the effluent disinfection project.

The information in this section and in particular in Table 5 will be updated based upon a number of ongoing developments, in the June 19, 2019 submission required under Consent Order Item 18.

3.3 Grant Application Status

In November 2018, the State of New York provided formal notification that $20 million in grants would be provided to the Water Board. The grants will be issued under the State and Municipal (SAM) facilities program in two phases. Phase 1 grant will be in the amount of $13.5 million and Phase 2 grant will be in the amount of $6.5 million for a combined total of $20 million. The Phase 1 grant will cover fifty percent of the $27 million improvements currently proposed. A loan from the New York State Clean Water State Revolving Fund (CWSRF) has been applied for to assist with remaining fifty percent or $13.5 million.

There are ongoing discussions between the NYSDEC and the NFWB related to the use of the $6.5 million. At this time, nothing has been formalized yet.

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**