Town of Thompson,

Sullivan County, New York

Emerald Green Wastewater Treatment Plant Upgrade
Preliminary Engineering Report

Prepared For:

Town of Thompson, NY

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1.0 EXECUTIVE SUMMARY

The Town of Thompson desires to upgrade its aging 0.410 MGD Emerald Green wastewater treatment plant (WWTP) in order to meet updated SPDES permit discharge limits for fecal coliform and total chlorine residual and to ensure the plant's long-term viability. As part of the project, the Town will be requesting a SPDES permit modification to increase the plant capacity to 0.475 MGD.

A site visit and comprehensive review of the plant conditions was conducted with Town staff to identify all possible improvements that would be necessary to ensure 25 years of future operation and compliance with flow up to the permit limit of 410,000 gallons per day (GPD). The review also included an evaluation of the improvements necessary to achieve compliance and increase capacity up to 475,000 GPD.

A comprehensive scope of improvements with associated costs was prepared. Following a review of the proposed improvements and costs, the Town Board determined that it would be feasible to move forward with upgrading the existing facilities to handle flow and loads up 475,000 GPD.

The recommended project includes that following upgrades:

- Influent Channel Improvements
- Influent Holding Tank Improvements
- SBR Basin 1 & 2 Improvements
- SBR Basin 3 Construction
- Post Equalization 1&2 Improvements
- Process Air Supply Blower Improvements
- Sand Filter Improvements
- UV Disinfection Process Improvements
- Post Aeration Improvements
- Sludge Holding Tank Improvements
- Sludge Processing Construction
- Yard Piping Improvements
- Site Work Improvements
- SCADA Improvements
- Other Improvements

The estimated total project cost, including issuance costs, for the recommended upgrades is $14 million.

The Town will seek funding through the Clean Water State Revolving Fund (CWSRF) program, as administered by the New York State Environmental Facilities Corporation (NYSEFC) for short-

term and long-term financing. In addition, the Town intends to apply for grant funding through the NYS Water Grants Program authorized under the NYS Water Infrastructure Improvement Act (WIIA) which provides for a maximum possible grant of 25% of the total project costs. The feasibility of seeking funding, or co-funding, from other sources (e.g., USDA RD, etc.) may also be considered in the future.

In 2019, the typical single-family home (SFH) in the Emerald Green Water and Sewer District paid approximately $825 in annual sewer rents. These rents were divided between operations and maintenance (O&M) costs (± $630) and debt service costs (± $195). If the project detailed in this report is implemented, final costs to the typical SFH will ultimately depend upon the terms of the financing package received by the Town. If no grant is awarded, a market rate loan (3.3%) with a 30-year term for the $14,000,000 project will increase the debt service paid by the typical SFH by $625-year, a 76% increase. If the Town is able to secure the maximum 25% grant award and hardship financing (0%), the project will increase the debt service paid by the typical SFH by $295-year, a 36% increase.

Based on the current plan forward, if a favorable funding determination is reached in November 2020, and the Town decides to move forward as planned, construction for this project would necessarily begin in early 2021 in order to meet the deadline for the required disinfection improvements with the remaining construction to be completed near the middle of 2023. This includes a 2 phased design/construction period. The first phase will complete the work necessary to install the new UV disinfection system, which is required to be completed by May 1, 2022. This phase will also include the upgrades to the sand filter system as both processes will occur in the same building. The second phase will complete all other improvements and upgrades.

It should be noted that there are added costs associated with this two-phase approach. These costs include the bid/award and construction inspection & administration for two separate projects. The Town may consider requesting a permit modification to allow for the completion of the UV disinfection facilities to occur by May 1, 2023. This 1-year compliance extension will allow for completion of the project at a lower cost, with shorter review periods and simplify project administration for all involved agencies.

2.0 STATEMENT OF PURPOSE

This Engineering Report has been prepared to assist the Town in receiving Clean Water State Revolving Fund (CWSRF) financial assistance, administered by the New York State Environmental Facilities Corporation (NYSEFC). This report will recommend options to upgrade the facility in order to satisfy the SPDES discharge limitations, increase plant capacity, and replace or upgrade equipment which has reached its useful life.

The CWSRF Engineering Report Outline (2019) was used in the preparation of this engineering report.

3.0 ENGINEERING REPORT PREPARATION STANDARDS

This Engineering Report has been developed in accordance with the followings standards whenever applicable and appropriate:

- *Recommended Standards for Wastewater Facilities*, 2014, Policies for the Design, Review, and Approval of Plans and Specifications for Wastewater Collection and Treatment Facilities (commonly known as the *10 States Standard*s)
- *TR-16 Guides for the Design of Wastewater Treatment Work*, 2016, New England Interstate Water Pollution Control Commission
- *New York State Design Stormwater Management Design Manual*, 2015
- *New York State Design Standards for Intermediate Sized Wastewater Treatment Systems Statewide (2014) and Lake George Design Standards (2015)*
- *Wastewater Engineering Treatment and Resource Recovery, 5th Edition*, Metcalf & Eddy / EACOM, 2014, referred to as *Metcalf & Eddy*
- *6NYCRR Part 750-2.10*

4.0 PROJECT BACKGROUND & HISTORY

4.1 Site Information

4.1.1 Location

The Town of Thompson, Sullivan County, is located in the Catskill foothills region of New York State. The Town owns and operates the Emerald Green wastewater treatment plant (WWTP) SPDES Number: NY0035645 which is located on a 14.92 -acre parcel on the southern side of NY Route 17 and just north of Lake Louise Marie, in the hamlet of Rock Hill. A United States Geological Survey (USGS) Location Map identifying the Emerald Green WWTP site is included as **Figure 1 – Location Map**. The facility serves an area comprised of communities around 3 private lakes: Lake Louise Marie (LLM), Treasure Lake (TL) and Davies Lake (DL).

The WWTP has a permitted capacity of 0.410 million gallons per day (MGD). Outflows from the plant are received by McKee Brook, an outlet stream of Lake Louise Marie that traverses the lot just west of the plant. The location of Outfall 001 is: Lat. 41° 37' 08" N and Long. 74° 35" 20" W.

4.1.2 Geologic Conditions

Improvements to the plant will involve limited ground disturbance in areas that have previously been disturbed. Geotechnical evaluations at the project site have not been conducted to date and will be conducted during the design phase of the project, as applicable.

According to the United State Department of Agriculture web soil survey map, included within **Appendix A – Project Background Information**, the predominate soil type found on the project site and in the areas of proposed ground disturbance are Wellsboro and Wurtsboro (WIC) soils characterized as strongly sloping, extremely stony and moderately well drained. Depth to bedrock is typically 60 inches or greater. In the case of Emerald Green, the depth to bedrock is fairly shallow which necessitated building of the SBR tankage up out of the ground.

Examination of the NYSDEC Environmental Resource Mapper, included within **Appendix A – Project Background Information**, determined that there are no identified unique geological features on or near the project site.

4.1.3 Environmental Resources

The plant discharge area is part of the Neversink sub-drainage basin (02) and Delaware River major drainage basin (14) and outflows from the plant are received by McKee Brook, an outlet stream for Lake Louise Marie. From the outfall, Mckee Brook runs approximately 2,500 feet to the northwest before discharging into Davies Lake, a fairly shallow waterbody with a maximum depth under 7 feet and average depth less than 3.5 feet.

According to the NYSDEC Environmental Resource Map (ERM) for the project site, included within **Appendix A – Project Background Information**, there is one surface water resource on the project site, McKee Brook, a classified Class B(T) stream, indicating a best usage for swimming and other contact recreation. The (T) designation indicates that the body may support trout populations.

There are no designated State or Federal Wetlands within the property boundaries.

According to the NYS Department of Agriculture and Markets Sullivan County Agricultural District Map, included within **Appendix A – Project Background Information**, neither the project site, nor any of the lands adjoining the site are located in an agricultural district.

4.1.4 Flood Plain Considerations

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) panel 36105C0630F, included within **Appendix A – Project Background Information**, McKee Brook and perimeter area are located in a special flood hazard area (SFHA). However, the entire WWTP, including all buildings, roads, and equipment is located outside of the floodplain and upgradient of the receiving stream. No work is proposed in SFHAs.

4.1.5 Archaeological Resources

There are no identified archaeological or historic resources associated with the project site. The NYS Office of Parks, Recreation and Historic Preservation has reviewed the project and a "Letter of No Effect" was issued.

4.2 Ownership & Service Area

The Emerald Green WWTP serves approximately 2,400 residents through 840 service connections in the Emerald Green-Lake Louise Marie Sewer and Water District, and is one of four treatment plants owned and operated by the Town of Thompson.

The plant was initially known as the Rock Hill Sewage Treatment Plant and was designed and constructed in the 1960's to serve the Lake Louise Marie residential area and the Emerald Green subdivision.

Flow contributions to the plant are primarily from district residences and light commercial uses. There are no major industrial discharges to the WWTP nor are any planned or anticipated in the near future.

The most recent (2010) U.S. Census shows a Town-wide population of 15,308. In the last 25 years, the Town of Thompson has experienced a 10% population increase.

Table 4.1 Population Trend

Year	Population	% CHANGE
1960	8,792	
1970	11,418	+30%
1980	13,479	+18%
1990	13,711	+2%
2000	14,189	+3.4%
2010	15,308	+8%
2015 (5-yr est.)	15,098	-2%

In 2017, the Town had a median household income (MHI) of $42,175.

The plant is currently utilizing approximately 70% of its available hydraulic capacity. The Town is requesting a permit increase of 65,000 GPD to ensure the facility will accommodate some future growth based on the following conditions:

- A few lots remain in the Emerald Green Corporate Center that could accommodate future office space.
- Apartments are proposed for a lot behind the existing Sullivan Hotel – approximately 300 apartments on 40 acres.
- There is a proposed strip mall with 40,000 sq. ft. of retail space.
- Rock Hill Service Center and Rock Hill Fire Department have both asked to hook into the Emerald Green system.
- The Center for Discovery® (TCFD) has purchased the former Frontier Insurance Headquarters, located in Rock Hill, NY. In an effort to significantly advance the Life Sciences and raise the standard of complex care in New York State, the building will house a Special Education Academy, a Children's Specialty Hospital, and The Research Institute for Brain and Body Health, with an expected completion date in 2020.
- There are approximately 163 vacant lots in the Emerald Green development.

4.3 Existing Facilities & Present Condition

4.3.1 General Description & History of Major System Components

The original wastewater treatment plant was designed and constructed in the 1960's to serve the Lake Louise Marie residential area and the Emerald Green subdivision. The original facility consisted of the following:

1. Influent Structure
2. Two (2) Circular Primary Clarifiers
3. Two (2) Aero – Accelerators, a combination of Aeration and Final Clarification
4. Chlorine Contact Tank
5. Anaerobic Digester
6. Control / Blower Building

The plant operated for several years but was subsequently abandoned as incoming flows were much lower than anticipated, resulting in inadequate treatment of the waste.

In the early 1970's a two-cell faculative lagoon system was installed that utilized the existing chlorine contact tank as a sump to dose enclosed ultraviolet disinfection units. The remaining old

equipment was abandoned. However, the lagoon system did not consistently meet its State Pollutant Discharge Elimination System Permit (SPDES) limits and subsequently the Town and New York State Department of Environmental Conservation (NYSDEC) entered into an Order of Consent. The Order required the Town to design, construct and operate a wastewater facility that would satisfy the tertiary treatment standards in force at the time.

A facility upgrade was initiated in 1993 to design and construct a wastewater plant to process an average daily flow of up to 410,000 gallons per day, generated predominantly from a second home community, to tertiary effluent standards that would meet the facility's SPDES permit limits.

Table 4.2 Emerald Green WWTP SPDES Permit Limits – WWTP Discharge

Parameter	Limit
Flow (30-day arithmetic mean)	410,000 gpd
CBOD (daily maximum)	5.0 mg/l, 17.1 lbs/day
Total Suspended Solids (daily maximum)	10 mg/l, 34.2 lbs/day removal
Dissolved Oxygen (daily minimum)	7.0 mg/l
Ammonia (30-day average average)	1.1 mg/l (as NH_3)
Total Phosphorous (30-day average average)	0.5 mg/l
Solids, Settleable (daily maximum)	0.1 ml/l
pH (range)	6.5-8.5
Temperature	70^oF
Coliform, Fecal (30-day geometric mean), in effect from May 15 – October 15	200 / 100 ml
Coliform, Fecal (7-day geometric mean), in effect from May 15 – October 15	400 / 100 ml
Coliform, Fecal, October 16 – May 14	No limit or monitoring required
Chlorine, Total Residual (daily maximum)	0.1 mg/l

The initial plan was to design an upgrade that would incorporate the existing faculative lagoon system. However, the engineer chose to pursue a design that incorporated a Sequencing Batch Reactors (SBR). This process was recommended to the Town because of its adaptability to seasonal flow fluctuations and flexibility to reuse/repurpose existing concrete tankage.

The upgrade included in the following components:

1. Influent Structure – The original structure was retrofitted with a grinder and flow monitoring, and included a bypass channel with manually cleaned bar screen. A mechanical screen was installed at the facility in 1995.

2. Influent Holding Tank – Converted existing aero-accelerator tanks to act as an influent holding tank ahead of a new SBR process.

3. Sequencing Batch Reactors (SBR) – Two (2) new concrete structures with a common wall were built to house this batch basis process; Jet Tech, Omniflo Sequencing Batch Reactors with jet aeration.

4. Post-Equalization Tank – Converted existing Primary #1 and aero-accelerator tank #1 to provide metered flow to the gravity sand filters.

5. Sand Filtration (231 sq. ft filter area) was installed within the confines of a new building for freeze protection.

6. Open Channel UV was installed to reduce fecal coliform levels and meet DRBC recommendations for disinfection of wastewater streams entering the Delaware River Basin. The channel was abandoned due to channel overflows created by the oversized channel feed pipe from the sand filters. At the present time, the plant operates using chemical disinfection, 12% hypochlorite and 38% sodium bisulfate.

7. Fine Bubble post-aeration tank – Repurposed the existing primary clarifier #2 to combine chlorine contact and post aeration. Following post-aeration and prior to the outfall, step-aeration was added to the process stream

8. Solids Processing – Existing anaerobic digester was converted to an aerated sludge holding tank and receives waste activated sludge (WAS) from the SBR process and backwash from the sand filtration. Aeration digested sludge is hauled from the Emerald Green plant to the Town of Thompson's Kiamesha WWTP.

A comprehensive evaluation of the existing facility has been completed, and the necessary improvements and upgrades are detailed below. The improvements and upgrades will encompass plant equipment, buildings, systems, and site conditions. The upgrade will occur within the current property limits, within previously disturbed areas, and involves improvements to existing facilities and the addition of new UV disinfection facilities as required by the most recent SPDES permit. The upgrade will ensure continued compliance with SPDES permit requirements for the near term, as well as for the estimated loading conditions based on flows up to 0.475 MGD.

The plant receives both domestic and some commercial wastewater. Existing treatment capabilities are based on 0.410 MGD permitted monthly average flow. Discharge limits to comply with conventional secondary treatment requirements are set forth in the facility's State Pollutant

Discharge Elimination System (SPDES) permit, contained within **Appendix B – WWTP SPDES Permit**, including seasonal limits for coliform, residual chlorine, and ammonia. In addition, the SPDES permit requires the Town to comply with the Delaware River Basin Commission Docket (NO. D-95-16 CP), which is attached as **Appendix C – DRBC Docket**.

A brief overview of the treatment processes is presented below. Process schematics for current plant conditions and for the proposed upgrade conditions are shown in **Figure 4** and **Figure 5,** respectively.

The facility receives sanitary wastewater from domestic users and provides treatment for a design flow of 0.410 MGD. The facility discharges treated wastewater via Outfall 001 to McKee Brook. Current treatment consists of: screening, influent pump station located in the influent holding tank, activated sludge-sequential batch reactor, filter feed equalization, sand filtration, chlorination, de-chlorination, and post aeration. Sludge is stored and hauled for processing at the Kiamesha Lake WWTP.

4.3.2 Existing & Design: Flows & Waste Loads

An evaluation of each existing unit process at Emerald Green was conducted utilizing the permit flow and existing loading for influent organic loadings. This review is carried out to establish the actual capacity of each of the unit processes.

Unit processes were evaluated based on Average Daily Flow (ADF), Peak Day Flow (PDF), Peak Hourly Flow (PDF).

Parameter	Design – Influent
Average Daily Flow:	410,000 gpd
Peak Day Flow (storm):	750,000 gpd
Peak Hourly Flow:	1,430,000 gpd

Evaluations were based on the limiting hydraulic and/or organic design standard of the various process steps.

Table 4.3, Historical Influent Loading lists influent loading characteristics for the Emerald Green WWTP based on historical testing of the influent (January 2018 –December 2019).

Table 4.3. Historical Loading (January 2018 – December 2019)

Parameter	Influent Concentration
Current Average Daily Flow (ADF)[1]	0.287
$CBOD_5$ [2]	83
TSS	99
NH_3 (as N) [3]	14
TKN [3]	23

1 ADF = Average of the monthly flows over a calendar year
2 Inhibitory chemical is added to test to prevent nitrification and resulting oxygen use.
3 Assumed Values (no influent sampling data is available). From Table 3-18, "Typical Composition of Untreated domestic wastewater", Wastewater Engineering, Metcalf & Eddy, 5th ed.

Table 4.4 shows historical flow data for the years 2018 and 2019.

Table 4.4 Historical Flow Data (2018 and 2019)

Year	Average Daily Flow[1] (MGD)	Average Monthly Maximum Daily Flow [2] (MGD)	Ratio of Max Day to Average Monthly Flow	Peak Hour Flow (MGD)[3]
2018	0.310	0.581	1.86	NA
2019	0.265	0.512	1.89	NA

1 ADF = Average of the average monthly flows over a calendar year.
2 Average monthly maximum daily flow is the average of the maximum daily flows for each month over a calendar year.
3 Peak hour flow data not recorded

All wastewater entering the plant flows via a 10" gravity line through a Schloss Mark V mechanical screen or manual bar screen bypass and then flows through a Parshall flume with 6" throat. Flow is measured with an Ultrasonic transducer.

Influent then flows to the Influent Holding Tank, a circular tank with a diameter of 29 feet and a working volume of 52,147 gallons. Forward feed is pumped out with two (2) Flygt, CP3152-434 that are rated at approximately 1100 gpm at 37' total developed head.

Influent Holding Tank

Sequencing Batch Reactor

The Emerald Green WWTP utilizes the Sequencing Batch Reactor (SBR) process as secondary wastewater treatment. The SBR is an activated sludge system, where wastewater is added to a single "batch" reactor for treatment. The SBR differentiates itself from typical activated sludge

systems in that while a typical activated sludge system uses separate tanks each for anoxic, biological treatment, and secondary clarification. The SBR process does it all in one tank in a time-sequenced process.

SBR Tanks

The SBR utilized at Emerald Green WWTP operates on a fill and draw principle; Anoxic Fill Time, Aerated Fill, React Time, Settle Time, Decant Time, Idle Time. In this style of SBR, flow is diverted from the basin during settling and decanting, and requires either an influent equalization or two or more operating basins.

SBR does not require a great deal of pretreatment, the important requirement is screening with maximum opening size of ¼" or less ahead of the SBR process (per TR-16 – 6.3.7.2). The SBR equipment at the Emerald Green WWTP was supplied by Jet Tech, an Evoqua company.

Emerald Green utilizes a two Omniflo - SBR basin set up to provide biological treatment for breakdown of BOD, NH_3 and Total Nitrogen. The system operates as a single stage nitrification process with the appropriate COD to TKN ration.

The SBR basins at Emerald Green are 40' in length and 38' wide. Basins are designed to operate between a maximum side water depth of 18'-0" to minimum side water depth of 13'- 6". Each basin operates between a total volume of 204,000 gallons and 153,489 gallons with a decant volume of 51,163 gallons. The design parameters are shown below in Table 4.5.

Table 4.5 SBR Design Parameters

Parameter	Design - Influent	Design - Effluent	Permit - Effluent
Average Flow	410,000 gpd	410,000 gpd	410,000 gpd [1]
Peak Hourly Flow	1,440,000 gpd[2]		
Peak Day Flow	742,000 gpd		
BOD_5	175 mg/l	5 mg/l	
$CBOD_5$			5 mg/l
Total Suspended Solids, TSS	175 mg/l	5 mg/l	10 mg/l[1]
Total Kjeldahl Nitrogen, TKN	40 mg/l		
Ammonia (as N)	25 mg/l	1.0 mg/l	1.1 mg/l[1] (6/1 to 10/31)
			2.2 mg/l[1] (11/1 to 5 /31)
Total Phosphorus	8	1.0 mg/l	0.5 mg/l[1 & 3]

[1] Monthly average
[2] Storm value
[3] Chemical precipitation required to achieve phosphorus limits

Design standards for SBR provide recommended operating range for various parameters; sludge retention time – days, Food to Mass, Volumetric loading of BOD, MLSS, hydraulic retention time. The design calculations for the SBR process are included in **Appendix M - Process Calculations**.

Post Equalization (EQ) Tank

Treated water is removed from the SBR basins via decanters to the Post EQ tanks to dampen the flow to downstream processes. Without the Post EQ tanks to equalize the flow surges from the decant cycle, downstream processes would have to be sized to handle the decant flow. The facility is equipped with two tanks; Post EQ No. 1 with a working volume of 27,131 gallons, and Post EQ No. 2 with a working volume of 52,147 gallons. A total combined volume of 79,000 gallons.

Post Equalization Tank

Flow from Post EQ No.1 gravity flows to Post EQ No. 2. Post EQ No. 2 is equipped with two (2) submersible centrifugal pumps that supply water to the Sand Filter. Pumps are 10 horsepower and capable of 650 gpm at 32 TDH. One of the pumps is equipped with Vari-drive for control of forward flow.

The SBR system is timed for a twenty (20) minute decant of 51,163 gallons, which yields a flow of 2,558 gpm. The downstream Sand Filtration process is not designed to accommodate short bursts of flow. At the given pump flow, it takes approximately 80 minutes for the feed forward pumps to run the decanted volume through the sand filters. Flow to the Sand Filter is limited by a control valve located ahead of the Sand Filter.

Sand Filtration

The SBR process is designed to produce treated water with the following expected concentrations; BOD of 5 mg/l, TSS of 11.8 mg/l, Ammonia of 1 mg/l and Total Phosphorus of 2 mg/l. The values for BOD and Ammonia will meet SPDES permit limits provided that proper operation conditions are met. However, for the TSS and Total Phosphorus (TP) to meet discharge limits, 10 and 0.5, respectively, the facility utilizes a US Filter - Gravity Sand Filter. The filter includes three 7'-0" x 11'-0" x 0'-10" cells for 77 ft^2 of filter area / cell and 231 ft^2 total area. The hydraulic loading of the filters is rated by the manufacturer at 3.2 gpm/ ft^2. With two filters in service and operating at 3.2 gpm/ft^2, the filter system is rated for an average flow of 709,600 gpd. Regulatory Standards (TR-16 /7-5 / 7.2.10.2) limit the peak hydraulic flow of this filter type to 5.0 gpm / ft^2 with largest filter (one filter out of service). Therefore, these filters have a total PHF capacity of 1,108,800 gpd with a unit out of service.

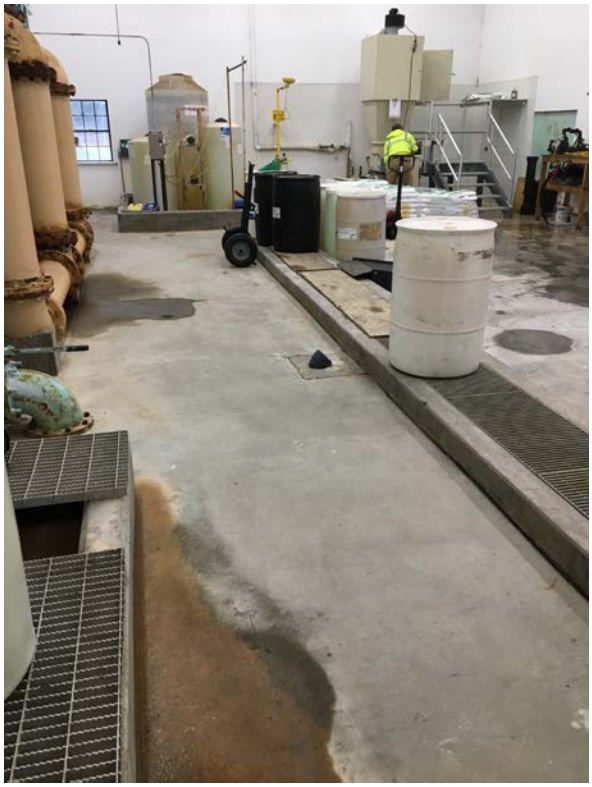
Sand Filter Interior

Sand Filter Exterior

Filtration of the secondary effluent is required to achieve SPDES permit discharge limits for TSS and TP. TSS reduction is met by direct filtration. Phosphorus removal is achieved by injecting SternPAC (Polyaluminum Chloride) at two locations; the feed pipe to the SBRs and the SBR effluent line prior to the Post Equalization Tanks. The aluminum salt reacts with dissolved phosphorus and precipitates as aluminum phosphate which is filtered out in the sand bed. The filters are periodically backwashed and the backwash is piped to the head of the plant with the option to send to the Sludge Holding Tank.

Open Channel UV

The Open Channel UV was to be housed in a 17'-2" x 2'-3" pit in the filter building floor. The UV was to be fed via an 8" ductile iron pipe. However, the influent was piped in with 10" ductile iron. The effluent line out was also 10". The operators could not get pass through and the channel overflowed. The system was bypassed, the UV equipment removed and the plant switched to chlorination / dechlorination to achieve disinfection.



Open Channel UV

Fine bubble Post –Aeration Tank

The Emerald Green WWTP SPDES permit requires a minimum dissolved oxygen level of 7.0 mg/l. This limit is consistently met via contact time in a 20 ft diameter Post Aeration Tank with side water depth of 8.26 ft for volume of 17,600 gallons. The tank is equipped with an aeration grid containing 25 ceramic fine bubble diffusers, each with diameter, 8-11/16" and an area of 0.41 ft^2. Total diffuser area is 10.25 ft^2.

As per NYS Design Standards for Intermediated Sized Wastewater Treatment Systems, I-5 / I.3.b, a detention time of at least 30 minutes at peak flow should be provided to achieve the necessary level of dissolved oxygen concentration. Peak day flow of .742 MGD equates to 515 gpm. The provided post aeration tank provides for 37 minutes of detention.

Design Standards require an air supply with a minimum of 20 scfm for each 1,000-gallon capacity. Therefore, the 17,600 gallon tank should be supplied with 388 scfm of air. However, the facility is equipped with step aeration following the post aeration tank. Based on the step aeration analysis and the current DO values in the post aeration tank effluent flow the new blowers will be rated at 135 SCFM and the tank will have 45- 9" fine bubble diffusers.

Disinfection

At the present time, the effluent stream is treated with Sodium Hypochlorite (12.5%) which is added via metering pump from either a 150- or 160-gallon tanks. Effluent is given contact time in the Post Aeration Tank - volume 17,600 gallons. At a peak hourly flow of 1.44 MGD (1,000 gpm) 19.4 minutes of contact time is provided which is greater than the 15 minutes of contact time required at Peak Hourly Flow (see 10 States Standards, §102.44 Contact Period and Tank). The inlet end of the tank is baffled with no air supply, the effluent half of the tank is air mixed providing post aeration as discussed above.

Solids Processing

Operating with an activated sludge process such as the SBR process utilized at the Emerald Green WWTP generates excess sludge from solids taken in and excess biomass. The amount of sewage sludge produced is proportional to the amount and concentration of wastewater treated. The total sludge production from a wastewater treatment process is the sum of sludge from primary settling tanks (not a part of the Emerald Green process), excess sludge from the biological treatment, and backwash gravity fed from the Sand Filters. Table 13- 7 of Metcalf & Eddy, 5th edition (page 1457) provides for typical quantities of sludge produced from various wastewater treatment methods. Sludge yield from medium strength waste in an extended aeration activated sludge plant is anticipated to be 0.8 lbs /dry solids/1,000 gallons influent (with range of 0.7-1.0). Therefore, for a permit flow of 410,000 gpd the expected yield would be 328 dry pounds of sludge per day. At an assumed concentration of 1% (10,000 mg/l) that would yield a volume of 32,800 gallons per day.

The facility stores and aerates the sludge in a 237,800 gallon aerated sludge tank. For a tank of this size, 10 States Standards requires an air supply of 30 cfm / 1,000 ft^3. Therefore, 237,800 g/7.48 g/ft^3) x (30 cfm/ 1,000 ft^3) = 954 cfm air delivered to the digester. Present blower(s) deliver 856 cfm.

Presently aerobically digested sludge is hauled to the Kiamesha WWTP – Town of Thompson for further processing / dewatering.

4.4 Definition of the Problem

As previously noted, the overall facility is rated for an average daily flow of 410,000 gpd, a peak hourly flow prior to post-SBR equalization and peak hourly flow after the post-SBR equalization of 1.44 MGD. The overall system is sufficiently sized to accept and treat the existing flows from the collection system. However, the system currently operates at 70% of capacity, and therefore has limited capacity to treat flows from future growth.

The existing Emerald Green WWTP has the following deficiencies:

Influent Screening
For SBR systems, the influent screening 'should be ¼ inch or smaller to minimize the potential for floatable solids entering the SBR tanks.' Per regulatory NEIWPCC, TR-16 / 6-31 / 6.3.7.2

Sequencing Batch Reactors
The existing SBR process equipment has been in use for nearly twenty years, requires frequent maintenance and is nearing the end if its useful life.

Post SBR Equalization Tanks
Post SBR Equalization Tanks require repair to the wall concrete as the concrete surface is badly abraded and shows exposed aggregate. This deficiency should be addressed before rebar is exposed. There is some leakage through the walls noted.

Sand Filters
The existing sand filters, while still performing their intended duty, are near the end of their life. The filtration system is contained in metal tankage that is showing signs of heavy corrosion.

Ultraviolet Disinfection (UV)
One of the primary goals of this upgrade to replace the chlorination disinfection system with UV Disinfection. This is necessitated by the daily effluent maximum limit of 0.03 mg/l residual chlorine which requires tight control and increased quantities of sodium bisulfite for de-chlorination, which in turn adds to the Total Dissolved Solids in the effluent. UV disinfection will eliminate these problems from further consideration.

Post Aeration
Per New York State Design Standards for Intermediate Sized Wastewater Treatment Systems, a detention time of 30 minutes should be provided when diffused or mechanical aeration is used (I-5, 1.3.b). At new flow – Peak Day Flow of 1.02 MGD (708 gpm) there will be a detention time in the 17,600 gallon Post Aeration Tank of 27 minutes.

Solids Processing
The blowers are not sufficiently sized for tank size.

Sidewalks / Access
Due to age sidewalks have become uneven and present a trip hazard. Existing sidewalks should be removed and replaced.

A comprehensive overhaul of the treatment train equipment is required in order for the plant to maintain long-term compliance with the SPDES permit.

4.5 Financial Status

In 2019, the Town of Thompson collected a total of $636,388 in sewer rents from 840 sewer accounts in the Emerald Green sewer district. Each account is assigned a rent points value and in 2019 district users were charged $63.02 per point for operations & maintenance (O&M) costs. A single-family home (SFH) in the Emerald Green sewer district is considered to have 10 rent points resulting in an annual water rent charge of $630 for a SFH.

Additionally, in 2019 the Town collected $215,618 in debt payments from all properties located in the sewer district, whether improved or not, to satisfy existing annual sewer district debt service. Each real property located in the sewer district was assigned a debt points value and in 2019, property owners were charged $19.67 per point. An SFH located in the Emerald Green sewer district is considered to have 10 debt points resulting in an annual debt service charge of $197. Therefore, in 2019, the total water rent/debt service paid by a typical SFH was $827.

5.0 ALTERNATIVE ANALYSIS

5.1 Alternatives Considered

Upgrade goals include the increase in the facility's flow capacity of the plant from 0.410 MGD to 0.475 MGD to allow for anticipated in-district expansion, the addition of UV disinfection to comply with the new discharge chlorine permit limits, and ensuring that the plant will be able to continue providing reliable treatment for the next 25 years with monthly average flows ranging from 0.170 to 0.475 MGD and O & M costs at or near current levels.

To that end, there were five major parts of the plant process that needed to be considered: The headworks process, principal biological treatment process (currently 2 SBR trains), the tertiary treatment process (currently rapid sand filtration), the disinfection process (currently chlorination and de-chlorination) and the sludge handling process (currently liquid sludge hauled off-site). Alternatives were considered for each of these five processes. All other portions of the plant were determined to require only repair and replace, or no action as possible alternatives.

Alternatives considered:

- No Action Alternative
- Upgrade Existing Facilities

- Construct New Treatment Process
- Green Infrastructure
- Regional Consolidation

Each of these alternatives is discussed in detail below as they pertain to the headworks, principal biological treatment, tertiary treatment, disinfection, and sludge handling processes of the Emerald Green treatment plant.

5.1.1 No Action Alternative

The No Action alternative would not address any of the issues currently facing the plant and would provide no capacity for anticipated in-district growth and increased flow. Some of the process equipment has reached the end of its useful life and requires replacement to continue with proper plant operations. This alternative is discussed below as it pertains to each of the five main plant processes involved in this upgrade project.

5.1.1.1 Headworks Process

If the plant is not upgraded to include improvements to the headworks process, the plant would be able to continue operating at its current level. However, the plant is currently having trouble with rag removal from the process stream, resulting in maintenance issues with other processes in the facility. It has been observed that the amount of rags in the influent stream has increased over the last five years. The plant's current mechanical bar screen has 1" bar spacing and a poor capture rate. This process is especially critical, as the rags cause issues in the rest of the plant. This is not a recommended alternative.

5.1.1.2 Principal Biological treatment Process

If the plant is not upgraded to include improvements to the principal biological treatment process, the plant would be able to continue operating at its current level, but might not be able to adequately provide treatment at maximum permitted flow rates. Considering the age and condition of the Sequenced Batch Reactor (SBR) system, the trend toward increasingly frequent repairs, the failing of components due to age, and the potential for permit exceedances due to mechanical failures, this alternative is not recommended.

5.1.1.3 Tertiary Treatment Process

If the plant is not upgraded to include improvements to the tertiary treatment process, the plant would be able to continue operating at its current level, but might not be able to adequately provide treatment at maximum permitted flow rates. Considering the aging condition of the tertiary treatment system in the existing filtration building, the trend toward increasingly frequent repairs

and failing of components due to age, the condition of the carbon-steel structure, and the potential for permit exceedances due to mechanical failures, this alternative is not recommended.

5.1.1.4 Disinfection Process

If the plant is not upgraded to include a change in technology for the disinfection process, it would potentially be out of compliance with its SPDES permit by May 2022 due to the extremely low concentration of 0.03 mg/L chlorine allowed to be discharged by permit. Therefore, this option is not feasible.

5.1.1.5 Sludge Handling Process

Sludge is currently hauled off-site by Town personnel for handling at the Town-owned Kiamesha WWTP. No dewatering currently occurs before hauling. If no action were taken to add some sludge handling process to this plant, the Town would need to continue hauling liquid sludge for treatment off-site. Additionally, if an issue were to arise preventing sludge from being processed at the Kiamesha facility, Emerald Green would not be in a position to be self-sufficient. Currently, potential limited sludge storage capacity exists at the plant if the Kiamesha plant cannot accept liquid sludge. This is not a recommended alternative.

5.1.2 Upgrade Existing Facilities

This alternative considers maintaining the existing plant processes to the greatest extent possible, while making necessary repairs and upgrades.

In 1995, the Town completed an upgrade to the plant, with costs approaching $2.2 million. Earlier upgrades were also undertaken. The existing plant, while generally capable of satisfying current SPDES permit limits, has limited available hydraulic capacity for future growth. In addition, non-monetary factors favoring the continued upgrading of existing facilities include the following:

- Most improvements could be completed within existing tanks, buildings, and previously disturbed areas.
- Staffing could remain at current levels and staff members could continue working at present levels of certification
- Plant operation and maintenance procedures could continue with limited modifications

5.1.2.1 Headworks Process

The influent channel is in good shape and was modified during the previous upgrade to facilitate the installation of the current mechanical bar screen. The screen should be upgraded, as the bar spacing of the existing screen provides a poor capture rate and allows the passage of rags, which can clog pumps and mixing nozzles and cause maintenance issues elsewhere in the process stream.

For this alternative, the existing mechanical bar screen will be removed and a new mechanical bar screen (1/4" bar spacing) will be installed in the existing screen location. The installation will be complete with a washer/compactor to clean the screenings, reduce odor, improve housekeeping, and reduce the volume of screenings requiring disposal.

The estimated cost for the proposed the headworks improvement's including the mechanical screen (including a new washer/compactor) is $310,030, not including any other necessary or recommended plant improvements.

5.1.2.2 Principal Biological Treatment Process

The principal biological treatment process for the plant is currently a two-tank, activated sludge, extended aeration system. The SBR tanks are in good shape and represent a significant investment made by the Town during previous upgrades. The aeration and mixing equipment should be upgraded, as the existing equipment is aging and has shown signs of deficiencies. For example, the diffusers and mixing jets have a tendency to clog, valves are failing and the control system is obsolete.

For this alternative, the aeration and mixing equipment of the two SBR tanks would be removed and replaced with new equipment. The mixings and air distribution system would be replaced with little change in design.

Headworks improvements would be made to prevent future clogging. The existing blowers would be replaced with higher efficiency models with automated VFDs that would allow the new blowers to be controlled based on oxygen demand.

A third SBR basin would be installed to handle increased flow to the facility and provide flexibility for tank and equipment maintenance. The new SBR basin will be provided with an equipment package identical to those installed in the two existing tanks, allowing all three basins to be served by a common spare parts inventory.

The estimated cost of the proposed upgrades to the existing principal biological treatment process is $983,300.

The estimated cost to install a third biological treatment process is $1.944 million, the total cost for the biological treatment process upgrade is $2.92 million, not including any other necessary or recommended plant improvements.

5.1.2.3 Tertiary Treatment

This alternative would involve removal of the existing tertiary filter and replacement with a new tertiary filter unit capable of treating the increased flow and provide operational flexibility for

process maintenance. The existing filter piping will need to be modified to connect to the new tertiary filter unit. The ancillary equipment, such as compressors and pumps, will also be upgraded to handle increased flow rates. The building that houses existing tertiary filter is in good condition and only minor repairs and modifications are required.

The estimated cost of the proposed tertiary filter upgrade is $1.12 million, not including any other necessary or recommended plant improvements.

5.1.2.4 Disinfection Process

This alternative would involve modifications to the UV channel and associated piping. The existing UV channel is located in the tertiary filtration building. It was installed during the 1995 upgrade and abandoned soon after due to hydraulic issues. The installation will include a new control panel and ancillary equipment to treat the increased flow. The UV installation will allow the facility to be compliant with the pending effluent chlorine limits listed in the SPDES permit and set to go into effect in May 2022.

As a result of this alternative, the existing chlorine and sodium bisulfate systems will be removed from service.

The estimated cost of the proposed UV upgrades is $292,500, not including any other necessary or recommended plant improvements.

5.1.2.5 Sludge Handling Process

The existing sludge handling process involves aerobic digestion and transportation of liquid sludge to the Kiamesha Lake WWTP for processing and final disposal.

This alternative would involve construction of a new sludge dewatering building and installation of a new 1-meter belt press. The new belt filter press would allow for dewatered sludge to be disposed of directly to a landfill, this would allow the Emerald Green facility to be self-sufficient and not rely on other town facilities for sludge disposal. Therefore, the new sludge dewatering building and belt filter press was selected for this alternative.

The estimated cost of construction of a new sludge dewatering building and a new 1-meter belt filter press is $1.96 million.

5.1.3 Construct New Treatment Process

This alternative would involve replacing one or more of the existing treatment processes with a new and different treatment process, or constructing a new treatment process that does not currently exist as a part of the Emerald Green wastewater treatment plant.

5.1.3.1 Headworks Process

This alternative has no alternative options due to the existing channel configuration and location of other channel elements.

5.1.3.2 Principal Biological Treatment Process

This alternative considers the possibility of replacing the principal treatment process with a new method of principal treatment. The principal treatment options considered were all activated sludge processes which would replace the plant's existing activated sludge SBR system.

New treatment technology selected for consideration was a new membrane bioreactor reactor (MBR) system. This treatment system would use the existing SBR process tanks for the MBR process. This technology would require the Town to make significant modifications to existing facilities, and would increase energy demands due to the necessity of larger aeration equipment and pumping requirements.

The cost to convert to a new MBR activated sludge facility is estimated to exceed $5.2 million, not including any other necessary or recommended plant improvements. This was the only alternative reviewed in detail due to the limited available space on the site and the existing topography.

Conceptual cost estimate for the MBR alternatives have been provided in **Appendix E**.

Annual O&M costs for MBR technologies would be greater than the current system due principally to higher energy consumption and recommended annual membrane replacement cost.

Therefore, replacing current principal biological treatment facilities with other technologies would require higher capital costs and would result in higher O & M costs, as compared to upgrading the current treatment process.

5.1.3.3 Tertiary Treatment

This alternative considers the possibility of replacing the tertiary treatment process with a new method of tertiary treatment. The tertiary treatment option considered as up flow dual sand filters, which would replace the plant's existing down flow sand filter system.

The building containing the tertiary filtration was reviewed for available head room and space for the new equipment and it was determined that upgrading the existing tertiary treatment process system is the most feasible option due to being able to install the unit in the filter footprint avoiding additions or alterations to the existing building or construction of a new building. The need to add an oxidation chemical (typically chlorine) to the filter to prevent organic fouling was also a concern with the effluent limit for chlorine residual being so low. Therefore, upgrading the tertiary filtration system in kind is the selected option for this alternative.

5.1.3.4 Disinfection Process

This alternative would involve the installation of a new disinfection system at the plant. This upgrade is necessary for the plant to meet pending disinfection limits scheduled to take effect in May of 2022. Due to the pending seasonal disinfection permit limit of 30 micrograms per liter of total chlorine, it was determined that an ultraviolet disinfection system was the most consistent process available. Options include open-channel and pipeline (closed-channel) UV systems.

The hydraulics of the flow leaving the tertiary filtration were reviewed and it was determined that upgrading the existing abandoned open-channel UV system is the most feasible option. A closed-channel UV system within a new building is not hydraulically feasible. Therefore, upgrading the open-channel UV system is the selected option for this alternative.

5.1.3.5 Sludge Handling Process

This alternative would involve the installation of a new rotary drum thickener or gravity belt thickening to enable the facility to thicken the sludge from .05 % to 4 % prior to transport to the Kiamesha plant, reducing the volume and number of loads hauled each year.

The estimated cost of the thickening equipment for this improvement is similarly priced at $228,000, a new sludge dewatering building would still be required for the equipment installation. This alternative does not provide self-sufficiency for the facility and disposal of sludge could still be impacted by issues at other town owned facilities. Therefore, installation of a 1-meter belt press for sludge dewatering is the selected option for this alternative.

5.1.4 Green Infrastructure

This alternative would involve installing new green infrastructure, or replacing existing processes, buildings, or facilities with new green infrastructure while maintaining the plant's ability to treat the waste flow delivered to it.

Several green alternatives were considered in regard to the general plant upgrade. The Town does not wish to utilize permeable asphalt, as they fear it will not hold up to DPW trucks and equipment, chemical delivery trucks, nor to sludge hauling trucks removing dewatered sludge from the Emerald Green plant. None of the existing buildings are designed to bear the added weight of green roof infrastructure without structural modifications.

Green infrastructure considerations specific to the five main plant processes involved in this upgrade are discussed below.

5.1.4.1 Headworks Process

Of the available options for headworks process treatment, none truly fit into the category of green infrastructure.

5.1.4.2 Principal biological Treatment Process

Of the considered options for principal biological treatment, none truly fit into the category of green infrastructure. The considered options were to upgrade the existing sequenced batch reactors, to construct a new MBR process. Of these, the upgraded sequenced batch reactors would be the most energy efficient, requiring the least energy to operate.

5.1.4.3 Tertiary Treatment

Of the considered options for tertiary treatment process, none truly fit into the category of green infrastructure.

5.1.4.4 Disinfection Process

Of the considered options for disinfection, none truly fit into the category of green infrastructure. The considered options were to install a new open-channel UV system and a closed-channel UV system. Neither of these options include feasible opportunities for inclusion of new green infrastructure. However, the open channel design requires less energy to operate than the closed channel design.

5.1.4.5 Sludge Handling Process

For new sludge handling equipment, a belt filter press is being considered for installation under this project. This system would increase the efficiency of the plant, while also reducing the number of loads of liquid sludge hauled from the plant for processing offsite.

The proposed sludge dewatering equipment would provide the plant with the ability to reduce the total volume of liquid sludge requiring off-site disposal by up to 75%. This decrease in liquid mass would reduce the frequency with which waste sludge would need to be hauled from the plant, reducing the amount of fuel expended to haul the plant's solid waste, increasing efficiency, and reducing environmental impacts.

5.1.5 Regional Consolidation

Consolidation with other regional facilities was also considered. The nearest plant is the Kiamesha WWTP, which is more than five miles away from the Emerald Green facility. The Kiamesha plant does not have sufficient excess capacity to accept the waste flow from the Emerald Green plant. Additionally, conveyance of raw sewage to the facility would be cost prohibitive.

5.2 Recommended Alternative/Planned Upgrade

The recommended alternatives were chosen based on ability to effectively address continued compliance with current SPDES requirements for the next 25 years, minimize site impacts, and minimize capital investment and O & M costs. Based on the review set forth above, the recommended alternatives are as follows:

- Headworks Improvements
  - Upgrade Existing Facilities - Install new mechanical screen with ¼" bar spacing and compactor with an estimated improvement cost of $310,030.

- Principal Biological Treatment:
  - Upgrade Existing Facilities - Upgrade Existing Facilities – sequenced batch reactor upgrades with an estimated improvement cost of $983,300, and construct new SBR treatment basin with an estimated improvement cost of $1.94 million, total cost $2.92 million.

- Tertiary Treatment:
  - Upgrade Existing Facilities - Replacement with a new tertiary filter unit to treat the anticipated increased flows to the facility with an estimated improvement cost of $1.2 million.

- Disinfection:
  - Upgrade Existing Facilities - modify abandoned UV channel and install new open-channel UV system with an estimated improvement cost of $292,500.

- Sludge Handling:
  - Construct New Treatment Process – construct new building and install a new 1-meter belt filter press system with an estimated improvement cost of 1.96 million.

A comprehensive cost estimate, which lists all recommended improvement costs, may be found in **Appendix G**.

5.3 Facility Upgrades

Proposed upgrades to the existing WWTP may include:

- Influent Channel Improvements
- Influent Holding Tank Improvements
- SBR Basin 1 & 2 Improvements
- SBR Basin 3 Construction

- Post Equalization 1&2 Improvements
- Process Air Supply Blower Improvements
- Sand Filter Improvements
- UV Disinfection Process Improvements
- Post Aeration Improvements
- Sludge Holding Tank Improvements
- Sludge Processing Construction
- Yard Piping Improvements
- Site Work Improvements
- SCADA Improvements
- Other Improvements

5.3.1 Description

A description of the proposed project improvements to each of the plant processes and buildings follows (including proposed new processes and buildings).

5.3.1.1 Influent Channel Improvements

The influent channel area will be upgraded as a part of this project. The existing mechanical screening equipment does not provide the recommended regulatory screening of ¼" inch (per NYS Design Standards for Intermediate Sized Wastewater Treatment Systems, NYSDSISWTS). Improvements to the influent channel will primarily involve replacement of the existing mechanical rake and ancillary equipment.

- Provide a new mechanical rake screen with ¼" slot openings.
- Demolish, remove, and dispose of the existing mechanical screen.
- Provide new washer compactor to separate out the soft organics, and then compact and dewater the inorganic trash.
- Provide new freeze protection for cold weather operation.
- Provide for electrical modifications and installations as required.
- Repair concrete where it is spalling, cracking or eroding.

5.3.1.2 Influent Holding Tank Improvements

The Influent Holding Tank is in need of typical maintenance overhaul typical of older tanks, the improvements are listed below:

- Repair concrete where spalling, cracking or eroding.
- Repair/replace in tank brackets, where required, due to corrosion.
- Repair/replace miscellaneous metals around the tank for safety and appearance.

- Replace existing pumps and appurtenances with new pumps to accommodate the increase permitted flow.
- Provide VFDs for pumps.
- Provide for electrical installation and modifications as required.

5.3.1.3 SBR Basin 1 & 2 Improvements

SBR Basins 1 & 2 will receive numerous improvements as part of this project. The improvements will involve the aeration system, number of basins, valves and ancillary. The proposed SBR 1 & 2 improvements are listed below:

- Provide repairs to the existing tank floor and walls.
- Provide for dissolved oxygen probes and controls tied to the positive displacement blowers.
- Provide new SBR equipment and appurtenances.
- Provide new valves and electric actuators.
- Provide for supervisory control and data acquisition (SCADA) updates.
- Perform other miscellaneous tank work and any modifications required.
- Provide for electrical installation and modifications, as required.

5.3.1.4 SBR Basin 3 Construction

Provide a third SBR Basin, SBR 3. This addresses regulatory recommendations for installation of equalization basin(s) where fewer than three independent SBR basins are provided (TR-16, 6.3.7.2). This will improve the scheduling of maintenance and upgrades to the existing SBR basins, and accommodate future influent flow increases.

- Provide new concrete tankage for the new SBR Basin.
- Provide new SBR process piping.
- Provide new SBR pumps.
- Provide positive displacement blowers with matched variable frequency drives (VFD).
- Provide for dissolved oxygen probes and controls tied to the positive displacement blowers.
- Provide new miscellaneous metals for tank access.
- Provide for electrical installation and modifications as required.

5.3.1.4 Post Equalization (EQ) 1 & 2 Improvements

Post EQ 1 & 2, perform the task of damping flow to downstream processes so that sizing of those processes can sized to lower flow. The improvements will mostly involve structural improvements to ensure the tanks will remain on-line for years to come. The proposed Post EQ 1 & 2 improvements are listed below:

- Repair concrete where it is spalling, cracking or eroding.

- Repair / replace in tank brackets, where required, due to corrosion.
- Repair / replace miscellaneous metals around the tank for safety and appearance.
- Replace existing pumps and appurtenances with new pumps to accommodate the increase permitted flow.
- Provide VFDs for Post EQ pumps.
- Provide for electrical modifications required.

5.3.1.5 Process Air Supply Blower Improvements

A major portion of this project will be to replace and upgrade the plant's process air supply system. This will include replacement of the three centrifugal blowers located within the SBR building, that supply the air for the two SBR Basins. The proposed improvements to the air supply system are listed below:

- Demolish, remove, and dispose of the existing SBR blowers (3 in total).
- Piping modification and new piping as required.
- Provide new blowers (three rotary screw blower packages: turn-key with VFD & SCADA controls). The two for new SBR and three for existing SBR process will be identical.
- Demolish, remove and dispose of the existing sludge blowers (2 in total).
- Provide two new positive displacement blowers to sludge tank with VFD and DO control.
- Demolish, remove and dispose of the existing post aeration blowers (2 in total).
- Provide two new positive displacement blowers for aeration to the post aeration tank.
- Provide required new piping and valves associated with installation of blowers.
- Provide for electrical power required.

5.3.1.6 Sand Filter Improvements

The Sand Filters are nearing the end of their useful life. Additionally, the ability to treat increased flow is not possible given the existing Sand Filters filter area. The sand filter improvements are summarized below:

- Demolish, remove, and dispose of existing Sand Filter.
- Provide for temporary, trailer mounted, tertiary treatment during demolition and construction. Additionally, the following will be provided:
    - Electrical connections to temporary unit prior to startup and demolition of said connections at end of use.
    - Site preparation for installation and site restoration at end of use.
- Modifications to existing floor concrete to accept process piping.
- Install new tertiary Sand Filter, associated pumps, piping, valves, controls and control panels as required.
- Provide new miscellaneous metals for tank access.

- Provide for electrical power required.

5.3.1.7 UV Disinfection Process Improvements

The existing UV disinfection channel is currently not used due to hydraulic/overflow issues. It is proposed to remedy the hydraulic issues and install new low-pressure UV disinfection system in the existing channel to be operated in lieu of chlorine disinfection presently utilized at the facility. The UV Disinfection improvements are summarized below.

- Modifications to the existing channel for installation of the new UV system.
- Demolition of existing floor for modifications to UV outlet piping.
- Installation of new UV disinfection system and controls.
- Installation of safety railings around UV system.
- Provide new electrical panel, disconnects, switches, etc.
- Provide new conduit and conductor, and electrical connections.
- Provide for electrical power required.

5.3.1.8 Post Aeration Improvements

The Post Aeration Tank is generally in good condition, but some improvements are proposed, including concrete repair and safety railing replacement. The Post Aeration improvements are summarized below:

- Provide for temporary piping around the Post Aeration tank during construction.
- Repair tank concrete as needed.
- Repair / replace safety railing and tank pipe brackets.
- Provide bypass pumping during improvements.
- Provide and install new fine bubble diffusers.
- Provide new non-potable water pumps and control panel (pressure controlled).
- Provide new conduit and conductor, and electrical connections.

5.3.1.9 Sludge Holding Tank Improvements

The Sludge Holding Tank is an older tank that requires maintenance/repair to prolong the tank life. The Sludge Holding Tank improvements are summarized below:

- Remove sludge and grit and clean the tank.
- Carry out repairs to the existing concrete.
- Demolish, remove, and dispose of existing diffusers and piping.
- Provide all appurtenances for new diffusers and piping.
- Provide two new sludge pumps.

5.3.1.10 Sludge Process Construction

The Emerald Green plant currently does not have sludge processing equipment. Aerobically digested sludge is decanted to raise the solids concentration and then hauled to the Town of Thompson – Kiamesha WWTP for further processing, pressing to gain solids 20% and greater for off-site disposal.

Sludge Dewatering should be added to the process train eliminating the need to truck low solids sludge to the Kiamesha WWTP. This improvement to the plant's treatment process would require the construction of a new building to house the new Sludge Process equipment. The proposed Sludge Process improvements are listed below:

- Provide new structure foundation.
- Provide new Sludge Process building structure.
- Provide new Belt Filter Press system for dewatering of the aerobically digested sludge.
- Provide new process piping.
- Provide for new processed solids receiving area.
- Miscellaneous metals.
- Provide new lighting within the new Sludge Process building.
- Provide new HVAC system for the new Sludge Process building.
- Provide for conduits, conductors and associated electrical work related to the Belt Filter Press and building.

5.3.1.11 Yard Piping Improvements

With consideration to age and upgrades, the following upgrades to Yard Piping should be completed:

- Rebuild head of plant manhole as identified by the Town for rehabilitation/rebuild.
- Provide new backwash line to sludge tank.
- Provide new UV effluent pipe (14") and manhole.
- Provide new non-potable waterline.

5.3.1.12 Site Work Improvements

Proposed Site Work improvements are listed below:

- Demolish existing sidewalks and replace with new sidewalks to address safety issues of uneven walkway.
- Mill and pave existing blacktop driveway.
- Provide new roadway and paving to proposed Sludge Building.
- Provide new WAS valves and electronic actuators valves (10").

5.3.1.13 SCADA Improvements

SCADA update can assist in maintaining compliance, improve security, and lower costs through process optimization. Proposed SCADA Improvements are listed below:

- Integration of dissolved oxygen and blower operation.
- Provide in process monitoring device upgrades to improve operational information and process control.
- Provide new Human Machine Interfaces (HMI) – workstations.
- Integrate all plant processes to the SCADA system.

5.3.1.14 Other Improvements

The Other improvements are listed below:

- Provide for plant-wide LED lighting upgrade which can save up to 75% in associated energy costs.
- HVAC upgrade to Filter Building for positive effect on equipment.
- Provide new Alkalinity dispersal/feed system for mixing powdered alkalinity products into solution and pumping into the process stream.
- Provide a new non-potable water system and all appurtenances in the filter building to provide plant effluent water for the proposed new compactor and the proposed new belt filter press.
- Provide new generator and automatic transfer switch so that the plant processes can be maintained during periods of power outage.
- Provide new conduits and conductors to plant process equipment.

5.3.2 Design Criteria

Facility improvements will be made to industry standards.
Electrical improvements will be made to NEC standards.
Building improvements will comply with NYS Building Codes and applicable Town codes.
Process improvements will comply with Ten State Standards.

5.3.3 Map/Location

See **Figure 3 – Upgrade Site Plan** for the location of the existing and proposed plant process units, buildings, and facilities. See **Figure 4 – Existing Process Schematic** and **Figure 5 – Proposed Process Schematic** for the relation of existing and proposed plant process units.

5.3.4 Environmental Impacts & Mitigation Measures

There are no anticipated environmental impacts that will occur as a result of this project or planned mitigation measures to be implemented during this project.

5.3.5 Land Requirements

No additional land will be required for the proposed improvements of this project. All new facilities will be constructed at the existing Emerald Lake WWTP site, on property owned by the Town.

5.3.6 Discharge Permit Requirements

The most recent changes to the SPDES permit discharge levels include monitoring and testing for fecal coliform and residual chlorine (if chlorine is used for disinfection), seasonal disinfection (from May 1 to October 31), and daily effluent temperature monitoring.

A temperature monitoring program is currently ongoing. Temperatures are monitored at each step throughout the process stream to identify those places where the temperature is rising. Based on the data obtained, a mitigation plan will be developed and submitted to the NYSDEC for review.

A Temperature Management Plan has been developed to assist in the evaluation process and is attached as **Appendix N** to the report.

No measures to mitigate increased effluent temperature are considered in this report, although it may be fiscally prudent to incorporate any necessary upgrades into the scope of this project. Any financial impacts from additional upgrades subsequently identified in the mitigation plan and implemented are not considered in this report.

It is anticipated that a request to increase plant average daily flow from 0.410 MGD to 0.475 MGD will require a SPDES modification.

5.3.7 Sustainability Considerations

Water and Energy Efficiency:

Potable water is and will continue to be of greater importance at the Emerald Green facility and beyond. Recognizing this the upgrade project proposes to include the installation of a Non-Potable Water System (NPW). NPW will be used for equipment rinsing, wash down where potable water would normally be used. This will save potable water and the associated costs.

In order to improve energy efficiency, it is proposed that the existing aeration systems be modified. New blowers will be installed that are amenable (have turn down capability) to operation with VFDs to more efficiently control the energy usage based on demand. The new blowers coupled

with updated SCADA controls will better be able to provide the required oxygen without running higher dissolved oxygen which will reduce the energy required to support the plant processes.

Additionally, all aging pumps and motors scheduled for replacement will be replaced with new, energy efficient models equipped with premium efficiency motors (85% and greater efficiency)

Other:
Providing new parts and equipment to replace aging and failing equipment will help to sustain plant operation for the foreseeable future. These improvements will improve the reliability of the plant and will reduce the risk of some or all of the plant becoming inoperable. For example, replacing the emergency power generator with a new model with readily available parts will ensure long-term reliability and mitigate the risk of plant downtime due to power outages.

5.3.8 Storm Flood Resiliency

The plant facilities are outside the flood plain area (see **Appendix A – Project Background Information** for FEMA Flood Maps). No storm damage of note has occurred to the plant. With the exception of replacing some damaged trench drain, no storm or flood resiliency improvements are planned for this project.

5.3.9 Schedule and Constructability

All planned improvements can be completed with minimal impact to plant operations and can be constructed within the anticipated construction schedule.

5.3.10 Estimated Costs

A basis of design table detailing existing and proposed design, including sizing calculations, has been provided for all equipment and unit processes and is included in **Appendix L – Basis of Design.**

Capital Improvement Costs:
The estimated total project cost for the recommended improvements is $14 million. The construction costs for the Town of Thompson, Emerald Green WWTP Upgrade Project are estimated to be $10,478,275. A detailed cost estimate is contained in **Appendix G – Comprehensive Project Cost Estimate**, and a summary is shown below in section 5.6.

5.5 Project Schedule

The anticipated project schedule is as follows:

Table 5.1 Anticipated Project Schedule

Action	Timeframe Start to Complete	Anticipated Date
Engineering Report*	6 months	January -**June 2020**
SEQR, SHPO, 202(b) & Bond Res	3 months	May - July 2020
Secure BAN	1 month	August 2020
DEC Eng. Report Approval	2-month review	August 2020
Chlorine Residual Engineering Plans	6 months	Aug 2020 - **Feb 2021**
SRF and WIIA Applications	*Point in Time*	*September 2020*
Chlorine Residual Plan Approval	2-month review	April 2021
Chlorine Residual Bidding	2 months	April - May 2021
Chlorine Residual Construction	11 months	**May 2021** – March 2022
WQIP CFA Application	*Point in Time*	*July 2021*
Close on SRF Financing	*Point in Time*	*September 2021*
Upgrade/Expansion Eng. Plans	12 months	Sept 2020 - Sept 2021
Upgrade/Expansion Plan Approval	2-month review	December 2021
Upgrade/Expansion Bidding	2 months	January - March 2022
Chlorine Residual Start-Up	1 month	**April 2022**
Upgrade/Expansion Construction	15 months	April 2022 – July 2023

*Comprehensive Engineering Report including chlorine residual compliance and upgrade/expansion; phased approach to design and construction to accommodate regulatory compliance schedule. **Bold** dates are for regulatory compliance; Gray shading denotes DEC Reviews; *Financing Actions* are underlined and in *italics*

The above schedule includes a 2 phased design/construction period. The first phase will complete the work necessary to install the new UV disinfection system, which is required to be completed by May 1, 2022. This phase will also include the upgrades to the sand filter system as both processes will occur in the same building. The second phase will complete all other improvements and upgrades.

It should be noted that there are added costs associated with this two-phase approach. These costs include the bid/award and construction inspection & administration for two separate projects. The Town may consider requesting a permit modification to allow for the completion of the UV disinfection facilities to occur by May 1, 2023. This 1-year compliance extension will allow for completion of the project at a lower cost, with shorter review periods and simplify project administration for all involved agencies.

5.6 Total Project Cost Estimate

A summary of the estimated costs for all considered project improvements is shown below. A detailed cost estimate is attached as **Appendix G – Comprehensive Project Cost Estimate**.

A. Construction:		
• Headworks Improvements	$	310,030
• Influent Holding Tank Improvements	$	77,000
• SBR Basin 1 & 2 Improvements	$	983,300
• SBR Basin 3 Construction	$	1,944,320
• Post EQ 1&2 Improvements	$	117,500
• Sand Filter Improvements	$	1,121,800
• UV Disinfection Process Improvements	$	292,500
• Post Aeration Improvements	$	98,500
• Sludge Holding Tank Improvements	$	235,863
• Sludge Processing Construction (BF Press)	$	1,729,500
• Yard Piping Improvements	$	166,500
• Site Work Improvements	$	100,520
• SCADA Improvements	$	200,000
• Instrumentation	$	100,000
• Emergency Generator	$	405,000
• Other Improvements	$	320,000
• Other Expenses	$	80,000
• Other Contract Costs		
o NYSEFC Contract Compliance	$	64,000
o Contractors Overhead and Profit (15%)	$	1,251,815
o Mobilization/Bonds/Insurance (3%)	$	287,017
Construction Subtotal	**$**	**9,885,165**
• Construction Cost Inflation Adjustment (3% per year for 2 years)	$	593,110
Adjusted Construction Subtotal	**$**	**10,478,275**
B. Other Costs:		
• Professional Services	$	2,020,655
• Other Town Costs	$	75,000
Other Costs Subtotal	**$**	**2,095,655**
C. Contingency (10%)	$	1,047,827
D. Total Estimated Project Cost (2021 dollars)	$	13,621,757
E. Other Funding	$	0
F. Total to Finance	$	13,621,757
G. NYSEFC CWSRF Issuance Costs*		
• Direct Expense and Issuance Costs (1.84%)	$	250,640
H. Total Project Costs and Issuance Costs	**$**	**13,872,397**

* These costs would go to zero if hardship financing is secured.

5.7 Annual Operation & Maintenance Costs

The planned upgrade primarily entails the replacement of existing equipment for continued operation with two additional systems will be introduced into the process train; UV disinfection and Sludge Dewatering. Additional operation costs associated with the anticipated increased energy use and periodic UV bulb replacement will be added to the annual O & M budget. However, energy costs saving should be realized through the installation of high efficiency lighting and VFD motors. O & M costs are not expected to substantially increase as a result of this upgrade. However, as plant flows increase, associated operation and maintenance costs can be expected to increase as well.

5.8 Projected Financial Impact

5.8.1 Current Rates

In 2019, the Town of Thompson collected a total of $636,388 in sewer rents from 840 sewer accounts in the Emerald Green sewer district. Each account is assigned a rent points value and in 2019 district users were charged $63.02 per point for operations & maintenance (O&M) costs. A single-family home (SFH) in the Emerald Green sewer district is considered to have 10 rent points resulting in an annual water rent charge of $630 for an SFH.

Additionally, in 2019, the Town collected $215,618 in debt payments from all properties located in the sewer district, whether improved or not, to satisfy existing annual sewer district debt service. Each real property located in the sewer district was assigned a debt points value and in 2019, property owners were charged $19.67 per point. An SFH located in the Emerald Green sewer district is considered to have 10 debt points resulting in an annual debt service charge of $197. Therefore, in 2019, the total water rent/debt service paid by a typical SFH was $827.

5.8.2 Projected Impact on Users

The estimated project cost to be financed approximately equals $14 million. The table below summarizes the cost to users under three interest rate scenarios and with and without the maximum 25% grant award. Please note that these figures assume 2019 sewer rates.

Given the Town's demographic data, the Town has a strong chance of securing both hardship (0%) financing and the maximum grant award. A more detailed funding analysis, which contains the demographic data used to analyze hardship and grant eligibility, is included in **Appendix H – Rate Impact Summary**.

Table 5.2 Rate Impact Summary

$14,000,000			
No Grant Award			
	Hardship Financing (0%)	Subsidized Financing[5,6] (1.65%)	Market Rate Financing[5,6] (3.3%)
Project Cost:	$14,000,000	$14,000,000	$14,000,000
Annual Debt Service:	$466,677	$595,419	$742,245
Average Annual Cost Increase for typical SFH:	$343	$502	$625
Percent Increase:	41%	61%	76%
Annual Sewer Service Cost to Typical SFH:	$1,170	$1,293	$1,210
Maximum Grant Award (SRF/WIIA): $3,500,000			
	Hardship Financing (0%)	Subsidized Financing (1.65%)	Market Rate Financing (3.3%)
Amount to be Financed:	$10,500,000	$10,500,000	$10,500,000
Annual Debt Service w/ Grant:	$350,000	$446,595	$556,684
Average Annual Cost Increase for Typical SFH:	$295	$376	$469
Percent Increase:	42%	54%	67%
Annual Sewer Service Cost to Typical SFH:	$1,122	$1,203	$1,296

NOTES
Final estimated user costs are the same regardless of whether the grant is SRF, WIIA or combination of both.
Market rate as of November 2019. Subsidized rate is set by EFC at 50% market rate
All financing assumes 30-year term
For 2018, the annual cost to a typical single-family home (1 EDU) was $827.
Rate projections utilize 2019 rate structure and budgets

Final costs to the typical single-family home will ultimately depend upon the terms of the financing package received by the Town. The proposed $14 million project will increase annual sewer rates by $625 (76%) if market rate financing is secured (currently 3.3%), and $343 (41%) if hardship funding (0%) is secured.

If the Town is able to secure the maximum $3.5 million grant award, then cost increases would be $469 (67%) if market rate financing is secured, and $295 (42%) if hardship financing is secured.

In 2019, the average annual sewer fee for the typical single-family home was approximately $827/year. The 2017 median household income (MHI) for Town residents was $42,175. As a percentage of MHI, district users currently pay approximately 1.96% of household income for sewer service.

5.9 The Next Steps

This engineering report, along with other required listing materials, allows the Town's project to be included on the NYSEFC Annual Intended Use Plan (IUP) for future SRF funding requests including CWSRF and Water Grant (WIIA) funding and will be uploaded to the applicable website.

The Town is ready to proceed with the project accordance with the project schedule presented above.

5.10 Engineering Report Certification

The signed certification form is contained in **Appendix J – Engineering Report Certification**.

5.11 Smart Growth Assessment

The signed form is contained in **Appendix K – Smart Growth Assessment Form**.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The Town was closely involved in the development of this upgrade and improvement plan, and has reviewed the scope of work and costs associated with WWTP upgrade. The Town has decided that it is feasible to move forward with upgrading its existing facilities to handle flow and loads up to an increased permit limit of 0.475 MGD. The recommended project includes that following upgrades:

- Influent Channel Improvements
- Influent Holding Tank Improvements
- SBR Basin 1 & 2 Improvements
- SBR Basin 3 Construction
- Post Equalization 1&2 Improvements
- Process Air Supply Blower Improvements
- Sand Filter Improvements
- UV Disinfection Process Improvements
- Post Aeration Improvements
- Sludge Holding Tank Improvements
- Sludge Processing Construction
- Yard Piping Improvements
- Site Work Improvements
- SCADA Improvements
- Other Improvements

The estimated total project cost, including inflation adjustment and issuance costs, is $14 million.

The Town will seek funding through the CWSRF program for short term and long-term financing, and will seek grant funding via the WIIA program. The Town will also consider funding or co-funding from other sources.

If hardship financing assistance and the maximum grant award ($3.5 million) is received, it is estimated that sewer rates (debt service and O & M) could increase by approximately 42% for an average SFH.

Based on the current plan forward, if a favorable funding determination is reached in November 2020, and the Town decides to move forward as planned, construction for this project could begin in early 2021 to complete the phase 1 work. Phase 2 work completed near the middle of 2023.

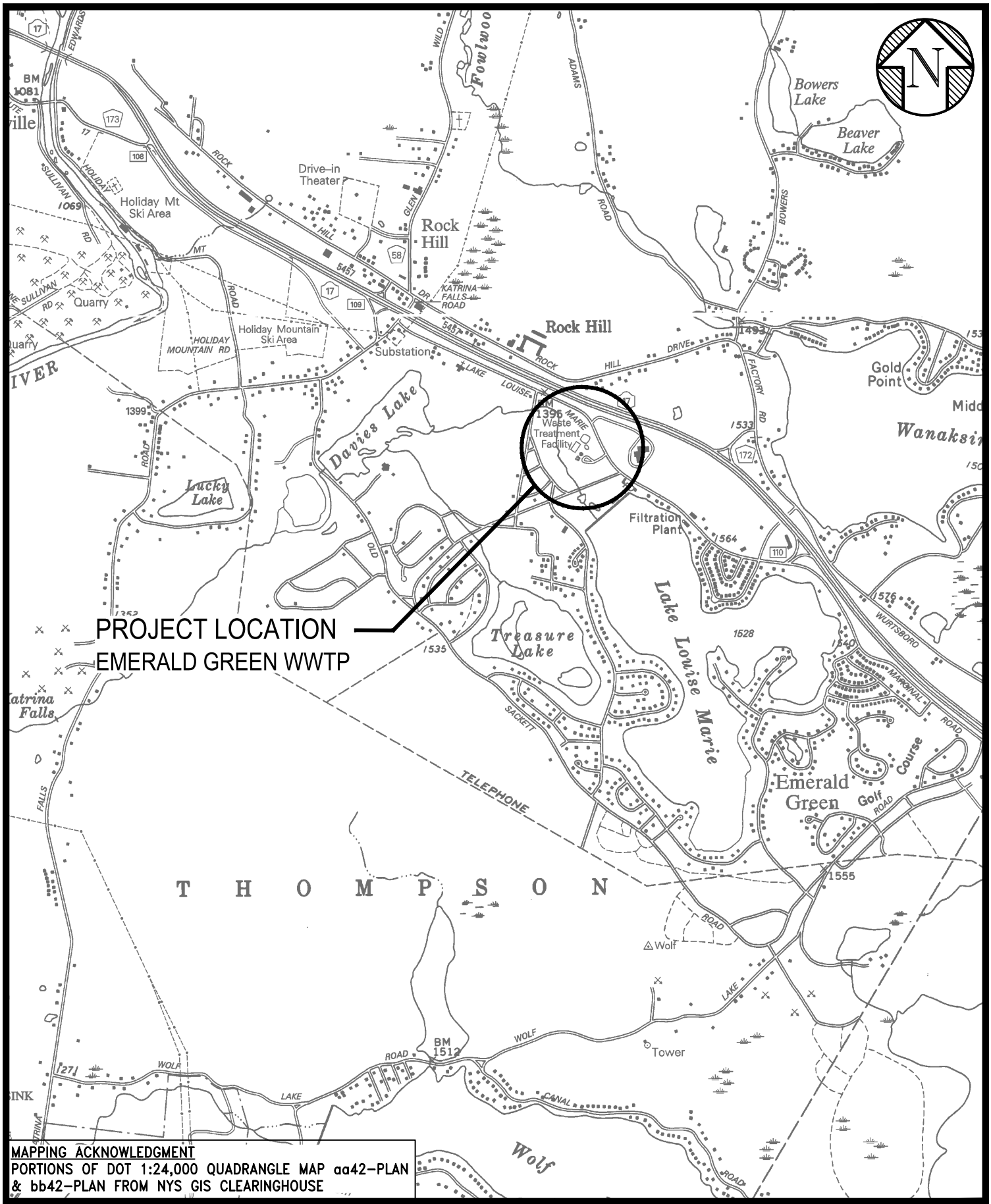
6.2 Recommendations

The Town should move forward with implementation of the project in accordance with the schedule and pursue grant funding to mitigate project cost impact.

FIGURES

FIGURE 1

Location Map



MAPPING ACKNOWLEDGMENT
PORTIONS OF DOT 1:24,000 QUADRANGLE MAP aa42-PLAN & bb42-PLAN FROM NYS GIS CLEARINGHOUSE

SHEET NO:

FIG-1

EMERALD GREEN WWTP
SITE LOCATION MAP
TOWN OF THOMPSON
SULLIVAN COUNTY, NY

DATE:	4/30/20
DRAWN BY:	MO
SCALE:	1" = 2,000"
REVIEWED BY:	JP
PROJECT NO.:	
FILE:	EMERALD GREEN WWTP

DELAWARE ENGINEERING, D.P.C.

ONEONTA
55 SOUTH MAIN STREET, ONEONTA, NY 13820 - 607.432.8073
ALBANY
28 MADISON AVENUE EXTENSION, ALBANY, NY 12203 - 518.452.1290
WALTON
6 TOWNSEND STREET, WALTON, NY 13856 - 607.865.92354
LIBERTY
31 N. MAIN STREET, LIBERTY, NY 12754 - 845.747.9952
RED HOOK
16 EAST MARKET STREET, RED HOOK, NY 12571 - 518.452.1290

FIGURE 2

Existing Site Plan

LANDS NOW OR FORMERLY OF
BRUCES LANDSCAPING CORP
52.-1-13.35

LAKE LOUISE MARIE ROAD

EXISTING AER. SLUDGE

EXISTING SBR 1

EXISTING SBR 2

EXISTING CONTROL BUILDING

EXISTING POST EQ

EXISTING INFLUENT HOLDING

EXISTING POST EQ

EXISTING INFLUENT STRUCTURE

EXISTING FILTER BUILDING

EXISTING POST AERATION

LANDS NOW OR FORMERLY OF
TOWN OF THOMPSON
52.-1-13.31

MAPPING ACKNOWLEDGMENT
ORTHOIMAGERY DATED 2016, FROM NYS GIS CLEARINGHOUSE
PARCEL INFORMATION, SULLIVAN COUNTY DIGITAL DATA, 2018

LEGEND

- WWTP PARCEL BOUNDARY
- TAX PARCEL BOUNDARIES
- 2' LIDAR CONTOURS (1490)
- FEDERAL RIVERINE AREA
- FEMA 100 YEAR FLOOD ZONE

50 0 25 50 100

PLAN SCALE=1"= 50'

DATE: 6/30/2020
DRAWN BY: MO
SCALE: 1"=50'
REVIEWED BY: DRO
PROJECT NO.: 19-1890
FILE: (1) THOMP/EM GR

DELAWARE ENGINEERING, D.P.C.
CIVIL AND ENVIRONMENTAL ENGINEERING
55 SOUTH MAIN STREET, ONEONTA, NY 13820 - 607.432.8073
28 MADISON AVENUE EXTENSION, ALBANY, NY 12203 - 518.452.1290
6 TOWNSEND STREET, WALTON, NY 13856 - 607.865.92354
31 N. MAIN STREET, LIBERTY, NY 12754 - 845.747.9952
16 EAST MARKET STREET, RED HOOK, NY 12571 - 518.452.1290

REVISIONS

NO.	DATE	DESCRIPTION
.		

EMERALD GREEN WWTP
TOWN OF THOMPSON
SULLIVAN COUNTY, NY

EXISTING SITE PLAN

SHEET:
FIG-2

FIGURE 3

Upgrade Site Plan

LANDS NOW OR FORMERLY OF
BRUCES LANDSCAPING CORP
52.-1-13.35

LAKE LOUISE MARIE ROAD

NEW 40' x 40' ,1,600 SQ FT
SLUDGE DEWATERING
BUILDING

NEW
PAVEMENT
1,700 FT²

NEW 40' x 40'
1,600 SQ FT
SBR BASIN

EXISTING
SBR 1

EXISTING
SBR 2

EXISTING
CONTROL
BUILDING

EXISTING
AER. SLUDGE

EXISTING
POST EQ

EXISTING
POST EQ

EXISTING
INF. HOLDING

EXISTING
POST AER

EXISTING
INF. STRUCTURE

NEW
TERTIARY
FILTER

NEW
UV

EXISTING
FILTER
BUILDING

MANHOLE REBUILD

LANDS NOW OR FORMERLY OF
TOWN OF THOMPSON
52.-1-13.31

AREA OF DISTURBANCE
<1 ACRE

MAPPING ACKNOWLEDGMENT
ORTHOIMAGERY DATED 2016, FROM NYS GIS CLEARINGHOUSE
PARCEL INFORMATION, SULLIVAN COUNTY DIGITAL DATA, 2018

UPGRADE LEGEND

- WWTP PARCEL BOUNDARY
- TAX PARCEL BOUNDARIES
- 1490 — 2' LIDAR CONTOURS
- MILL AND REPAVE, 2" TOP COAT
- NEW PAVED AREA, 8" ITEM 4, 4" BINDER, 2" TOP COAT
- FEDERAL RIVERINE AREA

40 0 20 40 80

PLAN SCALE=1"= 40'

DATE: 6/30/2020
DRAWN BY: MO
SCALE: 1"=40'
REVIEWED BY: DRO
PROJECT NO.: 19-1890
FILE: (1) THOMP/EM GR

DELAWARE ENGINEERING, D.P.C.
CIVIL AND ENVIRONMENTAL ENGINEERING
55 SOUTH MAIN STREET, ONEONTA, NY 13820 - 607.432.8073
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31 N. MAIN STREET, LIBERTY, NY 12754 - 845.747.9952
16 EAST MARKET STREET, RED HOOK, NY 12571 - 518.452.1290

REVISIONS

NO.	DATE	DESCRIPTION
.		

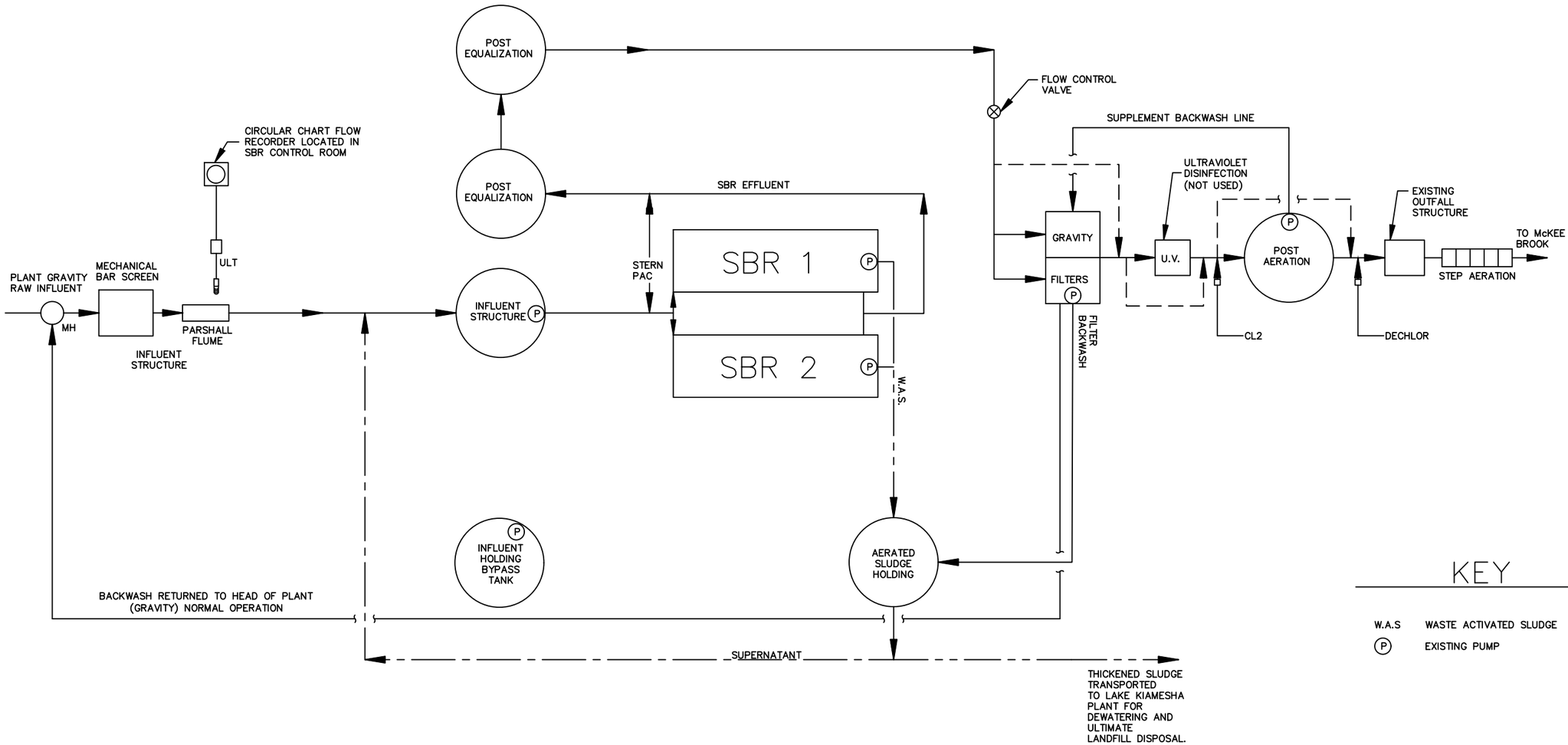
EMERALD GREEN WWTP
TOWN OF THOMPSON
SULLIVAN COUNTY, NY

SITE PLAN
WITH IMPROVEMENTS

SHEET:
FIG-3

FIGURE 4

Existing Process Schematic



KEY

W.A.S WASTE ACTIVATED SLUDGE

(P) EXISTING PUMP

EXISTING PROCESS SCHEMATIC

NORMAL FLOW TRAIN

BYPASS

WASTE SLUDGE

DECANT

CHEMICAL FEED

DATE: 06.30.20
DRAWN BY: AD
SCALE: NTS
REVIEWED BY: JP
PROJECT NO.: PROJ. NO
FILE: T.THOMPSON

DELAWARE ENGINEERING, D.P.C.
CIVIL AND ENVIRONMENTAL ENGINEERING
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6 COMMERCE STREET, WILLISTON, VT 05495 - 802.865.4595
31 N. MAIN STREET, LIBERTY, NY 12754 - 845.747.8952
16 EAST MARKET STREET, RED HOOK, NY 12571 - 518.452.1290

REVISIONS

NO.	DATE	DESCRIPTION

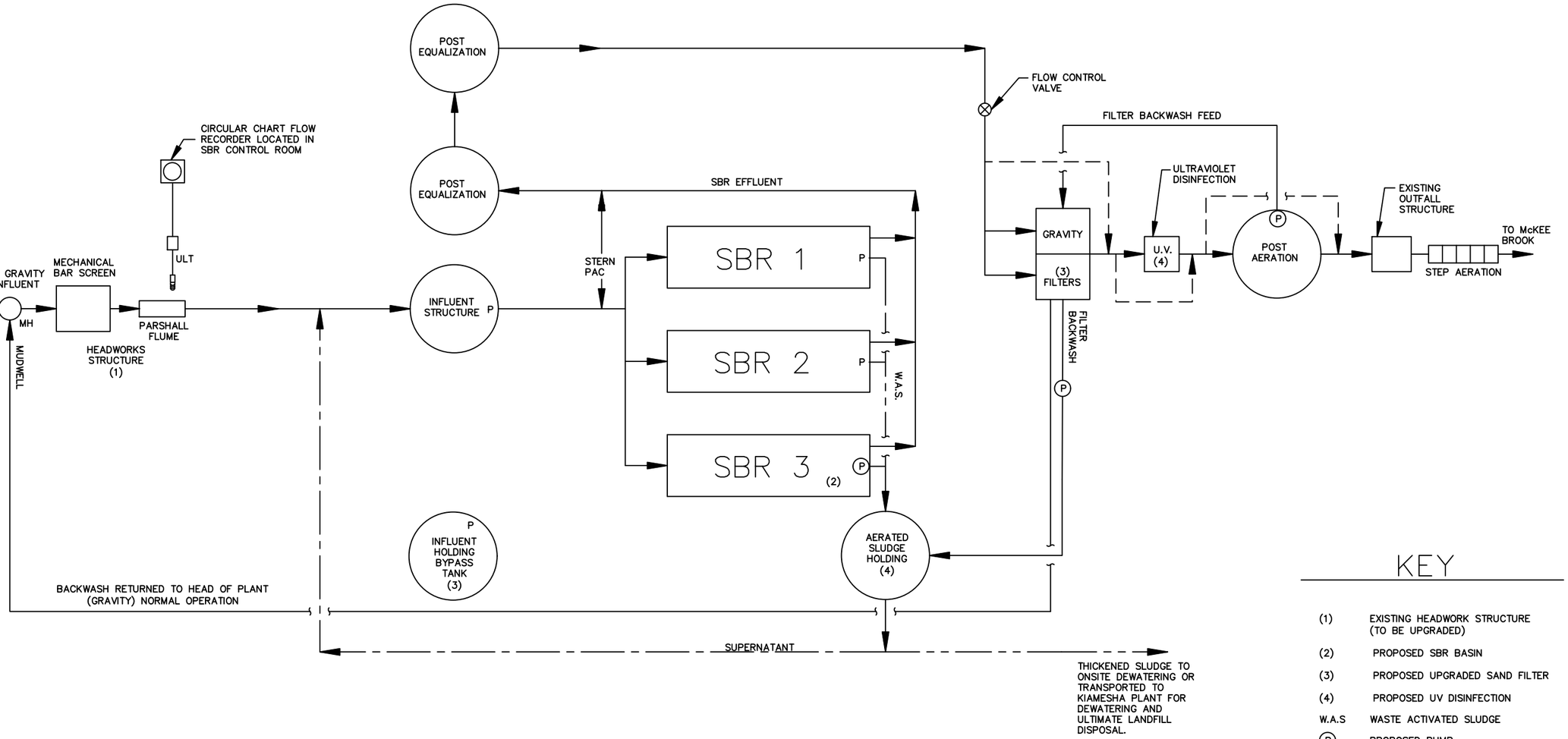
EMERALD GREEN WWTP
TOWN OF THOMPSON
SULLIVAN COUNTY, NY

EXISTING PROCESS SCHEMATIC

SHEET: FIG-4

FIGURE 5

Proposed Process Schematic



KEY

(1)	EXISTING HEADWORK STRUCTURE (TO BE UPGRADED)
(2)	PROPOSED SBR BASIN
(3)	PROPOSED UPGRADED SAND FILTER
(4)	PROPOSED UV DISINFECTION
W.A.S	WASTE ACTIVATED SLUDGE
(P)	PROPOSED PUMP
P	EXISTING PUMP

PROPOSED PROCESS SCHEMATIC

NORMAL FLOW TRAIN

BYPASS

WASTE SLUDGE

DECANT

CHEMICAL FEED

DATE: 06.30.20
DRAWN BY: AD
SCALE: NTS
REVIEWED BY: JP
PROJECT NO.: PROJ. NO
FILE: T.THOMPSON

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CIVIL AND ENVIRONMENTAL ENGINEERING
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28 MADISON AVENUE EXTENSION, ALBANY, NY 12203 - 518.452.1290
6 COUNCIL STREET, WALTON, NY 13856 - 607.865.6535
31 N. MAIN STREET, LIBERTY, NY 12754 - 845.747.3952
16 EAST MARKET STREET, RED HOOK, NY 12571 - 518.452.1290

REVISIONS

NO.	DATE	DESCRIPTION

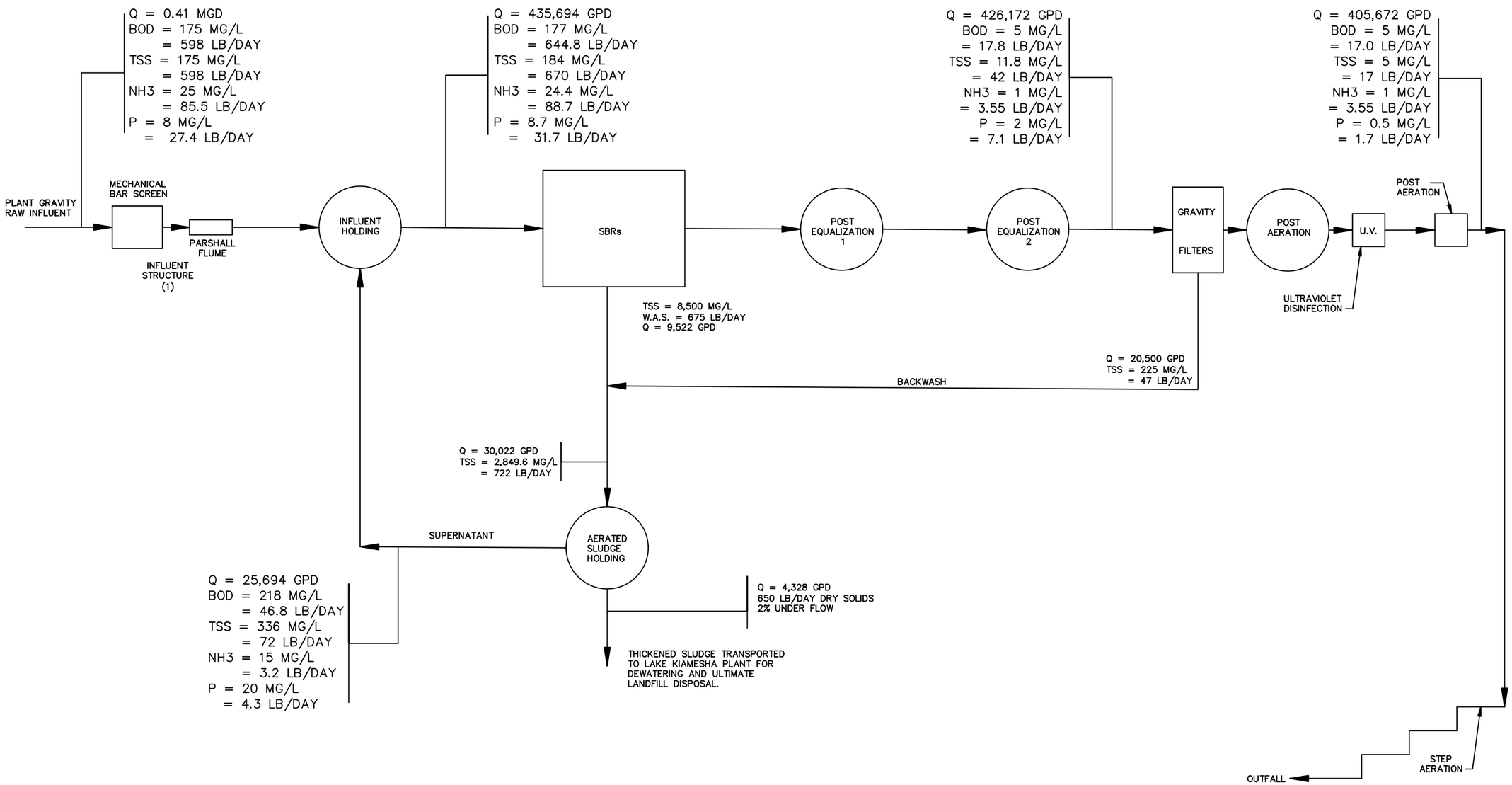
EMERALD GREEN WWTP
TOWN OF THOMPSON
SULLIVAN COUNTY, NY

PROPOSED PROCESS SCHEMATIC

SHEET: FIG-5

FIGURE 6

Existing Mass Balance



EXISTING MASS BALANCE

DATE: 06.30.20
DRAWN BY: AD
SCALE: NTS
REVIEWED BY: JP
PROJECT NO.: PROJ. NO
FILE: T THOMPSON

DELAWARE ENGINEERING, D.P.C.
CIVIL AND ENVIRONMENTAL ENGINEERING
55 SOUTH MAIN STREET, ONEONTA, NY 13820 - 607.432.8873
28 MADISON AVENUE EXTENSION, ALBANY, NY 12203 - 518.452.1290
6 FOWLER STREET, WATERVLIET, NY 12189 - 518.266.0295
31 N. MAIN STREET, LIBERTY, NY 12754 - 845.747.8952
16 EAST MARKET STREET, RED HOOK, NY 12571 - 518.452.1290

REVISIONS

NO.	DATE	DESCRIPTION

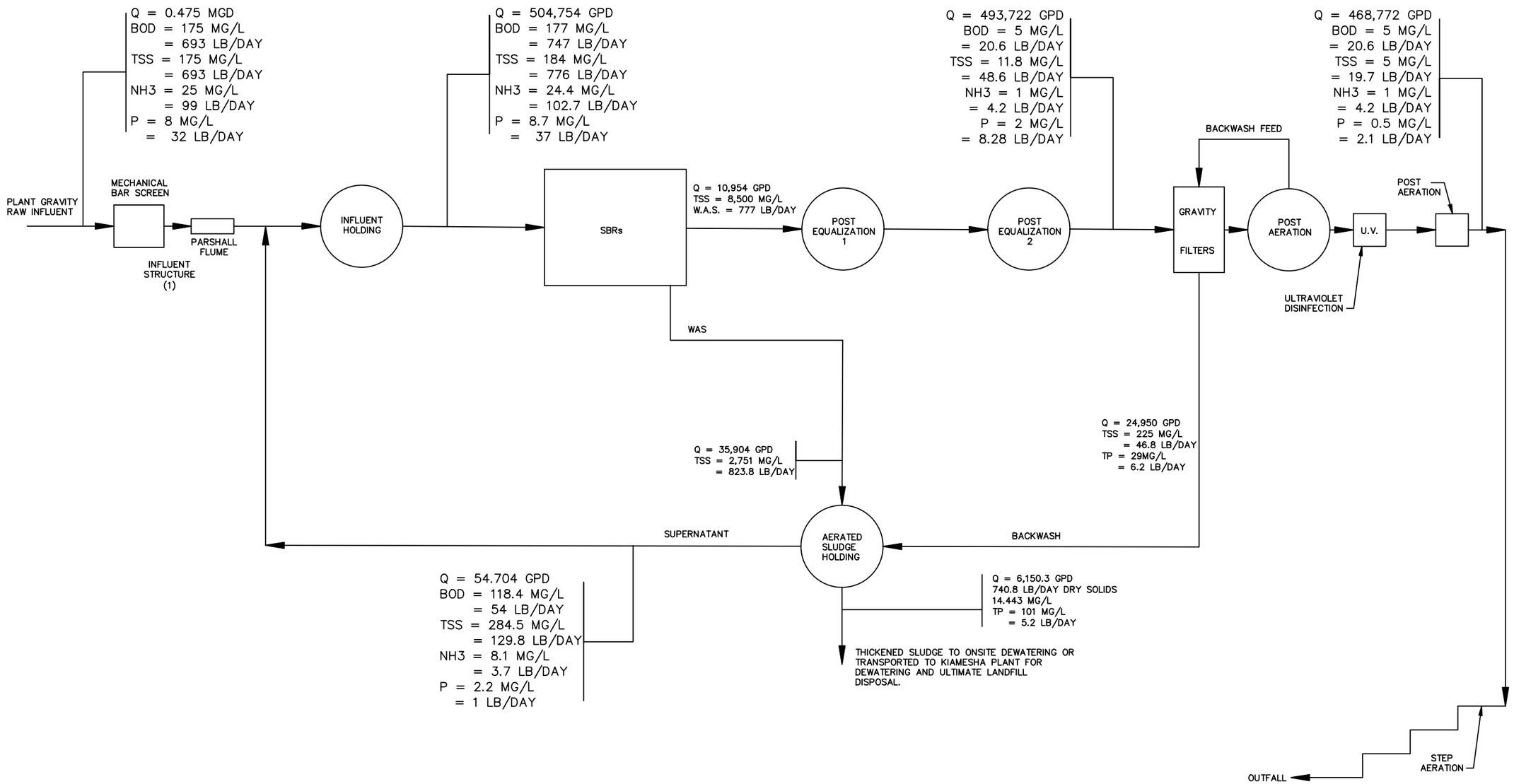
EMERALD GREEN WWTP
TOWN OF THOMPSON
SULLIVAN COUNTY, NY

EXISTING MASS BALANCE

SHEET: FIG-6

FIGURE 7

Proposed Mass Balance



PROPOSED MASS BALANCE

DATE: 06.30.20
DRAWN BY: AD
SCALE: NTS
REVIEWED BY: JP
PROJECT NO.: PROJ. NO
FILE: T.THOMPSON

DELAWARE ENGINEERING, D.P.C.
CIVIL AND ENVIRONMENTAL ENGINEERING
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6 FOWLER STREET, WATERVLIET, NY 12189 - 518.235.0835
31 N. MAIN STREET, LIBERTY, NY 12754 - 845.747.8952
16 EAST MARKET STREET, RED HOOK, NY 12571 - 518.452.1290

REVISIONS

NO.	DATE	DESCRIPTION

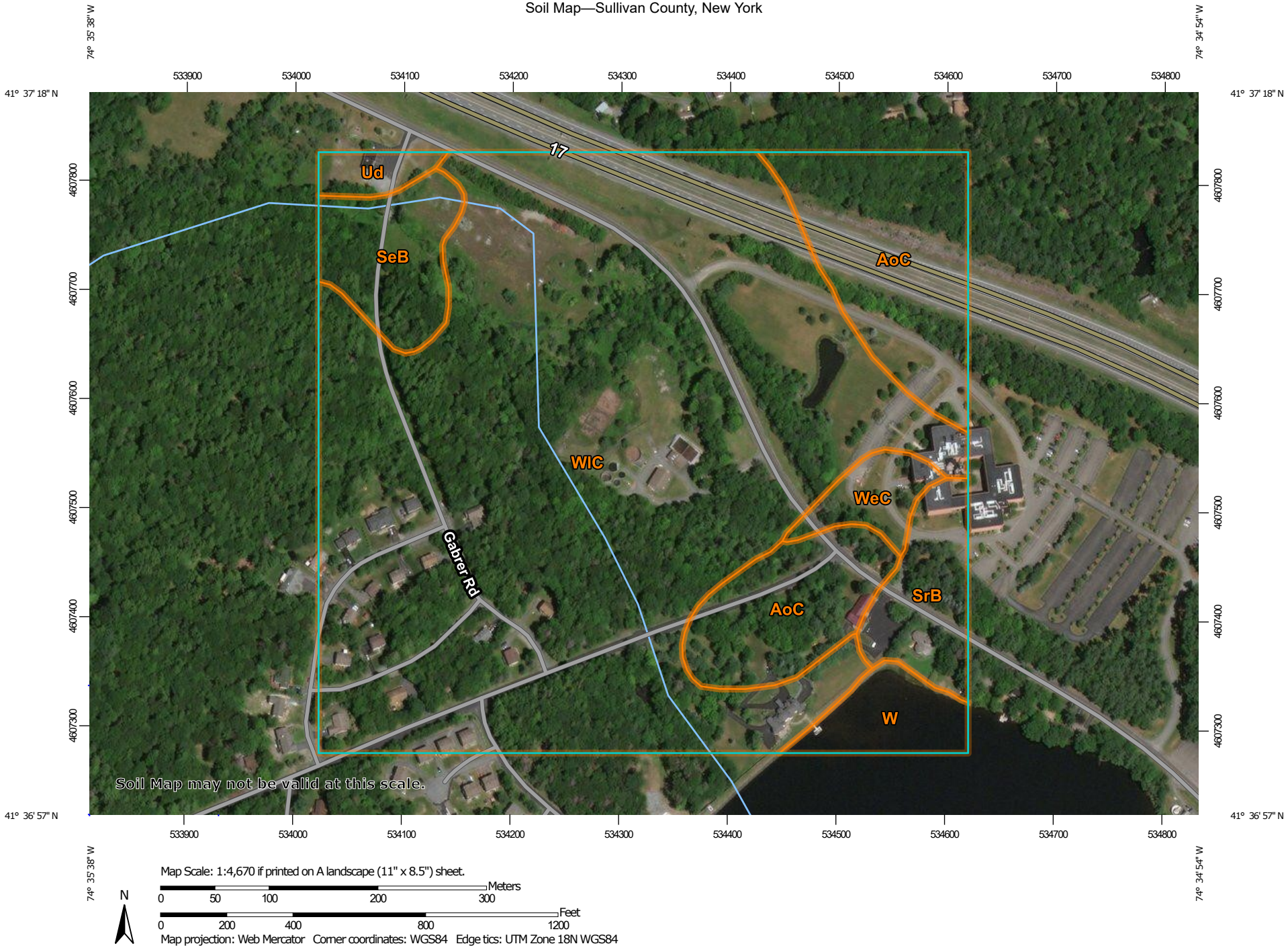
EMERALD GREEN WWTP
TOWN OF THOMPSON
SULLIVAN COUNTY, NY

PROPOSED MASS BALANCE

SHEET: FIG-7

APPENDIX A

Project Background Information



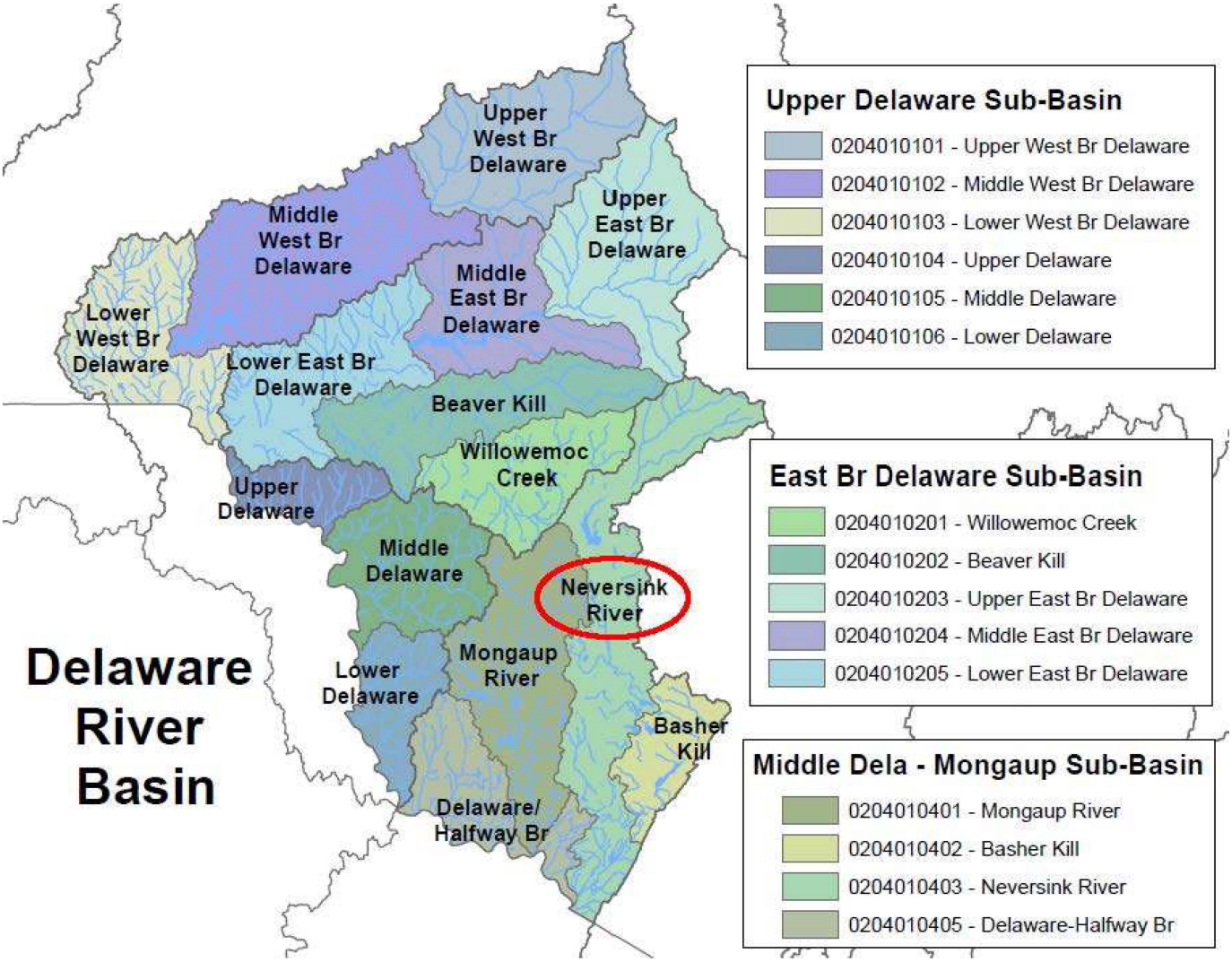
Map Scale: 1:4,670 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 50 100 200 300

Feet
0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84



Neversink River Watershed (0204010403)

Water Index Number	Waterbody Segment	Category
D- 1 (portion 1)	Neversink River, Lower, Main Stem (1402-0020)	MinorImpacts
D- 1 (portion 2)	Neversink River, Middle, Main Stem (1402-0006)	NoKnownImpct
D- 1 (portion 3)	Neversink River, Middle, Main Stem (1402-0021)	MinorImpacts
D- 1 (portion 4)/P58b	Neversink Reservoir (1402-0009)	Impaired Seg
D- 1 (portion 5)	Upper Neversink River and minor tribs (1402-0022)	MinorImpacts
D- 1- 1 thru 11 (selected)	Minor Tribs to Lower Neversink River (1402-0023)	MinorImpacts
D- 1- 2	Trib to Neversink/Port Jervis W.Supply (1402-0025)	UnAssessed
D- 1- 2-1-P2	Martin Lake (1402-0026)	UnAssessed
D- 1- 2-P3,P4,P5	Port Jervis Reservoirs (1402-0027)	UnAssessed
D- 1- 5-P5a	Hawthorne Lake (1402-0028)	UnAssessed
D- 1- 6-P8,P9	Lake Marling, Sand Pond (1402-0029)	UnAssessed
D- 1- 9-P13	Walls Pond (1402-0030)	UnAssessed
D- 1-10-P14	Guymard/Guymaer Lake (1402-0031)	UnAssessed
D- 1-13 thru 36 (selected)	Minor Tribs to Middle Neversink (1402-0041)	UnAssessed
D- 1-13	Unnamed trib to Neversink (1 402-0040)	UnAssessed

D- 1-22	Bush Kill and tribs (1402-0042)	NoKnownImpct
D- 1-22- 1-P31	Beaverdam Pond (1402-0043)	UnAssessed
D- 1-22-P33,P35,P36	Crane, Gilman Ponds, Melody Lake (1402-0044)	UnAssessed
D- 1-33-P37	Wolf Reservoir (1402-0045)	Need Verific
D- 1-34,35,36	Mercer, McKee, Barnum Brooks and tribs (1402-0046)	UnAssessed
D- 1-35-P38c	Davies Lake (1402-0047)	UnAssessed
D- 1-35-P39	Treasure Lake (1402-0048)	UnAssessed
D- 1-35-P40	McKee Reservoir/Lake Louise Marie (1402-0049)	UnAssessed
D- 1-37 thru 63 (selected)	Minor Tribs to Middle Neversink (1402-0050)	NoKnownImpct
D- 1-38	Sheldrake Stream and minor tribs (1402-0051)	NoKnownImpct
D- 1-38-3	Kiamesha Creek and minor tribs (1402-0005)	NoKnownImpct
D- 1-38-3-2	Anawana Brook and tribs (1402-0052)	UnAssessed
D- 1-38-3-2-P40b	Lotus/Bailey Lake (1402-0053)	UnAssessed
D- 1-38-3-2-P41	Anawana Lake (1402-0054)	UnAssessed
D- 1-38-3-P44	Kiamesha Lake (1402-0003)	NeedVerific
D- 1-38-P45	Pleasure Lake (1402-0055)	UnAssessed
D- 1-38-P47	Alta Lake (1402-0056)	UnAssessed
D- 1-38-P50	Hill Pond/Morningside Lake (1402-0001)	Need Verific
D- 1-38-P50a	Evens Lake (1402-0004)	Need Verific
D- 1-38-P51	Loch Sheldrake/Sheldrake Pond (1402-0057)	UnAssessed
D- 1-39-5-P52	Bowers Pond (1402-0058)	UnAssessed
D- 1-39-P53	Wanaksink Lake/Lords Reservoir (1402-0059)	UnAssessed
D- 1-48-P55	East Pond (1402-0060)	UnAssessed
D- 1-49-P55b	Wohl Lake (1402-0061)	UnAssessed
D- 1-51-P57	South Wind Lake (1402-0062)	UnAssessed
D- 1-59-P58a	Lake Paradise (1402-0063)	UnAssessed
D- 1-83-1-P65	Round Pond (1402-0064)	UnAssessed
D- 1-P58b-64 thru 75	Neversink Reservoir Tributaries (1402-0011)	NoKnownImpct
D- 1-P58b-82	East Branch Neversink River and tribs (1402-0007)	MinorImpacts
D- 1-P58b-83	West Branch Neversink River and tribs(1402-0008)	NoKnownImpct

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Sullivan County, New York
Survey Area Data: Version 18, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

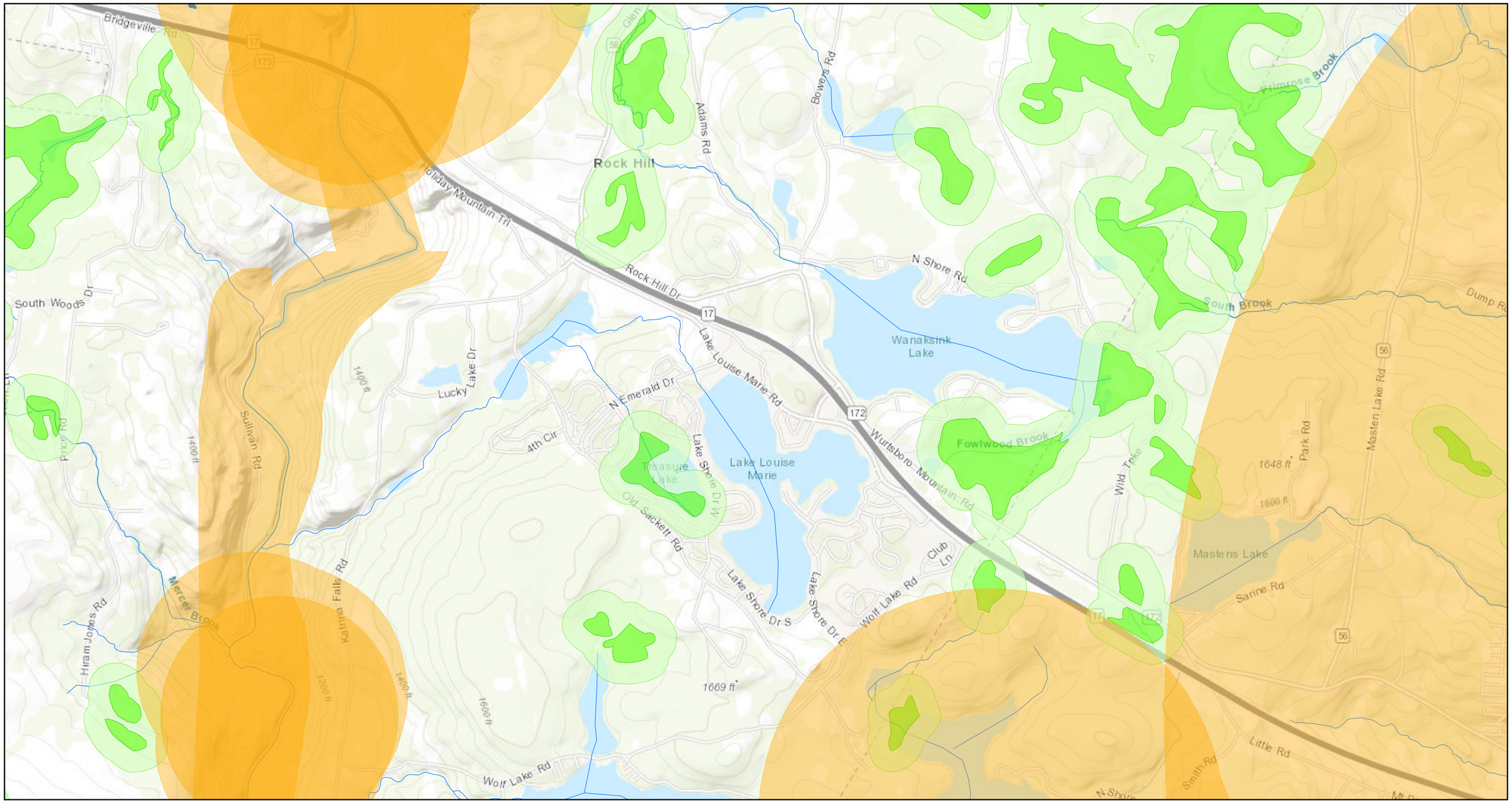
Date(s) aerial images were photographed: Feb 5, 2014—Sep 15, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AoC	Arnot-Oquaga complex, 0 to 15 percent slopes, very rocky	12.1	14.9%
SeB	Scriba and Morris loams, gently sloping, rubbly	3.8	4.6%
SrB	Swartswood gravelly loam, 3 to 8 percent slopes, stony	3.3	4.1%
Ud	Udorthents, smoothed	1.0	1.2%
W	Water	2.3	2.8%
WeC	Wellsboro gravelly loam, 8 to 15 percent slopes	1.6	2.0%
WlC	Wellsboro and Wurtsboro soils, strongly sloping, extremely stony	57.6	70.5%
Totals for Area of Interest		**81.7**	**100.0%**

NYSDEC ERM All Layers



May 21, 2020

1:36,112

0 0.33 0.65 1.3 mi

0 0.5 1 2 km

NYS Department of Environmental Conservation
Not a legal document

Environmental Resource Mapper

The coordinates of the point you clicked on are:

UTM 18	**Easting:**	528515.253	**Northing:**	4612194.277
Longitude/Latitude	**Longitude:**	-74.657	**Latitude:**	41.661

The approximate address of the point you clicked on is:
127-267 Thompson Rd, Monticello, New York, 12701

County: Sullivan
Town: Thompson
USGS Quad: MONTICELLO

DEC Region

Region 3:
(Lower Hudson Valley) Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster and Westchester counties. For more information visit **http://www.dec.ny.gov/about/607.html**.

Waterbody Classifications for Rivers/Streams

Regulation: 815-102
Standard: C
Classification: C

State Regulated Freshwater Wetlands

ID: MO-56
Class: 2
Size (Acres): 55.800000000000004

National Wetands Inventory

Attribute: undefined
Type: undefined
Acres: undefined

For more information about the National Wetands Inventory wetlands visit **http://www.fws.gov/wetlands/**

If your project or action is within or near an area with a rare animal, a permit may be required if the species is listed as endangered or threatened and the department determines the action may be harmful to the species or its habitat.

If your project or action is within or near an area with rare plants and/or significant natural communities, the environmental impacts may need to be addressed.

The presence of a unique geological feature or landform near a project, unto itself, does not trigger a requirement for a NYS DEC permit. Readers are advised, however, that there is the chance that a unique feature may also show in another data layer (ie. a wetland) and thus be subject to permit jurisdiction.

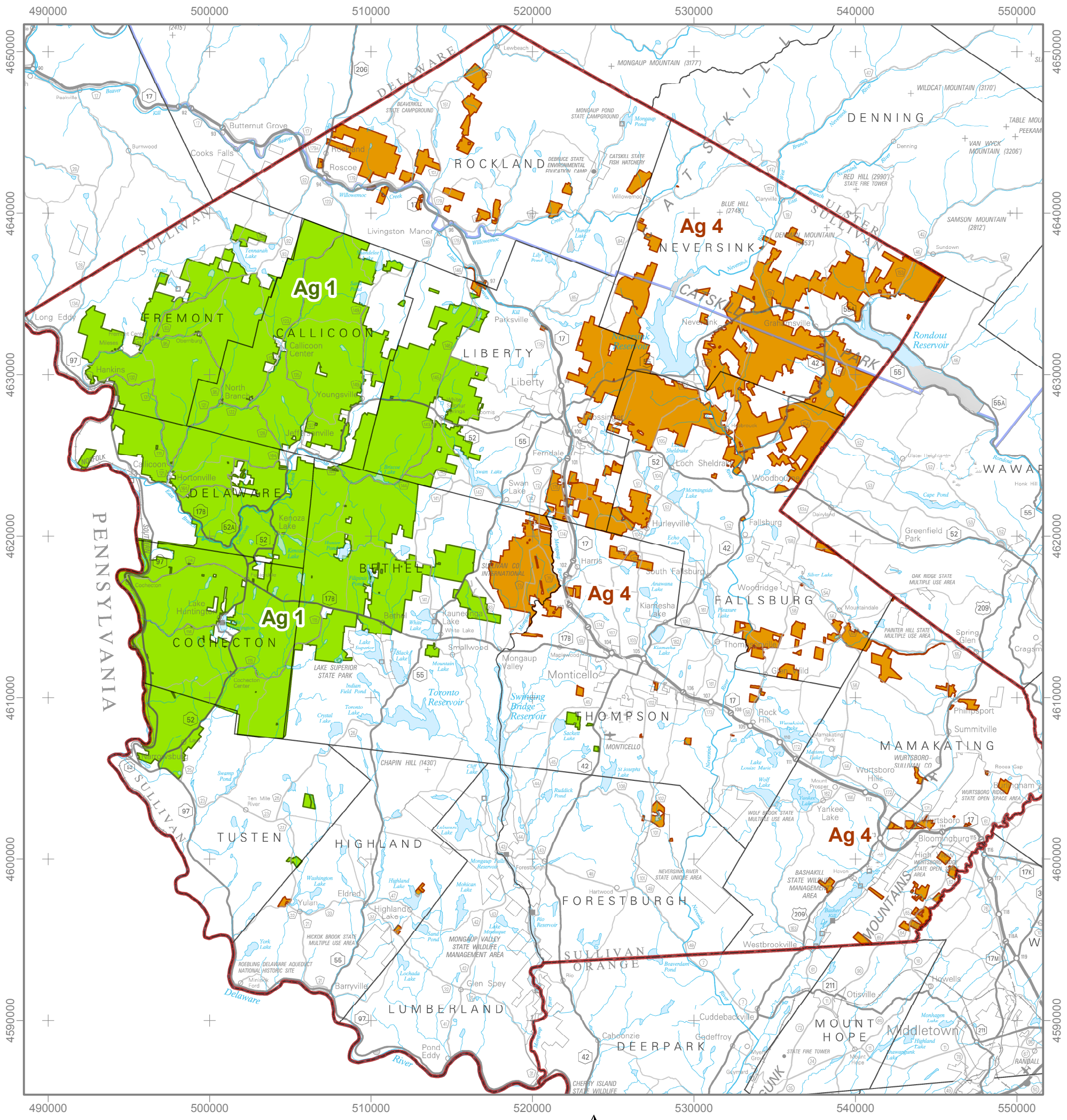
Please refer to the "Need a Permit?" tab for permit information or other authorizations regarding these natural resources.

Disclaimer: If you are considering a project or action in, or near, a wetland or a stream, a NYS DEC permit may be required. The Environmental Resources Mapper does not show all natural resources which are regulated by NYS DEC, and for which permits from NYS DEC are required. For example, Regulated Tidal Wetlands, and Wild, Scenic, and Recreational Rivers, are currently not included on the maps.

New York State Dept of Agriculture and Markets

SULLIVAN COUNTY

Agricultural Districts 2016



MAP PROJECTION
UTM Zone 18, NAD83 meters

5 4 3 2 1 0 5 miles
10,000 5,000 0 10,000 meters

KEY

Ag. District 1

Ag. District 4

DISTRICT CERTIFICATIONS and TOWNS

DISTRICT 1
CERTIFIED 11/13/2013

Bethel	Delaware	Thompson
Callicoon	Fremont	Tusten
Cochecton	Liberty	

DISTRICT 4
CERTIFIED 10/15/2015

Bethel	Highland	Neversink
Fallsburg	Liberty	Rockland
Forestburgh	Mamakating	Thompson

MAP SOURCE INFORMATION

Map created at Cornell IRIS (Institute for Resource Information Sciences) <http://iris.css.cornell.edu> for the NYS Department of Agriculture and Markets

Agricultural Districts boundary data is available at CUGIR (Cornell University Geospatial Information Repository) website: <http://cugir.mannlib.cornell.edu>

Base Map: state250_bw.tif 1998
Scale: 1:250,000; County boundaries imported from the file nyshore.e00 from the NYSGIS Clearinghouse website: <http://gis.ny.gov>

DISCLAIMER
This is a general reference to Agricultural District boundaries; not a legal substitute for actual tax parcel information.

Boundaries as certified prior to January 2016

Open Enrollment Annual Additions are not included in this data. Check with county agencies to confirm the status of individual parcels.

Emerald Green WWTP Upgrade & Expansion Project

Sullivan County

Agricultural Districts

1:36,112

0 0.3 0.6 1.2 mi

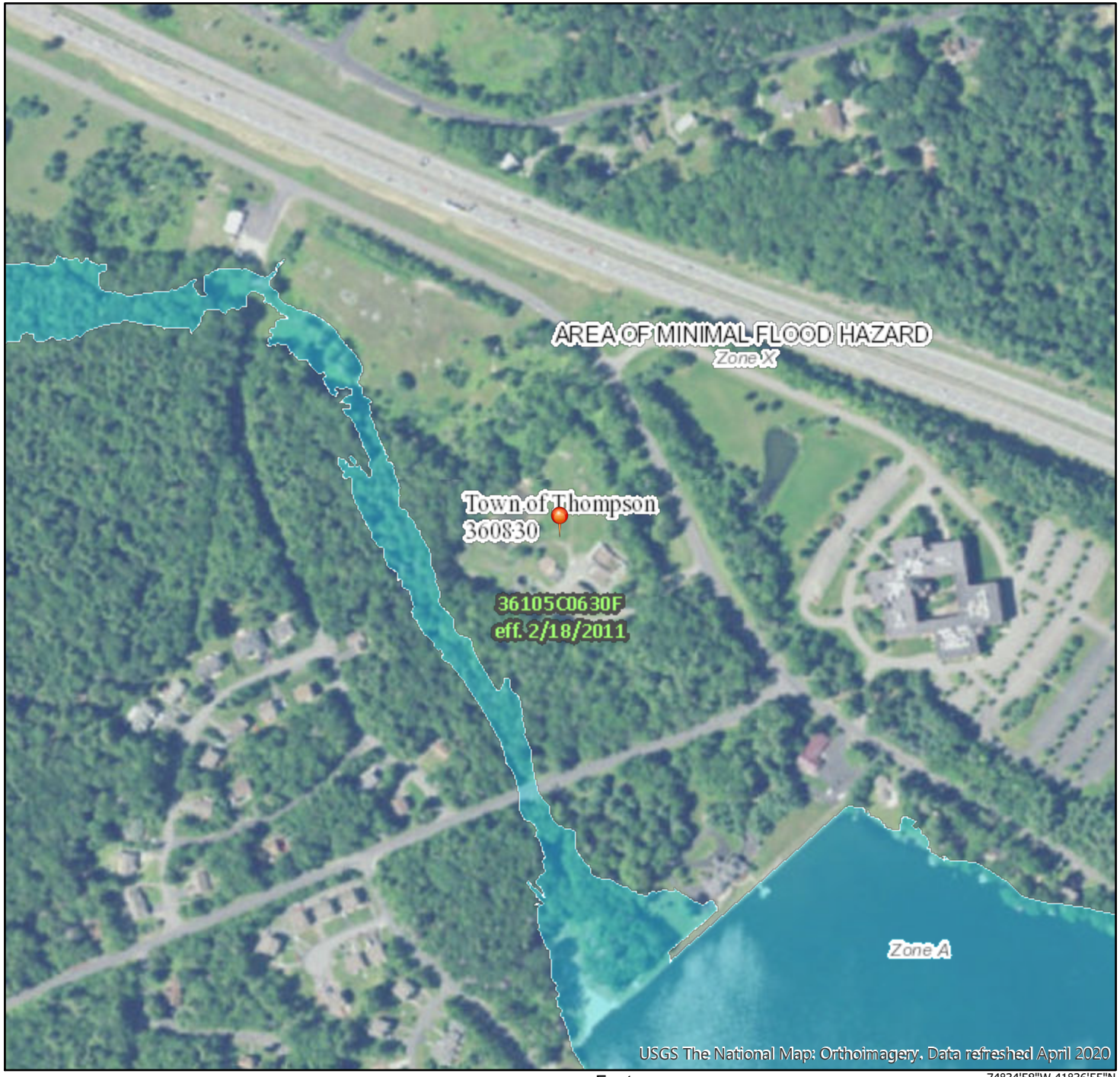
0 0.5 1 2 km

Judy Littrell 22-JUN-2020 @ 11:23:57

National Flood Hazard Layer FIRMette

FEMA

74°35'36"W 41°37'22"N



74°34'58"W 41°36'55"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 6/26/2020 at 2:16 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

APPENDIX B

WWTP SPDES Permit

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

State Pollutant Discharge Elimination System (SPDES) DISCHARGE PERMIT

Industrial Code:	**4952**	SPDES Number:	**NY0035645**
Discharge Class (CL):	**07**	DEC Number:	**3-4846-00196/00001**
Toxic Class (TX):	**N**	Effective Date (EDP):	**09/01/2019**
Major Drainage Basin:	**14**	Expiration Date (ExDP):	**08/31/2024**
Sub Drainage Basin:	**02**	Modification Dates: (EDPM)	
Water Index Number:	**D-1-35**		
Compact Area:	**DRBC**		

This SPDES permit is issued in compliance with Title 8 of Article 17 of the Environmental Conservation Law of New York State and in compliance with the Clean Water Act, as amended, (33 U.S.C. §1251 et.seq.)(hereinafter referred to as "the Act").

PERMITTEE NAME AND ADDRESS					
Name:	**Town of Thompson**	Attention:			
Street:	**4052 State Route 42**				
City:	**Monticello**	State:	**NY**	Zip Code:	**12701**
Email:		Phone:			

is authorized to discharge from the facility described below:

FACILITY NAME AND ADDRESS																	
Name:	**Emerald Green-Lake Louise Marie S&W District**																
Location (C, T, V):	**(T) Thompson**									County:	**Sullivan**						
Facility Address:	**4052 State Route 42**																
City:	**Monticello**				State:				**NY**	Zip Code:	**12701**						
Facility Location:		Latitude:	**41**	°	**35**	'	**16**	" N	& Longitude:	**74**	°	**35**	'	**16**	" W		
From Outfall No.:	**001**	at Latitude:	**41**	°	**37**	'	**08**	" N	& Longitude:	**74**	°	**35**	'	**20**	" W		
into receiving waters known as:	**McKee Brook**								Class:	**B (T)**							

and the outfalls listed on page 3 of this permit in accordance with: effluent limitations; monitoring and reporting requirements; other provisions and conditions set forth in this permit; and 6 NYCRR Part 750-1 and 750-2.

This permit and the authorization to discharge shall expire on midnight of the expiration date shown above. The permittee shall not discharge after the expiration date unless this permit has been renewed or extended pursuant to law. To be authorized to discharge beyond the expiration date, the permittee shall apply for permit renewal not less than 180 days prior to the expiration date shown above.

DISTRIBUTION:
CO BWP - Permit Coordinator
RWE
RPA
EPA Region II
NYSEFC
NYSDOH District Office

Deputy Chief Permit Administrator:	Scott E. Sheeley	
Address:	Division of Environmental Permits 625 Broadway, 4th Floor Albany, NY 12233-1750	
Signature:	Scott E. Sheeley	Date: AUG. 14, 2019

PERMIT LIMITS, LEVELS AND MONITORING DEFINITIONS

OUTFALL	WASTEWATER TYPE	RECEIVING WATER	EFFECTIVE	EXPIRING
	This cell describes the type of wastewater authorized for discharge. Examples include process or sanitary wastewater, storm water, non-contact cooling water.	This cell lists classified waters of the state to which the listed outfall discharges.	The date this page starts in effect. (e.g. EDP or EDPM)	The date this page is no longer in effect. (e.g. ExDP)

PARAMETER	MINIMUM	MAXIMUM	UNITS	SAMPLE FREQ.	SAMPLE TYPE
e.g. pH, TRC, Temperature, D.O.	The minimum level that must be maintained at all instants in time.	The maximum level that may not be exceeded at any instant in time.	SU, °F, mg/l, etc.	See below	See below

PARAMETER	EFFLUENT LIMIT or CALCULATED LEVEL	COMPLIANCE LEVEL / MINIMUM LEVEL (ML)	ACTION LEVEL	UNITS	SAMPLE FREQUENCY	SAMPLE TYPE
	Limit types are defined below in Note 1. The effluent limit is developed based on the more stringent of technology-based limits, required under the Clean Water Act, or New York State water quality standards. The limit has been derived based on existing assumptions and rules. These assumptions include receiving water hardness, pH and temperature; rates of this and other discharges to the receiving stream; etc. If assumptions or rules change the limit may, after due process and modification of this permit, change.	For the purposes of compliance assessment, the permittee shall use the approved EPA analytical method with the lowest possible detection limit as promulgated under 40CFR Part 136 for the determination of the concentrations of parameters present in the sample unless otherwise specified. If a sample result is below the detection limit of the most sensitive method, compliance with the permit limit for that parameter was achieved. Monitoring results that are lower than this level must be reported, but shall not be used to determine compliance with the calculated limit. This Minimum Level (ML) can be neither lowered nor raised without a modification of this permit.	Action Levels are monitoring requirements, as defined below in Note 2, which trigger additional monitoring and permit review when exceeded.	This can include units of flow, pH, mass, temperature, or concentration. Examples include µg/l, lbs/d, etc.	Examples include Daily, 3/week, weekly, 2/month, monthly, quarterly, 2/yr and yearly. All monitoring periods (quarterly, semiannual, annual, etc.) are based upon the calendar year unless otherwise specified in this Permit.	Examples include grab, 24 hour composite and 3 grab samples collected over a 6 hour period.

Notes:

1. EFFLUENT LIMIT TYPES:
   a. DAILY DISCHARGE: The discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for the purposes of sampling. For pollutants expressed in units of mass, the 'daily discharge' is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the 'daily discharge' is calculated as the average measurement of the pollutant over the day.
   b. DAILY MAX: The highest allowable daily discharge.
   c. DAILY MIN: The lowest allowable daily discharge.
   d. MONTHLY AVG: The highest allowable average of daily discharges over a calendar month, calculated as the sum of each of the daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.
   e. 7 DAY ARITHMETIC MEAN (7 day average): The highest allowable average of daily discharges over a calendar week.
   f. 30 DAY GEOMETRIC MEAN: The highest allowable geometric mean of daily discharges over a calendar month, calculated as the antilog of: the sum of the log of each of the daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.
   g. 7 DAY GEOMETRIC MEAN: The highest allowable geometric mean of daily discharges over a calendar week.
   h. 12 MONTH ROLLING AVERAGE: The current monthly value of a parameter, plus the sum of the monthly values over the previous 11 months for that parameter, divided by 12.
   i. RANGE: The minimum and maximum instantaneous measurements for the reporting period must remain between the two values shown.

2. ACTION LEVELS: Routine Action Level monitoring results, if not provided for on the Discharge Monitoring Report (DMR) form, shall be appended to the DMR for the period during which the sampling was conducted. If the additional monitoring requirement is triggered as noted below, the permittee shall undertake a short-term, high-intensity monitoring program for the parameter(s). Samples identical to those required for routine monitoring purposes shall be taken on each of at least three consecutive operating and discharging days and analyzed. Results shall be expressed in terms of both concentration and mass, and shall be submitted no later than the end of the third month following the month when the additional monitoring requirement was triggered. Results may be appended to the DMR or transmitted under separate cover to the same address. If levels higher than the Action Levels are confirmed, the permit may be reopened by the Department for consideration of revised Action Levels or effluent limits. The permittee is not authorized to discharge any of the listed parameters at levels which may cause or contribute to a violation of water quality standards.

PERMIT LIMITS, LEVELS AND MONITORING

OUTFALL	LIMITATIONS APPLY:	RECEIVING WATER	EFFECTIVE	EXPIRING
001	All Year unless otherwise noted	McKee Brook	09/01/2019	08/31/2024

PARAMETER	EFFLUENT LIMIT					MONITORING REQUIREMENTS				FN
								Location		
	Type	Limit	Units	Limit	Units	Sample Frequency	Sample Type	Inf.	Eff.	
Flow	Monthly Average	410,000	GPD			Continuous	Recorder	X		
$CBOD_5$	Monthly Average	5	mg/l	17.10	lbs/d	2/Month	6-hr. Comp.	X	X	(1)
Solids, Suspended	Monthly Average	10	mg/l	34.20	lbs/d	2/Month	6-hr. Comp.	X	X	(1)
Solids, Settleable	Daily Maximum	0.1	ml/l			Daily	Grab	X	X	
pH	Range	6.5 – 8.5	SU			Daily	Grab	X	X	
Nitrogen, TKN (as N)	Monitor		mg/l			Daily	6-hr. Comp.	X	X	
Nitrogen, Ammonia (as NH3) (June 1 to October 31)	Monthly Average	1.1	mg/l			Daily	6-hr. Comp.	X	X	
Nitrogen, Ammonia (as NH3 (November 1 to May 31)	Monthly Average	2.2	mg/l			Daily	6-hr. Comp.	X	X	
Phosphorus, Total (as P)	Monthly Average	0.5	mg/l			Daily	6-hr. Comp.	X	X	
Dissolved Oxygen	Daily Minimum	7.0	mg/l			Daily	Grab	X	X	
Effluent Disinfection required		[ ] All Year		[X] Seasonal from **May 1** to **Oct 31**						
Coliform, Fecal	30-Day Geometric Mean	200	No./ 100 ml				Grab		X	
Coliform, Fecal	7 Day Geometric Mean	400	No./ 100 ml				Grab		X	
Chlorine, Total Residual	Daily Maximum	0.03	mg/l				Grab		X	(2, 3)

PARAMETER	EFFLUENT LIMIT or CALCULATED LEVEL		COMPLIANCE LEVEL/ ML	ACTION LEVEL	UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	FN
	Monthly Avg	Daily Max						
Temperature				70	°F	1/day	Grab	(4)

Footnotes listed on page 4 of this permit.

FOOTNOTES:

(1) and effluent shall not exceed 15 % and 15 % of influent concentration values for BOD5 & TSS respectively.

(2) if chlorine is used for disinfection.

(3) an interim limit of 2.0 mg/l for Total Residual Chlorine shall be in effect as interim limits until the construction of facilities to achieve compliance with the final effluent limit of 0.03 mg/l.

(4) Temperature Action Level

Sampling Requirements – If the discharge temperature exceeds the Action Level of 70 degrees Fahrenheit the permittee shall, within one week, undertake the following one day monitoring program:

Monitoring Program – Temperature shall be measured at the following three locations, on the same day once in the morning and once in the afternoon:

1. effluent as close as practical to the outfall without influence from the receiving water,
2. receiving water downstream, about 200 feet downstream of the outfall,
3. receiving water 0 to 10 feet upstream of the outfall

The receiving water sampling locations shall be documented by the permittee and used for all subsequent monitoring, depicted on the Monitoring Locations page, locations 2 and 3 above, shall be used for monitoring unless a different location is approved by the Department. Temperature monitoring (i.e., collection and analysis of one round of influent, effluent, upstream, and downstream samples) shall be completed within one hour.

The permittee is exempt from this temperature monitoring program whenever conditions at or near the in-stream monitoring locations are unsafe due to weather.

Reporting - Results shall be appended to the corresponding Discharge Monitoring Report (DMR) and emailed in spreadsheet format to spdes.temperaturedata@dec.ny.gov.

TEMPERATURE MANAGEMENT FOR POTWs[1] DISCHARGES TO TROUT WATERS

The permittee is required to develop, maintain, and implement a temperature management plan. The purpose of this plan is to minimize the thermal impacts to the receiving water. The goal of the temperature management plan will be to reduce effluent temperature below the 70 degrees Fahrenheit Action Level. The permittee shall submit a plan which incorporates the following items:

1. **Thermal Track Down** – Permittee must conduct a thermal assessment of the current collection and treatment system. This is to include influent and effluent temperature monitoring data from the treatment system and each unit within the system. Any process or input source that adds heat to the system must be identified.

2. **Passive Cooling Measures** – Permittee shall assess passive cooling measures (e.g. shading of tankage) which may be implemented to reduce effluent temperature to the maximum extent practical. Such measures can be operational or physical modifications which the permittee believes will prove effective.

3. **Implementation –** The temperature management plan shall contain action items to address the assessments noted in 1 and 2 above as well as a schedule for implementation and shall be submitted to the Department for approval. The temperature management plan and schedule will become an enforceable part of the permit upon approval by the Department.

4. **Compliance Deadlines –** The permittee shall submit the temperature management plan **by 03/01/2020** to the Regional office listed on the Recording, Reporting and Additional Monitoring page of this permit and to the Bureau of Water Permits, 625 Broadway, Albany, NY 12233-3505, and in electronic format to spdes.temperaturedata@dec.ny.gov.

Mercury Minimization Program for Low Priority POTWs

The permittee shall inspect each tributary dental facility at least once every five years to verify compliance with the wastewater treatment operation, maintenance, and notification elements of 6NYCRR Part 374.4. In lieu of an inspection, the permittee can accept a certification from the dental facility owner that the treatment system was properly installed and the facility complies with the wastewater treatment operation, maintenance, and notification elements of 6NYCRR Part 374.4. Prior to acceptance of new or increased tributary discharges that are industrial in nature, including hauled wastes, sample data shall be provided to the permittee for mercury content. Discharges which may exceed 500 ng/L, must receive approval from the Department prior to acceptance. A file shall be maintained containing inspection results, certifications, and other information submitted by dental offices and all other potential dischargers of mercury. This file shall be available for review by NYSDEC representatives and copies shall be provided upon request.

Note: the mercury-related requirements in this permit conform to the mercury Multiple Discharge Variance specified in NYSDEC policy *DOW 1.3.10*.

DISCHARGE NOTIFICATION REQUIREMENTS

(a) Except as provided in (c) and (g) of these Discharge Notification Act requirements, the permittee shall install and maintain identification signs at all outfalls to surface waters listed in this permit. Such signs shall be installed before initiation of any discharge.

(b) Subsequent modifications to or renewal of this permit does not reset or revise the deadline set forth in (a) above, unless a new deadline is set explicitly by such permit modification or renewal.

(c) The Discharge Notification Requirements described herein do not apply to outfalls from which the discharge is composed exclusively of storm water, or discharges to ground water.

(d) The sign(s) shall be conspicuous, legible and in as close proximity to the point of discharge as is reasonably possible while ensuring the maximum visibility from the surface water and shore. The signs shall be installed in such a manner to pose minimal hazard to navigation, bathing or other water related activities. If the public has access to the water from the land in the vicinity of the outfall, an identical sign shall be posted to be visible from the direction approaching the surface water.

The signs shall have **minimum** dimensions of eighteen inches by twenty four inches (18" x 24") and shall have white letters on a green background and contain the following information:

N.Y.S. PERMITTED DISCHARGE POINT

SPDES PERMIT No.: NY_____

OUTFALL No. :____

For information about this permitted discharge contact:

Permittee Name: _____

Permittee Contact: _____

Permittee Phone: ( ) - ### - ####

OR:

NYSDEC Division of Water Regional Office Address:

NYSDEC Division of Water Regional Phone: ( ) - ### -####

(e) For each discharge required to have a sign in accordance with a), the permittee shall, concurrent with the installation of the sign, provide a repository of copies of the Discharge Monitoring Reports (DMRs), as required by the **RECORDING, REPORTING AND ADDITIONAL MONITORING REQUIREMENTS** page of this permit. This repository shall be open to the public, at a minimum, during normal daytime business hours. The repository may be at the business office repository of the permittee or at an off-premises location of its choice (such location shall be the village, town, city or county clerk's office, the local library or other location as approved by the Department). In accordance with the **RECORDING, REPORTING AND ADDITIONAL MONITORING REQUIREMENTS** page of your permit, each DMR shall be maintained on record for a period of five years

(f) The permittee shall periodically inspect the outfall identification sign(s) in order to ensure they are maintained, are still visible, and contain information that is current and factually correct. Signs that are damaged or incorrect shall be replaced within 3 months of inspection.

DISCHARGE NOTIFICATION REQUIREMENTS (continued)

(g) All requirements of the Discharge Notification Act, including public repository requirements, are waived for any outfall meeting any of the following circumstances, provided Department notification is made in accordance with (h) below:

(i) such sign would be inconsistent with any other state or federal statute;

(ii) the Discharge Notification Requirements contained herein would require that such sign could only be located in an area that is damaged by ice or flooding due to a one-year storm or storms of less severity;

(iii) instances in which the outfall to the receiving water is located on private or government property which is restricted to the public through fencing, patrolling, or other control mechanisms. Property which is posted only, without additional control mechanisms, does not qualify for this provision;

(iv) instances where the outfall pipe or channel discharges to another outfall pipe or channel, before discharge to a receiving water; or

(v) instances in which the discharge from the outfall is located in the receiving water, two-hundred or more feet from the shoreline of the receiving water.

(h) If the permittee believes that any outfall which discharges wastewater from the permitted facility meets any of the waiver criteria listed in (g) above, notification (form enclosed) must be made to the Department's Bureau of Water Permits, 625 Broadway, Albany, N.Y. 12233-3505, of such fact, and, provided there is no objection by the Department, a sign and DMR repository for the involved outfall(s) are not required. This notification must include the facility's name, address, telephone number, contact, permit number, outfall number(s), and reason why such outfall(s) is waived from the requirements of discharge notification. The Department may evaluate the applicability of a waiver at any time, and take appropriate measures to assure that the ECL and associated regulations are complied with.

SCHEDULE OF COMPLIANCE

a) The permittee shall comply with the following schedule:

Outfall(s)	Compliance Action	Due Date
001	The permittee shall submit an approvable engineering report, prepared by a Professional Engineer licensed to practice engineering in New York State, detailing the disinfection designs that will be used to comply with the final effluent limitations for Total Residual Chlorine.	03/01/2020
	The permittee shall submit approvable Engineering Plans, Specifications, and Construction Schedule for the implementation of effluent disinfection.	DEC Approval of Engineering Report + 6 months.
	The permittee shall begin construction of the treatment facilities in accordance with the Department approved schedule.	May 1, 2021
	The permittee shall complete construction and commence operation of the system and comply with the final effluent limitations for Total Residual Chlorine.	May 1, 2022

Parameter(s)Affected	Interim Effluent Limit(s)	Final Effluent Limit(s)	Effective Date of final effluent limit(s)
Total Residual Chlorine	2.0 mg/l ~~01 mg/l~~	0.03 mg/l	May 1, 2022

The above compliance actions are one time requirements. The permittee shall comply with the above compliance actions to the Department's satisfaction once. When this permit is administratively renewed by NYSDEC letter entitled "SPDES NOTICE/RENEWAL APPLICATION/PERMIT," the permittee is not required to repeat the submission(s) noted above. The above due dates are independent from the effective date of the permit stated in the "SPDES NOTICE/RENEWAL APPLICATION/PERMIT" letter.

b) For any action where the compliance date is greater than 9 months past the previous compliance due date, the permittee shall submit interim progress reports to the Department every nine (9) months until the due date for these compliance items are met.

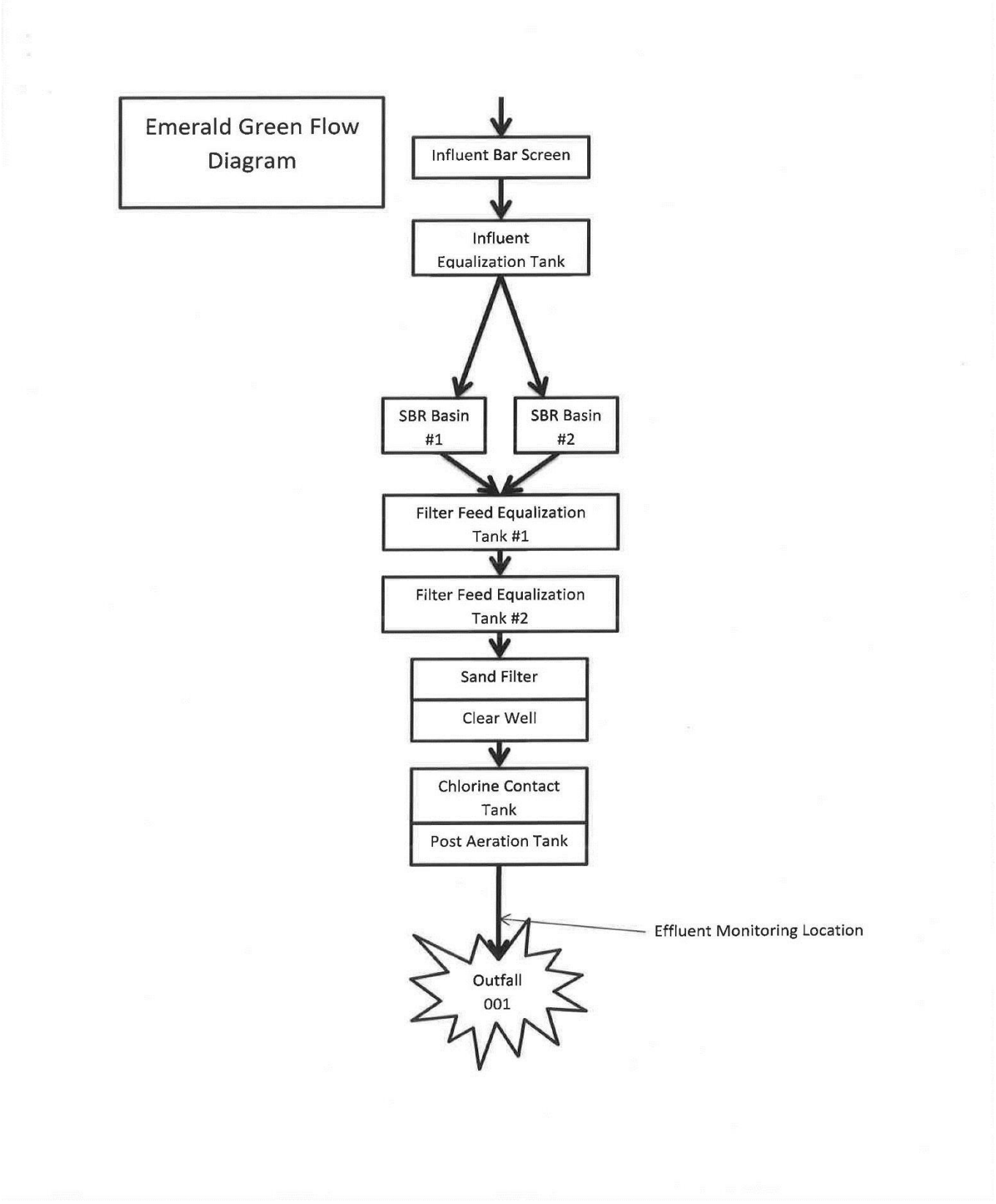
c) The permittee shall submit a written notice of compliance or non-compliance with each of the above schedule dates no later than 14 days following each elapsed date, unless conditions require more immediate notice as prescribed in 6 NYCRR Part 750-1.2(a) and 750-2. All such compliance or non-compliance notification shall be sent to the locations listed under the section of this permit entitled RECORDING, REPORTING AND ADDITIONAL MONITORING REQUIREMENTS. Each notice of non-compliance shall include the following information:

1. A short description of the non-compliance;
2. A description of any actions taken or proposed by the permittee to comply with the elapsed schedule requirements without further delay and to limit environmental impact associated with the non-compliance;
3. A description or any factors which tend to explain or mitigate the non-compliance; and
4. An estimate of the date the permittee will comply with the elapsed schedule requirement and an assessment of the probability that the permittee will meet the next scheduled requirement on time.

d) The permittee shall submit copies of any document required by the above schedule of compliance to the NYSDEC Regional Water Engineer at 100 Hillside Avenue, Suite 1W, White Plains, New York 10603-2860, and to the Bureau of Water Permits, 625 Broadway, Albany, N.Y. 12233-3505, unless otherwise specified in this permit or in writing by the Department.

MONITORING LOCATIONS

The permittee shall take samples and measurements, to comply with the monitoring requirements specified in this permit, at the locations(s) specified below:



GENERAL REQUIREMENTS

A. The regulations in 6 NYCRR Part 750 are hereby incorporated by reference and the conditions are enforceable requirements under this permit. The permittee shall comply with all requirements set forth in this permit and with all the applicable requirements of 6 NYCRR Part 750 incorporated into this permit by reference, including but not limited to the regulations in paragraphs B through J as follows:

B. General Conditions

1.	Duty to comply	6 NYCRR 750-2.1(e) & 2.4
2.	Duty to reapply	6 NYCRR 750-1.16(a)
3.	Need to halt or reduce activity not a defense	6 NYCRR 750-2.1(g)
4.	Duty to mitigate	6 NYCRR 750-2.7(f)
5.	Permit actions	6 NYCRR 750-1.1(c), 1.18, 1.20 & 2.1(h)
6.	Property rights	6 NYCRR 750-2.2(b)
7.	Duty to provide information	6 NYCRR 750-2.1(i)
8.	Inspection and entry	6 NYCRR 750-2.1(a) & 2.3

C. Operation and Maintenance

1.	Proper Operation & Maintenance	6 NYCRR 750-2.8
2.	Bypass	6 NYCRR 750-1.2(a)(17), 2.8(b) & 2.7
3.	Upset	6 NYCRR 750-1.2(a)(94) & 2.8(c)

D. Monitoring and Records

1.	Monitoring and records	6 NYCRR 750-2.5(a)(2), 2.5(a)(6), 2.5(c)(1), 2.5(c)(2), & 2.5(d)
2.	Signatory requirements	6 NYCRR 750-1.8 & 2.5(b)

E. Reporting Requirements

1.	Reporting requirements for POTWs	6 NYCRR 750-2.5, 2.7 & 1.17
2.	Anticipated noncompliance	6 NYCRR 750-2.7(a)
3.	Transfers	6 NYCRR 750-1.17
4.	Monitoring reports	6 NYCRR 750-2.5(e)
5.	Compliance schedules	6 NYCRR 750-1.14(d)
6.	24-hour reporting	6 NYCRR 750-2.7(c) & (d)
7.	Other noncompliance	6 NYCRR 750-2.7(e)
8.	Other information	6 NYCRR 750-2.1(f)
9.	Additional conditions applicable to a POTW	6 NYCRR 750-2.9

F. Planned Changes

1. The permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

    a. The alteration or addition to the permitted facility may meet of the criteria for determining whether facility is a new source in 40 CFR §122.29(b); or
    b. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, or to notification requirements under 40 CFR §122.42(a)(1); or
    c. The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.

In addition to the Department, the permittee shall submit a copy of this notice to the United States Environmental Protection Agency at the following address: U.S. EPA Region 2, Clean Water Regulatory Branch, 290 Broadway, 24th Floor, New York, NY 10007-1866.

GENERAL REQUIREMENTS continued

G. Notification Requirement for POTWs

1. All POTWs shall provide adequate notice to the Department and the USEPA of the following:
   a. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to section 301 or 306 of CWA if it were directly discharging those pollutants; or
   b. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.
   c. For the purposes of this paragraph, adequate notice shall include information on:
      i. the quality and quantity of effluent introduced into the POTW, and
      ii. any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

POTWs shall submit a copy of this notice to the United States Environmental Protection Agency, at the following address: U.S. EPA Region 2, Clean Water Regulatory Branch, 290 Broadway, 24th Floor, New York, NY 10007-1866Sludge Management
The permittee shall comply with all applicable requirements of 6 NYCRR Part 360.

H. Sludge Management

The permittee shall comply with all applicable requirements of 6 NYCRR Part 360.

I. SPDES Permit Program Fee

The permittee shall pay to the Department an annual SPDES permit program fee within 30 days of the date of the first invoice, unless otherwise directed by the Department, and shall comply with all applicable requirements of ECL 72-0602 and 6 NYCRR Parts 480, 481 and 485. Note that if there is inconsistency between the fees specified in ECL 72-0602 and 6 NYCRR Part 485, the ECL 72-0602 fees govern.

J. Water Treatment Chemicals (WTCs)

New or increased use and discharge of a WTC requires prior Department review and authorization. At a minimum, the permittee must notify the Department in writing of its intent to change WTC use by submitting a completed *WTC Notification Form* for each proposed WTC. The Department will review that submittal and determine if a SPDES permit modification is necessary or whether WTC review and authorization may proceed outside of the formal permit administrative process. The majority of WTC authorizations do not require SPDES permit modification. In any event, use and discharge of a WTC shall not proceed without prior authorization from the Department. Examples of WTCs include biocides, coagulants, conditioners, corrosion inhibitors, defoamers, deposit control agents, flocculants, scale inhibitors, sequestrants, and settling aids.

1. WTC use shall not exceed the rate explicitly authorized by this permit or otherwise authorized in writing by the Department.
2. The permittee shall maintain a logbook of all WTC use, noting for each WTC the date, time, exact location, and amount of each dosage, and, the name of the individual applying or measuring the chemical. The logbook must also document that adequate process controls are in place to ensure that excessive levels of WTCs are not used.
3. The permittee shall submit a completed WTC Annual Report Form each year that they use and discharge WTCs. This form shall be attached to either the December DMR or the annual monitoring report required below.

The *WTC Notification Form and WTC Annual Report Form* are available from the Department's website at: http://www.dec.ny.gov/permits/93245.html

RECORDING, REPORTING AND ADDITIONAL MONITORING REQUIREMENTS

A. A. The monitoring information required by this permit shall be retained for a period of at least five years from the date of the sampling for subsequent inspection by the Department or its designated agent.

B. The monitoring information required by this permit shall be summarized and reported by submitting:

Discharge Monitoring Reports (DMRs): Completed DMR forms shall be submitted for each 1 month reporting period in accordance with the DMR Manual available on Department's website.

DMRs must be submitted electronically using the electronic reporting tool (NetDMR) specified by NYSDEC. Instructions on the use of NetDMR are available in the DMR Manual. Attach the monthly "Wastewater Facility Operation Report" (form 92-15-7) and any required DMR attachments electronically to the DMR.

To submit via hard copy: **Hard copy paper DMRs will only be accepted by the Department if a waiver from the electronic submittal requirements has been granted by DEC to the facility**. Attach a hard copy of the monthly "Wastewater Facility Operation Report" (form 92-15-7) to the DMR. The Facility Operation report and DMRs shall be sent to:

Department of Environmental Conservation
Division of Water, Bureau of Water Compliance
625 Broadway, Albany, New York 12233-3506
Phone: (518) 402-8177

The first monitoring period begins on the effective date of this permit, and, unless otherwise required, the reports are due no later than the 28th day of the month following the end of each monitoring period.

C. Bypass and Sewage Pollutant Right to Know Reporting: In accordance with the Sewage Pollutant Right to Know Act (ECL § 17-0826-a), Publicly Owned Treatment Works (POTWs) are required to notify DEC and Department of Health within two hours of discovery of an untreated or partially treated sewage discharge and to notify the public and adjoining municipalities within four hours of discovery. Information regarding reporting and other requirements of this program may be found on the Department's website. In addition, POTWs are required to provide a five-day incident report and supplemental information to the DEC in accordance with Part 750-2.7(d) by utilizing the Department's Non-Compliance Report Form unless waived by DEC on a case-by-case basis.

D. Monitoring and analysis shall be conducted using sufficiently sensitive test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit.

E. More frequent monitoring of the discharge(s), monitoring point(s), or waters of the State than required by the permit, where analysis is performed by a certified laboratory or where such analysis is not required to be performed by a certified laboratory, shall be included in the calculations and recording of the data on the corresponding DMRs.

F. Calculations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in this permit.

G. Unless otherwise specified, all information recorded on the DMRs shall be based upon measurements and sampling carried out during the most recently completed reporting period.

H. Any laboratory test or sample analysis required by this permit for which the State Commissioner of Health issues certificates of approval pursuant to section 502 of the Public Health Law shall be conducted by a laboratory which has been issued a certificate of approval. Inquiries regarding laboratory certification should be directed to the New York State Department of Health, Environmental Laboratory Accreditation Program.

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

ENB Region 3 Completed Applications 07/10/2019

Region 3 SEQR and Other Notices
Region 3 SPDES Renewals

Sullivan County

Applicant:

Town of Thompson
33 Jefferson St
Monticello, NY 12701

Facility:

Emerald Green-Lake Louise Marie S&W Dist
Lake Louise Marie Rd
Thompson, NY 12742

Application ID:

3-4846-00196/00001

Permit(s) Applied for:

Article 17 Titles 7 & 8 Municipal SPDES - Surface Discharge

Project is Located:

Thompson, Sullivan County

Project Description:

The New York State Department of Environmental Conservation (DEC) is proposing a Department Initiated Modification (DIM) to the State Pollutant Discharge Elimination System (SPDES) Permit NY0035645, pursuant to 6 NYCRR Part 750-1.18, and 750-1.19, the Priority Ranking System known as New York State's Environmental Benefit Permit Strategy (EBPS).

The facility receives sanitary wastewater from domestic users and provides treatment for a design flow of 0.41 MGD. The facility discharges treated wastewater via Outfall 001 to McKee Brook, a class B(T) water. Current treatment consists of: screening, equalization, activated sludge-sequential batch reactor, filter feed equalization, sand filtration, chlorination, and post aeration. Sludge is stored and hauled for processing at Kiamesha Lake WWTP. The following changes to the permit are proposed: A new daily maximum effluent limit for Total Residual Chlorine (TRC) has been added; A Mercury Minimization program has been added; A temperature management plant has been added; and, a schedule of compliance has been added to meet the TRC limit.

As a result of the EBPS full technical review, a new five-year term is proposed. The permit includes updated forms and the latest general conditions. Details of changes are specified in the draft permit and fact sheet which may be viewed and printed from the Department web site at: http://www.dec.ny.gov/permits/6054.html.

Availability of Application Documents:

Filed application documents, and Department draft permits where applicable, are available for inspection during normal business hours at the address of the contact person. To ensure timely service at the time of inspection, it is recommended that an appointment be made with the contact person.

State Environmental Quality Review (SEQR) Determination:

Project is an Unlisted Action and will not have a significant impact on the environment. A Negative Declaration is on file. A coordinated review was not performed.

SEQR Lead Agency: None Designated

State Historic Preservation Act (SHPA) Determination:

The proposed activity is not subject to review in accordance with SHPA. The application type is exempt and/or the project involves the continuation of an existing operational activity.

Coastal Management:

This project is not located in a Coastal Management area and is not subject to the Waterfront Revitalization and Coastal Resources Act.

DEC Commissioner Policy 29, Environmental Justice and Permitting (CP-29)

It has been determined that the proposed action is not subject to CP-29.

Opportunity for Public Comment:

Comments on this project must be submitted in writing to the Contact Person no later than *Aug 09, 2019*.

Contact:

Teresa Diehsner
NYSDEC Headquarters
625 Broadway
Albany, NY 12233
(518)402-9167
DEPPermitting@dec.ny.gov

Ulster County

Applicant:

Lamela Sanitation Inc
Rt 9W
Marlboro, NY 12542

Facility:

Lamela Sanitation
1118 US Rte 9W
Marlboro, NY 12542

Application ID:

3-5136-00007/00002

APPENDIX C

DRBC Docket

DOCKET NO. D-95-16 CP

DELAWARE RIVER BASIN COMMISSION

Town of Thompson
Emerald Green Sewage Treatment Plant Upgrade
Town of Thompson, Sullivan County, New York

PROCEEDINGS

This is an application referred to the Commission, pursuant to an Administrative Agreement under Sections 2-3.4 (a) and 2-3.7 of the Administrative Manual - Part II, Rules of Practice and Procedure, by the New York State Department of Environmental Conservation (NYSDEC) on February 16, 1994, for the review of a sewage treatment plant upgrade project. The project was approved by the NYSDEC on February 15, 1995, [State Pollutant Discharge Elimination System (SPDES) Permit No. NY0035645], subject to the approval of the Delaware River Basin Commission (DRBC).

The application was reviewed for inclusion of the project in the Comprehensive Plan and approval under Section 3.8 of the Delaware River Basin Compact. The Sullivan County Planning Board has been notified of pending action on this docket. A public hearing on this project was held by the DRBC on May 24, 1995.

DESCRIPTION

Purpose.-- The purpose of this project is to upgrade the Emerald Green sewage treatment plant (STP).

Location.-- The upgraded STP will be integrated with the existing STP located along Lake Louise Marie Road in the Town of Thompson, Sullivan County, New York in the general vicinity of Exit 109 of State Route 17. The STP will discharge to McKee Brook, a tributary of the Neversink River, at River Mile 253.64 - 23.3 - 2.38 (downstream of the Neversink Reservoir). McKee Brook is a tributary in the watershed of the Special Protection Waters classified as Significant Resource Waters. The Significant Resource Waters are located between River Mile 250.1 and 258.4 in the Delaware River, approximately 25 river miles downstream of the project discharge.

Service area.-- The upgraded STP will continue to serve the Emerald Green/Lake Louise Marie Sewer District in the Town of Thompson, Sullivan County, New York.

Physical features.

a. Design criteria.-- The existing 0.41 mgd STP provides advanced secondary biological treatment with an aerated facultative lagoon system and ultraviolet disinfection. The lagoon system has not consistently satisfied the SPDES permit limits; therefore, the applicant and the NYSDEC entered into an Order of Consent on July 13, 1992. The consent order requires the applicant to design, construct and operate an upgraded STP to satisfy the tertiary treatment standards of the renewed SPDES permit. The upgraded STP will provide activated sludge secondary biological treatment, phosphorus removal, tertiary filtration, ultraviolet disinfection, and post-aeration.

The upgraded 0.41 mgd STP is designed to treat existing and projected wastewater flow generated mostly by the recreational second-house community surrounding Lake Louise Marie. In order to handle the fluctuation of flows from seasonal use, and to enable continued use of the facultative lagoon system, the applicant proposes a sequencing batch reactor (SBR) since it is adaptable to wide flow fluctuations. The SBR plant will allow the applicant to utilize concrete tankage remaining from an original STP which was abandoned in the 1960s.

Phosphorus removal will be enhanced by the addition of a coagulant such as alum or ferric chloride. Tertiary filtration will be provided and disinfection will continue to be via ultraviolet disinfection prior to discharge to McKee Brook.

b. Facilities.-- The original STP was designed and constructed in the early 1960s and consisted of two circular primary clarifiers, two aero-accelerators (which provided batch biological treatment and final clarification), a chlorine contact tank, an anaerobic digester, and a control/blower building. The original plant was abandoned; in the early 1970s, a two-cell aerated facultative lagoon system was constructed. The lagoon system remains in operation today and utilizes the original STP's chlorine contact tank as a sump to dose enclosed ultraviolet disinfection units.

A new mechanically cleaned bar screen will be installed in the existing concrete influent structure. The bypass flow channel will be provided with a new manually cleaned bar screen which will replace an existing deteriorating bar screen. An existing Parshall Flume will be utilized to meter flow with a new ultrasonic flow meter. One existing aero-accelerator tank will be utilized as an influent holding tank which will be sized for just over three hours of storage volume at the average daily flow rate. The tank will include a submersible mixer and duplex submersible pump to transfer, or dose, the influent wastewater to one of two proposed concrete SBRs. The SBRs will biologically process the wastewater, utilizing the activated sludge method. Each SBR has a volume of 205,000 gallons. The SBRs will provide aeration and mixing and a personal computer-based control system to monitor and modify the treatment process. A post-equalization tank will be

provided utilizing the other existing aero-accelerator tank. The SBRs will decant to the post-equalization basin which will detain and gradually release effluent to a proposed granular media filter. A coagulant storage tank and chemical addition system will be provided as well as a new ultraviolet disinfection system. One of the existing primary clarifier tanks will be utilized as a post-aeration system with a fine pore air diffuser system.

An aerated sludge holding tank is proposed to provide for sludge storage and reduction of volatile solids. The existing anaerobic digester will be converted for this purpose. A gravity sludge thickener will be made from one of the existing primary clarifiers. Thickened sludge will be withdrawn and transported by a licensed hauler for dewatering at the Town of Thompson's Kiamesha Lake STP and then disposed of at a State-approved facility.

c. Other.-- The potable water supply in the project service area is provided by the Lake Louise Marie Water Company.

The project facilities are above the 100-year flood elevation.

Emergency power will be provided by a standby diesel generator.

The STP will be controlled and monitored by a personal computer (PC) based system which can record all events during the treatment process, both on-site or at a remote location via a modem. The PC system can determine the operational status of the treatment process at all times to diagnose unfavorable occurrences. The control system will provide for automatic alarms and response in the event of equipment or other process failure.

Wasted sludge will be hauled off-site by a licensed hauler for deposit at a State-approved facility.

The SPDES Permit No. NY0035645 issued by the NYSDEC on October 15, 1993, includes final effluent limitations for the project discharge. The following average monthly effluent limits are among those listed in the NPDES permit and meet or are more stringent than the effluent requirements of the DRBC.

Parameter	Limit
Waste Flow	0.41 mgd
pH (Standard Units)	6.5 to 8.5 at all times
Total Suspended Solids	10.0 mg/l
Dissolved Oxygen	7.0 mg/l (daily minimum)

Parameter	Limit
CBOD (5-Day at 20°C)	5.0 mg/l (daily maximum)
Ammonia Nitrogen	2.2 mg/l
Fecal Coliform (5-15 to 10-15)	200 colonies per 100 ml as a geo. avg.
Total Phosphorus	0.5 mg/l
Temperature	70°F (daily maximum)

The total dissolved solids concentration in the effluent is expected to be less than 500 mg/l.

Cost.-- The overall cost of this project is estimated to be $2,200,000.

Relationship to the Comprehensive Plan.-- The existing Town of Thompson Emerald Green STP has not previously been included in the Comprehensive Plan.

FINDINGS

The NYSDEC has evaluated the project discharge and determined that it will not measurably change existing water quality at the boundary control point for the DRBC Special Protection Waters approximately 25 river miles away at Port Jervis, New York.

No new or increased non-point source loads are expected to be generated within the project service area that would have a measurable impact on the Special Protection Waters, since approximately one-third of the project service area is comprised of existing lakes (Lake Louise Marie, Davies Lake, and Treasure Lake), with an estimated total combined storage volume of over 250 million gallons, which should intercept and mitigate downstream effects of runoff from new development.

The limits in the SPDES Permit are in compliance with Commission effluent quality requirements, where applicable.

The proposed project is designed to produce a discharge meeting the effluent requirements as set forth in the Water Quality Standards of the DRBC.

At the project site, McKee Brook has an estimated seven day low flow with a recurrence interval of ten years of 0.13 mgd (0.2 cfs). The ratio of this low flow to the average design waste water discharge from the upgraded plant is approximately 0.32 to 1.

The project does not conflict with nor adversely affect the Comprehensive Plan, is physically feasible, and does not adversely influence the present or future use and development of the water resources of the Basin.

DECISION

I. The project, as described above, with modifications specified hereinafter, is hereby added to the Comprehensive Plan.

II. The project is approved pursuant to Section 3.8 of the Compact, subject to the following conditions:

a. Approval is subject to all conditions imposed by the NYSDEC.

b. The facility shall be available at all times for inspection by the DRBC.

c. The facility shall be operated at all times to comply with the requirements of the Water Quality Standards of the DRBC.

d. If at any time the receiving treatment plant proves unable to produce an acceptable effluent because of overloading or other reason, no further connections shall be permitted until the deficiency is remedied.

e. Nothing herein shall be construed to exempt the applicant from obtaining all necessary permits and/or approvals from other State, Federal or local government agencies having jurisdiction over this project.

f. Sound practices of excavation, backfill, and reseeding shall be followed to minimize erosion and deposition of sediment in streams.

g. Within 10 days of the date that construction of the project has started, the applicant shall notify the DRBC of the starting date and scheduled completion date.

h. Upon completion of construction of the approved project, the applicant shall submit a statement to the DRBC, signed by the applicant's engineer or other responsible agent, advising the Commission that the construction has been completed in compliance with the approved plans, giving the final construction cost of the approved project, and the date the project is placed into operation.

i. This approval shall expire three years from date below unless prior thereto the applicant has commenced operation of the subject project or has expended substantial funds (in relation to the cost of the project) in reliance upon this approval.

j. The area served by this project is limited to the service area as described above. Any expansion beyond this area is subject to review in accordance with Section 3.8 of the Compact.

k. Any requirements imposed by the National Pollutant Discharge Elimination System permitting agency shall supersede the requirements of this approval insofar as they impose more stringent treatment criteria.

l. The applicant shall make waste water discharge in such a manner as to avoid injury or damage to fish or wildlife and shall avoid any injury to public or private property. The applicant shall assume all responsibility for any claims arising from the proposed discharges and shall indemnify and hold harmless the Commission against and from any and all claims made by or on behalf of any person arising from any discharges made by the applicant.

m. Nothing in this docket shall be construed as limiting the authority of DRBC to adopt and apply charges or other fees to this discharge or project to compensate for flow augmentation or other actions necessary to compensate for impacts on the Delaware estuary salinity.

BY THE COMMISSION

DATED: May 24, 1995

APPENDIX D

Historical WWTP Data Summary (January 2018 – December 2019)

DELAWARE ENGINEERING, D.P.C.
CIVIL & ENVIRONMENTAL ENGINEERING
ALBANY — ONEONTA, NEW YORK

TOWN OF THOMPSON
EMERALD GREEN WWTP UPGRADE
HISTORICAL WWTP DATA SUMMARY
(JANUARY 2018 - DECEMBER 2019)

Last Revised 01/30/2020

	PRECIPITATION			FLOW				TEMP				pH				TSS								CBOD5								Settleable Solids		Ammonia Nitrogen (as N)				TKN Nitrogen (as N)		Phosphorus	
	(WWTP)			EFFFLUENT				INF	INF	EFF	EFF	INF	INF	EFF	EFF	INFLUENT			EFFLUENT					INFLUENT			EFFLUENT					INF	EFF	EFFLUENT				EFFLUENT		EFFLUENT	
	Monthly	Monthly	Monthly	Month	Monthly	Monthly	Avg. Ratio	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly Avg.	Monthly Avg.	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly
	Total	Min.	Max.	Avg.	Min.	Max.	Max. Day	Avg.	Max.	Avg.	Max.	Min.	Max.	Min.	Max.	Avg.	Min.	Max.	Avg.	Avg.	Min.	Min.	Max.	Avg.	Min.	Max.	Avg.	Avg.	Min.	Min.	Max.	Max.	Max.	June - Oct.	Nov. - May	Min.	Max.	Avg.	Max.	Avg.	Max.
PERMIT	-	-		0.410	-	-	Month Avg.	-	Mon.	-	AL 70 F	Mon.	Mon.	6.5	8.5	Mon.	-	Mon.	10	34.2	85%	-		Mon.	-	Mon.	5	17.1	85%	-		Mon.	0.1	1.1	2.2	-	-	Mon.	Mon.	0.5	Mon.
	in./day	in./day	in./day	(MGD)	(MGD)	(MGD)	-	Deg.F	Deg.F	Deg.F	Deg.F	pH	pH	pH	pH	mg/l	mg/l	mg/l	mg/L	lb/d	% Rem	mg/L	mg/L	mg/l	mg/l	mg/l	mg/L	lb/d	% Rem	mg/L	mg/L	ml/L	mL/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Jan-18	2.74	0.00	1.21	0.291	0.160	0.506	1.74	43	54	43	48	6.7	8.2	6.7	7.5	99	89	109	17	41	83	7	26	74	54	94	9.1	22	88	5	14	25	0.0	-	0.8	0.5	1.1	3.7	6.3	0.5	0.7
Feb-18	3.97	0.00	0.64	0.365	0.215	0.647	1.77	44	51	44	48	5.8	8.4	6.3	8.2	74	74	74	13	39	83	13	13	56	56	56	3.8	12	93			26	0.1	-	1.6	1.6	1.6	1.9	1.9	0.2	0.2
Mar-18	2.95	0.00	1.51	0.317	0.239	0.561	1.77	46	53	43	51	6.5	7.4	6.6	7.6	53	53	53	4	11	92	4	4	30	30	30	3.0	8	90	3	3	7	0.0	-	0.5	0.5	0.5	1.0	1.0	0.2	0.2
Apr-18	3.49	0.00	1.53	0.323	0.201	0.519	1.61	50	60	48	53	6.0	7.6	6.5	7.4	76	76	76	5	13	94	5	5	56	56	56	3.0	8	95	3	3	20	0.0	-	1.6	0.5	2.7	3.3	3.3	0.2	0.2
May-18	3.10	0.00	0.92	0.286	0.187	0.611	2.14	57	66	59	65	6.2	8.0	6.5	7.7	108	108	108	9	21	92	9	9	108	108	108	3.0	7	97	3	3	10	0.0	-	0.5	0.5	0.5	1.0	1.0	0.3	0.3
Jun-18	2.14	0.00	0.47	0.194	0.123	0.261	1.34	64	70	66	71	6.7	8.0	6.6	8.0	75	75	75	6	9	92	6	6	50	50	50	3.3	5	93	3	3	25	0.0	0.5	-	0.5	0.5	1.0	1.0	0.3	0.3
Jul-18	8.08	0.00	3.35	0.261	0.140	0.632	2.43	70	75	72	75	6.2	7.6	6.6	7.4	121	121	121	6	11	95	5	5	77	77	77	3.0	7	96	3	3	23	0.0	0.5	-	0.5	0.5	1.0	1.0	0.6	0.6
Aug-18	4.92	0.00	1.16	0.296	0.168	0.469	1.58	71	77	72	75	6.6	8.1	6.6	8.5	60	60	60	5	12	92	5	5	68	68	68	4.5	11	93	5	5	40	0.0	0.5	-	0.5	0.5	1.0	1.0	0.2	0.2
Sep-18	5.86	0.00	1.69	0.307	0.147	0.622	2.02	70	76	69	74	6.5	8.1	6.8	7.9	165	165	165	5	13	97	5	5	110	110	110	5.2	13	95	5	5	30	0.0	0.5	-	0.5	0.5	1.0	1.0	0.2	0.2
Oct-18	4.14	0.00	1.82	0.281	0.187	0.418	1.49	64	74	62	68	6.6	7.6	6.7	7.9	93	92	94	5	12	95	5	5	90	63	117	6.8	16	92	3	11	30	0.0	0.5	-	0.5	0.5	1.0	1.0	0.2	0.2
Nov-18	7.41	0.00	1.27	0.440	0.188	0.882	2.00	54	59	52	64	6.7	7.6	7.0	7.8	197	197	197	5	18	97	5	5	80	80	80	3.0	11	96	3	3	10	0.0	-	0.5	0.5	0.5	1.0	1.0	0.2	0.2
Dec-18	4.93	0.00	1.24	0.355	0.221	0.847	2.39	49	55	49	54	6.9	7.6	6.7	8.0	61	61	61	6	19	90	6	6	61	61	61	3.0	9	95	3	3	19	0.0	-	0.5	0.5	0.5	1.0	1.0	0.2	0.2
Jan-19	3.50	0.00	1.01	0.291	0.136	0.661	2.27	45	49	45	50	6.6	7.7	6.6	8.0	55	55	55	5	12	91	5	5	47	47	47	3.0	7	94	3	3	55	0.0	-	0.5	0.5	0.5	1.0	1.0	0.2	0.2
Feb-19	2.30	0.00	0.49	0.290	0.206	0.609	2.10	44	53	43	54	6.2	7.5	6.5	7.4	51	51	51	5	12	90	5	5	38	38	38	3.1	8	92	3	3	10	0.0	-	0.5	0.5	0.5	1.0	1.0	0.2	0.2
Mar-19	1.80	0.00	0.61	0.264	0.176	0.497	1.88	46	55	43	52	6.2	7.9	6.6	7.7	60	60	60	5	11	92	5	5	111	111	111	3.1	7	97	3	3	10	0.0	-	0.5	0.5	0.5	1.0	1.0	0.2	0.2
Apr-19	4.78	0.00	0.71	0.321	0.235	0.447	1.39	51	64	51	59	6.5	8.1	6.5	7.8	86	66	106	6	15	94	5	6	60	60	60	3.0	8	95	3	3	22	0.0	-	0.5	0.5	0.5	1.0	1.0	0.2	0.2
May-19	5.82	0.00	1.00	0.335	0.235	0.693	2.06	56	67	57	63	6.2	8.5	6.5	7.9	85	85	85	10	27	89	10	10	68	68	68	4.2	12	94	4	4	20	0.0	-	0.5	0.5	0.5	1.0	1.0	0.2	0.2
Jun-19	3.24	0.00	1.10	0.263	0.186	0.409	1.56	64	80	62	70	6.5	8.0	6.5	8.5	86	86	86	5	11	94	5	5	113	113	113	4.3	9	96	4	4	25	0.0	0.5	-	0.5	0.5	1.0	1.0	0.2	0.2
Jul-19	3.16	0.00	0.79	0.202	0.145	0.301	1.49	70	76	72	76	6.4	9.1	6.6	8.4	172	172	172	5	8	97	5	5	186	186	186	5.0	8	97	5	5	26	0.0	0.5	-	0.5	0.5	1.0	1.0	0.2	0.2
Aug-19	2.77	0.00	0.88	0.183	0.119	0.246	1.34	72	74	72	75	6.1	7.4	6.5	7.6	116	116	116	5	8	96	5	5	129	129	129	4.1	6	97	4	4	40	0.0	0.5	-	0.5	0.5	1.0	1.0	0.2	0.2
Sep-19	1.12	0.00	0.39	0.141	0.114	0.181	1.28	68	70	68	73	6.7	8.0	6.6	7.6	164	143	185	5	6	97	5	5	184	115	252	4.6	5	97	3	6	40	0.0	0.5	-	0.5	0.5	1.0	1.0	0.3	0.3
Oct-19	7.17	0.00	2.63	0.207	0.113	0.604	2.92	62	68	63	68	7.0	7.8	6.6	8.0	160	160	160	5	9	97	5	5	123	123	123	3.8	7	97	4	4	45	0.0	0.5	-	0.5	0.5	1.0	1.0	0.3	0.3
Nov-19	2.83	0.00	1.19	0.312	0.222	0.713	2.29	54	58	54	63	5.2	8.1	6.6	8.2	97	97	97	6	16	94	6	6	35	35	35	3.0	8	91	3	3	12	0.0	-	0.5	0.5	0.5	1.0	1.0	0.2	0.2
Dec-19	3.52	0.00	0.70	0.371	0.212	0.786	2.12	50	57	51	53	6.5	8.2	6.7	7.7	57	57	57	5	16	91	5	5	45	45	45	3.0	9	93	3	3	10	0.0	-	0.5	0.5	0.5	1.0	1.0	0.2	0.2
Annual Tot. 18	53.73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Annual Avg. 18	4.48	0.00	1.40	0.310	0.181	0.581	1.86	57	64	57	62	6.5	7.9	6.6	7.8	99	98	99	7	18	92	6	8	71	68	75	4	11	94	4	5	22	0.0	0.5	0.8	0.6	0.8	1.5	1.7	0.3	0.3
Min. 18	2.14	0.00	0.47	0.194	0.123	0.261	1.34	43	51	43	48	5.8	7.4	6.3	7.4	53	53	53	4	9	83	4	4	30	30	30	3	5	88	3	3	7	0.0	0.5	0.5	0.5	0.5	1.0	1.0	0.2	0.2
Max. 18	8.08	0.00	3.35	0.440	0.239	0.882	2.43	71	77	72	75	6.9	8.4	7.0	8.5	197	197	197	17	41	97	13	26	110	110	117	9	22	97	5	14	40	0.1	0.5	1.6	1.6	2.7	3.7	6.3	0.6	0.7
Annual Tot.. 19	42.01	-	-	-	-	-	-	682	771	681	756	76.1	96.3	78.8	94.8	1189	1148	1230	66	150	1121	66	67	1137	1069	1206	44	95	1141	43	46	315	0.0	2.5	3.5	6.0	6.0	12.0	12.0	2.6	2.6
Annual Avg. 19	3.50	0.00	0.96	0.265	0.175	0.512	1.89	57	64	57	63	6.3	8.0	6.6	7.9	99	96	103	6	12	93	5	6	95	89	100	4	8	95	4	4	26	0.0	0.5	0.5	0.5	0.5	1.0	1.0	0.2	0.2
Min. 19	1.12	0.00	0.39	0.141	0.113	0.181	1.28	44	49	43	50	5.2	7.4	6.5	7.4	51	51	51	5	6	89	5	5	35	35	35	3	5	91	3	3	10	0.0	0.5	0.5	0.5	0.5	1.0	1.0	0.2	0.2
Max. 19	7.17	0.00	2.63	0.371	0.235	0.786	2.92	72	80	72	76	7.0	9.1	6.7	8.5	172	172	185	10	27	97	10	10	186	186	252	5	12	97	5	6	55	0.0	0.5	0.5	0.5	0.5	1.0	1.0	0.3	0.3
Total Ave.	3.99	0.00	1.18	0.287	0.178	0.547	1.87	57	64	57	63	6.4	7.9	6.6	7.9	99	97	101	6	15	93	6	7	83	78	88	4	9	94	4	4	24	0.0	0.5	0.7	0.5	0.7	1.2	1.4	0.2	0.3
Total Min.	1.12	0.00	0.39	0.141	0.113	0.181	1.28	43	49	43	48	5.2	7.4	6.3	7.4	51	51	51	4	6	83	4	4	30	30	30	3	5	88	3	3	7	0.0	0.5	0.5	0.5	0.5	1.0	1.0	0.2	0.2
Total Max.	8.08	0.00	3.35	0.440	0.239	0.882	2.92	72	80	72	76	7.0	9.1	7.0	8.5	197	197	197	17	41	97	13	26	186	186	252	9	22	97	5	14	55	0.1	0.5	1.6	1.6	2.7	3.7	6.3	0.6	0.7

Indicates SPDES Permit Exceedances

APPENDIX E

Conceptual Cost Estimates for MBR Alternative

New MBR Process

Headworks				Line Cost	
Fine screens and Comp.	$200,000.00	/system	2 system	$400,000.00	capable of 2 mgd
Anoxic					
Mixers and pumps	$150,000.00	/system	2 system	$300,000.00	
Preaeration					
Aeration Tank Equipment/ piping / diffusers	$490,000.00	/system	2 system	$980,000.00	
MBR					
Building (one story)	$480.00	/ sq ft	1,600 sq ft	$768,000.00	
MBR Tanks	$540,000.00	per	2 tanks	$1,080,000.00	
MBR Equipment & Installation	$4.54	/gallon	475,000 gallons	$2,156,500.00	
WAS Pump System	$100,000.00		1 system	$100,000.00	
Other					
General demo	$100,000.00	per	1 job	$100,000.00	
Build separation walls	$60,000.00	per	2 job	$120,000.00	
Temporary piping / pumping	$20,000.00	per	1 job	$20,000.00	
Miscellaneous metals	$300,000.00	per	1 job	$300,000.00	
Deduct Tertiary filter upgrades	($1,120,000.00)	per	1 job	($1,120,000.00)	
				$5,204,500.00	

APPENDIX F

Estimated Project Cost Summary

Town of Thompson, NY
Emerald Green WWTP Upgrade
Estimated Project Cost Summary

Rehab in-kind of Existing SBR's (0.410 MGD) and New SBRs (Up to 0.074 MGD), 0.475 MGD Total

		Estimated Cost	Major Cost Items
1.)	**Construction - All Trades (General, Electrical, HVAC, & Plumbing)**		
a.)	**Headworks Improvements**		$ 310,030
b.)	**Influent Holding Tank improvments**		$ 77,000
c.)	**SBR Tank Improvements (0.410 MGD)**		$ 983,300
d.)	**SBR Process Construction (0.074 MGD)**		$ 1,944,320
e.)	**Post SBR Equalization Tank 1**		$ 15,000
f.)	**Post SBR Equalization Tank 2**		$ 102,500
g.)	**Sand Filter Improvements (0.401 MGD to 0.475 MGD)**		$ 1,121,800
h.)	**UV Disinfection**		$ 292,500
i.)	**Post Aeration -**		$ 98,500
j.)	**Sludge Dewatering Improvements**		$ 1,964,463
k.)	**Yard Piping**		$ 166,500
l.)	**Site Work**		$ 100,520
m.)	**SCADA**	$ 200,000	$ 200,000
n.)	**Instrumentation**	$ 100,000	$ 100,000
o.)	**WWTP Emergency Generator**		$ 405,000
p.)	**Existing Building and Other Facility Improvements**		$ 320,000
q.)	**Other Expenses**		$ 80,000
r.)	**NYSEFC Contract Compliance (4 prime contracts)**	$ 64,000	$ 64,000
s.)	**Contractors Overhead and Profit (15% Max)**	$ 1,251,815	$ 1,251,815
t.)	**Mobilization/Demobilization/Bonds/Insurance (3% Max)**	$ 287,917	$ 287,917
	Subtotal - All Construction	**$ 9,885,165**	**$ 9,885,165**
2.)	**Construction Cost Inflation Adjustment (@3% per year, June 2020- June. 2022 Bidding = 2 Years)**	$ 593,110	$ 593,110
	Subtotal - Construction Cost Inflation Adjustment	**$ 593,110**	**$ 593,110**
	Subtotal - All Construction	**$ 10,478,275**	**$ 10,478,275**
3.)	**Other Costs (20%)**	$ 2,095,655	$ 2,095,655
a.)	**Engineering/Professional Services**	$ -	
	Subtotal - Other Costs	**$ 2,095,655**	**$ 2,095,655**
	Subtotal - Construction and Other Costs	**$ 12,573,930**	**$ 12,573,930**
4.)	**Project Contingency (10% of Construction and Other Costs)**	$ 1,047,827	$ 1,047,827
	Subtotal - Project Contingency (10% of All Project Costs)	**$ 1,047,827**	**$ 1,047,827**
5.)	**SRF Issuance Costs (1.84%) ~~(Since it's hardship this goes to 0%)~~**	$ 250,640	$ 250,640
	Subtotal - SRF Issuance Cost (1.84% of All Project Costs)	**$ 250,640**	**$ 250,640**
	Total Estimated Project Cost	**$ 13,872,397**	**$ 13,872,397**

APPENDIX G

Comprehensive Project Cost Estimate

Town of Thompson, NY
Emerald Green WWTP Upgrade
Estimated Project Cost Summary

Rehab in-kind of Existing SBR's (0.410 MGD) and New SBRs (Up to 0.074 MGD), 0.475 MGD Total

			Estimated Cost	Major Cost Items
1.)	Construction - All Trades (General, Electrical, HVAC, & Plumbing)			
a.)	Headworks Improvements			$ 310,030
	Influent manhole rehabilation		$ 50,000	
	ULT flow sensor & transmitter		$ 5,250	
	Mechanical screen		$ 95,680	
	Compactor (complete with cold weather package)		$ 80,100	
	Structure Repair		$ 14,000	
	Gate repairs and replacment		$ 25,000	
	Electrical		$ 25,000	
	Non-potable water supply for washer compactor		$ 15,000	
b.)	Influent Holding Tank improvments			$ 77,000
	Influent Holding Tank Equipment (replace 3 pumps, & rails)		$ 35,000	
	Influent Holding Tank Repair		$ 15,000	
	Other Misc. Influent Holding Tank Work		$ 10,000	
	Electrical		$ 17,000	
c.)	SBR Tank Improvements (0.410 MGD)			$ 983,300
	SBR Tank Equipment (replace jet aerators, & pumps)		$ 759,500	
	SBR Tank Blowers		$ 163,800	
	SBR Tank Repair		$ 20,000	
	Other Misc. SBR Work		$ 20,000	
	Electrical		$ 20,000	
d.)	SBR Process Construction (0.074 MGD)			$ 1,944,320
	1 Tank SBR Structures (tank only, cast in place, installed, 42'X44'X21')		$ 1,050,000	
	SBR Equipment Package		$ 433,320	
	SBR Tank Blowers		$ 126,000	
	Misc. Metals		$ 85,000	
	Misc. process piping		$ 100,000	
	Electrical		$ 70,000	
	Site Work		$ 80,000	
e.)	Post SBR Equalization Tank 1			$ 15,000
	Post SBR Equalization tank 1 repairs		$ 15,000	
f.)	Post SBR Equalization Tank 2			$ 102,500
	Post SBR Equalization tank 1 Equipment (replace 2 pumps, & rails)		$ 52,500	
	Post SBR Equalization tank 1 repairs		$ 40,000	
	Electrical		$ 10,000	
g.)	Sand Filter Improvements (0.401 MGD to 0.475 MGD)			$ 1,121,800
	Sand Filter Equipment (Replace in kind eg. steel tanks)		$ 866,800	
	Piping and valve replacment & repair		$ 25,000	
	Misc. Metals		$ 70,000	
	Other Misc. Sand Filter Work		$ 70,000	
	Backwash Pumps (replace 2 pumps, & rails)		$ 60,000	
	Electrical		$ 30,000	
h.)	UV Disinfection			$ 292,500
	UV equipment		$ 202,500	
	Structure modifications		$ 30,000	
	Piping modifications		$ 35,000	
	Electric		$ 25,000	
i.)	Post Aeration -			$ 98,500
	Post Aeration Tank Blowers (135 scfm)		$ 16,000	
	Tank Diffusers & Blowers (45-9" fine bubble diffusers)		$ 37,500	
	Electric		$ 20,000	
	Site Work		$ 25,000	
j.)	Sludge Dewatering Improvements			$ 1,964,463
	Air diffusers (Replace in kind) 36 Coarse Bubble Diffusers		$ 20,000	
	New Blowers		$ 146,900	
	Tank Dewatering		$ 10,000	
	Upgrade Sludge Pump		$ 59,063	
	New Sludge Pump		$ 67,500	
	Miscellaneous Metals		$ 75,000	
	Dewatering Building (40' X 40' = 1,600 SF X $750/SF)		$ 1,200,000	
	New sludge pipe from Sludge Building to Dewatering Building (110LF, 6" @ $200/LF)		$ 22,000	
	New NPW line to the Dewatering Building (300 LF, 4" @$200/LF)		$ 60,000	
	New potable water line to the Dewatering Building (160 LF, 1" @$75/LF)		$ 12,000	
	New pump stations for press supernantant		$ 25,000	
	Misc. Repairs		$ 50,000	

Town of Thompson, NY
Emerald Green WWTP Upgrade
Estimated Project Cost Summary

Rehab in-kind of Existing SBR's (0.410 MGD) and New SBRs (Up to 0.074 MGD), 0.475 MGD Total

		Estimated Cost	Major Cost Items
	Electrical	$ 100,000	
	HVAC	$ 50,000	
	Plumbing	$ 50,000	
	New Pavement (1700 sq. ft. X $10/ sq. ft.)	$ 17,000	
k.)	Yard Piping		$ 166,500
	New gravity 14" main from UV Channel to new Post Air Tank(140 LF @ 250/LF)	$ 35,000	
	New 8" forcemain from filter backwash to areated sludge holding tank (140 LF @ 225/LF)	$ 31,500	
	New 4" NPW feed pipe from the post air tank to the filter bldg. (120 LF @ 200/LF)	8	
	Other (misc. valves, hydrants, etc.)	$ 100,000	
l.)	Site Work		$ 100,520
	Mill and 2" Pave around WWTP inside the fence (16,840 SF @ $3/sf)	$ 50,520	
	Erosion and sediment control	$ 50,000	
	Stormwater Facilities (none planned; < 1 acre of disturbance)	$ -	
m.)	SCADA	$ 200,000	$ 200,000
n.)	Instrumentation	$ 100,000	$ 100,000
o.)	WWTP Emergency Generator		$ 405,000
	New generator (250kW)	$ 325,000	
	Electric service upgrades	$ 80,000	
p.)	Existing Building and Other Facility Improvements		$ 320,000
	General Contract	$ 85,000	
	Electrical Contract	$ 75,000	
	Plumbing Contract	$ 75,000	
	HVAC Contract	$ 85,000	
q.)	Other Expenses		$ 80,000
	Misc. existing pipe supports	$ 20,000	
	Misc electrical yard piping	$ 35,000	
	Decommissioning/repurposing of existing facilities	$ 25,000	
r.)	NYSEFC Contract Compliance (4 prime contracts)	$ 64,000	$ 64,000
s.)	Contractors Overhead and Profit (15% Max)	$ 1,251,815	$ 1,251,815
t.)	Mobilization/Demobilization/Bonds/Insurance (3% Max)	$ 287,917	$ 287,917
	Subtotal - All Construction	**$ 9,885,165**	**$ 9,885,165**
2.)	Construction Cost Inflation Adjustment (@3% per year, June 2020- June. 2022 Bidding = 2 Years)	$ 593,110	$ 593,110
	Subtotal - Construction Cost Inflation Adjustment	**$ 593,110**	**$ 593,110**
	Subtotal - All Construction	**$ 10,478,275**	**$ 10,478,275**
3.)	Other Costs (20%)	$ 2,095,655	$ 2,095,655
a.)	Engineering/Professional Services	$ -	
b.)	Bond Council	$ -	
c)	Legal	$ -	
d.)	Misc. Other Town Costs	$ -	
e.)	DRBC Project Review Fee	$ -	
f.)	Short Term Financing Cost (Assume 1 year $500K BAN @ 4%; remianing peoject under SRF 0% short term finacning)	$ -	
	Subtotal - Other Costs	**$ 2,095,655**	**$ 2,095,655**
	Subtotal - Construction and Other Costs	**$ 12,573,930**	**$ 12,573,930**
4.)	Project Contingency (10% of Construction and Other Costs)	$ 1,047,827	$ 1,047,827
	Subtotal - Project Contingency (10% of All Project Costs)	**$ 1,047,827**	**$ 1,047,827**
5.)	SRF Issuance Costs (1.84%) ~~(Since it's hardship this goes to 0%)~~	$ 250,640	$ 250,640
	Subtotal - SRF Issuance Cost (1.84% of All Project Costs)	**$ 250,640**	**$ 250,640**
	Total Estimated Project Cost	**$ 13,872,397**	**$ 13,872,397**

APPENDIX H

Rate Impact Summary

Clean Water Project
Funding Matrix

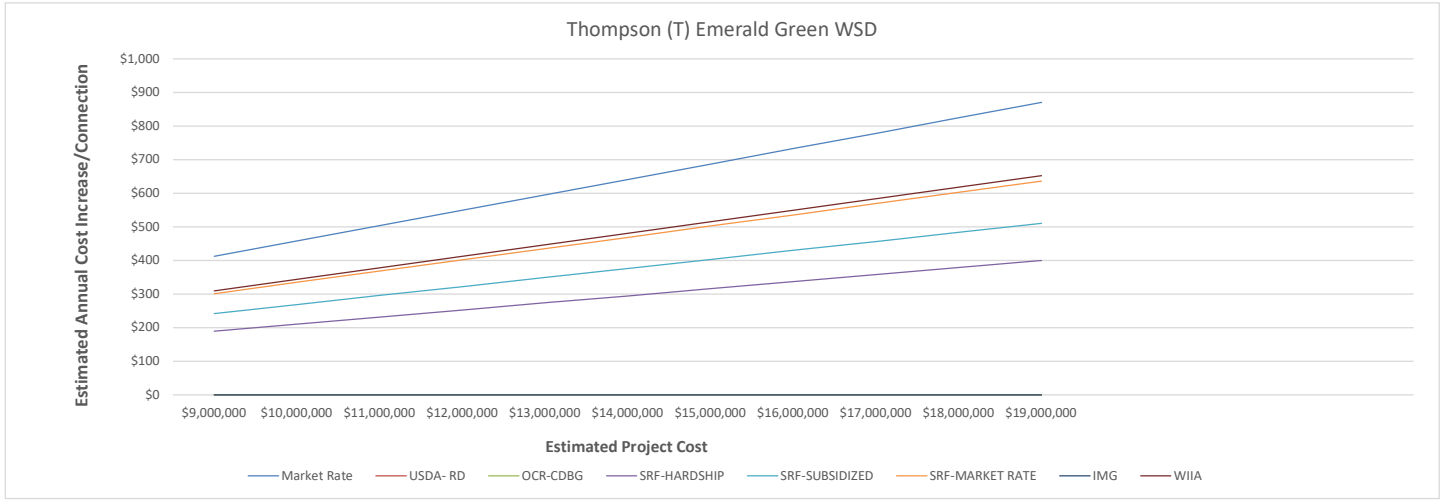
Municipality: Thompson (T) Emerald Green WSD
2017 Population: 15,034
2017 MHI: $42,175
No. of Service Connections: 840
Number of EDUs: 1,187
Average Annual Cost/EDU: $827
1.5% of MHI: $633
Rate as a percentage of MHI: 1.96%

Max Increase (1.5% MHI): -$194

CWSRF Category: D
CWSRF Priority Ranking Score:
DRAFT 2019 Hardship Line: --
DRAFT 2019 Subsidy Line: N/A

Average Annual Cost Increase per EDU								
Project Cost	**Market Rate**	**100% USDA Grant**	**OCR -Max Grant $750K**	**CWSRF (25% Grant)**			**IMG (40% Grant)**	**WIIA-CW (25% grant)**
	4.00%	2.125% @ 38 years*	3.50%	0%	1.65%	3.30%	3.30%	3.50%
		Not Eligible	Not Eligible				Not Eligible	
$9,000,000	$412	$0	$0	$190	$242	$301	$0	$309
$10,000,000	$458	$0	$0	$211	$269	$335	$0	$344
$11,000,000	$504	$0	$0	$232	$296	$368	$0	$378
$12,000,000	$550	$0	$0	$253	$322	$402	$0	$412
$13,000,000	$595	$0	$0	$274	$349	$435	$0	$447
$14,000,000	$641	$0	$0	$295	$376	$469	$0	$481
$15,000,000	$687	$0	$0	$316	$403	$502	$0	$515
$16,000,000	$733	$0	$0	$337	$430	$536	$0	$550
$17,000,000	$779	$0	$0	$358	$457	$569	$0	$584
$18,000,000	$825	$0	$0	$379	$484	$603	$0	$618
$19,000,000	$870	$0	$0	$400	$511	$636	$0	$653

* Unless otherwise indicated, the term of all loans is 30 years



Password: Deleng1		
Unless otherwise noted, for a complete matrix all yellow highlighted questions must be answered. Items in Red should be updated annually.		
Links to data resources are provided on the right.		
Municipality:	Thompson (T) Emerald Green WSD	
USDA RD 2010 ACS Data[1]		
USDA 2010 ACS Population*:	15,308	[1] https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml
USDA 2010 ACS MHI 5-year estimate (Table B19013)*:	$37,417	ref: Advanced Search Table B19013 for 5-year MHI estimate.
2010 SNMHI*:	$54,862	
EFC SRF 2017 ACS Data[2]		https://www.efc.ny.gov/sites/default/files/uploads/Financing%20Documents/EPG_MHI_POP_POV_ACS_5-year%20Estimate
EFC 2017 ACS Population*:	15,034	ref: Table for MHI, Population and Poverty Rate data.
2017 ACS MHI*:	$42,175	
2017 NYS MHI*:	$62,765	
2000 ACS Population:	14,189	https://www.census.gov/census2000/states/ny.html
2010 ACS Population:	15,308	https://www.census.gov/census2000/states/ny.html
(For CWSRF Projects) 2017 NYS Poverty Rate (%)*:	11.30%	
(For CWSRF Projects) Municipal Poverty Rate (%)*:	14.00%	
(For CWSRF Projects) 2017 % County Unemployment:	6.00%	
(For CWSRF Projects) 2017 NYS Unemployment Rate:	4.7%	
Municipal % of Low to Moderate Income*[3]:	49.44%	[3] http://www.nyshcr.org/Programs/NYS-CDBG/EligibleCommunities.htm
Does the project alleviate a documented		
health or sanitary problem (Y/N)*?	**Y**	
Is there an intermunicipal agreement for		
shared services for water and/or sewer (Y/N)*?	**N**	
Is the project located in Dutchess, Orange,		
Putnam, Rockland, Sullivan, Ulster, or Westchester County (Y/N)*[4]?	**Y**	
For Engineering Planning Grants Only		
Is this a Clean Water project or a Drinking Water project (C/D)?	**C**	
Is this an I&I project that is the resut of an		
Order on Consent or SPDES Permit Compliance Schedule (Y/N)?	**Y**	
2018 USDA Interest Rates[5]		[5] https://www.rd.usda.gov/programs-services/water-waste-disposal-loan-grant-program
Poverty Rate:	2.125%	
Intermediate Rate:	2.750%	
Market Rate:	3.500%	
Term (years):	38	
2019 CWSRF Interest Rates[6]		
Hardship:	0%	
Subsidized:	1.65%	
Market Rate:	3.30%	
Term (years):	30	
Sewer Department Data		
No. of Service Connections:	840	
Average Annual Cost/EDU*[7]:	$827	
Real Property Data		
Number of 1-Family Homes:	0.00	
Percentage of Residential Users:	0.00%	
Number of EDUs:	1,187.00	
Estimated Project Cost:	$14,000,000	
Project Cost Increment Range:	$1,000,000	

[1] -USDA RD uses the 2010 ACS information. For the 2010 5-year MHI estimates, refer to Table B19013 in the Advanced Search tab on the ACS website.

[2] -For EFC projects, use the linked 2015 spreadsheet for Population, MHI and Poverty Rate.

[3] - For low to moderate income data, choose the appropriate table (City, Town, Village) in the eligible communities tab.

[4] -SRF Projects located in these counties use a Regional Cost Factor for an adjusted MHI. For 2019, the factor is 1.33. (Ref cell B5 in SRF spreadsheets)

[5] -USDA Interest rates can be found at the link adjacent to the question.

[6] -SRF Interest rates are set in the annual IUP. Currently, to determine the subsidized rate, reduce the market rate by 50% for CWSRF projects.

[7] -Unless provided by the Municipality, the calculated average annual water rate is determined based upon the $/gal + fees
with an average usage for a single family home of 169 gpd or 61,685 gallons per year. If the Municipality has provided an average annual water rate, insert in cell B62.

CWSRF GRANT /LOAN CALCULATOR	
Municipality:	Thompson (T) Emerald Green WSD
Population:	15,034
Regionally Adjsted MHI Factor:	1.33
2015 ACS MHI:	$42,175
SMHI:	$83,477
80% of SMHI	$66,782
MHI as a % of SNMHI:	51%
Does the project Alleviate a Documented	
Health or Sanitary Problem (Y/N):?	Y
Interest Rate Eligibility	
Hardship:	0%
Subsidized:	1.650%
Market Rate:	3.30%
Term (years):	30
No. of Service Connections:	840
Average Annual Sewer Rate/EDU:	$827
Number of EDUs:	1187.00
Number of Single Family Connections:	0
Percentage of Residential Users:	0.00%
Population Change (2000-2010):	1,119
2016 % County Unemployment:	6.00%
2015 % Families Below Poverty:	14.00%
Maximum Grant Amount:	$5,000,000

$9,000,000

	Hardship Financing	Subsidized Financing	Market Rate Financing
Project Cost:	$9,000,000	$9,000,000	$9,000,000
Annual Debt Service:	$300,000	$382,770	$477,157
Average Annual Cost Increase/EDU:	$253	$322	$402
Maximum Grant Award:	$2,250,000	$2,250,000	$2,250,000
Amount to be Financed:	$6,750,000	$6,750,000	$6,750,000
Annual Debt Service if Awarded Grant:	$225,000	$287,077	$357,868
Average Annual Cost Increase/EDU:	$190	$242	$301

$10,000,000

	Hardship Financing	Subsidized Financing	Market Rate Financing
Project Cost:	$10,000,000	$10,000,000	$10,000,000
Annual Debt Service:	$333,333	$425,300	$530,175
Average Annual Cost Increase/EDU:	$281	$358	$447
Maximum Grant Award:	$2,500,000	$2,500,000	$2,500,000
Amount to be Financed:	$7,500,000	$7,500,000	$7,500,000
Annual Debt Service if Awarded Grant:	$250,000	$318,975	$397,631
Average Annual Cost Increase/EDU:	$211	$269	$335

$11,000,000

	Hardship Financing	Subsidized Financing	Market Rate Financing
Project Cost:	$11,000,000	$11,000,000	$11,000,000
Annual Debt Service:	$366,667	$467,830	$583,192
Average Annual Cost Increase/EDU:	$309	$394	$491
Maximum Grant Award:	$2,750,000	$2,750,000	$2,750,000
Amount to be Financed:	$8,250,000	$8,250,000	$8,250,000
Annual Debt Service if Awarded Grant:	$275,000	$350,872	$437,394
Average Annual Cost Increase/EDU:	$232	$296	$368

$12,000,000

	Hardship Financing	Subsidized Financing	Market Rate Financing
Project Cost:	$12,000,000	$12,000,000	$12,000,000
Annual Debt Service:	$400,000	$510,359	$636,210
Average Annual Cost Increase/EDU:	$337	$430	$536
Maximum Grant Award:	$3,000,000	$3,000,000	$3,000,000
Amount to be Financed:	$9,000,000	$9,000,000	$9,000,000
Annual Debt Service if Awarded Grant:	$300,000	$382,770	$477,157
Average Annual Cost Increase/EDU:	$253	$322	$402

$13,000,000			
	Hardship Financing	Subsidized Financing	Market Rate Financing
Project Cost:	$13,000,000	$13,000,000	$13,000,000
Annual Debt Service:	$433,333	$552,889	$689,227
Average Annual Cost /Connection:	$365	$365	$581
Maximum Grant Award:	$3,250,000	$3,250,000	$3,250,000
Amount to be Financed:	$9,750,000	$9,750,000	$9,750,000
Annual Debt Service if Awarded Grant:	$325,000	$414,667	$516,920
Average Annual Cost Increase/EDU:	$274	$349	$435
$14,000,000			
Project Cost:	$14,000,000	$14,000,000	$14,000,000
Annual Debt Service:	$466,667	$595,419	$742,245
Average Annual Cost Increase/EDU:	$393	$502	$625
Maximum Grant Award:	$3,500,000	$3,500,000	$3,500,000
Amount to be Financed:	$10,500,000	$10,500,000	$10,500,000
Annual Debt Service if Awarded Grant:	$350,000	$446,565	$556,684
Average Annual Cost Increase/EDU:	$295	$376	$469
$15,000,000			
	Hardship Financing	Subsidized Financing	Market Rate Financing
Project Cost:	$15,000,000	$15,000,000	$15,000,000
Annual Debt Service:	$500,000	$637,949	$795,262
Average Annual Cost Increase/EDU:	$421	$537	$670
Maximum Grant Award:	$3,750,000	$3,750,000	$3,750,000
Amount to be Financed:	$11,250,000	$11,250,000	$11,250,000
Annual Debt Service if Awarded Grant:	$375,000	$478,462	$596,447
Average Annual Cost Increase/EDU:	$316	$403	$502
$16,000,000			
	Hardship Financing	Subsidized Financing	Market Rate Financing
Project Cost:	$16,000,000	$16,000,000	$16,000,000
Annual Debt Service:	$533,333	$680,479	$848,280
Average Annual Cost Increase/EDU:	$449	$573	$715
Maximum Grant Award:	$4,000,000	$4,000,000	$4,000,000
Amount to be Financed:	$12,000,000	$12,000,000	$12,000,000
Annual Debt Service if Awarded Grant:	$400,000	$510,359	$636,210
Average Annual Cost Increase/EDU:	$337	$430	$536
$17,000,000			
	Hardship Financing	Subsidized Financing	Market Rate Financing
Project Cost:	$17,000,000	$17,000,000	$17,000,000
Annual Debt Service:	$566,667	$723,009	$901,297
Average Annual Cost Increase/EDU:	$477	$609	$759
Maximum Grant Award:	$4,250,000	$4,250,000	$4,250,000
Amount to be Financed:	$12,750,000	$12,750,000	$12,750,000
Annual Debt Service if Awarded Grant:	$425,000	$542,257	$675,973
Average Annual Cost Increase/EDU:	$358	$457	$569
$18,000,000			
	Hardship Financing	Subsidized Financing	Market Rate Financing
Project Cost:	$18,000,000	$18,000,000	$18,000,000
Annual Debt Service:	$600,000	$765,539	$954,315
Average Annual Cost Increase/EDU:	$505	$645	$804
Maximum Grant Award:	$4,500,000	$4,500,000	$4,500,000
Amount to be Financed:	$13,500,000	$13,500,000	$13,500,000
Annual Debt Service if Awarded Grant:	$450,000	$574,154	$715,736
Average Annual Cost Increase/EDU:	$379	$484	$603
$19,000,000			
	Hardship Financing	Subsidized Financing	Market Rate Financing
Project Cost:	$19,000,000	$19,000,000	$19,000,000
Annual Debt Service:	$633,333	$808,069	$1,007,332
Average Annual Cost Increase/EDU:	$534	$681	$849
Maximum Grant Award:	$4,750,000	$4,750,000	$4,750,000
Amount to be Financed:	$14,250,000	$14,250,000	$14,250,000
Annual Debt Service if Awarded Grant:	$475,000	$606,052	$755,499
Average Annual Cost Increase/EDU:	$400	$511	$636

APPENDIX I

IUP Listing Form

Project Scope:

Project Name:

Emerald Green WWTP Upgrade Project

Project No:

5378-07-00

County:

Sullivan

Location:

Lake Louise Marie Road, Rock Hill, NY

Latitude:

41.618870

Longitude:

-74.587770

If Project is in a district (proposed or actual) of a Town or County, please indicate population of district.

1700

Is the municipality under an enforcement order, SPDES permit or permit requiring the construction of the project?

☑

SPDES Permit No:

NY 0035645

What is the Receiving Water:

McKee Brook

Which category or categories is this project in? Check all that apply.

Treatment Plant Upgrade:

Treatment Plant New:

Collection System Upgrade:

Collection System New:

Combined Sewer Overflow:

Sanitary Sewer Overflow:

Storm Water Management:

Landfill:

Other Project Category:

Please describe this project:

The project will upgrade the existing 26 year old sewer plant and add new treatment processes to expand WWTP capacity. The project includes new sludge process equipment, new UV disinfection equipment and electrical upgrades.The Town is under consent order to add disinfection to the

If the project is identified in or consistent with an approved management plan, please list plan(s) here:

If the project is located in or serves a designated Empire Zone (EZ), please identify that EZ here:

If the project has received funding through the DEC/EFC Wastewater Infrastructure Engineering Planning Grant (EPG) Program, please identify the EPG number here:

Municipal Contact Information:

Salutation:
First:
MI:
Last:
Title:

Municipal Contact:

Mr.

William

Rieber

Town Supervisor

Mailing Address:

4052 Route 42

City:

Monticello

State:

NY

Zip Code:

12701

Phone Number:

(845) 794-2500

Fax:

(845) 794-8600

Municipal Email:

supervisor@townofthompson.com

Consulting Engineer Information:

Engineering Firm:

Delaware Engineering, D.P.C.

Salutation:
First:
MI:
Last:
Title:

Name of Contact:

Mr.

Robert

Chiappisi

Mailing Address:

55 South Main Street

City:

ONEONTA

State:

NY

Zip Code:

13820

Phone Number:

(607) 432-8073

Fax:

(607) 432-0432

Email:

rchiappisi@delawareengineering.com

Project Budget and Funding Sources

Construction Costs:

10,574,550.00

Equipment Costs:

0.00

Work Force Costs:

0.00

Engineering Fees:

Planning:

25,000.00

Design:

744,079.00

Construction:

1,116,119.00

Other Expense:

Local Counsel:

10,000.00

Bond Counsel:

30,000.00

Fiscal Services:

50,000.00

Miscellaneous:

20,000.00

Contingencies:

1,057,806.00

Total Project Costs (A):

13,627,554.00

Other Funding Sources

Type	Status	Amount

Total Other Funding Sources (B):

0.00

Subtotal (A - B) = (C):

13,627,554.00

Issuance Costs (D): (approx. 1.84% of (C))

250,746.99

Total CWSRF IUP Amount (C + D):

13,878,300.99

Prior CWSRF IUP Amount:

0.00

Project Schedule		Target/Actual	Date
1. Please indicate whether or not the implementation of your project requires the formation of a Special Improvement District. If yes, indicate the target or actual date of district formation.	☐		
2. Enter the date by which you anticipate submitting an engineering/technical report for review and approval by the appropriate reviewing agency. If you have already done so, indicate the actual date submitted. Please allow a minimum of two (2) months for completion of regulatory review of document(s). PLEASE NOTE: A municipality must have an approvable engineering/technical report to be listed for short-term or long-term financing in the Annual List of an IUP. A project must be listed on the Annual List of an IUP in order to receive funding during that IUP period.		Targe…	08/28/2020
3. A municipality must complete environmental review requirements for its project before it can receive either short-term or long-term financing. This process can take several months to complete.			
	3.a. Enter the date you anticipate completing the State Environmental Quality Review (SEQR) process or the date it was completed.	Targe…	07/01/2020
	3.b. Enter the date you anticipate receipt of the State Historic Preservation Office (SHPO) approval or the date approval was received.	Targe…	07/01/2020
Items 4, 5, 6 and 7 from previous Update Forms are now broken down by contract to enable multiple answers:			

Contract Type	Description	Amount	Plans and Specs Submitted to EFC	P&S Sub T/A	Anticipated Advertising Date for Bids	Advert Bid Date T/A	Constr. Start Date	Start Date T/A	Constr. End Date	End Date T/A
Construction	General	$10,574,550.00	10/1/2021	Targeted	3/1/2022	Targeted	6/1/2022	Targeted	11/1/2023	Targeted

Application Schedule	Target/Actual	Date
8.) Enter the date by which you anticipate submitting a CWSRF financing application.	Targe…	08/28/2020
9.) Enter the date by which you anticipate needing CWSRF financing.	Targe…	05/03/2021

Municipal Authorization:

Our community requests the listing of the project described herein on the CWSRF Project Priority List (PPL) of the Intended Use Plan (IUP). We are interested in the following type(s) of CWSRF financing for the project:

☐ Short-Term Financing Only;

☐ Long-Term Financing Only;

☑ Both Short & Long-Term Financing.

Completed By:

Robert Chiappisi

Date:

04/29/2020

Title:

Technician

Current Documents:

Document Type	File Name	Description	Uploaded Date	Uploaded By
Project Location	Emerald Green SPDES NY0035645.2019-09-01.Renewal&Modification_x.pdf	Enter a Description	4/29/2020	Robert Chiappisi
Project Location	WWTP SITE PLAN W NEW EQUIP REV 01-Layout1.pdf	Enter a Description	4/30/2020	Robert Chiappisi
Project Location	Figure 1 - Site Location 2.pdf	Enter a Description	4/30/2020	Robert Chiappisi

REQUIREMENTS FOR BUSINESS PARTICIPATION OPPORTUNITIES FOR MINORITY- AND WOMEN-OWNED BUSINESS ENTERPRISES AND EQUAL EMPLOYMENT OPPORTUNITIES FOR MINORITY GROUP MEMBERS AND WOMEN

To receive financial assistance through the Clean Water State Revolving Fund ("CWSRF"), the applicant for financial assistance ("You") will need to meet various New York State and federal requirements. Specifically, You must comply with the minority- and women-owned business enterprise ("MWBE") participation and equal employment opportunity ("EEO") requirements of Article 15-A of the New York State Executive Law, 5 NYCRR Parts 140-145, and 40 CFR Part 33, and other requirements as prescribed by the Environmental Facilities Corporation ("EFC"), as applicable, by:

1. Including required contractual language found in the applicable EFC Bid Packet, at www.efc.ny.gov (http://www.efc.ny.gov), in all bid documents and contracts to be funded through EFC;
2. Providing subcontracting opportunities and documenting good faith efforts to obtain MWBE participation;
3. Abiding by the requirements of Your EEO policy, which must include a policy to not discriminate against any employee or applicant for employment on the basis of race, creed, color, national origin, sex, age, disability, or marital status, and other requirements as further outlined in the applicable EFC Bid Packet; and
4. Maintaining records and taking actions necessary to demonstrate compliance throughout the life of the project.
5. Requiring your contractors and subcontractors to comply with 1-4 above.

Designated Minority Business Officer (MBO):

The MBO is responsible for administering Your MWBE-EEO program.

Name:

William Rieber

Email:

supervisor@townofthompson.com

Phone Number:

(845) 794-2500

Mailing Address:

4052 Route 42

City:

Monticello

State:

NY

Zip Code:

12701

MBE/WBE Combined Goals: 20% (MWBE goals may differ if You are also receiving other types of financial assistance from EFC. Please consult EFC's Bid Packets for additional information.)

Please note that all project costs You intend to finance through the CWSRF must meet the requirements referenced herein, regardless of whether some project work may have been completed prior to applying for CWSRF financing. Failure to meet these requirements may result in the loss of CWSRF financing for a particular contract.

I hereby certify that I have read and will abide by the above program requirements and that the information submitted herein is accurate and complete to the best of my knowledge and belief.

Authorized Representative for Applicant:

William Rieber

Date:

04/30/2020

By completing the above fields, I certify that the information submitted herein is true, accurate and complete to the best of my knowledge and belief.

State Smart Growth Public Infrastructure Policy Act Acknowledgement

CWSRF financings are subject to the State Smart Growth Public Infrastructure Policy Act. As set forth in the Act, EFC is required to determine that each project that includes the construction of new or expanded public infrastructure is consistent with the relevant smart growth criteria to the extent practicable. EFC has developed guidance for use by applicants that explains what is required by EFC to make this determination.

In addition to information required elsewhere, Applicants will need to demonstrate that projects meet the following criteria in the Smart Growth Assessment:

1. Uses or Improves Existing Infrastructure -supports projects that improve existing infrastructure.
2. Serves a Municipal Center - advances development and re-development of existing centers of activity and land use.
3. Community-Based Planning - encourages projects that result from inclusive, bottom-up, stakeholder-driven planning processes where proper outreach has been conducted, particularly to underserved/under-represented environmental justice communities.
4. Sustainable Development - promotes projects that use existing resources in ways that do not compromise the needs of future generations, including consideration and adoption, where appropriate, of green infrastructure techniques, decentralized infrastructure techniques and energy efficiency measures.

More information regarding EFC's smart growth review process (including the Act, Guidance for Applicants and Smart Growth Assessment) is available at:

http://www.efc.ny.gov/CleanWaterStateRevolvingFund/SmartGrowth.aspx

Completed By:

ROBERT CHIAPPISI

Date:

04/29/2020

Requirements for projects to be listed on the Annual List of the IUP – Acknowledgement

The Annual Project Priority List identifies projects that EFC may provide financial assistance to during the IUP Period. For a project to be included on the Annual List, the applicant must also submit an approvable engineering report and a Smart Growth Assessment Form to EFC. A project may receive financial assistance in the IUP Period only if it is on the Annual List.

Please check this box to acknowledge that you are aware of this requirement and that you are authorized to make this acknowledgement on behalf of the applicant.

☑

The Requirements of Davis-Bacon and Related Acts – Acknowledgement

In order to receive financial assistance through either the Clean Water or the Drinking Water State Revolving Funds (SRFs), you will need to meet various New York State and federal requirements. In support of your SRF-financed project, you are required to engage in procurement and construction oversight practices to ensure that construction contractors and subcontractors are complying with provisions of the Davis-Bacon Act and other related requirements including payment of the higher of the state or federal wages and supplemental benefits. The Davis-Bacon requirements apply to any construction contract in excess of $2,000 that is still under construction after October 30, 2009. For construction contracts executed prior to October 30, 2009, it may be necessary to issue a change order to the contractor to incorporate the provisions of the Act.

Recipients of SRF financial assistance will be required to perform certain actions to verify the proper wages were paid, maintain and retain certain records, and ensure certain provisions are contained in all contracts and subcontracts. Specific Davis-Bacon guidance is available on the EFC website (http://www.efc.ny.gov).

Please check this box to acknowledge that you are aware of this requirement and that you are authorized to make this acknowledgement on behalf of the applicant.

☑

American Iron & Steel Requirement – Acknowledgement

In order to receive financial assistance through either the Clean Water or Drinking Water State Revolving Funds (SRFs), you will need to meet various New York State and federal requirements. In support of your SRF-financed project, you are required to engage in procurement and construction oversigh practices to ensure that construction contractors and subcontractors are complying with the American Iron & Steel provisions of the CWSRF.

Recipients of SRF financial assistance will be required to perform certain actions to verify the compliance, and ensure certain provisions are contained in all contracts and subcontracts. Specific American Iron & Steel guidance is available on the EFC website (http://www.efc.ny.gov (http://www.efc.ny.gov)).

Please check this box to acknowledge that you are aware of this requirement and that you are authorized to make this acknowledgement on behalf of the applicant.

☑

 Questions should be referred to EFC at CWSRFinfo@efc.ny.gov.

APPENDIX J

Engineering Report Certification

Appendix C: Engineering Report Certification
(required for EFC financial assistance)

Engineering Report Certification

To Be Provided by the Professional Engineer Preparing the Report

During the preparation of this Engineering Report, I have studied and evaluated the cost and effectiveness of the processes, materials, techniques, and technologies for carrying out the proposed project or activity for which assistance is being sought from the New York State Clean Water State Revolving Fund. In my professional opinion, I have recommended for selection, to the maximum extent practicable, a project or activity that maximizes the potential for efficient water use, reuse, recapture, and conservation, and energy conservation, taking into account the cost of constructing the project or activity, the cost of operating and maintaining the project or activity over the life of the project or activity, and the cost of replacing the project and activity.

Title of Engineering Report: Thompson (T) Emerald Green WWTP Upgrade Preliminary Engineering Report

Date of Report: July 2, 2020

Professional Engineer's Name: Dave Ohman

Signature: 

Date: June 30, 2020

APPENDIX K

Smart Growth Assessment Form

NEW YORK STATE OF OPPORTUNITY. | Department of Health | Environmental Facilities Corporation

Smart Growth Assessment Form

This form should be completed by the applicant's project engineer or other design professional.[1]

Applicant Information

Applicant: Town of Thompson Project No.: 5378-07-00

Project Name: Emerald Green WWTP Upgrade

Is project construction complete? ☐ Yes, date: ☑ No

Project Summary: (provide a short project summary in plain language including the location of the area the project serves)

Upgrade WWTP to replace aged equipment, to meet SPDES permit discharge limitations and increase capacity from the current 0.401 MGD up to a maximum of 0.475 MGD.

Section 1 – Screening Questions

1. Prior Approvals

1A. Has the project been previously approved for EFC financial assistance? ☐ Yes ☑ No

1B. If so, what was the project number(s) for the prior approval(s)? Project No.:

Is the scope of the project substantially the same as that which was approved? ☐ Yes ☐ No

IF THE PROJECT WAS PREVIOUSLY APPROVED BY EFC'S BOARD AND THE SCOPE OF THE PROJECT HAS NOT MATERIALLY CHANGED, THE PROJECT IS **NOT** SUBJECT TO SMART GROWTH REVIEW. SKIP TO SIGNATURE BLOCK.

2. New or Expanded Infrastructure

2A. Does the project add new wastewater collection/new water mains or a new wastewater treatment system/water treatment plant? ☐ Yes ☑ No

Note: A new infrastructure project adds wastewater collection/water mains or a wastewater treatment/water treatment plant where none existed previously

2B. Will the project result in either: ☑ Yes ☐ No

An increase of the State Pollutant Discharge Elimination System (SPDES) permitted flow capacity for an existing treatment system;

OR

An increase such that a NYSDEC water withdrawal permit will need to be obtained or modified, or result in the NYSDOH approving an increase in the capacity of the water treatment plant?

Note: An expanded infrastructure project results in an increase of the SPDES permitted flow capacity for the wastewater treatment system, or an increase of the permitted water withdrawal or the permitted flow capacity for the water treatment system.

[1] If project construction is complete and the project was not previously financed through EFC, an authorized municipal representative may complete and sign this assessment.

IF THE ANSWER IS "NO" TO BOTH "2A" and "2B" ON THE PREVIOUS PAGE, THE PROJECT IS NOT SUBJECT TO FURTHER SMART GROWTH REVIEW. SKIP TO SIGNATURE BLOCK.

3. Court or Administrative Consent Orders

3A. Is the project expressly required by a court or administrative consent order? ☑ Yes ☐ No

3B. If so, have you previously submitted the order to NYS EFC or DOH? If not, please attach. ☐ Yes ☑ No

Section 2 – Additional Information Needed for Relevant Smart Growth Criteria

EFC has determined that the following smart growth criteria are relevant for EFC-funded projects and that projects must meet each of these criteria to the extent practicable:

1. Uses or Improves Existing Infrastructure

1A. Does the project use or improve existing infrastructure? ☑ Yes ☐ No

Please describe:

The project will upgrade the WWTPs existing aged equipment and add new UV disinfection as per the SPDES permit Schedule of Compliance

2. Serves a Municipal Center

Projects must serve an area in either 2A, 2B or 2C to the extent practicable.

2A. Does the project serve an area **limited** to one or more of the following municipal centers?

i. A City or incorporated Village	☐Yes ☑No
ii. A central business district	☑Yes ☐No
iii. A main street	☐Yes ☑No
iv. A downtown area	☐Yes ☑No
v. A Brownfield Opportunity Area (for more information, go to www.dos.ny.gov & search "Brownfield")	☐Yes ☑No
vi. A downtown area of a Local Waterfront Revitalization Program Area (for more information, go to www.dos.ny.gov and search "Waterfront Revitalization")	☐Yes ☑No
vii. An area of transit-oriented development	☐Yes ☑No
viii. An Environmental Justice Area (for more information, go to www.dec.ny.gov/public/899.html)	☐Yes ☑No
ix. A Hardship/Poverty Area ***Note: Projects that primarily serve census tracts and block numbering areas with a poverty rate of at least twenty percent according to the latest census data***	☐Yes ☑No

Please describe all selections:

The Emerald Green WWTP provides wastewater treatment to the central business district in the hamlet of Rock Hill, as well as the Emerald Green Corporate Park, a specialty hospital, and a large residential development.

2B. If the project serves an area located outside of a municipal center, does it serve an area located adjacent to a municipal center which has clearly defined borders, designated for concentrated development in a municipal or regional comprehensive plan and exhibit strong land use, transportation, infrastructure and economic connections to an existing municipal center? ☐Yes ☐No

Please describe:

N/A

2C. If the project is not located in a municipal center as defined above, is the area designated by a comprehensive plan and identified in zoning ordinance as a future municipal center? ☐Yes ☐No

Please describe and reference applicable plans:

N/A

3. Resiliency Criteria

3A. Was there consideration of future physical climate risk due to sea-level rise, storm surge, and/or flooding during the planning of this project? ☑Yes ☐No

Please describe:

Flood map were consulted and it was determined that no part of the existing WWTP is located in the flood zone and no proposed construction will occur in designated flood zone areas.

Signature Block: By entering your name in the box below, you agree that you are authorized to act on behalf of the applicant and that the information contained in this Smart Growth Assessment is true, correct and complete to the best of your knowledge and belief.

Applicant: Town of Thompson	Phone Number: (607) 432-8073
Dave Ohman, P.E., President, Delaware Engineering, D.P.C.	
(Name & Title of Project Engineer or Design Professional or Authorized Municipal Representative)	
	06/26/20
(Signature)	(Date)

APPENDIX L

Basis of Design

Table 1
Town of Thompson
WWTP Upgrade
Basis of Design
Equipment Summary

Unit Process	Existing Conditions		Anticipated Conditions		Design Standard	
	Value	Units	Value	Units	Ten States	Other
A.) Influent Pipe						
Size (in, dia.)	10	in				
Material	DIP					
Invert Elevation	1408.20	ft				
B.) Mechanical Screen						
Type	Reciprocating Rake		FlexRake			
Material of Construction	Carbon/stainless steel		304	SS		
Bar Openings	1		0.25	in		
Channel Width	27	in				
Channel Depth	30	in				
Invert	1408.20	ft				
Slope	75	deg	60	deg	45 - 90 degrees	OK 10 SS
PHF	1.43	MGD	2	MGD		
ADF	0.401	MGD	0.475	MGD		
HL @ PDF 25% blinding	1.21	ft	1.21	ft		
Estimated upstream velocity (ADF)	2	fps	2	fps	1.25 - 3 fps @design average condition	
Upstream depth (ADF)	0.35	ft	0.35	ft		
Downstream depth (ADF)	0.19	ft	0.19	ft		
Free Board (PHF)	1.35	ft	1.35	ft		
Isolation Gates	Yes		Yes		Isolation gates	OK 10 SS
Freeze Protection	Yes		Yes		Freeze Protection Req'd.	OK 10 SS
Ventilation	No		No		N/A, exterior installation	
Screen Control	Timer		Float Switch			
HWL Alarm	Float Switch		Float Switch			
Mechanical Compactor						
Type			Screw auger			
Material of Construction			304	SS		
Freeze Protection			Yes			
Disposal			Bagger System			
Wash water						
Flow			4-10	gpm		
Pressure			40-60	psi		
Bypass Channel						
Bar Thickness	0.5	in				
Bar Spacing	2	in				
Slope	48	deg			30-45 degree	
Channel Width	18	in				
Channel Depth	30	in				
Invert	1408.20	ft				
Average Flow	0.401	MGD	0.475	MGD		
% Plugged/Blinded	30	%	30	%		
Estimated Head loss	0.079	ft	0.17	ft		
Average Approach Velocity	3	fps	4	fps	Approach velocity 1.5 to 3.0 fps at average	
C.) Parshall Flume						
Size	6	in				
Min	25	gpm				
Max	1750	gpm				
Ultrasonic Transducer	Yes	MGD	Yes	MGD	Flow Measurement, totalizing and recording	OK 10 SS
D.) Influent Holding Tank						
Diameter	29	ft				

Table 1
Town of Thompson
WWTP Upgrade
Basis of Design
Equipment Summary

Unit Process			Existing Conditions		Anticipated Conditions		Design Standard	
			Value	Units	Value	Units	Ten States	Other
		Minimum SWD	1.58	ft				
		Maximum SWD	12.14	ft				
		Free Board	1.61	ft				
		Overall Tank Depth	13.75	ft				
		Volume per foot	4362	gallons				
		Total Volume	59980	gallons				
		Working Volume	52147	gallons				
		Detention Time @ PHF	41	min @PHF				OK 10SS
	Discharge Pumps							
		Type	Submersable					
		Low Flow Pump	285 (1-pump)	GPM	327 (1-pump)	GPM		
		TDH	34	ft, TDH	40	ft, TDH		
		Horsepower	5		8			
		VFD	No					
		High Flow Pump	1050 (2-pmps)	GPM	1200 (2-pmps)	GPM		
		TDH	37	ft, TDH	42	ft, TDH		
		Horsepower	20		20			
		VFD	No		Yes			
E.)	SBR Basins		2	Tanks	3	Tanks		OK 10 SS
		Tank length	38	ft	38	ft		
		Tank Width	40	ft	40	ft		
		Tank Depth	16	ft	16	ft		
		Maximum SWD	18	ft	18	ft		
		Minimum SWD	13.5	ft	13.5	ft		
		Operation Band	4.5	ft	4.5	ft		
		Free Board	2	ft	2	ft	18 inches or greater	OK 10 SS
		Volume each	204,650	gallons	204,650	gallons		
		Total Volume	409,305	gallons	613,956	gallons		
		Volume / foot	22,778	gallons	22,778	gallons		
		MLSS	2500	mg/L	2300	mg/L	< 5000 mg/L	
		SRT	18	days	22.3	days	Solids Retention Time (SRT)	
		F/M Ratio	0.07		0.06		0.05-0.1 F/M Ratio	OK 10 SS
		DO Control (Optical)	0-20	mg/L	0-20	mg/L		
	Diffused Air System							
		Jet bidrectional aeration header w/ 6" air duct	8	Jets/tank	8	Jets/tank		
	Motive Jet Pump						Mechanical mixing independent of aeration	
		Type	Centrifgual		Centrifgual			
		Flow	1,465	GPM	1,465	GPM		
		TDH	20	ft, TDH	20	ft, TDH		
		Outlet	12	in	12	in		
		Horsepower	15		15			
	Floating decanter							
		Decant length	13	ft	13	ft		
		Decant flow	1,708	GPM	1,708	GPM		
		Cycles	8	/day	8	/day		
		Decant time	30	min.	30	min.		
		Decant volume	51,250	Gals/cycle	37,500	Gals/cycle		
	SBR Blowers		3	Units	5	Units		
		Type	Centrifual		Positive Displacement		Multiple units, VFD & DO meter controlled	OK 10 SS
		Design Air Flow	367	scfm	540	scfm		
		Discharge Pressure	7.5	psi	8.8	psi		

Table 1
Town of Thompson
WWTP Upgrade
Basis of Design
Equipment Summary

Unit Process	Existing Conditions		Anticipated Conditions		Design Standard	
	Value	Units	Value	Units	Ten States	Other
VFD	No		Yes			
SOTE	25	%	25	%		
Critical wastewater temperature	20	C.	20	C.		
Altitude of plant	1400		1400	ft		
WAS Pumps	Shared duty with Motive Pump		Shared duty with Motive Pump			
F.) Post Equalization No. 1						
Diameter	20	ft	20	ft		
Minimum SWD	1.58	ft	1.58	ft		
Maximum SWD	12.65	ft	12.65	ft		
Free Board	1.1	ft	1.1	ft		
Overall Tank Depth	13.75	ft	13.75	ft		
Volume per foot	2349	gallons	2349	gallons		
Total Volume	29745	gallons	29745	gallons		
Working Volume	27131	gallons	27131	gallons		
G.) Post Equalization No. 2						
Diameter	29	ft	29	ft		
Minimum SWD	1.58	ft	1.58	ft		
Maximum SWD	12.65	ft	12.65	ft		
Free Board	1.1	ft	1.1	ft		
Overall Tank Depth	13.75	ft	13.75	ft		
Volume per foot	4362	gallons	4362	gallons		
Total Volume	59980	gallons	59980	gallons		
Working Volume	52147	gallons	52147	gallons		
Post Equalization Pumps				2		
Type	Centrifugal		Centrifugal			
Discharge	6	in	4	in		
Max Flow	650	gpm	750	gpm		
Min Flow	-	gpm	600	gpm		
TDH	32	ft	40	ft		
VFD	No		Yes			
Horsepower	10		15			
H.) Gravity Sand Filter						
Desgn flow	739	gpm	1417	gpm		
Number for filters	1		1			
Independent Cells	3		3		Two or more units, total available filter area with one unit out of service	OK 10 SS
Total Filter Area	231	ft^2	440	ft^2		
Filter Cell size						
Length	7.0	ft	13.3	ft		
Width	11	ft	11	ft		
Depth	1.00	ft	1.00	ft		
Filter area	77.00	ft^2	147	ft^2		
Hydraulic Loading	3.20	gpm/ft^2	3.20	gpm/ft^2		
Backwash Method	Multiwash		Multiwash			
Backwash Loading Rate (Water)	5.00	gpm/ft^2	5.00	gpm/ft^2		
Backwash Loading Rate (Air)	3.00	$scfm/ft^2$	3.00	$scfm/ft^2$		

Table 1
Town of Thompson
WWTP Upgrade
Basis of Design
Equipment Summary

Unit Process	Existing Conditions Value	Units	Anticipated Conditions Value	Units	Design Standard Ten States	Other
Backwash Flow Rate (Water)	358.00	gpm	733.00	gpm	The design shall provide for a minimum backwash period of 10 minutes, chlorine tank shall be used as the source of backwash water.	OK 10 SS
Backwask Flow Rate (Air)	231.00	scfm	440.00	scfm		
Tank Material	Epoxy Coated Carbon Steel		Epoxy Coated Carbon Steel			
Tank Dimensions						
Length	38.83	ft	40	ft		
Width	11	ft	11	ft		
Height	12	ft	12	ft		
Media (total 3 cells)					All media shall have a uniformity coefficient of 1.7 or less.	OK 10 SS
Sand depth	10 (192 ft3)	in	12 (462 ft3)	in		
Air scour blower					If air is to be used for filter backwash, separate backwash blower(s) shall be provided.	
Type	Regenerative		Regenerative			
Design Air Flow	256	scfm	440	scfm		
Discharge Pressure	5	psi	5	psi		
Air Compressor (Duplex)						
Air Flow	2.30	acfm	4.60	acfm		
Pressure	80	psi	80	psi		
Air Dryer						
Mudwell			Backwash direct to head of plant or sludge holding tank		Waste filter backwash shall be adequately treated.	OK 10 SS
Length	9.8	ft				
Width	11	ft				
Depth	10	ft				
Volume	8000	gal				
Wetwell			Pump direct from post aeration tank			
Length	7.17	ft				
Width	11	ft				
Depth	10	ft				
Volume	5900	gal				
Backwash pumps						
Type	Centrifugal		Centrifugal			
Discharge	10	in	4	in		
Max Flow	924	gpm	750	gpm		
Min Flow	-	gpm	600	gpm		
TDH	23	ft	40	ft		
VFD	No		Yes		Backwash system shall be capable of providing variable backwash rates	OK 10 SS
Horsepower	7.5		15			
I.) UV Disinfection						
Minimum flow			0.1	mgd		
Average flow			0.475	mgd		
Maximum flow			2.04	mgd		
Total suspended solids			≤ 30	mg/l	Suspended solids concentrations no greater than 30 mg/L at any time.	OK 10 SS
Transmittance			65	%		

Table 1
Town of Thompson
WWTP Upgrade
Basis of Design
Equipment Summary

Unit Process	Existing Conditions		Anticipated Conditions		Design Standard	
	Value	Units	Value	Units	Ten States	Other
Total Banks			1			
Modules per bank			2			
Lamps per module			4			
Total lamps			8			
Lever Controller			Serpintine weir			
Weir length			142	in		
Type			Low Pressure-Low Intensity			
Channel type			Open			
UV Dosage			≥ 30	(µW·s)/cm2	UV dosage not less than 30 (mW·s)/cm2	OK 10 SS
Channel length	17.17	ft	18	ft		
Channel Width	2.25	ft	8	in		
Channel Depth	36	in	46	in		
Voltage			480	Volts		
J.) Chlorine Disinfection	Sodium Hypochlorite 12.5%					
Tank 1						
Volume	150	gal				
Tank 2						
Volume	160	gal				
Chlorine metering pump (dual head)	1					
Containment						
Length	9.83	ft				
Width	6.13	ft				
Depth	1.04	ft				
Volume (95%)	5150	gal				
K.) Dechlorination	38% Sodium Bisulfate					
Tank (4 - drums)	55	gal				
PAC metering pump	2					
4 drum containment						
L.) Polyaluminium chloride (PAC)						
Tank (1 - drum)	55	gal				
Bisulfate metering pump	1					
M.) Post Aeration Tank (Existing CCT)						
Diameter	20	ft				
Maximum SWD	7.5	ft				
Free Board	1.5	ft				
Volume per foot	2350	gal				
Total Volume	17,600	gal				
Detention Time @ 0.750 MGD	33	min				
Detention Time @ 1.02 MGD	25	min				
N.) Aeration Tank Blower No. 1 & No. 2			Replace in kind			
Type	Positive Displacement					
Design Air Flow	75	scfm	135			
Discharge Pressure	7	psi	7			
Diffusers						
Per Tank	28		45			
Type	9" Fine Bubble		9" Fine Bubble			
O.) Step Areation to Outfall						
Length	90	ft				
Width	2	ft				
No. of steps	7					
Elevation Change	14.85	ft				

Table 1
Town of Thompson
WWTP Upgrade
Basis of Design
Equipment Summary

Unit Process	Existing Conditions Value	Existing Conditions Units	Anticipated Conditions Value	Anticipated Conditions Units	Design Standard Ten States	Design Standard Other
Inlet Pipe	10	in				
Outlet Pipe	12	in				
P.) Sludge Holding Tank No. 1					Volume Required, 4.5 ft3/P.E. or 0.8lbs/lb of influent BOD	
Tank diameter	45	ft			Multiple digestion units capable of independent operation are desirable	
Tank Depth	22	ft				
SWD	20	ft				
Free Board	4	ft				
Volume	237,800	gal			Total ft3 = 31,790	
Total volume	277,430	gal				
Covered	No				Aerobic digesters should be covered to minimize heat loss	
Tank Mixing	Coarse Bubble Diffusers		Replace in kind		Aerobic digesters shall be provided with mixing equipment	OK 10 SS
Tank air						
Unvalved overflow	Yes				An unvalved high level overflow and any necessary piping shall be provided to return digester overflow back to the head of the plant or to the aeration process in case of accidental overfilling	OK 10 SS
Floating Jetech decanter	1	Unit				
Q.) Sludge Transfer Pump						
Type	Positive Displacement		Positive Displacement			
Discharge	4	in	6	in		
Max Flow	100	gpm	150	gpm		
Min Flow	-	gpm	60	gpm		
TDH	30	ft	75	ft		
VFD	No		Yes			
Horsepower	5		10			
Suction	4	in	6	in		
Discharge	4	in	6	in		
R.) Sludge Tank Blower No. 1 & No. 2						
Type	Centrifugal		Positive Displacement			
Min. Air Flow	-	scfm	572		Sufficient air shall be provided to keep the solids in suspension and maintain dissolved oxygen between 1 mg/L and 2 mg/L. For minimum mixing and oxygen requirements, an air supply of 30 cfm/1000 ft3 of tank volume	OK 10SS
Max Air Flow	695	scfm	953.0			
Discharge Pressure	8.6	psig	5.2/9			
S.) Belt Filter Press						
Size			1	meter		
Feed Volume			75-150	gpm		
Flow Meter			4	in		
Feed Volume			850	lb/hr		
Discharge solids			18-20	%		
Wash Water Req.			100	gpm		
Polymer Feed System			1	unit		
Polymer Injection/sludge polymer mixing system			4	in		

Table 1
Town of Thompson
WWTP Upgrade
Basis of Design
Equipment Summary

Unit Process	Existing Conditions		Anticipated Conditions		Design Standard	
	Value	Units	Value	Units	Ten States	Other
Washwater Booster Pump						
Flow			50	gpm		
TDH			120	psi		
Suction			2	in		
Discharge			2	in		
Horsepower			7.5			
Duplex Basket Strainer			2	in		
Belt press feed pump						
(See Sludge Transfer Pump)						
Hydraulic power unit			1	unit		
Sludge screw conveyor			12	in		
Belt Press Control Panel			1	304 SS		
T.) Non-potable water system						
Non-potable water pump			2	units		
Flow			100	gpm		
TDH			120	TDH		
Suction			1.5	in		
Discharge			2	in		
VFD			Yes			
Horsepower			5			
Duplex Basket Strainer			4	in		
Pressure tank			211	gal		
Connection			4	in		

APPENDIX M

Process Calculations

SBR DESIGN PARAMETERS

Metcalf and Eddy, in Wastewater Engineering, Treatment and Resource Recovery, 5th edition, offer the following design considerations for SBR plant design in Table 8-19, page 793

Typical Design Parameters

Process Name	SRT,days	F/M		Volumetric loading, lb BOD / 1000 ft^3-d	MLSS	Total τ, hrs
SBR	15-30	0.04 – 0.1		5-15	2000 - 5000	15-40

Assumed BOD loading to the plant is 175 mg/l for 598.4 pounds per day
Present Process Conditions at the plant that can be compared to the

- SRT based on equation, VX/((Qw*R)+(Qe*e)) is 18.7 days, where

V = Volume aeration
X = Concentration of aeration tank solids
Qw =WAS flow rate, mgd
Qe = Effluent flow rate, mgd
R = WAS concentration
Xe = Eff. TSS concentration

- F/M

Incoming food, pounds, to pounds of microorganisms under air is at, 0.07

- Volumetric loading

The volumetric loading per 1,000 cubic feet of aeration basin volume is 10.9 lbs / 1000 ft^3-d

- MLSS

Mixed liquor suspended solids as supplied by the operator is 2500 mg/l

- Total τ, hrs

Total calculated hydraulic retention time is 24 hours

Emerald Green SBR process operates in a batch mode with the following sequences, design setting and current setting.

Phase	Design Setting	Current Setting
Anoxic Fill time (mix & fill)	2.25 hrs	5 minutes
Aerated Fill	0.75 hrs	175 minutes
React time	1.50 hrs	60 minutes
Settle time	0.75 hrs	100 minutes
Decant time	0.5 hrs	20 minutes
Idle time	0.25 hrs	

Emerald Lake WWTP is required to remove TSS, Phosphorus, BOD and Ammonia. To effectively remove BOD and Ammonia oxygen input is required. The required oxygen input is presented below.

Aeration Requirement Calculations

Aeration Requirement Calculations		
Maximum month flow	0.41	mgd
BOD loading	175	mg/l
BOD loading	598	lbs/day
TKN loading	40	mg/l

SBR DESIGN PARAMETERS

TKN loading	137	lbs/day
Oxygen Demand BOD	1.5	lb O_2 / lb BOD
Actual Oxygen Required, AOR, BOD =	897	lbs O_2 / day
Oxygen Demand TKN	4.6	lb O_2 / lb TKN
Actual Oxygen Required, AOR, TKN =	630	lbs O_2 / day
Total AOR, BOD + TKN =	1,527	lbs O_2 / day

Convert AOR, to Standard Oxygen (SOR): $SOR = \frac{AOR * Cs}{\alpha*(\beta*Csd-DO)*(\theta^{(T-20)})}$

Where:
Cs = DO saturation at Stnd Conditions
Maximum DO at Given Temperature of 20°C

Cs = DO saturation at Stnd Conditions	Csd = DO saturation at design conditions
Maximum DO at Given Temperature of 20°C = 9.07 mg/l	
= 9.07 *(1+((0.4*D)/34) = 11 mg/l = Cs	= Cst*(Fe + ((0.4*D)/34) *Cst = DO saturation at liq. Temp & 1 atm. = 9.1 mg/l = 9.1 *(0.95+((0.4*18)/34) = 10.6 mg/l = Csd
SWD,D = 18 ft	Alpha factor, $\alpha = 0.85$[1]
Elevation Factor, Fe = 0.95	Beta, $\beta = 0.95$[1]
Dissolved O2, mg/l = 1.0	Theta, $\theta = 1.024$
Liquid Temperature, T = 20 °C	

[1] Assumed value

$SOR = \frac{AOR * Cs}{\alpha*(\beta*Csd-DO)*(\theta^{(T-20)})}$	= 2,200 lbs oxygen / day[2] Convert to scfm air. 21% oxygen in air 2,200/0.21 = 10,476 pounds oxygen per day Weight of air per ft^3 = 0.0724 lb/ft^3 10,476 lbs O / day divided by 0.0724 lb/ft^3 = 144,696 cfm-day Cfm = 144,696 cfm -day /1440 min / day =100.5 cfm Transfer efficiency rated at 2% /ft. With 18 ft depth and 1 ft diffuser height it theoretically should be 34%. Utilize 30% 100.5 cfm / 0.3 = 335 cfm Convert to scfm Expected pressure = (depth 18 *.434) +1 psi = 9 Expected Temperature 68, R std/ R act = 460 + 68 / 460 +68 =1 Scfm = cfm * (Psia /atm) * R std / R act Scfm = 335 cfm*(23.7/14.7)*1 = 540 scfm

[2] No credit for denitrification taken as Anoxic time is fairly short.

Calculation Sheet For Height of Step Aeration

From: Metcalf & Eddy , 5th edition, page 446

Value to be entered

Formula cell

H= Height of step cascade

T= 21 In celsius

Cs = 8.914 DO saturation of the wastewater at temp. T, mg/l from Appendix E, M&E 5th ed.

Co= 2 DO in postaeration influent, mg/l

C= 7 Final DO required, mg/l

b= 1.3 1.0 for a weir; 1.1 for steps; 1.3 for step weirs

a= 0.8 Water quality parameter equal to 0.8 for a wastewater - treatment plant effluent

R= deficit ratio $\frac{Cs-Co}{Cs-C}$ = 3.61

H= (R-1) / (0.361*a*b*(1+(0.046*T)) **3.54** Meter

convert to feet **11.61** Feet

Flow to Aerate = 410,000 gallons per day

Loading rate = 240,000 Range of 100,000 - 500,000 gal / ft of width-day. Typical 240,000 gal / ft of width-day

Weir width **1.71** feet of width of weir

Typical Design information

Hydraulic loading rate @ ADF	100,000 to 500,000	gal / ft of width-day
Step dimensions		
Height	6 to 12	inches
Length	12 to 24	inches

Preferred step design for Emerald Lake would be, 6" height and 36" long

Value to be entered

Formula cell

H= Height of step cascade

T= 21 In celsius

Cs = 8.914 DO saturation of the wastewater at temp. T, mg/l from Appendix E, M&E 5th ed.

Co= 2 DO in postaeration influent, mg/l

C= 7 Final DO required, mg/l

b= 1.1 1.0 for a weir; 1.1 for steps; 1.3 for step weirs

a= 0.8 Water quality parameter equal to 0.8 for a wastewater - treatment plant effluent

R= deficit ratio $\frac{Cs-Co}{Cs-C}$ = 3.61

H= (R-1) / (0.361*a*b*(1+(0.046*T)) **4.18** Meter

convert to feet **13.72** Feet

Flow to Aerate = 475,000 gallons per day

Loading rate = 240,000 Range of 100,000 - 500,000 gal / ft of width-day. Typical 240,000 gal / ft of width-day

Weir width **1.98** feet of width of weir

Typical Design information

Hydraulic loading rate @ ADF	100,000 to 500,000	gal / ft of width-day
Step dimensions		
Height	6 to 12	inches
Length	12 to 24	inches

Input Data

Max. Design Flow:	.401 MGD
Bar Thickness:	.25 in.
Clear Opening:	1.75 in.
Channel Width:	1.5 ft.
Assumed Free Flow Water Level:	3 in
Inclination Angle Of Screen With Horiz:	48.5 DEG.
Bar Rake Plugged:	30 %
Average Velocity:	0.812 ft.

Calculate

Result

Velocity Above The Bar Rack: 2.214 ft/sec
Head Loss 30 % Plug: -0.079 ft
Estimated Water Depth Including 30 % Plug: 0.202 ft

Input Data

Max. Design Flow:	.475 MGD
Bar Thickness:	.25 in.
Clear Opening:	1.75 in.
Channel Width:	1.5 ft.
Assumed Free Flow Water Level:	6 in
Inclination Angle Of Screen With Horiz:	48.5 DEG.
Bar Rake Plugged:	30 %
Average Velocity:	0.481 ft.

Calculate

Result

Velocity Above The Bar Rack: 1.311 ft/sec
Head Loss 30 % Plug: -0.028 ft
Estimated Water Depth Including 30 % Plug: 0.534 ft

APPENDIX N

Temperature Management Plan

Town of Thompson,

Sullivan County, New York

Emerald Green Wastewater Treatment Plant
Temperature Management Plan

Prepared For:

Town of Thompson, NY

4052 State Route 42,
Monticello, NY 12701

Prepared by:

Delaware Engineering, D.P.C.

55 South Main Street
Oneonta, New York 13820
607-432-8073

February 29, 2020
Revised April 15, 2020

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FIGURES

ATTACHMENTS

I. Introduction:

The Town of Thompson, Sullivan County, is located in the Catskill foothills region of New York State. The Town owns and operates the Emerald Green Waste Water Treatment Plant (WWTP). The Emerald Green WWTP serves a residential sewer district within the Town of Thompson, known as the Emerald Green-Lake Louise Marie Sewer District. This treatment plant operates under State Pollution Discharge Elimination System (SPDES) Permit # NY0035645. The plant receives primarily residential waste flow, with very few commercial or industrial users, and is permitted for a flow of 0.41 MGD (on a monthly average basis). The current SPDES Permit for the Emerald Green WWTP is included with this report as **Attachment 1**.

II. Background:

As stipulated in the SPDES Permit, the Emerald Green wastewater treatment facility may discharge treated effluent to its receiving waters with a temperature of up to 70º F. Effluent temperature sampling is required once per day. The temperature limit has been exceeded during the months of July, August, and September in 2018 and 2019. **Attachment 2** of this report summarizes influent flow and effluent temperature data from January 2018 to October 2019.

The Emerald Green WWTP has a single outfall which discharges treated effluent into receiving waters known as McKee Brook. See **Figure 1 – Existing Aerial Site Plan** for the location of Mckee Brook relative to other plant facilities. Mckee Brook is classified as a B(T) stream (a class B trout stream). Because of this classification it is stipulated within the most recent version of the SPDES Permit (effective date 9/01/2019 – see **Attachment 1**) that the Town develop, implement, and maintain a temperature management plan.

This Temperature Management Plan has been prepared to summarize the proposed sampling, assessing, and corrective actions that the Town plans to undertake, with the goal being to ensure the effluent temperature is maintained at a level below 70º F, minimizing thermal impacts to Mckee Brook, to the extent feasible.

III. Thermal Track Down:

The SPDES Permit requires that a thermal assessment of the current collection and treatment system be conducted. The Town intends to perform this thermal assessment beginning this spring and continuing until sufficient data has been collected and analyzed.

The Town proposes to conduct daily temperature sampling at the influent and effluent ends of the plant, as well as at the influent and effluent end of all units (where possible) within the plant system. This process will allow the Town to determine which process or processes (if any) are contributing to increases in the temperature of the treated waste flow.

The proposed sampling plan will include 10 sampling locations throughout the plant. Sampling will be conducted by plant personnel, using handheld temperature reading devices. The proposed sampling locations are as follows:

1. Plant Influent
2. Influent Holding Tank Influent
3. Influent Holding Tank Effluent
4. SBR Process Tank (1 & 2) *
5. Post Equalization Tank Influent
6. Post Equalization Tank Effluent
7. Gravity Filter Influent **
8. Post Aeration Tank Influent
9. Post Aeration Tank Effluent
10. Plant Effluent

* The SBR influent enters the tank through a submerged, closed pipe, making temperature sampling of the SBR influent infeasible. There should be no significant temperature change between the influent holding tank and the SBR tanks.

** The gravity filter effluent exits the filter tanks through an inaccessible buried decant line, making temperature sampling of the gravity filter effluent infeasible. There should be no significant temperature change between the gravity filters and the post aeration tank.

The locations of all proposed sample points are shown on **Figure 1**, and **Figure 2**, which are included as a part of this Temperature Management Plan.

The Town plans to begin taking samples at the above described locations beginning on April 1, 2020, and plans to continue sampling until October 31, 2020. The samples will be taken twice daily, with one set of samples being taken between 8 a.m. and 9 a.m. and a second set of samples being taken between 2 p.m. and 3 p.m. These times fall within the normal hours of work for plant staff. On weekends and holidays, samples will be taken once a day. The results of the sampling will be recorded on a form such as the one included as **Attachment 3**.

It should be noted that the above-described temperature sampling procedures will be implemented in addition too, not instead of, the current temperature sampling that is conducted at the plant to determine compliance with the effluent temperature action level. The Town will continue to sample and report effluent temperatures and will continue to perform the monitoring program stipulated on page 4 of the SPDES Permit in the event of any exceedances of the permitted action level (70º F).

IV. Passive Cooling Measures:

The Town shall assess the feasibility and effectiveness of various passive cooling measures. These will include (but not necessarily be limited to) shading tanks or installing covers on tanks. The feasibility of such measures will be affected by which tanks (if any) are shown by the

temperature sampling to be most responsible for increasing the temperature of the flow through the plant. It may be feasible to plant trees or install devices to shade certain tanks, while others, like the SBR tanks, may not be easily shaded. Installation of tank covers may, in some cases be more feasible, but if the temperature sampling indicates that heat is coming from sources other than passive heating by the sun (such as forced air used for aeration), covering tanks may prove detrimental rather than helpful.

The final determination as to what cooling measures will be most practical and effective will need to occur once the results of the above-described temperature sampling plan have been compiled and assessed.

V. Implementation:

At this point, action items include implementation of the temperature sampling plan, review and assessment of the data collected, and assessment of the feasibility and effectiveness of potential cooling measures. The results of this data collection and assessment will be the determination of addition action items (if any) that will help reduce the plant's effluent temperature.

Attachment 4 shows an anticipated implementation schedule for the collection and assessment of the necessary temperature data. A further implementation schedule will need to be developed once the results of the above-described temperature sampling plan have been compiled and assessed.

VI. Compliance Deadlines:

This Temperature Management Plan is being submitted to the Department in order to satisfy the requirement set forth on page 5 of the SPDES Permit. Future compliance deadlines will need to be determined once the results of the above-described temperature sampling plan have been compiled and assessed.

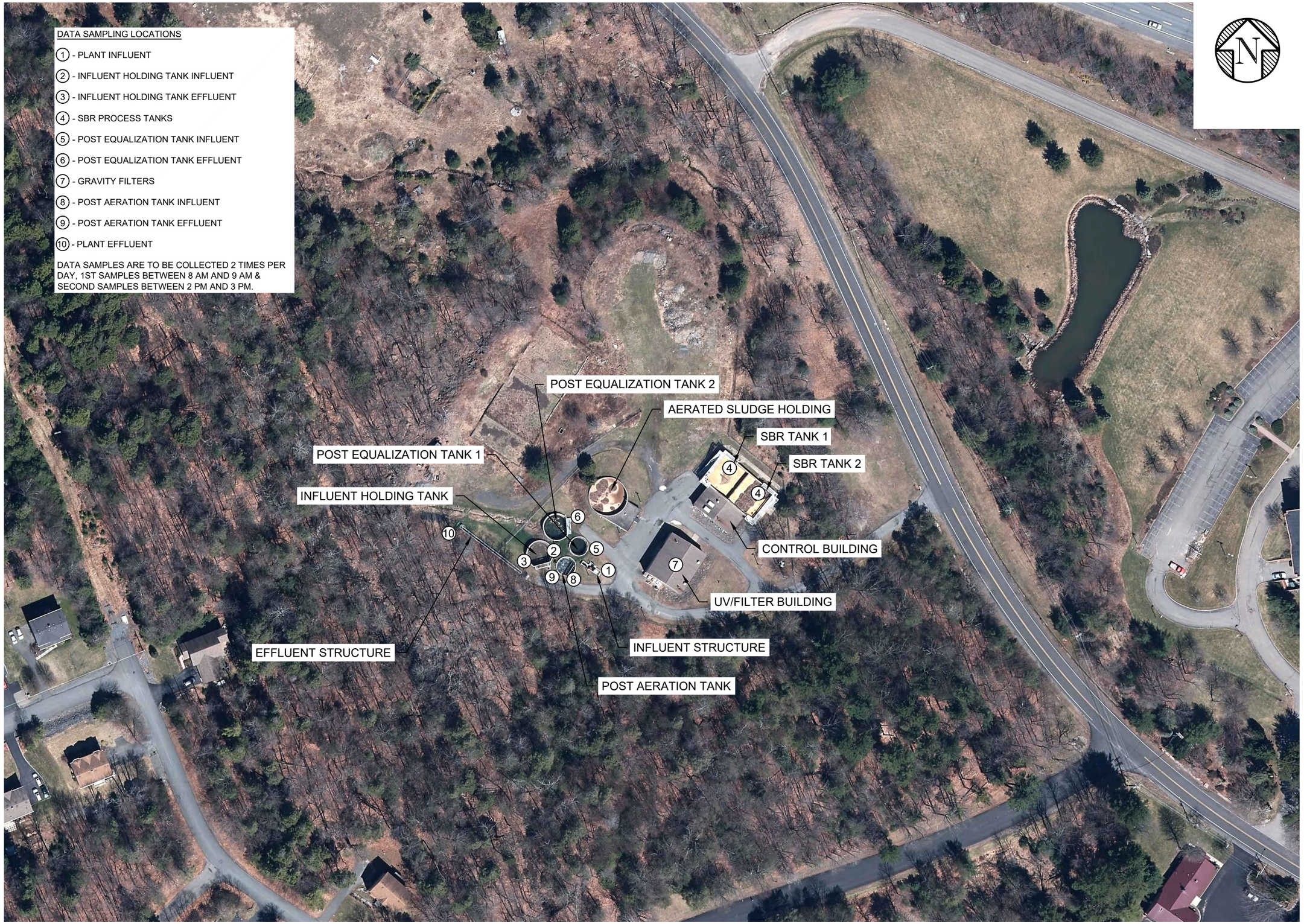
VII. Future Plant Upgrade Plans:

The Town is currently in the preliminary planning stages of a proposed upgrade to the Emerald Green Wastewater Treatment Plant. This project is expected to occur in phases between 2021 and 2023 (subject to changes). As temperature sampling results are collected and assessed, it is anticipated that implementation of cooling measures may be incorporated into phases of the plant upgrade.

FIGURES

FIGURE 1

Existing Aerial Site Plan



DATE: 2/28/20
DRAWN BY: JG
SCALE: 1" = 50'
REVIEWED BY: DRO
PROJECT NO.:
FILE: (T) THOMPSON

DELAWARE ENGINEERING, D.P.C.
CIVIL AND ENVIRONMENTAL ENGINEERING
55 SOUTH MAIN STREET, ONEONTA, NY 13820 - 607.432.8073
28 MADISON AVENUE EXTENSION, ALBANY, NY 12203 - 518.452.1290
6 TOWNSEND STREET, WALTON, NY 13856 - 607.865.9235
31 NORTH MAIN STREET, LIBERTY, NY 12754 - 845.747.3952

REVISIONS

NO.	DATE	DESCRIPTION

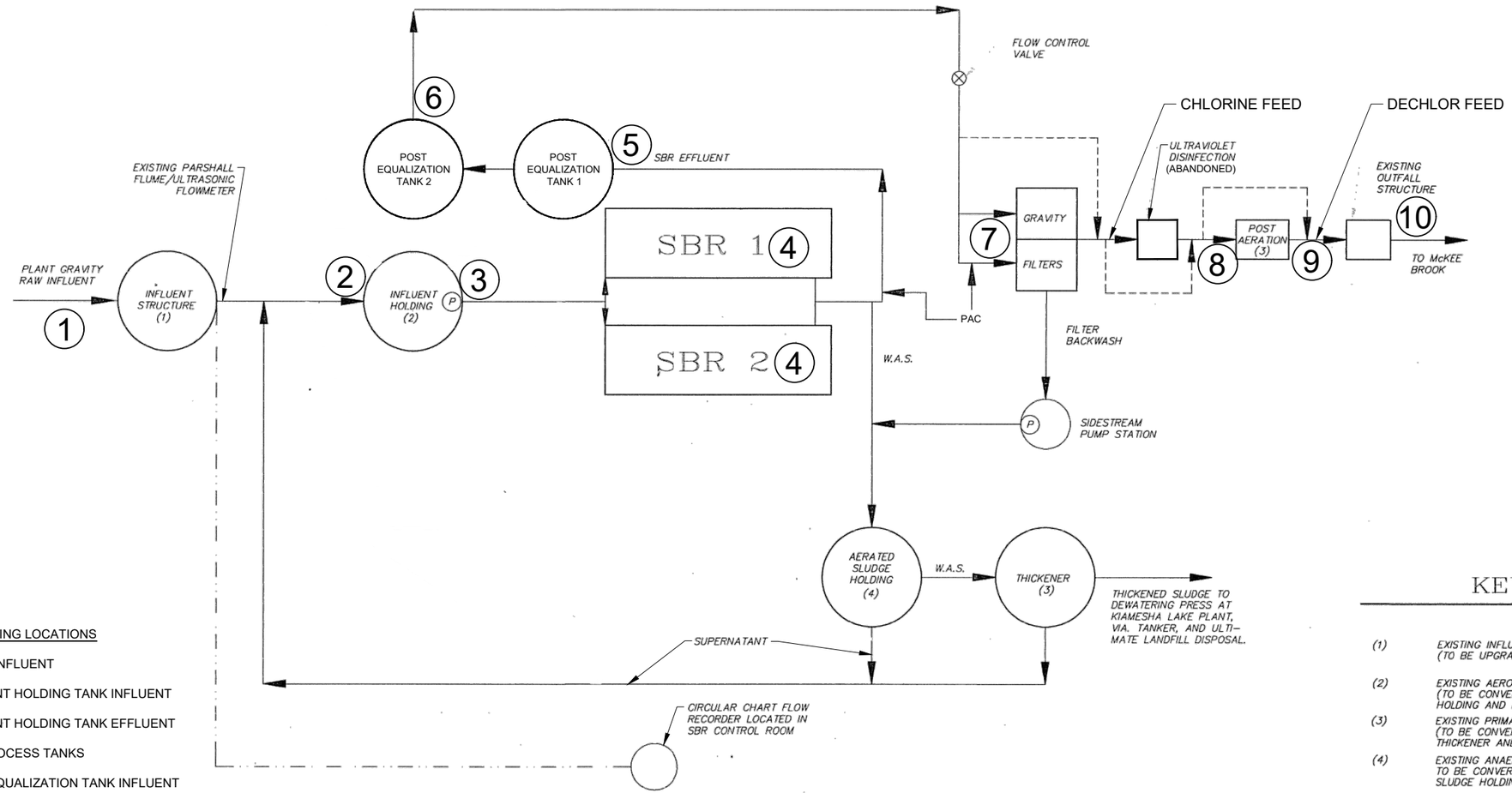
EMERALD GREEN SEWAGE TREATMENT FACILITY
TOWN OF THOMPSON
SULLIVAN COUNTY, N.Y.

EXISTING AERIAL SITE PLAN

SHEET:
FIG-1

FIGURE 2

Existing Plant Process Schematic



PROCESS SCHEMATIC

DATA SAMPLING LOCATIONS

1. PLANT INFLUENT
2. INFLUENT HOLDING TANK INFLUENT
3. INFLUENT HOLDING TANK EFFLUENT
4. SBR PROCESS TANKS
5. POST EQUALIZATION TANK INFLUENT
6. POST EQUALIZATION TANK EFFLUENT
7. GRAVITY FILTERS
8. POST AERATION TANK INFLUENT
9. POST AERATION TANK EFFLUENT
10. PLANT EFFLUENT

DATA SAMPLES ARE TO BE COLLECTED 2 TIMES PER DAY, 1ST SAMPLES BETWEEN 8 AM AND 9 AM & SECOND SAMPLES BETWEEN 2 PM AND 3 PM.

NORMAL FLOW TRAIN

BYPASS

KEY

(1)	EXISTING INFLUENT STRUCTURE (TO BE UPGRADED)
(2)	EXISTING AERO–CLARIATOR (TO BE CONVERTED TO INFLUENT HOLDING AND POST–EQUALIZATION)
(3)	EXISTING PRIMARY CLARIFIER (TO BE CONVERTED TO SLUDGE THICKENER AND POST AERATION)
(4)	EXISTING ANAEROBIC DIGESTER TO BE CONVERTED TO AERATED SLUDGE HOLDING TANK)
W.A.S.	WASTE ACTIVATED SLUDGE
(P)	PROPOSED PUMP

DATE: 2/28/20
DRAWN BY: JG
SCALE: NOT TO SCALE
REVIEWED BY: DRO
PROJECT NO.:
FILE: (T) THOMPSON

DELAWARE ENGINEERING, D.P.C.
CIVIL AND ENVIRONMENTAL ENGINEERING
55 SOUTH MAIN STREET, ONEONTA, NY 13820 - 607.432.8073
28 MADISON AVENUE EXTENSION, ALBANY, NY 12203 - 518.452.1290
6 TOWNSEND STREET, WALTON, NY 13856 - 607.865.9235
31 NORTH MAIN STREET, LIBERTY, NY 12754 - 845.747.9952

REVISIONS

NO.	DATE	DESCRIPTION

EMERALD GREEN SEWAGE TREATMENT FACILITY
TOWN OF THOMPSON
SULLIVAN COUNTY, N.Y.

EXISTING PLANT PROCESS SCHEMATIC

SHEET: FIG-2

ATTACHMENTS

ATTACHMENT 1

SPDES PERMIT # NY0035645

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

State Pollutant Discharge Elimination System (SPDES) DISCHARGE PERMIT

Industrial Code:	**4952**	SPDES Number:	**NY0035645**
Discharge Class (CL):	**07**	DEC Number:	**3-4846-00196/00001**
Toxic Class (TX):	**N**	Effective Date (EDP):	**09/01/2019**
Major Drainage Basin:	**14**	Expiration Date (ExDP):	**08/31/2024**
Sub Drainage Basin:	**02**	Modification Dates: (EDPM)	
Water Index Number:	**D-1-35**		
Compact Area:	**DRBC**		

This SPDES permit is issued in compliance with Title 8 of Article 17 of the Environmental Conservation Law of New York State and in compliance with the Clean Water Act, as amended, (33 U.S.C. §1251 et.seq.)(hereinafter referred to as "the Act").

PERMITTEE NAME AND ADDRESS					
Name:	**Town of Thompson**	Attention:			
Street:	**4052 State Route 42**				
City:	**Monticello**	State:	**NY**	Zip Code:	**12701**
Email:		Phone:			

is authorized to discharge from the facility described below:

FACILITY NAME AND ADDRESS																	
Name:	**Emerald Green-Lake Louise Marie S&W District**																
Location (C, T, V):	**(T) Thompson**									County:	**Sullivan**						
Facility Address:	**4052 State Route 42**																
City:	**Monticello**				State:				**NY**	Zip Code:	**12701**						
Facility Location:		Latitude:	**41**	°	**35**	'	**16**	" N	& Longitude:	**74**	°	**35**	'	**16**	" W		
From Outfall No.:	**001**	at Latitude:	**41**	°	**37**	'	**08**	" N	& Longitude:	**74**	°	**35**	'	**20**	" W		
into receiving waters known as:	**McKee Brook**								Class:	**B (T)**							

and the outfalls listed on page 3 of this permit in accordance with: effluent limitations; monitoring and reporting requirements; other provisions and conditions set forth in this permit; and 6 NYCRR Part 750-1 and 750-2.

This permit and the authorization to discharge shall expire on midnight of the expiration date shown above. The permittee shall not discharge after the expiration date unless this permit has been renewed or extended pursuant to law. To be authorized to discharge beyond the expiration date, the permittee shall apply for permit renewal not less than 180 days prior to the expiration date shown above.

DISTRIBUTION:
CO BWP - Permit Coordinator
RWE
RPA
EPA Region II
NYSEFC
NYSDOH District Office

Deputy Chief Permit Administrator:	Scott E. Sheeley	
Address:	Division of Environmental Permits 625 Broadway, 4th Floor Albany, NY 12233-1750	
Signature:	Scott E. Sheeley	Date: AUG. 14, 2019

PERMIT LIMITS, LEVELS AND MONITORING DEFINITIONS

OUTFALL	WASTEWATER TYPE	RECEIVING WATER	EFFECTIVE	EXPIRING
	This cell describes the type of wastewater authorized for discharge. Examples include process or sanitary wastewater, storm water, non-contact cooling water.	This cell lists classified waters of the state to which the listed outfall discharges.	The date this page starts in effect. (e.g. EDP or EDPM)	The date this page is no longer in effect. (e.g. ExDP)

PARAMETER	MINIMUM	MAXIMUM	UNITS	SAMPLE FREQ.	SAMPLE TYPE
e.g. pH, TRC, Temperature, D.O.	The minimum level that must be maintained at all instants in time.	The maximum level that may not be exceeded at any instant in time.	SU, °F, mg/l, etc.	See below	See below

PARAMETER	EFFLUENT LIMIT or CALCULATED LEVEL	COMPLIANCE LEVEL / MINIMUM LEVEL (ML)	ACTION LEVEL	UNITS	SAMPLE FREQUENCY	SAMPLE TYPE
	Limit types are defined below in Note 1. The effluent limit is developed based on the more stringent of technology-based limits, required under the Clean Water Act, or New York State water quality standards. The limit has been derived based on existing assumptions and rules. These assumptions include receiving water hardness, pH and temperature; rates of this and other discharges to the receiving stream; etc. If assumptions or rules change the limit may, after due process and modification of this permit, change.	For the purposes of compliance assessment, the permittee shall use the approved EPA analytical method with the lowest possible detection limit as promulgated under 40CFR Part 136 for the determination of the concentrations of parameters present in the sample unless otherwise specified. If a sample result is below the detection limit of the most sensitive method, compliance with the permit limit for that parameter was achieved. Monitoring results that are lower than this level must be reported, but shall not be used to determine compliance with the calculated limit. This Minimum Level (ML) can be neither lowered nor raised without a modification of this permit.	Action Levels are monitoring requirements, as defined below in Note 2, which trigger additional monitoring and permit review when exceeded.	This can include units of flow, pH, mass, temperature, or concentration. Examples include µg/l, lbs/d, etc.	Examples include Daily, 3/week, weekly, 2/month, monthly, quarterly, 2/yr and yearly. All monitoring periods (quarterly, semiannual, annual, etc.) are based upon the calendar year unless otherwise specified in this Permit.	Examples include grab, 24 hour composite and 3 grab samples collected over a 6 hour period.

Notes:

1. EFFLUENT LIMIT TYPES:
   a. DAILY DISCHARGE: The discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for the purposes of sampling. For pollutants expressed in units of mass, the 'daily discharge' is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the 'daily discharge' is calculated as the average measurement of the pollutant over the day.
   b. DAILY MAX: The highest allowable daily discharge.
   c. DAILY MIN: The lowest allowable daily discharge.
   d. MONTHLY AVG: The highest allowable average of daily discharges over a calendar month, calculated as the sum of each of the daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.
   e. 7 DAY ARITHMETIC MEAN (7 day average): The highest allowable average of daily discharges over a calendar week.
   f. 30 DAY GEOMETRIC MEAN: The highest allowable geometric mean of daily discharges over a calendar month, calculated as the antilog of: the sum of the log of each of the daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.
   g. 7 DAY GEOMETRIC MEAN: The highest allowable geometric mean of daily discharges over a calendar week.
   h. 12 MONTH ROLLING AVERAGE: The current monthly value of a parameter, plus the sum of the monthly values over the previous 11 months for that parameter, divided by 12.
   i. RANGE: The minimum and maximum instantaneous measurements for the reporting period must remain between the two values shown.

2. ACTION LEVELS: Routine Action Level monitoring results, if not provided for on the Discharge Monitoring Report (DMR) form, shall be appended to the DMR for the period during which the sampling was conducted. If the additional monitoring requirement is triggered as noted below, the permittee shall undertake a short-term, high-intensity monitoring program for the parameter(s). Samples identical to those required for routine monitoring purposes shall be taken on each of at least three consecutive operating and discharging days and analyzed. Results shall be expressed in terms of both concentration and mass, and shall be submitted no later than the end of the third month following the month when the additional monitoring requirement was triggered. Results may be appended to the DMR or transmitted under separate cover to the same address. If levels higher than the Action Levels are confirmed, the permit may be reopened by the Department for consideration of revised Action Levels or effluent limits. The permittee is not authorized to discharge any of the listed parameters at levels which may cause or contribute to a violation of water quality standards.

PERMIT LIMITS, LEVELS AND MONITORING

OUTFALL	LIMITATIONS APPLY:	RECEIVING WATER	EFFECTIVE	EXPIRING
001	All Year unless otherwise noted	McKee Brook	09/01/2019	08/31/2024

PARAMETER	EFFLUENT LIMIT					MONITORING REQUIREMENTS				FN
								Location		
	Type	Limit	Units	Limit	Units	Sample Frequency	Sample Type	Inf.	Eff.	
Flow	Monthly Average	410,000	GPD			Continuous	Recorder	X		
$CBOD_5$	Monthly Average	5	mg/l	17.10	lbs/d	2/Month	6-hr. Comp.	X	X	(1)
Solids, Suspended	Monthly Average	10	mg/l	34.20	lbs/d	2/Month	6-hr. Comp.	X	X	(1)
Solids, Settleable	Daily Maximum	0.1	ml/l			Daily	Grab	X	X	
pH	Range	6.5 – 8.5	SU			Daily	Grab	X	X	
Nitrogen, TKN (as N)	Monitor		mg/l			Daily	6-hr. Comp.	X	X	
Nitrogen, Ammonia (as NH3) (June 1 to October 31)	Monthly Average	1.1	mg/l			Daily	6-hr. Comp.	X	X	
Nitrogen, Ammonia (as NH3 (November 1 to May 31)	Monthly Average	2.2	mg/l			Daily	6-hr. Comp.	X	X	
Phosphorus, Total (as P)	Monthly Average	0.5	mg/l			Daily	6-hr. Comp.	X	X	
Dissolved Oxygen	Daily Minimum	7.0	mg/l			Daily	Grab	X	X	
Effluent Disinfection required		[ ] All Year		[X] Seasonal from **May 1** to **Oct 31**						
Coliform, Fecal	30-Day Geometric Mean	200	No./ 100 ml				Grab		X	
Coliform, Fecal	7 Day Geometric Mean	400	No./ 100 ml				Grab		X	
Chlorine, Total Residual	Daily Maximum	0.03	mg/l				Grab		X	(2, 3)

PARAMETER	EFFLUENT LIMIT or CALCULATED LEVEL		COMPLIANCE LEVEL/ ML	ACTION LEVEL	UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	FN
	Monthly Avg	Daily Max						
Temperature				70	°F	1/day	Grab	(4)

Footnotes listed on page 4 of this permit.

FOOTNOTES:

(1) and effluent shall not exceed 15 % and 15 % of influent concentration values for BOD5 & TSS respectively.

(2) if chlorine is used for disinfection.

(3) an interim limit of 2.0 mg/l for Total Residual Chlorine shall be in effect as interim limits until the construction of facilities to achieve compliance with the final effluent limit of 0.03 mg/l.

(4) Temperature Action Level

Sampling Requirements – If the discharge temperature exceeds the Action Level of 70 degrees Fahrenheit the permittee shall, within one week, undertake the following one day monitoring program:

Monitoring Program – Temperature shall be measured at the following three locations, on the same day once in the morning and once in the afternoon:

1. effluent as close as practical to the outfall without influence from the receiving water,
2. receiving water downstream, about 200 feet downstream of the outfall,
3. receiving water 0 to 10 feet upstream of the outfall

The receiving water sampling locations shall be documented by the permittee and used for all subsequent monitoring, depicted on the Monitoring Locations page, locations 2 and 3 above, shall be used for monitoring unless a different location is approved by the Department. Temperature monitoring (i.e., collection and analysis of one round of influent, effluent, upstream, and downstream samples) shall be completed within one hour.

The permittee is exempt from this temperature monitoring program whenever conditions at or near the in-stream monitoring locations are unsafe due to weather.

Reporting - Results shall be appended to the corresponding Discharge Monitoring Report (DMR) and emailed in spreadsheet format to spdes.temperaturedata@dec.ny.gov.

TEMPERATURE MANAGEMENT FOR POTWs[1] DISCHARGES TO TROUT WATERS

The permittee is required to develop, maintain, and implement a temperature management plan. The purpose of this plan is to minimize the thermal impacts to the receiving water. The goal of the temperature management plan will be to reduce effluent temperature below the 70 degrees Fahrenheit Action Level. The permittee shall submit a plan which incorporates the following items:

1. **Thermal Track Down** – Permittee must conduct a thermal assessment of the current collection and treatment system. This is to include influent and effluent temperature monitoring data from the treatment system and each unit within the system. Any process or input source that adds heat to the system must be identified.

2. **Passive Cooling Measures** – Permittee shall assess passive cooling measures (e.g. shading of tankage) which may be implemented to reduce effluent temperature to the maximum extent practical. Such measures can be operational or physical modifications which the permittee believes will prove effective.

3. **Implementation –** The temperature management plan shall contain action items to address the assessments noted in 1 and 2 above as well as a schedule for implementation and shall be submitted to the Department for approval. The temperature management plan and schedule will become an enforceable part of the permit upon approval by the Department.

4. **Compliance Deadlines –** The permittee shall submit the temperature management plan **by 03/01/2020** to the Regional office listed on the Recording, Reporting and Additional Monitoring page of this permit and to the Bureau of Water Permits, 625 Broadway, Albany, NY 12233-3505, and in electronic format to spdes.temperaturedata@dec.ny.gov.

Mercury Minimization Program for Low Priority POTWs

The permittee shall inspect each tributary dental facility at least once every five years to verify compliance with the wastewater treatment operation, maintenance, and notification elements of 6NYCRR Part 374.4. In lieu of an inspection, the permittee can accept a certification from the dental facility owner that the treatment system was properly installed and the facility complies with the wastewater treatment operation, maintenance, and notification elements of 6NYCRR Part 374.4. Prior to acceptance of new or increased tributary discharges that are industrial in nature, including hauled wastes, sample data shall be provided to the permittee for mercury content. Discharges which may exceed 500 ng/L, must receive approval from the Department prior to acceptance. A file shall be maintained containing inspection results, certifications, and other information submitted by dental offices and all other potential dischargers of mercury. This file shall be available for review by NYSDEC representatives and copies shall be provided upon request.

Note: the mercury-related requirements in this permit conform to the mercury Multiple Discharge Variance specified in NYSDEC policy *DOW 1.3.10*.

DISCHARGE NOTIFICATION REQUIREMENTS

(a) Except as provided in (c) and (g) of these Discharge Notification Act requirements, the permittee shall install and maintain identification signs at all outfalls to surface waters listed in this permit. Such signs shall be installed before initiation of any discharge.

(b) Subsequent modifications to or renewal of this permit does not reset or revise the deadline set forth in (a) above, unless a new deadline is set explicitly by such permit modification or renewal.

(c) The Discharge Notification Requirements described herein do not apply to outfalls from which the discharge is composed exclusively of storm water, or discharges to ground water.

(d) The sign(s) shall be conspicuous, legible and in as close proximity to the point of discharge as is reasonably possible while ensuring the maximum visibility from the surface water and shore. The signs shall be installed in such a manner to pose minimal hazard to navigation, bathing or other water related activities. If the public has access to the water from the land in the vicinity of the outfall, an identical sign shall be posted to be visible from the direction approaching the surface water.

The signs shall have **minimum** dimensions of eighteen inches by twenty four inches (18" x 24") and shall have white letters on a green background and contain the following information:

N.Y.S. PERMITTED DISCHARGE POINT

SPDES PERMIT No.: NY_____

OUTFALL No. :____

For information about this permitted discharge contact:

Permittee Name: _____

Permittee Contact: _____

Permittee Phone: ( ) - ### - ####

OR:

NYSDEC Division of Water Regional Office Address:

NYSDEC Division of Water Regional Phone: ( ) - ### -####

(e) For each discharge required to have a sign in accordance with a), the permittee shall, concurrent with the installation of the sign, provide a repository of copies of the Discharge Monitoring Reports (DMRs), as required by the **RECORDING, REPORTING AND ADDITIONAL MONITORING REQUIREMENTS** page of this permit. This repository shall be open to the public, at a minimum, during normal daytime business hours. The repository may be at the business office repository of the permittee or at an off-premises location of its choice (such location shall be the village, town, city or county clerk's office, the local library or other location as approved by the Department). In accordance with the **RECORDING, REPORTING AND ADDITIONAL MONITORING REQUIREMENTS** page of your permit, each DMR shall be maintained on record for a period of five years

(f) The permittee shall periodically inspect the outfall identification sign(s) in order to ensure they are maintained, are still visible, and contain information that is current and factually correct. Signs that are damaged or incorrect shall be replaced within 3 months of inspection.

DISCHARGE NOTIFICATION REQUIREMENTS (continued)

(g) All requirements of the Discharge Notification Act, including public repository requirements, are waived for any outfall meeting any of the following circumstances, provided Department notification is made in accordance with (h) below:

(i) such sign would be inconsistent with any other state or federal statute;

(ii) the Discharge Notification Requirements contained herein would require that such sign could only be located in an area that is damaged by ice or flooding due to a one-year storm or storms of less severity;

(iii) instances in which the outfall to the receiving water is located on private or government property which is restricted to the public through fencing, patrolling, or other control mechanisms. Property which is posted only, without additional control mechanisms, does not qualify for this provision;

(iv) instances where the outfall pipe or channel discharges to another outfall pipe or channel, before discharge to a receiving water; or

(v) instances in which the discharge from the outfall is located in the receiving water, two-hundred or more feet from the shoreline of the receiving water.

(h) If the permittee believes that any outfall which discharges wastewater from the permitted facility meets any of the waiver criteria listed in (g) above, notification (form enclosed) must be made to the Department's Bureau of Water Permits, 625 Broadway, Albany, N.Y. 12233-3505, of such fact, and, provided there is no objection by the Department, a sign and DMR repository for the involved outfall(s) are not required. This notification must include the facility's name, address, telephone number, contact, permit number, outfall number(s), and reason why such outfall(s) is waived from the requirements of discharge notification. The Department may evaluate the applicability of a waiver at any time, and take appropriate measures to assure that the ECL and associated regulations are complied with.

SCHEDULE OF COMPLIANCE

a) The permittee shall comply with the following schedule:

Outfall(s)	Compliance Action	Due Date
001	The permittee shall submit an approvable engineering report, prepared by a Professional Engineer licensed to practice engineering in New York State, detailing the disinfection designs that will be used to comply with the final effluent limitations for Total Residual Chlorine.	03/01/2020
	The permittee shall submit approvable Engineering Plans, Specifications, and Construction Schedule for the implementation of effluent disinfection.	DEC Approval of Engineering Report + 6 months.
	The permittee shall begin construction of the treatment facilities in accordance with the Department approved schedule.	May 1, 2021
	The permittee shall complete construction and commence operation of the system and comply with the final effluent limitations for Total Residual Chlorine.	May 1, 2022

Parameter(s)Affected	Interim Effluent Limit(s)	Final Effluent Limit(s)	Effective Date of final effluent limit(s)
Total Residual Chlorine	2.0 mg/l ~~01 mg/l~~	0.03 mg/l	May 1, 2022

The above compliance actions are one time requirements. The permittee shall comply with the above compliance actions to the Department's satisfaction once. When this permit is administratively renewed by NYSDEC letter entitled "SPDES NOTICE/RENEWAL APPLICATION/PERMIT," the permittee is not required to repeat the submission(s) noted above. The above due dates are independent from the effective date of the permit stated in the "SPDES NOTICE/RENEWAL APPLICATION/PERMIT" letter.

b) For any action where the compliance date is greater than 9 months past the previous compliance due date, the permittee shall submit interim progress reports to the Department every nine (9) months until the due date for these compliance items are met.

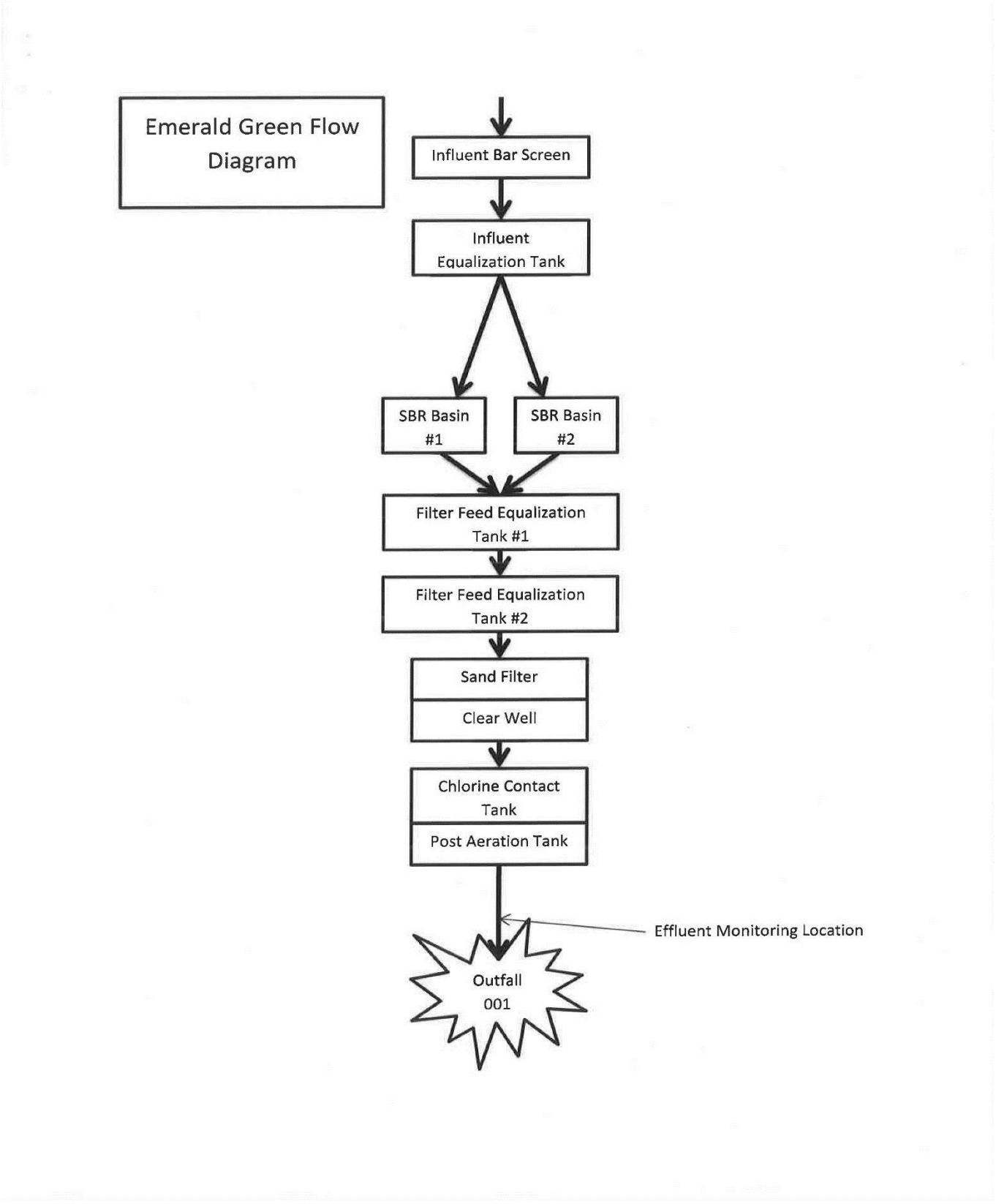
c) The permittee shall submit a written notice of compliance or non-compliance with each of the above schedule dates no later than 14 days following each elapsed date, unless conditions require more immediate notice as prescribed in 6 NYCRR Part 750-1.2(a) and 750-2. All such compliance or non-compliance notification shall be sent to the locations listed under the section of this permit entitled RECORDING, REPORTING AND ADDITIONAL MONITORING REQUIREMENTS. Each notice of non-compliance shall include the following information:

1. A short description of the non-compliance;
2. A description of any actions taken or proposed by the permittee to comply with the elapsed schedule requirements without further delay and to limit environmental impact associated with the non-compliance;
3. A description or any factors which tend to explain or mitigate the non-compliance; and
4. An estimate of the date the permittee will comply with the elapsed schedule requirement and an assessment of the probability that the permittee will meet the next scheduled requirement on time.

d) The permittee shall submit copies of any document required by the above schedule of compliance to the NYSDEC Regional Water Engineer at 100 Hillside Avenue, Suite 1W, White Plains, New York 10603-2860, and to the Bureau of Water Permits, 625 Broadway, Albany, N.Y. 12233-3505, unless otherwise specified in this permit or in writing by the Department.

MONITORING LOCATIONS

The permittee shall take samples and measurements, to comply with the monitoring requirements specified in this permit, at the locations(s) specified below:



GENERAL REQUIREMENTS

A. The regulations in 6 NYCRR Part 750 are hereby incorporated by reference and the conditions are enforceable requirements under this permit. The permittee shall comply with all requirements set forth in this permit and with all the applicable requirements of 6 NYCRR Part 750 incorporated into this permit by reference, including but not limited to the regulations in paragraphs B through J as follows:

B. General Conditions

1.	Duty to comply	6 NYCRR 750-2.1(e) & 2.4
2.	Duty to reapply	6 NYCRR 750-1.16(a)
3.	Need to halt or reduce activity not a defense	6 NYCRR 750-2.1(g)
4.	Duty to mitigate	6 NYCRR 750-2.7(f)
5.	Permit actions	6 NYCRR 750-1.1(c), 1.18, 1.20 & 2.1(h)
6.	Property rights	6 NYCRR 750-2.2(b)
7.	Duty to provide information	6 NYCRR 750-2.1(i)
8.	Inspection and entry	6 NYCRR 750-2.1(a) & 2.3

C. Operation and Maintenance

1.	Proper Operation & Maintenance	6 NYCRR 750-2.8
2.	Bypass	6 NYCRR 750-1.2(a)(17), 2.8(b) & 2.7
3.	Upset	6 NYCRR 750-1.2(a)(94) & 2.8(c)

D. Monitoring and Records

1.	Monitoring and records	6 NYCRR 750-2.5(a)(2), 2.5(a)(6), 2.5(c)(1), 2.5(c)(2), & 2.5(d)
2.	Signatory requirements	6 NYCRR 750-1.8 & 2.5(b)

E. Reporting Requirements

1.	Reporting requirements for POTWs	6 NYCRR 750-2.5, 2.7 & 1.17
2.	Anticipated noncompliance	6 NYCRR 750-2.7(a)
3.	Transfers	6 NYCRR 750-1.17
4.	Monitoring reports	6 NYCRR 750-2.5(e)
5.	Compliance schedules	6 NYCRR 750-1.14(d)
6.	24-hour reporting	6 NYCRR 750-2.7(c) & (d)
7.	Other noncompliance	6 NYCRR 750-2.7(e)
8.	Other information	6 NYCRR 750-2.1(f)
9.	Additional conditions applicable to a POTW	6 NYCRR 750-2.9

F. Planned Changes

1. The permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

    a. The alteration or addition to the permitted facility may meet of the criteria for determining whether facility is a new source in 40 CFR §122.29(b); or
    b. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, or to notification requirements under 40 CFR §122.42(a)(1); or
    c. The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.

In addition to the Department, the permittee shall submit a copy of this notice to the United States Environmental Protection Agency at the following address: U.S. EPA Region 2, Clean Water Regulatory Branch, 290 Broadway, 24th Floor, New York, NY 10007-1866.

GENERAL REQUIREMENTS continued

G. Notification Requirement for POTWs

1. All POTWs shall provide adequate notice to the Department and the USEPA of the following:
   a. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to section 301 or 306 of CWA if it were directly discharging those pollutants; or
   b. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.
   c. For the purposes of this paragraph, adequate notice shall include information on:
      i. the quality and quantity of effluent introduced into the POTW, and
      ii. any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

POTWs shall submit a copy of this notice to the United States Environmental Protection Agency, at the following address: U.S. EPA Region 2, Clean Water Regulatory Branch, 290 Broadway, 24th Floor, New York, NY 10007-1866Sludge Management
The permittee shall comply with all applicable requirements of 6 NYCRR Part 360.

H. Sludge Management

The permittee shall comply with all applicable requirements of 6 NYCRR Part 360.

I. SPDES Permit Program Fee

The permittee shall pay to the Department an annual SPDES permit program fee within 30 days of the date of the first invoice, unless otherwise directed by the Department, and shall comply with all applicable requirements of ECL 72-0602 and 6 NYCRR Parts 480, 481 and 485. Note that if there is inconsistency between the fees specified in ECL 72-0602 and 6 NYCRR Part 485, the ECL 72-0602 fees govern.

J. Water Treatment Chemicals (WTCs)

New or increased use and discharge of a WTC requires prior Department review and authorization. At a minimum, the permittee must notify the Department in writing of its intent to change WTC use by submitting a completed *WTC Notification Form* for each proposed WTC. The Department will review that submittal and determine if a SPDES permit modification is necessary or whether WTC review and authorization may proceed outside of the formal permit administrative process. The majority of WTC authorizations do not require SPDES permit modification. In any event, use and discharge of a WTC shall not proceed without prior authorization from the Department. Examples of WTCs include biocides, coagulants, conditioners, corrosion inhibitors, defoamers, deposit control agents, flocculants, scale inhibitors, sequestrants, and settling aids.

1. WTC use shall not exceed the rate explicitly authorized by this permit or otherwise authorized in writing by the Department.
2. The permittee shall maintain a logbook of all WTC use, noting for each WTC the date, time, exact location, and amount of each dosage, and, the name of the individual applying or measuring the chemical. The logbook must also document that adequate process controls are in place to ensure that excessive levels of WTCs are not used.
3. The permittee shall submit a completed WTC Annual Report Form each year that they use and discharge WTCs. This form shall be attached to either the December DMR or the annual monitoring report required below.

The *WTC Notification Form and WTC Annual Report Form* are available from the Department's website at: http://www.dec.ny.gov/permits/93245.html

RECORDING, REPORTING AND ADDITIONAL MONITORING REQUIREMENTS

A. A. The monitoring information required by this permit shall be retained for a period of at least five years from the date of the sampling for subsequent inspection by the Department or its designated agent.

B. The monitoring information required by this permit shall be summarized and reported by submitting:

Discharge Monitoring Reports (DMRs): Completed DMR forms shall be submitted for each 1 month reporting period in accordance with the DMR Manual available on Department's website.

DMRs must be submitted electronically using the electronic reporting tool (NetDMR) specified by NYSDEC. Instructions on the use of NetDMR are available in the DMR Manual. Attach the monthly "Wastewater Facility Operation Report" (form 92-15-7) and any required DMR attachments electronically to the DMR.

To submit via hard copy: **Hard copy paper DMRs will only be accepted by the Department if a waiver from the electronic submittal requirements has been granted by DEC to the facility**. Attach a hard copy of the monthly "Wastewater Facility Operation Report" (form 92-15-7) to the DMR. The Facility Operation report and DMRs shall be sent to:

Department of Environmental Conservation
Division of Water, Bureau of Water Compliance
625 Broadway, Albany, New York 12233-3506
Phone: (518) 402-8177

The first monitoring period begins on the effective date of this permit, and, unless otherwise required, the reports are due no later than the 28th day of the month following the end of each monitoring period.

C. Bypass and Sewage Pollutant Right to Know Reporting: In accordance with the Sewage Pollutant Right to Know Act (ECL § 17-0826-a), Publicly Owned Treatment Works (POTWs) are required to notify DEC and Department of Health within two hours of discovery of an untreated or partially treated sewage discharge and to notify the public and adjoining municipalities within four hours of discovery. Information regarding reporting and other requirements of this program may be found on the Department's website. In addition, POTWs are required to provide a five-day incident report and supplemental information to the DEC in accordance with Part 750-2.7(d) by utilizing the Department's Non-Compliance Report Form unless waived by DEC on a case-by-case basis.

D. Monitoring and analysis shall be conducted using sufficiently sensitive test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit.

E. More frequent monitoring of the discharge(s), monitoring point(s), or waters of the State than required by the permit, where analysis is performed by a certified laboratory or where such analysis is not required to be performed by a certified laboratory, shall be included in the calculations and recording of the data on the corresponding DMRs.

F. Calculations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in this permit.

G. Unless otherwise specified, all information recorded on the DMRs shall be based upon measurements and sampling carried out during the most recently completed reporting period.

H. Any laboratory test or sample analysis required by this permit for which the State Commissioner of Health issues certificates of approval pursuant to section 502 of the Public Health Law shall be conducted by a laboratory which has been issued a certificate of approval. Inquiries regarding laboratory certification should be directed to the New York State Department of Health, Environmental Laboratory Accreditation Program.

ATTACHMENT 2

Emerald Green Historical WWTP Data Summary (2018 – 2019)

DELAWARE ENGINEERING, D.P.C.
CIVIL & ENVIRONMENTAL ENGINEERING
ALBANY – ONEONTA, NEW YORK

Last Revised 02/29/2020

TOWN OF THOMPSON
EMERALD GREEN WWTP
TEMPERATURE MANAGEMENT PLAN
FIGURE 2
HISTORICAL WWTP DATA SUMMARY
(2018 - 2019)

	PRECIPITATION (WWTP)			FLOW EFFFLUENT				TEMP INF	TEMP INF	TEMP EFF	TEMP EFF
	Monthly Total	Monthly Min.	Monthly Max.	Month Avg.	Monthly Min.	Monthly Max.	Avg. Ratio Max. Day	Monthly Avg.	Monthly Max.	Monthly Avg.	Monthly Max.
PERMIT	-	-	-	**0.410**	-	-	Month Avg.	-	Mon.	-	AL 70 F
	in./day	in./day	in./day	(MGD)	(MGD)	(MGD)	-	Deg.F	Deg.F	Deg.F	Deg.F
Jan-18	2.74	0.00	1.21	0.291	0.160	0.506	1.74	43	54	43	48
Feb-18	3.97	0.00	0.64	0.365	0.215	0.647	1.77	44	51	44	48
Mar-18	2.95	0.00	1.51	0.317	0.239	0.561	1.77	46	53	43	51
Apr-18	3.49	0.00	1.53	0.323	0.201	0.519	1.61	50	60	48	53
May-18	3.10	0.00	0.92	0.286	0.187	0.611	2.14	57	66	59	65
Jun-18	2.14	0.00	0.47	0.194	0.123	0.261	1.34	64	70	66	71
Jul-18	8.08	0.00	3.35	0.261	0.140	0.632	2.43	70	75	72	75
Aug-18	4.92	0.00	1.16	0.296	0.168	0.469	1.58	71	77	72	75
Sep-18	5.86	0.00	1.69	0.307	0.147	0.622	2.02	70	76	69	74
Oct-18	4.14	0.00	1.82	0.281	0.187	0.418	1.49	64	74	62	68
Nov-18	7.41	0.00	1.27	0.440	0.188	0.882	2.00	54	59	52	64
Dec-18	4.93	0.00	1.24	0.355	0.221	0.847	2.39	49	55	49	54
Jan-19	3.50	0.00	1.01	0.291	0.136	0.661	2.27	45	49	45	50
Feb-19	2.30	0.00	0.49	0.290	0.206	0.609	2.10	44	53	43	54
Mar-19	1.80	0.00	0.61	0.264	0.176	0.497	1.88	46	55	43	52
Apr-19	4.78	0.00	0.71	0.321	0.235	0.447	1.39	51	64	51	59
May-19	5.82	0.00	1.00	0.335	0.235	0.693	2.06	56	67	57	63
Jun-19	3.24	0.00	1.10	0.263	0.186	0.409	1.56	64	80	62	70
Jul-19	3.16	0.00	0.79	0.202	0.145	0.301	1.49	70	76	72	76
Aug-19	2.77	0.00	0.88	0.183	0.119	0.246	1.34	72	74	72	75
Sep-19	1.12	0.00	0.39	0.141	0.114	0.181	1.28	68	70	68	73
Oct-19	7.17	0.00	2.63	0.207	0.113	0.604	2.92	62	68	63	68
Nov-19	2.83	0.00	1.19	0.312	0.222	0.713	2.29	54	58	54	63
Dec-19	3.52	0.00	0.70	0.371	0.212	0.786	2.12	50	57	51	53
Annual Tot. 18	53.73	-	-	-	-	-	-	-	-	-	-
Annual Avg. 18	4.48	0.00	1.40	0.310	0.181	0.581	1.86	57	64	57	62
Min. 18	2.14	0.00	0.47	0.194	0.123	0.261	1.34	43	51	43	48
Max. 18	8.08	0.00	3.35	0.440	0.239	0.882	2.43	71	77	72	75
Annual Tot.. 19	42.01	-	-	-	-	-	-	682	771	681	756
Annual Avg. 19	3.50	0.00	0.96	0.265	0.175	0.512	1.89	57	64	57	63
Min. 19	1.12	0.00	0.39	0.141	0.113	0.181	1.28	44	49	43	50
Max. 19	7.17	0.00	2.63	0.371	0.235	0.786	2.92	72	80	72	76
Total Ave.	3.99	0.00	1.18	0.287	0.178	0.547	1.87	57	64	57	63
Total Min.	1.12	0.00	0.39	0.141	0.113	0.181	1.28	43	49	43	48
Total Max.	8.08	0.00	3.35	0.440	0.239	0.882	2.92	72	80	72	76

- Cells highlighted in yellow indicate historical exceedances of the permited temperature limit.

ATTACHMENT 3

Sample Temperature Recording Form

THERMAL TRACK DOWN MONITORING REPORT FOR THE MONTH OF

SPDES PERMIT NO.	FACILITY NAME
NY-0035645	**EMERALD GREEN S.T.P.**

DAY	DATE	DAILY PRECIP. IN/DAY	PLANT INFLUENT		INFLUENT HOLDING TANK INFLUENT		INFLUENT HOLDING TANK EFFLUENT		SBR 1		SBR 2		GRAVITY FILTERS		POST AERATION TANK INFLUENT		POST AERATION TANK EFFLUENT		OUTFALL STRUCTURE	
			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
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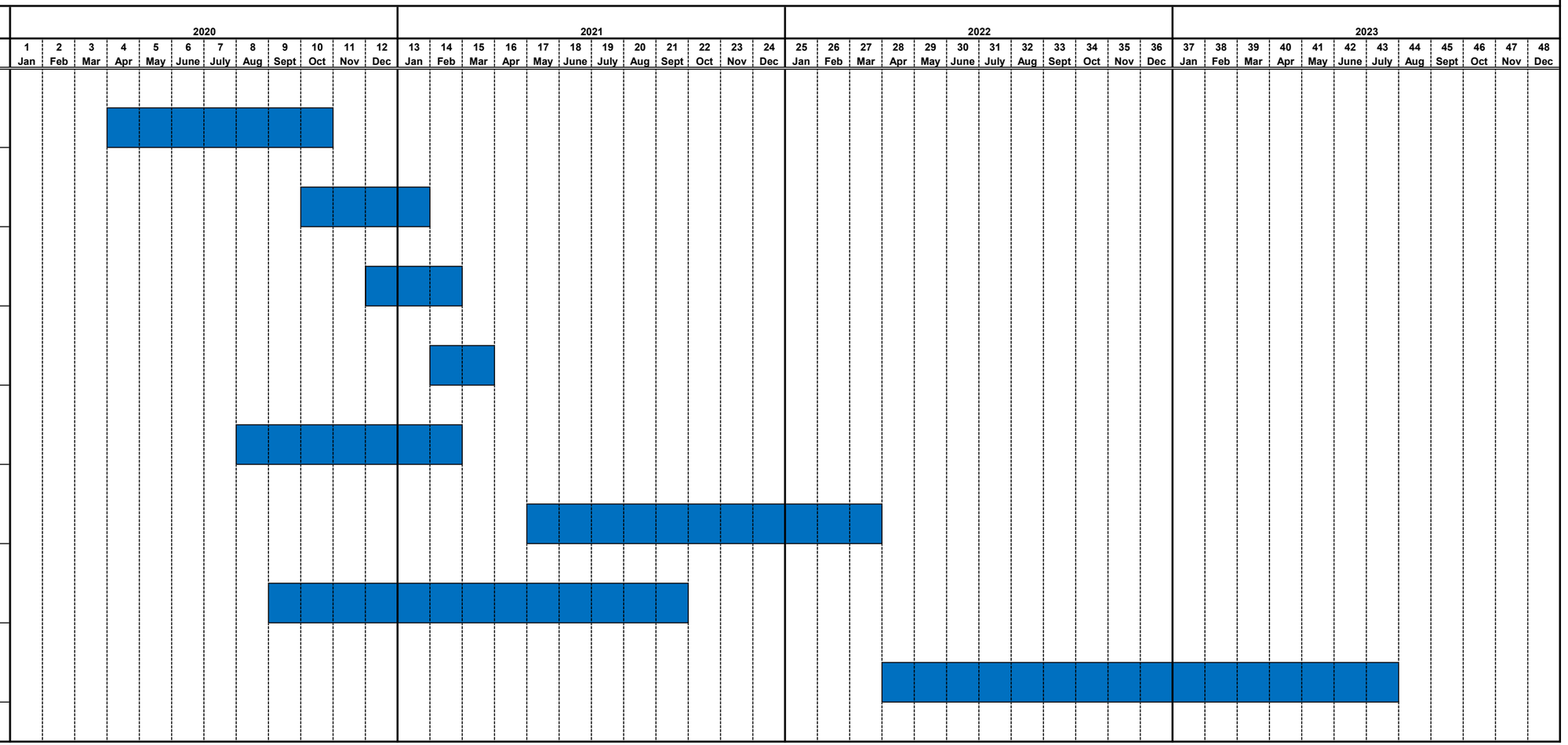
ATTACHMENT 4

Anticipated Implementation Schedule

Town of Thompson - Emerald Green WWTP Temperature Management Plan

Attacment 3 - Anticipated Implementation Schedule

Task Name	Duration (months)	Target Start	Target Finish
1. Temperature Sampling	7	Apr-20	Oct-20
2. Temperature Sampling Data Assesment	4	Oct-20	Jan-21
3. Assesment of Potential Cooling Methods	3	Dec-20	Feb-21
4. Determination of Appropriate Action Items	2	Feb-21	Mar-21
5. Anticipated Phase 1 Plant Upgrade Design	6	Aug-20	2/29/2021
6. Anticipated Phase 1 Plant Upgrade Construction	11	May-21	Mar-22
7. Anticipated Phase 2 Plant Upgrade Design	12	Sep-20	Sep-21
8. Anticipated Phase 2 Plant Upgrade Construction	15	Apr-22	Jul-23



APPENDIX O

UV Brochure

TROJANUV3000PLUS™

Wastewater Disinfection

TROJAN UV™

Water Confidence™

The Reference Standard in UV

Proven, chemical-free disinfection from the industry leader

UV is the most effective, safe and environmentally friendly way to disinfect wastewater. It provides broad-spectrum protection against a wide range of pathogens, including bacteria, viruses and chlorine-resistant protozoa (such as *Cryptosporidium* and *Giardia).*

The TrojanUV3000Plus™ is one of the reasons why UV treatment is now a favored technology in wastewater treatment. This highly flexible system has demonstrated effective and reliable performance around the world. It is well suited to wastewater disinfection applications with varying flow rates and influent. These include particularly challenging influents such as combined sewer overflows, primary and tertiary wastewater reclamation and reuse.

The proven infrastructure of the TrojanUV3000Plus has been continuously refined to enhance friendly operation. The result is more dependable performance, simplified maintenance and maximized UV lamp output at end-of-lamp life. The TrojanUV3000Plus also incorporates innovative features to further reduce operation and maintenance (O&M) costs, such as variable output electronic ballasts and our revolutionary ActiClean™ automatic chemical/mechanical sleeve wiping system.

TROJAN UV3000PLUS™

Designed for efficient, reliable performance

System Control Center (SCC)

The SCC monitors and controls all UV functions to ensure proper disinfection performance while conserving power and extending lamp life. The microprocessor-based Touch Smart Controller is housed in a small panel and features a user-friendly, touch-screen Human Machine Interface (HMI) along with Modbus Ethernet or Modbus RTU for SCADA connectivity. Along with dose-pacing control, the Touch Smart controller logs data for trending and analysis (flow, power, UVT, UV intensity and dose). A Programmable Logic Controller (PLC) can be supplied for larger systems (with more than 2 channels) for the advanced controls required for multiple channel operation and automatic slide/ sluice gate control.

Alarms

Extensive alarm reporting system ensures fast and accurate diagnosing of system process and maintenance alarms. Programmable control software can generate unique alarms for individual applications.

Power Distribution Center (PDC)

The PDC powers each bank of modules. Its ergonomic, angled design provides easy access to module power cables and hoses for the ActiClean cleaning system. The robust stainless steel enclosure is mounted across the channel, with module fuses and interlock relays visually aligned with module receptacles for fast diagnostics. Modules are individually overload-protected for safety. Like all TrojanUV3000Plus components, the PDC can be installed outdoors and requires no shelter, Heating, Ventilation or Air Conditioning (HVAC).

UV Intensity Sensor

The UV intensity sensor continually monitors UV lamp output. The ActiClean system automatically cleans lamp and sensor sleeves simultaneously.

Electronic Ballasts

The variable-output (60 - 100% power) electronic ballast is mounted in its own TYPE 6P (IP67) rated enclosure within the module frame. Features “quick connect” electrical connections. Cooling is by convection.

ActiClean Cleaning System

The system consists of two components:

1. Hydraulic System Center (HSC)

The HSC actuates the ActiClean cleaning system, and is mounted close to the channel in a stainless steel enclosure. It contains the pump, valves and ancillary equipment required to operate the cleaning system and links to the extend/retract hoses of the module wiper drives via a manifold located on the underside of the PDC.

2. ActiClean Wiper Assembly

A submersible wiper drive on each UV module drives the wiper carriage assembly along the module. Attached wiper canisters surround the quartz sleeves, and are filled with ActiClean-WW Gel. The gel uses food grade ingredients and contacts the lamp sleeves between the two wiper seals. Cleaning takes place while the lamps are submerged and while they are operating.

Water Level Sensor

The system includes an electrode low water level sensor for each channel. If effluent levels fall below defined parameters, an alarm will be activated.

UV Modules

UV lamps are mounted on modules installed in open channels. The lamps are enclosed in quartz sleeves, and positioned horizontally and parallel to water flow. A bank is made up of multiple modules placed in parallel. All ballast and lamp wiring runs inside the module frame.

Water Level Controller

A fixed weir, motorized weir gate, or Automatic Level Control gate (shown), is required in the channel to maintain the appropriate water level over the lamps. Trojan engineers will work with you to select the appropriate level control device for your application.

Key Benefits
TrojanUV3000Plus

Increased operator, community and environmental safety.
No disinfection by-products are created, and no chemicals are transported, stored or handled.

Most efficient UV system available. Compared to competitive low-pressure, high-output (LPHO) or amalgam lamp-based systems.

Reduces operating costs by as much as 30% per year. Long-lasting amalgam lamps and variable-output ballasts optimize UV output to meet wastewater conditions and maximize system efficiency.

Validated disinfection. Real-world, field performance data eliminates sizing assumptions resulting from theoretical dose calculations.

Dual-action sleeve cleaning system improves performance and reduces labor costs. Automatic ActiClean chemical/mechanical cleaning system maintains sleeve transmittance of at least 95%, and works online – eliminating the need to remove modules from the channel.

Reduced installation costs. The compact TrojanUV3000Plus can be retrofitted into existing chlorine contact tanks, and comes pre-tested, pre-assembled and pre-wired to minimize installation costs.

Outdoor installation flexibility. Can be installed outdoors, eliminating the need and costs of a building, shelter and HVAC for ballast cooling.

Guaranteed performance and comprehensive warranty. Includes a Performance Guarantee and the best lamp warranty in the industry.

ActiClean Dual-Action, Automatic Cleaning System

Chemical/mechanical cleaning system eliminates sleeve fouling

Benefits:

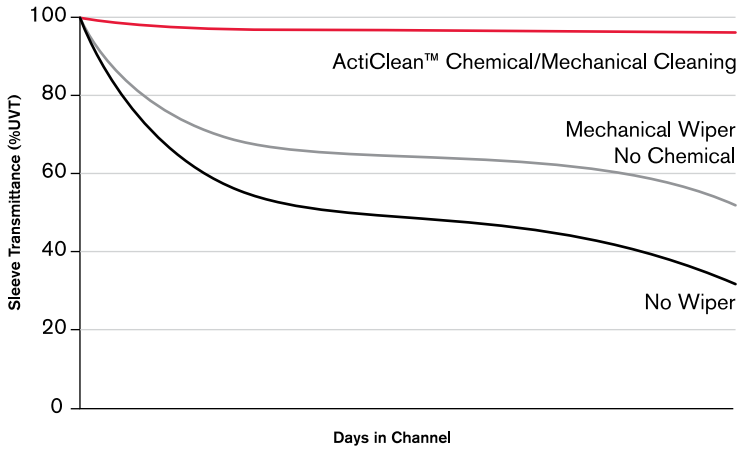
- Cleans 50% more effectively than mechanical wiping alone
- Improves lamp performance for more reliable dose delivery
- Reduced fouling reduces equipment sizing requirements and power consumption
- Automatic, online cleaning reduces O&M costs associated with manual cleaning
- Combination of chemical and mechanical cleaning action removes deposits on quartz lamp and sensor sleeves much more effectively than mechanical wiping alone
- Innovative wiper design incorporates a small quantity of ActiClean-WW Gel for superior, dual-action cleaning
- Automatic cleaning avoids the need to shut down the system during routine cleaning, reducung O&M costs.
- Proven in hundreds of systems around the world, including use in plants where heavy fouling had previously prohibited the use of UV disinfection technology
- Can be added to an installed TrojanUV3000Plus not originally equipped with a cleaning system

ActiClean-WW Gel is Safe to Handle

- ActiClean-WW Gel is comprised of food-grade ingredients
- Quick connect on cleaning system allows for easy refill of gel solution
- Lubricating action of ActiClean-WW Gel maximizes life of wiper seals

The dual-action, chemical/mechanical cleaning with the ActiClean system provides superior sleeve cleaning and reduces maintenance costs. Fouling and residue build-up on quartz sleeves reduces system efficiency. ActiClean maintains at least 95% transmittance, ensuring sleeves are clean and the system is consistently delivering accurate dosing while reducing power consumption.

Efficacy of Cleaning Technologies to Control Sleeve Fouling



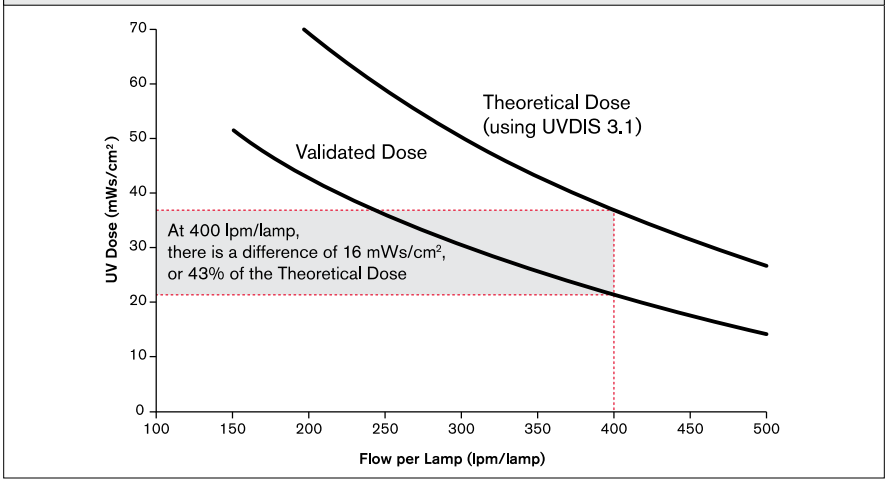
Regulatory-Endorsed Bioassay Validation

Real-world testing ensures accurate dose delivery

Benefits:

- Performance data is generated from actual field testing over a range of flow rates, effluent qualities, and UVTs
- Provides physical verification that system will perform as expected; ensures public and environmental safety
- Provides accurate assessment of equipment sizing needs
- In-field bioassay testing offers the peace of mind and improved public and environmental safety of verified dose delivery – not theoretical calculations
- The USEPA, NWRI and IUVA has endorsed bioassay as the cornerstone for UV reactor performance and UV dose delivery

Field Validated Dose vs. Theoretical Dose at 65% UVT
(Before Fouling & Lamp Aging Are Taken into Account)



This shows the validated dose of an actual working system and the theoretical dose calculated using UVDIS. Note that the UVDIS 3.1 dose calculation overestimates the system performance.

Amalgam Lamps Require Less Energy

Require fewer lamps and reduce O&M costs

Benefits:

- Draw less energy than competitive high-output systems – only 250 watts per lamp
- Stable UV output over a wide range of water temperatures
- Fewer lamps are required to deliver the required dose, which reduces O&M costs
- Can treat lower quality wastewater such as primary effluents, combined sewer overflows and storm water
- Fewer lamps allow systems to be located in compact spaces, reducing installation costs

Trojan's high-efficiency amalgam lamps generate stable UV output in a wide range of water temperatures.

- Produce significantly higher UV output than conventional low-output lamps
- Fast and simple lamp change-outs – replacing a 50-lamp system takes less than two hours and requires no tools
- Sealed inside heavy-duty quartz sleeves by our multi-seal system, maintaining a watertight barrier around the internal wiring while individually isolating each lamp and the module frame
- Pre-heated for reliable startup

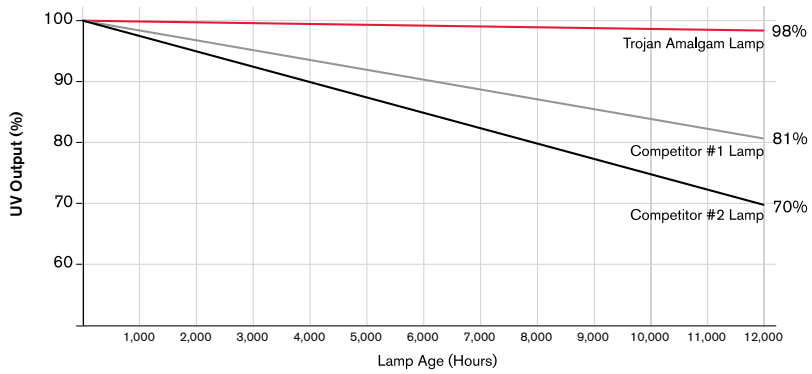
Amalgam Lamps Maintain Maximum UV Output

Trojan lamps deliver 98% of full UV output after more than one year of use

Benefits:

- Deliver the most consistent UV output
- Have 20% less decline in UV output after 12,000 hours of use compared to competitive UV lamps
- Validated performance assures you of reliable dose delivery and prolonged lamp life

Decrease in UV Lamp Output Over Time



The lamps used on the TrojanUV3000Plus system have been independently validated in accordance with standards set in the AwwaRF/NWRI 2003 Guidelines for Drinking Water and Water Reuse to maintain 98% of original output after 12,000 hours of operation.

Open-Channel Architecture Designed for Outdoor Installation

Cost-effective to install and expand

Benefits:

- Compact, open-channel design allows cost-effective installation in existing effluent channels and chlorine contact chambers
- System can be installed outdoors to reduce capital costs – no building, shelter or HVAC is required
- Gravity-fed design eliminates costs of pressurized vessels, piping and pumps
- Scalable architecture allows precise sizing – reduces capital and O&M costs associated with oversizing
- Modular design is readily expandable to meet new regulatory or capacity requirements
- Thorough design approach ensures that effluent quality, upstream treatment processes, and O&M needs are addressed in system configurations
- Horizontal lamp mounting delivers optimal hydraulic performance. This arrangement induces turbulence and dispersion, maximizing wastewater exposure to UV output

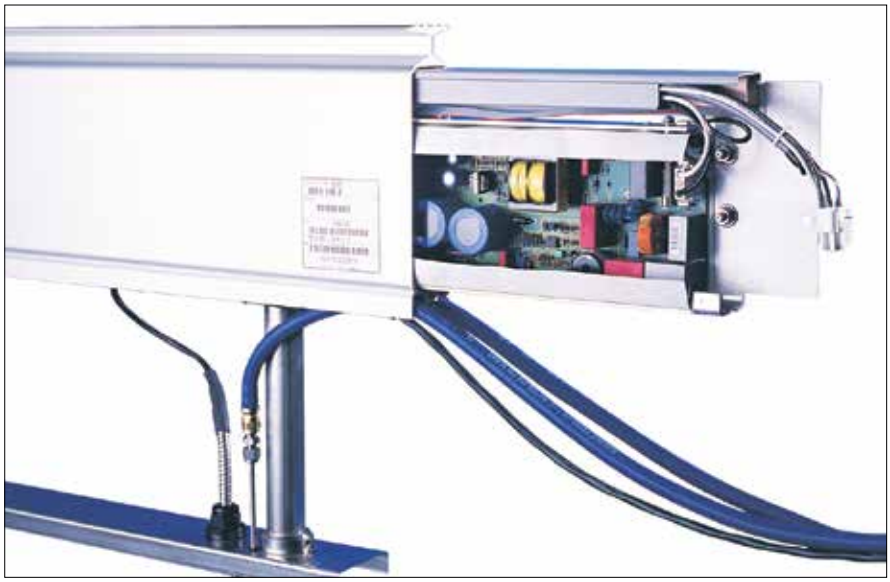
The TrojanUV3000Plus system delivers flexibility and cost savings through its simple installation in existing channels and chlorine contact chambers. The system can be situated outdoors with no additional building, shelter or cooling requirements.

Advanced, Self-Contained UV Module

Dramatically reduces footprint size and eliminates costs of air conditioning

Benefits:

- Lamps are protected in a fully submersible, 316 stainless steel frame
- Waterproof module frame protects cables from effluent, fouling and UV light
- Electronic ballasts are housed right in the module, reducing the system footprint, minimizing installation time and costs and eliminating the need for separate external cabinets
- Ballast enclosures are rated TYPE 6P (IP67) – air/water tight
- Module leg and lamp connector have a hydrodynamic profile to reduce headloss
- The variable-output, electronic ballast is mounted in an enclosure integrated within the module frame
- Wiring is pre-installed and factory-tested



Module-mounted ballasts allow for compact installation, convection cooling and protect wires and cables from exposure to effluent and UV light.

- Cooling ballasts by convection eliminates costs associated with air conditioning and forced-air cooling

Module leg and lamp connector have a hydrodynamic profile to reduce headloss and potential for debris fouling.

Designed for Easy Maintenance

UV lamps are easily replaced in minutes without the need for tools.

- TrojanUV3000Plus lamps are warranted for 12,000 hours
- Modular design allows for maintenance on one module without disrupting disinfection performance
- Maintenance limited to replacing lamps and ActiClean Gel
- Automated ActiClean cleaning system reduces manual labor associated with cleaning sleeves

Quick connect allows for easy refill of ActiClean-WW Gel.

System Specifications

System Characteristics	TrojanUV3000Plus
Typical Applications	Wide range of wastewater treatment plants
Lamp Type	High-efficiency Amalgam
Ballast Type	Electronic, variable output (60 to 100% power)
Input Power Per Lamp	250 Watts
Lamp Configuration	Horizontal, parallel flow
Module Configuration	4, 6 or 8 lamps per module
Level Control Device Options	ALC, fixed weir or motorized weir gate
Water Level Sensor	1 electrode low water level sensor per channel
Enclosure Ratings:	
Module Frame / Ballast Enclosure	TYPE 6P (IP68) / TYPE 6P (IP67)
All Other Enclosures	TYPE 4X (IP56)
Ballast Cooling Method	Convection; no air conditioning or forced air required
Installation Location	Indoor or outdoor
Sleeve Cleaning System:	
ActiClean Cleaning System	Optional Automatic Chemical/Mechanical Cleaning System
ActiClean-WW Gel	Non-corrosive, operator-friendly
Recommended Fouling Factor	1.0
System Control Center:	
Controller	Touch Smart Controller or PLC-based
Analog Inputs (Typical)	Flow (4-20 mA) and UVT (4-20 mA)
Discrete Outputs (Typical)	Bank status, common alarms and SCADA communication
Maximum Distance from UV Channel	500 ft. (152 m)
Electrical Requirements:	
Power Distribution Center	208Y/120V, 3 phase, 4 wire + GND, 60 Hz (Max. 8 modules per PDC) 480Y/277V, 3 phase, 4 wire + GND, 60 Hz 380Y/220V, 3 phase, 4 wire + GND, 50/60 Hz 400Y/230V, 3 phase, 4 wire + GND, 50/60 Hz 415Y/240V, 3 phase, 4 wire + GND, 50/60 Hz
System Control Center (stand alone)	120V, single phase, 2 wire + GND, 60 Hz, 1.8 kVA 220/230/240V, single phase, 2 wire + GND, 50/60 Hz, 1.8kVA
Hydraulic System Center (for Sleeve Cleaning System)	208V, 3 phase, 3 wire + GND, 60 Hz 380/400/415 V, 3 phase, 3 wire + GND, 50/60 Hz 480 V, 3 phase, 3 wire + GND, 60 Hz or 2.5kVA HSC powered from PDC
Water Level Sensor	24VDC powered from PDC

TrojanUV is part of the Trojan Technologies group of businesses.

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For a list of our global offices, please visit **trojanuv.com/contactus**.

TROJAN UV™
A TROJAN TECHNOLOGIES BUSINESS

APPENDIX P

Belt Press Brochure

BDP INDUSTRIES

Manufacturer of Dewatering Systems

Model 3DP™ Belt Filter Press

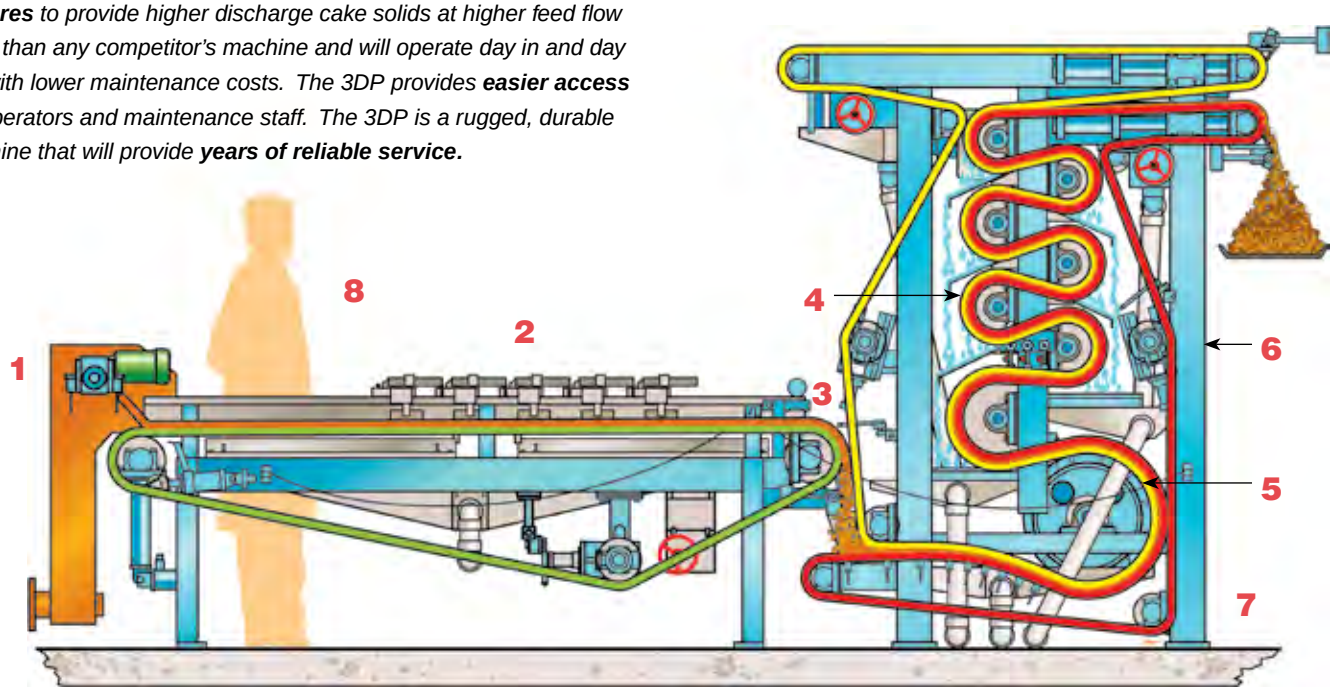
www.bdpindustries.com

Over 25 years of experience in belt press technology

Higher Cake Solids and Feed Rate

— with LOWER Maintenance Costs.

*BDP Industries' **Model 3DP Belt Press** was designed with **unique features** to provide higher discharge cake solids at higher feed flow rates than any competitor's machine and will operate day in and day out with lower maintenance costs. The 3DP provides **easier access** for operators and maintenance staff. The 3DP is a rugged, durable machine that will provide **years of reliable service.***



Design Features

1 **Feed Distributor:** Unique, variable speed paddle wheel provides full belt-width distribution and uniform thickness .

2 **Independent Gravity Zone:** Allows for higher production capacity as well as higher cake solids. ***Available in standard lengths from 6 - 16 ft in 2 ft intervals.***

3 **Spiral Wedge:** Applies increasing cake pressure over the entire length for effective expressing of filtrate with excellent cake retention.

4 **Vertical Pressure Rolls:** Vertical arrangement allows for filtrate pans under each roll to keep filtrate from falling on adjacent rolls. This eliminates reabsorbtion of filtrate and improves discharge cake solids. Discharge height adequate for conveyor without raising press. ***Up to 12 pressure rolls are available.***

5 **Perforated Roll:** Unique design and stainless steel construction improves dewatering and structural strength of roll.

6 **Tubular Frame Construction:** Provides superior structural strength over channel and I-beam construction. Enhanced cleanliness. Hot-dip galvanized coating inside and out affords maximum corrosion resistance. ***Also available in stainless steel.***

7 **Machined Mounting Pads:** All bearing and structural bolted connections are machined, tapped pads which are welded to frame. This enhances structural strength and corrosion resistance.

8 **Overall Layout:** Gravity zone and controls located at operator level simplifies process optimization and eliminates costly platforms.

Unique Features and How They Work

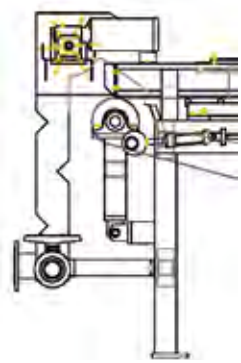
Standard two belt technology employed by most manufacturers forces a compromise in either through-put capacity or discharge cake solid concentration, because belt speed in the two zones must be the same. Three belt technology used by BDP overcomes this limitation by allowing independent speed control in each zone.

In addition significant improvements in feed distribution, wedge zone pressure gradation and effectiveness and elimination of filtrate pooling/rewetting in the pressure zone *MAXIMIZES PERFORMANCE*. The unique low profile gravity zone, tubular steel frame, machined mounting pads for bearings, and bolted connections all provide easier access for maintenance. In photo at right: notice the unique layout and lack of platforms, allowing easy access for maintenance.

The unique designs of the Gravity and Pressure Zones provide MAXIMUM PERFORMANCE.

3DP Belt Filter Press

Upflow Adjustable Speed Paddle Wheel Feed Box



This unique design produces extremely uniform slurry distribution. Sludge enters horizontally at floor level, then transitions to vertical in the upflow conditioning tank and spreads to full belt width. Then the slurry overflows the vertical tank into the paddle wheel distributor weir trough. The adjustable speed paddle wheel pushes the slurry out of the weir trough onto the belt.

Pictured (at right) is 3.5% concentration anaerobically digested sludge; notice the even, full width distribution immediately upon leaving the feed distributor.

Feed box side view

Paddle wheel

Uniform slurry distribution

Model 3DP Belt Filter Press

Independent Gravity Zone

The Model 3DP improves solids loading rate and cake solids with "Independent Gravity Zone Technology".
Conventional two-belt press designs use a gravity zone and pressure zone with a common belt fabric and drive. Belt speed and belt fabric porosity selections are compromised in an attempt to suit both gravity zone thickening and pressure zone dewatering, reducing effectiveness.
BDP has solved this problem.

The 3DP "Independent Gravity Zone Technology" uses separate gravity and pressure zones. This allows "optimizing" the porosity of the belt fabric and belt speed for the gravity and pressure zones rather than being forced to make a trade-off as explained below.

By increasing belt speed through the gravity zone, a thinner cake is applied to the belt. Resistance to filtrate flow is reduced exponentially as cake thickness is reduced. More filtrate is removed, less volume is sent to the pressure zone.

Filtrate removal in the pressure zone increases as the length of time cake is under pressure increases. The independent drive and reduced volume allow the pressure zone belt speed to be reduced for optimal filtrate removal.

Result: The Model 3DP provides higher hydraulic throughput and cake solids.

Independent Gravity Zone

Spiral Wedge

The problem with existing wedge layouts is that the top belt doesn't contact and apply pressure to the cake until typically 2/3 of the way through the zone. By curving the wedge profile the top belt immediately pressurizes the cake making the entire length of the zone effective. In addition, the spiral profile provides a gradual increase in pressure through the zone and forces an encapsulation of the cake to resist extrusion out the side.

Spiral Wedge

Vertical Pressure Zone

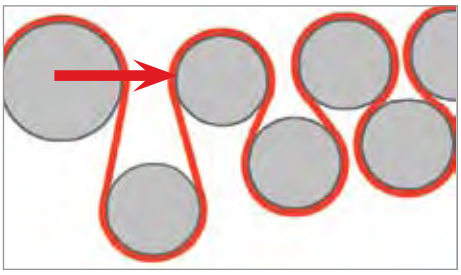
Vertical Pressure Zone

There is no pressure on the filter cake between tangent points of adjacent rolls in the pressure section of a belt press. Therefore, in a horizontal pressure roll configuration, filtrate expressed by each roll runs down the filter cloth to the lower roll and is reabsorbed *(pictured below)* decreasing discharge cake solids.

BDP has the answer.

With the the Vertical configuration of the Pressure Zone in the model 3DP, *(shown left)* filtrate expressed at each roll drips from the tangent point into a diversion pan; eliminating rewetting.

BDP's vertical arrangement eliminates the problem of filtrate running off upper rolls and pooling around lower rolls.



Perforated Roll

Superior Perforated Roll Construction

The highest frequency of roll failures for belt presses is the perforated roll. Typical construction of perforated rolls makes them susceptible to stress fatigue failure of the steel shell where it is welded to inner stiffening rings. BDP Industries' design eliminates the potential for shell failure as the stress load is carried by a solid inner roll. This revolutionary design is the strongest in the industry.

Model 3DP Belt Filter Press

Frame Construction

Channel or I-Beam frame construction are problematic in that corners and ledges are created that are difficult to clean. The tubular frame of the 3DP model provide a flat easy to clean surface.

All bearings are mounted on machined pads welded to the fabricated frame. These pad are precision machined and drilled and tapped for installation of all bearings and bolted frame components.

With channel or I beam, the frame is drilled and weakened at every mounting point. The 3DP frame, on the other hand, is strengthened by tubular steel and machine mounted bearing pads.

Vent holes are strategically placed so that when the frame is hot dip galvanized, it is coated inside and out.

Bottom line: The Model 3DP is stronger, more corrosion resistant, and easier to clean than other machines.

Machined Mounting Pads/Tubular Steel Frame

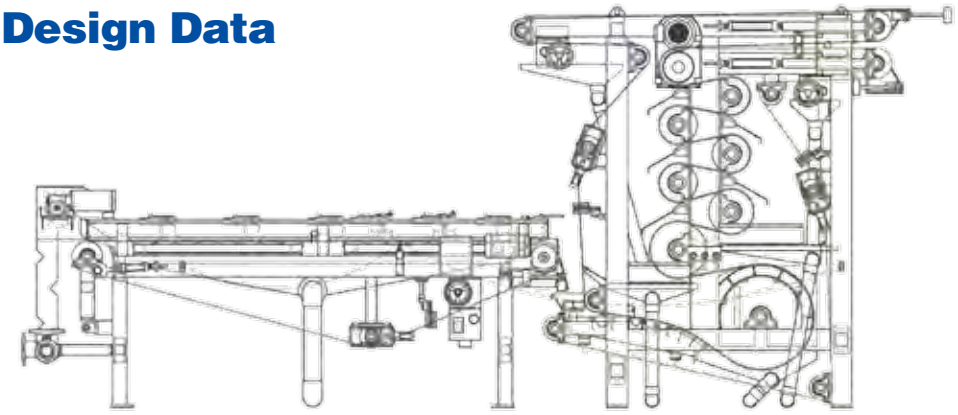
Overall Layout

Most other belt press designs require the belt press to be elevated due to the low cake discharge point. This requires costly platforms to provide observation of the feed distributor and gravity zone *(see below)*.

The layout of the model 3DP allows for gravity zone and controls to be located at operator level. This simplifies the process and eliminates platforms *(see right)*.

Model 3DP Belt Press

Design Data



Typical Performance Results

Municipal Sludge Dewatering Spectrum for 3DP

Sludge Type	Feed Consistency	Solid Loading Rate	Cake Dryness	Polymer Consumption
	%	lbs/hr, m	%	lbs/dt
Aerobically Digested	1 - 3	600 - 900	17 - 22	12 - 18
Waste Activated	.7 - 1.5	600 - 900	16 - 20	10 - 15
Anaerobically Digested	2 - 5	900 - 1500	18 - 25	8 - 12
Primary + WAS	3 - 5	900 - 1800	18 - 27	6 - 10
Primary + WAS + RBC	3 - 5	1000 - 2000	20 - 27	10 - 18
Primary + WAS +Trickling Filter	3 - 5	1000 - 2200	22 - 28	10 - 16
Primary + RBC	4 - 6	1200 - 2500	22 - 30	8 - 15
Primary + Trickling Filter	4 - 6	1200 - 2500	24 - 30	6 - 14
Raw Primary	4 - 8	2500 - 3500	28 - 35	3 - 5
SBR	1 - 1.5	600 - 800	15 - 18	10 - 15
MBR	.8 - 1	500 - 700	15 - 18	10 - 15

*** Polymer consumption is based on 100 percent active ingredients**

Because influents, processes and operation vary greatly, processing results have a wide range.
The ratio of blends will also have an impact on dewatering. The above represent the ranges that might be expected.

3DP Machine Data

Size	Overall Approx. Dimensions inches (mm)			Operating Weight	Belt Width
m	Length	Width	Height	lbs (kg)	m
0.5	258 (6,553)	60 (1,524)	98 (2,489)	7,500 (3,400)	0.6
0.75	258 (6,553)	70 (1,778)	98 (2,489)	9,000 (4,082)	0.9
1.0	258 (6,553)	80 (2,032)	105 (2,667)	12,500 (5,670)	1.2
1.5	276 (7,010)	100 (2,540)	118 (2,997)	19,000 (8,618)	1.7
2.0	290 (7,366)	120 (3,048)	120 (3,048)	23,000 (10,433)	2.2
2.5	290 (7,366)	140 (3,556)	126 (3,200)	27,000 (12,247)	2.7
3.0	290 (7,366)	164 (4,165)	132 (3,353)	35,000 (15,876)	3.2

*** Custom sizes and designs available upon request**

3DP Machine Data

Size	Dry Weight	Belt Width	Grav.	Pres.	Feed Box Drive	Belt Wash Water Volume	Belt Wash Water Pressure (80psi boost)	Belt Wash Water Motor
m	lb (kg)	m	hp	hp	hp	gpm	psi	hp
0.5	7,000 (3,180)	0.6	1	1	0.33	26	120	5
0.75	8,000 (3.630)	0.9	1	2	0.33	42	120	7.5
1	9,700 (4,400)	1.2	1	2	0.33	53	120	7.5
1.5	17,300 (7.855)	1.7	2	3	0.33	75	120	10
2.0	24,000 (10,900)	2.2	3	5	0.33	98	120	10
2.5	28,000 (12,715)	2.7	5	7.5	0.33	120	120	15
3.0	36,300 (16,480)	3.2	5	10	0.33	142	120	15

Note: These numbers are preliminary only and based on 10ft long gravity zone.

A Leader in Solids Dewatering.

BDP Industries began fabricating equipment over 25 years ago. BDP is an OEM supplier of solids dewatering equipment for several prestigious Fortune 500 companies. With over 650 installations throughout the world, and a 40,000 square-foot manufacturing facility, BDP Industries has evolved into one of the most modern and complete solids dewatering suppliers in the world.

BDP Industries produces a range of high quality products and services:

- Gravity Belt Thickeners
- Belt Presses
- Screw Presses
- Rotary Drum Concentrators
- Lime Stabilization Systems
- Polymer Systems
- Compost Turning Equipment
- Pulp & Paper Stock Thickeners
- Plate & Frame Presses
- Conveyors
- Process Control Panels
- Equipment Restoration
- On-Site Service
- Mobile Dewatering Demonstrations

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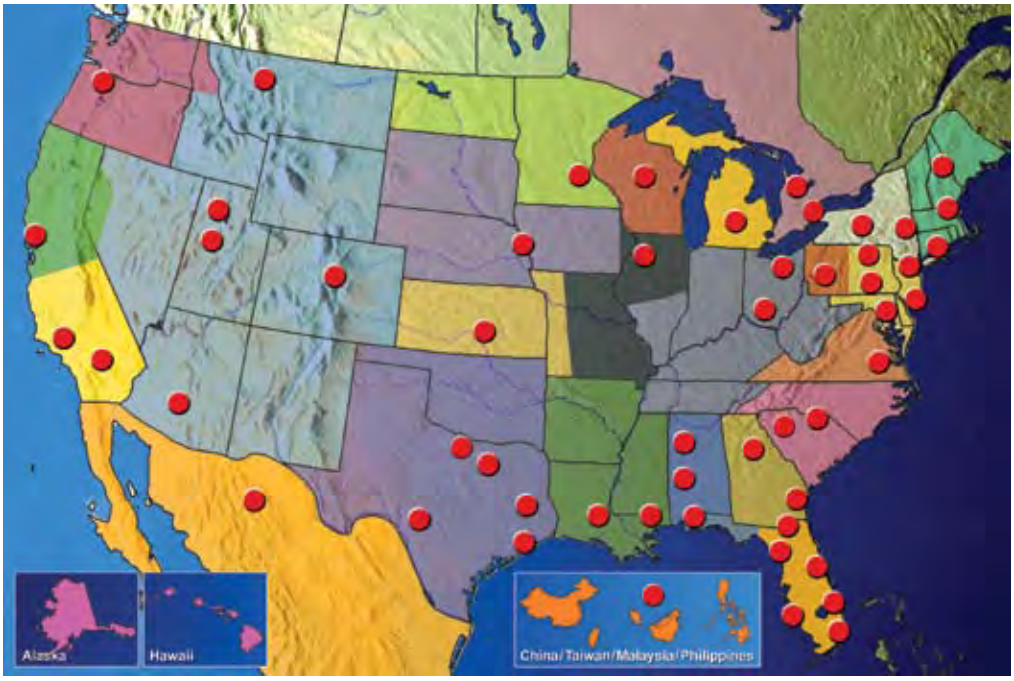
www.bdpindustries.com

1.5m 3DP mobile trailer unit

We're located near you.



Your local BDP representative: