

EPPING, NH
WWTF Phase II Short Term Improvements
WWEB Project No. D218-1212
CWSRF Project No. CS-330247-06
Corrective Action Plan Update
12-13-22 (Rev1 12-19-22)

BACKGROUND

In accordance with NHDES Wastewater Engineering Bureau (WEB) Innovative and Alternative Technologies requirements (Env-Wq 717), and a letter issued by NHDES dated October 21, 2021, the following Corrective Action Plan (CAP) is proposed to address issues with the new flat plate Weise Water AQQA240 membrane system installed at the Epping, NH wastewater treatment facility. In particular, the system has not been able to meet the required hydraulic performance tests, much more frequent and extensive cleaning is required than was promised or expected, and in the cold weather months the membranes have not been able to treat all of the flow coming into the plant and emergency bypass of partially treated wastewater has occurred.

The following plan is proposed to allow the plant to treat all influent flow and meet all NPDES permit limits.

SUMMARY

The Epping Board of Selectmen (BOS) and Epping Water & Sewer Commission (W&SC) have agreed to the following plan. The W&SC will purchase spare parts to service and maintain the existing Weise Water membranes in two trains, install new membranes in the third train, and install an Emergency Peak Flow Storage System (EPFSS) to achieve treatment of all flows coming to the plant and meet NPDES permit limits in this manner for the next 4 years, or until a new treatment system is constructed. Lagoon 1 and Lagoon 2 will be closed in 2024. In 2023, the BOS and W&SC will have a Total Nitrogen Upgrade study performed to identify the preferred upgrade technology and costs. In 2024, a warrant article will be put in front of the voters for the upgrade with final design in 2024 and construction in 2025 and 2026. If voter approval is not obtained in 2024, the W&SC will present the article again in 2025. Assuming voter support is received, the intent is to no longer be utilizing membranes for biological treatment by December 31, 2026.

CORRECTIVE ACTIONS

Actions to Maintain the Existing Membranes for 4 Years (2022-2026)

1. Perform regular chlorine and citric acid backwashing of the 3 membrane trains to maintain permeability
2. If permeability degrades, increase number and frequency of chlorine and citric acid backwashes

3. If permeability continues to degrade, perform recovery cleans on the subject train(s)
4. Each fall and spring as a minimum, perform manual cleaning and chemical recovery cleans on all three trains
5. If a module starts passing solids, remove, clean, and rebuild module and return it to service within 30 days
6. Add Nalco MPE50 chemical to address colloidal TOC to maintain good filterability
7. Utilize a smaller container in the heated sludge rolloff bay and free up space to store and work on the membranes
8. Construct a temporary weatherproof enclosure over the membrane crane rail lifting system and adjacent concrete pad to create a working space to remove and service the membranes in the cold weather. Provide temporary heat in the enclosure.
9. Purchase 1 spare module of membranes and 72 membrane end plates
10. Install new concrete baffle walls in the three MBR tanks to isolate the membranes in a smaller footprint
11. Install an automated alkalinity addition equipment to maintain MLSS pH
12. Swap out the 2mm slotted step screen with a 2mm dia. punch hole screen
13. Provide two frac tanks (21,000 gallons each) for storing peak flows coming to the plant during the day for bleed back at night
14. Install diamond plating over the aeration basin and grit removal tanks to hold in heat
15. Install heat trace and insulation on the MLSS recycle line to retain heat
16. Construct a permanent translucent weatherproof enclosure over the membrane crane rail lifting system and adjacent concrete pad to create a working space to remove and service the membranes in the cold weather. Provide heat in the enclosure.

Actions to Install and Maintain New Membranes in One Train (2022-2026)

17. Direct purchase one train of new membranes including a dedicated control panel and recommended spare parts
18. Perform engineering design for demolition and modification of membrane support beams, grating and grating supports, permeate piping, air scour piping, chemical feed piping, air scour blowers, electrical and instrumentation and controls for the new membrane train
19. Bid, award and construct the required demo and mods to accommodate the new membrane train
20. Put the train into service and maintain the train with recommended backwashes, manual and recovery cleans, and service

Actions to Close the Lagoons (2022-2025)

21. Empty and permanently close Lagoon 2 per a Lagoon Closure Plan approved by NHDES RMS, prior to implementation

22. Empty and permanently close Lagoon 1 per a Lagoon Closure Plan approved by NHDES RMS, prior to implementation
23. Develop a groundwater and surface water monitoring program associated with the former Lagoon 1 and Lagoon 2 areas for review and approval from NHDES DWGB
24. Implement the groundwater and surface water program approved by NHDES DWGB
25. Design new solar field to be installed in the footprint of Lagoon 1 and 2 and the sludge dewatering staging area, leaving space for the Total Nitrogen Upgrade
26. Bid and construct the new solar field and put into operation

Actions to Construct A Total Nitrogen Upgrade (2022-2026)

27. Perform TN Upgrade study to identify preferred upgrade alternative and costs
28. Campaign for warrant article for TN upgrade
29. Obtain positive warrant article vote for TN upgrade
30. Design TN upgrade
31. Bid and construct TN upgrade
32. Complete construction of TN upgrade

In addition, the Town shall make all reasonable efforts to prevent wastewater bypass of the MBR system, in accordance with the WWTF NPDES permit. Until the MBR performance issues are fully corrected, the Town shall maintain the existing emergency bypass treatment system (EBTS) in good working order as a contingency. If bypass operations are required, the Town shall take all necessary steps to meet NPDES permit disinfection requirements and shall not bypass without providing proper notice as per the approved Emergency Bypass SOP rev1 dated 11/23/22 issued by DES.

SCHEDULE

The work outlined in this CAP is proposed to be implemented starting immediately with a goal of completing all items by the end of calendar year 2026. The proposed dates of completion for individual tasks are presented in the following Gantt chart.