

Preliminary Evaluation and Recommendations for Revised WWTP Operations, Pactiv Evergreen – Canton, N. C. Mill

Background and Current Status

At the request of Pactiv Evergreen, Environmental Business Specialists, LLC (EBS) were asked to evaluate the Canton North Carolina mill wastewater treatment system from the perspective of operating this system in the event of a permanent shutdown of the mill.

The Canton mill is a fully integrated bleached pulp mill. The mill's wastewater treatment system is an activated sludge biological system that includes primary clarification, aeration, aerobic digestion, secondary clarification, and oxygen addition. The treated effluent from the Canton Mill discharges into the Pigeon River. The sludges produced from the primary and secondary treatment are dewatered on site by belt press dewatering equipment and then landfilled in a mill owned landfill. The mill's wastewater system also handles the wastewater from the Town of Canton, North Carolina. The flow from the Town is estimated to be approximately 1 MGD and experiences increases in flow during rain events.

Summary of Recommendations

After evaluating the Canton Mill's wastewater treatment system EBS developed the following recommendations and plan to transition the mill's wastewater system from handling mainly a fully bleached pulp mill and municipal wastewater to only municipal wastewater with a small amount of industrial wastewater (landfill leachate and stormwater runoff from the mill site). Based upon EBS experience with these types of wastewater systems the transition of the system would be divided into three distinct phases.

Phase I – Initial Shutdown of the mill operations

Phase I would also be further divided into a preparatory phase prior to the actual ceasing of operations, followed by the actual shutdown of the mill equipment.

The preparatory phase or Phase IA would involve all necessary preparations to maintain control of the wastewater loading generated during the initial shutdown for the purpose of maintaining the efficient treatment of the wastewater system and maintaining compliance with the mill's existing NPDES wastewater discharge permit. Phase IA would be very similar to preparations made by any pulp mill when going into a major mill outage. Important aspects of Phase IA would be as follows:

- Controlling and maintaining a circumneutral pH.
- Having surge volume, if possible, to impound high strength wastewater to allow controlled flow to the activated sludge system.

- Maintaining adequate inventories of sulfuric acid and carbon dioxide for pH control. Coagulants and polymers for WWTP upset solids control, and supplemental nutrients.
- Development of coordinated vessels draining plans to allow the wastewater system to better assimilate the mill wastewater and not be overwhelmed by volume or loading created from the shutdown.

Phase 1B would be the actual ceasing of operations and initial draining of tanks, vessels, piping, and other mill equipment. The BOD loading expected during this time would be similar to major mill maintenance outages and could last from several days to 2-3 weeks. During this phase it is recommended to continue to operate the wastewater system at full capacity to process and treat the wastewater generated from the mill. The mill should continue to monitor flow, BOD/surrogate loading, Food/Microorganism (F/M) ratio, and pH. The end of this phase would be signaled by a significant and sustained decrease in hydraulic and organic (BOD) loading. EBS recommends that when the mill flow and loading is 50% of normal for a sustained period such as a 3-5 day rolling average, then the mill can begin to transition to Phase II.

Phase II – Tank, vessel, mill, and piping clean-up

Phase II would be similar to the end of major maintenance outages where significant reductions in flow and loading are experienced. This phase could last several months and as a result the wastewater system would experience much lower flow and BOD loading. During this phase the wastewater system would start experiencing permanent changes in loading and could need to start being downsized to maintain treatment efficiency. Excess equipment could be taken out of service in response to the lower loading and flow. Equipment that can be evaluated for removal from service during this phase are primary clarifiers, discontinuing the use of CO₂ for pH control, secondary clarifiers, various pumps required to pump wastewater such as the low lift pumps, and one of the two aeration trains. Additionally, the number of operating Belt Presses may also be reduced. While EBS's initial recommendation is to continue operating the aeration trains in the activated sludge mode, there is the likelihood that loading and flow will not be sufficient to support activated sludge operation. If so, EBS's recommendation would be to move to Phase III and change the operation of the aeration system to a once through ASB (Aerated Stabilization Basin).

Phase III – Mill flow and loading approaches zero.

In this phase the primary source of wastewater to the treatment system will be the Town of Canton. Expected flow will be 1 MGD except during rain events. When this phase is reached it is EBS's recommendation that the wastewater system be downsized to the following:

- Primary Treatment – Grit Chamber, Bar Screen, Low Lift pump system, and flow splitting station would continue.
- Primary Clarification – The #1 Primary clarifier would receive normal flow from the Town with Nos. 2&3 out of service but available to impound storm surge flows.
- Secondary Treatment – One aeration train would be operated in a once through ASB mode of operation with the first 2.3 MG section being fully aerated and the second 3.4 MG section being aerated with a final settling zone at the discharge end.
- Secondary/Tertiary Clarification - The #6 or #5 clarifier would receive normal flow from the aeration train with the other two secondary clarifiers being out of service but available for emergency use such as additional storm surge or upset impoundment of flow from secondary treatment.
- Final discharge – the flume, reaeration cascade (O₂ injection) and flow measurement would be continued as required to maintain compliance with the NPDES discharge permit.

Further Investigation & Data Needs

EBS requested additional information to fully confirm its recommendations and conclusions and fully characterize the wastewater coming from the Town of Canton:

- Any Industrial components in the Town's wastewater. A brewery, plastic extrusion facility, and commercial dry cleaner may all discharge to the Town's collection system. With the mill no longer providing dilution flow there maybe constituents of concern from these dischargers.
- Nitrogen and ammonia content of the Canton wastewater.
- Further investigation of the normal and maximum/minimum flows that would be expected from the Town of Canton.
- Characterization of the landfill leachate and review of the mill's last NPDES permit priority pollutant analysis.
- Mill WWTP operator input and review of these recommendations and transition plan.
- A treatability study at the Mandeville lab to confirm the residence time needed to treat the Town of Canton wastewater stream using the once through ASB mode of operation.

The week of March 20, sampling and analysis will be completed to further characterize wastewater and to add more detail the transition plan.