

**LIFT Scholarship Exchange Experience for Innovation & Technology (SEE IT)
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TRIP REPORT

SCHOLARSHIP UTILITY: Jackson Wastewater Utility, City of Jackson, Missouri

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ATTENDEES: Kent Peetz

TRIP DATES: April 26 & 27, 2017

UTILITIES/SITES VISITED: Lewes, Delaware, Howard Seymour Water Reclamation Facility

TECHNOLOGIES/INNOVATIONS SEEN: Ovivo Mem-TAD system for aerobic sludge digestion and thickening.

TRIP BACKGROUND and RATIONALE: I went to see the Ovivo Mem-TAD system to see what operational issues, energy usage, materials consumption, maintenance requirements, and other details I could find out about the system from operators who have been using the system for several years. We are considering the membrane thickening system to help us reach our desired biosolids consistency, while eliminating operational and equipment issues within our plant.

Ovivo suggested this particular treatment plant because the system is closer than any other to what they would recommend for our facility.

I hoped that through the LIFT SEE IT scholarship, I could speak to the operators of this system without the pressure or input from salesmen or design engineers. And that is exactly the experience I had. The operators were very courteous and showed me their entire plant, explaining operating, design, and purchasing options to explore when considering this equipment for my facility.

TRIP SUMMARY: In 2016 Horner and Shifrin Engineering performed a Facility Plan update to determine what parts of the wastewater collection and treatment facilities needed to be addressed. They determined that the Ovivo Mem-TAD system would solve several issues that exist in our biosolids digestion and thickening process. Our existing process requires that the aeration be shut off to the digester so that the biosolids will settle and water can be drawn off the top through 3 stationary ports in the side of the tank. The existing method worked fine for about 20 years, but now that the system is becoming more heavily loaded, the process takes too long and does not allow for consistent sludge wasting from the treatment process. This causes the RAS (return activated sludge) and MLSS (mixed liquor suspended solids) numbers to go up and down, resulting in MCRT (mean cell residence time, or sludge age) and F/M (food to microorganism ratio) numbers that are too high at times. High MCRT and F/M numbers favor the growth of the wrong

kinds of bacteria and organisms within the treatment system.

The Mem-TAD (membrane thickened aerobic digestion) system is a constant flow, continuous aeration arrangement. It could be installed in our two existing 40-foot diameter, by 20-foot deep tanks. Partitions in each tank would separate aeration and thickening for that tank. Sludge would be thickened from about 0.5% solids to around 1.5% in the first tank, and increase to 3.5 to 4% solids in the second tank.

At the Lewes, Delaware plant that I toured, they accomplish the first phase of thickening by utilizing Zenon ZeeWeed membranes in the aerated treatment process, and then a single step of Mem-TAD unit thickening, followed by additional aerated digestion in holding tanks. This leads me to believe that the two step Mem-TAD system proposed for our plant could perform as advertised and reach our desired solids content for land application.

The fact that the Mem-TAD system utilizes constant aeration solves another issue that we have with our biosolids blowers. Our biosolids aeration is supplied by turbo blowers that utilize a high-speed turbo fan that rides on an "air bearing" of compressed air to eliminate friction during operation. Unfortunately every time we have to shut our blowers off to allow the biosolids to settle, or transfer one tank to the next, the turbo sets down on its shaft and this creates wear and tear on the machine, which kills the turbo unit prematurely.

I was pleased to hear from the Lewes operators that the system requires very little maintenance or operating attention. The membranes are maintained with by intermittent automatic backflushing and cleaned periodically in place with a chemical being added to the backflush solution, all without removal from the tanks. The plant operators have experience with a couple of these systems in the area, and say that the membranes are very robust, and can last several years.

The trip has convinced me that this technology could solve issues at our treatment facility, while being low maintenance and fairly easy to operate. It can also be modified to include side stream treatment for nutrients in the future if total nitrogen and phosphorous limits are required.

I have included 10 photos and a 2 minute montage of several pictures from my trip on a disk.