



Dual Stage Screening System Safeguards Largest MBRs in Chesapeake Bay

Background

Requirements to improve water quality forced the Borough of Mifflinburg to upgrade their facility to meet regulatory limits for Total Nitrogen and Total Phosphorus. Recognizing the need for change, management asked Herbert, Rowland, & Grubic to prepare a capital improvement plan and evaluate the best course of action to meet future wastewater treatment needs.

Now with the capacity to treat 4.4 million gallons of wastewater per day (17,000 m³/day), the Mifflinburg wastewater treatment plant is one of the largest MBRs in operation throughout the Chesapeake Bay region, which includes six states: Delaware, Maryland, New York, Pennsylvania, Virginia, and West Virginia.

Effective screening has long been a key concern for MBR owners, operators, and engineers. Membrane fouling is the most serious problem affecting system performance and is a direct result of suspended solids in the wastewater that can damage membranes, decreasing their efficiency, and dramatically increasing their lifecycle costs. Consequences to fouling include increased power consumption, backwashing, cleaning, and replacement. The mechanical screens installed at any MBR facility provide critical frontline protection to maximize the membrane systems efficiency and integrity.

Customer: Borough of Mifflinburg
Industry: Municipal

KEY FACTS

- **MS Bar Screen: 1**
- **Bar Spacing: 6 mm (0.24 in)**
- **Design Flow: 9.5 MGD (36,000 m³/day)**
- **Material of Construction: 304 SS**
- **Eliminator Band Screen: 2**
- **Openings: 2mm (0.08 in)**
- **Design Flow per Screen: 4.5 MGD (17,000 m³/day)**
- **Screwfactors: 2**
- **Handle the screenings volume produced by all 3 screens**

“ *The screens impact the efficiency of the entire facility. The Headworks MS Bar Screen and Eliminator Band Screens protect our membranes and overall their performance has been stellar.* ”

- Steve Benner

Borough Project Manager

Why Mifflinburg chose Headworks

To ensure successful operation of Mifflinburg’s Membrane Bioreactor, new screening equipment was required to truly safeguard the plant’s investment. When asked why Headworks® was selected as the supplier, Mr. Steve Benner, Borough Project Manager stated that, “with more than 15 years of wastewater screening experience, Headworks has earned a reputation for high quality, reliable, low maintenance screens. Although there are viable alternatives in this market, Headworks was able to competitively offer the required equipment meeting the stringent specifications of the bidding documents. They have a track record of successful installations and were a natural choice to provide all of the equipment for the headworks at the Mifflinburg facility.”

Solution

A dual stage screening system was designed and installed, that includes one MS® Bar Screen with 6 mm (0.25 in) bar spacing to achieve coarse screening and two Eliminator™ Band

Screens with 2 mm (0.08 in) openings to provide the fine screening necessary to ensure successful operation of the membrane. The dual stage screening system prevents the buildup of materials on the fine screens, since larger solids are removed in the first step. Ultimately, there are two lines of defense at the head of the plant to protect the membrane.

All of the solids produced by the three screens are then compacted by two Screwfacto™ for disposal. “Based on our experience protecting membranes in municipal and industrial applications, we have learned that the fine screens required for adequate protection of MBRs in most cases must have the protection of a more robust coarse screen. Fine screens take out fine solids and can’t be expected to be the workhorse like a MS Bar Screen handling trees, bricks, tires, etc. The 6mm bar spacing takes out debris that would damage the fine screens, allowing them to do their jobs correctly,” stated Founder and Sr. Vice President Gerald Seidl of Headworks Inc.

When asked about the screens performance since installation, Steve Benner, Borough Project Manager answered with enthusiasm, “The screens impact the efficiency of the entire facility. The Headworks MS Bar Screen and Eliminator Band Screens protect our membranes and overall their performance has been stellar. They were a great partner for a project of this size and scope.”



Installation of Eliminator Band Screen by crane

