



Pall Corporation

Retrofit Membrane System Treats High Turbidity Water

The Challenge

Originally constructed in 1917 and then renovated in 1933, the Brandywine Water Treatment Plant in Wilmington, Delaware required a retrofit into the mixed media filter basins in order to meet stringent drinking water standards. Furthermore, the facility needed a robust system as it previously experienced significant turbidity occurrences due to heavy rainfall. The raw water from the Brandywine Creek is coagulated with PAX-XL 19, aluminum chlorohydrate and settled in a sedimentation basin after pretreatment before reaching the membranes for filtration.

The Solution

The Brandywine Water Treatment Plant conducted a side-by-side pilot evaluation over a six month period where ferric chloride was used as the

coagulant and actual flux rates were between 75-93 gallons per square foot, per day (GFD). A turbidity spike of 60 NTU, which lasted four days, was experienced during the pilot program. During that timeframe, the coagulant feed was discontinued resulting in high transmembrane pressure (TMP) which caused excessive fouling of the membranes.

Pall Corporation's Aria™ FLEX filtration system was the only unit capable of achieving a recovery rate of >98% of the original permeability. Additionally, the system had a quick turnaround time when placed back into service for minimal downtime. Following the pilot study, the City of Wilmington chose to upgrade its water treatment plant with a custom built Aria FLEX filtration system that retrofits into the allotted footprint.



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The Result

The completed deployment of Pall's Aria FLEX system allowed Brandywine Water Treatment Plant to instantaneously reach a peak capacity of 14 MGD. Overall, the project resulted in the facility's ability to increase its average capacity to 7 MGD,

with peak instantaneous capacity of 14 MGD. The plant upgraded from existing conventional treatment to a new advanced system within the existing footprint.

“The quality of water that the Pall racks produce is very good. This is a great system that is superb at removing impurities in water.”

George Flowers, Water Production Supervisor at Brandywine Water Treatment Plant

The customized membrane unit was able to fulfill the water quality needs of the Brandywine Water Treatment Plant, allowing it to meet drinking water requirements while delivering on the facility's peak capacity needs. Overall, the Aria FLEX system was able to meet the following requirements for the Brandywine Water Treatment Plant:

- Treating source water during high turbidity events
- Meeting drinking water standards of <0.02 NTU
- Retrofitting into the existing historic building



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