

Case Study: Nucor Steel Plant Alabama - Oil, Grease and TSS removal



- ▶ Company: **Nucor Steel**
- ▶ Location: **Decatur, AL**
- ▶ Year: **2019**

▶ Description

Nucor is one of largest steel facilities. They are a Mini Mill which means they take scrap steel and utilize a melting process call EAF, or Electric Arc Furnaces. This is opposed to an integrated steel mill which takes raw materials, iron, limestone and Coke to make original steel by the use of Blast furnaces, QBOP furnaces, etc. The Nucor Decatur facility makes steel coils used in the automotive sector and other coiled applications. Their application is a new AF;filtration system to filter their laminar flow as the last water that touches the steel prior to shipment to their clients.

▶ Goal

- ▶ Clean water system up, remove oil and greases as well as achieve lower turbidity

▶ Problem

- ▶ Logistics (Not enough room for a large sand filter in the plant)
- ▶ Removal of waste from backwashing
- ▶ Overall Cost of the system

▶ Challenge

- ▶ We needed a low cost, small footprint application to assist in removal of Oil and greases as well as turbidity.
- ▶ Have the Water in the system be as clean as possible.
- ▶ Make sure that the system would perform the same each day.
- ▶ Make the system as low maintenance as possible.

▶ Technical Solution

- ▶ Trials were carried out in a site pilot plant comparing AFM® to quartz sand
- ▶ Full scale filtration system was revamped accordingly with the following processes: AFM®

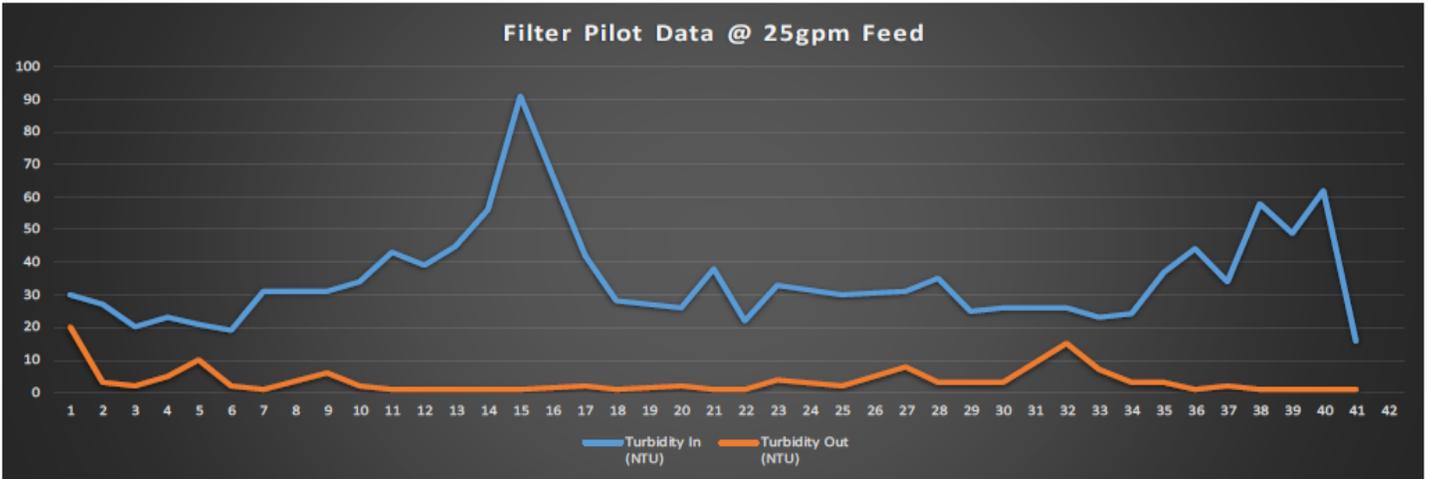
AFM Pilot Plant



Cooling Tower Basin Water



AFM Full Scale System



► Results

Following AFM® performance with the effluent polishing plant, quartz sand was replaced with AFM® at the process water inlet filtration system.

- Eight rapid gravity filters, each requiring several tons of quartz sand, were replaced with an equal amount of AFM® media in each vessel
- This resulted in a reduction of makeup water and chemical cost by a large percentage.
- The biggest benefit to the plant was a much lower turbidity of over 70%
- Another overwhelming benefit was the reduction in irons at more than 60%

Parameter	Required Value	Before Treatment	After Treatment	
Turbidity (NTU)	5	50	1	✓
COD (PPM)	50	750	30	✓
TSS (PPM) Residual	5	150	5	✓
Oil (PPM) Water	1	15	1	✓
saving (%) Electricity	Minimize	0	74 %	✓
saving (%)	Minimize	0	21 %	✓