

Polyaluminum Chloride

Case Study - 200 MGD Surface Water Plant Solves Iron Sludge Issue using Polyaluminum Chloride

Ferric Sulfate sludge plugging drain lines at Municipal Surface WTP

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PLANT MANAGER

"Flocculators are shut down due to sludge obstruction."

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A surface water treatment plant faced significant challenges with Ferric Sulfate sludge handling. Specifically, the sludge density was causing sludge transfer issues due to the original plant design requiring Aluminium Sulfate, not Ferric Sulfate.

ROOT CAUSE

The sludge drain sizes were undersized for Ferric Sulfate and could not keep up with the maximum production flow during the peak summer season. The flaw caused sludge accumulation that the original plant design plan did not anticipate. As a result, the basins required a drawdown every quarter for manual cleaning. When these occurred, the outages cut total water production capacity by approximately 25%.

Usalco Water Treatment Specialists collaborated with the customer's Engineering and Plant Management to solve the sludge handling issue. Jar studies by the customer and Usalco were undertaken to determine if the problem was solvable with a coagulant change.

Solutions

Bench studies revealed that a custom Polyaluminum Chloride solution would solve the sludge issue. Plant operations conducted a two-week trial that confirmed the original bench findings and realized the following benefits:

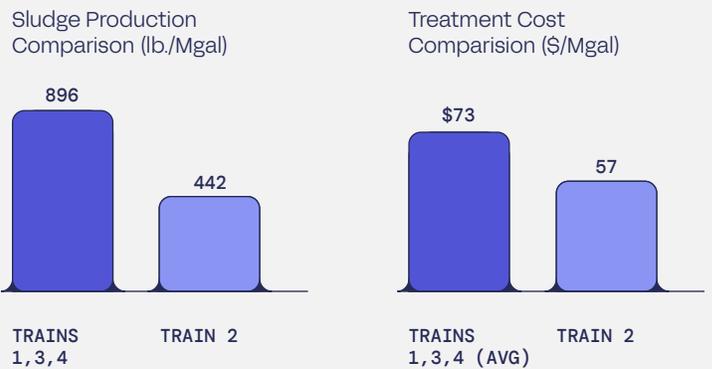
- Decreased sludge residuals
- Improved sludge handling
- Match in SUVA performance
- Improved filter run times
- Improved settled water NTU performance



KEY BENEFITS

Due to a reduction in coagulant dose and the lower sludge residuals produced, the facility was able to reduce its overall treatment costs by 21% which amounted to \$1.5M in savings. The lower dose and improved settled turbidity generated longer filter run times.

DRAMATIC REDUCTION OF CAUSTIC SODA DOSAGE



Our Methodology

- 01 Discover and understand process goals, challenges & opportunities
- 02 Examine and replicate current treatment process for jar study analysis
- 03 Collect jar study data during different water quality conditions while developing PAC formulation
- 04 Repeat product in jar studies until data is consistent throughout the seasons

40%

Coagulant Reduction

The customized formulation is designed to have a more efficient and resilient molecule.

51%

Lower Metal Salt Sludge Generation

Molecule efficiency increased compared to the former Ferric Sulfate program, requiring less metal salts.

\$1.5 MILLION

Chemical Cost Reduction

In addition to a coagulant reduction, lime feed elimination, lower electricity, and water savings generated savings.

