

Sodium Aluminate



CASE STUDY

Sodium aluminate helps a northeast Ohio WWTP cut major sludge disposal costs



NEAR HAZARDOUS CONDITIONS

The Ashtabula, Ohio wastewater treatment plant, located along Lake Erie, treats an average of 6 MGD with influent phosphorus concentrations of 3 to 4 ppm. For years, ferrous chloride was used successfully to meet the plant's 1.0 mg/L permit limit. In 2008, the plant began failing TCLP tests for chromium and cadmium, triggering more frequent monitoring and investigations. The new Plant Superintendent led an extensive review that confirmed ferrous chloride (pickle liquor) as the source of these metals. The issue escalated to the point where the sludge risked being classified as hazardous, which would have driven disposal costs beyond what the city could afford.

EVALUATING THE SOLUTION

The Plant Superintendent contacted Usalco for help. After multiple discussions and technical evaluations, bench testing was conducted using a more refined phosphorus removal agent: sodium aluminate. Results were positive, and Usalco recommended an extended online trial. Typically, trials last 30 to 45 days to evaluate phosphorus removal and monitor sludge turnover, dewatering, and system performance. In this case, additional time was required for TCLP and sludge testing to confirm the solution.

PERFORMANCE, VALUE, AND COST AVOIDANCE

After five months of testing, the plant permanently switched from ferrous chloride to sodium aluminate. The decision was based on several key outcomes:

- Sludge concentrations and TCLP levels for chromium, cadmium, and other metals dropped significantly, often below detection limits.
- The risk of sludge being classified as hazardous was eliminated, avoiding an estimated \$88,000 per year in disposal costs.
- Sodium aluminate consistently reduced effluent phosphorus to well below 1.0 mg/L at a dosage 72% lower than ferrous chloride (230 gpd vs. 64 gpd).
- Removing corrosive ferrous chloride allowed the city to proceed with a \$950,000 renovation of the chemical storage building, which had suffered years of damage.

In addition to solving a critical compliance issue, sodium aluminate may enable future savings as the plant considers land application of sludge.

