CASE STUDY

Korean automaker reduces wastewater sludge with expert support from Nalco Water

eROI℠ by Ecolab

BACKGROUND

At a South Korean automotive plant, every process area has annual cost-reduction targets. The paint shop manager is responsible for meeting each year's chemical spend budget and for identifying potential cost-saving projects. Due to a recent amendment of Korean law prohibiting waste discharge to seawater, sludge waste disposal costs had increased significantly. The plant paint shop manages its own sub wastewater treatment facility and was seeing the impact of these cost increases on their operations budget.

Environmental, Social and Governance (ESG) considerations have become a management priority in the automotive market. Reduction in waste could contribute favorably to the company's environmental goals and support the automaker's continued investment in the company's future.

The plant sought ways to reduce sludge disposal expense, reduce the overall chemical spend for wastewater treatment and reduce operating time. The incumbent supplier used commodity chemicals, which are known to be inefficient at reducing sludge and use a significant amount of chemistry albeit at a low cost per kilogram. The plant also wanted to ensure minimal disruption to the current work process. Any trial of a new treatment program had to be very thoroughly planned to avoid any major upsets to the wastewater treatment plant that could stop production.

A 60 m^3/hr (15,850 gallons/hr) wastewater stream came from the paint shop to a reaction tank. The wastewater was dosed with commodity pH adjustment chemistries, then floc was created by adding a flocculant before flowing to the dissolved air flotation (DAF) unit. Here, the sludge and water were separated before flowing to an aeration tank for biological treatment. Finally, the wastewater flowed to the sedimentation tank before release to the final wastewater treatment facility.

The facility and wastewater treatment systems were older and had significant residue in the piping. This residue was blocking certain portions of the system and caused unexpected technical challenges during the trial. The on-site team was able to resolve the issues and keep the trial on track.

ANNUAL SAVINGS

WASTE

Reduced sludge volume by

528 metric tons

per year

COSTS

Reduced chemical spend by

USD $29,400

per year

HUMAN HEALTH & SAFETY

Improved employee safety via reduced chemical handling and exposure

VALUE DELIVERED

USD $120,200 ANNUALLY

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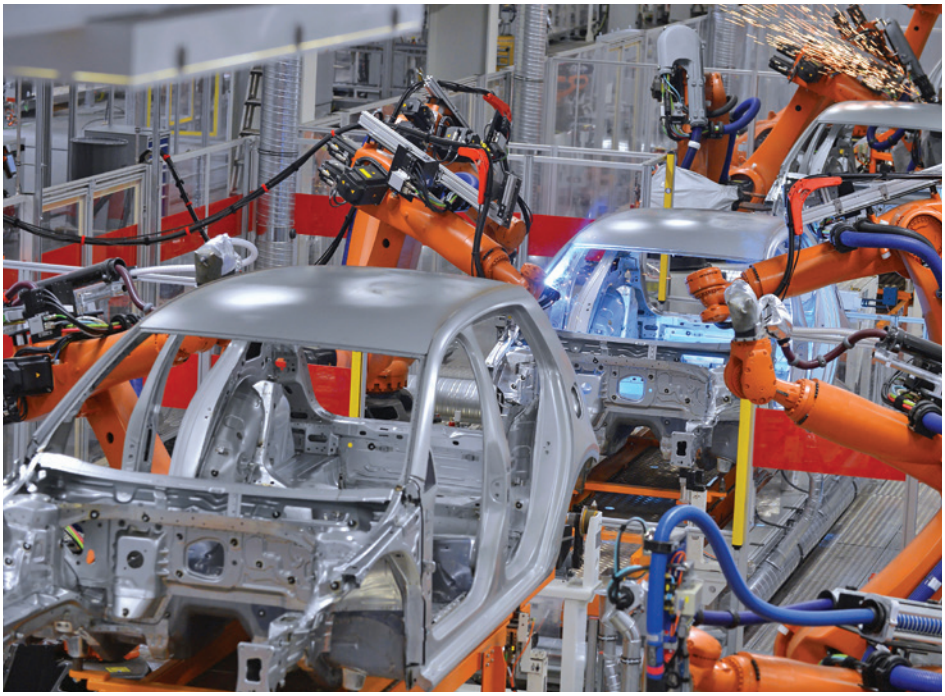
SOLUTION

A thorough site survey, led by a Nalco Water industrial technical consultant, was completed to assess the current wastewater treatment program and customer expectations to reducing sludge, disposal costs and chemical spend. The team set up a trial plan, prepared the necessary chemical samples and provided on-site technical support personnel for the trial, in case of any issues.

The wastewater was dosed with pH adjustment chemistries, plus an organic coagulant to improve separation. The Nalco Water team added a high-performance flocculant before flowing to the DAF unit. The rest of the process remained the same.



RESULTS

Monitoring of pH, COD, turbidity and suspended solids showed good performance with the new program. The updated program lessened the amount of pH adjustment and flocculant required, which in turn reduced the overall chemical spend by more than USD $29,000 per year. Employee safety was also improved through a reduction in chemical handling, inventory management and personnel exposure.

Further, the new program reduced sludge volumes by 528 metric tons, saving the customer more than USD $90,800 in disposal costs. The reduced amount of sludge also saved labor time at the centrifuge process.

During the trial, the residue blocking the pipes became dislodged, resulting in a change in the flow. Nalco Water's on-site support was able to help adjust the program throughout the trial.

To ensure the ongoing success of the trial, including all safety aspects and expected efficacy, the Nalco Water team led operator training for the customer's staff. Associates also received detailed instruction on how to assess the floc condition and dosing volumes according to treatment conditions.

The customer appreciated the thoroughness of the trial planning, execution, additional support and training as this assured operator buy-in and a smooth transition to the new program for everyone involved.

CONCLUSION

Nalco Water proved, with their technical expertise, to be a strong partner in helping the customer meet their site goals for cost reduction and corporate ESG improvement. Because of cost reduction in wastewater, the customer was able to meet their operational budget targets and help maintain their competitive edge in the tight automotive sales market. Sludge output volume reduction not only saves on current sludge disposal costs but also puts the customer in an advantageous position to defend against ever-increasing waste disposal costs in the future.

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