

EL DORADO IRRIGATION DISTRICT SEES REDUCED AERATION COSTS WHILE PROVIDING COMPLIANT RECYCLED WATER

Real-time monitoring and treatment control become part of utility's proactive approach to water availability

Summary

Water always has been a highly valued commodity in California's historic gold rush area, and it continues to be a primary focus for the El Dorado Irrigation District (EID) in Placerville, California. The utility treats wastewater to the State's stringent tertiary standards so that it can be recycled confidently for landscape irrigation to help meet growing water demands compounded by drought. Efficiency of power usage and sustainability also are primary goals of EID, so the utility aims to meet its water availability goal without increasing power consumption and relies on solar power to supplement electrical needs.

In this effort, EID's El Dorado Hills Wastewater Treatment Plant has complemented online ammonium monitoring of primary effluent and aeration effluent with a Real-Time Control System for Nitrification (RTC-N) from Hach Company, creating an integrated system that automates aeration dissolved oxygen (DO) levels based on continuous ammonia analyzer readings. This solution has allowed the utility to maintain its ammonia monthly average permit level of 1.2 mg/L, while cutting its aeration power consumption in half. As a result, the district is sustainably providing the high-quality recycled water needed by residents and businesses for irrigation purposes.

The Challenge

With Hach AMTAX sc Ammonium Analyzers located before and after the aeration basin providing continual monitoring, the El Dorado Hills facility looked for optimization in aeration control.

"Our goal is to be proactive so adverse quality changes don't sneak up on us," explained Alan Planje, Supervisor of Operations and Maintenance at the El Dorado Hills Wastewater Treatment Plant. He described how seasonal changes in wastewater makeup and increased aeration during winter months require manual attention to the treatment process. "Real-time control all the time is finite control—and that was our ultimate target. We wanted to get better control to avoid over-aeration while meeting our effluent quality requirements."

The Solution

In 2012, the utility worked collaboratively with Hach's field service team to install the Hach RTC-N platform, which collects aeration basin influent and effluent ammonia levels, flow rates, mixed liquor suspended solids, and temperature. It then calculates optimal dissolved oxygen levels and syncs with the utility SCADA to control aeration in real time for the nitrification needed to meet effluent ammonia set point. EID also has included Hach's Water Information Management Solution (WIMS™) software to its data management solution, to assure accurate and complete data collection.

The Results

The comprehensive Hach solution for monitoring and controlling ammonia levels in treated wastewater is helping make recycled water a viable part of EID's strategy to meet increasing water demands. Planje's team has found, with real-time ammonium measurement and aeration control, that DO levels could be reduced from a pre-implementation level of 2.0 mg/L or more, to a level of 1.0 mg/L or less, while maintaining targeted ammonia levels in reclaimed water; see Figure 1.

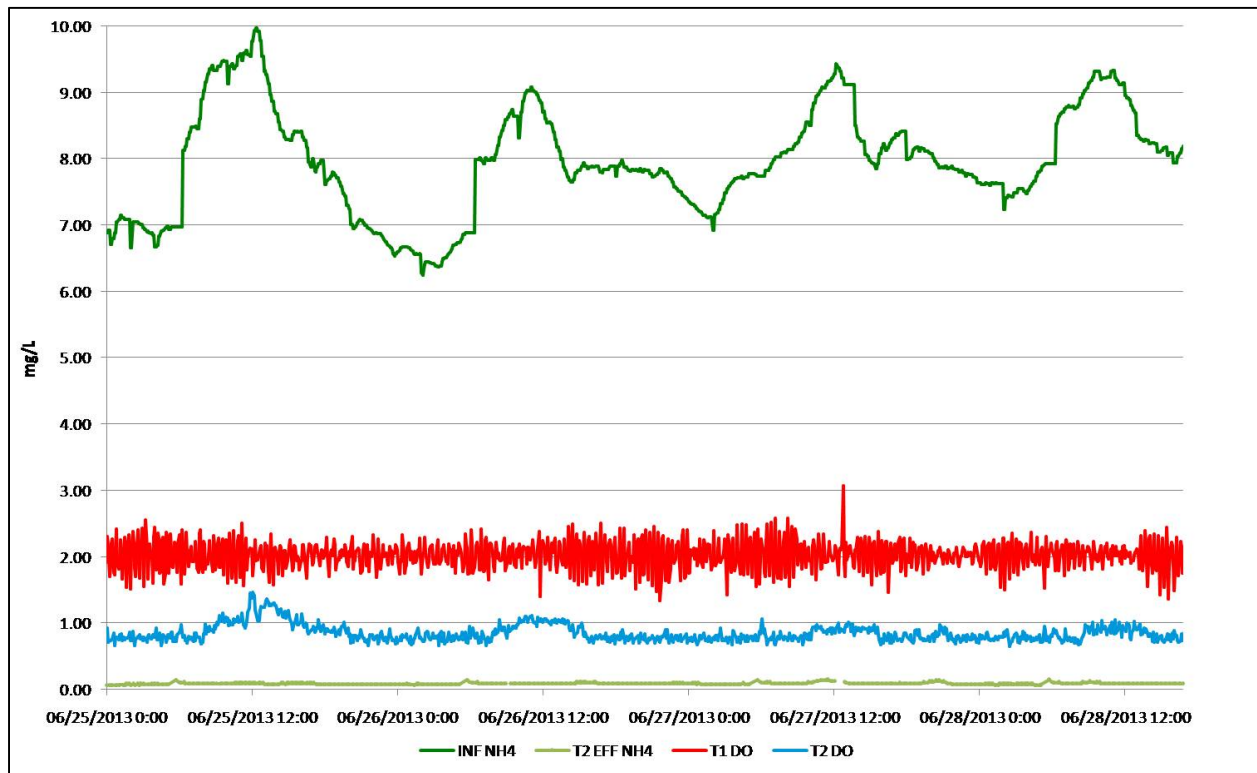


Figure 1. Relying on automated aeration, EID has reduced DO levels and aeration consumption significantly—while maintaining targeted ammonia effluent levels.

“We are running a smaller blower, controlled by the RTC-N read, and have reduced aeration power consumption by half,” Planje affirmed. “Eliminating over-aeration can help us reduce operating expenses.”

According to Vickie Caulfield, Division Manager of Operations, the District has been proactively evaluating operational and maintenance cost cutting. She explained, “In 2012, we purchased the Hach WIMS software to help optimize process data collection and streamline preparation of the utility’s several internal, stakeholder, and regulatory reports. Since collaborating with Hach on this endeavor, we were interested in the RTC for evaluating the potential for saving additional power costs. Although we have not quantified the actual savings of the RTC, we have seen a reduced SCFM output by 50%. Staff has been really excited to be part of this endeavor, and we hope to install the second RTC probe for the second aeration train.”

She added, “Once we complete the second train, we hope to evaluate the RTC’s potential at our other wastewater facilities, where applicable.”

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