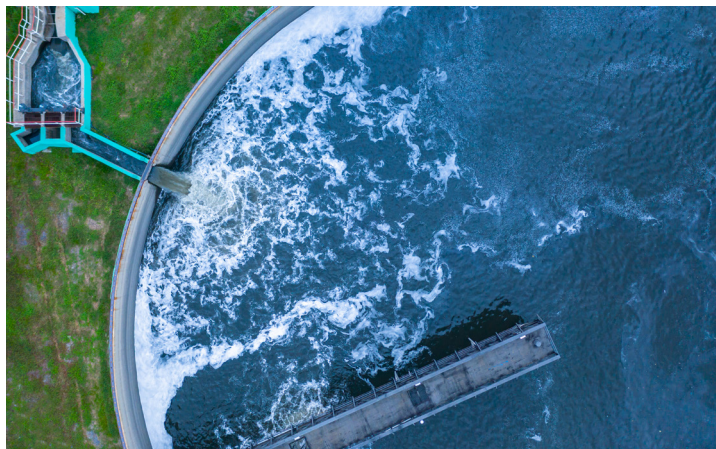


Alternative Energy Systems Consulting

Wastewater Treatment Plant Upgrades in CA Central Coast

Case Study



Outcomes

500,000 kWh

Identified savings through innovative measures

First

in CA to pilot nano-bubble infusion technology

Overview

This wastewater treatment plant is one of the leading wastewater treatment facilities in California, regularly receiving industry awards such as the Utility of the Future Today Award. As one of this agency's key partners, we took on the challenge to help them continue their innovative legacy – supporting them with large integrated audits, new technology pilots, and grant acquisition support.

Our partnership with this agency is now expanding into process optimization roadmapping through our RAPIDS program. As an integral part of the program, they are receiving training and new funding opportunities that will propel the agency's energy efficiency and reliability well into the future.

Our Approach

- Process optimization roadmapping, including implementation of emerging technologies for pre-treatment and solids handling, advanced controls, and process stabilization initiatives
- Large integrated audit
- Nano-bubble infusion technology pilot

Main Takeaways

1. Increased reliability
2. Increased regulatory compliance
3. New technologies plus process improvements

1. Increased reliability

Maintaining a high-level of reliability was a key driver to our process optimization. We identified flexible technologies that deliver optimal treatment reliability while maintaining a minimal impact to operating costs.

We researched and integrated an innovative solution to conventional aeration technology known as nano-bubble infusion technology. It utilizes high velocity clouds of supersaturated oxygen to mediate better biological activity and removal of contaminants – ultimately leading to reduced hydrogen sulfide levels, less septic conditions in headworks and tanks, and improved treatment conditions both upstream and downstream. This wastewater treatment plant was the first in California to pilot test this technology and is now considering expanding its use.

To optimize the site's sludge drying process, we investigated the installation of a thermal vacuum desiccation system. Unlike conventional screw press methods, thermal vacuum technology allows for a more reliable drying process, transforming sludge to a range of 85-95% total solids. The system is more energy efficient and its resulting solids content means less hauling costs, reduced operating labor, and a reduced need for solids thickening chemicals.

2. Increased regulatory compliance

Like most agencies in the water sector, this wastewater treatment plant is facing an ever-growing demand to keep up with new environmental regulations. We worked together to identify measures that not only deliver energy efficiency but drastically improve the efficacy of the facility as well.

We focused on simultaneous nitrification-denitrification automation using process and control monitoring software. This technology gives operators reliable information on wastewater chemistry while overall improving the treatment and removal of ammonia and nitrogen compounds.



3. New technologies plus process improvements

In addition to assessing new technologies, we investigated how to best retrofit and reuse older treatment equipment. We found an opportunity to utilize a long-abandoned clarifier as an additional equalization basin, an opportunity not included in previous facility upgrades. Integrate equalization strategies to stabilize process conditions, as well as allow this wastewater treatment plant to implement DER strategies (i.e. demand response, load shifting, load shaping strategies).

Couple with advanced controls, this type of strategy will allow the plant to safely and adequately maintain discharge compliance while implementing aggressive, money savings strategies. We also found an opportunity to add sequencers for existing basins as well. Such measures would help reduce overall site peak demand and energy consumption.

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About AESC

Founded in 1994, Alternative Energy Systems Consulting, Inc. (AESC) is an energy engineering practice that drives solutions in energy efficiency, renewable energy, and software for utilities, regulators, public entities and private enterprises throughout the United States.

