

FOX Teams With Clear Lake Sanitary District and Alliant Energy

February 2007

FOX teamed with the Clear Lake Sanitary District and Alliant Energy on an effluent-reuse project to provide tertiary wastewater effluent for additional cooling water supply for the new Mason City power plant. Project challenges included providing a continuous cooling water source from an intermittent discharge Sequencing Batch Reactor (SBR) facility and including operating flexibility and provisions to receive and discharge cooling water return. Challenges also included providing an on-line monitoring system and operating scheme for the new facility.



FOX designed a Tertiary Treatment Facility that included: flow equalization, Cloth Media Filtration and Ultraviolet Disinfection. The Tertiary Facility was carefully designed to fit into the plant's existing hydraulic profile so that secondary effluent not needed for cooling water could be treated in the new facility and discharged through the existing plant gravity outfall. Vertical Turbine pumps were designed to pump up to 3.0 mgd of cooling water supply over 6 miles to the new power plant.

Continuous water quality monitoring panels were included to measure the quality of the cooling water supply and return. Automatic valves and controls were included for automatically directing the flow of the cooling water return to discharge or equalization facilities, depending on water quality parameters.

The completed project provides a reliable supply of high-quality cooling water to the new Alliant Energy Emery Generating Station and provides for receiving and discharging Alliant's cooling water return.

FOX Engineering is an environmental engineering firm based in Ames, Iowa. It specializes in water, wastewater, and solid waste management solutions for its diverse governmental and industrial clients. The firm's environmental projects vary in size and scope and can be found throughout the Midwest and beyond. Dave Fox or Laurie Twitchell can be reached at 800/433-3469.



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Hach Monitoring Technology Key to Successful Water Reuse

In Clear Lake, Iowa, a resourceful system delivers treated domestic wastewater to a power plant for cooling water application and then returns the blowdown to the treatment plant for final discharge. The system's successful deployment since January 2004 is attributable in part to automated water quality monitoring and process control. Hard at work in this operation are three units of the Hach Water Distribution Monitoring Panel (WDMP), each providing continuous measurement of total chlorine, turbidity, pH, conductivity, and line pressure, as well as alarm and control signals when readings exceed vital operating set-point values.

A service agreement between the Clear Lake Sanitary District and Alliant Energy calls for the sanitary district to provide up to 3 mgd (11 ML/d) of treatment plant effluent to the power provider's nearby Emery Power Generating Station. The delivered water, which supplements well-sourced water used for auxiliary plant cooling and condenser cooling, is monitored by a WDMP unit to assure it meets the station's quality specifications.

A second WDMP monitors up to 1.3 mgd (4.9 ML/d) of spent cooling water returned to the treatment plant to assure that levels of added chlorine and sulfuric acid do not violate the sanitary district's permitted chlorine residual and pH limits. The presence of contamination requiring further treatment is likely to be signaled by a combination of the key parameters measured by the panel. A third WDMP monitors final treatment plant discharge, including returned cooling water, to the Cedar River watershed and provides chlorine residual, turbidity, pH, and conductivity data for regulatory reporting.

At each monitoring point operators rely on dual set-point alarms on each analyzer for warning of critical changes in parameter concentrations. Output signals to the treatment plant's supervisory control and data acquisition system actuate diversion for further treatment (if necessary) and provide trending data for troubleshooting.

System offers proven reliability plus economy

Fox Engineering of Ames, Iowa, designed this effective water reuse system. "Compared with other instrumentation options, we liked the prewired, preplumbed WDMP provided by Hach. It was ready to go," said Laurie Twitchell, Fox project engineer for the system. "Yet, this panel typically is associated with



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treated drinking water, so we were a bit concerned about the wastewater matrix," she added.

Kevin Moler, Clear Lake Sanitary District Superintendent and an engineer and certified operator, dispelled any doubts about the performance of the panels. "It's critical that these analyzers operate properly to control our water reuse system, and they have done so with minimal maintenance," he said. "We think these panels are the most efficient, economical way to monitor and manage the system."

Put reliable, online panel monitoring to work for you. Contact Katy Craig, Hach Company, (800) 604-3493, fax (970) 669-2932, e-mail kcraig@hach.com.



Wastewater Lab Manager Dennis Spilman (left) and Superintendent Kevin Moler inspect the Hach Water Distribution Monitoring Panels at the Clear Lake (Iowa) Sanitary District. Operators typically clean the sensors and check split samples against portable meters once a week.

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