

Small Plant Solves Big Problem Using Strantrol 890 For Cl₂ Feed Control

Challenge

Although designed to treat 5 MGD, the Yuon, Texas, Wastewater Treatment Plant is permitted to only treat flows up to .95 MGD and treats an average of 650,000 gallons per day. During its first year of operation, the plant experienced serious difficulties maintaining sufficient chlorine residual in its final effluent, despite the best efforts of plant operators.

The plant's permit requires a residual of at least 0.5 ppm when discharging up to 2,160 gallons per minute, and 1.0 ppm when effluent flows exceed that amount. "Although the effluent stream would have more than a 5 ppm chlorine residual when entering the contact chamber, we had to fight to keep it above 0.5 ppm at our discharge point," says Richard Clark, assistant water & wastewater supervisor for the community. We were feeding as much as 80 pounds of chlorine per day, which is a lot of chemical for our small flows."

The reason for the problem was twofold. One, the plant was stripping ammonia out of the waste stream prior to chlorination, hindering the ability to achieve breakpoint chlorination in the chlorine contact chamber. Secondly, chlorine dosage control at the plant was being performed through flowpacing, and this often proves problematic because chlorine profile and chlorine demand are constantly changing in a continuous flow system such as a wastewater treatment plant.

Solution

The plant performed two action steps. It began feeding a steady rate of nonhazardous ammonia to flows just prior to chlorine injection, and installed a Strantrol® 890 automated, demand-based chlorination control system from USFilter's Chem Feed & Disinfection Group in February 2000.

- The controller continuously modulates dosage according to the actual oxidant demand in flows entering the plant's contact chamber.
- A High Resolution Redox® (HRR) sensor that monitors for chlorine activity and demand was installed in the flow approximately 10 minutes downstream from chlorine injection.
- The controller has been programmed with an operator-determined HRR setpoint that corresponds to the chlorination value required to meet the plant's discharge requirements.

Results

"Since coming on-line, along with the initiation of ammonia addition, our Strantrol controller has provided us continuous and accurate chlorination control," says Clark. "The controller stays within the setpoints to provide consistent chlorine residual at the desired range in our final effluent." Clark says chlorine use at the plant has been reduced by more than 75 percent with the adoption of demand-based control.

- The controller compensates for changes in lag time between the chemical injection point and the sensor location. If flow rates increase, shortening lag time, or decrease, lengthening lag time, the controller continues to respond accurately, accounting for changes in flow while maintaining accurate control.
- "Our controller has required no maintenance and, after almost three years, it still has its original sensor," says Clark. "The Strantrol 890 contributed greatly to helping us out of a very serious situation."