San Jose Water Company Solves Chloramine Residual Problem with the Process Solutions, Inc. Monoclor™ Chloramine Management System

SAN JOSE WATER COMPANY

Located on the southern edge of California's ever-expanding Silicon Valley, the San Jose Water Company treats and distributes water to over 1 million people. Founded in 1866, the investor-owned public utility has built a reputation for being focused on customer service and has been an early adopter of new treatment technologies.

Like many water utilities, San Jose Water has had to adapt to the challenges of using chloramines for secondary disinfection to mitigate potential DBP (disinfection byproduct) formation. Chloramine can be a more stable disinfectant in distribution systems and is formed by reacting aqueous chlorine with ammonia. While the optimal laboratory ratio of chlorine to ammonia is 5:1, "real world" water sources that contain varying levels of ammonia can wreak havoc on residual concentrations.

Getting mix ratios of ammonia and chlorine wrong can not only result in reduced bacterial control in distribution systems, but create nitrification or taste and odor problems as well. Storage tanks pose particular problems to operators as out-of-control chloramine residuals can require a utility to flush or dump an entire tank – an increasingly unacceptable outcome in water stressed California. San Jose Water's Nitrification Monitoring Program identified the need to boost chloramine residuals in some of its tanks. A chloramine boosting pilot in one of San Jose Water's 1 million gallon storage tanks was unable to correctly dose the tank with either free chlorine or ammonia to achieve the desired target residuals.

After hearing about the Process Solutions, Inc. (PSI) Monoclor™ technology for managing chloramine residual, San Jose Water decided to pilot. The Monoclor™ system tackles the dynamic residual issues by simultaneously controlling three process parameters (1) adding adequate mix energy to the tank volume (2) creating a high energy mix zone for the chlorine and ammonia to fully react and (3) managing the proper mix ratio with a combination of real time sampling and a proprietary dosing algorithm.

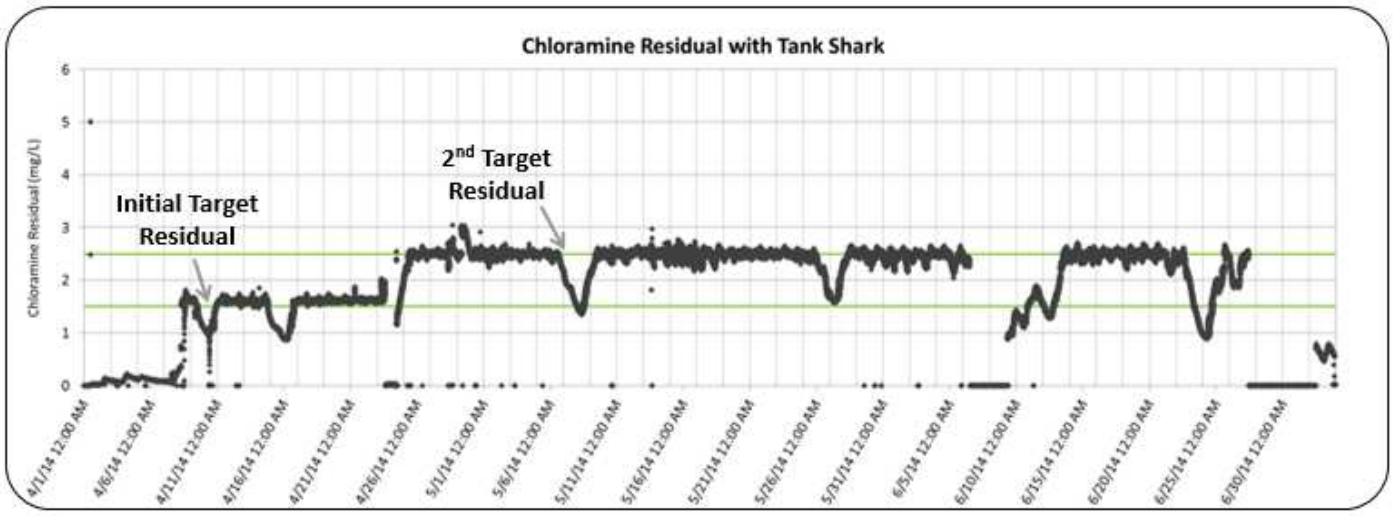
PSI provided a trailer unit for a 3 month trial period. The trailer and PSI scope included a skid-mounted MicrOclor™ on-site sodium hypochlorite generator that would provide up to 20 pounds per day

"I wasn't convinced that PSI's Monoclor™ chloramine dosing system would solve our problems after several failed attempts to improve residual, but with PSI offering a trial including installation, operation, and troubleshooting for three months, San Jose Water decided to invest the necessary resources to pilot this system. The system achieved the target residual onsite on the first day, and after making some operational changes to our system, we were able to keep stable disinfectant residuals in the downstream zone as well. PSI was fast, efficient, and responsive, and we are currently in design to install several more of their products across our distribution system."

San Jose Water Quality Engineer

of chlorine (at 0.8% concentration), a liquid ammonium sulfate skid, a chlorine analyzer, and a 15 gallon per minute (GPM) Tank Shark™ mixer to be placed in the reservoir. By using liquid ammonium sulfate and 0.8% sodium hypochlorite to generate monochloramine, a more stable and safer reactant profile is achieved. The water booster pump and chemical metering pumps were all located inside the trailer with tubing leading to the reservoir and Tank Shark™ mixer. With no moving parts or electrical components inside the tank, San Jose Water was able to drop the Tank Shark™ mixer through the reservoir hatch without confined space entry requirements, divers or taking the tank out of service.

Results were immediate (see quote). After reaching and maintaining the desired residual locally for several weeks, San Jose Water increased their target dose and took measures that allowed improved, stable residuals to continue further into the distribution system. The Monoclor™ chloramine management system was able to continually maintain the residual through multiple tests for the remainder of the trial.



Imported water introduced in high quantities throughout the trial caused momentary and intermittent concentration changes followed by quick recovery

As a result of the successful pilot, San Jose Water plans, as an integral part of its disinfection residuals management effort, on installing additional Monoclor™ chloramine management systems over the next four years.