

Worry-Free Water: Beyond the Technology

By Steve McLain

As a utility entirely reliant on groundwater for delivering high-quality water to its 28,000 customers in Salinas, Calif., California Water Service Co. (Cal Water) always has paid close attention to the makeup of its native water supply. Like many utilities in the region, the Salinas-area groundwater supply faces regulatory issues from both naturally occurring and manmade constituents. In 2001, as a number of wells serving this community began to show signs of nitrate and uranium levels reaching regulatory limits, Cal Water faced hard choices: shut down certain producing wells, drill new wells or undertake treatment. Two factors drove the decision-making process: a guarantee of reliably high-quality water for the community it served and the costs associated with delivering it.

Cal Water finds success in technology and service approach



All of the Envirogen systems at Cal Water Salinas sites feature a 10-year services agreement that guarantees performance for the life of the asset, volume of salt consumption, volume of waste brine and finished water quality. The agreement covers all treatment equipment and associated connections.

Ion-exchange technology recently had come to the forefront as a method for groundwater treatment, but the utility understood that success would require a high level of technical sophistication and a rigorous program to control costs in light of constantly changing water conditions. Over the next nine years, the solution for safe drinking water became a technology and services collaboration at nine different wells, in which Cal Water has had better than a 99% online performance along with a low life-cycle cost. Today, Envirogen Technologies and Cal Water work together on six separate installations that have the capacity to treat 6.5 million gal per day (mgd) of drinking water.

Meeting Evolving Needs

Located 100 miles south of San Francisco in Monterey County, the Salinas region is a heavily agricultural area known as the “Salad Bowl of the World” due to its production of a large percentage of the nation’s fresh produce supply. It is one of 24 districts served by Cal Water, which is a regulated public utility that provides water services to nearly half a million customers throughout California.

Providing a reliable, high-quality water supply to local residents can be a challenge, particularly during harvest season, when ramped-up agricultural processing operations and an increased worker population combine to create an abrupt seasonal jump in water demand.

In early 2002, Cal Water contracted Envirogen Technologies personnel for treatment options via ion exchange. Using a proprietary simulation software program, Cal Water was able to bypass months of pilot testing and feasibility studies to arrive at accurate cost and performance models for the systems. Envirogen personnel worked with Cal Water to obtain permits from the California Department of Public Health and go online with a treatment system before seasonal peak demand hit.

Two of Cal Water’s first three ion-exchange installations targeted nitrate and the third targeted uranium, removing these directly at the affected wellheads. The compact, containerized systems were designed to accommodate each site’s specific treatment requirements,

capable of handling fluctuating influent concentrations. They were built with mobility and rapid deployment in mind. Offering some of the highest removal efficiencies on the market, these systems generated small amounts of waste for disposal, minimized regenerant consumption and were equipped with state-of-the-art automation—all factors that contributed to low costs.

Since then, the relationship between Cal Water and Envirogen has grown to include numerous treatment installations, which have been added or taken offline to meet Cal Water’s evolving water needs. Today, all six Envirogen installations for Cal Water are treating nitrate. The most recent of these—Station 65-01—will treat influent nitrate concentrations currently running up to 41 mg/L down to less than 30 mg/L. The station is currently in place and ready to go online to meet this year’s peak water demand, adding 1.2 mgd of treated water to the district’s capacity. As with the other systems, this newest installation will be operated and maintained by Envirogen under a 10-year technology and services agreement.

Maintaining Reliability & Cost Effectiveness

The technology and services approach of Envirogen is a key element in maintaining reliability and a low life-cycle cost for the treatment installations. For example, along with fluctuations in seasonal demand, one of the treatment challenges in Salinas is the potential for wide swings in contaminant concentration. Influent nitrate levels at some sites have ranged from just below the established maximum contaminant level (MCL) of 45 mg/L to more than double that amount. In order to run efficiently at the lowest possible operating cost, the treatment system must be monitored and adjusted continually. This is done by a dedicated Envirogen technician—on call 24 hours a day, seven days a week—who optimizes system operation in response to influent conditions on a daily basis. This level of process expertise and attention is at the heart of the technology and services business model.

With six ion-exchange installations in Salinas today, each having a services agreement, Cal Water has entered into a collaboration with Envirogen to achieve

ARTICLE SUMMARY

Challenge: A growing number of wells serving Salinas, Calif., were experiencing nitrate and uranium levels reaching regulatory limits.

Solution: Cal Water opted for an ion-exchange technology to treat its groundwater, and worked with Envirogen on three initial installations, growing to six to meet the utility’s evolving water needs.

Conclusion: The technology and services approach maintains reliability and low life-cycle costs for the treatment installations. The presence of onsite personnel has resulted in zero treatment failures in the history of this working relationship.



The ion-exchange systems for nitrate removal are mobile and containerized for rapid deployment and offer a small footprint for space-challenged drinking water utilities.



The multi-bed, PLC-controlled treatment systems use 16 or more resin vessels depending on flow rates.



In order to run efficiently at the lowest possible operating cost, treatment systems at Cal Water Services sites are monitored and adjusted continually.

its treatment goals on a guaranteed performance basis with controlled costs. Over the 10-year duration of these agreements, Envirogen provides guaranteed performance for the life of the asset, including total volume of salt consumption, waste brine generation and finished water quality. These guarantees require Envirogen to constantly optimize system performance—minimizing salt consumption and waste generation—so that costs and compliance remain in balance. Along with monitoring and maintenance of the systems, Envirogen handles disposal of waste brine and provides Cal Water with permitting and regulatory assistance on a regular basis.

According to Mike Jones, district manager of Cal Water's Salinas District, the collaborative relationship between Cal Water and Envirogen is important

to maintaining the supply of reliable, high-quality water to the community. "We've been relying on ion-exchange technology and Envirogen to help us produce high-quality water for years," Jones said. "These systems perform as we expect them to day in and day out, and continue to meet the need for safe drinking water."

The technology and services working relationship with Envirogen allows Cal Water to incorporate state-of-the-art technology into its treatment scheme with confidence and without adding to the utility's operational burden. It also allows both parties to anticipate, react to and adjust to the moving targets that the utility must hit in its mission to deliver "worry-free water" to the local community. The presence of onsite personnel makes response to operating issues fast and efficient—even

under emergency conditions—and has resulted in zero treatment failures over the history of the relationship.

"This combination of a water utility skilled in the production and distribution of quality water and a technology provider skilled in treatment processes creates a powerful synergy in working toward a reliable supply of drinking water that will meet all water quality standards for years to come," Jones said. **wwd**

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