

GROUNDWATER REMEDIATION

Fast-track Response to Protect Groundwater Supply

Plant construction was completed in 24 months

When Carmichael Water District (CWD) heard that contaminants had been discovered in the groundwater aquifer beneath their drinking water supply wells, they knew a fast-track response was required.

GAC vessels used to treat TCE/VOC compounds in contaminated groundwater

The contaminants were migrating at a rate of 500 feet per year from the GenCorp/Aerojet (Aerojet) plant, a sprawling rocket and chemical manufacturing facility on a hillside eight miles east of CWD's Bajamont Surface Water Treatment Plant (WTP).

The Bajamont WTP is in Carmichael, an affluent suburb north of Sacramento, California. The plant occupies a small site overlooking

the American River, designated as a "wild and scenic river," in a historic residential neighborhood along the riverfront. The District had two years in which to gain community support for a large groundwater extraction and treatment (GET) facility and to complete construction before the EPA deadline.

SOLUTION-FOCUSED COLLABORATION

Rather than wasting precious time and funds in lawsuits, CWD and Aerojet by-passed the usual litigation and collaborated on building the facilities needed to contain the contamination. "When we first detected the chemical in 2003, we were concerned that it would get into our groundwater supply wells," says Steve Nugent, CWD's General Manager. "The goal was to contain the northerly movement of the contaminant plume leaving the Aerojet site, so it was critical to complete the GET plant as quickly as possible.

"We wanted to ensure that our groundwater supply was safe for our customers," explains Nugent. "The District saw that it took Aerojet seven to ten years to get similar facilities up and operating in the past. When districts detected contamination, they started litigation, which made the process much slower. We formed a partnering agreement in which Aerojet provided the funds and the Carmichael Water District used our influence in the community and Sacramento County to get the facility permitted, designed, built, and in operation. We were able to take a seven-to-ten-year process and complete it in only three — from time of detection to environmental



work, design, and construction. The plume is huge and advancing by the year, so getting the facility up and operating sooner gives us a better chance to get capture and control of the contaminant.”

Kennedy/Jenks Consultants teamed with CWD and Aerojet to complete the siting study, preliminary design evaluation, and California Environmental Quality Act (CEQA) compliance requirements and to design and manage construction of the GET facility.

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The siting study identified a small parcel of land on the Bajamont WTP site for the GET facility. The project was completed on a fast track which saved CWD about nine months of project time. It used a three-phased construction contract to excavate the hillside, stabilize the foundation, and begin construction of the concrete footings, retaining walls, slabs, and foundation of the facility.

GAINING COMMUNITY SUPPORT FOR THE PROJECT

It was critical to gain the support of the upscale, well-educated community to build the groundwater treatment plant, since it would impact their community and benefit, to some degree, the Aerojet Corporation. CWD and Aerojet launched a public outreach campaign to gain support from the community and the regulators. They held several townhall meetings that were attended by representatives of Congressman Dan Lungren and Senator Diane Feinstein as well as state, county, and local elected officials. They also made formal presentations to community interest groups, the parkway commission, and the local homeowners.

“We let them know what was happening and what to expect,” says Nugent. “We held a series of public meetings and talked about our partnership and what we wanted to accomplish. The community got behind our plan because they didn’t want us to lose any of our groundwater supply. They were concerned about groundwater contamination and how it would affect us. And they were supportive of the fact that we were taking positive action and getting facilities constructed rather than wasting time and money in lawsuits. When the CEQA

document was released for public comment, there was little opposition.”

A FACILITY THAT BLENDS INTO THE NEIGHBORHOOD

The GET facility was designed to look like a large residential building to blend with the surroundings. “The GET facility has to match the existing water treatment plant, which looks like a big ranch-style house,” notes Nugent. “It also has to be very quiet.” Architectural techniques that were used to

camouflage the plant included retaining walls, brick veneer, vinyl siding, and residential windows. The acoustical louvers at the plant not only minimize sound pollution but also reduce the amount of air handling equipment needed in the electrical room and the ultraviolet equipment room. The entire treatment process is enclosed, allowing very little noise to escape the plant.

The new 4,500-sq.ft. plant uses pressurized ultraviolet reactors to remove n-Nitrosodimethylamine (NDMA), the primary contaminant of concern. Other treatment processes include granular-activated carbon (GAC) filtration to trap volatile organic compounds. The design also allows the District to add ion exchange units in the future (if needed) to treat perchlorate (another potential contaminant) and hydrogen peroxide to extend the life of the GAC beds.

“This is the first of two projects with Aerojet,” adds Nugent. “We are ready to start a second project that will allow us to use treated water from the GET plant to irrigate the community golf course and reduce demand on the public water supply system. This will return more than one million gallons per day of capacity to the water district. It will also allow the County to use the treated water at the golf course for a reduced cost and to maintain a nature study pond at the Effie-Yeaw Nature Center.”

After 24 months of concerted effort, the GET facility was completed and started up three days ahead of a USEPA regulatory deadline.

Kennedy/Jenks staff working with the Carmichael Water District and Aerojet included Alex Peterson, Sean Maguire, Peter Symonds, Ryan Ray, Chris Defferding, and James Bowland.



Architectural features that allow the plant to blend with the neighborhood include brick veneer, retaining walls, and acoustical louvers.

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