

ARSENIC IN DRINKING WATER COMPLIANCE SUCCESS STORIES

Defense Distribution Depot San Joaquin Sharpe Site, CA: The Value of Researching All Possible Alternatives

Case Study Contact Information

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The environmental staff at the Defense Distribution Depot San Joaquin Sharpe Site identified an innovative solution for arsenic treatment that cost less and was quicker to implement than other alternatives.

Lessons Learned

Cooperation among four different parties resulted in implementation of the treatment solution in a three week period at a significantly lower cost than other alternatives.

Background and System Description

The DDJC Sharpe site is located 1.5 miles east of Lathrop in San Joaquin County, California. The 724-acre site employs approximately 1,500 people. The drinking water supply for the DDJC Sharpe site is provided by four wells, No. 1, No. 3, No. 5, and No. 6. Arsenic has been detected in these wells in the range of 17 to 51 ppb.

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Between 1941 and 1975, chemical wastes were generated on the site as a result of certain activities, including maintenance of aircraft, vehicles, industrial equipment, and medical equipment. The wastes were disposed of on-site in several areas, and have contaminated both soil and groundwater with volatile organic compounds including trichloroethylene.

All maintenance activities have ceased on this site, and the waste areas are no longer used. Site cleanup operations have been underway since 1987 including groundwater treatment and excavation/disposal of contaminated soil.

Summary

The four wells that provide drinking water for the Defense Distribution Depot San Joaquin (DDJC) Sharpe site (formerly referred to as the Sharpe Army Depot) have arsenic levels ranging from 17 to 51 ppb. In a very short time frame, the Depot Environmental Staff identified some existing treatment vessels on a nearby army depot, moved the vessels to the DDJC Sharpe site and refilled them with an appropriate adsorbent material for arsenic removal. This innovative thinking led to significant cost savings over installation of a new treatment system, and allowed DDJC to meet the USEPA compliance deadline of January 23, 2006 for the Arsenic Rule.

Treatment Selection

The Depot staff first considered a design-build project for a new ion exchange treatment system to remove arsenic from the existing groundwater supplies. The treatment system that was considered was sized to treat water from the Depot's four existing wells, with a maximum capacity of 0.5 MGD. The U.S. Army Center for Health Promotion and Preventive Medicine estimated the cost for this treatment facility to be in excess of \$1.2 million dollars.

After several different non-treatment alternatives were considered and then ruled out, as discussed below, a second treatment alternative was identified. DDJC was utilizing a granular activated carbon (GAC) treatment system at the DDJC Tracy site, located about 15 miles from the DDJC Sharpe site. This treatment system, rated at a 1.0 MGD capacity, was being used to remove pesticides from groundwater as part of a site remediation program. Since the remediation program was nearly complete, it was determined that this treatment system, including two treatment vessels operated in series, could be taken off-line and moved to the DDJC Sharpe site in order to treat the drinking water supply. In about 3 weeks time, GAC media was removed from the two treatment vessels, a concrete pad was poured at the Sharpe site, piping modifications were completed, and the two vessels were moved from Tracy to Sharpe and installed on the new pad. A granular ferric oxide media, Bayoxide® E33 manufactured by Severn Trent Services, was then placed in the treatment vessels. The work was accomplished through a cooperative effort amongst DDJC staff, the U.S. Army Corp of Engineers, URS Corporation, and Baker Tank. This alternative offered a significantly lower cost of \$250,000 and a quicker timeframe than building a new facility. The new treatment system was placed into service in January 2006. The treated water contains no detectable level of arsenic.

Non-Treatment Alternatives

The Depot staff considered several alternatives that did not involve treatment of the existing groundwater supplies. One alternative was to purchase water from the City of

Lathrop using an existing interconnection, but delays in negotiations with the City affected DDJC's ability to meet the January 23, 2006 compliance deadline. A second alternative was to truck drinking water from the DDJC Tracy site but this option was not approved by the California Department of Health Services (CADHS). Other alternatives that were investigated included blending purchased water from the City of Lathrop with the existing water supply; leasing a portable system; and privatizing the water system.

Conclusion

Since the initial idea of using ion exchange was an expensive solution to reduce arsenic levels in the drinking water, DDJC continued to pursue other alternatives. After meeting roadblocks to several ideas, the DDJC staff identified the optimal solution, modifying existing treatment vessels at a nearby DDJC site with an appropriate media for arsenic removal.