

Project Profile

Yucca Mountain Project, Nevada Arsenic Treatment System



Background

Wells J-12 and J-13 are located in Area 25 of the Nevada Test Site near Mercury, Nevada. These wells supply potable water for the Yucca Mountain Project. Water-quality analyses revealed that arsenic concentrations exceeded the new maximum contaminant level (MCL). Before choosing a technology, the site manager, Bechtel SAIC, contracted with Dr. Dennis A. Clifford, University of Houston, and a team of consultants to review various treatment technologies to reduce the arsenic concentrations to acceptable levels. Dr. Clifford and Los Alamos Technical Associates (LATA) recommended using granular ferric oxide (GFO) technology for the treatment system. AdEdge was subsequently selected and awarded the project as the preferred technology provider in the Bechtel-SAIC solicitation. AdEdge assisted Bechtel-SAIC with obtaining Nevada DEP regulatory approvals for permitting and installation of the system. It is one of the first arsenic treatment installations permitted in the state of Nevada by DEP.



Treatment System

The AdEdge arsenic treatment system consists a skid-mounted adsorption package unit (APU) sized to accommodate a maximum design flow rate of 80 gpm. The model APU-80CSLL utilizes a twin vessel carbon steel vessel configuration for arsenic removal in series (lead/lag). The system is equipped with automated control valves and harness, central control panel with programmable logic controller (PLC) and a color user interface screen. System features also include differential pressure switches, control panel and local gauges, flow sensors & totalizers, and a central hydraulic panel with sample ports for a complete functioning packaged unit. Groundwater is pumped from the 2 wells through a 20,000-gallon storage tank. From the storage tank, groundwater is chlorinated and flows through another atmospheric water storage tank prior to treatment. The 48-inch diameter APU vessels each contain approximately 37 cubic feet of Bayoxide E33® adsorption media.

Total As **	0.012	mg/L As
As(III)		mg/L
Alkalinity	92 to 110	mg/L @ CaCO ₃
Hardness **	35 to 46	mg/L @ CaCO ₃
Silica **	60 to 64	mg/L SiO ₂
Phosphate **	< 0.02	mg/L P ₀₄
Sulfate	17 to 25	mg/L SO ₄
Iron **	<.05 to .08	mg/L Fe
Manganese **	ND to .02	mg/L Mn

Performance

Bayoxide E33® adsorption media has been in commercial use since 1999 serving nearly 2 million customers and has been deployed in over 60 public water installations in the U.S., Canada, and Mexico by AdEdge Technologies since 2002. AdEdge's packaged solutions utilizing GFO media include small community water system applications, schools, mobile home parks, and extensive use in over 1,500 private residential applications. The 80-gpm Yucca Mountain system was deployed in early January, 2006 and began full scale operations treating approximately 5,000 gallons per day. Effluent samples taken at the time of startup and subsequently, have indicated a high efficiency arsenic removal to non-detectable levels, well below the new arsenic treatment standard of 10 ppb. To date, AdEdge has also received NDEP approvals and deployed an arsenic treatment system at the Tonopah Test Range and will be deploying two additional packaged systems for Newmont Mining in Nevada.

For More Information Contact

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