

# **Ambient Groundwater Quality of the Lake Mohave Basin: A 2003**

## **Baseline Study**

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## **ABSTRACT**

The Lake Mohave groundwater basin (MHV) stretches along the Colorado River from Hoover Dam south to the community of Topock in northwestern Arizona. A granite outcrop where Davis Dam on the Colorado River is located divides the MHV into the largely undeveloped North basin and the South basin which includes Bullhead City. In 2003, ADEQ conducted a baseline groundwater quality study of the MHV in which 43 groundwater sites were sampled for inorganic constituents and isotopes of oxygen and hydrogen. Samples were also collected at selected sites for radon (31 sites), perchlorate (18 sites), and radiochemistry (15 sites) analyses. At 15 sites, concentrations of at least one constituent exceeded a health-based, federal or State water-quality standard. At 31 sites, concentrations of at least one constituent exceeded an aesthetics-based, federal water-quality guideline. Samples collected in the South basin appeared to consist of 9 sites recharged by pre-dam Colorado River water, 10 sites recharged by post-dam Colorado River water, 12 sites recharged by local precipitation, and 2 sites whose source is the ancient marine-related Bouse Formation.

Numerous constituent concentration patterns were found among recharge sources (ANOVA with Tukey test,  $p \leq 0.05$ ). In the South basin, groundwater recharged by local precipitation is the preferred domestic source because of its lower salinity and fewer aesthetic water quality standard exceedances. However, sites sometimes exceeded health-based water quality standards for arsenic, which are probably naturally occurring because of long groundwater residence time. Groundwater recharged by the Colorado River had fewer health-based water quality standards but was higher in salinity with numerous aesthetics standard exceedances including TDS, sulfate, and chloride. These concentration increases from fresher river water are probably the result of the dissolution of halite and gypsum. Sites tapping the Bouse Formation were saline and had both health and aesthetics-based standard exceedances.