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**GROUNDWATER QUALITY IN THE MONTEREY BAY AND SALINAS VALLEY BASINS, CALIFORNIA**

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**ABSTRACT:** Groundwater quality in the ~2,600 km<sup>2</sup> Monterey Bay and Salinas Valley basins was investigated for the Priority Basin Project of the GAMA Program, a collaboration of the California State Water Resources Control Board, U.S. Geological Survey and Lawrence Livermore National Laboratory. Samples from 97 wells were analyzed for water chemistry, isotopic abundances, and dissolved gases. The study, designed to provide a spatially unbiased assessment of untreated groundwater quality in the primary aquifer systems (those parts of the aquifers corresponding to the perforated intervals of wells listed in the California Department of Public Health (CDPH) database), was based on water-quality and ancillary data from 91 of the wells sampled and water-quality data from the CDPH database. Inorganic constituents with human-health benchmarks were detected at high concentrations in 14.5%, moderate in 35.5%, and low in 50.0% of the primary aquifers. Arsenic, molybdenum, and boron were the trace elements that most frequently detected at high concentrations. Nitrate and gross alpha radioactivity was detected at high concentrations, and the inorganic constituents with secondary maximum contaminant levels, manganese, iron, total dissolved solids, chloride, and sulfate, also were detected at high concentrations. In contrast, organic constituents with human-health benchmarks were present at high concentrations in 0.2%, moderate in 6.6%, and low in 93.2% (not detected in 48.1%) of the primary aquifers. The high proportion of organic constituents reflected high concentrations of tetrachloroethene and methyl tert-butyl ether. Thirty-two of the 205 organic constituents analyzed for were detected. One organic constituent, the herbicide simazine, was detected in more than 10% of samples. This study found that most wells that contained nitrate were located in agricultural areas, and had top perforation depths <100m. High and moderate relative-concentrations of arsenic were attributed to reductive dissolution of manganese or iron oxides, or to desorption or inhibition of arsenic sorption under alkaline conditions. Arsenic concentrations increased with increasing groundwater depth and residence time (age). Simazine was detected more often in groundwater from wells with surrounding land use classified as agricultural or urban, and which had top perforation depths <60m, than in groundwater from wells surrounded by natural lands or with deeper perforation depths.

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