

GROUND-WATER QUALITY OF THE OGALLALA FORMATION, CENTRAL HIGH PLAINS, COLORADO, KANSAS, NEW MEXICO, OKLAHOMA, AND TEXAS, 1999

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ABSTRACT

As part of the U.S. Geological Survey's National Water Quality Assessment (NAWQA) Program, High Plains Regional Ground-Water Study, 74 domestic-supply wells were sampled to assess the broad-scale water-quality conditions in the Ogallala Formation of the Central High Plains; an area of 38,000 square miles in parts of Kansas, Colorado, Oklahoma, Texas, and New Mexico. To provide an areally representative assessment of ground-water quality in the Ogallala Formation, the domestic water-supply wells were randomly selected with an average well spacing of 500 square miles. In 1999, ground-water samples were collected and analyzed for major ions, nutrients, trace elements, radon, pesticides, and volatile organic compounds. Most of the wells sampled were in rural, agricultural settings with depths to water ranging from less than 50 to 400 feet.

The overall water-quality in the Ogallala Formation exhibited little variability over the entire study area and rarely exceeded any national drinking-water limits. For example, total dissolved solids ranged from 246 to 1,101 milligrams per liter with a median of 431 milligrams per liter. Fluoride in one well was the only constituent in its compound class that exceeded a national drinking-water limit. Nitrate nitrogen was the most common nutrient measured and ranged from less than 0.05 to 20 milligrams per liter. The drinking-water limit for nitrate nitrogen was exceeded in three wells. Of the trace elements analyzed for in this study, none exceeded any drinking-water limit. Radon concentrations measured ranged from 156 to 2,953 picocuries per liter. Of the 47 pesticides analyzed, ten compounds were detected in samples from the 74 wells: atrazine (15 detections), deethylatrazine (13 detections), metolachlor (5 detections), simazine (2 detections), and carbaryl, chlorpyrifos, diazinon, malathion, pendimethalin, prometon (each with 1 detection). No pesticides exceeded any national drinking-water limit. No volatile organic compounds were detected in water from any of the 74 wells.