



# WATER FACT SHEET

U.S. GEOLOGICAL SURVEY, DEPARTMENT OF THE INTERIOR

## U.S. GEOLOGICAL SURVEY GROUND-WATER STUDIES IN NEW MEXICO

### GROUND-WATER ISSUES

Ground-water resources supplied 41 percent of water used in New Mexico during 1985. About 86 percent (1.6 billion gallons per day) of all ground water pumped was used for irrigation. Water demands in the drainage basins of the Rio Grande and the San Juan, Gila, Canadian, and Pecos Rivers in New Mexico are met by conjunctive use of surface and ground water. Water demands in the eastern High Plains, the southwestern intermontane basins, and west-central parts of New Mexico are primarily met by ground water. Some major ground-water issues in New Mexico are:

- Interstate transfer of water;
- Ground-water use and depletion;
- Federal and Indian water rights;
- Hazardous-waste disposal and ground-water pollution; and
- Development of saline ground-water resources.

### U.S. GEOLOGICAL SURVEY PROGRAMS

The U.S. Geological Survey (USGS), established in 1879, is the principal source of scientific and technical expertise in earth sciences within the Federal government. USGS activities include research and services in the fields of geology, hydrology, and cartography. The mission of the Water Resources Division of the USGS is to develop and disseminate scientific information on the Nation's water resources. The activities of the Water Resources Division in New Mexico are conducted by scientists, technicians, and support staff in offices in Albuquerque, Santa Fe, Las Cruces, and Carlsbad.

Hydrologic-data stations are maintained at selected locations throughout New Mexico to record data on stream discharge and stage, reservoir and lake storage, ground-water levels, well and spring discharge, and the quality of surface and ground water. Water-resources data are stored in the USGS National Water Data Storage and Retrieval System data base. These data are used by water planners and others involved in decisions that affect New Mexico's water resources.




During 1987, the USGS maintained a network of about 1,200 observation wells in New Mexico in cooperation with Federal, State, and local agencies. Water-level measurements from wells are used to monitor ground-water trends; however, they need to be integrated with other observations and ground-water investigations to be most useful.

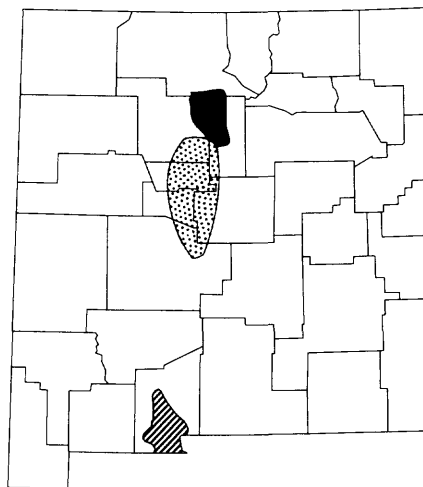
The USGS has conducted more than 300 hydrologic investigations in New Mexico. During 1987, the USGS entered into agreements with 36 Federal, State, and local agencies involving 41 hydrologic investigations in New Mexico; 24 of these investigations were directed toward ground-water quantity and quality. Three examples of ground-water studies by the USGS that address specific ground-water issues in New Mexico are discussed in the following sections.

### Depletion and Contamination in the Albuquerque Basin

Public-supply, industrial, and military water requirements in the Albuquerque area primarily are met by ground water from the sediments in the Albuquerque basin. Population growth in the Albuquerque area has increased rapidly in the last decade, and declines in ground-water levels are significant on the east side of the Rio Grande valley where most of the population is located. Recent population growth is to the west. Also, the Rio Grande valley is susceptible to toxic-waste contamination owing to shallow ground-water levels. Water-planning agencies need geohydrologic information for development of long-term water plans and implementation of ground-water-contamination monitoring programs. Since 1978, the USGS, in cooperation with the city of Albuquerque, Kirtland Air Force Base, Bernalillo County, and the New Mexico State Environmental Improvement Division, has conducted studies regarding the availability and quality of water in the basin-fill aquifer. Test wells have been drilled to determine aquifer properties. Water-level data, borehole-geophysical data, and water-chemistry data have been compiled and about 72 wells are used to provide long-term water-level data. The USGS has identified organic-compound contamination of ground water in Albuquerque's South Valley.

#### STUDY AREAS

-  Albuquerque Basin
-  Mesilla Basin
-  Santa Fe-Espanola Basin



Results from the studies are used by Federal, State, and local agencies to develop long-term water-use plans and to preserve the area's water resources.

### Ground-Water Resources in the Mesilla Basin

Urban development along the Rio Grande in southern New Mexico and El Paso, Texas, has increased the demand for water from basin-fill aquifers of the Mesilla basin. Further urban development will affect fully-appropriated surface-water supplies owing to the close relation between surface- and ground-water systems in the basin. Water-planning agencies need information about the relation between aquifers and the Rio Grande to plan for orderly ground-water development in the Mesilla basin. The USGS studied the geohydrology of the Mesilla basin from 1971 to 1987 in cooperation at various times with the New Mexico State Engineer Office (NMSEO), city of El Paso, city of Las Cruces, Elephant Butte Irrigation District, New Mexico Water Resources Research Institute, U.S. Bureau of Reclamation, and the International Boundary and Water Commission, U.S. Section. During this period, the USGS collected data from about 1,200 wells, drilled 105 test holes, and collected surface-geophysical data at 140 sites. Maps were prepared showing water quality and aquifer properties. A computer model was developed to simulate ground-water flow. Aquifer-test data, streamflow data, and water-level data from three hydrologic sections were used to define the relation between the Rio Grande and ground-water flow systems. Results of these studies are used by Federal, State, and local water management agencies to plan ground-water development in the Mesilla basin.

### Ground Water in the Santa Fe-Espanola Basin

Indian, municipal, and other water needs in the Santa Fe-Espanola basin have long been met through conjunctive use of surface and ground water. Urban development has resulted in increased pumpage from water-bearing volcanic and fluvial deposits. Ground-water pumpage affects fully-appropriated surface-water supplies owing to the relation between the surface- and ground-water systems. Federal, State, and local water planners need information about ground-water availability, aquifer properties, stream-aquifer relations, recharge mechanisms, and ground-water quality to plan for ground-water development and to aid in adjudication of Indian water rights. Since 1971, the USGS has conducted studies of the aquifer system in cooperation with the NMSEO, Santa Fe Metropolitan Water Board (SFMWB), and the U.S. Bureau of Indian Affairs (BIA). Geohydrologic data have been collected from approximately 2,100 wells. More than 60 test wells have been drilled to determine aquifer characteristics. A ground-water-monitoring program has been initiated to measure water-level and water-quality fluctuations. Maps have been prepared that describe the thickness and availability of freshwater in the aquifer, and a computer model of ground-water flow has been prepared. Study results are used by the NMSEO, SFMWB, BIA, and Pojoaque and Tesuque Tribes to aid in orderly water development and in the adjudication of Indian water rights.

### GROUND-WATER MANAGEMENT

The principal State agencies responsible for ground-water management are the New Mexico State Engineer Office and the Environmental Improvement Division of the Health and Environmental Department. The New Mexico State Engineer Office is responsible for administration of water law and the Environmental Improvement Division coordinates efforts to protect the quality of the State's water resources. Both agencies

use ground-water data and results of ground-water studies provided by the USGS. During 1987-88, the following Federal, State, and local agencies entered into interagency or cooperative cost-sharing agreements with the USGS to conduct ground-water investigations in New Mexico:

Bernalillo County  
 Cities of Alamogordo, Albuquerque, El Paso, Las Cruces,  
 and Santa Rosa  
 International Boundary and Water Commission, U.S. Section  
 Navajo Indian Nation  
 New Mexico Bureau of Mines and Mineral Resources  
 New Mexico Environmental Improvement Division  
 New Mexico Interstate Stream Commission  
 New Mexico State Engineer Office  
 Pecos River Commission  
 Pueblos of Acoma, Laguna, and Zuni  
 Santa Fe Metropolitan Water Board  
 U.S. Air Force  
 U.S. Army  
   Corps of Engineers  
   White Sands Missile Range  
 U.S. Department of Energy  
 U.S. Department of the Interior  
   Bureau of Indian Affairs  
   Bureau of Land Management  
   Bureau of Reclamation

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Information on technical reports and data related to ground water in New Mexico can be obtained from:

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