Ground water in southwestern New Mexico


This is one of many related papers that were included in the 1970 NMGS Fall Field Conference Guidebook.

Annual NMGS Fall Field Conference Guidebooks

Every fall since 1950, the New Mexico Geological Society (NMGS) has held an annual Fall Field Conference that explores some region of New Mexico (or surrounding states). Always well attended, these conferences provide a guidebook to participants. Besides detailed road logs, the guidebooks contain many well written, edited, and peer-reviewed geoscience papers. These books have set the national standard for geologic guidebooks and are an essential geologic reference for anyone working in or around New Mexico.

Free Downloads

NMGS has decided to make peer-reviewed papers from our Fall Field Conference guidebooks available for free download. Non-members will have access to guidebook papers two years after publication. Members have access to all papers. This is in keeping with our mission of promoting interest, research, and cooperation regarding geology in New Mexico. However, guidebook sales represent a significant proportion of our operating budget. Therefore, only research papers are available for download. Road logs, mini-papers, maps, stratigraphic charts, and other selected content are available only in the printed guidebooks.

Copyright Information

Publications of the New Mexico Geological Society, printed and electronic, are protected by the copyright laws of the United States. No material from the NMGS website, or printed and electronic publications, may be reprinted or redistributed without NMGS permission. Contact us for permission to reprint portions of any of our publications.

One printed copy of any materials from the NMGS website or our print and electronic publications may be made for individual use without our permission. Teachers and students may make unlimited copies for educational use. Any other use of these materials requires explicit permission.
This page is intentionally left blank to maintain order of facing pages.
Ground-Water Resources of the Region Are Great, but They Are Not Unlimited. Water Levels Are Declining in All Types of Rocks to Be Seen in the Area. Depths to Water Range from Less than 5 Feet at Some Points on Valley Floors to as Much as 550 Feet on the Upper Alluvial Slopes That Apron the Mountain Ranges. The Depth to Water in Wells Taps the Mountains Communally Is Less Than 500 Feet. However, the Few Wells That Have Been Successfully Developed in the More Rugged Parts of the Mountains Probably Tap Small Bodies of Perched Water. The Water Table Under the Mountain Ranges Seems to Stand at an Altitude Only Slightly Higher Than Under the Adjacent Valley Floors.

Although One Can Say with Reasonable Assurance "Drill Deep Enough and You'll Get Water" at Most Places in the Region, the Quantity That Can Be Developed Is Quite Another Matter. Large Quantities of Water Have Been Pumped from Wells Tapping the Valley Fill, or So-called "Bolson Deposits" in the San Simon, Animas, Playas, Lordsburg, and Mimbres (Deming) Valleys. In Each of These Areas Irrigation Wells Have Been Developed, Some of Which Have Yields Up to 1,800 Gpm (Gallons per Minute). City-Supply and Industrial Wells in the Vicinity of Silver City Obtain Yields of Up to 500 Gpm from Parts of the Gila Conglomerate. On the Other Hand, Wells That Tap the Crystalline Intrusive and Metamorphic Rocks, the Volcanic Rocks, and the Marine Sedimentary Rocks Commonly Yield Less Than 10 Gpm; in Some Areas, Particularly in the More Rugged Mountains, Yields of 1 to 2 Gpm Are Considered Good. Each of the Rock Formations Has Its Own Lithologic Characteristics, and These Determine the Ability of the Formation to Yield Water to Wells.

The Lithologic Characteristics of the Rock Formations in the Region Have Been Described in Detail in the Literature. The Hydrologic Characteristics of Most of the Formations or Types of Rocks to Be Seen in the Area Are Summarized by Trauger and Dooley (1965) in the Society's Sixteenth Guidebook. The Occurrence of Ground Water in the Principal Valley Areas Has Been Described in Detail in the Various Published Reports of the New Mexico State Engineer Cited in the List of Selected References. A Report on the Ground-Water Resources of Grant County Will Soon Be Published by the New Mexico Bureau of Mines and Mineral Resources. In Addition to the Areal Reports Cited, the New Mexico State Engineer Publishes Annually a Summary of Water-Level Measurements Made in Observation Wells Located Throughout the Area, and Maps That Show Changes in Water Levels in the Heavily Pumped Areas.

The Ground-Water Resources of the Region Are Great, But They Are Not Unlimited. Water Levels Are Declining in All the Areas of Heavy Pumping, and It Is Inevitable That Sooner or Later Development Will Have to Be Abandoned or the Extent of Operations Reduced. It Also Is Probable That, Although Water Levels Are Declining in the Known Aquifers, Large Supplies of Ground Water Have Yet to Be Discovered.

The Great Thicknesses of Limestone Rocks That Undoubtedly Underlie Much of the Bolson Fill Generally Have Been Discounted as Potential Supplies of Large Quantities of Water. Yet Evidence Exists That This Belief May Be Erroneous. It Is True That in the Upland Areas, the Limestone Rocks Do Not Commonly Yield Large Quantities of Water. But at Depth, the Situation May Be Different Where Deep Circulation of Water May Have Developed Solution Permeability or Where Fracturing Along Zones of Faulting May Have Increased Storage and Permeability. Records of Deep Wells at Tyrone, in Grant County, Indicate That the Original Large Yield of Wells Come from the Limestones at Depths of Over 1,000 Feet, and That Subsequent Caving Greatly Reduced the Yields. It Is Reported That Circulation Was Lost in the Montoya Limestone Penetrated in an Oil-Test Hole Near Hachita. More Recently, a Water Well Drilled Near the New Town of Tyrone Reportedly Penetrated the Lower Gila Conglomerate, Entered Limestone, and When Test Pumped Yields as Much as 1,500 Gpm. These Instances Suggest That When Future Demands for Water Warrant the Extra Cost, It May Be Worth While to Explore the Deep-Laying Limestone Formations That Underlie the Bolsons and Adjacent Alluvial-Fan Slopes.

At the Present Time the Quality of the Ground Water Found in the Region, in All the Aquifers, and at All Depths, Is Generally Fair to Excellent. The Few Reported Instances of Poor to Impotable Water Are Local, and Are Commonly Associated with Mineral Deposits. No Data Are Available Concerning the Quality of Water That Might Be Available in the Deep-Laying Limestones, But, Except for the Probability That It Would Be Very Hard, There Is No Reason to Expect It to Be Saline as Is Most Water in the Deep-Laying Formations in New Mexico East of the Rio Grande.

SELECTED REFERENCES


Conover, C. S., and Akin, P. D., 1942, Progress report on the groundwater supply of the Mimbres Valley, New Mexico, in 14th and 15th biennial repts. of the State Engineer of New Mexico, 1938-1942, p. 237-282.


Trauger, F. D., 1960, Availability of ground water at proposed well sites in Gila National Forest, Sierra and Catron Counties, New Mexico: N. Mex. State Engineer Tech. Rept. 18, 20 p., 3 pls., 2 figs.

