

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Geophysical Log Suite from Drill Hole No. 7
Mariano Lake-Lake Valley Drilling Project, McKinley County,
New Mexico

by

U.S. Geological Survey

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This report is preliminary and has not been reviewed
for conformity with U.S. Geological Survey editorial standards
and stratigraphic nomenclature.

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Plate 1: 4 - Parameter log - ntural gamma, resistivity, caliper,
gamma-gamma density

3 - Parameter log - ntural gamma, neutron-neutron, self
potential

Deviation plot

Plate 2: Magnetic susceptibility

Plate 3: Magnetic susceptibility

Plate 4: KUT

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INTRODUCTION

In the fall of 1980, the U.S. Geological Survey contracted with Longman Drilling Company of Albuquerque, New Mexico to rotary drill and core twelve holes along a north-south line from Mariano Lake to the vicinity of Lake Valley, New Mexico. This report incorporates the logs from drill hole no. 7. Similar reports on holes no. 1, 2, 3, 4, 5, and 6 were released by the U.S. Geological Survey (1981a-e).

The drilling project is funded under a reimbursable interagency agreement between the U.S. Bureau of Indian Affairs (BIA) and the U.S. Geological Survey (USGS). The program was designed by representatives of the BIA, USGS, and the Minerals Department of the Navajo Tribe.

PURPOSE

The principal objective of this project was to provide core samples and geophysical logs for petrologic, sedimentologic, geophysical, and geochemical studies of the Upper Jurassic Morrison Formation. Other objectives included the following: stratigraphic and coal studies of Upper Cretaceous rocks; hydrologic and water monitoring of well no. 2; control for a proposed seismic study of the same geographic area; and development of water wells by the Navajo Tribal Water and Sanitation Department.

GENERAL DRILLING PLAN

The locations of all twelve drill holes are shown on figure 1, which is a portion of the Gallup 1° x 2° Quadrangle. The general drilling plan called for most holes to be rotary drilled into the Upper Cretaceous Dakota Sandstone and then cored into or through the Recapture Member of the Morrison Formation. The interval to be cored in each hole was about 600 ft.

Exceptions to the general drilling were as follows: Hole No. 2, rotary drilled, surface to Jurassic Entrada Sandstone; Hole No. 4A, cored 21-218 feet, to test an observed near-surface I. P. anomaly; Hole No. 6, deepened after coring by rotary drilling into the Jurassic Entrada Sandstone; Hole No. 7A, cored only the Westwater Canyon Member of the Morrison Formation; Hole No. 8, abandoned in lower part of Westwater Canyon Member of the Morrison Formation; and Holes No. 9 and 10, abandoned in Upper Cretaceous rocks.

DRILL HOLE S-7

The location of this well is shown on figure 2.

The vital statistics on this well are:

Spud date: Jan. 3, 1981.

Location: T 19 N., R. 12 W., SE 1/4 sec. 31.

Lat. 35°49'45" Long. 108°09'00"

Collar Elevation	6585 feet	Menefee Sandstone (Cretaceous)
Core Point Tope:	2833 ft. (depth)	Dakota Sandstone (Cretaceous)
Bottom Cored Interval:	3440 ft. (depth)	Recapture Shale Member Morrison Formation (Jurassic)
Total Depth:	3440 ft. (depth)	Recapture Shale Member Morrison Formation (Jurassic)

Completion of well: Abandoned on February 11, 1981.

7 inch surface casing was set to 41 feet.

The following suite of geophysical logs were run on this hole and accompany this report: natural gamma, self potential, resistance, neutron-neutron porosity, deviation, gamma-gamma density, resistivity, caliper, magnetic susceptibility, and KUT (pls. 1-4).

The self potential, resistance (not plotted) and resistivity logs are of poor quality due to a high-salt-based mud used to maximize hole stability and core recovery. Salt concentrations at the time of logging was greater than 40,000 ppm and possibly as high as 80,000 ppm.

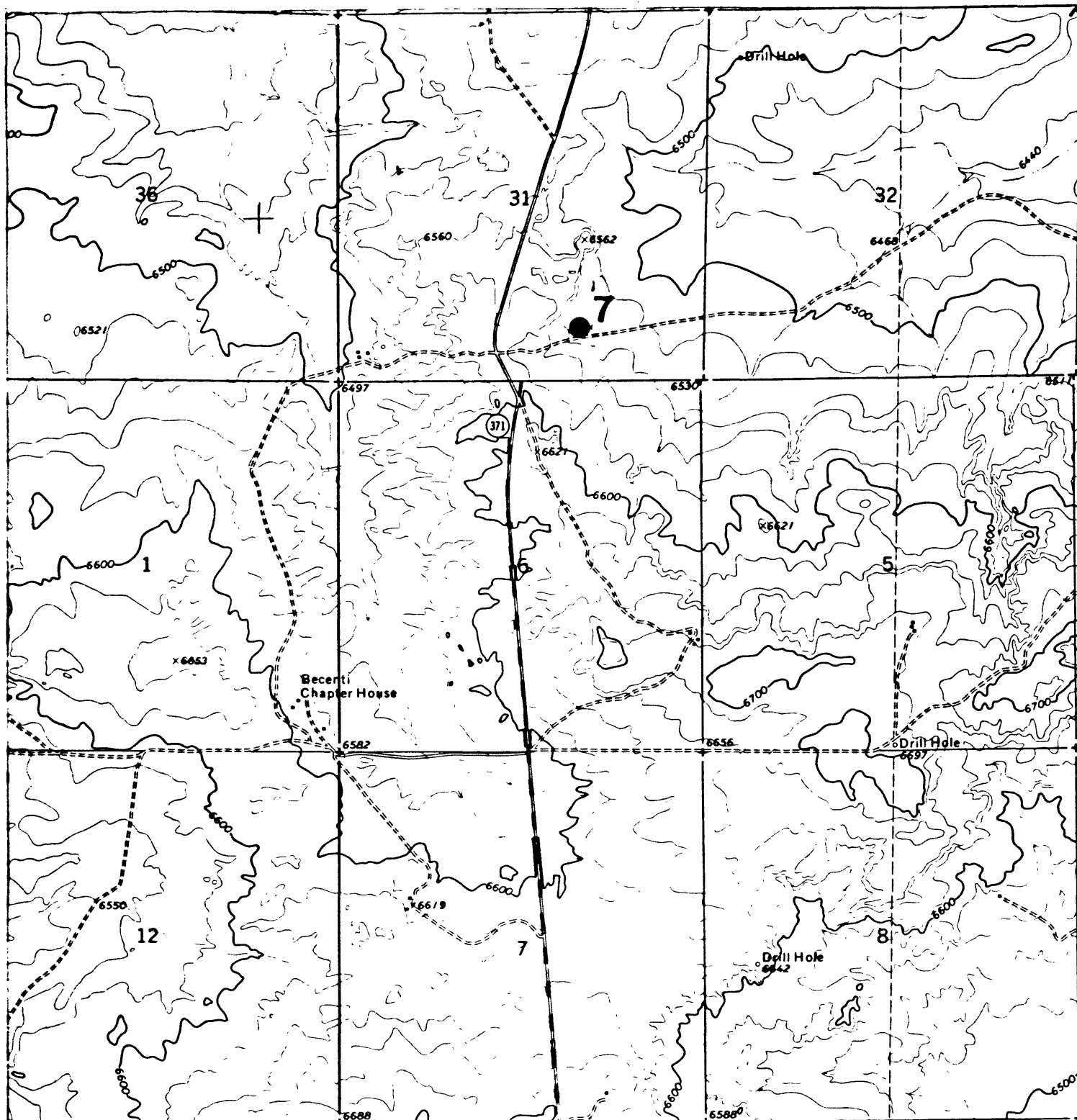


Figure 2.--Location of USGS Drill Hole No. 7, Antelope Lookout Mesa 7 1/2 Quadrangle, T18N, R12W.

Uranium mineralization was encountered in the intervals: 3165-3167.5, 3211-3216, and 3240-3256. Gamma-ray anomalies were also encountered at 3000, 3036, 3040, and 3154 feet.

Coal and carbonaceous shale zones were encountered at 150, 400-410, 2760 and 2798-2832 feet.

References

- U.S. Geological Survey, 1981a, Geophysical Log Suite from Drill Hole Nos. 1 and 2, Mariano Lake - Lake Valley Drilling Project, McKinley County, New Mexico: U.S. Geological Survey Open-File Report 81-172.
- U.S. Geological Survey, 1981b, Geophysical Log Suite from Drill Hole No. 3, Mariano Lake - Lake Valley Drilling Project, McKinley County, New Mexico: U.S. Geological Survey Open-File Report 81-439.
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