

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Geophysical Log Suite from Drill Hole No. 9
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 - natural gamma, self potential, resistance,
neutron-neutron porosity

Plate 2: 4-Parameter Log - natural gamma, resistivity, gamma-gamma
density, caliper

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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. 9. Similar reports were open-filed on hole nos. 1, 2, 3, 4, 5, 6, 7, 8, 7a, and 8 were released by the U.S. Geological Survey (1981a-h).

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 1⁰ x 2⁰ 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.

Chip samples were collected at 10-ft or 20-ft intervals throughout each hole and sludge samples collected at 20-ft intervals throughout the cored interval.

The following suite of geophysical logs were included in the general drilling project: Natural gamma, self potential, neutron-neutron porosity, resistance, resistivity, temperature, deviation, gamma-gamma density, caliper, magnetic susceptibility, gamma-ray spectrometer (KUT), sonic, induced polarization, conductivity, and high resolution 4-arm digital dipmeter.

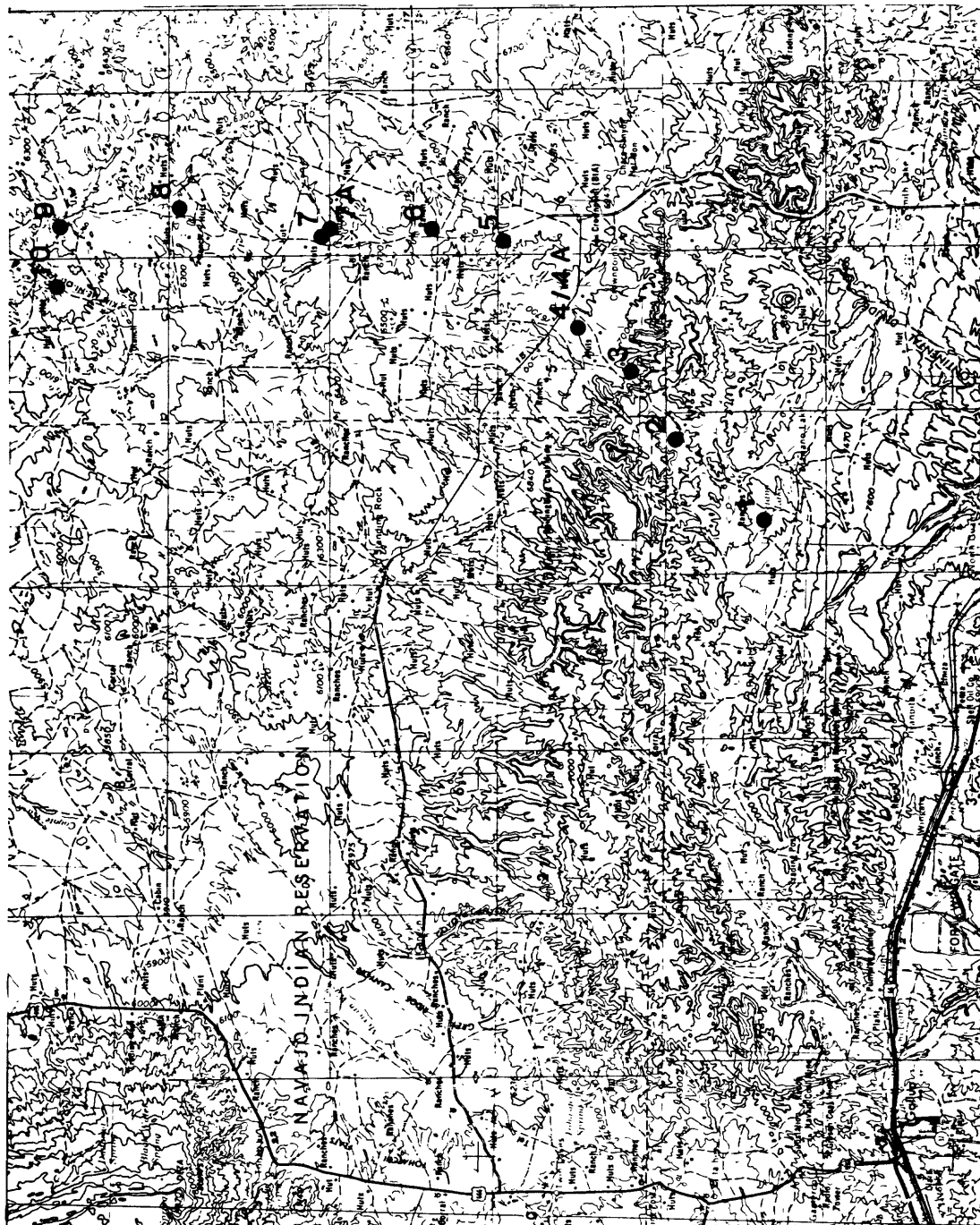


Figure 1. - Location of USGS Drill Holes, Gallup 1° x 2° Quadrangle.

DRILL HOLE NO. S-9.

The location of this well is shown on figure 2.

The vital statistics on this well are:

Spud date: Dec. 10, 1980

Location: T. 20 N., R. 12 W., SW 1/4 sec. 8.

Lat. 35°58'30" Long. 108°08'30"

Collar Elevation	6095 feet	Menefee Formation (Cretaceous)
Core Point Top:	N/A	N/A
Bottom Cored Interval:	N/A	N/A
Total Depth:	1465 feet (depth)	Satan Tongue of Mancos Shale (Cretaceous)

Completion of well: Cemented and abandoned December 12, 1980.

The following suite of geophysical logs were run on this hole and accompany this report: Natural gamma, self potential resistance, neutron-neutron porosity, caliper, gamma-gamma density, and resistivity (Plates 1-2).

The holes were drilled with clear water; 78 feet of 7 inch surface casing was set in this hole.

Thin coal beds were encountered at about 322, 715 and 972 feet.

This hole was abandoned at 1466 feet in the Satan Tongue of the Mancos Shale after encountering artesian flows (90 gallons/minute) of admixed oil and water in the Cretaceous Point Lookout Sandstone (1030-1177) beginning at a depth of about 1040 feet.

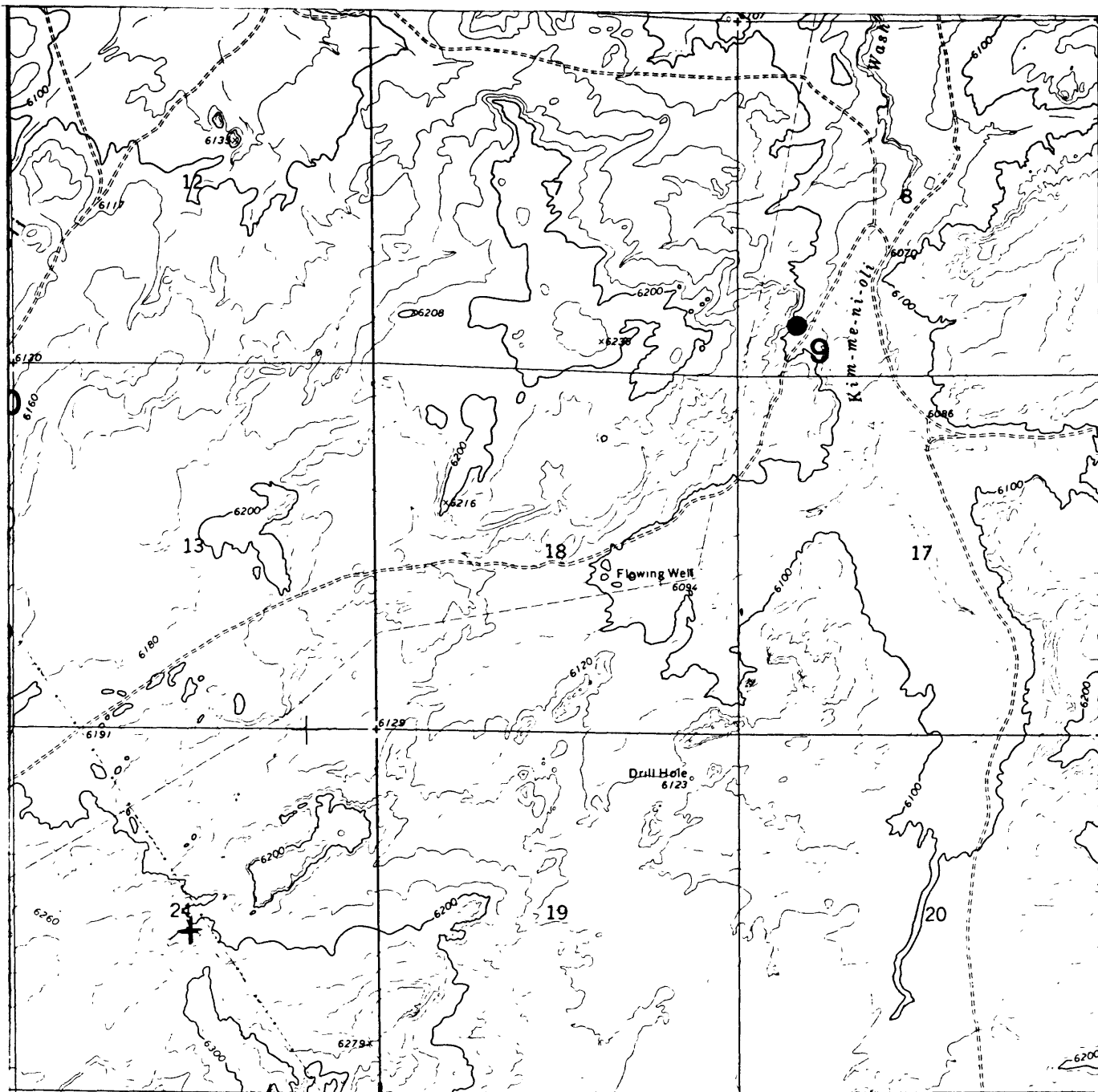


Figure 2.--Location of USGS Drill Hole No. 9, Milk Lake 7 1/2' Quadrangle, T20N, R12W.

References

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