DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

MISCELLANEOUS FIELD STUDIES
MAP MF-1496-A
SHEET 1 OF 2

106°45'00" 106°37'30" 106°30'00"
36°30'00" 36°27'30" 36°25'00" 36°22'30" 36°20'00"

RIO CEBOLLA
ALIRE
ARROYO BLANCO
RIO CHAMA
MESA GOLONDRINA
MESA DEL LOS VIEJOS
NO DATA

EXPLANATION

—80— ISOPACH—Showing thickness in feet of Burro Canyon(?) formation. Isopach interval 20 ft

● 75 DRILL HOLE—Showing thickness in feet of Burro Canyon(?) formation

Base modified from U.S. Geological Survey 1:24,000 Alire, Echo Amphitheater, Laguna Peak, Navajo Peak, 1953

SCALE 1:24 000

1 0 1 2 3 MILES
1 0 1 2 3 KILOMETERS

NEW MEXICO

ISOPACH MAP

ISOPACH AND STRUCTURE CONTOUR MAPS OF THE BURRO CANYON(?) FORMATION IN THE MESA GOLONDRINA AND MESA DE LOS VIEJOS AREAS, CHAMA BASIN, NEW MEXICO

By
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1983

DISCUSSION

In the Chama Basin a sequence of conglomerate, sandstone, and red, gray-green, and pale-purple mudstone occurs stratigraphically between the Upper Jurassic Morrison Formation and Upper Cretaceous Dakota Sandstone. This stratigraphic interval has been called the Burro Canyon Formation by several workers (Craig and others, 1959; Smith and others, 1961; Saucier, 1974). Although similarities in lithology and stratigraphic position exist between this unit and the Burro Canyon Formation in Colorado, no direct correlation has been made between the two. For this reason the unit in the Chama Basin is called the Burro Canyon(?) Formation.

The Burro Canyon(?) Formation of Early Cretaceous age in the Chama Basin is composed primarily of conglomerate and sandstone with thin red and green shale and mudstone lenses. Conglomerate is usually confined to the lower half of the formation. Mudstones and shales are sparse in the lower two-thirds of the formation but become more abundant, locally, in the upper one-third. The Burro Canyon(?) is unconformably overlain by the Upper Cretaceous Dakota Sandstone and unconformably overlies the Upper Jurassic Brushy Basin Member of the Morrison Formation.

Isopach and structure contour maps of the Burro Canyon(?) Formation were prepared using data primarily from geophysical and lithologic logs provided by the Anaconda Company and Marathon Resources Company. The geophysical logs include gamma, spontaneous potential, and resistivity logs. Subsurface drill-hole data were integrated with surface geologic data from Smith and others (1961) in preparing the structure contour map. Strike and dip data and faults shown on their maps were used as aids in interpreting the subsurface orientation of the top of the Burro Canyon(?) Formation as determined from geophysical logs.

The isopach map of the Burro Canyon(?) Formation indicates a range in thickness from about 57 to about 176 ft for the formation. In addition, it shows that over short distances the total variation in thickness of the formation can be pronounced. Most of this variation is attributed to relief at the base of the formation. This rolling-type topography at the base of the Burro Canyon(?) is interpreted by the author to represent an erosion surface cut into the top of the Brushy Basin Member of the Morrison Formation at some time prior to deposition of the Burro Canyon(?). Intertonguing of the Burro Canyon(?) and Brushy Basin has not been observed in outcrop or subsurface studies. The remaining variation in total thickness of the Burro Canyon(?) is attributed to erosion of the top of the formation preceding deposition of the Dakota Sandstone. Relief on the pre-Dakota erosion surface is relatively much less than that at the base of the Burro Canyon(?).

The density of subsurface control points is variable. Where the density of drill holes is high, accurate isopach patterns can be obtained. However, where drill holes are more widely spaced, the position of contour lines becomes less certain. Due to the lack of control points in the area between Mesa Golondrina on the west and Mesa de los Viejos on the east, isopach lines were not extended between the areas.

The structure map contoured on the top of the Burro Canyon(?) Formation is in general agreement with the general structure map of Smith and others (1961), but some areas show considerably more detail. Additional faults suggested by the subsurface data are shown on this map. Values of stratigraphic displacement shown for several of the faults were taken from Smith and others (1961) or were calculated from drill-hole data. In some areas the control points are too widely spaced to allow accurate placement of several of the faults. For this reason the faults are shown as approximately located.

No geologic map is available for the Mesa Golondrina area. The structural interpretation is made on the best fit of drill-hole data to topography and the author's limited knowledge of the geology of the area.

The data over most of the map area suggest a north to northeasterly regional dip. Dips are northwesterly in the vicinity of broad flexures in the southern part of the map area.

REFERENCES

Craig, L. C., and others, 1959, Measured sections of the Morrison and adjacent formations: U.S. Geological Survey Open-File Report, 700 p.

Saucier, A. D., 1974, Stratigraphy and uranium potential of the Burro Canyon Formation in the southern Chama Basin, New Mexico, in Siemers, C. T., ed., New Mexico Geological Society 25th Field Conference, Guidebook of Ghost Ranch central-northern New Mexico, p. 211-219.

Smith, C. T., Budding, A. T., and Pitrat, C. W., 1961, Geology of the southeastern part of the Chama Basin: New Mexico State Bureau of Mines and Mineral Resources Bulletin 75, 57 p.

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