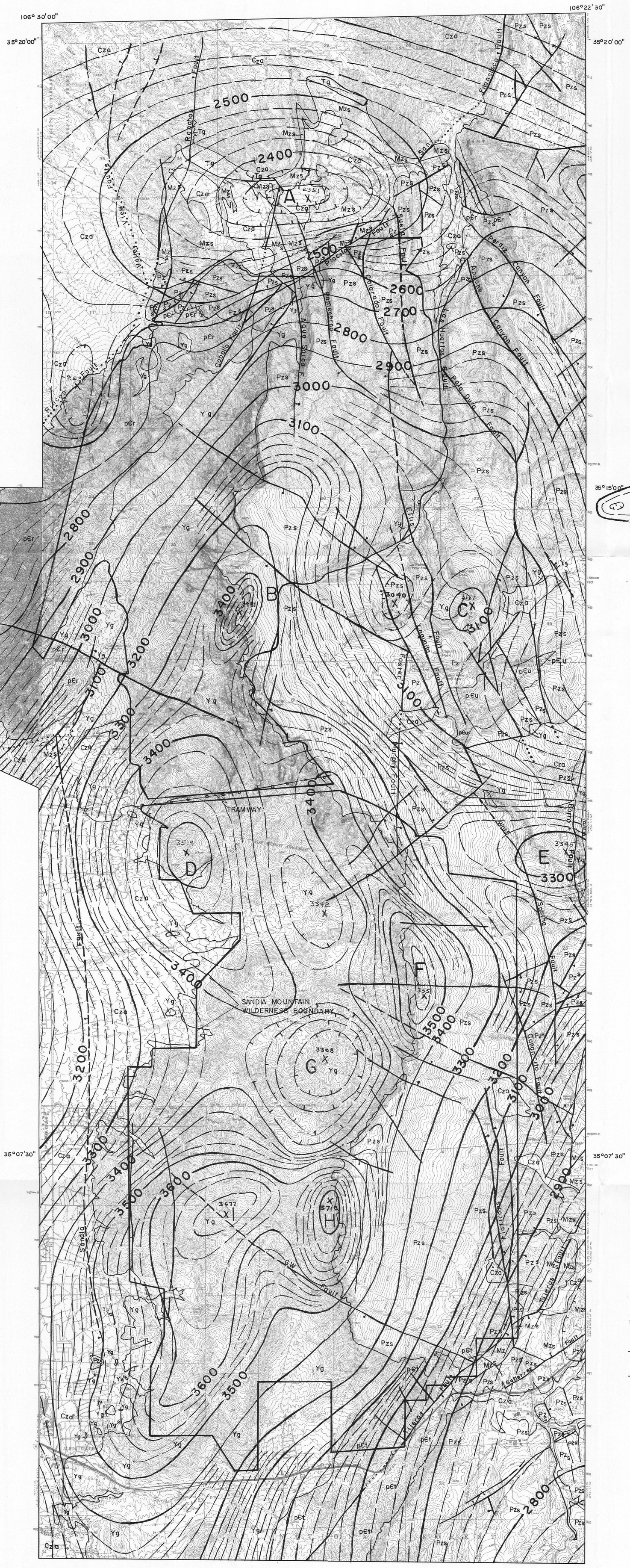
DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

MISCELLANEOUS FIELD STUDIES
MAP MF-1631-D



CORRELATION OF MAP UNITS

Cza	Upper Cenozoic	CENOZOIC
Tg	Lower Tertiary	
Mzs		MESOZOIC
Pzs		PALEOZOIC
Yg		MIDDLE PROTEROZOIC
pCr		MIDDLE AND EARLY PROTEROZOIC
pCu		
pCt		EARLY? PROTEROZOIC

DESCRIPTION OF MAP UNITS

Cza — ALLUVIUM, AND ALLUVIAL-FAN AND BASIN-FILL DEPOSITS (UPPER CENOZOIC)

Tg — GALISTEO FORMATION (LOWER TERTIARY)--Sandstone, mudstone, and minor conglomerate

Mzs — SEDIMENTARY ROCKS (MESOZOIC)--Sandstone, shale, and mudstone of Mesaverde, Mancos, Dakota Formations (Cretaceous); Morrison, Todilto, Entrada Formations (Jurassic); and Chinle, Santa Rosa Formations (Triassic)

Pzs — SEDIMENTARY ROCKS (PALEOZOIC)--Red beds, sandstone, limestone, and minor gypsum of the San Andres, Yeso, and Abo Formations (Permian); chiefly limestone and minor shale and sandstone of the Madera Group (Permian and Pennsylvanian) and Sandia Formation (Pennsylvanian); and Arroyo Penasco Group (Mississippian)

Yg — SANDIA GRANITE OF KELLEY AND NORTHROP (1975) (MIDDLE PROTEROZOIC)

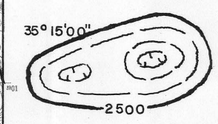
pCr — GNEISS AND SCHIST OF RINCON (MIDDLE AND EARLY PROTEROZOIC)

pCu — UNDIFFERENTIATED GNEISS AND GRANITE (MIDDLE AND EARLY PROTEROZOIC)

pCt — TIJERAS GREENSTONE OF KELLEY AND NORTHROP (1975) (EARLY? PROTEROZOIC)

——— CONTACT

———↑——— FAULT--Dashed where inferred or approximately located; dotted where concealed. Bar and ball on downthrown side



MAGNETIC CONTOURS--Showing total intensity magnetic field of the Earth in gammas relative to arbitrary datum. Hachures indicate closed areas of lower magnetic intensity. Contour interval 20 and 100 gammas

3481 X — MEASURED MAXIMUM OR MINIMUM INTENSITY WITHIN CLOSED HIGH OR LOW

A — MAGNETIC ANOMALY--Discussed in text

STUDIES RELATED TO WILDERNESS

The Wilderness Act (Public Law 88-577, September 3, 1964) and related acts require the U.S. Geological Survey and the U.S. Bureau of Mines to survey certain areas on Federal lands to determine their mineral value, if any, that may be present. Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of an aeromagnetic survey of the Sandia Mountain Wilderness, Cibola National Forest, Bernalillo and Sandoval Counties, New Mexico. The Sandia Mountain Wilderness was established by Public Law 95-237, February 24, 1978.

INTRODUCTION

During 1981 and 1982 the U.S. Geological Survey and the U.S. Bureau of Mines conducted field investigations to evaluate the mineral resource potential of the Sandia Mountain Wilderness, Bernalillo and Sandoval Counties, New Mexico. This report and map represent only the results of the aeromagnetic compilation from previous publications (U.S. Geological Survey, 1975a,b,c). The wilderness encompasses 61 mi^2 (37,232 acres) within the Cibola National Forest, but the map area is about 145 mi^2 and includes areas adjacent to the wilderness boundary.

The Sandia Mountains are a part of an eastward-tilted fault block that is about 18 mi long and 8-10 mi wide and that is continuous with the Manzanita-Manzano Mountain fault blocks to the south of Tijeras Canyon (fig. 1). The westward-facing Sandia range front of Precambrian crystalline rocks is capped by about 2,500 ft of Pennsylvanian and Permian limestone, sandstone, and siltstone strata that dip 15°-20° eastward to form the dip slope of the tilted fault block.

About 40-50 percent of the rocks exposed in the Sandia Mountains are of Precambrian age and include an older group of greenstone, metarhyolite, quartzite, and gneiss that is intruded by the Sandia Granite (1,445 m.y.). Paleozoic strata, about 2,500 ft thick, comprise about 30 percent of the outcrop area and form an extensive dip slope on the tilted fault block. Mesozoic strata commonly occupy synclinal basins such as that near Placitas in the Santo Domingo basin. Tertiary strata are represented by the early Tertiary Galisteo Formation and the poorly consolidated basin-fill sediments of the Santa Fe Group.

The dominant structural element is the east-tilted Sandia fault block, which is bounded on the west by the Pliocene and Miocene Sandia and Rincon-Ranchos range-front faults. These faults have as much as 20,000-28,000 ft of throw. Numerous north-trending faults along the dip slope are considered coeval with the range-front faults and have had an important influence on the localization of barite-fluorite veins. The northeast- and east-northeast-striking Placitas-San Francisco, Tijeras, and Gutierrez faults are principally of Laramide age but probably had numerous periods of movement.

Regional gravity data (Suits and Cordell, 1981) indicate no significant mass distribution anomalies within the study area.

AEROMAGNETIC SURVEY

The aeromagnetic map is contoured with respect to an arbitrary datum and is an enlarged part of the aeromagnetic map that was prepared from three surveys (U.S. Geological Survey, 1975a,b,c): one flown at 10,000 ft and two flown at 8,000 ft, barometric elevation. From this series of three aeromagnetic maps covering Albuquerque and vicinity, local magnetic anomalies can be related to topographic relief and to contrasts in rock magnetization that are superposed on the earth's main magnetic field.

The principal anomalies within and marginal to the Sandia Mountain Wilderness are lettered A through I. Negative anomaly A is over a thick (9,000 ft) section of Tertiary, Mesozoic, and Paleozoic strata that dip northward off the Precambrian crystalline rocks of the Sandia crest. This negative anomaly is part of an extensive magnetic low that extends westward across the Albuquerque basin. Positive anomalies B, F, and H along the Sandia Mountains are primarily the result of the topography of the ridge. Minor variations in accessory magnetite in the Sandia Granite account for anomalies D, G, and I. The decreasing magnetic gradient off the Sandia crest, especially along the dip slope to the east, is interrupted by anomalies C and E, which are the result of uplifted Precambrian crystalline rocks along strong faults on the dip slope.

REFERENCES

Suits, V. J., and Cordell, Lindreth, 1981, Bouguer gravity map of the San Juan basin area, Colorado, Arizona, and New Mexico: U.S. Geological Survey Open-File Report 81-657.

U.S. Geological Survey, 1975a, Aeromagnetic map of an area east of Albuquerque, New Mexico: U.S. Geological Survey Open-File Report 75-183, scale 1:125,000.

_____1975b, Aeromagnetic map of Albuquerque and vicinity, New Mexico: U.S. Geological Survey Open-File Report 75-186, scale 1:125,000.

_____1975c, Aeromagnetic map of an area north of Albuquerque, New Mexico: U.S. Geological Survey Open-File Report 75-187, scale 1:125,000.

Base from U.S. Geological Survey, 1:24,000
Placitas, 1954; Alameda, 1960; Sandia Crest and Tijeras, 1961

Aeromagnetic data compiled from U.S. Geological Survey Open-File Reports (1975a,b,c); geology modified from Hedlund (1985)

SCALE 1:50 000

1 ½ 0 1 2 3 MILES

1 .5 0 1 2 3 KILOMETERS

CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

MAP LOCATION

AEROMAGNETIC MAP OF THE SANDIA MOUNTAIN WILDERNESS BERNALILLO AND SANDOVAL COUNTIES, NEW MEXICO

By
D.C. Hedlund and L.E. Cordell

1985

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