DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY

Base from U. S. Geological Survey,
Ely, Nevada and Utah, 1971, 1:250,000

Geology simplified from R. K. Hose, 1981

MAP LOCATION

SCALE 1:62 500

1 ½ 0 1 2 3 4 MILES

1 .5 0 1 2 3 4 KILOMETERS

Data flown and compiled in December, 1980 by Geodata International, Inc., under contract to the U.S. Geological Survey, regional field removed, IGRF 1975 updated to month flown, datum base arbitrary

AEROMAGNETIC MAP OF THE MT. MORIAH ROADLESS AREA, WHITE PINE COUNTY, NEVADA

By

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CORRELATION OF MAP UNITS

Lower plate	Upper plate		
TKi			
	Pzus	Tertiary or Cretaceous Permian through Ordovician Cambrian	PALEOZOIC
€ms			

DESCRIPTION OF MAP UNITS

TKi INTRUSIVE IGNEOUS ROCKS (TERTIARY OR CRETACEOUS)--Composition varying from monzonite to granodiorite, present only in lower plate rocks (below the Snake Range décollement). Exposed as sills and small stocks and dikes

Pzus UNMETAMORPHOSED SEDIMENTARY ROCKS, UNDIVIDED (PALEOZOIC)--Upper plate rocks (above the Snake Range décollement) consisting of limestone, dolomite, shale, siltstone, sandstone, and quartzite of the Arcturus Formation, Riepe Spring Limestone, Ely Limestone, Chainman Shale, Joana Limestone, Pilot Shale, Guilmette Limestone, Simonson Dolomite, Sevy Dolomite, Laketown Dolomite, Fish Haven Dolomite, Eureka Quartzite, Pogonip Group, Notch Peak Formation, Dunderberg Shale, Lincoln Peak Formation, and Pole Canyon Limestone

€ms METAMORPHOSED SEDIMENTARY ROCKS, UNDIVIDED (CAMBRIAN)--Lower plate rocks (below the Snake Range décollement) consisting of marble, metaquartzite, garnet schist, and phyllite of the Dunderberg Shale, Lincoln Peak Formation, Pole Canyon Limestone, Pioche Shale, and Prospect Mountain Quartzite

— — APPROXIMATE BOUNDARY OF MOUNT MORIAH ROADLESS AREA (04352)

——— CONTACT BETWEEN INTRUSIVE IGNEOUS ROCKS AND SEDIMENTARY ROCKS

———▲———▲——— LOW-ANGLE FAULT (SNAKE RANGE DÉCOLLEMENT)--Sawteeth on upper plate

——— HIGH-ANGLE FAULT--Bar and ball on downthrown side. Complex faulting in upper plate rocks not shown

EXPLANATION OF SYMBOLS ON AEROMAGNETIC MAP

——400—— MAGNETIC CONTOURS--Represent total intensity magnetic field values of earth, in gammas, relative to an arbitrary datum. Contour interval 20 gammas. Hachured to indicate closed areas of lower magnetic intensity

B MAGNETIC ANOMALY--Discussed in text

— — — FLIGHT-PATH--Flight level 1,000 ft above ground level, flight-line spacing 0.5 mi

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 of Federal lands to determine their mineral resource potential. 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 Mt. Moriah Roadless Area in the Humboldt National Forest, White Pine County, Nevada. The Mt. Moriah Roadless Area was classified as a further planning area during the second Roadless Area Review and evaluation by the U.S. Forest Service in January, 1979.

INTRODUCTION

The Mt. Moriah Roadless Area covers 97,205 acres of the Humboldt National Forest in eastern White Pine County, Nevada (see index map). Located in the northern Snake Range and bounded on the west by Spring Valley and on the east by Snake Valley, the area lies about 1.5 miles north of U.S. Highway 6 and 50. Baker, Nevada, about 10 miles south of the area, is the only permanent community in the immediate area; Ely, Nevada, about 35 miles to the west, and Delta, Utah, about 85 miles to the northeast, are the nearest main population centers.

The perimeter of the Mt. Moriah Roadless Area generally coincides with the boundary of the Humboldt National Forest in the northern Snake Range, except in the northwest and southwest corners, where the roadless area boundary is coincident with Forest Service roads 460, 469, 457, and 458. These and other Forest Service roads, together with several hiking trails, provide limited access to the interior of the area. Elevations range from 6,000 ft along the eastern border and 7,000 ft for much of the western border to 12,500 ft on Mt. Moriah, which is located in the center of the roadless area.

An aeromagnetic survey of the Mt. Moriah Roadless Area was conducted to help identify geological features that might be associated with buried mineral deposits. The low-altitude magnetic survey was flown at 1,000 ft above the ground to detect shorter wavelength anomalies.

All rock units across the roadless area are sedimentary or metasedimentary except for the monzonite and granodiorite intrusive igneous rocks (TKi). A low-angle fault (decollement) separates Precambrian and Cambrian metasedimentary rocks and Cretaceous or lower Tertiary intrusive quartz monzonite to diorite rocks (lower plate) from middle Cambrian to Permian rocks that are not metamorphosed (upper plate) (Hose, 1981). Lower plate rocks were metamorphosed by the intrusive igneous rocks (TKi).

INTERPRETATION

Magnetic susceptibilities of the sedimentary and metasedimentary sections appear to be uniformly low across the Mt. Moriah Roadless Area; sedimentary rocks and unconsolidated deposits usually contain little or no magnetite and show very little magnetic expression. Although the survey was flown at a nominal elevation of 1,000 ft above ground, magnetic anomalies associated with the topography are not evident. Aeromagnetic anomalies are interpreted to reflect intrusive rocks in the lower plate.

Low magnetic relief dominates the aeromagnetic map and reflects both the sedimentary and metasedimentary terranes. The minus - 400 - gamma contour, anomaly A, over the southern part of the map occurs over sedimentary rocks of the upper plate at topographically high elevations, about 11,000 ft. The topographic ridge extending north from anomaly A does not affect the aeromagnetic pattern; aeromagnetic intensities increase over decreasing topographic elevations on the west side of the ridgeline where surface rocks are part of the upper plate. The minus - 400 - gamma magnetic contour interval to the north, anomaly B, is generally over metasedimentary rock and crosses topographic elevations ranging from about 11,000 ft to less than 8,000 ft. Abandoned mine workings in the metasedimentary terrane near lat 39°20' N. and long 114°14'W. within the area of magnetic low, anomaly B, are not discerned by the aeromagnetic survey.

The north-south-trending contour pattern, anomaly C, showing westward increasing magnetic intensity along the west edge of the map, probably reflects intrusive rock beneath the upper plate. The upper plate is estimated to be about 2,450 ft thick (Hose, 1981). Low-gradient magnetic-high closures within the broad north-south-trending anomaly possibly represent phases of the buried intrusive rocks with high magnetic susceptibility; however, the focal point of the north-south-trending anomaly is a magnetic high located about 1.5 mi west of the roadless area at lat 39°19' N. The magnetic high is located on the west pediment slope of the mountain range outside the area of mapped geology, but its shape and gradient suggest a plug of rock with high magnetic susceptibility near the surface. Metamorphosed rocks of the lower plate are exposed about 1.5 miles to the east.

Two east-southeast-trending magnetic highs, anomalies D and E, appear to be apophyses to the broad magnetic high along the west side of the map. Although the quality of the aeromagnetic data may be suspect because of single flight line anomalies along trend E, both E and D appear to extend to the east border of the map. Abandoned mine workings are located in upper plate rocks along magnetic trends D and E. Mineralization occurs in faults and fractures in the upper plate sedimentary rocks, but neither the faults nor the mineralized areas extend into the lower plate (Robert R. Carlson, geochemist, U.S. Geological Survey, oral commun.).

The southernmost apophysis, magnetic-high anomaly D, is mostly over outcropping intrusive rock (TKi), which is believed to be the anomaly source. The steep-gradient magnetic high near the southeast corner of the map and the low magnetic gradient near the west end of the outcrop of intrusive rock (TKi) suggest that different phases of the intrusive (Hose, 1981, Description of Map Units) cause the linear magnetic ridge.

The northern apophysis, magnetic-high anomaly E, is delineated across the metamorphic terrane by the minus - 360 - gamma contour interval. The magnetic field is constant over topographic relief that ranges from about 7,000 ft to about 11,000 ft suggesting that surface metamorphic rocks do not contribute to the anomaly. Possibly intrusive rock (TKi) similar to that exposed at the west end of anomaly D occurs at depth within the metamorphosed sedimentary rocks (€ms).

CONCLUSIONS

Aeromagnetic data indicate no significant features that can confidently be interpreted to be directly related to mineral deposits. Low magnetic relief dominates the aeromagnetic map and reflects both the sedimentary and metasedimentary terrane.

Abandoned mine workings located in rocks of the upper plate along magnetic trends D and E and in the northeast corner of the roadless area are not discerned by the aeromagnetic survey. Mineralization occurs in faults and fractures in the sedimentary rocks of the upper plate at the workings, but neither the faults nor the mineralized areas extend into the lower plate. One abandoned working near lat 39°20' N. and long 114°14' W. is in lower plate metasedimentary rocks (Robert R. Carlson, geochemist, U.S. Geological Survey, oral commun.), but it shows no identifying magnetic pattern. Aeromagnetic anomalies are interpreted to reflect intrusive rocks in the lower plate.

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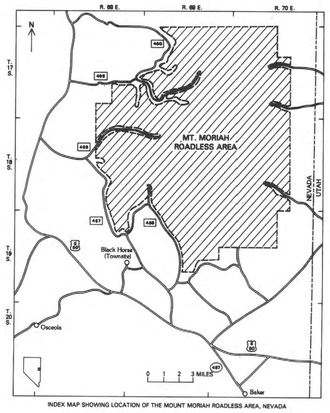
Hose, R. K., 1981, Geologic map of the Mount Moriah Further Planning (RARE II) Area, eastern Nevada: Miscellaneous Field Studies Map MF-1244-A, scale 1:62,500.



INDEX MAP SHOWING LOCATION OF THE MOUNT MORIAH ROADLESS AREA, NEVADA

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