



Map C-Aeromagnetic Map

**MINERAL RESOURCES OF THE POWDERHORN INSTANT STUDY AREA,
GUNNISON AND HINSDALE COUNTIES, COLORADO**

by

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EXPLANATION

AEROMAGNETIC CONTOUR
Hachured to indicate closed areas of lower intensity
Contour interval : 20 gammas
Flight spacing : 3/4 mile
Flown 13,000' A.S.L.
Flight path ———
Flown and compiled: 1978 -- 1979
by L.K.B. Resources, Inc. under contract to the
U.S. Geological Survey
Contours represent total intensity magnetic field
values of the earth in gammas
Regional field removed - I.G.R.F. 1975 updated to
month flown

FLOOD BASALT, extent given to show relationship
to aeromagnetic anomalies

TROUT CREEK VOLCANIC PLUG

RHYOLITE DIKES

Geophysical surveys
By
R. A. Martin
Aeromagnetic survey

An aeromagnetic survey covering the Powderhorn Instant Study Area was flown in 1978 by L. K. B. Resources, Inc., at 4 km (13,000 ft) altitude and with 1.2 km (3/4 mi) line spacing. The data are contoured at 20 gamma intervals (Map C). Relatively magnetic basalt lava flows cap the high plateaus in the southern part of the study area and cause intense, steep-gradient magnetic anomalies (Map A and Map C). The underlying volcanic rocks are somewhat less magnetic and have a much more subdued magnetic expression. Effects of the buried Precambrian rocks can be discerned only where the volcanic cover is thin near the north margin of the study area.

North of the plateaus, a gentle saddle on a magnetic ridge correlates with the Trout Creek intrusion. The lack of a stronger magnetic expression can be attributed to the compositional similarity between the intrusion and the enclosing rocks (Map A, unit Tpl). A magnetic low 2-3 km northeast of the intrusion, and a high 2-3 km to the northwest, probably have their sources in the Precambrian rocks beneath the volcanics. A magnetic high 2-3 km southeast of the Trout Creek intrusion covers an area in which monzonitic and rhyolitic porphyry dikes crop out. This high suggests the existence of a magnetic body at depth which may be related to the dikes. A magnetic low over basaltic and andesitic flows southeast of the dikes suggests the existence of rocks with low magnetic susceptibility beneath the basalt. The low continues to the southeast for about 6 km (4 mi). The steep magnetic gradient northeast of the plateaus reflects thinning of the volcanic cover and emergence of the Precambrian basement.

Features are lacking in the aeromagnetic contour map which might confidently be interpreted to have direct significance to mineral deposits. The aeromagnetic survey depicted (Map C) does not extend across the hydrothermally altered terrane near Slumgullion Pass, south and southwest of the study area, where magnetic patterns related to mineralization might be expected. A regional aeromagnetic survey (U.S. Geological Survey, 1972) which does cover the southwest area shows a magnetic high over basaltic flood-lavas on Mesa Seco. This high-amplitude anomaly is dominant and obscures any anomalies of lesser amplitude which might occur over the altered rock.

Gravity
A large negative Bouguer gravity anomaly underlies the southwest corner of the study area. The anomaly is part of the 100 by 150 km negative anomaly with steep marginal gradients which is believed to reflect a major, relatively shallow batholith beneath the San Juan Mountains (Plouff and Pakiser, 1972). The Trout Creek intrusion, the intrusive monzonitic and rhyolitic porphyry dikes, and the elongated south-trending magnetic low over basaltic and andesitic flows discussed previously are located along the steep gradient marking the margin of the major gravity low.

References
U.S. Geological Survey, 1972, Aeromagnetic map of the Ridgeway-Pagosa Springs area, southwestern Colorado: Geophysical Investigations Map GP-840.
Plouff, Donald, and Pakiser, L. C., 1972, Gravity study of the San Juan Mountains, Colorado: U.S. Geological Survey Professional Paper 800-B, p. 183-190.

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