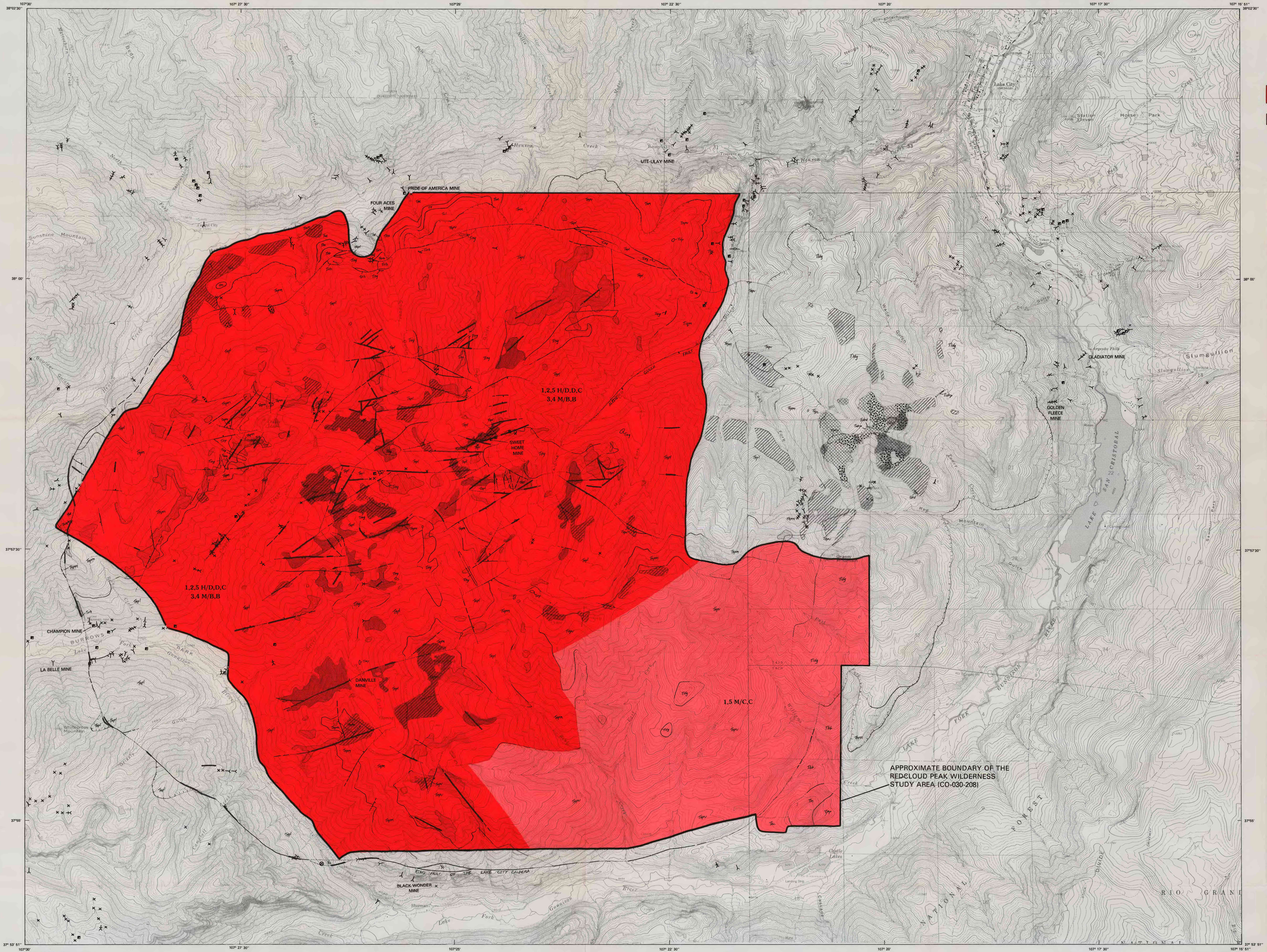
DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

BULLETIN 1715-B
PLATE 1



Base from U.S. Geological Survey
Uncompahgre Peak and Lake City, 1963;
Redcloud Peak and Lake San Cristobal, 1964

Geology simplified from Hon (1987)

APPROXIMATE MEAN DECLINATION, 1964

SCALE 1:24 000
1 0 1 MILE
1 5 0 1 KILOMETER

CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

COLORADO

EXPLANATION OF GENERALIZED MINERAL AND ENERGY RESOURCE POTENTIAL

[See figures 8 through 12 for more detailed information on potentials for commodities 1 through 5, respectively. Those parts of the study area that are underlain by the Henson Member of the Silverton Volcanics have low potential for resources of gold and silver in clastic-sediment-hosted disseminated-type epithermal deposits, with certainty level B. Study area has low potential for resources of (1) alunite, with certainty level D, (2) uranium in disseminated deposits, with certainty level C, and (3) geothermal energy sources, with certainty level B. Study area has no potential for coal, oil, and natural gas, with certainty level D]

1,2,5 H/D,D,C
3,4 M/B,B — **Geologic terrane having (1) high potential for commodities 1, 2, and 5, with certainty levels D, D, and C, respectively, and (2) moderate potential for commodities 3 and 4, with certainty level B**

1,5 M/C,C — **Geologic terrane having moderate potential for commodities 1 and 5, with certainty level C**

Commodities—Ag, silver; Au, gold; Pb, lead; Zn, zinc; Cu, copper; Mo, molybdenum; Sb, antimony; Bi, bismuth; Cd, cadmium; Mn, manganese; Hg, mercury; Se, selenium; Te, tellurium; W, tungsten

1 **Vein-type epithermal deposits (principally Ag, Au, Pb, Zn, and Cu, and minor Sb, barite, Bi, Cd, fluorspar, Mo, Hg, Se, Te, W)**

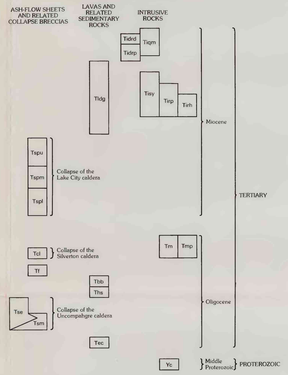
2 **Breccia-pipe-type epithermal deposits (principally Ag, Au, Pb, Zn, and Cu, and minor Sb, barite, Bi, Cd, fluorspar, Mo, Hg, Se, Te, W)**

3 **Volcanic-hosted disseminated-type epithermal deposits (Au, Ag)**

4 **Porphyry-type deposits (Mo and (or) Cu)**

5 **Vein uranium deposits**

CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

[Descriptions of units within the Lake City caldera are greatly simplified from Hon (1987). Descriptions of units from outside the Lake City caldera are simplified from Lipman (1976a). Volcanic and intrusive rocks were named using the IUGS classifications of Le Maitre (1984) and Streckeisen (1975). Rock colors assigned using Goddard and others (1980)]

MIOCENE ROCKS OF THE LAKE CITY CALDERA

Tiqm **Quartz monzonite of Alpine Gulch**—Grayish-pink to grayish-orange-pink, porphyritic quartz monzonite intrusion

Dacite of Red Mountain—Complex of porphyritic dacite intrusions that cut postcollapse lavas in vicinity of Red Mountain

Tidrd **Porphyro-aphanitic dacite dikes**—Light-olive-gray to light-brownish-gray, porphyritic dikes of dacite

Tidrp **Dacite porphyry**—Medium-dark-gray to greenish-gray, porphyritic plugs and dikes of dacite

Resurgent intrusions—Stocks, dike-like bodies, small plugs, and ring-fracture dikes of quartz syenite and related rhyolitic rocks

Tiay **Quartz syenite**—Grayish-pink to light-brownish-gray, seriate-porphyritic, quartz syenite

Tirp **Rhyolite porphyry**—Yellowish-gray to pinkish-gray, seriate rhyolite porphyry

Tirh **High-silica rhyolite**—Pale-red to moderate-pink, high-silica rhyolite porphyry

Tidg **Dacite lavas of Grassy Mountain**—Medium-gray to grayish-red-purple, seriate-porphyritic dacite lavas

Sunshine Peak Tuff—Compositionally zoned intracaldera ash-flow sheet. All members include compositionally interfingering caldera-collapse breccias

Tspu **Upper member**—Brownish-gray, to pale-red or grayish-red, quartz trachytic ash-flow tuff containing 45–50 percent phenocrysts

Tspm **Middle member**—Medium-light-gray or brownish-gray to medium-dark-gray, rhyolitic ash-flow tuff containing 35–45 percent phenocrysts

Tspl **Lower member**—Light-gray to medium-dark-gray, high-silica rhyolitic ash-flow tuff containing 30–40 percent phenocrysts

OLIGOCENE ROCKS OF THE UNCOMPAHGRE CALDERA

Trm **Monzonite**—Fine- to medium-grained equigranular to slightly porphyritic gray intrusive rocks. Texturally transitional into monzonite porphyry

Tmp **Monzonite porphyry**—Gray, moderately to coarsely porphyritic intrusive rocks having phaneritic fine-grained groundmass

Tcl **Crystal Lake Tuff**—Nonwelded gray to densely welded red-brown, rhyolitic ash-flow tuff containing 2–5 percent phenocrysts

Tf **Fish Canyon Tuff**—Nonwelded light-gray to densely welded dark-gray, dacitic ash-flow tuff containing about 50 percent phenocrysts

Silverton Volcanics—Lava flows of intermediate to silicic composition and related volcaniclastic sedimentary rocks that accumulated within the Uncompahgre caldera

Tbb **Burns Member**—Relatively silicic, thick lava flows of biotite dacite containing 15–30 percent phenocrysts

Ths **Henson Member**—Volcaniclastic sedimentary rocks generally consisting of green-gray, tuffaceous sandstone containing abundant grains of plagioclase, augite, and andesitic rock fragments

Sapinero Mesa Tuff—Rhyolitic ash-flow sheet, erupted from the San Juan and Uncompahgre calderas, and related caldera-collapse breccia

Tse **Eureka Member (intracaldera)**—Moderately welded gray to densely welded red-brown, ash-flow tuff containing 5–10 percent phenocrysts

Tsm **Picayune Megabreccia Member**—Chaotic large masses of precaldera rock, mostly intermediate-composition lavas, that underlie the Eureka Member and interfinger with its lower part

OLIGOCENE(?) EARLY INTERMEDIATE-COMPOSITION VOLCANIC ROCKS

Tec **Volcaniclastic facies**—Mostly conglomerates, sandstones, and mudflow breccias containing clasts of dark andesite and mafic dacite

MIDDLE PROTEROZOIC ROCKS

Yc **Granite of Cataract Canyon**—Light-pink two-feldspar granite or monzogranite. Occurs along southern ring fault zone as fault-bounded slices

Geologic contact—Dotted where concealed

Alteration contact—Dotted where adjacent to surficial deposits

Unconformity along wall of Lake City caldera—Dotted where concealed

Fault—Dashed where approximately located; dotted where concealed. Bar and ball on downthrown side

Quartz vein along fault

Hydrothermal breccia (Areas of >50 percent breccia)—Irregular intrusive bodies composed of angular to subrounded fragments of various lithologies

tb Tourmaline breccia—Narrow discontinuous zone of tourmaline-cemented breccias above the quartz monzonite of Alpine Gulch

Hydrothermally altered rocks—Areas of hydrothermally altered rocks largely within the Lake City caldera

Limonite- and hematite-stained rock

Limonite-stained rock

Bleached rock

Alunitized rock

Mine workings

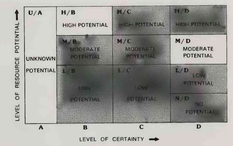
Adit

Caved adit

Shaft

Trench

Drillhole



LEVELS OF RESOURCE POTENTIAL

H High mineral resource potential
M Moderate mineral resource potential
L Low mineral resource potential
U Unknown mineral resource potential
N No known mineral resource potential

LEVELS OF CERTAINTY

A Available data not adequate
B Data indicate geologic environment and suggest level of resource potential
C Data indicate geologic environment, give good indication of level of resource potential, but do not establish activity of resource forming processes
D Data clearly define geologic environment and level of resource potential and indicate activity of resource forming processes in all or part of the area

Diagram showing relationships between levels of mineral resource potential and levels of certainty. Shading shows levels that apply to this study area

MAP SHOWING GENERALIZED MINERAL RESOURCE POTENTIAL, MINES, AND PROSPECTS, AND SIMPLIFIED GEOLOGY, ALTERATION, AND VEINS OF THE REDCLOUD PEAK WILDERNESS STUDY AREA, HINSDALE COUNTY, COLORADO

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