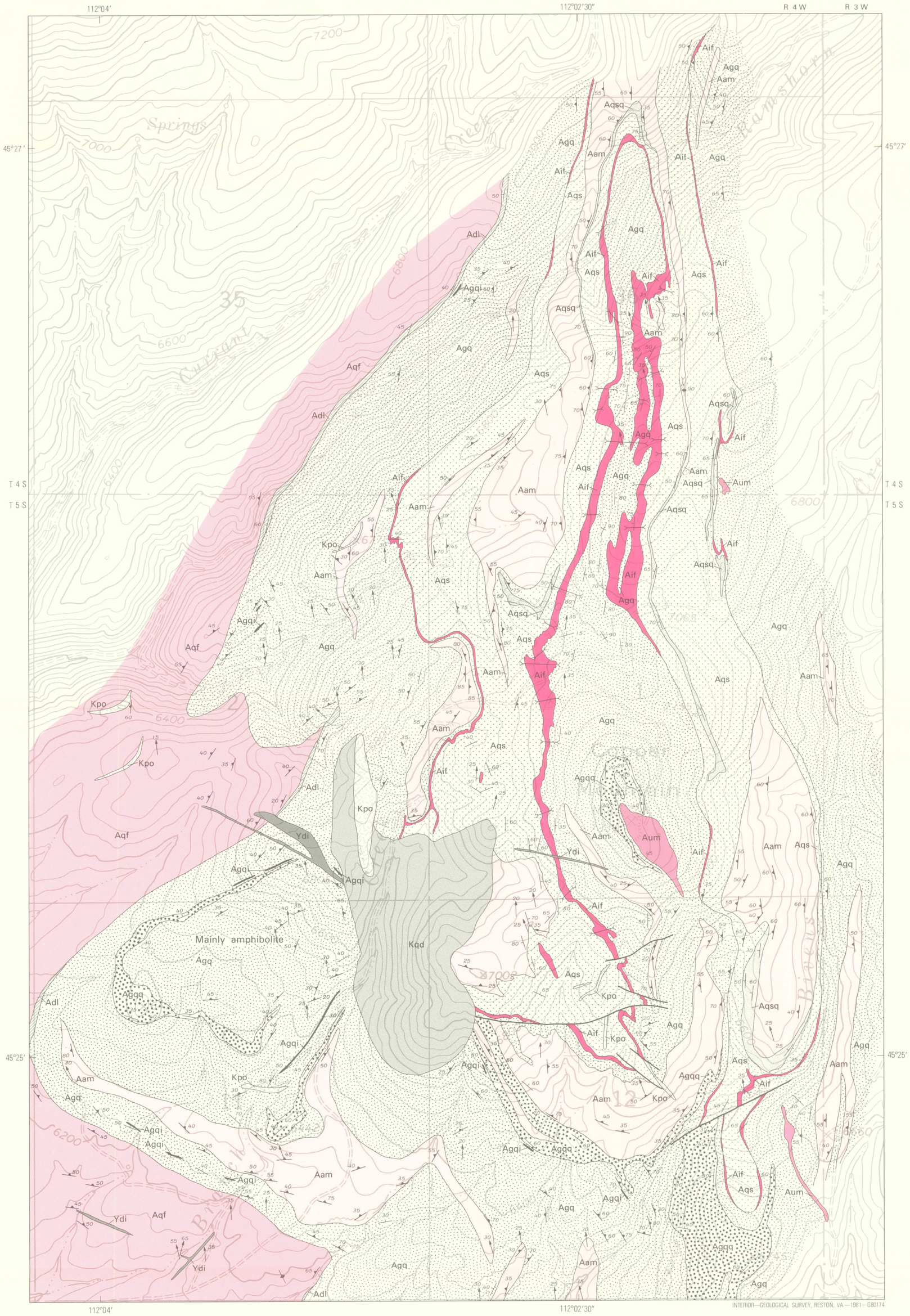
UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

PROFESSIONAL PAPER 1187
PLATE 1



CORRELATION OF MAP UNITS

Kqd, Kpo	75 m.y.	CRETACEOUS
Ydi	1,130–1,450 m.y.	PROTEROZOIC Y
Major deformation and metamorphism (2,750 m.y.)		
Aum, Aam, Aqsq, Aqs, Aif, Aqqq, Aqq, Aqqi, Adl, Aqf (Metasedimentary sequence)		ARCHEAN

DESCRIPTION OF MAP UNITS

Kqd QUARTZ DIORITE—Large stock, possibly composite, centering on common corner of secs. 1, 2, 11, and 12, T. 5 S., R. 4 W., southwest of Copper Mountain. Rock is massive, gray to dark gray, fine to medium grained, locally diabasic or porphyritic, containing phenocrysts of zoned plagioclase, hornblende, augite, and biotite

Kpo PORPHYRY—Massive sheetlike bodies, gray to buff; pronounced porphyritic texture defined by quartz and feldspar phenocrysts as long as 1 cm in fine-grained groundmass. Occurs as sheetlike bodies

Ydi DIABASE—Massive rock, dark gray to nearly black on fresh break, fine grained to diabasic in texture. Mostly in narrow dikes trending N. 60°–80° W., generally poorly exposed but yielding spheroidal boulders

Aum ULTRAMAFIC ROCKS—Massive dark rock, highly variable in grain size and mineralogy. Most common type consists of scattered grains of olivine or clinopyroxene in serpentine matrix, but may contain hypersthene, hornblende, tremolite, carbonate, or phlogopite as dominant constituents. Generally contains spinel (magnetite, chromite, or pleonaste)

Aam AMPHIBOLITE—Massive dark rock, commonly in bold outcrop, medium grained, consisting mainly of interlocking plagioclase and hornblende and lesser quartz. Some varieties garnetiferous. Generally weakly to moderately foliated, locally gneissic, with light segregation seams of quartz and feldspar. Forms sheetlike masses, now structurally concordant with enclosing rocks. Probably originated mainly as diabase sills

METASEDIMENTARY SEQUENCE—Consists of:

Aqs QUARTZITE AND SCHIST—Poorly exposed, consisting mainly of rusty-weathering thin-layered micaceous quartzite and quartz-seamed biotite schist; locally garnetiferous. Includes local bodies, probably originally intrusive, of aplitic gneiss and amphibolite

Aqsq Quartzite—Coarse-grained, white, commonly mottled tan or pink on exposed surfaces, showing distinct bedding. Green chrome mica locally a minor constituent. Occurs as discrete beds within quartzite and schist unit

Aif IRON-FORMATION—Heavy thin-layered rock composed of magnetite, quartz, and pyroxene, containing lesser garnet and amphibole; fine to medium grained. Exposures scarce; unit traceable magnetically and by distinctive reddish-brown soil

Agq GNEISS, QUARTZITE, AND SCHIST—Complex composite unit, defined mainly by position between overlying iron-formation unit and underlying dolomite marble unit. Rock types include garnetiferous gneiss (prominent in lowermost part), layered tonalite gneiss, aplitic gneiss, impure quartzite interbedded with biotite schist, and amphibolite (larger bodies mapped separately). Uppermost part commonly biotite-garnet-sillimanite schist with interlayered impure quartzite

Aqqq Quartzite—Coarse-grained, generally white, massive; indistinctly bedded. Locally contains minor amount of green chrome mica. Occurs as discrete beds within gneiss, quartzite, and schist unit

Aqqi Iron-formation—Thin discontinuous beds of layered quartz-magnetite-silicate rock within gneiss, quartzite, and schist unit, particularly near base. Heavy, magnetic; similar to main unit of iron-formation

Adl DOLOMITE MARBLE—Discontinuous unit within map area, but regionally a persistent marker bed. Medium-grained, crystalline, gray on fresh break, tan or chocolate on weathered exposure. Bedding commonly marked by layers rich in diopside and tremolite. Phlogopite, serpentine, and talc locally abundant

Aqf QUARTZOFELDSPATHIC GNEISS—Massive light-colored medium-grained foliate in which quartz and feldspar are the dominant constituents. Commonly layered on a scale of centimeters; darker layers contain biotite, more rarely hornblende. Occasional layers and boudins of quartzite and amphibolite

Contact

Fault

Strike and dip of beds

60 Inclined—Overturned beds not separately distinguished

Vertical

Strike and dip of foliation

60 Inclined

Vertical

20 Bearing and plunge of linear structure—Includes minor fold axes and mineral elongations

Exploration trench

Base from U.S. Geological Survey, 1:24 000
Copper Mountain, 1963

SCALE 1:12 000
½ 0 ½ MILE
.5 0 .5 KILOMETER

CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

Geology mapped by H. L. James, 1961–76

INTERIOR—GEOLOGICAL SURVEY, RESTON, VA—1981—G80174

GEOLOGIC MAP OF THE COPPER MOUNTAIN AREA, MADISON COUNTY, MONTANA