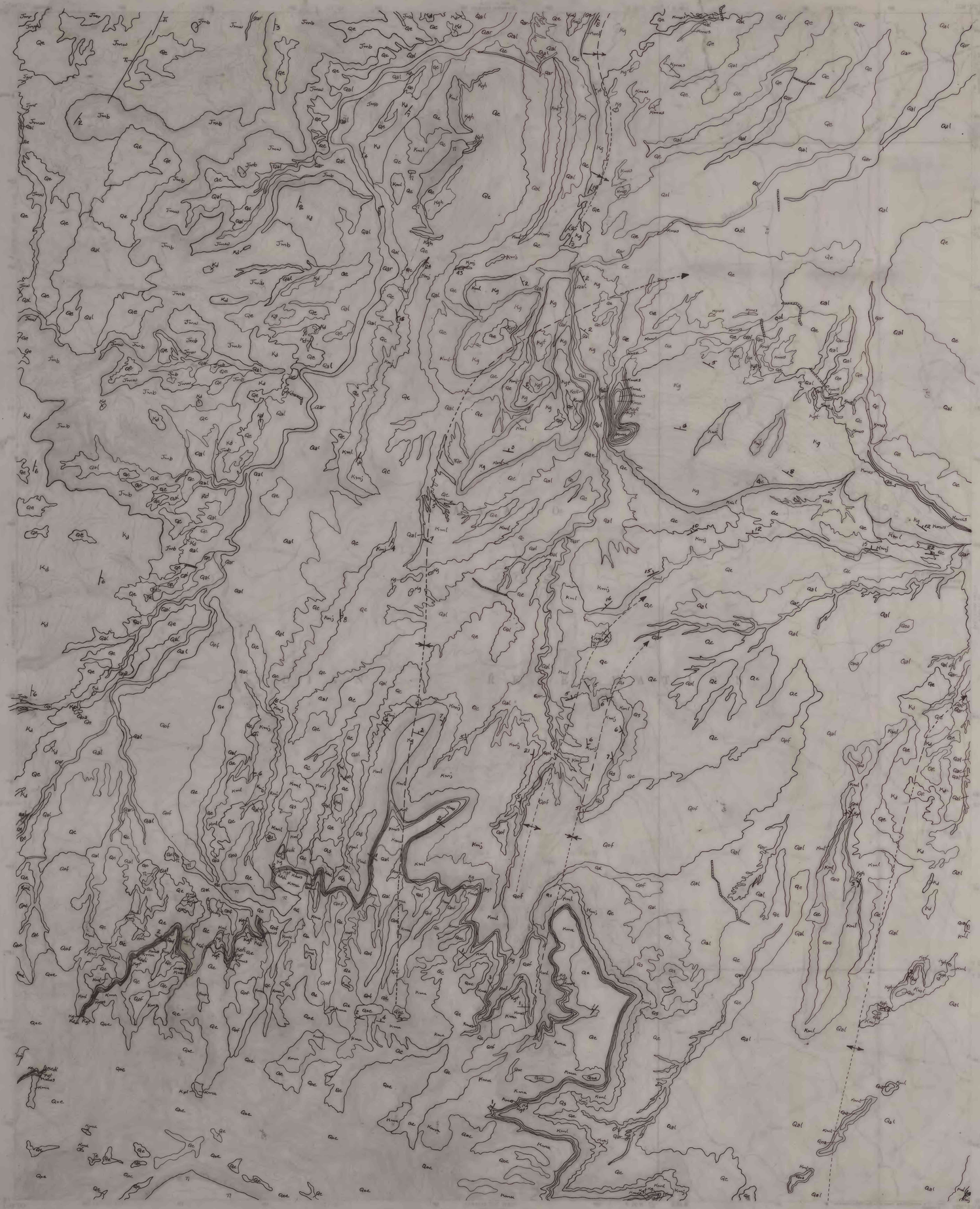
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

OPEN-FILE REPORT
79-723
MITTEN ROCK QUAD., N. M.



Base from U.S. Geological Survey, 1966

Geology mapped in 1976-1977

PRELIMINARY GEOLOGIC MAP OF THE MITTEN ROCK QUADRANGLE, SAN JUAN COUNTY, NEW MEXICO

By
A. Curtis Huffman, Jr.
1979

CORRELATION OF MAP UNITS

Qar, Qal, Qc, Qs, Qe, Qoc, Qof, Qoa	Holocene; Pleistocene(?)	QUATERNARY
UNCONFORMITY		
Ti	Oligocene(?)	TERTIARY
UNCONFORMITY		
Tc	Lower Oligocene to Eocene(?)	TERTIARY
UNCONFORMITY		
Kpl, Kmu, Kmus, Kmu, Kgt/Kcdi, Kg, Kml, Kmj, Kml, Kml (Kgh), Kd	Upper Cretaceous	CRETACEOUS
UNCONFORMITY		
Jmb, Jmw, Jmr	Upper Jurassic	JURASSIC

DESCIPTION OF MAP UNITS

Qar ARROYO ALLUVIUM (HOLOCENE)--Pale-orange to light-gray sandy to gravelly alluvium in very recent arroyos, along main channels in washes, and as outwash aprons on older surfaces

Qal ALLUVIUM (HOLOCENE AND PLEISTOCENE?)--Grayish-orange to yellowish-gray sandy to gravelly alluvium primarily in washes, headward from arroyos, and as reworked eolian sediments along drainages

Qc COLLUVIUM (HOLOCENE AND PLEISTOCENE?)--Dark-gray to reddish-brown silty to bouldery gravity and sheet-wash deposits. Commonly grades downslope into alluvium. Includes talus; mapped only where deposits substantially cover bedrock

Qs LANDSLIDE AND SLUMP DEPOSITS (HOLOCENE AND PLEISTOCENE?)

Qe EOLIAN SAND DEPOSITS (HOLOCENE AND PLEISTOCENE?)--Very pale orange to light-brown silt to medium-grained sand. Mapped only where areally significant or where more than 0.6 m thick

Qoc OLD COLLUVIUM (PLEISTOCENE?)--Unlithified to semi-indurated gravel to boulder deposits in gray clayey silt matrix. Rock fragments dominantly minette and trachy basalt with minor amounts of older sedimentary rocks. Occurs as isolated patches of slope wash on the slopes and at the base of Beautiful Mountain and the Chuska Mountains

Qof FAN DEPOSITS (PLEISTOCENE?)--Unlithified to semi-indurated gravel to boulder deposits in gray sand and silt matrix. Rock fragments dominantly minette and trachy basalt with various amounts of older sedimentary rocks. Forms dissected elongate lobes extending north and east from the base of Beautiful Mountain. Blagbrough (1967) termed this material solifluction debris and suggested a Wisconsin age

Qoa OLD ALLUVIUM (PLEISTOCENE?)--Unlithified to semi-indurated gravel deposits in medium-gray to grayish-orange silty clay matrix. Gravel composed dominately of diorite porphyry and minette with minor to subequal amounts of older sedimentary rocks. Lies topographically above younger sediment and valley floor surfaces

Ti INTRUSIVE ROCKS (OLIGOCENE?)--Dark-gray to black dikes and plugs composed of minette and trachybasalt tuff breccia with sparse to abundant small fragments to large blocks of igneous, metamorphic, and sedimentary rocks. Nearby minette dikes and plugs have been dated at 27.0 to 35.5 m.y. (Armstrong, 1969; Naeser, 1971)

Tc CHUSKA SANDSTONE (LOWER OLIGOCENE TO EOCENE?)--White friable fine- to medium-grained sandstone with thin beds and pods of calcite-cemented sandstone. Crops out on the flanks of Beautiful Mountain in the southwest corner of map. Incomplete section; thickness greater than 10 m

Kpl POINT LOOKOUT SANDSTONE (UPPER CRETACEOUS)--Yellowish-gray, thin- to medium-bedded, bioturbated, low angle trough crossbedded, calcareous sandstone. Lower contact transitional over 15 m interval of interbedded shale and sandstone overlain by 4 m thick sandstone the lower half of which is highly contorted. Incomplete section; thickness greater than 5 m. Crops out on the flank of Beautiful Mountain in the southwest corner of map.

MANCOS SHALE (UPPER CRETACEOUS)

Kmu Upper part--Grayish-black to yellowish-brown shale and very thin bedded to laminated siltstone. Thickness approximately 260 m

Kmus Sandstone--Yellowish-gray to pale-yellowish-brown, thin bedded, bioturbated medium- to coarse-grained calcareous sandstone. Contains scattered quartz granules and pebbles and thin beds of quartz granule conglomerate and shell hash containing sharks teeth. Upper and lower contacts sharp. Commonly occurs as two 1 m thick ledges separated by 1-2 m of upper part of unit (Kmu)

Kml Lower part--Grayish-black to yellowish-brown shale with very thin to thin beds of siltstone and very fine grained sandstone. Upper contact gradational with base of Gallup Sandstone. Lower contact sharp. Thickness including Juana Lopez Member (Kmj) and Greenhorn Limestone (Kgh) approximately 230 m

Kmj Juana Lopez Member--Pale yellowish-brown thin to very thin bedded fossiliferous calcareous siltstone and limestone ledges (15 cm-1 m thick) separated by dark-gray to yellowish-brown calcareous shale. Thickness 7-10 m

Kcdi DILCO COAL MEMBER OF THE CREVASSE CANYON FORMATION (UPPER CRETACEOUS)--Dark-gray to black carbonaceous shale and coal with interbedded thin (1-3 cm) siltstone and very fine grained sandstone. Thickness 1-2 m

GALLUP SANDSTONE (UPPER CRETACEOUS)

Kgt Torrivio Sandstone Member (Molenaar, 1973)--Yellowish gray, fine- to coarse-grained, trough cross-bedded sandstone. Commonly conglomeratic and iron stained at base. Lower contact scour surface with as much as 2 m relief. Thickness 2-3 m

Kg Main body--Very light gray thin-bedded fine- to medium-grained calcareous sandstone. Upper part cross bedded and burrowed. Thickness 10-20 m

Kgh GREENHORN(?) LIMESTONE (UPPER CRETACEOUS)--Light- to medium-gray fossiliferous calcilutite. Occurs as two 30 cm thick ledges separated by 1.5-2 m of medium-gray calcareous shale. Thickness 2-2.5 m

Kd DAKOTA SANDSTONE (UPPER CRETACEOUS)--Light-gray to yellowish-gray crossbedded medium- to coarse-grained 10-15 m thick sandstone ledges interbedded with 10-15 m thick carbonaceous shale, coal, and siltstone intervals. Base is a sharp scour surface with little visible relief. Thickness 50-70 m

MORRISON FORMATION (UPPER JURASSIC)

Jmb Brushy Basin Member--Dominantly grayish green to pale-green shaly mudstone and siltstone with interbedded grayish-green chert, limestone, and quartzite. Includes 7.6-9 m thick lenses of yellowish-gray crossbedded medium-grained calcareous arkosic sandstone. Upper 5-10 m contains thin light-gray quartzite beds and chert pebble conglomerate composed of subrounded to well-rounded red, green, black, and tan chert pebbles and may be in part equivalent to Burro Canyon Formation (Lower Cretaceous) of southwestern Colorado. Thickness 60-70 m

Jmw Westwater Canyon Member--Yellowish-gray to pale-red crossbedded fine- to medium-grained calcareous arkosic sandstone interbedded with medium-gray to greenish-gray silty mudstone. Sandstone units trough crossbedded, commonly with shale chip and chert granule conglomerate at base of troughs. Upper and lower contacts gradational. Thickness 61-76 m

Jmr Recapture Member--Pinkish-gray to pale-red crossbedded fine- to medium-grained calcareous subarkose interbedded with medium- to greenish-gray and reddish-brown claystone. Thickness 60-156 m

CONTACT

12 STRIKE AND DIP OF BEDS

ANTICLINE--Showing crestline and direction of plunge; long dashed where approximately located; short dashed where covered

SYNCLINE--Showing troughline and direction of plunge; long dashed where approximately located; short dashed where covered

MONOCLINE--Showing hingeline; long arrows on steep limb

EARTH DAM

References cited

Armstrong, R.L., 1969, K-Ar dating of laccolithic centers of the Colorado Plateau and vicinity: Geological Society of America Bulletin, v. 80, p. 2081-2086.

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