DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

OPEN-FILE REPORT
78-404
REDROCK VALLEY SE QUAD.

Base from U.S. Geological Survey, 1953

Geology mapped in 1976

SCALE 1:24000

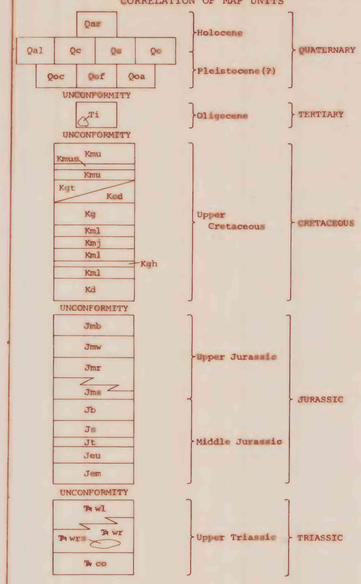
1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

APPROXIMATE MEAN DECLINATION, 1953

CONTOUR INTERVAL 40 FEET
DATUM IS MEAN SEA LEVEL

CORRELATION OF MAP UNITS



DESCRIPTION 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 trachybasalt 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 OLD FAN DEPOSITS (PLEISTOCENE?)--Unlithified to semi-indurated gravel to boulder deposits in gray sand and silt matrix. Rock fragments dominantly minette and trachybasalt with various amounts of older sedimentary rocks. Forms dissected elongate lobes extending into Redrock Valley from the base of the Chuska Mountains. Blagbrough (1967) termed this material soliflucion 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 dominantly of diorite porphyry and minette with minor to subequal amounts of older sedimentary rocks. Lies topographically above younger sediment and valley floor surfaces

Ti INTRUSIVES (OLIGOCENE)--Dark-gray to black plug 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±1.1 m.y. to 35.5±3.1 m.y. (Armstrong, 1969; Naeser, 1971)

Kmu MANCOS SHALE (UPPER CRETACEOUS)
Upper part--Grayish-black to yellowish-brown shale and very thin bedded to laminated siltstone. Incomplete section; thickness greater than 30 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. Sharp upper and lower contacts. Commonly occurs as two 1 m thick ledges separated by 1-2 m of the upper part (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 to 1 m thick) separated by dark-gray to yellowish-brown, calcareous shale. Thickness 7-10 m

Ked 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 of Molenaar (1973, p. 98)--Yellowish-gray, fine- to coarse-grained, trough crossbedded sandstone. Commonly conglomeratic and iron stained at base. Lower contact scour surface with as much as 2 m relief. Thickness 2-3 m

Kg Sandstone--Very light gray, thin bedded, fine to medium grained, calcareous. Upper part cross-bedded and burrowed. Thickness 23-30 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. A pollen and spore assemblage collected from the base of the Dakota near the head of Little Shiprock Wash yielded an early Cenomanian age (R. H. Tschudy, written commun., 1977). 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). 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, cross-bedded claystone and pinkish-gray, crossbedded sandstone in the upper third; reddish-brown to greenish-gray claystone in middle third; and crossbedded sandstone in lower third. Contact with Salt Wash Member gradational and interbedded in southern portion of quadrangle. Thickness 60-156 m

Jms Salt Wash Member--Yellowish-gray to greenish-gray, crossbedded, very fine to medium-grained, calcareous sandstone interbedded with greenish-gray and reddish-brown claystone. Lower contact sharp and placed at base of lower channel sand or underlying thin, gray clay bed. Thickness 23-60 m, thinning to south

Jb BLUFF SANDSTONE (MIDDLE JURASSIC)--Moderate reddish-orange to light-brown, fine- to medium-grained, laminated sandstone. Wavy and parallel laminated throughout except near the top which consists of light-brown, wedge-crossbedded, 0.3-0.6 m thick sandstone containing abundant white chert grains. Weathers to massive, rounded (slickrock) form. Formation thickens southward and is colored grayish orange at southern boundary of quadrangle. Thickness 9-20 m

Js SUMMERVILLE FORMATION (MIDDLE JURASSIC)--Upper 30 m composed of interbedded, moderate reddish-brown siltstone and fine-grained, horizontally wavy laminated sandstone and light-brown, fine- to medium-grained, horizontally laminated and cross-laminated sandstone. Distinctive ledge-forming, light-brown to grayish orange-pink, fine- to medium-grained crossbedded, burrowed, 2 m thick sandstone, 9-10.5 m below top. Lower 10.5-12 m composed of moderate reddish-orange, very fine grained, horizontally wavy laminated sandstone banded by irregular 15-30 cm white bands in 3 m units. Weathers to massive, rounded form. Lower contact sharp. Thickness 39-42 m

Jt TODILTO LIMESTONE (MIDDLE JURASSIC)--Light olive-gray to light-gray, very thin bedded, silty limestone 2-3 m thick underlain by as much as 1.0 m of pale-red to grayish-red siltstone to very fine grained, parallel and cross-laminated sandstone. Lower contact is a scour surface with as much as 1 m relief. Thickness 2-4 m

ENTRADA SANDSTONE (MIDDLE JURASSIC)

Jeu Upper sandstone member--Moderate reddish-orange, very fine to fine-grained, calcareous sandstone. Dominantly horizontally wavy laminated with some zones of medium-scale trough cross-lamination. Basal 15-30 cm bleached white. Thickness 15-23 cm

Jem Medial silty member--Moderate reddish-brown clayey siltstone to very fine grained, structureless sandstone. Weathers to shaly or earthy slope or rounded biscuit-type cliff. Thickness 7.5-10.5 m

WINGATE SANDSTONE (UPPER TRIASSIC)

Trwl Lukachukai Member--Moderate reddish-orange to light-brown fine- to medium-grained, calcareous sandstone. Bedding is dominantly thick cosets of large-scale, high-angle, tangential, tabular crossbeds but there are also considerable thickness of horizontally wavy laminated sandstone. Upper contact mapped at top of 0.3-1 m thick bleached, fine-grained, calcareous sandstone containing subrounded to subangular pebble-size white blebs of calcite-cemented sandstone. Unit interbedded and apparently interfingered with Rock Point Member (Trwr) over a thickness of 60-90 m. Thickness above the interbedded zone 60-120 m

Trwr Rock Point Member--Moderate reddish-brown, calcareous siltstone and very fine grained sandstone. Dominantly structureless with some beds finely cross laminated and rippled. Lower contact sharp and placed at top of uppermost limestone ledge. Thickness beneath interbedded zone 30-60 m

Trwrs Sandstone--Pale-red and medium-gray, very fine to medium-grained, trough crossbedded, calcareous, micaceous sandstone and medium dark-gray limestone-cobble conglomerate ledges separated by beds of pale-red to light-gray siltstone and very fine grained sandstone. Whole complex lens-shaped in cross section, narrow and sinuous in plan. Occurs 6-12 m above base of Rock Point Member (Trwr) and commonly has petrified wood associated with it or just above. Probably correlative with Hite Bed of the Church Rock Member of the Chinle Formation described in southeast Utah (Stewart and others, 1959) and Monument Valley (O'Sullivan, 1970). Upper contact, gradational. Lower contact is a scour surface. Thickness 0-12 m

Trc CHINLE FORMATION (UPPER TRIASSIC)--Pale-red and greenish-gray, nodular, cherty limestone interbedded with pale reddish-brown, calcareous, silty claystone. Limestone beds 0.6-2 m thick form ledges in upper 30-45 m of unit. Beds of grayish-red and greenish-gray, very fine grained calcareous, micaceous sandstone and limestone-pebble conglomerate form ledges in middle portion of unit. Lower portion of unit composed of moderate-red, calcareous, silty claystone. Incomplete thickness 91 m

CONTACT

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

D5688 USGS PALEOBOTANY SAMPLE LOCALITY

EARTH DAM

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PRELIMINARY GEOLOGIC MAP OF THE REDROCK VALLEY SE QUADRANGLE, APACHE COUNTY, ARIZONA AND SAN JUAN COUNTY, NEW MEXICO

By

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