DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

Base from U.S. Geological Survey, 1966

SCALE 1:24 000

1 0 1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 0 1 KILOMETRE

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

GN MN
1°16' 21 MILS
14° 249 MILS
UTM GRID AND 1966 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

Geology mapped in 1975

U.S. Geological Survey
OPEN FILE REPORT
This map is preliminary and has not been edited or reviewed for conformity with Geological Survey standards or nomenclature.

NEW MEXICO
QUADRANGLE LOCATION

PRELIMINARY GEOLOGIC MAP OF THE SAND SPRING QUADRANGLE, SAN JUAN COUNTY, NEW MEXICO

By

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76-408
SAND SPRING QUAD., NEW MEXICO

CORRELATION OF MAP UNITS

Qar, Qal, Qc, Qs, Qe	Holocene	QUATERNARY
Qoa	Pleistocene(?)	QUATERNARY
UNCONFORMITY		
Tl	Oligocene(?)	TERTIARY
UNCONFORMITY		
Kmu, Kmus, Kmu, Kg, Kml, Kmj, Kml, Kgh, Kml, Kd	Upper Cretaceous	CRETACEOUS
UNCONFORMITY		
Jmb, Jmw, Jmr, Jms	Upper Jurassic	JURASSIC

DESCRIPTION OF MAP UNITS

[Surficial deposits, where mapped, are generally 3 feet (1 m) or more thick]

Qar ARROYO ALLUVIUM (HOLOCENE)--Pale-orange to light-gray sandy to gravelly alluvium found in very recent arroyos and outwash aprons on older surfaces

Qal ALLUVIUM (HOLOCENE AND PLEISTOCENE(?))--Grayish-orange to yellowish-gray sandy to gravelly alluvium found primarily in washes and headward from arroyos

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

Qs LANDSLIDE AND SLUMP DEPOSITS (HOLOCENE AND PLEISTOCENE(?))

Qe EOLIAN SAND (HOLOCENE AND PLEISTOCENE(?))--Very pale orange to light-brown medium-grained sand to silt. Mapped only where of significant extent or more than 2 feet (0.6 m) thick

Qoa OLD ALLUVIUM (PLEISTOCENE(?))--Unlithified to semi-indurated gravel deposits in medium-gray to grayish-orange silty clay matrix. Located topographically above surrounding younger sediments as remnants of dissected pediment and valley floor surfaces

Tl INTRUSIVES (OLIGOCENE(?))--Dark-gray to black dikes and plugs composed predominantly of minette with a wide variety of zenoliths

MANCOS SHALE (UPPER CRETACEOUS)

Kmu Upper part--Grayish-black to yellowish-brown shale and very thin bedded to laminated siltstone. Incomplete section; thickness greater than 975 feet (297.2 m)

Kmus Sandstone--Yellowish-gray to pale yellowish-brown, thin bedded densely burrowed medium- to coarse-grained calcareous sandstone. Contains scattered quartz granules and pebbles and thin beds of quartz granule conglomerate. Thickness 2-15 feet (0.6-4.6 m)

Kml Lower part--Grayish-black to yellowish-brown shale with very thin to thin beds of siltstone and very fine to fine-grained sandstone. Limestone concretionary zone 15 feet (4.6 m) below gradational contact with Gallup Sandstone. Thickness including Km and Kg 850-1,000 feet (260-305 m)

Kmj Juana Lopez Member--Pale yellowish-brown very thin bedded fossiliferous calcareous siltstone and limestone ledges (6 inches to 2 feet (15 cm to 0.6 m) thick) separated by dark-gray to yellowish-brown calcareous shale. Thickness 20-30 feet (6-9 m)

Kg GALLUP SANDSTONE OF MESAVERDE GROUP (UPPER CRETACEOUS)--Very light-gray to yellowish-gray thin-bedded fine- to medium-grained calcareous sandstone. Upper part crossbedded and burrowed. Thickness 15-75 feet (4.6-22.8 m)

Kgh GREENHORN(?) LIMESTONE (UPPER CRETACEOUS)--Light- to medium-gray fossiliferous calcilutite. Occurs as two 6-inch (15 cm) to 1-foot (30 cm) thick ledges separated by 3-5 feet (0.9-1.5 m) of medium-gray calcareous shale. Thickness 4-7 feet (1.2-2.1 m)

Kd DAKOTA SANDSTONE (UPPER CRETACEOUS)--Very light-gray to yellowish-gray crossbedded fine- to medium-grained sandstone (upper 20-30 feet (6-9 m)) underlain by 6-15 feet (1.8-3.5 m) of black carbonaceous shale and coal underlain by as much as 50 feet (15 m) of light-gray to yellowish-gray crossbedded medium- to coarse-grained sandstone with one or more 4-foot (1.2 m) thick coarse pebble conglomerate beds at base

MORRISON FORMATION (UPPER JURASSIC)

Jmb Brushy Basin Member--Grayish-green to pale-green shale, siltstone, and limestone. Includes 25- to 30-foot (7.6-9 m) thick lenses of yellowish-gray crossbedded medium-grained arkosic sandstone. Probably includes Burro Canyon (Lower Cretaceous) and equivalents in the upper 50-100 feet (15-30 m). Thickness 200-250 feet (61-76 m)

Jmw Westwater Canyon Member--Yellowish-gray to pale-red crossbedded medium-grained arkosic sandstone. Thickness 200-250 feet (61-76 m)

Jmr Recapture Member--Pinkish-gray to pale-red crossbedded medium-grained calcareous arkosic sandstone with interbedded reddish-brown and medium-gray claystone. Thickness about 200 feet (61 m)

Jms Salt Wash Member--Yellowish-gray to greenish-gray crossbedded very fine to medium-grained calcareous sandstone with interbedded medium-gray and reddish-brown claystone. Incomplete section; thickness greater than 200 feet (61 m)

CONTACT

10 STRIKE AND DIP OF BEDS

80 STRIKE AND DIP OF JOINTS

STRIKE OF VERTICAL JOINT

ANTICLINE--Showing crestline and direction of plunge. Long dashes where approximately located; short dashes where covered

SYNCLINE--Showing troughline and direction of plunge. Long dashes where approximately located; short dashes where covered