



Base from U.S. Geological Survey 1952, from photographs taken 1947 and first checked in 1952.
1927 North American datum, UTM projection - zone 13A
1927 North American datum, UTM projection - zone 13A
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Geologic Map of the Tome SE 7.5 - minute Quadrangle

by
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1:24,000

0 0.25 0.5 1 1.5 2 Miles
0 0.25 0.5 1 1.5 2 Kilometers

CONTOUR INTERVAL: 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

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COMMENTS TO MAP USERS

A geologic map displays information on the distribution, thickness, orientation, and age relationships of rock and deposits and the occurrence of structural features. Geologic and fault contacts are irregular surfaces that form boundaries between different types or ages of units. Data depicted on this geologic quadrangle map may be based on any of the following: reconnaissance field mapping, compilation of published and unpublished work, and photogeologic interpretation. Locations of contacts are not surveyed, but are plotted by interpretation of the position of a given contact onto a topographic base map; therefore, the accuracy of contact locations depends on the scale of mapping and the interpretation of the geologist(s). Any enlargement of this map could cause misunderstanding in the detail of mapping and may result in erroneous interpretations. Site-specific conditions should be verified by detailed surface mapping or subsurface exploration. Topographic and cultural changes associated with recent development may not be shown.

Cross sections are constructed based upon the interpretations of the author made from geologic mapping, and available geophysical, and subsurface (driftless) data. Cross-sections should be used as an aid to understanding the general geologic framework of the map area, and not be the sole source of information for use in locating or designing wells, buildings, roads, or other man-made structures.

The map has not been reviewed according to New Mexico Bureau of Geology and Mineral Resources standards. The contents of the report and map should not be considered final and complete until reviewed and published by the New Mexico Bureau of Geology and Mineral Resources. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the State of New Mexico, or the U.S. Government.

EXPLANATION OF MAP UNITS

Anthropogenic Deposits

af Artificial fill for stock tanks.

Quaternary Surficial Deposits

Mapping of surficial deposits was based largely on air photo interpretation and geomorphic position, and locally field checked.

QHa - Arroyo alluvium, undivided (Holocene to Historic) - Gravel and poorly to moderately sorted fine- to coarse-grained sand in active drainages. Bar and swale topography is well developed. Soils are very weakly developed. Thickness: <1 m to 4 m.

Qe - Eolian sand sheets with subdued or no dune forms (Holocene) - Dominantly sand sheets. Deposit consists of light brown to light reddish brown, fine to very fine-grained, rounded to subrounded sand composed largely of quartz. Locally pebbly due to bioturbation (?). Forms a broad undulating surface with little or no development of drainage incision or dune microtopography around shrubs. Unit typically has one or more episodes of soil development beneath the surface. Thickness: 2 m (?).

Qed - Eolian deposits with recent dune form development (Holocene) - Deposits are pink, light brown to very pale brown to brownish yellow, unconsolidated, very fine- to medium-grained, moderately well-rounded to well-rounded sand composed largely of quartz. Contains scattered pebbles. Dunes are less than one meter to several meters in height. Thickness: < 1 m to 5 m (?).

Qmf - Eolian and playa deposits on floors of small blowouts (Holocene) - Deposits are sand, silty clay, and clay. Thickness: 2 m.

Qedo - Eolian deposits with stabilized and subdued dune forms (early (?) Holocene) - Deposits are composed of pink, light brown to very pale brown to brownish yellow, unconsolidated, very fine- to medium-grained, moderately well-rounded to well-rounded dominantly quartz sand. Contains scattered pebbles. Dunes are less than one meter to several meters in height. Thickness: < 1 m to 5 m (?).

Quaternary and Tertiary Piedmont Deposits

Sequence of piedmont-slope alluvial deposits marking local base level for mountain front drainages. Deposits differentiated by topographic position and degree of constructional surface preservation. Deposits are dominated by sandy gravel with variable sorting and imbrication.

Qpy - Piedmont alluvium (upper Pleistocene to Holocene) - Poorly to moderately sorted, poorly to moderately lithified pebble and cobble gravel and pebbly sand. Consist of pebbles to cobbles of limestone and Precambrian metamorphic and igneous rocks such as granite, quartzite, metarhyolite, and amphibolite. Constructional surface is present and has bar and swale topography. Unit is locally mantled by eolian sand sheets. Thickness: 4 - 5 m (?).

Qpm (locally includes Qpo?) - Piedmont alluvium (middle Pleistocene) - Poorly to moderately sorted, moderately lithified pebble and cobble gravel and pebbly sand. Consist of pebbles to boulders of limestone and Precambrian metamorphic and igneous rocks such as granite, quartzite, and metarhyolite. Boulders on surface locally exceed 2 m in diameter. Soil development is variable and multiple buried soils with stage II to III calcium-carbonate morphology are present. Parts may be equivalent to unit Qpo of the Tome NE (Rawling and McCraw, 2004) and Manzano Peak quadrangles (Baer et al., 2003), and as old as lower Pleistocene. Thickness: 4 - 5 m (?).

MAP AND CROSS SECTION SYMBOLS

A - A' Location of geologic cross section

--- Geologic contact, solid where exposed, dashed where approximately located, queried where inferred

--- Trace of aeromagnetic lineament inferred to represent trace of buried fault; data from Sweeney et al. (2002)

20°/10° Dip and dip direction of bedding

20°/140° Dip and dip direction of S1 foliation in Proterozoic rocks; double-sided symbol indicates vertical dip

20°/140° Dip and dip direction of S2 foliation in Proterozoic rocks

140°/20° Azimuth and plunge of mineral elongation lineation in Proterozoic rocks

20°/140° Dip and dip direction of joints

W-7211 Water well with NM State Engineer office identification number

I Water well projected into cross section

REFERENCES CITED AND SELECTED REFERENCES

Pertinent to the Study Area

Baer, S., Karlstrom, K. E., Bauer, P., and Connell, S., 2003. Geology of the Manzano Peak 7.5 minute quadrangle, Valencia and Torrance Counties, New Mexico: New Mexico Bureau of Geology and Mineral Resources Open-File Geologic Map OF-GM-61, scale 1:24000.

Bauer, P. W., Karlstrom, K. E., Bowring, S. A., Smith, A., and Goodwin, L. B., 1993. Proterozoic plutonism and regional deformation-new constraints from the southern Manzano Mountains, central New Mexico: New Mexico Geology, v. 15, p. 49-55.

Cather, S. M., Chamberlain, R. M., Chapin, C. E., and McIntosh, W. C., 1994. Stratigraphic consequences of episodic extension in the Lemiar Mountains, central Rio Grande rift, in Keller, G. R., and Cather, S. M., eds., Basins of the Rio Grande Rift: Structure, Stratigraphy, and Tectonic Setting: Geological Society of America Special Paper 291, Boulder, CO, p. 157-170.

Hudson, M. R., and Grauch, V. J. S., 2003. Paleomagnetic evidence for a lower Tertiary not Triassic age for rocks in the lower part of the Grober-Fuqua #1 well, southeastern Albuquerque Basin, New Mexico: New Mexico Geology, v. 25, p. 31-36.

Kelley, V. C., 1977. Geology of Albuquerque Basin: New Mexico Bureau of Mines and Mineral Resources Memoir 33, 59 p.

Kelley, V. C., 1982. Diverse geology of the Hubbell Bench, Albuquerque Basin, New Mexico, in Grambling, J. A., and Wells, S. G., eds., Albuquerque Country II: New Mexico Geological Society Guidebook 33, p. 159-160.

Lozinsky, R. P., 1994. Cenozoic stratigraphy, sandstone petrology, and depositional history of the Albuquerque basin, central New Mexico, in Keller, G. R., and Cather, S. M., eds., Basins of the Rio Grande Rift: Structure, Stratigraphy, and Tectonic Setting: Geological Society of America Special Paper 291, Boulder, CO, p. 73-82.

Myers, D. A., 1977. Geologic map of the Scholle quadrangle, Socorro, Valencia, and Torrance Counties, New Mexico: U.S. Geological Survey Geologic Quadrangle Map GQ-1412, scale 1:24000.

Rawling, G. C., and McCraw, D. J., 2004. Preliminary geologic map of the Tome NE quadrangle, Valencia County, New Mexico: New Mexico Bureau of Geology and Mineral Resources Open-File Geologic Map OF-GM-91, scale 1:24000.

Sweeney, R. E., Grauch, V. J. S., and Phillips, J. D., 2002. Merged Digital Aeromagnetic Data for the Middle Rio Grande and Southern Española Basins, New Mexico: U.S. Geological Survey Open-File Report 02-205, 17 p.

Qtpu - Piedmont alluvium, undivided (upper Pliocene (?) to Pleistocene) - Pebble to cobble gravel, sand, and clay encountered in water wells. Total thickness unknown, at least 205 m thick in well RG-71148. May interfinger with or be in part equivalent to Qtsu. Cross section only.

Quaternary and Tertiary Sedimentary Rocks

Qtsu - Santa Fe Group deposits, undivided (Miocene (?) to Pleistocene) - piedmont and axial river (?) deposits, undivided. Interval described as "very hard tan sand and clay" in well RG-71124 is interpreted to be Santa Fe group sediment and is 73 m thick. Total thickness is unknown, but probably at least several hundred meters. Cross section only.

Qtpbu - lower Tertiary sedimentary rocks, undivided (Eocene (?) to Miocene (?) - Interval in well RG-71124 described as "sand lavender in color, some limestone, limestone stringers red in color, sand, some clay" is interpreted as Popatosa and/or Baca Formation, based on color and presence of limestone. Interval is 55 m thick, total thickness unknown but combined thickness of the two units is up to 3000 m in the Albuquerque and Socorro basins (Cather et al., 1994; Hudson and Grauch, 2003; B. Brister, personal communication, 2004). Cross section only.

Paleozoic Sedimentary Rocks

PPI - San Andres Limestone (middle to upper Permian) and/or Madera group limestone (middle and upper Pennsylvanian) - Limestone encountered in wells RG-71211 and RG-61338. Well RG-71211 appears to penetrate a dissolution breccia of fractured limestone and soft yellow rock. Thickness is unknown, but San Andres Limestone unit is 95 meters thick in the Ringle Tome #1 well within the Tome NE quadrangle to the north (Rawling and McCraw, 2004) and Madera Group limestones are ~385 m thick in the Scholle quadrangle to the southeast (Myers, 1977). Cross section only.

Proterozoic Igneous and Metamorphic Rocks

Xml - Monte Largo Pluton - (Paleoproterozoic) - Pinkish gray to brown to dark bluish-gray, moderately to strongly foliated granodiorite to quartz monzonite. Age is 1656 ± 10 Ma (Bauer et al., 1993).

Xbq - Blue Springs Quartzite - (Paleoproterozoic) - Thin bedded medium grained quartzites interbedded with chlorite-muscovite schist and quartz-muscovite schist. Occurs as lenticular pods within Blue Springs Schist and along contact between Blue Springs schist and the Monte Largo pluton.

Xbs - Blue Springs Schist - (Paleoproterozoic) - Rusty red to brown quartz-chlorite-garnet schist. Fishhook-shaped and lenticular lenses and pods of deformed vein quartz, from mm to cm in width, and up to 10s of cm in length, are abundant and locally may comprise up to 50% of the rock. Contains two well developed foliations. S1 is a transposition layering defined by quartz lenses, and S2 is the dominant, northeast trending schistosity.

Xa - Amphibolite - (Paleoproterozoic) - Black to very dark green fine- to coarse-grained amphibolite with variable amounts of fine- to medium- grained white plagioclase. Rock is massive to strongly foliated.

Xsr - Sevilleta Metarhyolite - (Paleoproterozoic) - Strongly lineated and weakly to moderately foliated metavolcanic rock. Contains 10% phenocrysts of plagioclase and clear to pale blue quartz deformed into sigma and delta porphyroclasts and abundant finely crystalline muscovite in an aphanitic matrix. Rock is pinkish gray on weathered surfaces and dark gray on fresh surfaces.

