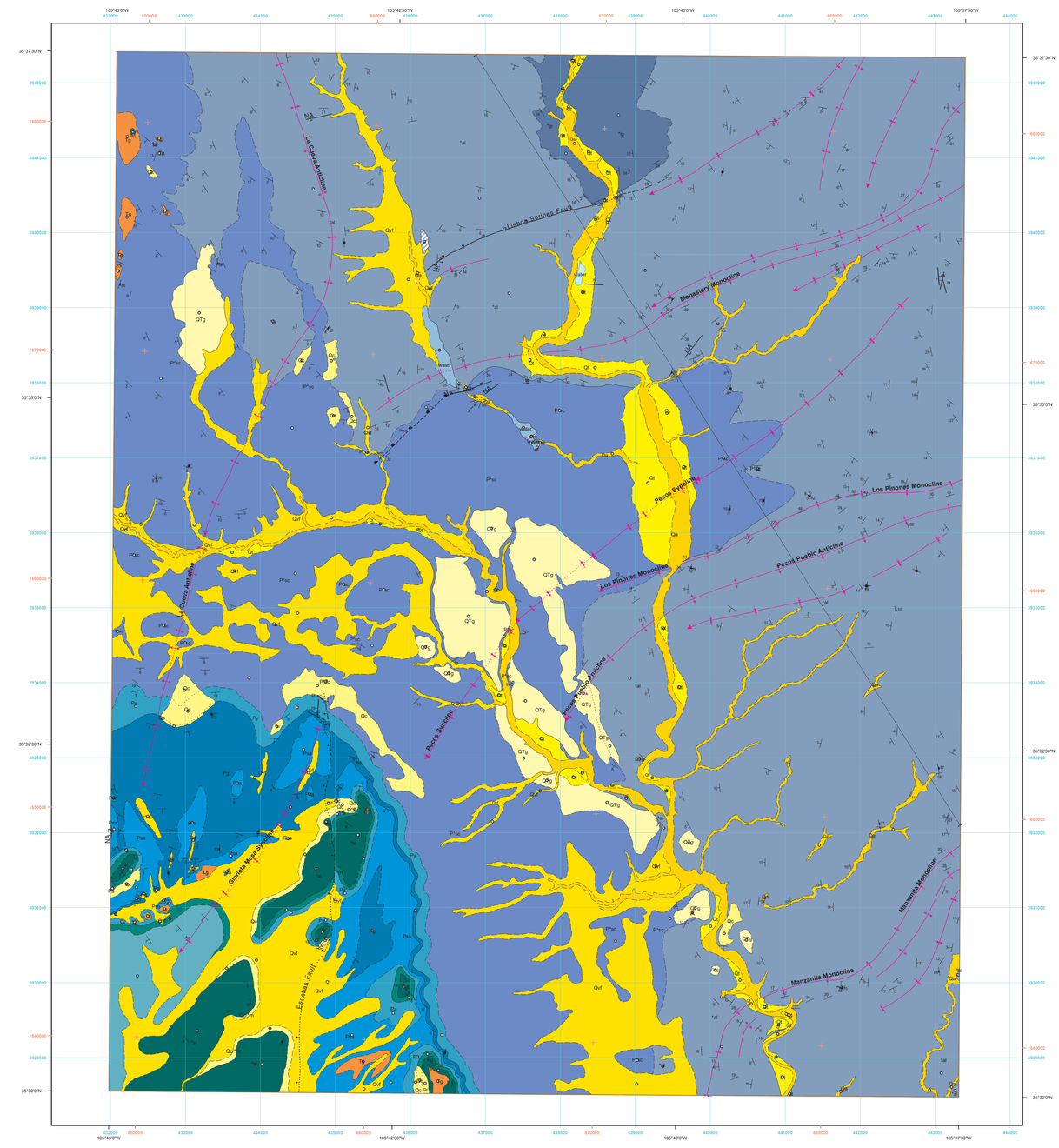
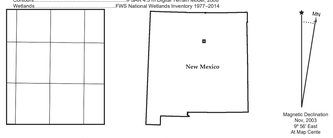


Base map from U.S. Geological Survey 2002.
North American Datum of 1927 (NAD27).
Projection and 1,000-meter grid: Universal Transverse Mercator, Zone 13S, shown in blue.
10,000-foot ticks: New Mexico Coordinate System of 1927 (Central zone), shown in red.

Roads.....U.S. Census Bureau, 2015–2016
Names.....GNIS, 2016
Hydrography.....National Hydrography Dataset, 2014
Contours.....IFSAR 4.5 m Digital Terrain Dataset, 2014
Wetlands.....FWS National Wetlands Inventory 1977–2014



Quadrangle Location

1:24,000

1 0.5 0 1 Mile

1000 0 1000 2000 3000 4000 5000 6000 7000 Feet

1 0.5 0 1 Kilometer

Contour Interval 20 Feet
National Geodetic Vertical Datum 1929

New Mexico Bureau of Geology and Mineral Resources
Open-File Geologic Map 52

Geologic Map of the Pecos 7.5-Minute Quadrangle, Santa Fe and San Miguel Counties, New Mexico

December 2002

by
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This and other STATEMAP quadrangles are available for free download in both PDF and ArcGIS formats at:

http://geoinfo.nmt.edu

Digital layout and cartography by the NMBGMR Map Production Group:
Phil L. Miller, Amy L. Dunn, Ann D. Knight, and Justine L. Nicolette

This draft geologic map is preliminary and will undergo revision. It was produced from either scans of hand-drafted originals or from digitally drafted original maps and figures using a wide variety of software, and is currently in cartographic production. It is being distributed in this draft form as part of the bureau's Open-file map series (OFGM), due to high demand for current geologic map data in these areas where STATEMAP quadrangles are located, and it is the bureau's policy to disseminate geologic data to the public as soon as possible.

After this map has undergone review, editing, and final cartographic production adhering to bureau map standards, it will be released in our Geologic Map (GM) series. This final version will receive a new GM number and will supercede this preliminary open-file geologic map.

DRAFT

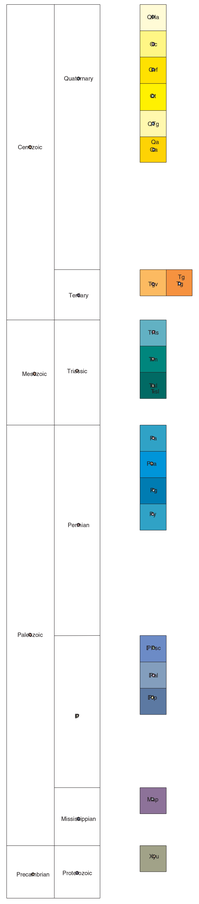
Comments to Map Users

A geologic map displays information on the distribution, nature, 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 geologic 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 may not be shown due to recent development.

Cross sections are constructed based upon the interpretations of the author made from geologic mapping and available geophysical and subsurface (drillhole) 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 New Mexico Bureau of Geology and Mineral Resources created the Open-file Geologic Map Series to expedite dissemination of these geologic maps and map data to the public as rapidly as possible while allowing for map revision as geologists continued to work in map areas. Each map sheet carries the original date of publication below the map as well as the latest revision date in the upper right corner. In most cases, the original date of publication coincides with the date of the map product delivered to the National Cooperative Geologic Mapping Program (NCGMP) as part of New Mexico's STATEMAP agreement. While maps are produced, maintained, and updated in an ArcGIS geodatabase, at the time of the STATEMAP deliverable, each map goes through cartographic production and internal review prior to uploading to the Internet. Even if additional updates are carried out on the ArcGIS map data files, citations to these maps should reflect this original publication date and the original authors listed. The views and conclusions contained in these map documents 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.

Data Frame Name: Correlation of Map Units



Description of Map Units

01-00-00-00-00—Heading01—Cenozoic—Cenozoic—Era

01-01-00-00-00—Heading02—Quaternary—Quaternary—Period

01-01-01-00-00—Unit—Qfa—Quaternary-Holocene alluvium (Quaternary)—Unconsolidated sediments in active perennial and ephemeral stream channels and flood plain deposits composed of clay, silt, sand and gravel. Grades into minor colluvial or alluvial fans and older valley fills (Qvf). May include terrace deposits whose treads lie within 20 feet of grade. Note that much of the mapping this unit was based on photointerpretation. Thickness: 0 to 25(?) feet.

01-01-02-00-00—Unit—Qc—Quaternary colluvium (Quaternary)—Primarily talus, locally derived. Commonly occurs as a veneer of variable thickness on slope-forming bedrock. Thickness: 0 to 30 (?) feet.

01-01-03-00-00—Unit—Qvf—Quaternary valley fill (Quaternary)—Unconsolidated to consolidated fine grained valley fills composed of clay, silt, and sand along the margins of active stream channels and in areas of low relief or where runoff is not channelized. Deposits likely formed by a combination of alluvial, eolian, and hillslope processes. These fills may form terraces when incised by modern arroyos. Note that much of the mapping this unit was based on photointerpretation. Thickness: 0 to 40(?) feet

01-01-04-00-00—Unit—Qt—Quaternary terrace deposits (Quaternary)—Undivided, gravel-capped terrace deposits along the Pecos River and Glorieta Creek. See Karas (1988) for more detail on these deposits. Note that some of the mapping these terraces was based on photointerpretation. Thickness: 0 to 25 (?) feet.

01-01-05-00-00—Unit—QTg—Quaternary-Tertiary? (Tertiary)—Gravel deposits. Gravel and cobble deposits composed of rounded Proterozoic and Paleozoic clasts. These gravels were deposited prior to the establishment of the incised modern Pecos River and Glorieta Creek. Thickness: 0 to 30 feet

01-01-06-00-00—Unit—Qa—Quaternary Alluvium (Quaternary)—Quaternary Alluvium

01-02-00-00-00—Heading02—Tertiary—Tertiary—Period

01-02-01-00-00—Unit—Tgv—Tertiary gravel deposits (Tertiary)—Fine- to coarse-grained deposits dominated by boulder and cobble gravel composed of rounded Proterozoic clasts with fewer clasts of Paleozoic age. Proterozoic clasts are heterolithic representing the varied metaigneous and metasedimentary rock types exposed throughout the Pecos Wilderness and the rest of the Santa Fe Range to the north. Deposits contain proportionally less Paleozoic rocks further to the north where exposed along the western edge of the quadrangle. Deposits are typically poorly exposed, but cobbles and boulders form highs in the landscape, up to 1500 feet above the modern Pecos River, and mantle hillsides with their colluvium. These deposits are similar to deposits found downstream in Texas and by inference are late Miocene to early Pliocene and equivalent to the Upper Ogalala (Hawley, 2002 personal communication). Thickness: 0 to 120 feet

01-02-02-00-00—Unit—Tg—Tg (Tertiary)—Tg

02-00-00-00-00—Heading01—Mesozoic—Mesozoic—Era

02-01-00-00-00—Heading02—Triassic—Triassic—Period

02-01-01-00-00—Unit—^s—Santa Rosa Formation (Triassic)—Santa Rosa Formation. (upper and middle units are not present on this quadrangle)

02-01-02-00-00—Unit—^m—Moenkopi Formation (Tertiary)—Grayish red to purplish-red sandstones, conglomerates, mudstones, and siltstones. Lacks gypsum. Sandstones are micaceous litharenites or lithic graywackes. Sandstones are modelately to poorly sorted, subangular to angular, and fine to coarse grained. Sandstones and conglomerates are generally trough crossbedded and lenticular. Fossils include vertebrate bones and coprolites, footprints, charophytes, and ostracods. Dark brown carbonate concretions that are up to 70 cm-diameter were found on the hill to the north of Rowe Peak. The contact with underlying Artesia Formation is disconformable. Thickness: to 75-120 feet. (about 120 feet near Rowe Peak).

02-01-03-00-00—Unit—^s—Santa Rosa Formation, Lower member (Triassic)—Light gray to buff, thick bedded, fine- to coarsegrained crossbedded sandstone with conspicuous iron oxide staining. Limestone- and chert-pebble conglomerates present in most places, particularly along the southwest edge of the quadrangle. Fossil wood is common. Thickness: 90-120 feet.

03-00-00-00-00—Heading01—Paleozoic—Paleozoic—Paleozoic

03-01-00-00-00—Heading02—Permian—Permian—Period

03-01-01-00-00—Unit—Pa—Artesia Formation (Permian)—Moderate reddish brown (orange to brick-red), sandstones, siltstones and gypsum. Sandstones and siltstones are quartzarenites and usually gypsiferous. Sandstones are well sorted, subrounded to subangular, and very fine to fine grained. Sandstones are laminated, ripple laminated, and massive (bioturbated), crossbedding is rare, and beds are laterally persistent. Unfossiliferous except for bioturbation. Mottled greenish-white reduction spots are common. Thickness: 30-60 feet.

03-01-02-00-00—Unit—Psa—San Andres Formation (Permian)—Buff to light gray thin-bedded dense silty limestone and interbedded calcareous sandstone. Reddish-orange chert or white aragonite satin spar (after gypsum?) is often present near the contact with the underlying Glorieta Sandstone. Thickness: 15-45 feet.

03-01-03-00-00—Unit—Pg—Glorieta Sandstone (Permian)—Yellow to buff, thick-bedded, fine- to medium-grained quartz sandstone. Grains are well rounded, well sorted, and conspicuously frosted. Thickness: 80-120 feet.

03-01-04-00-00—Unit—Py—Yeso Formation (Permian)—Reddish-orange to red thick-bedded mudstone and interbedded buff to reddish-orange and yellow, fine-grained sandstone and some buff, coarse-grained, arkosic sandstone. Buff to yellow, dense, nonfossiliferous, crystalline limestone 2-3 m thick in the upper part. Thickness: 160-200 feet

03-02-00-00-00—Heading02—Pennsylvanian—Pennsylvanian—Period

03-02-01-00-00—Unit—IPPsc—Sangre de Cristo Formation (Pennsylvanian)—Brownish red to purple, thick-bedded mudstone and interbedded buff to dark brown arkosic sandstone. Sandstone beds are typically lensoidal. Also contains some gray to purple, thinbedded, dense, microcrystalline limestone and buff, thin-bedded, medium-grained quartz sandstone. Along the NW side of the quadrangle, thick arkosic conglomerates are well indurated and laterally extensive. Minimum thickness of 2600 feet.

03-02-02-00-00—Unit—IPal—Alamitos Formation (Pennsylvanian)—Gray medium to thin-bedded, fossiliferous marine limestone, interbedded buff to brown coarse-grained arkosic sandstone, and dark-grey to reddish shales. Many limestone and sandstone beds in the Northeast part of the quadrangle are dominantly composed of very coarse and angular K-spar fragments but nonetheless can often remain quite fossiliferous. Contact with overlying Sangre de Cristo Formation is locally sharp just east of Pecos but is gradational or poorly exposed in most places. Basal fedspathic unit is cemeted by silica or clay. Aproximate thickness of 1500 feet.

03-02-03-00-00—Unit—IPlp—La Posada Formation (Pennsylvanian)—Gray medium to thick-bedded, fossiliferous marine limestone with banded chert layers, Thick limestone beds form cliffs where exposed near the State Fish Hatchery. Limestone is interbedded with thin shales and sandstones. Uppermost unit is quartz sandstone with calcite cement (wheras the basal Alamitos sandstone is silica cemented). Measured thickness at Dalton Bluff 973 feet (Sutherland, 1963).

03-03-00-00-00—Heading02—Mississippian—Mississippian—Period

03-03-01-00-00—Unit—Map—Arroyo Penasco Group (Mississippian)—Undifferentiated Mississippian rocks (cross section only). Thickness is 106 feet at Dalton Bluff (Sutherland, 1963).

04-00-00-00-00—Heading01—Precambrian—Precambrian—Eon

04-01-00-00-00—Heading02—Protero—Proterozoic—Proterozoic

04-01-01-00-00—Unit—Xyu—Proterozoic basement (Proterozoic)—Undifferentiated metaigneous and metasedimentary rocks (cross section only)

Explanation of Map Symbols

- GenericPoints_temp
- 30.02.29 Shoreline—Showing open water
- 1.1.1 Contact—Identity and existence certain, location accurate
- 1.1.3 Contact—Identity and existence certain, location approximate
- 1.1.7 Contact—Identity and existence certain, location concealed
- 2.1.1 Fault (generic; vertical, subvertical, or high-angle; or unknown or unspecified orientation or sense of slip)—Identity and existence certain, location accurate
- 2.1.2 Fault (generic; vertical, subvertical, or high-angle; or unknown or unspecified orientation or sense of slip)—Identity or existence questionable, location accurate
- 2.1.5 Fault (generic; vertical, subvertical, or high-angle; or unknown or unspecified orientation or sense of slip)—Identity and existence certain, location inferred
- 2.1.7 Fault (generic; vertical, subvertical, or high-angle; or unknown or unspecified orientation or sense of slip)—Identity and existence certain, location concealed
- 2.2.1 Normal fault—Identity and existence certain, location accurate
- 2.2.3 Normal fault—Identity and existence certain, location approximate
- 2.2.5 Normal fault—Identity and existence certain, location inferred
- 2.2.7 Normal fault—Identity and existence certain, location concealed
- 2.4.2 Reverse fault—Identity or existence questionable, location accurate
- 2.4.5 Reverse fault—Identity and existence certain, location inferred
- 31.8 Map Boundary
- 31.10 Cross section line
- 5.1.1 Anticline (1st option)—Identity and existence certain, location accurate
- 5.1.7 Anticline (1st option)—Identity and existence certain, location concealed
- 5.5.1 Syncline (1st option)—Identity and existence certain, location accurate
- 5.5.5 Syncline (1st option)—Identity and existence certain, location inferred
- 5.5.7 Syncline (1st option)—Identity and existence certain, location concealed
- 5.9.17 Monocline, anticlinal bend (1st option)—Identity and existence certain, location accurate
- 5.9.7 Monocline (1st option)—Identity and existence certain, location concealed
- 19.03.02
- 19.03.04
- 19.03.35
- 02.15.01
- 04.03.02
- 04.03.03
- 05.10.05
- 06.02
- 07.02

Data Frame Name: Geologic Cross Section A–A'