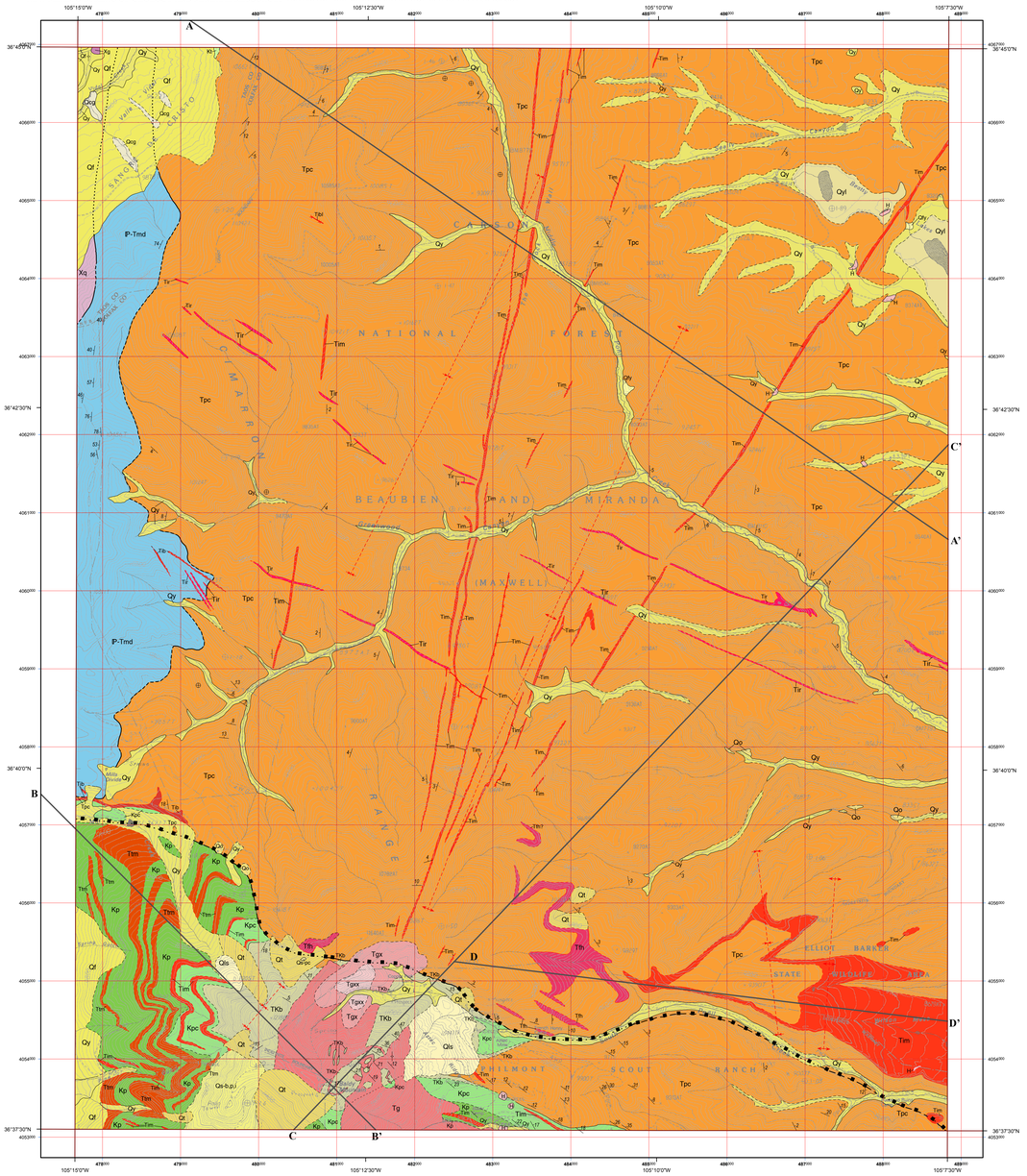
NMBGMR Open-file Geologic Map 125
Last Modified 08 August 2008



Base map from U.S. Geological Survey 1987, from photographs taken 1981, field checked in 1983, edited in 1987.
1927 North American datum, UTM projection – zone 13N
1000-meter Universal Transverse Mercator grid, zone 13, shown in red

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 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

QUADRANGLE LOCATION

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 scientific peer 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

New Mexico Bureau of Geology and Mineral Resources
Open-file Geologic Map
OFGM 125

Mapping of this quadrangle was funded by a matching-funds grant from the STATEMAP program of the National Cooperative Geologic Mapping Act, administered by the U. S. Geological Survey, and by the New Mexico Bureau of Geology and Mineral Resources. (Dr. Peter A. Scholle, *Director and State Geologist*. Dr. J. Michael Timmons, *Geologic Mapping Program Manager*.).

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This and other STATEMAP quadrangles are (or soon will be) available for free download in both PDF and ArcGIS formats at:

http://geoinfo.nmt.edu/publications/maps/geologic/ofgm/home.html

Geologic map of the Baldy Mountain quadrangle, Colfax County, New Mexico.

May 2006

by
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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 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 (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 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 Symbols

A —— A' Location of geologic cross section.

Geologic contact. Solid where certain, dashed where approximate, dotted where concealed.

Thrust fault; barbs in hanging wall. Solid where certain, dashed where approximate, dotted where buried.

Reverse fault; barbs in hanging wall. Solid where certain, dashed where approximate, dotted where intruded by younger granite OR buried by younger sedimentary rocks.

Probable thrust fault which may, in whole or in part, be depositional and/or a normal fault; barbs in hanging wall. Solid where certain, dashed where approximate, dotted where buried.

Anticline or syncline.

Dike.

Strike and dip of inclined bedding.

Horizontal bedding.

Tectonic foliation. Slaty cleavage in sedimentary rocks, shape fabric in granite, schistosity in quartzite.

Joint.

Explanation of Cross Section Symbols

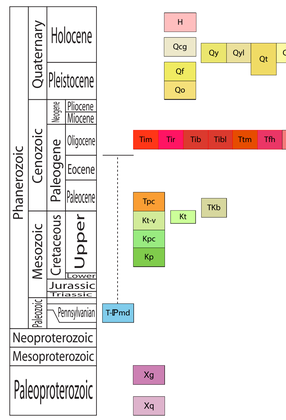
Limit of interpretation

Geologic contact. Certain, approximate, above ground, gradational.

Fault. Certain, approximate, above ground

Incipient slaty cleavage

Correlation of Map Units



Description of Map Units

Quaternary

H **Disturbed areas (Holocene)** – Mostly earthen dams.

Qy **Alluvium (Holocene)** – Active and recently active alluvial deposits.

Qyf **Young alluvial fans (Holocene)** – Alluvial fans that merge with and/or overlie active alluvial, valley bottom deposits.

Qcg **Ciénega deposits (Holocene)** – Long-lived deposits of perpetually wet younger alluvium in the Valle Vidal. The soil in these areas is black and very loamy.

Qyl **Alluvium and lacustrine deposits (Holocene to Pleistocene)** – Mostly silt and clay with interbeds of fine-grained to coarse-grained sand and locally granular gypsum. Deposits fill a series of small lacustrine basins in the northeast corner of the quadrangle.

Qls **Landslide deposits (Holocene to Pleistocene)** – Disorganized masses of landslide debris, in both instances consisting mostly of the unit of Baldy Mountain. The areas of each map unit are characterized by irregular topography including numerous fine-grained sediment-filled depressions.

Qls-pc **Slumped mass (Holocene to Pleistocene)** – Semi-coherent mass of Poison Canyon Formation.

Qa-b,p,l **Slumped mass (Holocene to Pleistocene)** – Semi-coherent mass of the unit of Baldy Mountain, Pierre Shale, and porphyry intrusions.

Qt **Talus and colluvium (Holocene to Pleistocene)** – Talus and colluvium-covered slopes.

Qo **Older alluvium (Pleistocene)** – Pebble-cobble alluvium caps two small hills near the head of Mill Creek in the southwest central part of the map area.

Qf **Alluvial fan deposits of Valle Vidal (Pleistocene)** – Undifferentiated alluvial fan deposits. In areas where subcrop is the unit of Mills Divide, very large boulders (up to 2 m) of sillimanite schist, quartzite and felsic porphyry occur.

Tertiary

Tim **Monzonite (Oligocene)** – Fine- to medium-grained monzonite porphyry with subhedral to euhedral plagioclase phenocrysts up to 3 mm, but mostly less than 2 mm. Mafics are typically altered, but mostly appear to be hornblende with lesser amounts of biotite and pyroxene. Locally, miarolitic cavities are present. Dikes of this kind consistently strike northerly or northeasterly. The dikes intrude and are intruded by the northwest-striking suite of quartz-feldspar porphyry dikes (*Tir*). In the southeast (Wilson Mesa), and southwest, the porphyry mostly forms sills.

Tir **Quartz-feldspar porphyry (Oligocene)** – Strongly porphyritic felsic to intermediate dikes containing up to 20% 4-15 mm euhedral to subhedral feldspar (mostly potassium feldspar) phenocrysts with hornblende and sparse biotite. Dikes of this variety, along with the biotite-red porphyry (*Tib*) and biotite-lamproite (*Tibl*) dikes consistently strike to the northwest. These dikes intrude and are intruded by the north to northeast-striking monzonite porphyry dikes (*Tim*).

Tib **Biotite-rich intermediate porphyry (Oligocene)** – A distinctive subhedral-population of the northwest-striking suite of dikes containing abundant biotite (5-15% 1-3 mm) and feldspar phenocrysts up to 6 mm.

Tibl **Biotite lamproite dike (Oligocene)** – A single northwest-striking dike (northernmost of the suite) of coarse-grained biotite lamproite, containing greater than 60% biotite.

Ttm **Monzonite porphyry of French Henry Camp (Oligocene)** – A suite of fat, stubby, northwest-striking dikes and a lacolith-shaped stock in the vicinity of French Henry Camp, northeast of Baldy Mountain. Similar to the monzonite porphyry in terms of mineralogy, containing plagioclase and mostly hornblende, but this porphyry is characteristically porphyritic with 2-10% plagioclase phenocrysts up to 5 mm set in a groundmass that is virtually identical to the monzonite porphyry suite of dikes (*Tim*).

Tg **Granite of Copper Park, fine- to medium-grained (Oligocene)** – The outer phase of a granitic stock centered on Copper Park, just to the north of Baldy Mountain. The phase is similar mineralogically to the monzonite porphyry (*Tim*), except that the texture is more equigranular, the mafic content appears to be lower and it grades inward into a coarse-grained to megacrystic granite.

Tgx **Granite of Copper Park, medium- to coarse-grained (Oligocene)** – Intermediate phase of the Copper Park stock containing feldspar phenocrysts ranging in size from 5 mm to 4 cm. Mafics, mostly biotite make up less than 15%.

Tgxx **Granite of Copper Park, coarse-grained to megacrystic (Oligocene)** – Interior phase of the Copper Park stock containing euhedral to subhedral potassium feldspar phenocrysts up to 7 cm.

Ttm **Hornblende monzonite porphyry of Deep Tunnel Mine (Oligocene)** – A suite of sills in the southwest corner of the map area that contain conspicuous hornblende phenocrysts up to 1 cm. The hornblende is concentrated in cumulate-like inclusions in a fine- to medium-grained matrix porphyry that otherwise resembles the monzonite porphyry suite of dikes and sills (*Tim*).

Tpc **Poison Canyon Formation (Paleocene)** – Sandstone, pebbly sandstone, pebble-cobble conglomerate interbedded with lesser claystone, sparse shale, and rare coal seams. Eastern exposures are equivalent to the Raton Formation (*TKr*). The sandstone and conglomerate occur in medium- to thick-bedded, typically cross-stratified and channelized beds commonly amalgamated into sets greater than 20 m thick. Trough and wedge-planar cross-stratified sets 20-100 cm thick are the most common, but tabular-planar sets are also present. An average paleocurrent azimuth of 083 was determined from 189 measurements, mostly from foresets. Mudstone interbeds, up to 20 m thick, are typically massive, where not punctuated by siltstone intervals, poorly organized, and contain abundant detrital muscovite. Rare dark green and locally dusky red shale intervals are also present. The feldspathic (rarely arkosic) quartz sandstone is poorly- to moderately-sorted, argillaceous and micaceous. Clasts in the conglomeratic sandstone and pebble-cobble conglomerate are well-rounded to sub-rounded and dominated by vein quartz, micaceous quartzite, quartz sandstone, and chert throughout most of the map area. Towards the west, the maximum grain size increases to 25-30 cm and clasts of leucogranite, sericitic schist, sillimanite (fibrolite) schist, felsic to intermediate volcanics, and sparse amphibolite. The unit is at least 500 m (1,600 ft) thick.

Tertiary and Cretaceous

TKb **Unit of Baldy Mountain (Paleocene - Upper Cretaceous)** – A complex unit exposed only in the vicinity of Baldy Mountain. The unit is typically hornfelsed or strongly silicified and poorly exposed, forming long talus slopes and large landslide and semi-coherent slump deposits. The unit is dominated by fine- to medium-grained, well-sorted, arenaceous quartz sandstone that is typically present in parallel laminated to low-angle cross-stratified, medium- to thick-beds. The sandstone is also interbedded with dark silicified argillite and in this regard is very similar and probably equivalent to the Trinidad Formation. However, the unit also includes several intervals, up to 30 m thick, of medium- to thick-bedded, clean (non-argillaceous) medium- to coarse-grained quartz sandstone and pebbly sandstone. Pebbles are mostly light and dark gray chert. The unit is provisionally given a temporary, informal name due to its poor exposure, the lack of a well-defined upper contact, and the fact that the unit is several times thicker than the Trinidad Formation. The unit is at least 250-300 m (800-1,000 ft) thick.

Cretaceous

Kt **Trinidad Formation (Upper Cretaceous)** – Gray to green shale and laminated siltstone interbedded with thin- to thick-bedded fine-grained, well-sorted quartz sandstone, typically argillaceous. The sandstone beds are parallel laminated to low-angle cross-stratified and locally display hummocky cross-stratification. 60 m (200 ft) thick.

Kt-v **Combined Trinidad - Vermejo Formations (Upper Cretaceous)** – A unit shown only on cross-sections. 125-155 m (400-500 ft) thick.

Kpc **Pierre Shale, calcareous upper zone (Upper Cretaceous)** – Black shale with septarian nodules up to 1 m and sparse, thin- to medium-bedded micritic limestone beds containing molluscan shell debris. 125-155 meters (400-500 feet) thick.

Kp **Pierre Shale (Upper Cretaceous)** – Black shale undifferentiated. Greater than 600 m (2,000 ft) thick.

Tertiary and Pennsylvanian

T-Pmd **Conglomerate of Mills Divide (Paleocene - Pennsylvanian)** – A very poorly exposed unit composed of cobble-boulder, well-rounded conglomerate and pebbly sandstone. Clasts of vein quartz, micaceous quartzite, quartz sandstone, silicified argillite, chert, leucogranite, foliated leucogranite and gniess, sillimanite (fibrolite) schist, sericitic schist, and porphyritic intermediate to felsic igneous rocks are virtually identical to those found in the Poison Canyon, but much larger typically 2-3 times. Along the eastern edge of its outcrop belt, sparse clasts of micaceous, argillaceous, feldspathic quartz sandstone that strongly resemble the Poison Canyon Formation are present. Outcrops of this unit are rare, but consist of medium- to thick-bedded pebble-cobble, mostly clast-supported conglomerate and pebbly sandstone. One paleocurrent (azimuth of 170) was obtained. The unit is differentiated from the Poison Canyon Formation by dark red soil and maximum clast sizes that are typically greater than 60 cm. Most of the unit probably correlates with the thick, dark red hematite-cemented, coarse-grained, Pennsylvanian conglomeratic (Sangre de Cristo Formation) units of the area. The presence of clasts that might have been derived from the Paleocene Poison Canyon Formation in the south, and a zone of very coarse-grained clasts (greater than 2 m) of quartz sandstone that strongly resembles the Dakota Sandstone (of Upper Cretaceous age) along the eastern edge of the outcrop belt in the northerly adjacent Ash Mountain 7.5' quadrangle, suggests a more complex origin for this unit. That the conglomerate might also include zones of younger, possibly Laramide-aged, thrust-front generated, coarse-grained lenses is a possibility that must be considered. That the thrust fault zone might have been reactivated as a normal fault is also a possibility. At least 200 m (650 ft) thick.

Paleoproterozoic

Xq **Foliated leucogranite (Paleoproterozoic)** – Fine- to medium-grained, foliated, leucocratic granitoid, locally intruded by undifferentiated amphibolite dikes.

Xq **Quartzite (Paleoproterozoic)** – Weakly to strongly foliated fine- to coarse-grained quartzite locally containing segregations of coarse-grained muscovite. Only shown on cross-section and on the westerly adjacent Red River Pass 7.5' quadrangle.