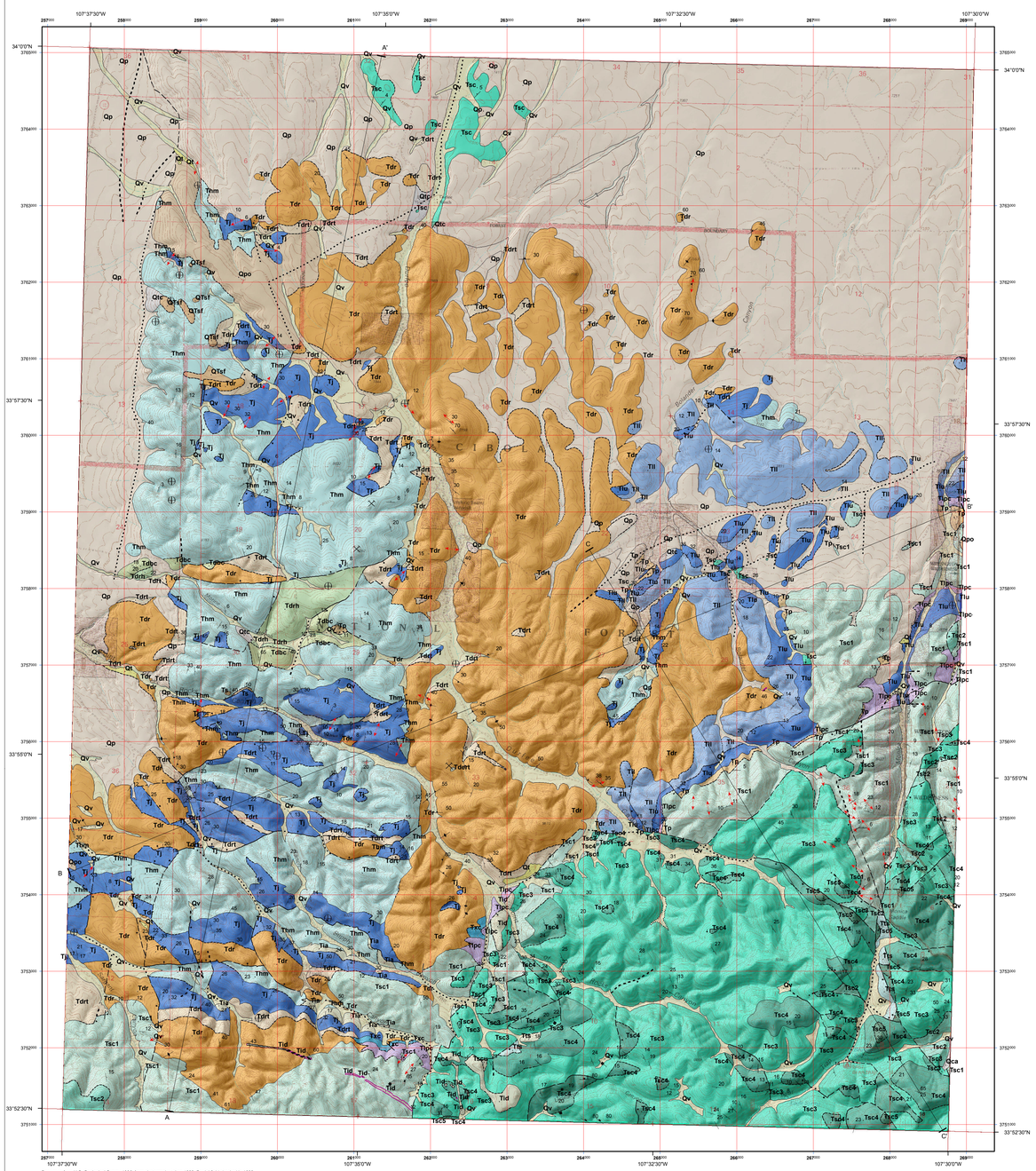
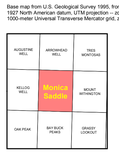


Base map from U.S. Geological Survey 1995, from photographs taken 1992. Partial field checked in 1995.
1927 North American datum, UTM projection – zone 13N
1000-meter Universal Transverse Mercator grid, zone 13, shown in red



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 20 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

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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 Monica Saddle 7.5-Minute Quadrangle, Socorro County, New Mexico

June 2011

by

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New Mexico Bureau of Geology and Mineral Resources
Open-file Geologic Map 217

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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.

MONICA SADDLE UNIT DESCRIPTIONS

af Man-made deposits (Holocene) – Earthen dams for tanks along active gulleys or valleys.

Qv Active alluvium (Holocene) - Active and recently active alluvium, usually along stream ways, typically incised <1m.

Qt Terrace deposits (Holocene to Quaternary) – Remnant areas of alluvium with flat upper surfaces more than 1m above active drainages.

Qbs Eolian deposits (Quaternary) – Deposits consist of active and vegetated dunes (fine to medium-grained sand) and silt (loess).

Qpl Pluvial and lacustrine deposits (Quaternary) – Deposits are fine grained playa muds and silts locally mantled with eolian sand.

Qca Colluvium and other slope deposits (Quaternary)

Qtc Talus and other slope deposits on steep slopes (Quaternary)

Qf Alluvial fan and piedmont deposits (Quaternary) - Deposits are typically incised <5m. clasts are derived from a local source.

Ted East Red dacite (Miocene – Oligocene) – dark purple dacite intrusions containing 5 to 20 percent large plagioclase phenocrysts. Occurs as discrete dikes and small stocks within the South Canyon Tuff exposures in southeastern third of the quadrangle

Tsc South Canyon Tuff (Oligocene) – Rhyolitic ash-flow tuff containing 4-30% phenocrysts of plagioclase, sanidine, quartz, and biotite. Lithic-lapilli are generally <5%, and pumice lapilli 5-25%. Thickness: 0 - >1000m. Phenocryst content in South Canyon is zoned from about ~5 % at the base increasing abruptly to 30% in the upper parts. Mapped as **Tscl** and **Tscu** respectively in outflow exposures where thickness and exposure permit. Within the caldera (SE part this quadrangle) five subdivisions are sometimes mapped. **Tsc1-** 4 -**10%** phenocrysts of sanidine and quartz in sub equal amounts , **Tsc2-** 10-15% phenocrysts of sanidine and quartz usually with abundant lithic fragments, **Tsc3-** 15-30% phenocrysts of sanidine, quartz and minor plagioclase and biotite**, Tsc4-** 30-40% phenocrysts similar to Tsc3 but containing noticeable amounts dark-red, quartz-poor pumice (plagioclase, biotite and hornblende**), Tsc5** – 30-40% phenocrysts of feldspar biotite and hornblende, no quartz.

Tlpc Basalt to basaltic andesite (Oligocene) – Vesicular basalt and basaltic andesite lavas containing < 10% phenocrysts of plagioclase, olivine, and pyroxene. Occurs between rhyolite of Durfee Canyon and tuff of Caronita Canyon, between tuff of Caronita Canyon and Lemitar Tuff and above Lemitar Tuff.

Tll/Tlu Lemitar Tuff (Oligocene)- Densely welded rhyolite to rhyodacite ash flow tuff containing 10-35% phenocrysts and 5-25% pumice lapilli. Unit is complexly zoned from phenocryst-poor rhyolite (10-15%) in lower parts (**Tll**) to crystal rich rhyodacite to rhyolite (25-35%) in upper (**Tlu**). Upper member consists of a lower dk-red rhyodacite (20-35 % plagioclase, sanidine, and biotite) which grades upward into a phenocryst-rich rhyolite (30-35% sanidine, plagioclase, quartz, and biotite).

Txc Caronita Canyon (tuff of) - Rhyolite to rhyodacite ash flow tuff (10-35%) , Crystal-poor (biotite, plagioclase) lower member; crystal-rich (sanidine, quartz, plagioclase, biotite) upper member.

Tar Rhyolite of Durfee Canyon - Rhyolite lavas containing 2-8% phenocrysts, chiefly sanidine up to 5 mm. Occasionally contains secondary pseudobrookite and bixbyite in gas cavities. Lava often underlain by tuffs, and minor flow breccias, and volcanoclastic sedimentary rocks (**Tdrt**).

Tir Rhyolite dikes- Rhyolite dikes similar in mineralogy to rhyolite of Durfee Canyon.

Tvp Vicks Peak Tuff (Oligocene) – Densely welded rhyolitic ash-flow tuff containing 1-15% phenocrysts, chiefly sanidine up to 4mm, lesser plagioclase up to 2mm, and sparse pyroxene, hornblende, and biotite <2mm. The tuff contains 2-25% strongly flattened pumice lapilli up to 1m long, and sparse <10cm lithic lapilli. The tuff is typically light gray and the pumice lapilli are commonly recessive on weathered surfaces. Thickness: up to 150m.

Tj La Jencia Tuff (Oligocene) – Densely welded rhyolitic ash-flow tuff containing 2-10% phenocrysts of sanidine (1-4mm) and plagioclase (1-2mm), and minor biotite, pyroxene, and hornblende, and quartz. The tuff is generally light to dark gray and contains 5-15% strongly flattened pumice lapilli up to 1m long, and up to 5% lithic lapilli. Thickness: up to 120m.

Tia mafic dikes – rhyolite dikes and sills within southwestern third of quadrangle. Stratigraphic position is unclear.

Thm Hells Mesa Tuff (Oligocene) – Densely welded phenocryst-rich rhyolitic to trachytic ash-flow tuff containing 20-35% phenocrysts of plagioclase (≤3mm), sanidine (≤3mm), quartz (≤4mm), hornblende (≤2mm), and biotite (≤2mm). The tuff is reddish brown to orange in color and contains sparse lithic lapilli and generally <10% pumice lapilli <10cm long. Thickness: Up to 400m.

Tdbc Blue Canyon Tuff (Oligocene) – Moderately phenocryst-rich ash-flow tuff containing 10-20% 1-4mm plagioclase phenocrysts, and abundant 1-3mm biotite. Thickness: Up to 150m.

Tdrh Rock House Canyon Tuff (Oligocene) – Phenocryst-poor mafic lava contains less than 5% < 3mm feldspar phenocrysts, and a trace of mafics. Thickness: Up to 150m.

CORRELATION DIAGRAM Monica Saddle Quadrangle and vicinity

af Artificial Fill
Qbs Blow Sands
Qv Valley Alluvium
Qpl Playa Deposits
Qf Quaternary Fan
Qt Terrace Deposits
Qtc Talus/Colluvium
Qca colluvium/alluvium

OUTFLOW STRATIGRAPHY

Tscu
Tscl
Tp Popotosa Formation
Tlpc La Jara Peak basaltic andesite
Tlu Lemitar Tuff, upper
Tll Lemitar Tuff, lower

Tsc5 South Canyon 5
Tsc4 South Canyon 4
Tsc3 South Canyon 3
Tsc2 South Canyon 2
Tsc1 South Canyon 1

Ted East Red dacitic lavas and intrusions
Tir rhyolite intrusions
Tir basaltic andesite intrusions

Tlpc la Jara Peak Basaltic Andesite
Txc tuff of Caronita Canyon
Tlpc la Jara Peak Basaltic Andesite
Tdr rhyolite of Durfee Canyon
Tdrt rhyolite tuffs of Durfee Canyon
Tj LaJencia Tuff
Thm Hells Mesa Tuff
Datil Group Tdbc Tdbc Blue Canyon Tuff
Tdrh Rock House Canyon Tuff

MAP LEGEND

- Joint
- Vertical Joint
- Prospect location
- Arrow to indicate fault dip
- Down ball on fault
- Lineation direction arrow
- Foliation in ash flow tuff
- Lava foliation
- Horizontal strike and dip
- Strike and dip in sediments
- Vertical foliation

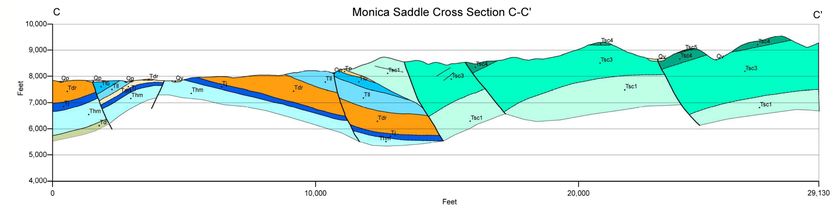
Contact- Solid where exposed or known; dashed where approximately located; dotted where concealed.

Normal fault- Bar and ball on downthrown side; solid where exposed
Aor known; dashed where approximately located; dotted where concealed.

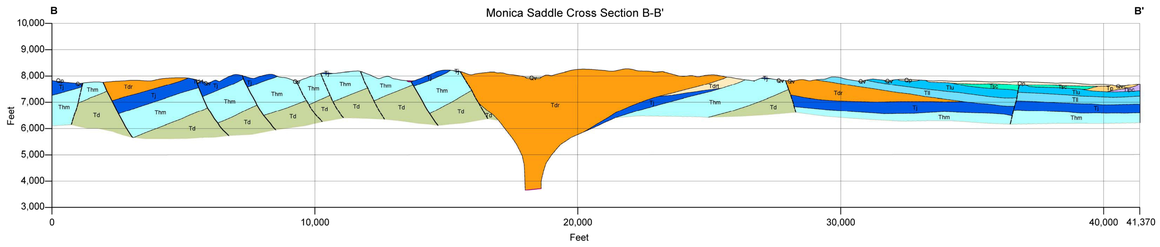
Dike

A A' **Geologic cross section**

Monica Saddle Cross Section C-C'



Monica Saddle Cross Section B-B'



Monica Saddle Cross Section A-A'