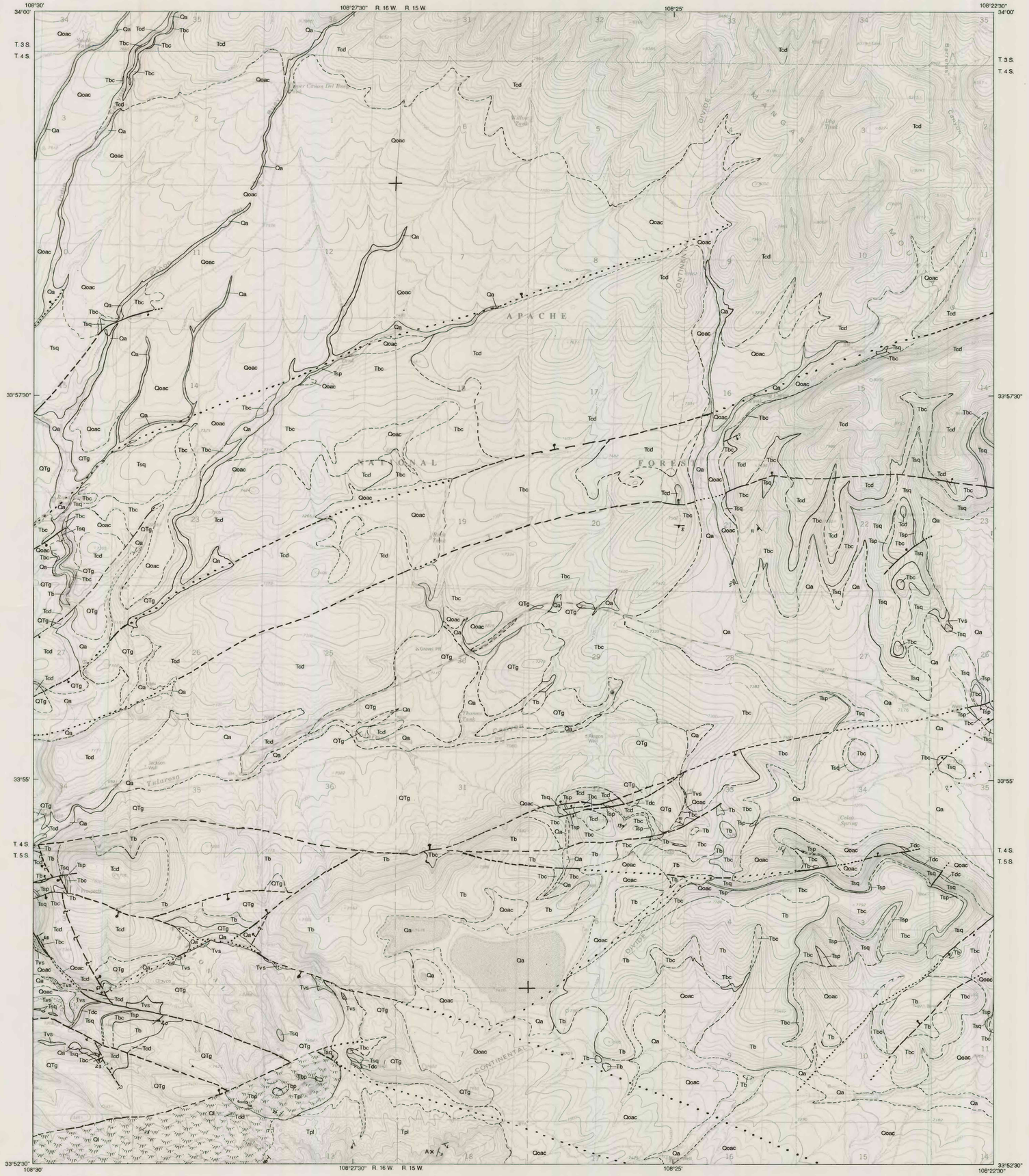
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

OPEN-FILE REPORT OF 92-0187
SHEET 1 OF 1



Mapped edited, and published by the Geological Survey

Geology mapped in 1989 and 1991

SCALE 1:24 000

1 MILE

1 KILOMETER

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

APPROXIMATE MEAN DECLINATION, 1992

NEW MEXICO

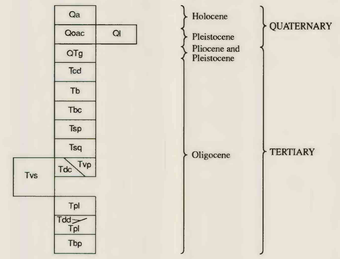
PRELIMINARY GEOLOGIC MAP OF THE TULAROSA CANYON QUADRANGLE, CATRON COUNTY, NEW MEXICO

By

James C. Ratté

1992

CORRELATION OF MAP UNITS



SYMBOLS

Contact--Dashed where approximately located or inferred

Fault, showing dip--Dashed where approximately located or inferred; dotted where concealed; ball and bar on downthrown side; queries indicate fault is uncertain

Strike and dip of bedding in sedimentary rocks

Inclined

Horizontal

Strike and dip of flow layers in volcanic rocks

Inclined

Vertical

Landslide or slump scarp

Pattern indicates slumped or landslide bedrock, as identified by letter symbols in parentheses

A× **Agate ledge locality in sec. 18, T. 5 S., R. 15 W.**

DESCRIPTION OF MAP UNITS

Qa **Alluvium (Quaternary)**--Mainly Holocene alluvium along major drainages, and sheetwash alluvium in poorly drained areas such as the dry "lakes" in south-central part of quadrangle; may include colluvium, which grades into alluvium at base of most slopes; 0 to a few meters thick

Qoac **Older colluvium, alluvial fans, and pediment deposits (Quaternary)**--Broad, dissected alluvial fans, as at the edge of the Mangas Mountains in the northern part of the quadrangle, and at its southeastern edge; locally grade into pediments, as in sec. 14, T. 4 S., R. 16 W., where a pediment surface bevels Bloodgood Canyon Tuff and Squirrel Springs Canyon Andesite

Ql **Landslide deposits (Quaternary?)**--Slumped and rotated bedrock in southwest corner of quadrangle. Rocks involved are mainly Pueblo Creek Formation, (volcaniclastic conglomerate, Tpc, and andesite of Dry Leggett Canyon, Tpl), and densely welded pink, ash-flow tuff tentatively correlated with the tuff of Bishop Peak, Tbp, (Finnell, unpublished geologic mapping of Underwood Lake quadrangle). Within the landslide area, mapped stratigraphic units are shown with an overprinted landslide pattern and a symbol in parentheses that identifies the slumped rocks

QTg **Gila Group (Oligocene? to Pleistocene?)**--Typical volcaniclastic conglomerate and sandstone, as exposed overlying Bloodgood Canyon Tuff in cuts along State Highway NM-12 west of Continental Divide; however, Gila Group as mapped in southwest corner of quadrangle consists of poorly exposed, coarse debris-flow deposits that are seen mainly as heterolithic float capping drainage interfluves. Clasts in debris flows may be as large as 1-2 m in diameter. Caliche cemented breccia is a common facies that in some places may represent talus along fault scarps, as in northeast corner of sec. 10, T. 5 S., R. 16 W.

Tcd **Bearwallow Mountain Andesite (Oligocene)**
Canon del Buey member--Mainly gray, porphyritic trachyandesite lava flows, probably derived from volcanic center(s) in the Mangas Mountains north and east of the Tularosa Canyon quadrangle, where a sample from Mangas Mountain has given a whole rock conventional potassium argon age of 25.5 Ma (H.H. Mehnert, written communication, 1991). Typical flows in northern part of quadrangle contain about 5 percent mafic phenocrysts of olivine and light-green clinopyroxene in subequal amounts, in distinctive clusters ~1-5 mm across. Also unique compared to most other Bearwallow Mountain Andesite lavas are hornblende- and biotite-bearing flows, which are prevalent in the west-central part of the quadrangle, as at the NM-12 State Highway bridge across Canon del Buey. In the northeast corner of sec. 10, T. 4 S., R. 16 W., the hornblende and biotite-bearing flows contain abundant small crustal xenoliths, a few cm across, that include granitic and gabbroic types, hornblende diorite(?) and pyroxenite. Maximum thickness in northeast part of quadrangle about 200 m

Tb **Bearwallow Mountain Andesite, undivided**--Flows of Canon del Buey member are locally underlain by fine-grained, iddingsitic andesite to basaltic andesite flows that more closely resemble typical Bearwallow Mountain flows elsewhere. Some or all of these flows may have come from sources of Bearwallow Mountain Andesite to the south or east, rather than from the Mangas Mountain source area

Tbc **Bloodgood Canyon Tuff (Oligocene)**--Generally light-gray, partially welded to densely welded, 28 Ma (McIntosh and others, 1990), rhyolite ash-flow tuff with 10-20 percent phenocrysts of quartz and sanidine; distal outflow sheet from Bursum caldera in Mogollon Mountains, about 50 km to the south (Ratté and others, 1984). Maximum thickness about 60 m in southern part of quadrangle; thins northward

Tsp **Shelley Peak Tuff (Oligocene)**--Brick-red to pink, phenocryst-rich, densely welded, 28.1 Ma (McIntosh and others, 1990) dacitic ash-flow tuff with phenocrysts of plagioclase, biotite, and green pyroxene; distal outflow sheet from Mogollon Mountains caldera cluster to south; as much as 20 m thick in southern half of quadrangle; pinches out to north

Tsq **Squirrel Springs Canyon Andesite (Oligocene)**--Gray, coarsely porphyritic, plagioclase phyric, basaltic andesite; 1-2 cm plagioclase crystals commonly aligned in flow structures; 60-70 m thick

Tvs **Volcaniclastic sandstone (Oligocene)**--Buff, crossbedded sandstone; 0-60 m thick

Tdc\Tvp **Davis Canyon Tuff, Tdc (Oligocene)**--Thin, light-gray, phenocryst-poor, 29 Ma (McIntosh and others, 1990), rhyolite ash-flow tuff, observed only locally beneath Squirrel Springs Canyon Andesite in southern half of quadrangle. Between faults in northeast corner of sec. 10, T. 5 S., R. 16 W., in southwest corner of quadrangle, map unit includes light-gray, phenocryst-poor Vicks Peak Tuff, Tvp, which overlies Davis Canyon Tuff; their combined thickness is less than 20 m; the two tuffs are separated by a few meters of buff to pink volcaniclastic sandstone
Pueblo Creek Formation (Oligocene)--Largely volcaniclastic rocks with interlayered andesitic lava flows (Ratté, 1989); approximately equivalent to Spears Formation of Osburn and Chapin (1983)

Tpl **Andesite of Dry Leggett Canyon**--Gray to reddish-brown, plagioclase phyric lava flows, with sparse black pyroxene phenocrysts; present only in landslide area in southwestern part of quadrangle. Landslide source is Wagontongue Mountain in John Kerr Peak quadrangle to south

Tpc **Volcaniclastic conglomerate**--Red, gray, green, brown round-pebble conglomerate; same as round-pebble and boulder conglomerate beneath andesite of Dry Leggett Canyon in type locality in Bull Basin quadrangle (Ratté, 1989), where round-boulder conglomerate has been considered to be transitional to, if not part of, Eocene-age Baca Formation (S.M. Cather, oral communication, 1989). Conglomerate in Tularosa Canyon quadrangle, as in Bull Basin quadrangle, contains rounded pebbles to boulders of fossiliferous Paleozoic limestone and red, Precambrian granitic gneiss. Locally contains layers of bluish agate as much as 20 cm thick, as in conspicuous landslide scar in sec. 18, T. 5 S., R. 15 W., locality A, near south edge of quadrangle. About 150 m thick in Tularosa Canyon quadrangle

Tdd **Hornblende dacite dike (Oligocene)**--2-3 m wide dike cuts volcaniclastic conglomerate (Tpc) within landslide area in southwestern corner of quadrangle; greenish-black hornblende crystals as much as 1/2 cm long

Tbp **Tuff of Bishop Peak? (Oligocene)**--Generally pink to red, eutaxitic, densely welded, locally lithophysal, rhyolitic ash-flow tuff; contains about 10 percent phenocrysts, mainly plagioclase, sanidine and biotite, and minor brown hornblende, opaque oxide, zircon and tiny clinopyroxene; sparse lithic fragments; about 10 m maximum thickness in jumbled exposures within landslide area in southwest corner of quadrangle

NOTE

The Tularosa Canyon quadrangle is near the northwest margin of the Mogollon-Datil volcanic field, in the transition zone between the Colorado Plateau and the Rio Grande rift part of the southwestern Basin and Range province. Distal remnants of some caldera-related, regional, ash-flow tuff outflow sheets from the eruptive centers in the interior Mogollon-Datil field are present here, but are largely buried by post-caldera volcanic rocks such as the Bearwallow Mountain Andesite.

The Tularosa Canyon quadrangle is along the northeast projection of the N35E Reserve graben (Crews, 1990), which is part of the proposed Morenci-Reserve fault zone (Ratté, 1989). Faults in the Tularosa Canyon quadrangle, however, trend more nearly east-west, + or - 20 degrees, raising doubts about the continuation of the N35E-trending structures farther to the northeast. Alternatively, the northeast structure may be offset eastward by the east-west faults in the Tularosa Canyon quadrangle and adjacent areas, or the Reserve graben and the east-west faults in this quadrangle are part of a fault system that does wrap around the central Mogollon-Datil volcanic field, as previously proposed by Elston and others (1976, p. 27). Within the quadrangle, the rocks are believed to form a half graben whose footwall near the southern edge of the quadrangle exposes the Pueblo Creek Formation, the oldest rocks in the quadrangle. A number of minor, steeply dipping, antithetic, and some synthetic, normal faults, which are the east-west faults that characterize this quadrangle, break the hanging wall slope between the Mangas Mountains in the northern part of the Tularosa Canyon quadrangle and the footwall near the southern edge of the quadrangle.

MINERAL PROSPECTS

Several prospects, consisting of bulldozer cuts, are present near the western edge of the quadrangle, east of New Mexico State Highway 12, in secs. 2 and 3, T. 5 S., R. 16 W. According to information provided by the U.S. Forest Service at Reserve, New Mexico, the prospects were part of a uranium exploration effort in the 1960's. The ridge top prospects are in thin, poorly consolidated gravels that may be unmapped remnants of Gila Group gravels, QTg, which have little potential for uranium mineralization in this region. However, no samples were collected nor was a radioactivity survey made during this study.

REFERENCES CITED

Crews, S.G., 1990, Structure, syntectonic sedimentation, and stratigraphy of asymmetrical non-marine basins: Laramie, University of Wyoming, Ph.D. dissertation, 196 p.

Elston, W.E., Rhodes, R.C., Coney, P.J., and Deal, E.G., 1976, Progress report on the Mogollon plateau volcanic field, southwestern New Mexico, No. 3 - Surface expression of a pluton: New Mexico Geological Society special publication no. 5, p. 3-28.

McIntosh, W.C., Sutter, J.F., Chapin, C.E., and Kedzie, L.L., 1990, High-precision $^{40}Ar/^{39}Ar$ sanidine geochronology of ignimbrites in the Mogollon-Datil volcanic field, southwestern New Mexico: Bulletin of Volcanology, v. 52, p. 584-601.

Osburn, G.R., and Chapin, C.E., 1983, Nomenclature for Cenozoic rocks of northeast Mogollon-Datil volcanic field, New Mexico: New Mexico Bureau of Mines and Mineral Resources, Stratigraphic Chart 1.

Ratté, J.C., 1989, Geologic Map of the Bull Basin quadrangle, Catron County, New Mexico: U.S. Geological Survey Geologic Quadrangle Map GQ-1651, scale 1:24,000.

Ratté, J.C., Marvin, R.F., and Naeser, C.W., 1984, Calderas and ash-flow tuffs of the Mogollon Mountains, southwestern New Mexico: Journal of Geophysical Research, v. 89, no. B10, p. 8713-8732.

This map is preliminary and has not been reviewed for conformity with U. S. Geological Survey editorial standards nor with the North American stratigraphic code.