

Geologic Map of the Bay Buck Peaks 7.5-Minute Quadrangle, Socorro County, New Mexico

By

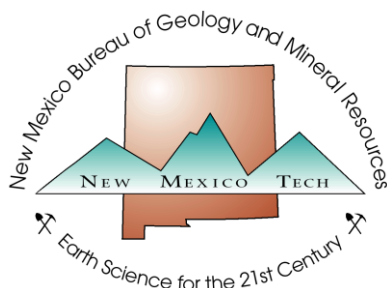
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Open-file Digital Geologic Map OF-GM 147

Scale 1:24,000

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Bay Buck Peaks Quadrangle
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The Bay Buck Peaks Quadrangle lies on the western slope of the San Mateo Mountains, Socorro County New Mexico. Exposures consist entirely of Tertiary Volcanic and volcanoclastic rocks of Oligocene and Miocene age. Quaternary and possibly latest Tertiary alluvial deposits occupy valley floors, piedmont slopes and form slope cover over a small part of the quadrangle.

The volcanic geology of the quadrangle is dominated by two cauldrons of Oligocene age, the Mount Withington Cauldron source of the South Canyon Tuff and the Bear Trap Canyon Cauldron which erupted the Tuff of Turkey Springs. The Bay Buck Peaks quadrangle lies entirely within the Mount Withington Cauldron whose rocks are exposed in the northern third of the map. These rocks have been dropped deep into the subsurface in the southern two thirds of the quadrangle by the younger Bear Trap Canyon Cauldron. The Bear Trap Cauldron rocks forms the obvious bulls-eye pattern which dominates the map. Large exposures of the intracauldron Tuff of Turkey Springs (Tt) are broken by a north-trending apical graben and buried and surrounded by poorly welded pyroclastics and sediments (Tbt).

Quaternary Deposits

- Qv** **Valley Alluvium (Holocene – Late Pleistocene)** – Valley bottom alluvium including active alluvium and low terraces incised less than 3m.
- Qf** **Alluvial fans (Holocene – Late Pleistocene)** – Discrete fans and coalesced fans which overlap and merge locally with valley (**Qv**) and terraced alluvium (**Qt**).

- Qtc Talus and Colluvium (Holocene – Late Pleistocene)** – Slope colluvium and talus shown only in areas of extensive cover or in areas where critical bedrock relationships are concealed.
- Qt Terrace surfaces (Holocene – Late Pleistocene)** – The upper, soil-modified surface of alluvial terraces incised more than 3m above active alluvial deposits.
- Qp1 Piedmont alluvium younger (Pleistocene - Pliocene)** - Poorly to moderately consolidated sandstone and conglomerate comprising the main mass of piedmont alluvium throughout the map area. Two main levels of piedmont surfaces exist in the area. Qp1 the younger is inset against the older.
- Qp2 Piedmont alluvium older and higher (Pleistocene - Pliocene)** - Poorly to moderately consolidated sandstone and conglomerate comprising the main mass of piedmont alluvium throughout the map area. This, the highest piedmont level in the area often caps higher ridges. A few areas consist of beveled bedrock surfaces which were mapped as bedrock.

Tertiary Deposits

- Tbt Beartrap Canyon Formation (Miocene)** – Fill of the Bear Trap Canyon Cauldron. Volcaniclastic sandstone, conglomerate with abundant, complexly interleaved, mostly poorly welded felsic pyroclastic rocks. Medium- to thick-bedded sandstone, pebbly sandstone, and pebble-cobble-boulder conglomerate is locally matrix-supported and/or clast-supported. Some sandstone intervals that display moderate to high-angle, thick-bedded cross-stratified sets suggestive of eolian deposition. Unwelded tuffs dominate near rhyolite domes and flows and grade laterally to more sediment-rich intervals. Beartrap Canyon Formation is lithologically very similar to the Miocene – Oligocene unit of East Red Canyon as exposed to the south and east.
- Tbr Beartrap Canyon Formation, phenocryst-poor rhyolite lava and lava domes (Miocene)** – Rhyolite lava and hypabyssal rhyolite containing less than ~10% phenocrysts of feldspar, biotite, \pm quartz.
- Tbrx Beartrap Canyon Formation phenocryst-rich rhyolite lava and lava domes (Miocene)** – Rhyolite lava and hypabyssal rhyolite containing greater than ~10% phenocrysts of quartz, feldspar, and biotite.
- Tbd Beartrap Canyon Formation dacitic to andesitic dikes and intrusions (Miocene)** – Andesite to dacite lavas and intrusions containing 5 to 25% large phenocrysts of plagioclase, biotite and hornblende.

- Tts Turkey Springs Tuff (Miocene)** – Welded to non-welded rhyolite ash-flow tuff containing 2-30% quartz-feldspar phenocrysts with biotite. Phenocryst content increases up-section. The tuff is typically light gray to pink. Erupted from Bear Trap Canyon Cauldron. Base not seen within the quadrangle.
- Ttb Turkey Springs Breccia (Miocene)** – Mostly non-welded rhyolite ash-flow tuff with abundant zones of mesobreccia and megabreccia (blocks South Canyon Tuff and minor rhyolite lava). In these exposures blocks (mostly South Canyon Tuff) so dominate that the tuff matrix is hard to identify. Turkey Springs Tuff often forms vitrophyric margin against the breccia exposures. Confined in this quadrangle to east central part of quadrangle adjacent the Northeastern caldera margin. Believed to represent rockfall and landslides which cascaded into cauldron during the eruption. Difficult to delineate accurately since most blocks are South Canyon which is “very” difficult to distinguish from Turkey Springs.
- Te Unit of East Red Canyon (Miocene - Oligocene)** – Unit of East Red Canyon represents the caldera fill of the Mount Withington Cauldron (**cross sections only**). It is represented in this quadrangle only by a rhyolite and dacite intrusive complex near Baney Park in the Northwest quadrant of the map. Other lithologies are presumed to underly Tuff of Turkey at depth within the cauldron.
- Ter East Red rhyolite intrusion (Miocene - Oligocene)** - Rhyolite lava and hypabyssal rhyolite containing less than ~10% phenocrysts of feldspar, biotite, ± quartz. Intrusive into and interlayered with upper members of South Canyon Tuff. Also complexly intermixed with East Red dacite lavas (Ted).
- Ted East Red dacite (Miocene – Oligocene)** – Dark purple dacite lavas and intrusions containing 5 to 20 percent large plagioclase phenocrysts. Occurs as complex intermixed zones within Ter and as discrete dikes and small stocks throughout the South Canyon Tuff exposures in northern third of the quadrangle
- Trm Rhyolite (Oligocene)** – Feldspar phenocryst-poor rhyolite that intrudes South Canyon Tuff and is overlain by Turkey Springs Tuff.
- Tsc South Canyon Tuff (Oligocene)** – Phenocryst-poor to phenocryst-rich quartz-feldspar-biotite, mostly welded ash-flow tuff. Phenocryst content increases up-section. Subdivided into lower (**Tsc1** (<15% phenocrysts) and upper **Tscu** > 15% phenocrysts) where thickness allows. In thicker exposures 5 units are mapped. From bottom to top these are **Tsc1** - base to ~8% phenocryst, **Tsc2** - eight to 15% phenocryst, **Tsc3** - 15% until first occurrence of deep red quartz-poor pumice, **Tsc4** - from first deep red quartz-poor pumice to base of **Tsc5** which remains phenocryst rich but no longer contains quartz. Some intervals are virtually identical to the Turkey Springs Tuff, such that it is sometimes impossible

to determine which unit is which without stratigraphic context or high-precision geochronology.