Geologic Map of the Arroyo Hondo Quadrangle, Taos County, New Mexico

By

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New Mexico Bureau of Geology and Mineral Resources
Open-file Digital Geologic Map OF-GM 116

Scale 1:24,000

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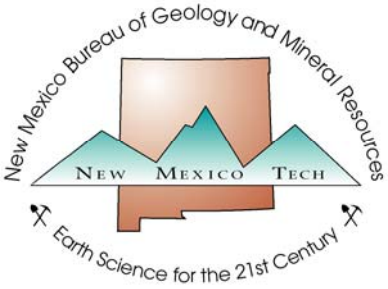

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Unit Descriptions for Arroyo Hondo, NM Quadrangle
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Surficial Deposits

Qal **Stream channel and valley-floor alluvium, and active floodplains (Holocene)** - poorly to well-sorted, poorly sorted sand, pebbles, and boulders; clasts of granitic, metamorphic, volcanic, and sandstone rock types; clasts along Rio Hondo dominated by granitic rock types, quartzite and basalt; clasts along tributaries draining the western side of the Rio Grande dominated by volcanic rock types.

Qc **Colluvial mantle on slopes, undifferentiated (middle Pleistocene to Holocene)** - poorly-sorted sand, pebbles and boulders; prevalent along bases of mountain-front facets; in northwestern part of quadrangle (west of Rio Grande), thin mantle overlying volcanic bedrock.

Qls **Landslide deposit (late Pleistocene to Holocene)** - poorly sorted sand to boulders, includes large rotational slide blocks within the Rio Grande gorge, which include large, rotated and detached beds of Servilleta Basalt (Tb)

Qfy Qty: **Young alluvial-fan and stream terrace deposits (latest Pleistocene to Holocene)** - poorly sorted silt, sand, pebbles, cobbles, and boulders; clasts primarily of quartzite, schist, granite, and volcanic rock types; associated soils have stage I calcium carbonate development; includes unit Qt8 of Kelson (1986).

Qt7 **Stream terrace deposits (early to middle Holocene)** - poorly sorted silt, sand, pebbles, cobbles, and boulders; clasts primarily of quartzite, schist, granite, and volcanic rock types; associated soils have stage I calcium carbonate development.

Qt6 **Stream terrace deposits (latest Pleistocene)** - poorly sorted silt, sand, pebbles, cobbles, and boulders; clasts primarily of quartzite, schist, granite, and volcanic rock types; associated soils have stage I to II calcium carbonate development.

Qt5 **Stream terrace deposits (late Pleistocene)** - poorly sorted silt, sand, pebbles, cobbles, and boulders; clasts primarily of quartzite, schist, granite, and volcanic rock types; associated soils have stage II to III calcium carbonate development.

Qt4 **Stream terrace deposits (middle to late Pleistocene)** - poorly sorted silt, sand, pebbles, cobbles, and boulders; clasts primarily of quartzite, schist, granite, and volcanic rock types; associated soils have stage III calcium carbonate development, argillic Bt soil horizons and 10YR to 7.5YR hues in Bt horizons.

Qt3 Stream terrace deposits (middle to late Pleistocene) - poorly sorted silt, sand, pebbles, cobbles, and boulders; clasts primarily of quartzite, schist, granite, and volcanic rock types; associated soils have stage III calcium carbonate development, argillic Bt soil horizons and 10YR to 7.5YR hues in Bt horizons.

Qfu **Undifferentiated alluvial fan deposits (middle to late Pleistocene)** - probably correlative with stream units Qt2 through Qt6; poorly sorted silt, sand, pebbles, and cobbles; not correlated to other fan units because of lack of well-defined age control, clear stratigraphic position, and distinct lithologic characteristics.

Qt2 **Stream terrace deposits (middle Pleistocene)** -poorly sorted silt, sand, pebbles, cobbles, and boulders; clasts primarily of quartzite, schist, granite, and volcanic rock types; associated soils have stage III to IV calcium carbonate development; associated soils have stage III to IV calcium carbonate development, thick argillic Bt soil horizons, and 7.5YR to 10YR hues in soil Bt horizons; upper soil horizons locally affected by surface erosion.

Qt2rg **Stream terrace deposits flanking Rio Grande (middle Pleistocene)** - poorly sorted silt, sand, pebbles, and boulders; clasts primarily of granitic, metamorphic, intermediate volcanic, basalt, and sedimentary rocks; locally may contain clasts of Tertiary Amalia Tuff; associated soils have stage III

to IV calcium carbonate development, thick argillic Bt soil horizons, and 7.5YR to 10YR hues in soil Bt horizons; upper soil horizons locally affected by surface erosion; may be mantled locally by unit Qe; possibly faulted along the Dunn fault.

Qf1 **Alluvial fan deposits (middle Pleistocene)** - poorly sorted silt, sand, and rare pebbles; clasts primarily of granitic, intermediate volcanic, basalt, and metamorphic rock types; stage III and IV calcium carbonate development where preserved, although soil horizons are commonly affected by surface erosion; correlative with Unit Q1p of Kelson (1986); ash probably within Qf1 deposits at locality on Ranchos de Taos quadrangle near Stakeout Road dated at 1.27 0.02 Ma (40Ar-39Ar method, W. McIntosh, personal communication, 1996); deposit is more than 5 m thick in northeastern part of quadrangle, and is thinner from northeast to southwest; differentiated from unit QTbh by larger clast size (Kelson, 1986), less oxidation, poor sorting, absence of abundant manganese oxide staining, and clasts that are less weathered.

Qt1rg **Stream terrace deposits flanking Rio Grande (middle Pleistocene)** - poorly sorted silt, sand, pebbles, and boulders; clasts of basalt, quartzite, slate, schist, other metamorphic rock types, volcanic rock types, and (rarely) sandstone and limestone; locally may contain clasts of Tertiary Amalia Tuff; where preserved, associated relict soils have stage III to IV calcium carbonate development, thick argillic Bt soil horizons, and 7.5YR hues in soil Bt horizons; upper soil horizons commonly affected by surface erosion; may be mantled locally by unit Qe.

QTrg **Stream gravel deposited by ancestral Rio Grande (late Tertiary? to middle? Pleistocene)** - poorly sorted sand, pebbles, and cobbles; clasts of basalt, quartzite, slate, schist, other metamorphic rock types, and volcanic rock types; very rare Amalia Tuff clasts; associated with broad, highest terrace west of Rio Grande; upper soil horizons commonly affected by surface erosion; locally mantled by eolian sand.

QTg **Old alluvium (late Tertiary? to middle? Pleistocene)** - poorly sorted sand, pebbles, and cobbles; clasts of basalt, quartzite, slate, schist, other metamorphic rock types, and volcanic rock types; locally high percentage of angular to subangular quartzite pebbles and cobbles; may be correlative with Blueberry Hill deposit; present along piedmont between Sangre de Cristo range front and Rio Grand gorge north of Rio Hondo; correlative with Lama Formation of Lambert (1966); contains ash layer in roadcut near Cerro Negro (UTM 439989, 4044603)

QTbh **Blueberry Hill deposit (late Tertiary? to middle Pleistocene)** - poorly sorted silt, sand and pebbles; commonly cross-bedded, and stained with black manganese oxide and yellowish-orange iron oxide coatings; oxidized; clasts are weathered or grussified; contains distinct discontinuous sandy interbeds; clasts are granitic rock types, quartzite, metamorphic rock types, and volcanic rock types; commonly crudely imbricated; imbrication suggests westerly flow direction in area north of Taos Municipal Airport; based on exposures at southwestern end of Blueberry Hill, thickness exceeds 25 m; may be considerably more; deposit may interfinger with unit QTg and QTrg; correlative with “Basin Fill deposit” of Kelson (1986).

Tertiary Rocks

Tb **Servilleta Formation, basalt (Pliocene)** -Dark-gray, diktytaxitic olivine tholeiite that forms thin, fluid, widespread pahoehoe basalt flows of the Taos Plateau volcanic field. These flows commonly form columnar-jointed cliffs in the Rio Grande Gorge. Tabular plagioclase and sparse olivine are the only phenocrysts. Individual flows, which are up to 12 m thick, are grouped into packages of from one to ten flows (Peterson 1985; Dungan et al., 1984). These packages are separated by sedimentary intervals that are as much as 5 thick in southern part of quadrangle, but as much as 180 m thick in northern part of quadrangle (Leininger, 1982). Five central volcanic vents to the north are sources for the Servilleta Formation (Lipman and Mehnert, 1979). 40Ar/39Ar ages from basalts exposed in the Rio Grande gorge range in age from 4.81 +/- 0.03 Ma for the lowest basalt near the Gorge Bridge, to 3.12 +/_ 0.13 Ma for the highest basalt flow at the Gorge Bridge (Appelt, 1998).

Tg **Servilleta Formation, interbasalt gravel (Pliocene)** - Sedimentary intervals between basalt flow members (Leininger, 1982), as much as 180 m thick in northern part of quadrangle, as exposed in the Rio Grande and Rio San Cristobal gorges.

Tv **Intermediate volcanic rocks (Pliocene)** - undifferentiated