

Geologic Map of the Hatch Quadrangle, Doña County, New Mexico

By

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Scale 1:24,000

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Hatch Map Unit Descriptions

Quaternary

Qvy: Younger, valley-fill alluvium—Arroyo, fan, and terrace deposits (from boulder gravel to silt-clay), associated with surfaces graded to or within a few feet of the modern Rio Grande floodplain. As much as 40ft (12m) thick.

Qvyf: Younger valley-fill, fluvial facies—Rio Grande floodplain and channel deposits (mostly gravel, sand, and clay); as much as 70ft (21m) thick.

Qvo: Older valley-fill alluvium—Arroyo, fan, and terrace deposits, and erosion-surface veneers (from boulder gravel to silt-clay), associated with graded surfaces formed during at least three major episodes of valley entrenchment and partial back-filling. Pedogenic carbonate cements the uppermost part of the deposits, especially the older (higher) ones. As much as 66ft (20m) thick.

Qvof: Older valley-fill, fluvial facies—River channel and floodplain deposits (sand to cobble gravel with lesser silt-clay), as much as 180ft (55m) above the modern river floodplain; unit interfingers with **Qvo** deposits; as much as 50ft (15m) thick.

Qvou: Intertonguing Qvo and Qvof

Qva: Undifferentiated Qvo and Qvy

Qcg: Camp Rice Formation, upper piedmont-slope facies—Boulder to pebble conglomerate and gravel with stage IV pedogenic carbonate as much as 3ft (1m) thick at the top. Unit is 65ft (20m) or more thick near mountain fronts, thinning basinward.

QTc: Camp Rice Formation, undifferentiated—Cross-sections only.

QTcf: Camp Rice Formation, fluvial and associated facies—Light-gray, yellow, and pink to tan sand, sandstone, gravel, conglomerate, conglomeritic sandstone and mudstone representing fluvial channel and overbank deposits of the ancestral Rio Grande, as well as adjacent alluvial flat and eolian environments. Tongues of piedmont-slope conglomerate are interbedded locally with the unit. As much as 300ft (91m) thick.

QTcc: Camp Rice Formation, piedmont-slope conglomerate—Well- to moderately – cemented, tan to reddish-brown, boulder to cobble-pebble conglomerate and conglomeritic sandstone; derived from Red House Mountain and Sierra de las Uvas; intertongues with **QTcf** downslope and is gradational upward into **Qcg** upslope; unconformable with underlying formations. At least 150ft (48m) thick.

QTcu: Camp Rice Formation, Qcg and QTcc undifferentiated—300ft (91m) or more thick.

Tertiary

Lower Santa Fe Group, Rincon Valley Formation, Hayner Ranch Formation, Thurman Formation (description of individual units listed below)

Trvc: Rincon Valley Formation, conglomerate Facies—Reddish-brown to tan conglomerate, conglomeritic sandstone, and mudstone; boulder- to cobble-sized clasts are predominantly Paleozoic limestone, sandstone, and siltstone adjacent to the Caballo Mountains and Tertiary volcanic rocks adjacent to the Sierra de las Uvas. Strata represent “early rift” alluvial fan deposits derived from ancestral Caballo Mountains as well as from uplifts east of the Sierra de las Uvas. Unit intertongues with playa and alluvial-flat sediments, **Trv**. At least 2,000ft (610m) thick.

Trv: Rincon Valley Formation, siltstone-mudstone facies—Pale-red claystone, mudstone, and siltstone, gypsiferous over broad areas. Strata formed on alluvial flats or playas on “early rift” basin floors. Unit intertongues with or grades into **Trvc**. At least 2,000ft (610m) thick.

Thr: Hayner Ranch Formation—Dark-gray to tan conglomerate, conglomeritic sandstone, and mudstone containing mostly boulder- to cobble-sized clasts of **Tu** and Bell Top ash-flow tuff; unit unconformably overlies Thurman Formation or Uvas Basaltic Andesite, and is both conformable and unconformably overlain in different areas by Rincon Valley Formation. Strata represent “early rift” alluvial fans derived from ancestral Caballo uplift, as well as paleocanyon fill that was deposited on the hanging wall dip slope of the Rincon basin. At least 1,400ft (427m) thick.

Tt: Thurman Formation—White to light-tan to light-gray, parallel-bedded, tuffaceous sandstone and interbedded, pale-red to pale-tan mudstone; interpreted to be distal parts of alluvial aprons adjacent to rhyolitic volcanic center; unit intertongues downward with Uvas Basaltic Andesite. As much as 1,300ft (396m) thick.

Tu: Uvas Basaltic Andesite—Gray to black vesicular basaltic andesite flows containing at least two tongues of Thurman sandstone. Conformably overlain by Thurman Formation in footwall of West Rincon Hills fault but unconformably overlain by Hayner Ranch Formation in the Hatch uplift. Approximately 400ft (122m) thick.

Tbt: Bell Top Formation, undifferentiated—Cross-sections only.

Tbt7: Bell Top Formation, ash-flow tuff 7—Fine-grained, gray vitric ash-flow tuff; very discontinuous and local in distribution; 3-10ft (1-3m) thick.

Tbc: Bell Top Formation, conglomerate member—Reddish-brown to tan conglomerate, conglomeritic sandstone and sandstone interbedded with white tuffaceous sandstone, and pale-red mudstone; derived from Kneeling Nun Tuff and Palm Park Formation, as well as Love Ranch Formation; ash-flow **Tbt6** occurs near the middle of the unit. Shifting alluvial fan, basin floor, and distal volcanic piedmont-slope environments are represented. Approximately 425ft (130m) thick.

Tbt6: Bell Top Formation, ash-flow tuff 6—Grayish-orange, crystal ash-flow tuff; moderately welded; interbedded with **Tbc**. Approximately 35ft (10m) thick.

Tbt5: Bell Top Formation, ash-flow tuff 5—Light-gray, moderately-welded, crystal-rich ash-flow tuff containing conspicuous white pumice lumps and dipyrimidial quartz. Approximately 55ft (17m) thick.

Tpp: Palm Park Formation—Purple, gray, red, and green sandstone, mudstone, and laharic breccia; upper $\frac{3}{4}$ of the formation is exposed in Palm Park in hanging wall of Palm fault. At least 1,500ft (457m) thick.

Tlr: Love Ranch Formation—Red and grayish-red conglomerate and conglomeratic sandstone containing abundant boulder- and cobble-sized clasts of Paleozoic limestone and Precambrian granite; only 20ft (6m) of formation is exposed in hanging wall of Palm fault.

Permian

Pz: Paleozoic rocks, undifferentiated—Cross-sections only.

Pa: Abo Formation—Red, cross-bedded sandstone and siltstone. Only 50ft (15m) exposed in hanging wall of the Palm fault.

Pennsylvanian

IP: Magdalena Group—Basal Red House Formation consists of basal white chert breccia, gray to green shale, thin- to medium-bedded limestone, and tan sandstone or quartzite, which grades up into medial Nakaye Formation. This unit includes medium- to thick-bedded, fossiliferous, burrowed, gray cherty limestone and interbedded shale conformably overlain by Bar B Formation. Thick shale units with interbedded, burrowed, fossiliferous limestone beds and limestone or chert pebble conglomerate comprise the Bar B. Exposed only in the footwall of the Palm fault (Red House Mountain). Approximately 910ft (277m) thick.

Mississippian

M: Lake Valley Formation—Basal Andrecito Member 3ft, (1m) thick is thin-bedded limestone and interbedded shale, followed by cliff-forming, cherty Alamogordo Member 20ft (6m) thick. Unconformably overlain by Red House Formation. Total thickness approximately 23ft (7m).

Devonian

Dp: Percha Shale—Greenish-gray to black micaceous shale in the lower part grading in the uppermost 32 ft (10 m) into brown micaceous siltstone. Maximum thickness is 236ft (72m) but varies considerably due to pre-Magdalena erosion.

Silurian

Sf: Fusselman Dolomite—Tan to gray, coarse-grained dolomite. Generally silicified and mineralized with fluorite and barite in only exposure in footwall of the Palm fault. At least 50ft (15m) thick.

Precambrian

pC: Precambrian rocks, undifferentiated—Cross-sections only.