

Geologic Map of the Upham Quadrangle, Sierra County, New Mexico

By

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Open-file Digital Geologic Map OF-GM 205

Scale 1:24,000

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Unit Descriptions for the Upham quadrangle

Quaternary

Qpy: Younger piedmont-slope alluvium—Sand, gravel, silt, and clay of modern, shallowly incised drainageways, and thin sand and gravel veneers mantling broad pediments. As much as 20ft (6m) thick.

Qpo: Older piedmont-slope alluvium—Gravel and gravelly sand deposits of alluvial fans that are intermediate in geomorphic position between higher Palomas (**Qpg**) fans and lower (**Qpy**) arroyo alluvium. Upper part of **Qpo** deposits are cemented by pedogenic carbonate that represents stage II to stage IV carbonate accumulation. As much as 25ft (7m) thick.

Qpa: Qpy and Qpo, undifferentiated.

Qc: Slope colluvium—Generally correlative with **Qpy** but some may be as old as **Qpo**. As much as 3ft (1m) thick.

Qpg: Palomas Formation, piedmont-slope deposits—Boulder to cobble conglomerate, gravel, and sandy-gravel of both high-level alluvial fans and erosion surface veneers. Upper beds are generally indurated by stage IV caliche. Unit forms relatively undissected alluvial fans as well as mesa-capping erosional remnants of fans or pediment veneers. As much as 20ft (6m) thick.

Tertiary

Tpp: Palm Park Formation—Only lower few feet (10m) of gray to purplish-gray, tuffaceous, soft, volcanoclastic sandstone is exposed in the southeastern part of the Upham quadrangle. Unit may be as much as 1,800ft (550m) thick in adjacent quadrangles to the south and east.

Tlr: Love Ranch Formation—Finning upward sequence of red, gray, and purple conglomerate, conglomeratic sandstone, sandstone, and mudstone representing alluvial-fan and fluvial deposits in the Laramide Love Ranch basin. The formation documents progressive erosional unroofing of Cretaceous intermediate - and silicic - composition volcanic rocks, Mesozoic, and Paleozoic sedimentary rocks, and Precambrian granite from the Laramide Rio Grande uplift. At least one intraformational unconformity probably exists near the middle of the formation. In the Upham quadrangle the formation is approximately 2,600ft (796m) thick, but this does not include uppermost beds which are exposed to the east in the Prisor Hill quadrangle. Total thickness probably exceeds 3,000ft (914m).

Cretaceous

K: Km, Kt, Kdc, Kg and Kcl, undifferentiated.

Kmh: McRae Formation, Hall Lake Member—Purple to gray shale and mudstone with interbedded volcanoclastic sandstone and conglomeratic sandstone in lower half. Medial tongue of volcanic cobble to boulder conglomerate, and upper section of purple to gray volcanoclastic sandstone, conglomeratic sandstone, and mudstone containing conspicuous granitic detritus. Fluvial in origin, the formation also contains scattered dinosaur bone fragments. Zero to approximately 600ft (183m) thick in the Upham quadrangle, thinning, and pinching out to the southwest.

Kmj: McRae Formation, Jose Creek Member—Brown to dark-gray boulder conglomerate in channel-form lenses. Clasts are angular to sub-rounded, intermediate-composition volcanic and hypabyssal rocks ranging in size from 0.2 to 1m in diameter. Debris flow in origin. In Upham quad the unit is only exposed discontinuously in the hangingwall of the Yoast Draw fault. 20 ft (6m) thick or less.

Kca: Crevasse Canyon Formation, Ash Canyon Member—Predominantly tan, medium-grained, cross-bedded lithofeldspathic sandstone interbedded with lesser amounts of olive gray mudstone. Chert-pebble conglomerate lenses within sandstone beds are present locally, especially near the top of the unit. Local petrified wood. Approximately 1,200ft (365m) thick.

Kcat: Crevasse Canyon Formation—Tongues of Ash Canyon sandstone and conglomeratic sandstone within Kcl, each 30-50ft (9-15m) thick.

Kcl: Crevasse Canyon Formation, lower member—Crevasse Canyon Formation - Brown to tan to greenish-brown, fine- to medium-grained, lithofeldspathic sandstone in channel shaped and lenticular beds, intercalated with olive-gray shale and mudstone. At least 830ft (153m) thick.

Kg: Gallup Sandstone—Massive to cross-bedded cream to gray marine sandstone and minor marine shale, gradational downward into D-Cross Tongue of Mancos (**Kdc**). Approximately 110ft (33m) thick.

Kdc: D-Cross tongue of Mancos Shale—Dark gray, fissile marine shale with thin interbeds of fossiliferous sandstone. 60ft (18m) thick.

Kt: Tres Hermanos Formation, Lower Atarque Member—Consists of brown and greenish-brown fossiliferous, burrowed marine sandstone, followed upward by fluvial, brown sandstone, and olive-green mudstone of the Carthage Member, and capped by marine, brown, fossiliferous, burrowed sandstone of the Fite Ranch Member. Total thickness is approximately 328 to 348ft (100-106m).

Km: Mancos Shale—Not exposed or not identified in Upham quadrangle. In adjacent parts of Apache Gap quadrangle the Mancos consists of thin-bedded to fissile, fine, marine siltstone and shale with at least 5 ash beds, each 2 to 5in (6 to 12cm) thick. Total thickness is approximately 394ft (120m).

Kd: Dakota Sandstone—Lower yellow-brown, cross-bedded, fluvial, quartzose sandstone overlain by marine shale and marine, cross-bedded, quartzose sandstone gradational upward into Mancos Shale. Approximately 144 ft (44 m) thick.

Permian

Pyu: Upper Yeso Formation (sandstone-limestone member)—Only upper 50ft (15m) exposed in southwest corner of Upham quadrangle, consisting of medium- to light-gray limestone. Total thickness of Yeso, including both upper and lower parts and all four members described in McLeod Tank and Alivio quadrangles, is approximately 1,300ft (390m).