

Geologic Map of the Surveyors Canyon Quadrangle, Otero County, New Mexico

By

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*Open-file Digital Geologic Map OF-GM 161***

Scale 1:24,000

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El Paso Canyon, Rogers Ruins, and Surveyor's Canyon quadrangles, unit descriptions
Sean Long, July-August, 2006

Qal – Quaternary alluvium – poorly-sorted, subangular to subrounded, pebble- to boulder-sized clasts consisting mainly of locally-derived limestone, deposited by modern stream processes. Forms areas of flat topography adjacent to major streams and tributaries; generally unconsolidated, but locally poorly-consolidated with poorly-developed stratification, and a tan, silt-rich matrix; locally cemented by caliche into a hard conglomerate. Thickness variable, estimated at 30 ft (9 m) or less.

Qtg (or QTtg?) – Quaternary terrace gravel unit – pebble- to cobble-sized, with local boulders, moderately-sorted, subrounded clasts of locally-derived limestone; generally occurs as unconsolidated float, light-gray in color due to caliche coating on clasts; in rare exposures, gravels are poorly-stratified, matrix-supported, and have a tan, silt- and clay-rich matrix; locally well-consolidated by a caliche cement. Exposed in a large expanse in the southern Rogers Ruins quad and northernmost El Paso Canyon quad, at the Timberon town site; exposed in a north-trending canyon in the northeast part of the Surveyor's Canyon quad, and a small exposure is present in the southeast corner of the Surveyor's Canyon quad. Float of subrounded limestone clasts are found in many parts of the map area, well above the levels of modern streams, but were either too sparse or covered too small an area to map. Gravels in the Rogers Ruins quadrangle are present at elevations up to 500 feet higher than modern stream levels, and are deeply dissected, in some places down to bedrock. These gravels are interpreted to represent older fluvial deposits of the Sacramento River and its tributaries in the study area. At least 30 ft (6 m) thick at single exposures, but may be up to 100 ft (30 m) thick in the southern Rogers Ruins quadrangle.

Qaf (or QTaf?) – Quaternary alluvial fan gravel unit – subangular to subrounded, poorly-sorted, pebble- to cobble-sized clasts of San Andres limestone composition; most clasts are light gray to white due to caliche coating; no consolidated exposures were seen. Deeply dissected by modern streams; in many places eroded through to underlying bedrock. Qaf occupies area of subdued topography south of a northwest-trending ridge interpreted to be the uplifted footwall block of a normal fault; gravels pinch out at base of ridge, which coincides with position of drag folding of San Andres limestone; gravels are interpreted as alluvial fan deposits sourced from the footwall block of the normal fault when it was active; they have since been dissected by modern streams. Thickness up to 50 ft (15 m) at single exposures; however, may be up to ~200 ft (60 m) thick.

Ps – Permian San Andres limestone – fine-crystalline, medium- to thick-bedded limestone; medium to light gray or tan on weathered surfaces, medium gray on fresh surfaces; commonly fossiliferous, local fossil hash, locally rich in ammonites; local tan chert nodules and stringers. Limestone is locally interbedded with thin, tan, laminated siltstone and shale beds, local thin-bedded, silicified, tan dolomite beds, and local thick-bedded, white-weathering dolomite. One bed of medium-grained, well-sorted, rounded, thick-bedded, quartz sandstone is present ~50-100 ft (15-30 m) above the base of the unit, and serves as an important marker bed; sandstone bed is tan on weathered surfaces, tan to

white on fresh surfaces, locally cross-bedded, and is between 1 and 10 ft (30 cm to 3 m) thick. Where exposed, the lower contact with Yeso Formation is an abrupt transition from fine-grained tan to red sandstones and siltstones of the Yeso Formation to thick-bedded, medium-gray limestones of the San Andres. Upper contact not exposed in map area; thickness is estimated by Pray (1961) at 300-700 feet; however, a section possibly up to 1000 ft thick is exposed in the Surveyor's Canyon quadrangle (cross-section A-A').

Py – Permian Yeso Formation – interbedded siltstone, shale, limestone, sandstone and gypsum; siltstones and shales are very thin- to medium-bedded, and tan to red on fresh and weathered surfaces; limestones are thin- to medium-bedded, tan, light-gray, or white on weathered surfaces, light- to medium-gray on fresh surfaces, local tan silty partings and tan chert nodules, locally fossiliferous, locally silicified; sandstones are fine-grained, tan, red, or yellow on fresh and weathered surfaces, medium- to thick-bedded, and contain mostly subrounded, moderately sorted quartz grains; gypsum beds are white and thick-bedded, up to 5-6 ft (1.5-2 m), and often display contorted black laminations. Two or more fine-grained tan to yellow sandstone beds are often present at or near the top of the formation, interbedded with siltstone and limestone. Lower contact not exposed in map area; thickness estimated at 1000 ft, based on cross-section A-A', which extends in to the quadrangle to the west of El Paso Canyon quad, and has a full section of the formation; Pray (1961) estimates a thickness of 1200-1800 ft for the formation.

Pa – Permian Abo Formation – shown in cross-section only, the Abo Formation underlies the Yeso Formation throughout the region. Thickness estimated at 600 feet, based on a complete section exposed in cross-section A-A', in the quadrangle to the west of the El Paso Canyon quad.