GEOLOGIC MAP OF THE SAN LUCAS DAM 7.5' QUADRANGLE, McKINLEY COUNTY, NEW MEXICO

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SUMMARY

The San Lucas dam quadrangle occupies part of the Chaco homocline, the gentle structural ramp that forms the southern limb of the San Juan Basin (Cather, 2004). Faults are mostly north- to east-striking, steeply dipping and mostly exhibit small to moderate normal separations. A major, arcuate monocline appears to bound the northeast corner of a upthrown block in the central part of the quadrangle.

Bedrock units consist entirely of Upper Cretaceous strata. These strata range in age from Turonian to Campanian (Molenaar, 1983), and form an interfingered succession of marine, shore-zone, and coastal plain beds. The landward pinch-out of the marine Satan Tongue of the Mancos Shale is exposed in the quadrangle. A major coal mine in the Menefee Formation is active in the northeast part of the quadrangle. Pliocene(?) basalt crops out on mesas in the southeast part of the study area.

Quaternary sedimentary units include talus (unit Qt), alluvium (Qal), and alluvially reworked eolian silt (Qae). The latter unit is anomalously thick (as much as 10 m) in parts of the quadrangle, and may reflect abundant sources of deflationary silt to the southwest where Quaternary basalt flows have episodically dammed the Rio San Jose.

ACKNOWLEDGEMENTS

This map is modified from the excellent map by Elmer S. Santos (1966). Principal changes include a more detailed treatment of Quaternary units, addition/deletion of a few faults, and construction of a cross section. I thank Harry Lee for access to private lands.

DESCRIPTION OF UNITS

CENOZOIC ERATHEM

daf Disturbed and/or artificial fill —Areas affected by human disturbances, mapped where deposits or extractions associated with coal mining are areally extensive.

Qal Alluvium (Holocene) — Sand, gravel, and mud in and adjacent to modern arroyo channels. Alluvium is typically at or near the grade of modern channels. 0-10 m thick.

Qae Eolian deposits (middle Pleistocene–Holocene)—Reddish-brown eolian sand and loessic silt locally reworked by alluvial processes. Deposits are stabilized by vegetation in most areas. Includes discontinuous eolian veneers on stable upland surfaces. 0–10 m thick.

Qt Talus and colluvium (upper Pleistocene–Holocene) — Coarse mass-wasting deposits of sand to boulder size that mantle steep slopes ajjacent to upland areas. 0–15 m thick.

Tb Basalt (Pliocene?) — Flows of black to gray, medium- to fine-grained trachybasalt with sparse phenocrysts of olivine, plagioclase, and augite. Erupted from vents on adjacent Cerro Pelon quadrangle. Unit is not dated. Maximum thickness is ~30 m. Corresponds to map unit Tyxtb of McGraw et al. (2009).

MESOZOIC ERATHEM

Upper Cretaceous

Kmf Menefee Formation (Santonian–Campanian) — Drab-colored mudstone, fine to medium sandstone, and coal. The contact with the underlying Point Lookout Sandstone is gradational and is placed at the top of the last thick shore-zone sandstone. The top of the unit is not exposed. Minimum thickness is ~120 m.

Kp Point Lookout Sandstone (Santonian) — Light gray to buff medium to fine-grained, cross-bedded sandstone. In the northeast half of the quadrangle, the Point lookout Sandstone is divided into lower (**Kph**, Hosta Sandstone Member) and upper (**Kpu**, upper member) parts by the Satan Tongue of the Mancos Shale (**Kms**). Thickness is ~60–80 m.

Kms Mancos Shale, Satan Tongue (Santonian) — Dark gray mudstone and yellowish gray very fine sandstone. Pinches out to the southwest in central part of quadrangle. 0–40 m thick.

Kcg Crevasse Canyon Formation, Gibson Coal Member (Coniacian?) — Drab mudstone, buff, brown, and greenish gray sandstone, and coal. Sandstone is commonly cross-bedded. Petrified wood is common. The coals are typically less than 0.5 m thick. Thickness is ~60–90 m.

Kcda Crevasse Canyon Formation, Dalton Sandstone Member (Turonian?) — Gray to yellowish gray, fine- to medium-grained, cliff-forming sandstone. About 20 m thick.

Kcdi Crevasse Canyon Formation, Dilco Coal Member (Turonian) — Drab mudstone, fineto medium-grained sandstone, and coal. Sandstone is commonly cross-bedded or ripple laminated. Thin coal beds are present in the lower part of the unit. Thickness is ~30–50 m.

Kg Gallup Sandstone (Turonian) — Brownish gray to gray, medium to thick-bedded, crossbedded, fine- to medium-grained sandstone. Bioturbation is common. Carbonaceous shale is locally intercalated with the sandstone. Thickness is $\sim 25-35$ m.

Km Mancos Shale, main body (Cenomanian–Turonian) — Medium to dark gray mudstone intercalated with thin-bedded sandstone. Only the upper part (~ 10 m) is exposed in quadrangle.

Kd Dakota sandstone (Cenomanian) (cross-section only)

Jurassic and older

Jm Jurassic Morrison Formation and older rocks, undivided (cross-section only)

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