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Quaternary Fault and Fold Database of the United States

As of January 12, 2017, the USGS maintains a limited number of metadata fields that characterize the Quaternary faults and folds of the United States. For the most up-to-date information, please refer to the interactive fault map.

unnamed faults and folds on La Mesa (Class A) No. 2077

Last Review Date: 2016-01-12

Compiled in cooperation with the New Mexico Bureau of Geology & Mineral Resources

citation for this record: **Machette, M.N., and Jochems, A.P., compilers, 2016, Fault number 2077, unnamed faults and folds on La Mesa, in Quaternary fault and fold database of the United States: U.S. Geological Survey website, https://earthquakes.usgs.gov/hazards/qfaults, accessed 12/14/2020 02:22 PM.**

Synopsis	These faults and associated monoclines lie between the East and West Robledo faults [2063, 2064, respectively], and thus occupy an intrahorst position. Most of the faults offset upper La Mesa (geomorphic) surface, which is of early Quaternary age. No detailed studies have been made of these faults or their morphology.
Name comments	These unnamed faults and folds (monoclines) lie between the East Robledo fault [2063] and the West Robledo fault [2064] (Seager and others, 1987 #627; Seager, 1995 #975).

County(s) and State(s)	DOÑA ANA COUNTY, NEW MEXICO
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:24,000 scale. *Comments:* Faults and monoclines digitized from generalized traces on 1:125,000-scale maps of Seager and others (1987 #627) and Seager (1995 #975) combined with accurate placement using photogrammetric methods. Faults and monoclines north of Interstate Highway 10 digitized from 1:24,000-scale map of Seager and others (2008 #7298).
Geologic setting	These north-northeast-trending faults and monoclines are between the East and West Robledo faults [2063, 2064, respectively] and thus occupy an intrahorst position. They deform sediment of the Camp Rice Formation and its constructional surface (La Mesa surface).
Length (km)	24 km.
Average strike	N14°E
Sense of movement	Normal
Dip Direction	W; E *Comments:* These faults are probably high-angle structures sympathetic to the horst-bounding faults shown by Seager and others (1987 #627). However, no dip values are shown on their small-scale map.
Paleoseismology studies	
Geomorphic expression	The faults and monoclines deform the constructional La Mesa surface. No detailed studies have been made of fault heights or scarp morphology.
Age of faulted surficial deposits	Faulted Quaternary units include the upper part of the Camp Rice Formation (possibly early to middle Pleistocene) and the upper (?) La Mesa surface (constructional top of Camp Rice Formation)

	as shown on the maps of maps of Seager and others (1987 #627), Seager (1995 #975), and Seager and others (2008 #7298). Upper La Mesa is probably a local, tectonically uplifted surface that is not regionally significant as a stratigraphic datum; however, it clearly pre-dates lower La Mesa, which is believed to have stabilized about 700–900 ka (Mack and Seager, 1995 #1021). The presence of 1.2-Ma basalts on the upper La Mesa surface (Seager, 1995 #975) suggests the surface is early Quaternary in age. No measurements of fold amplitude or fault offset of La Mesa surface are published; however, topographic maps show little (<10 m) offset of La Mesa surface south of Interstate Highway 10.
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) *Comments:* Timing based on offset of upper La Mesa surface (>0.9–1.2 Ma). However, middle Pleistocene or younger faulting may have occurred.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Low slip-rate category assigned based on less than 10-m-high scarps on 1.2 Ma upper La Mesa surface.
Date and Compiler(s)	2016 Michael N. Machette, U.S. Geological Survey, Retired Andrew P. Jochems, New Mexico Bureau of Geology & Mineral Resources
References	#1021 Mack, G.H., and Seager, W.R., 1995, Transfer zones in the southern Rio Grande rift: Journal of the Geological Society, London, v. 152, p. 551-560. #975 Seager, W.R., 1995, Geology of southwest quarter of Las Cruces and northwest El Paso 1° x 2° sheets, New Mexico: New Mexico Bureau of Mines and Mineral Resources Geologic Map 60, 5 sheets, scale 1:125,000. #627 Seager, W.R., Hawley, J.W., Kottlowski, F.E., and Kelley, S.A., 1987, Geology of east half of Las Cruces and northeast El Paso 1° x 2° sheets, New Mexico: New Mexico Bureau of Mines and Mineral Resources Geologic Map 57, 3 sheets, scale

	1:125,000. #7298 Seager, W.R., Kottlowski, F.E., and Hawley, J.W., 2008, Geologic map of the Robledo Mountains and vicinity, Doña Ana County, New Mexico: New Mexico Bureau of Geology and Mineral Resources Open-File Report 509, 2 sheets, scale 1:24,000.