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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.

La Madre fault (Class A) No. 1075

Last Review Date: 1998-04-24

citation for this record: **Anderson, R.E., compiler, 1998, Fault number 1075, La Madre fault, 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 02:18 PM.**

Synopsis	The La Madre fault is on the northeastern flank of the main northwest-trending spine of the Spring Mountains. It is broadly convex to the northeast, but has an overall northwest strike approximately parallel to, but about 20 km south of, the dextral-slip Las Vegas Valley shear zone. Its Quaternary trace was mapped photogeologically, with little evidence for Quaternary displacement, and there are no constraints on its slip history, despite detailed studies of Quaternary stratigraphy, geomorphology, and soils in the Kyle Canyon area, west of Las Vegas.
Name comments	Name applied by Piety (1995 #915) to a northwest-striking fault at the northeast base of the main spine of the central Spring Mountains; this structure was referred to by Reheis (1992 #1604) and dePolo (1998 #2845) as La Madre fault zone. **Fault ID:** Referred to as LMD by Piety (1995 #915) and LV8 by

	dePolo (1998 #2845).
County(s) and State(s)	CLARK COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:250,000 scale. *Comments:* Compiled from aerial photos at about 1:60,000 and 1:80,000 scales and taken from maps at 1:250,000 and 1:100,000 scales respectively (Dohrenwend and others, 1991 #288; Reheis, 1992 #1604).
Geologic setting	La Madre fault is on the northeastern flank of the main northwest-trending spine of the Spring Mountains. It is broadly convex to the northeast, but has an overall northwest strike approximately parallel to, but about 20 km south of, the dextral-slip Las Vegas Valley shear zone. Its northwest part separates bedrock from proximal portions of large alluvial-fan complexes and its southeast part is mainly in bedrock (Longwell and others, 1965 #4694).
Length (km)	22 km.
Average strike	N49°W
Sense of movement	Normal *Comments:* Displacement on a short part of the west-northwest-striking northern portion is shown as down to the north (Reheis, 1992 #1604). Although it strikes approximately parallel to the dextral-slip Las Vegas Valley shear zone, dextral slip is not reported.
Dip Direction	NE
Paleoseismology studies	
Geomorphic expression	Parts of the north-northwest-striking central portion are portrayed as topographic lineaments bounding a linear range front (Reheis, 1992 #1604). About 6 km of the west-northwest-striking northern portion is shown as juxtaposing Quaternary alluvium against bedrock, but not as a major range-front fault (Dohrenwend and

	others, 1991 #288). The morphology of this part of the Spring Mountains front would be similar to that along a major range-front fault and may be characterized by "fault juxtaposition of Quaternary alluvium against bedrock, fault scarps and lineaments on surficial deposits along or immediately adjacent to range front, a general absence of pediments, abrupt piedmont-hillslope transitions, steep bedrock slopes, faceted spurs, wineglass valley, and subparallel systems of high-gradient, narrow, steep-sided canyons orthogonal to range front" (Dohrenwend and others, 1991 #288). However, this part of La Madre fault would be significantly less extensive and fault scarps would be substantially lower, shorter, and less continuous than those along a major range-front fault (Dohrenwend and others, 1991 #288).
Age of faulted surficial deposits	Two parts of La Madre fault, one 5 km long and the other 3 km long, are portrayed as having moderately expressed lineaments or scarps on surfaces of Quaternary deposits, whereas at the mouths of Kyle Canyon, Lee Canyon, and North Fork Deer Creek the trace is shown as concealed (Reheis, 1992 #1604). Reheis (1992 #1604) suggested that La Madre fault shows little or no evidence for Quaternary displacement.
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) *Comments:* Although there are published results of studies of Quaternary stratigraphy, soils, and geomorphology of parts of the northeast flank of the Spring Mountains (Sowers, 1985 #1649; Sowers, 1986 #1650), those studies do not address Quaternary displacement on La Madre fault. As noted by Reheis (1992 #1604), there is little evidence of Quaternary displacement.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* The Quaternary slip rate is unconstrained. The fault is shown as buried where it is crossed by Kyle Canyon (Reheis, 1992 #1604), it reasonable to assume a low slip rate. dePolo (1998 #2845) assigned a reconnaissance vertical slip rate of 0.01 mm/yr for the fault based on the presence of scarps on alluvium and the absence of basal facets. The late Quaternary

	characteristics of this fault (overall geomorphic expression, continuity of scarps, age of faulted deposits, etc.) support a low slip rate. Accordingly, the less than 0.2 mm/yr slip-rate category has been assigned to this fault.
Date and Compiler(s)	1998 R. Ernest Anderson, U.S. Geological Survey, Emeritus
References	#2845 dePolo, C.M., 1998, A reconnaissance technique for estimating the slip rate of normal-slip faults in the Great Basin, and application to faults in Nevada, U.S.A.: Reno, University of Nevada, unpublished Ph.D. dissertation, 199 p. #288 Dohrenwend, J.C., Menges, C.M., Schell, B.A., and Moring, B.C., 1991, Reconnaissance photogeologic map of young faults in the Las Vegas 1° by 2° quadrangle, Nevada, California, and Arizona: U.S. Geological Survey Miscellaneous Field Studies Map MF-2182, 1 sheet, scale 1:250,000. #4694 Longwell, C.R., Pampeyan, E.H., Bowyer, B., and Roberts, R.J., 1965, Geology and mineral deposits of Clark County, Nevada: Nevada Bureau of Mines and Geology Bulletin 62, 218 p., 16 pls. #915 Piety, L.A., 1995, Compilation of known and suspected Quaternary faults within 100 km of Yucca Mountain, Nevada and California: U.S. Geological Survey Open-File Report 94-112, 404 p., 2 pls., scale 1:250,000. #1604 Reheis, M.C., 1992, Aerial photographic interpretation of lineaments and faults in late Cenozoic deposits in the Cactus Flat and Pahute Mesa 1:100,000 quadrangles and the western parts of the Timpahute Range, Pahranagat Range, Indian Springs, and Las Vegas 1:100,000 quadrangles, Nevada: U.S. Geological Survey Open-File Report 92-193, 14 p., 3 pls., scale 1:100,000. #1649 Sowers, J.M., 1985, Pedogenic calcretes of the Kyle Canyon alluvial fan, southern Nevada—Morphology and development: Berkeley, University of California, unpublished Ph.D. dissertation, 159 p., 1 pl., scale 1:24,000. #1650 Sowers, J.M., 1986, Geomorphic map of the Kyle Canyon alluvial fan, Clark County, Nevada: U.S. Geological Survey Open-File Report 86-210, 9 p., 2 pls.