Jump to Navigation

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.

Dry Lake fault (Class A) No. 1124

Last Review Date: 1999-06-28

citation for this record: **Sawyer, T.L., and Anderson, R.E., compilers, 1999, Fault number 1124, Dry Lake 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 02:17 PM.**

Synopsis	This down-to-the-west normal fault zone bounds the west flanks of the West Range, Ely Springs Range, and Burnt Springs Range, and extends south to the northernmost part of the Delamar Mountains. The entire fault was mapped primarily from reconnaissance photogeologic analysis and a limited investigation of scarp morphology is known. Over much of its length, the fault is expressed as a narrow (<400 m) graben formed on Quaternary deposits. The Quaternary scarps are not observed at the base of a bedrock escarpment, suggesting either that they mark a new fault trace or a fault that was long dormant prior to renewed movement in the Quaternary. There has clearly been recurrent Quaternary movement on the fault as indicated by increasing scarp heights on increasingly older alluvium along the main west-facing fault.
Name comments	Refers to Dry Lake fault (fault 36) as mapped by Schell (1981 #2844), Dohrenwend and others (1991 #287), and Swadley (1995

	#2621) and Dry Lake Valley fault zone of dePolo (1998 #2845). Fault extends along west and east flank of the West Range and across piedmont slope to the south, and further south along the eastern side of Dry Lake Valley from north end of the West Range to south end of Burnt Springs Range. **Fault ID:** Refers to fault 36 on Plates A9 and A6 in Schell (1981 #2844) and to fault C13 of dePolo (1998 #2845).
County(s) and State(s)	LINCOLN COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* Location based on 1:250,000-scale maps of Schell (1981 #2844) and of Dohrenwend and others (1991 #287; 1996 #2846). Mapping by Schell (1981 #2844) based on photogeologic analysis of primarily 1:24,000-scale color aerial photography supplemented with 1:60,000-scale black-and-white aerial photography, transferred by inspection to 1:62,500-scale topographic maps and photographically reduced and directly transferred to 1:250,000-scale topographic maps supplemented by field verification. Mapping by Dohrenwend and others (1991 #287; 1996 #2846) based on photogeologic analysis of 1:58,000-nominal-scale color-infrared photography transferred directly to 1:100,000-scale topographic quadrangle maps enlarged to scale of the photographs. The southern part of the trace is compiled from 1:50,000-scale map by Swadley (1995 #2621).
Geologic setting	The northern part of the fault is mainly down to the west and bounds the west flanks of the West Range, the Ely Springs Range, and the Burnt Springs Range. The southern part of the fault is within the late-Tertiary, closed, fault-bounded structural basin occupied by Dry Lake Valley. The fault trace is located about 1 km west of the irregular contact between the basin-fill alluvium and bedrock of the Burnt Springs and Ely Springs Ranges to the east. Its southernmost part strikes northeast and actually bounds the northernmost part of the Delamar Mountains. Thus, the fault forms the approximate west margin of all or parts of three ranges.
Length (km)	58 km.

Average strike	N8°E
Sense of movement	Normal *Comments:* The fault has not been studied in detail, sense of movement is largely inferred from topography. Swadley (1995 #2621) shows only dip-slip displacement along the southern part, consistent with formation of a narrow fault-parallel Quaternary graben.
Dip Direction	W; E
Paleoseismology studies	
Geomorphic expression	Along the northern part of the fault, the western traces are marked by scarps and (or) lineaments on Quaternary and Tertiary deposits (Dohrenwend and others, 1991 #287). Eastern fault traces are marked by scarps and (or) lineaments on Tertiary rock and by a short range-front fault juxtaposing Quaternary deposits against bedrock (Dohrenwend and others, 1991 #287). For most of its approximately 46 km length, the Dry Lake fault is marked by an asymmetrical graben bounded by west-sloping scarps on the east and smaller east-sloping scarps on the west. Scarp heights on the main west-facing fault range from more than 9 m on early Pleistocene alluvium to 5-8 m on middle Pleistocene alluvium to 1-3 m on late middle Pleistocene alluvium (Swadley, 1995 #2621). The heights of the east-sloping antithetic graben-forming scarps are less than 2 m. Schell (1981 #2843) reports the maximum scarp height as 11 m and the maximum scarp slope angle at 17? from unknown locations. The Quaternary scarps do not lie at the base of a bedrock escarpment, suggesting either that they mark a new fault trace or a fault that was long dormant prior to its Quaternary activity.
Age of faulted surficial deposits	Quaternary and Tertiary (Schell, 1981 #2844; Dohrenwend and others, 1991 #287). The youngest deposits displaced are late middle Pleistocene (130-250 ka?). The fault trace is crossed in many places by unfaulted alluvium of late Pleistocene (10-130 ka) and early Holocene age (Swadley, 1995 #2621).
Historic earthquake	
Most recent prehistoric	late Quaternary (<130 ka)

deformation	*Comments:* Although timing of the most recent event is not well constrained, Schell (1981 #2844) suggested a late Pleistocene time based on scarp morphology and estimated ages of offset deposits. Dohrenwend and others (1991 #287; 1996 #2846) suggested a Quaternary time based on reconnaissance photogeologic studies. The assigned age category of late Quaternary is based on estimate by Swadley (1995 #2621) that the youngest displaced deposits are late middle Pleistocene (possibly 130–250 ka). Schell (1981 #2844, Table 2A) estimated the age of last movement as late Pleistocene (10–130 ka) and the youngest unit displaced as mostly <200 ka.
Recurrence interval	*Comments:* There is clear evidence of recurrent Quaternary movement on the Dry Lake fault as indicated by increasing scarp heights on increasingly older alluvium along the main west-facing fault. They range from more than 9 m on early Pleistocene alluvium to 5–8 m on middle Pleistocene alluvium to 1–3 m on late middle Pleistocene alluvium (Swadley, 1995 #2621). However, without knowing individual offset amounts, one cannot estimate the recurrence interval between surface rupturing events.
Slip-rate category	Less than 0.2 mm/yr *Comments:* dePolo (1998 #2845) calculated a preferred vertical slip rate of 0.008 mm/yr based on a vertical offset of 4.4 m across a graben north of Seven Oaks Spring. The preferred age of the deposit is 550 k.y. The height of scarps on alluvial deposits of various ages support a low middle and late Quaternary slip rate. In addition, the longer term slip rate must be even lower because the fault trace lies outboard of the bedrock escarpment, suggesting either that the trace marks a new fault or one that was long dormant prior to its Quaternary history. A low slip rate is consistent with general knowledge of slip rates estimated for other faults in the region.
Date and Compiler(s)	1999 Thomas L. Sawyer, Piedmont Geosciences, Inc. 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.

#287 Dohrenwend, J.C., Schell, B.A., and Moring, B.C., 1991, Reconnaissance photogeologic map of young faults in the Lund 1° by 2° quadrangle, Nevada and Utah: U.S. Geological Survey Miscellaneous Field Studies Map MF-2180, 1 sheet, scale 1:250,000.

#2846 Dohrenwend, J.C., Schell, B.A., Menges, C.M., Moring, B.C., and McKittrick, M.A., 1996, Reconnaissance photogeologic map of young (Quaternary and late Tertiary) faults in Nevada, *in* Singer, D.A., ed., Analysis of Nevada's metal-bearing mineral resources: Nevada Bureau of Mines and Geology Open-File Report 96-2, 1 pl., scale 1:1,000,000.

#2843 Schell, B.A., 1981, Faults and lineaments in the MX Sitting Region, Nevada and Utah, Volume I: Technical report to U.S. Department of [Defense] the Air Force, Norton Air Force Base, California, under Contract FO4704-80-C-0006, November 6, 1981, 77 p.

#2844 Schell, B.A., 1981, Faults and lineaments in the MX Siting Region, Nevada and Utah, Volume II: Technical report to U.S. Department of [Defense] the Air Force, Norton Air Force Base, California, under Contract FO4704-80-C-0006, November 6, 1981, 29 p., 11 pls., scale 1:250,000.

#2621 Swadley, W.C., 1995, Map showing modern fissures and Quaternary faults in the Dry Lake Valley area, Lincoln County, Nevada: U.S. Geological Survey Miscellaneous Investigations Map I-2501, 1 sheet.