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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.

Kane Spring Wash fault (Class A) No. 1123

Last Review Date: 1999-07-12

citation for this record: **Anderson, R.E., compiler, 1999, Fault number 1123, Kane Spring Wash 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	The Kane Springs Wash fault is a steep northeast-striking predominantly left-lateral fault. Movement on the fault has resulted in left-lateral strike-slip or oblique-slip displacement of at least 8 km. A younger datum indicates that 4.5 km of offset has occurred in the past 14 m.y. Most scarps and fault-line scarps associated with the Kane Springs Wash fault face northwest. Where developed on piedmont deposits of early Pleistocene and Pliocene (?) age, scarp heights are as much as 15 m, but where developed on middle Pleistocene alluvium, they range from 2–7 m with an average of 4.3 m. In places, subsidiary scarps horsetail from the main scarp. Also, some southeast-facing antithetic scarps are mapped.
Name comments	Name taken from Schell (1981 #2844). **Fault ID:** Referred to as fault #29 by Schell (1981 #2844, Table

	A2) and fault number C16 by dePolo (1999 #2845).
County(s) and State(s)	LINCOLN COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:250,000 scale. *Comments:* Southwest part of fault trace modified from Schell (1981 #2844) who compiled it at 1:250,000 from 1:25,000-scale aerial photos following field study. The trace is not extended to the south margin of the Caliente sheet as was shown by Schell (1981 #2844) because deposits of early Pleistocene and Pliocene (?) alluvium and early Pliocene (?) well-consolidated sand and gravel that are situated along strike of the fault in the southwest part of Kane Springs Wash are apparently not faulted (Page and others, 1990 #3839). Northeast part is compiled from 1:24,000 mapping in the Vigo NW quadrangle (Scott and others, 1991 #3847), and unpublished mapping in the Elgin quadrangle (R.B. Scott, person. commun. 1999).
Geologic setting	The Kane Springs Wash fault is a narrow zone of steep northeast-striking predominantly left-lateral faults similar to those making up the nearby Pahranagat shear zone as defined by Tschanz and Pampeyan (1970 #1682) and expanded by Ekren and others (1977 #1036). The main faults in the shear zone, from north to south, are: Arrowhead Mine, Buckhorn, Maynard Lake [1122], and Kane Springs Wash. Ekren and others (1977 #1036) considered the Kane Springs Wash fault to have left-lateral strike-slip or oblique-slip displacement of at least 8 km. Later study by Harding and others (1991 #3840) indicates that the 14-Ma Kane Springs Wash caldera is offset left-laterally about 4.5 km. Pampeyan (1993 #3841) speculated that the fault is either an oblique-slip transfer fault or a breakaway zone marking the rotation of the southern Delamar Mountains away from the Meadow Valley Mountains.
Length (km)	41 km.
Average strike	N37°E
Sense of movement	Left lateral

	Comments: Along part of its trace, the fault lies at the northwest base of the Meadow Valley Mountains where it forms the structural boundary between those mountains and the alluvial fill of Kane Springs Wash. In that area, it has the appearance of a range-bounding fault with large throw, but to the southwest, it crosses a broad area of Quaternary piedmont deposits to form the northwest base of a small northeast-trending ridge of uplifted bedrock. The possibility exists that it is predominantly a strike-slip fault with along-strike variations in throw.
Dip	75–83° NW. *Comments:* Dips ranging from 75° to 83° are reported on the geologic map of the Delamar 3 SE quadrangle (Swadley and others, 1994 #3848) where the fault splays and crosses a broad area of Quaternary piedmont deposits.
Paleoseismology studies	
Geomorphic expression	Most scarps and fault-line scarps associated with the Kane Springs Wash fault face northwest. In places, old high scarps developed on bedrock or alluvial deposits are partially buried by young Quaternary deposits, leaving a subdued scarp or fault-line scarp (Swadley and others, 1994 #3848). The partially buried scarps are located mostly where alluvium is deposited against resistant bedrock escarpments. Where developed on piedmont deposits of early Pleistocene and Pliocene (?) age, scarp heights are as much as 15 m, but where developed on alluvium of Willow Spring (middle Pleistocene), they range from 2–7 m with an average of 4.3 m (Swadley and others, 1994 #3848). In places, subsidiary scarps horsetail from the main scarp. Also, some southeast-facing antithetic scarps are mapped (Swadley and others, 1994 #3848). dePolo (1998 #2845) indicates that there are no basal fault facets.
Age of faulted surficial deposits	In the Delamar 3 SE quadrangle (Swadley and others, 1994 #3848), the fault cuts middle Pleistocene deposits (alluvium of Willow Spring) and is either buried by or partially buried by early Holocene and late Pleistocene alluvium. Deposits of early Pleistocene and Pliocene (?) alluvium and early Pliocene (?) well-consolidated sand and gravel that are situated along strike of the fault in the southwest part of Kane Springs Wash are apparently not faulted (Page and others, 1990 #3839, Delamar 3 SW quad).

	This suggests that Quaternary activity on the fault does not extend to the south margin of the Caliente 1:250,000-scale map as was indicated by Schell (1981 #2844). According to Schell (1981 #2844), the youngest unit displaced is intermediate-age alluvial fan with estimated age of 15–700 ka (mostly 15–200 ka). In the unpublished Caliente 1:250,000-scale map by J. C. Dohrenwend of Quaternary faults compiled at 1:1,000,000 (Dohrenwend and others, 1996 #2846), northwest-facing scarps are estimated photogeologically as formed on latest Pleistocene and questionable Holocene deposits or surfaces. This estimate does not agree with recent geologic mapping (Swadley and others, 1994 #3848) or with estimates made by Schell (1981 #2844).
Historic earthquake	
Most recent prehistoric deformation	middle and late Quaternary (<750 ka) *Comments:* Age category based on suggestion by Swadley and others (1994 #3848) that middle Pleistocene alluvium of Willow Spring is faulted.
Recurrence interval	*Comments:* Recurrent Quaternary displacement is indicated by conspicuously higher scarps developed on piedmont deposits of early Pleistocene and Pliocene (?) age (up to 15 m high), than on middle Pleistocene alluvium of Willow Spring (2–7 m with an average of 4.3 m) (Swadley and others, 1994 #3848). Because of a lack of detailed studies, no reliable recurrence times can be estimated.
Slip-rate category	Less than 0.2 mm/yr *Comments:* No detailed data exists to determine slip rates for this fault. 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)	1999 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.

#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.

#1036 Ekren, E.B., Orkild, P.P., Sargent, K.A., and Dixon, G.L., 1977, Geologic map of Tertiary rocks, Lincoln County, Nevada: U.S. Geological Survey Miscellaneous Investigations Map I-1041, 1 sheet, scale 1:250,000.

#3840 Harding, A.E., Scott, R.B., Mehnert, H.H., and Pampeyan, E.H., 1991, Kane Springs Wash Caldera, southeast Nevada—The other half of the story: Geological Society of America Abstracts with Programs, v. 23, no. 4, p. 30.

#3839 Page, W.R., Swadley, W.C., and Scott, R.B., 1990, Preliminary geologic map of the Delamar 3 SW quadrangle, Lincoln County, Nevada: U.S. Geological Survey Open-File Report 90-336.

#3841 Pampeyan, E.H., 1993, Geologic map of the Meadow Valley Mountains, Lincoln and Clark Counties, Nevada: U.S. Geological Survey Miscellaneous Investigations Map I-2173, 19 p. pamphlet, 2 sheets, scale 1:50,000.

#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.

#3847 Scott, R.B., Harding, A.E., Swadley, W.C., Novak, S.W., and Pampeyan, E.H., 1991, Preliminary geologic map of the Vigo NW quadrangle, Lincoln County, Nevada: U.S. Geological Survey Open-File Report 91-0389, 48 p.

#3848 Swadley, W.C., Page, W.R., Scott, R.B., and Pampeyan, E.H., 1994, Geologic map of the Delamar 3 SE quadrangle,

	Lincoln County, Nevada: U.S. Geological Survey Geologic quadrangle Map GQ-1754. #1682 Tschanz, C.M., and Pampeyan, E.H., 1970, Geology and mineral deposits of Lincoln County, Nevada: Nevada Bureau of Mines and Geology Bulletin 73, 188 p.