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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.

Western Sand Springs Range faults (Class A) No. 1682

Last Review Date: 1999-03-25

citation for this record: **Sawyer, J.E., compiler, 1999, Fault number 1682, Western Sand Springs Range faults, 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 02:26 PM.**

Synopsis	This relatively short zone has range-front faults discontinuously bounding west front of Sand Springs Range and piedmont faults extending from west of Big Kasock Mountain north to southeast end of Cocoon Mountains. Reconnaissance photogeologic mapping of the fault zone and regional geologic mapping are the sources of data. Trench investigations and detailed studies of scarp morphology have not been conducted.
Name comments	Refers to faults mapped by Slemmons (1968, unpublished Reno 1? X 2? sheet), Bell (1984 #105), and Greene and others (1991 #3487) on west of Sand Springs Range and on north side of Black Eagle Hill. dePolo (1998 #2845) referred to them as the Western Sand Springs Range faults.

	Fault ID: Refers to fault numbers R31A and R31B (Western Sand Springs Range faults) of dePolo (1998 #2845).
County(s) and State(s)	CHURCHILL COUNTY, NEVADA MINERAL COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* Fault locations are based on 1:250,000-scale maps of Bell (1984 #105) and Slemmons (1968, unpublished Reno 1? X 2? sheet). Mapping by Bell (1984 #105) is from photogeologic analysis of 1:40,000-scale low sun-angle aerial photography, supplemented with 1:12,000-scale aerial photography of selected areas, several low-altitude aerial reconnaissance flights, and field reconnaissance of major structural and stratigraphic relationships. Mapping by Slemmons (1968, unpublished Reno 1? X 2? sheet) is from analysis of 1:60,000-scale AMS photography transferred to mylar overlaid onto a 1:250,000-scale topographic map using proportional dividers.
Geologic setting	This relatively short zone has range-front faults discontinuously bounding west front of Sand Springs Range and piedmont faults extending from west of Big Kasock Mountain north to southeast end of Cocoon Mountains (Slemmons, 1969, unpublished Reno 1? X 2? sheet; Bell, 1984 #105; Greene and others, 1991 #3487).
Length (km)	22 km.
Average strike	N3°E
Sense of movement	Normal *Comments:* Not studied in detail; sense of movement is inferred from topography.
Dip Direction	W; SE
Paleoseismology studies	
Geomorphic expression	Range-front faults juxtapose Quaternary piedmont-slope deposits against bedrock and are expressed as abrupt front of Sand Springs Range. dePolo (1998 #2845) reports a maximum preferred basal

	fault facet height of 183 m (158-207 m). Piedmont faults appear to be expressed as minor west-facing scarps on piedmont-slope deposits (Bell, 1984 #105; Greene and others, 1991 #3487).
Age of faulted surficial deposits	Quaternary. Range-front faults juxtapose Quaternary piedmont-slope deposits against bedrock and piedmont faults displace Quaternary deposits (Bell, 1984 #105; Greene and others, 1991 #3487).
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) *Comments:* Although timing of most recent event is not well constrained, a Quaternary time is suggested based on mapping by Bell (1984 #105) and Greene and others (1991 #3487), which is consistent with Dohrenwend and others (1996 #2846).
Recurrence interval	
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 0.335 mm/yr for the northern part of the fault and 0.288 for the southern part based on an empirical relationship between his preferred maximum basal facet height and vertical slip rate. The size of the facets (tens to hundreds of meters, as measured from topographic maps) indicates they are the result of many seismic cycles, and thus the derived slip rate reflects a long-term average. However, the late Quaternary characteristics of this fault (overall geomorphic expression, continuity of scarps, age of faulted deposits, etc.) suggest the slip rate during this period is of a lesser magnitude. Accordingly, the less than 0.2 mm/yr slip-rate category has been assigned to this fault.
Date and Compiler(s)	1999 Janet E. Sawyer, Piedmont Geosciences, Inc.
References	#105 Bell, J.W., 1984, Quaternary fault map of Nevada—Reno sheet: Nevada Bureau of Mines and Geology Map 79, 1 sheet, scale 1:250,000. #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. #3487 Greene, R.C., Stewart, J.H., John, D.A., Hardyman, R.F., Silberling, N.J., and Sorensen, M.L., 1991, Geologic map of the Reno 1° by 2° quadrangle, Nevada and California: U.S. Geological Survey Miscellaneous Field Studies Map MF-2154-A, scale 1:250,000.