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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.

Sand Springs Range fault (Class A) No. 1685

Last Review Date: 2004-08-01

citation for this record: **Sawyer, T.L., compiler, 2004, Fault number 1685, Sand Springs Range 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 02:26 PM.**

Synopsis	This nearly continuous, moderately long zone primarily consists of: (1) prominent range-front faults bounding sinuous east front of Sand Springs Range and subdued east front of southernmost Stillwater Range, from south of Contact Canyon north to La Plata Canyon and (2) distributed piedmont and intra basin faults in northern Fairview Valley, that extend across valley floor in vicinity of Labou Flat and across pediment on apparently uplifted Quaternary-Tertiary alluvium. Reportedly the 1954 Fairview Peak-Dixie Valley earthquakes ruptured one short fault in western Labou Flat. Fault may be related to the Dixie Valley fault [1687b].
Name comments	Refers to faults mapped by Slemmons (1968, unpublished Reno 1:250,000-scale map), Butler (1979 #3708), Bell (1984 #105), Greene and others (1991 #3487), and John and Silberling (1994 #3709) along east side of the Sand Springs Range and in northern

	Fairview Valley. dePolo (1998 #2845) referred to it as the Sand Springs Range fault. **Fault ID:** Refers to fault R30 (Sand Springs Range fault) of dePolo (1998 #2845).
County(s) and State(s)	MINERAL COUNTY, NEVADA CHURCHILL 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 *Comments:* Fault locations are based on 1:250,000-scale maps of Bell (1984 #105) and Slemmons (1968, unpublished Reno 1:250,00-scale map). Mapping of Bell (1984 #105) is based on 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 Mapping by Slemmons (1968, unpublished Reno 1?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 nearly continuous, moderately long zone primarily consists of prominent range-front faults bounding sinuous east front of Sand Springs Range and subdued east front of southernmost Stillwater Range, from south of Contact Canyon north to La Plata Canyon, and distributed piedmont and intra basin faults in northern Fairview Valley, that extend across valley floor in vicinity of Labou Flat and across pediment on apparently uplifted Quaternary-Tertiary alluvium (Slemmons, 1968, unpublished Reno 1? X 2? sheet; Bell, 1981 #105; Greene and others, 1991 #3487). Reportedly the 1954 Fairview Peak-Dixie Valley earthquakes ruptured one short fault in western Labou Flat (Slemmons, 1957 #154), but this feature is no longer visible (Bell, 1984 #105). Fault may be related to the Dixie Valley fault [1687b] (Bell and Ramelli, 1999 #4330).
Length (km)	40 km.
Average strike	N22°E

Sense of movement	Normal *Comments:* Not studied in detail; sense of movement from Slemmons (1968, unpublished Reno 1? X 2? sheet) and Greene and others (1991 #3487), and inferred from topography.
Dip Direction	E; NE; W
Paleoseismology studies	
Geomorphic expression	Range-front faults are morphologically young scarps on Holocene upper piedmont-slope deposits near mouth of La Plata Canyon and along east side of Sand Springs Range (Bell, 1981 #2875), that are up to 4 m high (Bell, 1984 #105). In some locations Quaternary piedmont-slope deposits are juxtaposed against bedrock (Greene and others, 1991 #3487), and locally the fault is expressed as topographic lineaments indicative of young faulting at alluvial-bedrock contact (Bell, 1984 #105). Piedmont faults are marked by short scarps adjacent and parallel to front of Sand Springs and Stillwater ranges, that near mouth of La Plata Canyon define a graben on apparently uplifted pediment. Intrabasin faults are marked by generally east-facing scarps near margins of Labou Flat and in northern Fairview Valley (Slemmons, 1957 #154, 1968, unpublished Reno 1? X 2? sheet; Bell, 1981 #2875; 1984 #105; Greene and others, 1991 #3487); southernmost intra basin fault in Labou Flat reportedly had 1954 breaks (Slemmons, 1957 #154) that are no longer visible (Bell, 1984 #105). dePolo, 1998 #2845) reports a maximun preferred basal fault facets height of 134 m (110-158 m).
Age of faulted surficial deposits	Holocene; Quaternary; Quaternary-Tertiary; Tertiary. Quaternary alluvium on piedmont slope of Sand Springs Range and basin-fill deposits on floor of central Fairview Valley, as young as Holocene, are displaced by faults in this zone (Slemmons, 1957 #154, 1968, unpublished Reno 1? X 2? sheet; Bell, 1981 #2875; 1984 #105; Greene and others, 1991 #3487). Graben-bounding faults near mouth of La Plata Canyon are in Quaternary-Tertiary alluvial deposits and Quaternary deposits are juxtaposed against Tertiary and older bedrock along front of Sand Springs and Stillwater ranges (Butler, 1979 #3708; Greene and others, 1991 #3487; John and Silberling, 1994 #3709).
Historic earthquake	

Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* Bell and others (2004 #7763) document evidence of two post 15-ka coseismic surface ruptures. A Holocene time is suggested based on photogeologic mapping by Bell (1984 #105; 1984 #108) and Dohrenwend and others (1996 #2846), which is consistent with a latest Quaternary time suggested by Slemmons (1967 #156).
Recurrence interval	
Slip-rate category	Between 0.2 and 1.0 mm/yr *Comments:* dePolo (1998 #2845) assigned a reconnaissance vertical slip rate of 0.248 mm/yr 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 maximum. However, the late Quaternary characteristics of this fault (overall geomorphic expression, age of faulted deposits, and sinuous character of the range front, etc.) indicate young movement, there exists no data to indicate recurrent movement in the latest Quaternary. Accordingly, the less than 0.2 mm/yr slip-rate category has been assigned to this fault. The slip-rate assignment is based on 0.45± vertical displacement rate documented in Bell and others (2004 #7763).
Date and Compiler(s)	2004 Thomas L. Sawyer, Piedmont Geosciences, Inc.
References	#2875 Bell, J.W., 1981, Quaternary fault map of the Reno 1° by 2° quadrangle, Nevada-California: U.S. Geological Survey Open-File Report 81-982, 62 p., http://pubs.er.usgs.gov/publication/ofr81982. #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. #108 Bell, J.W., 1984, Holocene faulting in western Nevada and recurrence of large-magnitude earthquakes, *in* Lintz, J., Jr., ed., Western geological excursions: Reno, Nevada, University of Nevada, Mackay School of Mines, 1984 Annual Meetings of the

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#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.

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#3709 John, D.A., and Silberling, N.J., 1994, Geologic map of the La Plata Canyon quadrangle, Churchill County, Nevada: U.S. Geological Survey Geologic quadrangle Map GQ-1710, scale 1:24,000.

#154 Slemmons, D.B., 1957, Geological effects of the Dixie Valley-Fairview Peak, Nevada, earthquakes of December 16, 1954: Bulletin of the Seismological Society of America, v. 47, no. 4, p. 353-375.