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Quaternary Fault and Fold Database of the United States

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Singatse Range fault zone (Class A) No. 1294

Last Review Date: 1999-03-23

citation for this record: **Adams, K., and Sawyer, T.L., compilers, 1999, Fault number 1294, Singatse Range fault zone, 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 02:14 PM.**

Synopsis	The Singatse Range fault zone is a predominately north-striking normal fault zone along the east side of the Singatse Range. Reconnaissance photogeologic mapping and bedrock mapping of faults are the sources of data. Trench investigations and detailed studies of scarp morphology have not been completed.
Name comments	Refers to the faults on east side of the Singatse Range that were mapped by Moore (1961 #2879), Slemmons (1966, unpublished Walker Lake 1:250,000-scale map), Proffett (1977 #2889; 1984 #2890), Proffett and Dilles (1984 #2891), Dohrenwend (1982 #2481; 1982 #2870), Stewart and others (1982 #2873), Bell (1984 #105), and Greene and others (1991 #3487). **Fault ID:** Refers to fault number WL8 "Singatse (sic) Range fault zone" in compilation by dePolo (1998 #2845).
County(s) and	

County(s) and State(s)	LYON COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* Locations primarily based on 1:250,000-scale maps of Dohrenwend (1982 #2481; 1982 #2870) and Bell (1984 #105). Mapping by Dohrenwend (1982 #2481; 1982 #2870) 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. 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 in selected areas, and several low-altitude aerial reconnaissance flights and field reconnaissance of major structural and stratigraphic relationships.
Geologic setting	This predominately north-striking range front fault bounds east side of Singatse Range. The fault is continuous from near Wilson Hot Springs north along west edge of Mason Valley to west of Yerington and continues discontinuously to north end of range (Moore, 1961 #2879; Slemmons, 1966, unpublished Walker Lake 1:250,000-scale map; Proffett, 1977 #2889; Dohrenwend, 1982 #2481; 1982 #2870; Stewart and others, 1982 #2873; Bell, 1984 #105; 1984 #2890; Proffett and Dilles, 1984 #2891; Greene and others, 1991 #3487). Proffett and Dilles (1984 #2891) show Quaternary alluvium generally in fault contact along the Singatse Range fault zone, with over 450 m of Quaternary alluvium adjacent to the fault. Singatse Range is a west-tilted mountain block that probably began tilting in Miocene (Stewart, 1978 #2866; Proffett, 1984 #2890). Westward tilting of Mason Valley, related to down-to-the-east faulting along the Singatse Range fault zone, may be ongoing because the Walker River flows on the extreme west side of its Holocene flood plain and Quaternary alluvium is westward-tilted adjacent to range front faults (Proffett, 1984 #2890).
Length (km)	40 km.
Average strike	N4°W
Sense of	Normal

movement	*Comments:* Not studied in detail. Normal sense of movement is from Dohrenwend (1982 #2481; 1982 #2870) and Proffett (1984 #2891), and inferred from topography.
Dip	53–65° E. *Comments:* Proffett (1984 #2891) reported fault dips at northern end of zone ranging from 53–65 ° to the east on pre-Tertiary bedrock and on Tertiary volcanic rocks (location uncertain).
Paleoseismology studies	
Geomorphic expression	Along much of its length, this zone juxtaposes Holocene and older Quaternary alluvium against bedrock at the abrupt eastern front of Singatse Range (Moore, 1961 #2879; Slemmons, 1966, unpublished Walker Lake 1:250,000-scale map; Proffett, 1977 #2889; Dohrenwend, 1982 #2481; 1982 #2870; Stewart and others, 1982 #2873; Bell, 1984 #105; 1984 #2890; Proffett and Dilles, 1984 #2891; Greene and others, 1991 #3487). At the extreme north end, near Yerington, faults are expressed as scarps on upper Pleistocene and on undifferentiated Pleistocene alluvium (Dohrenwend, 1982 #2481; 1982 #2870). Proffett (1977 #2889) notes that late Pleistocene fanglomerate is offset a few meters to a few tens of meters by the Singatse Range fault zone and Holocene fanglomerate is offset about a meter southwest of Mason. dePolo (1998 #2845) reports a maximum preferred basal fault facet height of 158 m (134–200 m).
Age of faulted surficial deposits	late Pleistocene and Pleistocene. Dohrenwend (1982 #2481) and Dohrenwend and others (1996 #2846) mapped faults in northern part of the zone as displacing undifferentiated Pleistocene piedmont-slope deposits, and in southern part of the zone as displacing late Pleistocene deposits (Dohrenwend, 1982 #2870). Other mapped faults juxtapose Holocene and older alluvium against bedrock along most of the zone (Dohrenwend, 1982 #2870) suggesting the possibility of even younger movement.
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* The timing of most recent event is not well

	constrained. Age-category assignment is based on Dohrenwend and others (1996 #2846). They portray the southern part of the fault as characterized by late Quaternary faulting and the northern part as Quaternary. Some data suggests that faulting may be younger.
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 preferred reconnaissance vertical displacement rate of 0.288 mm/yr based on an empirical relationship between his preferred maximum basal facet height and vertical displacement 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 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 Kenneth Adams, Piedmont Geosciences, Inc. Thomas L. 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. #2481 Dohrenwend, J.C., 1982, Map showing late Cenozoic faults in the Walker Lake 1° by 2° quadrangle, Nevada-California: U.S. Geological Survey Miscellaneous Field Studies Map MF-1382-D, 1 sheet, scale 1:250,000. #2870 Dohrenwend, J.C., 1982, Surficial geologic map of the Walker Lake 1° by 2° quadrangle, Nevada-California: U.S.

Geological Survey Miscellaneous Field Studies Map MF-1382-C, 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.

#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.

#2879 Moore, J.G., 1961, Preliminary geologic map of Lyon, Douglas, Ormsby and part of Washoe Counties, Nevada: U.S. Geological Survey Miscellaneous Field Studies Map MF-80, scale 1:200,000.

#2889 Proffett, J.M., 1977, Cenozoic geology of the Yerington district, Nevada, and implications for the nature and origin of basin and range faulting: Geological Society of America Bulletin, v. 88, p. 247-266.

#2890 Proffett, J.M., 1984, Late Cenozoic faulting, tilting and extension in the Yerrington District, Nevada, *in* Lintz, J., Jr., ed., Western geological excursions: Geological Society of America, Annual Meeting, Reno, Nevada, Guidebook, v. 4, p. 161-176.

#2891 Proffett, J.M., and Dilles, J.H., 1984, Geologic map of the Yerrington District, Nevada: Nevada Bureau of Mines and Geology Map 77.

#2866 Stewart, J.H., 1978, Basin-range structure in western North America—A review, *in* Smith, R.B., and Eaton, G.P., eds., Cenozoic tectonics and regional geophysics of the western cordillera: Geological Society of America Memoir 152, p. 1-31, scale 1:2,500,000.

#2873 Stewart, J.H., Carlson, J.E., and Johannesen, D.C., 1982, Geologic map of the Walker Lake 1° by 2° quadrangle, California and Nevada: U.S. Geological Survey Miscellaneous Field Studies

	Map MF-1382-A, scale 1:250,000.

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