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Quaternary Fault and Fold Database of the United States

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Olinghouse fault zone (Class A) No. 1668

Last Review Date: 1999-03-26

citation for this record: **Adams, K., and Sawyer, T.L., compilers, 1999, Fault number 1668, Olinghouse 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 02:26 PM.**

Synopsis	This short nearly continuous sinistral zone has east-northeast-striking intermontane faults in southern Pah Rah Range, from north of Clark Station to about Pierson Canyon, and north-northeast-striking range-front and piedmont faults that continue northeastward to White Hill and into western Dodge Flat. The December 26, 1869 earthquake (estimated M6.7) or an earlier event in 1860 may have ruptured approximately 14 km of the intermontane faults. The sinistral Olinghouse fault zone may be structurally related to the dextral Pyramid Lake fault zone [1669] because they appear to merge near White Horse Canyon on east side of Pah Rah Range. Detailed topical studies of the fault zone, reconnaissance photogeologic mapping, and regional geologic mapping are the sources of data. Trench investigations have not been conducted.
Name	Refers to faults mapped by Slemmons (1968, unpublished Reno

comments	1? X 2? sheet), Bonham (1969 #2999), Sanders and Slemmons (1979 #152; 1996 #1229), Bell (1984 #105; 1984 #107), Greene and others (1991 #3487), and Yount and others (1993 #1608) at southern end of Pah Rah Range; named the Olinghouse fault zone by Sanders and Slemmons (1979 #152). **Fault ID:** Refers to fault R18 (Olinghouse fault zone) of dePolo (1998 #2845).
County(s) and State(s)	WASHOE 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 *Comments:* Fault locations are based on 1:250,000-scale maps of Bell (1984 #105) and Slemmons (1968, unpublished Reno 1?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 Mapping by Slemmons (1968, unpublished Reno 1?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 short nearly continuous sinistral zone has east-northeast-striking intermontane faults in southern Pah Rah Range, from north of Clark Station to about Pierson Canyon, and north-northeast-striking range-front and piedmont faults that continue northeastward to White Hill and into western Dodge Flat (Sanders and Slemmons, 1979 #152; Bell, 1984 #105). The December 26, 1869 earthquake (estimated M6.7) or an earlier event in 1860 may have ruptured approximately 14 km of the intermontane faults. The left-lateral Olinghouse fault zone may be structurally related to the right-lateral Pyramid Lake fault zone [1669] because they appear to merge near White Horse Canyon on east side of Pah Rah Range (Slemmons and others, 1969 #2613; Sanders and Slemmons, 1979 #152; Yount and others, 1993 #1608; 1996 #1229).

Length (km)	18 km.
Average strike	N49°E
Sense of movement	Left lateral *Comments:* (Slemmons and others, 1969 #2613; Sanders and Slemmons, 1979 #152; Bell, 1981 #2875; 1984 #107; Yount and others, 1993 #1608; 1996 #1229)
Dip Direction	SE; N; S
Paleoseismology studies	
Geomorphic expression	Intermontane faults are expressed as sag ponds, hillside benches and shutter ridges, uphill facing scarps up to 40 cm high, offset stream channels and stone stripes (< 3.6 m left-lateral), and echelon fracture patterns (Slemmons and others, 1969 #2613; Sanders and Slemmons, 1979 #152; 1996 #1229). One of the intermontane faults has an exposed extremely planar fault surface that records multiple fault movements both in strike-slip and dip-slip sense (Yount and others, 1993 #1608). The range-front and piedmont faults are expressed by short southeast-facing single- and multiple-event scarps on young alluvium that have a right-stepping echelon pattern. Profiles of single-event scarps document offsets ranging from 0.32 to 0.97 m and slope angles ranging from 6.5? to 17.1?. Multiple event scarps record total offsets of 2.5 to 4.8 m and are delineated by one or two distinct bevels above the most recent scarp face with bevel angles ranging from 6.3? to 11.0?. In general, the most recent scarp faces on multiple event scarps have steeper slopes than single-event scarps, ranging from 13.1? to 16.6? (Sanders and Slemmons, 1996 #1229).
Age of faulted surficial deposits	Holocene; Quaternary; Tertiary. Sanders and Slemmons (1996 #2846) mapped faults that displace Holocene and Quaternary deposits; mapping of Bonham (1969 #2999) and Greene and others (1991 #3487) show these same faults also displacing Tertiary bedrock.
Historic earthquake	Olinghouse earthquake 1869 Pyramid Lake earthquake 1860
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* Although timing of most recent event is not well constrained, a latest Quaternary time is suggested based on

	reconnaissance photogeologic mapping of Slemmons (1968, unpublished Reno 1? X 2? sheet) and Dohrenwend and others (1996 #2846). A latest Quaternary time is also supported by more detailed studies of Sanders and Slemmons (1996 #2846).
Recurrence interval	8 to 16 k.y. (<21 ka) *Comments:* Sanders and Slemmons (1996 #2846) calculated recurrence intervals by diffusion modeling of multiple-event scarps ranging in height from 2.5 to 4.8 m with one or two distinct bevels above the most recent scarp face. Their results suggest that earthquakes occurred at roughly 5 and 21 ka or 5, 13, and 21 ka, for two and three event scarps, respectively. This suggests a recurrence period of 8 to 16 k.y. over past 21 ka.
Slip-rate category	Less than 0.2 mm/yr *Comments:* The average vertical slip rate calculated using heights and estimated ages of multiple event scarps reported by Sanders and Slemmons (1996 #2846) would fall within the assigned slip-rate category. However, since the lateral component is not considered, these calculated values are considered minimums.
Date and Compiler(s)	1999 Kenneth Adams, Piedmont Geosciences, Inc. 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. #107 Bell, J.W., 1984, Guidebook for selected Nevada earthquake areas (field trip 18), *in* Lintz, J., Jr., ed., Western geological excursions: Reno, Nevada, University of Nevada, Mackay School of Mines, 1984 Annual Meetings of the Geological Society of America, Guidebook, v. 4, p. 387-472. #2999 Bonham, H.F., 1969, Geology and mineral deposits of Washoe and Storey Counties, Nevada: Nevada Bureau of Mines and Geology Bulletin 70, 140 p., 1 pl., 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.

#152 Sanders, C.O., and Slemmons, D.B., 1979, Recent crustal movements in the central Sierra Nevada-Walker Lane region of California-Nevada—Part III, The Olinghouse fault zone: Tectonophysics, v. 52, no. 1-4, p. 585-597.

#1229 Sanders, C.O., and Slemmons, D.B., 1996, Geomorphic evidence for Holocene earthquakes in the Olinghouse fault zone, western Nevada: Bulletin of the Seismological Society of America, v. 86, p. 1784-1792.

#2613 Slemmons, D.B., McDonald, R.L., and Cluff, L., 1969, Surface faulting from the December 16, 1954, earthquake in Dixie Valley, Nevada: Earthquake Notes, v. 40, no. 2, p. 23.

#1608 Yount, J.C., Bell, J.W., dePolo, C.M., Ramelli, A.R., Cashman, P.H., and Glancy, P.A., 1993, Neotectonics of the Walker Lane, Pyramid Lake to Tonopah, Nevada—Part II Road log, *in* Lahren, M.M., Trexler, J.H., Jr., and Spinosa, C., eds., Crustal evolution of the Great Basin and the Sierra Nevada: Reno, Mackay School of Mines, University of Nevada, Geological Society of America, Cordilleran/Rocky Mountain section meeting, Reno, Nevada, May 19-21, 1993, Guidebook, p. 391-408.