Jump to Navigation

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.

Louderback Mountains fault (Class A) No. 1689

Last Review Date: 1999-03-24

citation for this record: **Sawyer, T.L., compiler, 1999, Fault number 1689, Louderback Mountains 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 short, nearly continuous zone has piedmont faults bordering southeast side of southern Dixie Valley from near north end of Chalk Mountain across western piedmont slope of Louderback Mountains to northwest of Pirouette Mountain, and has range-front fault locally bounding southwest front of mountains; Louderback Mountains appear to be tilted eastward and down faulted against Clan Alpine Mountains forming a half-graben (Stingaree Valley). The 1954 Fairview Peak-Dixie Valley earthquakes rupture pattern suggests that this fault is related to the West Gate fault [1692], Gold King fault [1691], Dixie Valley fault [1687], and Fairview fault [1690], which it's south end is separated from by a 100-m-wide right stepover. Most faults are marked by well defined scarps on piedmont-slope deposits, locally exhibiting distinct left-stepping echelon patterns, that were produced or enhanced during the 1954 earthquakes. Near Chalk Mountain some of the lowest 1954 scarps are no longer obvious

	due to scarp degradation. These ruptures extended the entire length of this fault and exhibited predominantly right-lateral motion with a normal component that, along two faults, reverses along strike suggesting dominantly lateral slip. Westernmost faults from south end of zone to near north end did not ruptured in 1954. In addition, faults are expressed as abrupt contacts between bedrock and piedmont-slope deposits, right-laterally offset channels and ridge lines, asymmetric scarps indicating right-lateral offset in 1954, minor graben, and compound paleoscarps. Reconnaissance and detailed photogeologic mapping of the fault and detailed studies of fault offsets are the sources of data. Trench investigations and detailed studies of scarp morphology have not been completed.
Name comments	Refers to faults mapped by Slemmons (1968, unpublished Reno 1? X 2? sheet), Bell (1984 #105), Greene and others (1991 #3487), John (1995 #3713), Caskey (1996 #2437), and Caskey and others (1996 #2439) along southeast side of southern Dixie Valley and locally along southwest sides of Louderback Mountains; commonly referred to as the Louderback Mountains fault (e.g., Caskey and others, 1996 #2439).
County(s) and State(s)	CHURCHILL COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* Fault locations are predominantly based on 1:48,000-scale map of Caskey (1996 #2437; reproduced in Caskey and others, 1996 #2439). Mapping based on detailed photogeologic analysis of 1:10,000- to 1:12,000-scale vertical, low-sun-angle aerial photography, transferred by inspection to 1:24,000-scale mylar orthophotos and directly to 1:24,000-scale topographic maps, that were then reduced to 1:48,000-scale; mapping also based on detailed field mapping and numerous measurements of fault offsets along the fault. One fault trace north of Chalk Mountain is based on 1:250,000-scale map of Bell (1984 #105).
Geologic setting	This short nearly continuous zone consists of piedmont bordering southeast side of southern Dixie Valley from near north end of Chalk Mountain across western piedmont slope of Louderback

	Mountains to northwest of Pirouette Mountain and range-front fault locally bounding southwest front of mountains (Slemmons, 1968, unpublished Reno 1?x2? sheet, Bell, 1981 #2875; 1984 #105; Greene and others, 1991 #3487; Caskey, 1996 #2437; Caskey and others, 1996 #2439); Louderback Mountains appear to be tilted eastward and down faulted against Clan Alpine Mountains forming a half-graben (Stingaree Valley) (Caskey, 1996 #2437). The 1954 Fairview Peak-Dixie Valley earthquakes rupture pattern suggests that this fault related to the West Gate fault [1692], Gold King fault [1691], Dixie Valley fault [1687], and Fairview fault [1690], which it's south end is separated from by a 100-m-wide right stepover (Caskey, 1996 #2437).
Length (km)	14 km.
Average strike	N2°W
Sense of movement	Right lateral *Comments:* Caskey (1996 #2437) and Caskey and others, (1996 #2439) make numerous measurements of offsets associated with the 1954 Fairview Peak earthquake. From these measurements they determined that right-lateral motion with a normal component predominated and along two sections of the fault the normal component reverses, suggesting primarily strike-slip motion. Lateral offset could not be confidently identified along northern two faults.
Dip	70° W *Comments:* Caskey (1996 #2437) and Caskey and others (1996 #2439) reported one of the most continuous faults in the zone dips 70? W at alluvial-bedrock contact near south end of Louderback Mountains.
Paleoseismology studies	
Geomorphic expression	Bell (1981 #2875), Caskey (1996 #2437) and Caskey and others (1996 #2439) reported that most faults are spectacularly well defined as west-facing scarps averaging 0.5 to 2.0 km in length on piedmont-slope deposits, that were produced or locally enhanced during the 1954 Fairview Peak-Dixie Valley earthquakes. The 1954 ruptures extend the entire length of the fault and in many places produced a distinct left-stepping echelon pattern;

	westernmost faults from south end of zone to near north end did not ruptured in 1954. The 1954 scarps and other geomorphic features exhibit predominantly right-lateral offset with a normal component that, along two sections, reverses along strike, suggests dominantly lateral slip in 1954. Some of the lowest 1954 scarps near Chalk Mountain are no longer visible due to scarp degradation (Bell, 1981 #2875). In addition, faults are expressed as abrupt contacts between bedrock and piedmont-slope deposits, right-laterally offset channels and ridge lines, minor graben, and compound paleoscarps (Bell, 1981 #2875; Caskey, 1996 #2437; Caskey and others, 1996 #2439), and asymmetric scarps indicating right-lateral offset in 1954 (Caskey, 1996 #2437, e.g., fig. 8).
Age of faulted surficial deposits	Quaternary. Bell (1984 #105), Greene and others (1991 #3487), and John (1995 #3713) mapped faults that displace undifferentiated Quaternary piedmont-slope deposits.
Historic earthquake	Fairview Peak earthquake 1954 Dixie Valley earthquake 1954
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) *Comments:* Although timing of most recent paleoevent is not well-constrained, a Quaternary time is suggested based on mapping of Bell (1984 #105), Greene and others (1991 #3487), and John (1995 #3713).
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Not studied in detail. A low slip rate is inferred from general knowledge of slip rates estimated for other faults in the region.
Date and Compiler(s)	1999 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. #2437 Caskey, S.J., 1996, Surface faulting, static stress changes, and earthquake triggering during the 1954 Fairview Peak (M (sub s) = 7.2) and Dixie Valley (M (sub s) = 6.8) earthquakes, central Nevada: Reno, University of Nevada, Mackay School of Mines, unpublished Ph.D. dissertation, 144 p. #2439 Caskey, S.J., Wesnousky, S.G., Zhang, P., and Slemmons, D.B., 1996, Surface faulting of the 1954 Fairview Peak (Ms 7.2) and Dixie Valley (Ms 6.8) earthquakes, central Nevada: Bulletin of the Seismological Society of America, v. 86, no. 3, p. 761-787. #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. #3713 John, D.A., 1995, Tilted middle Tertiary ash-flow calderas and subjacent granitic plutons, southern Stillwater Range, Nevada—Cross sections of and Oligocene igneous center: Geological Society of America Bulletin, v. 107, no. 2, p. 180-200.