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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.

Eastern Dixie Valley fault (Class A) No. 1171

Last Review Date: 2000-08-21

citation for this record: **Lidke, D.J., compiler, 2000, Fault number 1171, Eastern Dixie Valley 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 02:17 PM.**

Synopsis	This discontinuous, northeast-striking fault zone consists of faults that place bedrock against Pleistocene piedmont-slope deposits and faults that form scarps on piedmont-slope deposits as young as late Quaternary age. Although there appears to be abundant evidence for Quaternary movement along the fault zone, estimates of offsets along individual fault strands or along the entire zone have not been reported. Basal fault facets are absent along the range-front adjacent to this fault zone and the absence of basal fault facets suggests relatively low Quaternary slip rates. The fault zone has not been studied in detail. The principal sources of data include geologic mapping, reconnaissance photogeologic mapping, and reconnaissance geomorphic study of fault scarps.
Name comments	The unnamed northern section refers to faults mapped by Willden and Speed (1968 #4370; 1974 #3645) and Dohrenwend and

	others (1992 #283) along parts of the western flanks of the southern Augusta and northern Clan Alpine Mountains, and refers to the northern part of the Eastern Dixie Valley fault zone as shown by dePolo (1998 #2845). Section extends from just south of 40? 00' latitude, along the Augusta Mountains, southwest to about Shoshone Creek, along the Clan Alpine Mountains. **Fault ID:** Refers to fault MI1 of dePolo (1998 #2845).
County(s) and State(s)	CHURCHILL COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:250,000 scale. *Comments:* Location is from 1:250,000-scale map of Dohrenwend and others (1992 #283), which shows mapping based on photogeologic analysis of 1:58,000-nominal-scale, color-infrared photography transferred directly to 1:100,000-scale topographic maps enlarged to the scale of the photographs; these maps were then reduced and compiled at 1:250,000-scale.
Geologic setting	This northeast-striking zone of faults consists of two groups of faults along the western flanks of the Augusta and Clan Alpine Mountains. These mountain ranges expose bedrock that consists mainly of Tertiary volcanic and volcaniclastic rocks (Willden and Speed, 1968 #4370; 1974 #3645). Some faults of the zone place Tertiary bedrock of the mountain ranges against Pleistocene surficial deposits of the adjacent Dixie Valley, but apparently do not have the geomorphic expression of range-front faults (Dohrenwend and others, 1992 #283). Those faults that involve bedrock, as well as several west-facing scarps on Pleistocene, piedmont-slope deposits, consistently indicate down-to-the-west offsets that probably reflect continued Quaternary uplift of the mountain ranges relative to the adjacent northern part of the Dixie Valley. Although there appears to be abundant evidence for Quaternary movement along the fault zone, estimates of offsets along individual faults or along the entire zone have not been reported.
Length (km)	38 km.
Average strike	N24°E

Sense of movement	Normal *Comments:* Not specifically reported, however, west-facing scarps on piedmont deposits, as well as down-to-the-west bedrock faults, consistently indicate down-to-the-west fault offsets, which in this extensional regime probably reflects principally normal, dip-slip movement along west-dipping faults.
Dip Direction	NE *Comments:* Not reported, but probably steep, based on dip measurements of other Quaternary faults in localities nearby and elsewhere in the Basin and Range Province
Paleoseismology studies	
Geomorphic expression	Faults define a zone of deformation along parts of the western flanks of the Augusta and Clan Alpine Mountains and the adjacent eastern piedmont slope of the Dixie Valley. Locally the fault juxtaposes Pleistocene piedmont-slope deposits against Tertiary bedrock and by scarps and some linear features developed on Pleistocene piedmont-slope deposits (Willden and Speed, 1968 #4370; 1974 #3645; Dohrenwend and others, 1992 #283). The range-fronts show a gentle topographic transition with the piedmont-slope of the Dixie Valley and, according to mapping by Dohrenwend and others (1992 #283), none of the faults show the topographic expression typical of range-front faults. dePolo (1998 #2845) reported that basal fault facets are absent along the range-front adjacent to this fault zone, and he related the absence of basal fault facets to relatively low Quaternary slip rates.
Age of faulted surficial deposits	Dohrenwend and others (1992 #283) assigned a late Quaternary age to faulted surficial deposits along this section of the fault zone.
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* Although the timing of the most recent prehistoric faulting event is not well constrained, Dohrenwend and others (1992 #283) suggest a late Pleistocene (10-130 ka) time, based on faulted surficial deposits along this section of the fault zone.

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 0.01 mm/yr for the fault based on the presence of scarps on alluvium and the absence of basal facets. The late Quaternary characteristics of this fault (overall geomorphic expression, continuity of scarps, age of faulted deposits, etc.) support a low slip rate. Accordingly, the less than 0.2 mm/yr slip-rate category has been assigned to this fault.
Date and Compiler(s)	2000 David J. Lidke, U.S. Geological Survey
References	#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. #283 Dohrenwend, J.C., Schell, B.A., and Moring, B.C., 1992, Reconnaissance photogeologic map of young faults in the Millett 1° by 2° quadrangle, Nevada: U.S. Geological Survey Miscellaneous Field Studies Map MF-2176, 1 sheet, scale 1:250,000. #4370 Willden, R., and Speed, R.C., 1968, Geology and mineral deposits of Churchill County, Nevada: U.S. Geological Survey Open-File Report 68-329, 3 sheets, scale 1:200,000. #3645 Willden, R., and Speed, R.C., 1974, Geology and mineral deposits of Churchill County, Nevada: Nevada Bureau of Mines and Geology Bulletin 83, 95 p.