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Quaternary Fault and Fold Database of the United States

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Eastern Edwards Creek Valley fault zone (Class A) No. 1191

Last Review Date: 2011-09-25

citation for this record: **Lidke, D.J., and Haller, K.M., compilers, 2011, Fault number 1191, Eastern Edwards Creek Valley 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 02:17 PM.**

Synopsis	This northeast-striking zone of faults is in part characterized by a relatively continuous range front fault that places bedrock of the Desatoya Mountains and New Pass Range against Quaternary piedmont-slope deposits of the Edwards Creek Valley. West-facing scarps are locally present along the range front fault, and mostly west- but some east-facing scarps are also formed on Quaternary piedmont-slope deposits west of the range front fault. Down-to-the-west stratigraphic offset along the range front fault as well as the predominant west-facing direction of the scarps, imply down-to-the-west offset along the fault zone. There is evidence for at least one Quaternary faulting event that probably is no older than late Pleistocene (<30 ka). The fault zone has not been studied in detail and little is actually known with certainty about its nature, character, and movement history. The principal sources of data consist of reconnaissance photogeologic mapping

	and reconnaissance geomorphic study of fault scarps and basal fault facets.
Name comments	Refers to northeast- to north-striking zone of faults mapped by Dohrenwend and others (1992 #283) along the southeastern side of the Edwards Creek Valley and the adjoining western flanks of the Desatoya Mountains and New Pass Range. dePolo (1998 #2845) referred to this fault zone as the northern part, of three parts, of the Eastern Edwards Creek Valley fault system. The central and southern parts of this fault system, as defined by dePolo (1998 #2845), are described as separate fault zones [faults 1192 and 1189, respectively]. The name used herein, Eastern Edwards Creek Valley fault zone, is a slight modification of that used by dePolo (1998 #2845). The fault zone extends from about 5 km northwest of New Pass Peak along the western flank of the New Pass Range southwest along the western flank of the Desatoya Mountains to about 3 km beyond Edwards Creek. **Fault ID:** Refers to fault zone that dePolo (1998 #2845) portrayed and labeled MI4A.
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) that shows mapping based on photogeologic analysis of 1:58,000-nominal-scale, color-infrared photography which was transferred directly to 1:100,000-scale topographic maps enlarged to the scale of the photographs. The 1:100,000-scale fault maps were reduced and compiled at 1:250,000-scale for final publication.
Geologic setting	This northeast- to north-striking zone of faults is partly marked by a relatively continuous range-front fault that places Tertiary bedrock of the Desatoya Mountains and Newport Range against Quaternary piedmont slope deposits of the Edwards Creek Valley (Dohrenwend and others, 1992 #283). A few west-facing scarps are present along the range front fault but most of the scarps are on Quaternary piedmont-slope deposits west of the range-front

	fault (Dohrenwend and others, 1992 #283). Stratigraphic relations across the range front fault, as well as the west-facing direction of nearly all of scarps, imply down-to-the-west offset along the fault zone that probably reflects some continued Quaternary uplift of the Desatoya Mountains and New Pass Range relative to the adjacent Edwards Creek Valley.
Length (km)	35 km.
Average strike	N42°E
Sense of movement	Normal *Comments:* Not specifically reported, the down-to-the-west range-front fault and the predominantly westerly facing direction of scarps suggest mostly down-to-the-west offsets, which in this extensional regime, probably reflects principally normal dip-slip movement along westerly dipping faults.
Dip Direction	NW *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	Site 1191-1, Edwards Creek trench, excavated 0.5 km west of the Edwards Creek channel, where Qfi alluvium has a 2.3–2.5 m high scarp (Koehler and Wesnousky, 2011 #7175). The stratigraphy is interpreted to record three cosiesmic surface ruptures in the late Pleistocene.
Geomorphic expression	Fault zone is expressed by a relatively continuous, down-to-the-west, range front fault and by some scarps that are principally west-facing features on piedmont-slope deposits of the Edwards Creek Valley. dePolo (1998 #2845) reported a maximum preferred basal facet height of 158 m (134–183 m).
Age of faulted surficial deposits	Recessional shorelines of Lake Desatoya and late Pleistocene and older fans are offset by the fault (Koehler and Wesnousky, 2011 #7175).
Historic earthquake	
Most recent	late Quaternary (<130 ka)

prehistoric deformation	*Comments:* Stratigraphic relations near the trench (site 1191-1) indicate that the most recent coseismic surface deformation occurred in the late Pleistocene time, prior to the highstand of pluvial Lake Desatoya (Koehler and Wesnousky, 2011 #7175). Earlier interpretations based on reconnaissance photogeologic mapping by Dohrenwend and others (1992 #283) suggested that the most recent prehistoric faulting event probably is no older than late Pleistocene (<30 ka) and it could be as young as Holocene (<10 ka).
Recurrence interval	The three earthquakes occurred in the late Pleistocene and were separated by time that was sufficient to develop soils on the two older colluviums (Koehler and Wesnousky, 2011 #7175).
Slip-rate category	Less than 0.2 mm/yr *Comments:* Koehler and Wesnousky (2011 #7175) estimate vertical-separation data for 20-k.y. and 60-k.y. timeframes that suggest low rates of vertical deformation that fall within the assigned slip-rate category. dePolo (1998 #2845) assigned a reconnaissance vertical slip rate of 0.288 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 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)	2011 David J. Lidke, U.S. Geological Survey Kathleen M. Haller, 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. #7175 Koehler, R.D., and Wesnousky, S.G., 2011, Late Pleistocene regional extension rate derived from earthquake geology of late Quaternary faults across the Great Basin, Nevada, between 38.5 degrees N and 40 degrees N latitude: Geological Society of America Bulletin, v. 123, no. 3-4, p. 631–650, doi:10.1130/B30111.1. #7773 Koehler, R.D., III, 2009, Late Pleistocene regional extension rate derived from earthquake geology of late Quaternary faults across Great Basin, Nevada between 38.5° and 40° N. latitude: Reno, University of Nevada, unpublished Ph.D. dissertation, 119 p.