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.

Paymaster Ridge fault (Class A) No. 1105

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Synopsis	The Paymaster Ridge fault is a mostly north-striking fault. The south part of the fault appears to be a range-bounding or major block-bounding fault separating Paymaster Ridge from the basin beneath Clayton Valley. The north part of the fault extends along Paymaster Canyon between the Weepah Hills on the west and Paymaster Ridge and the General Thomas Hills on the east, and extends farther northward to the area east of Lone Mountain. Photogeologic mapping is the main source of data for this fault. It probably dips to the west and is mainly a normal fault. The most recent paleoevent is estimated to be late Quaternary, but the recurrence interval is unknown. A preferred vertical slip rate of 0.214 mm/yr was estimated for this fault and (or) the Clayton Ridge fault [1104] to the south, based mainly on the presence of scarps in alluvium and the height of basal facets.
Name	Name given here to a prominent north-northeast-striking fault.

comments	The south part extends along the west side of Paymaster Ridge and appears to be a range-bounding or major block-bounding fault that separates Paymaster Ridge from Clayton Valley (Reheis and Noller, 1991 #1195). The north part extends along Paymaster Canyon between the Weepah Hills on the west and Paymaster Ridge/General Thomas Hills on the east (Schell, 1981 #2843) and extends farther north to the area east of Lone Mountain (Dohrenwend, 1996 #2846). Schell (1981 #2843) referred to the part of the fault he mapped as the Paymaster Canyon fault. Piety (1995 #915) and dePolo (1998 #2845) combined the Paymaster Ridge fault with a fault to the south at the west base of Clayton Ridge and they referred to the more than 50-km-long structure as the Clayton Ridge-Paymaster Ridge fault and the Clayton-Paymaster Ridges fault zone, respectively. The southern fault is designated herein as a separate structure (Clayton Ridge fault [1104]) because, as mapped by Reheis and Noller (1991 #1195), it bends eastward at its north end and does not align with the Paymaster Ridge fault that bends westward at its south end. A left-sense step-over of 5 km is required to connect the two range-bounding structures. A left step is not indicated on the 1:100,000 scale photogeologic map of Reheis and Noller (1991 #1195). The traces mapped by Dohrenwend and others (1996 #2846) show more continuity between these two faults than do those mapped by Reheis and Noller (1991 #1195). **Fault ID:** Schell (1981 #2843) referred to part of this fault as fault no. 12, and the southern part of this long fault was referred to as CRPR by Piety (1995 #915).
County(s) and State(s)	ESMERALDA COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* Location of fault south of 38? N. latitude is from Reheis and Noller (1991 #1195) who compiled this part of the fault on a 1:100,000-scale topographic map from photogeologic study of aerial photos at scales ranging from 1:24,000 to 1:80,000. North of 38? N. latitude, fault location is from unpublished map of the Tonopah 1?x2? sheet published at 1:100,000-scale by Dohrenwend and others (1996 #2846). Mapping of Dohrenwend and others (1996 #2846) based on

	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.
Geologic setting	The Paymaster Ridge fault is in the Goldfield section of the Walker Lane belt of Stewart (1988 #1654), an area characterized by a general lack of major through-going northwest-striking strike-slip faults and a scarcity of major Basin and Range faults. The fault strikes north to north-northeast. The south part of the fault has the appearance of a Basin and Range fault because it separates Paymaster Ridge on the east from the basin beneath Clayton Valley on the west (Reheis and Noller, 1991 #1195). The central part is located along a narrow valley that separates bedrock highlands to the east and west (Schell, 1981 #2843). The north part of the fault appears to mark the east margin of a narrow graben located west of Lone Mountain (Dohrenwend and others, 1996 #2846). It is conspicuously more north-striking than a nearby group of north-northeast- to northeast-striking faults that extend 25 km westward from the Montezuma Range across Clayton Valley (Reheis and Noller, 1991 #1195; Dohrenwend and others, 1992 #289). The fault was not recognized in the 1:250,000-scale mapping of the geology of Esmeralda County (Albers and Stewart, 1972 #3863), and its tectonic significance is not reported.
Length (km)	34 km.
Average strike	N8°E
Sense of movement	Normal *Comments:* No specific displacement-sense data are available. Reheis and Noller (1991 #1195) show the fault facing west, and this facing direction combined with the range-front aspect of its south part may suggest that the fault is a west-dipping normal fault. Evidence for a left-lateral sense of displacement has locally been reported for some of the north-northeast- to northeast-striking faults in this general area; however, for most of these faults there is little or no evidence to support left-lateral displacement (Reheis and Noller, 1991 #1195). The presence of a graben in the area east of Lone Mountain suggests principally a normal sense of displacement along this fault.
Dip Direction	W

	Comments: On the basis of photogeologic interpretation and limited field data pertaining to the north-northeast- and northeast-striking faults in the area, Reheis and Noller (1989 #1610) suggested that these faults dip steeply (70? to 90?). West-facing scarps (Reheis and Noller, 1991 #1195) and the range-front character of the fault (Dohrenwend and others, 1992 #289) may suggest that the fault mostly dips steeply to the west.
Paleoseismology studies	
Geomorphic expression	Dohrenwend and others (1996 #2846) portray the Paymaster Ridge as one of the major Quaternary range-front faults in the area. Its south part is expressed as moderate to prominent lineaments and scarps on surfaces of chiefly Quaternary deposits, whereas its north part along Paymaster Canyon is portrayed chiefly as topographic lineaments either bounding a linear range front or, rarely, within bedrock (Reheis and Noller, 1991 #1195). The northern part of the fault in the Tonopah sheet, is expressed by faults that juxtapose Quaternary alluvium against bedrock and by a few short scarps that are preserved on high-level piedmont-slope deposits, unpublished map of the Tonopah 1?x2? sheet published at 1:100,000-scale by Dohrenwend and others (1996 #2846).
Age of faulted surficial deposits	The unpublished map of the Tonopah 1?x2? sheet by J.C. Dohrenwend and the 1:100,000-scale map published by Dohrenwend and others (1996 #2846) show scarps east of Lone Mountain on Quaternary deposits that may be as young as late Pleistocene; Schell (1981 #2843) mapped middle to early Pleistocene deposits displaced along Paymaster Canyon. Fan deposits of assumed upper Pleistocene and Holocene age abut the bedrock front of Paymaster Ridge, but the displacement relations are not reported in detail (Reheis and Noller, 1989 #1610).
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* Late Quaternary displacement on the Paymaster Ridge fault is suggested by upper Pleistocene and Holocene alluvial-fan deposits that abut the bedrock fronts of Clayton Ridge and Paymaster Ridge and appear to bury older alluvial-fan

	deposits (Reheis and Noller, 1989 #1610). Dohrenwend and others (1996 #2846) indicate a late Pleistocene time for displacement at the east front of Lone Mountain based on reconnaissance photogeologic mapping.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* No age or displacement data are reported that could constrain the slip rate. 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)	1999 R. Ernest Anderson, U.S. Geological Survey, Emeritus
References	#3863 Albers, J.P., and Stewart, J.H., 1972, Geology and mineral deposits of Esmeralda County, Nevada: Nevada Bureau of Mines and Geology Bulletin 78, 88 p. #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. #289 Dohrenwend, J.C., Schell, B.A., McKittrick, M.A., and Moring, B.C., 1992, Reconnaissance photogeologic map of young faults in the Goldfield 1° by 2° quadrangle, Nevada and California: U.S. Geological Survey Miscellaneous Field Studies Map MF-2183, 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. #915 Piety, L.A., 1995, Compilation of known and suspected Quaternary faults within 100 km of Yucca Mountain, Nevada and California: U.S. Geological Survey Open-File Report 94-112, 404

p., 2 pls., scale 1:250,000.

#1610 Reheis, M.C., and Noller, J.S., 1989, New perspectives on Quaternary faulting in the southern Walker Lane, Nevada and California, *in* Ellis, M.A., ed., Late Cenozoic evolution of the southern Great Basin: Nevada Bureau of Mines and Geology Open-File Report 89-1, p. 57-61.

#1195 Reheis, M.C., and Noller, J.S., 1991, Aerial photographic interpretation of lineaments and faults in late Cenozoic deposits in the eastern part of the Benton Range 1:100,000 quadrangle and the Goldfield, Last Chance Range, Beatty, and Death Valley Junction 1:100,000 quadrangles, Nevada and California: U.S. Geological Survey Open-File Report 90-41, 9 p., 4 sheets, scale 1:100,000.

#2843 Schell, B.A., 1981, Faults and lineaments in the MX Sitting Region, Nevada and Utah, Volume I: Technical report to U.S. Department of [Defense] the Air Force, Norton Air Force Base, California, under Contract FO4704-80-C-0006, November 6, 1981, 77 p.

#1654 Stewart, J.H., 1988, Tectonics of the Walker Lane belt, western Great Basin—Mesozoic and Cenozoic deformation in a zone of shear, *in* Ernst, W.G., ed., Metamorphism and crustal evolution of the western United States, Ruby Volume VII: Englewood Cliffs, New Jersey, Prentice Hall, p. 683-713.