

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](#).

Indian Head fault (Class A) No. 1307

Last Review Date: 1998-09-25

citation for this record: Adams, K., compiler, 1998, Fault number 1307, Indian Head 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 02:15 PM.

Synopsis	This relatively short, down-to-the-west, northwest-striking right lateral fault extends for about 15 km along southwest front of Indian Head Peak, a sub range of the Gillis Range; this is one of four or five northwest-striking dextral faults in the Monte Cristo Valley, Stewart Valley, and Gabbs Valley Range area of the "Walker Lane" belt. Reconnaissance photogeologic mapping and bedrock mapping of the fault are the sources of data. Trench investigations and detailed studies of scarp morphology have not been completed.
Name comments	Refers to a fault that extends from southern piedmont slope of the Gabbs Valley Range northwest of Luning in the Soda Spring Valley through Paymaster Canyon and into Win Wan Valley. Named the Indian Head fault by Ekren and Byers (1984 #2902). Faults were mapped by Nielsen (1965 #2544), Slemmons (1966, unpublished Walker Lake 1:250,000-scale map), Dohrenwend (1982 #2481; 1982 #2870; 1982 #2871), Stewart and others (1982

	<p>#2873), and Ekren and Byers (1984 #2902; 1985 #2903).</p> <p>Fault ID: Refers to fault numbers WL26 (Indian Head fault) of dePolo (1998 #2845).</p>
County(s) and State(s)	MINERAL COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	<p>Good Compiled at 1:100,000 scale.</p> <p><i>Comments:</i> Location based on 1:62,500-scale (Dohrenwend, 1982 #2871) and 1:250,000-scale maps (Dohrenwend, 1982 #2481; 1982 #2870); small-scale mapping by photogeologic analysis of 1:58,000-nominal-scale color-infrared photography transferred directly to 1:100,000-scale topographic quadrangle maps enlarged to scale of the photographs.</p>
Geologic setting	<p>This relatively short, down-to-the-west, northwest-striking dextral fault extends for about 15 km along southwest front of Indian Head Peak, a sub range of the Gillis Range. This fault is one of four or five northwest-striking dextral faults in the Monte Cristo Valley, Stewart Valley, and Gabbs Valley Range area of the "Walker Lane" belt. Ekren and Byers (1984 #2902) estimate that total right-slip displacement along this fault amounts to about 4 km, based on the offset of a steeply dipping marker bed in the Triassic Luning Formation.</p>
Length (km)	15 km.
Average strike	N31°W
Sense of movement	<p>Right lateral</p> <p><i>Comments:</i> Sense of slip is from Ekren and Byers (1984 #2902; 1985 #2903). However, dePolo (dePolo, 1998 #2845) indicates that the normal component may be greater than the lateral component of slip.</p>
Dip Direction	SW
Paleoseismology studies	

Geomorphic expression	<p>The fault is expressed primarily as a range-bounding and intermontane fault along the southwest side of Indian Head Peak, but forms scarps on Pleistocene alluvium at its southern end on the piedmont slope above Soda Spring Valley. In its central part, the fault still bounds the prominent topographic escarpment (nearly 500 m) of Indian Head Peak, but the southeast flowing Paymaster Canyon is located at the base of the escarpment. Pearthree (1990 #148) profiled scarps on alluvium at 11 locations; he indicates that all the scarps were low (averaging 1 m high) and makes no mention of large scarps. dePolo (1998 #2845) reports a maximum preferred basal fault facet height of 183 m (158-207 m).</p>
Age of faulted surficial deposits	<p>Upper Quaternary through Mesozoic. Along about a third of its length, the fault only cuts bedrock but a single scarp is shown on an upper Quaternary deposit (Slemmons, 1966, unpublished Walker Lake 1:250,000-scale map, Dohrenwend, 1982 #2481; Dohrenwend, 1982 #2870).</p>
Historic earthquake	
Most recent prehistoric deformation	<p>latest Quaternary (<15 ka)</p> <p><i>Comments:</i> Although timing of the most recent paleoevent is not constrained by radiometric age determinations, Pearthree (1990 #148) estimates a preferred timing for the most recent event of 4.5 ka based on modeling of 11 scarp profiles. This interpretation is consistent with the mapping of Slemmons (1966, unpublished Walker Lake 1:250,000-scale map) and Dohrenwend (1982 #2870) that indicates that upper Quaternary alluvium at both the north and south ends of the fault is offset.</p>
Recurrence interval	
Slip-rate category	<p>Less than 0.2 mm/yr</p> <p><i>Comments:</i> Few studies of this fault have been conducted to date, so estimates of slip and timing of faulting events are poorly constrained. dePolo (1998 #2845) assigned a preferred reconnaissance vertical slip rate of 0.335 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)</p>

indicates they are the result of many seismic cycles, and thus the derived slip rate reflects a long-term average. Even though, the late Quaternary characteristics of this fault (overall geomorphic expression, continuity of scarps, age of faulted deposits, etc.) indicate young movement, there exists no data to indicate recurrent movement in the latest Quaternary. Accordingly, the less than 0.2 mm/yr slip-rate category has been assigned to this fault.

Date and Compiler(s)

1998
Kenneth Adams, Piedmont Geosciences, Inc.

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.
- #2481 Dohrenwend, J.C., 1982, Map showing late Cenozoic faults in the Walker Lake 1° by 2° quadrangle, Nevada-California: U.S. Geological Survey Miscellaneous Field Studies Map MF-1382-D, 1 sheet, scale 1:250,000.
- #2870 Dohrenwend, J.C., 1982, Surficial geologic map of the Walker Lake 1° by 2° quadrangle, Nevada-California: U.S. Geological Survey Miscellaneous Field Studies Map MF-1382-C, 1 sheet, scale 1:250,000.
- #2871 Dohrenwend, J.C., 1982, Reconnaissance surficial geologic map of the Aurora quadrangle, Nevada and California: U.S. Geological Survey Miscellaneous Field Studies Map MF-1373, scale 1:62,500.
- #2902 Ekren, E.B., and Byers, F.M., Jr., 1984, The Gabbs Valley Range—A well exposed segment of the Walker Lane in west-central Nevada, *in* Lintz, J., Jr., ed., Western geological excursions: Geological Society of America, Annual Meeting, Reno, Nevada, Guidebook, v. 4, p. 203-215.
- #2903 Ekren, E.B., and Byers, F.M., Jr., 1985, Geologic map of the Win Wan Flat, Kinkaid NW, Kinkaid, and Indian Head Peak quadrangles, Mineral County, Nevada: U.S. Geological Survey Miscellaneous Investigations Map I-1578, scale 1:48,000.
- #2544 Nielsen, R.L., 1965, Right-lateral strike-slip faulting in the Walker Lane, west-central Nevada: Geological Society of America Bulletin, v. 76, no. 11, p. 1301-1308.

#148 Pearthree, P.A., 1990, Geomorphic analysis of young faulting and fault behavior in central Nevada: Tucson, University of Arizona, unpublished Ph.D. dissertation, 212 p.

#2873 Stewart, J.H., Carlson, J.E., and Johannesen, D.C., 1982, Geologic map of the Walker Lake 1° by 2° quadrangle, California and Nevada: U.S. Geological Survey Miscellaneous Field Studies Map MF-1382-A, scale 1:250,000.

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