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Quaternary Fault and Fold Database of the United States

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Greenhorn Mountain fault (Class B) No. 2297

Last Review Date: 1997-06-12

Compiled in cooperation with the Colorado Geological Survey

citation for this record: **Widmann, B.L., compiler, 1997, Fault number 2297, Greenhorn Mountain 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 03:02 PM.**

Synopsis	Tweto and others (1978 #2770) showed this fault as a single down to the northeast fault. Unruh and others (1993 #2777) showed the Greenhorn Mountain fault (zone) as seven down to the northeast and southwest faults that form a northwest-trending graben. The fault zone is marked by an escarpment and scarps (Kirkham and Rogers, 1981 #792), closed depressions, saddles, and springs (Unruh and others, 1993 #2777). The faults offset Quaternary landslide deposits according to Kirkham and Rogers (1981 #792). Unruh and others (1993 #2777) concluded that the faults are related to evaporite flowage and dissolution. In as much as the faulting may be salt related, we consider these to be Class B structures.

Name comments	The Greenhorn Mountain fault is defined by a group of seven northwest- trending faults north of Eagle. They extend from the Colorado River north of Big Red Hill (on the northwest) to I-70 between Eagle and Wolcott (on the southeast). Unruh and others (1993 #2777) refered to this group of faults as the Greenhorn Mountain fault. **Fault ID:** Fault 58 in Kirkham and Rogers (1981 #792) and fault number Q46 of Widman and others (1998 #3441).
County(s) and State(s)	EAGLE COUNTY, COLORADO
Physiographic province(s)	SOUTHERN ROCKY MOUNTAINS
Reliability of location	Good Compiled at 1:250,000 scale. *Comments:* Tweto and others (1978 #2770) and Unruh and others (1993 #2777) mapped this group of faults at a scale of 1:250,000. Kirkham and Rogers (1981 #792) had previously mapped these faults at a scale of 1:500,000. The trace used herein is from Unruh and others (1993 #2777).
Geologic setting	This group of faults forms a northwest-trending graben on the northeast flank of Greenhorn Mountain, east of the White River Uplift. The course of Eiby Creek is within this graben, but itbends south and flows out of the south end of the graben. The area is underlain by Pennsylvanian evaporite deposits.
Length (km)	21 km.
Average strike	N49°W
Sense of movement	Normal *Comments:* Normal movement is indicated on these faults by Kirkham and Rogers (1981 #792) and Unruh and others (1993 #2777).
Dip Direction	NE *Comments:* The main fault trace is described as a northeast-dipping normal fault (Unruh and others, 1993 #2777).

Paleoseismology studies	
Geomorphic expression	The southwest margin of the graben is marked by a 25-m-high northeast-facing escarpment (Kirkham and Rogers, 1981 #792). Scarps typically <3 m high are present along the graben margins. Other features include closed depressions, saddles, and springs (Unruh and others, 1993 #2777).
Age of faulted surficial deposits	Tweto and others (1978 #2770) showed Holocene and Pleistocene landslide deposits as faulted against Mesozoic and Paleozoic rock. Kirkham and Rogers (1981 #792) reported Quaternary landslide deposits as being offset by the fault. Unruh and others (1993 #2777) reported the presence of scarps and geomorphic features indicative of Quaternary faulting, but suggested these features developed in response to flowage and dissolution of evaporite deposits from beneath the area.
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) *Comments:* Tweto (1978 #1956) showed this group of faults as pre-Neogene, but Tweto and others (1978 #2770) showed Quaternary landslide deposit as offset by the faults. Kirkham and Rogers (1981 #792) reported Quaternary movement related to salt flowage and dissolution. Colman (1985 #1953) and Unruh and others (1993 #2777) also reported faulting due to salt tectonism.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Widmann and others (1998 #3441) placed these faults within the <0.2 mm/yr slip-rate category.
Date and Compiler(s)	1997 Beth L. Widmann, Colorado Geological Survey
References	#1953 Colman, S.M., 1985, Map showing tectonic features of late Cenozoic origin in Colorado: U.S. Geological Survey Miscellaneous Geologic Investigations I-1566, 1 sheet, scale 1:1,000,000.

	#792 Kirkham, R.M., and Rogers, W.P., 1981, Earthquake potential in Colorado: Colorado Geological Survey Bulletin 43, 171 p., 3 pls. #1956 Tweto, O., 1978, Northern rift guide 1, Denver-Alamosa, Colorado, *in* Hawley, J.W., ed., Guidebook to Rio Grande rift in New Mexico and Colorado: New Mexico Bureau of Mines and Mineral Resources Circular 163, p. 13-27. #2770 Tweto, O., Moench, R.H., and Reed, J.C., 1978, Geologic map of the Leadville 1° x 2° quadrangle, northwestern Colorado: U.S. Geological Survey Miscellaneous Geologic Investigations I-999. #2777 Unruh, J.R., Wong, I.G., Bott, J.D.J., Silva, W.J., and Lettis, W.R., 1993, Seismotectonic evaluation, Rifle Gap Dam, Silt Project, Ruedi Dam, Fryingpan-Arkansas Project, northwestern Colorado: U.S. Bureau of Reclamation, 154 p. #3441 Widmann, B.L., Kirkham, R.M., and Rogers, W.P., 1998, Preliminary Quaternary fault and fold map and database of Colorado: Colorado Geological Survey Open-File Report 98-8, 331 p., 1 pl., scale 1:500,000.