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Quaternary Fault and Fold Database of the United States

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Cimarron fault, Bostwick Park section (Class B) No. 2290a

Last Review Date: 1997-11-17

Compiled in cooperation with the Colorado Geological Survey

citation for this record: **Widmann, B.L., compiler, 1997, Fault number 2290a, Cimarron fault, Bostwick Park section, 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	**General:** The west-northwest trending Cimarron fault and adjacent Red Rocks fault [2291] are on the southwest side of the Laramide Gunnison Uplift. The following is summarized from Lettis and others (1996 #4453). The Cimarron fault consists of four fault sections: from west to east they are the Bostwick Park, Poverty Mesa, Blue Mesa, and Powderhorn sections. The Poverty Mesa section [2290b] probably moved during the late Quaternary. The Bostwick Park [2290a] and Blue Mesa sections [2290c] are suspected of Quaternary movement. The Powderhorn section is suspected only of late Cenozoic movement, and is not discussed

	further in this database. The Bostwick Park section [2290a] is marked by a series of scarps of unknown origin. **Sections:** This fault has 3 sections. The fault was described as segmented by Lettis and others (1996 #4453), but their studies were not extensive. The Cimarron fault is divided into four sections, three of which show evidence of Quaternary movement. They include from west to east the Bostwick Park section [2290a], the Poverty Mesa section [2290b], and the Blue Mesa section [2290c]. The fourth section, the Powderhorn section, may have moved during the late Tertiary movement, but lacks evidence for Quaternary movement. Therefore is not discussed herein.
Name comments	**General:** The Cimarron fault is a west-northwest-striking fault between Montrose and Blue Mesa Reservoir. The western end of the fault is parallel to State Highway 50 and the Gunnison River. The fault extends from the Black Canyon of the Gunnison National Monument, continues southeast past Powderhorn and Iron Hill, and terminates south of the southeastern end of Huntsman Mesa. **Section:** Lettis and others (1996) referred to this section as the Bostwick Park segment of the Cimarron fault. As discussed previously, fault segments described by Lettis and others (1996 #4453) are herein referred to as sections. The Bostwick Park section of the fault extends from the mouth of Red Rock Canyon about 12 km southeastward into Bostwick Park. **Fault ID:** Fault number Q40b of Widman and others (1998 #3441).
County(s) and State(s)	MONTROSE COUNTY, COLORADO
Physiographic province(s)	COLORADO PLATEAUS
Reliability of location	Good Compiled at 1:250,000 scale. *Comments:* The Bostwick Park section was mapped at a scale of 1:24,000 and 1:250,000 by Lettis and others (1996 #4453), 1:250,000 by Tweto and others (1976 #2774), and 1:250,000 and 1:500,000 by Widmann and others (1998 #3441). Part of the section was mapped at a scale of 1:100,000 by Steven and others

	(1989 #2747). The trace used herein is from Lettis and others (1996 #4453).
Geologic setting	The Cimarron fault [2290] and associated Red Rocks fault [2291] are on the southwest margin of the Laramide-age Gunnison Uplift. The Cimarron fault is a high-angle, northeast-dipping reverse fault that was reactivated during the late Cenozoic as a down-to-the-northeast normal or oblique-slip structure (Hansen, 1971 #2695; Lettis and others, 1996 #4453). Based on geologic relationships exposed at the surface, Lettis and others (1996 #4453) suggested the Cimarron fault may merge with the Red Rocks fault at a depth of 5–9 km and then flatten to merge with a blind thrust or detachment at a depth of 8–10 km. Hansen (1971#2695) reported 5.5 km of left-lateral Laramide-age displacement across the fault. Bostwick Park is underlain by as much as 50 m of Quaternary deposits that include the Lava Creek B ash, dated at 620 ka (Hansen, 1971 #2695; Lettis and others, 1996 #4453).
Length (km)	This section is 15 km of a total fault length of 57 km.
Average strike	N45°W
Sense of movement	Normal *Comments:* Lettis and others (1996 #4453) suggested this section is northeast-dipping with normal or oblique slip during the late Cenozoic.
Dip Direction	NE *Comments:* The Cimarron fault is primarily a northeast-dipping fault plane (Hansen, 1971 #2695; Lettis and others, 1996 #4453).
Paleoseismology studies	
Geomorphic expression	The Bostwick Park section of the Cimarron fault is marked by a series of discontinuous, southwest-facing fault scarps, fault-line scarps, or fluvial scarps (Lettis and others, 1996 #4453).
Age of faulted surficial deposits	Scarps of unknown origin are present on Quaternary alluvial fans along the Bostwick section of the Cimarron fault (Lettis and others, 1996 #4453). These suggest but do not prove Quaternary

	activity. These alluvial fans have a 3- to 5-m-thick soil with a stage II+ morphology calcic horizon that is estimated to be middle to late Pleistocene (100 to 150 ka) in age (Lettis and others, 1996 #4453). Latest Pleistocene and Holocene deposits are not offset across the fault (Lettis and others, 1996 #4453) and upper Tertiary rocks are not along this section of this fault.
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) *Comments:* Evidence of activity during the Quaternary is equivocal.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Widmann and others (1998 #3441) placed this section within the <0.2 mm/yr slip-rate category based on slip rates calculated for other sections on the Cimarron fault.
Date and Compiler(s)	1997 Beth L. Widmann, Colorado Geological Survey
References	#2695 Hansen, W.R., 1971, Geologic map of the Black Canyon of the Gunnison River and vicinity, western Colorado: U.S. Geological Survey Miscellaneous Geologic Investigations I-584. #4453 Lettis, W., Noller, J., Wong, I., Ake, J., Vetter, U., and LaForge, R., 1996, Draft report, Seismotectonic evaluation of Colorado River storage project-Crystal, Morrow Point, Blue Mesa dams, Smith Fork project-Crawford dam, west-central Colorado: Technical report to U.S. Bureau of Reclamation, Denver, Colorado, 177 p. #2747 Steven, T.A., and Hail, W.J., Jr., 1989, Geologic map of the Montrose 30' x 60' quadrangle, southwestern Colorado: U.S. Geological Survey Miscellaneous Geologic Investigations I-1939. #2774 Tweto, O., Steven, T.A., Hail, W.J., Jr., and Moench, R.H., 1976, Preliminary geologic map of the Montrose 1° x 2° quadrangle, southwestern Colorado: U.S. Geological Survey Miscellaneous Field Studies Map MF-761.

	#2775 Unruh, J.R., Noller, J.S., Lettis, W.R., Sawyer, T.L., and Bott, J.D.J., 1993, Quaternary faults of the central Rocky Mountains, Colorado—A new seismotectonic evaluation: Geological Society of America Abstracts with Programs, v. 25, no. 5, p. 1. #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.