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Quaternary Fault and Fold Database of the United States

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Ridgway fault (Class A) No. 2276

Last Review Date: 1997-11-14

Compiled in cooperation with the Colorado Geological Survey

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Synopsis	The Ridgway fault is an east-west-oriented fault on the southwest margin of the Uncomphagre Uplift. The fault is defined by a 300-m-high fault-line scarp, but there is no observable surface rupture or offset of middle to late Quaternary deposits. Sullivan and others (1980 #2756) reported possible offset of Kansan (early middle Quaternary) to early Wisconsin (late Quaternary) glacial deposits. Micorseismic studies in the area reveal a close spatial association of seismicity to the Ridgway fault. The fault was considered to be potentially active by Kirkham and Rogers (1981 #792), Sullivan and others (1980 #2756) and Lettis and others (1996 #4453).
Name	The Ridgway fault extends east from the Ouray/Montrose County

comments	line, runs parallel to and north of Pleasant Valley Creek, and ends northeast of the town of Ridgway. **Fault ID:** Fault 179 in Kirkham and Rogers (1981 #792) and fault number Q26 of Widman and others (1998 #3441).
County(s) and State(s)	OURAY COUNTY, COLORADO MONTROSE COUNTY, COLORADO
Physiographic province(s)	COLORADO PLATEAUS SOUTHERN ROCKY MOUNTAINS
Reliability of location	Good Compiled at 1:250,000 scale. *Comments:* The Ridgway fault was mapped at a scale of 1:24,000 by Hail (1988 #2692; 1989 #2693) and Lettis and others (1996 #4453), 1:100,000 by Steven and Hail (1989 #2747), and 1:250,000 by Tweto and others (1976 #2774). The trace used herein is from Lettis and others (1996 #4453).
Geologic setting	The Ridgway fault lies on the southwest margin of the Uncompahgre Uplift, which is a northwest-trending, east- tilted fault block. The Ridgway fault is a high-angle normal fault that is down to the south.
Length (km)	24 km.
Average strike	N87°E
Sense of movement	Normal *Comments:* Sullivan and others (1980 #2756) and Sullivan and Martin (1986 #2755) reported a south-dipping fault plane based on microseismicity studies. Down- to-the-south movement on a south-dipping fault plane indicates normal movement.
Dip Direction	S
Paleoseismology studies	
Geomorphic expression	Sullivan and others (1980 #2756) described a south-facing, 300-m-high fault-line scarp along the Ridgway fault. However, Lettis and others (1996 #4453) reported that there has not been any documented surface rupture in at least 140 k.y., which is supported by the general lack of geomorphic features such as

	scarps or lineaments along the fault.
Age of faulted surficial deposits	Sullivan and others (1980 #2756) postulated that Kansan (early middle Quaternary) to early Wisconsin (late Quaternary) glacial deposits may be offset by the Ridway fault. However, Lettis and others (1996 #4453) and Ake and others (1997 #2105) reported that pre-Bull Lake (middle Pleistocene) to Pinedale (10 to 40 ka) deposits are not offset by the fault. Lettis and others (1996 #4453) further stated that Holocene non-glacial deposits are not offset by the fault based on the absense of geomorphic features indicative of youthful faulting. Maxium stratigraphic throw on the Ridway fault is about 150 m, most of which is believed to have occurred during the Laramide (Sullivan and others, 1980 #2756).
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) *Comments:* Sullivan and others (1980 #2756) examined glacial deposits and attempted to correlate them across the fault. They postulated that elevation differences in these glacial deposits across the fault could suggest Quaternary movement on the Ridgway fault. Microseismicity studies by Sullivan and others (1980 #2756) and Martin (1987 #2722) reported that seismicity is associated with the Ridgway fault. Kirkham and Rogers (1981 #792) and Colman (1985 #1953) indicated Quaternary movement on the fault. Lettis and others (1996) reported no observable surface rupture since at least 140 ka. They also suggested that either the seismicity is being produced by the Ridgway fault itself but without surface rupture since 140 ka, or that the seismicity is induced by the filling of Ridgway Reservoir and is occurring on the Ridgway fault and/or associated branch faults in the region. The most recent paleoevent on the Ridway fault is herein conservatively considered to have occurred during the Quaternary (<1.6 Ma) based on possible offset of Quaternary glacial deposits and microseismicity data cited by Sullivan and others (1980 #2756).
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Based on the lack of geomorphic evidence to support

	recent fault activity, and the lack of any observable surface rupture, Widmann and others (1998 #3441) placed this structure within the <0.2 mm/yr slip-rate category.
Date and Compiler(s)	1997 Beth L. Widmann, Colorado Geological Survey
References	#2105 Ake, J.P., Vetter, U., and Hawkins, F., 1997, Seismicity and Quaternary faulting near Ridgway, Colorado: Colorado Geological Survey Geohazards Conference field trip guidebook. #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. #2692 Hail, W.J., Jr., 1988, Reconnaissance geologic map of the Horsefly Peak quadrangle, Ouray, Montrose, and San Miguel Counties, Colorado: U.S. Geological Survey Miscellaneous Field Studies Map MF-2059. #2693 Hail, W.J., Jr., 1989, Reconnaissance geologic map of the Ridgway quadrangle, Ouray County, Colorado: U.S. Geological Survey Miscellaneous Field Studies Map MF-2100. #792 Kirkham, R.M., and Rogers, W.P., 1981, Earthquake potential in Colorado: Colorado Geological Survey Bulletin 43, 171 p., 3 pls. #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. #2722 Martin, R.A., Jr., 1987, Preliminary results of network operation for the period June 4, 1985 through April 30, 1987, Ridgway seismic network: U.S. Bureau of Reclamation Seismotectonic Report 87-1. #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.

	#2755 Sullivan, J.T., and Martin, R.A., 1986, Seismic hazard studies for Ridgway dam site, Colorado, *in* Colorado tectonics, seismicity and earthquake hazards—Proceedings and field trip guide: Colorado Geological Survey Special Publication 19, p. 30-31. #2756 Sullivan, J.T., Meeder, C.A., Martin, R.A., and West, M.W., 1980, Seismic hazard evaluation-Ridgway dam and reservoir site-Dallas Creek project Colorado: U.S. Water and Power Resources Service, Seismotectonic Section, report, 43 p. #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. #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.