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.

Animas Valley faults (Class A) No. 2093

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Compiled in cooperation with the New Mexico Bureau of Geology & Mineral Resources

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Synopsis	These faults bound the eastern margin of the Animas Valley and western piedmont of the Pyramid Mountains. The faults have small scarps that appear to be latest Pleistocene in age on the basis of their morphology. Most of the scarps are compound and have bevels near their crests, indicating they may be the result of multiple faulting events. No detailed studies have been made of the timing of fault movement or of the age of faulted materials.
Name comments	These faults were mentioned early by Reeder (1957 #1069) and Gillerman (1958 #1067), but were later mapped by Drewes and others (1985 #1034). Smith (1978 #1706) named the faults for the Animas Valley, which they border on the east. The faults extend

	from about 1 km north of Gore Canyon south to the latitude of Holtkamp Canyon, about 5 km northeast of Cotton City, New Mexico. **Fault ID:** Fault number 10 of Machette and others (1986 #1033).
County(s) and State(s)	HIDALGO COUNTY, NEW MEXICO
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:24,000 scale. *Comments:* Location of fault shown on 1:250,000-scale map of Machette and others (1986 #1033), which was compiled at 1:24,000-scale from aerial photographs. Thorman and Drewes (1978 #1039) mapped the northern end of the fault at 1:24,000 scale and Drewes and others (1985 #1034) showed the generalized trace of the entire fault on their 1:250,000-scale map. Fleischhauer and Stone (1982 #1274) showed some parts of the fault at 1:48,000 scale, along with late Pleistocene and Holocene shorelines of pluvial Lake Animas. The faults have been re-mapped at 1:24,000 scale using the above sources coupled with photogrammetric investigations.
Geologic setting	This south-striking fault forms a sinuous trace 1–5 km west of the Pyramid Mountains. The scarps bound the eastern margin of the Animas Valley and west margin of the southern part of the Pyramid Mountains. A shallow hot water anomaly along the southern end of the fault indicate locally high heat flow in the near subsurface. The geothermal potential of the area to the south (Lightening Dock known geothermal resource area) has been developed in the form of greenhouses, an aquaculture facility, and a 10MW power plant (Schochet and Cunniff, 2001 #7351; Witcher and others, 2002 #7353). The Animas Valley fault system overlaps an area of steep gravity gradients, though these anomalies have been attributed to basement structures and the topographic rim and ring fracture zone of a mid-Tertiary caldera (Schochet and Cunniff, 2001 #7351; Witcher, 2008 #7352).
Length (km)	20 km.
Average strike	N9°E
Sense of	

Sense of movement	Normal
Dip Direction	W
Paleoseismology studies	
Geomorphic expression	Wells (in Elston and others, 1983 #1068) reported that the scarps have as much as 5 m of vertical relief. Machette and others (1986 #1033) measured topographic profiles across the scarps and found that they are commonly 2–3 m high and have maximum scarp-slope angles of 5°–10° (Machette and others, 1986 #1033, fig. 10). In addition, the larger scarps show clear evidence of being the result of two faulting events (compound scarps), with pronounced bevels on the crest of the scarps. The younger element of the scarp height is 0.7 to less than 2 m high; these data led Machette and others (1986 #1033) to suggest that the most recent faulting event occurred in the latest Pleistocene (<15 ka).
Age of faulted surficial deposits	The scarps are formed on piedmont-slope deposits having "well-developed" soil horizons (Wells in Elston and others, 1983 #1068). Machette and others (1986 #1033) indicated that the scarps are formed on alluvial-fan deposits of middle (?) to late Pleistocene age, and are buried by Holocene deposits. Likewise, Fleischhauer and Stone (1982 #1274) showed the fault as cutting old fan alluvium (unit Qfo), which is of late to middle Pleistocene age. These age estimates were based on preservation of landforms, expression on aerial photographs, and soils developed on the deposits. However, no comprehensive studies of the Quaternary alluvial sequence have been made in this area.
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* Morphometric data from the scarps indicate they probably formed between about 10–15 ka. These data support Wells' (in Elston and others, 1983 #1068) inference of late Pleistocene or Holocene faulting.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr

	Comments: Low slip-rate category assigned based on small scarps (2–3 m) on late Pleistocene deposits.
Date and Compiler(s)	2016 Michael N. Machette, U.S. Geological Survey, Retired Andrew P. Jochems, New Mexico Bureau of Geology & Mineral Resources
References	#1034 Drewes, H., Houser, B.B., Hedlund, D.C., Richter, D.H., Thorman, C.H., and Finnell, T.L., 1985, Geologic map of the Silver City 1° x 2° quadrangle New Mexico and Arizona: U.S. Geological Survey Miscellaneous Investigations Map I-1310-C, 1 sheet, scale 1:250,000. #1068 Elston, W.E., Deal, E.G., and Logsdon, M.J., 1983, Geology and geothermal waters of Lightning Dock region, Animas Valley and Pyramid Mountains, Hidalgo County, New Mexico: New Mexico Bureau of Mines and Mineral Resources Circular 177, 44 p., 2 pls. #1274 Fleischhauer, H.L., Jr., and Stone, W.J., 1982, Quaternary geology of Lake Animas, Hidalgo County, New Mexico: New Mexico Bureau of Mines and Mineral Resources Circular 174, 25 p., 1 pl., scale 1:48,000. #1067 Gillerman, E., 1958, Geology of the central Peloncillo Mountains, Hidalgo County, New Mexico, and Cochise County, Arizona: [New Mexico] Bureau of Mines and Mineral Resources Bulletin 57, 152 p., 2 pls. #1033 Machette, M.N., Personius, S.F., Menges, C.M., and Pearthree, P.A., 1986, Map showing Quaternary and Pliocene faults in the Silver City 1° x 2° quadrangle and the Douglas 1° x 2° quadrangle, southeastern Arizona and southwestern New Mexico: U.S. Geological Survey Miscellaneous Field Studies Map MF-1465-C, 12 p. pamphlet, 1 sheet, scale 1:250,000. #1069 Reeder, H.O., 1957, Ground water in Animas Valley, Hidalgo County, New Mexico: New Mexico Engineer Technical Report 11, 101 p. #7351 Schochet, D.N., and Cunniff, R.A., 2001, Development of a plan to implement enhanced geothermal system (EGS) in the Animas Valley, New Mexico: Special proprietary report to U.S. Department of Energy by ORMAT International, Inc., and

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