Jump to Navigation

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.

unnamed fault northeast of Longhorn Ranch (Class A) No. 2059

Last Review Date: 2015-12-14

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

citation for this record: **Machette, M.N., and Jochems, A.P., compilers, 2015, Fault number 2059, unnamed fault northeast of Longhorn Ranch, 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 02:22 PM.**

Synopsis	Little is known about the bedrock and Quaternary fault along the eastern margin of the Estancia basin. Most of the trace of the fault is mapped in either Permian and Triassic bedrock or in Pliocene (?) to Pleistocene deposits. The fault has been drilled and trenched as part of a regional reconnaissance study of a proposed site for the Superconducting Super Collider (SSC). Post-Permian throw on the fault is no more than 33 m, and no quantitative information has been published about the fault's movement history in the Quaternary.

Name comments	This unnamed Quaternary fault was mapped by Johnpeer and others (1987 #1672) in a study for the proposed Estancia Basin, New Mexico, Superconducting Super Collider (SSC) site. The fault is located northeast of Longhorn Ranch (12 km east of Moriarty), and extends from U.S. Highway 66 north to the vicinity of El Cuervo Butte.
County(s) and State(s)	SANTA FE COUNTY, NEW MEXICO TORRANCE COUNTY, NEW MEXICO
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:24,000 scale. *Comments:* Location of fault from 1:62,500-scale map of Stanley 15-minute quadrangle, which was enlarged to 1:24,000-scale by Johnpeer and others (1987 #1672). The fault trace was transferred to a 1:250,000-scale topographic base for compilation. The location of the fault was digitized at 1:24,000 scale using photogrammetry to accurately map its trace from Johnpeer and others (1987 #1627).
Geologic setting	This north-trending fault forms a gentle scarp (on alluvium) to locally steep escarpment (on bedrock) on the eastern margin of the northern part of the Estancia Basin. It is mapped as offsetting Pliocene (?) to Pleistocene deposits (QTa) and a variety of bedrock units, such as Triassic mudstones and claystones, and the Permian Yeso Formation and Glorieta Sandstone. On the basis of drill-hole data, there does not appear to be more than 33 m of throw across the fault.
Length (km)	10 km.
Average strike	N6°E
Sense of movement	Normal
Dip	60°– 90° W *Comments:* The trench log of Johnpeer and others (1987 #1672) shows a near surface dip of about 60 (?)°, with the fault plane steepening to vertical within 3 m of the surface. The fault is probably moderately high-angle at depth.

Paleoseismology studies	Johnpeer and others (1987 #1672) excavated an exploratory trench (site 2050-1) across the mapped trace of this unnamed fault. Their site (SSC-BH-10, fig. 3.2-1B) was located on the north bank of a small unnamed stream channel about 2.8 km NNE of Erramousbe Ranch (Stanley 15-minute quadrangle). The trench showed evidence of Quaternary offset of sandy to silty gravel, gravelly silty clay, and silty to fine sand (units 4-8). Unit 3 buries the scarp associated with the fault plane in the trench, and units 1 and 2 form a fairly uniform ground surface that does not display evidence of deformation (these interpretations were made by the compiler from trench log SSC-BH-10, fig. 3.2-1B). The upper three units (1–3) are referred to as older alluvium (Johnpeer and others, 1987 #1672, p. 3-31). No information about the age of faulted and unfaulted materials are included on the log or the discussion in the text of the report.
Geomorphic expression	Johnpeer and others (1987 #1672) reported that the fault forms a gentle scarp on alluvium to a locally steep escarpment on bedrock. No topographic-profile data was collected to quantify the morphology of the scarps on alluvium.
Age of faulted surficial deposits	The fault offsets deposits that underlie the older (Quaternary) alluvium of Johnpeer and others (1987 #1672). These unbroken cover units contain a moderately well-developed calcic horizon (Bk) of pedogenic origin, thus indicating that the fault last moved well in excess of 10 ka. No descriptive or laboratory data are presented from which one might estimate the probable age of the unfaulted soil.
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) *Comments:* Quaternary movement indicated by Johnpeer and others (1987 #1672); however, they concluded that the fault has not been active for more than 10,000 years.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* A very low slip rate is probably associated with movement on this fault owing to the probable time of last

	movement (pre-Holocene) and lack of surficial expression in the older alluvium.
Date and Compiler(s)	2015 Michael N. Machette, U.S. Geological Survey, Retired Andrew P. Jochems, New Mexico Bureau of Geology & Mineral Resources
References	#1672 Johnpeer, G., Robinson-Cook, S., Bobrow, D., Barrie, D., Kelliher, J., and McNeil, R., 1987, Geology and tunneling, *in* Estancia Basin, New Mexico superconducting super collider: New Mexico Bureau of Mines and Mineral Resources Open-File Report 258, p. 3-1-3-224.