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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 in Logan Valley (Class A) No. 812

Last Review Date: 2002-12-03

citation for this record: **Personius, S.F., compiler, 2002, Fault number 812, unnamed fault in Logan Valley, 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 01:58 PM.**

Synopsis	This northwest-trending, down-to-the-southwest normal fault is parallel to and structurally controls the east flank of Logan Valley in central Oregon. Logan Valley is located at the northern end of the 25-km-long Logan Valley graben; the unnamed fault described herein is the eastern bounding fault of the graben, and a parallel, down-to-the-northeast fault forms the western margin of the graben. This area is underlain by Miocene and Pliocene (?) Strawberry Volcanics; Logan Valley is filled with Miocene and Pliocene tuffaceous sedimentary rocks and Quaternary alluvium. No detailed information on Quaternary offset are available, but limited airphoto analysis suggests possible middle or late Quaternary displacement.
Name	This unnamed normal fault forms the eastern margin of Logan

comments	Valley in east-central Oregon.
County(s) and State(s)	GRANT COUNTY, OREGON
Physiographic province(s)	COLUMBIA PLATEAU
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* Fault location is from 1:100,000-scale mapping of Weldon and others (2002 #5648), based on 1:500,000-scale mapping of Pezzopane (1993 #3544).
Geologic setting	The Logan Valley fault is parallel to and structurally controls the east flank of Logan Valley (Brown and Thayer, 1966 #3577). Logan Valley is located at the northern end of the 25-km-long Logan Valley graben; the unnamed fault described herein is the eastern bounding fault of the graben. A parallel, down-to-the-northeast fault forms the western margin of Logan Valley and graben. This area is underlain by Miocene and Pliocene (?) Strawberry Volcanics; Logan Valley is filled with Miocene and Pliocene tuffaceous sedimentary rocks and Quaternary alluvium (Brown and Thayer, 1966 #3577; Walker and MacLeod, 1991 #3646).
Length (km)	9 km.
Average strike	N57°W
Sense of movement	Normal *Comments:* This structure is depicted as a normal fault on the geologic maps of Brown and Thayer (1966 #3577) and Walker and MacLeod (1991 #3646).
Dip Direction	SW
Paleoseismology studies	
Geomorphic expression	No information on geomorphic expression of this fault has been described, but the fault is coincident with 100-m-high escarpments in Miocene and Pliocene (?) Strawberry Volcanics along the eastern margin of Logan Valley (Brown and Thayer, 1966 #3577; Walker and MacLeod, 1991 #3646).

Age of faulted surficial deposits	Brown and Thayer (1966 #3577) show the eastern Logan Valley fault buried by Holocene alluvium; Walker and MacLeod (1991 #3646) dash the fault across Miocene and Pliocene tuffaceous sedimentary rocks and Holocene alluvium in Logan Valley.
Historic earthquake	
Most recent prehistoric deformation	middle and late Quaternary (<750 ka) *Comments:* Existing small-scale geologic maps do not discuss evidence of Quaternary displacement, but Pezzopane (1993 #3544) used airphoto analysis to infer middle and late Quaternary (<700 ka) displacement. Subsequent compilations (Geomatrix Consultants Inc., 1995 #3593; Madin and Mabey, 1996 #3575; Weldon and others, 2002 #5648) also show the unnamed eastern Logan Valley fault as active in the middle and late Quaternary (<780 ka).
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* No published slip rates are available for the unnamed eastern Logan Valley fault. The fault is coincident with 100-m-high escarpments in Miocene and Pliocene (?) Strawberry Volcanics; such displacements suggest low rates of long-term slip.
Date and Compiler(s)	2002 Stephen F. Personius, U.S. Geological Survey
References	#3577 Brown, E.C., and Thayer, T.P., 1966, Geologic map of the Canyon City quadrangle northeastern Oregon: U.S. Geological Survey Miscellaneous Geologic Investigations I-447, 1 sheet, scale 1:250,000. #3593 Geomatrix Consultants, Inc., 1995, Seismic design mapping, State of Oregon: Technical report to Oregon Department of Transportation, Salem, Oregon, under Contract 11688, January 1995, unpaginated, 5 pls., scale 1:1,250,000. #3575 Madin, I.P., and Mabey, M.A., 1996, Earthquake hazard maps for Oregon: State of Oregon, Department of Geology and Mineral Industries Geological Map Series GMS-100, 1 sheet.

	#3544 Pezzopane, S.K., 1993, Active faults and earthquake ground motions in Oregon: Eugene, Oregon, University of Oregon, unpublished Ph.D. dissertation, 208 p. #3646 Walker, G.W., and MacLeod, N.S., 1991, Geologic map of Oregon: U.S. Geological Survey, Special Geologic Map, 2 sheets, scale 1:500,000. #5648 Weldon, R.J., Fletcher, D.K., Weldon, E.M., Scharer, K.M., and McCrory, P.A., 2002, An update of Quaternary faults of central and eastern Oregon: U.S. Geological Survey Open-File Report 02-301 (CD-ROM), 26 sheets, scale 1:100,000.