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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 faults near Diamond Craters (Class B) No. 820

Last Review Date: 2002-12-03

citation for this record: **Personius, S.F., compiler, 2002, Fault number 820, unnamed faults near Diamond Craters, 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 01:59 PM.**

Synopsis	These short, northwest-trending high-angle faults form a narrow graben on the ea flank of the Diamond Craters volcano, a late Quaternary basalt volcanic field in southeastern Oregon. These faults are parallel to and may be part of the Brothers zone, a 250- to 300-km-long zone of high-angle faulting that may be the surface manifestation of a regional-scale right-lateral shear zone. Herein these faults are classified as Class B structures because they are restricted to rocks of the volcanic and form large escarpments in relation to their short length, and thus are likely re to late Quaternary volcanism associated with the Diamond Craters volcanic field than to tectonic processes.
Name comments	These unnamed high-angle faults are located southeast of Harney Lake in central Oregon. They are shown on some maps (Greene and others, 1972 #3560; Brown others, 1980 #3572; Pezzopane, 1993 #3544; Geomatrix Consultants Inc., 1995 # Madin and Mabey, 1996 #3575; Weldon and others, 2002 #5648), but not others (

	and others, 1939 #3488; Walker and MacLeod, 1991 #3646).
County(s) and State(s)	HARNEY COUNTY, OREGON
Physiographic province(s)	COLUMBIA PLATEAU
Reliability of location	Good Compiled at 1:62,500 scale. *Comments:* Location of fault from ORActiveFaults (http://www.oregongeology.org/arcgis/rest/services/Public/ORActiveFaults/MapS downloaded 06/02/2016) attributed to 1:62,500-scale mapping of Brown and othe (1980 #3727).
Geologic setting	These short, northwest-trending high-angle faults form a narrow graben on the ea flank of the Diamond Craters volcano, a late Quaternary basalt volcanic field in southeastern Oregon. These faults are parallel to and may be part of the Brothers zone, a 250– to 300-km-long zone of high-angle faulting that may be the surface manifestation of a regional-scale right-lateral shear zone (Lawrence, 1976 #3506) However, the faults are short and restricted to rocks of the volcanic field, and thus probably are related to late Quaternary volcanism associated with the Diamond C volcanic field, rather than to tectonic processes.
Length (km)	5 km.
Average strike	N37°W
Sense of movement	Normal, Right lateral *Comments:* These structures as depicted as high-angle, presumably normal faults maps of Greene and others (1972 #3560), Brown and others (1980 #3572), Pezzo (1993 #3544), and Geomatrix Consultants, Inc. (1995 #3593). If they are part of t Brothers fault zone, they may represent part of the surface manifestations of a reg right-lateral shear zone (Lawrence, 1976 #3506).
Dip Direction	SW; NE
Paleoseismology studies	
Geomorphic expression	No details on the geomorphic expression of these faults has been reported. Howe these faults form 20- to 40-m-high escarpments in late Quaternary rocks of the Diamond Craters volcanic field.
Age of faulted	These faults offset volcanic rocks of the Diamond Craters volcanic field. These ro

surficial deposits	are variously categorized as Pleistocene and Holocene (Piper and others, 1939 #3 Greene and others, 1972 #3560), Holocene (Brown and others, 1980 #3572), and Holocene or upper Pleistocene (Walker and MacLeod, 1991 #3646). Peterson and (1964 #4029) used the freshness of volcanic features to infer an age within the las 1,000 years. A hydration-rind age of 17,000±2,000 years on the basalts in the vol field has been reported by Friedman and Peterson (1971 #3992).
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* Pezzopane (1993 #3544) used airphoto analysis to infer middle and la Quaternary (<700 ka) displacement. Subsequent compilations (Geomatrix Consul Inc., 1995 #3593; Madin and Mabey, 1996 #3575; Weldon and others, 2002 #564 also show these faults as active in the middle or late Quaternary (<780 ka). Howe the offset rocks at Diamond Craters are latest Pleistocene or Holocene in age (Friedman and Peterson, 1971 #3992; Brown and others, 1980 #3572; Walker and MacLeod, 1991 #3646), then the youngest event occurred in the latest Quaternary
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* No published slip rates are available for these faults, but 20- to 40-m-escarpments on late Quaternary rocks suggest higher rates of slip than would be expected from such short faults. These relations support a volcanic origin for thes features.
Date and Compiler(s)	2002 Stephen F. Personius, U.S. Geological Survey
References	#3727 Brown, D.E., McLean, G.D., and Black, G.L., 1980, Preliminary geology a geothermal resource potential of the southern Harney Basin, Oregon: State of Ore Department of Geology and Mineral Industries Open-File Report O-80-7, 90 p., 8 #3992 Friedman, I., and Peterson, N., 1971, Obsidian hydration dating applied to dating of basaltic volcanic activity: Science, v. 172, p. 1028, DOI: 10.1126/science.172.3987.1028. #3593 Geomatrix Consultants, Inc., 1995, Seismic design mapping, State of Oreg Technical report to Oregon Department of Transportation, Salem, Oregon, under Contract 11688, January 1995, unpaginated, 5 pls., scale 1:1,250,000. #3560 Greene, R.C., Walker, G.W., and Corcoran, R.E., 1972, Geologic map of th Burns quadrangle, Oregon: U.S. Geological Survey Miscellaneous Geologic

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#3506 Lawrence, R.D., 1976, Strike-slip faulting terminates the Basin and Range province in Oregon: Geological Society of America Bulletin, v. 87, p. 846-850.

#3575 Madin, I.P., and Mabey, M.A., 1996, Earthquake hazard maps for Oregon: of Oregon, Department of Geology and Mineral Industries Geological Map Serie GMS-100, 1 sheet.

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#3544 Pezzopane, S.K., 1993, Active faults and earthquake ground motions in Or Eugene, Oregon, University of Oregon, unpublished Ph.D. dissertation, 208 p.

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#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, 2002, An update of Quaternary faults of central and eastern Oregon: U.S. Geolog Survey Open-File Report 02-301 (CD-ROM), 26 sheets, scale 1:100,000.