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Quaternary Fault and Fold Database of the United States

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Turner and Mill Creek faults (Class A) No. 871

Last Review Date: 2002-04-09

citation for this record: **Personius, S.F., compiler, 2002, Fault number 871, Turner and Mill Creek faults, 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 03:14 PM.**

Synopsis	The northeast-striking Turner and Mill Creek faults offsets Miocene rocks of the Columbia River Basalt Group in the Salem Hills and Waldo Hills of the central Willamette Valley. This fault has the same strike and displacement direction as th Corvallis fault, but there is no evidence that these structures are continuous acros Willamette River. The Mill Creek fault is coincident with a gentle, embayed rang front along the southern margin of the Waldo Hills, and may deform middle Pleistocene (?) deposits near the Mill Creek water gap.
Name comments	Parts of this fault is included in the Salem Hills structures of Pezzopane (1993 #3 The fault was originally mapped and named as two separate structures, the Turne Mill Creek faults. The Turner fault is named after the town of Turner in the Salen Hills; it was mapped by Walker and Duncan (1989 #3581) and mapped and name Graven (1990 #3990) and Yeats and others (1996 #4291). The Mill Creek fault is named after Mill Creek, which parallels part of the fault trace; the fault was mapp and named by Graven (1990 #3990) and Yeats and others (1996 #4291). Several studies include both faults in a single fault (Yeats and others, 1993 #5057; Crenna

	Yeats, 1994 #4129; Geomatrix Consultants Inc., 1995 #3593), so that named is us herein. These faults are not shown on most older geologic maps of the area (Thay 1939 #4070; Hampton, 1972 #4065; Bela, 1981 #4033), but is included in more r maps (Tolan and Beeson, 2000 #5069). **Fault ID:** This structure is fault number 7 of Pezzopane (1993 #3544) and fault number 33 of Geomatrix Consultants, Inc. (1995 #3593).
County(s) and State(s)	MARION COUNTY, OREGON
Physiographic province(s)	PACIFIC BORDER
Reliability of location	Good Compiled at 1:24,000 and 1:100,000 scale. *Comments:* Location of fault from ORActiveFaults (http://www.oregongeology.org/arcgis/rest/services/Public/ORActiveFaults/MapS downloaded 06/02/2016) attributed to 1:24,000-scale mapping of Tolan and Bees (2000 #5069) and 1:100,000-scale mapping of Yeats and others (1996 #4291).
Geologic setting	The faults offset Miocene rocks of the Columbia River Basalt Group and form aeromagnetic anomalies in the Salem Hills and Waldo Hills of the central Willam Valley (Walker and Duncan, 1989 #3581; Yeats and others, 1996 #4291; Blakely others, 2000 #4333; Tolan and Beeson, 2000 #5069). This fault has the same strik displacement direction as the Corvallis fault, but there is no evidence that these structures are continuous across the Willamette River (Yeats, 1990 #4018; Yeats a others, 1993 #5057; Yeats and others, 1996 #4291).
Length (km)	18 km.
Average strike	N66°E
Sense of movement	Unspecified, Left lateral *Comments:* The Mill Creek fault is mapped as a near-vertical fault by Graven (19 #3990), Crenna and others (1994 #4129), Yeats and others (1993 #5057), and Yea and others (1996 #4291). Yeats and Levi (1994 #4024) and Yeats and others (199 #5057) describe basin relations that may suggest a strong component of left-latera strike slip.
Dip Direction	Unknown *Comments:* The faults were modeled as a 70° dipping reverse fault in the probabi seismic hazards analysis of Geomatrix Consultants, Inc. (1995 #3593).

Paleoseismology studies	
Geomorphic expression	The faults have little if any geomorphic expression where it traverses the bedrock cored Salem Hills but is coincident with a gentle, embayed range front at the sout margin of the Waldo Hills and the northern margin of the Stayton (North Santiam basin.
Age of faulted surficial deposits	The faults may deform older Quaternary deposits along the southern margin of th Waldo Hills near the Mill Creek water gap. Yeats and others (1993 #5057) infer deformation of the middle Pleistocene (?) Lacomb gravel and Dolph geomorphic surface, but the fault does not appear to deform late Quaternary surfaces such as t Linn gravel (Rowland Formation), and the Winkle geomorphic surface (Yeats and others, 1991 #3953; Yeats and others, 1993 #5057; Yeats and Levi, 1994 #4024; Crenna and Yeats, 1994 #4129; Yeats and others, 1996 #4291).
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) *Comments:* Pezzopane (1993 #3544) mapped these faults as Quaternary (<1.6 Ma later compilations (Geomatrix Consultants Inc., 1995 #3593; Madin and Mabey, #3575) infer middle and late Quaternary (<780 ka) displacement. Given the equiv nature of evidence for Quaternary displacement, these faults are mapped herein a Quaternary (<1.6 Ma).
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Graven (1990 #3990) and Yeats and others (1996 #4291) estimate 10 and Yeats and others (1993 #5057) and Crenna and others (1994 #4129) estimate 150–210 m of offset of Miocene Columbia River Basalt Group rocks across the f these data and the lack of significant geomorphic expression along these faults su low rates of slip. Geomatrix Consultants, Inc. (1995 #3593) and Wong and others (1999 #4073; 2000 #5137) assigned slip rates of 0.005–0.05 mm/yr in their analy the earthquake hazards associated with the Turner and Mill Creek faults.
Date and Compiler(s)	2002 Stephen F. Personius, U.S. Geological Survey
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