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Ortigalita fault zone, Little Panoche Valley section (Class A) No. 52d

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Compiled in cooperation with the California Geological Survey

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Synopsis	**General:** The Ortigalita fault zone is a major Holocene dextral strike-slip fault in the central Coast Ranges that is an eastern part of the larger San Andreas fault system. The Ortigalita fault zone extends from about 20 km northwest of San Luis Reservoir southeast to the vicinity of Panoche Valley. The Ortigalita fault zone is characterized by en echelon fault traces separated by pull-apart basins. Anderson and others (1982 #5344; 1982 #5345) excavated trenches along each of the four sections, demonstrating that the Ortigalita fault zone is latest Pleistocene to Holocene (active) and that the Little Panoche Valley section is late

	Holocene active. Most of the Ortigalita fault zone is delineated by geomorphic evidence of latest Pleistocene to Holocene dextral strike-slip displacement and is locally marked by complex dextral normal offset, primarily at the section boundaries marked by pull-apart basins (Anderson and others, 1982 #5344; 1982 #5345; Hart, 1985 #5350; Manson, 1985 #5355). Late Quaternary slip rates and recurrence intervals are unknown, although Anderson and others (1982 #5344) concluded that the recurrence interval for the entire Ortigalita fault zone is about 2–5 k.y. Clark and others (1984 #2876) reported a minimum vertical slip rate of 0.01–0.04 mm/yr. The dextral slip component is probably greater than the vertical component, but this has not been documented. **Sections:** This fault has 4 sections. Anderson and others (1982 #5344) defined four segments of the Ortigalita fault, from north to south: Cottonwood Arm, Los Banos Valley, Piedra Azul, and Little Panoche. There is insufficient data to define these as seismogenic fault segments. The names and segment boundaries from Anderson and others (1982 #5344) are adopted as sections for this compilation and include the Cottonwood Arm [52a], Los Banos Valley [52b], Piedra Azul [52c], and Little Panoche [52d] sections.
Name comments	**General:** The Ortigalita fault zone was first recognized and mapped by Anderson and Pack (1915 #5347) for a fault that juxtaposes Cretaceous Franciscan Complex rocks against Upper Cretaceous Chico Group along the eastern side of Ortigalita Peak. The fault was first named by Taliaferro (1943 #5356), who identified a steeply west-dipping reverse fault (cross-section VII) that he named the Ortigalita Thrust. The fault has also been referred to as the Tesla-Ortigalita fault (e.g., Cotton, 1972 #5348). This compilation refers to the Ortigalita fault zone (most common name) as the zone of faults from about 20 km northwest of San Luis Reservoir southeast to Panoche Valley that are characterized by predominantly dextral late Pleistocene and Holocene strike-slip. **Section:** The Little Panoche Valley section corresponds to the Little Panoche Valley segment of Anderson and others (1982 #5344). This section extends from the northern end of Little Panoche Valley south-southeast to the northern end of Panoche Valley. **Fault ID:** Refers to number 214 (Ortigalita fault) of Jennings (1994 #2878) and number L03 (Ortigalita fault) of Working

	Group on Northern California Earthquake Potential (1996 #1216).
County(s) and State(s)	SAN BENITO COUNTY, CALIFORNIA FRESNO COUNTY, CALIFORNIA MERCED COUNTY, CALIFORNIA
Physiographic province(s)	PACIFIC BORDER
Reliability of location	Good Compiled at 1:62,500 scale. *Comments:* Locations based on digital revisions to Jennings (1994 #2878) using original mapping by Dibblee (1975 #4832) at 1:62,500 scale and mapping by Anderson and others (1982 #5345), Lettis (1982 #5353), and Manson (1985 #5355) at 1:24,000 scale.
Geologic setting	The Ortigalita fault zone consists of near vertical dipping dextral strike-slip faults located along the eastern border of the central Diablo Range (Anderson and others, 1982 #5344; Lettis, 1985 #5354). This fault zone separates the Franciscan core of the range from the Great Valley Sequence of the eastern foothills of the range (Anderson and others, 1982 #5344). The fault's style of displacement locally is complex with minor reverse and normal components to the predominant dextral strike-slip displacement (Anderson and others, 1982 #5344; 1982 #5345; Manson, 1985 #5355). Cumulative dextral displacement is unknown, but the large-scale dextral displacement of Los Banos Creek suggests at least 5 km of offset (Manson, 1985 #5355). Anderson and La Forge (1990 #5346) estimated that at least 1–2 km of dextral slip is indicated by the size of pull-apart basins associated with the Ortigalita fault zone. Lettis (1985 #5354) argued that the location of Basalt Hill, an outlier of the late Miocene Quien Sabe volcanic field, limits the amount of significant late Cenozoic dextral displacement along the Ortigalita fault zone. Elevations of the Quien Sabe volcanic rocks on either side of the Ortigalita fault zone also limit the amount of late Cenozoic vertical displacement (Lettis, 1985 #5354).
Length (km)	This section is 13 km of a total fault length of 71 km.
Average strike	(for section) versus N28°W (for whole fault)
Sense of movement	Right lateral

	Comments: The fault zone is characterized by geomorphic indicators of dextral strike-slip offset (Anderson and others, 1982 #5344; 1982 #5345; Manson, 1985 #5355).
Dip Direction	V *Comments:* Trenches excavated by Anderson and others (1982 #5344; 1982 #5345) exposed vertical to steeply east dipping faults. Geometry of fault plane at depth is not known.
Paleoseismology studies	Anderson and others (1982 #5344; 1982 #5345) conducted a detailed study of the fault zone, and about nine fault-normal trenches were excavated along traces of the Ortigalita fault zone for the Cottonwood Arm, Los Banos Valley, Piedra Azul, and Little Panoche Valley sections. One study site was examined along the Little Panoche Valley section. Site 52-6 consists of one fault normal trench excavated across a 20-m-wide graben. Their trenching exposed faults that bound both sides of the graben. The eastern fault offsets alluvium as young as 1–3 ka, based on soil development. The fault is overlain by unfaulted alluvium that contained charcoal dated at 900±90yr BP.
Geomorphic expression	North of Mine Creek, the fault zone is marked by moderately to well defined geomorphic evidence of Holocene dextral strike-slip offset, such as dextrally deflected drainages, linear troughs, linear scarps, and closed depressions (Anderson and others, 1982 #5345; Manson, 1985 #5355). South of Mine Creek, the fault is characterized by a broad zone of low, discontinuous scarps, saddles, and linear drainages (Manson, 1985 #5355). Here the fault zone lacks geomorphic evidence of Holocene displacement (Manson, 1985 #5355).
Age of faulted surficial deposits	Anderson and others (1982 #5344; 1982 #5345) reported that the youngest faulted deposit is an alluvial unit deposited between 1 ka and 3 ka, as estimated from soil development (Anderson and others, 1982 #5344; 1982 #5345). Overlying this faulted alluvium is a 900-year-old unfaulted deposit; its age is based on a radiocarbon date from charcoal (Anderson and others, 1982 #5344; 1982 #5345).
Historic earthquake	

Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* The most recent paleoevent occurred prior to 900±90 yr BP, based on radiocarbon dating of charcoal sampled from unfaulted deposits that overlie faulted alluvium interpreted to be as young as 1–3 ka based on soil profile development (Anderson and others, 1982 #5344; 1982 #5345).
Recurrence interval	*Comments:* Anderson and others (1982 #5344) concluded that the average recurrence interval for movement somewhere along the entire fault is about 2–5 k.y. based on their observations that there have been at least four major surface rupturing earthquakes on the Ortigalita fault zone in the past 15 k.y. There is no documentation for recurrence intervals on specific fault sections, although Anderson and others (1982 #5344) state that recurrence of large earthquakes on individual sections may be on the order of 10–15 k.y.
Slip-rate category	Between 1.0 and 5.0 mm/yr *Comments:* Clark and others (1984 #2876) reported late Pleistocene vertical displacement rates of about 0.01–0.04 mm/yr for the Cottonwood Arm [52a] and Los Banos Valley [52b] sections; the dextral component of slip is unknown. Clark and others (1984 #2876) qualify this slip rate by stating that the vertical rate is an extreme minimum, that trench exposures and geomorphic expression of the fault zone suggest a much greater dextral rate on the order of 0.5–1.0 mm/yr or greater. Petersen and others (1996 #4860) used a probable slip rate of 1±0.5 mm/yr, so the 1–5 mm/yr category seems to fit best.
Date and Compiler(s)	2000 William A. Bryant, California Geological Survey Sereyna E. Cluett, California Geological Survey
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