

Qal	QUATERNARY ALLUVIUM: sand, silt, clay and gravel deposits, usually unconsolidated, deposited as fan, lacustrine, or fluvial sediments.	Qaf	ARTIFICIAL FILL: loose to firm gravel, sand, silt, clay, rock fragments, vegetable matter, and man-made debris.	U	UNDIFFERENTIATED LANDSLIDE DEPOSITS: may include earth flows, debris flows, slumps, and rotational slides.	Qal	Qb	Qd	Qsr	Qm	Qaf
Qt	TERRACE DEPOSITS: gravel, sand, silt, and clay in varying proportions, sorted by size into indistinct to distinct beds and lenses. The sediments are buff to rust-brown in color. Included in this unit are both marine and stream terrace deposits.	Qm	SAN FRANCISCO BAY MUD: silty clay, with local interspersed lenses and layers of sand, gravel, peat, and shell fragments. The mud is blue-gray, dark-gray or black in color; contains abundant organic matter.	Qsr	SLOPE WASH AND RAVINE FILL (COLLUVIUM): sand, silt, clay, gravel, rock fragments and organic material.	Qt					
Qoal	OLDER ALLUVIUM: sand, silt, clay and gravel deposits, usually unconsolidated, deposited as fan, lacustrine, or fluvial sediments. Occurs on uplifted areas and as older alluvial fans.	Qb	BEACH DEPOSITS: loose sand, medium- to coarse-grained, well-sorted, gray to pale-yellow in color.	Qa	ARONAS Fm.: red to yellowish-brown, friable, well-sorted, cross bedded, and easily eroded, quartzose sandstone.	Qoal					
QTs	SANTA CLARA Fm.-UNDIVIDED: slightly to moderately consolidated fluvial and lacustrine gravel, sand, silt and clay.	Qd	WIND BLOWN SAND: loose sand, as dunes and dune deposits.	SC	SILICA CARBONATE ROCK: altered serpentinite. Chiefly composed of magnesite and fine-grained quartz. Where fresh it retains its original lenticular or streaked appearance. Typically found adjacent to serpentinite masses.	Qc	Qa				
QTsca	SANTA CLARA Fm.-STEVENS CREEK MEMBER: gravel, with interbedded sand, minor silt and clay; pebbles mostly derived from Franciscan graywacke and greenstone.	Qc	COLMA Fm.: soft, and easily friable to loose sand, with minor amounts of gravel, silt and clay. Sand is arkosic in composition, generally well-sorted and clean, and fine- to medium-grained. Fresh, it is yellowish-gray to gray, and weathered it is pale to dark yellow-orange in color.	QTp	PASO ROBLES Fm.: non-marine, nodular clay, sand and pebble gravel.	QTsca	QTsca	QTp	SC		
QTsa	SANTA CLARA Fm.-ARASTRADERO MEMBER: silt and clay with minor gravel and sand; pebbles mostly of red chert, graywacke, arkosic sandstone, laminated brown shale and porphyritic volcanic rocks. Gravel better sorted and of smaller average clast size than that of Stevens Creek Member.	TP	PURISIMA Fm.-UNDIVIDED: largely fine-grained sandstone, siltstone and mudstone. Sandstone and siltstone have a clay matrix. These rocks are massive to indistinctly bedded in medium to very thick beds. Fresh rocks are gray to greenish-gray; weathered rocks are buff. This unit may also include porcelaneous shale and mudstone, chert, and silty mudstone.	QTm	MERCED Fm.: sandstone, siltstone, and claystone, with a few lenses of conglomerate and beds of volcanic ash. Sandstone is medium- to very fine-grained and in many places is silty, clayey or conglomeratic. Fresh sandstone is medium-gray in color; weathered, it is yellowish-orange to yellowish-gray in color.	QTs	QTsa	QTp	SC		
QTss	SANTA CLARA Fm.-SEARSVILLE MEMBER: red, massive weathered gravel, minor sand; pebbles mostly of greenstone, graywacke and arkosic sandstone.	TP(c)	PURISIMA Fm.-TUNITAS MEMBER: sandstone, massive or indistinctly bedded in medium layers. Sandstone is very fine- to medium-grained with a clay matrix; greenish-gray where fresh, weathering to light-gray, pale-orange or greenish-brown. Described by Cummings et. al., 1962.	TP(d)	PURISIMA Fm.: greenish claystone, sandstone, pebble conglomerate (Tp(c)) and sandstone (Tp(s)). Found in southeast quarter of the Chittenden quadrangle. Identified as Purisima by Allen (1949) and Swanson (personal communication, 1979).	TP	TPtu	TP(c)	TP(s)		
Tsc	SANTA CRUZ MUDSTONE: primarily hard, brittle, porcelaneous shale and mudstone, with firm to soft nonsiliceous mudstone, siltstone, and minor sandstone. Rocks are brown to gray where fresh, and weather to light-gray, buff to light-yellow. In some exposures distinct thin to medium beds of porcelaneous mudstone alternate with beds of sandy siltstone or very fine-grained sandstone.	Tptu	PURISIMA Fm.-LOBITOS MEMBER: silty mudstone, massive, dark-gray where fresh, light-gray and brown where weathered. This unit has a maximum thickness of 450 feet as described by Cummings et. al., 1962.	Tus	UNDIFFERENTIATED MIOCENE ROCKS: fine-grained, well-sorted sandstone and siltstone with minor amounts of coarse- and medium-grained sandstone, dolomitic claystone, porcelaneous shale, and porcelanite. Fine-grained sandstone and siltstone probably constitutes more than 90% of this unit. Fresh rocks are medium- to light-gray in color; weathered rocks are yellowish-gray to buff. Most of the fine-grained sandstone and siltstone has a matrix of clay, but is clean and poorly cemented. Coarse- and medium-grained sandstone occurs in very thick beds within the fine-grained sandstone and siltstone. The coarser sandstone is firm to friable; light gray where fresh, buff where weathered. The dolomitic claystone is a hard, dense rock that is medium-gray where fresh, rusty-orange where weathered. The porcelaneous shale is a firm dense rock that weathers white, and occurs in thick beds in the fine-grained sandstone and siltstone. The porcelanite is white to cream colored, brittle, and forms thin to medium beds. This unit is about 1,500 feet thick.	TP	TPtu	TP(c)	TP(s)		
Tsm	SANTA MARGARITA SANDSTONE: sandstone, massive to indistinctly bedded in very thick beds, locally internally cross-bedded in thick beds. The sandstone is soft and friable on ridges and slopes, firm in stream bottoms; light-gray to grayish-orange where fresh, white where weathered; well-sorted; and arkosic in composition. Sandstone ranges from very fine- to very coarse-grained. The fine-grained sandstone commonly contains silt and glauconite. A quartz and feldspar conglomerate occurs locally near the base. Near Santa Cruz the sandstone contains a mixture of fossils of terrestrial and marine animals including camels, horses, sharks, whale, and birds in addition to marine snails, clams, and sand dollars, of late Miocene age. The Santa Margarita Sandstone reaches a maximum thickness of 200 feet.	Tpl	PURISIMA Fm.-SAN GREGORIO MEMBER: sandstone, massive, fine- to coarse-grained; rock is greenish-gray where fresh, light-brown where weathered. Commonly contains hard, irregularly shaped calcareous concretions generally less than one foot across. Described by Cummings et. al., 1962.	Tmb	MINEDEGO BASALT: basaltic volcanic rocks, both extrusive and intrusive. Extrusive rocks are primarily flow breccia composed of blocks one inch to one foot across in a matrix of glass and calcite. The blocks are dark gray where fresh, and orange-brown to greenish-gray where weathered. Extrusive rocks include tuffs and pillow lavas. Extrusive rocks of the Mindego Basalt have a maximum thickness of 4,000 feet. The intrusive rocks are medium- to coarse-grained crystalline rocks similar in composition to the extrusive rocks. The intrusive rocks are unlayered; dark-gray where fresh, weathering to orange-brown. They commonly weather spheroidally, producing hard cores surrounded by soft material. Minor amounts of sandstone and mudstone are locally included in this unit.	Tpsg	TP	TPtu	TP(c)	TP(s)	
Tm	MONTEREY SHALE: porcelaneous shale with chert, porcelaneous mudstone, impure diatomite, calcareous claystone, and small amounts of siltstone and sandstone near the base. Fresh rocks are grayish-brown to brownish-black; weathered rocks are pale-orange to white. The Monterey Shale ranges between 400 and 1,500 feet thick.	TPp	PURISIMA Fm.-POMPONIO MEMBER: light-gray or white silicified mudstone alternating with medium-gray silty mudstone.	TPt	PURISIMA Fm.-TAHANA MEMBER: sandstone and siltstone with some silty mudstone. Sandstone is medium- to very fine-grained and in many places has a matrix of clay and glass shards. Rocks are massive, but in places are bedded in medium to thick beds. They are greenish-gray where fresh, weathering to white or buff. This unit has a maximum thickness of 2,150 feet, as described by Cummings et. al., 1962.	TPp	TP	TPtu	TP(c)	TP(s)	
Tsl	SAN LORENZO Fm.-UNDIVIDED: shale, mudstone, and sandstone. These rocks are massive to laminated, and dark-gray where fresh, weathering to red and brown. They are fractured at very close to moderate spacing, and in places show very closely spaced bedding-plane parting. The San Lorenzo Formation is about 1,800 feet thick. It has been divided into two units, a lower Twobar Shale Member, Brabb (1964) and an upper Rices Mudstone Member, Brabb (1964).	Tpt	PURISIMA Fm.-SAN GREGORIO MEMBER: sandstone, massive, fine- to coarse-grained; rock is greenish-gray where fresh, light-brown where weathered. Commonly contains hard, irregularly shaped calcareous concretions generally less than one foot across. Described by Cummings et. al., 1962.	Tlo	LAMPICO SANDSTONE: sandstone, massive to indistinctly bedded in thick to very thick beds. The sandstone is very fine- to very coarse-grained; typically hard, but soft and friable in places; light-gray where fresh, weathering to buff. This unit contains a minor amount of soft mudstone that has closely spaced features and is pinkish-brown in weathered exposures. The Lampico Sandstone is about 500 feet thick.	TPp	TP	TPtu	TP(c)	TP(s)	
Tz	ZAYANTE SANDSTONE: bluish-gray, pebbly, medium- to coarse-grained, arkose interbedded with grayish-olive micaceous sandy siltstone with lenses and thick interbeds of pebble and cobble conglomerate.	Tpsg	PURISIMA Fm.-SAN GREGORIO MEMBER: sandstone, massive, fine- to coarse-grained; rock is greenish-gray where fresh, light-brown where weathered. Commonly contains hard, irregularly shaped calcareous concretions generally less than one foot across. Described by Cummings et. al., 1962.	Tt	TEMBLOR Fm.: massive sandstone, varies in sorting and composition from arkosic to lithic feldspathic arenite. Poorly sorted basal conglomerate contains material derived from underlying units. Fossil barnacle and mollusk fragments, glauconite and phosphate pellets occur locally near the base.	TPp	TP	TPtu	TP(c)	TP(s)	
Teb	BUTANO SANDSTONE: sandstone, interbedded with mudstone and shale. Sandstone is very fine- to very coarse-grained; generally moderately-sorted; arkosic in composition; and light-gray to buff in color. It is hard where carbonate cemented, which is common in the thicker beds. Interbeds of mudstone and shale are firm to soft, and dark- to light-gray where fresh, weathering to red or brown. Conglomerate occurs locally in the lower part of the section and includes boulders of granitic and metamorphic rocks up to several feet in diameter, and well-rounded cobbles and pebbles of quartzite. A few marine clams are the only large fossils that have been found in the Butano Sandstone. Fossil foraminifers and fish scales are common in the mudstone and shale. The Butano Sandstone is about 9,000 feet thick. This unit can be distinguished from the Vaqueros Sandstone (Tva) only with knowledge of the stratigraphic sequence or diagnostic fossils.	TPt	PURISIMA Fm.-TAHANA MEMBER: sandstone and siltstone with some silty mudstone. Sandstone is medium- to very fine-grained and in many places has a matrix of clay and glass shards. Rocks are massive, but in places are bedded in medium to thick beds. They are greenish-gray where fresh, weathering to white or buff. This unit has a maximum thickness of 2,150 feet, as described by Cummings et. al., 1962.	Tt	UNNAMED EOCENE MARINE ROCKS: arkosic sandstone.	TPp	TP	TPtu	TP(c)	TP(s)	
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