DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

OPEN-FILE REPORT
89-161

DESCRIPTION OF MAP UNITS

QUATERNARY DEPOSITS

Holocene and Pleistocene deposits

Qya Young alluvium -- Gravel, sand, and silt along active stream channels, in fans, and on flood plains

Qoa Old alluvium -- Gravel, sand, and silt generally perched above active stream channels; dissected; depositional surfaces preserved at places

TERTIARY SEDIMENTARY ROCKS

Miocene Sedimentary Rocks

Tsm Santa Margarita Formation -- Sandstone, locally calcareous, and subordinate siliceous claystone; marine; unconformity at base; unit contains abundant "Margaritan" Stage mollusks; occurs in isolated exposures north of Charlie Valley, Chimney Canyon quadrangle

Tmu Monterey Formation, upper part -- Siltstone, mudstone, shale, and sandstone; marine; shale and mudstone beds laminated to thin bedded, siliceous and locally calcareous; sandstone, very fine to coarse grained, thick bedded and lenticular, locally bioturbated; unit contains Luisian and Mohnian Stage foraminifers according to Hall and Corbató (1967); occurs southwest of East Huasna fault zone

Tml Monterey Formation, lower part -- Silty mudstone and sandstone; marine; mudstone indistinctly bedded to thin bedded, commonly calcareous and locally contains dolomitic concretions; sandstone, very fine to coarse grained, indistinctly bedded and lenticular, locally calcareous; assigned to Point Sal Formation by Hall and Corbató (1967)

Tss Sandstone; marine; thick bedded to indistinctly bedded; fine to coarse grained; generally calcareous and locally micaceous; unconformity at base; assigned to Vaqueros Formation by Hall and Corbató (1967) on Huasna Peak quadrangle; unit includes pebble conglomerate, barnacle coquina, and calcareous sandy mudstone in Willow Spring area on Chimney Canyon quadrangle; contains upper Zemorrian or lower Saucesian foraminifers and early Miocene mollusks near Willow Spring

Miocene and/or Oligocene Sedimentary Rocks

Ts Simmler Formation -- Conglomerate, sandstone, and minor mudstone; nonmarine; lenticular; conglomerate contains abundant Late Cretaceous and/or Paleogene sandstone clasts; unconformity at base; exposures near mouth of Chimney Canyon assigned to Sespe Formation by Brown (1968)

Eocene and/or Paleocene Sedimentary Rocks

Tus Sandstone, conglomerate, and minor mudstone; lenticular; submarine-fan deposits; sandstone, quartzofeldspathic, micaceous; conglomerate includes abundant siliceous metavolcanic clasts; contains Paleocene and early Eocene(?) sporomorphs, foraminifers, and mollusks in the adjoining Los Machos Hills and Miranda Pine Mountain quadrangles

TERTIARY IGNEOUS ROCKS

Tv Volcanic rocks locally interbedded with upper part of Monterey Formation (Tmu); mapped as volcanic rocks in Point Sal Formation by Hall and Corbató (1967)

UPPER CRETACEOUS SEDIMENTARY ROCKS

Kus Sandstone, conglomerate, and mudstone; lenticular; submarine-fan deposits; quartzofeldspathic, micaceous; unconformity at base; provisionally named Carrie Creek Formation by Hall and Corbató (1967); contains sparse Late Cretaceous foraminifers and mollusks; unit subdivided into Morris Formation and Buckhorn Sandstone by Crandall (1961) (see Explanatory Notes)

LOWER CRETACEOUS AND UPPER JURASSIC ROCKS

Klc Espada Formation -- mudstone, sandstone, and minor conglomerate; generally thin bedded; marine; conglomerate in lower part contains abundant clasts of limestone and unaltered andesite, conglomerate in upper part includes abundant chert pebbles; lower part contains Tithonian radiolarians and mollusks, upper part contains Valanginian mollusks; lower part mapped as Franciscan Group by Hall and Corbató (1967), upper part mapped as Jollo Formation by Hall and Corbató (1967)

Jt Tuffaceous chert, tuff, and subordinate limestone; unconformity at base; contains abundant Kimmeridgian and Tithonian radiolarians; mapped as part of Franciscan Group by Hall and Corbató (1967)

Jo Ophiolite; spilite, keratophyre, and subordinate tuff, albitized and altered to zeolite and greenschist facies (Hopson, Mattinson, and Pessagno, 1981); lower part includes small remnants of intrusive dioritic, diabasic, and plagiogranitic rocks; upper part locally consists of greenstone breccia; Kimmeridgian(?) radiolarians occur in interpillow limestone in Alamo Creek; mapped as part of Franciscan Group by Hall and Corbató (1967) and as greenstone unit of Knoxville Formation by Brown (1968); zircons in plagiogranite yielded concordant U/Pb age of 160.4±2Ma (Meyerhoff and Pessagno, 1988)

ROCKS OF UNKNOWN AGE

KJf Franciscan complex -- melange; chiefly blocks of graywacke, greenstone, and banded radiolarian chert and subordinate conglomerate, amphibolite, and blueschist (Korsch, 1982) in pervasively sheared mudstone matrix; one amphibolite body ~800 m long (Brown, 1968), many blocks of graywacke 10 to 50 meters long, one at least 200 m long; intruded by serpentinite, outcrops generally obscured by landslides

s Serpentinite; highly sheared, intrusive in Franciscan complex (KJf); generally occurs as elongate, narrow northwest-trending bodies; locally altered to silica-carbonate rock

EXPLANATORY NOTES

This preliminary map is one of a series that covers a large part of the Los Padres National Forest and adjoining areas from the vicinity of Santa Margarita to Big Pine Mountain. The fieldwork was done sporadically from 1977 through 1987. From 1980 through 1983, the mapping was supported by funds supplied under the provisions of the Wilderness Act for a survey of the mineral resource potential of designated "wilderness" and "roadless" areas.

This map was constructed using reconnaissance field methods of widely separated ground traverses, helicopter overflights, and photogeology; consequently, contacts and structures are largely interpretive. For example, most faults shown by short dashes were inferred by examination of aerial photographs. To supplement the structural control, selected strike and dip symbols were compiled from Hall and Corbató (1967) in and southwest of the East Huasna fault zone and in upper Stephens Canyon on the Huasna Peak quadrangle. Similarly, selected flow and bedding attitudes in the ophiolite (Jo) and Espada Formation (Klc) in the vicinity of Stanley Mountain were compiled from Brown (1968), and a few bedding attitudes in the unnamed Upper Cretaceous (Kus) in the southwest corner of the Chimney Canyon quadrangle were taken from Crandall (1961). Where contacts do not match those along the south edge of the Caldwell Mesa and Los Machos Hills quadrangles (Vedder and others, 1988), the changes shown hereon are preferred.

Both the nomenclature and depiction of the Mesozoic units differ from those of previous workers. Because Taliaferro (1943) did not recognize the low-angle faults in the area, he misinterpreted the stratigraphic sequence and the relations between the Franciscan complex (KJf), the ophiolite (Jo), and the Espada Formation (Klc) in the vicinity of Stanley Mountain were compiled from Brown (1968), and a few bedding attitudes in the unnamed Upper Cretaceous (Kus) in the southwest corner of the Chimney Canyon quadrangle were taken from Crandall (1961). Where contacts do not match those along the south edge of the Caldwell Mesa and Los Machos Hills quadrangles (Vedder and others, 1988), the changes shown hereon are preferred.

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The Late Cretaceous through early Eocene submarine-fan sequences consist largely of turbidites that are lenticular and contain no distinctive marker beds or throughgoing subformational units. Designations of submarine-fan lithofacies (Walker and Mutti, 1973) in these sequences are generalized from field notes.

Stratigraphic subdivision of the Miocene sequences is hampered by limited exposures, gradational contacts, lithologic similarity, and lateral facies changes. For example, the isolated patches of Santa Margarita Formation (Tsm) north of Shell Peak are lithologically nearly identical to much of the unnamed Miocene sandstone (Tss) in the vicinity of Willow Spring east of the Cuyama River gorge, yet the age of the fossil assemblage from each unit is different. Another possible source of confusion is the similar nature of sandstone lenses in the lower part of the Monterey Formation (Tml) and upper part of the Monterey Formation (Tmu) west of the East Huasna fault zone on the Huasna Peak quadrangle.

Fault nomenclature follows the usage of Page (1970) for the Sur-Nacimiento fault zone and Hall and Corbató (1967) for the East Huasna fault [zone].

Unpublished paleontologic data used in support of this mapping were provided by the following individuals: R.E. Arnal, Late Cretaceous and Miocene foraminifers; D.L.Jones, Late Jurassic radiolarians and mollusks, Early and Late Cretaceous mollusks; J.G. Vedder, Cretaceous and Miocene mollusks.

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SYMBOLS

Contact
Long dashes where approximately located; short dashes where inferred; intertonguing contacts diagrammatic

Fault trace
U, relatively upthrown side; D, relatively downthrown side; arrows, inferred direction of strike slip; bar and number indicate dip of fault plane; open teeth on upper plate of detachment fault; long dashes where approximately located; short dashes where inferred; dots where concealed

Anticline, approximate crestline
Short dashes where inferred

Syncline, approximate troughline
Short dashes where inferred

Landslide area
Arrows show direction of movement

25 25 25
Strike and dip of bedding
Solid symbol, measured on the ground; broken dip line, estimated from helicopter or distant sighting; broken dip and strike lines, estimated from aerial photographs; includes attitude of flow bedding and layering in ophiolite (Jo)

75 75 75
Strike and dip of overturned beds
Solid and broken symbols described above

Strike of vertical beds
Solid and broken symbols described above

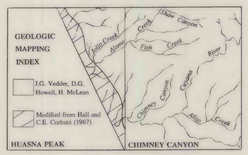
Horizontal or nearly horizontal beds
Solid and broken symbols described above

→S
Apparent dip of beds

AB EG
Generalized submarine-fan lithofacies of Walker and Mutti (1973)

x
Fossil locality

Chert-pebble conglomerate in unit Klc
Approximate distribution of chert-pebble conglomerate zones in upper part of Espada Formation



Base from U.S. Geological Survey Chimney Canyon, 1967; and Huasna Peak, 1967, quadrangles

SCALE 1:24 000

1 0 1 MILE
1 0 1 KILOMETER

GEOLOGIC MAP OF CHIMNEY CANYON QUADRANGLE AND PART OF HUASNA PEAK QUADRANGLE, CALIFORNIA

by

J.G. Vedder, D.G. Howell, and Hugh McLean

1989

Geology mapped at intervals from 1977-1987 by J.G. Vedder, D.G. Howell, and Hugh McLean, assisted by J.M. Joyce, (1982), R.G. Stanley (1987), and T.J. Wiley (1987). Parts of the area in and southwest of the East Huasna fault zone modified from Hall and Corbató (1967) (see Index to Geologic Mapping).