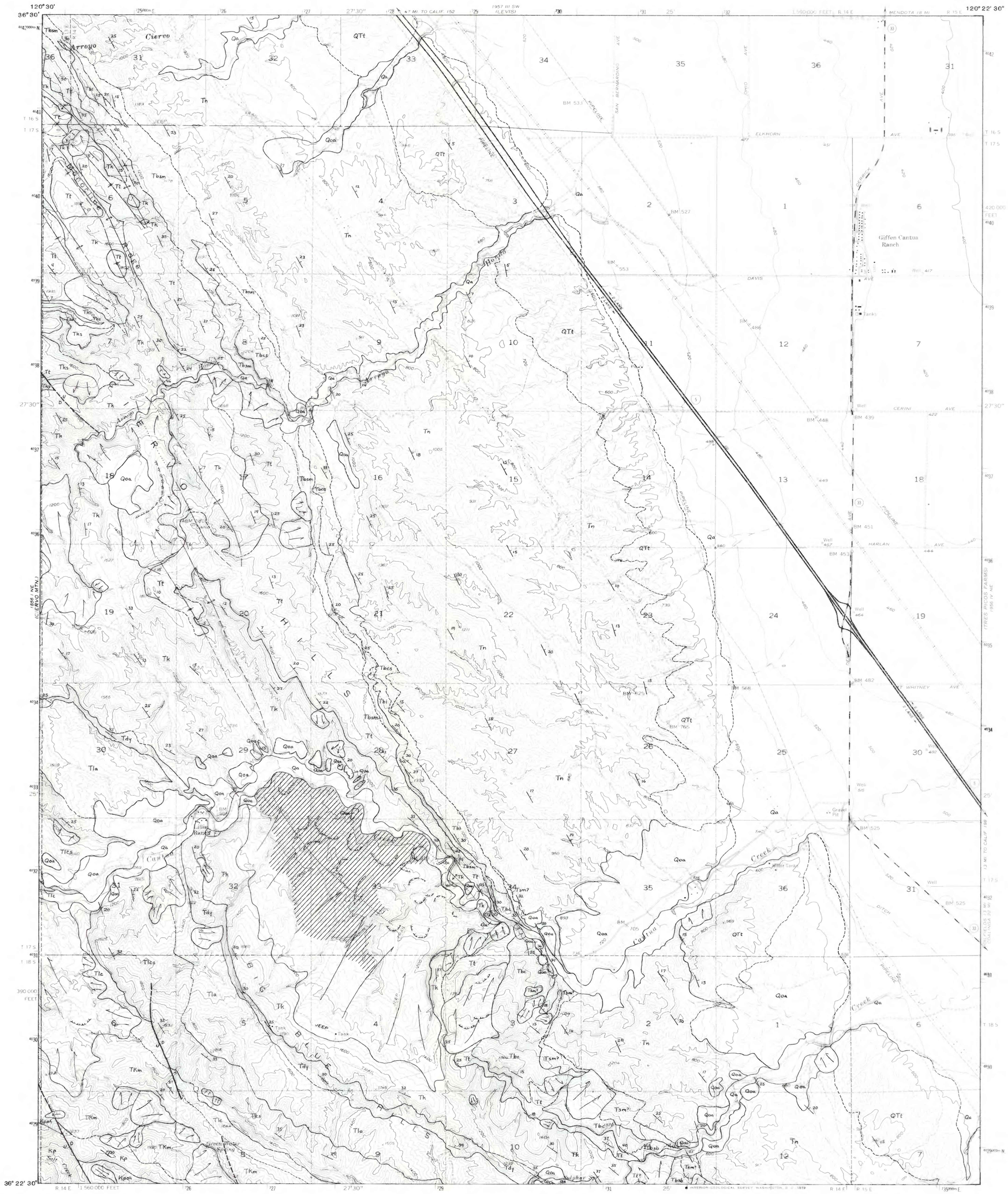
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

OPEN-FILE REPORT
88-49



Base from U.S. Geological Survey
Lillis Ranch quadrangle, 1971

N
MN
16°

SCALE 1:24 000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETRE

CONTOUR INTERVAL 40 FEET
DOTTED LINES REPRESENT 10-FOOT CONTOURS
DATUM IS MEAN SEA LEVEL

PRELIMINARY GEOLOGIC MAP OF THE LILLIS RANCH QUADRANGLE, CALIFORNIA

by

J. Alan Bartow
1988

EXPLANATION

CORRELATION OF MAP UNITS

Qa	Holocene	QUATERNARY
Qoa	Pleistocene	QUATERNARY
Unconformity		
QTt	Pliocene	TERTIARY
Unconformity?		
Tn	Pliocene	TERTIARY
Unconformity		
Tsm?	Miocene	TERTIARY
Unconformity		
Tbsb, Tbc, Tbsm, Tbi, Tbcs	Miocene	TERTIARY
Tt	Miocene	TERTIARY
Unconformity		
Tks, Tk	Eocene	TERTIARY
Tdy	Eocene	TERTIARY
Unconformity		
Tla, Tlcs, Tlc	Paleocene	TERTIARY
Unconformity		
TKm	Upper Cretaceous	CRETACEOUS
Kp	Upper Cretaceous	CRETACEOUS

DESCRIPTION OF MAP UNITS

Qa — **Alluvium (Holocene and upper Pleistocene)**--Unconsolidated gravel, sand, and silt

Qoa — **Older alluvium (Pleistocene)**--Unconsolidated or weakly unconsolidated gravel, sand, and silt

QTt — **Tulare Formation (Lower Pleistocene and upper Pliocene?)**--Weakly consolidated mudstone, siltstone, and pebble conglomerate, and unconsolidated lenses of sand

Tn — **Nonmarine deposits (Pliocene and upper Miocene?)**--Friable or locally calcareous sandstone, commonly crossbedded; greenish-gray and red-brown mudstone and claystone; and pebble conglomerate

Tsm? — **Santa Margarita(?) Formation (Upper Miocene)**--Well-bedded sandstone, sandy siltstone, and sandy pebble conglomerate, commonly calcareous. Intensely burrowed locally, and with concentrations of fossils and fossil fragments near base

Big Blue Formation (Middle Miocene)--divided into:

Tbsb — **Serpentinite breccia unit**--Foliate serpentinite breccia in thick massive lens

Tbc — **Chaotic unit**--Chaotic mixture of serpentinite breccia, bedded serpentinite-clast conglomerate and sandstone, and large slabs or blocks of fossiliferous lithic to arkosic sandstone apparently derived from the underlying Temblor Formation; nonmarine?

Tbsm — **Serpentinous mudstone and sandstone unit**--Laminated to thin-bedded, serpentinous mudstone and serpentinite-grain sandstone; marine?

Tbi — **Interbedded lithic sandstone and serpentinous sandstone unit**--Fossiliferous lithic sandstone and pebble conglomerate lenses interbedded with serpentinite-grain sandstone and mudstone; marine

Tbcs — **Serpentinite-clast conglomerate, sandstone and mudstone unit**--Serpentinite-clast and polymict conglomerate and sandstone lenses interbedded with serpentinous mudstone and sandstone; marine?

Tt — **Temblor Formation (Middle and lower Miocene)**--Calcareous to friable, lithic to arkosic sandstone; commonly abundantly fossiliferous and occasionally pebbly

Tk — **Kreyenhagen Shale (Upper and middle Eocene)**--Thin-bedded, chocolate-brown shale and mudstone grading upward to soft, white diatomaceous shale and diatomite. Gray lithic sandstone interbeds near base, and abundant sandstone dikes throughout. Includes the Tumey Formation of Atwill (1935)

Tks — **Sandstone member**--Gray or brown, friable to calcareous, concretionary, lithic sandstone; locally pebbly near base

Tdy — **Domengine and Yokut Sandstones, undivided (Middle and lower? Eocene)**--Massive or crossbedded, arkosic to quartzose sandstone; interbeds of gray siltstone and claystone, and streaks of dark chert pebbles. Lower part (Yokut) predominantly white, upper part (Domengine) predominantly tan or light brown

Lodo Formation (Lower Eocene and upper Paleocene)--divided into:

Tla — **Arroyo Hondo Shale Member**--Gray claystone with a few thin interbeds of siltstone or sandstone

Tlcs — **Cantua Sandstone Member**--Thin- to thick-bedded, light brown, arkosic sandstone; thin interbeds of gray siltstone or claystone. Grades up into Arroyo Hondo Shale Member

Tlc — **Cerros Shale Member**--Gray claystone with thin interbeds of siltstone or sandstone increasing upward

TKm — **Moreno Formation (Paleocene and Upper Cretaceous)**--Brown to maroon siltstone and shale. Includes white-weathering concretionary unit near top

Panoche Formation (Upper Cretaceous)--divided into:

Kp — **Sandstone**--Thick- to thin-bedded, calcareous sandstone, commonly concretionary; thin interbeds of gray siltstone

Kpsh — **Shale**--Gray-brown siltstone and shale; thin, fine-grained sandstone interbeds locally

Contact--Dashed where indefinite or inferred

Fault--Dashed where indefinite; U, upthrown side; D, downthrown side

Fold axes

Anticline--Dashed where approximately located; dotted where concealed

Syncline--Dashed where approximately located; dotted where concealed

Strike and dip of beds

Inclined

Vertical

Overturned

Landslide--Arrows show direction of movement; hachured lines indicate secondary scarps within large landslide areas. Lined area south of Cantua Creek contains large, semi-intact blocks of Big Blue Formation resting on more highly deformed Kreyenhagen Formation or locally on remnants of Temblor Formation

REFERENCES

Atwill, E.R., 1935, Oligocene Tumey Formation of California: American Association of Petroleum Geologists Bulletin, v. 19, p. 1192-1204.

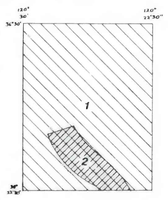
Casey, T.A.L., and Dickinson, W.R., 1976, Sedimentary serpentinite of the Miocene Big Blue Formation near Cantua Creek, California, in Fritsche, A.E., TerBest, Harry, and Wornardt, W.W., eds., The Neogene Symposium: San Francisco, Calif., Society of Economic Paleontologists and Mineralogists, Pacific Section, p. 67-74.

Dibblee, T.W., Jr., 1971, Geologic map of the Joaquin Rocks quadrangle, California: U.S. Geological Survey Open-File Report, scale 1:62,500.

INDEX TO GEOLOGIC MAPPING

Geology mapped 1987 by J.A. Bartow, assisted by Kari Bassett, with additional information from:

1. Dibblee (1971)
2. Casey and Dickinson (1976)



This map is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature.