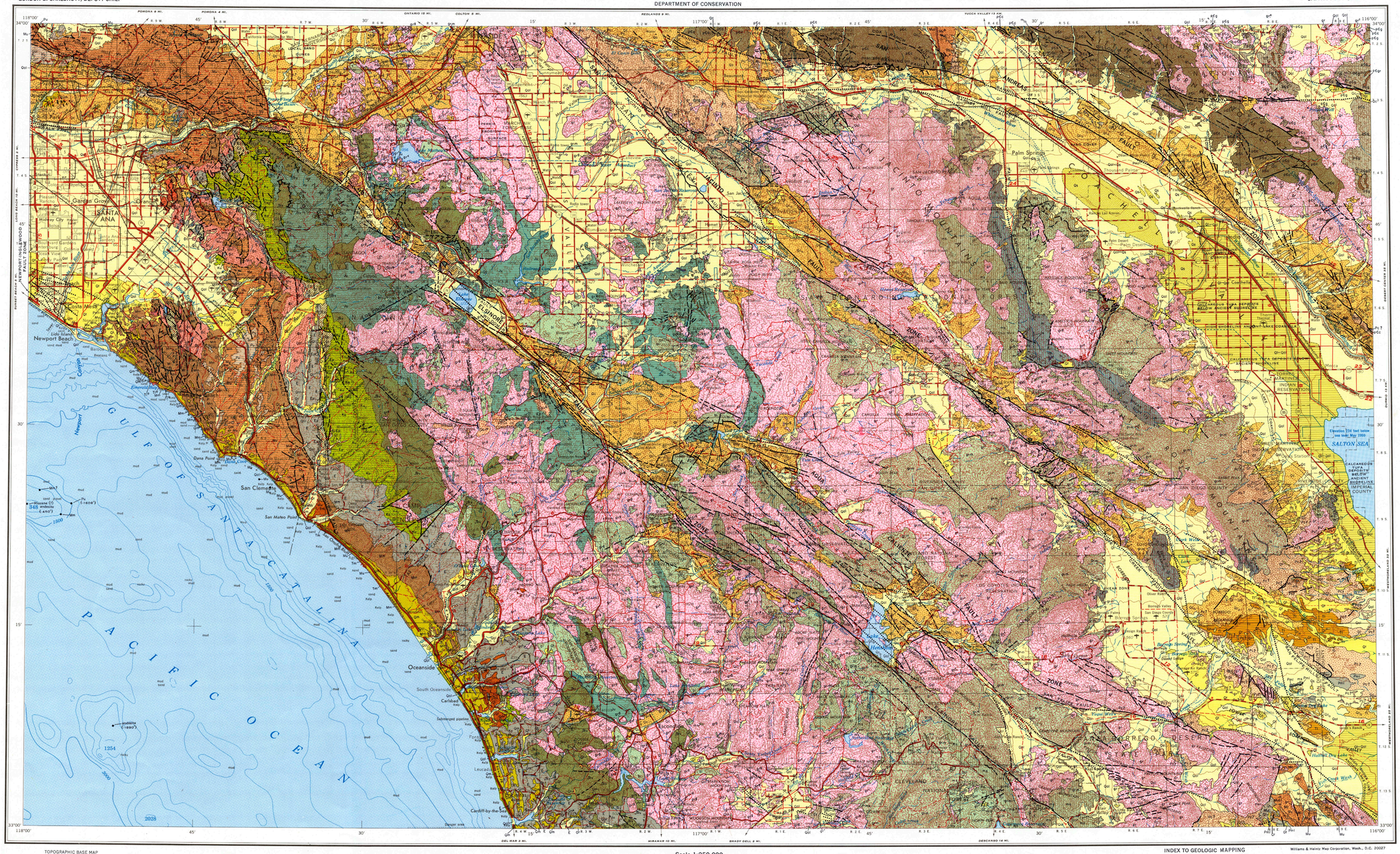
DIVISION OF MINES AND GEOLOGY
IAN CAMPBELL, CHIEF
GORDON B. OAKESHOTT, DEPUTY CHIEF

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF CONSERVATION

GEOLOGIC MAP OF CALIFORNIA
SANTA ANA SHEET



TOPOGRAPHIC BASE MAP

Prepared by the Army Map Service (ACLD), Corps of Engineers, U.S. Army, Washington, D.C. Compiled in 1958 from United States Quadrangles, 1:24,000, 1:25,000, 1:50,000, U.S. Geological Survey and AMS, 1938-56; USC&GS Charts 5142, 1954; 5101, 1955; 5108, 1957. Planimetric detail revised by photo-planimetric methods Control by USGS, USC&GS, and CE. Map field checked 1959.

Land net prepared by U.S. Geological Survey.

Submarine contours adapted from Shepard and Emery Special Paper No. 31, Geol. Soc. America.

Minor corrections and additions to culture by California Division of Mines and Geology, 1965.

SUBMARINE CONTOUR INTERVAL 300 FEET

Local depressions 1500

Limit of danger: Reef
Rocks: Awash: Sunken
Foreshore flat
Intermittent or dry stream
Marsh or swamp

LOCATION MAP FOR SANTA ANA SHEET

Contact
Dashed where approximately located, gradational or inferred

Fault
Dashed where approximately located; dotted where concealed

Thrust fault
Barbs on upper plate; dashed where approximately located

Scale 1:250,000

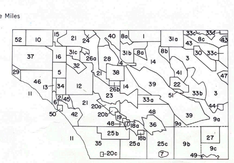
5 0 5 10 15 20 Statute Miles

5 0 5 10 15 20 25 30 Kilometers

CONTOUR INTERVAL 200 FEET
WITH SUPPLEMENTARY CONTOURS AT 100 FOOT INTERVALS

GEOLOGIC MAP OF CALIFORNIA
OLAF P. JENKINS EDITION
SANTA ANA SHEET
COMPILATION BY THOMAS H. ROGERS, 1965
SECOND PRINTING 1973

INDEX TO GEOLOGIC MAPPING
(COMPLETE INDEX ON EXPLANATORY DATA SHEET)



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Williams & Heintz Map Corporation, Wash., D.C. 20027

EXPLANATION

SEDIMENTARY AND METASEDIMENTARY ROCKS

CENOZOIC

QUATERNARY — Recent

- Qd — Dune sand
- Qal — Alluvium
- Qsc, Qf, Qfc — Stream channel deposits; Fan deposits; Basin deposits (GREAT VALLEY)
- Qst — Salt deposits
- Ql — Quaternary lake deposits
- Qgl — Glacial deposits
- Qt — Quaternary nonmarine terrace deposits

QUATERNARY — Pleistocene

- Qm — Pleistocene marine and marine terrace deposits
- Qc — Pleistocene nonmarine
- QP — Plio-Pleistocene nonmarine

TERTIARY — Pliocene

- Pc — Undivided Pliocene nonmarine
- Pnl — Upper Pliocene nonmarine
- Pu — Upper Pliocene marine
- Pmnl — Middle and/or lower Pliocene nonmarine
- Pml — Middle and/or lower Pliocene marine

TERTIARY — Miocene

- Mc — Undivided Miocene nonmarine
- Mnl — Upper Miocene nonmarine
- Mu — Upper Miocene marine
- Mmc — Middle Miocene nonmarine
- Mm — Middle Miocene marine
- Ml — Lower Miocene marine

TERTIARY — Oligocene

- Oc — Oligocene nonmarine
- O — Oligocene marine

TERTIARY — Eocene

- Ec — Eocene nonmarine
- E — Eocene marine

TERTIARY — Paleocene

- Epc — Paleocene nonmarine
- Paleocene marine

TERTIARY — Undivided

- Cenozoic nonmarine
- Tertiary nonmarine
- Tertiary lake deposits
- Tertiary marine

MESOZOIC

CRETACEOUS

- K — Undivided Cretaceous marine
- Ku — Upper Cretaceous marine
- Kl — Lower Cretaceous marine

JURASSIC

- Kx — Knoxville Formation
- Ju — Upper Jurassic marine
- Jml — Middle and/or Lower Jurassic marine

TRIASSIC

- TR — Triassic marine

PALEOZOIC

UNDIVIDED

- Pzs — Pre-Cretaceous metamorphic rocks (ls = limestone or dolomite)
- Pzs — Pre-Cretaceous metasedimentary rocks
- P — Paleozoic marine (ls = limestone or dolomite)

PERMIAN

- Pl — Permian marine

CARBONIFEROUS

- C — Undivided Carboniferous marine
- CP — Pennsylvanian marine
- CM — Mississippian marine

DEVONIAN

- D — Devonian marine

SILURIAN

- S — Silurian marine

ORDOVICIAN

- Pzs — Pre-Silurian metasedimentary rocks
- Ordovician marine

CAMBRIAN

- Cambrian marine

PRECAMBRIAN

- Cambrian – Precambrian marine
- Undivided Precambrian metamorphic rocks (pCg = gneiss, pCs = schist)
- Later Precambrian sedimentary and metamorphic rocks
- Earlier Precambrian metamorphic rocks

IGNEOUS AND META-IGNEOUS ROCKS

- Qrv — Recent volcanic: Qrv^r—rhyolite; Qrv^a—andesite; Qrv^b—basalt; Qrv^p—pyroclastic rocks
- Qpv — Pleistocene volcanic: Qpv^r—rhyolite; Qpv^a—andesite; Qpv^b—basalt; Qpv^p—pyroclastic rocks
- Quaternary and/or Pliocene cinder cones
- Pv — Pliocene volcanic: Pv^r—rhyolite; Pv^a—andesite; Pv^b—basalt; Pv^p—pyroclastic rocks
- Mv — Miocene volcanic: Mv^r—rhyolite; Mv^a—andesite; Mv^b—basalt; Mv^p—pyroclastic rocks
- Ov — Oligocene volcanic: Ov^r—rhyolite; Ov^a—andesite; Ov^b—basalt; Ov^p—pyroclastic rocks
- Ev — Eocene volcanic: Ev^r—rhyolite; Ev^a—andesite; Ev^b—basalt; Ev^p—pyroclastic rocks
- QTv — enozoic volcanic: QTv^r—rhyolite; QTv^a—andesite; QTv^b—basalt; QTv^p—pyroclastic rocks
- Tr — Tertiary intrusive (hypabyssal) rocks: Tr^r—rhyolite; Tr^a—andesite; Tr^b—basalt
- Tv — Tertiary volcanic: Tv^r—rhyolite; Tv^a—andesite; Tv^b—basalt; Tv^p—pyroclastic rocks

Franciscan Formation

- Kfv — Franciscan volcanic and metavolcanic rocks
- Gr — Mesozoic granitic rocks: gr^g—granite and adamellite; gr^d—granodiorite; gr^t—tonalite and diorite
- bi — Mesozoic basic intrusive rocks
- ub — Mesozoic ultrabasic intrusive rocks
- Jbv — Jura-Trias metavolcanic rocks
- Pzv — Pre-Cretaceous metavolcanic rocks
- gr/c — Pre-Cenozoic granitic and metamorphic rocks
- PPv — Paleozoic metavolcanic rocks
- Pl — Permian metavolcanic rocks
- Cv — Carboniferous metavolcanic rocks
- Dv — Devonian metavolcanic rocks
- Dvl — Devonian and pre-Devonian? metavolcanic rocks
- pSv — Pre-Silurian metamorphic rocks
- pSv — Pre-Silurian metavolcanic rocks
- pCi — Precambrian igneous and metamorphic rock complex
- pCu — Undivided Precambrian granitic rocks

HEAVY BORDER ON BOXES INDICATES UNITS THAT APPEAR ON THIS SHEET