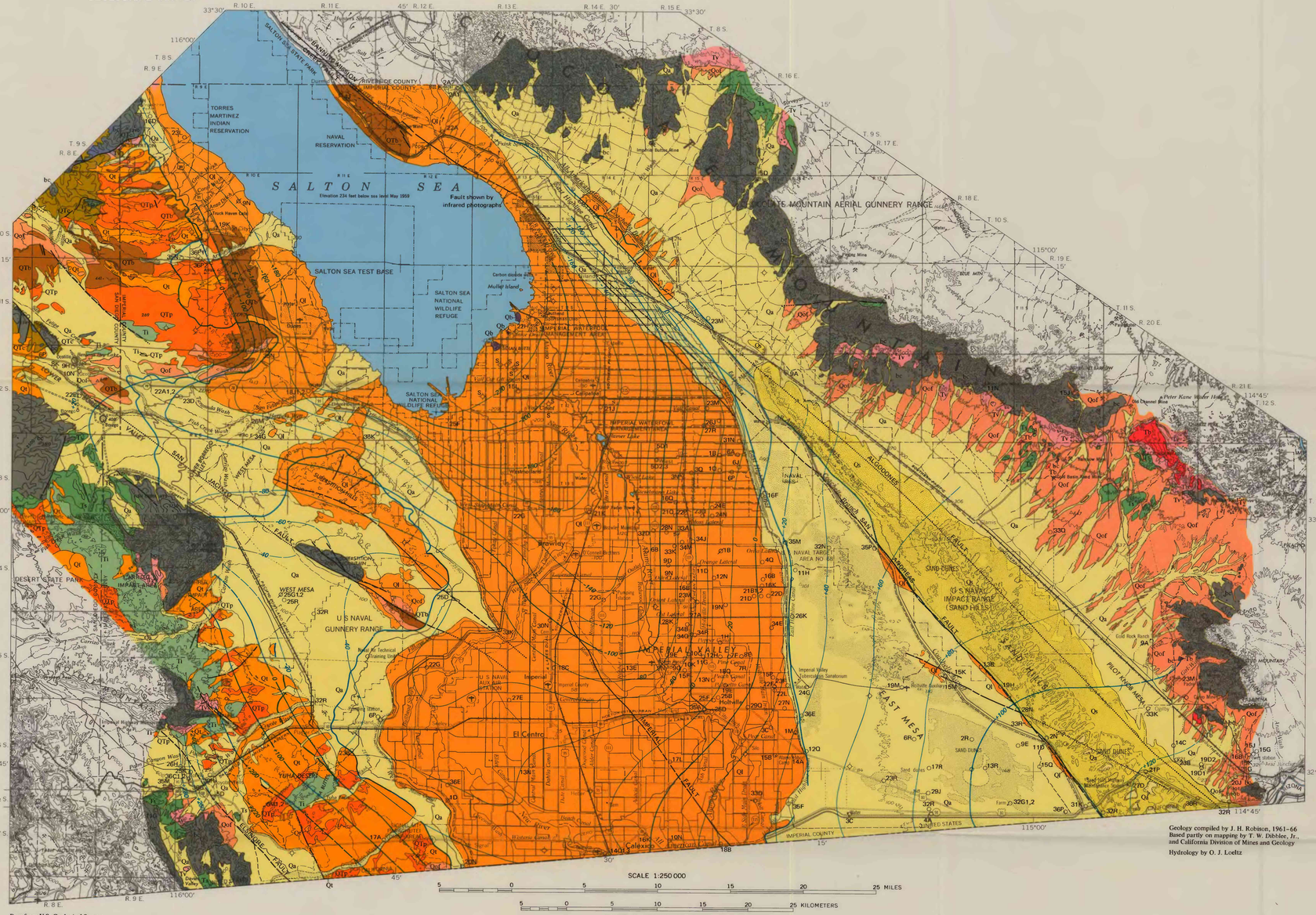

Base from U.S. Geological Survey
Santa Ana, 1944; Salton Sea, 1948;
San Diego and El Centro, 1958

Geology compiled by J. H. Robison, 1961–66
Based partly on mapping by T. W. Dibblee, Jr.,
and California Division of Mines and Geology

Hydrology by O. J. Loeltz

EXPLANATION

QUATERNARY

Pleistocene and Holocene

Qa — Alluvium
Alluvial and deltaic sand, gravel, and silt. Includes some dune sand (stipple pattern) where generally less than about 10 feet thick

Qs — Windblown sand
Well-sorted fine to medium sand, commonly in high dunes and ridges, where more than about 10 feet thick. Includes Sand Hills (Algodones Dunes)

Qb — Niland Obsidian of Dibblee (1954)
Obsidian, pumice, and scoria

Ql — Lake deposits
Lacustrine silt, sand, and clay. Include the Brawley Formation of Dibblee (1954), exposed along the perimeter of the trough, and the deposits of Lake Cahuilla, exposed in the middle of the trough

Qt — Terrace deposits
Thin pediment gravel and sand, formed mostly on the Palm Spring Formation; may grade into fans of older alluvium

Qof — Older alluvium
Older alluvial and fan gravel and sand, distinguished in most areas by a surface of desert varnish; near the Chocolate Mountains may be only a veneer on older sedimentary rocks (Ts); in western Imperial Valley includes Ocotillo Conglomerate of Dibblee (1954) of Pliocene or Pleistocene age

TERTIARY

Pliocene and Pleistocene

QTb — Borrego Formation of Tarbet and Holman (1944)
Lacustrine and brackish-water deposits; light-gray silt, clay, and sandstone; grades laterally into Palm Spring Formation

QTp — Palm Spring Formation
Unconsolidated to weakly consolidated terrestrial deposits; light-brown sand, gravel, and silt; upper units may be equivalent in part to older alluvium

QTc — Canebreak Conglomerate of Dibblee (1954)
Coarse silty conglomerate and sandstone; grades laterally into Palm Spring Formation

Miocene or Pliocene

Ti — Imperial Formation
Shallow marine deposits; basal conglomerate overlain by gray, tan, and yellow siltstone, sandstone, and claystone; fossiliferous

Oligocene(?) – Miocene

Ts — Sedimentary rocks
Mostly nonmarine coarse sedimentary rocks of several ages; include Split Mountain Formation (Miocene) of Tarbet and Holman (1944), and its proposed revisions by Woodard (1961) and Durham and Allison (1961); outcrops near the Chocolate Mountains are of Oligocene(?) age (prebasalt of Chocolate Mountains)

Tb / Tv — Volcanic rocks
Tb, basalt, andesite, and scoria of Chocolate Mountains
Tv, basalt, andesite, and rhyolite; includes Alverson Andesite Lava of Dibblee (1954) and older volcanic rocks of Chocolate Mountains

PRE-TERTIARY

Precambrian(?) – Cretaceous(?)

bc — Igneous and metamorphic rocks
Intrusive rocks of granitic to gabbroic composition, metasedimentary gneiss, schist, and marble, and metavolcanic rocks

Contact
Dashed where approximately located or gradational

Shoreline of prehistoric Lake Cahuilla
Former shoreline of Pleistocene to Holocene age; contact between units where shoreline is coincident

Fault
Dashed where approximately located; queried where inferred; dotted where concealed

-100
-80
Water-level contour
Dashed where approximately located. Shows altitude of water level in feet above (+) or below (–) mean sea level. Contour interval 20 and 100 feet

23M
Well or test hole, destroyed

24G
Water well or test well
Number and letter, 22G, is location of well within township. See text for explanation of well-numbering system

Oil test

Steam well or test hole

MAP SHOWING WATER-LEVEL ALTITUDE IN 1965, GEOLOGY, AND LOCATION OF WELLS AND SPRINGS, IMPERIAL VALLEY, CALIFORNIA

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