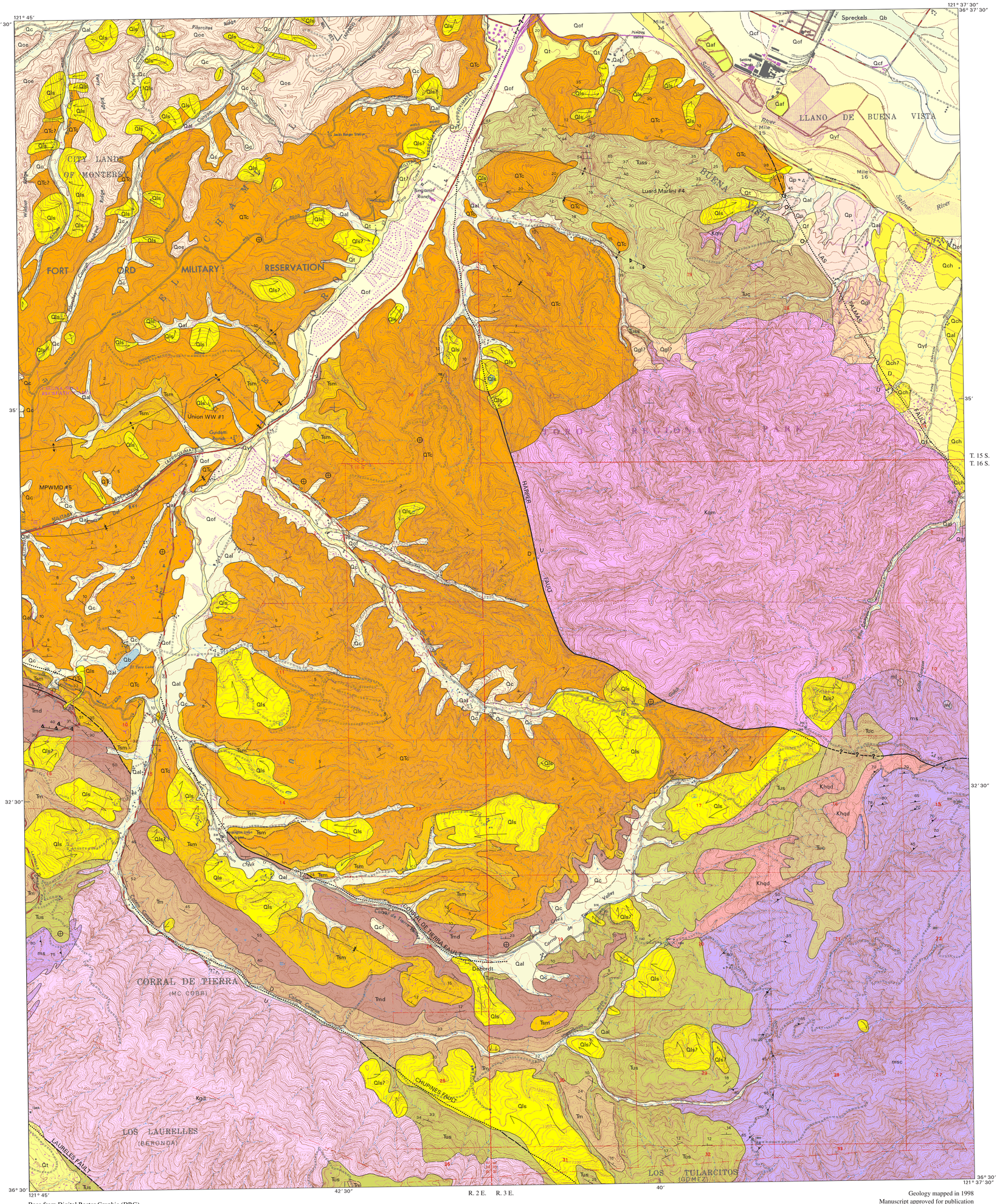
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

Prepared in cooperation with
California Division of Mines and Geology

MISCELLANEOUS FIELD STUDIES
MF-2349
Pamphlet accompanies map



Base from Digital Raster Graphic (DRG)
Topographic Base Map, U.S. Geological Survey,
Reston, Virginia, scale 1:24,000.

Geology mapped in 1998
Manuscript approved for publication
October 18, 2000

SCALE 1:24,000

1 1/2 0 1 MILE

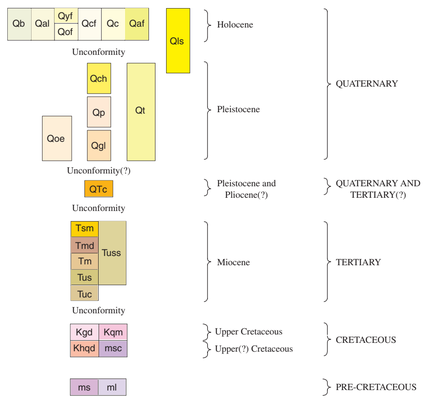
1 .5 0 1 KILOMETER

Universal Transverse Mercator projection, Zone 10

APPROXIMATE MEAN DECLINATION, 1995

QUADRANGLE LOCATION

CORRELATION OF MAP UNITS



LIST OF MAP UNITS

[See accompanying pamphlet for more detailed Description of Map Units]

- **Qb** — **Basin deposits (Holocene)**—Unconsolidated, plastic clay and silty clay containing much organic material; locally contains interbedded thin layers of silt and silty sand
- **Qal** — **Alluvial deposits, undivided (Holocene)**—Unconsolidated, heterogeneous, moderately sorted silt and sand with discontinuous lenses of clay and silty clay
- **Qyf** — **Younger flood-plain deposits (Holocene)**—Unconsolidated, relatively fine-grained, heterogeneous deposits of sand and silt; commonly includes relatively thin, discontinuous layers of clay
- **Qcf** — **Abandoned channel fill deposits (Holocene)**—Unconsolidated, plastic, poorly sorted clay, silty clay, and silt. Deposited within channels on younger and older flood-plain deposits. Thickness generally less than 3 m
- **Qc** — **Colluvium (Holocene)**—Unconsolidated, heterogeneous deposits of moderately to poorly sorted silt, sand, and gravel deposited by slope wash and mass movement
- **Qaf** — **Artificial fill (Holocene)**—Heterogeneous mixture of artificially deposited material ranging from well-compacted sand and silt to poorly compacted sediment high in organic content; only locally delineated
- **Qls** — **Landslide deposits (Quaternary)**—Heterogeneous mixture of deposits ranging from large block slides of indurated bedrock to debris flows in semiconsolidated sand and clay
- **Qof** — **Older flood-plain deposits (Holocene)**—Unconsolidated, relatively fine-grained, heterogeneous deposits of sand and silt, commonly includes relatively thin layers of clay
- **Qch** — **Alluvial fan deposits of Chualar (Pleistocene)**—Weakly consolidated, moderately to poorly sorted sand, silt, and gravel deposited as a series of alluvial fans flanking the Salinas Valley, south of Spreckels. Unit age is late Pleistocene
- **Qt** — **Terrace deposits, undivided (Pleistocene)**—Weakly consolidated to semiconsolidated, moderately to poorly sorted silt, silty clay, sand, and gravel deposited in a fluvial environment
- **Qp** — **Alluvial fan deposits of Placentia (Pleistocene)**—Semiconsolidated, moderately to poorly sorted sand, silt, and gravel; gravel content increases toward head of the fan. Similar to the alluvial fan deposits of Chualar (Qch), except capped by well-developed soils. Unit age is middle(?) Pleistocene
- **Qoe** — **Older eolian deposits (Pleistocene)**—Moderately well-sorted sand as much as 60 m thick that contains no intervening fluvial deposits
- **Qgl** — **Alluvial fan deposits of Gloria (Pleistocene)**—Moderately consolidated, deeply weathered, moderately to poorly sorted sand, silt, and gravel, capped with moderately well drained, maximally developed soils with duripans. Unit age is middle to early(?) Pleistocene
- **QTc** — **Continental deposits, undivided (Pleistocene-Pliocene(?))**—Nonmarine, semiconsolidated, poorly sorted, fine- to coarse-grained sand with pebble and cobble gravel interbeds
- **Tsm** — **Santa Margarita Sandstone (Miocene)**—Marine and brackish-marine, white, friable, fine- to coarse-grained, arkosic sandstone. Age of unit is late Miocene
- **Tuss** — **Unnamed sandstone, undifferentiated (Miocene)**—Marine; buff to light-gray, poorly to well-sorted arkosic sandstone, lithologically similar to unnamed sandstone (Tus). Rests with apparent conformity on the unnamed conglomerate (Tuc). Where Monterey Formation is absent, the unnamed sandstone is not differentiated from the younger Santa Margarita Sandstone, and both units are mapped as Tuss. Age of unit is middle to late Miocene
- **Tmd** — **Monterey Formation, diatomite (Miocene)**—Very pale orange to white, soft, punky, commonly silty; Mohnian Stage
- **Tm** — **Monterey Formation, porcelanite (Miocene)**—Light-brown to white, hard, brittle, platy; Mohnian Stage
- **Tus** — **Unnamed sandstone (Miocene)**—Marine; buff to light-gray, poorly to well-sorted arkosic sandstone, locally friable, locally conglomeratic. Age of unit is middle Miocene
- **Tuc** — **Unnamed conglomerate (Miocene)**—Nonmarine; buff to light-gray, poorly sorted sandy cobble conglomerate, well-indurated. Age of
- **Kgd** — **Granodiorite of Cachagua of Ross (1976a) (Late Cretaceous)**
- **Kqm** — **Garnetiferous quartz monzonite of Pine Canyon of Ross (1976a) (Late Cretaceous)**
- **Khqd** — **Hornblende-biotite quartz diorite and diorite of Corral de Tierra (Late? Cretaceous)**
- **msc** — **Schist of the Sierra de Salinas of Ross (1976a) (Late? Cretaceous)**
- **ms** — **Quartzofeldspathic rocks (pre-Cretaceous)**
- **ml** — **Marble (pre-Cretaceous)**

EXPLANATION

- **Contact**—Dashed where approximately located or gradational, dotted where concealed, queried where questionably located
- **Fault**—Dashed where inferred, dotted where concealed, queried where doubtful. U, relatively upthrown side; D, relatively downthrown side
- **Fold**—Dashed where approximately located, dotted where concealed. Showing direction of plunge
- **Anticline**
- **Syncline**
- **Strike and dip of beds**
- **Horizontal**
- **Inclined**
- **Overturned**
- **Vertical**
- **Ash Bed**
- **Foliation**
- **Water well**
- **Dry hole drilled for hydrocarbon exploration**
- **Landslide**—Arrows show general direction of movement. Query indicates that identification of feature as a landslide is in doubt
- **Spring**

Digital Data prepared using Arc/INFO 7.1.2 running under Solaris 2.6 on a UNIX workstation. Map formatted using Adobe Illustrator 8.0 running under Mac OS 8.6.

This project was supported in part by an appointment to the U.S. Geological Survey Earth Science Internship Program administered by the Environmental Careers Organization.

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Digital files available on the World Wide Web at http://geopubs.wr.usgs.gov

GEOLOGIC MAP OF THE SPRECKELS 7.5-MINUTE QUADRANGLE, MONTEREY COUNTY, CALIFORNIA

By Joseph C. Clark, Earl E. Brabb, and Lewis I. Rosenberg
Digital database by Heather V. Goss and Sarah E. Watkins

2000