



**EXPLANATION**

**CORRELATION OF MAP UNITS**

Qaf	Qya	Qya <sub>2</sub>	Qya <sub>1</sub>	Qls	Qds	} QUATERNARY		
Qoa	Qoa <sub>2</sub>	Qoa <sub>1</sub>						
Ts	Ts <sub>1</sub>					} TERTIARY (?)		
Kqm	Kqm	Kgd	Kgd <sub>2</sub>	Kgd <sub>1</sub>	Kqd	Kqd <sub>2</sub>	Kqd <sub>1</sub>	} CRETACEOUS
s	m							} PRE-CRETACEOUS (?)

**DESCRIPTION OF MAP UNITS**

**Qaf** ARTIFICIAL FILL—Uncompacted fill from mining operations, compacted road fill, and dams

**Qya** YOUNGER ALLUVIUM—Unconsolidated grayish sandy to cobbly alluvium along Santa Ana River and Lytle Creek Wash. Subject, or recently subject to reworking by stream flow

**Qya<sub>2</sub>** YOUNGER ALLUVIUM—Unconsolidated grayish to locally tannish pebbly to bouldery alluvium

**Qya<sub>1</sub>** YOUNGER ALLUVIUM—Unconsolidated grayish sandy to pebbly alluvium

**Qls** LANDSLIDES—Areas mapped as landslides generally consist of a crown area and a landslide deposit of massive unconsolidated debris. Principal direction of movement shown by arrows

**Qds** DUNE SAND—Unconsolidated grayish to tannish massive fine-grained sand forming stabilized dunes. May include some deposits of Pleistocene age

**Qoa** OLDER ALLUVIUM—Mainly indurated tannish to brown sandy to pebbly and cobbly clay-bearing older alluvium. Locally includes gray well-bedded silty lacustrine(?) deposits along Santa Ana River banks

**Qoa<sub>2</sub>** OLDER ALLUVIUM—Perched mainly indurated brown pebbly to cobbly clay-bearing older alluvium east of Rache Canyon. Contains quartzite, pegmatite, and Pelona Schist cobbles

**Qoa<sub>1</sub>** OLDER ALLUVIUM—Unconsolidated to indurated sandy to conglomeratic gray well-bedded older alluvium. May be equivalent in age to upper part of sandstone and conglomerate (unit Ts)

**Ts** SANDSTONE AND CONGLOMERATE—Unconsolidated to indurated grayish to tannish poorly bedded coarse-grained sandstone, pebbly sandstone, and conglomerate. Locally contains beds of reddish-brown clay-bearing sandstone. May include some deposits of Pleistocene age

**Ts<sub>1</sub>** SANDSTONE AND SILTSTONE—Mainly greenish-gray indurated finely bedded sandstone and siltstone. Locally contains gypsum. Locally contains convolute bedding

**Kqm** QUARTZ MONZONITE—Light-colored coarse-grained porphyritic foliated biotite quartz monzonite. Phenocrysts are K-feldspar

**Kqm<sub>1</sub>** QUARTZ MONZONITE—Heterogeneous light-colored porphyritic, foliated biotite quartz monzonite. Contains widespread mesocratic inclusions and leucocratic granitoid- and pegmatoid-textured dike and sill rock

**Kgd** GRANODIORITE—Uniform light-gray unfoliated medium-grained hornblende-biotite granodiorite. Locally contains faint schlieren and compositional layering

**Kgd<sub>2</sub>** GRANODIORITE—Heterogeneous gray medium- to very coarse-grained biotite and hornblende-biotite granodiorite. Contains widespread segregation-type pegmatite clots and dikes

**Kgd<sub>1</sub>** GRANODIORITE—Relatively homogeneous light-gray foliated medium-grained hornblende-biotite granodiorite. Common "pancake"-shaped inclusions

**Kqd** QUARTZ DIORITE—Mainly coarse-grained equigranular gray biotite-hornblende quartz diorite. Generally foliated and contains widespread dark ellipsoidal inclusions

**Kqd<sub>2</sub>** QUARTZ DIORITE—Mainly coarse-grained gray biotite-hornblende quartz diorite, similar to unit Kqd except this unit contains megascopically visible K-feldspar. Generally foliated and contains widespread dark ellipsoidal inclusions

**Kqd<sub>1</sub>** QUARTZ DIORITE—Heterogeneous medium- to coarse-grained biotite, hornblende, and biotite-hornblende quartz diorite. Massive to well foliated and contains locally abundant ellipsoidal inclusions

**s** SCHIST—Brown well-layered and foliated biotite schist and minor gray quartzite

**m** MARBLE—Off-white well-layered coarse-grained marble with minor pods of calc-silicate rock and quartzite (metachert?)

**Symbols**

--- Contact. Solid where accurately located; dashed where approximately located

--- Fault, showing dip. Solid where accurately located; dashed where approximately located

--- Fault consisting of thin shear zone, showing dip

--- Strike and dip of bedding in sedimentary rocks

--- Horizontal

--- Inclined

--- Overturned

--- Strike and dip of foliation in plutonic rock

--- Inclined

--- Vertical

--- Strike and dip of foliation in metamorphic rock

--- Inclined

--- Vertical

--- Bearing and plunge of mineral lineation in plutonic rock

--- Bearing and plunge of minor fold axis in metamorphic rock

--- Direction of landslide movement

(7m) Depth, in meters, beneath surface where strike and dip recorded

**GEOLOGIC MAP OF THE SAN BERNARDINO SOUTH QUADRANGLE,  
SAN BERNARDINO AND RIVERSIDE COUNTIES, CALIFORNIA**

By  
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1978

This report is preliminary and has not been edited or reviewed for conformity with Geological Survey standards and nomenclature.