



**EXPLANATION**

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| Qya | Younger alluvium (Quaternary) -- Sand and gravel with admixed silt and clay, generally along present-day stream courses  |
| Qls | Landslide deposits (Quaternary) -- Unsorted mixtures of boulders, cobbles, and matrix of finer materials   |
| Qs  | Windblown sand (Quaternary)  |
| Qpl | Playa deposits (Quaternary) -- Silt, clay, and evaporite minerals  |
| Qoa | Older alluvium and terrace deposits (Quaternary) -- Dissected sand and gravel deposits lying above stream courses  |
| Qf  | Alluvial-fan deposits (Quaternary) -- Moderately dissected fans of sand and gravel with cobbles and boulders near apexes   |
| Qwf | Well-dissected alluvial fans (Quaternary)  |
| Qg  | Glacial till and outwash (Quaternary) -- Unsorted boulder clay and stream-deposited sand and gravel  |
| Qb  | Bautista Beds of Rogers (1965) (Pleistocene) -- Semi-consolidated sandstone, shale, and coarse boulder gravel  |
| Tcr | Crowder Formation (Pliocene) -- Semi-consolidated arkosic sandstone and conglomerate, with minor siltstone and mudstone  |
| Tsa | Santa Ana Sandstone of Vaughan (1922) (Miocene) -- Semi-consolidated sandstone, conglomeratic sandstone, and silty sandstone   |
| Tcv | Punchbowl(?) Formation of Cajon Valley (Miocene) -- Unit of Bortugno and Spittler (1986). Semiconsolidated arkosic sandstone and conglomerate, interbedded shale and siltstone |
| b   | Bedrock -- Granite and other plutonic rocks, gneiss, schist, quartzite, and limestone; also includes well-consolidated sedimentary rocks                                       |

- Contact
- National Forest Boundary
- Ⓛ Locality referred to in text

Base from U.S. Geological Survey 1:250,000  
San Bernardino 1956 (revised 1969) and  
Santa Ana 1959 (revised 1979) Quadrangles

Geology modified from Bortugno and Spittler (1986)  
and Rogers (1965)

This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards or with the North American Stratigraphic Code. Any use of trade, product, or firm names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

**SAND AND GRAVEL RESOURCES OF THE SAN BERNARDINO NATIONAL FOREST,  
CALIFORNIA**

by  
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1995

Scale 1:250,000  
Contour Interval 200'

