DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

OPEN FILE REPORT

78-977

EXPLANATION

CORRELATION OF MAP UNITS

DESCRIPTION OF MAP UNITS

MANMADE DEPOSITS AND MODIFICATIONS

af — ARTIFICIAL FILL.--Areas modified by construction of airports, housing developments, earth-fill dams, quarries, and furnace slag heaps. Includes areas of cut-and-fill. Most highway and railroad grades have been omitted. Texture and induration very greatly between units, depending on filling materials and type of treatment (grouting, tamping) applied, if any

HOLOCENE SEDIMENTS

Nonmarine sedimentary deposits of Holocene age (less than about 10,000 years). Consist of relatively unconsolidated, undeformed deposits in which soil-forming processes have not significantly altered the original character of the beds. Forms coalescing alluvial fans along south fronts of San Gabriel and San Bernardino Mountains and occupy active channels and low stream terraces along Santa Ana River and its tributaries. Become progressively finer grained downstream away from the mountain fronts

Qhmc — VERY COARSE GRAINED HOLOCENE ALLUVIUM.--Unconsolidated gravel containing abundant boulders, together with cobbles, pebbles, and variable amounts of sand and silt. Very permeable. Restricted to parts of alluvial fans and stream valleys that are near mountain fronts

Qhc — COARSE-GRAINED HOLOCENE ALLUVIUM.--Unconsolidated gravel containing abundant cobbles, supported by pebbles and smaller in a sandy matrix. Very permeable. Particularly characteristic of middle and lower regions of large alluvial fans

Qhm — MEDIUM-GRAINED HOLOCENE ALLUVIUM.--Unconsolidated deposits consisting principally of fine- to coarse-grained sand, but locally containing thin beds of pebble gravel or silt. Moderately permeable to very permeable. Widespread, but occurs most extensively on lower parts of alluvial fans and in parts of stream valleys far removed from mountain fronts

Qhf — FINE-GRAINED HOLOCENE ALLUVIUM.--Unconsolidated to compact deposits of clay and silty clay containing variable amounts of fine sand. Generally poorly permeable to impermeable; permeable to impermeable. Found in low-lying areas; often associated with a high ground-water table. Restricted mainly to the southwestern part of the area, south of Chino

Qha — EOLIAN SAND.--Unconsolidated fine- to medium-grained wind-deposited sand. Moderately permeable to very permeable. Most deposits stabilized by vegetation. Restricted to west-central part of the area, between Ontario and Fulton

LATE PLEISTOCENE SEDIMENTS

Alluvial deposits of late Pleistocene age (about 10,000 to several hundred thousand years). Weakly to moderately consolidated, generally uniformed. Distinguished from the Holocene alluvium mainly by the presence of soils that have developed well-developed textural B horizons. Tend to be better consolidated and slightly less permeable than Holocene alluvial deposits, due to advanced sediment compaction and redistribution of binding agents such as clays. Preserved as dissected remnants of old alluvial fans along mountain fronts and as isolated deposits situated tens to hundreds of feet above modern stream courses. Also form extensive alluvial plain in Edgemont-Sunnymead area, near the southeast margin of the area

Qpvc — VERY COARSE GRAINED LATE PLEISTOCENE ALLUVIUM.--Boulder gravel. Restricted to small dissected alluvial fan north of Yucaipa, at eastern margin of area. Notably uncommon compared to Holocene deposits in this textural class

Qpc — COARSE-GRAINED LATE PLEISTOCENE ALLUVIUM.--Cobble and cobble gravel. Restricted to dissected alluvial fans and terrace deposits near Corona, Rialto, and Yucaipa

Qpm — MEDIUM-GRAINED LATE PLEISTOCENE ALLUVIUM.--Fine- to coarse-grained sand. Areally widespread

Qpf — FINE-GRAINED LATE PLEISTOCENE ALLUVIUM.--Clay and silty clay. Deposits located south of Chino near fine-grained Holocene alluvium

PLIOCENE AND PLEISTOCENE SEDIMENTS

Nonmarine sedimentary deposits of middle(?) Pleistocene to earliest Pliocene age (several hundred thousand to 5 or 6 million years). Well consolidated in some areas due to compaction and (or) weak cementation; however, many exposures virtually indistinguishable from unconsolidated to moderately consolidated late Pleistocene and Holocene sediments. Locally tilted, folded and faulted. Texturally similar to younger Quaternary deposits, although the very coarse grained textural class is uncommon. Form hilly terrain south of Redlands

QTsm — PLIOCENE AND PLEISTOCENE NONMARINE SEDIMENTS

TERTIARY ROCKS

Marine and nonmarine sedimentary rocks, and volcanic rocks, of Miocene and Pliocene age. Typically strongly folded and faulted

Tn — TERTIARY SEDIMENTARY ROCKS, UNDIVIDED.--Range from well-consolidated sediments to indurated rocks. Wide range in texture. Restricted to hilly and mountainous areas near northeast and southwest margins of area. Deposits in San Bernardino Mountains consist of nonmarine rocks that are particularly well indurated. Deposits in Puente Hills, southwest of Chino, consist of marine rocks that vary widely in degree of induration

Tv — TERTIARY VOLCANIC ROCKS.--Volcanic flow rocks and pyroclastic rocks ranging widely in texture and induration. Generally as well or better indurated than the Tertiary sedimentary rocks. Restricted to hills in the northwest and southwest of Pomona, near west margin of area

PRE-TERTIARY CRYSTALLINE ROCKS WITH WIDELY SPACED FRACTURES

Mesozoic granitoid rocks, predominantly quartz monzonite to quartz diorite in composition. Fractures relatively widely spaced, consisting mainly of joints related to cooling and (or) unloading. Tectonically induced fractures appear to be minimal. Characteristic rocks of Peninsular Ranges province (south half of area)

Mz — GRANITOID ROCKS, RELATIVELY UNWEATHERED.--Areas dominated by large exposures of coherent rock. Found in hilly and mountainous areas

Mz$_s$ — GRANITOID ROCKS, DEEPLY WEATHERED.--Areas mantled with a thick residual layer of weathered granitic rock. Found in low-lying sites near south margin of area

PRE-TERTIARY CRYSTALLINE ROCKS WITH CLOSELY SPACED FRACTURES

Primarily of Mesozoic and pre-Mesozoic age, but including minor areas of Tertiary intrusive rocks. Compositionally diverse. Widely distributed in San Gabriel Mountains area, probably reflecting high degree of tectonic disturbance. Characteristic basement rocks of San Bernardino and San Gabriel Mountains

Mz$_1$ — GRANITOID ROCKS.--Intrusive rocks. Predominantly structurally massive, or nearly so, but varying widely in composition and texture. Found in mountainous margin of area in San Bernardino and San Gabriel Mountains

Mz$_2$ — HIGH-GRADE METAMORPHIC ROCKS.--Strongly foliated medium- to coarse grained rocks with schistose to gneissic structure. Compositionally diverse. Widely distributed in San Bernardino and San Gabriel Mountains

Mz$_3$ — LOW-GRADE METAMORPHIC ROCKS.--Moderately to strongly foliated fine- to medium grained schist and quartzite. Found in eastern San Gabriel Mountains and in low hills along southwest front of San Bernardino Mountains

(EXPLANATION CONTINUED TO RIGHT)

EXPLANATION
(Continued from left)

DERIVATION OF MAPPED DATA

This map is based almost entirely on previous geologic and soil mapping. Previous mapping has been modified in only a few places on the basis of spot checks in the field.

Pre-late Pleistocene materials and their boundaries with late Pleistocene and Holocene sediments are based on geologic mapping (Shelton, J. S., 1955; Morton, D. M., 1974; Gray, C. H., unpublished data, 1977; Morton, D. M., 1978a, 1978b, 1978c, 1978d).

Subdivision of Quaternary deposits is based on soil mapping and soil profile descriptions prepared by the U.S. Soil Conservation Service (Eckmann, E. C., and Zinn, C. J., 1921; Knecht, A. A., 1971; Soil Conservation Service Staff, unpublished data, 1969). Textural class and age of Quaternary deposits have been assigned according to the following criteria:

TEXTURAL CLASSIFICATION OF QUATERNARY DEPOSITS.-- The texture of the C horizon, as provided in soil profile descriptions, is assumed to characterize the grain size of underlying sedimentary deposits. Deposits containing abundant boulders (stony C horizon) are classified as very coarse grained; deposits with abundant pebbles or cobbles (gravelly or cobbly C horizon) are classified as coarse grained; deposits of sand, loamy sand, sandy loam, loam, sandy clay loam, loamy sand, sandy clay loam, silt loam, silt loam, or silt) are classified as medium grained; deposits dominated by clay-size material (C horizon of clay, sandy clay, silty clay, clay loam, or silty clay loam) are classified as fine grained.

AGE ASSESSMENT OF QUATERNARY DEPOSITS.-- Deposits overlain by a pedogenic textural B soil horizon are inferred to be late Pleistocene. Deposits lacking such a B horizon are inferred to be Holocene.

REFERENCES

Eckmann, E. C., and Zinn, C. J., 1917, Soil survey of the Pasadena area, California: U.S. Department of Agriculture, Bureau of Soils, scale 1:62,500.

Gray, C. H., 1977, Unpublished geologic mapping in the Corona North quadrangle, California, scale 1:24,000.

Knecht, A. A., 1971, Soil survey of the western Riverside area, California: U.S. Department of Agriculture, Soil Conservation Service, and U.S. Department of the Interior, Bureau of Indian Affairs, in cooperation with the University of California Agriculture Experiment Station, scale 1:15,840.

Morton, D. M., compiler, 1974, Generalized geologic map of southwestern San Bernardino County, California: California Division of Mines and Geology Special Report 113, "A" series, Plates I-A and I-B, scale 1:48,000.

Morton, D. M., 1978a, Geologic map of the Fontana quadrangle, San Bernardino Co., California: U.S. Geological Survey Open-File Report 78-19, Menlo Park, California, scale 1:24,000.

_____, 1978b, Geologic map of the Redlands quadrangle, California: U.S. Geological Survey Open-File Report 78-21, Menlo Park, California, scale 1:24,000.

_____, 1978c, Geologic map of the San Bernardino South quadrangle, California: U.S. Geological Survey Open-File Report 78-20, Menlo Park, California, scale 1:24,000.

_____, 1978d, Geologic map of the Sunnymead quadrangle, California: U.S. Geological Survey Open-File Report 78-22, Menlo Park, California, scale 1:24,000.

Shelton, J. S., 1955, Glendora Volcanic Rocks, Los Angeles basin, California: Geol. Soc. Amer. Bull., v. 66, p. 45-90, Pl. 1, scale 1:24,000.

Soil Conservation Service Staff, 1969, Unpublished soil survey of the San Bernardino area, California: U.S. Department of Agriculture, Soil Conservation Service, Redlands, California, scale 1:24,000.

Base from U.S. Geological Survey, 1:24,000: GLENDORA, 1953, 5 ft.; MT. BALDY, 1967, 40 ft.; CUCAMONGA PEAK, 1966, 40 ft.; DEVORE, 1966, 40 ft.; SAN BERNARDINO NORTH, 1967, 40 ft.; HARRISON MTN., 1967, 40 ft.; KELLER PEAK, 1967, 40 ft.; SAN DIMAS, 1966, 20 ft.; ONTARIO, 1967, 10 ft.; GUASTI, 1966, 10 ft.; FONTANA, 1967, 20 ft.; SAN BERNARDINO SOUTH, 1967, 20 ft., REDLANDS, 1967, 20 ft.; YUCAIPA, 1967, 20 ft.; CRAFTON HILLS, 1967, 20 ft.; MENTONE, 1967, 20 ft.; REDLANDS DAM, 1967, 25 ft.; CORONA NORTH, 1967 (Photo rev. 1973), 20 ft.; RIVERSIDE WEST, 1967, 20 ft.; RIVERSIDE EAST, 1967, 20 ft.; SUNNYMEAD, 1967, 40 ft.; EL CASCO, 1967, 40 ft.; CALIFORNIA. Compiled U.S. Geological Survey Menlo Park Base Map Section.

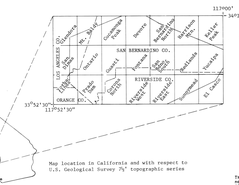
SCALE 1:48 000

APPROXIMATE MEAN DECLINATION, 1978

PRELIMINARY MAP OF SURFICIAL MATERIALS IN NORTHWESTERN RIVERSIDE AND SOUTHWESTERN SAN BERNARDINO COUNTIES, CALIFORNIA

Compiled by B. F. Cox and D. M. Morton

1978



Map location in California and with respect to U.S. Geological Survey 7½' topographic series