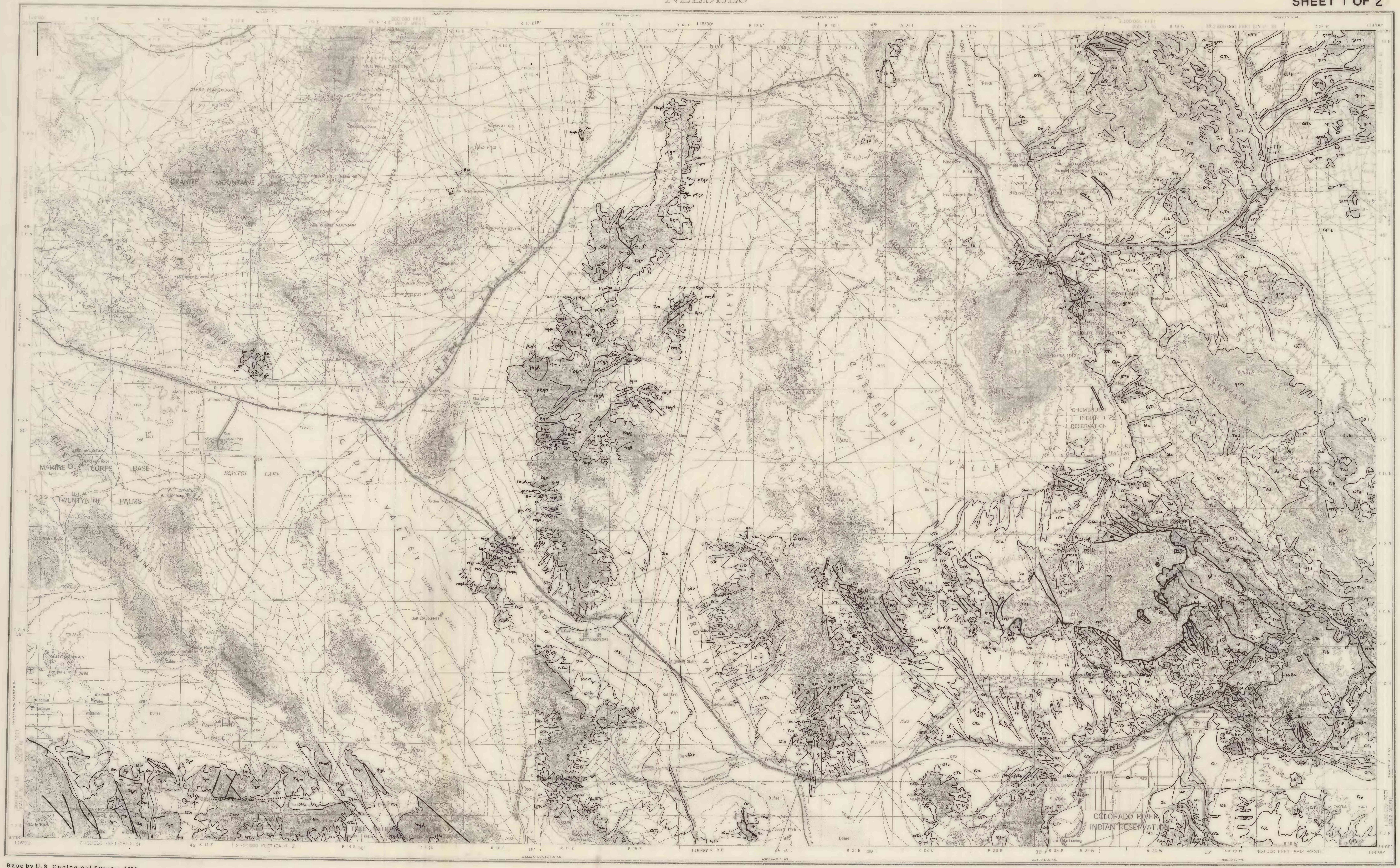
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

OPEN FILE REPORT
79-388

NEEDLES



Base by U.S. Geological Survey, 1969

Scale 1:250,000

CONTOUR INTERVAL 200 FEET
WITH SUPPLEMENTARY CONTOURS AT 100 FOOT INTERVALS
TRANSVERSE MERCATOR PROJECTION

QUADRANGLE LOCATION

COMPILATION OF GEOLOGIC MAPPING IN THE NEEDLES 1°x2° SHEET, CALIFORNIA AND ARIZONA

By Paul Stone and K. A. Howard

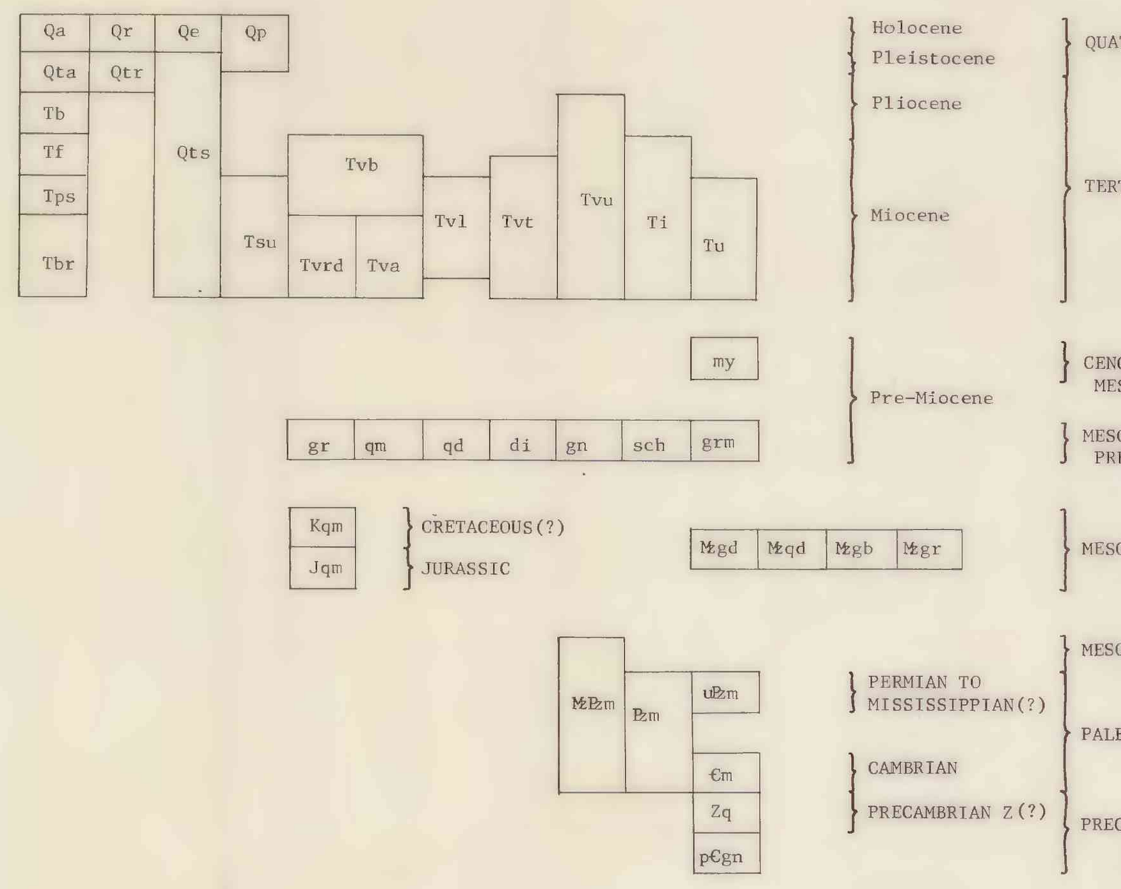
1979

SHEET 1: PRELIMINARY REVISIONS AND ADDITIONS TO NEEDLES SHEET, GEOLOGIC MAP OF CALIFORNIA

Compiled by Paul Stone and K. A. Howard

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

CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

Qa	ALLUVIUM
Qr	RIVER DEPOSITS
Qe	EOLIAN SAND
Qp	PLAYA DEPOSITS
Qta	OLDER ALLUVIUM
Qtr	OLDER RIVER DEPOSITS
Qts	SEDIMENTARY ROCKS, UNDIVIDED--Includes equivalents of units, Qta, Qtr, Tf, and possibly Tb, Tsu, and Tu
Tb	BOUSE FORMATION (PLIOCENE)--Marine to brackish-water limestone, mudstone, siltstone, sandstone, and tufa
Tf	FANGLOMERATE--Includes fanglomerate of Osborne Wash
Tps	PEACH SPRINGS TUFF OF YOUNG AND BRENNAN (1974) (MIOCENE)
Tbr	SEDIMENTARY BRECCIA
Tsu	SEDIMENTARY ROCKS, UNDIVIDED
	VOLCANIC ROCKS
Tvb	Basalt
Tvl	Latite--Includes Gold Road Latite and Oatman Andesite
Tvt	Trachyte--In Black Mountains includes Esperanza and Alcyone Trachytes
Tvrd	Rhyodacite and rhyolite
Tva	Andesite
Tvu	Volcanic rocks, undivided
Ti	INTRUSIVE ROCKS
Tu	SEDIMENTARY AND VOLCANIC ROCKS, UNDIVIDED
my	MYLONITIC GNEISS
gr	GRANITIC ROCKS--Largely gneissic
qm	QUARTZ MONZONITE
qd	QUARTZ DIORITE
di	DIORITE
gn	GNEISS
sch	SCHIST
grm	GRANITIC AND METAMORPHIC ROCKS, UNDIVIDED
Kqm	TWO-MICA QUARTZ MONZONITE (CRETACEOUS?)
Jqm	PORPHYRITIC QUARTZ MONZONITE
Mzgd	GRANODIORITE
Mzqd	QUARTZ DIORITE
Mzgb	GABBRO
Mzgr	GRANITIC ROCKS, UNDIVIDED--In part gneissic
MzPzm	MESOZOIC(?) AND PALEOZOIC METASEDIMENTARY ROCKS, UNDIVIDED
Pzm	PALEOZOIC METASEDIMENTARY ROCKS, UNDIVIDED (PERMIAN TO CAMBRIAN)--Calcite and dolomite marble, quartzite, and schist
uPzm	UPPER PALEOZOIC METASEDIMENTARY ROCKS--Calcite and dolomite marble, quartzite, and calc-schist; includes Bird Spring Formation (Permian and Pennsylvanian) and possibly Monte Cristo Limestone (Mississippian). In Arica Mountains includes Kaibab Limestone, Coconino Sandstone, Hermit Shale, Supai Formation, and probably Redwall Limestone
€m	CAMBRIAN METASEDIMENTARY ROCKS--Dolomite and calcite marble, quartzite, and schist; includes Bonanza King Formation, Bright Angel Shale, and Tapeats Sandstone
Zq	QUARTZITE (PRECAMBRIAN Z?)
p€gn	GNEISS--Includes layered gneiss, augen gneiss, granitic gneiss, schist, amphibolite, and quartzite

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DATA SOURCES

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2. Evenson, W.A., 1973, Geology of the southern Kilbeck Hills and an adjacent portion of the Old Woman Mountains, eastern Mojave Desert, San Bernardino County, California: Univ. Southern California, M.S. thesis, figs. 3 and 12, scale 1:10,417. (Note--Paleozoic metasedimentary rocks identified by G.A. Davis; mapping modified by K. A. Howard and Paul Stone.)
3. Gillespie, J.B., and Bentley, C.B., 1971, Geohydrology of Hualapai and Sacramento Valleys, Mohave County, Arizona: U.S. Geol. Survey Water-Supply Paper 1899-H, pl. 1, scale 1:125,000.
4. Hope, R.A., 1966, Geology and structural setting of the eastern Transverse Ranges, southern California: Univ. California, Los Angeles, Ph.D. dissertation, pl. 1, scale 1:62,500.
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6. IntraSearch, Denver, Col., date unknown, Geology of the Needles Quadrangle (Arizona part only), prepared for U.S. Dept. Energy, scale 1:250,000. (Note--photogeology only, no field mapping.)
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   ________________, 1960, T7N, R23-24E.
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   Davis, G.A., University of Southern California, unpublished mapping.
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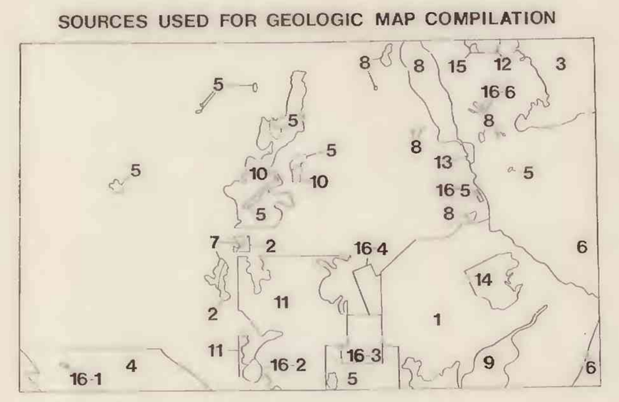
16. Woodward-McNeill and Associates, 1974, *in* Southern California Edison Company, Information concerning site characteristics, Vidal Nuclear Generating Station.
   16-1. The Pinto Mountain Fault at Humbug Mountain, California: Vol. V, Appendix 2.5-E, fig. E-16, scale 1:24,000 (approx.).
   16-2. Geologic relationships across Granite Pass, Riverside and San Bernardino Counties, California: Vol. II, fig. 2.5-90, and Vol. V, Appendix 2.5-E, fig. E-22, scale 1:15,615.
   16-3. Geologic map of the southern Turtle Mountains: Vol. V, Appendix 2.5-E, fig. E-27, scale 1:30,170 (approx.).
   16-4. Reconnaissance geologic map, Castle Rock area, Mopah Range-Turtle Mountains: Vol. V, Appendix 2.5-I, fig. I-2, scale 1:24,000.
   16-5. Chemehuevi graben feature, aerial view and location map: Vol. II, figs. 2.5-84 and 2.5-85.
   16-6. Graben structure near Needles (aerial view): Vol. II, fig. 2.5-83.

Unnumbered areas: Unrevised from Bishop, C.C., 1963, Geologic map of the Needles sheet: California Div. Mines and Geology, Geologic Map of California, Olaf P. Jenkins Edition, scale 1:250,000.

SOURCES USED FOR GEOLOGIC MAP COMPILATION



MAP SYMBOLS

CONTACT

FAULT--Dotted where concealed. Bar and ball on downthrown side

LOW-ANGLE FAULT--Dotted where concealed. Sawteeth on upper plate

BOUNDARY BETWEEN DIFFERENTIATED AND UNDIFFERENTIATED MAP UNITS