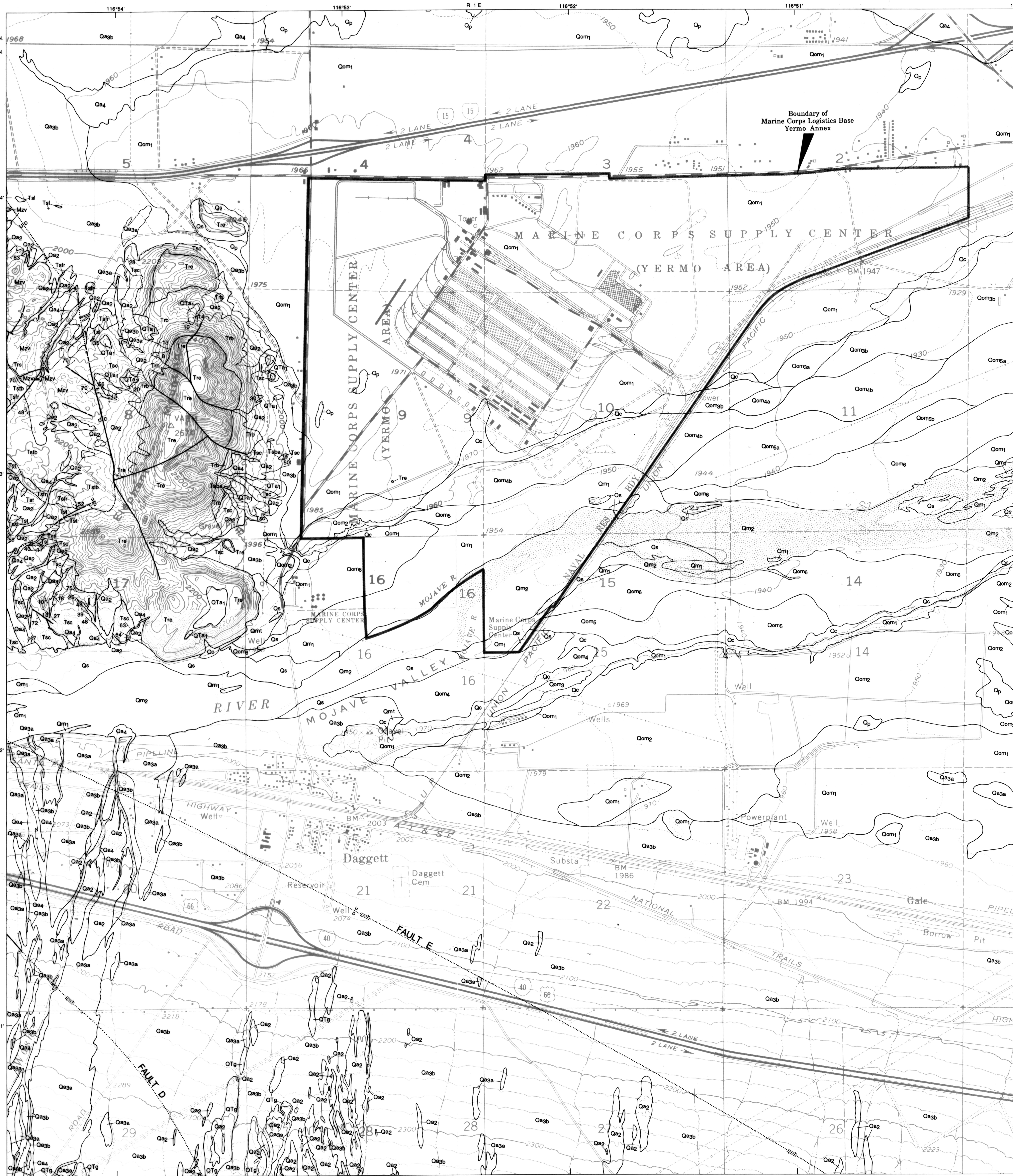


Base from U.S. Geological Survey, 1:24,000
Lambert conformal conic projection

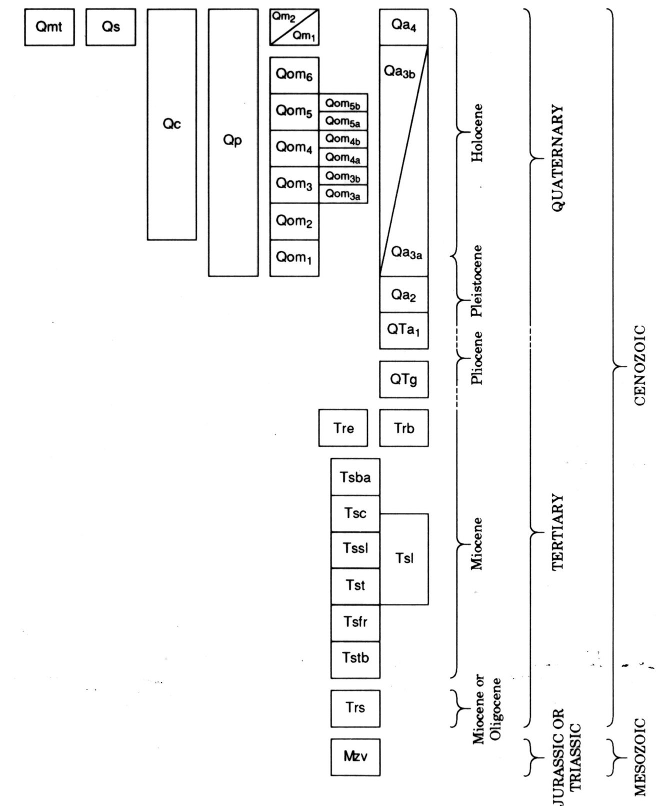
SCALE 1:12 000

CONTOUR INTERVAL 20 FEET
DASHED LINES REPRESENT 10-FOOT CONTOURS
DATUM IS MEAN SEA LEVEL

MAP LOCATION

Geology mapped by B.F. Cox and H.G. Wilshire, 1992-1994, assisted by J.M. Dahm, 1992

CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

Qmt — **Mine tailings (Holocene)**—Laminated reddish-brown to orange-pink silt and fine sand deposited as a byproduct of past silver-processing operations. Also includes small areas of artificial fill and disturbed ground near foundations of abandoned smelters. The tailings are found in two areas located northeast of Daggett and at the south end of Elephant Mountain

Qs — **Sand dunes (Holocene)**—Wind-deposited sand and silt forming low dunes and sand sheets within and adjacent to the active channel of the Mojave River. Unit also includes climbing dunes around a low hill at north end of Elephant Mountain

Qc — **Colluvium (Holocene)**—Sand, silt, and gravel deposited at the base of erosional scarps by rainwash, gullying, and slumping

Qp — **Playa deposits (Holocene)**—Light-gray to pinkish-gray sand, silt, and clay. Forms floor of large playa at north edge of map area. Also includes thin deposits of small ephemeral ponds on poorly-drained surfaces of units Qom_1 and Qom_2

Younger alluvium of the Mojave River (Holocene)—Unconsolidated yellowish-gray fluvial sand and pebble-cobble gravel deposited within and adjacent to active wash of the Mojave River. Sand is arkosic, coarse to very coarse grained, moderately to well sorted, angular to subrounded. Gravel contains subrounded to rounded clasts of granite and quartzite, and subangular to angular clasts of volcanic and metavolcanic rocks. Unit locally is covered by unmapped thin deposits of windblown sand. Divided into:

Qm_2 — **Unit 2**—Alluvium with little or no plant cover, forming main floor of active channel

Qm_1 — **Unit 1**—Alluvium with moderate plant cover, forming sand bars and low stream terraces that lie less than 1 m above floor of active channel

Older alluvium of the Mojave River (Holocene to Pleistocene)—Unconsolidated to weakly indurated fluvial sand, silt, and pebble-cobble gravel. Detrital composition and texture are the same as described for younger alluvium of the Mojave River. Comprises thick unit of valley fill (unit 1) and thinner deposits that drape stream terraces adjacent to Mojave River (units 2-6). Locally covered by unmapped thin deposits of windblown sand. Divided into:

Qom_6 — **Unit 6 (Holocene)**—Unconsolidated yellowish-gray to grayish-orange sand and gravel. Unit drapes stream terraces lying about 1 m above active channel of Mojave River

Qom_5 — **Unit 5 (Holocene)**—Unconsolidated yellowish-gray to grayish-orange sand and gravel. Unit drapes stream terraces lying about 1-2 m above active channel of Mojave River. Locally subdivided into deposits of higher (5a) and lower (5b) terrace levels

Qom_4 — **Unit 4 (Holocene)**—Unconsolidated yellowish-gray to grayish-orange sand and gravel. Unit drapes stream terraces lying about 2-3 m above active channel of Mojave River. Locally subdivided into deposits of higher (4a) and lower (4b) terrace levels

Qom_3 — **Unit 3 (Holocene)**—Unconsolidated yellowish-gray to grayish-orange sand and gravel. Unit drapes stream terraces lying about 3-5 m above active channel of Mojave River. Deposits locally are capped by spotty, loosely packed pavement of thinly varnished pebbles. Locally subdivided into deposits of higher (3a) and lower (3b) terrace levels

Qom_2 — **Unit 2 (Holocene)**—Unconsolidated to weakly indurated, grayish-orange to yellowish-brown sand and gravel. Unit drapes stream terraces lying about 5-7 m above active channel of Mojave River. Deposits locally are capped by spotty, loosely packed pavement of thinly varnished pebbles

Qom_1 — **Unit 1 (Holocene to Pleistocene)**—Unconsolidated to weakly indurated grayish-orange to yellowish-brown sand and gravel, locally containing interbedded gray silt. Constitutes main alluvial fill of western Mojave Valley. The broad, slightly dissected upper surface of the deposits has about 1-2 m of local erosional relief and lies about 6-8 m above active channel of Mojave River. Deposits locally are capped by spotty, loosely packed pavement of thinly varnished pebbles

Alluvial-fan deposits (Holocene to Pliocene)—Fluvial and debris-flow deposits consisting mainly of poorly sorted silty sand and pebble or cobble gravel; unconsolidated to weakly indurated. Clasts typically angular and composed predominantly of volcanic and metavolcanic rocks. Divided into:

Qa_4 — **Unit 4 (Holocene)**—Unconsolidated, unweathered, light-gray to grayish-orange alluvium of active stream channels; lacks significant soil development, desert pavement, or varnish on exposed clasts

Unit 3 (Holocene to Pleistocene)—Undissected to slightly dissected, grayish-orange to yellowish-brown alluvium, mostly elevated no more than 1-2 m above floors of active channels. Covered by moderate amounts of shrubby vegetation. Coarse bar-and-swale texture is developed where coarse alluvium is available. Includes alluvium of unit Qa_4 where active channels are too small to map separately. Divided into:

Qa_{3b} — **Subunit 3b**—Relatively undissected deposits subject to sporadic flooding. Lacks conspicuous soil development or varnish on exposed clasts

Qa_{3a} — **Subunit 3a**—Slightly dissected deposits that are rarely flooded. Slight to moderate soil development and varnish on exposed clasts

Qa_2 — **Unit 2 (Pleistocene)**—Moderately dissected, grayish-orange to yellowish-brown alluvium lying about 1-6 m above floors of active channels. Sparsely covered with shrubs. Locally includes colluvial aprons at margins of hills. Upper surface of deposits commonly has tight pavement of moderately to well varnished clasts. Conspicuous soil development includes vesicular A horizon as much as 3 cm thick, and argillic B horizon

QTa_1 — **Unit 1 (Pleistocene and Pliocene?)**—Strongly dissected, grayish-orange to yellowish-brown alluvium lying about 5-15 m above floors of active channels. Soils, pavements, and varnish unevenly preserved, largely stripped off by erosion. Forms thin deposits capping planar-crested ridges on flanks of Elephant Mountain

QTg — **Gravel and conglomerate (Pleistocene? to Miocene?)**—Thick fluvial and debris-flow deposits of old alluvial fans, consisting mainly of poorly sorted silty sand and pebble or cobble gravel; pale-yellowish-brown to grayish-orange and grayish-orange-pink; slightly to moderately indurated. Clasts typically angular and composed predominantly of volcanic and metavolcanic rocks. Locally contains buried soils with thick petrocalcic horizons. Strongly eroded, forming ridges with rounded crests

Tre — **Rhyodacite of Elephant Mountain (Miocene)**—Pale-red to gray porphyritic rhyodacite, containing small phenocrysts of plagioclase, biotite, and hornblende in a glassy to microcrystalline groundmass. Forms extrusive and shallow-intrusive bodies (domes and plugs) at Elephant Mountain; also includes an outlying small body near the west entrance to Yermo Annex

Trb — **Rhyodacitic breccia and sandstone (Miocene)**—Structureless to well-bedded breccia and pebbly sandstone containing clasts of porphyritic rhyodacite identical to rhyodacite of Elephant Mountain. Includes structureless autobreccia along margins of plugs and domes. Well-bedded fluvial deposits apparently consist of reworked pyroclastic materials

Sedimentary and volcanic rocks (Miocene)—Diverse assemblage of fluvial and lacustrine sedimentary rocks interlayered with extrusive volcanic rocks. Correlated with Pickhandle Formation of neighboring areas. Divided into:

Tsba — **Basalt**—Fine-grained vesicular olivine basalt; dark-gray to brownish-gray; vesicles partly filled with zeolite minerals and calcite. May include shallow-intrusive bodies as well as flows

Tsc — **Conglomerate and sandstone**—Reddish-brown to pinkish-gray conglomerate, breccia, sandstone, and minor siltstone and claystone. Consists mostly of fluvial and debris-flow deposits, locally interbedded with landslide or avalanche breccia. The deposits are mainly composed of granitic detritus, mixed with lesser amounts of metavolcanic debris

Tsl — **Limestone**—Thin-bedded to thick-bedded cherty micritic limestone, locally grading into calcareous sandstone and silty marlstone. Fresh surfaces are yellowish brown or brownish gray; weathered surfaces are yellowish gray or grayish orange. Resistant, forming prominent ridges

Tssl — **Sandstone and limestone**—Yellowish-gray, fine- to coarse-grained sandstone, interbedded with micritic limestone

Tst — **Tuff**—White to yellowish-gray ash tuff, locally interbedded with tuff breccia and tuffaceous sandstone. Biotite flakes commonly present in minor amounts. Includes air-fall tuff and reworked stream-deposited tuff

Tsfr — **Red felsite**—Reddish-purple aphanitic silicic extrusive rock; typically flow-laminated and autobrecciated. Contains sparse small phenocrysts of plagioclase and biotite. Locally interlayered with ash tuff

Tstb — **Tuff breccia and felsite flows**—Light-gray to pale-red-purple tuff breccia and autobrecciated felsite flows, interbedded with minor amounts of ash tuff and debris-flow beccia

Trs — **Red sandstone (Miocene or Oligocene)**—Variegated reddish-brown and pale-greenish-gray volcaniclastic sandstone; medium- to coarse-grained; partly weathered to clay. Correlated with Jackhammer Formation of neighboring areas

Mzv — **Metavolcanic rocks (Mesozoic)**—Extrusive rocks, including abundant silicic flows and ash-flow tuff, interlayered with sparse flows or sills of andesite or basalt. Indurated siltstone, sandstone, and conglomerate locally present in minor amounts. Contains weak to prominent tectonic cleavage that generally is nearly parallel to steeply dipping lithologic layering. Some rocks are seriticized; many others may contain metamorphic epidote and chlorite, judging from their greenish color; sparse veins of white quartz as much as 5 cm thick are present locally. Unit is cut by abundant faults and fractures and contains numerous irregular zones of argillic and limonitic alteration

STRUCTURAL SYMBOLS

Contact

U D 66 — **Fault**—Dashed where approximately located; dotted where concealed. Single arrow indicates dip. Paired arrows indicate sense of slip on strike-slip faults. U, upthrown side; D, downthrown side

Strike and dip of beds:

34 — Inclined

Vertical

83 — **Strike and dip of tectonic cleavage**

INTRODUCTION

The Yermo Annex of the Marine Corps Logistics Base (MCLB) lies between Interstate Highways 15 and 40 about 15 km east of Barstow, California (see index map). This map presents the results of a new geologic survey of the annex and surrounding areas, and it is intended to serve as a spatial geologic framework for geotechnical and hydrologic operations at the MCLB. The study was funded jointly by the National Geologic Mapping Program of the U.S. Geological Survey and by the Department of the Navy, represented by the Southwest Division, Naval Facilities Engineering Command.

METHODS

Data for the map were obtained from aerial photography and field observations. Three sets of aerial photographs were consulted: a recent color survey (7-2-91, 1:10,000-scale) and two black-and-white surveys from the early to middle 1940s (10-18-40, 1:18,000-scale; undated, 1:23,000-scale). The older photographs were consulted because agriculture and construction projects during the past 50 years have obscured surface geologic features across much of the study area. Data were transferred from the aerial photographs to a 1:12,000-scale topographic base map using a Kern PG-2 stereo plotter. Field studies of the mapped area were conducted during 1992-1994.

PREVIOUS STUDIES

There have been no previous detailed geologic surveys of the Yermo Annex. The general geologic setting of the area is shown by maps of the Daggett 15-minute quadrangle (Dibblee, 1970) and of the Nebo and Yermo 7.5-minute quadrangles (McCulloh, 1965). Hills west of the Yermo Annex (Elephant Mountain and southern Mitchel Range) were mapped by Lambert (1987). Alluvial deposits similar to those that underlie the Yermo Annex have been dated by paleontologic and isotopic studies in neighboring areas (summarized in Reynolds and Reynolds, 1985, 1991). The present map of the Yermo Annex is an eastward extension of a geologic map of the area around the MCLB Nebo Annex (Cox and Wilshire, 1993). The areas covered by the two maps overlap for about 2 km in the vicinity of Elephant Mountain. Substantial revisions within the area of overlap have been incorporated into the present map.

GEOLOGIC SUMMARY

GENERAL SETTING

The Yermo Annex lies at the west end of Mojave Valley, a large intermontane plain in the central Mojave Desert (see index map). This geologic map covers the valley floor around the annex and extends into neighboring uplands south and west of the valley. Mojave Valley is filled with Quaternary-age alluvium deposited by the Mojave River, a regional intermittent stream with distant mountain headwaters south of the Mojave Desert. The river deposits are important because they contain the main ground-water resources in the region. Minor deposits of colluvium, eolian sand and silt, and playa silt and clay cover small areas of the valley floor. The valley is bordered to the south by piedmont alluvial fans of the Newberry Mountains, and to the west by alluvial fans and volcanic buttes of the Mitchel Range.

RIVER AND PLAYA DEPOSITS OF MOJAVE VALLEY

The landforms and sedimentary deposits of Mojave Valley reflect the dynamic alluvial history of the Mojave River. During Pleistocene and early Holocene time, the river filled the west end of the valley with a large fan-shaped lobe of sand, silt, and pebble gravel that is represented by our map unit Qom_1. This unit forms a broad north- and northeast-sloping surface that underlies the buildings and storage lots of the Yermo Annex. The same alluvial unit also crops out discontinuously south of the Mojave River. The north edge of the lobe blocked a tributary alluvial-fan drainage between the Mitchel Range and the Calico Mountains, causing a playa to form at the north edge of the map area. Alluvium in the uppermost several meters of the lobe is about 7,350-12,200 years old, as determined by four radiocarbon ages measured on detrital charcoal (Reynolds and Reynolds, 1985, 1991, sites 1.76.13, 1.76.33, 1.76.34, and 1.76.35). Data from water wells indicate that the river deposits are as much as 110-140 m thick in western Mojave Valley near the Yermo Annex (Peter Martin, written commun., 1994). The deep alluvium penetrated by the wells is undated, but it may include deposits as old as middle Pleistocene.

The alluvial filling of western Mojave Valley ended in early or middle Holocene time, when the Mojave River and its tributaries began incising their channels. A nested series of Holocene stream terraces draped by alluvium (map units Qom_2-Qom_6) records progressive erosion that cut the modern 8-m-deep channel of the Mojave River at the south side of the Yermo Annex. Once incision began, the broad floor of Mojave Valley was cut off from its main source of alluvial sediment. A tributary stream then breached the inactive alluvial dam at the north edge of the valley, re-establishing drainage across the floor of the playa. The bed of this ephemeral stream is marked by young Holocene alluvium (unit Qa_4) at the northeast corner of the map area.

ALLUVIAL-FAN DEPOSITS

Alluvial fans flank the Mitchel Range and Newberry Mountains at the west and south sides of the map area. The fans consist of ramp-like accumulations of sand, silt, and gravel deposited by ephemeral streams and debris flows. Some elevated, deeply eroded alluvial-fan deposits may be as old as Pliocene or even late Miocene (units QTa_1 and QTg). However, the more widespread, relatively undissected, younger alluvial-fan deposits (units Qa_2-Qa_4) are late Pleistocene and Holocene in age, broadly coeval with the valley-fill and terrace deposits of the Mojave River. The toes of the fans have gradually advanced into Mojave Valley since the Mojave River incised its channel. This is most evident along the south side of the valley, where the fans have expanded northward at least several hundred meters, partly burying low hills and ridges composed of old river deposits (unit Qom_1).

CONTRASTS BETWEEN FAN AND RIVER DEPOSITS

Previous geologic maps of western Mojave Valley (McCulloh, 1965; Dibblee, 1970; Bortugno and Spittler, 1986) do not consistently distinguish between deposits of the Mojave River and those of adjacent alluvial fans, probably because both consist of grossly similar mixtures of sand, silt, and gravel. We have differentiated the river and fan deposits on this map not only because they have different origins, but also because they have distinct physical characteristics that may affect their engineering properties and their potential value as sources of ground water and construction materials. This differentiation is readily made in the field on the basis of sediment color, texture, and composition.

The alluvial-fan deposits are composed of poorly sorted mixtures of angular rock detritus derived from nearby mountains, including abundant fragments of volcanic and metavolcanic rocks. By contrast, the river deposits are moderately to well sorted and contain abundant relatively light-colored granitic detritus and common clasts of quartzite. Pebbles of granite and quartzite are conspicuously abraded, indicating long-distance transport by the river. Much of the material probably originated in the headwaters of the Mojave River, which lie in the western San Bernardino Mountains more than 100 km upstream from Mojave Valley.

ROCKS WEST OF THE YERMO ANNEX

Beyond its narrow fringe of alluvial-fan deposits, the Mitchel Range directly west of the Yermo Annex consists of Mesozoic-age metavolcanic rocks overlain by a Tertiary-age sequence of continental sedimentary and volcanic rocks. These rocks were described in detail in a previous report (Cox and Wilshire, 1993). The metavolcanic rocks (map unit Mzv) crop out extensively west of Elephant Mountain. They consist of silicic lava flows and pyroclastic rocks, with rare interbeds of sandstone and conglomerate, and sparse flows or sills of andesitic or basaltic rocks. These rocks have been correlated with similar metavolcanic rocks of Late Triassic to Early Jurassic age that are found in neighboring mountains south of the Yermo Annex (Cox and Wilshire, 1993).

Tertiary sedimentary and volcanic rocks crop out on the flanks and crest of Elephant Mountain. They include a thin basal unit of reddish sandstone (unit Trs), correlated with the Jackhammer Formation of Oligocene or early Miocene age. This unit is overlain by a thick succession of tuff and tuff breccia, felsite flows, lacustrine limestone, sandstone, conglomerate, and basalt, all correlated with the early Miocene-age Pickhandle Formation (Cox and Wilshire, 1993). The Pickhandle-equivalent strata are unconformably overlain by rhyodacitic breccia and sandstone (unit Trb) and are intruded by plugs and domes of rhyodacite (unit Tre) that form the scenic buttes of Elephant Mountain. The rhyodacitic intrusions and sediments are inferred to be early or middle Miocene in age (Cox and Wilshire, 1993). They include a small outlier of intrusive rhyodacite that is surrounded by Quaternary alluvium near the west entrance to the Yermo Annex (S-1/2 sec. 9, T9N, R1E).

FAULTS

The Yermo Annex lies within an elongate structural block bounded by the northwest-trending Calico and Camp Rock-Harper Lake fault zones (see index map). These fault zones are elements of a regional system of young right-lateral strike-slip faults in the central Mojave Desert (Bortugno, 1986). The youthful nature of this system was demonstrated by extensive ground ruptures that formed along the Camp Rock and related faults during the 1992 Landers earthquake, which mainly affected more southerly parts of the desert (Hart and others, 1993). Two faults associated with the Camp Rock-Harper Lake zone cross the southwestern area of this geologic map (faults D and E). Other faults west of the Yermo Annex may also be elements of the regional strike-slip system.

Faults D and E are the easternmost of five principal strike-slip faults that we described in our previous report (Cox and Wilshire, 1993). These faults were identified from the following lines of evidence: (1) fault planes exposed north of the Mojave River about 4-6 km west of the area covered by this map; (2) subsurface structural discontinuities southwest of Daggett, as inferred from a direct-current resistivity survey (Zohdy and Bisdorf, 1994) and an aeromagnetic survey (U. S. Geological Survey, 1987); and (3) offset topographic surfaces in old fanglomerate (unit QTg) south and southeast of the area of this map. Lateral displacement on fault E is measurable about 6-9 km southeast of Daggett (in sec. 6, T8N, R2E), where several fanglomerate ridges are offset right-laterally about 150 m (Cox and Wilshire, 1993). The cited aeromagnetic survey suggests that the southwest side of the fault has dropped relative to its northeast side in the vicinity of Daggett. Fault E probably last moved during Pleistocene time. More recent movements are unlikely because the fault is covered by undisturbed late Pleistocene and Holocene alluvium (units Qa_{3a} and Qa_{3b}) across the southern half of this map.

While assembling the present map, we found new information pertaining to the location and activity of fault D. Faint air-photo lineaments reveal the path of this fault at the west edge of the map area and at several neighboring sites extending northwest to the Mojave River. Previously, this segment of the fault was only approximately located (Cox and Wilshire, 1993). Most of the lineaments were observed only on old aerial photographs taken before about 1950. They apparently were largely obliterated by subsequent construction projects, including the building of Interstate Highway 40. West of the map area, the lineaments cut across alluvial deposits of late Pleistocene and Holocene age (units Qa_{3a} and Qa_{3b}), suggesting there has been Holocene displacement on fault D. This interpretation reverses our previous finding of no Holocene activity on the fault (Cox and Wilshire, 1993).

The current investigation also revealed several faults west of the Yermo Annex that were not shown on our earlier map (Cox and Wilshire, 1993). These faults are indicated by predominantly northwest-trending topographic lineaments that coincide with right-lateral jogs in the crest of Elephant Mountain. We suspect that the faults are genetically related to the regional strike-slip fault system, but further field work is needed to establish their age and style of displacement. Most of them seem to be inactive, inasmuch as they apparently do not disturb late Pleistocene alluvium on the flanks of Elephant Mountain or on the adjacent floor of Mojave Valley (units Qa_2 and Qom_1).

One northwest-trending fault on the west side of Elephant Mountain (W-1/2 sec. 8, T9N, R1E) locally appears to have minor Holocene displacement, because it juxtaposes late Pleistocene alluvium (unit Qa_2) on its east wall against Mesozoic and Tertiary rocks of the west wall. Earlier, much larger movements of this fault are implied by a thick Tertiary sequence on the east wall, which is dropped down against Mesozoic volcanic rocks of the west wall. The large displacement probably was produced by normal faulting during the early Miocene (Cox and Wilshire, 1993), whereas the apparent minor dislocation of Pleistocene alluvium may represent Holocene reactivation of the old fault under the modern strike-slip regime.

REFERENCES CITED

Bortugno, E.J., compiler, 1986, Map showing recency of faulting, San Bernardino quadrangle, California, 1:250,000: California Division of Mines and Geology, regional geologic map series, map no. 3A, sheet 5.

Bortugno, E.J., and Spittler, T.E., compilers, 1986, Geologic map of the San Bernardino quadrangle, California, 1:250,000: California Division of Mines and Geology, regional geologic map series, map no. 3A, sheet 1.

Cox, B.F., and Wilshire, H.G., 1993, Geologic map of the area around the Nebo Annex, Marine Corps Logistics Base, Barstow, California: U.S. Geological Survey Open-File Report 93-568, scale 1:12,000, 36-p. explanatory text.

Dibblee, T.W., Jr., 1970, Geologic map of the Daggett quadrangle, San Bernardino County, California: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-592, scale 1:62,500.

Hart, E.W., Bryant, W.A., and Treiman, J.A., 1993, Surface faulting associated with the June 1992 Landers earthquake, California: California Geology, v. 46, no. 1, p. 10-16.

Lambert, J.R., 1987, Middle Tertiary structure and stratigraphy of the southern Mitchell Range, San Bernardino County, California: Baton Rouge, Louisiana State University, M.S. thesis, 119 p.

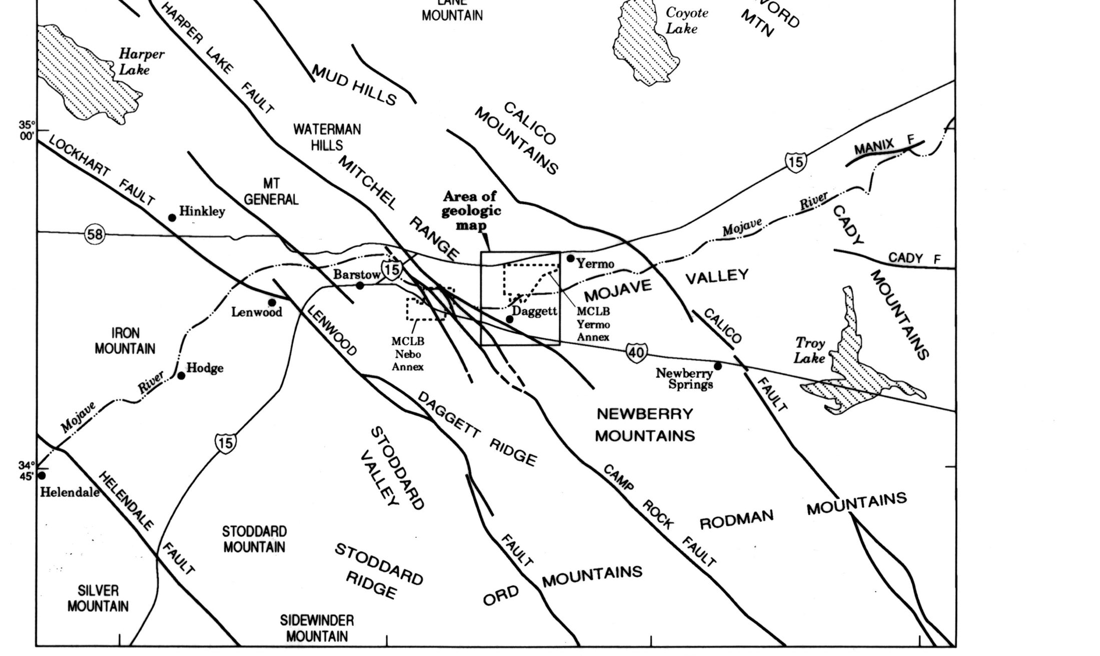
McCulloh, T.H., 1965, Geologic map of the Nebo and Yermo quadrangles, San Bernardino County, California: U.S. Geological Survey Open-File Map 65-107.

Reynolds, R.E. and Reynolds, R.L., 1985, Late Pleistocene faunas from Daggett and Yermo, San Bernardino County, California, *in* Reynolds, R.E., compiler, geologic investigations along Interstate 15, Cajon Pass to Manix Lake, California: San Bernardino County Museum, Redlands, California, p. 175-191.

——— 1991, Structural implications of late Pleistocene faunas from the Mojave River Valley, California, *in* Woodburne, M.O., Reynolds, R.E., and Whistler, D.P., eds., Inland southern California: The last 70 million years: San Bernardino County Museum Association Quarterly, v. 38, nos. 3 and 4, p. 100-105.

U.S. Geological Survey, 1987, Aeromagnetic map of the Ord Mountains area, southern California: U.S. Geological Survey Open-File Report 87-005, 9 sheets, scale 1:62,500.

Zohdy, A.A.R., and Bisdorf, R.J., 1994, A direct-current resistivity survey near the Marine Corps Logistics Bases at Nebo and Yermo, Barstow, California: U.S. Geological Survey Open-File Report 94-202, 155 p.



INDEX MAP SHOWING LOCATION OF STUDY AREA

GEOLOGIC MAP OF THE YERMO ANNEX AND VICINITY, MARINE CORPS LOGISTICS BASE, BARSTOW, CALIFORNIA

By
Brett F. Cox and Howard G. Wilshire

1994