MAP UNITS

Late Holocene (Surficial Deposits)

- af — **Artificial Fill** - deposits of fill resulting from human construction, mining, or quarrying activities; includes engineered fill for buildings, roads, dams, airport runways, harbor facilities, and waste landfills
- Qsu — **Undifferentiated Surficial Deposits** - includes colluvium, slope wash, talus deposits, and other surface deposits of all ages; generally unconsolidated but locally may contain consolidated layers
- Qls — **Landslide Deposits** - may include debris flows and older landslides of various earth material and movement types; unconsolidated to moderately well-consolidated
- Qw — **Alluvial Wash Deposits** - unconsolidated sandy and gravelly sediment deposited in recently active channels of streams and rivers; may contain loose to moderately loose sand and silty sand
- Qf — **Alluvial Fan Deposits** - unconsolidated boulders, cobbles, gravel, sand, and silt recently deposited where a river or stream issues from a confined valley or canyon; sediment typically deposited in a fan-shaped cone; gravelly sediment generally more dominant than sandy sediment
- Qa — **Alluvial Valley Deposits** - unconsolidated clay, silt, sand, and gravel recently deposited parallel to localized stream valleys and/or spread more regionally onto alluvial flats of larger river valleys; sandy sediment generally more dominant than gravelly sediment
- Ql — **Lacustrine, Playa, and Estuarine (Paralic) Deposits** - mostly unconsolidated fine-grained sand, silt, mud, and clay from fresh water (lacustrine) lakes, saline (playa) dry lakes that are periodically flooded, and estuaries; deposits may contain salt and other evaporites
- Qe — **Eolian and Dune Deposits** - unconsolidated, generally well-sorted wind-blown sand; may occur as dune forms or sheet sand

Holocene to Late Pleistocene (Surficial Deposits)

- Qyf — **Young Alluvial Fan Deposits** - unconsolidated to slightly consolidated, undissected to slightly dissected boulder, cobble, gravel, sand, and silt deposits issued from a confined valley or canyon
- Qya — **Young Alluvial Valley Deposits** - unconsolidated to slightly consolidated, undissected to slightly dissected clay, silt, sand, and gravel along stream valleys and alluvial flats of larger rivers
- Qyl — **Young Lacustrine, Playa, and Estuarine (Paralic) Deposits** - unconsolidated to slightly consolidated, undissected to slightly dissected fine-grained sand, silt, mud and clay from lake, playa, and estuarine deposits of various types
- Qye — **Young Eolian and Dune Deposits** - unconsolidated to slightly consolidated, undissected to slightly dissected wind-blown sands

Late to Middle Pleistocene (Surficial Deposits)

- Qof — **Old Alluvial Fan Deposits** - slightly to moderately consolidated, moderately dissected boulder, cobble, gravel, sand, and silt deposits issued from a confined valley or canyon
- Qoa — **Old Alluvial Valley Deposits** - slightly to moderately consolidated, moderately dissected clay, silt, sand, and gravel along stream valleys and alluvial flats of larger rivers
- Qol — **Old Lacustrine, Playa, and Estuarine (Paralic) Deposits** - slightly to moderately consolidated, moderately dissected fine-grained sand, silt, mud, and clay from lake, playa, and estuarine deposits of various types
- Qoe — **Old Eolian and Dune Deposits** - slightly to moderately consolidated, moderately dissected wind-blown sands

Middle to Early Pleistocene (Surficial Deposits)

- Qvof — **Very Old Alluvial Fan Deposits** - moderately to well-consolidated, highly dissected boulder, cobble, gravel, sand, and silt deposits issued from a confined valley or canyon
- Qvoa — **Very Old Alluvial Valley Deposits** - moderately to well-consolidated, highly dissected clay, silt, sand, and gravel along stream valleys and alluvial flats of larger rivers; generally uplifted and deformed
- Qvoe — **Very Old Eolian and Dune Deposits** - moderately to well-consolidated, highly dissected wind-blown sands

Tertiary (Bedrock)

- Tss — **Coarse-grained Tertiary age formations** - primarily sandstone and conglomerate
- Tv — **Tertiary age formations of volcanic origin**

Mesozoic and Older (Bedrock)

- pKm — **Cretaceous and pre-Cretaceous metamorphic formations of sedimentary and volcanic origin**
- gr — **Granitic and other intrusive crystalline rocks of all ages**

SYMBOL EXPLANATION

[For geologic line symbols: lines are solid where location is accurate, long-dashed where location is approximate, short-dashed where location is inferred, dotted where location is concealed. Queries added where identity or existence may be questionable.]

Contacts

- Contact
- Reference contact -- Used to delineate geologic units that were mapped as separate units on the original source map, but are consolidated on this map.
- Gradational contact
- Reference gradational contact

Fault -- Includes strike-slip, normal, reverse, oblique, and unspecified slip

Lineament

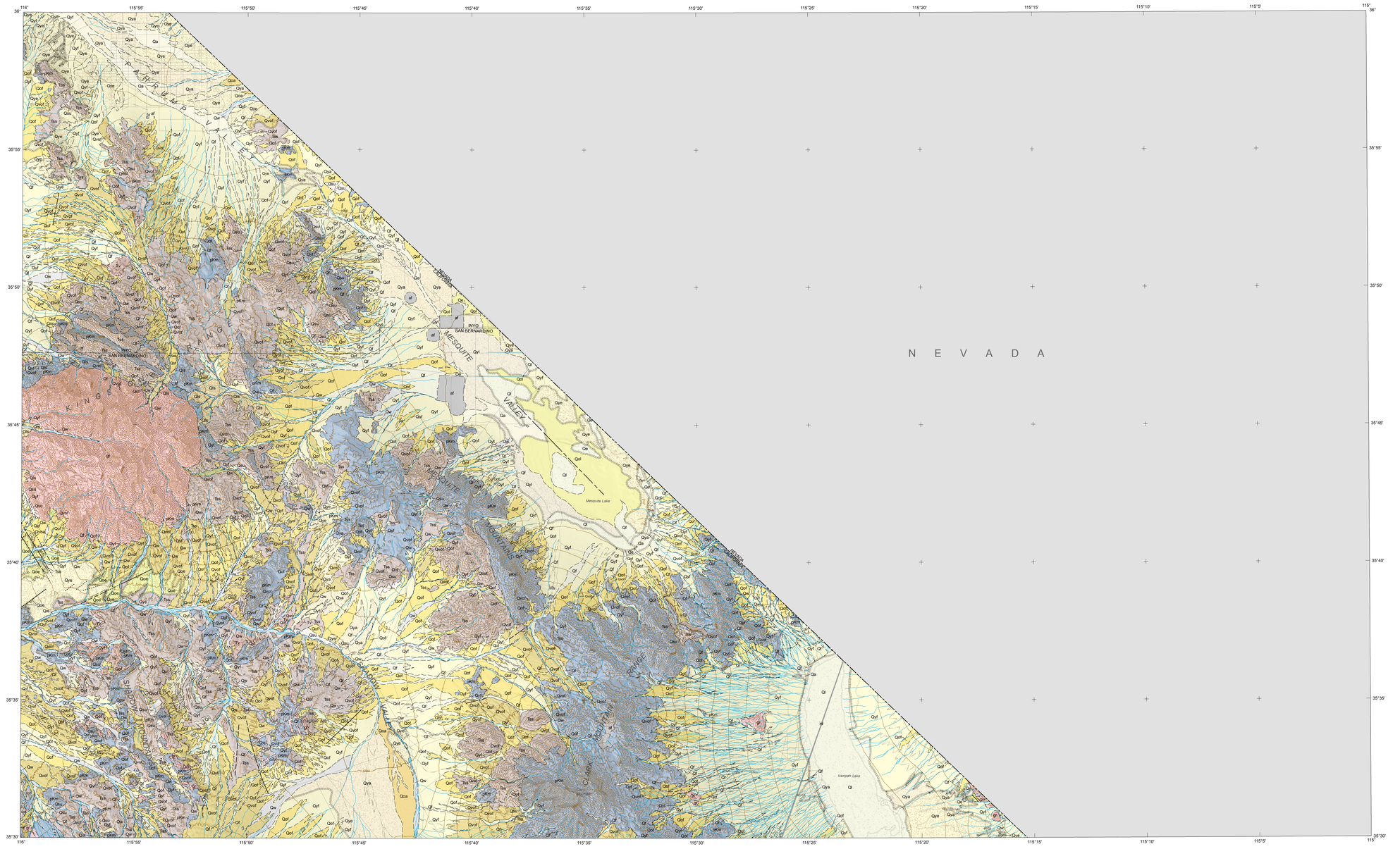
Stream

Spring

Road

County boundary

State boundary



GEOLOGIC COMPILATION OF QUATERNARY SURFICIAL DEPOSITS IN SOUTHERN CALIFORNIA
CALIFORNIA PORTION OF THE MESQUITE LAKE 30' X 60' QUADRANGLE

A Project for the Department of Water Resources by the California Geological Survey

Compiled from existing sources by
Trinda L. Bedrossian, CEG

Digital preparation by
Solomon McCrea and Barbara Wanish

July 2010

CORRELATION OF MAP UNITS*

		Artificial Fill	Undiff. Surficial Deposits	Landslide Deposits	Alluvial Deposits: Alluvial Wash Deposits	Alluvial Deposits: Alluvial Fan Deposits	Alluvial Deposits: Alluvial Valley Deposits	Lacustrine, Playa, and Estuarine Deposits	Eolian and Dune Deposits
Quaternary Surficial Deposits	Late Holocene	af	Qsu	Qls	Qw	Qf	Qa	Ql	Qe
	Holocene to Late Pleistocene					Qyf	Qya	Qyl	Qye
	Late to Middle Pleistocene					Qof	Qoa	Qol	Qoe
	Middle to Early Pleistocene					Qvof	Qvoa		Qvoe

		Coarse-grained	Volcanic	Cretaceous and Pre-Cretaceous Metamorphic (sedimentary and volcanic)	Granitic Rocks (all ages)
	Tertiary (Bedrock)	Tss	Tv		
	Mesozoic and Older (Bedrock)			pKm	gr

* Boundaries of Quaternary units are gradational and time transgressive in a regional sense.

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MAP EXPLANATION

This map of Quaternary surficial deposits in the California portion of the Mesquite Lake 30' x 60' quadrangle was compiled by the California Geological Survey (CGS) for the Department of Water Resources (DWR) to assist in identifying where flooding and deposition of sediment occurred in the geologically recent past. The focus of this project is on Quaternary (Q) surficial deposits (less than 1.8 million years) on alluvial fans, floodplains, and in basins where such deposits are subject to a number of geologic hazards including flooding, amplification of seismic shaking, liquefaction, and collapsible soils. In general, areas of most recent deposition during Late Holocene time (within the last 500 years) have a greater potential to be areas of future flooding and deposition than those underlain by older surficial deposits.

Project Overview

The California portion of the Mesquite Lake 30' x 60' quadrangle represents one of several 100,000 scale quadrangles included in the detailed Geographic Information System (GIS) based geologic data set compiled by CGS from recent high resolution geologic mapping available for southern California. The GIS database merges more than 2100 geologic units from source maps published primarily by the U.S. Geological Survey (USGS) and by CGS (Source GIS Database) into a common format that depicts 40 derivative categories of surficial deposits and bedrock for the entire area (Derivative GIS Database). Quaternary surficial deposits are divided into 28 categories modified from the methodology of Matti and Cossette (2007), the Southern California Areal Mapping Project (SCAMP, 2000), and the USGS and California Division of Mines and Geology (2000). While specific variations in age and physical properties exist within units on each source map, CGS retained the basic premise of Matti and Cossette (2007) that surficial deposits within each of the Quaternary derivative map units formed during a particular range of geologic time, have a similar origin, and have generally similar physical properties. Within the 28 derivative units, progressively older surficial deposits are typically better consolidated and more highly dissected by erosion, have more developed and/or eroded soil profiles with stronger degrees of weathering and surface armoring, and occupy a higher topographic position within alluvial fan and floodplain terrains. Geologic bedrock formations from the source geologic maps are divided into 12 categories on the derivative maps, based on age and rock type. CGS rectified inconsistencies along the boundaries of mapped areas to create a seamless Derivative GIS Database, but retained links to the original mapping in the Source GIS Database so that the more detailed basic geologic information can be retrieved. Correlation of equivalent deposits across the whole southern California project area is represented in the GIS table entitled Correlation of Derivative and Source Geologic Map Units.

California Portion of the Mesquite Lake Quadrangle

The Mesquite Lake quadrangle, which lies within the northeast portion of the Mojave Desert, is bisected diagonally by the California-Nevada state line. Landscape within the California portion of the quadrangle is characteristic of the southern Basin and Range geomorphic province. It consists of north-northwest trending, high-relief mountain ranges, with elevations over 2100 meters, separated by broad alluvial piedmonts, or sloping plains (Schmidt and McMackin, 2006). Alluvial fan deposits on the piedmonts grade into fine-grained sediments on the valley floors, which are typically occupied by playas (short-lived or ephemeral dry lakes). Numerous faults, some known to be active during Quaternary time, have influenced the formation of the linear mountains and alluvial basins within the California portion of the quadrangle. The primary Quaternary faults in the mapped area are within in the Pahrump and Mesquite valleys near the California-Nevada state border, and in the vicinity of the Kingston Range along the western boundary of the quadrangle (Schmidt and McMackin, 2006). Factors such as faulting, topography, variability in composition of the source rocks, and rates of weathering influence the nature of surficial deposits and basin sedimentation in the area. The majority of Quaternary surficial deposits consist of young alluvial fan deposits and axial valley deposits intermixed with varying amounts of eolian sediment. Alluvial fans form where sediment exits higher gradient channels along the mountain fronts, such as the Clark Mountains and northern Kingston Range, and along linear valleys such as those along the east side of the Kingston Range. Axial valley deposits generally occupy topographically lower valley areas, such as in Shadow Valley in the southern portion of the map area. Active alluvial and wash deposits consist largely of gravelly to sandy bars or terraces surrounding active alluvial channels and are typically inset along the margins of younger alluvium (Schmidt and McMackin, 2006). Eolian deposits are present on the eastern and southeastern edges of valley-axis and playa deposits throughout the area, including Pahrump and Mesquite valleys. Wet playa deposits, including gypsum-rich sand, and other groundwater discharge deposits are also present along the edge of Mesquite Lake.

In preparing this derivative map of the California portion of the Mesquite Lake 30' x 60'quadrangle, CGS used geologic source data compiled in digital format by Schmidt and McMackin (2006). CGS retained the boundaries of Quaternary age surficial deposits shown on the source map with very few revisions. Quaternary surficial deposits on the source map are represented on this map by 19 of the 28 generalized project derivative units; boundaries of more detailed source map subdivisions are shown without label within the generalized derivative unit. This indicates more detailed geologic information is available in the Source GIS Database. For example, an area designated Qyf (young alluvial fan deposits) on this map may have been further divided on the source map into several units to distinguish different depositional surfaces and compositions. Bedrock units identified by Schmidt and McMackin (2006) are represented on this map by 4 of the 12 project derivative bedrock units (see Map Units and Correlation of Map Units). Quaternary surficial deposits and geologic formation names originally compiled by Schmidt and McMackin (2006) are correlated with derivative categories used by CGS in the Geologic Labels GIS spreadsheet for the Mesquite Lake quadrangle.

This map, along with others in the Geologic Compilation of Quaternary Surficial Deposits in Southern California Derivative GIS Database, is regional in nature and should not be used as a substitute for detailed geologic studies in any specific area. It is intended only for rapid identification of areas subject to previous and potential future flooding and other geologic hazards on alluvial fans and floodplains.

MAP REFERENCES

DIGITAL GEOLOGIC DATA FILE USED IN GIS COMPILATION OF QUATERNARY UNITS

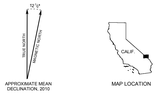
Schmidt, K.M., and McMackin, M., 2006, Preliminary surficial geologic map database of the Mesquite Lake 30' x 60' quadrangle, California and Nevada: http://pubs.er.usgs.gov/usgspubs/ofr/ofr20061035: U.S. Geological Survey, Open-File Report 2006-1035, scale 1:100,000.

REFERENCES USED IN PREPARING LEGENDS AND MAPS FOR QUATERNARY UNITS

Matti, J. C., and Cossette, P.M., 2007, Classification of surficial materials, Inland Empire Region, southern California: conceptual and operational framework: U.S. Geological Survey, Open-File Report (in progress).

Southern California Areal Mapping Project (SCAMP), 2000, A proposed classification for surficial geologic materials in southern California, version 1.0.

U.S. Geological Survey and California Division of Mines and Geology, 2000, Classification of Quaternary deposits, Southern California Areal Mapping Project (SCAMP), a working model, version 1.0: (09/10/2000).



Projection: Universal Transverse Mercator, Zone 11 North, North American Datum of 1983.

Topographic contours derived from USGS 1/3 arc-second National Elevation Dataset (NED). Shaded topographic relief derived from USGS 1 arc-second NED. Base map of hydrography from National Hydrography Dataset Plus (NHDPlus) and California Department of Fish and Game. Base map of geographic names from USGS Geographic Names Information System (GNIS).

SCALE 1:100 000

5 0 2.5 0 5 MILES
5000 0 5000 10000 15000 20000 25000 30000 35000 40000 45000 50000 FEET
5 2.5 0 5 10 KILOMETERS
5000 0 5000 10000 METERS

CONTOUR INTERVAL 50 METERS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

INDEX TO USGS 7.5' QUADRANGLES