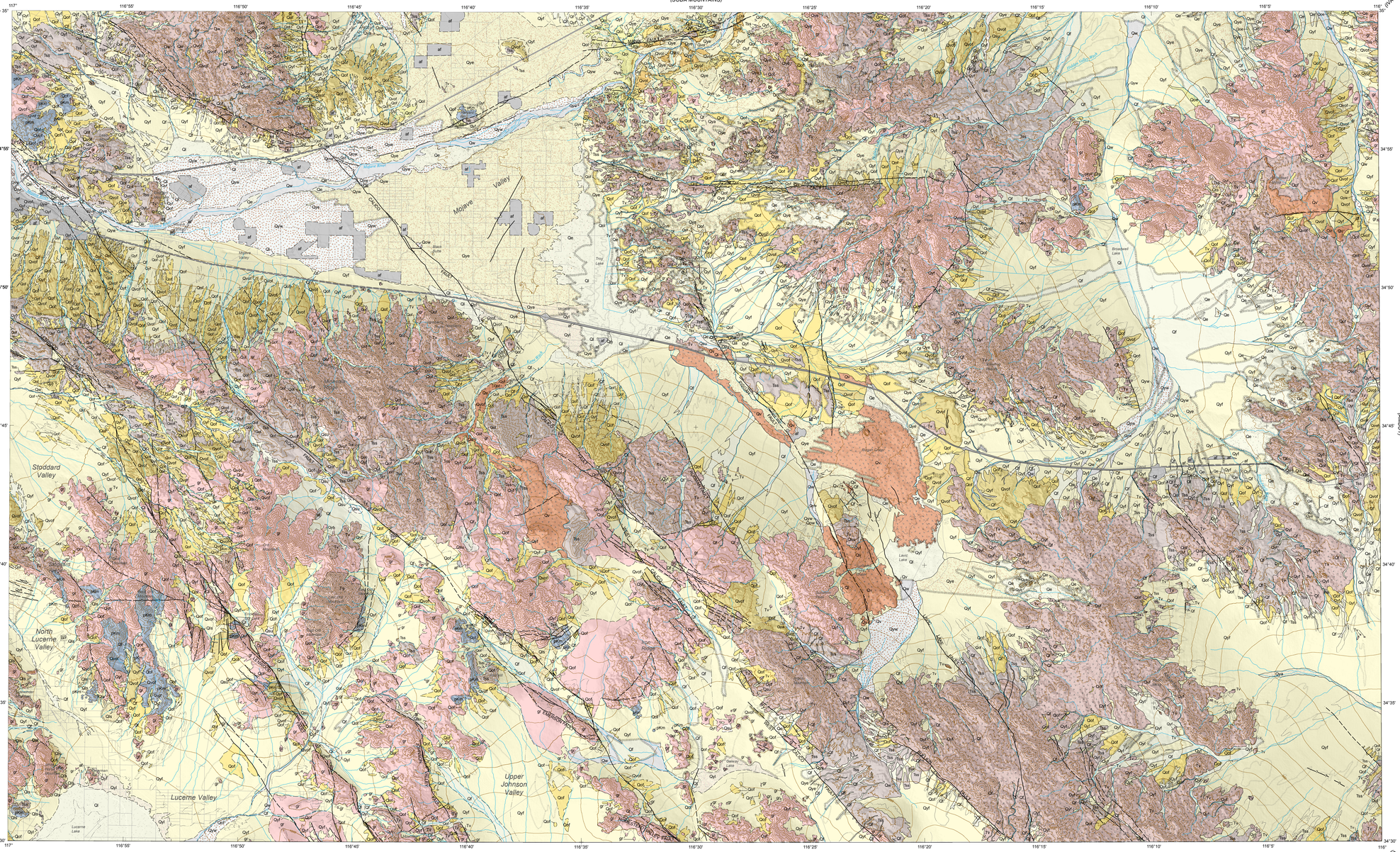


Projection: Universal Transverse Mercator, Zone 11 North, North American Datum of 1983.

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).

APPROXIMATE MEAN DECLINATION, 2011

MAP LOCATION

MAP EXPLANATION

SCALE 1:100,000

5 2.5 0 5 MILES

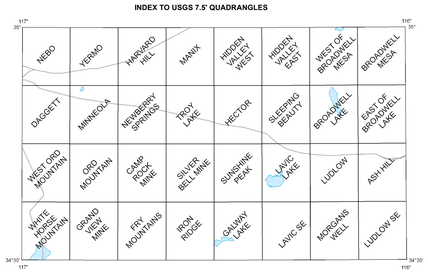
5000 0 5000 10000 15000 20000 25000 30000 35000 40000 45000 50000 FEET

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



GEOLOGIC COMPILATION OF QUATERNARY SURFICIAL DEPOSITS IN SOUTHERN CALIFORNIA
NEWBERRY SPRINGS 30' X 60' QUADRANGLE

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

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Digital preparation by

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MAP EXPLANATION

This map of Quaternary surficial deposits in the Newberry Springs 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 Newberry Springs 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 1400 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 CGS (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. The bedrock categories can be used to provide a general understanding of the relative erodibility of the upland materials and the general character of the derived sediments. 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.

Newberry Springs Quadrangle

The Newberry Springs quadrangle lies within the central eastern Mojave Desert of southern California. The area encompasses several fault-bound mountain ranges, piedmonts (sloping plains), playa (short-lived or ephemeral) lakes, cinder cones, and basaltic lava fields. The ephemeral Mojave River flows through the northwest corner of the map area (Phelps and others, 2011). Mountain ranges in the quadrangle are comprised mainly of Tertiary and older plutonic and volcanic rocks with a generally west-northwest to east-southeast orientation, parallel to most of the regional faults. Much of the landscape is characterized by piedmont alluvial plains that extend downslope from the mountains and terminate locally at the base of closed basins such as the Broadwell, Lavic, and Troy dry lakes. The central part of the quadrangle is dominated by Quaternary volcanism, including cinder cones and lava flows associated with the Pisgah Crater, the Sunshine Peak Craters, and Rodman Mountain. Elevations range approximately from 300 meters to 2000 meters (about 384 feet to 6562 feet) (Phelps and others, 2011).

Most of the Quaternary age surficial deposits in the Newberry Springs quadrangle are located in the valleys that lie between the mountain ranges. The largest of these valleys is the Mojave Valley in the northwestern corner of the quadrangle. Directly surrounding the intermittently flowing Mojave River are active wash deposits and older associated wash deposits of Holocene to late Pleistocene age. The central portion of the valley is dominated by Holocene to late Pleistocene age eolian (wind-blown) deposits, while active eolian and playa deposits are prevalent along the east and southeastern side of the valley in the vicinity of Troy Lake. Along the perimeter and in the southeastern portions of the Mojave Valley are mixed age alluvial fan and primarily Holocene to late Pleistocene age alluvial valley deposits. Small active to late Pleistocene eolian and wash deposits are also present near Lavic Lake. Other broad valleys that contain mixed age alluvial fan deposits, eolian deposits, and wash deposits are Lucerne Valley, in the southwestern corner of the quadrangle, and the valley in the northeastern corner of the quadrangle that contains Broadwell (playa) Lake. Other regional valleys that contain alluvial fan and alluvial valley deposits include Stoddard Valley, Upper Johnson Valley, and the valley east of the Bullion Mountains. Numerous Quaternary age faults are indentified on the map. Those known to be active include the Bullion, Calico, Camp Rock, Emerson, Homestead Valley, Johnson Valley, Lavic Lake, Lenwood, Manix, and West Calico faults.

In preparing this derivative map of the Newberry Springs 30' x 60' quadrangle, CGS used geologic source data compiled in digital format by Phelps and others (2011). 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 20 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 Phelps and others (2011) are represented on this map by 5 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 Phelps and others (2011) are correlated with derivative categories used by CGS in the Geologic Labels GIS spreadsheet for the Newberry Springs 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 COMILATION OF QUATERNARY UNITS

Phelps, G.A., Bedford, D.R., Lidke, D.J., Miller, D.M., and Schmidt, K.S., 2011, Preliminary Quaternary geologic map and database of the Newberry Springs 30' x 60' quadrangle, California: U.S. Geological Survey, Open-File Report 2011-1044, 103 p., 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.

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).

OTHER SELECTED PUBLICATIONS USED AS REFERENCES

Bedford, D.R., Miller, D.M., and Phelps, G.A., 2010, Surficial geologic map of the Amboy 30' x 60' quadrangle, San Bernardino County, California: U.S. Geological Survey, Scientific Investigations Map 3109, 26 p., scale 1:100,000, http://pubs.usgs.gov/sim/3109/index.html

Bortugno, E.J. and Spittler, T.E. (compilers), 1986, Geologic map of the San Bernardino quadrangle: California Division of Mines and Geology, Regional Geologic Map Series, Map No. 3A (geology), scale 1:250,000.

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)

Qyw — **Young Alluvial Wash Deposits** - unconsolidated to slightly consolidated, undissected to slightly dissected sandy and gravelly stream bed sediments in marginal parts of active and recently active washes and river channels

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)

Qow — **Old Alluvial Wash Deposits** - slightly to moderately consolidated, moderately dissected sand and gravel; typically elevated above modern washes

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

Qvol — **Very Old Lacustrine, Playa, and Estuarine (Paralic) Deposits** - moderately to well-consolidated, highly dissected fine-grained sand, silt, mud, and clay from lake, playa, and estuarine deposits of various types

Quaternary (Bedrock)

Qv — **Pleistocene age and younger formations of volcanic origin**

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.

Contact

Gradational contact

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

Folds -- Showing direction of plunge where appropriate

Anticline

Syncline

Stream

Spring

Road

County boundary

CORRELATION OF MAP UNITS*

	Artificial Fill	Undiff. Surficial Deposits	Landslide Deposits	Alluvial Wash Deposits	Alluvial Fan Deposits	Alluvial Valley Deposits	Lacustrine, Playa, and Estuarine Deposits	Eolian and Dune Deposits
				Alluvial Deposits				
Quaternary Surficial Deposits: Late Holocene	af	Qsu	Qls	Qw	Qf	Qa	Ql	Qe
Quaternary Surficial Deposits: Holocene to Late Pleistocene				Qyw	Qyf	Qya	Qyl	Qye
Quaternary Surficial Deposits: Late to Middle Pleistocene				Qow	Qof	Qoa	Qol	Qoe
Quaternary Surficial Deposits: Middle to Early Pleistocene					Qvof		Qvol	
	Coarse-grained	Volcanic						
Quaternary (Bedrock)		Qv						
Tertiary (Bedrock)	Tss	Tv						
				Cretaceous and Pre-Cretaceous Metamorphic (sedimentary and volcanic)		Granitic Rocks (all ages)		
Mesozoic and Older (Bedrock)				pKm		gr		

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

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Information on this map is not sufficient to serve as a substitute for the geologic and geotechnical site investigations required under Chapters 7.5 and 7.8 of Division 2 of the California Public Resources Code.