

Needles Valley Groundwater Basin

- Groundwater Basin Number: 7-44
- County: San Bernardino
- Surface Area: 88,300 acres (138 square miles)

Basin Boundaries and Hydrology

This basin underlies the portion of Mohave Valley that lies in eastern San Bernardino County. It is bounded by the Colorado River on the east and by nonwater-bearing rocks of the Dead Mountains on the northwest, of the Sacramento Mountains on the southwest, of the Chemehuevi and Whale Mountains on the south (Bishop 1963). The Mojave Valley, and its underlying groundwater basin, extends into Nevada and Arizona (Jennig 1961; Bishop 1963; Metzger and Loeltz 1973). The surface is drained by Piute Wash eastward to the Colorado River. Annual average precipitation ranges from about 4 to 6 inches.

Hydrogeologic Information

Water Bearing Formations

Groundwater in the basin is found in alluvium and the Bouse Formation.

Alluvium. Holocene age younger alluvium, which is found in washes and in the floodplain of the Colorado River, is composed of sand, silt, and gravel (Metzger and Loeltz 1973). Older alluvium consists of unconsolidated, fine-to coarse-grained sand, pebbles, and boulders with variable amounts of silt and clay.

Bouse Formation. The Pliocene age Bouse Formation is composed of a basal limestone bed overlain by interbedded clay, silt, and sand. Thickness of the formation reaches 254 feet (Metzger and Loeltz 1973). The formation is underlain by locally derived fanglomerate and overlain by alluviums of the Colorado River and its tributaries.

Restrictive Structures

An unnamed fault is found on the southern side of the basin (Bishop 1963); however, it is not known whether or not this fault impedes groundwater flow.

Recharge Areas

Recharge of the basin is chiefly from percolation of Colorado River, with deep percolation of irrigation water and precipitation, and subsurface inflow as minor additional sources (Metzger and Loeltz 1973).

Groundwater Level Trends

Groundwater levels generally fluctuate within an annual range of two feet except near pumping wells, irrigated land, and the river (Metzger and Loeltz 1973). Water levels are generally between 9 and 12 feet below the land surface (Metzger and Loeltz 1973). Under natural conditions, groundwater flows eastward through the basin toward the Colorado River; however, pumping can reverse this flow pattern.

Groundwater Storage

Groundwater Storage Capacity. The total storage capacity is estimated at 1,100,000 (DWR 1975).

Groundwater in Storage. Unknown.

Groundwater Budget (Type A)

Natural recharge is estimated at about 1,000 af/yr (DWR 1975). About 150,000 af/yr of water infiltrates the Mohave Valley directly from the Colorado River, which mainly supports consumptive use by phreatophytes (Metzger and Loeltz 1973). Groundwater discharge into the valley averaged about 170,000 af/yr (Metzger and Loeltz 1973). Recharge from excess irrigation water is about 5,000 to 10,000 af/yr (Metzger and Loeltz 1973). Total pumpage of groundwater in 1962 was less than 12,000 af, (Metzger and Loeltz 1973). The consumptive use by native vegetation is estimated at about 8,800 af/yr (Metzger and Loeltz 1973).

Groundwater Quality

Characterization. Groundwater in this basin is sodium chloride or sodium-calcium sulfate in character (Metzger and Loeltz 1973). TDS content is higher near the Colorado River and averages 1,222 mg/L in floodplain deposits; whereas, TDS content averages 917 mg/L in older alluvial deposits more than one-half mile from the river (Metzger and Loeltz 1973). Three public supply wells sampled in the basin show an average TDS content of approximately 856 mg/L with a range from 797 to 950 mg/L.

Impairments. Sulfate, chloride, fluoride, and TDS content levels are high in the basin (DWR 1975).

Water Quality in Public Supply Wells

Constituent Group¹	Number of wells sampled²	Number of wells with a concentration above an MCL³
Inorganics – Primary	4	0
Radiological	3	0
Nitrates	5	0
Pesticides	4	0
VOCs and SVOCs	4	0
Inorganics – Secondary	4	3

¹ A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).

² Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.

³ Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

Well Characteristics

Well yields (gal/min)		
Municipal/Irrigation	Range: to 1,500 gal/min	Average: 980 gal/min (DWR 1975)
Total depths (ft)		
Domestic	Range	Average:
Municipal/Irrigation	Range	Average:

Active Monitoring Data

Agency	Parameter	Number of wells / measurement frequency
USGS	Groundwater levels	34
Department of Health Services and cooperators	Miscellaneous water quality	11
	Title 22 water quality	

Basin Management

Groundwater management:

Water agencies

Public

Private

References Cited

- Bishop, C. C. 1963. *Geologic Map of California, Needles Sheet*. California Division of Mines and Geology. Single Map Sheet, Scale 1:250,000.
- California Department of Water Resources (DWR). 1954. *Ground Water Occurrence and Quality, Colorado River Basin Region*. Water Quality Investigations Report No. 4.
- _____. 1975. *California's Ground Water*. Bulletin 118. 135 p.
- Jennings, C. W. 1961. *Geologic Map of California, Kingman Sheet*. California Division of Mines. Single Map Sheet, Scale 1:250,000.
- Metzger, D. G., and Loeltz, O. J. 1973. *Geohydrology of the Needles Area, Arizona, California, and Nevada*. U. S. Geological Professional Paper 486-J.

Additional References

- Kunkel, F. 1969. Test-Well and Soil Data Fort Mojave Indian Reservation Area, California. U. S. Geological Survey Basic Data Compilation.
- _____. 1970. *The Deposits of the Colorado River on the Fort Mojave Indian Reservation in California 1850-1969*. U. S. Geological Survey Open File Report.
- Metzger, D. G., and Loeltz, O. J. 1971. *Water Resources of Lower Colorado River – Salton Sea Area as of 1971, Summary Report*. U. S. Geological Professional Paper 486-A.

Errata

Changes made to the basin description will be noted here.