Ivanpah Valley Groundwater Basin

- Groundwater Basin Number: 6-30
- County: San Bernardino
- Surface Area: 199,000 acres (311 square miles)

Basin Boundaries and Hydrology

The Ivanpah Valley Groundwater Basin underlies a north-trending valley located along the California-Nevada border in northeast San Bernardino County. Elevation of the valley floor ranges from 2,595 feet at Ivanpah (dry) Lake to about 4,000 feet above mean sea level at the southern end of the valley. The basin is bounded by nonwater-bearing rocks of the Clark Mountains on the northwest, the Ivanpah Range on the west, and by the New York Mountains on the southeast. Although the physical groundwater basin extends into Nevada, the California-Nevada state line is the northeast boundary of the basin for this report. Elevation in the bordering mountains range from 7,903 feet at Clark Mountain to about 7,500 feet in the New York Mountains (Waring 1920; DWR 1964).

Average annual precipitation ranges from about 4 to 10 inches. Surface runoff from the bordering mountains drains towards Ivanpah Lake (Jennings 1961).

Hydrogeologic Information

Water Bearing Formations

Quaternary alluvium, which forms the primary water-bearing unit within the basin, includes unconsolidated younger alluvial fan material underlain by semi-consolidated, older alluvium. Maximum thickness of the alluvium is at least 825 feet (DWR 1964).

Restrictive Structures

Several northwest-trending faults may impede the movement of groundwater. Among these are the State Line, Ivanpah, and Clark Mountain faults (Jennings 1961; DWR 1964).

Recharge and Discharge Areas

The principal source of recharge to the basin is the percolation of runoff through alluvial deposits found in Wheaton Wash and at the base of the bordering mountains. Additional recharge may be derived from the infiltration of precipitation that falls to the valley floor. Groundwater in the alluvium moves, as does surface runoff, towards Ivanpah Lake where a pressure zone exist beneath the lacustrine deposits. From Ivanpah Lake, groundwater moves northwards into the Nevada portion of the basin. Discharge from the basin is mainly through pumping and underflow to the Las Vegas Valley to the north (Waring 1920; DWR 1964).

Groundwater Level Trends

The record of groundwater levels intermittently spans 1916 through 1984. Groundwater levels declined by about 6 feet during 1923 to 1981 at one well

located in the southcentral part of the basin. Depth to water over this period ranged between 367 and 373 feet. In the central part of the basin east of Wheaton Wash, water levels declined at one location by about 8.5 feet during 1916 through 1984. Water levels fluctuated between 90 and 106 feet below the surface during this period. Along the western margins of the basin beneath Wheaton Wash, water levels rose slightly during 1917 through 1970 at one former artesian well and rose 7 feet at another well between 1955 and 1969. Depth to water at the latter location ranged from about 24 and 31 feet below the surface. Water levels remained unchanged in the north-central part of the basin from 1959 through 1970. Depth to water over this period remained at about 85 feet below the surface.

Groundwater Storage

Groundwater Storage Capacity. The total storage capacity of the basin within California is estimated to be about 3,090,000 af (DWR 1975).

Groundwater in Storage. Unknown.

Groundwater Budget (C)

Groundwater budget information is not available.

Groundwater Quality

Characterization. The character of the groundwater varies widely within the basin; however, sodium and calcium are generally the predominant cations, while bicarbonate is generally the major anion. In the vicinity of Ivanpah Lake, the character of the groundwater is sodium chloride.

Impairments. The groundwater in the basin is rated marginal to inferior for both domestic and irrigational use because of elevated fluoride and sodium contents. Fluoride, which was detected at concentrations at or above 0.9 mg/L in 18 of 33 wells, ranges from 0.2 to 3.0 mg/L, with an average concentration of about 1.0 mg/L. Wells and springs in the vicinity of Wheaton Wash and in the central part of the basin are most impaired by fluoride; wells and springs in the southwest part of the basin and along the margin of the New York Mountains generally have water of low fluoride content, which is suitable for domestic consumption. Elevated concentrations of sodium preclude the use of groundwater for irrigation in many parts of the basin. TDS concentrations generally range from about 300 to 500 mg/L, although near Ivanpah Lake and in the northeast part of the basin, TDS concentrations have been recorded as high as 7,702 and 27,501 mg/L (Waring 1920).

Well Production Characteristics

	Well yields (gal/min)	
Municipal/Irrigation	Range: to 600	Average: 400 (DWR 1975)
	Total depths (ft)	
Domestic		
Municipal/Irrigation		

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
	Groundwater levels	
	Miscellaneous water quality	
Department of Health Services and cooperators	Title 22 water quality	9

Basin Management

Groundwater management:

Water agencies

Public

Private

References Cited

California Department of Water Resources (DWR). 1964. *Ground Water Occurrence and Quality Lahontan Region.* Bulletin No.106-1. 439 p.

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Jennings, C. W., 1961. *Geologic Map of California: Kingman Sheet*. Olaf P. Jenkins Edition. California Department of Conservation, Division of Mines and Geology. Scale 1: 250,000.

Waring, G. A., 1920. *Ground Water in Pahrump, Mesquite, and Ivanpah Valleys Nevada and California*. Water–Supply Paper 450-C. pp. 51-85.

Errata

Substantive changes made to the basin description will be noted here.