Jacumba Valley Groundwater Basin

- Groundwater Basin Number: 7-47
- County: San Diego
- Surface Area: 6,400 acres (10 square miles)

Basin Boundaries and Hydrology

Jacumba Valley Groundwater Basin lies within the southeastern Peninsular Ranges. The basin is bounded by faults on the east and west, and by the international border with the Republic of Mexico on the south. The remainder of the basin is bounded by crystalline rocks of the Penninsular Ranges. A prominent hill adjacent to the basin is named Dubber Spur (Roff and Franzone 1994). Average annual rainfall ranges from about 14 to 16 inches. Several streams have deposited a thick section of alluvium in the central part of the valley, and several springs, including hot springs are found in the basin (Roff and Franzone 1994).

Hydrogeologic Information

Water Bearing Formations

The main water bearing deposits in the basin are alluvium and the Table Mountain Formation.

Alluvium. Holocene age alluvium consists mostly of gravel, sand, and clay. These deposits are estimated to reach 100 (Roff and Franzone 1994) or 150 feet (Swenson 1980) in thickness. Wells completed in these deposits can produce more than 1,000 gpm (Roff and Franzone 1994). Specific yields for this unconfined aquifer have been estimated to range from 5 to 10 percent (Swenson 1980) and from 15 to 25 percent (Roff and Franzone 1994).

Table Mountain Formation. The Table Mountain Formation is comprised of Tertiary age, medium- to coarse-grained sandstone and conglomerate that rests unconformably on crystalline basement. This unit lies below and is separated from the Holocene alluvium by the Jacumba volcanics, creating a semi-confined to confined aquifer (Swenson 1980). The Table Mountain Formation may reach 600 feet thick and has specific yields ranging from 5 to 10 percent (Swenson 1980).

Groundwater Level Trends

Groundwater levels in the basin remained stable into the 1990s with some fluctuations caused by seasonal or climatic factors (Roff and Franzone 1994).

Groundwater Storage

Groundwater Storage Capacity. Total groundwater storage capacity is unknown.

Groundwater in Storage. Groundwater in storage in the alluvial aquifer was estimated to range from 9,600 to 16,000 af (Roff and Franzone 1994), or from 3,200 to 6,400 af (Swenson 1980). Groundwater stored in the Table Mountain Formation aquifer was estimated to range from 84,000 to 169,000 af (Swenson 1980).

Groundwater Budget (Type A)

Recharge from runoff in Boundary Creek was calculated by Roff and Franzone (1994) to be about 982 af/yr. Recharge from runoff in Flat Creek and Boundary Creek was calculated by Swenson (1980) at about 2,700 af/yr. Groundwater usage is approximately 810 af/yr (Roff and Franzone 1994).

Groundwater Quality

Characterization. Water type ranges from sodium chloride to sodium sulfate and calcium chloride to calcium sulfate. TDS content ranges from 296 to 6,100 mg/L and conductivity ranges from 499 to 8,030 μmhos (Roff and Franzone 1994). Water from one public supply well has a TDS concentration of 424 mg/L.

Impairments. Groundwater quality degrades in the basin northward towards Carrizo Gorge where spring water has TDS concentrations ranging from 2,000 to 6,000 mg/L. During the summer and fall, surface flow in Carrizo Gorge is dominated by this poor quality spring water. The Jacumba Valley groundwater basin is recharged from the Boundary Creek drainage and the Flat Creek drainage. Groundwater in the Boundary Creek drainage shows TDS concentrations ranging from 292 to 422 mg/L; whereas, the Flat Creek drainage has TDS concentrations that reach 1,640 mg/L (Roff and Franzone 1994).

Water Quality in Public Supply Wells

Constituent Group[1]	Number of wells sampled[2]	Number of wells with a concentration above an MCL[3]
Inorganics – Primary	1	0
Radiological	0	0
Nitrates	1	0
Pesticides	0	0
VOCs and SVOCs	0	0
Inorganics – Secondary	1	0

[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

Total depths (ft)

Domestic

Municipal/Irrigation

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
Department of Health Services and cooperators	Title 22 water quality	3

Basin Management

Groundwater management:

Water agencies

Public	Unknown
Private	Unknown

References Cited

Roff, D. F., and J. G. Franzone. 1994. Proposed Final Report, Hydrogeological Investigation, Proposed Jacumba Valley Ranch Development, Jacumba, San Diego County, California. Leighton and Associates Inc. 19 p.

Swenson, G. A. 1980. The Groundwater Hydrology of Jacumba Valley, California and Baja California. Master's Thesis. San Diego State University. 264 p.

Additional References

California Department of Public Works. 1954. Ground Water Occurrence and Quality, Colorado River Basin Region. Water Quality Investigations Report No. 4.

California Department of Water Resources. 1967. Ground Water Occurrence and Quality: San Diego Region. Bulletin No. 106-2. 106 p.

California Department of Water Resources. 1975. California's Ground Water. Bulletin No. 118. 135 p.

Mido, K. W. 1990. Water Supply for Jacumba Valley Ranch. Consultant's Report.

Mido, K. W. 1991. The Use of Water from the Top Aquifer in Jacumba Valley Ranch During Drought Years. Consultant's Report.

Weber, F. J. 1963. Geology and Mineral Resources of San Diego County, California. California Division of Mines and Geology. County Report No. 3. Map.

Errata

Changes made to the basin description will be noted here.