

Fenner Valley Groundwater Basin

- Groundwater Basin Number: 7-2
- County: San Bernardino
- Surface Area: 454,000 acres (709 square miles)

Basin Boundaries and Hydrology

This basin underlies Fenner and Clipper Valleys in eastern San Bernardino County. The basin is bounded by nonwater-bearing rocks of the Marble and Providence Mountains on the west, of the Providence and New York Mountains on the north, of the Piute and Old Woman Mountains on the east, and of the Ship and Old Woman Mountains on the south. Short segments of surface water and groundwater divides also compose parts of the northern, eastern, and southern boundaries (Bishop 1963). One short segment of the western boundary is placed in Fenner Gap formed between the Marble and Ship Mountains, separating the Bristol Valley Groundwater Basin from the Fenner Valley Groundwater Basin. In addition, the Clipper and Van Winkle Mountains are emergent consolidated rocks that lie within the Fenner Valley Groundwater Basin. Surface water drains toward Schuyler Wash, which follows the axis of the valley, and exits the valley through Fenner Gap. Average annual precipitation ranges from 7 to 10 inches.

Hydrogeologic Information

Water Bearing Formations

In this part of the Mojave Desert, both an upper and a lower alluvial aquifer have been identified. The upper aquifer consists of Quaternary age sands and gravels that reach 600 feet thick (DWR 1967; MWD 1999; 2000). The lower aquifer consists of middle to late Tertiary age alluvial deposits that contain a higher proportion of fine material and are generally less permeable than those the upper aquifer (MWD 2000). The thickness of the lower alluvial aquifer may reach 1,800 feet near the town of Danby (MWD 2000). These aquifers are separated in places by discontinuous layers of silt and clay; however, both aquifers are presumably unconfined (MWD 1999). Wells in the Fenner Valley Groundwater Basin yield as much as 200 gpm; however, wells in the Fenner Gap area of the adjacent Bristol Valley Groundwater Basin completed in the same aquifers yield 1,000 to 3,000 gallons per minute (MWD 1999).

Restrictive Structures

Late Tertiary and Quaternary faults are common throughout this basin. Because groundwater information is not extensive or available for much of this basin, it is unknown whether or not these faults are barriers to groundwater flow.

Recharge Areas

Recharge is dominantly from percolation of surface runoff through stream beds and washes.

Groundwater Level Trends

Because of limited pumping, groundwater levels in the basin have remained fairly stable (MWD 1999). Groundwater flows from the edges of the basin toward the central drainage of Schuyler Wash and southwest out of the basin beneath Fenner Gap toward Bristol and Cadiz Lakes, which are normally dry (Geoscience 2001).

Groundwater Storage

Groundwater Storage Capacity. The total storage capacity is estimated at 5,600,000 af (DWR 1975).

Groundwater in Storage. Unknown.

Groundwater Budget (Type A)

Natural recharge is estimated to be about 3,000 af/yr, and extractions in 1952 are estimated to have been about 7 af (DWR 1975). Pumping is estimated to have been about 7 to 8 af/yr during 1954 through 1981 (Friewald 1984) and is estimated to be about 8 af/yr (MWD 1999).

Groundwater Quality

Characterization. Groundwater in the basin is primarily calcium-bicarbonate type near the western mountain ranges and sodium-bicarbonate type near the center of the basin. TDS content ranges from 173 to 2,260 mg/L and averages 515 mg/L (Friewald 1984). Near Fenner Gap, TDS concentrations typically range from 300 to 350 mg/L (MWD 1999).

Impairments. Water from some wells in the basin contain high concentrations of TDS and fluoride, however, virtually all of the groundwater sampled in 1981 was suitable for domestic and livestock use. A comparison with water samples analyzed before 1981 indicates no significant change in water quality with time (Friewald 1984).

Well Characteristics

	Well yields (gal/min)	
Municipal/Irrigation	Range: to 200 gal/min	Average: 100 gal/min (DWR 1975)
	Total depths (ft)	
Domestic	Range:	Average:
Municipal/Irrigation	Range:	Average:

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	4

Basin Management

Groundwater management:

Water agencies

Public

Private

References Cited

- California Department of Water Resources (DWR). 1967. Water Wells and Springs in Bristol, Broadwell, Cadiz, Danby and Lavic Valleys and Vicinity, San Bernardino and Riverside Counties, California. Bulletin No. 91-14.
- _____. 1975. California's Ground Water. Bulletin No. 118. 135 p.
- Freiwald, D.A. 1984. Ground-Water Resources of Lanfair and Fenner Valleys and Vicinity, San Bernardino County, California. U.S. Geological Survey Water-Resources Investigations Report 83-4082. 60 p.
- Geoscience Support Services, Inc. (Geoscience). 2001. Fourth Annual Monitoring Report, January 2000-December 2000. Cadiz Valley Agricultural Development. Prepared for Cadiz, Inc.
- Metropolitan Water District of Southern California (MWD). 1999. Cadiz Groundwater Storage and Dry-Year Supply Program: Draft Environmental Impact Report, Draft Environmental Impact Statement, SCH. No 99021039. MWD Report No. 1157.
- _____. 2000. Supplement to the Cadiz Groundwater Storage and Dry-Year Supply Program: Draft Environmental Impact Report, Draft Environmental Impact Statement, SCH. No 99021039. MWD Report No. 1169.

Additional References

- California Department of Public Works. 1956. Office Report on Water Well and Groundwater Data in Pahrump, Mesquite, Ivanpah, Lanfair, Fenner, Chuckwalla and Jacumba Valleys. 58 p.
- California Department of Water Resources (DWR). 1963. Desert Areas of Southeastern California Land and Water Use Survey, 1958. Bulletin 101. 72 p.

Errata

Changes made to the basin description will be noted here.