San Joaquin Valley Groundwater Basin
Pleasant Valley Subbasin

- Groundwater Basin Number: 5-22.10
- County: Fresno, Kings
- Surface Area: 146,000 acres (227 square miles)

Basin Boundaries and Hydrology

The San Joaquin Valley is surrounded on the west by the Coast Ranges, on the south by the San Emigdio and Tehachapi Mountains, on the east by the Sierra Nevada and on the north by the Sacramento-San Joaquin Delta and Sacramento Valley. The northern portion of the San Joaquin valley drains toward the Delta by the San Joaquin River and its tributaries, the Fresno, Merced, Tuolomne, and Stanislaus Rivers. The southern portion of the valley is internally drained by the Kings, Kaweah, Tule, and Kern Rivers that flow into the Tulare drainage basin including, the beds of the former Tulare, Buena Vista, and Kern Lakes.

The Pleasant Valley subbasin lies along the west side of the San Joaquin Valley, north of the Kings-Kern County line. It straddles the Fresno-Kings County Line. The subbasin is surrounded throughout most of its perimeter by Tertiary continental and marine sediments of the Coast Ranges and west flank of the Kettleman Hills. The subbasin includes the older and younger alluvium of the San Joaquin Valley. The eastern boundary of the subbasin abuts the Westside and Tulare Lake subbasins. The southern boundary abuts the Kern County subbasin. These subbasin boundaries have been derived from both hydrologic and political criteria. Several small, ephemeral streams enter the basin from the surrounding mountains; these streams include Los Gatos, Warthan, Jacalitos, Avenal, and Zapato Chino Creeks. Average precipitation values range from 7 in. for a majority of the basin with 9 in. along the western margin

Hydrogeologic Information

The San Joaquin Valley represents the southern portion of the Great Central Valley of California. The San Joaquin Valley is a structural trough up to 200 miles long and 70 miles wide filled with up to 32,000 feet of marine and continental sediments deposited during periodic inundation by the Pacific Ocean and by erosion of the surrounding mountains, respectively. Continental deposits shed from the surrounding mountains form an alluvial wedge that thickens from the valley margins toward the axis of the structural trough. This depositional axis is below to slightly west of the series of rivers, lakes, sloughs, and marshes which mark the current and historic axis of surface drainage in the San Joaquin Valley.

Water Bearing Formations

Geologic units comprising the Pleasant Valley subbasin include Holocene alluvium, the Plio-Pleistocene Tulare Formation, and possibly the upper part of the San Joaquin Formation. Specific yield is estimated to be 8.4 percent for the subbasin from DWR, San Joaquin District internal data. Williamson, Prudic, and Swain (1989) estimated water in storage in Pleasant Valley using a specific yield of 9.9 percent. For a study in Pleasant Valley WD, Summers

Engineering, Inc. (1986) estimated the specific yield at 10.3 percent. In another study for Pleasant Valley WD, Kenneth D. Schmidt and Associates (2000) estimated the average specific yield of deposits below the water table at 10 percent.

Holocene Alluvium. The alluvium consists of highly lenticular deposits of poorly sorted clay, silt, and sand with occasional interbeds of well-sorted fine-to-medium-grained sand. The thickness is unknown, but it is doubtful that it is more than 300 feet.

Plio-Pleistocene Tulare Formation. The alluvium consists of highly lenticular deposits of poorly sorted clay, silt, and sand with occasional interbeds of well-sorted fine-to-medium-grained sand. The thickness is unknown, but it is doubtful that it is more than 300 feet.

San Joaquin Formation. The San Joaquin Formation consists of unfossiliferous silt and clay beds alternating with beds of sandstone and conglomerate and contains marine, brackish water and nonmarine fossils (Kahanovit and Manning 1954).

Recharge Areas

Groundwater recharge is primary from seepage from the various streams that cross the subbasin. The cities of Coalinga, in the northern portion of the subbasin, and Avenal, near the longitudinal midpoint, import water for municipal purposes. The state prisons near Coalinga and Avenal also use imported water. Additional recharge may occur as a consequence of this water use.

Groundwater Level Trends

Summers Engineering, Inc. (1986) calculated the rate of water level decline between the mid-1960s and early 1980s in Pleasant Valley WD as 4.8 feet per year. Schmidt (2000) estimated the annual decline for the previous four decades at approximately 4 feet per year. The slower decline was attributed to recent reductions in groundwater pumping. In the past decade water levels have generally continued their long historic decline, with hydrographs on file with DWR indicating water level changes of -5 to -25 feet. Localized areas however have shown some rebound from 1995 to 2001.

Groundwater Storage

As part of this Bulletin 118 update, the total subbasin storage capacity is estimated to be 14,100,000 af. This assumes an average thickness of 1,150 feet (base of fresh water), a specific yield of 8.4 percent, and an area of 146,000 acres. Williamson, Prudic and Swain (1989) estimated the volume of water in storage to a maximum depth of 1,000 feet and a groundwater elevation in 1961 with a specific yield of 9.9 percent to be 4,000,000 af.

Groundwater Budget (Type B)

The budget presented below is based on data collected as part of DWR's Bulletin 160 preparation. The basis for calculations include a 1990 normalized year and land and water use data, with subsequent analysis by a DWR water budget spreadsheet to estimate overall applied water demands,

agricultural groundwater pumpage, urban pumping demand and other extraction data. No data for subsurface inflow or outflow exists. Applied water recharge is estimated at 4,000 af per year, there is no known artificial recharge, and natural recharge has not been determined. Estimated extractions include urban pumping at 5,700 af per year, agricultural pumping at 90,000 af per year, and oil industry related extractions 8,830 af per year.

Groundwater Quality

Schmidt (2000) estimated the TDS of groundwater in Pleasant Valley WD ranged from 1,000 to 3,000 mg/L with an average of 1,500 mg/L. The constituents in groundwater include calcium, magnesium, sodium, bicarbonates, chlorides, sulfates, and boron. The high TDS concentrations limit the usability of groundwater in the subbasin for most uses.

Well Characteristics

	Well yields (gal/min)	
Municipal/Irrigation	Range: 35-3,300 (DWR unpublished data)	
	Total depths (ft)	
Domestic	Range: Not Determined	Average: Not Determined
Municipal/Irrigation	Range: 300-1,760	Average: 1,000 (DWR unpublished data and Pleasant Valley Water District)

Active Monitoring Data

Agency	**Parameter**	**Number of wells**	**/measurement frequency**
DWR and cooperators	Groundwater levels	151	Semi-annually
Department of Health Services and cooperators	Title 22 water quality	2	Varies

Basin Management

Groundwater management:	The County of Fresno adopted in 2000 an ordinance, which includes a permit process for groundwater transfers. Pleasant Valley Water District adopted a groundwater management plan on May 9, 2000 and is currently working on an update of the plan.
Water agencies	
Public	Pleasant Valley Water District, City of Coalinga, Devil's Den WD, Green Valley WD
Private	

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Errata

Updated groundwater management information. (1/20/06)