# San Fernando Valley Groundwater Basin

- Groundwater Basin Number: 4-12
- County: Los Angeles
- Surface Area: 145,000 acres (226 square miles)

## Basin Boundaries and Hydrology

The San Fernando Valley Groundwater Basin was adjudicated in 1979 and includes the water-bearing sediments beneath the San Fernando Valley, Tujunga Valley, Browns Canyon, and the alluvial areas surrounding the Verdugo Mountains near La Crescenta and Eagle Rock. The basin is bounded on the north and northwest by the Santa Susana Mountains, on the north and northeast by the San Gabriel Mountains, on the east by the San Rafael Hills, on the south by the Santa Monica Mountains and Chalk Hills, and on the west by the Simi Hills. The valley is drained by the Los Angeles River and its tributaries. Precipitation in the San Fernando Valley ranges from 15 to 23 inches per year and averages about 17 inches.

## Hydrogeologic Information

### *Water Bearing Formations*

The water-bearing sediments consist of the lower Pleistocene Saugus Formation, Pleistocene and Holocene age alluvium (CSWRB 1962). The ground-water in this basin is mainly unconfined with some confinement within the Saugus Formation in the western part of the basin and in the Sylmar and Eagle Rock areas (CSWRB 1962). The average specific yield for deposits within the basin varies from about 14 to 22 percent (DPW 1934). Well yield averages about 1,220 gpm with a maximum of about 3,240 gpm.

**Alluvium.** Holocene age alluvium consists primarily of coarse-grained unsorted gravel and sand deposited by coalescing alluvial fans emanating from the surrounding highlands. The amount of clay in the Holocene deposits increases from about 20 percent in the east to about 70 percent in the west. The lower clay content results in higher permeability and specific yield in the central to eastern parts of the basin (CSWRB 1962; ULARAW 1995). The maximum thickness of Holocene alluvium ranges from about 100 feet in the north to 400 feet in the east to about 800 feet on the west and a maximum of about 900 feet near Burbank. Pleistocene age alluvium consists dominantly of highly permeable, unconsolidated coarse-grained alluvial fan deposits interspersed with lower permeability paleosols (CSWRB 1962).

**Saugus Formation.** The Saugus Formation is composed of continental and shallow marine (Sunshine Ranch Member) deposits of conglomerates, sands, silts, and clays, with permeability less than that of the Pleistocene alluvium (CSWRB 1962). The Saugus Formation is 2,000 to 3,000 feet thick in the eastern and western parts of the basin and reaches a maximum thickness of 6,400 feet in the central part of the basin (CSWRB 1962).

### *Restrictive Structures*

Several structures disturb the flow of groundwater through this basin. A step in the basement resulting from movement on the Verdugo fault and/or the Eagle Rock fault causes a groundwater cascade down to the south near the mouth of Verdugo Canyon (CSWRB 1962). To the north, the Verdugo fault is a partial barrier to flow that causes a change in water levels in the Hansen Spreading Grounds (CSWRB 1962). Differences in rock type along the Raymond fault create a barrier to groundwater flow from the Eagle Rock area toward the Los Angeles River Narrows and may cause rising water conditions there (CSWRB 1962). Other unnamed faults cause changes in levels of basement and groundwater in the Sunland, Chatsworth, and San Fernando areas and at the mouths of the Little Tujunga and Big Tujunga Canyons (CSWRB 1962). The Little Tujunga syncline affects groundwater movement in the northern part of the basin and folds associated with the Northridge Hills, Mission Hills and Lopez faults also affect groundwater movement (CSWRB 1962). Subsurface dams in the Pacoima Wash near Pacoima and in Verdugo Canyon are barriers to groundwater flow (CSWRB 1962).

### *Recharge*

Recharge of the basin is from a variety of sources. Spreading of imported water and runoff occurs in the Pacoima, Tujunga, and Hansen Spreading Grounds (ULARAW 1999). Runoff contains natural streamflow from the surrounding mountains, precipitation falling on impervious areas, reclaimed wastewater, and industrial discharges (ULARAW 1999). Water flowing in surface washes infiltrates, particularly in the eastern portion of the basin.

### *Groundwater Level Trends*

Water levels in this basin have been fairly stable over about the past 20 years, since adjudication of the basin. Hydrographs show variations in water levels of 5 feet to 40 feet in the western part of the basin, a variation of about 40 feet in the southern and northern parts of the basin, and a variation of about 80 feet in the eastern part of the basin (ULARAW 1999). Hydrographs show 1998 water levels roughly equal to or higher than water levels of 1980, except near La Crescenta where the 1998 water level is about 60 feet below that of 1980 (ULARAW 1999).

Groundwater flows generally from the edges of the basin toward the middle of the basin, then beneath the Los Angeles River Narrows into the Central Subbasin of the Coastal Plain of Los Angeles Basin. In the northeastern part of the basin, groundwater moves from the La Crescenta area southward beneath the surface of Verdugo Canyon toward the Los Angeles River near Glendale, whereas the groundwater in the Tujunga area flows west following the Tujunga Wash around the Verdugo Mountains to join groundwater flowing from the west following the course of the Los Angeles River near Glendale (ULARAW 1999). Flow velocity ranges from about 5 feet per year in the western part of the basin to 1,300 feet per year beneath the Los Angeles River Narrows (ULARAW 1999).

### *Groundwater Storage*

**Groundwater Storage Capacity.** The total storage capacity of the San Fernando Valley Groundwater Basin is calculated at 3,670,000 af (ULARAW 1999) by adding values for the San Fernando, Sylmar, Verdugo and Eagle Rock Basins (SWRB 1962). The estimated change in storage for the 1997-1998 water year is an increase of about 43,600 af (ULARAW 1999).

**Groundwater in Storage.** The groundwater in storage in 1998 is calculated at 3,049,000 af with an additional 621,000 af of storage space available (ULARAW 1999).

### *Groundwater Budget (Type A)*

Though the San Fernando Valley Groundwater Basin is managed by adjudication, not enough data exist to compile a complete groundwater budget. A total of about 108,500 af of groundwater was extracted from the San Fernando Valley Groundwater Basin during the 1997-1998 water year (ULARAW 1999). In addition, subsurface outflow of about 300 af to the Raymond Groundwater Basin and 404 af to the Central Subbasin of the Los Angeles Coastal Plain Groundwater Basin is estimated (ULARAW 1999). To balance the extraction, a total of 61,119 af of native runoff water was diverted to spreading grounds for infiltration (ULARAW 1999).

### *Groundwater Quality*

**Characterization.** In the western part of basin, calcium sulfate-bicarbonate character is dominant, and in the eastern part of basin, calcium bicarbonate character dominates (ULARAW 1999). Total dissolve solids range from 326 to 615 mg/L, and electrical conductivity ranges from 540 to 996 µmhos (ULARAW 1999). Data from 125 public supply wells shows an average TDS content of 499 and a range from 176 to 1,160.

**Impairments.** A number of investigations have determined contamination of volatile organic compounds such as trichloroethylene (TCE), perchloroethylene (PCE), petroleum compounds, chloroform, nitrate, sulfate, and heavy metals (Setmire 1985; ULARAW 1999). TCE, PCE and nitrate contamination occurs in the eastern part of the basin and elevated sulfate concentration occurs in the western part of the basin (ULARAW 1999).

## 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 | 129 | 6 |
| Radiological | 122 | 13 |
| Nitrates | 129 | 44 |
| Pesticides | 134 | 3 |
| VOCs and SVOCs | 134 | 90 |
| Inorganics – Secondary | 129 | 17 |

[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 Production characteristics

| | **Well yields (gal/min)** | |
|---|---|---|
| Municipal/Irrigation | | |
| | **Total depths (ft)** | |
| Domestic | | |
| Municipal/Irrigation | Maximum: 3,240 | Average: 1,220 |

## Active Monitoring Data

| **Agency** | **Parameter** | **Number of wells /measurement frequency** |
|---|---|---|
| ULARAW | Water levels and water quality | 19/ Daily, monthly and quarterly (Kiechler 2000) |
| EPA | Water levels | 1,379/ Daily, monthly, yearly and quarterly(EPA 1998) |
| EPA | Water quality | 2,366 Daily, monthly, yearly and quarterly (EPA 1998) |
| Department of Health Services | Title 22 | 126 |

## Basin Management

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| Groundwater management: | Basin adjudicated in 1979. Managed by the Upper Los Angeles River Area Watermaster. |
| Water agencies | |
| Public | City of Burbank Water Division, City of Glendale Department of Water and Power, City of Los Angeles Department of Water and Power, City of San Fernando Water Department, and the Crescent Valley County Water District Metropolitan Water District. |
| Private | |

## References Cited

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California State Water Rights Board (SWRB). 1962. *Report of Referee: The City of Los Angeles vs. City of San Fernando et al.*

Environmental Protection Agency (EPA). 1998. San Fernando Valley - Water Quality and Water Level Data (Access), Webpage: http://www.epa.gov/region09/waste/sfund/npl/sanfernando/sh_file.htm.

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## Additional References

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Peterson, L.L. 1979. *Preliminary Evaluation of State Water Project Ground Water Storage Program, San Fernando Basin*. California Department of Water Resources, Southern District Technical Information Record. 1610-1-J-1.

Upper Los Angeles River Area Watermaster (ULARAW). 2000. *Ground Water Pumping and Spreading Plan, 1999-2004 water Years.* Los Angeles California.

## Errata

Changes made to the basin description will be noted here.