Sunol Valley Groundwater Basin

- Groundwater Basin Number: 2-11
- County: Alameda
- Surface Area: 16,623 acres (30 square miles)

Basin Boundaries and Hydrology

The Sunol Valley Groundwater Basin occupies a structural trough in the central Coast Ranges east of the San Francisco Bay and is surrounded by hills of the Diablo Range. Streams in the drainage area include Alameda, La Costa, Sinbad, Indian, Vallecitos, San Antonio Creeks, and Arroyo de la Laguna. The general direction of groundwater movement appears to be from the upland areas toward Alameda Creek and then westward toward the outlet of the Basin. Sunol Valley Groundwater Basin is cut by several faults including the Calaveras, Verona, Las Positas and Williams (Dibblee and Minch 2005). Mean annual precipitation in the basin ranges from 17 to 20 inches.

Hydrogeologic Information

Information was not available for the following subsections:

Groundwater Storage
Groundwater Budget (Type C)

Water-Bearing Formations

Water-bearing formations make up the floor of the Sunol Valley, as well as the lower portions of the La Costa and Vallecitos Valleys. Under most conditions, these formations yield adequate to large quantities of groundwater to wells. The water-bearing formations consist of deposits ranging in age from Late Pliocene to Recent. These deposits were laid down under continental conditions in alluvial fans, outwash plains, and lakes. They include Plio-Pleistocene sediments of the Livermore Formation and more recent Quaternary alluvium.

Quaternary Alluvium. Deposits of Pleistocene to Recent age are grouped together as Quaternary Alluvium. The Quaternary Alluvium consists of stream and lake deposited sediments including various mixtures of gravel, sand, silt, and clay. It is largely unconsolidated and overlies the Livermore Formation in the valleys (DWR 1966). Terrace deposits occur along the San Antonio and Alameda Creeks. They overlie semi-consolidated deposits of the Livermore Formation and consolidated marine sediments. The deposits are comprised of poorly bedded boulders, cobbles, pebbles, sand, and silt (DWR 1974).

Plio-Pleistocene Livermore Formation. The Livermore Formation is Plio-Pleistocene in age and is prominently exposed over broad regions of the Sunol Valley. It also lies beneath both La Costa and Vallecitos Valleys at relatively shallow depths. This formation is up to 4,000 feet thick and consists of unconsolidated to semi-consolidated beds of gravel, sand, silt, and clay. Limey concretions are fairly common in its lower portion, and tuffaceous beds are present at its base. The source of the coarse-grained

Livermore Formation is probably the Jurassic and Cretaceous rocks to the south (DWR 1966).

Restrictive Structures

Within the Sunol Valley Groundwater Basin, faults are the major structural features known to have marked effect on the movement of groundwater. Faults in this region tend to act as barriers to the lateral movement of groundwater. The resulting groundwater levels stand higher on the up-gradient side (DWR 1974).

Recharge Areas

Recharge in the Sunol Basin occurs by infiltration of surface water along Arroyo de la Laguna and Alameda, San Antonio Creek, and Vallecitos Creeks (DWR 1974).

Groundwater Level Trends

The Alameda Watershed Management Plan (1999) reviewed data from nearly 18 monitoring wells in the Sunol Valley. The data indicated that shallow groundwater typically occurs 20 to 30 feet below the ground surface and that groundwater flow is parallel to Alameda Creek.

Groundwater Quality

Characterization. The quality of water produced from this basin ranges from poor to excellent, with most water in the good to excellent range. Averages of significant mineral constituents range as follows: total dissolved solids, 200 to 800 milligrams per liter (mg/l); total hardness, 100 to 350 mg/l; and boron, 0.03 to 0.5 mg/l. The quality of groundwater in the Sunol Valley is generally suitable for irrigation. High nitrate levels in some shallow wells indicate possible degradation from surface sources (DWR 1974).

Well Characteristics

	Well yields (gal/min)	
Municipal/Irrigation	Range: 2 – 50	Average: 23 (based on 22 well completion reports [WCRs])
	Total depths (ft)	
Domestic	Range: 20 – 835	Average: 265 (based on 57 WCRs)
Municipal/Irrigation	Range: 210 – 600	Average: 335 (based on 10 WCRs)

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
DWR	Groundwater levels	None
DWR	Miscellaneous water quality	None
Department of Health Services and cooperators	Title 22 water quality	2 wells/annually

Basin Management

Groundwater management:	No known water management agency
Water agencies	
Public	California Water Service Company, Pleasanton Township County Water District, San Francisco Water Department, Valley Community Services District, East Bay Municipal Utility District, and Zone 7 of the Alameda County Flood Control and Water Conservation District
Private	Unknown

References Cited

California Department of Water Resources (DWR). 1966. Bulletin No. 118-2, Evaluation of Groundwater Resources: Livermore and Sunol Valleys, Appendix A: Geology.

California Department of Water Resources (DWR). 1974. Bulletin No. 118-2, Evaluation of Groundwater Resources: Livermore and Sunol Valleys.

Dibblee TW and Minch JA. 2005. Geologic Map of the La Costa Valley quadrangle, Alameda County, California, Dibblee Foundation Map DF-152, scale 1:24,000

San Francisco Planning Department. 1999. Alameda Watershed Management Plan, Draft Environmental Impact Report.

Errata

Changes made to the basin description will be noted here.