

## Burns Valley Basin

- Groundwater Basin Number: 5-17
- County: Lake
- Surface Area: 2,900 acres (4 square miles)

### Basin Boundaries and Hydrology

Burns Valley Basin is located along the southeastern edge of Clear Lake and consists of low-lying alluvial plains and upland terrace deposits. The basin is bounded by basalt flows to the northwest and the Plio-Pleistocene Cache Formation on all other sides with the exception of Olivine basalt to the southeast. The west side of the basin opens to Clear Lake. The Cache Formation underlies the majority of the basin. Assuming that there is hydraulic continuity between the alluvium and the Cache Formation, groundwater is in hydraulic continuity in all directions beyond the alluvial plain with the exception being to the northwest. The Jurassic-Cretaceous Franciscan Formation and volcanics constitute the basement rock (USBR 1976). Almost all of the groundwater of Burns Valley is derived from rain that falls within a 12.5 square mile drainage area (Upson 1955). Annual precipitation in the basin is approximately 27 inches.

### Hydrogeologic Information

#### *Water-Bearing Formations*

Quaternary alluvium and upland terrace deposits and the Plio-Pleistocene Cache Formation are the primary water-bearing deposits in the valley.

**Quaternary Alluvium.** Lowlands in the valley are composed of stream channel gravel and adjacent floodplain deposits of several unnamed creeks. The Quaternary alluvium of the lowland deposits is composed of silt, sand, and gravel. Its maximum thickness at the lower end of the valley is approximately 50 feet (USBR 1976). Groundwater is essentially unconfined and yields water for domestic use (DWR 1976).

**Quaternary Terrace Deposits.** On either side of the alluvial plain are remnants of a least two levels of terrace deposits (Upson 1955). The deposits are approximately 15 feet above the valley floor and slope up the valley and merge with the Cache terrain. The deposits consist almost entirely of clastic debris from the Cache formation (DOM 1953).

**Plio-Pleistocene Cache Formation.** Plio-Pleistocene Cache formation deposits underlie all alluvial and terrace deposits. The formation is largely made up of lake deposits with the potential for included stream deposits (DWR 1957). The formation consists of fine sands, silts, and thin interbeds of marl and limestone to a thickness of 200 feet. Near the top of the formation, water-laid tuffs and tuffaceous sands become dominant with intercalated clay, marl, limestone, and diatomite (DOM 1953). The formation has low permeability and yields water to wells at rates up to a few hundred gallons per minute (Upson 1955).

### **Groundwater Level Trends**

Analysis incomplete.

### **Groundwater Storage**

**Groundwater Storage Capacity.** Storage capacity is estimated to be 4,000 acre-feet based on an area of 1,000 acres, a saturated thickness of 50 feet, and a specific yield of 8 percent (Upson 1955). DWR (1960) estimates the useable storage capacity to be 1,400 acre-feet.

### **Groundwater Budget (Type B)**

Estimates of groundwater extraction for the Burns Valley Basin are based on a survey conducted by the California Department of Water Resources in 1995. The survey included land use and sources of water. Estimates of groundwater extraction for agricultural use is 900 acre-feet. Deep percolation from applied water is estimated to be 210 acre-feet.

### **Groundwater Quality**

**Characterization.** Groundwater in the basin consists of magnesium-calcium type waters. Total dissolved solids concentrations range from 280- to 455-mg/L, averaging 335 mg/L (DWR unpublished data).

**Impairments.** Groundwater in the basin has high sodium and iron concentrations. Locally high manganese, magnesium, calcium, and phosphorus also occurs. High boron concentrations may be an issue for agricultural applications.

### **Well Characteristics**

Well yields (gal/min)		
Municipal/Irrigation	30 (1 Well Completion Report)	
Total depths (ft)		
Domestic	Range: 30 – 335	Average: 108 (65 Well Completion Reports)
Municipal/Irrigation	Range: 68 – 175	Average: 134 (3 Well Completion Reports)

### **Active Monitoring Data**

<b>Agency</b>	<b>Parameter</b>	<b>Number of wells /measurement frequency</b>
Lake County	Groundwater levels	1 well measured semi-annually
DWR	Miscellaneous water quality	5 wells biennially
Department of Health Services and cooperators	Title 22 water quality	0

## Basin Management

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Groundwater management:	County of Lake
Water agencies	
Public	None
Private	Highland Mutual Water Company

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## Errata

Changes made to the basin description will be noted here.