

## Clear Lake Cache Formation Groundwater Basin

- Groundwater Basin Number: 5-66
- County: Lake
- Surface Area: 30,000 acres (47 square miles)

### Basin Boundaries and Hydrology

The Clear Lake Cache Formation Groundwater Basin is located east of Clear Lake and shares a basin boundary with the Burns Valley Groundwater Basin to the southwest. The basin is bounded to the south by lower Cretaceous marine and Knoxville Formation deposits and Mesozoic ultra-basic intrusive rocks. The basin is bounded on the east by lower Cretaceous marine deposits and to the north and west by rocks of the Franciscan Formation. The basin is drained by the North Fork Cache Creek and by Cache Creek. Faulting is observed along portions of the western and southern boundaries. Precipitation ranges from 25- to 29-inches.

### Hydrogeologic Information

#### *Water-Bearing Formations*

The primary water-bearing formation is the Cache Formation. The Cache Formation is largely made up of lake deposits. The formation consists of tuffaceous and diatomaceous sands and silts, limestone, gravel, and intercalated volcanic rocks. In some areas the general lithology includes up to 400 feet of blue clay and shale with alternating strata of shale and limestone below 400-feet (DWR 1957). The permeability of the formation is generally low.

Hydrogeologic information for the following was not available:

#### ***Groundwater Level Trends***

#### ***Groundwater Storage***

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

Estimates of groundwater extraction are based on a survey conducted by the California Department of Water Resources in 1995. The survey included land use and sources of water. The estimate of groundwater extraction for municipal/industrial use is 55 acre-feet. Deep percolation from applied water is estimated to be 61 acre-feet.

#### ***Groundwater Quality***

#### **Water Quality in Public Supply Wells**

Constituent Group <sup>1</sup>	Number of wells sampled <sup>2</sup>	Number of wells with a concentration above an MCL <sup>3</sup>
Inorganics – Primary	3	0
Radiological	2	0
Nitrates	2	0
Pesticides	2	0

VOCs and SVOCs	2	0
Inorganics – Secondary	3	3

<sup>1</sup> 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).

<sup>2</sup> Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.

<sup>3</sup> 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 Characteristics

Well yields (gal/min)		
Municipal/Irrigation	Range: 11 – 245	Average: 52 (12 Well Completion Reports)
Total depths (ft)		
Domestic	Range: 23 – 450	Average: 103 (113 Well Completion Reports)
Municipal/Irrigation	Range: 58 – 380	Average: 162 (23 Well Completion Reports)

### Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
	Groundwater levels	NKD
Department of Health Services and cooperators	Title 22 water quality	4
NKD – No known data.		

### Basin Management

Groundwater management:	Lake County adopted a groundwater management ordinance in 1999.
Water agencies	
Public	County of Lake
Private	

### Selected References

California Department of Water Resources (DWR). July 1957. Lake County Investigation. California Department of Water Resources. Bulletin 14.

California Department of Water Resources (DWR). 1960. Northeastern Counties Investigation. California Department of Water Resources. Bulletin 58.

Hearn BC, Donnelly JM, Goff FE. 1975. Geology and Geochronology of the Clear Lake Volcanics, California. USGS. 75-296.

- Hearn BC, Jr., McLaughlin RJ, Donnelly-Nolan JM. 1988. Tectonic Framework of the Clear Lake Basin, California. Geological Society of America.
- Jennings CW, Strand RG. 1960. Geologic Map of California [Ukiah Sheet] Scale 1:250,000, California Division of Mines.
- Koenig J B. 1963. Geologic Map of California [Santa Rosa Sheet] Scale 1:250,000, California Division of Mines and Geology.
- Ott Water Engineers, Inc. 1987. Lake County Resource Management Plan Update. Lake County Flood Control and Water Conservation District.
- McLaughlin RJ, Ohlin HN, Blome CD. 1983. Tectonostratigraphic Framework of the Franciscan Assemblage and Lower Part of the Great Valley Sequence in the Geysers-Clear Lake Region, California. American Geophysical Union, Eos, Transactions.
- Rymer MJ. 1978. Stratigraphy of the Cache Formation (Pliocene-Pleistocene) in Clear Lake basin, Lake County, California. USGS.
- Rymer MJ. 1981. Stratigraphic Revision of the Cache Formation (Pliocene and Pleistocene), Lake County, California. USGS.
- Rymer MJ. 1983. Late Cenozoic Stratigraphic Setting of the Clear Lake Area, Lake County, California. Geological Society of America.
- Rymer MJ, Roth B, Bradbury JP, Forester RM. 1988. Depositional Environments of the Cache, Lower Lake, and Kelseyville Formations, Lake County, California. Geological Society of America.
- Sims JD. 1988. Late Quaternary Climate, Tectonism, and Sedimentation in Clear Lake, Northern California Coast Ranges. Geological Society of America.

## Bibliography

- California Department of Water Resources. 1975. California's Ground Water. California Department of Water Resources. Bulletin 118.
- California Department of Water Resources. 1980. Ground Water Basins in California. California Department of Water Resources. Bulletin 118-80.
- California Department of Water Resources. 1998. California Water Plan Update. California Department of Water Resources. Bulletin 160-98, Volumes 1 and 2.
- McNitt JR. 1968. Geology of the Kelseyville Quadrangle, Sonoma, Lake and Mendocino Counties. California Divisions of Mines and Geology. Map Sheet 9.
- McNitt JR. 1968. Geology of the Lakeport Quadrangle, Lake County, California. California Division of Mines and Geology. Map Sheet 10.
- Planert M, Williams JS. 1995. Ground Water Atlas of the United States, Segment 1, California, Nevada. USGS. HA-730-B.
- United States Bureau of Reclamation Mid Pacific Region. 1976. Four Counties Study, Appraisal Ground-water Geology and Resources Appendix for Yolo, Lake, and Napa Counties. United States Bureau of Reclamation Mid Pacific Region.

## Errata

Changes made to the basin description will be noted here.