

## Secret Valley Groundwater Basin

- Groundwater Basin Number: 6-100
- County: Lassen
- Surface Area: 33,680 acres (53 square miles)

### Basin Boundaries and Hydrology

Secret Valley Groundwater Basin is bounded by the Plio-Pleistocene to Pleistocene basalt of Five Springs Mountain and the Skedaddle Mountains on the east and south, and Snowstorm Mountain on the north. To the west is South Plateau which is a broad lava field of Pleistocene basalt. Secret Creek originates north of Secret Valley, flows southwesterly through the valley, and continues southerly through Balls Canyon to the Honey Lake Basin. The major tributaries to Secret Creek are Snowstorm Creek on the west and Deep Creek on the east. Annual precipitation ranges from 9- to 11-inches.

### Hydrogeologic Information

Secret Valley is composed of a dissected volcanic plateau underlain by fairly flat-lying Pliocene lake deposits. During the early Pleistocene, this area was entirely covered by volcanic basalt flows. Streams eventually eroded canyons through the lava field and re-exposed the underlying lake beds. Once the relatively soft lake beds were exposed, the overlying lavas were undermined by erosion and the canyons slowly widened to form Secret Valley. Subsequent down cutting along Secret Valley Creek has left the lake deposits as level terrace surfaces along the valley perimeter (DWR 1963).

#### ***Water-Bearing Formations***

The water-bearing formations are Holocene sedimentary deposits, Plio-Pleistocene to Pleistocene basalt, and Pliocene lake deposits. The following summary is from DWR (1963).

**Holocene Sedimentary Deposits.** Holocene sedimentary deposits include basin deposits, alluvial fans, and intermediate alluvium. Generally the deposits have limited thickness, low permeability, and provide sufficient water to shallow wells for domestic and stock watering purposes.

**Plio-Pleistocene to Pleistocene Basalt.** The Pliocene basalts are fractured older flows that are interbedded with lake deposits and form the principal aquifers in Secret Valley. These lava flows may yield large amounts of confined water to wells. They supply groundwater to most of the irrigation wells east of Highway 395. These wells range in depth from 300- to 500-feet.

The Pleistocene basalt consists of fractured flows of basalt containing zones of scoria having moderate to high permeability. The formation provides recharge to springs and underlying older rocks where it's exposed at the edge of the valley and in the surrounding upland. These flows support numerous springs on the north side of the valley.

**Pliocene Lake Deposits.** The lake deposits consist of gently folded beds of consolidated shale, sandstone, diatomite and lenses of gravel with low

overall permeability. The formation yields sufficient water for domestic and stock purposes. The gravel lenses are moderately permeable and may provide moderate quantities of groundwater.

### **Groundwater Level Trends**

Groundwater levels have increased 10- to 20-feet during the period of the late 1980's through 1999.

### **Groundwater Storage**

**Groundwater Storage Capacity.** No published information was found for groundwater storage in the basin.

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

Estimates of groundwater extraction are based on a survey conducted by the California Department of Water Resources during 1997. The survey included land use and sources of water. Estimates of groundwater extraction for agricultural and municipal/industrial uses are 1,100 and 5 acre-feet respectively. Deep percolation from applied water is estimated to be 300 acre-feet.

### **Groundwater Quality**

**Characterization.** Sodium bicarbonate type water is the main water type found in the basin. The concentration of total dissolved solids ranges from 125 to 3,200 mg/L, averaging 818 mg/L (DWR unpublished data).

**Impairments.** Some high adjusted sodium absorption ratio levels have been found in groundwater in the basin.

### **Well Characteristics**

		<b>Well yields (gal/min)</b>	
Municipal/Irrigation		NKD	
		<b>Total depths (ft)</b>	
Domestic	Range: 200 - 657	Average: 468 (5 Well Completion Reports)	
Municipal/Irrigation	Range: 352 - 750	Average: 555 (7 Well Completion Reports)	

### **Active Monitoring Data**

Agency	Parameter	Number of wells /measurement frequency
DWR	Groundwater levels	2 wells semi-annually
DWR	Miscellaneous Water Quality	2 wells bi-yearly

### **Basin Management**

**Groundwater management:** No known groundwater management plans, groundwater ordinances, or basin adjudications.

Water agencies

Public

Private

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## Selected References

California Department of Water Resources (DWR). 1963. Northeastern Counties Groundwater Investigation, Volume 1, Text. California Department of Water Resources. Bulletin 98. 224 p.

California Department of Water Resources (DWR). 1963. Northeastern Counties Investigation, Volume 2, Plates. California Department of Water Resources. Bulletin 98.

## Bibliography

Bailey EH. 1966. Geology of Northern California. California Division of Mines and Geology. Bulletin 190.

Bedinger MS. 1990. Studies of Geology and Hydrology in the Basin and Range Province, Southwestern United States, for Isolation High-Level Radioactive Waste; Evaluation of the Regions. USGS. 84-745.

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

California Department of Water Resources. 1965. Northeastern Counties Ground Water Investigation, Appendix C, Geology. California Department of Water Resources, Northern District. Bulletin 98.

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. 1992. Lassen County Water Resources Assessment Study. California Department of Water Resources, Northern District. Memorandum Report.

Coggins V. 1970. Hydrology of Willow Creek, Lassen County, California: California State University, Chico. 92 p.

Dickinson WR, Ingersoll RV, Graham SA. 1979. Paleogene Sediment Dispersal and Paleotectonics in Northern California. Geological Society of America Bulletin 90:1458-1528.

Gester GC. 1962. The Geological History of Eagle Lake. California Academy of Science(34):29.

Handman EH, Londquist CJ, Maurer DK. 1990. Ground-water Resources of Honey Lake Valley, Lassen County, California, and Washoe County Nevada. USGS. 90-4050.

Mariner RH, Presser TS, Evans WC. 1977. Chemical Composition Data and Calculated Aquifer Temperature for Selected Wells and Springs for Honey Lake Valley, California. USGS. OFR-76-783.

Planert M, Williams JS. 1995. Ground Water Atlas of the United States, Segment 1, California, Nevada. USGS. HA-730-B.

Reheis M. 1999. Extent of Pleistocene Lakes in the Western Great Basin. USGS. MF-2323.

Rockwell GL. 1990. Surface-Water Hydrology of Honey Lake Valley, Lassen County, California and Washoe County, Nevada. USGS. OF-90-177.

Rockwell GL. 1993. Surface-Water Hydrology of Honey-Lake Valley, Lassen County, California, and Washoe County, Nevada. USGS. HA-726.

Rockwell GL, Friebel MF, Webster MD, Anderson SW. 1998. Water Resources Data for California, Water Year 1997; Volume 4, Northern Central Valley Basins and the Great Basin from Honey Lake Basin to Oregon State Line. USGS.

Rowan WJ, Cordova T. 1971. Hydrogeologic Investigations for Secret Valley Ranch Units 1 & 2. Kroesen Enterprises by Earth Science Consultants Associated. 12 p.

Thompson TH, Chappell R. 1983. Maps Showing Distribution of Dissolved Solids and Dominant Chemical Type in Ground Water, Basin and Range Province, Northern California. USGS. WRI 83-4115-B.

U. S. Geological Survey. 1981. Water Resources Data for California; Volume 4, Northern Central Valley Basins and the Great Basin from Honey Lake Basin to Oregon State Line. USGS.

Youngkin MT. 1980. Late Cenozoic Volcanism and Tectonism of the Eagle Lake Area, Lassen County, California: Colorado School of Mines.

## **Errata**

Changes made to the basin description will be noted here.