

Willow Creek Groundwater Basin

- Groundwater Basin Number: 6-3
- County: Lassen
- Surface Area: 11,700 acres (18 square miles)

Basin Boundaries and Hydrology

The Willow Creek Groundwater Basin is bounded by Pleistocene to Pliocene Pleistocene basalt of Horse Lake Mountain to the north, Mesozoic granitic rocks of Deans Ridge to the west, and by Pleistocene basalt of Susanville Peak and Antelope and Tunnison mountains to the south.

Willow Creek originates from artesian springs in the northwestern part of the valley and flows southeasterly through the valley to Honey Lake Basin. Groundwater generally flows southeasterly in the valley. Annual precipitation ranges from 21 to 23-inches.

Hydrogeologic Information

Water-Bearing Formations

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

Holocene Sedimentary Deposits. The Holocene sedimentary deposits consist of intermediate alluvium and alluvial fans underlying most of the southwestern half of the valley to a thickness of 250 feet. The intermediate alluvium consists of unconsolidated silt, sand, and lenses of gravel that are moderately permeable with moderate water yields. The alluvial fan deposits consist of unconsolidated gravel, sand, and clay that are moderate to high in permeability and yield moderate to large amounts of water to wells.

Holocene Basin Deposits. These deposits consist of unconsolidated clay, silt, sand, and organic muck and underlie the northeastern part of the valley. The deposits have low permeability and yield small supplies of groundwater to stock and domestic wells.

Pleistocene to Holocene Basalt. These deposits consist of highly fractured basalt containing zones of scoria with moderate to high permeability. The lavas form areas of recharge and act as aquifers beneath the southeastern and possibly the northern portions of the basin.

Pliocene Lake Deposits. These deposits consist of beds of consolidated shale, sandstone, diatomite, and lenses of gravel and underlie several hundred feet of younger sediments in the valley. The permeability is generally low with yields sufficient only for domestic and stock purposes. Gravel lenses within these deposits are moderately permeable and can provide moderate quantities of semiconfined groundwater.

Groundwater Level Trends

Groundwater levels declined 2- to 10-feet during the early 1990s and have recovered as of 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 surveys conducted by the California Department of Water Resources during 1997. Surveys included land use and sources of water. Estimates of groundwater extraction for agricultural and municipal/industrial uses are 1,900 and 5 acre-feet, respectively. Deep percolation from applied water is estimated to be 1,200 acre-feet.

Groundwater Quality

Characterization. Bicarbonate-type waters occur throughout the basin. The concentration of total dissolved solids ranges from 90- to 1,200-mg/L, averaging 401 mg/L (DWR unpublished data).

Well Production Characteristics

Well yields (gal/min)		
No known data		
Total depths (ft)		
Domestic	Range: 80 – 580	Average: 213 (32 Well Completion Reports)
Irrigation	Range: 201 – 606	Average: 382 (5 Well Completion Reports)

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
DWR	Groundwater levels	7 wells/semi-annually
DWR	Miscellaneous water quality	4

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Errata

Changes made to the basin description will be noted here.