

Sierra Valley Groundwater Basin, Chilcoot Subbasin

- Groundwater Basin Number: 5-12.02
- County: Plumas
- Surface Area: 7550 acres (12 square miles)

Basin Boundaries and Hydrology

The Chilcoot Subbasin is an irregularly shaped, complexly faulted valley on the eastern side of the Sierra Valley Groundwater Basin in Plumas County. The basin is bounded to the north and east by Mesozoic granitic rocks and, to the south, by Tertiary Sierran basalt and pyroclastic rocks and Paleozoic metamorphic rocks. The basin is hydrologically connected to the Sierra Valley Subbasin to the west in the near surface but may be discontinuous at depth due to a bedrock sill.

The surface drainage is tributary to Little Last Chance Creek, which drains to the Middle Fork Feather River. Annual precipitation ranges between 13- to 17-inches, increasing to the south. The following summary is from DWR (1963) and DWR (1983) unless otherwise noted.

Hydrogeologic Information

Water-Bearing Formations

The primary water-bearing formations in the Chilcoot Subbasin are the Holocene sedimentary deposits and silt and sand deposits, fractured and faulted Paleozoic to Mesozoic metamorphic and granitic rocks, and Tertiary volcanic rocks.

Holocene Sedimentary Deposits. Holocene sedimentary deposits include alluvial fans and intermediate alluvium.

Alluvial fans consist of unconsolidated gravel, sand, and silt with minor clay lenses. These deposits are located at the perimeter of the valley to a thickness of 200 feet and are a major source of confined and unconfined groundwater. The fan deposits coalesce or interfinger with basin, lake, and alluvial deposits. Specific yield ranges from 8- to 17-percent. The fans also serve as important recharge areas.

Intermediate alluvium consists of unconsolidated silt and sand with lenses of clay and gravel. Specific yield is estimated to range between 5- to 25-percent. This unit is limited in extent and is found along the margins of the basin. The deposits are up to 50 feet in thickness and yield moderate amounts of groundwater to shallow wells.

Holocene Silt and Sand Deposits. Sand and silt deposits are located in the northeast portion of the subbasin. The deposits are generally unconsolidated and have high permeability and porosity. Potentially large quantities of water may be extracted.

Tertiary Volcanic Rocks. Volcanic rocks make up a portion of the bedrock outcrop north of Chilcoot along Frenchman Lake road. These rocks are

fractured and faulted and produce between 5- to 10-gpm where wells encounter interconnected openings in the rock.

Mesozoic Granitic Rocks and Paleozoic Metamorphic Rocks. These rocks form the bedrock base of the subbasin and most of the surrounding mountain uplands. The metamorphic rocks underlie the eastern portion and the granitic rocks the western portion of the subbasin. Major north-south high angle faults form the contacts between these rocks. Several test wells drilled in a proposed subdivision in the area show that where wells encounter sufficient interconnected fractures, wells developed in these rocks can produce up to 20 gpm, but typically only produce 3- to 5-gpm (Bohm 1986).

Recharge Areas

Most of the upland recharge areas are composed of permeable materials occurring along the upper portions of the alluvial fans that border the valley. Recharge to groundwater is primarily by way of infiltration of surface water from the streams that drain the mountains and flow across the fans.

A minor amount of recharge may also be derived from some of the Sierran volcanic rocks located south of the valley. Most of these rocks appear to be of fairly low permeability and only small quantities of recharge can be derived from them (DWR 1963).

Groundwater Level Trends

Section incomplete.

Groundwater Storage

Groundwater Storage Capacity. The estimated groundwater storage in the basin is 7,500,000 acre-feet to a depth of 1000 feet (DWR 1963). DWR (1963) notes that the quantity of water that is useable is unknown. DWR (1973) estimates storage capacity to be between 1,000,000 to 1,800,000 acre-feet for the top 200 feet of sediments based on an estimated specific yield ranging from 5 to 8 percent. These estimates include the Sierra Valley Subbasin.

Groundwater Budget (Type B)

Estimates of groundwater extraction for the Chilcoot Subbasin 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 64 and 72 acre-feet respectively. Deep percolation from applied water is estimated to be 400 acre-feet.

Groundwater Quality

Characterization. Groundwater in the subbasin is bicarbonate type water with mixed cationic character. Total dissolved solids concentration for the Sierra Valley Groundwater Basin ranges between 110- to 1620- mg/L, averaging 321 mg/L (DWR unpublished data).

Water Quality in Public Supply Wells

Constituent Group ¹	Number of wells sampled ²	Number of wells with a concentration above an MCL ³
Inorganics – Primary	5	0
Radiological	4	0
Nitrates	5	0
Pesticides	4	0
VOCs and SVOCs	4	0
Inorganics – Secondary	5	1

¹ 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).

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

³ 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	NKD	
	Total depths (ft)	
Domestic	Range: 50 - 425	Average: 203 (70 Well Completion Reports)
Irrigation	Range: 33	Average: 33 (1 Well Completion Reports)

NKD – No known data

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
DWR	Groundwater levels	15 wells semi-annually
DWR	Miscellaneous Water Quality	15 wells biennially (includes Subbasin 5-12.01)
Department of Health Services and cooperators	Miscellaneous Water Quality	8

Basin Management

Groundwater management:	Sierra Valley Groundwater Management District (authorized by Senate Bill 1391, enacted in 1980)
Water agencies	
Public	Loyalton WD
Private	

Selected References

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Errata

Changes made to the basin description will be noted here.