Potter Valley Groundwater Basin

- Groundwater Basin Number: 1-51
- County: Mendocino
- Surface Area: 8,243 acres (13 square miles)

Basin Boundaries and Hydrology

Potter Valley, located in east central Mendocino County, is approximately 12 miles northeast of Ukiah, and is the northernmost valley in the Russian River drainage basin. This northwest-trending valley is approximately 8 miles long, up to 2 miles wide, and is situated in a structural depression formed in bedrock of the Franciscan Complex. The groundwater basin is generally defined by the areal extent of unconsolidated alluvial sediments but does include some areas of older valley-fill deposits primarily along the western margin of the basin. The majority of the basin is bounded by bedrock of the Franciscan Complex. Potter Valley Basin is separated from the Ukiah Valley Groundwater Basin by approximately 4 miles through a narrow gorge formed into the Franciscan Complex by the Russian River.

The valley drains to the south through the East Fork of the Russian River. The Russian River is joined by Bush Creek in the northern part of the valley, Mewhinney Creek in the southeast, and several other unnamed tributaries along the length of Potter Valley. Precipitation in the Potter Valley area ranges from approximately 36 to 44 inches per year.

Hydrogeologic Information

Water Bearing Formations

The primary water bearing formation within Potter Valley is the Alluvium. Terrace Deposits and Continental Deposits are secondary in importance with respect to water bearing and yielding capacity. The Franciscan Complex the surrounds the majority of the valley is considered essentially non-waterbearing. Information on water bearing formations and groundwater conditions was taken from Cardwell (1965).

Alluvium. The alluvium is Holocene in age and consists mainly of silt and clay, with some sand and thin lenses of gravel. Coarse deposits are not extensive and are poorly connected. The alluvium is generally about 40 to 60 feet thick. Wells installed into the alluvium generally have low yields with several wells reportedly yielding 50 to 75 gpm, and the maximum yield is about 100 gpm. The majority of alluvial groundwater in Potter Valley is semiconfined beneath beds of silt and clay. Unconfined groundwater occurs in the upper part of the alluvium and at the heads of alluvial fans along the valley margins. A conservative estimate of specific yield for this unit is 5 percent based on estimates from alluvial deposits of similar nature in the Santa Rosa Valley (Cardwell 1958).

Terrace Deposits. Terrace Deposits of probable Pleistocene age crop out discontinuously along the southeastern and southern parts of Potter Valley. These deposits are characterized by an abundance of silt and clay, although they may contain local lenses of poorly sorted sand and gravel. The subsurface thickness of these deposits is not well defined, but surface

exposures are 10 to 30 feet thick, and maximum thickness is possibly about 100 feet. Shallow wells that tap this deposit generally yield only a few gpm.

Continental Deposits. These deposits are discontinuously exposed along the southern and western margins of the valley. The continental deposits are probably Pliocene to Pleistocene in age and are contemporary with similar deposits in the Ukiah Valley area. The formation is poorly consolidated and not well exposed. In the northern part of the valley these deposits are characterized by sandy silt and clay. Exposures in the southern part of the valley are characterized by gravel, friable silty sandstone, and mudstone, and concretions are common. The thickness beneath the valley is unknown but probably ranges from a few feet to several hundred feet. Well yields from this deposit are low but are sufficient for domestic purposes. No published values for specific yield were found for this unit.

Groundwater Level Trends

Hydrographs from 1967 to about 1995 for two alluvial wells showed only minor seasonal fluctuations and water levels in most cases at or near the ground surface (DWR unpublished data).

Groundwater Storage

Groundwater Storage Capacity. Cardwell (1965) estimated the storage capacity to be approximately 10,000 af based on an assumed specific yield of 5 percent and an aquifer thickness of about 45 feet (alluvium from 5 to 50 feet depth). DWR (1965) estimated usable storage capacity at 9,000 af based on specific yield of 5 percent and alluvium from 10 to 50 feet depths. Approximately 60,000 af of storage is contained in the older continental deposits; however, this storage is probably not usable for short-term cyclic storage because of the low permeability of this unit (DWR 1965).

Groundwater in Storage. Groundwater in storage was estimated to range from 9,000 to 10,000 af (Cardwell 1965; DWR 1965).

Groundwater Budget (Type C)

There are not enough data available to determine the groundwater budget for this basin.

Groundwater Quality

Characterization. Groundwater in Potter Valley is generally characterized by calcium magnesium bicarbonate or magnesium calcium bicarbonate types (Cardwell 1965). TDS ranges from 140 to 395 ppm. The quality of water from all water bearing formations except the bedrock is excellent for irrigation use. Water for domestic use is considered to be hard to moderately hard.

Impairments. No significant impairments noted although the water may contain objectionable concentrations of iron for domestic use (Cardwell 1965).

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	1	0
Radiological	0	0
Nitrates	1	0
Pesticides	1	0
VOCs and SVOCs	1	0
Inorganics – Secondary	1	0

[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)

Several alluvial wells reportedly yield 50 to 75 gpm, and the maximum yield is about 100 gpm; specific capacities of most wells range from about 1 to 5 gpm/ft.

Total depths (ft)

Domestic	Range: 20 to 398	Average: 115 (Based on 61 well completion reports)
Municipal/Irrigation	Range: 90 to 190	Average: 131 (Based on 5 well completion reports)

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
DWR	Groundwater levels	2 wells / semiannually
DWR and cooperators	Miscellaneous water quality	
Department of Health Services and cooperators	Title 22 water quality	One well / annually

Basin Management

Groundwater management:	No groundwater management plans were identified.
Water agencies	
Public	Potter Valley Community Service District; Potter Valley Irrigation District
Private	

References Cited

California Department of Water Resources (DWR) 1965. Water Resources and Future Water Requirements – North Coastal Hydrographic Area, Volume 1: Southern Portion (Preliminary Edition) –
Bulletin No. 142-1. April.

Cardwell, G.T., 1958. Geology and Ground Water in the Santa Rosa and Petaluma Valley Areas, Sonoma County, California. USGS Water Supply Paper 1427.

Cardwell, G.T. 1965. Geology and Ground Water in Russian River Valley Areas and in Round, Laytonville and Little Lake Valleys, Sonoma and Mendocino Counties, California. USGS Water Supply Paper 1548.

Additional References

California Department of Water Resources (DWR) 1958. Recommended Water Well Construction and Sealing Standards, Mendocino County. Bulletin No. 62 – November.

Errata

Changes made to the basin description will be noted here.