

Redding Groundwater Basin, Rosewood Subbasin

- Groundwater Basin Number: 5-6.02
- County: Tehama
- Surface Area: 45,230 acres (71 square miles)

Basin Boundaries and Hydrology

The Rosewood Subbasin is comprised of the portion of the Redding Groundwater Basin bounded on the west and northwest by the Coast Ranges, on the north by North Fork Cottonwood Creek, and on the southeast by Salt Creek, Dry Creek, and Cottonwood Creek. Annual precipitation ranges from 25- to 29-inches.

Hydrogeologic Information

Water-Bearing Formations.

The Rosewood Subbasin aquifer system west of the Sacramento River is comprised of continental deposits of late Tertiary to Quaternary age. The Quaternary deposits include Holocene alluvium and Pleistocene Modesto and Riverbank formations. The Tertiary deposits include the Pliocene Tehama Formation. The following descriptions are from Helley and Harwood (1985) unless otherwise noted.

Holocene Alluvium. The alluvium consists of unconsolidated gravel, sand, silt and clay from stream channel and floodplain deposits. These deposits are found along stream and river channels. The thickness ranges up to 30 feet. This unit represents the perched water table and the upper part of the unconfined zone of the aquifer. Although the alluvium is moderately permeable, it is not a significant contributor to groundwater usage.

Pleistocene Modesto and Riverbank Formations. The Modesto and Riverbank formations consist of poorly consolidated gravel with some sand and silt deposited during the Pleistocene time. They are usually found as terrace deposits near the surface along the Sacramento River and its tributaries. Modesto Formation deposits are observed along parts of Cottonwood Creek. Riverbank Formation deposits are observed along all major creeks. The thickness ranges up to 50 feet. The deposits are moderately to highly permeable and yield limited domestic water supplies.

Pliocene Tehama Formation. The Tehama Formation consists of locally cemented silts, sand, gravel, and clay of fluvial origin derived from the Klamath Mountains and Coast Ranges. The formation is the principal water-bearing formation in the subbasin and is exposed over approximately 80 percent of the subbasin surface area. Thickness of the deposits is unknown but may reach up to 500 feet, thinning to the west where the Great Valley Sequence daylight at the subbasin boundary (DWR 1964). The permeability of the formation is moderate to high with yields of 100- to 1,000-gpm.

Recharge Areas

Recharge to the principal aquifer formation is mostly by infiltration of streamflows at the margins of the subbasin. Infiltration of applied water and

streamflows, and direct infiltration of precipitation are the main sources of recharge into the alluvium (Pierce 1983).

Groundwater Level Trends

Review of the hydrographs for long-term comparison of spring-spring groundwater levels indicates a slight decline in groundwater levels associated with the 1976-77 and 1987-94 droughts, followed by a recovery to pre-drought conditions of the early 1970's and 1980's. Generally, groundwater levels have a seasonal fluctuation of approximately 5- to 10-feet for normal and dry years. Overall, there does not appear to be any increasing or decreasing trends in the groundwater levels.

Groundwater Storage

Groundwater Storage Capacity. The storage capacity for the entire Redding Basin is estimated to be 5.5 million acre-feet for 200 feet of saturated thickness over an area of approximately 510 square miles (Pierce 1983). Specific yield data for the Rosewood Subbasin aquifer system is not available to estimate storage capacity at the subbasin level.

Groundwater Budget (Type B)

Estimates of groundwater extraction are based on surveys conducted by the California Department of Water Resources during 1994 and 1995. Surveys included land use and sources of water. Estimates of groundwater extraction for agricultural and municipal/industrial uses are 680 and 990 acre-feet respectively. Deep percolation of applied water is estimated to be 1,200 acre-feet.

Groundwater Quality

Characterization. Groundwater in the subbasin is characterized as magnesium-calcium bicarbonate and calcium-magnesium bicarbonate type waters. Total dissolved solids concentrations range from 118- to 218-mg/L (DWR unpublished data).

Impairments. No impairments have been identified.

Well Characteristics

	Well yields (gal/min)	
Irrigation	No known data	
	Total depths (ft)	
Domestic	Range: 48 – 398	Average: 181 (447 Well Completion Reports)
Irrigation	Range: 65 – 565	Average: 311 (15 Well Completion Reports)

Active Monitoring Data

Agency	Parameter	Number of wells / measurement frequency
DWR	Groundwater levels	4 wells semi-annually
	Miscellaneous Water Quality	0

Basin Management

Groundwater management: Tehama County adopted a Countywide AB3030 plan in 1996.
 Tehama County adopted a groundwater management ordinance in 1994.

Water agencies

Public	Anderson-Cottonwood ID; Igo-Ono Community Service District
Private	

References Cited

- California Department of Water Resources. 1964. Shasta County Investigation. Appendixes E through P. Bulletin 22.
- Helley EJ, Harwood DS. 1985. Geologic Map of the Late Cenozoic Deposits of the Sacramento Valley and Northern Sierran Foothills, California. USGS Map MF-1790.
- Pierce MJ. 1983. Ground Water in the Redding Basin Shasta and Tehama Counties California. USGS Water-Resources Investigations Report 83-4052.

Additional References

- Bailey EH. 1966. Geology of Northern California. California Division of Mines and Geology. Bulletin 190.
- California Department of Water Resources. 1964. Quality of Ground Water in California 1961-62, Part 1: Northern and Central California. California Department of Water Resources. Bulletin 66-62.
- California Department of Water Resources. 1964. Shasta County Investigation. California Department of Water Resources. Bulletin 22.
- California Department of Water Resources. 1968. Water Well Standards-Shasta County, California. California Department of Water Resources. Bulletin 74-8.
- California Department of Water Resources. 1975. California's Ground Water. California Department of Water Resources. Bulletin 118.
- California Department of Water Resources. 1975. Progress Report Sacramento And Redding Basins Groundwater Study. California Department of Water Resources, Northern and Central Districts, in cooperation with the U.S. Geological Survey. 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. 1987. Progress Report Sacramento and Redding Basins Ground Water Study. California Department of Water Resources, Northern and Central Districts, in cooperation with the U.S. Geological Survey.

- California Department of Water Resources. 1995. Sacramento Valley Groundwater Quality Investigation. California Department of Water Resources, Northern District.
- California Department of Water Resources. 1996. Groundwater Levels in the Redding Groundwater Basin. California Department of Water Resources, Northern District.
- California Department of Water Resources. 1998. California Water Plan Update. California Department of Water Resources. Bulletin 160-98 Volumes 1 and 2.
- CH2M Hill. 1975. Redding Regional Water Supply Alternatives for Shasta County Water Agency, City of Redding, Enterprise Public Utility District, Cascade Community Services District, and Bella Vista Water District. Engineering Report.
- CH2M Hill. 2001. Redding Basin Water Resources Management Plan, Phase 2B Report, Prepared for Redding Area Water Council.
- Dickinson WR, Ingersoll RV, Graham SA. 1979. Paleogene Sediment Dispersal and Paleotectonics in Northern California. Geological Society of America Bulletin 90:1458-1528.
- Diller JA. 1906. Description of the Redding Quadrangle (California). USGS. Report No. 138. 14 p.
- Evenson KD, Kinsey WB. 1985. Maps Showing Ground-Water Conditions in the Cottonwood Creek Area, Shasta and Tehama Counties, California, 1983-84. USGS. WRI 85-4184.
- Fogelman RP, Evenson KD. 1984. Water Resources Monitoring in the Cottonwood Creek Area, Shasta and Tehama Counties, California, 1982-1983. USGS. Water Resources Investigations 84-4187.
- Fratlicelli LA, Albers JP, Irwin WP, Blake MC. 1987. Geologic Map of the Redding 1 x 2 Degree Quadrangle, Shasta, Tehama, Humboldt, and Trinity Counties, California. USGS. OF-87-257.
- Graham SA, Lowe DR, editors. 1993. Advances in Sedimentary Geology of the Great Valley Group, Sacramento Valley, California.
- Helley EJ, Jaworowski C. 1985. The Red Bluff Pediment; A Datum Plane for Locating Quaternary Structures in the Sacramento Valley, California. USGS.
- Hinds NEA. 1933. Geologic Formations of the Redding and Weaverville Districts, Northern California. California Journal of Mines and Geology 29(1):76-122.
- Ingersoll RV, Rich EI, Dickerson WR. 1977. Field Guide: Great Valley Sequence, Sacramento Valley.
- Johnson MJ, Houston ER, Neil JM. 1989. Test Holes for Monitoring Surface Water/Groundwater Relations in the Cottonwood Creek Area, Shasta and Tehama Counties, California. USGS. WRI 88-4090.
- McManus D. 1993. Groundwater Resource Evaluation of the West-Side of the Upland Area: Sacramento Valley [M.S.]: California State University, Chico.
- Planert M, Williams JS. 1995. Ground Water Atlas of the United States, Segment 1, California, Nevada. USGS. HA-730-B.
- Steele WC. 1980. Quaternary Stream Terraces in the Northwestern Sacramento Valley, Glenn, Tehama, and Shasta Counties, California. USGS.
- Strand RG. 1963. Geologic Atlas of California [Redding Sheet]. California Division of Mines and Geology.
- Tehama County Flood Control and Water Conservation District. 1996. Coordinated AB 3030 Groundwater Management Plan. Tehama County Flood Control and Water Conservation District.
- Tehama County Flood Control and Water Conservation District. 1999. Coordinated AB 3030 Groundwater Management Plan, First Annual Report. Tehama County Flood Control and Water Conservation District.

Errata

Changes made to the basin description will be noted here.