Scotts Valley Groundwater Basin

- Groundwater Basin Number: 3-27
- County: Santa Cruz
- Surface Area: 774 acres (1.2 square miles)

Basin Boundaries and Hydrology

The Scotts Valley Groundwater Basin is located in the Santa Cruz Mountains in central Santa Cruz County. The basin is a "J" shaped alluviated valley located along State Highway 17. The basin boundary is the contact edge of the Quaternary alluvial fill with the surrounding Tertiary sedimentary units. In addition to the alluvial basin, a groundwater resource area of about 20 square miles comprised of Tertiary sedimentary units exists in the Scotts Valley area.

Carbonera Creek drains the upper northern basin and an unnamed tributary drains the southern portion. Average annual precipitation varies from 39 to 41 inches, increasing westerly.

Hydrogeologic Information

Water Bearing Formations

The Tertiary Lompico Sandstone sits atop the valley's granitic basement. The Monterey Shale is above the Lompico Sandstone and varies in thickness up to 600 feet (DKTCE 1994). The thickness varies because of the earlier erosion of vertically displaced blocks due to faulting and structural folding

The principal water bearing formation is the Santa Margarita Sandstone that lies above the Monterey Shale. The Lompico Sandstone also yields water to wells. However, Todd Engineers (1996) assigned a specific yield of six percent to the Lompico Sandstone and 12 percent to the Santa Margarita Sandstone. Unconfined water conditions exist in the Santa Margarita Sandstone (up to 350 feet thick) and semi-confined or confined conditions occur in the lower Lompico Sandstone formation (DKTCE 1994).

Alluvial fill sits above the Santa Margarita formation at the valley floor. Exposed in portions of the hills surrounding the valley is the Santa Cruz Mudstone, immediately above the Santa Margarita formation. Also exposed is the Purisima formation that is above the mudstone.

Restrictive Structures

The sedimentary units have been structurally deformed into a synclinal structure. The axis of the syncline plunges gently eastward across the northern end of the basin (Muir 1981 and DKTCE 1994). The basin is bounded by two normal faults, one on the northern end and the other on the southern end. The faults are sub-parallel to the synclinal axis and created a downthrown block, westerly of the basin. Another fault, trending perpendicular to the axis of the syncline, has uplifted the central portion of the basin. Review of groundwater data indicates the syncline-parallel faults are not groundwater barriers. The syncline-perpendicular fault may act as a restriction to westward groundwater flow due to the juxtaposition of the Monterey Shale on the west with the Lompico Sandstone on the east.

Recharge Areas

Groundwater recharge occurs from the percolation of precipitation, seepage from streams, and subsurface flow from adjacent areas and formations. Percolation of precipitation is the most significant source of recharge (Muir 1981).

Groundwater Level Trends

Groundwater flow is generally westward, toward Bean Creek, in the northern and southern portions of the basin (DKTCE, 1994). Bean Creek is topographically lower and parallels the basin in the northwest. The Santa Margarita Sandstone is unsaturated in the central basin, water production in this area is from the underlying Lompico Sandstone. Groundwater flow in this formation is also westward where not locally affected by pumping.

Groundwater Storage

Groundwater in Storage. Todd Engineers (1996) stated the groundwater stored in the Santa Margarita aquifer in 1986 was 43,460 af. The area of the Santa Margarita aquifer was much larger than the basin and extended west to Zayante Creek and northerly of the basin. The area of the formation was approximately three times that of Scotts Valley Water District. The district is approximately 3,500 acres. Todd Engineers (1996) also stated the Lompico formation at Camp Evers and the El Pueblo area contained 6,800 af in a 1988 report. Groundwater storage for the portion of the groundwater basin near the City of Scotts Valley has been estimated at 266,806 af (Todd Engineers, 1998) including both the Santa Margarita and Lompico aquifers.

Groundwater Budget (Type C)

Information, specific to the basin, is insufficient due to the extent of the water bearing formations that provide groundwater outside of the basin area.

Groundwater Quality

Characterization. The primary ions in the basin are calcium and bicarbonate (Muir 1981). The range of TDS was from 100-980 mg/l with an average 360 mg/l (DHS 2000). Generally, the groundwater quality in terms of TDS is better in the Santa Margarita formation than in the Lompico formation (DKTCE 1995).

Impairments. Iron and manganese can occur at elevated levels (Todd Engineers, 2002). VOCS (Volatile Organic Compounds) have been found at detection levels in various localized areas within the basin. These contamination problems include a trichloroethene (TCE) plume; a plume of benzene, ethylbenzene, MTBE, and 1,2-DCA; a chlorobenzene plume, and detections of PCE. Municipal wells have been affected, but all sites are undergoing remediation and affected well water is treated to remove contaminants. No new sites affecting drinking water have been identified since 1993 (Todd Engineers, 2002).

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	4	0
Radiological	4	0
Nitrates	4	0
Pesticides	4	0
VOCs and SVOCs	4	2
Inorganics – Secondary	4	2

[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 Production characteristics

	Well yields (gal/min)	
Municipal/Irrigation	Range: 100-900	Average: 410 (34 well completion reports)
	Total depths (ft)	
Domestic	Range: 100-450	Average: 210 (23 well completion reports)
Municipal/Irrigation	Range: 70-1,470	Average: 500 (13 well completion reports)

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
Scotts Valley WD	Groundwater levels	26 Semi-annually (DKTCE 1994)
Scotts Valley WD	Miscellaneous water quality	7 Semi-annually (DKTCE 1994)
Department of Health Services and cooperators	Title 22 water quality	7 Varies

Basin Management

Groundwater management:	Scotts Valley WD adopted a groundwater management plan in 1994.
Water agencies	
Public	Scotts Valley WD
Private	Manana Woods MWC

References Cited

_____. 1995. *Scotts Valley Groundwater Management Plan (AB 3030), 1994-1995 Annual Report*. Scotts Valley Water District. 27p.

California Department of Health Services (DHS). 2000. *California Water Quality Monitoring Database.* Sacramento: Division of Drinking Water and Environmental Management. CD-ROM.

California Department of Water Resources (DWR), San Joaquin District. Water level data files.

David Keith Todd Consulting Engineers, Inc. (DKTCE). 1994*. Scotts Valley Groundwater Management Plan (AB 3030).* Scotts Valley Water District. 94p.

Jennings, C.W. and J. L. Burnett (compilers). 1961. *San Francisco Sheet of Geologic Map of California*. California Division of Mines and Geology (CDMG). Scale 1:250,000.

Muir, K.S. 1981. *Assessment of the Santa Margarita Sandstone as a Source of Drinking Water for the Scotts Valley Area, Santa Cruz, County, California*. Menlo Park: U.S. Geological Survey Water Resources Investigations 81-6. 22p.

Todd Engineers. 1996*. Scotts Valley Groundwater Management Plan (AB 3030), 1995-1996 Annual Report*. Scotts Valley Water District. 43p.

_____. 1998. *Reevaluation of the Water Balance.* Scotts Valley Water District.

_____. 2002. *Scotts Valley Groundwater Management Plan (AB 3030), 200-2001 Annual Report.* Scotts Valley Water District.

Additional References

Akers, J.P. 1969. Ground Water in the Scotts Valley Area, Santa Cruz County, California. U.S. Geological Survey open-file report. 12 p.

California Department of Water Resources (DWR). 1966. San Lorenzo Watershed Water Quality Investigation, Bulletin No. 143-1. 180p.

Errata

Updated groundwater management information and added hotlinks to applicable websites. (1/20/06)