San Jacinto Groundwater Basin

- Groundwater Basin Number: 8-05
- County: Riverside
- Surface Area: 188,000 acres (293 square miles)

Basin Boundaries and Hydrology

The San Jacinto Groundwater Basin underlies San Jacinto, Perris, Moreno, and Menifee Valleys in western Riverside County. This basin is bounded by the San Jacinto Mountains on the east, the San Timoteo Badlands on the northeast, the Box Mountains on the north, the Santa Rosa Hills and Bell Mountain on the south, and unnamed hills on the west. Lake Perris is located in the eastern part of Perris Valley. The valleys are drained by the San Jacinto River and its tributaries. Average annual precipitation ranges from 10 to 18 inches.

Hydrogeologic Information

Water Bearing Formations

The San Jacinto Groundwater Basin contains sediments that have filled valleys and underlying canyons incised into crystalline basement rock. The valley fill deposits are generally divided into younger and older alluvium (TechLink 2002). Maximum depths of valley fill reach about 900 feet in the western and northern parts of the basin, but may exceed 5,000 feet in the eastern part of the basin between the Casa Loma and Claremont faults (TechLink 2002). Confined groundwater is found in the eastern part of the basin between the Casa Loma and Claremont fault (DWR 1959; TechLink 2002). Wells in this basin produce 200 to 2,600 gpm.

Younger Alluvium. The younger alluvium in the southeastern part of the basin is generally coarse and permeable with specific yield estimated to range from about 12 to 15 percent (TechLink 2002). In other parts of the basin, specific yield is estimated at about 5 to 10 percent.

Older Alluvium. The older alluvium may correlate to sediments of Pleistocene age that are exposed in the San Timoteo Badlands and underlies the San Jacinto River near the confluence of Bautista Creek (DWR 1959). These sediments generally contain more fine material and have lower specific yield and transmissivity values than the younger alluvium.

Restrictive Structures

The San Jacinto fault zone cuts through the eastern part of the basin and is composed of five northwest trending segments: the San Jacinto, Claremont, Hot Springs, Park Hill, and Casa Loma faults (DWR 1978). These active faults are barriers to groundwater movement (DWR 1959; TechLink 2002).

Recharge Areas

Natural recharge to the basin is primarily from percolation of flow in the San Jacinto River and its tributary streams; less recharge is from infiltration of rainfall on the valley floor. The primary recharge area for the confined aquifers is found where the San Jacinto River and Bautista Creek enter the San Jacinto Valley (DWR 1959). Natural recharge is augmented by spreading of State Water Project (SWP) and reclaimed water through infiltration ponds in the upper reaches of the San Jacinto River (EMWD 2002; TechLink 2002). Percolation of water stored in Lake Perris has been an additional source of recharge since construction of the lake in the 1970s, and reclaimed water percolates through several storage ponds distributed throughout the valley. Artificial recharge can exceed natural recharge, particularly in years with low precipitation (EMWD 2003).

Groundwater Level Trends

Prior to the extraction of groundwater from the basin, groundwater flow was generally toward the course of the San Jacinto River and westward out of the basin (Techlink 2002). High extraction rates have produced groundwater depressions and locally reversed the historical flow pattern (TechLink 2002). During the 1960s, groundwater levels in the western and central parts of the basin declined; whereas, in the south-central part of the basin, they were moderately stable (DWR 1978). During the 1970s through the 1990s, groundwater levels declined about 20 to 40 feet in the northern and southeastern parts of the basin and were relatively stable in the southern part of the basin. During the 1970s through the 1980s, groundwater levels rose 80 to 200 feet in the western part of the basin because of infiltration from Lake Perris (Techlink 2002). During 2001 and 2002, groundwater levels generally rose in the central part of the basin and declined in the northeastern and southern parts of the basin (EMWD 2002; 2003).

Groundwater Storage

Groundwater Storage Capacity. The estimated groundwater storage capacity of the San Jacinto Basin is 3,070,000 af (DWR 1978).

Groundwater in Storage. In 1975, the calculated groundwater in storage was 2,700,000 af (DWR 1978).

Groundwater Budget (Type A)

Eastern Municipal Water District gathers and compiles groundwater production and artificial recharge amounts for this basin and reports these data annually (EMWD 2003). A model of the San Jacinto Valley Groundwater Basin was commissioned by EMWD to study groundwater flow and transport patterns and develop effective management strategies for the basin (TechLink 2002).

Groundwater production in the portion of the basin managed under the West San Jacinto Groundwater Management Plan is estimated at 18,880 af for 2001 and 20,058 af for 2002 (EMWD 2003). Estimates of extraction for the entire basin during 1984 through 1999 range from 60,361 to 100,137 af/yr and average about 78,714 af/yr (TechLink 2002). About 1,260 af of reclaimed water were recharged in 2001 and about 1,052 af in 2002. About 5,811 af of SWP water were recharged in 2002; however, no imported water was recharged in 2001 (EMWD 2003). Estimates of infiltration of San Jacinto River flow for 1984 through 1999 range from 4,504 to 191,590 af/yr and average 46,890 af/yr (TechLink 2002).

Groundwater Quality

Characterization. Historically, groundwater was of good quality for domestic, irrigation and industrial purposes (DWR 1978). The groundwater was typically sodium bicarbonate, calcium bicarbonate, or sodium chloride in character (DWR 1978). In 2002, depending on the part of the basin, average groundwater character was sodium chloride, sodium-calcium chloride, calcium-sodium chloride, or calcium-sodium chloride-bicarbonate (EMWD 2003). Historically, groundwater in the basin typically had a TDS content less than 1,000 mg/L (DWR 1978). In 2002, TDS content ranged from 230 to 12,580 mg/L; maximum TDS content exceeded 1,000 mg/L in most parts of the basin (EMWD 2003). Data from 51 public supply wells show TDS content in the basin ranges from 160 to 1,390 mg/L and averages about 463 mg/L.

Impairments. Historically, high levels of boron and fluoride were found in the central and northwest parts of the basin, and high nitrate-nitrogen concentrations were found in the southeast part of the basin (DWR 1978). In 2002, groundwater exceeding a nitrate-nitrogen concentration of 10 mg/L was found in wells throughout most of the basin (EMWD 2003). Nitrate-nitrogen concentrations as high as 40 mg/L were found in the northern part of the basin in the 1990s and as high as 28 mg/L in the southern part of the basin in 2002 (EMWD 2003). In 2002, TDS content was measured as high as 12,580 mg/L in the basin, and some wells with TDS content exceeding 1,000 mg/L were found throughout most of the basin (EMWD 2003). Pumping is causing groundwater of high TDS content to move from the western part of the basin into groundwater of lower TDS content in the central part of the basin (TechLink 2002; EMWD 2003). Remediation efforts have helped slow the migration of this plume.

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	56	3
Radiological	56	2
Nitrates	58	12
Pesticides	55	1
VOCs and SVOCs	54	0
Inorganics – Secondary	56	15

[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	Range: to 2,600 gpm	Average:
	Total depths (ft)	
Domestic	Range: to 917 feet	Average:
Municipal/Irrigation	Range:	Average:

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
EMWD	Groundwater levels	169/ biannually (EMWD 2003)
EMWD	Miscellaneous water quality	113/ annually (EMWD 2003)
Department of Health Services and cooperators	Title 22 water quality	56/ annually

Basin Management

Groundwater management:	Most of the basin is managed under the jurisdiction of the West San Jacinto Groundwater Basin Management Plan, an AB 3030 plan adopted in June 1995.
Water agencies	
Public	Eastern Municipal Water District, Lake Hemet Municipal Water District
Private	

References Cited

California Department of Water Resources (DWR). 1959. *Santa Ana River Investigation.* Bulletin No. 15. 207 p.

____, Southern District. 1978. *Water Resources Evaluation of the San Jacinto Area.* Southern District Report. 81 p.

Eastern Municipal Water District (EMWD). 2002. *West San Jacinto Groundwater Management Plan 2001 Annual Report onthe Status of the Groundwater Subbasins.* Perris California.

Eastern Municipal Water District (EMWD). 2003. *West San Jacinto Groundwater Management Plan; 2002 Annual Report onthe Status of the Groundwater Subbasins.* Perris California.

TechLink Environmental Inc. (TechLink). 2002. *Regional Groundwater Model for the San Jacinto Watershed.* Consultant's report for Eastern Municipal Water District. Perris California.

Additional References

Lang, David J. 1979. Water Resources Data, 1970-75, For Perris Valley and Vicinity, Riverside County, California. U.S. Geological Survey Open File report 79-1256. 127 p.

Errata

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