Orocopia Valley Groundwater Basin

- Groundwater Basin Number: 7-31
- County: Riverside
- Surface Area: 96,000 acres (150 square miles)

Basin Boundaries and Hydrology

This basin underlies Orocopia Valley, northeast of the Salton Sea, in central Riverside County. It is bounded by impermeable rocks of the Cottonwood and Eagle Mountains on the north and of the Orocopia and Chocolate Mountains on the south. The basin is bounded by a section of the San Andreas fault zone and semi-permeable rocks of the Mecca Hills on the west and by a bedrock constriction on the east. The western portion of the valley drains westward toward the Salton Sea, but the eastern part drains eastward into Hayfield (dry) Lake and Chuckwalla Valley. Average annual precipitation ranges to 4 inches.

Hydrogeologic Information

Water Bearing Formations

Water-bearing units in the basin consist of alluvial and lake deposits ranging from Pliocene (?) to Quaternary in age and may reach 4,400 feet in thickness near Hayfield Lake (LeRoy Crandall 1981).

Groundwater occurs under confined as well as unconfined conditions in the western part of the basin. Confined conditions also are found in the eastern basin particularly near the Hayfield Lake (LeRoy Crandall 1981).

Quaternary Deposits. These alluvial and lake deposits, which may be more than 3,000 feet thick in parts of the basin (URS 2000), are probably the most important aquifer in the area (DWR 1963). The materials forming these deposits are from the surrounding mountains (LeRoy Crandall 1981).

Pinto Formation. This Pleistocene-age unit is a coarse bouldery fanglomerate with lacustrine clay and interbedded basalt flows. The fanglomerate yields water freely to wells, but the basalt likely yields only small amounts of water (DWR 1963).

Pliocene Deposits. In the subsuface, coarse alluvial and fanglomerate deposits are interpreted to lie directly on basement (URS 2000). These deposits may correlate with deposits mapped in adjacent valleys as the Pliocene-age Bouse Formation and older fanglomerate (URS 2000). In Chuckwalla Valley, similar deposits are reported to yield as much as several hundred gallons per minute of water to wells perforated in the coarse grained sections (Wilson and Owen-Joyce 1994).

Restrictive Structures

East-trending faults are located along the northern and southern boundaries of the basin. The North Chiriaco fault, which is inferred to extend eastward into Chuckwalla Valley, is a partial barrier, but it is unknown whether or not the South Chiriaco fault is a barrier to groundwater movement. An unnamed

northwest-trending fault is found in the eastern part of the basin northeast of Red Cloud Wash (Jennings 1967; LeRoy Crandall 1981). This fault displaces nonwater-bearing rocks and forms a basement rock high below the eastern part of the basin, which is likely a barrier to groundwater movement (URS 2000).

Recharge Area

Natural recharge is likely from subsurface inflow and infiltration of runoff from the surrounding mountains and rainfall to the valley floor. An artificial groundwater recharge site is under construction in the Hayfield Lake area of the basin near the Julian Hinds Pumping Station for the Colorado River Aqueduct.

Groundwater Level Trends

Data show groundwater levels range from about 480 to 800 feet below ground surface (URS 2000).

Groundwater Storage

Groundwater Storage Capacity. DWR (1975) reported total storage capacity of the basin at 1,500,000 af; however, a more recent study (LeRoy Crandall 1981) estimates a storage capacity of about 6,250,000 af.

Groundwater in Storage. The amount of groundwater in storage in 1980 was reported to have been about 4,300,000 af (LeRoy Crandall 1981).

Groundwater Budget (Type A)

Subsurface inflow from adjacent basins is estimated at about 1,600 af/yr, and natural recharge to the basin can be as high as 4,700 af/yr (LeRoy Crandall 1981). Subsurface outflow from the basin can be as high as 6,200 af/yr. Inflow is considered generally equal to outflow for this basin (LeRoy Crandall 1981).

Groundwater Quality

Characterization. Mineral analyses indicate that the groundwater in the basin ranges from sodium bicarbonate to sodium sulfate in character (LeRoy Crandall 1981). Near Hayfield Lake, TDS content ranges from 254 to 665 mg/L, but most wells sampled tap water with less than 300 mg/L (URS 2000).

Impairments. Fluoride, color, radon, and uranium concentrations in some wells exceed drinking water standards (URS 2000).

Well Characteristics

	Well yields (gal/min)	
Municipal/Irrigation	Range: to 210 gal/min	Average: 165 gal/min (DWR 1975)
	Total depths (ft)	
Domestic	Range: -	Average:
Municipal/Irrigation	Range: -	Average:

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
	Groundwater levels	
	Miscellaneous water quality	
Department of Health Services and cooperators	Title 22 water quality	1

Basin Management

Groundwater management:	The Hayfield Lake area in the eastern basin near the Julian Hinds Pumping Station is being managed by Metropolitan Water District of Southern California as a conjunctive use project site.
Water agencies	
Public	
Private	

References Cited

California Department of Water Resources. 1963. Data on Water Wells and Springs in the Chuckwalla Valley Area, Riverside County, California. Bulletin 91-7.

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Jennings, C. W. 1967. Geologic Map of California: Salton Sea Sheet. Olaf P. Jenkins Edition. California Department of Conservation, Division of Mines and Geology. Scale 1: 250,000.

LeRoy Crandall and Associates. 1981. Report of Phase II Investigation, Feasibility of Storing Colorado River Water in Desert Groundwater Basins. Prepared for Metropolitan Water District of Southern California.

URS Corporation. 2000. Feasibility Assessment Hayfield Lake/Chuckwalla Valley Groundwater Conjunctive-Use Project. Prepared for Metropolitan Water District of Southern California. Volumes I–III.

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Additional References

California Department of Public Works. 1954. *Ground Water Occurrence and Quality, Colorado River Basin Region.* Water Quality Investigations Report No. 4.

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Errata

Changes made to the basin description will be noted here.