STATE OF CALIFORNIA

The Resources Agency

Department of Water Resources

Southern District

GROUND WATER AND WASTE WATER QUALITY STUDY, ANTELOPE VALLEY, LOS ANGELES AND KERN COUNTIES

A Report to

Lahontan Regional Water Quality Control Board (No. 6)

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Ground Water

Ground water is contained in the vast alluvial deposits that underlie most of Antelope Valley. They extend to at least 1,900 feet in thickness and are the major water-yielding deposits of the area. A cursory estimate of the quantity of ground water in storage beneath the Valley -- based on the average value of the specific yield and general knowledge -- is in the order of 70 million acre-feet. Although all of this large store of water may not be usable, it nevertheless constitutes an important resource and should be protected.

In the central part of the Valley there are two water-bearing zones, the principal and deep zones, or aquifers, separated by impermeable clay deposits, or lenses, several hundred feet thick in the eastern part of the Lancaster Subarea, dipping gently southeastward and confining the water in the deep zone under pressure. Around the perimeter of this area the two zones merge. Thus, this peripheral area constitutes an area of recharge for water-bearing zones. However, the degree of hydraulic continuity between the two bodies is not fully known.

Ground water extractions are greatest from the principal zone that underlies a large part of the Valley and consists of sands, gravels, and clay. These deposits are generally permeable and yield large amounts of water to wells. But a limited amount is obtained from discontinuous semiperched water bodies and from shallow bodies overlying bedrock locally near the perimeters of the central Valley area.*

Due to extensive and increasing agricultural pumping, however, ground water levels in the Valley have declined steadily, particularly

*For a more detailed discussion of the geology of Antelope Valley see "Antelope Valley Investigation, Lahontan Region", April 1956, pp. 3-10.

in the Lancaster Subarea. For example, wells about one mile northeast of Palmdale have dropped about 180 feet between 1927 and 1966, an average of 4.6 feet a year. Long-term hydrographs are available for a dozen wells in Antelope Valley and they indicate a steady decline in water level elevations over that 39-year period.

This rate of decline, however, may be somewhat slowed in areas of most serious depletion by imported State Water Project water, scheduled for delivery in 1972, being used in place of local ground water, thereby diminishing the drain on the latter supply. Initially, 20,000 acre-feet has been contracted for delivery in that year, the amount increasing periodically until 1990 when 120,000 acre-feet has been contracted for by Antelope Valley - East Kern Water Agency.

Beneficial Uses of Water

Table 11 of Bulletin No. 121 "Southern Lahontan Area Land and Water Use Survey", August 1965, shows an increasing urban water use. Estimated levels of net water use in the Antelope Valley Unit for conditions of development in 1950, 1957, and 1961 in acre-feet are:

	1950	1957	1961	Difference 1950-1961	Difference 1957-1961
Irrigated Lands	200,000	131,700	147,000	-53,000	15,300
Urban-suburban areas	2,200	9,500	19,000	16,800	9,500
TOTALS	200,200	141,200	166,000	-36,200	24,800

CHAPTER V. FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

This study has resulted in the following findings:

1. Antelope Valley's climate is arid, with an average rainfall ranging from about 8 inches on the Valley floor to about 35 inches at higher elevations.

2. The total volume of ground water in storage in the Valley's vast alluvial deposits is estimated (1966) at more than 70 million acre-feet and constitutes the major source of water supply.

3. Alluvial deposits are replenished primarily by percolation of runoff from mountainous areas surrounding the Valley; the estimated seasonal runoff amounts to approximately 66,000 acre-feet, more than one-third of it from Little Rock and Big Rock Creeks.

4. Withdrawals of ground water in excess of annual replenishment account for the steady decline in water levels over the past 40 years. This trend may be somewhat slowed by importation of State Water Project water scheduled for delivery in 1972.

5. Net urban water use has increased by about 17,000 acre feet from 1950 to 1961, while net water use for irrigation decreased about 53,000 acre feet during the same period.

6. The chemical quality of runoff is excellent, as shown by analyses of samples from Little Rock and Big Rock Creeks. Water from these streams is calcium bicarbonate in character.

7. The chemical quality of ground water ranges from good to excellent (TDS of less than 500 ppm) and has generally remained unimpaired during the past two decades. The best quality water is in the southwestern area, around Lancaster and Palmdale. Inferior quality water (over 1,000 ppm TDS) is in the North Muroc Hydrologic Subarea in the northeastern part of