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DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

CERTIFICATE OF EXACT COPY

Pursuant to 43 U. S. C. 1460, I hereby certify that the official records identified below are in the legal custody of the United States Geological Survey and attest that each annexed record is a true copy of a document comprising part of the official records of the United States Geological Survey: Ground-Water Inventory for 1966, Edwards Air Force Base, California; Open File Report 67-0223; 1967 edition; "*this report has been scanned and reproduced*".

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and caused the seal of the Geological Survey, Department of the Interior to be affixed, the day and year written below.

SIGNATURE: .....

TITLE: Business Partner Specialist.....

OFFICE: ...United States Geological Survey.....

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PWS-0122-0002

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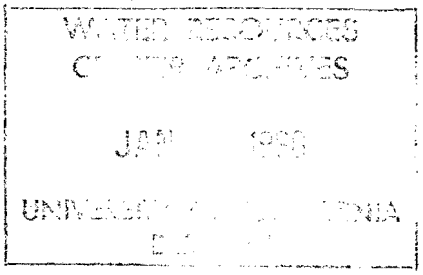
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Water Resources Division

GROUND-WATER INVENTORY FOR 1966

EDWARDS AIR FORCE BASE, CALIFORNIA



Prepared in cooperation with the
Department of the Air Force

OPEN-FILE REPORT

Menlo Park, California
1967

CONTENTS

ILLUSTRATIONS

[1]All illustrations are at the end of the report. The page number given is that of the first principal reference to the illustration in the text.

CONTENTS

TABLES

GROUND-WATER INVENTORY FOR 1966, EDWARDS AIR FORCE BASE, CALIFORNIA

By S. J. Tyley

SUMMARY AND CONCLUSIONS

The water supply for Edwards Air Force Base is ground water pumped from wells. Because annual recharge to the ground-water supply is very small, constant surveillance of the quantity and quality of the water stored in the underground basin is maintained. This report is the tenth annual inventory made in cooperation with the Department of the Air Force. The results of the current study are summarized below.

1. Pumpage.--Pumpage by the base for all uses during 1966 was about 6,280 acre-feet, most of which was pumped from the Main Base, East Camp, and North Base wells.

2. Water-level fluctuations.--During the period March 1961 to March 1967, four pumping depressions have formed in which water levels declined as much as 100 feet.

3. Ground-water depletion.--The estimated depletion of ground water in storage during the period April 1, 1966, to March 31, 1967, is 13,000 acre-feet. The quantity remaining in storage is about 1,300,000 acre-feet.

4. Quality of water.--Chemical analyses of water collected from the principal base-supply wells indicate no appreciable deterioration of the ground-water quality during the period April 1, 1966, to March 31, 1967. Because the dissolved-solids content of well 10N/9W-7A2 changes during pumping, determination should be made as to how long this well needs to be pumped to obtain potable water. Partial chemical analyses may be adequate to monitor changes in the quality of the ground water.

5. Condition of wells.--Specific-capacity tests made at wells 9N/8W-6H1, 9N/9W-14P2, 9N/9W-15J1, and 9N/10W-24G1 indicate no deterioration in their condition. Specific-capacity tests should be standardized.

GROUND-WATER INVENTORY, 1966, EDWARDS AIR FORCE BASE, CALIF.

WATER-LEVEL FLUCTUATIONS

The water-level contour map (fig. 4) shows four pumping depressions in
wards Air Force Base vicinity. The locations of these four depressions
sted below in order of decreasing magnitude of water-level gradient:

1. About 12 miles east of Lancaster (secs. 11 and 14, T. 7 N.,
W.).
2. About 5 miles northeast of Lancaster (centered in secs. 2 and 11,
N., R. 11 W.).
3. Main Base well field (sec. 24, T. 9 N., R. 10 W.).
4. Northern edge of Rogers dry lake (sec. 4, T. 10 N., R. 9 W.).

The hydrographs (figs. 5 and 6) show that water levels begin to decline
rch to a low in late summer or early autumn when recovery begins. As
evious years, new low-water levels were reached in three of the
der wells. However, the rates of decline continue to be fairly
ant. Figure 5 shows hydrographs of wells 8N/10W-8R3 and 10N/9W-4D1
reviously included in the annual inventory. These two additional
graphs give a more complete coverage of the hydrologic conditions at
ds Air Force Base. Although pumping occurred in wells near well
W-8R3 during 1963 and 1964, the overall rate of decline of the water
has remained constant. The best possible conditions for monitoring
orth Base well field water-level fluctuations are not met because a
ly pumped supply well is about 300 feet west of the recorder well
W-4D1; however, this is the only well available for recorder use in
area. Further investigation is required to determine if a more
ble well exists for monitoring the water-level fluctuations in that

Figure 7 shows the water-level changes that occurred from March 1961
rch 1967. Water levels have declined very little near the southern
ary of the base; however, about 4 miles south of the base boundary,
levels have declined as much as 50 feet in the last 6 years. The
st water-level decline, 90 feet, has occurred 12 miles east of
ster (secs. 11 and 14, T. 7 N., R. 10 W.). A possible explanation
hese large declines is that heavy pumping has occurred in an area
ed on the east by consolidated rocks and a probable fault that may
e the eastward expansion of the cone of depression. The hydrograph
11 8N/10W-8R3 will indicate the extent to which the heavy irrigation
ng may affect the water levels in the southern part of the base.

GROUND-WATER DEPLETION

Ground water in storage beneath and adjacent to the base in 1952 was estimated by Dutcher (1958, p. 40) to be 1,500,000 acre-feet. Giessner and Westphal (1966, p. 16) estimated ground-water depletion for the period 1952-66 to total 146,000 acre-feet, an average of approximately 10,000 acre-feet per year. However, since 1960 the average rate of depletion has been nearly 13,000 acre-feet per year. Because no large changes in pumping patterns have occurred, a reasonable estimate for ground-water depletion during the period April 1, 1966, to March 31, 196 is .13,000 acre-feet.

The total ground-water depletion since 1952 is about 160,000 acre-feet, or only slightly more than 10 percent of the 1,500,000 acre-feet in storage in 1952. Assuming no change in the present rate of use, the estimated 1,300,000 acre-feet of water remaining in storage is sufficien for about 100 years. However, prior to that time pumping lifts may become great enough to be uneconomic when compared to the cost of alternative sources of water. Nevertheless, assuming no large-scale increase in the use of ground water at Edwards Air Force Base and vicinity, the quantity of usable ground water in storage probably is adequate to meet the needs of the Air Force for at least the next 25 to 50 years. In the future an estimate of the maximum possible economic, or physical pumping lift, or both, should be made to more accurately predict how long the usable ground water in storage will adequately meet these needs.

Antelope Valley