UNITED STATES OF AMERICA

UNITED STATES

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 1960 Edwards Air Force Base, California; Open File Report 61-0108; 1961 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.....

PWS-0081-0001

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PWS-0081-0002

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Ground Water Branch

GROUND-WATER INVENTORY FOR 1960

EDWARDS AIR FORCE BASE, CALIFORNIA

By

W. B. Mayle, Jr.

Prepared in cooperation with the

Department of the Air Force

Open-file report

Long Beach, California
1961

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GROUND-WATER INVENTORY FOR 1960,

EDWARDS AIR FORCE BASE, CALIFORNIA

By W. R. Moyle, Jr.

SUMMARY AND CONCLUSIONS

This report presents the results of the continuing inventory of ground-water resources at Edwards Air Force Base for 1960, giving tabulated lists of pumpage for the 1960 calendar year and the water-level decline between March 1960 and March 1961.

1. Ground-water pumpage.--The total ground-water pumpage by the base for all uses during 1960 was about 5,400 acre-feet, most of which was pumped from the Main Base, East Camp, and North Base wells.

2. Water-level fluctuations.--In the Main Base, East Camp, and Rosamond storage units and North Muroc basin areas water levels have declined ~~at a rate between~~ about 5 to 6 feet during 1960. In the North Muroc basin, water levels remained virtually unchanged between 1952 and 1959; however, beginning in the autumn of 1959 the water levels started to decline more rapidly, as is shown by measurements of the water level in observation well 11/9-3A1.

3. Ground water in storage.--Ground water in storage beneath and adjacent to the base in the saturated deposits to a depth of 200 feet below the 1952 water levels was estimated to be 1,500,000 acre-feet. (Dutcher, 1958, p. 40). Depletion of ground water in storage during 1960-61 (April 1-March 31) was about 14,600 acre-feet. The total depletion of ground water in storage during 1952-61 has been estimated to be about 84,600 acre-feet (table 5).

4. Quality of water.--Chemical analyses of water collected from base wells are made periodically, and in the Main Base, East Camp, or South Truck areas, the analyses do not indicate an appreciable deterioration of chemical quality. However, the analyses of water from North Base well 10/9-7A2 (NB-2) show a progressive and rapid increase in the chloride content, beginning in 1956. The chloride content was 595 ppm in September 1960, an increase of 175 ppm over the amount shown on the September 1959 analysis, and 1,020 ppm in April 1961. Use of this well should be discontinued as a source of domestic supply.

PURPOSE AND SCOPE OF THE CONTINUING INVENTORY

This report, covering the period January 1960 through March 1961, is the fourth periodic appraisal of ground-water conditions at Edwards Air Force Base, Los Angeles, Kern, and San Bernardino Counties, Calif. It was prepared by the U.S. Geological Survey in cooperation with the Air Force.

These periodic (generally annual) reports extend the collection and analysis of basic data for the period 1950-54, which were presented in an appraisal report on the geology and ground-water resources of the base (Dutcher and Hilton, 1954 and 1955; Dutcher and Worts, 1958). The first continuing-inventory report was prepared for the period 1954-57 (Dutcher, 1958), the second for 1958 (Dutcher, 1959), and the third for 1959 (Moyle, 1960). The purpose of the continuing program is to collect the geologic and hydrologic data needed to keep the Air Force advised as to the current water-supply conditions on the base. The area of the investigation is shown on figure 1.

Figure 1. Map of part of southern California showing area described in this report.

The scope of the program requested by the Air Force is as follows: (1) Continue periodic water-level measurements in key observation wells on the base in order to estimate the status of ground water in storage; (2) continue to interpret chemical analyses of water from base wells to detect any changes in quality of ground water, and in particular, to detect any deterioration of quality due to return of sewage effluent, downward movement of water of inferior quality from the shallow water bodies, or migration of water of poor quality from local areas near the margins of the basins toward the base wells; and, as funds permit, to collect water samples periodically from key wells to supplement the base sampling program, ~~as funds permit~~; (3) continue as technical adviser on water-supply problems at Edwards Air Force Base; and (4) prepare a brief annual report incorporating the findings made during the continuing inventory, including a summary of ground-water pumpage, an estimate of ground water in storage, hydrographs and tabulations of water-level measurements, chemical analyses, and other basic data.

The work has been carried on by the Geological Survey, U.S. Department of the Interior, under the immediate supervision of Fred Kunkel, geologist in charge, Long Beach subdistrict office, and under the general supervision of H. D. Wilson, Jr., district engineer in charge of ground-water investigations in California.

A description of the well-numbering system is included in the Tables of Basic Data for Wells at Edwards Air Force Base, Appendix A (Dutcher and Hiltgen, 1953, p. 6) and the subsequent periodic reports.

Table 1.--Cross index of Bass and Geological Survey well numbers and use of wells

Bass number or name	Abbreviated Bass number 1/	USGS number	Basin and ground-water storage unit	Use
			Lanesater basin	
Main Base well 1	MB- 1	9/9 - 6Z1	Main Base (adjacent)	a
3	MB- 3	9/9-- 6Z3	Main Base (adjacent)	b
5	MB- 5	9/9 - 6A1	Main Base (adjacent)	a
6	MB- 6	9/10-12R1	Main Base (adjacent)	c
6A	MB- 6A	9/10-8H2	Main Base	a
7	MB- 7	9/9 -10C1	Main Base	a
8	MB- 8	9/10-8H1	Main Base	a
9	MB- 9	9/10-8H1	Main Base	a
11	MB-11	9/10-8H1	Main Base	a
Telemeter Station well 10	TS-10	9/10- 8P1	--	a
South Trench well A	ST-A	8/10- 2T1	Main Base	a
B	ST-B	8/10- 1T1	Main Base	b
Rest Camp well 1	RC-1	9/8 - 6N2	Rest Camp	a
2	RC-2	9/8-- 6N1	Rest Camp	a
			North Horse basin	
North Base well 1	NB-1	10/9- 7A1	North Horse	a
2	NB-2	10/9- 7A2	North Horse	a
3	NB-3	11/9-32Q1	North Horse	a
4	NB-4	10/9- 4Z2	North Horse	a
Test well 4	TW-4	10/9- 4Z1	North Horse	b
Graham Ranch well		9/10-16P1		d
		9/10-9H3		d
Red Barn well		9/10-9H1		d
		9/10-9H2		d

1. Symbol shown in text.
a. Supply well.
b. Unused well.
c. Recorder well.
d. Recreational well.

GROUND-WATER PUMPAGE

The metered pumpage for the base during 1960 totaled 4,600 acre-feet, and the monthly pumpage ranged from a January low of 33,375,000 gallons (171 acre-feet) to a July high of 194,252,000 gallons (550 acre-feet). Pumpage for all uses by the base during 1960, including both metered and estimated pumpage from unmetered wells, was approximately 5,400 acre-feet. Pumpage from the various ground-water basins and base storage units is shown in table 2 and on figure 2. Pumpage records

Figure 2. Pumpage at Edwards Air Force Base.

for irrigation and other uses outside the base during 1960 are not available.

Table 2.--Pumpage from base wells, 1960

Basin and well field	1960 [1]	
	1,000 gallons	acre-feet [2]
Lancaster basin		
Main Base wells 6, 7, 8, 9, & 11	960,000	2,950
Main Base wells 1 & 5	60,900	187
East Camp wells 1 & 2	226,000	694
Recreation wells [3]	250,000	767
Telemeter Station well 10	844	2.6
South Track well A	2,630	8.1
Subtotal	1,500,000	4,600
North Edwards basin		
North Base wells 1 & 2	1,210	3.7
North Base wells 3 & 4	260,000	798
Total	1,760,000	5,400

1. All values rounded to three significant figures.

2. One acre-foot equals 325,851 gallons.

3. Pumpage is estimated; the water is not used for base supply and the pumpage is not shown on figure 2.

WATER-LEVEL FLUCTUATIONS

The rate of decline in water level in well 11/9-3AA1 in the North Muroc storage unit appears to have been accelerated, beginning in the fall of 1959. This accelerated rate probably is due to the installation of a large pump in well 11/9-25L1 during March of 1960, and the pumping of wells 11/9-24R2 and 11/9-24Q1. Apparently, the pumping depression is not yet extensive in this area, because there had been no appreciable decline in the water level in well 11/9-36A1, as shown by the measurement of the level in the spring of 1961. The water levels in most of the other observation wells continued to decline during the period March 1960 to March 1961. In the East Camp area, declines ranged from 1.5 to 4.5 feet; in the Main Base storage unit, the declines ranged from 1.7 to 4.8 feet depending on the proximity of the observation well to the pumping wells in the main well field or to the wells in the Red Barn recreation area; and in the Rosamond storage unit the declines ranged from 0.6 to 4.5 feet, except for well 8/10-8R2 where the water level has risen about 2 feet since March 1960.

The water-level contour map (fig. 3) shows three pumping depressions

Figure 3. Map of Edwards Air Force Base and vicinity, California, showing geology, location of wells, ground-water storage units, and water-level contours for March 1961.

in the vicinity of Edwards Air Force Base. The largest is centered southeast of Rosamond dry lake at the corner of 60th and "F" Streets, the second depression is centered around well 9/10-24K1 in the Main Base well field, and the third is centered around well 11/9-14R1 in the North Muroc basin.

Seasonal fluctuations of water levels due to changes in pumping and large summer withdrawals range up to a maximum of 11 feet each year. The water level starts to decline in the early spring and continues to decline until about September, when it begins to recover (fig. 4).

Figure 4. Hydrographs of wells 10/9-12N1 and 9/10-34H1.

Each succeeding year, for the period of record, the highest annual water level has been lower than the high for the previous year. Similarly, the lowest annual water level also has been lower each succeeding year.

Table 3.--Records of water levels in wells, Edwards Air Force Base and vicinity

Records by U.S. Geological Survey. For uniformity in reference, footnotes are the same as those used in appendixes for the comprehensive report (Dutcher and Hiltgen, 1954 and 1955). Water levels are in feet below land-surface datum; depth of well and altitude are with reference to land-surface datum.

7/9-17R2. Depth 303.0 ft. Altitude about 2,492 ft. Records available: 1959-61. Dec. 8, 1959, 195.82; Mar. 1, 1960, 192.35; Nov. 15, 203.34; Feb. 27, 1961, 201.53.

7/10-6R1. Depth 403 ft. Altitude about 2,412 ft. Records available: 1951-54, 1956-61.

Date	Water level	Date	Water level	Date	Water level
Mar. 12, 1959	174.09	Mar. 1, 1960	179.70	Feb. 28, 1961	188.35
Dec. 8	179.35	Nov. 16	188.10		

7/10-5Y1. Depth 384 ft. Altitude about 2,392 ft. Records available: 1956-61. Mar. 12, 1959, 172.37; Mar. 1, 1960, 171.18; Nov. 16, 179.95.

7/10-5R3. Depth 980 ft. Altitude about 2,398 ft. Records available: 1945-47, 1951-53, 1956-60. Mar. 12, 1959, 187.34; Mar. 1, 1960, 194.35; Nov. 16, 204.20.

Table 3.—Records of water levels in wells, Edwards Air Force Base and vicinity—Continued

7/10-14Q1. Depth 350 ft. Altitude about 2,460 ft. Records available: 1950, 1959-61.

Date	Water level	Date	Water level	Date	Water level
Nov. 29, 1950	199.36	Dec. 8, 1959	236.20	Nov. 15, 1960	250.00
Mar. 12, 1959	224.95	Mar. 1, 1960	241.35	Feb. 27, 1961	245.62

7/10-17R1. Depth 400 ft. Altitude about 2,453 ft. Records available: 1957-61.

Date	Water level	Date	Water level	Date	Water level
Nov. 20, 1957	228.41	Mar. 12, 1959	e238.12	Nov. 16, 1960	239.05
Mar. 12, 1958	221.32	Dec. 8	232.46	Feb. 28, 1961	236.22
Nov. 6	229.18	Mar. 1, 1960	229.54		

7/10-31D1. Depth 365 ft. Altitude 2,505.3 ft. Records available: 1951-52, 1954, 1956-61.

Date	Water level	Date	Water level	Date	Water level
Mar. 23, 1951	213.33	Mar. 5, 1957	288.68	Dec. 8, 1959	297.40
Nov. 15	280.2	Nov. 14	288.87	Mar. 1, 1960	298.93
Mar. 5, 1952	221.13	Mar. 12, 1958	287.08	Nov. 16	290.96
Oct. 19, 1954	258.72	Nov. 6	294.10	Feb. 27, 1961	295.32
Oct. 15, 1956	287.20	Mar. 12, 1959	293.85		

See footnotes at end of table.

Table 3.--Records of water levels in wells, Edwards Air Force Base and vicinity--Continued

7/10-3k3l. Depth 333.0 ft. Altitude about 2,520 ft. Records available: 1960-61. Nov. 11, 1960, 299.05; Feb. 27, 1961, 299.13.

7/10-3k4l. Depth 270.0 ft. Altitude about 2,542 ft. Records available: 1958-60.

Date	Water level	Date	Water level	Date	Water level
Mar. 12, 1958	277.63	Mar. 12, 1959	280.52	Mar. 1, 1960	291.10
Nov. 6	280.34	Dec. 9	289.00	Nov. 15	Dry

7/11-1Q1. Depth unknown. Altitude about 2,305 ft. Records available: 1958-60. Dec. 8, 1959, 180.30; Mar. 1, 1960, 179.55; Nov. 16, 186.98.

7/11-6A1. Depth 130 ft. Altitude about 2,351 ft. Records available: 1951-53, 1956-61.

Mar. 9, 1959	76.08	Mar. 1, 1960	77.81	Feb. 28, 1961	78.80
Dec. 2	77.65	Nov. 11	78.32		

7/11-10R1. Depth 169.8 ft. Altitude about 2,394 ft. Records available: 1951-54, 1956-60.

Aug. 9, 1956	151.96	Nov. 14, 1957	153.61	Mar. 9, 1959	a169.69
Oct. 23	156.92	Mar. 11, 1958	150.30	Dec. 2	163.80
Mar. 8, 1957	149.68	Nov. 6	155.63	Mar. 1, 1960	153.93

See footnotes at end of table.

Table 3.--Records of water levels in wells, Edwards Air Force Base and vicinity--Continued

7/11-13G1. Depth 570 ft. Altitude about 2,434 ft. Records available: 1956-61.

Date	Water level	Date	Water level	Date	Water level
Oct. 23, 1956	227.82	Oct. 23, 1957	224.17	Nov. 6, 1958	225.24
Nov. 28	208.73	Nov. 14	211.92	Dec. 8, 1959	218.88
Feb. 28, 1957	206.34	Dec. 17	209.45	Nov. 16, 1960	224.96
July 16	e218.28				

7/11-19Q1. Depth 401 ft. Altitude about 2,418 ft. Records available: 1951-52, 1956-61.

Date	Water level	Date	Water level	Date	Water level
Oct. 17, 1951	177.69	Nov. 12, 1957	187.20	Dec. 2, 1959	e196.00
Nov. 14	178.27	Mar. 10, 1958	179.13	Mar. 1, 1960	178.72
Mar. 4, 1952	e157.98	Nov. 4	188.85	Nov. 11	196.75
Oct. 23, 1956	194.12	Mar. 9, 1959	188.54	Feb. 27, 1961	201.17
Mar. 8, 1957	183.41				

7/11-33M1. Depth unknown. Altitude about 2,473 ft. Records available: 1951, 1954, 1956-61.

Date	Water level	Date	Water level	Date	Water level
Oct. 21, 1954	233.49	Mar. 10, 1958	234.80	Dec. 9, 1959	251.96
Oct. 15, 1956	243.50	Nov. 4	250.20	Nov. 16, 1960	262.46
Mar. 8, 1957	237.55	Mar. 12, 1959	244.70	Feb. 27, 1961	258.24
Nov. 12	243.17				

See footnotes at end of table.

Table 3.--Records of water levels in wells, Edwards Air Force Base and vicinity--Continued

7/12-13Y1. Depth 752 ft. Altitude about 2,382 ft. Records available: 1958-61.

Date	Water level	Date	Water level	Date	Water level
Mar. 11, 1958	125.96	Dec. 9, 1959	136.74	Nov. 11, 1960	142.20
Nov. 6	134.80	Mar. 1, 1960	134.85	Feb. 28, 1961	142.10
Mar. 9, 1959	132.88				

7/12-15Y2. Depth 599.7 ft. Altitude about 2,354 ft. Records available: 1954, 1957-61.

Date	Water level	Date	Water level	Date	Water level
Oct. 20, 1954	e142.1	Mar. 10, 1958	103.46	Dec. 2, 1959	118.76
Mar. 8, 1957	102.03	Nov. 4	118.58	Mar. 1, 1960	108.52
Nov. 12	108.99	Mar. 9, 1959	121.00	Feb. 28, 1961	120.78

7/12-25Q1. Depth unknown. Altitude about 2,455 ft. Records available: 1951-52, 1957-61.

Date	Water level	Date	Water level	Date	Water level
Oct. 17, 1951	178.44	Nov. 6, 1958	200.75	Mar. 1, 1960	209.60
Nov. 14	178.48	Mar. 9, 1959	205.60	Nov. 11	214.60
Mar. 4, 1952	177.64	Dec. 2	210.05	Feb. 27, 1961	214.76

See footnotes at end of table.

Table 3.—Records of water levels in wells, Edwards Air Force Base and vicinity—Continued

7/12-6B2. Depth 407 ft. Altitude about 2,447 ft. Records available: 1954, 1956-60.

Date	Water level	Date	Water level	Date	Water level
Oct. 21, 1954	181.89	Nov. 22, 1957	194.58	Dec. 2, 1959	203.10
Oct. 25, 1956	193.01	Mar. 11, 1958	198.24	Mar. 1, 1960	200.00
Mar. 8, 1957	186.81	Nov. 6	199.17	Nov. 11	205.89

8/9-6D1. Depth about 700 ft. Altitude about 2,293 ft. Records available: 1959-61. Mar. 1, 1961, 29.91.

8/9-6P1. Depth 27 ft. Altitude 2,293.5 ft. Records available: 1948, 1950-58, 1959-61. Mar. 11, 1959, 15.19; Mar. 3, 1960, 16.2; Mar. 1, 1961, 16.65.

8/10-6P1. Depth 234.9 ft. Altitude about 2,310 ft. Records available: 1941-54, 1956-61. Nov. 16, 1960, 52.96; Mar. 1, 1961, 47.17.

8/10-4G1. Depth 91.4 ft. Altitude about 2,300 ft. Records available: 1950-54, 1956-61. Nov. 16, 1960, 65.43; Mar. 1, 1961, 59.99.

Table 3.—Records of water levels in wells, Edwards Air Force Base and vicinity—Continued

8/10-8N1. Depth 94.9 ft. Altitude about 2,316 ft. Records available: 1953-54, 1956-61.

Date	Water level	Date	Water level	Date	Water level
Mar. 12, 1959	79.68	Mar. 16, 1960	87.83	Mar. 1, 1961	98.89
Dec. 8	Dry	Nov. 16	Dry		

8/10-8N2. Depth 340 ft. Altitude about 2,316 ft. Records available: 1951-54, 1956-61. Nov. 16, 1960, 58.49; Mar. 1, 1961, 59.11.

8/10-8N3. Depth 250 ft. Altitude about 2,318 ft. Records available: 1947-49, 1951, 1954, 1956-61.

Jan. 19, 1960	53.94	July 5, 1960	55.56	Nov. 8, 1960	55.94
Feb. 26	54.28	Aug. 5	55.77	Dec. 12	55.91
Mar. 29	54.71	Sept. 8	56.04	Jan. 9, 1961	55.84
May 3	54.96	Oct. 12	56.11	Feb. 14	56.16
31	55.20				

8/10-9N1. Depth 250 ft. Altitude about 2,321 ft. Records available: 1951-54, 1956-61. Nov. 16, 1960, 50.15; Mar. 1, 1961, 50.60.

Table 3.--Records of water levels in wells, Edwards Air Force Base and vicinity--Continued

8/10-1kK1. Depth 250 ft. Altitude about 2,333 ft. Records available: 1956-61.

Date	Water level	Date	Water level	Date	Water level
Mar. 12, 1959	52.88	Mar. 4, 1960	55.14	Feb. 28, 1961	56.92
Dec. 8	57.70	Nov. 16	56.87		

8/10-1gM4. Depth 196.4 ft. Altitude about 2,338 ft. Records available: 1951-54, 1956-61.

Mar. 12, 1959	114.38	Mar. 4, 1960	118.85	Feb. 28, 1961	117.56
Dec. 8	111.99	Nov. 16	116.49		

8/10-1gQ1. Depth 690 ft. Altitude about 2,342 ft. Records available: 1939-42, 1944-48, 1950-54, 1958-61.

Mar. 12, 1959	93.56	Mar. 4, 1960	101.77	Feb. 28, 1961	102.97
Dec. 8	108.49	Nov. 15	106.43		

8/10-2gF1. Depth 250 ft. Altitude about 2,350 ft. Records available: 1951-54, 1956-61.

Mar. 12, 1959	85.95	Mar. 4, 1960	81.60	Feb. 28, 1961	84.68
Dec. 8	81.32	Nov. 16	84.15		

Table 3.--Records of water levels in wells, Edwards Air Force Base and vicinity--Continued

8/10-28R1. Depth 245 ft. Altitude about 2,358 ft. Records available: 1951-54, 1956-61.

Date	Water level	Date	Water level	Date	Water level
Mar. 12, 1959	99.63	Mar. 4, 1960	103.45	Feb. 28, 1961	107.87
Dec. 8	102.86	Nov. 16	106.62		

8/10-29P2. Depth 500 ft. Altitude about 2,364 ft. Records available: 1959-61. Dec. 8, 1959, 137.20; Nov. 15, 1960, 106.38; Mar. 1, 1961, 90.85.

8/11-13P2. Depth 156.8 ft. Altitude about 2,313 ft. Records available: 1958-61. Feb. 28, 1961, 70.45.

8/11-14R1. Depth 337.7 ft. Altitude about 2,312 ft. Records available: 1951-54, 1956-61.

Mar. 12, 1959	68.30	Mar. 4, 1960	70.78	Feb. 28, 1961	69.12
Dec. 8	68.61	Nov. 16	69.24		

8/11-14R2. Depth 205 ft. Altitude about 2,317 ft. Records available: 1952-54, 1956-61. Nov. 16, 1960, 97.30; Feb. 28, 1961, 98.05.

Table 3.--Records of water levels in wells, Edwards Air Force Base and vicinity--Continued

8/11-15Q1. Depth 179.2 ft. Altitude about 2,307 ft. Records available: 1952, 1954, 1958-61. Feb. 28, 1961, 90.85.

8/11-18L1. Depth 800+ ft. Altitude about 2,297 ft. Records available: 1951-52, 1958-61. Mar. 9, 1959, 3.19; Mar. 9, 1960, 4.27; Feb. 28, 1961, 5.29.

8/11-18Q1. Depth 268.2 ft. Altitude about 2,298 ft. Records available: 1951-52, 1958-61. Feb. 28, 1961, 66.42.

8/11-22R3. Depth 144.2 ft. Altitude about 2,317 ft. Records available: 1937, 1939-54, 1956-61.

Date	Water level	Date	Water level	Date	Water level
Mar. 12, 1959	104.54	Mar. 4, 1960	a106.68	Feb. 28, 1961	108.64
Dec. 8	a107.90	Nov. 16	109.73		

8/11-23R2. Depth 293.2 ft. Altitude about 2,331 ft. Records available: 1951-54, 1956-61. Dec. 8, 1959, 120.63; Mar. 4, 1960, a131.70; Nov. 16, 127.57; Feb. 28, 1961, 134.51.

8/11-27N2. Depth unknown. Altitude about 2,341 ft. Records available: 1951, 1960-61. Sept. 21, 1951, 160.4; Mar. 4, 1960, 156.6; Nov. 16, 162.08; Feb. 28, 1961, a175.09.

See footnotes at end of table.

Table 3.--Records of water levels in wells, Edwards Air Force Base and vicinity--Continued

8/11-30D2. Depth 200 ft. Altitude about 2,321 ft. Records available: 1951, 1959-61.

Date	Water level	Date	Water level	Date	Water level
May 1, 1951	35.85	Dec. 2, 1959	49.50	Nov. 17, 1960	50.80
Mar. 9, 1959	48.56	Mar. 1, 1960	49.69	Feb. 28, 1961	51.07

8/11-34D2. Depth 250.5 ft. Altitude about 2,340 ft. Records available: 1951-53, 1956-61.

Mar. 12, 1959	a155.87	Mar. 3, 1960	a153.65	Feb. 28, 1961	151.56
Dec. 8	148.77	Nov. 16	e153.10		

8/11-34N2. Depth unknown. Altitude about 2,358 ft. Records available: 1951-52, 1956-61.

Mar. 12, 1959	177.84	Mar. 4, 1960	175.27	Feb. 28, 1961	178.19
Dec. 8	171.05	Nov. 16	173.19		

8/12-6Q1. Depth 260 ft. Altitude about 2,283 ft. Records available: 1951-54, 1956-61. Nov. 17, 1960, 24.26; Feb. 28, 1961, 18.99.

See footnotes at end of table.

Table 3.--Records of water levels in wells, Edwards Air Force Base and vicinity--Continued

8/12-11N2. Depth 437 ft. Altitude about 2,282 ft. Records available: 1952, 1957-61. Nov. 17, 1960, 44.45.

8/12-14N1. Depth 187.7 ft. Altitude about 2,291 ft. Records available: 1951-52, 1958-61. Feb. 28, 1961, 37.58.

8/12-20N2. Depth 287.2 ft. Altitude 2,317.5 ft. Records available: 1951-53, 1956-61.

Date	Water level	Date	Water level	Date	Water level
Oct. 17, 1956	37.10	Mar. 10, 1958	41.27	Mar. 9, 1960	44.30
Mar. 8, 1957	38.78	Nov. 4	39.32	Nov. 17	39.23
Nov. 18	38.69	Mar. 9, 1959	42.48	Feb. 28, 1961	48.11

8/12-22N1. Depth 298.5 ft. Altitude about 2,302 ft. Records available: 1943-54, 1956-61.

Mar. 9, 1959	21.62	Mar. 9, 1960	23.00	Feb. 28, 1961	26.23
Nov. 3	30.98	Nov. 17	37.52		

Table 3.--Records of water levels in wells, Edwards Air Force Base and vicinity--Continued

8/12-30K1. Depth unknown. Altitude about 2,324 ft. Records available: 1951, 1956-61.

Date	Water level	Date	Water level	Date	Water level
Oct. 23, 1956	72.05	Nov. 4, 1958	71.24	Mar. 1, 1960	61.69
Mar. 8, 1957	58.76	Mar. 9, 1959	57.62	Nov. 17	76.54
Nov. 12	67.51	Dec. 9	71.76	Feb. 28, 1961	67.67
Mar. 10, 1958	55.18				

9/8-6K1 (EC-2). Depth 467 ft. Altitude about 2,357 ft. Records available: 1951-54, 1956-61. Nov. 16, 1960, 131.65; Mar. 1, 1961, 131.06.

9/8-18P1. Depth 419.4 ft. Altitude 2,357.2 ft. Records available: 1948, 1951-53, 1961. Feb. 28, 1961, 141.52.

9/9-8K1. Depth 122.8 ft. Altitude 2,274.8 ft. Records available: 1948, 1951-53, 1956-61. Nov. 16, 1960, 25.28; Mar. 1, 1961, 25.35.

9/9-8K2 (EC-3). Depth 103.7 ft. Altitude 2,290.2 ft. Records available: 1948, 1951-53, 1956-61.

Mar. 11, 1959	42.92	Dec. 3, 1959	43.26	Nov. 17, 1960	43.03
Apr. 9	42.87	Mar. 3, 1960	43.03	Mar. 1, 1961	43.52

Table 3.--Records of water levels in wells, Edwards Air Force Base and vicinity--Continued

9/9-10R1. Depth 106.0 ft. Altitude about 2,280 ft. Records available: 1951-53, 1958-61. Feb. 28, 1961, 33.55.

9/9-12P1. Depth unknown. Altitude 2,288.8 ft. Records available: 1951-53, 1958-61. Feb. 28, 1961, 36.04.

9/9-12Q1. Depth 93.2 ft. Altitude 2,346.0 ft. Records available: 1951, 1958-61. Feb. 28, 1961, Dry.

9/9-14M1 (formerly 9/9-14-1). Depth unknown. Altitude 2,330.0 ft. Records available: 1958-61. Feb. 28, 1961, 80.39.

9/9-16P1. Depth unknown. Altitude 2,353.3 ft. Records available: 1958-61. Nov. 16, 1960, 100.46; Feb. 28, 1961, 100.93.

9/9-17M2. Depth 200 ft. Altitude about 2,280 ft. Records available: 1957-61. Nov. 16, 1960, 30.00; Mar. 1, 1961, 30.10.

9/10-12N1 (NB-6). Depth 186.6 ft. Altitude 2,280.0 ft. Records available: 1948, 1951-54, 1956-61.

Date	Water level	Date	Water level	Date	Water level
Jan. 19, 1960	36.28	July 5, 1960	43.83	Nov. 8, 1960	42.00
Feb. 26	36.48	Aug. 5	44.20	Dec. 12	39.18
Mar. 29	39.41	Sept. 8	43.79	Jan. 9, 1961	38.32
May 3	40.59	Oct. 12	42.87	Feb. 14	38.45
31	42.94				

Table 3.--Records of water levels in wells, Edwards Air Force Base and vicinity--Continued

9/10-16C1. Depth 130.2 ft. Altitude about 2,333 ft. Records available: 1952-54, 1957-61.

Date	Water level	Date	Water level	Date	Water level
Mar. 11, 1959	57.33	Mar. 3, 1960	59.23	Nov. 17, 1960	60.16
Dec. 3	58.62	Oct. 13	60.02	Mar. 1, 1961	60.62

9/10-16C2. Depth 206.4 ft. Altitude about 2,328 ft. Records available: 1951-54, 1956-61.

Mar. 11, 1959	81.03	Mar. 3, 1960	82.21	Nov. 17, 1960	83.43
Dec. 3	81.72	Oct. 13	82.05	Mar. 1, 1961	82.55

9/10-16D1. Depth 140.7 ft. Altitude about 2,325 ft. Records available: 1951-54, 1956-61.

Mar. 11, 1959	88.12	Mar. 3, 1960	87.59	Mar. 1, 1961	88.88
Dec. 3	87.76	Nov. 17	89.05		

9/10-16H1. Depth 396 ft. Altitude about 2,325 ft. Records available: 1954, 1956-60. Mar. 11, 1959, 89.88; Dec. 3, 89.99; Mar. 3, 1960, 89.39; Nov. 17, 90.80.

Table 3.--Records of water levels in wells, Edwards Air Force Base and vicinity--Continued

9/10-16P1. Depth about 532 ft. Altitude about 2,322 ft. Records available: 1950-54, 1956-61.

Date	Water level	Date	Water level	Date	Water level
Mar. 11, 1959	82.39	Mar. 3, 1960	87.35	Mar. 1, 1961	83.18
Dec. 3	82.56	Nov. 17	85.12		

9/10-8R2. Depth 109.0 ft. Altitude about 2,285 ft. Records available: 1959-61. Nov. 17, 1960, 49.78; Feb. 28, 1961, 48.35.

9/10-8K1 (KB-9). Depth 730 ft. Altitude about 2,285 ft. Records available: 1950-53, 1956, 1960. Nov. 17, 1960, 69.88.

9/10-8K2 (KB-11). Depth 700.0 ft. Altitude about 2,280 ft. Records available: 1958-61.

Mar. 12, 1958	89.38	Nov. 5, 1958	40.82	Nov. 17, 1960	82.93
May 15	281.80	Dec. 15, 1959	90.25	Mar. 1, 1961	e56.78

9/10-8N1 (KB-6A). Depth 530 ft. Altitude 2,281.2 ft. Records available: 1951-52, 1956-60. Dec. 15, 1959, 49.69; Nov. 17, 1960, 258.20

See footnotes at end of table.

Table 3.--Records of water levels in wells, Edwards Air Force Base and vicinity--Continued

9/10-8N21 (WB-8). Depth 750 ft. Altitude about 2,280 ft. Records available: 1951-52, 1956-59, 1961. Mar. 1, 1961, 49.54.

9/10-8N22. Depth 127.4 ft. Altitude about 2,273 ft. Records available: 1951-52, 1956-61. Nov. 17, 1960, 42.54; Mar. 1, 1961, 40.34.

9/10-8N72. Depth 140.8 ft. Altitude about 2,300 ft. Records available: 1957-61. Nov. 17, 1960, 53.70; Feb. 28, 1961, 53.98.

9/10-9N1. Depth 54.1 ft. Altitude about 2,290 ft. Records available: 1956-61. Feb. 28, 1961, 54.43.

9/10-9N21. Depth 268 ft. Altitude about 2,285 ft. Records available: 1952, 1956-61. Nov. 17, 1960, 51.91; Feb. 28, 1961, 48.36.

9/10-9N22. Depth 198 ft. Altitude about 2,285 ft. Records available: 1951-52, 1957-61.

Date	Water level	Date	Water level	Date	Water level
Jan. 19, 1960	30.17	July 5, 1960	36.98	Nov. 8, 1960	37.79
Feb. 26	29.75	Aug. 5	37.87	Dec. 12	35.91
Mar. 29	31.19	Sept. 8	38.23	Jan. 9, 1961	33.61
May 3	33.80	Oct. 12	39.19	Feb. 14	32.88
31	35.89				

Table 3.—Records of water levels in wells, Edwards Air Force Base and vicinity—Continued

9/11-9G1. Depth unknown. Altitude about 2,290 ft. Records available: 1951-54, 1956-61. Nov. 17, 1960, 53.03; Feb. 28, 1961, 51.63.

9/12-8N3. Depth 107.2 ft. Altitude about 2,350 ft. Records available: 1951-54, 1956-61.

Date	Water level	Date	Water level	Date	Water level
Nov. 9, 1959	72.89	Nov. 8, 1960	75.71	Feb. 28, 1961	79.66
Dec. 3	76.58	Nov. 10	80.80		

9/12-8P1. Depth 266.7 ft. Altitude about 2,294 ft. Records available: 1951-54, 1956-61.

Nov. 9, 1959	25.96	Dec. 3, 1959	29.99	Nov. 17, 1960	32.00
Apr. 8	25.98	Nov. 3, 1960	28.17	Feb. 28, 1961	30.64

9/12-8Q1. Depth 150 ft. Altitude about 2,296 ft. Records available: 1951, 1956-61. Nov. 16, 1960, 26.44; Feb. 28, 1961, 25.63.

9/12-9M1. Depth unknown. Altitude about 2,360 ft. Records available: 1951, 1957-61.

Nov. 19, 1957	86.49	Nov. 9, 1959	86.63	Nov. 17, 1960	96.57
Nov. 10, 1958	84.35	Dec. 3	98.67	Feb. 28, 1961	Dry
Nov. 4	89.67	Nov. 8, 1960	90.90		

Table 3.--Records of water levels in wells, Edwards Air Force Base and vicinity--Continued

9/12-31K1. Depth 300 ft. Altitude about 2,347 ft. Records available: 1951-54, 1956-61.

Date	Water level	Date	Water level	Date	Water level
Oct. 18, 1956	106.48	Nov. 4, 1958	100.19	Mar. 2, 1960	88.05
Mar. 8, 1957	75.57	Mar. 9, 1959	84.18	Nov. 17	104.27
Mar. 10, 1958	78.30	Dec. 3	99.77	Feb. 28, 1961	94.37

9/12-32K1. Depth 171.5 ft. Altitude about 2,295 ft. Records available: 1954, 1956-61.

Mar. 9, 1959	18.52	Mar. 1, 1960	20.38	Feb. 28, 1961	22.68
Dec. 3	22.69	Nov. 17	22.32		

10/9-4N2. Depth 500.0 ft. Altitude 2,307 ft. Records available: 1957-61.

Jan. 13, 1959	95.83	Nov. 18, 1959	95.42	Aug. 5, 1960	100.62
Feb. 10	95.85	Dec. 15	95.37	Sept. 8	101.33
Mar. 11	95.82	Jan. 19, 1960	95.43	Oct. 12	101.51
Apr. 9	95.84	Feb. 26	95.44	Nov. 8	98.03
May 5	95.85	Mar. 29	95.47	Dec. 12	100.37
15	95.87	May 9	96.05	Jan. 9, 1961	96.37
July 8	95.81	31	96.39	Feb. 14	96.48
Aug. 4	96.32	July 5	97.30		

Table 3.--Records of water levels in wells, Edwards Air Force Base and vicinity--Continued

10/9-7A2 (EB-2). Depth about 200 ft. Altitude about 2,276.9 ft. Records available: 1948, 1951-52, 1956-61.

Date	Water level	Date	Water level	Date	Water level
Mar. 11, 1959	66.02	Mar. 3, 1960	66.20	Mar. 1, 1961	66.95
Dec. 4	67.13	Nov. 17	66.69		

10/9-8AA2. Depth unknown. Altitude about 2,292 ft. Records available: 1954, 1956-61.

Mar. 11, 1959	72.58	Mar. 3, 1960	72.74	Mar. 1, 1961	72.90
Dec. 4	72.74	Nov. 16	72.82		

10/9-31C1. Depth 146.8 ft. Altitude about 2,250 ft. Records available: 1951-52, 1957-61.

Mar. 11, 1959	40.00	Mar. 3, 1960	39.90	Mar. 1, 1961	39.93
Dec. 9	38.96	Nov. 17	39.98		

10/9-36D1. Depth 93.5 ft. Altitude 2,282.4 ft. Records available: 1951-54, 1956-61. Nov. 16, 1960, 39.21; Mar. 1, 1961, 39.73.

11/8-2CN1. D. W. Swanson. Depth 213.9 ft. Altitude about 2,380 ft. Records available: 1951-53, 1958-61. Mar. 1, 1961, 167.27

Table 3.--Records of water levels in wells, Edwards Air Force Base and vicinity--Continued

11/8-29N1. U.S. Borax and Chemical Corp., well 41. Depth 495 ft. Altitude 2,355 ft. Records available: 1958-61. Mar. 1, 1961, 140.61.

11/8-32N1. Depth 156.0 ft. Altitude about 2,340 ft. Records available: 1951-54, 1956-61. Nov. 16, 1960, 129.44; Mar. 1, 1961, 129.51.

11/8-35D1. Depth 606 ft. Altitude about 2,380 ft. Records available: 1958-60. Mar. 11, 1959, 174.11; Mar. 3, 1960, 174.27.

11/9-17N1 (formerly 17N1). Depth 184.6 ft. Altitude about 2,324 ft. Records available: 1951-61. Nov. 16, 1960, 131.98; Mar. 1, 1961, 132.08.

11/9-24N1. U.S. Borax and Chemical Corp. Depth 150.4 ft. Altitude 2,343.6 ft. Records available: 1952-53, 1958-61. Mar. 1, 1961, a139.86.

11/9-26C1. Harry Levy. Depth 186.9 ft. Altitude about 2,305 ft. Records available: 1958-61. Mar. 1, 1961, 88.49.

11/9-30N1. W. MacClanaghan. Depth 270 ft. Altitude about 2,310 ft. Records available: 1958-61. Mar. 1, 1961, 94.08.

11/9-30N1 (formerly 31N1). Depth 200 ft. Altitude about 2,328 ft. Records available: 1951-52, 1956-61. Nov. 16, 1960, 116.45; Mar. 1, 1961, 116.77.

See footnotes at end of table.

Table 3.--Records of water levels in wells, Edwards Air Force Base and vicinity--Continued

11/9-3M1. Depth 193.5 ft. Altitude about 2,303 ft. Records available: 1951-52, 1955-61. Nov. 16, 1960, 102.60; Mar. 1, 1961, 104.93.

11/9-36A1. U.S. Borax and Chemical Corp., well 28. Depth 610 ft. Altitude 2,323.6 ft. Records available: 1956, 1959-61. Mar. 1, 1961, 114.37.

11/9-36D1. Depth 298 ft. Altitude about 2,315 ft. Records available: 1954, 1956, 1958-61. Mar. 1, 1961, 99.13.

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a. Nearby well being pumped.

b. Well being pumped.

c. Well pumped recently.

GROUND WATER IN STORAGE 1960 AND 1961

The quantity of ground water in storage in 1952 in the ground-water storage units of Edwards Air Force Base (fig. 3) was estimated in the appraisal report by Dutcher and Worts (1958, p. 201). Dutcher (1959, p. 47) estimated the depletion of ground water in storage during the period 1952-58. Mayle (1960, p. 26) estimated the depletion of ground water in storage during the period March 1959 through March 1960. Table 4 shows the estimate of depletion by years for the period 1952 to March 1961.

The estimated depletion of ground water, between March 1960 and March 1961, is about 14,600 acre-feet (table 4) in the East Camp, Main Base, Rosamond, and North Muroc storage units. As shown by table 4, the quantity of depletion during 1960-61 for the East Camp and Main Base storage units was about the same as that for the 1959-60 depletion. However, for the Rosamond storage unit ~~storage decrement~~ depletion was only 2,500 acre-feet during 1960-61 compared to a ~~decrease~~ depletion of 4,000 acre-feet during the 1959-60 period. In the North Muroc storage unit ~~storage decrement~~ depletion was 4,000 acre-feet during 1960-61 compared to a ~~decrease~~ depletion of 1,000 acre-feet in the 1959-60 period.

The total depletion for 1952-61, as shown by table 4 and figure 5,

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Figure 5. Estimated total depletion of ground water in storage in East Camp, Main Base, and Rosamond, ~~and North Muroc~~ storage units.

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is about 84,400 acre-feet and is reflected by an average water-level decline of about 23 feet for the 10-year period.

Table 4.—Status of ground water in storage, Biggs Air Force Base, 1952-61

Basin and storage unit [1]	Estimated ground water in storage in 1952 [1] (acre-feet)	Estimated ground-water depletion, in acre-feet [2]					
		1956-57 [3]	1957-58 [4]	1958-59 [5]	1959-60 [5]	1960-61	Total 1952-61
Lanmaster basin:							
East Camp	310,000	11,000	8,600	8,800	4,300	4,100	84,800
Main Base	440,000	17,000	8,400	4,100	3,600	4,000	31,100
Reserved	350,000	11,000	3,900	3,900	4,000	8,500	81,300
Subtotal	1,100,000	39,000	6,900	8,800	11,900	10,600	76,600
North Mesa basin:							
North Mesa	450,000	1,000	1,000	1,000	1,000	4,000	8,000
Total	1,600,000	40,000	7,900	9,800	12,900	14,600	84,600

1. Storage units and estimates of ground water in storage from Dutcher and Worts (1958, pl. 12 and table 10).
2. Estimates were made from water-level measurements obtained in the spring of the year.
3. Estimate of depletion from Dutcher (1958, p. 40).
4. Estimate of depletion from Dutcher (1959, p. 47).
5. Estimate of depletion from Moyle (1960, p. 21).
a. Approximately 70 percent within base.
b. See point plot on figure 5.

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QUALITY OF WATER

Water samples have been collected periodically from base wells for chemical analysis (table 5). The analyses provide an indication of changes in the quality of water that might be the result of treated sewage effluent returning to the ground water, downward movement of water of inferior quality from shallow water bodies, or migration of water from adjacent local areas of inferior quality.

Records of chemical analyses made prior to 1960 are tabulated in reports by Dutcher and Hiltgen (1954, table 5B, p. 106-115, and 1955, table 5A, p. 71-84), Dutcher and Worts (1958, table 9, p. 189), Dutcher (1959, table 8, p. 52-56), and Moyle (1960, table 6, p. 29-31).

The one significant change in chemical quality of water from the base-supply wells during 1960 was in well 10/9-7A2 (MB-2). This change was an increase in the chloride content from 420 ppm (parts per million) in 1959 to 595 ppm on September 8, 1960 (table 5 and fig. 6). This

Figure 6. Graph showing chloride content of well waters.

increase of 175 ppm of chloride during a 1-year period prompted the collection of additional samples on April 27, 1961, from wells 10/9-7A1 and 10/9-7A2. The analyses of water from well 10/9-7A2 showed that the chloride content had increased further to 1,020 ppm, which is a total increase of 425 ppm between 1959 and 1960. It is the highest chloride content determined for any supply well on the base. This chloride content is considerably greater than the 250 ppm that is the recommended maximum limit for use on interstate carriers (U.S. Public Health Service, 1946, p. 383).

On the other hand, well 10/9-7A1 has shown a decrease in chloride content of about 80 ppm in the past 2 years. Its chloride content has been about 250 ppm or less for the period of record (fig. 6).

Table 5.--Chemical analyses of waters from wells

Analysis by: DWR California Department of Water Resources, GS U.S. Geological Survey.

Well number	9/8-6R1	9/8-6R2	9/9-6L1
Date of collection	8-11-60	9-8-60	9-8-60
Constituents in parts per million			
Silica (SiO_2)	29	-	-
Iron (Fe)	-	-	-
Calcium (Ca)	23	29	45
Magnesium (Mg)	13	13	9.4
Sodium (Na)	212	210	73
Potassium (K)	1.7	1.6	1.2
Bicarbonate (HCO_3)	385	314	149
Carbonate (CO_3)	0	0	0
Sulfate (SO_4)	146	a130	a93
Chloride (Cl)	112	135	66
Fluoride (F)	5.5	-	-
Nitrate (NO_3)	7.3	-	-
Boron (B)	.97	-	-
Dissolved solids			
Calculated	700	674	361
Residue on evaporation at 180°C	664	-	-
Hardness as $CaCO_3$	110	124	151
Percent sodium	80	78	51
Specific conductance (micromhos at 25°C)	1,150	1,240	652
pH	8.1	7.5	7.3
Temperature (°F)	-	-	-
Depth of well	467	354	147
Laboratory	DWR	GS	GS
Laboratory number	2-529	34815	34816

See footnotes at end of table.

Table 5.--Chemical analyses of waters from wells--Continued

Well number	9/10-8A1	10/9-4B2		10/9-7A1	
Date of collection	9-8-60	8-11-60	9-8-60	9-8-60	4-27-61
Constituents in parts per million					
Silica (SiO_2)	-	21	26	-	-
Iron (Fe)	-	-	.01	-	-
Calcium (Ca)	34	5.6	5.6	10	-
Magnesium (Mg)	3.2	1.7	.7	2.7	-
Sodium (Na)	61	109	114	230	
Potassium (K)	2.3	.6	.8	1.2	-
Bicarbonate (HCO_3)	140	186	206	310	-
Carbonate (CO_3)	0	6	0	0	-
Sulfate (SO_4)	68	67	69	-	-
Chloride (Cl)	34	21	20	208	174
Fluoride (F)	-	1.4	1.0	-	-
Nitrate (NO_3)	-	1.3	.6	-	-
Boron (B)	-	.34	.2	-	-
Dissolved solids					
Calculated	272	327	339	605	-
Residue on evaporation at 180°C	-	410	368	-	-
Hardness as $CaCO_3$	98	21	17	36	-
Percent sodium	57	92	93	93	-
Specific conductance (micromhos at 25°C)	462	534	518	1,220	1,200
pH	7.1	8.5	7.6	7.7	-
Temperature (°F)	-	-	-	-	67
Depth of well	750	500	500	200	200
Laboratory	GS	DWR	GS	GS	GS
Laboratory number	34814	L-532	34807	34812	36835

See footnotes at end of table.

Table 5.--Chemical analyses of waters from wells--Continued

Well number	10/9-7A2		11/9-32Q1	
Date of collection	9-8-60	4-27-61	8-11-60[2]	9-8-60
Constituents in parts per million				
Silica (SiO_2)	-	-	27	29
Iron (Fe)	-	-	-	.03
Calcium (Ca)	43	-	9	12
Magnesium (Mg)	14	-	4.0	2.2
Sodium (Na)	426	-	140	151
Potassium (K)	3.0	-	2.1	1.4
Bicarbonate (HCO_3)	266	-	213	229
Carbonate (CO_3)	0	-	0	0
Sulfate (SO_4)	438	-	75	87
Chloride (Cl)	595	1,020	65	62
Fluoride (F)	-	-	1.4	1.0
Nitrate (NO_3)	-	-	.7	.4
Boron (B)	-	-	.54	.3
Dissolved solids				
Calculated	1,850	-	434	459
Residue on evaporation at 180°C	-	-	394	493
Hardness as $CaCO_3$	166	-	39	39
Percent sodium	84	-	88	89
Specific conductance (micromhos at 25°C)	2,690	3,690	746	734
pH	7.3	-	8.4	7.7
Temperature (°F)	-	68	-	-
Depth of well	200	200	450	450
Laboratory	GS	GS	DWR	GS
Laboratory number	34813	36836	1-530	34808

a. Calculated

PUMPING TEST OF WELL 9/10-8P1

At the request of the Air Installations Officer, the Geological Survey made a pumping test (fig. 7) on well 9/10-8P1 (Telemeter well 10)

Figure 7. Pumping test for well 9/10-8P1.

to determine whether it would be possible to pump 10,000 gallons per day from this well, or to sustain a continuous pumping rate of about 7 gpm (gallons per minute).

Well 9/10-8P1 has a 6-inch casing, is 137 feet deep, reportedly is bottomed in consolidated rock, and is equipped with a 5-horsepower pump, set at 124 feet. The static water level is about 90 feet below the land surface. During the test, the well discharged 1,270 gallons in 161 minutes, which is approximately 8 gpm. The pump broke suction about 4 hours after the test was started.

Analysis of the test data indicates that the ability of the deposits to yield water to the well is very low and the well is not capable of yielding the desired 10,000 gallons per day.

Using a cyclic method of repeated drawdown and recovery curves (fig. 7), a safe pumping rate has been derived to let the well pump as much water as possible without pumping air. This cyclic method would permit alternate pumping of the well for 3½ hours and allowing the water level to recover for 3 hours. Thus, in a 24-hour period, almost four pumping and recovery cycles could be made, and the amount pumped would be about 6,600 gallons.

If more water is required, consideration should be given to using well 9/10-16C2, about 4,800 feet southeast of well 9/10-8P1. It should be tested to determine the yield and drawdown. This well probably would yield the total amount of water required. Well 9/10-16C2 is 207 feet deep, has a 12-inch casing, and a static water level of about 82 feet below land surface.

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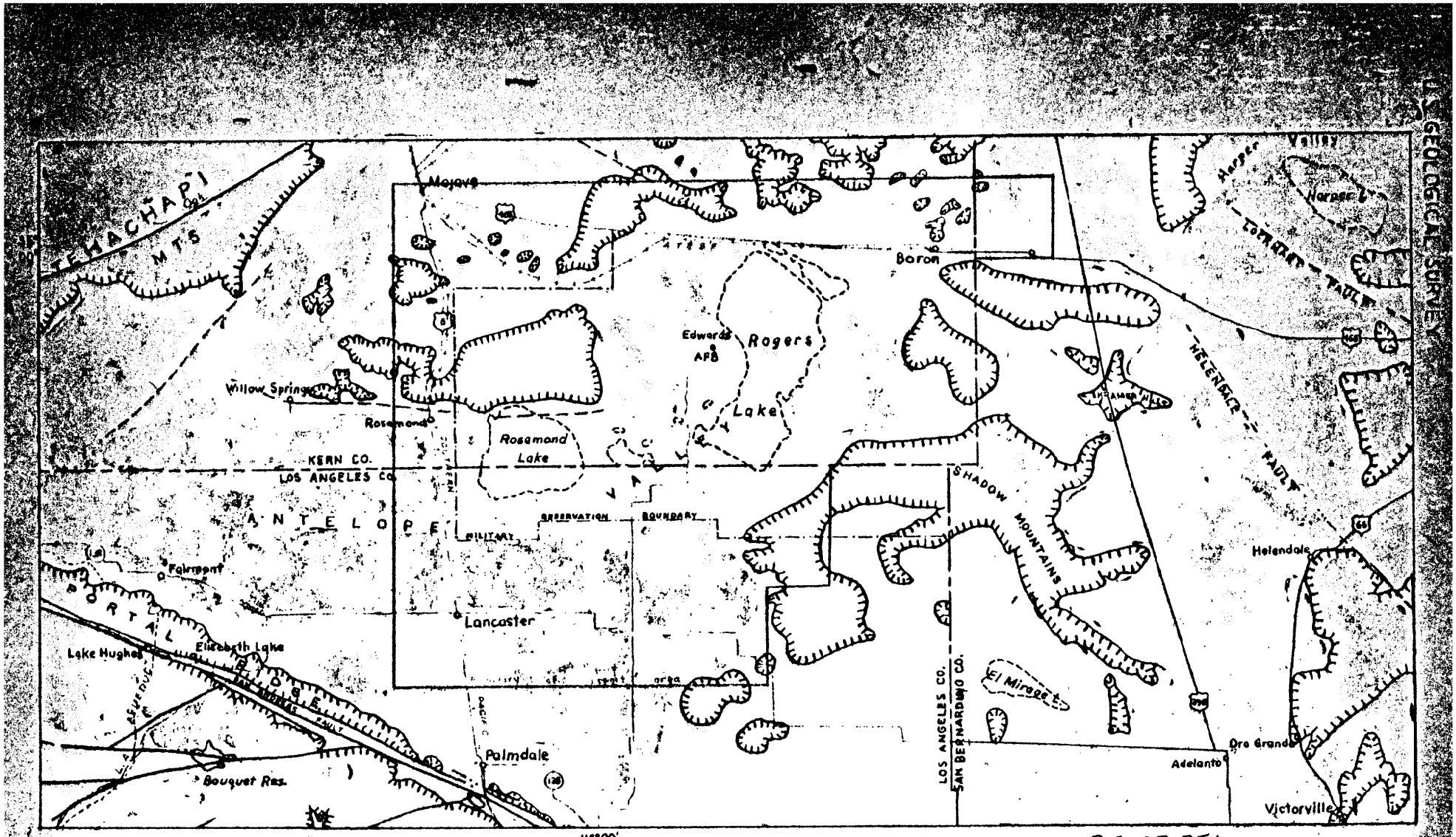


MAP OF PART OF SOUTHERN CALIFORNIA SHOWING AREA ~~COVERED~~ DESCRIBED IN ~~BY~~ THIS REPORT

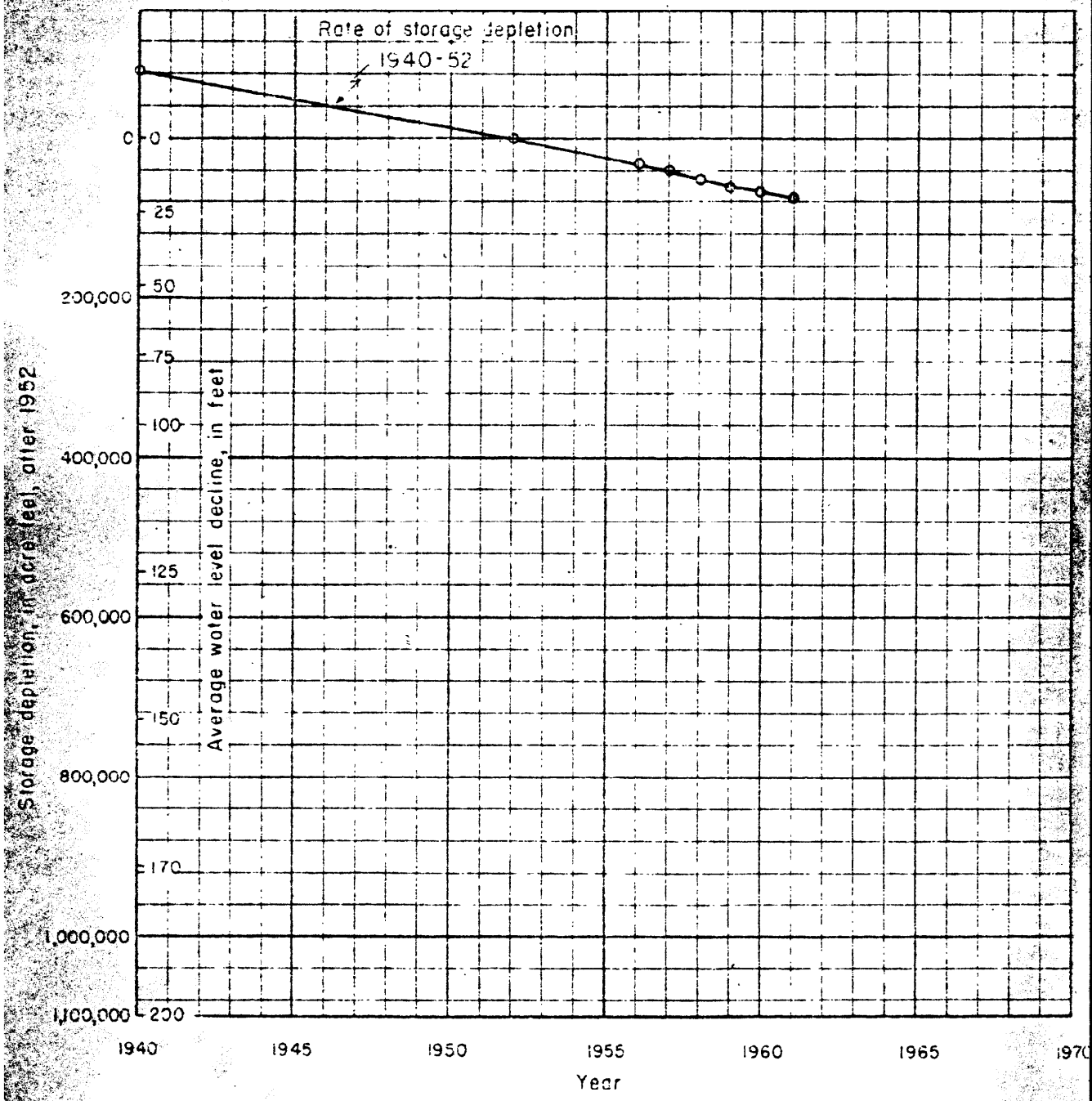
Base map and fault pattern largely after geologic map of California (Jenkins, 1938)

0 8 16 miles
Scale 1 inch = 8 miles

Valley area
Mountain area
Fault
Dashed where inferred

FIGURE 1

HYDROGRAPHS OF WELLS 10/9-12R1 AND 9/10-34H1



ESTIMATED TOTAL DEPLETION OF GROUND WATER IN STORAGE IN EAST CAMP, MAIN BASE, AND ROSAMOND STORAGE UNITS

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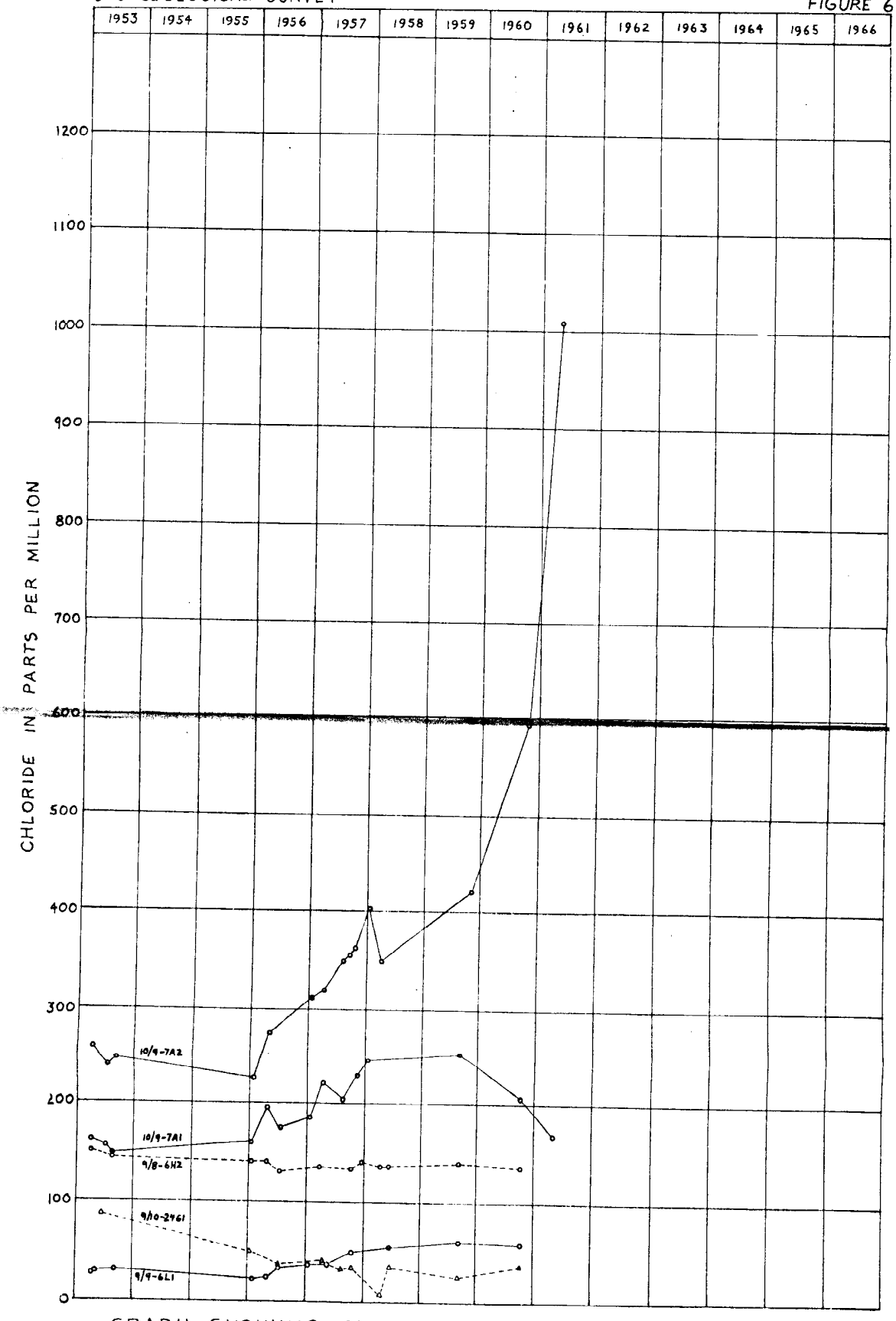
U. S. GEOLOGICAL SURVEY

FIGURE 6

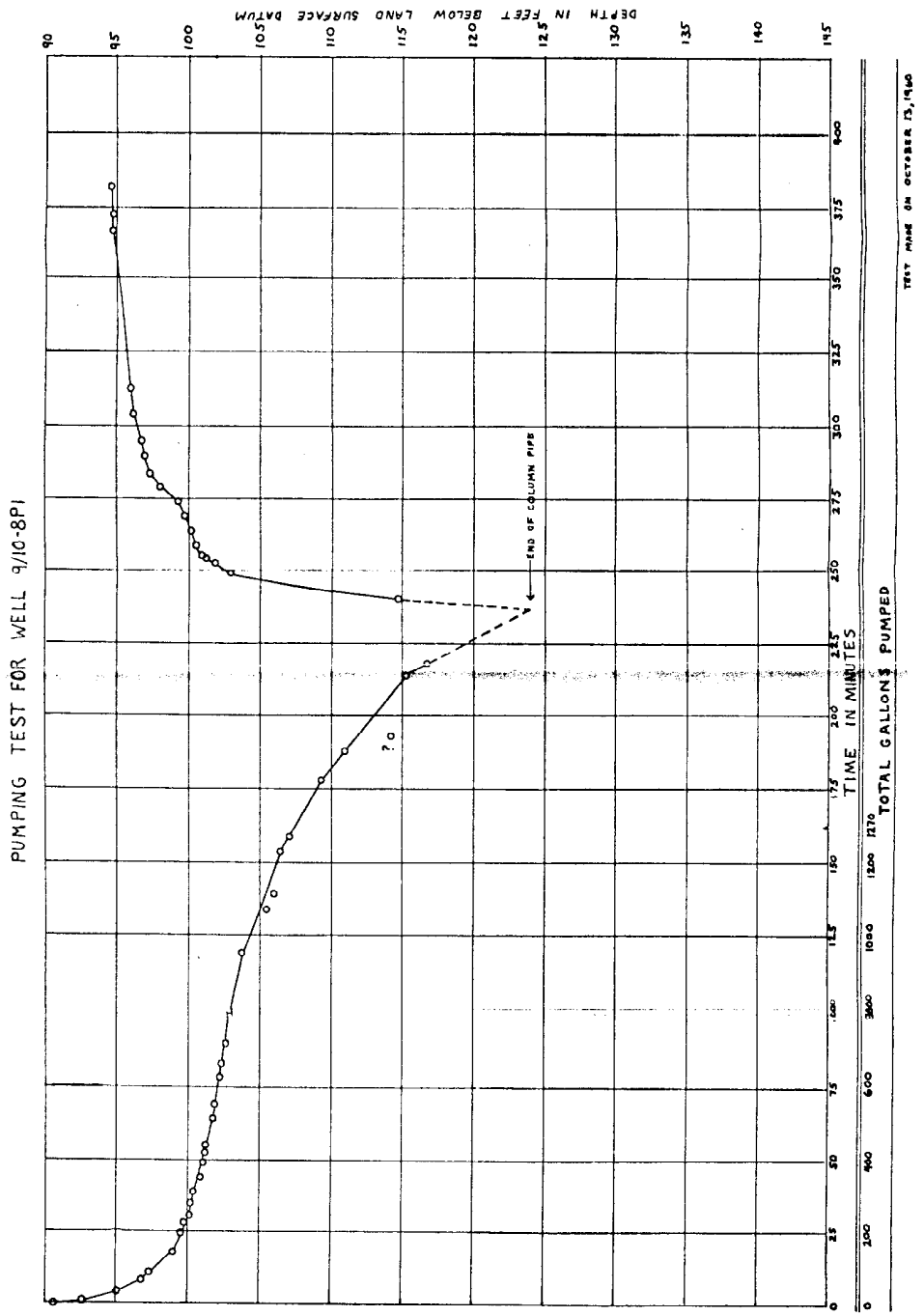


GRAPH SHOWING CHLORIDE CONTENT OF WELL WATERS

PWS-0081-0051

61-108

FIGURE 7



U.S. GEOLOGICAL SURVEY