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TEXAS BOARD OF WATER ENGINEERS

Durwood Manford, Chairman
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O. F. Dent, Member

BULLETIN 6010

GEOLOGY AND GROUND-WATER RESOURCES OF HALE COUNTY, TEXAS

Prepared in cooperation with the Geological Survey
United States Department of the Interior
and Hale County

November 1960

FOREWORD

This report was prepared by the United States Geological Survey. During the preparation of the report for publication, the staff of the Survey and of the Board of Water Engineers were in frequent contact in order to assure a coverage and treatment that would be acceptable to both agencies. Editorial revisions of the text and illustrations were made by the staff of the Board of Water Engineers in reviewing and preparing the report for final publication.

All reports published as bulletins of the Board of Water Engineers are intended to aid those interested in the State's water resources so that through the information available in these bulletins the maximum benefit from and utilization of these resources can be attained.

TEXAS BOARD OF WATER ENGINEERS

O. F. Dent, Acting Chairman
November 17, 1960

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GEOLOGY AND GROUND-WATER RESOURCES OF HALE COUNTY, TEXAS

ABSTRACT

Hale County, in the southern High Plains of Texas, has an area of 1,033 square miles. The land surface is one of low relief, the regional slope being about 10 feet per mile toward the southeast. Surface runoff drains into numerous playa lakes and two intermittent streams, Running Water Draw and the Double Mountain Fork of the Brazos River.

The Ogallala formation of Tertiary age is the principal water-bearing formation in the county. The Ogallala lies on red beds of Triassic age throughout most of the county and on rocks of Cretaceous age in approximately the southern fifth of the county. The Triassic and underlying Permian rocks are not fresh water bearing in the county. The Cretaceous rocks, on the other hand, are in direct hydraulic connection with the Ogallala and a few wells tapping them yield large quantities of water from cracks and solution channels in the limestones. The Ogallala formation is overlain by thin deposits of sand, gravel, silt, and clay of Pleistocene and Recent age. These younger rocks are, for the most part, above the water table and consequently, are nonwater bearing.

The water in the Ogallala formation occurs principally as unconfined water in layers and lenses of sand and gravel. The hydraulic properties of the Ogallala were determined by a long-term aquifer test at Plainview where coefficients of transmissibility ranging from 24,000 to 38,000 gpd (gallons per day) per foot were measured. The coefficient of storage was determined to be about 0.14.

The aquifer is recharged from precipitation in Hale County and in the southern High Plains northwest of the county. The water moves generally southeastward at about 2 inches a day.

Ground water in Hale County is used principally for irrigation. In 1955 more than 3,700 wells were used to irrigate 470,000 acres, about 560,000 acre-feet of water being pumped. About 5,000 acre-feet was pumped for other purposes including municipal, industrial, stock, and domestic uses.

The water in the Ogallala formation in Hale County is suitable chemically for irrigation and most other uses; however, it should be softened for more satisfactory domestic use. The high silica content indicates that the water may be unsuitable for use in boilers. The fluoride content is excessive.

It is estimated that in 1955 about 39 million acre-feet of water was in storage in the Ogallala formation in Hale County; however, only about 16 million is theoretically available to wells, and a somewhat smaller amount is practically available. About 3 million acre-feet was removed from storage from 1938 through 1955. Water levels in wells have declined more or less steadily since 1938, and it is apparent that the ground-water resources of the county are insufficient to support large-scale perennial irrigation such as that of 1955.

INTRODUCTION

Purpose and Scope

The investigation in Hale County was made possible through a cooperative agreement among Hale County, the Texas Board of Water Engineers, and the U. S. Geological Survey. The purpose of the investigation was to make a comprehensive study of the Ogallala formation, the principal ground-water reservoir in the county, with special attention to the thickness of the ground-water reservoir, the amount of water that has been removed from storage, the amount of water remaining in storage, the ability of the ground-water reservoir to yield water to wells, and the amount of recharge to the reservoir. As part of the investigation, the observation well program, which has been carried on since 1937, was expanded so that the amount of water withdrawn from the ground-water reservoir could be estimated more accurately in the future.

The field investigations were begun in October 1954 and were concluded in December 1955.

The report contains records of 415 wells (table 3), drillers' logs of 82 wells (table 4), records of water-level measurements in 97 wells (table 5), and chemical analyses of water samples from 125 wells (table 6). Many other well records were collected during the investigation; however, only a representative number, including wells used for control of such illustrations as contour maps of the water table, are included in the tables. Plate 1 shows the location and well numbers of all the wells for which records are available. The unpublished records may be consulted at the offices of the Geological Survey and the Board of Water Engineers at Austin, Texas. Many names of well owners, as shown in the tables, were taken from a landownership map of the county available at the time of the investigation. Because of the rapid exchange of land in parts of the county, the owners' names may not all be correct.

Location

Hale County is in the Texas Panhandle (figure 1). It is rectangular in shape, and is bounded on the north by Castro and Swisher Counties, on the east by Floyd County, on the south by Lubbock County, and on the west by Lamb County. Plainview, the county seat, is in the northeastern part of the county and is about 75 miles south of Amarillo, Texas.

According to the General Land Office of Texas, the county contains 661,382 acres or about 1,033 square miles. The population was 28,211 in 1950.

Transportation facilities include two Federal and several State highways and an extensive network of paved and graded county highways. The Santa Fe railway system serves Plainview, Hale Center, and Abernathy, and the Burlington railway system serves Plainview, Petersburg, and Edmonson. Plainview is served also by Continential Airlines.

Physiography and Drainage

Hale County is on the High Plains of Texas, a part of the Great Plains physiographic province. The Canadian River in Texas separates the High Plains into two segments known locally as the North Plains and the South Plains; Hale County occupies part of the South Plains.

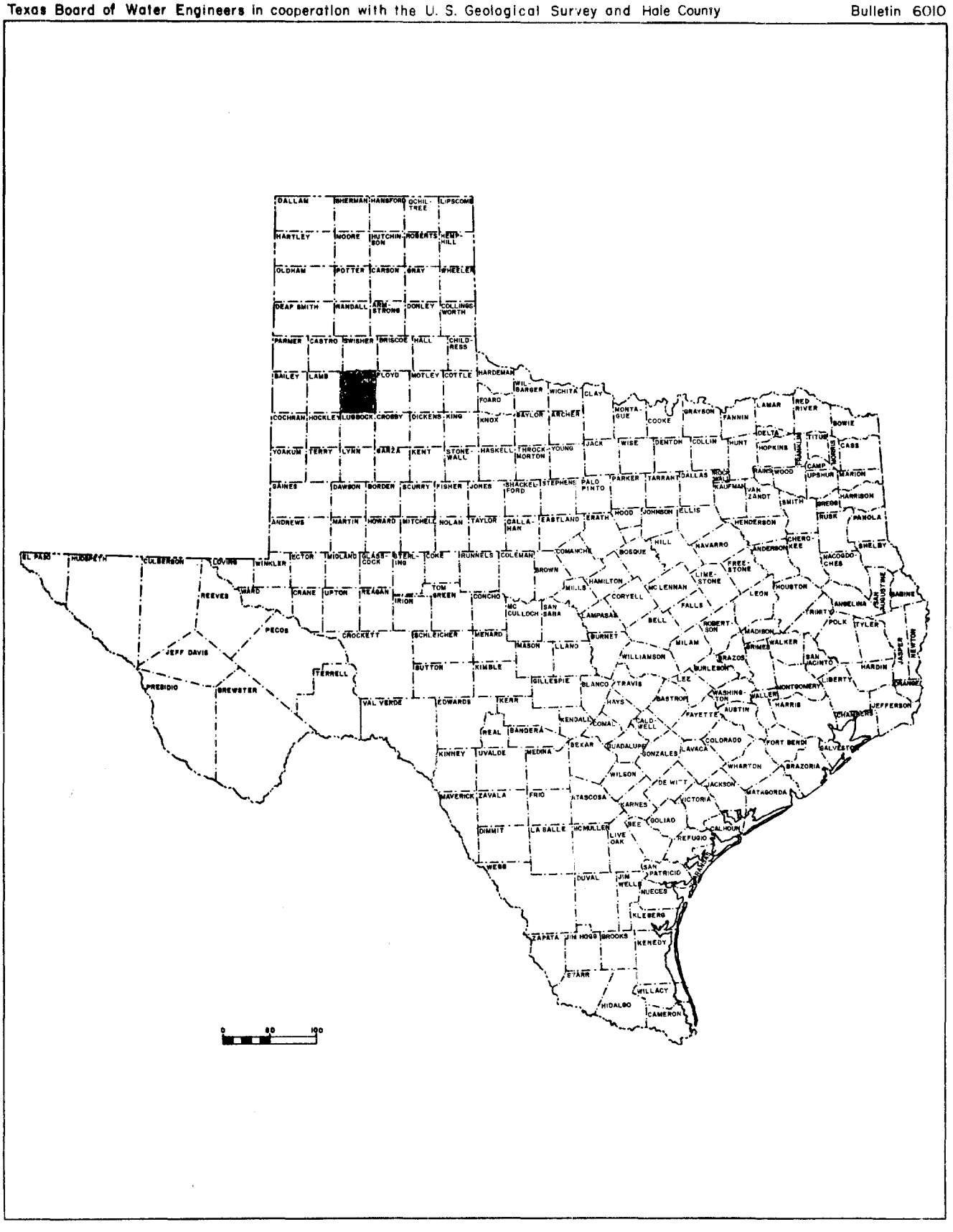


FIGURE 1. — Map of Texas showing location of Hale County

The land slopes generally from northwest to southeast at about 10 feet per mile. The total relief in Hale County is about 400 feet, the altitude ranging from about 3,200 to 3,600 feet above sea level. Many depressions in the land surface, known locally as playa lakes, form the principal topographic features on the otherwise monotonously flat land surface. Two intermittent streams, Running Water Draw and the Double Mountain Fork of the Brazos River, cross Hale County from northwest to southeast. The channel of Running Water Draw in most places is shallow and broad, whereas the channel of the Double Mountain Fork of the Brazos River is relatively deep and narrow.

Climate

The climate in Hale County is semiarid and mild. According to the United States Weather Bureau, the average annual precipitation at Plainview over a period of 62 years (1894-1955) was 21.28 inches. The annual precipitation ranged from a maximum of 38.10 inches in 1926 to a minimum of 10.20 inches in 1917 (figure 2). July is the wettest month, having an average precipitation of 3.21 inches; January is the driest month, having an average of 0.50 inch (figure 2).

The mean annual temperature at Plainview during the 57-year period 1899-1955 was 59.8°F. The highest temperature recorded during 1955 was 101°F in June, and the lowest was 3°F in February. The average monthly temperature ranges from 78.5°F in July to 40.8°F in January (figure 2).

Long-term records of evaporation are not available for Hale County; however, the records for the station maintained by the Texas Agricultural Experimental Station near Lubbock, Texas may be considered as nearly representative for Hale County. Records from this station for a period of 37 years (1917-53) show that the average annual evaporation from a Bureau of Plant Industry pan was 63.80 inches (Bloodgood and others, 1954, p. 22). The average monthly pan evaporation ranges from 8.83 inches in July to 1.77 inches in January (figure 3).

Natural Resources and Economic Development

The economy of Hale County is dependent largely on agriculture maintained by irrigation. The county is one of the most intensively cultivated in the State. In 1955 about 470,000 acres were irrigated out of a total of 536,000 in cultivation.

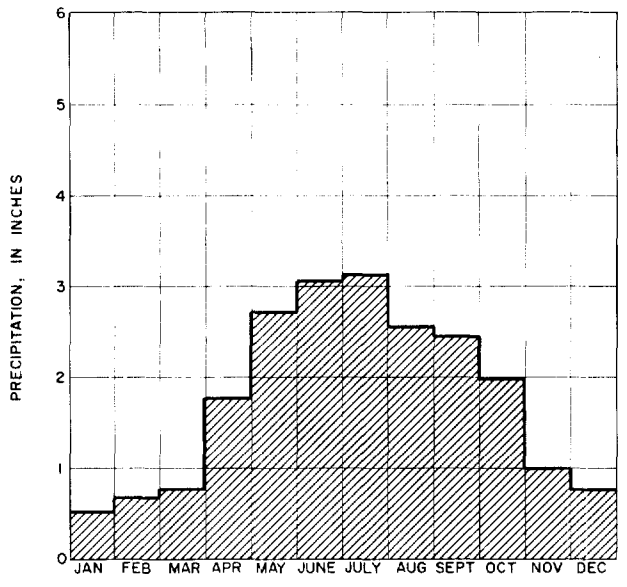
The principal irrigated crops are grain sorghum and cotton; about 230,000 acres of grain sorghum and 170,000 acres of cotton were irrigated in 1955. Other irrigated crops include wheat, alfalfa, sudangrass, corn, barley, oats, and pasture. Other agricultural pursuits include dairying, stock farming, and poultry production.

Oil was discovered in Hale County in 1946 and has become an important source of income. According to the Texas Railroad Commission, 2,302,198 barrels of oil was produced in 1954 from several fields in the southern part of the county.

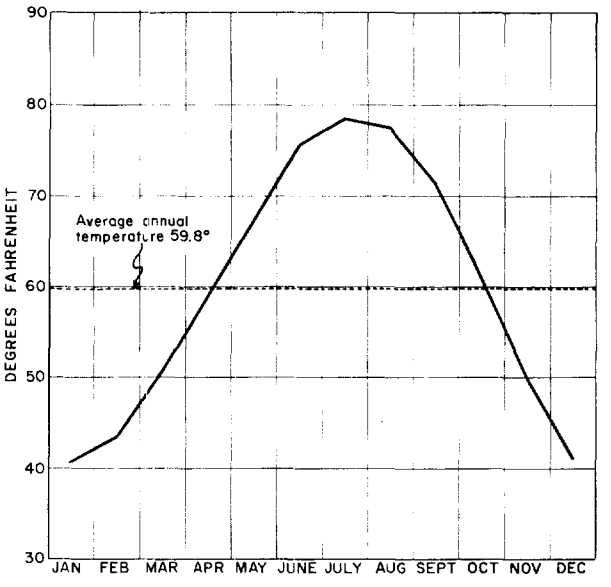
Other industries in the county include grain storage, alfalfa dehydration, and manufacture of farm implements and machine shop products.

Previous Investigations

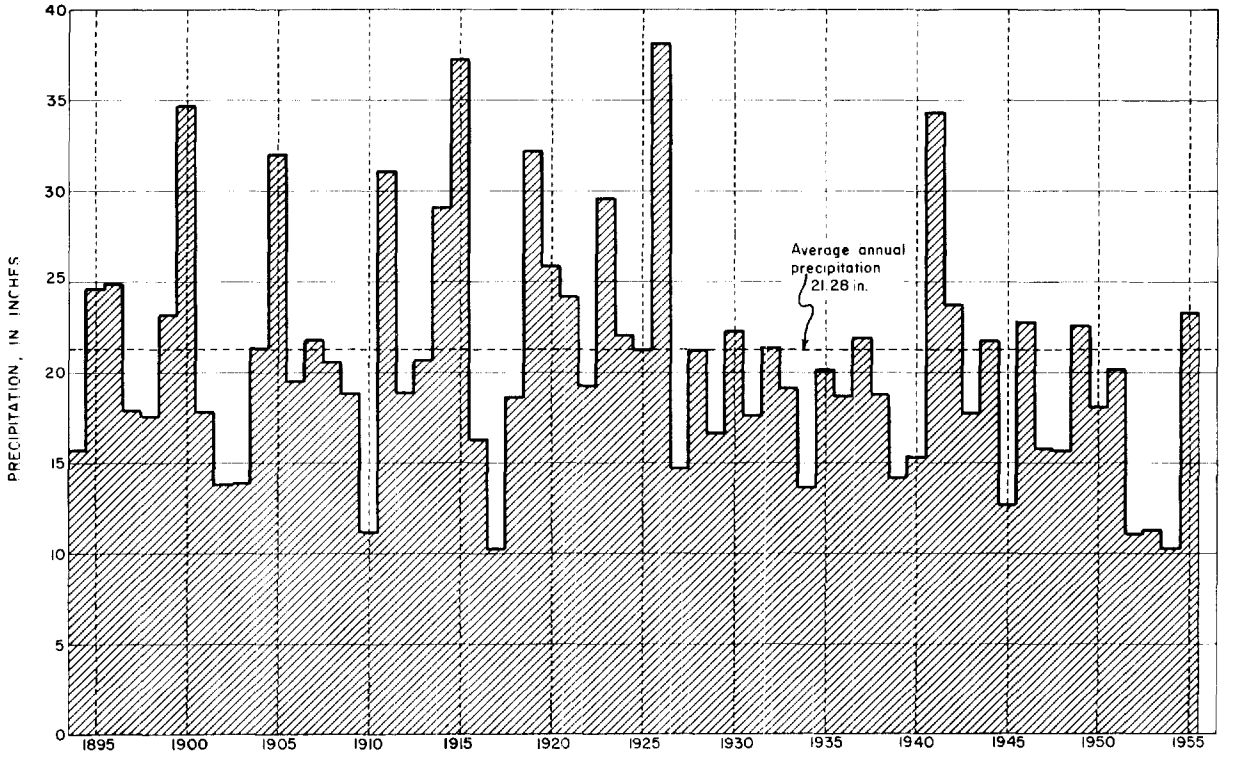
Ground water in Hale County has not been studied in detail previously; however many reports on larger areas have presented data pertaining to the county.



Average monthly precipitation, 1894-1955



Average monthly temperature, 1899-1955



Annual precipitation, 1894-1955

FIGURE 2.—Precipitation and temperature at Plainview, Texas

(From records of the U. S. Weather Bureau)

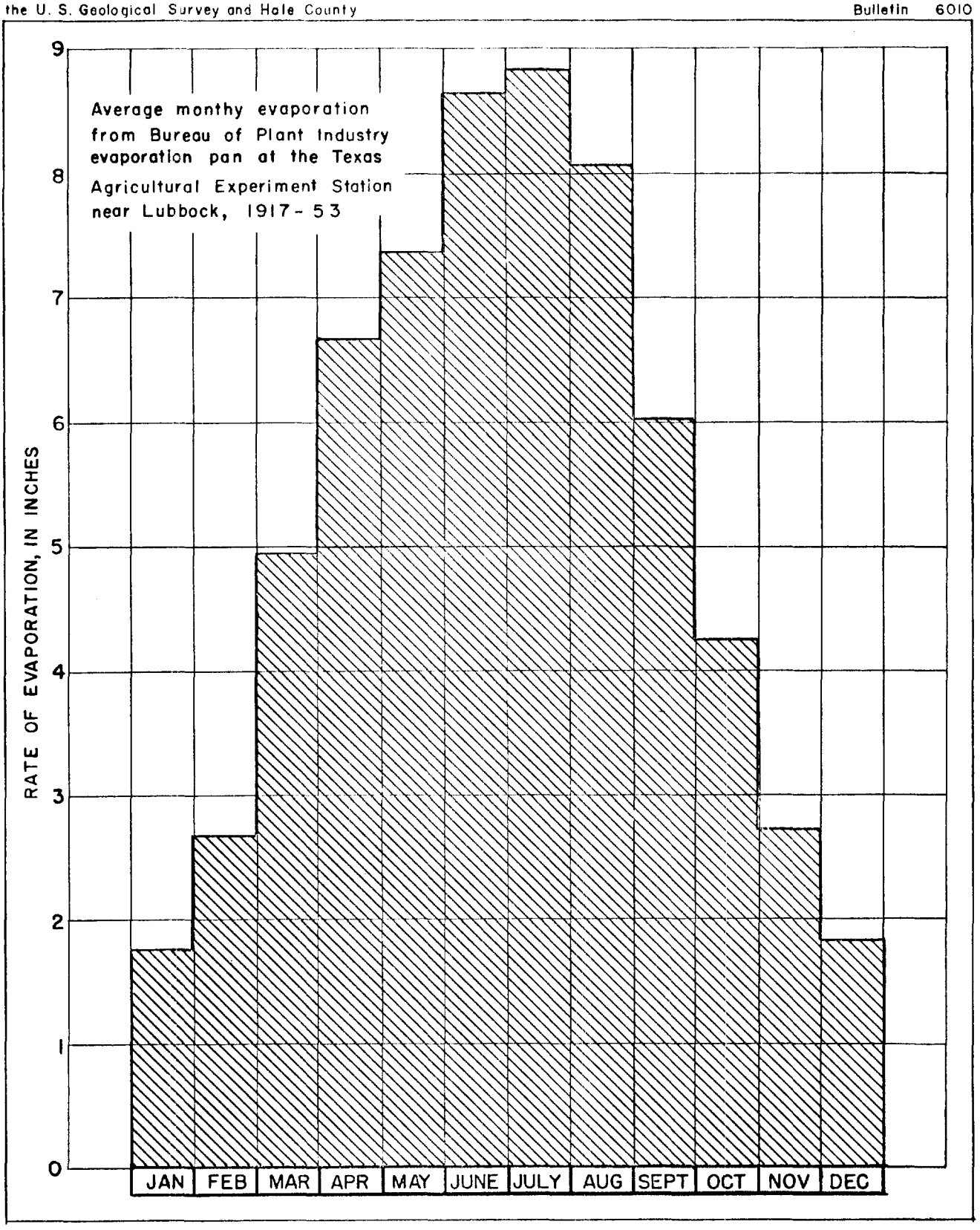


FIGURE 3.- Pan evaporation near Lubbock, Texas

Early reports by Johnson (1902) and Baker (1915) briefly described the geology and utilization of the High Plains. A series of reports published periodically have summarized the work of the Geological Survey and the Texas Board of Water Engineers in the High Plains; the most comprehensive of these was a report by Barnes and others (1949). Since 1938 the results of measurements of water levels in observation wells in Hale County have been published in the annual reports of the Geological Survey on water levels and artesian pressures in the United States.

The first report specifically on Hale County was a well-inventory report by Broadhurst and others (1938). The report consists of tables of well records, well logs, water analyses, and a map showing locations of the wells listed. A similar report (Merritt and Follett, 1946) brought the records up to date through 1946.

Reports of annual water-level measurements made in wells on the High Plains up to and including 1959 have been published by the Texas Board of Water Engineers in a series of Board bulletins.

The public water supplies at Abernathy, Hale Center, Petersburg, and Plainview have been described by Broadhurst and others (1951, p. 80-82).

Well-Numbering System

In reports by Broadhurst and others (1938) and Merritt and Follett (1946) wells were numbered consecutively in one series. With the tremendous development of irrigation in the county, this system became unwieldy and a system based on the location of the wells within the county was devised. Lines of latitude and longitude have been used to establish a modified 5-minute-grid system. The grids are identified by letters of the alphabet starting with "A" in the northwest corner of the county and continuing in a west-to-east and north-to-south succession. Within the grids the wells are numbered consecutively, roughly from northwest to southeast.

Table 1 is an index of well numbers published previously and corresponding numbers in this report.

Acknowledgments

The writers acknowledge their indebtedness to the many farmers and ranchers for their cooperation in supplying information about their wells and permitting access to their properties. They are grateful also to the well drillers and pump companies who gave freely of data from their files and to the officials of the cities in the county for their records of municipal wells. Special thanks are extended to the Mayor, the City Council, and the employees of the Water Department of the city of Plainview for their splendid cooperation during an aquifer test for which the city drilled two observation wells.

GEOLOGIC FORMATIONS AND THEIR WATER-BEARING PROPERTIES

General Geology

Hale County is underlain in most places by unconsolidated rocks of Pliocene and younger age, a part of which constitute the Ogallala formation, the principal fresh-water-bearing formation in the county. These deposits lie on an erosion surface of rocks of Cretaceous and Triassic age and dip gently toward the southeast, in the general direction of topographic slope.

Table 1.--Index of well numbers published in the Texas Board of Water Engineers 1938 and 1946 Hale County well-inventory reports and Bulletin 5302, and the corresponding well numbers shown in the records of selected wells in this report

Well no. in this report.	Well no. in 1938 report.	Well no. in 1946 report.	Well no. in Bull. 5302.	Well no. in this report.	Well no. in 1938 report.	Well no. in 1946 report.	Well no. in Bull. 5302.
A- 4	--	63	--	G- 69	601	601	--
30	--	58	--	70	--	641	641
31	--	59	--	97	21	21	--
35	--	70	70	98	40	40	--
44	24	24	--	99	31	31	--
46	23	23	--	100	39	39	--
49	--	56	--	H- 1	18	18	--
59	--	55	--	11	--	93	93
61	22	22	--	32	--	86	86
B- 14	6	6	--	49	36	36	36
17	--	81	81	57	--	153	--
39	--	131	--	59	--	154	154
46	--	92	--	82	--	1610	--
67	15	15	15	95	--	656	--
C- 7	103	103	103	103	607	607	--
13	--	174	--	J- 11	--	159	159
24	--	138	138	20	--	163	163
46	105	105	105	31	118	118	--
D- 15	268	268	--	2/ 60	--	172	124b
16	202	202	202	75	611	611	--
33	--	225	225	89	126	126	--
42	--	285	285	90	124	124	--
50	267	267	--	91	500	500	--
52	222	222	--	K- 10	--	165	165
54	228	228	--	47	--	1223	1223
E- 1	206	206	206	49	--	262	--
8	212	212	212	65	--	1226	--
44	311	311	--	72	259	259	259
47	220	220	220	94	509	509	509
66	--	1206	--	103	--	583	--
75	315	315	--	109	256	256	256
F- 11	308	308	--	110	511	511	511
1/ 13	--	--	--	111	255	255	255
28	319	319	--	L- 6	238	238	238
30	--	398	--	28	--	1231	1231
40	316	316	316	29	241	241	241
52	323	323	323	81	273	273	--
53	--	334	334	82	272	272	--
88	324	324	--	83	274	274	--
89	391	391	--	89	--	1336	1336
G- 20	--	53	--	3/ 116	--	--	407a
27	--	--	40a	4/M- 1	--	--	--
63	--	--	31a	10	331	331	331

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See footnotes at end of table.

Table 1.--Index of well numbers published in the Texas Board of Water Engineers 1938 and 1946 Hale County well-inventory reports and Bulletin 5302, and the corresponding well numbers shown in the records of selected wells in this report--continued

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M- 11	332	332	332	T-100	--	1430	1430
36	343	343	--	110	451	451	--
46	--	367	367	111	486	486	--
60	348	348	--	112	438	438	--
79	--	389	389	U- 9	--	680	--
122	388	388	--	12	--	682	--
123	386	386	--	40	707	707	--
124	384	384	--	74	--	--	704a
125	385	385	--	86	625	625	--
126	390	390	--	V- 14	--	688	--
127	480	480	--	115	--	634	--
128	496	496	--	116	639	639	--
N- 73	--	676	--	117	710	710	--
91	623	623	--	W- 4	--	1609	1609
92	627	627	--	51	--	764	--
P- 13	622	622	--	112	573	573	--
71	--	698	--	X- 36	569	569	569
76	--	696	--	37	--	562	562
98	620	620	--	38	--	1527	--
99	628	628	--	47	553	553	553
100	629	629	629	98	801	801	--
Q- 9	--	661	661	99	802	802	--
37	617	617	617	100	803	803	--
68	--	1604	1604	Y- 9	--	--	1529
95	--	1606	--	49	--	902	--
R- 4	508	508	508	81	923	923	923
63	--	1501	--	99	805	805	--
5/ 90	--	--	--	100	921	921	--
101	--	546	546	Z- 17	457	467	467
115	533	533	--	73	906	906	906
116	558	558	--	121	471	471	--
S- 35	--	1447	--	122	469	469	--
39	--	1413	--	AA- 82	721	721	--
59	--	1417	1417	83	722	722	--
100	--	1428	--	BB- 14	717	717	--
121	481	481	--	19	--	714	714
122	518	518	--	29	--	762	--
T- 19	427	427	427	91	723	723	--
51	--	1436	1436	104	--	786	--
67	--	1433	1433	113	749	749	--
77	454	454	454	114	716	716	--
97	459	459	459	CC- 1	--	713	--
98	463	463	463	21	--	829	829
99	462	462	462	120	828	828	828

(continued on next page)

See footnotes at end of table.

Table 1.--Index of well numbers published in the Texas Board of Water Engineers 1938 and 1946 Hale County well-inventory reports and Bulletin 5302, and the corresponding well numbers shown in the records of selected wells in this report--continued

Well no. in this report	Well no. in 1938 report.	Well no. in 1946 report.	Well no. in Bull. 5302.	Well no. in this report.	Well no. in 1938 report.	Well no. in 1946 report.	Well no. in Bull. 5302.
CC-121	827	827	--	JJ-125	--	1818	--
122	728	728	--	126	862	862	--
EE- 20	816	816	816	127	731	731	--
74	840	840	840	KK- 45	857	857	--
104	818	818	--	54	--	1811	1811
FF- 48	--	945	--	115	854	854	--
55	942	942	942	LL- 35	--	1829	--
146	--	1917	--	52	--	1928	--
159	964	964	964	54	973	973	--
160	929	929	--	77	--	1932	--
161	949	949	--	103	977	977	--
GG- 91	--	738	738	106	975	975	--
99	740	740	--	MM- 50	--	1924	--
100	739	739	--	52	--	1923	--
HH- 1	724	724	724	61	--	1921	1921
9	--	726	--	77	974	974	--
120	725	725	--	81	--	--	1957
JJ- 40	848	848	848	96	--	1945	--
64	850	850	--	120	978	978	978
65	849	849	--	137	979	979	--
66	--	1816	--	159	969	969	--
123	732	732	--	160	--	1908	--
124	--	1817	--	163	--	1942	--

1/ Hale County well 317a in U. S. Geological Survey Water-Supply Paper 1159.
2/ Hale County well 124b in U. S. Geological Survey Water-Supply Paper 947.
3/ Hale County well 407a in U. S. Geological Survey Water-Supply Paper 1124.
4/ Hale County well 330a in U. S. Geological Survey Water-Supply Paper 1159.
5/ Hale County well 539a in U. S. Geological Survey Water-Supply Paper 1159.

Cretaceous rocks of marine origin, some of which yield large quantities of water, underlie the Ogallala formation in about one-fifth of the county, having been removed by erosion in the remainder. The Ogallala overlies red beds of Triassic age where the Cretaceous rocks are absent. The Triassic rocks overlie red beds of Permian age.

Pertinent data concerning the water-bearing formations in Hale County are summarized in table 2. The geologic sections (figures 4-6) show the geologic structure of the formations underlying the county and the relations between the various formations.

Permian System

Rocks of Permian age in Hale County consist of beds of red sandstone, clay, shale, gypsum, dolomite, and limestone. The rocks have not been penetrated by water wells and their water-yielding properties have not been determined. Electric logs of oil tests, however, indicate that the Permian rocks contain saline water.

Triassic System

DOCKUM GROUP

Rocks presumed to be of the Dockum group of Triassic age underlie Hale County at depths ranging from 150 to nearly 400 feet below the land surface. The Dockum group ranges in thickness from about 300 to 1,000 feet and consists characteristically of variegated shale, most of which is dark-red to maroon micaceous sandstone and conglomerate. The group comprises the red beds immediately underlying Cretaceous rocks and the Ogallala formation in the county. The Triassic rocks resemble the underlying Permian rocks closely, and it is difficult to distinguish the two. In general, however, shale of Triassic age is more massive and micaceous, and deeper red then shale of Permian age.

The Dockum group has not been tested for water supply in Hale County; however data from tests in nearby areas suggest that the water is too highly mineralized, insufficient in quantity, or a combination of both, to be used for irrigation, industrial, or municipal supplies. The chemical analysis of a water sample from the Dockum group from a well 2 miles northwest of Lubbock showed 20,600 ppm (parts per million) of dissolved solids and 10,800 ppm of chloride. The water was obtained at a depth of 953 to 999 feet from a sandstone in the Dockum group. Another well testing the same sandstone at a depth of 825 feet in Floyd County, $1\frac{1}{2}$ miles north and 5 miles east of Petersburg, produced water containing 13,700 ppm of dissolved solids and 7,320 ppm of chloride. The initial yield of this well was 250 gpm (gallons per minute), but after 72 hours of pumping the yield decreased to 150 gpm. An exploratory well testing the Dockum group in Bailey County failed to yield adequate quantities of water for irrigation after pumping 10 minutes according to reports. In Cochran County a water sample obtained from a drill-stem test of the Dockum group contained 2,070 ppm of dissolved solids and 590 ppm of chloride. This well, however, produced only 15 gpm with a large drawdown.

Table 2.--Geologic formations in Hale County, Texas

System	Series	Sub-division	Thickness (feet)	Physical character	Water supply	Remarks
Quaternary	Recent and Pleistocene		0-75	Silt, clay, sand, gravel, and caliche.	Not a source of water supply.	Sand dunes, stream-channel, and playa deposit.
Tertiary	Pliocene	Ogallala formation	70-400+	Fine to coarse sand, gravel, clay, silt, and caliche. Sediments generally are reddish.	Principal aquifer in the county.	
Cretaceous	Comanche	Washita and Fredericksburg groups: Duck Creek limestone and Kiamichi formation, undifferentiated.	0-110±	Yellowish limestone, yellow, blue, and white clay, and sandstone.	Cracks, crevices, and caverns in limestone yield large quantities of water locally.	Underlies approximately one-fifth of the county.
Triassic	--	Dockum group	300-1,000	Variegated shale, micaceous sandstone, and conglomerate.	Contains highly mineralized water.	Locally called red beds; underlies all the county.
Permian	--	--	5,000+	Red shale, sandstone, clay, limestone, dolomite, and gypsum.	Contain highly mineralized water.	Locally called red beds. Penetrated only in tests for oil and gas.

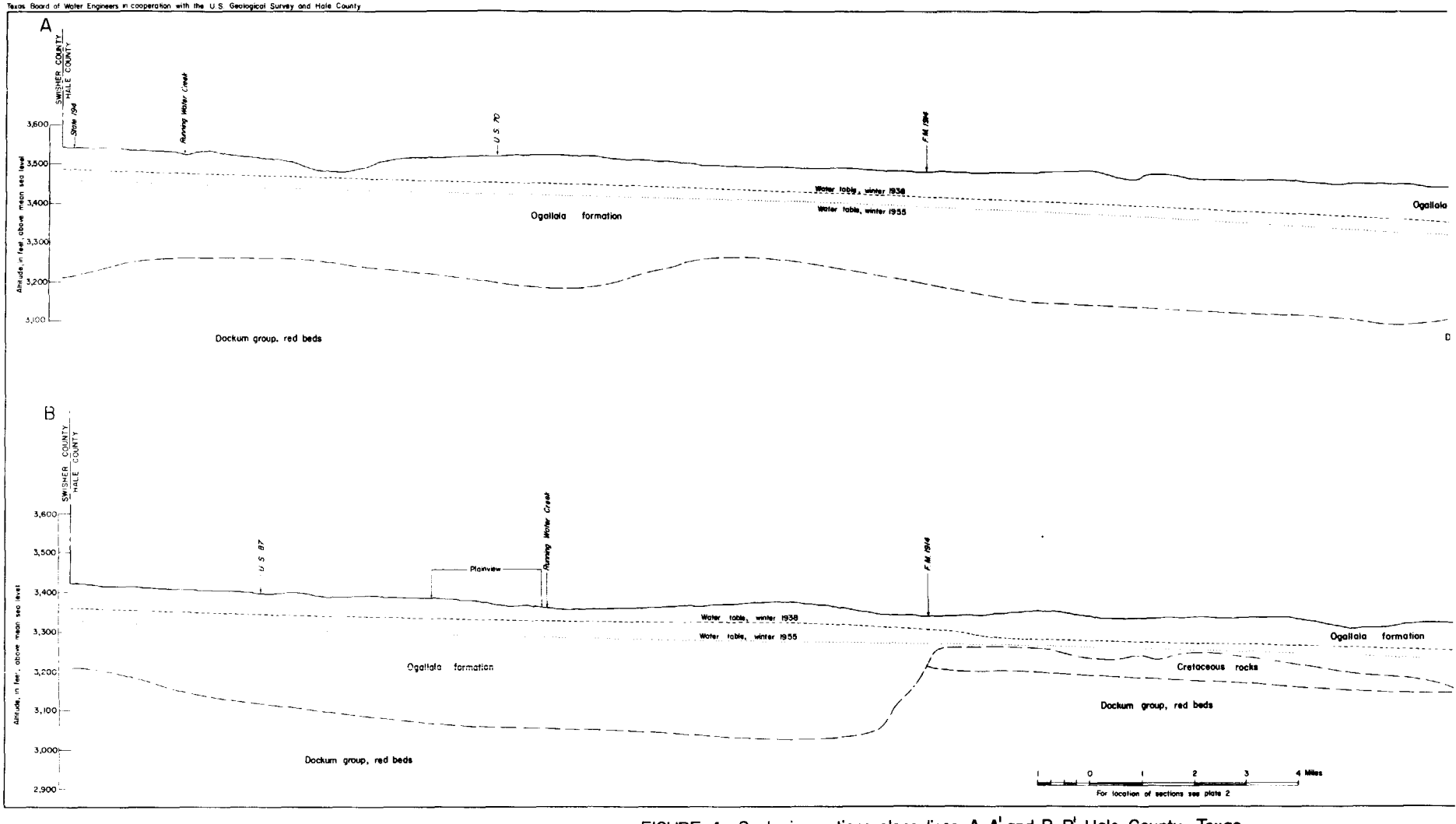

FIGURE 4.- Geologic sections along lines A-A' and B-B', Hale County, Texas

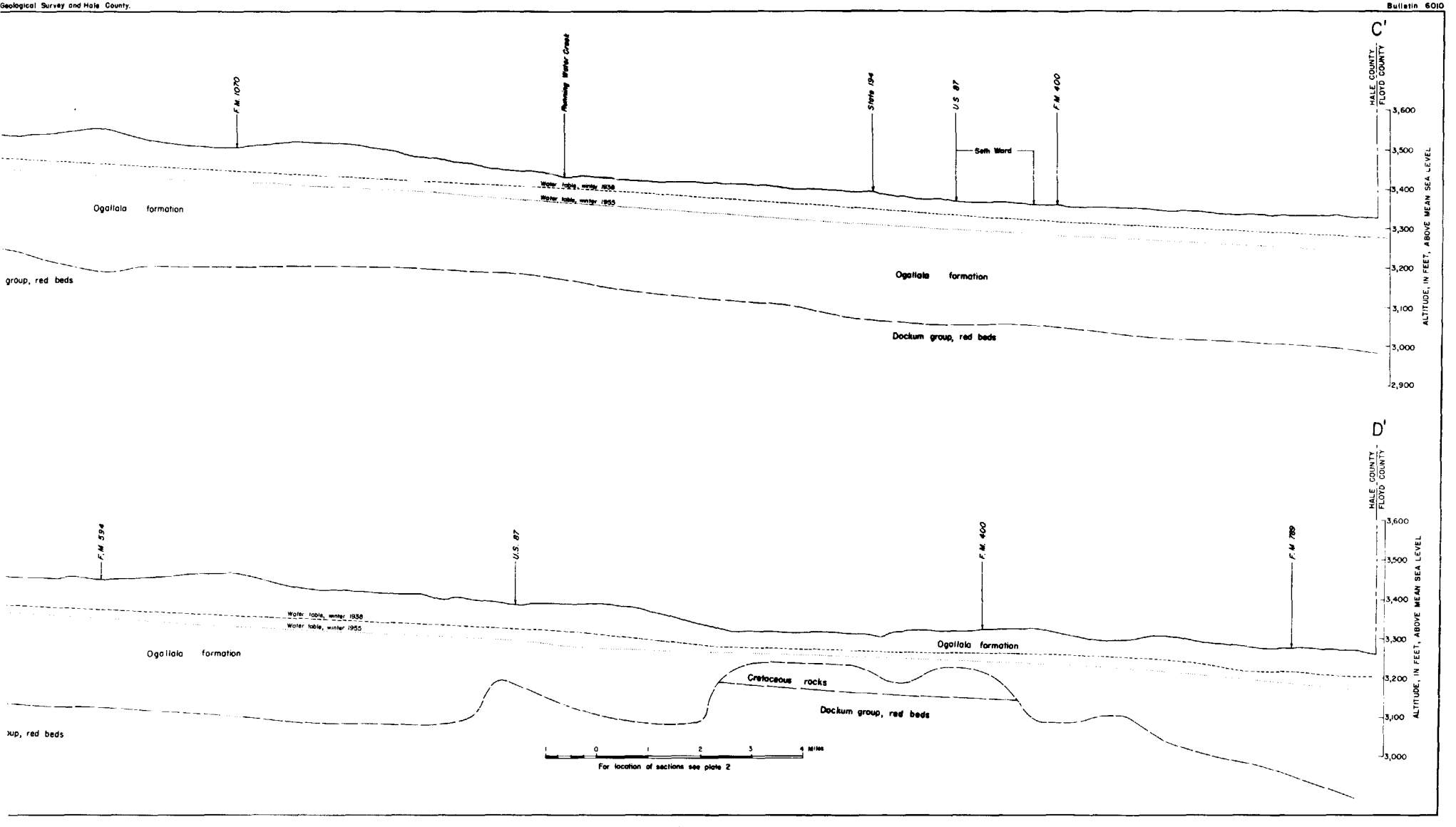

FIGURE 5. - Geologic sections along lines C-C' and D-D', Hale County, Texas

Cretaceous System

COMANCHE SERIES

Kiamichi formation and Duck Creek limestone, undifferentiated

Rocks of Cretaceous age in Hale County consist of the Kiamichi formation of the Fredericksburg group and the Duck Creek limestone of the Washita group. The Cretaceous rocks are not exposed in the county, and it is difficult to distinguish the formations in the subsurface; consequently, they are not differentiated in this report.

The Cretaceous rocks lie unconformably on rocks of the Dockum group and are, in turn, overlain unconformably by the Ogallala formation. The strata dip gently toward the southeast. Cretaceous rocks formerly underlay all the county, but they were removed by pre-Ogallala erosion from all but approximately the southern fifth of the county. The areal extent and altitude of the top of the Cretaceous rocks are shown in plate 2. The Cretaceous strata, where present, range in depth below the land surface from less than 50 to nearly 200 feet. The buried Cretaceous rocks form mesas, buttes, and plateaus similar in form to those exposed in the Edwards Plateau country to the south.

Cretaceous rocks in Hale County consist mainly of limestone and shale and minor amounts of sandstone. The uppermost of the Cretaceous rocks consists of a layer of hard yellow limestone that averages about 20 to 30 feet in thickness. The limestone is underlain mainly by beds of yellow and blue shale and in places by beds of gray or white shale. The rocks contain a few thin layers of sandstone in some places. Cretaceous rocks in the county range in thickness from zero to about 110 feet. The Cretaceous section probably was much thicker before the pre-Ogallala erosion.

Cretaceous rocks yield water in amounts as much as 900 gpm to wells from cracks or caverns in the limestone. A well that penetrates a single large crack may have a smaller yield than a well that penetrates smaller and more numerous cracks. Limestone having numerous cracks resembles a loose sand hydrologically. Wells that do not penetrate cracks or cavities yield only small quantities of water.

Aquifers in the Cretaceous limestone presumably are recharged through the overlying Ogallala formation, as is strongly suggested by the similarity of the chemical analyses (table 6) of water from two wells (Z-82 and JJ-125) tapping the Cretaceous rocks and nearby wells (Z-121 and LL-55) tapping the Ogallala formation.

Tertiary System

PLIOCENE SERIES

Ogallala formation

The Ogallala formation underlies the entire county. The formation was deposited upon the eroded surface of Triassic and Cretaceous rocks by streams whose headwaters were in the Rocky Mountains area to the west. The erosion surface upon which the Ogallala was deposited is shown in plate 3. In general, the pre-Ogallala surface was more mature and had greater relief than that of the present.

The Triassic rocks were eroded to form low hills and wide, gentle-sided valleys containing deep narrow stream channels. The Cretaceous rocks were more resistant to erosion and remain as small buried mesas or buttes. Streams in pre-Ogallala time flowed generally southeastward, as do the streams of the present, although the remnant Cretaceous buttes may have diverted some streamflow to the northeast for short distances. The streams were laden heavily with gravel, sand, and silt and shifted their courses widely over the area that is now the High Plains. At each change in the course of the streams, deposits of sand, gravel, and silt were left in the old channels and on flood plains that were later buried beneath similar material during subsequent shifting of the streams. According to Johnson (1902, p. 638), the Ogallala was laid down in substantially its present position as to elevation and dip. The Ogallala dips southeastward at about 10 feet per mile.

Since the deposition of the Ogallala, streams have begun to degrade the formation. The Canadian River has cut through the Ogallala, through most of its course through Texas, so that the formation is divided into two units having little hydraulic connection. Erosion on the eastern, southern, and western edges of the High Plains has formed escarpments where the Ogallala formation, Cretaceous rocks, and red beds crop out. The southern High Plains, although relatively flat, stands in high relief and is hydraulically independent of contiguous areas.

The Ogallala formation consists of interfingering bodies of fine to coarse sand, gravel, silt, clay, and caliche. The lithology varies greatly within short distances both laterally and vertically. The material predominantly is red. For the most part, the beds of sand and gravel are unconsolidated, but in places they are fairly well cemented. The formation ranges in thickness from about 70 to more than 400 feet.

Caliche is a major constituent of the Ogallala, especially in the upper part of the formation. In many places the caliche forms hard, dense layers, and in other places is soft and porous or fractured.

The Ogallala formation is the principal aquifer throughout the High Plains, and it yields large quantities of water to wells for irrigation, public supply, and industrial uses in Hale County. Yields of wells range from a few gallons per minute from domestic and stock wells to as much as 1,800 gpm from irrigation wells. The water generally is of good chemical quality except that it is hard; the fluoride content is excessive in some places, however.

Quaternary System

PLEISTOCENE AND RECENT SERIES

Rocks of Pleistocene and Recent age mantle the Ogallala formation throughout most of Hale County. The rocks of Pleistocene age consist of beds of clay, silt, fine- to coarse-grained sand, and gravel which range in thickness from 0 to about 75 feet. Clay and silt predominate in the playa-lake deposits, and the coarser materials predominate in the valleys of the Double Mountain Fork of the Brazos River and Running Water Draw.

Valley fill of the Double Mountain Fork of the Brazos River and Running Water Draw consists of deposits of Recent age. Sand dunes in the western part of the county and wind-blown material that mantles most of the land surface are of Recent age. Recent deposits probably are not more than 40 feet thick at a maximum.

Pleistocene and Recent deposits are above the water table in the county and are not water bearing. The sandy areas, however, particularly those having dunes, facilitate recharge to the underlying Ogallala formation.

GROUND WATER

Occurrence

The fresh-water aquifer underlying Hale County is part of the extensive aquifer underlying the southern High Plains. The only source of recharge to the aquifer is precipitation, the Plains being hydraulically isolated from the surrounding area by erosion. A small part of precipitation on the Plains percolates downward to the water table (upper surface of the saturated zone) and then moves laterally to be discharged from seeps along the edge of the Plains or from wells and springs. The principal water-bearing formation in Hale County and in the Plains is the Ogallala formation. Limestone of Cretaceous age, which contains appreciable quantities of water in the southern part of Hale County, underlies and is hydraulically connected with the Ogallala formation and is considered part of the same aquifer.

The aquifer has no lateral boundaries within the county. The relatively impermeable red beds of Triassic age form the lower boundary of the aquifer and mark the lower extent of fresh water. The ground water generally is unconfined. Locally, however, where the water is confined beneath lenticular bodies of clay of limited areal extent, it may be under slight artesian pressure.

Water in the saturated zone fills the pore spaces or voids in the rocks. The voids in the Ogallala range in size from very small pores in the clay and silt to large solution channels in the caliche. Most of the water available to wells from the Ogallala is in the sand and gravel.

The size of the voids in the Cretaceous formations may vary more than in the Ogallala, ranging from minute pores to cavernous passageways. Most of the water available to wells occurs in cracks, crevices, and solution channels in the limestone.

Hydraulic Properties of the Aquifer

The capacity of an aquifer to yield water to wells depends largely upon its hydraulic properties. The coefficients of permeability, transmissibility, and storage are terms used to describe these properties.

The coefficient of permeability is the rate of flow of water, in gallons a day, through a cross section of 1 square foot under a unit hydraulic gradient. The standard coefficient is defined for water at a temperature of 60°F. The field coefficient requires no temperature adjustment and the units are stated in terms of the prevailing water temperature.

The coefficient of transmissibility is the number of gallons of water that will move in 1 day through a vertical strip of the aquifer 1 foot wide and having the height of the aquifer when the hydraulic gradient is unity (Theis, 1938, p. 894). It is the field coefficient of permeability times the thickness of the aquifer, in feet.

The coefficient of storage of an aquifer is the volume of water it releases from or takes into storage per unit surface area of the aquifer per unit change in the component of head normal to that surface. For an unconfined aquifer the coefficient of storage is virtually the same as the specific yield, which is definded as the unit volume of water that will drain by gravity from a unit volume of saturated material.

Coefficients of permeability, transmissibility, and storage may be determined or estimated by field and laboratory methods. Previous ground-water investigations in the High Plains of Texas and New Mexico have employed both methods.

Theis (1937, p. 566) reported that the coefficients of permeability ranged from 15 to 125 and averaged 60 gpd (gallons per day) per square foot for 23 samples of the Ogallala formation in Lea County, New Mexico.

Alexander, Broadhurst, and White (1943, p. 15-16) estimated the specific yield by comparing the pumpage with the volume of Ogallala deposits dewatered during a 3-year period, 1938-41. The estimates assume that no recharge occurred during this period. They estimated the specific yield to be 14.1 percent for the "Plainview District" and 14.5 percent for the "Hereford District". Barnes and others (1949, p. 39-41) determined the specific yield of 8 samples of sand and gravel from the Ogallala formation. They concluded that the average specific yield of the Ogallala probably is greater than 15 but less than 20 percent.

Pumping tests made in the High Plains prior to 1954 were too short for an accurate determination of the coefficients of transmissibility or storage. In 1954 and 1955 recharge tests of long duration near Amarillo, Texas (Moulder and Frazer, 1957, p. 15), showed that the coefficient of transmissibility of the aquifer ranged from 6,000 to 7,000 gpd per foot and that the coefficient of storage ranged from 0.09 to 0.16.

A long-duration test made in cooperation with the city of Plainview during the period November 1955 to March 1956 provided additional data on aquifer properties in Hale County. During the test, well L-84, a public-supply well, was pumped and water levels were observed in it and in two observation wells (L-112 and L-113) drilled especially by the city for the test. The pumping period, drawdown and recovery of water levels, and location of the wells are shown on figure 7. The two observation wells were checked twice--once prior to pumping and once near the end of pumping--by pouring water down the wells to verify the hydraulic connection between the wells and the aquifer. The pumping rate was kept within 1 percent of the average rate at all times during the test.

The water-level data were adjusted and plotted against time (figures 8 and 9). The adjustments and computations were made according to methods developed by Theis (1935), Jacob (1944), and Cooper and Jacob (1946).

Only the latter parts of the drawdown and recovery data from the Plainview test were used in calculating aquifer coefficients. The water-level data from the early part of the drawdown and recovery were not used for calculating aquifer coefficients principally because one of the assumed conditions of the non-equilibrium (unsteady-state) method was not approximated closely during these periods. The method assumes that water is released from or taken into storage immediately as the piezometric surface rises or declines as indicated by water levels in wells. Actually, when pumping starts, an appreciable amount of water becomes suspended temporarily above the rapidly lowering water table near the pumped well. As the rate of decline decreases, the suspended water drains to the water table and the cone of depression develops more nearly in accordance with the conditions assumed

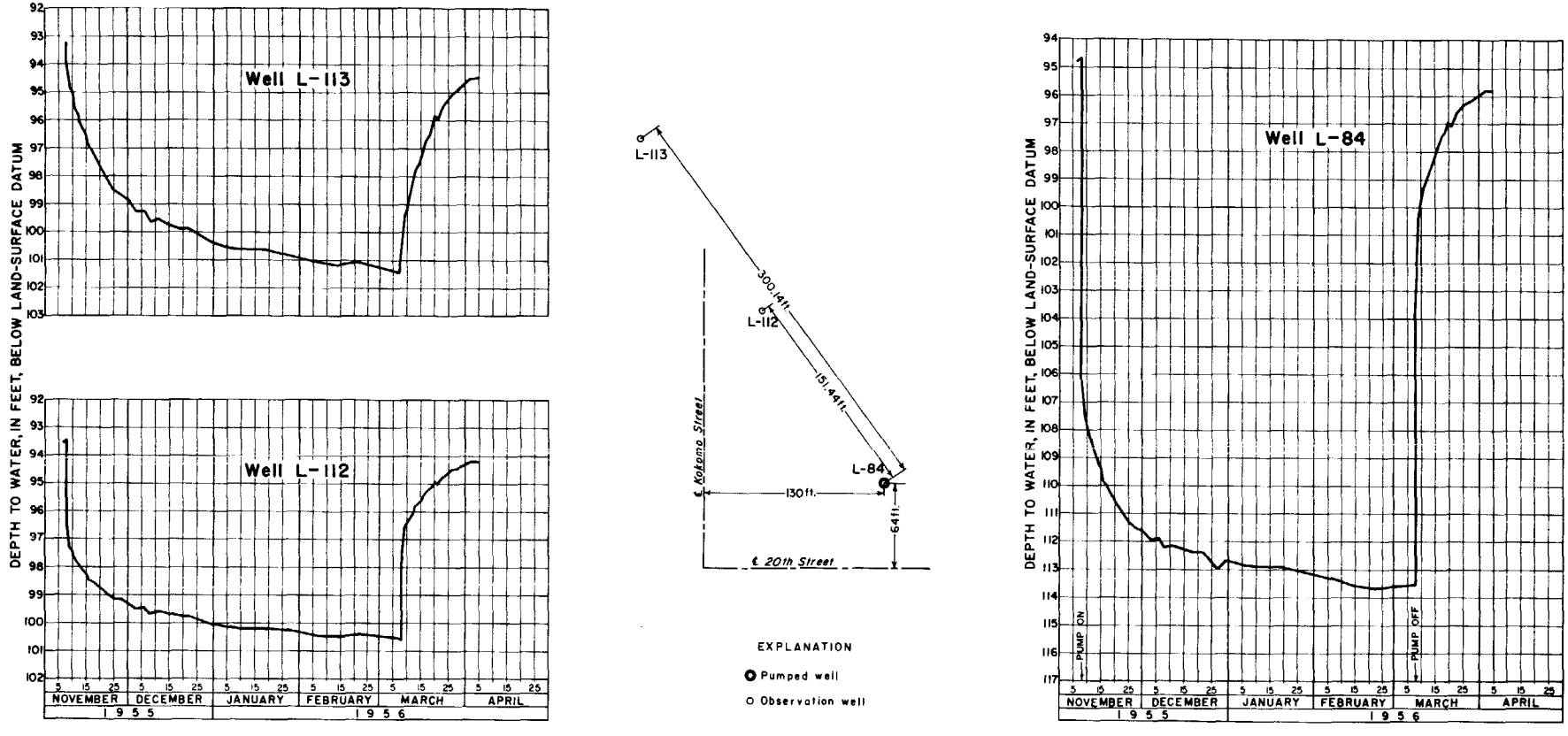

FIGURE 7.- Pumping period, drawdown and recovery of water levels, and location of test wells, Plainview, Texas

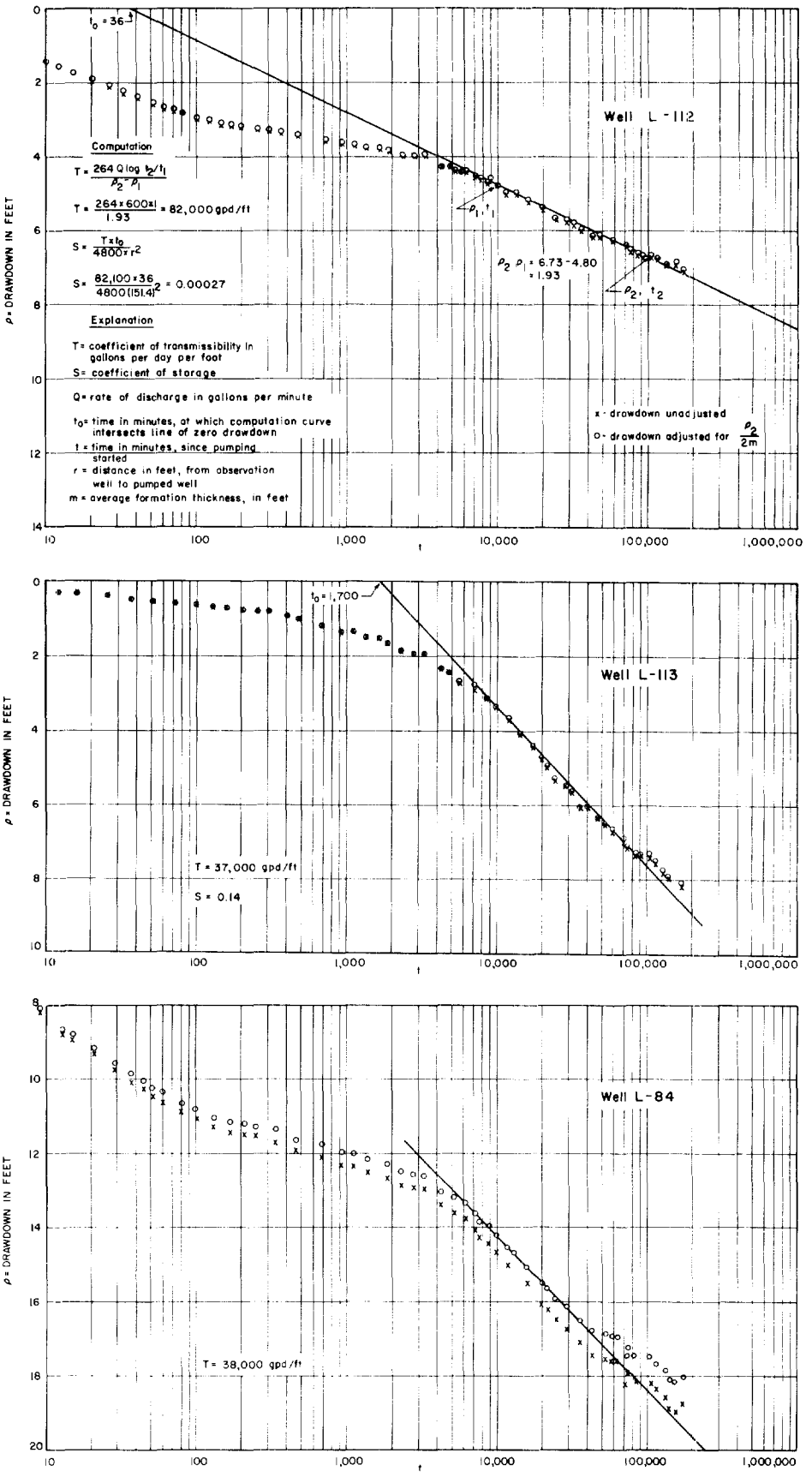

FIGURE 8.- Nonequilibrium method of analysis of drawdown data for wells L-112, L-113, and L-84

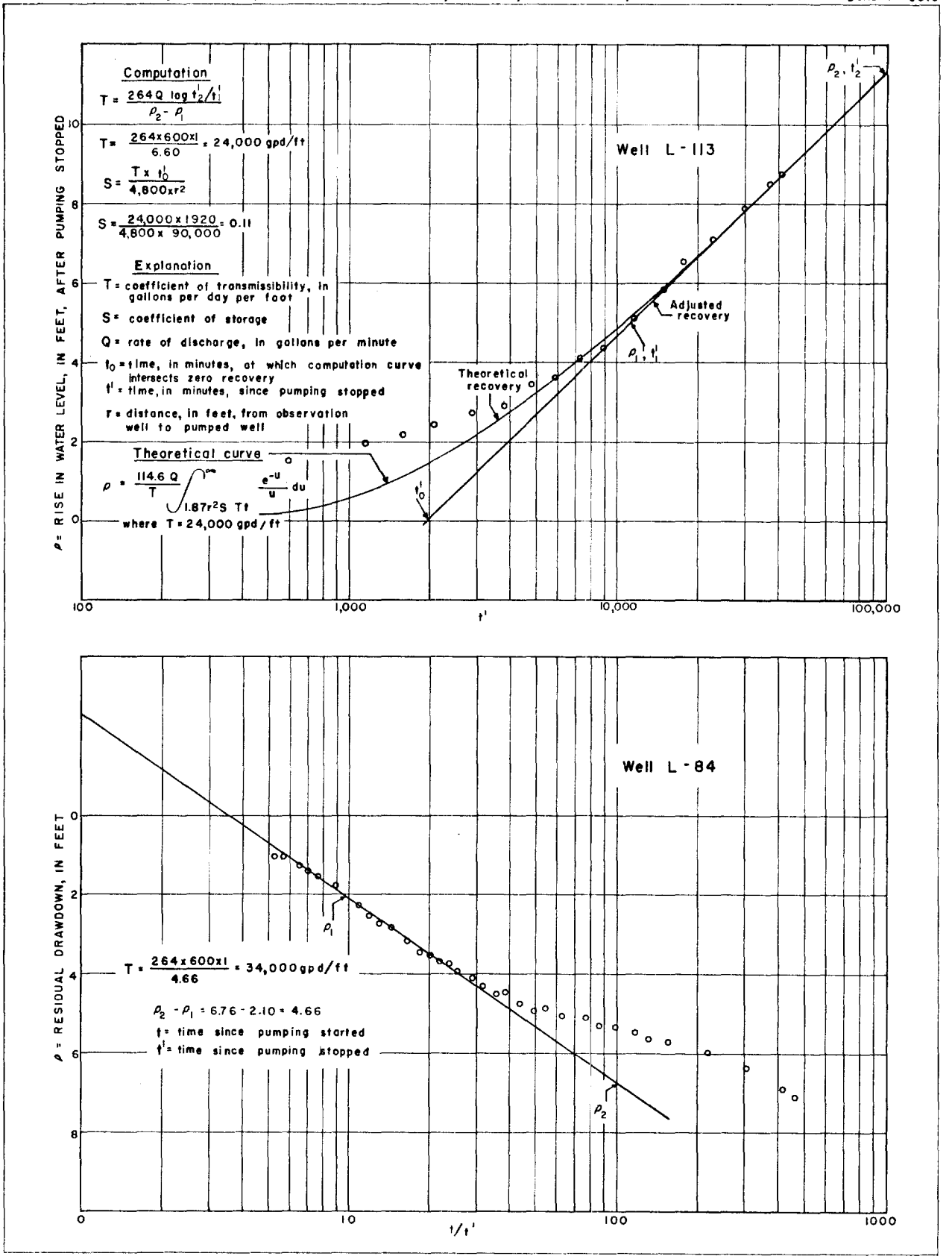

FIGURE 9.- Nonequilibrium method of analysis of adjusted recovery data for wells L-113 and L-84

by the nonequilibrium method. Similarly, for a period after the well is shut off, the water table rises so rapidly that the material below this surface is not completely saturated.

The water-level data from well L-112 probably are unsuitable for calculating aquifer coefficients. The drawdown data from well L-112 obviously conflict with data from wells L-84 and L-113. Figure 7 shows that the total drawdown in well L-113 was greater than in well L-112 despite the fact that well L-113 is farther away from the pumping well. The cause is not readily apparent, as the wells were of similar construction and neither well showed signs of being even partly plugged. Although both wells were of the same depth, neither penetrated the full thickness of the aquifer as did the pumping well. A possible explanation is that well L-113 and well L-84 tap a highly permeable zone that is not present in well L-112.

The fact that the rate of drawdown in well L-113 during the latter part of the pumping period corresponds closely with the rate of drawdown in the pumped well (L-84) suggests that the data from both of these wells can be used to compute aquifer coefficients.

Precise values for aquifer coefficients at the test site appear to be unobtainable owing to certain discrepancies. Transmissibilities based on the drawdown data from wells L-84 and L-113 agree closely; however, the transmissibility calculated from the recovery data is slightly less for well L-84 and considerably less for well L-113 (figures 8 and 9). Part of the difference between drawdown and recovery data could be explained if the water levels at the test site prior to the test were recovering from previous pumping from this well and nearby irrigation wells. Although insufficient water-level records are available to show a trend prior to pumping, nearby irrigation wells were shut-down for the winter and water levels probably were rising. If such a trend appreciably affected water levels at the test site, the true transmissibility would be less than calculated from the drawdown data.

Probably the true coefficient of transmissibility at the test site is between 24,000 and 38,000 gpd per foot; it may be somewhat less than 38,000 but probably is not less than 34,000 gpd per foot. The true coefficient of storage is between 0.11 and 0.14 but probably is nearer 0.14.

The coefficient of storage from the test is representative of only the part of the aquifer dewatered by the pumping; however, it agrees closely with estimates by previous investigators. The apparent field permeability of the formation is between about 100 and 170 gpd per square foot, based on the total saturated thickness.

No data are available in the High Plains regarding the hydraulic properties of the Cretaceous rocks.

Movement

The configuration of the water table in Hale County in 1955 is shown by contour lines on figure 10. Ground water tends to move in the direction of the greatest slope of the water table, which is perpendicular to the contour lines. In general, the water moves southeastward through the county, the average slope of the water table being about 9 feet per mile. The movement of the water is very slow. If the average permeability of the aquifer in the county is equal to that determined from the aquifer test at Plainview, that the porosity

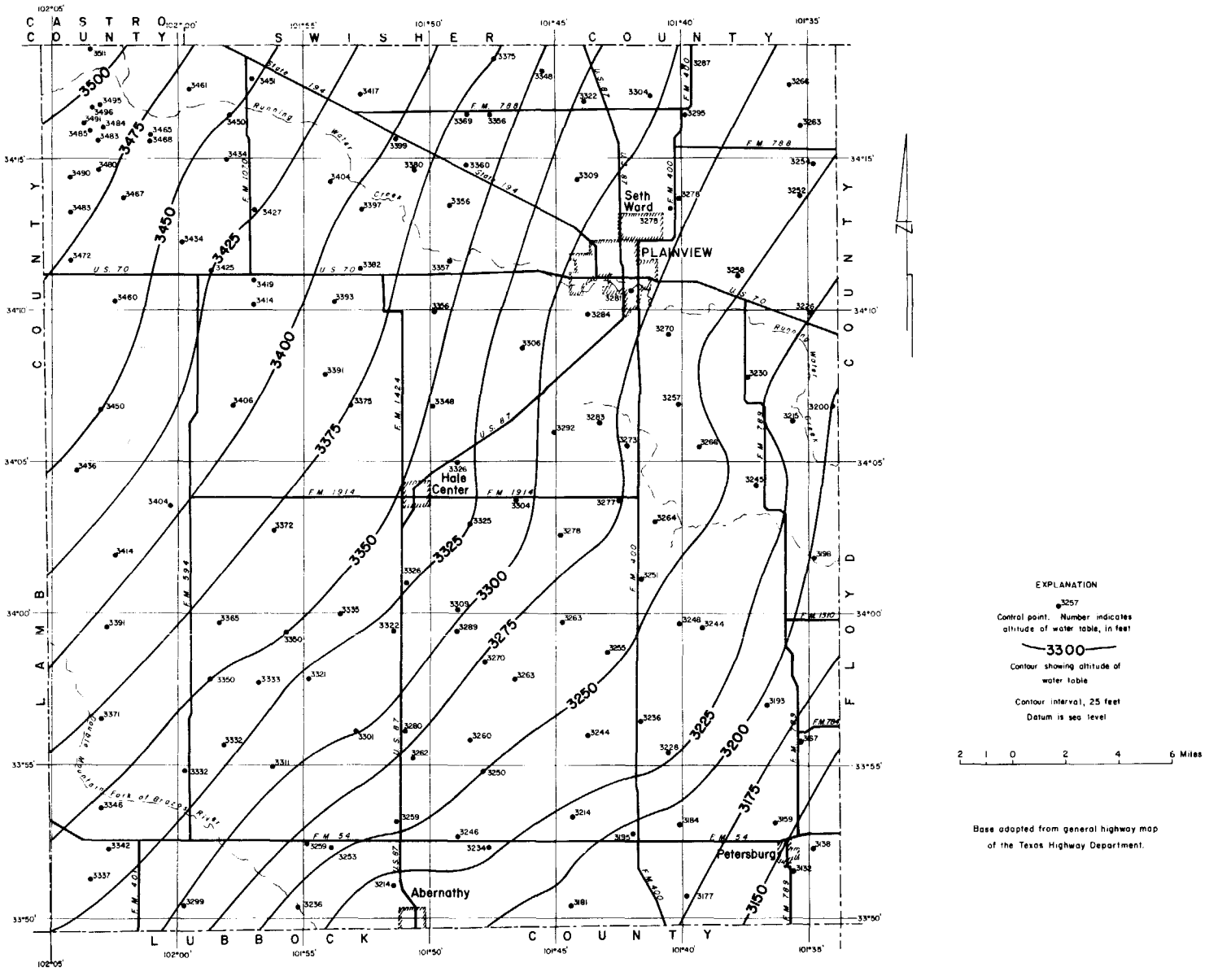

FIGURE 10.- Altitude of water table, Hale County, Texas, 1955

of the aquifer is 0.3, and the average slope of the water table is 9 feet per mile, the water is moving through the county at roughly 2 inches per day.

Uniform hydrologic conditions generally are reflected by a smoothly sloping water table. Irregularities in the contour pattern are the result of differences in recharge-discharge relation, in the permeability and thickness of the water-bearing material, and in the slope of the confining beds underlying the aquifer.

Recharge

NATURAL RECHARGE

The aquifer in Hale County is recharged by precipitation in Hale County and in part of the Southern High Plains to the northwest. Most of the precipitation on the Plains is retained temporarily in depressions or in the soil close to the land surface, from which it evaporates or is transpired by plants. A small part of the water percolates downward below the root zone and eventually reaches the water table.

Recharge to the aquifer by underflow from the northwest is fairly uniform, but recharge from the surface is irregular, owing to irregular rainfall and differences in topography and soils. Recharge from the surface is the most important to residents of Hale County because accretions from this source cause a rise in the water table, whereas the accretions from underflow into the county are approximately negated by underflow out of the county.

Several factors tend to retard the rate of recharge from the surface in the county. One of the most important is the clay-loam soils which have low permeabilities and are capable of storing large quantities of water as soil moisture between periods of precipitation. As the soil close to the land surface becomes dry from evapotranspiration, differences in vapor pressure and capillarity cause water from the deeper moist zones to move upward. Recharge is retarded also by relatively impermeable silt and clay deposits that form the bottoms of most of the lakes and ponds and by compacted soils in uncultivated areas.

Recharge is greatest when rains are of sufficient intensity and duration to increase the soil moisture to a point where the capillary forces in the soil become small in comparison to gravitational forces. During and after rains of this type, considerable quantities of water may recharge the aquifer. Along the principal drainageways, which generally are underlain by relatively coarse material, are the most favorable areas for recharge. Sharp rises in water levels in wells near the drainageways after heavy precipitation substantiate this conclusion. The abrupt rises in water levels, as shown in the hydrograph of well K-110 (figure 11), which is near Running Water Draw, can be correlated with intense storms.

Records of daily precipitation at Plainview in 1955 and daily water-level measurements in wells J-92 and L-116 (figure 12) show the effects of heavy precipitation on the water table. The water levels in both wells rose appreciably after the heavy rains in May. A rise in water level after an extended wet period probably is caused only in part by the percolating water recharging the aquifer; part of the rise is caused by a decrease in withdrawal of water for irrigation during the wet period. Because these two factors cannot be separated quantitatively with existing data, the amount of rise from recharge cannot be estimated accurately.

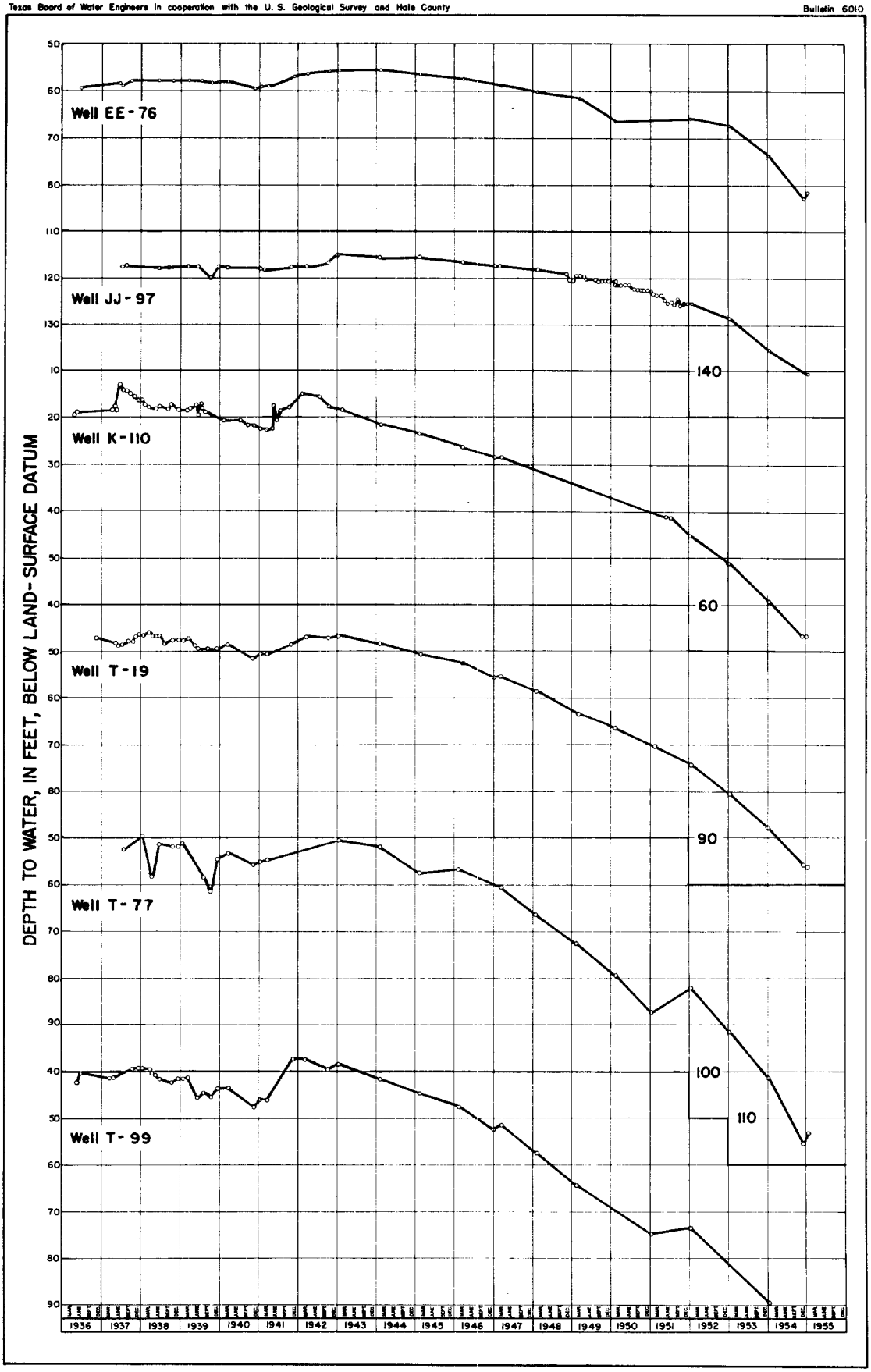

FIGURE 11.- Hydrographs of representative wells in Hale County, Texas

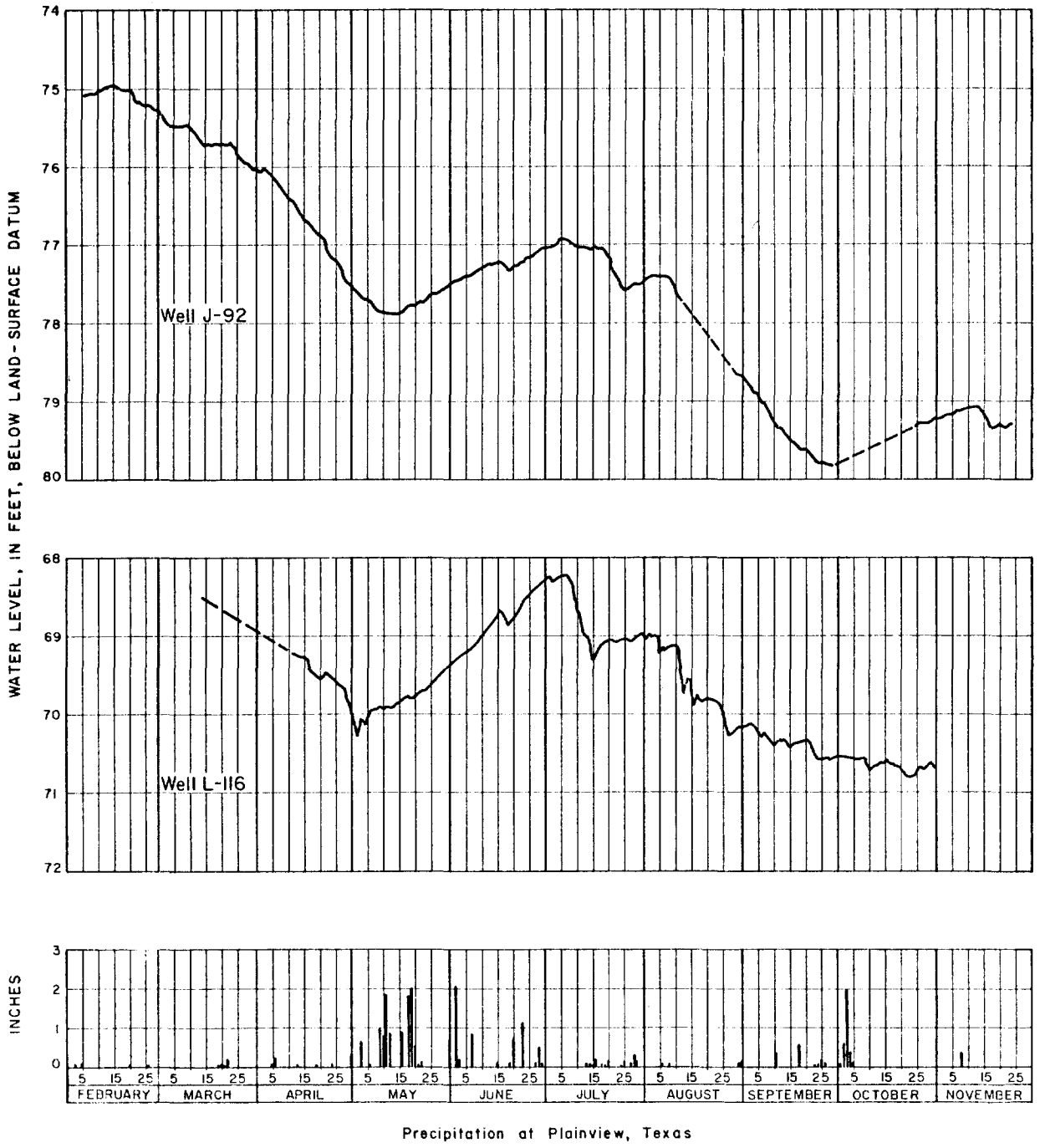

FIGURE 12.- Hydrographs of wells J-92 and L-116 and daily precipitation at Plainview, Texas, Feb.-Nov. 1955

Water levels rose after the abnormally great rainfall in 1941 (34.35 inches recorded at Plainview). Water levels in all the observation wells rose noticeably and some rose nearly 10 feet (well T-99, figure 11). A large part of the rise during this period may be attributed to recharge.

Effects on water levels from precipitation in 1947, 1951, and 1955 are shown by the hydrographs of wells T-99, T-77, J-92, and L-116 (figures 11 and 12). The effects are shown either as a rise in water level or as a reduced rate of decline. A part of the change in water levels during these periods was caused by recharge, although some of it may have resulted from reduced withdrawals.

A comparison of water-level changes with precipitation data suggests that water levels rise appreciably only when rainfall totals 10 inches or more within a period of 2 or 3 months. Accretions to the aquifer during periods of less intense rain may occur despite the lack of evidence shown by the water-level records. Further study is needed to determine more accurately the relation between precipitation and recharge.

ARTIFICIAL RECHARGE

Artificial recharge has been given considerable attention although in 1955 it was not practiced extensively in Hale County except unintentionally. Return flow from irrigation may be considered as a form of artificial recharge, but field observations suggest that recharge from this source probably is of little consequence, owing to low rates of application of irrigation water and high rates of evapotranspiration. However, waste water in ditches and ponds is evidence that in some areas the fields are being irrigated in excess of crop requirements. Some of this excess water undoubtedly returns to the aquifer in areas where the soil and subsoil are relatively permeable.

Artificial recharge may be divided into three classifications: (1) recharge by surface spreading; (2) recharge through pits, ditches, and ponds; and (3) recharge through wells. Recharge from irrigation losses is a form of surface spreading. Each of the three methods of recharging has been practiced successfully in various parts of the United States, but each method has certain unfavorable aspects. The principal difficulty, clogging, is common to all three methods. The pore spaces on the surface of the ground, sides of the pits, or walls of the well tend to become clogged by sediment or organic materials, or by chemical and physical reactions.

Several recharge experiments have been made on the High Plains with varying degrees of success. The well method appears to be the most popular to the conservation-minded people of the Plains because it greatly reduces the loss of water by evaporation. Several recharge wells in Hale County have been used periodically since 1950. Basically the installations are similar; each recharge well is constructed like most of the irrigation wells except that the casing is connected by a pipe to a pond or lake which is the source of recharge water. Each well is equipped with a turbine pump which is operated periodically during the recharging cycle in order to remove a portion of the sediment and other materials that tend to clog the well screen and surrounding aquifer.

Recharge studies made near Amarillo (Moulder and Frazer, 1956) showed that sediment-free water similar in quality to the native water can be recharged without clogging.

Broadhurst (1957, p. 3) experimented with filters made from cottonseed hulls. The filters were designed to remove much of the suspended solids from lake or pond water before injection. The experiment was unsuccessful.

Little information has been recorded on the quantity of water available for recharge, the performance of recharge wells, and the feasibility of an extensive recharging program in the High Plains.

NATURAL DISCHARGE

Most if not all of the natural discharge from the county occurs by underflow to the northeast. The water table is several feet below the lowest topographic depressions, so there are no springs or seeps in the county. It is unlikely that many plants in the county have roots that extend to the water table.

Baker (1915, p. 83) reported the presence of springs and subirrigated land along Running Water Draw and the Double Mountain Fork of the Brazos River in 1914. He stated:

> "...the water table is so near the surface in the valleys of some of the 'draws', as for instance, in the Blanco near Running Water post-office, Hale County, and along the Double Mountain Fork in southwestern Hale County, that the valley is subirrigated for alfalfa. Similarly, the valley of the 'draws' may locally be cut below the general ground-water level and give rise to springs, such as are found in both of the stream valleys in the places just mentioned."

Withdrawals for irrigation and other uses subsequent to 1914 apparently were sufficient to lower the water table enough to stop the spring flow by 1938 because no springs were reported in a ground-water study by Broadhurst and others (1938) at that time. The shallowest depth to water reported during that study was 14.3 feet below the land surface in a well near Running Water Draw. In 1939 a brief survey was made of possible ground-water discharge along Running Water Draw, upstream from Plainview. The survey revealed a few places where the water table was at or near the bed of the channel, indicating a small amount of ground-water discharge by evapotranspiration from the draw. Further declines of water levels since that time have, no doubt, halted or at least lessened this discharge.

Withdrawals of Water from Wells

IRRIGATION SUPPLIES

The first irrigation well on the Southern High Plains was drilled in 1910 a few miles west of Plainview. It was pumped at 1,700 gpm. The Texas Land and Development Company, encouraged by the success of this well, bought several thousand acres of land and began installing wells. The death of Dr. Pearson, head of the company, on the ill-fated Lusitania in 1915 slowed development of irrigation in Hale County.

Figure 13 shows that less than 100 wells were in operation in the county as late as 1933. Starting with 1934, the development of ground water for irrigation accelerated until the start of World War II, when the production of war materials cut deeply into the supply of steel and manpower for civilian needs. Toward the end of the war and until 1948, development increased at an unprecedented rate. By the end of 1947, more than 1,500 irrigation wells were in use in the county.

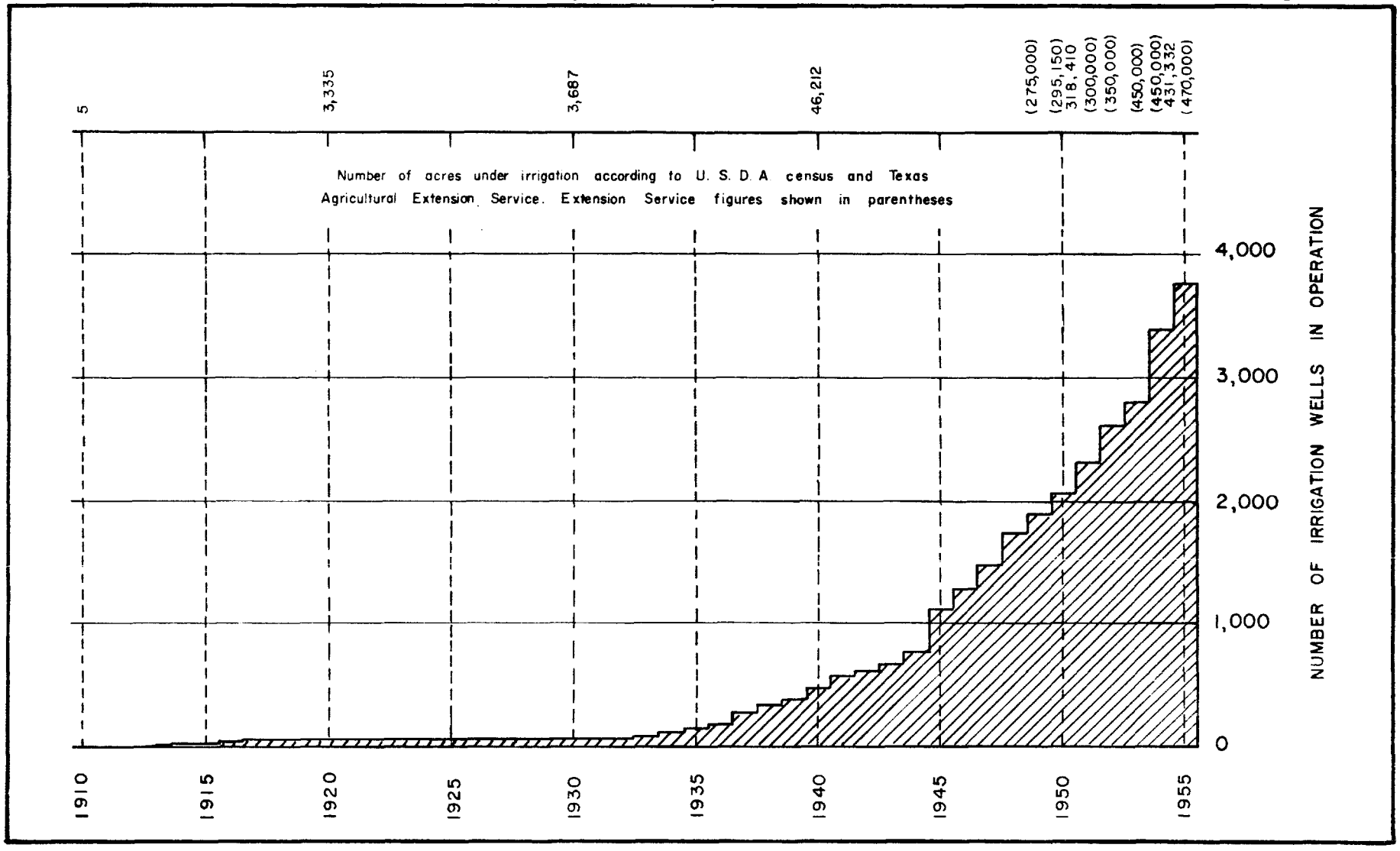

FIGURE 13.- Irrigation development, Hale County, Texas, 1910-55

Development continued at a reduced rate until 1951, when again the rate increased. From the end of 1950 to the end of 1955 more than 1,700 irrigation wells were put into operation, an average of about 340 per year.

The increase in withdrawals of ground water for irrigation has paralleled approximately the increase in the number of irrigation wells and the irrigated acreage. A study made in the Lubbock area in 1947-49 by Bonnen and others (1952, p. 12) showed that, despite a wide range in precipitation, the range in unit use of water for irrigation was relatively small. The use of water on heavy soils, in acre-inches per acre, reportedly ranged from 8.1 in 1949, when the rainfall at Lubbock was more than 29 inches, to 13 in 1948, when the rainfall was 9.5 inches. Although the quantity of water withdrawn annually per acre of irrigated land is influenced by climate the rate of withdrawal is determined more directly by the irrigated acreage.

Withdrawals of ground water for irrigation in 1955 were estimated from data collected on acreage irrigated, pumping rates, power consumption, and time of pump operation. Engines on 30 wells in Hale County were equipped with time-totalizing meters. Several times during the year the meters were read and the rate of flow was measured. Only 13 meters were operative for an entire year. The average use of water from the 13 metered wells serving about 2,100 acres from March 1955 to March 1956 was 0.94 acre-feet per acre. The electric power consumption of pumps on 47 wells was used to estimate the use of water on about 6,900 acres. The average use was about 1.3 acre-feet per acre. The weighted average use of the 60 wells is about 1.2 acre-feet per acre. If the average use of water for irrigation in the county is assumed to be the same as the average for the 60 wells, about 560,000 acre-feet of water was used in 1955 to irrigate about 470,000 acres. The rate of withdrawal for irrigation was nearly triple that in 1949 when it was estimated that 200,000 acre-feet was pumped to irrigate 275,000 acres.

OTHER SUPPLIES

Withdrawals of ground water for all uses in Hale County other than irrigation was about 5,000 acre-feet in 1955, or less than 1 percent of the total pumpage. The city of Plainview was the largest user, pumping about 3,100 acre-feet, or 2.8 mgd (million gallons per day). Withdrawals for other municipal supplies were as follows: Abernathy, 0.33 mgd; Hale Center, 0.36 mgd; and Petersburg, 0.11 mgd. The Tuco plant of the Southwestern Public Service Company was the largest industrial user of water in the county, using about 0.4 mgd principally for cooling. Other industrial uses, mostly for the processing of agricultural products, were small. Some of the industries are supplied water by municipalities; those having their own wells probably use a total of less than 50,000 gpd. Wells supplying livestock and domestic needs in rural areas use about 100,000 gpd.

DISTRIBUTION OF PUMPING

In 1955 irrigation wells were rather uniformly distributed throughout the county (plate 1). The density of wells generally ranged from about 3 to 5 and averaged about 3.8 per square mile, as compared to 2.1 in 1950, 1.1 in 1945, and 0.5 in 1940. Inventories made in 1937 and in 1945-46 showed that irrigation wells were most heavily concentrated in the northeastern quarter of the county, becoming more evenly distributed to the south and west by 1945.

The density of wells in an area is an indication of the distribution of pumping, but the yields of the wells also affect the distribution. The annual

withdrawal per well is more uniform throughout the county than would be expected from the great range in pumping rates because wells having small yields usually are pumped for longer periods than wells having large yields. Wells having the largest yields generally are in the areas where the saturated thickness of the Ogallala formation is greatest and where the water table is closest to the surface. However, in the southern part of the county where the saturated Ogallala is thin, some of the wells yield large quantities of water from Cretaceous rocks. Thus, annual withdrawals are smallest from areas where the Ogallala deposits are thin and where the Cretaceous rocks are absent or poorly productive.

PUMPING EQUIPMENT AND WELL CONSTRUCTION

Improvements in pumping equipment and well construction through the years have aided the development of irrigation materially. Some of the early irrigation wells were dug to a depth of about 30 feet by hand and cased with wood or bricks. Because the yield from these wells declined as the water table was lowered, they were abandoned or drilled deeper. Until recent years most of the wells did not penetrate the water-bearing material completely; now most of them are drilled to the red beds.

Rotary drilling has gained in popularity in recent years, and cable-tool rigs have nearly disappeared from the irrigation scene in the county. As a result, well drilling is becoming more standardized. Most wells drilled since 1940 are equipped with 16-inch casing perforated below the water table with slots about 18 inches long and 1/4 to 3/4 inch wide.

Larger yields from wells of smaller diameter were made possible by the introduction of the deep-well turbine pump during the 1920's. Prior to that time irrigators depended upon low capacity plunger-type pumps, where the water table was deep, or low-lift centrifugal pumps where the water table was shallow. About 1934 the change from the slow oil-burning engine to the more efficient gasoline engine with direct drive brought a sharp reduction in the cost of pumping and encouraged irrigation development. This type of engine has retained its popularity, but the trend has been toward the use of cheaper fuels. Butane is commonly used, but the use of natural gas is increasing. Electric motors also have become popular in recent years owing to their low cost of maintenance.

Water in Storage

VOLUME IN 1955

It is practicable to recover for irrigation only a part of the water stored in the aquifers in Hale County. As the water table declines, part of the water in the unsaturated deposits is retained in the pore spaces by capillarity, and it may be impractical to recover all the gravity water in the lower part of the aquifer owing to increased lifts and decreased well yields. In general, the quantity of water available for development in Hale County is dependent upon the thickness of saturated material in the aquifer.

The zone of saturation in the Ogallala formation in Hale County in 1955 was thickest in a small area northeast of Petersburg where more than 300 feet of the formation was saturated (figure 14). Other thick sections are along the Swisher County line north of Edmonson, small areas north of Hale Center and east of Plainview, and extensive areas along the Floyd County line, especially in the vicinity of Petersburg. The saturated thickness of the Ogallala is less than 50 feet in large areas in the vicinities of Happy Union and Abernathy; however, these areas

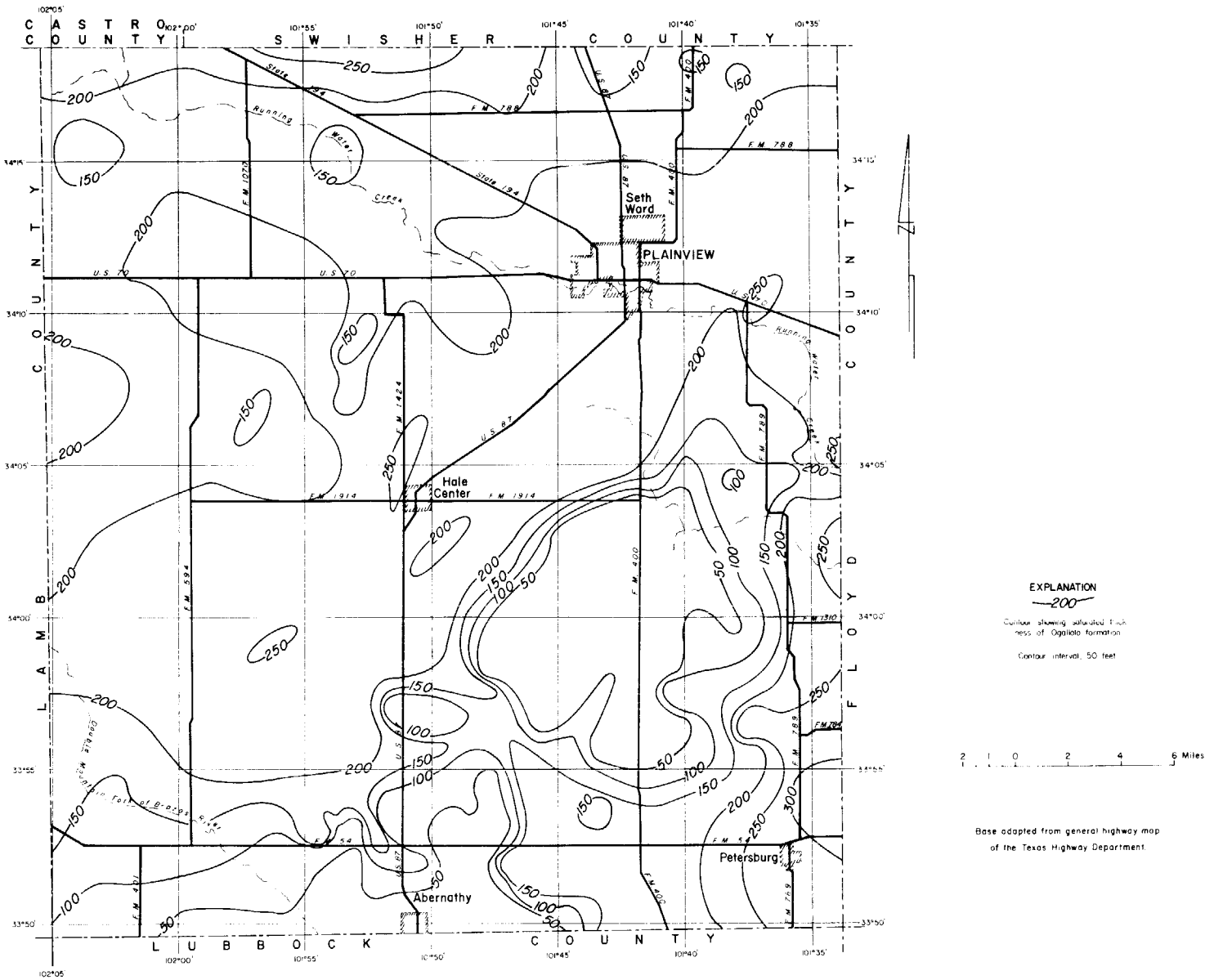

FIGURE 14.—Generalized saturated thickness of Ogallala formation, Hale County, Texas, 1955

are underlain by Cretaceous rocks that contain fresh water. The thickness of the Cretaceous rocks is shown in plate 2.

The volume of water stored in the Ogallala formation in the county is the product of the volume of saturated material and the porosity. The volume of saturated material was determined for the winter of 1955 from figure 14. Assuming an average porosity of about 34 percent (Barnes and others, 1949, p. 39-40), about 39 million acre-feet of water was stored in the Ogallala formation in Hale County in 1955. Only a part of this water (that is represented by the coefficient of storage) is available to wells; a part is held by capillarity as the water table is lowered. The storage coefficient determined from the pumping test at Plainview was 0.14. (See p. 24.) If it is assumed that this storage coefficient is representative, 16 million acre-feet of the water in storage in Hale County in 1955 was theoretically available to wells. This quantity of water represents the ultimate amount of water recoverable from the Ogallala, assuming that no recharge occurs and that net underflow into and out of the county is zero. As the saturated thickness and the quantity of water in storage decrease, however, the yields from wells also will decrease; thus not all of the 16 million acre-feet of "available" water is practically recoverable. It is not possible to estimate how much of the 16 million acre-feet could be recovered, largely because it is impossible to predict the economic trends that determine the cost of well construction and pumping.

The quantity of water available from storage in the Cretaceous rocks is indeterminate because no data are available on specific yield. The limestone does not lend itself readily to the determination of these factors because of the difficulty of determining the amount of void space. Examination of cuttings and exposures of Cretaceous limestone suggests, however, that both porosity and specific yield is considerably less than in the Ogallala.

DEPLETION OF STORAGE

Ground water is being withdrawn from the aquifer in Hale County at a much greater rate than it is being replenished, as shown by the persistent decline of water levels throughout the county during the several years prior to 1956 (table 5). The approximate rate of decline of the water table in the eastern half of the county is shown by the composite graph showing change in water level in 19 wells (figure 15). Insufficient records are available to show the average rate of decline of the water table in the western half; however, the available records suggest that the decline in the western half of the county was somewhat less until about 1950, but thereafter it was as great or nearly as great as in the eastern half.

Before about 1950 the uneven distribution of withdrawals resulted in some areas being depleted faster than others. A large number of wells whose water levels were measured in 1938 were remeasured in 1955. The decline of the water table, as interpreted from these measurements, is shown on figure 16. In general, the areas where ground water has been withdrawn for the longest time are the areas where the water table has declined the most. For example, wells T-77 and T-99 (figure 11), which are in an area where irrigation wells have been closely spaced since 1938, show a much greater decline than wells EE-76 and JJ-97, which are in areas that contained relatively few wells until about 1950. Because the distribution of pumping has become more uniform, the rate of depletion throughout the county may be expected to become more uniform.

The map showing the decline of the water table (figure 16) has been used to compute the depletion of storage for the period 1938-55. About 21.5 million

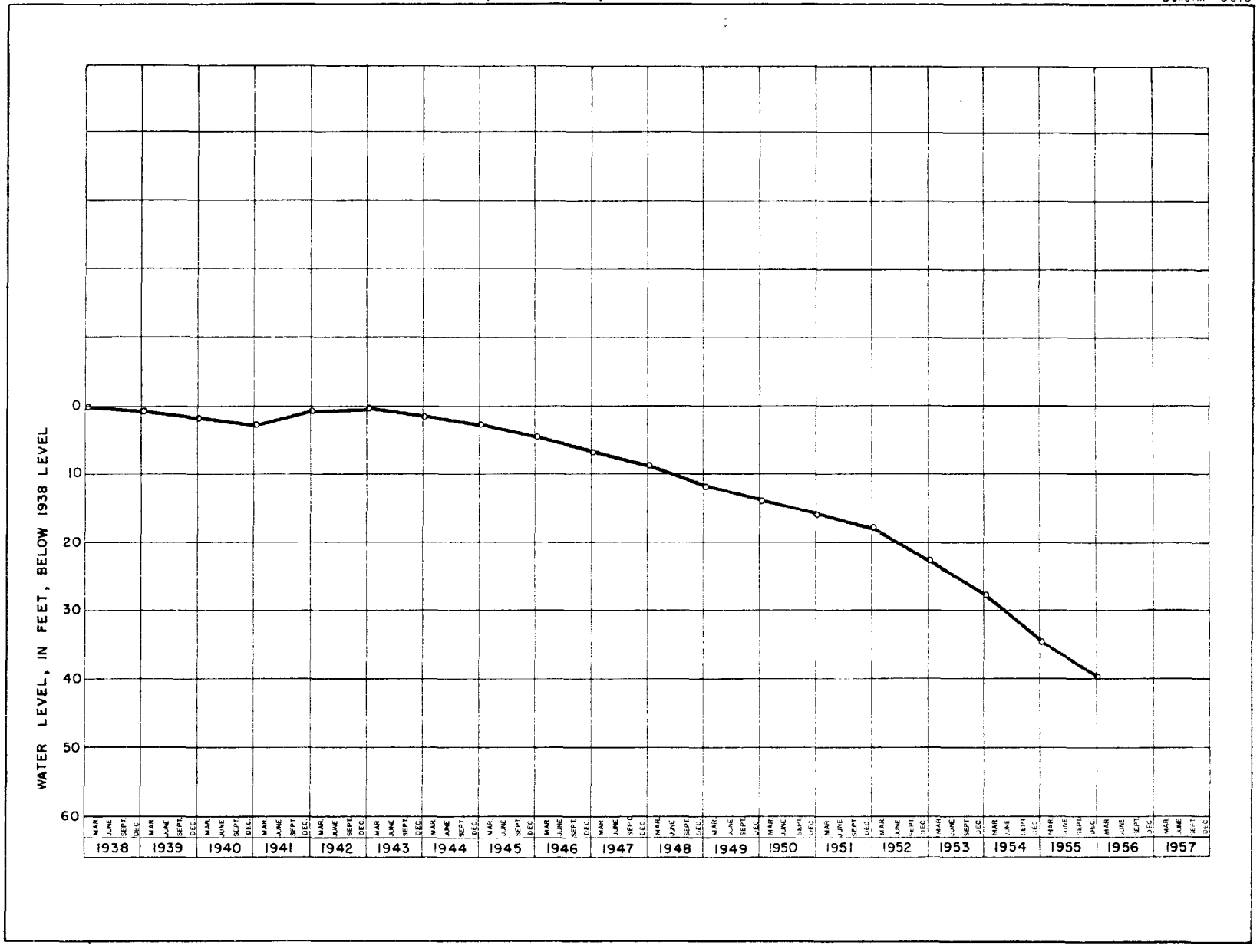

FIGURE 15. - Average water level in 19 wells in eastern Hale County, Texas, 1938-56

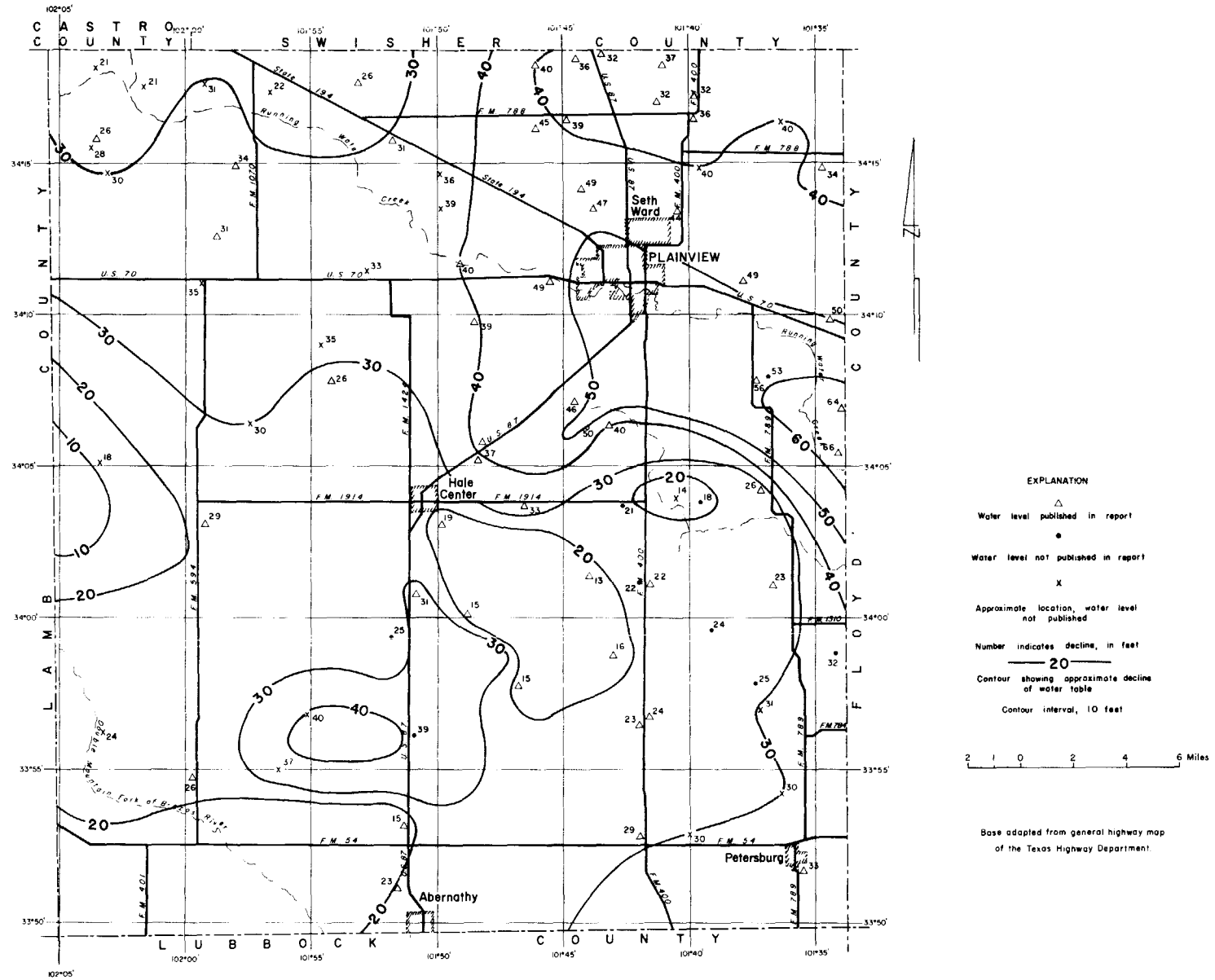

FIGURE 16.- Approximate decline of water table, Hale County, Texas, 1938-55

acre-feet of material was dewatered representing an average decline of the water table throughout the county of about 34 feet. On the assumption that the average coefficient of storage of the dewatered material is 0.14 (p. 24), it is calculated that about 3 million acre-feet of water was removed during the period 1938-55. The data are not sufficiently accurate to determine the difference between depletion and pumpage for this period, but they indicate that the depletion accounts for a very large percentage of the withdrawal, perhaps of 90 percent or more.

QUALITY OF WATER

Ground water from the Ogallala formation and Cretaceous rocks in Hale County is fairly low in mineralization, averaging less than 400 ppm (parts per million) of dissolved solids (table 6).

In comparison with water from many unconsolidated formations in Texas, the chemical quality of water in the county is uniform throughout the county. Calcium generally is the principal cation; the water commonly contains 40 to 60 ppm. The magnesium content generally is slightly less than that of calcium, and the sodium a little less than the magnesium. The principal anion is bicarbonate, averaging more than 300 ppm. The concentrations of sulfate and chloride ions are commonly less than 50 ppm each. The water is characteristically hard and in most places has an objectionable concentration of fluoride. Except for the excessive fluoride content, the water generally is suitable for irrigation and public supply, although the hardness and high concentration of silica make it somewhat objectionable for domestic and many industrial uses.

No analyses were made of water from rocks older than Cretaceous, but reports from drillers and other reliable sources indicate that water from older rocks is highly mineralized and thus would be unsuitable for most uses. The chemical analyses in table 6, of samples collected over a 20-year period, indicate that the water is suitable for irrigation--the principal use of water in the county. The older records should not be used in the design of treatment facilities for municipal and industrial supplies or for other purposes where more recent analyses are mandatory.

Suitability for Irrigation

Water from the Ogallala formation and rocks of Cretaceous age has been used for irrigation in Hale County for several decades with satisfactory results. According to the U. S. Salinity Laboratory Staff (1954) the principal factors affecting the use of water for irrigation are related to the concentrations of dissolved solids, sodium, and boron. The analyses (table 6) show that water from aquifers bearing fresh water in Hale County does not contain these constituents in excess of the limits of tolerance of most crops.

Suitability for Other Uses

The excessive content of fluoride makes the water undesirable for public supply and domestic use. The continued use of water containing more than 1.5 ppm fluoride may cause the teeth of children to become mottled. However, water having about 1.0 ppm inhibits tooth decay. Although only 15 samples were analyzed for fluoride content, the fact that 13 contained quantities in excess of the permissible limit of 1.5 ppm and that mottled teeth are prevalent in the county suggest that excessive fluoride concentration is a countywide characteristic of the water. Other constituents generally considered objectionable in

drinking water were not present in excessive quantities. Water suitable for human consumption is, of course, suitable for stock.

Hardness and silica content are important properties of the water for domestic and industrial use. Both properties are related to boiler scale that forms in boilers, hot water pipes and coils, and other heating equipment. The scale reduces the flow of water through pipes and because of its insulating property interferes with heat transfer. Soap and detergent consumption in washing and laundering operations increases as the hardness increases. Soap used with hard water forms an insoluble adherent scum, whereas detergents do not. Water having a hardness of more than 200 ppm is considered very hard and should be softened for most purposes. The hardness of 87 samples from wells in Hale County averaged about 300 ppm, the lowest being 199 ppm.

According to Moore (1940, p. 263), water containing silica in excess of 40 ppm should not be used in boilers operating at pressures of as much as 150 pounds per square inch, and water containing silica in excess of 20 ppm should not be used at pressures of as much as 250 pounds per square inch. Concentrations of silica in 10 of 12 determinations exceeded 40 ppm and all exceeded 30 ppm. The data suggest that the silica content of water in Hale County is too high for the water to be used satisfactorily in boilers.

OUTLOOK FOR THE FUTURE

The water resources of Hale County are insufficient to support irrigation perennially on the scale of 1955 unless a new source of water becomes available. The transportation of water from other areas, although remotely possible, is not feasible under present economic conditions. Materially increasing precipitation artificially by cloud seeding or other means also is only a remote possibility. If demineralization of saline water becomes economically feasible, water from geologic formations older than Cretaceous may be exploited, but it is doubtful that these formations would yield water as abundantly as the Ogallala. Undoubtedly other plans for supplementing the water supply will be considered during the next few decades.

A more tangible method for ameliorating the water-depletion problem is by improving water-conservation practices, but this would serve only to extend the life of large-scale agricultural production, not to make it perennial.

Considering the economic value of irrigation, conserving the water supply even to permit a few additional years of large-scale production appears worthy of a concerted effort. The farmers in the county already have adopted many practices designed to conserve water. These include the distribution of water to the fields through underground pipes, improved land practices, and the artificial recharge in a few places of the aquifer with water from small lakes and ponds. The quantity of water available from the lakes and ponds is small by comparison to the 1955 withdrawals, but an accurate estimate of the quantity has not been made. Other conservation measures that may be of increasing value in the future include the reduction or reuse of waste water from irrigated fields, widespread adoption of irrigation and land practices designed to reduce evaporation and transpiration by nonbeneficial plants, and production of crops requiring less water.

Three readily apparent facts will be of especial significance to the future of irrigation in Hale County if the trends observed in 1955 continue: (1) the maximum rates of withdrawal of ground water and decline of water levels will not

greatly exceed the rates of 1955; (2) after the maximum irrigation development has been reached, the annual withdrawal will gradually decrease as the areas of substantial lowering of water levels become larger; and (3) the length of time that any particular area in the county will produce water in sufficient quantities for irrigation is largely dependent upon the thickness of water-bearing material underlying that area.

In 1955 about 470,000 acres of land was irrigated, of an estimated total of 550,000 irrigable acres in the county. Thus, the potential increase in development was less than 20 percent. If the rate of increase during the 5 years prior to 1955 continues, irrigation development will reach its maximum in less than 10 years. If the rates of withdrawal and depletion increase proportionately, the average annual withdrawal probably never will exceed 700,000 acre-feet, and the average annual decline of the water table probably will never exceed 7 feet.

Wells in certain small areas in the county would not yield water in sufficient quantities for economical irrigation in 1955 because the Ogallala deposits had been nearly dewatered (figure 14). As the water table declines the nonproductive area will grow larger and the productive area will become smaller.

The water table may continue to decline at nearly a constant rate even after the rate of withdrawal begins to decrease, if it is assumed that the rate of withdrawal per unit area remains the same in the productive area. This supposition is based on the fact that the area containing saturated Ogallala deposits becomes smaller as the storage in the remaining area is depleted. If, as previously stated, the maximum anticipated rate of decline is 7 feet per year and if the minimum anticipated rate of decline is 5 feet per year (the average rate for the 3-year period 1953-56), the productive life of any area in the county can be predicted roughly. For example, the area shown on figure 14 as having saturated Ogallala deposits less than 150 feet thick in 1955 was about 250 square miles (160,000 acres). Figure 17 indicates that the deposits in this area will become dewatered between 1976 and 1985. The nonproductive area, however, will be somewhat larger because part of the remaining area will not have enough saturated thickness to support irrigation wells.

In some areas where water-bearing Cretaceous rocks underlie the Ogallala, dewatering may be delayed as much as 10 years beyond the time indicated by figures 14 and 17. However, the potential water supply from the Cretaceous rocks is of little importance to the county as a whole, because the areal extent and thickness of the water-bearing material are small.

More wells will be needed to produce the same quantity of water per unit area as the zone of saturation becomes thinner. The pumping rate per unit drawdown is largely a function of the thickness of saturation, so that, when the yield of a well can no longer be increased by lowering the pump, the yield will decrease with a further lowering of the water table. The ultimate number of wells per unit area thus will be determined by economic conditions.

Water supplies for cities and industries will be affected similarly by storage depletion. Figures 14 and 17 can be used to predict the approximate life of wells for industries and cities as well as irrigated farms. Figure 14 shows that Petersburg is situated best and Plainview and Hale Center also are in areas having thick saturated sections, but Abernathy likely will have difficulty finding an adequate supply within the city limits before 1965. However, the cities in Hale County, among other cities on the High Plains, have long-range plans to replace or supplement their ground-water supplies with surface water from a proposed reservoir on the Canadian River.

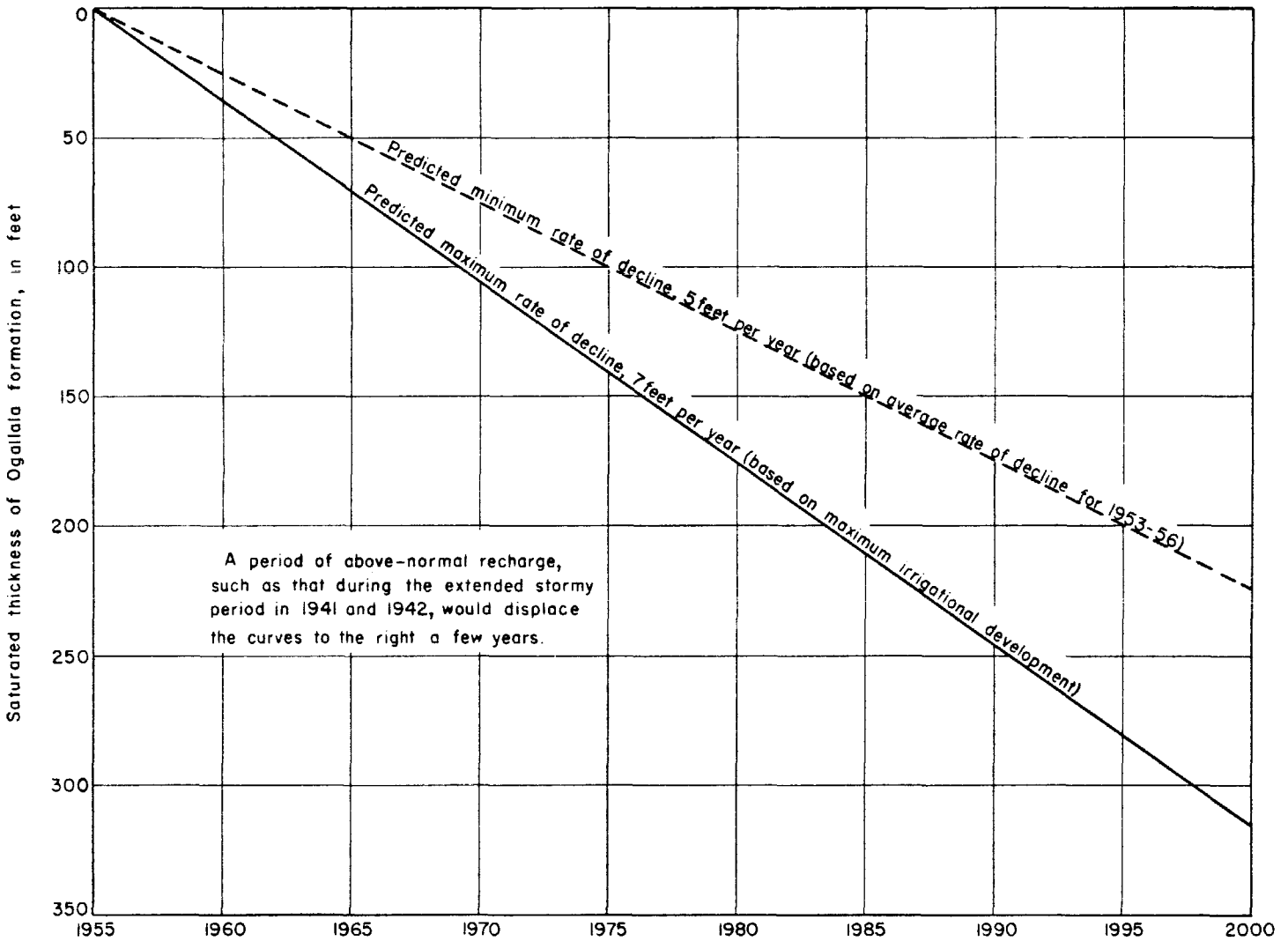

FIGURE 17.—Predicted maximum and minimum rates of decline of the water table, Hale County, Texas, 1955–2000

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Table 3.--Records of selected wells in Hale County, Texas

All wells are drilled unless otherwise noted in remarks.

Water level : Reported water levels given in feet; measured water levels given in feet and tenths.
Method of lift and type of power : B, butane; C, cylinder; E, electric; G, gasoline and Diesel engine; H, hand; Ng, natural gas; T, turbine; W, windmill. Number indicates horsepower.
Use of water : D, domestic; Ind, industrial; Irr, irrigation; N, none; P, public supply; S, stock.

Well	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Diameter of pump discharge pipe (in.)	Water level		Method of lift	Use of water	Remarks
							Below land surface datum (ft.)	Date of measurement			
A-4	Emil Sorley	Davis & Green	1945	200	16	10	91.7	Nov. 15, 1954	T,B	Irr	Altitude of land surface, 3,603 ft.
A-26	O. E. Jones	Green Machinery Co.	1948	268	16	--	70 86.1	Mar. 1948 Oct. 20, 1954	T,B, 145	Irr	1/
A-30	R. L. Hines	M. A. Patton	1938	206	14, 12	8	93.7	Oct. 21, 1954	T,B	Irr	Measured yield 816 gpm on Aug. 31, 1955. Altitude of land surface, 3,589 ft.
A-31	do	George Taylor	1939	217	14	8	92.1	do	T,B, 90	Irr	Measured yield 777 gpm on Aug. 29, 1955. Altitude of land surface, 3,587 ft.
A-35	Tom Bostic	Green Machinery Co.	1945	161	16	10	66.6 93.3	Mar. 12, 1947 Jan. 9, 1956	T,-, 160	Irr	Pump set at 140 ft. Reported yield, 1,300 gpm in 1947. 2/
A-42	C. Alexander	--	1953	200	16	10	108.2	Oct. 20, 1954	T,B	Irr	Altitude of land surface, 3,599 ft.
A-44	L. R. Vaughn	Green Machinery Co.	1935	196	15, 12, 11	8	90.6 116.7	Aug. 31, 1937 Oct. 20, 1954	T,B	Irr	Altitude of land surface, 3,602 ft. Red beds reported at 222 ft.
A-46	Sam E. Clark	G. Garmes	1936	222	18, 16, 14	8	108.6	Oct. 21, 1954	T,-	Irr	Altitude of land surface, 3,593 ft. Red beds reported at 222 ft.
A-49	J. L. La Font	Green Machinery Co.	1944	220	16	10	108.1	Nov. 4, 1954	T,B, 180	Irr	Pump set at 128 ft. Altitude of land surface, 3,573 ft.
A-56	Carrie V. Sheffy	do	1948	200	16	--	113.2	Oct. 22, 1954	T,B	Irr	Red beds reported at 200 ft. Pump set at 160 ft. Altitude of land surface, 3,596 ft.
A-59	F. L. Bass	do	1939	251	16	10	107.1	Nov. 16, 1954	T,B	Irr	Pump set at 160 ft. Altitude of land surface, 3,575 ft.
A-60	do	do	1952	250	16	10	--	--	T,B	Irr	Red beds reported at 250 ft. Pump set at 160 ft. Pumping level 129.9 ft. on Sept. 15, 1955, after pumping continuously for 60 days at 1,143 gpm. Altitude of land surface, 3,575 ft.

See footnotes at end of table.

Table 3.--Records of selected wells in Hale County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Diameter of pump discharge pipe (in.)	Water level: Below land surface datum (ft.)	Water level: Date of measurement	Method of lift	Use of water	Remarks
*A-61	E. D. Smith	--	1937	95	--	3	78.2	Oct. 11, 1937	--	--	Water level measured while pumping 2 gpm. Altitude of land surface, 3,572 ft.
B-14	W. E. Thurman	--	1936	210	--	8	81.5	Dec. 2, 1954	T,Ng	Irr	Altitude of land surface, 3,533 ft.
B-17	J. Wells Kinkaid	A. W. Fish	1945	202	16	--	59.4 86.7	Feb. 19, 1945 Jan. 14, 1955	T,-	Irr	2/
B-24	J. O. Grisham	--	1954	198	16	--	91.7	Nov. 15, 1954	T,B	Irr	Pump set at 120 ft. Altitude of land surface, 3,553 ft.
*B-39	Pete Workman	S. E. Curry	1945	202	16	10	--	--	T,-	Irr	Pump set at 145 ft.
*B-46	Joe Ashburn	Green Machinery Co.	1944	240	16	--	57.4	Apr. 12, 1942	T,E	Irr	Measured yield, 969 gpm on Sept. 7, 1955.
B-47	do	--	--	--	16	--	84.0	Feb. 18, 1955	T,E	Irr	Altitude of land surface, 3,534 ft.
B-67	M. J. Malouf	--	1927	100	16	--	57.3 80.4	Aug. 19, 1937 Jan. 9, 1954	N	N	2/
C-5	Ralph Block	Green Machinery Co.	1954	302	16	10	--	--	T,-	Irr	1/
C-7	J. N. McWilliams	do	1934	204	16	8	48.6 70.4	Apr. 24, 1936 Jan. 14, 1955	T,-	Irr	2/
*C-13	E. B. Tunnell Estate	do	1942	200	16	8	--	--	T,-	Irr	
C-24	Wayne Painter	--	1945	200	16	8	50.0 71.0	Mar. 12, 1947 Jan. 14, 1955	T,E, 50	Irr	Measured yield, 825 gpm on Aug. 31, 1955. Altitude of land surface, 3,488 ft. 2/
C-46	William B. Spilman	M. A. Patton	1937	280	24, 13	8	52.2 85.0	July 28, 1937 Jan. 9, 1956	T,Ng, 80	Irr	Altitude of land surface, 3,479 ft. 2/
D-10	Curt Glenn	Pioneer Drilling Co	--	203	16	8	94.3	Dec. 7, 1954	T,B, 140	Irr	Altitude of land surface, 3,470 ft.
*D-15	Mrs. J. W. Ray	--	--	70	--	--	60.7	Oct. 28, 1937	--	--	
D-16	J. H. Koeninger	Texas Land & Development Co.	1916	256	26	--	62.6 105.9	Apr. 18, 1934 Jan. 10, 1956	N	N	2/
D-20	Dennis Williams	--	--	--	16	8	105.9	Oct. 21, 1954	T,Ng, 180	Irr	Altitude of land surface, 3,453 ft.
D-33	C. E. Monroe	-- Bradford	1942	212	16.	8	62.1 100.1	Mar. 13, 1947 Jan. 10, 1956	T,-, 180	Irr	2/

See footnotes at end of table.

Table 3.--Records of selected wells in Hale County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Diameter of pump discharge pipe (in.)	Water level: Below land surface datum (ft.)	Water level: Date of measurement	Method of lift	Use of water	Remarks
D-42	Mrs. -- Stien	Earl Crabble	1945	237	16	10	59.4 90.5	Mar. 12, 1948 Dec. 7, 1954	T,Ng	Irr	Measured yield 562 gpm on Aug. 26, 1955. Altitude of land surface, 3,460 ft. 2/
D-44	Elmer Crawford Estate	--	--	--	--	8	97.2	Nov. 3, 1954	T,Ng	Irr	Altitude of land surface, 3,453 ft.
D-49	W. M. Toliver	--	1947	210	16	10	92.7	Jan. 12, 1955	T,Ng	Irr	2/
*D-50	-- Hefflefinger	--	--	56	4	--	40.8	Oct. 28, 1937	C,W	--	
*D-52	W. M. Toliver	Green Machinery Co.	1937	227	16	8	--	--	T,B, 185	Irr	
*D-54	C. E. Carter	-- Baker	1937	232	16	8	44.8	Aug. 6, 1937	T,Ng	Irr	Pump set at 90 ft. Altitude of land surface, 3,457 ft.
D-56	do	Green Machinery Co.	1948	245	16	10	70	May 1948	T,Ng	Irr	1/
E-1	T. P. Gerald	Texas Land & Development Co.	1916	165	24, 13	8	70.2 107.7	May 11, 1936 Jan. 12, 1956	T,Ng 90	Irr	2/
E-7	M. Howell	A. W. Fish	1953	220	16	--	95.8	Jan. 11, 1955	T,B, 150	Irr	Pump set at 160 ft. 2/
E-8	W. C. Whittle	Texas Land & Development Co.	1914	171	24, 13	8	61.5 94.0	Mar. 30, 1938 Jan. 9, 1956	T,B, 100	Irr	2/
E-23	John F. Dubose	--	1954	--	--	8	107.5	Jan. 9, 1956	T,-	Irr	2/
E-31	J. W. Hines, et al	--	--	--	16	8	96.1	Nov. 4, 1954	T,E, 40	Irr	Measured yield, 711 gpm on Aug. 27, 1955. Altitude of land surface, 3,419 ft.
*E-44	R. M. Morris	Texas Land & Development Co.	1917	271	24, 13, 10	8	58.7 90.6	June 3, 1937 Nov. 12, 1954	T,E, 50	Irr	
E-45	L. J. Halbert	--	1954	--	--	--	91.8	Nov. 12, 1954	T,E, 50	Irr	Altitude of land surface, 3,396 ft.
E-47	W. M. Toliver	Texas Land & Development Co.	1916	252	13	8	49.5 94.9	Apr. 18, 1934 Jan. 10, 1956	T,Ng	Irr	Pump set at 120 ft. 2/
*E-66	Carrie Bonner	A. W. Fish	1946	200	16	10	--	--	T,Ng 145	Irr	
*E-75	Liberty School	--	--	--	4	--	--	--	N	N	Destroyed.

See footnotes at end of table.

Table 3.--Records of selected wells in Hale County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Diameter of pump discharge pipe (in.)	Water level: Below land surface datum (ft.)	Water level: Date of measurement	Method of lift	Use of water	Remarks
F-8	L. V. Brittain	Green Machinery Co.	1948	224	16	8	94.7	Oct. 19, 1954	T,B, 160	Irr	1/
F-11	C. L. Carter	Texas Land & Development Co.	1916	251	24, 13	--	63.8 103.6	Sept.16, 1937 Oct. 20, 1954	T,G, 50	Irr	Altitude of land surface, 3,390 ft.
F-13	Owen Egger	--	1948	200	16	8	82.1	Jan. 12, 1955	T,B, 105	Irr	Pump set at 120 ft. 2/
F-20	Ola M. Brittain	Green Machinery Co.	1954	200	16	--	100.6	Nov. 12, 1954	T,B, 185	Irr	1/
F-28	B. E. Sebastian	D. L. Handley	1936	210	16	8	98.8	Nov. 15, 1954	T,E	Irr	Altitude of land surface, 3,365 ft.
*F-30	E. F. Readhimer	Green Machinery Co.	1944	202	16	--	--	--	T,E, 60	Irr	Pump set at 135 ft.
F-40	Homer Rook	Texas Land & Development Co.	1916	280	26, 13	8	46.7 83.1	Apr. 23, 1936 Jan. 12, 1955	T,E, 40	Irr	Measured yield, 764 gpm on Aug. 26, 1955. Altitude of land surface, 3,378 ft. 2/
F-52	Paul Williams	Green Machinery Co.	--	224	16, 12	10	70.4 97.9	Mar. 19, 1947 Jan. 9, 1956	T,B, 185	Irr	2/
F-53	do	do	1944	219	16	10	62.3 99.7	Mar. 19, 1947 Jan. 9, 1956	T,-	Irr	2/
F-73	B. F. Sammann	Earl Grable	1947	210	--	8	60 84.1	Mar. 1947 Feb. 9, 1955	T,E, 40	Irr	Measured yield, 806 gpm on Aug. 26, 1955. Altitude of land surface, 3,347 ft.
F-74	H. H. Sammann	Green Machinery Co.	1954	305	16	--	--	--	-,E, 50	Irr	1/
*F-88	Paul Williams	--	--	--	--	--	53.3	May 5, 1936	C,W	--	
*F-89	Prairie View School	--	--	--	--	--	--	--	C,W	--	
G-13	L. V. Howell	--	1954	324	16	--	101.4	Oct. 22, 1954	T,B, 115	Irr	Cased to 319 ft. Pump set at 172 ft. Altitude of land surface, 3,581 ft.
*G-20	S. N. Reed	--	1943	208	18	--	--	--	T,B	Irr	Pump set at 130 ft.
G-26	T. C. Meinecke	--	--	--	--	--	89.4	Oct. 25, 1954	T,B	Irr	Altitude of land surface, 3,573 ft.
G-27	J. A. Johnson	Green Machinery Co.	1941	216	16	--	79.9 102.7	Feb. 23, 1949 Jan. 14, 1955	T,B	Irr	Pump set at 138 ft. 2/

See footnotes at end of table.

Table 3.--Records of selected wells in Hale County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Diameter of pump discharge pipe (in.)	Water level: Below land surface datum (ft.)	Water level: Date of measurement	Method of lift	Use of water	Remarks
G-30	E. W. Johnson	L. P. Davis	1946	215	16	--	99.4	Nov. 3, 1954	T,-, 250	Irr	Red beds reported at 215 ft. Pump set at 175 ft. Measured yield, 700 gpm on Aug. 29, 1955. Altitude of land surface, 3,567 ft.
G-53	Mrs. Fannie Patterson	--	--	--	16	--	114.6	Oct. 25, 1954	T,B	Irr	Altitude of land surface, 3,587 ft.
G-63	Walter Hurt	--	1949	200	16	--	67.7 90.1	Mar. 12, 1948 Jan. 11, 1956	T,B	Irr	2/
*G-69	C. M. Wilson	Green Machinery Co.	1936	180	16	8	74.1	Oct. 18, 1937	T,-	Irr	Altitude of land surface, 3,578 ft.
G-70	B. A. Dalton	do	1941	208	16	8	72.5 94.2	Mar. 21, 1947 Jan. 18, 1955	T,-	Irr	2/
G-89	W. H. Feathers	Consolidated Gas & Equipment Co.	1952	200	16	--	78.8	Jan. 26, 1955	T,B	Irr	Pump set at 140 ft. Altitude of land surface, 3,539 ft.
*G-97	Margaret Folks	--	--	83	--	3	72.9	Oct. 11, 1937	C,W	--	
*G-98	J. A. Johnson	--	1930	84	5	--	72.7	Nov. 6, 1937	N	N	Destroyed.
*G-99	Westside School	--	--	50	--	2	--	--	N	N	do
*G-100	W. L. Hurt	--	--	61	--	--	51.4	Nov. 6, 1937	N	N	Unused.
*H-1	Mrs. E. F. Witten	G. Garmes	1935	210	21	--	73.6 107.5	Aug. 14, 1937 Dec. 1, 1954	T,G	Irr	Altitude of land surface, 3,541 ft.
H-11	J. E. McAlister	J. W. Altman	1943	196	16	10	86.0 118.4	Mar. 12, 1947 Jan. 10, 1956	T,-	Irr	Well drilled to depth of 300 ft. in 1954. Pump set at 180 ft. 2/
H-32	V. Craig	Green Machinery Co.	1940	224	16	--	80.8 111.9	Mar. 12, 1947 Jan. 10, 1956	T,B	Irr	2/
H-39	Chester Hooper	do	1953	254	16	10	97.2	Jan. 25, 1955	T,-, 180	Irr	Pump set at 130 ft. Altitude of land surface, 3,524 ft.
H-44	Allen Estate	do	1952	200	16	8	126.0	Nov. 17, 1954	T,B	Irr	Pump set at 160 ft. Altitude of land surface, 3,560 ft.
H-49	G. D. Lewellen	--	1934	202	15	--	77.5 115.6	May 19, 1936 Jan. 10, 1956	T,B	Irr	Pump set at 120 ft. 2/
*H-57	C. C. Taylor	Green Machinery Co.	1938	200	16, 12	8	--	--	T,-	Irr	Pump set at 132 ft.

See footnotes at end of table.

Table 3.--Records of selected wells in Hale County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Diameter of pump discharge pipe (in.)	Water level: Below land surface datum (ft.)	Water level: Date of measurement	Method of lift	Use of water	Remarks
H-59	Winford Smith	Green Machinery Co.	1939	238	16	--	68.6 94.2	Mar. 21, 1947 Jan. 10, 1956	T,B	Irr	2/
H-67	Pearl Clark	Robertson Drilling Co.	1954	200	16	--	116.6	Nov. 18, 1954	T,B	Irr	Casing perforated from 135 to 200 ft. Pump set at 160 ft. Altitude of land surface, 3,542 ft.
*H-82	Frank Kanady	L. P. Davis & Son	1946	210	17	10	--	--	T,E, 40	Irr	
H-89	Clinton Walters	Green Machinery Co.	1954	333	16	8	105	1954	T,-	Irr	1/
H-93	Texas Research Foundation	-- Block	1949	200	16	8	96.2	Feb. 23, 1955	T,-, 140	Irr	Altitude of land surface, 3,515 ft.
H-95	W. H. Dean	Green Machinery Co.	1941	208	16	8	101.5	Jan. 26, 1955	T,B	Irr	Pump set at 120 ft. Measured yield, 712 gpm on Aug. 29, 1955. Altitude of land surface, 3,515 ft.
H-100	V. M. Block	do	1955	315	16	--	--	--	--	Irr	1/
*H-103	Halfway School	--	--	87	--	2	67.3	Aug. 17, 1937	--	--	
J-11	M. L. Glantz	--	1945	200	16	8	67.9 96.6	Mar. 12, 1947 Jan. 10, 1956	T,E	Irr	Altitude of land surface, 3,497 ft. 2/
J-20	S. E. Curry	Bud Gibbons	1941	182	16	8	48.1 83.2	Mar. 26, 1943 Jan. 14, 1955	T,E, 30	Irr	2/
J-31	C. D. Howell	Green Machinery Co.	1936	200	16	8	90.9	Jan. 25, 1955	-,E, --	Irr	Measured yield, 722 gpm on Aug. 31, 1955. Altitude of land surface, 3,488 ft.
J-48	Chas. & Helen Clements	Peerless Pump Co.	1951	260	16	8	--	--	T,-	Irr	Casing perforated from 84 to 260 ft. Pump set at 160 ft. 1/
J-60	Lester James	Green Machinery Co.	1941	236	16	8	72.5 111.3	Jan. 17, 1941 Jan. 10, 1956	T,B	Irr	Altitude of land surface, 3,490 ft. 2/
J-75	J. E. McPherson	M. A. Patton	1936	279	14, 10	8	92.9	Feb. 7, 1955	T,Ng	Irr	Pump set at 130 ft. Measured yield, 234 gpm on Aug. 31, 1955. Altitude of land surface, 3,486 ft.
*J-89	Running Water School	--	--	--	4	--	--	--	N	N	Destroyed.
*J-90	Laura C. James	--	Old	69	--	2	57.4	July 23, 1937	C,W	--	

See footnotes at end of table.

Table 3.--Records of selected wells in Hale County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Diameter of pump discharge pipe (in.)	Water level: Below land surface datum (ft.)	Water level: Date of measurement	Method of lift	Use of water	Remarks
*J-91	G. E. Edwards	--	--	--	4	2	72.8	June 15, 1937	C,W	--	
J-92	S. E. Curry	--	--	--	4	--	60.1 79.0	Feb. 29, 1952 Jan. 1, 1956	N	N	Observation well. Equipped with automatic water-stage recorder. Altitude of land surface, 3,455 ft. 2/
K-10	A. B. Tarwater	Green Machinery Co.	1938	232	--	--	51.8 87.9	Nov. 20, 1939 Jan. 14, 1955	T,E	Irr	2/
K-14	C. A. Davis, et al	--	--	--	--	8	80.3	Dec. 1, 1954	T,Ng	Irr	Altitude of land surface, 3,441 ft.
K-30	H. D. Slaton	--	1954	--	16	8	78.5	Feb. 18, 1955	T,E, 40	Irr	Measured yield, 977 gpm on Aug. 26, 1955. Altitude of land surface, 3,434 ft.
K-43	L. L. Simpson	B & F Drilling Co.	1953	260	16	8	80	Mar. 1953	T,Ng	Irr	1/
K-44	Pioneer Natural Gas Co.	--	--	--	8	4	--	--	T,E, 5	Ind	Pump set at 120 ft.
K-45	do	-- Robinson	1954	220	10	4	--	--	T,Ng	Ind	Pump set at 200 ft.
K-47	H. Wasson	Taylor & Gibbons	1943	240	16	10	69.9 92.0	Apr. 5, 1948 Jan. 9, 1956	T,Ng	Irr	2/
*K-49	F. N. Joachim	Green Machinery Co.	1942	230	16	8	--	--	T,-	Irr	
*K-65	E. M. Carter, Jr.	Taylor Gibbons	1943	240	16	10	--	--	T,Ng	Irr	
K-72	C. S. Ebeling	--	1914	175	16	--	20.0 55.1	June 7, 1937 Jan. 14, 1955	N	N	Altitude of land surface, 3,412 ft. 2/
K-94	R. E. Walker	J. C. Cook	1935	170	20, 14	8	54.0 88.0	Feb. 19, 1948 Jan. 12, 1955	T,B	Irr	2/
*K-103	E. H. Kirchoff	Carl Mangum	1941	170	18	10	--	--	T,Ng	Irr	
*K-109	R. B. Walker	--	Old	--	--	--	40.4	Apr. 27, 1936	N	N	Destroyed.
K-110	E. H. Kirchoff	--	--	140	26	--	19.4 66.3	Apr. 27, 1936 Jan. 12, 1955	N	N	Altitude of land surface, 3,380 ft. 2/
K-111	H. D. Slaton	--	1910	130	--	--	17.6 51.2	Aug. 16, 1937 Jan. 4, 1954	N	N	Dug to 29 ft. 2/

See footnotes at end of table.

Table 3.--Records of selected wells in Hale County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Diameter of pump discharge pipe (in.)	Water level: Below land surface datum (ft.)	Water level: Date of measurement	Method of lift	Use of water	Remarks
L-6	McKinley Howell	--	1914	180	26	10	43.9 92.9	Apr. 23, 1936 Jan. 10, 1956	T,B	Irr	Measured yield, 323 gpm on Aug. 29, 1955. Pumping level, 136 ft. Altitude of land surface, 3,398 ft. 2/
L-28	J. S. Simpson	Green Machinery Co.	1946	228	16	10	60.2 98.9	Mar. 3, 1947 Jan. 12, 1955	T,Ng	Irr	2/
L-29	do	-- Wood	1934	198	16	--	47.9 94.9	Sept.14, 1937 Jan. 12, 1955	-,Ng	Irr	2/
L-42	C. W. Kelichor	Consolidated Gas & Equipment Co.	1953	200	16	8	87.1	Jan. 24, 1955	T,E, 40	Irr	Altitude of land surface, 3,365 ft.
L-48	L. E. Draper	--	1948	200	16	8	86.5 91.1	Jan. 11, 1955 Jan. 9, 1956	T,B	Irr	Altitude of land surface, 3,365 ft.
L-81	City of Plainview	L. A. Peoples	1937	301	18, 12	8	--	--	T,E, 40	P	Casing: 64 ft. of 18-in., 254 ft. of 12-in. Pump set at 120 ft.
*L-82	do	do	1937	301	18, 12	8	--	--	T,E, 40	P	Casing: 64 ft. of 18-in., 298 ft. of 12-in. Pump set at 160 ft.
L-83	do	do	1937	301	18, 12	8	--	--	T,E, 40	P	Casing: 64 ft. of 18-in., 298 ft. of 12-in. Pump set at 120 ft.
L-84	do	Robertson Drilling Co.	1953	323	16	8	--	--	T,E, 50	P	Pump set at 140 ft. Altitude of land surface, 3,377 ft. 1/
L-85	do	do	1953	322	16	8	--	--	T,E, 75	P	Pump set at 140 ft.
*L-86	do	L. A. Peoples	1949	305	16	8	--	--	T,E, 100	P	Pump set at 120 ft.
L-87	do	--	1928	287	16, 8	8	--	--	T,E, 100	P	Casing: 240 ft. of 16-in., 47 ft. of 8-in. Pump set at 140 ft.
L-89	Gifford Hill Western Co.	--	1945	200	24	--	47.5 91.9	Mar. 7, 1945 Jan. 9, 1956	--	N	2/
L-101	J. L. Baker	Green Machinery Co.	1951	290	16	10	70	Oct. 1951	T,B	Irr	1/
L-112	City of Plainview	L. C. Malone	1955	215	4	--	--	--	N	N	Observation well 1, for pumping test. Altitude of land surface, 3,377 ft.

See footnotes at end of table.

Table 3.--Records of selected wells in Hale County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Diameter of pump discharge pipe (in.)	Water level: Below land surface datum (ft.)	Water level: Date of measurement	Method of lift	Use of water	Remarks
L-113	City of Plainview	L. C. Malone	1955	215	4	--	--	--	N	N	Observation well 2 for pumping test. Altitude of land surface, 3,377 ft.
L-116	do	--	--	115	8	--	41.9 71.2	June 28, 1949 Nov. 1, 1955	N	N	Observation well equipped with automatic water-stage recorder. Altitude of land surface, 3,350 ft. 2/
M-1	Frank Moore	--	1948	--	--	8	90.7	Jan. 9, 1956	T,B	Irr	2/
M-10	Perry Wood	--	1915	232	--	8	50.7 88.9	Mar. 17, 1947 Jan. 6, 1956	T,B	Irr	Pump set at 140 ft. 2/
M-11	Robert & Bruce Rigler	--	1911	210	16, 12	10	53.6 80.6	Mar. 13, 1947 Jan. 6, 1954	T,B	Irr	do
M-13	Jesse A. Horn	--	1954	237	16	8	81.5	Jan. 9, 1956	T,B	Irr	Altitude of land surface, 3,333 ft. 2/
M-36	Walter Hoffman	Calvin Cook	1931	210	14, 10	8	83.7	Feb. 8, 1955	-,B	Irr	Pump set at 120 ft. Measured yield, 685 gpm on Aug. 26, 1955. Altitude of land surface 3,336 ft.
M-46	D. W. Kerr	Green Machinery Co.	1943	200	16	8	60.9 97.8	Mar. 13, 1947 Jan. 12, 1955	-,E	Irr	2/
*M-60	W. E. Brown, et al	Baker Pump Co.	1937	255	16	10	--	--	T,B	Irr	
M-79	R. C. Jackson	Green Machinery Co.	1946	225	16	8	63.4 97.6	Mar. 7, 1949 Jan. 9, 1956	T,B	Irr	2/
M-88	Helen W. Hart	--	--	--	--	--	75.3	Dec. 20, 1954	C,W	--	Altitude of land surface, 3,333 ft.
M-112	Frank M. Eiring	Robertson Drilling Co.	1953	332	16	10	--	--	T,B	Irr	Casing perforated from 112 to 332 ft. Pump set at 160 ft. 1/
*M-122	R. J. Parks	Jim Cook	1912	50	8	--	43.8 44.4	Oct. 26, 1937 June 21, 1938	E,J	D,S	Deepened to 117 ft.
*M-123	Louis B. Clements	--	--	64	--	--	45.3	Nov. 6, 1937	C,W	--	
*M-124	F. W. Wehrheim	--	Old	46	--	--	41.3 42.2	Oct. 20, 1937 June 21, 1938	C,W	D,S	
*M-125	H. M. La Font	--	--	65	--	--	47.0	Nov. 6, 1937	N	N	Destroyed.
*M-126	L. E. Mayfield	--	--	--	--	--	--	--	N	N	
*M-127	H. E. Graham	--	--	--	4	--	--	--	N	N	Destroyed.

See footnotes at end of table.

Table 3.--Records of selected wells in Hale County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Diameter of pump discharge pipe (in.)	Water level: Below land surface datum (ft.)	Water level: Date of measurement	Method of lift	Use of water	Remarks
*M-128	East Mound School	--	--	49	--	--	42.9	Dec. 6, 1937	N	N	
N-27	W. E. Cannon	Peerless Pump Co.	1950	220	16	10	93.4	Jan. 11, 1956	T,-	Irr	
N-30	J. Q. Reddinger	A. W. Fish	1952	260	--	10	87.5	Jan. 19, 1955	T,-	Irr	
N-35	R. T. Guffee	--	1948	204	16	10	71.8	Feb. 7, 1955	T,Ng, 200	Irr	Measured yield, 470 gpm on Sept. 1, 1955. Altitude of land surface, 3,521 ft.
*N-73	Otto Steinberg	A. W. Fish	1944	238	16	10	--	--	T,-	Irr	
*N-91	Sunshine School	--	--	68	--	--	50.6	June 27, 1938	N	N	Altitude of land surface, 3,522 ft. Destroyed.
*N-92	Bill Moody Estate	--	--	45	--	3	--	--	C,W	N	
*P-13	Davis Cannon	Peerless Pump Co.	1937	204	16	10	68.7	Oct. 19, 1937	T,-	Irr	Pump set at 126 ft. Altitude of land surface, 3,520 ft.
P-65	T. P. King	Consolidated Gas & Equipment Co.	1954	220	16	8	--	--	T,-	Irr	1/
P-71	C. C. Scroggins	Green Machinery Co.	1938	210	16	--	92.1	Jan. 26, 1955	T,B	Irr	Pump set at 108 ft. Altitude of land surface, 3,498 ft.
*P-76	J. C. Kerr	--	1939	190	16	8	87.4	Jan. 19, 1955	T,-	Irr	
*P-98	E. A. Howard	--	--	60	--	2	40	Aug. 1937	C,W	--	
*P-99	O. L. Fleming	--	--	78	--	--	62.1	Aug. 16, 1937	N	N	
*P-100	Mayfield School	--	--	81	--	--	59.7 72.0	Aug. 12, 1937 Jan. 29, 1952	C,W	N	2/
Q-9	C. E. Reed	M. A. Patton	1938	233	13, 10	8	70.8 98.2	Mar. 21, 1947 Jan. 13, 1955	T,-	Irr	2/
Q-33	W. G. Laney	B & F Drilling Co.	1952	333	16	8	--	--	T,-	Irr	1/
Q-37	J. E. Laney	G. Garms	1937	165	14	--	53.5 80.2	Aug. 26, 1937 Jan. 13, 1955	T,Ng	Irr	Cased to 150 ft. Altitude of land surface, 3,471 ft. 2/
Q-39	Fielding Helm	Green Machinery Co.	1949	225	16	10	65	Mar. 1949	T,-, 125	Irr	1/
Q-52	do	B & F Drilling Co.	1955	327	16	10	--	--	T,-	Irr	Casing perforated from 207 to 327 ft. 1/

See footnotes at end of table.

Table 3.--Records of selected wells in Hale County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Diameter of pump discharge pipe (in.)	Water level: Below land surface datum (ft.)	Water level: Date of measurement	Method of lift	Use of water	Remarks
Q-66	Carl Laney	A. W. Fish	1945	180	16	8	90.7	Feb. 7, 1955	T,Ng	Irr	Pump set at 160 ft. Measured yield, 856 gpm on Aug. 27, 1955. Altitude of land surface, 3,467 ft.
Q-68	J. E. Laney	--	1945	200	16	10	62.1 96.8	Mar. 21, 1947 Jan. 10, 1956	T,-	Irr	2/
Q-84	V. D. Ross	Green Machinery Co.	1953	280	16	10	80	June 1953	T,-	Irr	1/
*Q-95	S. L. Quisenberry	A. W. Fish	1945	200	16	8	--	--	T,-	Irr	Pump set at 150 ft.
R-1	Melvin Evans	Green Machinery Co.	--	--	--	8	91.4	Feb. 7, 1955	T,E, 40	Irr	Measured yield, 700 gpm on Aug. 31, 1955. Altitude of land surface, 3,447 ft.
R-4	Mrs. J. D. Webb	--	1913	170	72, 10	8	46.0 71.2	May 11, 1936 Jan. 8, 1953	T,-	Irr	Dug to 54 ft.; drilled to 170 ft. 10-in. casing from 54 to 170 ft. 2/
R-36	C. C. Gidney Estate	G. L. Taylor	1952	200	16	8	108.5	Dec. 10, 1954	T,Ng	Irr	Altitude of land surface, 3,414 ft.
R-63	Rayburn Karrh	Green Machinery Co.	1941	240	16	8	60.8 91.6	Jan. 21, 1941 Feb. 7, 1955	T,E, 40	Irr	Measured yield, 340 gpm on Apr. 26, 1955. Altitude of land surface, 3,440 ft.
R-90	Mrs. Ferd Rastetter	--	--	--	--	10	107.4	Jan. 13, 1956	T,B, 185	Irr	2/
R-91	M. H. Gibson	B & F Drilling Co.	1955	343	16	8	--	--	T,Ng	Irr	Cased to 308 ft. Casing perforated from 110 to 308 ft. 1/
R-101	G. E. Bench	--	1944	202	16	8	57.4 99.4	Mar. 14, 1947 Jan. 13, 1956	T,B	Irr	Pump set at 120 ft. Measured yield, 330 gpm on Aug. 26, 1955. Altitude of land surface, 3,387 ft. 2/
R-113	Saigling & Foster	--	--	185	6	--	84.5 90.9	Jan. 14, 1955 Jan. 10, 1956	C,W	D,S	
*R-115	Less & Floyd Tiffin	--	--	--	--	--	51.8 60.5	May 12, 1936 Feb. 17, 1944	C,W	--	
*R-116	Mrs. Emma Cotton	--	--	--	6	--	55.5 56.8	May 11, 1936 June 28, 1938	--	--	
S-6	Lewis E. Allen	--	--	--	16	8	90.3	Dec. 10, 1954	T,E, 40	Irr	Measured yield 835 gpm on Sept. 8, 1955. Altitude of land surface, 3,374 ft.
S-10	City of Plainview	Green Machinery Co.	1952	303	16	8	--	--	T,E, 100	P	Pump set at 130 ft. 1/

See footnotes at end of table.

Table 3.--Records of selected wells in Hale County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Diameter of pump discharge pipe (in.)	Water level: Below land surface datum (ft.)	Water level: Date of measurement	Method of lift	Use of water	Remarks
*S-35	S. C. Horan	Burney Fish	1945	209	16	8	--	--	T,E	Irr	
S-38	K. P. Chester	--	--	--	--	10	81.3	Dec. 14, 1954	T,E, 50	Irr	Altitude of land surface, 3,352 ft.
*S-39	do	Green Machinery Co.	1940	229	16	10	--	--	T,B	Irr	
S-59	J. P. Horton	Bradford Supply Co.	1938	160	--	8	58.8 99.1	Mar. 11, 1947 Jan. 16, 1956	T,E, 30	Irr	2/
S-94	R. C. Yarborough	--	--	--	--	--	85.0	Jan. 21, 1955	T,B, --	Irr	Measured yield, 830 gpm on Aug. 20, 1955. Altitude of land surface, 3,342 ft.
S-100	G. A. Benefield	John Buth	1940	181	16	10	105.8	Jan. 13, 1956	T,B	Irr	Altitude of land surface, 3,381 ft. 2/
S-117	Charles Clements	Robertson Drilling	1952	249	16	8	85.8	Dec. 13, 1954	T,B	Irr	Altitude of land surface, 3,359 ft.
*S-121	Castleberry & Clanton	--	1920	59	8	--	43.2	Oct. 27, 1937	C,W	--	
*S-122	T. S. Branham	--	--	76	5	2	40.8 41.1	July 7, 1937 Dec. 12, 1938	C,W	N	
T-17	J. M. Long	--	--	--	16	8	93.4	Jan. 24, 1955	T,E, 40	Irr	Measured yield, 633 gpm on Aug. 26, 1955. Altitude of land surface, 3,320 ft.
T-19	E. L. Cross	--	--	--	--	8	47.0 99.2	Nov. 22, 1936 Jan. 16, 1956	T,Ng	Irr	2/
T-40	C. C. Castleberry	Green Machinery Co.	1955	232	16	--	--	--	-,B	Irr	1/
T-41	W. S. Noel	do	1951	185	16	8	59	June 1951	T,E	Irr	Cased to 96 ft. 1/
T-50	I. B. Rankin	--	--	--	--	10	112.4	Jan. 16, 1956	T,E, 50	Irr	Altitude of land surface, 3,336 ft. 2/
T-51	W. E. Burnett, et al	W. O. Tye	1944	200	16	10	58.8 105.8	Mar. 14, 1947 Jan. 16, 1956	T,E, 60	Irr	2/
T-58	Clyde L. Young	Green Machinery Co.	1954	290	16	8	100	Aug. 1954	T,B	Irr	1/
T-67	Carroll C. Castleberry	do	1943	175	16	10	53.3 93.4	Mar. 14, 1947 Jan. 13, 1955	T,B	Irr	2/
T-77	J. C. Powell	--	1914	276	24, 16	8	52.7 116.4	July 23, 1937 Jan. 16, 1956	T,E, 40	Irr	Altitude of land surface, 3,314 ft. 2/

See footnotes at end of table.

Table 3.--Records of selected wells in Hale County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Diameter of pump discharge pipe (in.)	Water level: Below land surface datum (ft.)	Water level: Date of measurement	Method of lift	Use of water	Remarks
T-78	George M. Schick	--	--	--	--	--	95.0	Jan. 24, 1955	T,E, 40	Irr	Altitude of land surface, 3,310 ft.
T-97	M. T. Dunn	--	1915	277	24, 16	8	39.3 103.5	May 15, 1936 Jan. 13, 1955	T,E, 40	Irr	Altitude of land surface, 3,302 ft. 2/
T-98	J. B. Latimer	Texas Land & Development Co.	1915	271	24, 17	8	32.6 79.9	Sept.10, 1937 Jan. 6, 1954	T,B	Irr	2/
T-99	C. D. Haston	--	1915	266	26	--	42.4 89.1	May 15, 1936 Jan. 6, 1954	-,B	Irr	2/
T-100	A. H. Schrock	Green Machinery Co.	1945	185	16	8	43.5 81.0	Nov. 28, 1945 Jan. 16, 1956	T,B	Irr	Altitude of land surface, 3,339 ft. 2/
T-101	do	do	1955	175	16	--	--	--	T,B	Irr	1/
*T-110	R. W. Burchardt	--	--	--	--	--	38.8	May 5; 1936	C,W	N	Destroyed.
*T-111	Bellview School	--	--	51	6	--	36.0	Nov. 13, 1937	C,W	--	No casing.
*T-112	Clarence Stalcup	--	--	--	4	--	39.6	May 1, 1936	C,W	N	
U-5	George W. Struve	--	--	--	16	10	86.9	Jan. 19, 1955	T,-	Irr	Altitude of land surface, 3,523 ft.
*U-9	Tony Chisum Estate	Sam Scroggins	1945	322	16	10	--	--	T,-	Irr	
*U-12	J. L. Mann, Jr.	--	1944	200	16	10	--	--	T,-	Irr	
U-29	Orville Jones	Green Machinery Co.	1948	224	16	10	84.8	Dec. 21, 1954	T,-	Irr	Pump set at 140 ft. Altitude of land surface, 3,489 ft.
*U-40	John Schoonvelt	Mounts & Garms	1935	200	16, 14 9	8	--	--	T,-	Irr	Pump set at 120 ft.
U-53	Oscar T. Gross	Consolidated Gas & Equipment Co.	1953	300	16	8	85.3	Feb. 2, 1955	T,B, 180	Irr	Pump set at 180 ft. Measured yield 445 gpm on Aug. 27, 1955. Altitude of land surface, 3,499 ft.
*U-70	Lida Jones	Green Machinery Co.	1952	300	16	10	83	July 1952	T,-	Irr	Pump set at 160 ft. 1/
U-74	E. B. Allen	Altman Drilling Co.	--	305	16	10	88.1 100.1	Mar. 3, 1949 Jan. 11, 1956	T,-	Irr	Red beds reported at 305 ft. Pump set at 200 ft. Well deepened to 305 ft. in 1954. 2/

See footnotes at end of table.

Table 3.--Records of selected wells in Hale County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Diameter of pump discharge pipe (in.)	Water level		Method of lift	Use of water	Remarks
							Below land surface datum (ft.)	Date of measurement			
*U-86	Haislip & Hardt	--	--	--	--	--	--	--	--	--	
*V-14	J. D. Ivey	B. Fish	1946	216	16	8	--	--	T,-	Irr	
V-17	R. L. King	Green Machinery Co.	1948	223	16	10	--	--	T,-	Irr	1/
V-33	J. D. Neely	do	1954	312	16	10	100	May 1954	T,-	Irr	Shutter screen from 108 to 312 ft. 1/
V-58	Mrs. W. M. Fisher	Consolidated Gas & Equipment Co.	1953	310	16	8	96.9	Feb. 7, 1955	T,E	Irr	Pump set at 200 ft. Measured yield, 830 gpm on Sept. 8, 1955. Altitude of land surface, 3,468 ft.
V-87	H. McBeth	Green Machinery Co.	1948	328	16	8	65	Oct. 1948	T,-	Irr	Pump set at 165 ft. 1/
*V-115	Roberta Miller	do	1944	204	16	--	--	--	N	N	
*V-116	Center Plains School	--	--	--	4	2	--	--	C,W	--	
*V-117	M. K. Fisher	-- Alderman	1937	200	18	--	66	1937	N	N	Destroyed.
*W-4	Claude Pruett	Green Machinery Co.	1945	200	16	8	64.6 80.2	Mar. 21, 1947 Jan. 9, 1954	--	Irr	2/
W-30	Glen Tullis	do	1955	300	16	8	90	July 1955	T,-	Irr	1/
*W-51	Boyd Elliott	do	1945	210	16	10	--	--	T,-	Irr	Pump set at 170 ft.
W-96	Bruce T. Harp	do	1950	290	16	8	75	Aug. 1950	T,-	Irr	1/
*W-99	B. E. Wimberly	Pioneer Drilling Co.	1947	283	16	8	--	--	T,-	Irr	Pump set at 193 ft. Well deepened to 283 ft. in 1955.
W-105	R. J. Harrell	--	--	--	16	8	99.5	Jan. 12, 1956	T,G, 60	Irr	Altitude of land surface, 3,423 ft. 2/
*W-112	City of Hale Center	Garms & Mounts	1936	123	12	4	51	1936	N	N	
W-113	do	Peerless Pump Co.	1953	330	20, 16	8	--	--	T,E, 40	P	Casing perforated from 117 to 317 ft. Reported pumping level, 187 ft. after 67½ hours pumping 630 gpm in 1953. 1/
X-4	W. T. Helbert	--	--	--	--	10	93.2	Jan. 11, 1955	T,Ng	Irr	Altitude of land surface, 3,419 ft. 2/
X-27	Grady Shepard	Peerless Pump Co.	1953	312	16	--	--	--	-,E	Irr	Cased to 310 ft. 1/

See footnotes at end of table.

Table 3.--Records of selected wells in Hale County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Diameter of pump discharge pipe (in.)	Water level: Below land surface datum (ft.)	Water level: Date of measurement	Method of lift	Use of water	Remarks
X-36	Swan Pettit	--	1917	210	26	8	53.5 72.3	May 11, 1936 Jan. 12, 1956	T,B	Irr	2/
X-37	J. H. Sweat	--	1939	200	13	--	61.9 87.7	Mar. 14, 1947 Jan. 17, 1955	T,B, 100	Irr	2/
X-38	W. Roddy	Green Machinery Co.	1945	300	16	--	--	--	--	Irr	1/
X-46	H. S. Dunaway	--	--	--	16	8	91.3	Dec. 13, 1954	T,B	Irr	Measured yield, 288 gpm on Sept. 7, 1955. Altitude of land surface, 3,395 ft. 2/
X-47	Bert Jacobs	--	1916	309	26	8	52.9 98.2	Apr. 16, 1934 Jan. 13, 1956	T,B, 185	Irr	2/
X-50	D. T. Findley	Green Machinery Co.	1949	296	16	8	60	May 1949	T,Ng	Irr	1/
X-58	Hubert L. Turner	--	--	256	16	--	80.7	Feb. 8, 1955	-,Ng, 150	Irr	Pump set at 200 ft. Measured yield, 329 gpm on Aug. 26, 1955. Altitude of land surface, 3,406 ft.
X-75	J. C. Carter	Altman Drilling Co.	1952	131	16	--	65	May 1952	--	Irr	Water from Cretaceous limestone. Cased to 80 ft. Casing perforated from 20 to 80 ft. 1/
X-76	do	do	1952	152	16	6	70	Jan. 1952	T,B	Irr	Water from Cretaceous limestone. Cased to 89 ft. Casing perforated from 59 to 89 ft. 1/
X-87	J. Wells Kinkaid	Green Machinery Co.	--	--	--	5	85.4	Jan. 12, 1956	T,B	Irr	Altitude of land surface, 3,388 ft. 2/
X-91	W. C. Mooney	Don Wade	--	180	16	8	--	--	T,-	Irr	1/
*X-98	J. H. Hooker	--	--	100	6	--	60.3	Oct. 9, 1937	C,W	--	
*X-99	E. P. Phillips	--	--	56	--	--	54.7	do	C,W	--	No casing.
*X-100	Arthur Ford	--	1911	70	4	--	52.4	do	C,W	--	
Y-9	H. M. Burch	--	--	--	--	8	48.5 94.9	Mar. 14, 1947 Jan. 17, 1955	T,B	Irr	2/
Y-16	Bill A. Bay	Green Machinery Co.	1953	290	16	8	--	--	T,E	Irr	1/
Y-23	C. A. Shook	--	--	--	16	--	45.1	Dec. 16, 1954	N	N	Altitude of land surface, 3,324 ft.

See footnotes at end of table.

Table 3.--Records of selected wells in Hale County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Diameter of pump discharge pipe (in.)	Water level: Below land surface datum (ft.)	Water level: Date of measurement	Method of lift	Use of water	Remarks
Y-28	Frank W. Budd	-- McDanial	1951	150	18	6	61.8	Dec. 16, 1954	T,E	Irr	Red beds reported at 124 ft. Altitude of land surface, 3,339 ft.
Y-35	Virgil Young	Altman Drilling Co.	--	117	--	--	--	--	--	Irr	Water from Cretaceous limestone. No casing. 1/
Y-36	do	do	--	--	--	8	58.1	Jan. 21, 1955	T,E	Irr	Measured yield, 807 gpm on Aug. 26, 1955. Altitude of land surface, 3,322 ft.
Y-38	H. D. Meil	do	1954	135	--	6	60.6	Jan. 20, 1955	T,B, 80	Irr	Water from Cretaceous limestone. No casing. Measured yield, 171 gpm on Aug. 26, 1955. Altitude of land surface, 3,339 ft.
Y-44	J. C. Montgomery	do	1952	123	--	8	--	--	T,B	Irr	Water from Cretaceous limestone. No casing. 1/
*Y-49	S. J. Young	--	1938	133	15, 12	--	43.2 40.9	Nov. 21, 1939 Nov. 29, 1945	T,-	Irr	Cased to bottom.
Y-53	Virgil Young	Altman Drilling Co.	1952	136	16	8	55	June 1955	T,B	Irr	Water from Cretaceous limestone. 1/
Y-81	R. & J. Wilson	--	--	--	10	--	50.0 77.0	Aug. 9, 1937 Jan. 13, 1956	N	N	Altitude of land surface, 3,322 ft. 2/
*Y-99	A. K. Price	-- Yoder	1917	70	--	--	51.9	Oct. 9, 1937	N	N	No casing. Windmill pumping when water-level measured.
*Y-100	Chas. Wendt	--	--	--	--	--	52.8	May 6, 1936	C,W	--	
Z-3	M. E. Courtney	Green Machinery Co.	1953	154	16	10	60	Oct. 1953	T,Ng	Irr	Shutter screen from 46 to 154 ft. Pump set at 130 ft. 1/
Z-11	Mrs. J. F. Terrell	do	1952	255	16	8	--	--	T,Ng	Irr	Cased to 130 ft. 1/
Z-17	M. E. Courtney	M. E. Courtney	1937	135	26	--	34.1 62.3	Sept.10, 1937 Jan. 16, 1956	N	N	No casing. Altitude of land surface, 3,303 ft. 2/
Z-39	H. F. Whitney, et al	Altman Drilling Co.	1952	162	--	4	40	Jan. 1952	T,E	Irr	No casing. 1/
Z-73	Floyd Reagan	Floyd Reagan	1936	--	18	6	37.7 62.3	May 5, 1936 Jan. 17, 1955	T,E, 10	Irr	2/
Z-79	G. A. & A. P. McWilliams	--	--	--	16	8	70.4	Feb. 21, 1955	--	Irr	Altitude of land surface, 3,269 ft.

See footnotes at end of table.

Table 3.--Records of selected wells in Hale County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Diameter of pump discharge pipe (in.)	Water level: Below land surface datum (ft.)	Water level: Date of measurement	Method of lift	Use of water	Remarks
*Z-82	Paul Schur	W. J. Altman	1949	146	16	8	72.1	June 27, 1955	T,B, 108	Irr	Water from Cretaceous limestone. Estimated yield, 1,100 gpm. Temp. 63°F.
Z-86	W. H. Burton	Altman Drilling Co.	1952	145	--	8	55	Apr. 1952	T,-	Irr	No casing. 1/
Z-89	M. L. Hester	do	1951	145	--	8	55	Sept. 1951	T,-	Irr	Water from Cretaceous limestone. No casing. Pump set at 110 ft. 1/
*Z-121	Mrs. F. C. DeBaca	--	--	--	--	--	33.3 33.3	June 16, 1936 June 3, 1937	C,W	--	
*Z-122	Frank Beard	--	--	--	--	--	30.9	May 5, 1936	C,W	N	
AA-3	Lida Jones	Green Machinery Co.	1951	297	16	8	77	Jan. 1951	T,-	Irr	Pump set at 160 ft. 1/
AA-9	E. B. Allen	Altman Drilling Co.	1952	309	16	10	93.8	Feb. 2, 1955	T,Ng, 180	Irr	Pump set at 190 ft. Measured yield, 560 gpm on Aug. 27, 1955. Altitude of land surface, 3,485 ft.
*AA-16	B. R. McWhorter	L. P. Davis & Son	1953	278	16	8	--	--	T,-	Irr	Pump set at 200 ft.
AA-25	do	L. P. Davis	1953	312	16	8	--	--	T,-	Irr	Pump set at 200 ft. 1/
AA-32	Mrs. Martha White	Consolidated Gas & Equipment Co.	1954	310	16	8	--	--	T,-	Irr	1/
AA-55	C. C. Coffee et al	--	--	--	--	8	101.4	Jan. 13, 1955	T,-	Irr	Altitude of land surface, 3,472 ft.
AA-79	Bowen & Gayle	Consolidated Gas & Equipment Co.	1952	225	16	8	--	--	T,Ng	Irr	Pump set at 190 ft. 1/
*AA-81	Mrs. Ethel M. Thompson	--	1933	230	12	6	--	--	T,-	N	
*AA-83	Clara Barton	--	1937	220	16, 12	8	90	Aug. 1937	T,-	Irr	
BB-5	Mrs. Viola Moody	--	1950	--	16	8	98.4	Feb. 2, 1955	T,Ng	Irr	Measured yield, 663 gpm on Sept. 28, 1955. Altitude of land surface, 3,463 ft.
*BB-14	W. J. Walker	Bradford Supply Co.	1937	220	16, 12	8	--	--	T,-	Irr	Pump set at 160 ft.
BB-19	R. J. Burnett	--	1944	218	18	8	79.5 109.1	Mar. 21, 1947 Jan. 11, 1956	T,-	Irr	Pump set at 150 ft. Altitude of land surface, 3,464 ft. 2/

See footnotes at end of table.

Table 3.--Records of selected wells in Hale County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Diameter of pump discharge pipe (in.)	Water level: Below land surface datum (ft.)	Water level: Date of measurement	Method of lift	Use of water	Remarks
BB-21	W. E. Burnett	Pioneer Drilling Co.	1952	284	16	8	102.1	Jan. 9, 1954	T,-	Irr	Pump set at 180 ft. 2/
BB-29	Oscar Gould	--	1944	287	16	8	95.0	Dec. 27, 1954	T,-	Irr	Altitude of land surface, 3,445± ft.
BB-32	J. P. McFarland	B & F Drilling Co.	1955	350	16	8	--	--	T,-	Irr	Casing perforated from 170 to 350 ft. Pump set at 180 ft. 1/
BB-37	C. F. Hunt, Jr.	--	--	--	16	6	105.4	Dec. 27, 1954	T,G	Irr	Altitude of land surface, 3,456 ft.
BB-61	P. G. George	Consolidated Gas & Equipment Co.	--	315	16	8	119.0	do	T,-	Irr	Altitude of land surface, 3,452 ft.
*BB-91	Mrs. E. M. Thompson	--	1933	235	16, 12	8	89	Aug. 1937	T,-	Irr	
BB-99	Billy Houston	B & F Drilling Co.	1954	350	16	8	--	--	T,E, 50	Irr	Casing perforated from 123 ft. to bottom. 1/
BB-100	do	do	1954	300	16	8	110.5	Jan. 31, 1955	T,E, 50	Irr	Casing perforated from 240 ft. to bottom. Altitude of land surface, 3,443 ft.
*BB-104	K. L. Riggs	--	1944	300	16	8	--	--	T,-	Irr	Red beds reported at 298 ft. Pump set at 240 ft. Well deepened from 200 to 300 ft.
*BB-113	Cotton Center School	--	--	--	4	--	--	--	C,W	N	
*BB-114	Wiley Bogart	-- Coffee	--	85	4	2	76.5	July 28, 1937	C,W	--	
*CC-1	C. E. Newson	Peerless Pump Co.	1945	300	16	8	--	--	T,-	Irr	Pump set at 160 ft.
CC-3	McFarland Estate	--	--	218	16	8	99.0	Jan. 24, 1955	T,-, 125	Irr	Pump set at 130 ft. Measured yield, 881 gpm on Aug. 26, 1955. Altitude of land surface, 3,434 ft.
CC-21	Bowling & Lyles	Burney Fish	1945	318	16	8	76.7 100.3	Mar. 11, 1947 Jan. 12, 1956	T,E, 50	Irr	Measured yield, 288 gpm on Sept. 8, 1955. Altitude of land surface, 3,420 ft. 2/
CC-27	W. S. Thomas	Green Machinery Co.	1954	336	16	6	100	July 1954	T,Ng	Irr	1/
CC-31	Mrs. V. E. McKnight	Consolidated Gas & Equipment Co.	--	300	16	8	114.6	Dec. 27, 1954	T,-	Irr	Pump set at 170 ft. Altitude of land surface, 3,436 ft.
CC-69	R. G. Harvey	Taylor Bros.	1955	286	16	--	--	--	--	Irr	1/
CC-78	C. T. Newell	Green Machinery Co.	1954	324	16	8	117	Jan. 1954	T,-	Irr	1/

See footnotes at end of table.

Table 3.--Records of selected wells in Hale County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Diameter of pump discharge pipe (in.)	Water level: Below land surface datum (ft.)	Water level: Date of measurement	Method of lift	Use of water	Remarks
CC-80	R. P. Freeman	Green Machinery Co.	1950	360	16	8	112.9	Jan. 28, 1955	T,Ng	Irr	Pump set at 200 ft. Measured yield, 750 gpm on Aug. 26, 1955. Altitude of land surface, 3,414 ft.
CC-85	Clyde L. Pratt	--	--	--	--	8	115.8 123.9	Jan. 13, 1955 Jan. 12, 1956	T,G	Irr	Altitude of land surface, 3,395 ft.
CC-106	Wyley Wilkinson	Green Machinery Co.	1952	353	16	8	102	Sept. 1952	T,-	Irr	Pump set at 200 ft. 1/
CC-118	Mrs. Chas. E. Saigling	--	1951	218	16	8	117.3	Dec. 23, 1954	T,B, 185	Irr	Altitude of land surface, 3,379 ft.
*CC-120	John I. Bowling	-- Garmes	1936	218	14	8	74.0 91.5	June 15, 1938 Jan. 8, 1954	N	N	Destroyed. 2/
*CC-121	Iowa Avenue School	--	--	84	4	2	71.2 70.2	July 26, 1937 Feb. 16, 1944	N	N	Destroyed.
*CC-122	J. R. Harral	--	--	92	--	2	80.3	July 29, 1937	C,W	--	
DD-15	Leroy Adrian	Green Machinery Co.	1952	293	16	8	96	June 1952	T,-	Irr	1/
DD-16	R. A. Brinson	--	1942	260	16	--	88.8	Jan. 25, 1955	T,B	Irr	Pump set at 160 ft. Measured yield, 426 gpm on Sept. 2, 1955. Altitude of land surface, 3,378 ft.
DD-39	E. P. Wright	Green Machinery Co.	1945	320	16	8	--	--	T,B	Irr	1/
DD-46	J. B. Cornett	Altman Drilling Co.	1951	162	16	6	86.7	Dec. 21, 1954	T,B	Irr	Cased from 42 to 102 ft. Altitude of land surface, 3,357 ft.
DD-51	O. A. Sweatt	do	1954	139	--	8	86.5	Jan. 12, 1956	T,B, 100	Irr	Water from Cretaceous limestone. No casing. Altitude of land surface, 3,342 ft. 2/
DD-101	F. M. Crenshaw	--	1954	351	--	8	104.4	Feb. 4, 1955	T,B, 150	Irr	Measured yield, 635 gpm on Sept. 2, 1955. Altitude of land surface, 3,365 ft.
EE-1	Bob Ashley	--	--	--	--	--	71.9	Jan. 24, 1955	T,B, --	Irr	Altitude of land surface, 3,335 ft.
EE-8	J. D. Buchanan	--	--	--	--	--	69.4	Jan. 21, 1955	T,E, 30	Irr	Measured yield, 448 gpm on Sept. 1, 1955. Altitude of land surface, 3,318 ft.
EE-20	A. M. Eason	--	1935	94	12	4	55.5 74.5	May 7, 1936 Jan. 13, 1956	T,E	Irr	Altitude of land surface, 3,327 ft. Well deepened to red beds in 1955. 2/

See footnotes at end of table.

Table 3.--Records of selected wells in Hale County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Diameter of pump discharge pipe (in.)	Water level: Below land surface datum (ft.)	Water level: Date of measurement	Method of lift	Use of water	Remarks
EE-37	O. B. Wilson	Altman Drilling Co.	1952	143	16	4	58	Apr. 1952	T,E	Irr	Water from Cretaceous limestone. Cased from 90 to 130 ft. 1/
EE-69	V. D. McLaughlin	--	--	--	--	6	78.2	Feb. 4, 1955	T,E, 30	Irr	Measured yield, 288 gpm on Sept. 2, 1955. Altitude of land surface, 3,322 ft.
EE-74	Debs McLaughlin	--	1934	185	--	--	60.4 87.5	Oct. 21, 1937 Jan. 13, 1956	T,E	Irr	2/
EE-76	J. W. Heard	--	1950	--	--	8	81.7	Jan. 13, 1955	T,E, 40	Irr	Altitude of land surface, 3,317 ft. 2/
EE-103	T. L. Elliott	--	--	--	--	--	79.6	Feb. 1, 1955	-,E, 40	Irr	Measured yield, 885 gpm on Sept. 2, 1955. Altitude of land surface, 3,308 ft.
*EE-104	J. W. Barrett	--	--	--	--	--	60.0 60.5	May 7, 1936 June 28, 1938	N	N	
FF-3	J. A. Line	Peerless Pump Co.	1947	--	--	8	47.3 68.1	Feb. 28, 1948 Jan. 13, 1956	T,B	Irr	Altitude of land surface, 3,309 ft. 2/
FF-35	J. C. Fuller	Altman Drilling Co.	1950	201	16	4	70	May 1950	-,E	Irr	Cased to 130 ft. 1/
*FF-48	Effie Whiteside	Bradford Supply Co.	1945	379	16	8	--	--	T,B	Irr	Cased to 270 ft. Red beds reported at 269 ft.
FF-55	C. J. Barnard	-- Tye	1934	307	--	--	51.9 88.5	Jan. 12, 1939 Jan. 13, 1956	N	N	Casing set at 60 ft. 2/
FF-78	J. F. Sitton	--	--	--	5	--	92.4	Dec. 22, 1954	C,W	S	Altitude of land surface, 3,285 ft.
FF-89	R. E. Wilson	Altman Drilling Co.	1952	173	16	6	78	Apr. 1952	T,E	Irr	Cased to 60 ft. 1/
FF-124	John Fowler	W. O. Tye	1950	199	16	8	--	--	T,E	Irr	1/
FF-146	J. J. Hegi	--	1941	200	16	--	97.5	Jan. 31, 1955	T,E, 40	Irr	Altitude of land surface, 3,264 ft.
FF-159	M. Carr	-- Tarkington	1937	339	16	8	72.4 95.9	Mar. 2, 1949 Jan. 3, 1955	T,E, 60	Irr	Casing set at 215 ft. 2/
*FF-160	J. A. Line	--	--	--	--	--	39.5 46.1	May 7, 1936 Feb. 28, 1948	C,W	N	
*FF-161	H. M. McElroy	--	1924	71	--	--	52.4 54.9	May 8, 1936 Apr. 26, 1937	C,W	--	

See footnotes at end of table.

Table 3.--Records of selected wells in Hale County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Diameter of pump discharge pipe (in.)	Water level		Method of lift	Use of water	Remarks
							Below land surface datum (ft.)	Date of measurement			
GG-11	B. R. McWhorter	L. P. Davis & Son	1954	338	16	10	--	--	T,-	Irr	Pump set at 180 ft. 1/
GG-23	C. N. Kennon	--	1949	240	16	8	111.6	Jan. 13, 1955	T,-	Irr	Pump set at 210 ft. Measured yield 253 gpm on Sept. 9, 1955. Altitude of land surface, 3,458 ft.
GG-28	L. E. Gilliland	Peerless Pump Co.	1955	275	16	8	--	--	T,-	Irr	1/
GG-32	E. C. Pounds & A. R. McGuire	--	--	--	16	8	102.5	Feb. 2, 1955	T,-	Irr	Pump set at 190 ft. Measured yield, 230 gpm on Aug. 27, 1955. Altitude of land surface, 3,445 ft.
GG-76	J. L. Irish	--	--	--	--	6	96.2	Jan. 13, 1955	T,E, 25	Irr	Altitude of land surface, 3,433 ft.
GG-91	J. B. Sneed	-- Bishop	1943	144	16	8	92.4 93.5 96.0 96.8	Mar. 3, 1949 Feb. 20, 1950 Jan. 30, 1952 Jan. 13, 1953	T,-	Irr	
GG-95	Lee Irish	Taylor Bros.	1954	193	16	4	--	--	-,E, 10	Irr	Measured yield, 26 gpm on Sept. 9, 1955. 1/
*GG-99	do	--	--	--	4	2	106.4	July 26, 1937	N	N	Destroyed.
*GG-100	G. W. Blackman	-- Handley	1935	320	16	--	103.4 103.4	July 26, 1937 Aug. 15, 1938	--	N	Cased to 170 ft.
HH-1	B. R. McWhorter	-- Huges	1936	240	16	8	94.6 122.1	July 27, 1937 Jan. 11, 1956	T,-	Irr	Altitude of land surface, 3,453 ft. Well deepened to 300 ft. in 1953. 2/
HH-9	Margaret Fields	-- Fish	1945	327	16	8	95.8 127.0	Nov. 30, 1945 Mar. 18, 1955	T,-	Irr	Altitude of land surface, 3,438 ft.
HH-15	L. C. O'Neal	Green Machinery Co.	1952	324	16	8	90	May 1952	T,E, 50	Irr	1/
HH-20	Tom W. Houston	do	1949	305	16	8	85	Oct. 1949	T,-	Irr	Pump set at 180 ft. 1/
HH-35	C. E. Rhodes	do	1947	315	16	6	--	--	T,-	Irr	Pump set at 270 ft. 1/
HH-45	Ted Watts	Taylor Bros.	1955	210	16	6	--	--	T,-	Irr	1/
HH-92	Thomas Johnson	do	1954	205	16	6	--	--	T,-	Irr	1/
HH-105	H. B. Granberry	Green Machinery Co.	1952	176	16	--	45	Apr. 1952	T,-	Irr	Cased to 126 ft. Pump set at 180 ft. 1/

See footnotes at end of table.

Table 3.--Records of selected wells in Hale County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Diameter of pump discharge pipe (in.)	Water level		Method of lift	Use of water	Remarks
							Below land surface datum (ft.)	Date of measurement			
HH-107	J. T. Howell	--	1948	--	--	4	114.9	Jan. 13, 1955	T,E	Irr	Red beds reported at 228 ft. Altitude of land surface, 3,414 ft.
HH-118	Mrs. C. M. Barrick	--	--	--	16	6	72.0	do	T,-	Irr	Altitude of land surface, 3,308 ft.
*HH-120	Elbert Brown	--	--	92	--	2	83.7	July 28, 1937	C,W	--	
JJ-14	C. E. Rhodes	Green Machinery Co.	1954	303	16	6	114	July 1955	T,-	Irr	Pump set at 270 ft. 1/
JJ-19	Ergar G. Harp	Altman Drilling Co.	1953	201	16	8	105	Aug. 1953	T,-	Irr	Water from Cretaceous limestone. Cased to 189 ft. Casing perforated from 109 to 189 ft. 1/
JJ-40	Ercelle Givens	--	--	124	6	--	96.0 116.0	July 27, 1937 Jan. 12, 1956	C,W	S	Altitude of land surface, 3,370 ft. Well deepened to 124 ft. in 1952. 2/
JJ-50	M. H. Clark	--	1946	--	--	6	118.0	Jan. 13, 1955	T,B	Irr	Red beds reported at 213 ft. Pump set at 190 ft. Measured yield, 115 gpm on Sept. 8, 1955. Pumping level, 165.9 ft. on Sept. 14, 1955. Altitude of land surface, 3,377± ft.
JJ-54	E. A. Houston	Green Machinery Co.	1949	214	16	8	121.6	Feb. 2, 1955	-,Ng	Irr	Measured yield, 416 gpm on Aug. 26, 1955. Altitude of land surface, 3,375 ft.
*JJ-64	Southwestern Public Service Co.	D. L. McDonald	1930	182	18, 14	8	93 123	Aug. 1937 Nov. 1955	-,E	Ind	Reported pumping level, 142.58 ft. at 250 gpm on Nov. 20, 1955.
*JJ-65	do	do	1930	267	18, 14	8	95 124	Aug. 1937 Nov. 1955	--	Ind	
JJ-66	do	--	1940	195	24, 16	8	116.8	July 1955	T,E	Ind	Water from Cretaceous limestone.
JJ-69	do	L. A. Peoples	1946	185	16	6	114	July 1955	T,E	Ind	Cased to 119 ft. Pump set at 183 ft.
JJ-70	do	do	1949	210	16	6	131	Nov. 1955	T,E, 60	Ind	Pump set at 179 ft.
JJ-75	Phillips & Given	Taylor Bros.	1954	230	16	6	--	--	T,-	Irr	Water from Cretaceous limestone. Pump set at 210 ft. 1/
JJ-76	do	do	1954	230	16	8	--	--	T,-	Irr	Water from Cretaceous limestone. 1/
JJ-97	Owen Benn	--	--	--	--	--	148.6	Jan. 12, 1956	T,-	Irr	Altitude of land surface, 3,356 ft. 2/

See footnotes at end of table.

Table 3.--Records of selected wells in Hale County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Diameter of pump discharge pipe (in.)	Water level		Method of lift	Use of water	Remarks
							Below land surface datum (ft.)	Date of measurement			
JJ-98	C. F. Phillips	Taylor Bros.	1955	218	16	6	--	--	T,-	Irr	Cased to 175 ft. 1/
*JJ-123	Leo Konesko	--	--	140	--	--	--	--	C,W	--	
*JJ-124	City of Abernathy well 1	--	1934	200±	--	--	--	--	N	N	
*JJ-125	City of Abernathy well 2	Clowe & Cowan	1944	226	15	--	110	1944	N	N	
*JJ-126	J. H. Nunn	--	--	95	6	--	85.1	Nov. 5, 1937	C,W	--	
*JJ-127	M. H. Clark	--	--	110+	--	2	--	--	N	N	
JJ-128	City of Abernathy well 8	Taylor Bros.	1956	220	16	--	--	--	N	P	Cased to 158 ft. Used as standby well.
JJ-129	City of Abernathy well 5	D & E Drilling Co.	1953	228	18	6	--	--	T,E	P	Cased to 176 ft. Water from Cretaceous limestone. Well 100 ft. south of county line in Lubbock County.
JJ-130	City of Abernathy well 6	Taylor Bros.	1955	222	16	6	--	--	T,E	P	Cased to 170 ft. Water from Cretaceous limestone.
JJ-131	City of Abernathy well 4	do	1955	202	16	6	--	--	T,E	P	Cased to 162 ft. Water from Cretaceous limestone.
JJ-132	City of Abernathy well 7	do	1956	223	16	6	--	--	T,E	P	Cased to 165 ft.
KK-2	Mrs. Eva Perry	--	--	--	--	8	114.2	Dec. 23, 1954	T,B	Irr	Altitude of land surface, 3,364 ft.
*KK-25	J. A. Lutrick	--	1954	300	16	8	--	--	T,-	Irr	
KK-32	T. Wyatt	--	--	--	--	4	111.6	Jan. 31, 1955	T,E, 10	Irr	Altitude of land surface, 3,358 ft.
*KK-45	T. E. Lutrick	-- Regan	1937	200	12	8	80	Aug. 1937	T,-	Irr	
KK-47	Southwestern Public Service Co.	L. A. Peoples	1952	214	16	6	90 100	Oct. 1952 Nov. 1955	T,E	Ind	Pump set at 177 ft.
KK-48	do	do	1949	205	16	6	113	Feb. 1954	T,E	N	Pump set at 175 ft.
KK-54	W. F. Buske	--	1944	220	16	6	92.8 115.8	Mar. 3, 1949 Jan. 12, 1956	T,E, 25	Irr	Altitude of land surface, 3,351± ft. 2/

See footnotes at end of table.

Table 3.--Records of selected wells in Hale County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Diameter of pump discharge pipe (in.)	Water level: Below land surface datum (ft.)	Water level: Date of measurement	Method of lift	Use of water	Remarks
KK-55	W. F. Buske	Taylor Bros.	1956	230	16	6	--	--	T,-	Irr	Water from Cretaceous limestone. 1/
KK-74	J. W. McReynolds	do	1956	232	16	6	--	--	T,-	Irr	Water from Cretaceous limestone. Casing perforated from 204 ft. to bottom. 1/
KK-91	A. H. Druesedow	do	1955	230	--	6	--	--	T,B	Irr	1/
*KK-115	-- Struve	Buck Patton	1934	465	15, 12	--	105.5	Dec. 10, 1945	N	N	
LL-29	H. M. La Font	Green Machinery Co.	1952	238	16	8	81	Nov. 1952	T,-	Irr	1/
LL-35	O. D. Rhodes	do	1940	200	16	10	76.9 103.2	Dec. 10, 1945 Jan. 31, 1955	T,E, 60	Irr	Measured yield, 680 gpm on Sept. 2, 1955. Altitude of land surface, 3,317 ft.
LL-45	L. Ragland	-- Higgins	1955	225	16	8	110.3	Jan. 13, 1956	T,E, 40	Irr	Altitude of land surface, 3,299 ft. 2/
LL-52	R. C. Sell, Sr.	--	1944	198	16	--	67.8 97.7	Dec. 5, 1945 Jan. 31, 1955	T,E, 50	Irr	Altitude of land surface, 3,282 ft.
*LL-54	L. L. Wienke	-- McDaniels	1937	200	15, 10	8	80	Aug. 1937	T,-	Irr	
*LL-55	O. D. Rhodes	--	1952	300+	16	8	--	--	T,-	Irr	Pump set at 200 ft.
*LL-77	John V. Porterfield	Bud Gibbons	1944	220	14	8	--	--	--	Irr	
LL-80	A. W. Mayo	Peerless Pump Co.	1946	220	16	8	126.0	Dec. 27, 1954	T,B	Irr	Altitude of land surface, 3,307 ft.
*LL-103	W. A. Waters	-- McDaniels	1937	211	16	8	98.9	July 23, 1937	T,-	Irr	
*LL-106	W. A. Mahagan	Buck Patton	1937	224	15	8	81.7 81.0	July 23, 1937 Dec. 6, 1945	N	N	
*MM-50	W. F. Finkner	--	1944	240±	16	8	--	--	T,-	Irr	
*MM-52	do	-- Tarkington	1944	200±	16	6	--	--	T,-	Irr	
MM-61	N. S. Willis	D. L. Handley	1945	180±	16	8	67.7 101.4	Mar. 11, 1947 Jan. 13, 1956	T,B	Irr	Altitude of land surface, 3,254 ft. 2/
*MM-77	M. P. Mahogan	-- Sawyer	1937	223	18	--	75.9	July 23, 1937	--	Irr	
MM-81	J. J. Hegi	--	--	--	--	8	70.1 108.0	Mar. 11, 1947 Jan. 13, 1956	T,Ng 100	Irr	2/

See footnotes at end of table.

Table 3.--Records of selected wells in Hale County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Diameter of pump discharge pipe (in.)	Water level: Below land surface datum (ft.)	Water level: Date of measurement	Method of lift	Use of water	Remarks
MM-96	Clarence Thorp	Jack Tarkington	1940	177	16, 14	6	105.1	Feb. 1, 1955	T,E, 30	Irr	Pump set at 140 ft. Measured yield, 235 gpm on Sept. 2, 1955. Altitude of land surface, 3,243 ft.
MM-104	M. J. Williams	--	--	--	--	--	112.8	Dec. 27, 1954	--	Irr	Measured yield, 413 gpm on Sept. 2, 1955. Altitude of land surface, 3,290 ft.
*MM-120	Joe S. Jackson	-- McDaniels	1936	402	16	8	80.0 120.0	Aug. 3, 1937 Jan. 19, 1956	T,B	Irr	Altitude of land surface, 3,245 ft. Well deepened from 200 ft. to 402 ft. in 1955. 1/ 2/
MM-128	-- Mabry	Peerless Pump Co.	1955	444	16	--	--	--	--	Irr	1/
*MM-137	J. W. Allen	Carl Mangum	1937	200	16, 14	6.	69.0 74.2	Aug. 2, 1937 Nov. 30, 1945	T,-	Irr	
*MM-159	W. D. Scarborough	Jack Brannon	1937	180	15, 13	8	58	Aug. 1937	N	N	
*MM-160	A. K. Hulburt	Green Machinery Co.	1945	230	16	--	--	--	N	N	
MM-161	City of Petersburg	Fox Bros.	1948	206	16	6	--	--	T,E	P	
*MM-163	do	L. A. Peoples	1945	222	12	--	76	Nov. 1945	T,G	P	Casing perforated from 200 to 222 ft.

1/ See table 4 for drillers' logs of wells in Hale County, Texas.
2/ See table 5 for water levels in wells in Hale County, Texas.
* See table 6 for analyses of water from wells in Hale County, Texas.

Table 4.--Drillers' logs of selected wells in Hale County, Texas

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Well A-26					
Owner: O. E. Jones. Driller Green Machinery Co.					
Soil	5	5	Shale and sand	50	160
Caliche	25	30	Clay, sandy	30	190
Clay	30	60	Shale, sandy	45	235
Rock and lime	5	65	Sand	30	265
Sand	25	90	Red bed	3	268
Shale	20	110			
Well C-5					
Owner: Ralph Block. Driller: Green Machinery Co.					
Topsoil	5	5	Sand	22	146
Caliche	13	18	Shale, some clay	36	182
Clay and shale	46	64	Sand, tight	44	226
Sand, some shale	28	92	Sand, some gravel	64	290
Sand	16	108	Clay, blue, and red bed	12	302
Shale, hard	16	124			
Well D-56					
Owner: C. E. Carter. Driller: Green Machinery Co.					
Topsoil	5	5	Rock, hard	4	122
Clay and shale	53	58	Sand, some boulders	54	176
Rock, hard	4	62	Boulders and clay	17	193
Sand	31	93	Sand and gravel	49	242
Clay	25	118	Red bed	3	245

Table 4.--Drillers' logs of selected wells in Hale County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)

Well F-8

Owner: L. V. Brittain. Driller: Green Machinery Co.

Topsoil	5	5	Sand and caliche	34	128
Clay and shale	46	51	Shale	14	142
Rock	8	59	Sand and caliche	34	176
Clay	14	73	Gravel	43	219
Sand	13	86	Red bed	5	224
Clay	8	94			

Well F-20

Owner: Ola M. Brittain. Driller: Green Machinery Co.

Topsoil	4	4	Sand and shale	25	110
Caliche	16	20	Rock	8	118
Clay	25	45	Sand, tight	37	155
Rock	9	54	Clay	8	163
Sand	16	70	Sand and boulders	33	196
Clay and rock	15	85	Red bed	4	200

Well F-74

Owner: H. H. Sammann. Driller: Green Machinery Co.

Topsoil	4	4	Sand, medium tight, and gravel	15	235
Caliche	26	30	Clay and shale	30	265
Caliche and rock, hard	30	60	Sand, medium tight, and gravel	10	275
Sand, fine	20	80	Sand and gravel, loose	25	300
Clay, red	40	120	Red bed	5	305
Sand, tight	80	200			
Sand, medium coarse	20	220			

Table 4.--Drillers' logs of selected wells in Hale County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)

Well H-89

Owner: Clinton Walters. Driller: Green Machinery Co.

Topsoil	6	6	Sand, loose, coarse, and gravel	45	235
Caliche	34	40	Sand, loose, and boulders	60	295
Clay, red	30	70	Sand, loose, coarse, and gravel	30	325
Sand, fine, loose	30	100	Sand, medium, tight, and gravel	8	333
Clay, hard, red	45	145	Red bed	2	335
Sand, medium, tight, and gravel	45	190			

Well H-100

Owner: V. M. Block. Driller: Green Machinery Co.

Topsoil	5	5	Clay	18	192
Caliche	13	18	Sand and gravel	46	238
Clay and shale	56	74	Clay	16	254
Sand	44	118	Sand and gravel	56	310
Clay	20	138	Red bed	5	315
Sand	36	174			

Well J-48

Owner: Charles and Helen Clements. Driller: Peerless Pump Co.

Topsoil	4	4	Sand	25	135
Caliche	26	30	Clay	30	165
Caliche and rock	40	70	Sand and gravel	90	255
Sand	10	80	Clay	5	260
Sand and shale	30	110			

Table 4.--Drillers' logs of selected wells in Hale County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Well K-43					
Owner: L. L. Simpson. Driller: B&F Drilling Co.					
Topsoil	3	3	Rock	12	113
Caliche and shale, sandy	37	40	Sand and rock, white	27	140
Rock	9	49	Sand	105	245
Sand and shale	21	70	Sand and gravel	13	258
Sand	6	76	Rock	1	259
Shale and rock, white	25	101	Clay, red	1	260
Well L-84					
Owner: City of Plainview. Driller: Robertson Drilling Co.					
Topsoil	2	2	Sand and shale	36	136
Caliche	34	36	Sand, fine, and shale	67	203
Rock, cap	24	60	Sand, coarse	64	267
Sand, fine, shale, and clay	15	75	Sand, fine	22	289
Sand, fine	25	100	Shale and sand	33	322
			Red bed	1	323
Well L-101					
Owner: J. L. Baker. Driller: Green Machinery Co.					
Topsoil	3	3	Shale, hard, sandy	17	190
Shale, hard	32	35	Sand	33	223
Sand	5	40	Rock	12	235
Rock, soft	16	56	Shale, hard	40	275
Shale, hard	39	95	Sand and gravel	10	285
Sand	78	173	Red bed	5	290

Table 4.--Drillers' logs of selected wells in Hale County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)

Well M-112

Owner: Frank M. Eiring. Driller: Robertson Drilling Co.

Topsoil	4	4	Sand, fine, and clay	50	157
Caliche	30	34	Clay, fine, and shale	33	190
Rock, cap	8	42	Sand, coarse, and gravel	21	211
Shale, sandy	11	53	Sand, clay, and shale	27	238
Clay and shale	17	70	Sand and gravel	47	285
Sand, fine, clay and boulders	11	81	Clay and sand	15	300
			Sand, coarse, and gravel	28	328
Clay	26	107	Clay and rock	4	332

Well P-60

Owner: T. P. King. Driller: Consolidated Gas & Equipment Co.

Surface	8	8	Shale and sand, red	93	170
Caliche	16	24	Shale and sand	45	215
Sand and boulders	6	30	Red bed	5	220
Sand, pack	47	77			

Well Q-33

Owner: W. G. Laney. Driller: B&F Drilling Co.

Surface	3	3	Sand, broken	33	178
Caliche	56	59	Sand	17	195
Rock	4	63	Clay and shale	16	211
Sand	7	70	Sand, broken	8	219
Sand, broken	25	95	Sand and clay	41	260
Rock	11	106	Sand, coarse, and gravel	70	330
Shale and sand	25	131	Clay	3	333
Sand	14	145			

Table 4.--Drillers' logs of selected wells in Hale County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Well Q-39					
Owner: Fielding Helm. Driller: Green Machinery Co.					
Topsoil	5	5	Shale, hard	41	138
Caliche	4	9	Sand	27	165
Shale, hard	6	15	Shale	9	174
Clay	40	55	Sand	11	185
Sand	5	60	Rock	5	190
Rock, soft	7	67	Sand	34	224
Sand	18	85	Red bed	1	225
Rock	12	97			
Well Q-52					
Owner: Fielding Helm. Driller: B&F Drilling Co.					
Surface	4	4	Sand and rock, white	19	234
Caliche	55	59	Sand, coarse, and rock, white	25	259
Sand	10	69	Sand, coarse, and gravel	35	294
Clay	5	74	Rock	4	298
Rock, sand, and clay	26	100	Sand and gravel	27	325
Shale	26	126	Red bed	2	327
Sand	40	166			
Rock, white, clay, and sand	49	215			
Well Q-84					
Owner: V. D. Ross. Driller: Green Machinery Co.					
Topsoil	4	4	Shale, red	20	35
Caliche	11	15	Clay	21	56

(Continued on next page)

Table 4.--Drillers' logs of selected wells in Hale County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Well Q-84--Continued					
Rock, soft	7	63	Sand	25	190
Shale	11	74	Clay	18	208
Sand	18	92	Sand	27	235
Rock	4	96	Gravel, sandy	15	250
Clay	21	117	Sand	15	265
Shale	11	128	Boulders	14	279
Sand	27	155	Red bed	1	280
Clay	10	165			
Well R-91					
Owner: M. H. Gibson. Driller: B&F Drilling Co.					
Surface	4	4	Sand and clay streaks	27	171
Caliche and sand	71	75	Sand, white rock, and clay	79	250
Rock	4	79	Sand, gravel, and clay streaks	56	306
Clay, shale, and white rock	32	111	Sand and gravel	35	341
Clay and sand	9	120	Red bed	2	343
Sand	24	144			
Well S-10					
Owner: City of Plainview. Driller: Green Machinery Co.					
Topsoil	4	4	Sand, red	4	61
Caliche	10	14	Shale, red, sandy	12	73
Shale, sandy	29	43	Clay, red, hard, and rock	7	80
Rock	8	51	Clay and sand	8	88
Lime and rock	6	57	Sand	3	91

(Continued on next page)

Table 4.--Drillers' logs of selected wells in Hale County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Well S-10--Continued					
Rock	4	95	Sand	22	222
Sand	45	140	Gravel	63	285
Rock	8	148	Clay	3	288
Sand	10	158	Sand	2	290
Gravel	10	168	Gravel	9	299
Sand and gravel	32	200	Red bed	4	303
Well T-40					
Topsoil	5	5	Clay	6	132
Caliche and clay	37	42	Sand	23	155
Rock and shale	22	64	Gravel	50	205
Sand	9	73	Clay	21	226
Clay	22	95	Red bed	6	232
Sand	31	126			

Owner: C. C. Castleberry. Driller: Green Machinery Co.

Well T-41

Owner: W. S. Noel. Driller: Green Machinery Co.

Topsoil	3	3	Rock, soft	5	123
Caliche	20	23	Sand	37	160
Rock, soft	22	45	Sand and gravel	10	170
Rock, hard	5	50	Sand	13	183
Rock, soft	35	85	Red bed	2	185
Sand	33	118			

Table 4.--Drillers' logs of selected wells in Hale County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)

Well T-58

Owner: Clyde L. Young. Driller: Green Machinery Co.

Topsoil	4	4	Sand, medium coarse	60	170
Caliche	36	40	Sand and gravel, coarse, loose	35	205
Rock, cap, hard	4	44	Clay and boulders	25	230
Clay, red	36	80	Sand and gravel, coarse	57	287
Sand, loose, fine	30	110	Red bed	3	290

Well T-101

Owner: A. H. Schrock. Driller: Green Machinery Co.

Topsoil	5	5	Clay	18	120
Caliche and clay	27	32	Gravel	30	150
Rock and shale, hard	36	68	Sand	15	165
Sand	7	75	Clay, blue	2	167
Clay	16	91	Red bed	8	175
Sand	11	102			

Well U-70

Owner: Lida Jones. Driller: Green Machinery Co.

Topsoil	3	3	Shale, sandy	25	145
Caliche	9	12	Sand	45	190
Shale, hard	48	60	Shale, sandy	52	242
Shale, sandy	5	65	Clay and shale	23	265
Rock, soft	9	74	Sand and gravel, coarse	33	298
Shale	26	100	Red bed	2	300
Sand	20	120			

Table 4.--Drillers' logs of selected wells in Hale County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)

Well V-17

Owner: R. L. King. Driller: Green Machinery Co.

Potash----------	20	20	Shale----------	10	95
Shale, hard----------	55	75	Shale, sandy----------	15	110
Sand----------	6	81	Clay, soft----------	15	125
Rock----------	4	85	Sand, good, and red bed-	98	223

Well V-33

Owner: J. D. Neely. Driller: Green Machinery Co.

Topsoil----------	10	10	Sand, medium coarse-----	45	160
Caliche----------	20	30	Sand, coarse, and gravel	80	240
Sand----------	10	40	Shale and clay----------	15	255
Caliche and rock-------	13	53	Sand and gravel, coarse-	51	306
Sand and boulders------	25	78	Rock----------	2	308
Caliche and rock, hard-	17	95	Red bed----------	4	312
Clay, sandy----------	20	115			

Well V-87

Owner: H. McBeth. Driller: Green Machinery Co.

Topsoil----------	3	3	Clay----------	12	212
Caliche----------	7	10	Clay, sandy----------	57	269
Clay----------	10	20	Rock----------	1	270
Rock, soft----------	6	26	Gravel----------	20	290
Clay----------	36	62	Rock----------	10	300
Shale, hard----------	13	75	Clay, sandy----------	17	317
Rock----------	40	115	Rock----------	6	323
Clay, tough----------	47	162	Red bed----------	5	328
Clay, sandy----------	38	200			

Table 4.--Drillers' logs of selected wells in Hale County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)

Well W-30

Owner: Glen Tullis. Driller: Green Machinery Co.

Topsoil	5	5	Shale	18	140
Caliche	20	25	Sand	70	210
Clay	40	65	Clay, sandy	25	235
Sand	10	75	Sand, tight	35	270
Clay	19	94	Sand and gravel	27	297
Sand	16	110	Red bed	3	300
Clay	12	122			

Well W-96

Owner: Bruce T. Harp. Driller: Green Machinery Co.

Topsoil	5	5	Shale, sandy	60	200
Shale, hard, and soft rock	45	50	Sand	22	222
Rock, hard	5	55	Clay	38	260
Caliche and rock	45	100	Sand and gravel	25	285
Shale, red	22	122	Rock	2	287
Clay	18	140	Red bed	3	290

Well W-113

Owner: City of Hale Center. Driller: Peerless Pump Co.

Topsoil and caliche	30	30	Shale	5	95
Caliche	20	50	Clay and shale	20	115
Sand, fine	10	60	Sand, fine	10	125
Caliche	20	80	Clay and shale	20	145
Sand, fine	10	90	Sand and shale	20	165

(Continued on next page)

Table 4.--Drillers' logs of selected wells in Hale County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Well W-113--Continued					
Clay and shale ----------	10	175	Shale ----------	20	275
Clay ----------	10	185	Clay, shale, and rock ---	10	285
Clay and shale ----------	30	215	Clay and shale ----------	10	295
Shale ----------	10	225	Sand ----------	17	312
Shale and rock ----------	20	245	Red bed ----------	18	330
Sand, rock, and shale ---	10	255			
Well X-27					
Topsoil ----------	4	4	Sand, fine, and clay ----	35	150
Caliche ----------	26	30	Sand and shale ----------	25	175
Sand, fine ----------	25	55	Sand, fine, and clay ----	85	260
Rock, cap ----------	15	70	Sand and gravel ---------	48	308
Clay ----------	10	80	Red bed ----------	4	312
Sand and shale, water ---	35	115			
Well X-38					
Topsoil ----------	5	5	Sand, fine ----------	35	175
Caliche ----------	20	25	Sand, coarse ----------	25	200
Clay and shale ----------	35	60	Sand and shale ----------	30	230
Sand and shale ----------	20	80	Clay, sandy ----------	15	245
Shale and boulders ------	10	90	Sand, some clay ---------	30	275
Shale, brown ----------	20	110	Clay, yellow, and shale -	15	290
Clay, sandy ----------	15	125	Red bed ----------	10	300
Sand and shale ----------	15	140			

Well X-27

Owner: Grady Shepard. Driller: Peerless Pump Co.

Well X-38

Owner: W. Roddy. Driller: Green Machinery Co.

Table 4.--Drillers' logs of selected wells in Hale County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)

Well X-50

Owner: D. T. Findley. Driller: Green Machinery Co.

Topsoil	5	5	Shale, hard	56	218
Clay and shale	48	53	Sand	25	243
Sand	8	61	Shale	15	258
Rock, hard, and shale	23	84	Sand and gravel	36	294
Clay	34	118	Red bed	2	296
Sand, and gravel	44	162			

Well X-75

Owner: J. C. Carter. Driller: Altman Drilling Co.

Topsoil	4	4	Rock, very hard	18	90
Caliche	31	35	Rock, porous, water	12	102
Rock	25	60	Clay, yellow	26	128
Clay	8	68	Shale, red	3	131
Sand, water	4	72			

Well X-76

Owner: J. C. Carter. Driller: Altman Drilling Co.

Topsoil	4	4	Rock	17	110
Caliche	16	20	Shale, yellow	12	122
Clay	10	30	Shale, gray	5	127
Clay, sandy	21	51	Sand	8	135
Rock	5	56	Sand, black	3	138
Shale, sandy	19	75	Shale, blue	9	147
Sand, water	18	93	Shale, red	5	152

Table 4.--Drillers' logs of selected wells in Hale County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Well X-91					
Owner: W. C. Mooney. Driller: Don Wade					
Topsoil	3	3	Lime, broken	10	130
Caliche	32	35	Shale, blue	5	135
Lime, sandy	10	45	Shale, black	5	140
Sand, dry	25	70	Sand and gravel	15	155
Sand and water	20	90	Shale, red	25	180
Lime, gray	30	120			
Well Y-16					
Owner: Bill A. Bay. Driller: Green Machinery Co.					
Topsoil	5	5	Sand and gravel	27	195
Clay and shale	30	35	Clay	5	200
Rock, hard	25	60	Gravel and sand	34	234
Clay	40	100	Clay	24	258
Sand	35	135	Sand and gravel	27	285
Gravel	28	163	Red bed	5	290
Clay	5	168			
Well Y-35					
Owner: Virgil Young. Driller: Altman Drilling Co.					
Topsoil	3	3	Shale, yellow	10	106
Caliche	26	29	Sand, white	6	112
Clay, red	35	64	Shale, blue	4	116
Rock	32	96	Shale, red	1	117

Table 4.--Drillers' logs of selected wells in Hale County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)

Well Y-44

Owner: J. C. Montgomery. Driller: Altman Drilling Co.

Soil----------	4	4	Rock, honeycomb--------	28	98
Caliche----------	36	40	Clay, yellow----------	17	115
Rock----------	8	48	Shale, blue----------	3	118
Clay, sandy----------	17	65	Shale, red----------	5	123
Sand----------	5	70			

Well Y-53

Owner: Virgil Young. Driller: Altman Drilling Co.

Topsoil----------	4	4	Rock, hard----------	13	95
Caliche----------	36	40	Rock, porous----------	13	108
Rock----------	18	58	Shale, yellow----------	20	128
Sand and water---------	7	65	Sand, gray----------	7	135
Clay, sandy----------	17	82	Red bed----------	1	136

Well Z-3

Owner: M. E. Courtney. Driller: Green Machinery Co.

Topsoil----------	5	5	Clay----------	15	55
Caliche----------	13	18	Sand and clay----------	85	140
Rock, soft----------	22	40	Red bed----------	14	154

Well Z-11

Owner: Mrs. J. F. Terrell. Driller: Green Machinery Co.

Topsoil----------	2	2	Sand, tight----------	35	130
Caliche and shale------	27	29	Rock, hard----------	19	149
Rock----------	7	36	Red bed----------	106	255
Clay, hard, red--------	59	95			

Table 4.--Drillers' logs of selected wells in Hale County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)

Well Z-39

Owner: H. F. Whitney, et al. Driller: Altman Drilling Co.

Topsoil	4	4	Clay, sandy	20	105
Caliche	51	55	Shale, gray	23	128
Sand and water	15	70	Caliche	27	155
Clay, sandy	10	80	Rock	2	157
Sand and water	5	85	Shale, gray, and red bed-	5	162

Well Z-86

Owner: W. H. Burton. Driller: Altman Drilling Co.

Topsoil	4	4	Rock, porous	10	116
Caliche	26	30	Clay, yellow	12	128
Clay	10	40	Shale, gray	7	135
Sand, dry	12	52	Sand, gray	5	140
Rock	8	60	Shale, blue	4	144
Sand and water	23	83	Shale, red	1	145
Rock, hard	23	106			

Well Z-89

Owner: M. L. Hester. Driller: Altman Drilling Co.

Topsoil	5	5	Sand, hard	10	100
Caliche	30	35	Rock	25	125
Sand, dry	17	52	Shale, yellow	3	128
Caliche	11	63	Shale, blue	4	132
Sand and water	5	68	Sand, black, and shale	11	143
Shale, sandy	22	90	Shale, red	2	145

Table 4.--Drillers' logs of selected wells in Hale County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)

Well AA-3

Owner: Lida Jones. Driller: Green Machinery Co.

Topsoil	5	5	Clay and rock	8	143
Caliche and clay	63	68	Sand, tight, and gravel	67	210
Sand	12	80	Caliche and rock	15	225
Rock, hard	10	90	Clay and shale	40	265
Clay, brown	30	120	Gravel, good	30	295
Sand, tight	15	135	Red bed	2	297

Well AA-18

Owner: B. R. McWhorter. Driller: L. P. Davis

Topsoil	4	4	Sand	50	210
Caliche	11	15	Rock and shale	27	237
Shale	15	30	Gravel	57	294
Rock and shale	40	70	Rock	4	298
Rock, hard	5	75	Sand	12	310
Sand	15	90	Red bed	2	312
Shale	70	160			

Well AA-32

Owner: Mrs. Martha White. Driller: Consolidated Gas & Equipment Co.

Topsoil	3	3	Shale and gravel	74	221
Caliche	28	31	Clay and sand, pack	31	252
Sand, pack	33	64	Shale and sand	48	300
Rock	2	66	Red bed	10	310
Clay, broken, and sand	81	147			

Table 4.--Drillers' logs of selected wells in Hale County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)

Well AA-75

Owner: Bowen & Gayle. Driller: Consolidated Gas & Equipment Co.

Topsoil	3	3	Sand, broken	8	91
Caliche	39	42	Shale	16	107
Clay and sand, dry	36	78	Sand, broken	111	218
Rock	5	83	Shale and red bed	7	225

Well BB-32

Owner: J. P. McFarland. Driller: B&F Drilling Co.

Topsoil	3	3	Sand, broken	33	198
Caliche	75	78	Clay, shale, white rock, and sand streaks	84	282
Sand	9	87	Sand and gravel	66	348
Shale and rock, white	22	109	Red bed	2	350
Sand and shale	22	131			
Sand	34	165			

Well BB-99

Owner: Billy Houston. Driller: B&F Drilling Co.

Topsoil	4	4	Sand and clay streaks	73	231
Caliche	69	73	Clay	21	252
Rock	2	75	Sand and gravel	58	310
Sand and rock, white	19	94	Sand and clay	14	324
Sand	6	100	Sand and gravel	23	347
Rock, white	4	104	Red bed	3	350
Sand	54	158			

Table 4.--Drillers' logs of selected wells in Hale County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)

Well CC-27

Owner: W. S. Thomas. Driller: Green Machinery Co.

Topsoil	5	5	Sand	28	136
Caliche	35	40	Clay	57	193
Sand, fine, and boulders-	35	75	Sand and gravel	39	232
Rock, hard	4	79	Clay	22	254
Clay	4	83	Sand	26	280
Rock	3	86	Shale, hard, and clay	22	302
Shale and clay	9	95	Sand, coarse	15	317
Rock, soft	2	97	Clay	15	332
Clay	11	108	Red bed	4	336

Well CC-69

Owner: R. G. Harvey. Driller: Taylor Bros.

Topsoil	5	5	Clay	20	145
Caliche	20	25	Sand and water	10	155
Clay, sandy	30	55	Clay	20	175
Sand, dry	35	90	Clay, hard, sandy	20	195
Clay, sandy	15	105	Sand	90	285
Sand and water	10	115	Red bed	1	286
Clay and sandstone	10	125			

Well CC-78

Owner: C. T. Newell. Driller: Green Machinery Co.

Topsoil	6	6	Shale	19	62
Caliche	22	28	Sand	14	76
Clay	15	43	Rock	19	95

(Continued on next page)

Table 4.--Drillers' logs of selected wells in Hale County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Well CC-78--Continued					
Clay	20	115	Clay	9	252
Sand	15	130	Sand	33	285
Clay	13	143	Sand and gravel	25	310
Sand	62	205	Sand and boulders	3	313
Sand and gravel	25	230	Sand and gravel	10	323
Sand and boulders	13	243	Red bed	1	324

Well CC-106

Owner: Wyley Wilkinson. Driller: Green Machinery Co.

Topsoil	5	5	Clay and shale	35	175
Caliche	27	32	Sand and gravel, medium coarse	55	230
Rock, hard, and caliche	18	50	Sand and gravel, coarse	40	270
Clay, red, and some sand	15	65	Clay	15	285
Rock, hard, and caliche	15	80	Sand and gravel, river bed	65	350
Rock and sand	15	95	Red bed	3	353
Shale and sand	25	120			
Sand, tight	20	140			

Well DD-15

Owner: Leroy Adrian. Driller: Green Machinery Co.

Topsoil	3	3	Clay and shale	70	170
Shale, hard	12	15	Shale, sandy	35	205
Shale, soft	45	60	Clay	35	240
Shale, sandy	10	70	Sand and gravel	38	278
Rock	12	82	Rock	10	288
Shale, hard	18	100	Red bed	5	293

Table 4.--Drillers' logs of selected wells in Hale County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)

Well DD-39

Owner: E. P. Wright. Driller: Green Machinery Co.

Topsoil	5	5	Rock and boulders	10	95
Caliche	20	25	Sand and shale	10	105
Shale and clay	10	35	Clay, sandy	25	130
Shale and boulders	20	55	Sand and shale	110	240
Clay and shale	20	75	Sand and gravel, river bed	65	305
Shale and sand	10	85	Red bed	15	320

Well EE-37

Owner: O. B. Wilson. Driller: Altman Drilling Co.

Topsoil	4	4	Clay	12	87
Caliche	11	15	Rock	38	125
Clay	35	50	Clay, yellow	3	128
Caliche and rock	10	60	Sand, gray	7	135
Clay	9	69	Clay, yellow	5	140
Sand and water	6	75	Shale, red	3	143

Well FF-35

Owner: J. C. Fuller. Driller: Altman Drilling Co.

Topsoil	4	4	Clay, joint	9	65
Caliche	21	25	Shale, hard, sandy	24	89
Clay	12	37	Sand and water	7	96
Sand, dry	12	49	Shale, sandy	14	110
Shale, sandy, little water	5	54	Clay	14	124
Rock, hard	2	56	Rock	6	130

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Table 4.--Drillers' logs of selected wells in Hale County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Well FF-35--Continued					
Shale, red	10	140	Shale, gray	17	180
Rock	10	150	Shale, blue	10	190
Sand and water	8	158	Red bed	11	201
Rock	5	163			
Well FF-89					
Topsoil	4	4	Clay	13	108
Clay	21	25	Sand	17	125
Caliche	10	35	Rock	23	148
Sand, dry	15	50	Clay, yellow	7	155
Rock	8	58	Clay, blue	2	157
Sand, dry	12	70	Sand, white	11	168
Shale, gray	10	80	Shale, blue	3	171
Sand and water	15	95	Red bed	2	173
Well FF-124					
Topsoil	4	4	Clay, brown, and lime shell	37	165
Caliche, red	38	42	Sand, red	30	195
Rock	27	69	Red bed	4	199
Clay, red	18	87			
Sand, red	41	128			

Owner: R. E. Wilson. Driller: Altman Drilling Co.

Owner: John Fowler. Driller: W. O. Tye

Table 4.--Drillers' logs of selected wells in Hale County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)

Well GG-11

Owner: B. R. McWhorter. Driller: L. P. Davis & Son

Topsoil	5	5	Sand, soft	75	179
Caliche	25	30	Rock and shale	33	212
Sand, fine	49	79	Sand and gravel	125	337
Rock, white	15	94	Red bed	1	338
Shale, sandy	10	104			

Well GG-28

Owner: L. E. Gilliland. Driller: Peerless Pump Co.

Topsoil	4	4	Sand and gravel	40	230
Caliche and clay	46	50	Clay	35	265
Clay, fine, sand, and shale	80	130	Red bed	10	275
Sand, fine, and shale	60	190			

Well GG-95

Owner: Lee Irish. Driller: Taylor Bros.

Clay, sandy, and caliche-	88	88	Rock, white, and lime	8	172
Sand and sandrock ledges-	50	138	Clay, sandy, white rock and lime	3	175
Sand and sandy clay	2	140	Sand	1	176
Sandrock, hard, white	3	143	Clay, sand, and soft rock	2	178
Clay, white	5	148	Clay, blue, yellow	6	184
Rock, black	3	151	Clay, blue, sandy, sand and gravel	8	192
Rock, yellow, and lime	5	156	Clay, blue, and red bed	1	193
Rock, brown, and lime	6	162			
Clay, yellow	2	164			

Table 4.--Drillers' logs of selected wells in Hale County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)

Well HH-15

Owner: L. C. O'Neal. Driller: Green Machinery Co.

Topsoil	3	3	Sand	36	182
Shale, hard	27	30	Shale, hard	84	266
Sand, red	20	50	Sand and boulders	21	287
Shale	23	73	Sand and gravel	29	316
Rock, soft	5	78	Rock	4	320
Sand	12	90	Red bed	4	324
Shale, hard	56	146			

Well HH-20

Owner: Tom W. Houston. Driller: Green Machinery Co.

Topsoil	5	5	Shale and sand	32	206
Clay and shale	81	86	Sand and gravel	28	234
Rock	16	102	Clay	44	278
Shale	44	146	Sand and gravel	24	302
Clay	28	174	Red bed	3	305

Well HH-35

Owner: C. E. Rhodes. Driller: Green Machinery Co.

Topsoil	3	3	Sand, dry	23	106
Caliche	5	8	Rock, not hard	2	108
Sand, dry	17	25	Sand, soft	18	126
Shale	45	70	Clay, red	4	130
Shale and rock	3	73	Sand, soft	34	164
Shale, hard	10	83	Shale	11	175

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Table 4.--Drillers' logs of selected wells in Hale County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Well HH-35--Continued					
Sand	15	190	Rock	3	288
Clay	40	230	Sand	24	312
Sand and clay	55	285	Red bed	3	315
Well HH-45					
Owner: Ted Watts. Driller: Taylor Bros.					
Clay, sandy, and caliche	56	56	Rock and yellow lime	3	181
Sand	12	68	Rock, yellow lime, and clay streaks	7	188
Rock, cap	14	82	Clay, yellow	4	192
Sand and clay, red	38	120	Clay, yellow, and rock	8	200
Clay, red	12	132	Clay, blue, sandy	8	208
Sand and clay streaks, red	46	178	Red bed	2	210
Well HH-92					
Owner: Thomas Johnson. Driller: Taylor Bros.					
Clay, sandy, and caliche	112	112	Clay, yellow	2	174
Sand and clay, red	36	148	Rock and brown lime	6	180
Clay, sandy, white	14	162	Clay, blue	14	194
Rock and white lime	4	166	Sand, white	2	196
Clay, white	2	168	Clay, blue	8	204
Limerock, brown and black	4	172	Red bed	1	205
Well HH-105					
Owner: H. B. Granberry. Driller: Green Machinery Co.					
Topsoil	5	5	Sand, dry	10	25
Caliche	10	15	Rock	8	33

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Table 4.--Drillers' logs of selected wells in Hale County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Well HH-105--Continued					
Clay	27	60	Rock and some gravel	10	156
Sand	13	73	Sand	6	162
Sand and some clay	49	122	Clay, blue	5	167
Rock	20	142	Sand and gravel	6	173
Sand, yellow	4	146	Red bed	3	176
Well JJ-14					
Owner: C. E. Rhodes. Driller: Green Machinery Co.					
Topsoil	8	8	Clay	8	128
Caliche	8	16	Sand	82	210
Clay	18	34	Shale	20	230
Sand	37	71	Sand and clay	51	281
Rock, soft	4	75	Sand and gravel	12	293
Shale	20	95	Clay	7	300
Sand	25	120	Red bed	3	303
Well JJ-19					
Owner: Ergar G. Harp. Driller: Altman Drilling Co.					
Soil	3	3	Rock	28	168
Caliche	82	85	Clay, yellow	7	175
Clay	33	118	Shale, gray, sandy	10	185
Sand, little water	7	125	Shale, blue	15	200
Clay, sandy	15	140	Shale, red	1	201

Table 4.--Drillers' logs of selected wells in Hale County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)

Well JJ-75

Owner: Phillips & Given. Driller: Taylor Bros.

Clay, surface----------	70	70	Clay, yellow, and sand-	2	198
Rock, cap----------	2	72	Clay, blue----------	6	204
Clay, red, and sand-----	34	106	Rock, blue----------	4	208
Sand----------	54	160	Rock, blue, and blue clay	8	216
Clay, white, sandy------	12	172	Clay, blue----------	8	224
Rock, yellow lime, and little black honeycomb----------	24	196	Sand, white, and clay--	4	228
			Red bed----------	2	230

Well JJ-76

Owner: Phillips & Given. Driller: Taylor Bros.

Clay, sandy, and caliche	78	78	Clay, yellow, and sand-	10	212
Clay, red----------	8	86	Rock, black, and yellow lime----------	2	214
Sand and clay, red------	32	118	Clay, yellow----------	6	220
Sand and clay, red streaks----------	50	168	Sand, white, purple and gravel----------	4	224
Lime, brown----------	28	196	Red bed----------	6	230
Clay, yellow----------	6	202			

Well JJ-98

Owner: C. F. Phillips. Driller: Taylor Bros.

Topsoil----------	5	5	Rock----------	20	192
Caliche----------	10	15	Clay, yellow, sandy----	3	195
Clay, sandy----------	60	75	Sand, yellow----------	15	210
Rock, cap, and clay-----	30	105	Clay, blue----------	6	216
Clay, sandy----------	43	148	Red bed----------	2	218
Sand and water----------	24	172			

Table 4.--Drillers' logs of selected wells in Hale County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)

Well KK-55

Owner: W. F. Buske. Driller: Taylor Bros.

Topsoil	5	5	Rock and lime	29	195
Caliche, sandy	45	50	Sand, yellow	3	198
Sand, dry	20	70	Sand, brown	10	208
Rock, cap, and clay	35	105	Clay, white, sandy	10	218
Clay, sandy	30	135	Clay, blue, sandy	10	228
Sand and clay streaks, water	31	166	Red bed	2	230

Well KK-74

Owner: J. W. McReynolds. Driller: Taylor Bros.

Topsoil	6	6	Rock and lime	42	194
Caliche, sandy	49	55	Sand, yellow, and clay	8	202
Sand, dry	20	75	Clay, blue	10	212
Rock, cap, and clay	10	85	Sand, white	14	226
Clay, white	45	130	Sand, yellow	4	230
Clay, red	5	135	Red bed	2	232
Sand and water	17	152			

Well KK-91

Owner: A. H. Druesedow. Driller: Taylor Bros.

Sand, coarse, and strip of clay	125	125	Clay	3	160
Sand, coarse	25	150	Rock, brown and yellow lime	12	172
Clay	3	153	Lime, soft, and clay	4	176
Sand	4	157	Lime, white, hard	16	192

(Continued on next page)

Table 4.--Drillers' logs of selected wells in Hale County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Well KK-91--Continued					
Lime, soft	4	196	Clay, white	2	210
Sand, yellow	2	198	Sand, white	16	226
Clay, yellow, sandy	4	202	Clay, blue	2	228
Clay, yellow, blue	6	208	Red bed	2	230

Well LL-29

Owner: H. M. LaFont. Driller: Green Machinery Co.

Topsoil	5	5	Clay	26	146
Caliche	7	12	Sand	36	182
Clay	48	60	Clay	36	218
Rock	10	70	Sand and gravel	16	234
Clay	12	82	Red bed	4	238
Sand	38	120			

Well MM-120

Owner: Joe S. Jackson. Driller: -- McDaniels

Topsoil	4	4	Clay, red	14	126
Chalk, white	2	6	Sand and water	14	140
Clay, brown	6	12	Clay and gumbo	12	152
Clay, crumbly, red	8	20	Quicksand	14	166
Clay, sandy	33	53	Clay, sandy	7	173
Sand	10	63	Sand and water	47	220
Rock, cap	13	76	Shale, gray	40	260
Sand, water, and clay	7	83	Sand and water	60	320
Sand and water	22	105	Gumbo	73	393
Quicksand	7	112	Shale, red	9	402

Table 4.--Drillers' logs of selected wells in Hale County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Well MM-128					
Owner: -- Mabry. Driller: Peerless Pump Co.					
Topsoil	5	5	Sand, fine	60	180
Clay and caliche	21	26	Sand, white	55	235
Rock, cap	4	30	Sand and gravel	83	318
Sand, fine, and clay	32	62	Rock	3	321
Rock	13	75	Sand and gravel	81	402
Clay and shale	45	120	Gravel, rocks, and clay	42	444

Table 5.--Water levels in selected wells in Hale County, Texas
(in feet below land surface datum)

Date	Water level	Date	Water level	Date	Water level

Well A-35

Owner: Tom Bostic

Mar. 12, 1947	66.63	Jan. 17, 1951	72.72	Jan. 9, 1954	82.50
Feb. 19, 1948	69.54	Jan. 29, 1952	73.88	Jan. 14, 1955	91.60
Feb. 23, 1949	70.89	Jan. 9, 1953	78.67	Jan. 9, 1956	93.33

Well B-17

Owner: J. Wells Kinkaid

Feb. 19, 1945	59.37	Feb. 20, 1948	62.91	Jan. 28, 1952	72.97
Feb. 25, 1946	60.12	Feb. 22, 1949	65.95	Jan. 9, 1953	77.40
Jan. 17, 1947	61.35	Feb. 18, 1950	68.11	Jan. 4, 1954	82.44
Mar. 10	60.74	Feb. 2, 1951	74.75	Jan. 14, 1955	86.68

Well B-67

Owner: M. J. Malouf

Aug. 19, 1937	57.30	July 20, 1943	57.98	Feb. 23, 1949	64.54
Jan. 17, 1941	59.50	Feb. 3, 1944	58.58	Feb. 18, 1950	66.15
Nov. 13	58.62	Feb. 3, 1945	59.35	Jan. 17, 1951	67.60
Feb. 27, 1942	58.15	Feb. 25, 1946	60.19	Jan. 28, 1952	69.80
Oct. 9	58.16	Mar. 12, 1947	62.93	Jan. 12, 1953	76.28
Jan. 18, 1943	58.28	Feb. 20, 1948	62.52	Jan. 9, 1954	80.37

Well C-7

Owner: J. N. McWilliams

Apr. 24, 1936	48.61	Oct. 1, 1937	46.04	June 25, 1938	45.89
June 8, 1937	47.08	Jan. 5, 1938	44.89	Mar. 4, 1939	45.27
July 28	46.45	Mar. 12	45.61	June 24	45.47

(Continued on next page)

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level
Well C-7--Continued					
Aug. 15, 1939	46.18	Feb. 28, 1942	45.05	Feb. 20, 1948	52.25
Oct. 2	45.71	Oct. 9	44.95	Feb. 19, 1950	55.31
Dec. 1	45.80	Jan. 27, 1943	44.33	Jan. 18, 1951	56.51
Mar. 5, 1940	45.89	Feb. 3, 1944	45.42	Jan. 28, 1952	58.14
Nov. 16	46.68	Feb. 24, 1945	46.90	Jan. 9, 1953	62.14
Jan. 17, 1941	46.80	Feb. 25, 1946	47.91	Jan. 4, 1954	65.90
Mar. 8	46.65	Jan. 21, 1947	50.38	Jan. 14, 1955	70.40
Nov. 13	45.59	Mar. 10	50.20		
Well C-24					
Owner: Wayne Painter					
Mar. 12, 1947	50.02	Jan. 18, 1951	56.92	Jan. 4, 1954	65.74
Feb. 20, 1948	51.40	Jan. 28, 1952	58.37	Jan. 14, 1955	71.00
Feb. 22, 1949	54.25	Jan. 9, 1953	61.85		
Well C-46					
Owner: William B. Spilman					
July 28, 1937	52.24	Jan. 4, 1939	50.29	July 24, 1941	51.15
Aug. 11	52.54	Jan. 31	49.94	Nov. 13	50.57
Jan. 5, 1938	49.46	Mar. 4	49.70	Feb. 28, 1942	49.48
Mar. 12	48.87	June 24	54.04	Oct. 9	50.16
Apr. 12	49.33	Dec. 1	51.65	Jan. 27, 1943	48.80
June 25	55.68	Feb. 29, 1940	50.44	Feb. 3, 1944	49.20
Aug. 10	56.65	Nov. 16	55.27	Feb. 24, 1945	50.83
Oct. 19	52.83	Jan. 17, 1941	52.08	Feb. 25, 1946	52.94
Dec. 6	50.66	Mar. 8	51.63	Feb. 20, 1948	56.19

(Continued on next page)

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level
Well C-46--Continued					
Feb. 22, 1949	62.10	Jan. 28, 1952	67.05	Jan. 14, 1955	80.37
Feb. 18, 1950	63.05	Jan. 12, 1953	70.67	Jan. 9, 1956	84.97
Jan. 18, 1951	64.42	Jan. 4, 1954	75.02		
Well D-16					
Owner: J. H. Koeninger					
Apr. 29, 1961	1/61	Dec. 8, 1938	65.15	Feb. 7, 1944	66.64
Apr. 18, 1934	62.60	Feb. 28, 1939	64.56	Feb. 24, 1945	67.22
May 11, 1936	66.29	June 16	68.30	Feb. 27, 1946	68.52
Aug. 24, 1937	66.15	Oct. 2	66.58	Jan. 17, 1947	70.66
Sept. 10	66.14	Dec. 1	65.52	Mar. 13	70.63
Oct. 1	64.63	Mar. 5, 1940	65.22	Feb. 20, 1948	73.68
Nov. 2	64.15	Nov. 7	67.13	Mar. 7, 1949	77.68
Dec. 3	63.80	Jan. 16, 1941	66.55	Feb. 14, 1950	80.18
Jan. 5, 1938	63.69	Mar. 10	66.48	Jan. 28, 1952	84.94
Mar. 11	63.66	Nov. 5	66.38	Jan. 9, 1953	90.08
Apr. 11	65.68	Feb. 27, 1942	65.77	Jan. 5, 1954	97.00
June 21	65.90	Oct. 12	66.30	Jan. 11, 1955	103.75
Sept. 15	65.92	Jan. 27, 1943	65.44	Jan. 10, 1956	109.65
Well D-33					
Owner: C. E. Monroe					
Mar. 13, 1947	62.07	Jan. 18, 1951	74.29	Jan. 5, 1954	89.07
Feb. 20, 1948	65.26	Jan. 28, 1952	76.65	Jan. 12, 1955	95.24
Mar. 7, 1949	68.88	Jan. 9, 1953	82.64	Jan. 10, 1956	100.12

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level

Well D-42

Owner: Mrs. -- Stien

Mar. 12, 1948	59.39	Jan. 28, 1952	70.75	Jan. 4, 1954	81.22
Mar. 7, 1949	63.27	Jan. 9, 1953	76.03	Dec. 7	90.49
Jan. 18, 1951	72.91				

Well D-49

Owner: W. M. Toliver. Water-level measurements prior to 1948 were made in a well 300 feet east of well D-49

Dec. 23, 1916	1/43	Oct. 2, 1939	56.16	Feb. 27, 1946	56.34
Apr. 24, 1936	47.87	Dec. 1	52.87	Jan. 17, 1947	60.85
May 3, 1937	53.45	Mar. 5, 1940	52.05	Mar. 13	60.21
June 10	50.68	Nov. 7	55.44	Feb. 20, 1948	64.47
July 16	49.86	Jan. 16, 1941	54.10	Mar. 7, 1949	68.76
July 28	50.89	Mar. 10	53.66	Feb. 14, 1950	70.74
Oct. 1	51.23	Nov. 4	53.04	Jan. 18, 1951	71.98
Nov. 2	50.42	Feb. 27, 1942	52.13	Jan. 18, 1952	75.35
Mar. 12	50.02	Oct. 12	53.45	Jan. 9, 1953	80.94
Apr. 11	50.14	Jan. 27, 1943	52.23	Jan. 5, 1954	86.10
June 24, 1938	51.21	Feb. 7, 1944	53.25	Dec. 8	95.50
Oct. 18	51.77	Feb. 24, 1945	54.37	Jan. 12, 1955	92.74
Feb. 28, 1939	50.63				

Well E-1

Owner: T. P. Gerald

Sept. 8, 1916	1/62	June 10, 1937	69.72	Jan. 5, 1938	67.46
May 11, 1936	70.23	Sept. 14	71.10	Apr. 11	66.96
		(Continued on next page)			

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Well E-11--Continued

Date	Water level	Date	Water level	Date	Water level
Jan. 6, 1939	67.71	Feb. 27, 1942	70.12	Mar. 4, 1949	82.40
Mar. 1	67.55	Oct. 13	71.53	Jan. 19, 1951	83.24
Dec. 1	69.85	Jan. 26, 1943	70.56	Jan. 28, 1952	88.20
Mar. 5, 1940	69.16	Feb. 10, 1944	72.18	Jan. 9, 1953	92.61
Nov. 15	71.50	Feb. 24, 1945	72.48	Jan. 5, 1954	98.35
Jan. 16, 1941	70.87	Feb. 27, 1946	74.21	Oct. 21	104.23
Mar. 10	68.10	Mar. 13, 1947	77.45	Jan. 12, 1955	103.08
Nov. 5	71.06	Feb. 21, 1948	79.16	Jan. 12, 1956	107.69

Well E-7

Owner: M. Howell. Water-level measurements prior to 1955 were made in a well 100 feet south of well E-7.

May 7, 1936	62.06	Mar. 5, 1940	62.26	Feb. 24, 1945	67.60
June 10, 1937	64.25	Sept. 18	66.15	Feb. 27, 1946	69.84
Jan. 5, 1938	63.44	Sept. 28	66.10	Jan. 17, 1947	73.00
Apr. 9	62.97	Nov. 15	65.99	Mar. 13	72.58
May 27	63.65	Jan. 16, 1941	65.71	Feb. 21, 1948	74.84
June 27	63.44	Mar. 10	65.52	Mar. 4, 1949	76.57
Dec. 8	63.70	May 31	65.48	Feb. 14, 1950	78.32
Jan. 6, 1939	63.55	July 25	65.37	Jan. 18, 1951	84.86
Mar. 1	63.31	Nov. 5	65.49	Jan. 28, 1952	82.17
June 16	63.87	Feb. 5, 1942	65.07	Jan. 9, 1953	86.42
Aug. 10	65.09	Oct. 13	65.85	Jan. 5, 1954	92.61
Oct. 3	64.80	Jan. 26, 1943	65.25	Oct. 21	99.51
Dec. 1	64.58	Feb. 10, 1944	66.76	Jan. 11, 1955	95.78

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level

Well E-8

Owner: W. C. Whittle

Sept.12, 1914	1/51.5	Mar. 10, 1941	64.54	Mar. 4, 1949	72.20
Mar. 30, 1938	61.52	Nov. 5	64.42	Feb. 14, 1950	74.25
June 21	63.72	Feb. 25, 1942	62.78	Jan. 18, 1951	75.70
Oct. 19	66.23	Oct. 13	65.09	Jan. 28, 1952	76.57
Jan. 6, 1939	62.74	Jan. 26, 1943	62.74	Jan. 9, 1953	81.22
Oct. 3	72.63	Feb. 10, 1944	64.26	Jan. 5, 1954	86.71
Dec. 1	66.25	Feb. 24, 1945	64.82	Jan. 17, 1955	90.00
Mar. 5, 1940	62.89	Feb. 27, 1946	66.09	Jan. 9, 1956	94.05
Nov. 15	68.37	Mar. 13, 1947	68.28		
Jan. 18, 1941	65.80	Feb. 21, 1948	69.90		

Well E-23

Owner: John F. Dubose. Water-level measurements prior to 1955 were made in a well 200 feet east of Well E-23.

Apr. 2, 1917	1/57	Dec. 8	68.91	Feb. 10, 1944	69.02
Sept.16, 1937	68.32	Mar. 5, 1940	68.09	Feb. 24, 1945	69.65
Mar. 30, 1938	66.10	Nov. 15, 1940	70.96	Feb. 27, 1946	73.42
May 27	66.84	Jan. 16, 1941	70.17	Mar. 13, 1947	76.38
June 27	66.87	Mar. 10	69.68	Feb. 21, 1948	78.42
Dec. 8	66.97	July 25	69.41	Mar. 4, 1949	83.14
Mar. 1, 1939	66.41	Nov. 5	69.20	Feb. 14, 1950	84.40
June 16	68.16	Feb. 24, 1942	68.40	Jan. 18, 1951	94.79
Oct. 3	69.68	Oct. 13	68.86	Jan. 28, 1952	87.73
Oct. 24	69.45	Jan. 26, 1943	68.10	Jan. 10, 1953	92.76

(Continued on next page)

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level
Well E-23--Continued					
Jan. 5, 1954	98.18	Jan. 12, 1955	103.35	Jan. 9, 1956	107.50
Dec. 7	104.00				

Well E-47

Owner: W. M. Toliver

July 7, 1916	1/46	Dec. 1, 1939	55.65	Mar. 13, 1947	61.87
Apr. 18, 1934	49.48	Mar. 5, 1940	54.90	Feb. 20, 1948	64.60
Sept. 13, 1937	55.12	Nov. 7	57.62	Feb. 7, 1949	68.24
Dec. 3	52.60	Jan. 16, 1941	56.86	Feb. 14, 1950	70.32
Jan. 5, 1938	52.35	Mar. 10	56.58	Jan. 18, 1951	72.13
Mar. 12	52.96	Nov. 4	56.12	Jan. 28, 1952	74.00
Apr. 11	52.69	Feb. 27, 1942	54.77	Jan. 9, 1953	80.52
June 21	54.94	Oct. 12	56.34	Jan. 5, 1954	86.15
Oct. 18	54.62	Jan. 27, 1943	55.40	Dec. 8	91.88
Jan. 4, 1939	54.20	Feb. 7, 1944	56.70	Jan. 12, 1955	91.36
Feb. 28	53.47	Feb. 24, 1945	57.37	Jan. 10, 1956	94.90

Well F-13

Owner: Owen Egger. Water-level measurements prior to 1948 were made in a well 300 feet south of well F-13.

Aug. 5, 1916	1/44	June 27, 1938	50.77	June 16, 1939	54.40
Apr. 18, 1934	47.91	Sept. 15	51.66	July 18	51.32
Sept. 16, 1937	50.69	Oct. 18	50.62	Oct. 24	51.36
Jan. 5, 1938	49.63	Dec. 8	50.09	Dec. 8	51.78
Mar. 12	49.56	Jan. 6, 1939	50.07	Mar. 5, 1940	50.82
Apr. 11	49.58	Feb. 28	50.03	Oct. 27	52.40

(Continued on next page)

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Well F-13--Continued

Date	Water level	Date	Water level	Date	Water level
Nov. 15, 1940	52.16	Feb. 10, 1944	52.93	Feb. 14, 1950	65.46
Jan. 16, 1941	52.04	Feb. 24, 1945	53.97	Jan. 18, 1951	66.83
Mar. 10	51.92	Feb. 27, 1946	55.10	Jan. 28, 1952	68.35
July 25, 1941	51.43	Jan. 17, 1947	57.50	Jan. 10, 1953	71.99
Oct. 16	51.76	Mar. 13	57.92	Jan. 5, 1954	77.01
Feb. 25, 1942	51.52	Jan. 17, 1948	60.76	Jan. 12, 1955	82.10
Oct. 23	52.25	Feb. 21	60.68		
Jan. 26, 1943	51.66	Mar. 4, 1949	63.94		

Well F-40

Owner: Homer Rook

Apr. 23, 1936	46.70	Oct. 18, 1938	47.64	July 25, 1941	49.92
June 10, 1937	47.16	Dec. 8	47.67	Oct. 16	49.76
Sept.14	47.28	Jan. 6, 1939	47.69	Feb. 25, 1942	49.50
Oct. 4	47.31	Feb. 28	47.73	Oct. 23	50.01
Nov. 1	47.35	June 16	47.81	Jan. 26, 1943	49.82
Dec. 3	47.38	July 20	47.86	Feb. 10, 1944	50.88
Jan. 5, 1938	47.40	Aug. 14	47.90	Feb. 24, 1945	51.99
Mar. 12	47.44	Oct. 3	47.99	Feb. 27, 1946	54.79
Apr. 11	47.46	Dec. 8	48.11	Mar. 13, 1947	57.37
May 27	47.49	Mar. 5, 1940	48.27	Feb. 21, 1948	60.58
June 27	47.53	Nov. 15	49.08	Mar. 4, 1949	63.96
Aug. 11	47.57	Jan. 16, 1941	49.32	Feb. 14, 1950	65.67
Sept.15	47.61	Mar. 10	49.42	Jan. 18, 1951	67.51

(Continued on next page)

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level
Well F-40--Continued					
Jan. 28, 1952	69.51	Jan. 5, 1954	77.91	Jan. 12, 1955	83.14
Jan. 10, 1953	72.87				

Well F-52

Owner: Paul Williams

Mar. 19, 1947	70.40	Jan. 25, 1952	79.91	Dec. 8, 1954	94.63
Feb. 21, 1948	71.40	Jan. 11, 1953	84.43	Jan. 11, 1955	94.55
Mar. 7, 1949	73.93	Jan. 6, 1954	89.28	Jan. 9, 1956	97.94
Feb. 14, 1950	76.10				

Well F-53

Owner: Paul Williams

Mar. 19, 1947	62.33	Jan. 18, 1951	70.47	Nov. 16, 1954	91.48
Feb. 21, 1948	64.51	Jan. 25, 1952	74.80	Jan. 11, 1955	92.88
Mar. 7, 1949	67.36	Jan. 11, 1953	78.45	Jan. 9, 1956	99.72
Feb. 14, 1950	68.55	Jan. 6, 1954	83.45		

Well G-27

Owner: J. A. Johnson

Feb. 23, 1949	79.90	Jan. 29, 1952	90.70	Jan. 14, 1955	102.69
Jan. 17, 1951	91.56	Jan. 10, 1954	96.27		

Well G-63

Owner: Walter Hurt

Mar. 12, 1948	67.74	Jan. 17, 1951	71.74	Jan. 10, 1954	81.36
Feb. 23, 1949	69.98	Jan. 29, 1952	74.00	Jan. 14, 1955	85.80
Feb. 17, 1950	70.55	Jan. 9, 1953	76.52	Jan. 11, 1956	90.10

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level
Well G-70					
Owner: B. A. Dalton					
Mar. 21, 1947	72.52	Feb. 17, 1950	76.90	Jan. 10, 1954	88.81
Mar. 12, 1948	74.24	Jan. 29, 1952	81.04	Jan. 18, 1955	94.18
Feb. 23, 1949	76.10	Jan. 12, 1953	84.67		
Well H-11					
Owner: J. E. McAlister					
Mar. 12, 1947	85.95	Jan. 17, 1951	95.41	Dec. 21, 1954	117.17
Feb. 19, 1948	89.04	Jan. 29, 1952	99.12	Jan. 14, 1955	114.50
Feb. 23, 1949	92.86	Jan. 12, 1953	104.50	Jan. 10, 1956	118.43
Feb. 18, 1950	93.27	Jan. 10, 1954	108.78		
Well H-32					
Owner: V. Craig					
Mar. 12, 1947	80.76	Feb. 18, 1950	87.42	Jan. 10, 1954	103.62
Feb. 19, 1948	82.98	Jan. 29, 1952	93.09	Jan. 14, 1955	108.30
Feb. 23, 1949	87.19	Jan. 12, 1953	103.35	Jan. 10, 1956	111.85
Well H-49					
Owner: G. D. Lewellen					
May 19, 1936	77.53	June 27, 1938	77.49	Oct. 24, 1942	77.55
June 8, 1937	77.72	Jan. 17, 1941	78.60	Jan. 20, 1943	77.37
Aug. 16	77.46	Mar. 8	78.33	Feb. 3, 1944	78.06
Jan. 6, 1938	76.88	Nov. 13	78.01	Feb. 25, 1946	79.38
May 31	77.39	Feb. 28, 1942	77.53	Jan. 21, 1947	81.60

(Continued on next page)

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Well H-49--Continued

Date	Water level	Date	Water level	Date	Water level
Mar. 12, 1947	81.34	Jan. 29, 1952	92.83	Dec. 21, 1954	109.07
Feb. 19, 1948	83.59	Jan. 12, 1953	98.19	Jan. 14, 1955	107.73
Feb. 23, 1949	86.15	Jan. 10, 1954	102.98	Jan. 10, 1956	115.62
Feb. 18, 1950	87.59				

Well H-59

Owner: Winford Smith

Mar. 21, 1947	68.56	Jan. 17, 1951	77.23	Jan. 9, 1954	85.00
Feb. 19, 1948	70.72	Jan. 28, 1952	76.85	Jan. 14, 1955	92.95
Feb. 23, 1949	72.19	Jan. 12, 1953	81.06	Jan. 10, 1956	94.15

Well J-11

Owner: M. L. Glantz

Mar. 12, 1947	67.86	Jan. 29, 1952	77.22	Jan. 14, 1955	93.18
Feb. 23, 1949	73.99	Jan. 12, 1953	85.20	Jan. 10, 1956	96.55

Well J-20

Owner: S. E. Curry

Mar. 26, 1943	48.06	Mar. 10, 1947	56.68	Jan. 28, 1952	68.35
Feb. 9, 1944	49.69	Feb. 22, 1949	62.27	Jan. 12, 1953	73.42
Feb. 19, 1945	51.11	Mar. 29	61.95	Jan. 4, 1954	77.48
Feb. 26, 1946	53.81	Feb. 18, 1950	65.24	Jan. 14, 1955	83.22
Jan. 16, 1947	57.36	Jan. 17, 1951	65.89		

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level
Well J-60					
Owner: Lester James					
Jan. 17, 1941	72.51	Feb. 23, 1945	72.92	Feb. 23, 1949	81.64
July 24	72.41	Feb. 26, 1946	74.79	Jan. 8, 1953	95.35
Feb. 28, 1942	72.47	Jan. 21, 1947	77.70	Jan. 5, 1954	100.77
Oct. 24	71.63	Mar. 21	76.88	Dec. 21	107.40
Feb. 11, 1943	70.29	Feb. 19, 1948	78.53	Jan. 10, 1956	111.33
Feb. 3, 1944	72.93				
Well J-92					
Owner: S. E. Curry					
Feb. 29, 1952	6/60.07	Mar. 5, 1953	65.31	Feb. 15, 1955	74.97
Mar. 11	60.00	Apr. 1	66.58	Mar. 1	75.29
Apr. 1	61.65	May 1	67.38	Apr. 2	76.05
May 25	62.90	June 1	67.85	May 31	77.51
June 1	63.00	July 1	68.80	June 30	77.04
July 1	64.10	Aug. 2	69.87	July 4	76.95
Aug. 1	64.70	Sept. 1	70.96	Aug. 2	77.42
Sept. 1	66.45	Oct. 31	70.96	Sept. 1	78.75
Oct. 1	67.16	Nov. 30	70.22	Oct. 31	79.24
Nov. 30	66.77	Dec. 17	69.93	Nov. 10	79.09
Dec. 31	66.20	Nov. 22, 1954	75.76	Dec. 30	78.88
Jan. 30, 1953	65.73	Dec. 6	75.73	Jan. 1, 1956	78.98
Feb. 27	65.36				

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level

Well K-10

Owner: A. B. Tarwater

Nov. 20, 1939	51.83	Jan. 17, 1947	60.55	Jan. 28, 1952	71.44
Mar. 26, 1943	51.70	Mar. 10	59.65	Jan. 12, 1953	77.75
Feb. 2, 1944	53.50	Feb. 20, 1948	62.74	Jan. 5, 1954	80.77
Feb. 20, 1945	54.32	Feb. 22, 1949	65.65	Jan. 14, 1955	87.90
Feb. 26, 1946	57.24	Feb. 15, 1950	67.09		

Well K-47

Owner: H. Wasson

Apr. 5, 1948	69.9	Jan. 18, 1951	71.15	Jan. 9, 1953	81.94
Feb. 22, 1949	69.51	Jan. 21, 1952	76.57	Jan. 9, 1956	92.02
Feb. 20, 1950	69.63				

Well K-72

Owner: C. S. Ebeling

1914	2/25.7	Jan. 31, 1939	20.46	Mar. 8, 1941	22.85
1936	19.4	Mar. 3	20.61	June 2	21.26
June 7, 1937	19.99	Mar. 26	20.78	Nov. 13	17.32
Aug. 25	19.88	June 23	20.92	Feb. 28, 1942	18.28
Jan. 6, 1938	19.48	July 19	23.54	Oct. 24	18.88
Mar. 12	19.77	Oct. 2	21.72	Jan. 20, 1943	18.83
Apr. 12	19.97	Dec. 1	21.74	Feb. 3, 1944	21.46
May 31	20.22	Feb. 29, 1940	21.89	Feb. 23, 1945	23.00
June 27	20.20	Nov. 13	23.71	Feb. 27, 1946	24.93
Dec. 6	20.52	Jan. 17, 1941	22.70	Jan. 21, 1947	25.34

(Continued on next page)

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level
Well K-72--Continued					
Mar. 21, 1947	25.93	Jan. 17, 1951	36.92	Jan. 4, 1954	49.55
Feb. 19, 1948	28.27	Jan. 28, 1952	39.08	Dec. 9	55.12
Feb. 22, 1949	31.99	Jan. 8, 1953	43.64	Jan. 14, 1955	55.11
Well K-94					
Owner: R. E. Walker					
May 1935	1/45	Jan. 19, 1951	64.48	Jan. 5, 1954	78.36
Feb. 19, 1948	54.02	Jan. 28, 1952	67.35	Dec. 9	88.61
Feb. 22, 1949	58.34	Jan. 8, 1953	72.85	Jan. 12, 1955	88.01
Feb. 15, 1950	61.74				
Well K-110					
Owner: E. H. Kirchoff					
1914	2/20	Dec. 1, 1937	16.47	June 26, 1939	17.22
1916	3/20	Jan. 5, 1938	16.88	July 3	17.34
Apr. 27, 1936	19.43	Mar. 12	17.50	Aug. 14	18.79
May 15	19.08	Apr. 12	17.78	Oct. 2	19.47
Apr. 22, 1937	18.33	May 31	18.16	Dec. 1	20.00
May 21	17.60	June 25	17.83	Feb. 29, 1940	20.73
June 8	13.06	Aug. 10	18.11	July 9	20.67
July 13	14.11	Oct. 17	17.26	Oct. 27	21.80
Aug. 11	14.60	Dec. 6	18.27	Nov. 14	21.92
Sept. 10	14.77	Jan. 16, 1939	17.01	Jan. 17, 1941	22.14
Oct. 1	15.22	Mar. 4	18.29	Mar. 4	22.28
Nov. 2	16.00	Apr. 3	18.25	May 30	17.38

(Continued on next page)

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Well K-110--Continued

Date	Water level	Date	Water level	Date	Water level
June 3, 1941	15.51	Feb. 2, 1944	21.20	Jan. 28, 1952	45.54
July 24	13.75	Feb. 23, 1945	23.19	Jan. 8, 1953	51.11
Oct. 14	12.90	Mar. 6, 1946	26.28	Jan. 4, 1954	59.02
Feb. 28, 1942	14.79	Jan. 21, 1947	27.37	Dec. 10	66.30
July 2	15.56	Mar. 12	28.12	Jan. 12, 1955	66.33
Oct. 8	17.88	June 8, 1951	41.24		
Feb. 11, 1943	18.10	July 19	40.07		

Well K-111

Owner: H. D. Slaton

1910	4/20	Apr. 3, 1939	18.75	Feb. 23, 1945	21.58
1914	2/20	July 19	18.75	Feb. 27, 1946	24.26
Aug. 16, 1937	17.59	Dec. 1	20.21	Mar. 21, 1947	26.92
Apr. 12, 1938	18.65	Feb. 29, 1940	20.24	Feb. 19, 1948	27.82
June 2	18.69	Nov. 13	21.62	Feb. 23, 1949	31.70
Aug. 10	18.96	Jan. 17, 1941	21.20	Jan. 17, 1951	35.80
Dec. 9	18.73	Mar. 8	21.24	Jan. 29, 1952	37.80
Jan. 16, 1939	18.32	Oct. 8, 1942	17.05	Jan. 8, 1953	45.45
Jan. 31	18.44	Jan. 20, 1943	16.69	Jan. 4, 1954	51.19
Mar. 4	18.75	Feb. 3, 1944	19.63		

Well L-6

Owner: McKinley Howell

1914	2/42	June 15, 1936	44.09	Sept. 3, 1937	49.59
Apr. 23, 1936	43.90	June 10, 1937	46.63	Jan. 5, 1938	45.54

(Continued on next page)

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Well L-6--Continued

Date	Water level	Date	Water level	Date	Water level
Mar. 12, 1938	45.36	Nov. 7, 1940	49.18	Mar. 5, 1947	55.40
Apr. 11	45.46	Jan. 18, 1941	48.83	Feb. 20, 1948	58.12
June 21	45.71	Mar. 10	48.69	Feb. 28, 1949	63.15
Oct. 18	45.90	Nov. 5	48.11	Feb. 14, 1950	65.30
Jan. 4, 1939	45.82	Feb. 24, 1942	47.41	Jan. 18, 1951	68.40
Feb. 28	45.78	Oct. 12	48.25	Jan. 21, 1952	71.53
June 16	46.30	Jan. 27, 1943	47.92	Jan. 8, 1953	77.69
Aug. 14	46.37	Feb. 23, 1944	49.00	Jan. 5, 1954	84.05
Oct. 2	46.72	Feb. 24, 1945	50.17	Dec. 8	89.21
Dec. 1	46.85	Feb. 26, 1946	52.56	Jan. 12, 1955	89.13
Mar. 5, 1940	46.78	Jan. 17, 1947	55.57	Jan. 10, 1956	92.90

Well L-28

Owner: J. S. Simpson

Mar. 3, 1947	60.20	Jan. 21, 1952	77.89	Dec. 9, 1954	97.73
Feb. 20, 1948	64.16	Jan. 9, 1953	82.73	Jan. 12, 1955	98.90
Feb. 28, 1949	68.77	Jan. 4, 1954	87.54		

Well L-29

Owner: J. S. Simpson

Sept.14, 1937	47.86	Jan. 16, 1951	82.75	Dec. 9, 1954	97.77
Mar. 13, 1947	61.24	Jan. 21, 1952	78.95	Jan. 12, 1955	94.85
Feb. 20, 1948	65.38	Jan. 9, 1953	83.65		
Feb. 28, 1949	69.93	Jan. 4, 1954	88.30		

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level

Well L-89

Owner: Gifford Hill Western Co.

Mar. 7, 1945	47.50	Feb. 28, 1949	61.42	Jan. 17, 1955	88.05
Mar. 5, 1946	50.78	Jan. 28, 1952	70.77	Jan. 9, 1956	91.85
Jan. 16, 1947	54.19	Jan. 8, 1953	74.66		
Mar. 6, 1947	54.08	Jan. 5, 1954	80.34		

Well L-116

Owner: City of Plainview

June 28, 1949	6/41.86	Nov. 1, 1950	47.15	Apr. 3, 1952	51.16
July 1	41.97	Dec. 1	47.44	May 6	51.60
Aug. 3	42.54	Jan. 1, 1951	47.88	June 10	52.18
Sept.18	43.14	Feb. 1	48.12	July 18	53.23
Oct. 14	43.35	Mar. 1	48.38	Aug. 5	53.82
Nov. 1	43.34	Apr. 1	48.70	Sept. 1	54.34
Dec. 1	43.73	May 1	49.45	Oct 1	54.94
Jan. 14, 1950	43.98	June 24	46.61	Nov. 3	55.31
Feb. 2	44.38	July 6	46.53	Dec. 1	55.53
Mar. 2	44.38	Aug. 1	47.14	Jan. 1, 1953	6/55.74
Apr. 1	44.85	Sept. 1	48.21	Feb. 1	56.00
May 3	45.63	Oct. 1	48.47	Mar. 1	56.15
June 1	46.07	Nov. 1	49.34	Apr. 1	56.97
July 28	46.55	Dec. 4	49.70	May 1	58.04
Aug. 12	46.50	Jan. 1, 1952	49.94	June 1	59.18
Sept.25	46.58	Feb. 1	50.18	July 2	60.65
Oct. 1	46.59	Mar. 3	50.49	Aug. 2	61.73

(Continued on next page)

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level
Well L-116--Continued					
Sept. 1, 1953	62.55	Mar. 14, 1955	5/69.03	Aug. 2, 1955	69.53
Oct. 31	63.07	Apr. 15	69.82	Sept. 2	70.68
Nov. 24	62.64	May 31	69.89	Oct. 1	71.10
Jan. 7, 1954	62.69	June 30	68.81	Nov. 1	71.20
Nov. 22	5/68.80	July 6	68.77		

Well M-1

Owner: Frank Moore. Water-level measurements prior to 1948 were made in a well 30 feet southeast of well M-1.

1914	2/42	Oct. 18, 1938	45.32	Feb. 10, 1944	47.34
Apr. 23, 1936	44.59	Dec. 8	45.24	Feb. 24, 1945	48.91
June 10, 1937	44.85	Jan. 6, 1939	45.32	Feb. 27, 1946	50.25
July 13	44.73	Feb. 28	45.51	Jan. 17, 1947	52.17
Aug. 26	44.75	July 20	45.80	Mar. 13	53.30
Oct. 4	44.85	Aug. 14	45.74	Feb. 21, 1948	57.00
Nov. 1	44.89	Dec. 8	47.24	Mar. 7, 1949	61.21
Dec. 3	44.84	Mar. 5, 1940	46.03	Feb. 14, 1950	62.82
Jan. 5, 1938	44.89	Nov. 15	46.68	Jan. 18, 1951	64.72
Mar. 12	45.38	Jan. 16, 1941	46.60	Jan. 25, 1952	67.28
Apr. 11	45.44	Mar. 10	46.67	Jan. 10, 1953	72.58
May 27	45.44	Nov. 5	46.21	Jan. 5, 1954	78.97
June 27	45.52	Feb. 25, 1942	45.98	Dec. 15	85.93
Aug. 12	45.24	Oct. 23	46.76	Jan. 12, 1955	84.49
Sept. 15	45.66	Jan. 26, 1943	46.78	Jan. 9, 1956	90.70

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level

Well M-10

Owner: Perry Wood

Mar. 17, 1947	50.74	Jan. 18, 1951	62.19	Dec. 15, 1954	80.21
Feb. 21, 1948	52.62	Jan. 25, 1952	63.47	Jan. 6, 1956	88.87
Mar. 7, 1949	58.96	Jan. 11, 1953	69.32		
Feb. 14, 1950	59.85	Jan. 6, 1954	75.26		

Well M-11

Owner: Robert & Bruce Rigler

Mar. 13, 1947	53.60	Feb. 14, 1950	63.40	Jan. 6, 1954	80.60
Feb. 21, 1948	56.22	Jan. 25, 1952	68.10		
Mar. 7, 1949	60.32	Jan. 11, 1953	73.56		

Well M-13

Owner: Jesse A. Horn. Water-level measurements prior to 1954 were made in a well 100 feet west of Well M-13.

1914	2/42	June 27, 1938	45.66	Jan. 18, 1941	48.40
Apr. 30, 1936	45.30	Oct. 18	45.82	Mar. 11	48.34
Aug. 27, 1937	45.62	Dec. 5	45.78	Nov. 5	46.73
Sept. 14	45.68	Jan. 3, 1939	45.69	Feb. 25, 1942	46.21
Oct. 1	45.41	Feb. 27	45.68	Oct. 20	46.86
Nov. 1	45.32	June 24	45.58	Jan. 26, 1943	46.35
Dec. 3	45.24	Aug. 14	48.07	Feb. 11, 1944	48.44
Jan. 4, 1938	45.25	Oct. 4	47.53	Feb. 12, 1945	49.86
Mar. 11	45.29	Dec. 8	46.99	Feb. 28, 1946	51.53
Apr. 13	45.32	Mar. 6, 1940	46.97	Jan. 17, 1947	52.51
May 26	45.96	Nov. 15	48.42	Mar. 19	53.09

(Continued on next page)

See footnoted at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level
Well M-13--Continued					
Feb. 21, 1948	54.81	Jan. 25, 1952	63.61	Jan. 12, 1955	79.73
Mar. 7, 1949	57.91	Jan. 11, 1953	68.80	Jan. 9, 1956	81.53
Feb. 14, 1950	59.20	Dec. 15, 1954	79.97		
Well M-46					
Owner: D. W. Kerr					
Mar. 13, 1947	60.93	Mar. 7, 1949	68.38	Jan. 11, 1953	85.85
Feb. 21, 1948	64.60	Jan. 25, 1952	78.45	Jan. 12, 1955	97.83
Well M-79					
Owner: R. C. Jackson					
Mar. 7, 1949	63.41	Jan. 21, 1952	72.30	Jan. 12, 1955	92.04
Jan. 18, 1951	63.37	Jan. 6, 1954	84.83	Jan. 9, 1956	97.55
Well P-100					
Owner: Mayfield School					
Aug. 12, 1937	59.70	Feb. 20, 1950	68.20	Jan. 29, 1952	71.98
Feb. 23, 1949	66.32	Jan. 19, 1951	69.51		
Well Q-9					
Owner: C. E. Reed					
Mar. 21, 1947	70.83	Feb. 18, 1950	76.84	Jan. 9, 1954	90.74
Feb. 28, 1948	72.86	Jan. 29, 1952	80.90	Jan. 13, 1955	98.20
Mar. 7, 1949	75.30	Jan. 8, 1953	85.20		

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level

Well Q-37

Owner: J. E. Laney

Aug. 26, 1937	53.52	Mar. 7, 1949	60.82	Jan. 8, 1953	70.55
Mar. 21, 1947	56.43	Feb. 18, 1950	62.65	Jan. 9, 1954	75.36
Feb. 28, 1948	58.21	Jan. 27, 1952	65.65	Jan. 13, 1955	80.16

Well Q-68

Owner: J. E. Laney

Mar. 21, 1947	62.07	Jan. 19, 1951	71.32	Jan. 9, 1954	85.18
Feb. 28, 1948	64.38	Jan. 29, 1952	74.23	Jan. 13, 1955	92.50
Mar. 7, 1949	67.43	Jan. 13, 1953	79.64	Jan. 10, 1956	96.84

Well R-4

Owner: Mrs. J. D. Webb

1914	2/49	July 19, 1939	46.85	Feb. 16, 1944	49.08
May 11, 1936	46.00	Oct. 6	47.15	Feb. 23, 1945	49.97
Aug. 27, 1937	46.14	Dec. 1	47.31	Mar. 6, 1946	51.54
Jan. 6, 1938	45.70	Mar. 4, 1940	47.53	Jan. 21, 1947	53.65
Apr. 12	45.86	Nov. 14	49.10	Mar. 12	53.58
June 25	46.03	Jan. 17, 1941	48.85	Feb. 28, 1948	55.15
Aug. 10	46.15	Mar. 11	48.86	Feb. 22, 1949	58.63
Oct. 19	46.37	Oct. 14	48.69	Feb. 15, 1950	60.94
Dec. 9	46.41	Feb. 28, 1942	47.82	Jan. 19, 1951	63.66
Jan. 5, 1939	46.45	Oct. 24	48.10	Jan. 28, 1952	66.70
Mar. 3	46.47	Jan. 20, 1943	47.92	Jan. 8, 1953	71.20
June 23	46.73				

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level

Well R-90

Owner: Mrs. Ferd Rastetter. Water-level measurements prior to March 7, 1949 were made in a well 225 feet northeast of Well R-90.

Oct. 26, 1937	54.52	Dec. 14, 1939	56.18	Feb. 28, 1948	64.18
Apr. 12, 1938	55.30	Mar. 13, 1940	56.11	Mar. 7, 1949	67.00
June 2	55.07	Nov. 14	57.66	Feb. 16, 1950	72.68
Aug. 11	55.66	Jan. 21, 1941	57.18	Jan. 19, 1951	68.35
Oct. 20	55.78	Mar. 4	57.29	Jan. 30, 1952	74.63
Dec. 9	55.83	Jan. 26, 1943	56.01	Jan. 13, 1953	82.91
Mar. 3, 1939	55.28	Feb. 17, 1944	57.59	Jan. 9, 1954	89.91
June 19	56.88	Feb. 24, 1945	57.70	Dec. 10	102.20
July 19	56.59	Mar. 1, 1946	61.19	Jan. 11, 1955	100.26
Aug. 16	56.34	Jan. 21, 1947	62.79	Jan. 13, 1956	107.41
Oct. 6	57.25	Mar. 14	61.96		

Well R-101

Owner: G. E. Bench

Mar. 14, 1947	57.39	Jan. 19, 1951	66.41	Dec. 13, 1954	99.95
Feb. 26, 1948	59.36	Jan. 28, 1952	68.85	Jan. 17, 1955	94.34
Mar. 4, 1949	62.06	Jan. 13, 1953	76.33	Jan. 13, 1956	99.35
Feb. 16, 1950	62.96	Jan. 8, 1954	84.66		

Well S-59

Owner: J. P. Horton

Mar. 11, 1947	58.79	Jan. 19, 1951	67.62	Jan. 8, 1954	90.35
Feb. 24, 1948	62.19	Jan. 30, 1952	76.36	Jan. 17, 1955	99.05
Mar. 2, 1949	66.50	Jan. 14, 1953	82.15	Jan. 16, 1956	99.14

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level

Well S-100

Owner: G. A. Benefield. Water-level measurements prior to 1947 were made in a well 50 feet west of Well S-100.

1914	2/57.5	June 26, 1939	58.82	Feb. 13, 1945	61.72
May 6, 1936	57.75	Aug. 16	59.11	Feb. 28, 1946	62.67
Apr. 26, 1937	59.00	Oct. 6	59.08	Jan. 20, 1947	64.63
June 8	58.34	Dec. 14	59.40	Mar. 14	64.58
July 12	58.17	Mar. 7, 1940	59.00	Feb. 26, 1948	65.73
Aug. 9	58.20	Nov. 14	61.91	Mar. 16, 1949	69.63
Jan. 8, 1938	57.60	Jan. 21, 1941	61.08	Feb. 16, 1950	69.54
Mar. 11	57.81	Mar. 4	60.90	Jan. 19, 1951	69.87
Apr. 12	57.76	Nov. 24	60.14	Jan. 28, 1952	74.89
June 2	58.30	Mar. 12, 1942	60.08	Jan. 13, 1953	80.05
Aug. 10	58.20	Oct. 8	60.83	Jan. 8, 1954	89.04
Oct. 20	58.55	Jan. 26, 1943	60.01	Jan. 13, 1955	97.79
Dec. 7	58.37	Feb. 8, 1944	60.70	Jan. 13, 1956	105.83
Mar. 3, 1939	58.29				

Well T-19

Owner: E. L. Cross

1914	2/41	Oct. 1, 1937	47.29	May 26, 1938	46.90
Nov. 22, 1936	47.02	Nov. 1	46.62	June 23	46.92
May 3, 1937	48.64	Dec. 2	46.29	Aug. 11	48.02
June 9	47.90	Jan. 4, 1938	46.03	Oct. 17	47.64
July 27	48.35	Mar. 10	45.84	Dec. 5	47.78
Sept. 14	47.61	Apr. 14	46.88	Jan. 5, 1939	47.71

(Continued on next page)

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level
Well T-19--Continued					
Mar. 1, 1939	47.21	Mar. 9, 1942	46.97	Feb. 19, 1950	66.87
June 26	48.60	Oct. 23	47.01	Feb. 2, 1951	70.45
July 25	49.29	Jan. 26, 1943	46.60	Jan. 21, 1952	74.15
Oct. 5	49.65	Feb. 15, 1944	48.34	Jan. 9, 1953	80.54
Dec. 14	49.27	Feb. 13, 1945	50.95	Jan. 6, 1954	87.96
Mar. 6, 1940	48.65	Mar. 1, 1946	52.92	Dec. 14	96.00
Nov. 15	51.40	Jan. 16, 1947	55.44	Jan. 12, 1955	96.08
Jan. 20, 1941	50.70	Mar. 19	55.25	Jan. 16, 1956	99.18
Mar. 11	50.53	Feb. 21, 1948	58.85		
Nov. 21	48.08	Mar. 7, 1949	63.77		

Well T-50

Owner: I. B. Rankin. Water-level measurements prior to 1955 were made in a well 50 feet southwest of Well T-50.

May 4, 1936	52.00	Mar. 8, 1938	50.36	Jan. 20, 1941	55.51
Mar. 17, 1937	53.62	Apr. 13	51.01	Mar. 11	55.51
May 25	52.00	May 26	51.44	Nov. 21	52.76
June 26	51.22	June 23	51.27	Mar. 12, 1942	51.29
July 23	51.68	Oct. 17	51.90	Oct. 20	52.23
Aug. 25	52.35	Dec. 7	51.82	Jan. 18, 1943	51.40
Sept. 10	51.50	Mar. 2, 1939	51.48	July 20	52.65
Oct. 2	51.16	Aug. 16	54.06	Feb. 17, 1944	53.03
Nov. 2	50.81	Oct. 5	54.15	Feb. 13, 1945	55.85
Dec. 1	50.56	Dec. 14	53.54	Mar. 1, 1946	58.85
Jan. 4, 1938	50.30	Nov. 14, 1940	56.51	Jan. 20, 1947	63.20

(Continued on next page)

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level
Well T-50--Continued					
Mar. 11, 1947	62.53	Jan. 23, 1951	78.45	Dec. 14, 1954	104.81
Feb. 24, 1948	66.20	Jan. 21, 1952	81.39	Jan. 13, 1955	106.34
Mar. 2, 1949	71.30	Jan. 11, 1953	89.41	Jan. 16, 1956	112.36
Feb. 16, 1950	73.84	Jan. 6, 1954	96.14		
Well T-51					
Owner: W. E. Burnett, et al.					
Mar. 14, 1947	58.79	Jan. 22, 1951	74.51	Dec. 14, 1954	101.69
Feb. 24, 1948	62.45	Jan. 21, 1952	77.46	Jan. 13, 1955	100.84
Mar. 2, 1949	67.81	Jan. 9, 1953	85.75	Jan. 16, 1956	105.82
Feb. 16, 1950	70.70	Jan. 7, 1954	93.74		
Well T-67					
Owner: Carroll C. Castleberry					
Mar. 14, 1947	53.30	Feb. 16, 1950	63.75	Dec. 13, 1954	93.43
Feb. 24, 1948	56.80	Jan. 25, 1952	70.90	Jan. 13, 1955	93.43
Mar. 2, 1949	61.34	Jan. 6, 1954	86.59		
Well T-77					
Owner: J. C. Powell					
June 27, 1914	1/47.60	Oct. 17, 1938	51.62	Dec. 14, 1939	54.30
July 23, 1937	52.69	Dec. 7	51.78	Mar. 7, 1940	53.12
Jan. 8, 1938	49.45	Jan. 5, 1939	51.10	Nov. 15	55.96
Apr. 14	58.04	Aug. 16	58.05	Jan. 20, 1941	55.19
June 26	51.12	Oct. 5	61.88	Mar. 11	54.94

(Continued on next page)

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level
Well T-77--Continued					
Jan. 26, 1943	50.23	Feb. 24, 1948	66.42	Jan. 9, 1953	91.42
Feb. 17, 1944	51.90	Feb. 28, 1949	72.44	Jan. 6, 1954	101.44
Feb. 13, 1945	57.42	Feb. 16, 1950	79.80	Jan. 13, 1955	113.20
Feb. 28, 1946	56.76	Jan. 23, 1951	87.39	Jan. 16, 1956	116.39
Mar. 11, 1947	60.59	Jan. 25, 1952	82.20		
Well T-97					
Owner: M. T. Dunn					
Mar. 2, 1915	1/38	Mar. 10, 1938	37.57	Dec. 14, 1939	42.70
May 15, 1936	39.28	Apr. 14	38.08	Mar. 7, 1940	41.22
June 20	38.6	May 26	38.86	Nov. 15	44.20
Apr. 29, 1937	39.01	June 28	38.85	Jan. 20, 1941	43.67
June 9	39.16	Aug. 11	39.99	Mar. 11	42.57
July 23	38.65	Oct. 17	40.00	Nov. 24	37.50
Aug. 9	38.49	Dec. 7	39.63	Mar. 12, 1942	36.83
Oct. 2	38.21	Jan. 5, 1939	39.52	Oct. 29	38.15
Nov. 2	37.86	Mar. 2	39.30	Jan. 26, 1943	37.47
Dec. 1	37.65	Aug. 16	42.20	Jan. 13, 1955	103.49
Jan. 8, 1938	37.49	Oct. 5	42.63		
Well T-98					
Owner: J. B. Latimer					
Feb. 24, 1915	1/35	Nov. 2, 1937	32.53	June 28, 1938	34.81
Sept.10, 1937	32.60	Dec. 1	32.61	Oct. 17	35.78
Oct. 2	32.62	Apr. 14, 1938	34.92	Dec. 7	35.62

(Continued on next page)

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Well T-98--Continued

Date	Water level	Date	Water level	Date	Water level
Jan. 5, 1939	35.50	June 2, 1941	37.67	Mar. 11, 1947	45.49
Mar. 2	35.13	July 23	31.47	Feb. 26, 1948	50.45
Aug. 16	37.60	Nov. 24	32.09	July 19	59.55
Oct. 5	38.90	Mar. 12, 1942	31.12	Feb. 28, 1949	56.60
Dec. 14	37.79	Oct. 29	32.40	Feb. 16, 1950	61.46
Mar. 7, 1940	37.54	Jan. 26, 1943	31.97	Jan. 23, 1951	63.99
Nov. 15	40.23	Feb. 17, 1944	36.82	Jan. 25, 1952	64.96
Jan. 20, 1941	39.84	Feb. 13, 1945	38.88	Jan. 6, 1954	79.85
Mar. 11	39.81	Feb. 28, 1946	41.74		

Well T-99

Owner: C. D. Haston

Mar. 13, 1915	1/38	Dec. 7, 1938	41.81	Oct. 29, 1942	39.31
May 15, 1936	42.35	Jan. 5, 1939	41.76	Jan. 26, 1943	38.60
June 16	40.44	Mar. 2	41.39	Feb. 17, 1944	41.66
Mar. 17, 1937	41.62	June 19	45.79	Feb. 13, 1945	44.90
Apr. 29	41.67	Aug. 16	44.56	Feb. 28, 1946	47.74
Oct. 2	39.21	Oct. 5	45.39	Jan. 20, 1947	52.32
Dec. 1	39.01	Dec. 14	43.99	Mar. 11	51.85
Jan. 8, 1938	39.22	Mar. 7, 1940	43.65	Feb. 26, 1948	57.68
Mar. 10, 1938	39.50	Nov. 15	47.56	Feb. 28, 1949	64.24
Apr. 14	40.35	Jan. 20, 1941	46.09	Jan. 23, 1951	74.90
May 26	40.97	Mar. 11	46.03	Jan. 25, 1952	73.10
June 28	41.34	Nov. 24, 1941	37.20	Jan. 6, 1954	89.14
Oct. 17	42.21	Mar. 12, 1942	37.37		

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level

Well T-100

Owner: A. H. Schrock

Nov. 28, 1945	43.54	Feb. 16, 1950	51.95	Jan. 7, 1954	66.67
Mar. 14, 1947	46.80	Jan. 22, 1951	54.55	Jan. 13, 1955	73.63
Feb. 26, 1948	49.16	Jan. 25, 1952	57.30	Jan. 16, 1956	80.99
Mar. 3, 1949	50.98	Jan. 14, 1953	62.92		

Well U-74

Owner: E. B. Allen

Mar. 3, 1949	88.10	Jan. 13, 1953	85.90	Jan. 11, 1956	100.12
Feb. 20, 1950	78.99	Jan. 9, 1954	90.54		
Jan. 30, 1952	82.28	Jan. 13, 1955	95.41		

Well W-4

Owner: Claude Pruett

Mar. 21, 1947	64.60	Feb. 16, 1950	73.30	Jan. 13, 1953	76.79
Feb. 28, 1948	67.54	Jan. 19, 1951	72.09	Jan. 9, 1954	80.21
Mar. 7, 1949	68.75	Jan. 29, 1952	72.43		

Well W-105

Owner: R. J. Harrell. Water-level measurements prior to 1954 were made in a well 500 feet north of Well W-105.

June 16, 1937	65.12	Oct. 18, 1938	64.98	Nov. 13, 1940	65.80
July 17	65.08	Mar. 7, 1939	65.02	Jan. 21, 1941	65.57
Aug. 8	65.10	June 23	65.11	Mar. 11	65.61
Apr. 13, 1938	65.22	Dec. 17	65.27	July 25	65.39
Aug. 10	65.04	Mar. 7, 1940	65.22	Nov. 25	65.30

(Continued on next page)

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level
Well W-105--Continued					
Mar. 13, 1942	65.17	Feb. 17, 1944	64.85	Jan. 14, 1953	85.80
July 23	65.04	Mar. 5, 1946	66.68	Dec. 27, 1954	96.45
Oct. 29	65.03	Jan. 21, 1947	68.38	Jan. 12, 1956	99.53
Jan. 24, 1943	64.89				
Well X-4					
Owner: W. T. Helbert. Water-level measurements prior to 1950 were made in a well 200 feet south of Well X-4.					
Aug. 16, 1937	55.85	Aug. 16, 1939	56.36	Feb. 16, 1944	57.34
Sept.10	55.88	Oct. 6	56.45	Feb. 16, 1945	57.85
Oct. 2	55.89	Dec. 14	56.53	Mar. 1, 1946	58.67
Nov. 2	55.87	Mar. 13, 1940	56.66	Mar. 14, 1947	60.68
Dec. 1	55.83	July 10	56.87	Feb. 28, 1948	62.32
Jan. 6, 1938	55.76	Nov. 14	57.21	Mar. 7, 1949	65.64
Mar. 11	55.75	Jan. 21, 1941	57.28	Feb. 16, 1950	66.89
Apr. 12	55.73	Mar. 4	57.34	Jan. 19, 1951	69.30
June 2	55.75	July 25	57.46	Jan. 28, 1952	73.95
Aug. 11	55.75	Nov. 25	57.15	Jan. 13, 1953	78.05
Oct. 20	55.96	Mar. 13, 1942	56.87	Jan. 9, 1954	86.37
Dec. 9	56.00	July 25	56.68	Dec. 10	93.80
Mar. 3, 1939	56.05	Oct. 29	56.79	Jan. 11, 1955	93.24
July 19	56.31	Jan. 26, 1943	56.86		

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level

Well X-36

Owner: Swan Pettit

1917	3/56	July 19, 1939	54.00	Jan. 21, 1947	58.55
May 11, 1936	53.50	Oct. 6	54.03	Mar. 14	57.93
Apr. 26, 1937	55.10	Dec. 14	54.11	Feb. 28, 1948	59.86
June 7	55.74	Mar. 7, 1940	54.34	Mar. 4, 1949	61.72
July 26	53.87	Nov. 13	55.69	Feb. 16, 1950	61.86
Aug. 11	53.14	Jan. 21, 1941	55.37	Jan. 19, 1951	63.57
Jan. 6, 1938	52.56	Mar. 4	55.52	Jan. 30, 1952	63.72
Mar. 11	52.64	Nov. 25	53.13	Jan. 13, 1953	66.08
Apr. 12	52.60	Mar. 13, 1942	52.98	Jan. 8, 1954	68.50
June 28	53.38	Oct. 29	53.35	Dec. 10	71.82
Aug. 15	53.08	Jan. 24, 1943	53.21	Jan. 17, 1955	71.33
Oct. 20	53.27	Feb. 17, 1944	53.98	Jan. 12, 1956	72.26
Dec. 9	53.14	Feb. 24, 1945	55.05		
June 19, 1939	54.00	Mar. 1, 1946	57.82		

Well X-37

Owner: J. H. Sweat

Mar. 14, 1947	61.92	Feb. 16, 1950	67.96	Jan. 13, 1953	75.92
Feb. 28, 1948	64.26	Jan. 19, 1951	69.66	Jan. 8, 1954	80.28
Mar. 4, 1949	66.21	Jan. 30, 1952	70.86	Jan. 17, 1955	87.72

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level

Well X-46

Owner: H. S. Dunaway. Water-level measurements prior to Dec. 13, 1954 were made in a well 100 feet south of Well X-46.

Dec. 28, 1914	1/62	Aug. 15, 1938	61.41	Mar. 13, 1942	58.35
Apr. 16, 1934	57.36	Oct. 20	58.61	Oct. 29	58.55
May 5, 1936	60.33	Dec. 9	58.49	Jan. 26, 1943	58.20
Apr. 26, 1937	58.93	Jan. 5, 1939	58.40	Feb. 16, 1944	58.80
May 27	59.16	Mar. 3	58.28	Feb. 24, 1945	59.58
July 12	59.23	June 19	66.49	Mar. 1, 1946	62.30
Aug. 9	58.36	July 19	60.92	Jan. 20, 1947	61.77
Sept.10	58.09	Aug. 16	59.69	Mar. 14	61.53
Oct. 2	57.89	Oct. 6	60.13	Feb. 28, 1948	63.44
Nov. 2	57.73	Dec. 14	59.20	Mar. 4, 1949	65.70
Dec. 1	57.60	Mar. 7, 1940	59.04	Jan. 19, 1951	69.35
Jan. 6, 1938	57.64	Nov. 13	60.50	Jan. 28, 1952	70.44
Mar. 11	57.60	Jan. 21, 1941	60.14	Jan. 13, 1953	73.90
Apr. 12	57.65	Mar. 4	61.06	Jan. 8, 1954	81.03
June 28	58.36	Nov. 25	58.97	Dec. 13	91.25

Well X-47

Owner: Bert Jacobs

Apr. 16, 1934	52.85	July 9, 1937	53.66	Dec. 1, 1937	53.03
May 5, 1936	55.95	Aug. 24	54.50	Jan. 6, 1938	52.99
Mar. 17, 1937	53.43	Sept.10	53.47	Mar. 11	52.94
Apr. 26	54.41	Oct. 2	53.31	Apr. 12	52.97
May 27	54.35	Nov. 2	52.16	June 28	53.69

(Continued on next page)

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Well X-47--Continued

Date	Water level	Date	Water level	Date	Water level
Aug. 15, 1938	59.75	Jan. 21, 1941	55.31	Feb. 28, 1948	59.90
Oct. 20	53.88	Mar. 4	58.97	Mar. 4, 1949	61.10
Dec. 9	52.76	Nov. 25	54.40	Feb. 20, 1950	62.45
Jan. 5, 1939	53.65	Mar. 13, 1942	53.86	Jan. 19, 1951	63.05
Mar. 3	53.55	Oct. 29	54.04	Jan. 28, 1952	66.68
July 19	56.26	Jan. 26, 1943	53.71	Jan. 13, 1953	71.41
Aug. 16	54.94	Feb. 16, 1944	54.11	Jan. 8, 1954	77.82
Oct. 6	55.42	Feb. 24, 1945	54.89	Dec. 13	89.48
Dec. 14	54.46	Mar. 1, 1946	57.62	Jan. 17, 1955	86.13
Mar. 7, 1940	54.31	Jan. 20, 1947	57.57	Jan. 13, 1956	98.15
Nov. 13	55.73	Mar. 14	57.34		

Well X-87

Owner: J. Wells Kinkaid. Water-level measurements prior to 1948 were made in a well 250 feet south of Well X-87.

May 11, 1936	64.00	Nov. 13, 1940	64.17	Mar. 4, 1949	66.73
Apr. 26, 1937	64.05	Jan. 21, 1941	64.18	Feb. 19, 1950	67.38
July 26	64.01	Mar. 11	64.20	Jan. 19, 1951	68.19
June 28, 1938	63.93	July 25	64.20	Jan. 30, 1952	68.93
Aug. 11	63.90	Nov. 7	64.10	Jan. 13, 1953	69.05
June 23, 1939	63.88	Mar. 12, 1942	63.82	Jan. 8, 1954	73.58
Oct. 6	63.92	July 23	63.49	Jan. 17, 1955	78.78
Dec. 17	63.93	Oct. 29	63.62	Jan. 12, 1956	85.43
Mar. 7, 1940	64.02	Jan. 24, 1943	63.29		
July 10	64.03	Feb. 28, 1948	61.77		

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level

Well Y-9

Owner: H. M. Burch

Mar. 14, 1947	48.53	Jan. 30, 1952	66.08	Dec. 13, 1954	98.82
Feb. 28, 1948	50.27	Jan. 13, 1953	62.96	Jan. 17, 1955	94.93
Mar. 3, 1949	52.61	Jan. 8, 1954	70.65		

Well Y-81

Owner: R. & J. Wilson

Aug. 9, 1937	50.05	July 19, 1939	50.72	Feb. 13, 1945	48.67
Sept.10	50.13	Aug. 16	50.70	Mar. 1, 1946	49.71
Oct. 2	50.09	Oct. 5	50.78	Jan. 20, 1947	50.83
Nov. 2	50.07	Dec. 14	50.75	Mar. 14	50.76
Dec. 1	50.02	Mar. 7, 1940	50.86	Feb. 28, 1948	52.48
Jan. 8, 1938	50.01	Nov. 13	51.66	Mar. 3, 1949	54.38
Mar. 11	49.99	Jan. 21, 1941	51.46	Feb. 18, 1950	54.21
Apr. 13	50.03	Mar. 11	51.69	Jan. 22, 1951	58.26
June 24	50.31	July 25	50.43	Jan. 31, 1952	57.40
Aug. 11	50.37	Nov. 24	49.48	Jan. 14, 1953	61.30
Oct. 20	50.48	Mar. 12, 1942	48.94	Dec. 16, 1954	72.24
Dec. 7	50.46	Oct. 30	48.83	Jan. 17, 1955	71.91
Mar. 3, 1939	50.44	Jan. 26, 1943	48.24	Jan. 13, 1956	76.97
June 24	50.71	Feb. 16, 1944	48.02		

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level
Well Z-17					
Owner: M. E. Courtney					
Sept. 10, 1937	34.11	Aug. 16, 1939	36.77	Feb. 28, 1946	37.67
Oct. 2	33.90	Oct. 5	36.61	Jan. 20, 1947	40.70
Nov. 2	33.73	Dec. 14	35.47	Mar. 14	39.95
Dec. 1	33.40	Mar. 7, 1940	35.00	Feb. 26, 1948	42.30
Jan. 8, 1938	33.07	Nov. 13	39.30	Mar. 2, 1949	44.32
Mar. 11	32.76	Jan. 20, 1941	38.03	Feb. 16, 1950	44.60
Apr. 13	32.68	Mar. 11	37.45	Jan. 23, 1951	45.12
June 28	32.65	Nov. 24	35.49	Jan. 24, 1952	48.05
Aug. 11	32.87	Mar. 12, 1942	34.02	Jan. 14, 1953	51.58
Oct. 20	33.74	Oct. 29	33.80	Jan. 7, 1954	54.74
Dec. 7	33.94	Jan. 26, 1943	33.17	Dec. 14	57.93
Jan. 5, 1939	33.92	Feb. 17, 1944	35.70	Jan. 13, 1955	58.23
Mar. 2	33.65	Feb. 13, 1945	37.55	Jan. 16, 1956	62.30
June 19	34.42				
Well Z-73					
Owner: Floyd Reagan					
May 5, 1936	37.7	Oct. 2, 1937	39.46	June 24, 1938	39.49
May 10, 1937	44.19	Nov. 2	39.22	Aug. 11	39.52
June 3	41.18	Dec. 1	39.02	Oct. 20	39.58
July 29	40.73	Jan. 8, 1938	38.84	Dec. 7	39.57
Aug. 9	41.52	Mar. 11	38.86	Mar. 3, 1939	39.57
Sept. 10	40.02	Apr. 13	39.81	Aug. 2	43.86

(Continued on next page)

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Well Z-73--Continued

Date	Water level	Date	Water level	Date	Water level
Oct. 5, 1939	41.30	Oct. 30, 1942	38.37	Mar. 2, 1949	43.96
Nov. 21	41.14	Jan. 26, 1943	37.59	Feb. 18, 1950	44.58
Dec. 14	41.06	Feb. 8, 1944	38.39	Jan. 22, 1951	46.89
Mar. 7, 1940	40.83	Feb. 13, 1945	39.12	Jan. 31, 1952	48.48
Nov. 13	42.83	Mar. 1, 1946	40.75	Jan. 14, 1953	51.75
Jan. 21, 1941	42.80	Jan. 20, 1947	42.35	Jan. 7, 1954	56.88
Nov. 24	39.43	Mar. 11	41.98	Dec. 16	62.94
Mar. 12, 1942	37.50	Feb. 28, 1948	43.13	Jan. 17, 1955	62.31

Well BB-19

Owner: R. J. Burnett

Mar. 21, 1947	79.50	Jan. 19, 1951	90.95	Dec. 27, 1954	104.30
Feb. 23, 1948	80.95	Jan. 30, 1952	87.43	Jan. 11, 1956	109.06
Mar. 3, 1949	83.22	Jan. 13, 1953	91.70		
Feb. 18, 1950	85.71	Jan. 9, 1954	97.25		

Well BB-21

Owner: W. E. Burnett. Water-level measurements prior to 1952 were made in a well 250 feet south of well BB-21.

Mar. 11, 1947	80.66	Feb. 18, 1950	86.00	Jan. 13, 1953	95.68
Feb. 23, 1948	82.89	Jan. 19, 1951	86.52	Jan. 9, 1954	102.05
Mar. 3, 1949	84.56	Jan. 30, 1952	89.92		

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level

Well CC-21

Owner: Bowling & Lyles

Mar. 11, 1947	76.74	Jan. 19, 1951	82.24	Jan. 8, 1954	92.99
Feb. 23, 1948	78.20	Jan. 30, 1952	84.04	Dec. 27, 1954	98.00
Mar. 3, 1949	79.73	Jan. 13, 1953	87.65	Jan. 12, 1956	100.26
Feb. 19, 1950	81.25				

Well CC-120

Owner: John I. Bowling

June 15, 1938	73.99	Nov. 24, 1941	72.22	Mar. 11, 1947	75.32
Oct. 18	72.86	Mar. 13, 1942	71.48	Feb. 23, 1948	76.70
Mar. 7, 1939	71.58	Oct. 29	71.53	Mar. 3, 1949	78.23
June 23	74.11	Jan. 24, 1943	71.12	Feb. 19, 1950	79.70
Dec. 17	72.83	Feb. 17, 1944	71.37	Jan. 19, 1951	80.81
Mar. 13, 1940	72.23	Feb. 24, 1945	71.75	Jan. 30, 1952	82.49
Nov. 15	73.51	Mar. 5, 1946	75.65	Jan. 13, 1953	86.04
Jan. 21, 1941	72.65	Jan. 21, 1947	76.04	Jan. 8, 1954	91.45

Well DD-51

Owner: O. A. Sweatt. Water-level measurements prior to 1954 were made in a well 1,000 feet southwest of well DD-51.

May 9, 1936	64.0	June 23, 1939	63.94	July 23, 1942	62.76
Apr. 26, 1938	64.55	Oct. 6	63.87	Oct. 29	62.58
June 15	63.98	Dec. 17	63.86	Jan. 24, 1943	62.44
Aug. 9	63.90	Mar. 7, 1940	63.95	Feb. 16, 1944	61.79
Oct. 18	63.86	Nov. 7, 1941	63.73	Feb. 16, 1945	61.65
Mar. 7, 1939	63.88	Mar. 12, 1942	63.18	Mar. 12, 1946	61.97

(Continued on next page)

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level
Well DD-51--Continued					
Jan. 21, 1947	62.63	Mar. 3, 1949	63.81	Jan. 17, 1955	78.93
Mar. 14	62.58	Feb. 19, 1950	63.76	Jan. 12, 1956	86.53
Feb. 28, 1948	63.14	Jan. 8, 1954	72.32		

Well EE-20

Owner: A. M. Eason

May 7, 1936	55.50	Dec. 7, 1938	56.57	Feb. 16, 1944	53.82
Apr. 26, 1937	56.31	Mar. 3, 1939	56.50	Feb. 13, 1945	53.94
June 7	56.40	June 26	56.80	Mar. 2, 1946	54.88
July 19	56.24	Aug. 16	56.60	Jan. 20, 1947	55.80
Aug. 9	56.33	Oct. 5	56.86	Mar. 14	55.78
Sept.10	56.36	Dec. 14	56.73	Feb. 28, 1948	56.80
Oct. 2	56.29	Mar. 7, 1940	56.79	Mar. 3, 1949	57.57
Nov. 2	56.30	Nov. 13	57.44	Feb. 19, 1950	58.53
Dec. 1	56.26	Jan. 21, 1941	57.34	Jan. 22, 1951	60.97
Jan. 8, 1938	56.26	Mar. 11	57.34	Jan. 13, 1952	59.93
Mar. 11	56.26	July 25	55.78	Jan. 13, 1953	62.85
Apr. 13	56.30	Nov. 24	54.88	Jan. 7, 1954	67.30
June 24	56.54	Mar. 12, 1942	54.48	Jan. 13, 1955	72.04
Aug. 11	56.55	Oct. 30	54.47	Jan. 13, 1956	74.47
Oct. 20	56.60	Jan. 24, 1943	54.11		

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level
Well EE-74					
Owner: Debs McLaughlin					
Oct. 21, 1937	60.37	Mar. 12, 1942	58.72	Jan. 22, 1951	65.56
June 16, 1938	60.73	Jan. 24, 1943	57.72	Jan. 30, 1952	68.09
Oct. 18	60.88	Feb. 16, 1945	58.85	Jan. 13, 1953	71.42
Mar. 7, 1939	60.36	Mar. 1, 1946	59.82	Jan. 7, 1954	77.06
July 19	60.48	Mar. 14, 1947	61.24	Dec. 23	84.24
Oct. 5	60.61	Feb. 28, 1948	62.62	Jan. 13, 1955	83.95
Nov. 13, 1940	61.79	Mar. 3, 1949	63.86	Jan. 13, 1956	87.54
Nov. 24, 1941	59.18	Feb. 19, 1950	64.95		
Well EE-76					
Owner: J. W. Heard. Water-level measurements prior to 1952 were made in a well 300 feet east of Well EE-76.					
May 7, 1936	59.33	Mar. 7, 1940	58.00	Mar. 1, 1946	57.15
June 7, 1937	58.15	Nov. 13	59.14	Mar. 14, 1947	58.55
July 14	58.63	Jan. 21, 1941	58.88	Feb. 28, 1948	60.14
Sept.15	57.88	Mar. 11	58.85	Mar. 3, 1949	61.23
June 28, 1938	57.82	Nov. 24	56.50	Feb. 19, 1950	66.24
Oct. 20	57.81	Mar. 12, 1942	56.02	Jan. 30, 1952	65.87
Mar. 3, 1939	57.64	Oct. 30	55.82	Jan. 13, 1953	67.07
July 19	57.96	Jan. 24, 1943	55.33	Jan. 7, 1954	73.73
Oct. 5	58.05	Feb. 16, 1944	55.27	Dec. 23	83.00
Dec. 14	57.90	Feb. 16, 1945	56.15	Jan. 13, 1955	81.71

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level

Well FF-3

Owner: J. A. Line

Feb. 28, 1948	47.33	Jan. 22, 1951	50.95	Jan. 7, 1954	59.82
Mar. 2, 1949	48.96	Jan. 31, 1952	52.35	Jan. 3, 1955	65.03
Feb. 18, 1950	49.22	Jan. 13, 1953	55.46	Jan. 13, 1956	68.14

Well FF-55

Owner: C. J. Barnard

Jan. 12, 1939	51.87	Jan. 22, 1951	69.48	Jan. 7, 1954	75.87
Mar. 2, 1949	60.19	Jan. 31, 1952	68.79	Jan. 3, 1955	84.14
Feb. 18, 1950	67.78	Jan. 13, 1953	72.61	Jan. 13, 1956	88.45

Well FF-159

Owner: M. Carr

Mar. 2, 1949	72.43	Jan. 31, 1952	78.00	Jan. 7, 1954	84.98
Feb. 19, 1950	82.78	Jan. 13, 1953	81.68	Jan. 3, 1955	95.88
Jan. 22, 1951	87.09				

Well HH-1

Owner: B. R. McWhorter

July 27, 1937	94.56	Jan. 29, 1940	92.36	Mar. 11, 1947	92.12
Aug. 15, 1938	94.19	Mar. 13	92.57	Feb. 23, 1948	93.77
Dec. 22	93.04	Mar. 11, 1941	93.11	Mar. 3, 1949	96.37
June 16, 1939	92.58	Feb. 17, 1944	91.15	Jan. 13, 1955	120.63
Aug. 16	92.50	Jan. 21, 1947	92.37	Jan. 11, 1956	122.12

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level

Well JJ-40

Owner: Ercelle Givens

July 27, 1937	95.95	Jan. 22, 1941	96.03	Feb. 19, 1950	98.72
June 15, 1938	95.89	Mar. 11	96.05	Jan. 30, 1952	99.44
Oct. 18	95.83	Nov. 25	95.20	Jan. 14, 1953	101.00
Mar. 7, 1939	95.81	Oct. 30, 1942	95.32	Jan. 8, 1954	106.64
Dec. 17	95.67	Feb. 23, 1948	96.52	Jan. 13, 1955	110.75
Mar. 13, 1940	95.78	Mar. 8, 1949	97.10	Jan. 12, 1956	116.00

Well JJ-97

Owner: Owen Benn. Water-level measurements prior to 1954 were made in a well 300 feet southwest of Well JJ-97.

July 27, 1937	117.82	Jan. 24, 1943	115.20	Sept. 30, 1949	120.55
Aug. 11	117.80	Feb. 17, 1944	115.72	Oct. 31	120.63
June 15, 1938	117.91	Feb. 24, 1945	115.65	Nov. 30	120.64
Sept. 23	117.90	Mar. 2, 1946	116.25	Dec. 31	120.78
Mar. 7, 1939	117.79	Jan. 21, 1947	117.30	Feb. 3, 1950	120.86
June 23	117.86	Mar. 11	117.23	Feb. 28	121.06
Oct. 6	118.01	Feb. 23, 1948	118.20	Apr. 7	121.16
Dec. 17	117.79	Nov. 30	119.41	Apr. 20	121.54
Mar. 13, 1940	117.82	Feb. 28, 1949	119.67	May 1	121.32
Jan. 22, 1941	118.16	Mar. 31	119.82	June 1	121.57
Mar. 11	118.39	Apr. 29	119.82	June 30	121.82
Nov. 7	117.74	May 31	120.00	Aug. 7	122.12
Mar. 13, 1942	117.30	Aug. 1	120.13	Sept. 1	122.10
Oct. 30	116.95	Aug. 31	120.61	Oct. 16	122.62

(Continued on next page)

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Well JJ-97--Continued

Date	Water level	Date	Water level	Date	Water level
Nov. 10, 1950	122.70	May 1, 1951	124.79	Dec. 3, 1951	125.63
Dec. 4	122.75	June 9	125.06	Jan. 7, 1952	125.50
Jan. 4, 1951	122.96	July 2	125.00	Jan. 30	125.50
Jan. 19	122.98	Aug. 2	125.80	Jan. 14, 1953	128.45
Feb. 6	123.22	Sept.10	124.52	Jan. 8, 1954	135.69
Mar. 1	123.28	Oct. 2	125.86	Jan. 13, 1955	141.38
Apr. 3	123.72	Nov. 6	125.64	Jan. 12, 1956	148.63

Well KK-54

Owner: W. F. Buske

Mar. 3, 1949	92.77	Jan. 13, 1953	102.62	Jan. 3, 1955	114.63
Jan. 22, 1951	107.10	Jan. 7, 1954	108.10	Jan. 12, 1956	115.84
Jan. 30, 1952	97.69				

Well LL-45

Owner: L. Ragland. Water-level measurements prior to 1948 were made in a well 200 feet east of Well LL-45.

Sept.15, 1937	75.2	Mar. 12, 1942	73.57	Feb. 28, 1948	80.12
June 16, 1938	76.23	Oct. 30	72.69	Mar. 2, 1949	83.08
Mar. 7, 1939	75.80	Jan. 24, 1943	72.25	Feb. 18, 1950	87.22
June 23	76.33	Feb. 16, 1944	72.50	Jan. 30, 1952	89.99
Oct. 6	76.62	Feb. 16, 1945	73.62	Jan. 13, 1953	94.31
Nov. 29, 1940	77.16	Mar. 2, 1946	76.16	Jan. 7, 1954	98.43
Jan. 25, 1941	77.00	Jan. 20, 1947	78.13	Jan. 3, 1955	105.21
Nov. 7	74.24	Mar. 11	77.96	Jan. 13, 1956	110.25

See footnotes at end of table.

Table 5.--Water levels in selected wells in Hale County--Continued

Date	Water level	Date	Water level	Date	Water level
Well MM-61					
Owner: N. S. Willis					
Mar. 11, 1947	67.69	Jan. 22, 1951	85.03	Jan. 3, 1955	94.53
Feb. 28, 1948	70.49	Jan. 31, 1952	82.94	Jan. 13, 1956	101.42
Mar. 2, 1949	75.19	Jan. 13, 1953	85.74		
Well MM-81					
Owner: J. J. Hegi					
Mar. 11, 1947	70.11	Jan. 31, 1952	84.65	Jan. 3, 1955	105.09
Feb. 28, 1948	72.38	Jan. 13, 1953	88.95	Jan. 13, 1956	107.95
Mar. 3, 1949	75.44	Jan. 7, 1954	94.61		
Well MM-120					
Owner: Joe S. Jackson					
Aug. 3, 1937	80.00	Jan. 31, 1952	94.50	Jan. 7, 1954	104.89
Mar. 22, 1949	86.66	July 24	104.10	Jan. 3, 1955	113.17
Feb. 18, 1950	88.96	Jan. 13, 1953	97.50	Jan. 19, 1956	120.00
Jan. 19, 1951	91.83				

1/ Reported by owner or driller.
2/ Reported by Baker, 1915.
3/ Data from records of Texas Land & Development Co.
4/ Reported in Plainview newspaper, 1910.
5/ Tape measurement.
6/ Monthly highest water level from recorder graph.

Table 6.--Analyses of water from selected wells in Hale County, Texas

(Analyses given are in parts per million except specific conductance, pH, and percent sodium)

Well	Owner	Depth of well (ft.)	Date of collection	Silica (SiO_2)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Phosphate (PO_4)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Percent sodium	Specific conductance (micromhos at 25°C)	pH
A-61	E. D. Smith	95	Oct. 11, 1937	-	-	-	-	-	-	281	29	27	-	a	-	-	313	-	-	-	-
B-39	Pete Workman	202	Apr. 9, 1946	-	-	-	51	39	14	310	34	20	-	0.0	-	-	391	288	9.3	-	-
B-46	Joe Ashburn	240	do	-	-	-	48	31	37	336	26	18	-	.8	-	-	395	248	25	-	-
C-13	E. B. Tunnell Estate	200	do	-	-	-	50	35	23	330	26	16	-	.0	-	-	363	269	16	-	-
D-15	Mrs. J. W. Ray	70	Oct. 28, 1937	-	-	-	-	-	-	275	84	84	-	15	-	-	495	-	-	-	-
D-50	-- Hefflefinger	56	do	-	-	-	-	-	-	299	29	17	-	2.5	-	-	317	-	-	-	-
D-52	W. M. Toliver	227	Sept.13, 1937	-	-	-	66	35	19	329	39	25	-	a	-	-	346	305	-	-	-
D-54	C. E. Carter	232	Apr. 8, 1946	-	-	-	46	35	32	332	30	18	-	.0	-	-	398	259	21	-	-
E-44	R. M. Morris	271	Dec. 3, 1937	-	-	-	62	26	31	329	29	20	2.4	a	-	-	330	261	-	-	-
E-66	Carrie Bonner	200	Apr. 6, 1946	-	-	-	60	41	9.7	338	34	18	-	.5	-	-	396	318	6.2	-	-
E-75	Liberty School	-	Dec. 7, 1937	-	-	-	70	42	15	366	47	20	-	2.0	-	-	376	346	-	-	-
F-30	E. F. Readhimer	202	Apr. 10, 1946	-	-	-	42	41	27	326	30	24	0	.0	-	-	403	274	18	-	-
F-88	Paul Williams	-	Dec. 7, 1937	-	-	-	-	-	-	392	43	68	-	a	-	-	437	-	-	-	-
F-89	Prairie View School	-	Dec. 6, 1937	-	-	-	57	41	20	293	57	39	-	a	-	-	358	310	-	-	-
G-20	S. N. Reed	208	Apr. 9, 1946	-	-	-	51	31	18	302	22	16	-	1.5	-	-	360	255	-	-	-
G-69	C. M. Wilson	180	Oct. 18, 1937	-	-	-	-	-	-	232	36	18	-	a	-	-	269	-	-	-	-
G-97	Margaret Folks	83	Nov. 20, 1937	-	-	-	-	-	-	323	50	45	-	a	-	-	406	-	-	-	-
G-98	J. A. Johnson	84	Nov. 6, 1937	-	-	-	-	-	-	317	46	49	-	9	-	-	402	-	-	-	-
G-99	Westside School	50	Dec. 7, 1937	-	-	-	58	43	4	262	54	42	-	a	-	-	330	322	-	-	-
G-100	W. L. Hurt	61	Nov. 6, 1937	-	-	-	72	63	36	305	146	78	-	24	-	-	575	454	-	-	-
H-1	Mrs. E. F. Witten	210	Apr. 9, 1946	-	-	-	46	35	22	316	24	16	-	1.0	-	-	361	259	16	-	-
H-57	C. C. Taylor	200	June 22, 1955	59	0.20	0.00	48	32	19 7.7	307	21	16	2.6	4.3	0.0	-	366	252	14	550	7.7

See footnotes at end of table.

Table 6.--Analyses of water from selected wells in Hale County--Continued

Well	Owner	Depth of well (ft.)	Date of collection	Silica (SiO_2)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Phosphate (PO_4)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Percent sodium	Specific conductance (micromhos at 25°C)	pH
H-82	Frank Kanady	210	Apr. 3, 1946	-	-	-	53	39	11	305	28	24	-	3.0	-	-	402	293	7.2	-	-
H-103	Halfway School	87	Dec. 3, 1937	-	-	-	69	29	22	329	32	26	-	a	-	-	340	293	-	-	-
J-89	Running Water School	-	Nov. 30, 1937	-	-	-	54	27	103	415	61	46	2.8	a	-	-	497	247	-	-	-
J-90	Laura C. James	69	Dec. 1, 1937	-	-	-	70	58	18	218	36	125	-	8.6	-	-	454	411	-	-	-
J-91	G. E. Edwards	-	Dec. 3, 1937	-	-	-	-	-	-	305	72	58	-	a	-	-	443	-	-	-	-
K-49	F. N. Joachim	230	Apr. 5, 1946	-	-	-	52	41	28	366	26	22	-	.2	-	-	414	298	17	-	-
K-65	E. M. Carter, Jr.	240	Apr. 4, 1946	-	-	-	46	38	32	330	34	24	-	0	-	-	392	271	20	-	-
K-103	E. H. Kirchoff	170	Dec. 1, 1945	-	-	-	48	35	20	321	17	18	-	1.5	-	-	362	264	14	-	-
K-109	R. B. Walker	-	Dec. 7, 1937	-	-	-	-	-	-	342	79	57	-	a	-	-	481	-	-	-	-
L-82	City of Plainview	301	Feb. 28, 1945	60	0	-	44	37	28 8.5	329	28	18	3.6	1.2	-	-	379	262	18	594	7.4
L-86	do	305	Nov. 13, 1951	60	0	.00	38	34	45 4.0	335	26	22	2.8	2.5	.00	-	394	235	29	622	7.8
L-86	do	305	June 10, 1952	68	0.01	0.00	40	36	43 1.6	328	29	22	2.8	3.0	0.00	0.11	399	248	27	655	7.7
L-86	do	305	June 11, 1954	-	-	-	-	-	-	334	-	27	-	-	-	-	-	-	-	639	8.1
M-60	W. E. Brown et al	255	Dec. 1, 1937	-	-	-	49	29	51	354	30	23	-	a	-	-	356	243	-	-	-
M-122	R. J. Parks	50	Oct. 26, 1937	-	-	-	-	-	-	354	37	31	-	8.8	-	-	402	-	-	-	-
M-123	Louis B. Clements	64	Oct. 22, 1937	-	-	-	46	37	5	281	12	11	-	26	-	-	275	268	-	-	-
M-124	F. W. Wehrheim	46	Oct. 20, 1937	-	-	-	-	-	-	329	59	52	-	a	-	-	435	-	-	-	-
M-125	H. M. La Font	65	Oct. 22, 1937	-	-	-	62	60	40	262	84	112	-	33	-	-	520	401	-	-	-
M-126	L. E. Mayfield	-	Nov. 12, 1937	-	-	-	54	45	33	342	54	34	-	6.5	-	-	395	318	-	-	-
M-127	H. E. Graham	-	Oct. 20, 1937	-	-	-	-	-	-	281	55	92	-	14	-	-	470	-	-	-	-
M-128	East Mound School	49	Dec. 6, 1937	-	-	-	63	44	25	275	43	86	-	a	-	-	396	337	-	-	-
N-73	Otto Steinberg	238	Apr. 3, 1946	-	-	-	45	41	13	312	21	17	-	7.8	-	-	344	281	9.1	-	-
N-91	Sunshine School	68	Dec. 7, 1937	-	-	-	64	49	-	378	32	10	-	a	-	-	341	360	-	-	-

See footnotes at end of table.

Table 6.--Analyses of water from selected wells in Hale County--Continued

Well	Owner	Depth of well (ft.)	Date of collection	Silica (SiO_2)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Phosphate (PO_4)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Percent sodium	Specific conductance (micromhos at 25°C)	pH
N-92	Bill Moody Estate	45	Dec. 7, 1937	-	-	-	-	-	-	360	30	15	-	a	-	-	359	-	-	-	-
P-13	Davis Cannon	204	Aug. 12, 1937	-	-	-	44	47	11	317	36	22	-	a	-	-	316	304	-	-	-
P-76	J. C. Kerr	190	Mar. 20, 1946	-	-	-	32	41	27	318	21	17	-	.8	-	-	335	248	19	-	-
P-98	E. A. Howard	60	Aug. 12, 1937	-	-	-	-	-	-	372	85	58	-	16	-	-	538	-	-	-	-
P-99	O. L. Fleming	78	Aug. 16, 1937	-	-	-	-	-	-	323	55	40	-	a	-	-	405	-	-	-	-
P-100	Mayfield School	81	Aug. 12, 1937	-	-	-	40	50	8	311	43	17	-	a	-	-	311	306	-	-	-
Q-95	S. L. Quisenberry	200	Mar. 20, 1946	-	-	-	45	39	12	299	30	16	-	0.8	-	-	368	273	8.7	-	-
R-115	Less & Floyd Tiffin	-	May 12, 1936	-	-	-	-	-	-	305	43	168	-	a	-	-	574	-	-	-	-
R-116	Mrs. Emma Cotton	-	Apr. 24, 1937	-	-	-	-	-	-	268	57	36	-	a	-	-	357	-	-	-	-
S-35	S. C. Horan	209	Nov. 26, 1945	-	-	-	49	36	21	321	26	18	-	.8	-	-	353	270	15	-	-
S-39	K. P. Chester	229	Nov. 28, 1945	-	-	-	48	41	20	325	28	26	-	.8	-	-	374	288	13	-	-
S-121	Castleberry & Clanton	59	Oct. 27, 1937	-	-	-	-	-	-	305	37	40	-	a	-	-	365	-	-	-	-
S-122	T. S. Branham	76	Dec. 8, 1937	-	-	-	-	-	-	-	64	56	-	7.5	-	-	-	-	-	-	-
T-110	R. W. Burchardt	-	Dec. 7, 1937	-	-	-	-	-	-	329	28	17	-	a	-	-	335	-	-	-	-
T-111	Bellview School	51	Nov. 13, 1937	-	-	-	69	44	21	360	54	33	-	a	-	-	398	352	-	-	-
T-112	Clarence Stalcup	-	Dec. 7, 1937	-	-	-	-	-	-	323	43	50	-	a	-	-	404	-	-	-	-
U-9	Tony Chisum Estate	322	Apr. 3, 1946	-	-	-	34	47	41	334	50	30	-	30	-	-	422	278	24	-	-
U-12	J. L. Mann, Jr.	200	Mar. 21, 1946	-	-	-	33	54	30	370	50	20	-	3.2	-	-	408	304	18	-	-
U-40	John Schoonvelt	200	Aug. 10, 1937	-	-	-	39	48	39	305	82	30	-	3.8	-	-	392	295	-	-	-
U-70	Lida Jones	300	Nov. 19, 1955	55	-	-	50	36	21 8.1	280	34	36	1.2	8.0	-	0.12	386	273	14	607	7.8
U-86	Haislip & Hardt	-	Aug. 11, 1937	-	-	-	70	69	59	275	253	44	-	44	-	-	674	457	-	-	-
V-14	J. D. Ivey	216	Mar. 21, 1946	-	-	-	37	44	15	302	30	20	-	.0	-	-	352	274	11	-	-

See footnotes at end of table.

Table 6.--Analyses of water from selected wells in Hale County--Continued

Well	Owner	Depth of well (ft.)	Date of collection	Silica (SiO_2)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Phosphate (PO_4)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Percent sodium	Specific conductance (micromhos at 25°C)	pH
V-115	Roberta Miller	204	Mar. 29, 1946	-	-	-	46	51	5.3	342	22	22	-	1.0	-	-	386	324	3.4	-	-
V-116	Center Plains School	-	Dec. 7, 1937	-	-	-	60	49	39	354	72	50	-	a	-	-	444	350	-	-	-
V-117	M. K. Fisher	200	Aug. 12, 1937	-	-	-	58	48	6	323	59	23	-	a	-	-	353	345	-	-	-
W-4	Claude Pruett	200	Mar. 20, 1946	-	-	-	39	52	4.4	326	24	20	-	0.0	-	-	368	312	3.0	-	-
W-51	Boyd Elliott	210	Mar. 25, 1946	-	-	-	32	37	24	294	18	16	-	.5	-	-	322	232	18	-	-
W-99	B. E. Wimberly	283	Dec. 8, 1955	50	-	-	40	38	19 12	330	17	7.0	4.0	2.6	-	0.22	332	256	13	550	7.7
W-112	City of Hale Center	123	Mar. 3, 1945	54	0.02	-	50	52	21 8.3	349	43	35	4.4	5.2	-	-	439	339	11	702	7.6
X-98	J. H. Hooker	100	Oct. 9, 1937	-	-	-	-	-	-	372	93	28	-	a	-	-	481	-	-	-	-
X-99	E. P. Phillips	56	do	-	-	-	-	-	-	317	82	33	-	a	-	-	428	-	-	-	-
X-100	Arthur Ford	70	do	-	-	-	-	-	-	299	47	34	-	a	-	-	365	-	-	-	-
Y-49	S. J. Young	133	Nov. 29, 1945	-	-	-	52	41	19	331	19	20	-	1.2	-	-	375	298	12	-	-
Y-99	A. K. Price	70	do	-	-	-	60	56	62	281	108	114	-	11	-	-	549	379	-	-	-
Y-100	Chas. Wendt	-	Dec. 8, 1937	-	-	-	-	-	-	317	82	138	-	a	-	-	592	-	-	-	-
Z-82	Paul Schur	146	June 27, 1955	60	.00	0.00	46	37	37 11	340	31	31	3.2	1.8	0.1	-	406	267	22	671	7.7
Z-121	Mrs. F. C. DeBaca	-	Dec. 8, 1937	-	-	-	56	34	31	342	32	24	-	a	-	-	345	281	-	-	-
Z-122	Frank Beard	-	do	-	-	-	37	44	58	317	57	56	-	a	-	-	408	272	-	-	-
*AA-16	B. R. McWhorter	278	July 27, 1937	-	-	-	-	-	-	287	32	33	-	8.0	-	-	332	-	-	-	-
AA-82	Mrs. Ethel Thompson	230	Aug. 10, 1937	-	-	-	64	41	33	311	85	42	-	a	-	-	418	330	-	-	-
AA-83	Clara Barton	220	July 28, 1937	-	-	-	-	-	-	268	51	20	-	a	-	-	323	-	-	-	-
BB-14	W. J. Walker	220	Aug. 10, 1937	-	-	-	-	-	-	311	70	40	-	a	-	-	417	-	-	-	-
BB-91	Mrs. E. M. Thompson	235	do	-	-	-	28	31	26	232	39	18	-	a	-	-	256	199	-	-	-
BB-104	K. L. Riggs	300	Nov. 29, 1945	-	-	-	47	37	13	298	15	25	-	3.2	-	-	345	270	9.7	-	-

See footnotes at end of table.

Table 6.--Analyses of water from selected wells in Hale County--Continued

Well	Owner	Depth of well (ft.)	Date of collection	Silica (SiO_2)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Phosphate (PO_4)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Percent sodium	Specific conductance (micromhos at 25°C)	pH
BB-113	Cotton Center School	-	Dec. 7, 1937	-	-	-	58	41	14	305	50	32	-	a	-	-	345	316	-	-	-
BB-114	Wiley Bogart	85	July 28, 1937	-	-	-	-	-	-	232	51	45	-	a	-	-	333	-	-	-	-
CC-1	C. E. Newson	300	Nov. 26, 1945	-	-	-	46	45	23	367	30	12	-	1.2	-	-	426	300	14	-	-
CC-120	John I. Bowling	218	Aug. 10, 1937	-	-	-	-	-	-	323	47	17	-	a	-	-	358	-	-	-	-
CC-121	Iowa Avenue School	84	Dec. 8, 1937	-	-	-	54	39	38	354	43	30	-	a	-	-	378	294	-	-	-
CC-122	J. R. Harral	92	July 29, 1937	-	-	-	80	40	37	348	78	56	-	15	-	-	462	365	-	-	-
EE-104	J. W. Barrett	-	Dec. 8, 1937	-	-	-	-	-	-	329	139	73	-	4.5	-	-	588	-	-	-	-
FF-48	Effie Whiteside	379	Nov. 30, 1945	-	-	-	36	43	26	329	24	20	-	.5	-	-	354	267	18	-	-
FF-160	J. A. Line	-	Dec. 8, 1937	-	-	-	38	41	50	354	43	28	-	a	-	-	374	-	-	-	-
FF-161	H. M. McElroy	71	do	-	-	-	76	49	35	342	89	66	-	a	-	-	483	390	-	-	-
GG-99	Lee Irish	-	July 26, 1937	-	-	-	-	-	-	329	82	56	-	a	-	-	474	-	-	-	-
GG-100	G. W. Blackman	320	do	-	-	-	71	44	154	268	183	200	-	a	-	-	784	357	-	-	-
HH-120	Elbert Brown	92	July 28, 1937	-	-	-	-	-	-	293	59	39	-	a	-	-	384	-	-	-	-
JJ-64	Southwestern Public Service Co.	182	Aug. 2, 1937	-	-	-	-	-	-	287	59	38	-	a	-	-	378	-	-	-	-
JJ-65	do	267	do	-	-	-	-	-	-	232	51	30	-	a	-	-	309	-	-	-	-
JJ-123	Leo Konesko	140	July 26, 1937	-	-	-	-	-	-	305	51	42	-	-	-	-	388	-	-	-	-
JJ-124	City of Abernathy well 1	200±	Nov. 14, 1944	36	0.02	-	49	33	20 10	297	20	28	2.0	5.0	-	-	352	258	14	589	-
JJ-125	City of Abernathy well 2	226	Nov. 16, 1945	37	.04	-	49	33	23 10	301	21	30	2.2	4.0	-	-	357	258	15	667	7.2
JJ-126	J. H. Nunn	95	Nov. 5, 1937	-	-	-	45	52	33	244	81	82	-	a	-	-	413	327	-	-	-
JJ-127	M. H. Clark	110+	July 27, 1937	-	-	-	-	-	-	305	51	30	-	2.5	-	-	369	-	-	-	-
*KK-25	J. A. Lutrick	300	Oct. 18, 1937	-	-	-	-	-	-	311	47	17	-	a	-	-	348	-	-	-	-

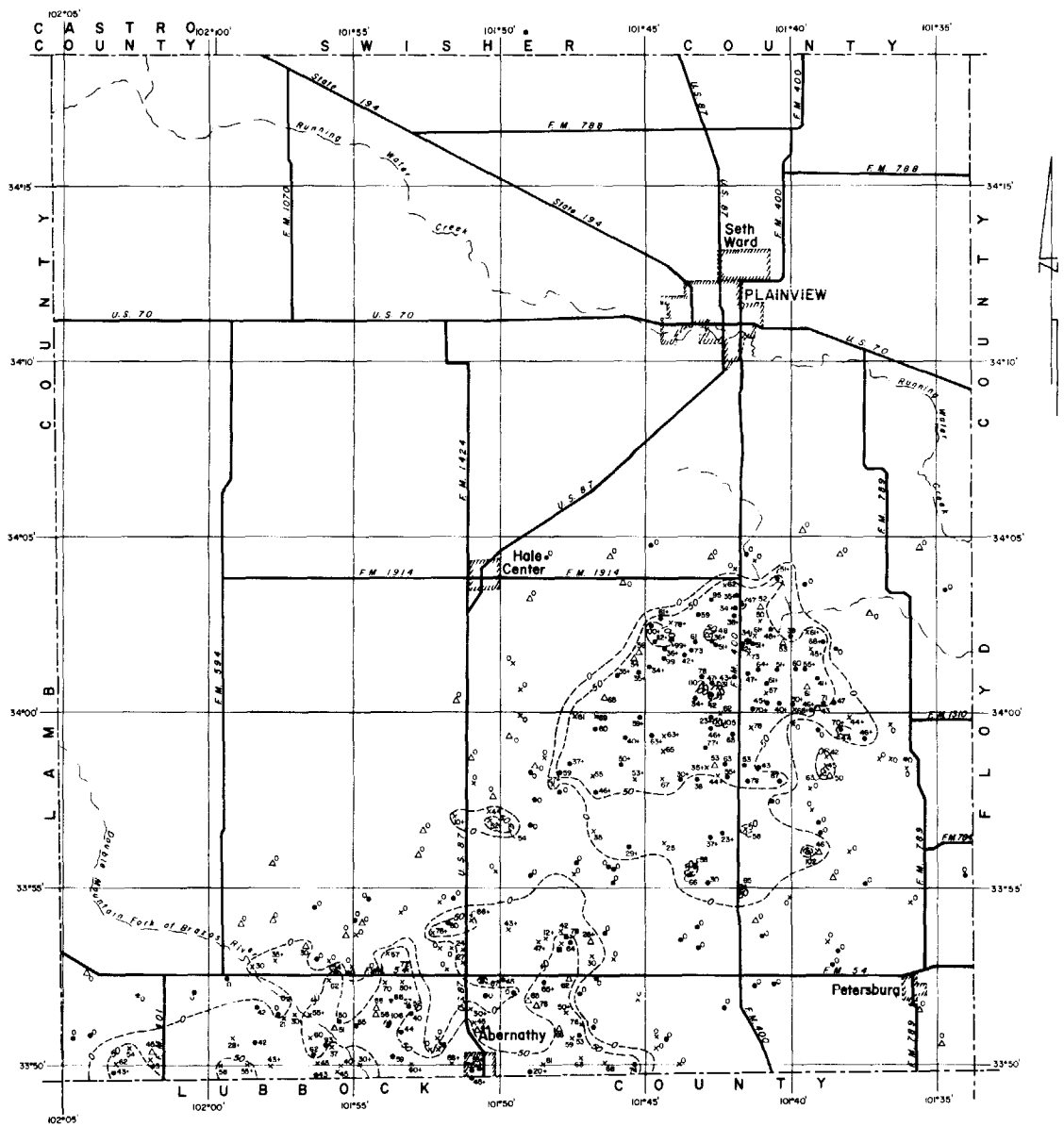
See footnotes at end of table.

Table 6.--Analyses of water from selected wells in Hale County--Continued

Well	Owner	Depth of well (ft.)	Date of collection	Silica (SiO_2)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Phosposte (PO_4)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Percent sodium	Specific conductance (micromhos at 25°C)	pH
KK-45	T. E. Lutrick	200	Aug. 2, 1937	-	-	-	-	-	-	281	71	26	-	15	-	-	371	-	-	-	-
KK-115	-- Struve	465	July 23, 1937	-	-	-	-	-	-	-	59	25	-	-	-	-	-	-	-	-	-
LL-54	L. L. Wienke	200	Aug. 2, 1937	-	-	-	38	39	76	342	59	56	-	a	-	-	436	254	-	-	-
LL-55	O. D. Rhodes	300+	Dec. 7, 1955	48	-	-	44	37	50 11	324	49	27	2.8	.9	-	0.22	402	262	24	647	7.8
LL-77	John V. Porterfield	220	Dec. 6, 1945	-	-	-	49	45	31	356	40	26	-	5.7	-	-	448	308	18	-	-
LL-103	W. A. Waters	211	July 23, 1937	-	-	-	56	33	46	354	55	20	-	a	-	-	384	275	-	-	-
LL-106	W. A. Mahagan	224	do	-	-	-	-	-	-	372	55	20	-	a	-	-	414	-	-	-	-
MM-50	W. F. Finkner	240±	Nov. 30, 1945	-	-	-	42	36	47	347	36	23	-	.8	-	-	409	253	29	-	-
MM-52	W. F. Finkner	200±	do	-	-	-	39	36	41	330	32	21	-	1.2	-	-	384	246	27	-	-
MM-77	M. P. Mahogan	223	July 23, 1937	-	-	-	-	-	-	329	51	20	-	-	-	-	373	-	-	-	-
MM-120	Joe S. Jackson	402	Aug. 3, 1937	-	-	-	36	34	64	354	51	20	-	15	-	-	379	231	-	-	-
MM-137	J. W. Allen	200	Aug. 2, 1937	-	-	-	-	-	-	329	63	28	-	a	-	-	403	-	-	-	-
MM-159	W. D. Scarborough	180	Aug. 3, 1937	-	-	-	-	-	-	293	118	25	-	2.5	-	-	446	-	-	-	-
MM-160	A. K. Hulburt	230	Dec. 4, 1945	-	-	-	42	34	50	350	35	21	-	.5	-	-	413	245	31	-	-
MM-163	City of Petersburg	222	Nov. 30, 1945	42	0.06	-	36	40	34 11	334	34	17	3.6	1.2	-	-	373	254	21	629	8.2

Analyses dated before 1941 were made under the direction of E. P. Schoch, Bureau of Industrial Chemistry of the University of Texas, and E. W. Lohr, Quality of Water Branch, United States Geological Survey.

* Water sample from well at about same location as present well.
a Nitrate less than 20 parts per million.



EXPLANATION

△

Log published in report

•

Log not published in report

x

Approximate location, log not published

35+

Number indicates thickness, in feet. Plus sign indicates thickness is greater than number shown

~50~

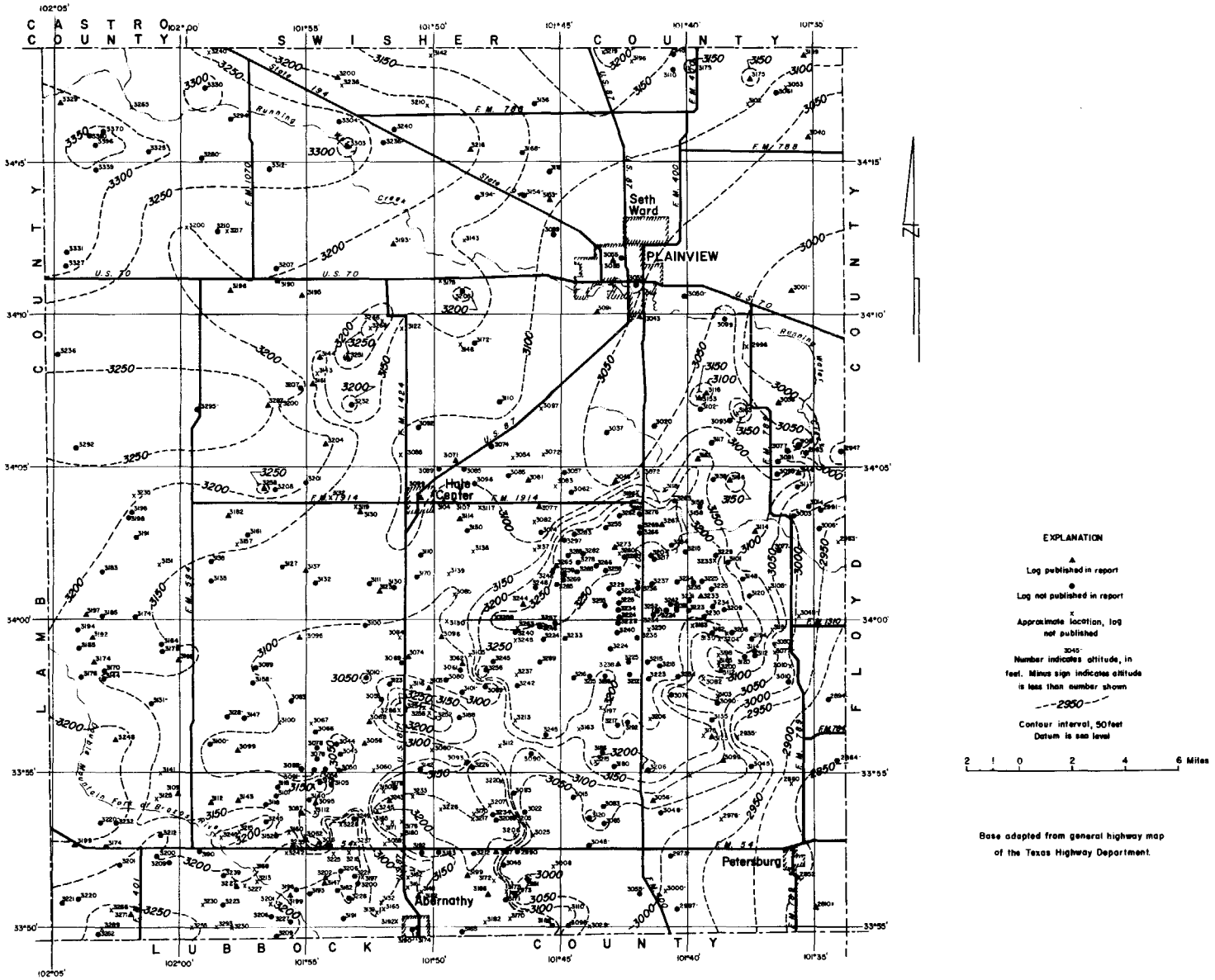
Contour showing approximate thickness of Cretaceous rocks

Contour interval 50 feet

2 1 0 2 4 6 Miles

Base adapted from general highway map of the Texas Highway Department.

APPROXIMATE THICKNESS OF CRETACEOUS ROCKS, HALE COUNTY, TEXAS



APPROXIMATE ALTITUDE OF THE BASE OF THE OGALLALA FORMATION, HALE COUNTY, TEXAS