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**UNITED STATES DEPARTMENT OF THE INTERIOR**

**WATER LEVELS AND ARTESIAN  
PRESSURE IN OBSERVATION  
WELLS IN THE UNITED STATES  
IN 1939**

**GEOLOGICAL SURVEY WATER-SUPPLY PAPER 886**

UNITED STATES DEPARTMENT OF THE INTERIOR  
Harold L. Ickes, Secretary  
GEOLOGICAL SURVEY  
W. C. Mendenhall, Director

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Water-Supply Paper 886

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WATER LEVELS AND ARTESIAN PRESSURE  
IN OBSERVATION WELLS IN THE  
UNITED STATES IN 1939

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BY  
O. E. MEINZER, L. K. WENZEL  
and others



UNITED STATES  
GOVERNMENT PRINTING OFFICE  
WASHINGTON : 1940



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# WATER LEVELS AND ARTESIAN PRESSURE IN OBSERVATION WELLS IN THE UNITED STATES IN 1939

## INTRODUCTION

By O. E. Meinzer and L. K. Wenzel

The rock formations of the earth are great natural underground reservoirs in which a part of the water derived from rain and snow is stored to supply wells and springs and to maintain the flow of streams during periods of fair weather. Water levels in wells register the stages of these natural reservoirs; they show the extent to which water supplies are depleted by drought or by heavy pumping for public waterworks, for irrigation, or for industrial uses and the extent to which they are replenished in seasons of abundant rainfall or melting snow. The changes in pressure recorded on flowing wells may indicate depletion or replenishment of the artesian reservoirs.

The present report is the fifth of an annual series on ground-water levels and artesian pressures, the first, second, third, and fourth of which were published as Water-Supply Papers 777, 817, 840, and 845, respectively. This series of reports is in a sense an inventory, year by year, of the water supplies of those parts of the country that it covers. The present report gives records of water level or artesian pressure in about 5,500 observation wells in 35 States and the Territory of Hawaii that were obtained by the Geological Survey and cooperating Federal, State, Territorial, county, and local agencies. About 265 of these wells are equipped with automatic water-stage recorders. The complete records of water levels in some wells not heretofore published are given in this report, including those for years before 1939. For the most part, however, this volume gives current records on wells whose previous records have been published in Water-Supply Papers 777, 817, 840, and 845, and it includes about 67,000 individual measurements of water level or artesian pressure made in 1939. If complete descriptions of the wells were given in one of the previous reports of this series, the well numbers only or the well numbers and brief identifying descriptions are given in this report.

In most States for which records are given in this report the observation wells are not systematically distributed in accordance with a State-wide program but are the wells used in specific investigations of certain areas, chiefly areas of heavy pumping. In Indiana, Nebraska, New Jersey, North Dakota, Pennsylvania, Texas, and Utah systematic State-wide programs are being carried on, although some parts of these States have very few observation wells.

The water levels in this report are given with reference to datum planes of different kinds. Some are given in depths below the measuring point--that is, below the recognized reference mark, at or near the top of the well, from which the depth to water level is usually measured; some are given with reference to sea level; and some are given in height above an assumed datum plane. As the measuring points on some of the wells were changed in 1939, the records may not be directly comparable with those in the previous annual volumes; but changes in measuring points are recorded in this report. Water levels given in heights above sea level or above assumed datum planes are generally comparable with those given in the previous volumes. Unless otherwise stated, the depth of wells is usually the measured depth below the measuring point.

Acknowledgments for effective services in the preparation of this report are due Misses Martha M. Evans and Gorge M. Pellen, who typed the offset copy; Rodney Hart, who prepared many of the illustrations; and Miss Mary F. Bugbee and G. Q. Shepard, who edited the report.

#### GENERAL SUMMARY OF CHANGES IN GROUND-WATER LEVEL IN 1939

Ground-water levels declined generally over the United States in 1939. Precipitation was below normal in most of the States along the eastern seaboard and in all States west of the Mississippi River except Arkansas. As a result of the low precipitation, recharge to most underground reservoirs was relatively small, and ground-water levels at the end of the year were generally at lower stages than at the end of 1938.

Water levels in most observation wells on Long Island, N. Y., were lower at the end of 1939 than at the beginning of the year. Further progressive decline in water levels took place in 1939 in observation wells in Kings County, on the western end of Long Island, where the water table over a large area has been drawn down below sea level. The water levels in many of the wells on the Island east of Kings County established

new high stages in the spring of 1939, but because the precipitation in the last part of the year was small the high stages were not maintained and the water levels dropped below their stages at the corresponding time in 1938.

Water levels in four wells in the central part of the State of New York reached new maximum stages and also new minimum stages in 1939. Abnormal precipitation in February caused unseasonable rises in water levels, whereas subnormal rainfall in the fall caused correspondingly large declines.

In the Atlantic City area, New Jersey, water levels in wells that tap the so-called "800-foot sand" were higher during the first part of 1939 than during the corresponding period in 1938 but were lower during the last part of 1939 than during the last part of 1938. On the other hand, water levels in wells that tap the No. 1 sand in the Runyon area were much lower during the first 10 months of 1939 than in 1938 but were much higher during the last 2 months. Fluctuations in both areas appear to be in direct response to changes in the rate of pumping from the two sands.

Water levels in 30 observation wells in Pennsylvania at the end of January 1939 showed the lowest average on record for that time of year, but owing to abnormal recharge from precipitation they had risen by the last of February to a higher average than any recorded previously for that part of February. Low precipitation in late summer and fall caused the water levels to decline greatly and to reach new minimum stages for November. Observations on most of these wells were begun in 1931.

Water levels in five observation wells in northern Virginia, which were at low stages at the beginning of 1939, rose notably during the spring as a result of high precipitation and then declined during summer and fall until they again reached very low stages.

Water levels in seven out of nine observation wells in different parts of North Carolina that were not appreciably affected by pumping had net declines in 1939 that ranged from 0.7 foot to 7.9 feet.

Water levels in observation wells in the Tiger River area of South Carolina at the end of 1939 showed the lowest average of the 5-year period of record.

An investigation that is being made in the Coastal Plain of Georgia indicates that, as a result of heavy pumping, the piezometric surface in an area about Savannah is now 65 feet or more below its original level and is at places as much as 30 feet below sea level.



In the heavily pumped areas near Cincinnati, Ohio, water levels in many wells rose rapidly during March and April 1939 as a result of heavy precipitation. In the period from July 1 to December 1, 1939, the precipitation was almost 5 inches below normal, and the water levels in shallow wells dropped rapidly. In the heavily pumped areas in Mill Creek Valley the water levels were generally as high in November and December 1939 as on corresponding dates in 1938, or somewhat higher.

The water level in a typical well in Roscommon County, in the northern part of the Southern Peninsula of Michigan, fluctuated through a range of about 1.3 feet in 1939, but at the end of the year it was about the same stage as at the beginning of the year. In 1938 a net decline of 0.8 foot in water level took place.

Water levels in 35 out of 42 observation wells in Indiana declined during 1939, when the average net decline for all the wells was 1.45 feet, which is in addition to an average net decline of 0.7 foot in 1938. The water level in some of these wells is affected by pumping.

Water levels in 12 wells in the Tarkio Creek area, in Iowa and Missouri, had an average net decline of 0.13 foot in 1939. In 1938 an average net rise of 0.44 foot had taken place in these wells.

In North Dakota the water levels in 42 observation wells distributed over the State were in general lower throughout 1939 than at corresponding times in 1938. At the end of 1939 the average of the water levels was 0.23 foot lower than at the end of 1938 and 0.74 foot lower than at the end of 1937. The precipitation in North Dakota in 1939 was 84 percent of normal.

Water levels in observation wells in southeastern South Dakota that are unaffected by heavy withdrawals were at or near the lowest stages recorded since observations were begun in 1936.

Water levels in 167 selected observation wells in Nebraska had an average net decline of 0.22 foot in 1939, which contrasts with a net average rise of 0.18 foot in 1938. The average at the end of 1939 was the lowest for the period of record, which began in 1934. The precipitation in Nebraska in 1939 was only 69 percent of normal.

Of the 33 observation wells in Ford County, Kans., water levels in all except 2 showed net declines in 1939. Precipitation at Dodge City was 7.53 inches below normal. In the Limestone Creek area, Kansas, water levels declined in 26 out of 39 observation wells. In south-central Kansas the water levels in 36 of 43 observation wells had a net decline.

In the Oklahoma Panhandle, comprising Beaver, Cimarron, and Texas Counties, the average of water levels in 119 observation wells were essentially the same at the end of 1939 as at the end of 1938, although the precipitation was 4.2 inches below normal. In the Stillwater Creek area, Oklahoma, water levels in 12 wells had an average decline of 0.9 foot in 1939. The precipitation in this area was 7.2 inches below normal.

At the end of 1939 the water levels in observation wells in the Elm Creek and Deer Creek areas, near Temple, Tex., averaged 2.35 feet lower than at the end of 1938 and 6.26 feet lower than at the end of 1937.

Net declines in water level for 1939 were recorded in most of the observation wells in the Mimbres and Portales Valleys and in the shallow and artesian wells in the Roswell basin. In all these areas there is heavy pumping for irrigation.

Water levels in observation wells in Utah in 1939 had average net declines in 25 of 32 ground-water areas. These prevailing declines were apparently the result of low precipitation in the last part of the year. Water levels in most of these areas were still higher at the end of 1939 than at the end of 1936.

Water levels in 39 wells in the Flathead Valley between Flathead Lake and Kalispell, Mont., declined an average of 0.26 foot in 1939.

In the Palouse River Basin, Idaho, water levels in water-table wells averaged 0.21 foot lower at the end of 1939 than at the end of 1938, and water levels in artesian wells averaged 1.32 feet lower.

Water levels in 20 wells in the Spokane Valley, Wash., averaged 1.16 feet lower at the end of 1939 than at the end of 1938.

Average net declines in water levels in 1939 were recorded in all six of the areas in Oregon under observation--that is, in Baker Valley, Fort Rock Valley, Grande Ronde Valley, Harney Valley, Walla Walla Basin, and Willamette Valley.

In California the precipitation in 1939 was only 67 percent of the average. In the Baldwin Park well, No. 42a, in the San Gabriel River Basin, the water level stood about 9.5 feet lower at the end of 1939 than at the end of 1938 but about 3.5 feet higher than at the end of 1937. In the Williams well in the Santa Ana River Basin, the water level had a net decline of about 2.75 feet in 1939, and 8 wells in the San Jacinto Valley had an average net decline of 0.9 foot. In 24 key observation wells in the Mokelumne area, California, there was an average net decline of 3.6 feet in the year. This decline canceled essentially all the gain of the preceding 3 years.

## ARIZONA

By S. F. Turner

An investigation of the ground-water resources of Arizona was started on August 1, 1939, in cooperation with the Arizona State Water Commissioner and with the Corps of Engineers, United States Army. The work done so far has been concentrated in the Gila and Santa Cruz River drainage basins. On January 1, 1940, the status of the investigation with respect to water-level measurements, was as follows:

Queen Creek Area. This includes the area between the Salt River on the north, the Gila River on the south, the Superstition and Pinal Mountains on the east, and the Salt River Irrigation District on the west.

- 1 well with water-stage recorder,
- 3 wells with maximum-minimum strip recorders,
- 44 additional wells measured each month.

Santa Cruz River Valley from Mexican border north to Casa Grande.

- 31 wells with maximum-minimum strip recorders,
- 84 additional wells measured each month.

San Pedro River Valley near Benson and Saint David.

- 15 wells measured four times a year.

Avra Valley along Brawley wash from Sierrita Mountains to junction with Santa Cruz River.

- 4 wells with maximum-minimum strip recorders,
- 16 additional wells measured four times a year.

Duncan-Virden Valley of upper Gila River.

- 1 well with water-stage recorder,
- 5 wells with maximum-minimum strip recorders,
- 16 additional wells measured each month.

Safford Valley of upper Gila River.

- 1 well with water-stage recorder,
- 19 wells with maximum-minimum strip recorders,
- 100 additional wells measured each month.

No records have been published for these wells, but the full record is to be published next year.



# ARKANSAS

## GRAND PRAIRIE REGION

By D. G. Thompson

Measurements of depth to water level in wells in the Grand Prairie region, which comprises Arkansas County, large parts of Lonoke and Prairie Counties, and very small parts of Jefferson and Monroe Counties, Ark., were continued in 1939 by cooperative agreement between the Arkansas Agricultural Experiment Station and the Federal Geological Survey. This is the thirteenth successive year that measurements have been made in this region, the first measurements having been made by the Federal Geological Survey, in cooperation with the Arkansas Geological Survey, in September 1927. The work of measuring the wells was done by employees of the Agricultural Experiment Station under the general supervision of Prof. Deane G. Carter and under the immediate direction of Kyle Engler and L. C. Carter. As in past years, T. J. Fricke, engineer of the Federal Land Bank of St. Louis, has cooperated informally in the well-measurement program and in the study and interpretation of the field records. During 1939 a report on some features of the investigation in the Grand Prairie region, especially of those phases of it carried on by the Arkansas Agricultural Experiment Station, were published by that organization as its Bulletin 371, "Problems of water resources for rice irrigation," by Deane G. Carter and Kyle Engler. A briefer paper by the same authors was published under the title, "Ground-water resources," in Agricultural Engineering, July 1939.

Water-Supply Paper 777 contains records of 18 wells from the beginning of measurements, in 1927 or 1928, through 1935; Water-Supply Paper 840 contains the complete records of 16 additional wells; and Water-Supply Paper 845 contains the complete records of 5 additional wells. The present report contains the measurements of these wells, with the complete record through 1939 of 11 additional wells, or a total of 50.

As stated in the earlier reports of measurements of water level just mentioned, the trend of water level or artesian head in the Grand Prairie region from year to year may be determined by annual measurements made as late as possible in the spring but before pumping for rice irrigation begins. Accordingly, for most of the wells in most years only a single measurement, in the spring, has been made. Measurements made in the fall, after the irrigation season has ended, give some suggestion as to the effects of pumping during the previous summer; but, because local irregularities due to pumping during the summer have not been smoothed out, they are not so conclusive as the measurements made during the following spring. For well 280,

which is equipped with an automatic water-stage recorder, measurements are given of the depth to water level whenever the recorder charts were changed, which was generally at weekly intervals. A continuous record of the fluctuations of water level in this well has been obtained since August 1928.

As described in previous reports, the water level in all wells in the Grand Prairie region fluctuates--at times as much as 0.8 foot in 24 hours and more than 1 foot in a few days--as a result of changes in atmospheric pressure. To make accurate comparisons of the water level on corresponding dates in different years, corrections for fluctuations of atmospheric pressure must be made by comparing the pressures, as determined from barograph records at some place nearby, at the time of measurement in successive years. Messrs. Engler and Fricke have made such corrections for about 350 wells that were measured by them in the spring of 1938 and of 1939 and on the basis of the corrected data have prepared a map of the Grand Prairie region showing lines of equal change in water level in 1939. The map shows that a net decline in water level took place throughout most of the region, but the amount of change in level differed considerably in different parts of the region. In general, the differences in decline can be attributed in large part to differences in quantity of water pumped for irrigation.

Out of a total of 353 wells that were measured in both 1938 and 1939, 327 showed an average drop of 0.925 foot, and 26 showed an average rise of 0.778 foot. The average decline was somewhat less than that between the spring of 1937 and the spring of 1938. The greatest decline, more than 6 feet, occurred in a small area at the extreme southeastern part of the region, including a part of the area known as Little Prairie, and in an area farther west, a few miles north of the settlement of Arkansas Post. Observations in previous years show that the water level in this part of the region is affected by the level of the Arkansas and White Rivers and of channels connecting them. The decline in this area is, accordingly, believed to be due to a lower level of these streams at the time of measurement in 1939 than in 1938. In 1938 the water levels in this area were higher than in 1937. Declines of a foot or more occurred during the year in several parts of the Grand Prairie region. These include two large, irregular-shaped areas between Lonoke and Hazen; a narrow, elongated area extending southward from Hazen to the boundary line between Prairie and Arkansas Counties; an area a few miles west of Crocketts Bluff; an area just west of Olena; and an area about 5 miles northwest of Gillette. In two small areas, one about 3 miles north of Almyra and

the other about a mile southwest of De Witt, the observed decline, corrected for differences in atmospheric pressure, was less than 0.20 foot. Along the extreme western edge of the Grand Prairie, between parts of T. 4 S., R. 5 W., T. 5 S., R. 5 W., and T. 6 S., R. 4 W., the water level apparently rose in amounts ranging from a few hundredths of a foot to more than 1.0 foot.

It is believed that originally, in practically the whole region, the so-called shallow or Pleistocene water-bearing beds were completely saturated and the water was under artesian pressure. In a preliminary report on the Grand Prairie region,<sup>1/</sup> made public in 1931, it was stated that by the spring of 1929 the water level had declined so much that the upper part of the water-bearing beds had been drained in several areas that totaled about 100 square miles, or about 64,000 acres. It was estimated that at least 220,000, and perhaps more than 333,000, acre-feet of water had been removed from storage. On the basis of 286 well logs and other data, Mr. Engler determined that by the spring of 1939 the area in which the upper part of water-bearing beds had been drained had enlarged to include almost the whole prairie, except only areas near the border of the Grand Prairie. The total area in which drainage is believed to have occurred is about 422,000 acres. Using an average figure for the annual decline in water level throughout the region and an assumed porosity of 30 percent, Engler further estimated that the amount of water withdrawn from storage in the 1938 irrigation season was about 85,000 acre-feet. The total acreage irrigated in that year was about 129,000 acres. Of this, about 15,000 acres were irrigated from deep wells that draw from beds of Tertiary age and from surface water, and about 114,000 acres were irrigated from shallow wells that draw from Pleistocene beds. If we allow a consumption of 1.8 acre-feet per acre, about 205,000 acre-feet of water was pumped from the wells in the Pleistocene beds. Deducting 85,000 acre-feet from this quantity gives 120,000 acre-feet as the quantity of water believed to have moved underground to the wells from areas of recharge, which, as stated in the report of 1931, are all believed to be outside the Grand Prairie region.

During the past year Mr. Engler made several pumping tests, on the basis of which, by using a method described as the Thiem method,<sup>2/</sup> he estimated the permeability (that is, the ability to carry water) of the

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<sup>1/</sup> Ground-water supplies for rice irrigation in the Grand Prairie region, Arkansas: U. S. Dept. Interior Press memo. 49844, 21 pp., 2 maps, Jan. 26, 1931.

<sup>2/</sup> For a description of this method see Wenzel, L. K., The Thiem method for determining permeability of water-bearing materials and its application to the determination of specific yield, results of investigations in the Platte River Valley, Nebr.: U. S. Geol. Survey Water-Supply Paper 679-A, 1936.



water-bearing materials that surround the test wells. Using the average of the results from three pumping tests an average figure for thickness of water-bearing materials and an average hydraulic gradient Engler arrived at another estimate for the rate of inflow of ground water into the Grand Prairie region, namely, about 104,000 acre-feet. This is not greatly different from the recharge estimated on the basis of quantity of water pumped, minus the quantity taken from storage.

If we assume an average consumption of water of 1.8 acre-feet per acre, the two figures determined by Engler for estimated inflow or recharge--in other words, the safe annual yield of shallow water-bearing beds in the Grand Prairie region under present conditions--would be sufficient to irrigate from 58,000 to 67,000 acres of rice. In the preliminary report of 1931, referred to above, it was estimated that the safe yield did not exceed 175,000 acre-feet and might be as low as 150,000 acre-feet. By the use of a somewhat lower estimate of consumption per acre of rice irrigated, namely 1.5 acre-feet, it was estimated in that report that the safe yield was sufficient to irrigate between 100,000 and 117,000 acres of rice. The more recent estimates, based on a much longer period of observation and on many more field data, show that both the safe yield and the area that can be irrigated by ground water from the Pleistocene water-bearing beds are much less than originally estimated.

As pointed out in Water-Supply Paper 845, a study of water-level measurements obtained in the fall of 1938 shows that water is moving toward the Grand Prairie region from rather distant localities to the west, northwest, and north of the region. Furthermore, in the rice-growing territory north of the Grand Prairie region the water level has declined somewhat as a result of pumping. If there should be a considerable increase in the acreage irrigated in this northern territory, with a consequent increase in consumption of ground water, the inflow from this direction into the Grand Prairie region would probably decrease, and the ultimate safe yield would be even less than the estimate given above. The consumption of ground water from the Pleistocene beds must be reduced greatly if the slow but continual decline in water level is to be stopped.

Water levels in the following wells are given in feet below the measuring points described in Water-Supply Papers 777, 840, and 845.

Unless otherwise stated the measuring points for the following wells are either as given in the original published description or in the last amended statement published in footnotes in Water-Supply Papers 777, 817, 840, or 845. Where measuring points have been changed, corrections for the change in altitude have not been made.

## Arkansas County

280. Fred Hedrich. Equipped with an automatic water-stage recorder. For 1939 the depths to water level whenever the recorder charts were changed, usually at weekly intervals, are given below. Comparison of the 1939 record with previous years may be made by reference to the graph of the lowest water level reached each day since the recorder was installed in August 1928, which was published as figure 1, p. 9, in Water-Supply Paper 840. Lowest water level in 1939, 94.86 feet Aug. 21. In comparison, lowest water level in 1938, 93.90 feet Sept. 4. Highest water level in 1939, 88.00 feet Jan. 29, as compared to 87.71 feet in 1938. The high points are primarily induced by extreme conditions of low atmospheric pressure. These figures are not corrected to a uniform atmospheric pressure.

Water level, in feet below measuring point, 1939

Date	Hour	Water level	Date	Hour	Water level
Jan. 6	9:10 a.m.	89.40	July 7	1:30 p.m.	89.89
13	8:45 a.m.	88.85	14	1:45 p.m.	90.52
20	2:25 p.m.	89.25	21	8:45 a.m.	93.72
27	4:35 p.m.	89.29	28	8:45 a.m.	93.42
Feb. 3	9:45 a.m.	88.54	Aug. 4	7:45 a.m.	91.79
10	2:55 p.m.	89.04	11	10:45 a.m.	91.20
17	12:10 p.m.	89.35	18	8:30 a.m.	94.20
25	9:15 a.m.	88.55	25	7:40 a.m.	94.78
Mar. 3	1:30 p.m.	88.97	Sept. 1	8:00 a.m.	91.26
10	11:30 a.m.	88.97	8	8:00 a.m.	94.52
16	11:45 a.m.	89.28	16	8:15 a.m.	91.84
24	3:40 p.m.	88.83	23	7:30 a.m.	91.18
31	1:30 p.m.	88.72	29	10:10 a.m.	90.80
Apr. 7	4:50 p.m.	89.13	Oct. 7	7:45 a.m.	90.70
13	4:00 p.m.	89.28	13	3:30 p.m.	90.74
21	7:05 p.m.	89.00	20	7:35 a.m.	90.46
28	5:30 p.m.	88.77	27	8:00 a.m.	90.27
May 5	4:25 p.m.	88.82	Nov. 3	9:30 a.m.	90.81
13	12:00 noon	89.01	10	11:40 a.m.	90.15
19	11:05 a.m.	88.71	17	11:15 a.m.	90.18
26	5:00 p.m.	88.74	24	7:50 a.m.	90.07
June 6	10:30 a.m.	89.79	Dec. 1	10:10 a.m.	89.66
9	8:00 a.m.	93.10	9	10:00 a.m.	89.96
16	8:00 a.m.	90.66	15	10:05 a.m.	90.15
23	8:10 a.m.	90.14	22	1:45 p.m.	90.08
30	8:00 a.m.	90.19	29	10:50 a.m.	90.12

Annual spring measurements, and for a few wells a fall measurement, have been made as follows:

Water level, in feet below measuring point, 1939

Well	Date	Time	Water level	Well	Date	Time	Water level
205	Apr. 13	1:10 p.m.	94.66	440	Apr. 20	10:50 a.m.	85.86
210	Apr. 12	3:40 p.m.	93.08	456	Sept. 19	3:30 p.m.	90.13
261	Apr. 25	11:40 p.m.	63.25	472	Apr. 20	11:25 a.m.	82.66
293	(b)			475	Apr. 4	3:45 p.m.	51.98
304	May 9	5:25 p.m.	82.01	480	Apr. 4	12:15 p.m.	60.62
311	Apr. 27	1:00 p.m.	100.59	486	Apr. 14	11:00 a.m.	53.98
318	Apr. 11	6:15 p.m.	86.33	499	Apr. 4	1:14 p.m.	45.95
344	Apr. 11	6:00 p.m.	92.44	501	Apr. 4	2:40 p.m.	38.77
353	Sept. 19	2:30 p.m.	94.57	506	Sept. 20	1:50 p.m.	42.18
392(392A)	Apr. 25	11:05 a.m.	76.47	507	(b)		
412	(c)			506	Apr. 14	11:55 a.m.	42.50
414	Apr. 25	12:45 p.m.	58.50	507	Sept. 20	2:55 p.m.	52.82
	Apr. 22	2:25 p.m.	59.79		Apr. 14	1:00 p.m.	37.24

a Pump removed from well. b No measurement made in 1939.

c Not measured in 1939. Water level in a companion well 392A was 81.61 feet at 2:30 p.m. on Apr. 25.

## Arkansas County--Continued

The following measurements are reported for the first time:

362. H. Bothe Estate. NW $\frac{1}{4}$  sec. 22, T. 3 S., R. 2 W. Measuring point, top of pump base at small hole, 0.5 foot above land surface, 199.53 feet above sea level.

Water level, in feet below measuring point, 1928-39

Date	Hour	Water level	Date	Hour	Water level
Aug. 15, 1928	.....	50.20	Feb. 25, 1932	9:45 a.m.	55.60
Sept. 1	.....	50.39	Apr. 20	11:50 a.m.	54.36
Oct. 9	3:40 p.m.	50.82	Sept. 8	4:30 p.m.	55.25
Mar. 1, 1929	1:30 p.m.	a51.65	27	4:30 p.m.	b55.52
Apr. 17	5:30 p.m.	51.04	Oct. 18	12:10 p.m.	55.85
May 10	5:12 p.m.	50.79	Mar. 2, 1933	10:30 a.m.	56.37
26	10:50 a.m.	50.56	Sept. 29	1:40 p.m.	c54.62
July 11	9:30 a.m.	49.70	Oct. 17	9:20 a.m.	c54.87
Aug. 3	10:15 a.m.	49.84	Mar. 14, 1934	2:30 p.m.	56.10
Sept. 10	11:30 a.m.	50.72	Sept. 10	3:00 p.m.	d56.09
Oct. 15	12:00 noon	51.45	28	11:15 a.m.	56.42
15	5:25 p.m.	51.39	Oct. 17	12:40 p.m.	56.74
Apr. 16, 1930	12:45 p.m.	51.95	Mar. 1, 1935	1:45 p.m.	56.85
Aug. 11	12:45 p.m.	53.05	14	3:15 p.m.	56.80
Sept. 3	3:00 p.m.	53.58	Mar. 18, 1936	.....	56.05
26	12:20 p.m.	54.15	Sept. 16	.....	58.97
Oct. 15	4:00 p.m.	54.46	Apr. 19, 1937	5:30 p.m.	55.45
Apr. 15, 1931	2:00 p.m.	55.00	Sept. 24	3:20 p.m.	e55.92
Sept. 4	7:45 a.m.	55.37	Apr. 23, 1938	2:45 p.m.	f54.38
26	9:45 a.m.	55.40	Sept. 10	9:25 a.m.	g54.95
Oct. 15	4:00 p.m.	55.70	Apr. 22, 1939	2:50 p.m.	h54.70

374. Charles W. MacDougall. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 1, T. 4 S., R. 5 W. Measuring point, top of outer raised flange of pump base, 0.5 foot above top of pit, 0.60 foot above land surface and 200.20 feet above sea level. Well is 876 feet deep and draws from sand of Tertiary age.

Water level, in feet below measuring point, 1928-30, 1934-38

Sept. 17, 1928	.....	41.71	Oct. 1, 1934	1:45 p.m.	44.26
Nov. 14	10:30 a.m.	38.06	Mar. 6, 1935	.....	38.28
Jan. 5, 1929	10:00 a.m.	36.82	Mar. 30, 1936	.....	39.05
May 4	12:37 a.m.	35.12	Sept. 23	.....	47.37
Sept. 17	9:30 a.m.	47.19	Apr. 10, 1937	4:05 p.m.	38.44
May 2, 1930	9:10 a.m.	36.14	Sept. 27	2:00 p.m.	j43.77
Sept. 17	4:00 p.m.	149.25	Apr. 11, 1938	1:25 p.m.	k41.69

374A. Charles W. MacDougall, east side NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 1, T. 4 S., R. 5 W. Original measuring point, top of casing. Measuring point after first measurement, hole in top of pump base, about 0.35 foot above top of casing. Well is 925 feet deep and replaces well 374, also a deep well. Water levels, in feet below measuring point: Apr. 11, 1938, 1:30 p.m., 37.65; Apr. 10, 1939, 1:45 p.m., 38.50.

a Measurement uncertain.

b Not pumped in 1932.

c Not pumped in 1933.

d Not pumped in 1934.

e Hole developed around well about 15 feet in diameter and 9 feet deep.

f Pump out of well; measurement made from top of pit level with land surface.

g Measurement made from base of pump.

h Measurement made from top of pit.

i In the fall of 1930 a seal was placed between pump and well pipe near bottom of pit and the water level in the pit was said to be no longer truly indicative of the head on the Tertiary sand bed. However, measurements were resumed in 1934.

j Measuring point, white mark on north side of well.

k Well abandoned; measurements hereafter made in a new deep well, 374A, several hundred feet southwest of well 374.

## Arkansas County--Continued

378. Yeske. Near SE cor. sec. 13, T. 4 S., R. 5 W. Measuring point, top of pump base at hole on east side, 0.05 foot above top of pit, 0.20 foot above land surface and 198.76 feet above sea level.

Water level, in feet below measuring point, 1928-30, 1936-39

Date	Hour	Water level	Date	Hour	Water level
Sept. 17, 1928	.....	76.30	May 2, 1930	9:45 a.m.	74.57
Nov. 14	11:10 a.m.	73.86	Mar. 21, 1936	.....	76.30
Jan. 5, 1929	12:03 p.m.	72.80	Apr. 23, 1937	11:50 a.m.	b82.49
Mar. 27	.....	a73.00	Apr. 25, 1938	3:45 p.m.	83.43
May 4	2:10 p.m.	72.59	Apr. 24, 1939	3:50 p.m.	84.09

437. B. L. Williams. Near SW cor. sec. 7, T. 5 S., R. 4 W. Measuring point, top of pump base at hole on south side, 194.59 feet above sea level.

Water level, in feet below measuring point, 1928-39

Oct. 4, 1928	5:15 p.m.	68.25	Apr. 22, 1932	3:15 p.m.	69.53
Nov. 14	11:50 a.m.	67.00	Sept. 27	12:30 p.m.	d74.68
Jan. 5, 1929	11:45 a.m.	65.57	Oct. 17	4:00 p.m.	73.79
Feb. 21	11:20 a.m.	65.45	Feb. 24, 1933	8:15 a.m.	71.26
May 4	2:50 p.m.	64.70	Sept. 30	8:40 a.m.	e74.90
Sept. 25	2:05 p.m.	73.06	Mar. 1, 1934	10:10 a.m.	72.03
Oct. 7	5:15 p.m.	71.88	Sept. 12	8:15 a.m.	f77.48
Apr. 24, 1930	1:25 p.m.	67.18	27	5:00 p.m.	76.85
May 2	10:15 a.m.	67.10	Feb. 22, 1935	5:30 p.m.	73.25
Sept. 25	5:20 p.m.	74.25	Mar. 23, 1936	.....	73.50
Nov. 11	1:20 p.m.	73.35	Apr. 23, 1937	3:00 p.m.	74.24
Apr. 23, 1931	4:10 p.m.	69.32	Apr. 25, 1938	1:50 p.m.	74.69
May 4	2:00 p.m.	69.17	Sept. 10	4:10 p.m.	78.72
Sept. 25	5:25 p.m.	c72.78	Apr. 24, 1939	11:45 a.m.	74.52
Oct. 13	12:45 p.m.	72.20	Sept. 18	3:40 p.m.	77.68
Feb. 23, 1932	12:15 p.m.	70.35			

461. Dewitt Bank and Trust Co. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 34, T. 5 S., R. 2 W. Measuring point, bottom edge of hole in side of pump, 1.7 feet above land surface, and about 186 feet above sea level (estimated).

Water level, in feet below measuring point, 1928-33, 1935-39

Nov. 14, 1928	5:00 p.m.	55.45	Apr. 20, 1932	4:00 p.m.	53.20
Mar. 8, 1929	3:30 p.m.	51.36	Sept. 9	3:30 p.m.	60.30
May 15	5:15 p.m.	44.05	23	4:45 p.m.	60.35
29	6:55 p.m.	43.43	24	11:45 a.m.	g62.22
Sept. 10	5:50 p.m.	57.48	Mar. 1, 1933	6:00 p.m.	56.28
23	5:40 p.m.	58.00	Apr. 25	11:45 a.m.	51.45
Mar. 20, 1930	5:00 p.m.	51.18	Sept. 23	12:10 p.m.	58.20
Apr. 24	3:30 p.m.	52.66	Feb. 23, 1935	1:10 p.m.	58.60
May 15	1:50 p.m.	53.33	Mar. 14, 1936	.....	57.22
Sept. 22	2:10 p.m.	62.10	Apr. 19, 1937	12:15 p.m.	55.39
Apr. 29, 1931	8:20 a.m.	57.30	Apr. 19, 1938	5:20 p.m.	h54.8
May 15	4:50 p.m.	57.12	Apr. 20, 1939	4:30 p.m.	57.05
Sept. 3	2:00 p.m.	64.10			
23	1:00 p.m.	44.85			

- a Measurement probably not correct because of oil on top of water.  
 b New measuring point, top of pit curb on west side, 0.2 foot lower than original measuring point.  
 c Not pumped in 1931.  
 d Pumped in 1932.  
 e Pumped in 1933.  
 f Pumped.  
 g Pumped in 1932.  
 h Measurement somewhat doubtful because of grease on top of water.

## Arkansas County--Continued

465. E. Herold. SE $\frac{1}{4}$  sec. 8, T. 6 S., R. 4 W. Measuring point, top of raised flange of pump base, 179.76 feet above sea level.

Water level, in feet below measuring point, 1928-39

Date	Hour	Water level	Date	Hour	Water level
Aug. 14, 1928	3:20 p.m.	33.75	May 4, 1931	11:55 a.m.	34.58
Oct. 4	3:35 p.m.	34.56	Oct. 13	1:50 p.m.	36.02
Nov. 14	1:10 p.m.	33.55	Apr. 23, 1932	12:45 p.m.	34.60
Dec. 9	10:05 a.m.	33.49	Oct. 17	2:40 p.m.	35.66
May 4, 1929	3:45 p.m.	32.30	Oct. 16, 1933	2:45 p.m.	b35.18
Sept. 2	3:00 p.m.	a39.28	Oct. 16, 1934	4:20 p.m.	36.60
25	2:35 p.m.	35.65	May 8, 1935	2:30 p.m.	35.56
Oct. 7	4:25 p.m.	35.20	Mar. 21, 1936	.....	35.37
May 2, 1930	12:40 p.m.	33.40	Apr. 12, 1937	5:45 p.m.	36.40
Sept. 25	3:30 p.m.	37.25	Apr. 12, 1938	3:25 p.m.	34.50
Oct. 11	2:00 p.m.	36.50	Apr. 11, 1939	3:35 p.m.	37.27
Apr. 23, 1931	1:30 p.m.	34.75			

## Jefferson County

270. Water level, in feet below measuring point, 1939: Apr. 3, 2:50 p.m., 17.62.

## Lonoke County

Water level, in feet below measuring point, 1939

Well	Date	Hour	Water level	Well	Date	Hour	Water level
1	May 1	3:50 p.m.	51.80	28	May 1	1:25 p.m.	69.09
	Sept. 6	3:45 p.m.	55.77		Sept. 6	2:10 p.m.	72.09
8	May 1	4:00 p.m.	49.40	126	Apr. 3	4:11 p.m.	49.50
	Sept. 6	4:15 p.m.	55.82		Sept. 3	3:25 p.m.	51.16
10	May 1	11:15 a.m.	74.02	127	May 2	9:00 a.m.	35.11
	Sept. 6	1:10 p.m.	79.97				

The following measurements are reported for the first time:

61. Lonoke County Bank, Bishop farm. Fifteen miles north of SW cor. SW $\frac{1}{4}$  sec. 4, T. 1 N., R. 8 W. Measuring point, bottom of hole in side of pump, level with land surface, 236.28 feet above sea level.

Water level, in feet below measuring point, 1928-39

Date	Hour	Water level	Date	Hour	Water level
Sept. 24, 1928	.....	45.76	Sept. 24, 1932	3:50 p.m.	46.36
Nov. 20	12:15 p.m.	c46.10	Apr. 25, 1933	4:45 p.m.	45.24
Feb. 11, 1929	3:30 p.m.	45.08	Sept. 26	10:10 a.m.	b46.69
May 13	3:40 p.m.	44.10	Feb. 28, 1934	1:40 p.m.	46.25
July 8	11:30 a.m.	d44.56	Sept. 26	4:00 p.m.	47.50
Aug. 5	3:00 p.m.	44.92	Oct. 23	9:00 p.m.	47.24
Sept. 4	3:15 p.m.	45.40	Nov. 19	4:00 p.m.	46.93
11	3:20 p.m.	45.56	Feb. 19, 1935	1:40 p.m.	46.68
24	.....	45.50	Apr. 22	12:50 p.m.	46.12
Apr. 21, 1930	12:35 p.m.	44.75	Apr. 24, 1936	.....	46.56
Sept. 1	5:00 p.m.	46.15	Apr. 28, 1937	4:15 p.m.	47.68
24	4:25 p.m.	46.16	May 3, 1938	12:45 p.m.	48.20
Oct. 17	9:30 a.m.	46.23	Sept. 9	1:05 p.m.	49.87
Apr. 20, 1931	4:45 p.m.	45.40	May 2, 1939	2:25 p.m.	49.00
Sept. 24	10:10 a.m.	46.70	Sept. 8	2:50 p.m.	50.56

a Pump shut down morning of Sept. 1.

b Not pumped in 1933.

c Measurement unsatisfactory.

d No pumping nearby.



## Lonoke County--Continued

78. J. L. Ducharme. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 20, T. 1 N., R. 7 W. Measuring point, bottom of hole in side of pump, 1.5 feet above land surface, 227.72 feet above sea level.

Water level, in feet below measuring point, 1928-39

Date	Hour	Water level	Date	Hour	Water level
Aug. 10, 1928	.....	49.60	Feb. 20, 1932	10:00 a.m.	48.20
Sept. 24	4:10 p.m.	48.99	Apr. 21	5:00 p.m.	47.32
Nov. 20	10:25 a.m.	48.23	Sept. 7	10:10 a.m.	52.38
Jan. 7, 1929	1:05 p.m.	46.80	24	11:20 a.m.	51.74
May 21	11:05 a.m.	46.26	Apr. 29, 1933	11:00 a.m.	48.03
July 8	2:00 p.m.	a47.10	Sept. 26	2:10 p.m.	d51.47
Aug. 5	4:15 p.m.	b47.72	Feb. 20, 1934	10:10 a.m.	e48.74
Sept. 11	12:50 p.m.	c49.12	Aug. 28	9:15 a.m.	51.97
24	4:45 p.m.	48.36	Sept. 26	1:40 p.m.	51.25
Feb. 20, 1930	3:00 p.m.	46.29	Feb. 19, 1935	3:00 p.m.	49.34
Apr. 21	10:40 a.m.	46.10	Apr. 22	3:00 p.m.	48.65
May 21	9:15 a.m.	46.08	Sept. 20	.....	51.58
Aug. 12	10:20 a.m.	50.38	Apr. 24, 1936	.....	f49.30
Sept. 1	6:15 p.m.	c50.70	Apr. 29, 1937	12:05 p.m.	50.42
24	2:10 p.m.	49.74	May 2, 1938	11:30 a.m.	49.97
Apr. 21, 1931	1:15 p.m.	47.38	Sept. 9	2:20 p.m.	53.90
Sept. 7	11:20 a.m.	50.92	May 5, 1939	10:15 a.m.	50.79
24	11:55 a.m.	50.95	Sept. 9	10:50 a.m.	53.71

## Monroe County

The following measurements are reported for the first time:

193. Hugh H. Burns. NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 19, T. 1 S., R. 3 W. Measuring point, top of pit about 10 inches above land surface and 217.6 feet above sea level.

Water level, in feet below measuring point, 1928-39

Nov. 11, 1928	.....	65.73	Sept. 30, 1933	4:20 p.m.	70.55
Jan. 9, 1929	9:25 a.m.	65.35	Mar. 15, 1934	4:40 p.m.	69.39
May 17	2:10 p.m.	64.38	Nov. 10	11:00 a.m.	71.27
25	2:15 p.m.	64.25	Dec. 4	4:30 p.m.	71.52
Sept. 6	2:50 p.m.	g66.67	22	3:45 p.m.	71.20
21	5:50 p.m.	h66.60	Mar. 6, 1935	12:40 p.m.	70.32
Apr. 23, 1930	12:45 p.m.	65.85	15	5:00 p.m.	70.25
Aug. 30	10:45 a.m.	i68.00	Apr. 23	1:40 p.m.	69.80
Sept. 29	1:50 p.m.	68.00	Apr. 17, 1936	.....	70.94
Apr. 22, 1931	11:45 a.m.	67.97	Sept. 17	.....	72.40
Sept. 29	10:55 a.m.	69.70	Apr. 30, 1937	1:50 p.m.	k71.00
Feb. 26, 1932	3:25 p.m.	j68.10	Apr. 30, 1938	1:00 p.m.	71.25
Apr. 22	11:45 a.m.	68.08	Apr. 29, 1939	11:35 a.m.	71.47
Sept. 29	12:00 noon	70.44	Sept. 13	3:55 p.m.	72.77
Mar. 4, 1933	4:20 p.m.	70.40			

- a Well 79, nearby, recently pumped.
- b Well 77, 1 mile west, pumping.
- c Well pumping 0.25 mile west.
- d Nearby pump shut down Sept. 23.
- e Not pumped in 1933.
- f Measuring point 0.6 foot above previous point.
- g Pump shut down 6 days.
- h Pump shut down about Sept. 14.
- i Pump shut down about Aug. 22.
- j Water probably leaking into well.
- k Measuring point, bottom of hole at east side of pump, 2.5 feet above land surface and 1.2 feet above previous measuring point.

## Prairie County

Water level, in feet below measuring point, 1939

Well	Date	Hour	Water level	Well	Date	Hour	Water level
55	Apr. 28	1:50 p.m.	59.65	144	Apr. 10	3:15 p.m.	80.25
	Sept. 8	4:25 p.m.	75.02	159	Apr. 8	10:00 a.m.	b58.65
100	Apr. 26	4:35 p.m.	70.70		Sept. 8	9:30 a.m.	80.59
116	Apr. 26	5:10 p.m.	74.18	201	Apr. 13	10:25 a.m.	47.08
	Sept. 21	9:50 a.m.	77.65				
135	Apr. 13	2:05 p.m.	a45.59				

The following measurements are reported for the first time:

88. Herman Hardke. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 8, T. 1 N., R. 6 W. Measuring point, top of outer raised rim of pump base, about 225 feet above sea level.  
Water level, in feet below measuring point, 1928-39

Date	Hour	Water level	Date	Hour	Water level
Aug. 1, 1928	.....	c60.04	Oct. 20, 1933	9:40 a.m.	e58.28
Sept. 18	4:50 p.m.	56.73	Mar. 12, 1934	9:40 a.m.	57.29
May 31, 1929	1:50 p.m.	52.58	Oct. 19	10:40 a.m.	58.61
July 30	1:45 p.m.	d59.42	Feb. 21, 1935	9:40 a.m.	57.70
Sept. 12	3:30 p.m.	57.70	Mar. 13	10:30 a.m.	57.45
18	11:30 a.m.	57.52	Apr. 24	.....	57.13
Apr. 22, 1930	4:00 p.m.	53.62	Sept. 12	.....	59.83
26	3:20 p.m.	53.68	Apr. 24, 1936	.....	57.35
Sept. 18	5:10 p.m.	57.55	Sept. 18	.....	61.28
Oct. 22	4:30 p.m.	56.67	Apr. 27, 1937	3:55 p.m.	58.81
Apr. 20, 1931	9:00 a.m.	54.86	Apr. 27, 1938	3:45 p.m.	60.11
25	10:55 a.m.	54.65	Sept. 9	4:00 p.m.	63.84
Oct. 22	8:00 p.m.	57.06	Apr. 26, 1939	3:30 p.m.	60.73
Oct. 20, 1932	9:10 a.m.	58.75			

122. George Randall. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 29, T. 1 N., R. 4 W. Measuring point, bottom edge of hole in side of pump, 0.1 foot above top of pit and 0.3 foot above land surface, 221.47 feet above sea level.

Water level, in feet below measuring point, 1928-39

Aug. 24, 1928	3:30 p.m.	78.42	Oct. 12, 1933	1:55 p.m.	e77.10
Nov. 13	1:50 p.m.	70.46	Mar. 16, 1934	1:00 p.m.	73.88
Apr. 23, 1929	2:20 p.m.	68.14	Sept. 4	10:00 a.m.	h87.13
May 17	3:30 p.m.	67.65	22	4:00 p.m.	81.40
25	3:00 p.m.	67.46	Oct. 1	10:40 a.m.	80.35
Sept. 27	12:30 p.m.	f78.05	22	11:20 a.m.	78.80
Nov. 13	10:45 p.m.	73.42	Nov. 12	11:50 a.m.	78.10
Apr. 23, 1930	11:45 a.m.	71.18	Dec. 4	3:00 p.m.	77.52
Aug. 26	.....	g91.00	22	12:15 p.m.	76.92
Sept. 29	10:30 a.m.	78.97	Feb. 20, 1935	5:00 p.m.	76.00
Nov. 19	11:00 a.m.	75.74	Mar. 15	5:45 p.m.	75.28
Apr. 22, 1931	10:15 a.m.	73.00	Apr. 23	11:45 a.m.	74.82
Aug. 31	8:00 a.m.	80.57	Apr. 22, 1936	.....	85.90
Sept. 29	10:00 a.m.	78.85	Sept. 17	.....	85.49
Apr. 22, 1932	4:00 p.m.	72.97	Apr. 30, 1937	3:40 p.m.	76.15
Sept. 10	4:00 p.m.	83.61	Apr. 30, 1938	2:00 p.m.	76.54
29	1:30 p.m.	79.67	Apr. 29, 1939	1:05 p.m.	77.18
Mar. 4, 1933	5:30 p.m.	74.68	Sept. 13	2:25 p.m.	86.34

a Water level in well 135A equipped with pump, 95 feet north of well 135, was 44.77 feet at 2:00 p.m. on Apr. 13.

b Pump removed from well.

c Pump operating in well 0.5 mile south.

d Pumped in 1929.

e Pumped in 1933.

f Owner of well reported measured depth to water level as low as 81 feet in summer of 1929.

g Measurement reported by owner of well.

h Pumping.

# CALIFORNIA

## GENERAL SUMMARY

By F. C. Ebert

The Geological Survey continued during 1939 its program of measuring the depth to water level in selected wells in southern California.<sup>1/</sup> A water-stage recorder was maintained on well 42a at Baldwin Park, in the upper San Gabriel Valley. Systematic measurements by other agencies of the depth to water level in wells in several areas in California were also continued during 1939. The State of California, Department of Public Works, Division of Water Resources, assembled the records of water level that were collected during 1938 by the agencies interested in the south coastal basins and published them in Bulletin 39-G, Records of ground-water levels at wells for the year 1938.

## CLIMATOLOGICAL DATA

The following general summary of climatological data for the calendar year 1939 is taken from a report<sup>2/</sup> of the Weather Bureau:

"The total precipitation for the State was 67 percent and the total snowfall was 89 percent of the 43-year average. Monthly averages exceeded the normal slightly in May and July. The September rainfall was nearly four times the normal amount, but the excess was confined to desert regions and southwestern counties. Precipitation was subnormal during the other 9 months, with deficiency large in the first 2 and the last 2 months of the year. The total snowfall for the first 3 months of 1939 was moderately heavy, but snowfall was generally light thereafter, with large deficiencies in November and December. The snow cover at the end of December was negligible below the 8,000-foot level, and was decidedly deficient above that level.

"Annual precipitation totals exceeded the normal in the desert regions and San Diego County, and locally elsewhere in southern California and the Southern San Joaquin Valley, but were subnormal elsewhere, with deficiencies largest in central coastal and Sacramento valleys and over the western slopes of the northern and middle Sierra Nevada. The annual surplus in the desert regions and locally in other limited areas of southern California was due to the excessive rains that attended the tropical storm that moved inland near the Los Angeles Harbor on September 25. In the northern fifth of the State a large percentage of the annual precipitation occurred in December."

## FLUCTUATIONS OF WATER LEVEL

### San Gabriel River Basin

<sup>3/</sup> Well 42a at Baldwin Park showed a continued drop in water level to a mean daily altitude of 300.38 feet on February 5, then rose 1.55 feet to the peak for the year of 301.93 feet on April 20. On December 31, 1939, the water level was at an altitude of 291.40 feet, which is 10.53 feet

<sup>1/</sup> See Water-Supply Papers 817, 840, and 845.

<sup>2/</sup> U. S. Department of Agriculture, Weather Bureau, Climatological Data, vol. XLIII, No. 13, 1939.

<sup>3/</sup> Ebert, F. C., Am. Geophys. Union Trans. 1936, p. 372.

below the peak for the year and 9.48 feet below the water level of December 31, 1938.

#### Santa Ana River Basin

##### San Bernardino Area

The water level in the Williams well rose gradually from January 1 to May 6, when the depth to water level was 15.25 feet. The low stage of the year--26.75 feet--occurred September 30 and was a decline of 11.5 feet from May 6. On December 30, 1939, the water level was 2.76 feet below its stage on December 31, 1938.

The following statement was furnished by the San Bernardino Valley Water Conservation District:

"Results of monthly measurements on 293 wells show that the ground-water level over about one-third of the area above the Bunker Hill dike was higher at the end of 1939 than at the end of 1938. The areas showing gains are Redlands, Del Rosa, the west portion of San Bernardino, and Lytle Creek. The water table in all other sections, including Warm Creek, Highland, East Highland, Loma Linda, and Mentone is lower now than 1 year ago. At present the water table is higher in all sections than at its low stage in 1936. In general the basin has recovered in the past 3 years a little over 50 percent of the decline suffered from 1923 to 1936. West of San Bernardino in Lytle Creek the water table has risen to within 80 percent of its low stage in 1916. Wells along Warm Creek and in the Antil region show a recovery of about 25 percent. The water levels in the Williams well and other wells in the vicinity of Redlands have recovered 60 percent of the previous decline."

##### South Coastal Plain

The water level in well 41b, in the coastal plain of southern California, rose gradually from January 1 to March 30, at which time the elevation of the water level was 24.43 feet. The lowest observed stage unaffected by pumping occurred on September 14, when the elevation of the water level was 13.73 feet. The water level on December 28, 1939, was 17.91 feet--0.41 foot above its stage on December 15, 1938.

##### San Jacinto Valley

Measurements of water level made during 1939 in eight wells distributed over the valley indicate a change in water level ranging from a rise of 2.2 feet to a decline of 6.6 feet. The greatest rises and declines occurred in wells adjacent to the San Jacinto River and in wells at Winchester and east of Hemet, which tap material that may have been deposited in an ancient channel of the river.

In the northern and western parts of the valley, in the vicinity of March Field and Perris, the change in water level during the year was 0.6 foot or less. Water levels in well 72 and its companion well 72c, at Perris, have declined 41.0 feet during 35 years of record. During

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<sup>4/</sup> See Water-Supply Papers 468, 817, 840, and 845.

the same period the water levels in well 69a and its companion well 69, between Perris and March Field, declined 1.5 feet. Water levels in both these sets of wells are affected only slightly by variations in annual precipitation. During a period of 19 years the water level in Riverside County well near March Field rose 20.9 feet. The water level in this well, which is near the north end of the valley, shows a greater annual change and is more responsive to variations in annual precipitation than the other well.

Water levels in the eight wells measured during the year declined 0.9 foot.

#### Tia Juana River Basin

The average of water levels in five wells rose 0.3 foot from December 1938 to November 1939. During the year, water levels in these wells had seasonal fluctuations that ranged from 1.5 feet in well 0140b to 5.0 feet in well 0130b.

#### San Diego River Basin

The water level in well L37 at Lakeside, Calif., rose 0.8 foot, and water levels in other wells in the basin rose about 0.5 foot, from December 1938 to December 1939. The average net rise was rather uniform from El Monte to Old Town.

#### San Pasqual Valley

The water level in well H34b, at the upper end of the valley, showed a net gain of 0.5 foot from November 1938 to November 1939, whereas three wells farther down the valley showed an average net loss in water level of 0.2 foot. The water level in well H31b, at a considerable distance from the San Dieguito River, declined 1.6 feet.

#### San Luis Rey River Basin

Water levels in three wells at the narrows above Oceanside, Calif., rose several feet from December 1938 to December 1939, whereas well F17, at San Luis Rey, Calif., declined 0.6 foot. The average of water levels in eight wells between San Luis Rey and Monserate Narrows declined 0.3 foot during the year.

#### Santa Maria Valley

In the Santa Maria Valley, measurements of depths to water level in 21 selected wells have been made on the first day of January, April, July, and October since April 1938. On April 1, 1939, water levels in 11 wells

were higher and in 9 wells lower than they were on April 1, 1938. The water level in 1 well was affected by pumping. Rises in the wells ranged from 0.42 foot to 13.43 feet and averaged 4.19 feet; declines ranged from 0.21 foot to 10.57 feet and averaged 3.73 feet. The average rise in water level in the 20 wells was 0.61 foot. Between January 1, 1939, and January 1, 1940, however, water levels in only 2 wells showed a rise--one of 0.07 foot and the other of 1.05 feet--whereas water levels in 18 wells showed a decline. Declines ranged from 0.43 foot to 18.4 feet. Water levels in the 20 wells declined an average of 5.13 feet during 1939.

#### Salinas Valley

According to H. F. Cozzens, county surveyor of Monterey County:

"Water-level measurements of 120 wells in Salinas Valley extending from Moss Landing adjacent to Monterey Bay upstream to San Ardo, a distance of 80 miles, were made in April and October 1939. The 1939 measurements showed an average decline in water level of 2 feet from the 1931-39 average. This decline is probably the result of deficient rainfall.

"In some of the wells in the lower portion of the Valley the 1939 measurements indicate a decline in water level of 30 feet from the levels of 1916, as indicated by a few available records."

#### Santa Clara Valley

The following summary of ground-water conditions in the Santa Clara Valley during 1939 was furnished by G. W. Hunt, district engineer of the Santa Clara Valley Conservation District:

"Due to the fact that the surface run-off was very small and the pumping draft heavy during 1939, there was a decline in ground-water levels throughout Santa Clara Valley. For the study of ground-water conditions, the Valley has been divided into two areas; one, the former area of artesian flow; and the other, the remainder of the Valley.

#### "ARTESIAN AREA:

"The former area of artesian flow lies at the northern end of Santa Clara Valley and comprises 26 percent of the total area. In this area during 1939 the average water levels dropped 5.6 feet. On January 1, 1939, the average water level was 20.0 feet higher than it had been on January 1 of the preceding year. It continued to rise until the beginning of April, at which time it was higher than it had been for many years. With the beginning of the spring pumping season the water levels dropped rapidly and by the end of the year were 5.6 feet lower than on the same date the previous year.

"Due to the high water levels during the first few months of 1939 a large number of wells started to flow. In 1938 a few wells along the edge of the marsh land flowed for about 2 months. This had been the first time in many years that there were any flowing wells in the Valley. During 1939 this condition continued until the latter part of April. The area in which these flowing wells were located extended about 3.5 miles inland (Southerly) and up to elevations of about 40 feet above sea level.

#### "REMAINDER OF THE VALLEY:

"At the beginning of 1939 the average water level in the remainder of the Valley was 20.3 feet higher than at the beginning of 1938. There was a rise over this area (with the exception of the heads of the alluvial cones) until April and from then on a steady decline in water levels. The decline in water levels at the heads of the cones during the spring months

was due to the fact that there was practically no run-off in the streams entering the Valley. By the end of 1939 the average water level in this area was 18.4 feet lower than on the corresponding date in 1938.

"CONCLUSION:

"Although the water levels throughout Santa Clara Valley declined during 1939, the condition is not serious. The average water level for the entire Valley in November 1939 was 30 feet higher than in November 1934, at which time the water levels were at an all-time low. The probability of another year, in which the distribution of rainfall is such that it will produce practically no run-off, occurring in the near future is very slight. Consequently there is no cause for alarm due to this rather large decline in water levels."

Sacramento and San Joaquin Valleys

Edward Hyatt, State engineer, furnished the following information:

"No measurements of ground-water elevations in the Sacramento Valley and that portion of the San Joaquin Valley north of Chowchilla River were made by this office during 1939.

"Ground-water measurements in the fall and early winter of 1939 in the upper San Joaquin Valley south of Chowchilla River showed some average lowering of the ground-water table in areas recharged by Chowchilla, Fresno, San Joaquin, Kings, Kaweah, Tule, and Kern Rivers, and by Deer, Poso, and Caliente Creeks, and other minor streams. Lowerings in Madera Irrigation District averaged approximately 4 feet, and in Fresno, Consolidated, and Alta Irrigation Districts, approximately 2.5 feet. Average lowerings in the Kaweah Delta and Lindsay, Tule-Deer Creek, and Earlimart-Delano areas varied from 3 to 6 feet. Substantial lowerings were also recorded in the McFarland-Shafter, Rosedale, and Edison-Arvin areas."

Mojave River Basin

Observations during spring and fall were continued on about 90 wells in the area. The flow in the Mojave River during the winter of 1938-39 was below normal; generally, changes in water levels were those caused by the movement of the ground water placed in the basin during the years of high run-off, 1936-37 and 1937-38.

In the lands adjacent to the Mojave River, upstream from Victorville, water levels declined during 1939 in amounts varying from 6 feet at the extreme upper end of the valley to 1 foot or less near Victorville. Water levels in wells between the bottom lands and the borders of the basin declined about in proportion to the distance from the Mojave River. Water levels in a few wells on the borders of the basin rose slightly.

Water levels in the Victorville-Helendale-Hodge area changed very little, as they showed only the usual seasonal fluctuations. In the Hodge-Hinckley area the water level dropped about 3 feet in wells in the bottom lands downstream from Hodge Crossing and rose about 4 feet in a well near the Barstow-Mojave Highway. The level in the latter well may be affected by pumping. Measurements of depth to water level in a well between the river bottom lands and Barstow-Mojave Highway indicate that

the peak water level in that locality following the recharge of the basin in 1936-37 and 1937-38 occurred in the spring of 1939. The water level in this well in November 1939 was about 6.5 feet higher than in January 1937. Small but persistent declines were indicated in the area southeast of Harper Lake. Water levels in wells in the Lenwood-Barstow area have remained about stationary or have declined slightly.

The water level in the area between Barstow and the Van Dyke ditch-intake dropped 1 to 2 feet. Downstream from the ditch-intake, the water level, as shown by well 11, dropped about 6 feet during the period from November 1938 to November 1939. In the basin bounded on the west by Daggett and Yermo and on the east by the Kouns-Newberry sand-dune belt,<sup>5/</sup> the changes in water level ranged from a decline of 5 to 6 feet in the vicinity of Daggett to a decline of 1 foot or less in the sand-dune belt and to a rise of about 1 foot in the south border of the valley near Minneola. The pattern of the movement of the ground water in this basin, following the large recharge of 1937-38 and 1938-39, was quite similar on the north and south sides of the river. Wells to the east and downstream from Kouns-Newberry break indicated no definite change in water level; water levels in the vicinity of Newberry and in the Newberry-Troy Lake area continued practically stationary.

#### Antelope Valley

Observations during 1939 were made in this area shortly before and after the irrigating season, in March and November, respectively. The difference in the two observations indicates a lowering of water level of from 1 to 14 feet throughout the valley, with most of the wells indicating a lowering in water level of from 5 to 6 feet. Declines varied mainly with the amount of pumping during the season in the vicinity of the observation wells. A comparison of water levels in November 1939 with those of November 1937 indicates an average net decline in 2 years of about 2 feet in observation wells in the Roosevelt-Redman area and in the northwestern part of the valley, and declines of from 5 to 6 feet in the rest of the valley.

#### WELL DESCRIPTIONS AND WATER-LEVEL MEASUREMENTS

On the following pages are given the records for 1939 of all wells that were published in Water-Supply Paper 845. Complete descriptions and basic data are given also for 7 additional wells in San Diego County and for 94 wells in the Mojave River Basin.

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<sup>5/</sup> Thompson, D. G., The Mojave Desert region, Calif.: U. S. Geol. Survey Water-Supply Paper 578, p. 481, 1929.



The four key wells, 42a, on which a recorder was maintained, 41b, 72c, and the Williams well are presented first, followed by the records, arranged by basins, of wells in San Diego County and the Mojave River Basin.

For descriptions of the wells not given in this report, see Water-Supply Papers 817, 840, and 845.

### San Gabriel River Basin

#### 42a. Baldwin Park, Calif.

Water level, in feet above mean sea level minus 200, 1939

Date	Jan.	Feb.	Mar.	Apr.	May	June
1	100.88	100.46	100.71	101.63	101.76	101.33
2	100.90	100.40	100.85	101.65	101.74	101.26
3	100.82	100.51	100.90	101.68	101.70	101.24
4	100.79	100.49	100.85	101.70	101.68	101.21
5	100.88	100.38	100.85	101.75	101.65	101.20
6	100.84	100.41	100.92	101.74	101.63	101.12
7	100.76	100.48	100.93	101.75	101.63	101.06
8	100.71	100.55	100.97	101.81	101.61	101.03
9	100.72	100.43	101.01	101.85	101.64	101.05
10	100.70	100.42	100.98	101.85	101.65	101.02
11	100.69	100.39	100.99	101.85	101.69	100.86
12	100.67	100.49	101.09	101.86	101.72	100.83
13	100.64	100.49	101.12	101.88	101.70	100.79
14	100.62	100.47	101.14	101.85	101.70	(a)
15	100.64	100.59	101.16	101.78	101.72	(a)
16	100.62	100.54	101.20	101.81	101.73	(a)
17	100.57	100.61	101.21	101.87	101.75	(a)
18	100.57	100.55	101.23	101.87	101.75	(a)
19	100.62	100.58	101.25	101.91	101.78	(a)
20	100.62	100.59	101.28	101.93	101.76	100.37
21	100.58	100.58	101.32	101.92	101.72	100.29
22	100.48	100.64	101.35	101.90	101.71	100.23
23	100.47	100.62	101.36	101.87	101.66	100.18
24	100.46	100.67	101.40	101.90	101.64	100.11
25	100.46	100.70	101.40	101.92	101.52	100.05
26	100.45	100.71	101.48	101.89	101.48	99.89
27	100.51	100.69	101.53	101.85	101.40	99.89
28	100.49	100.73	101.52	101.87	101.47	99.76
29	100.43	.....	101.51	101.77	101.48	99.71
30	100.49	.....	101.58	101.77	101.43	99.62
31	100.50	.....	101.60	.....	101.44	.....

Water level, in feet above mean sea level minus 200, 1939

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	99.60	97.68	94.66	93.06	92.66	91.93
2	99.39	97.64	94.57	93.08	92.61	91.91
3	99.28	97.58	94.49	93.05	92.57	91.88
4	99.22	97.52	94.45	93.05	92.54	91.88
5	99.15	97.43	94.43	93.07	92.52	91.85
6	99.11	97.31	94.37	93.09	92.52	91.84
7	99.07	97.19	94.27	93.11	92.53	91.80
8	99.02	97.14	94.18	93.08	92.56	91.77
9	98.97	97.07	94.08	93.05	92.51	91.76
10	98.90	96.94	94.00	93.07	92.48	91.74
11	98.85	96.83	93.94	93.09	92.47	91.73
12	98.80	96.73	93.85	93.10	92.48	91.70
13	98.67	96.64	93.70	93.08	92.47	91.70
14	98.58	96.54	93.69	93.06	92.41	91.67
15	98.55	96.37	93.64	93.06	92.36	91.64
16	98.55	96.26	93.56	93.03	92.34	91.64
17	98.53	96.15	93.51	93.02	92.32	91.63
18	98.49	96.02	93.44	93.02	92.31	91.53
19	98.44	95.91	93.30	93.00	92.29	91.48
20	98.37	95.87	93.21	93.00	92.26	91.47

a Recorder not operating.

## San Gabriel River Basin--Continued

42a. Baldwin Park, Calif.--Continued

Water level, in feet above mean sea level minus 200, 1939

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.
21	98.31	95.79	93.16	93.00	92.23	91.46
22	98.25	95.73	93.08	93.00	92.20	91.45
23	98.29	95.64	92.96	92.98	92.18	91.44
24	98.28	95.52	92.91	92.97	92.12	91.42
25	98.28	95.37	92.93	92.94	92.03	91.40
26	98.16	95.22	92.89	92.81	92.06	91.41
27	98.10	95.15	92.93	92.78	92.01	91.39
28	97.97	95.04	92.95	92.79	91.99	91.37
29	97.85	94.95	92.97	92.79	91.96	91.38
30	97.86	94.85	93.01	92.75	91.93	91.41
31	97.78	94.77	.....	92.71	.....	91.40

## San Bernardino Basin

Williams Well. Record furnished by Gage Canal Co.. Location of well given in Water-Supply Paper 817, p. 12, should be revised to read: 50 feet north of Santa Ana River.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	22.50	Apr. 8	17.92	July 8	20.50	Oct. 7	26.50
14	21.92	15	17.00	15	21.25	14	26.25
21	21.42	22	16.08	22	22.00	21	26.00
28	20.92	29	15.50	29	22.83	28	26.00
Feb. 4	20.58	May 6	15.25	Aug. 5	23.50	Nov. 4	26.00
11	20.25	13	15.50	12	24.00	11	26.00
18	19.92	20	15.92	19	24.50	18	26.08
25	19.50	27	16.50	26	25.00	25	26.16
Mar. 4	19.16	June 3	17.16	Sept. 2	25.50	Dec. 2	26.00
11	18.92	10	17.75	9	25.92	9	26.08
18	18.66	15	18.50	16	26.25	16	26.08
25	18.58	24	19.08	23	26.58	23	26.00
Apr. 1	18.42	July 1	19.83	30	26.75	30	25.92

## Santa Ana River Basin

41b. South of Anaheim, Orange County. Measuring point, 0.1 foot above land surface and 136.1 feet above mean sea level. Record furnished by Orange County Flood Control District.

Water level, in feet below measuring point, 1939

Jan. 5	115.87	Mar. 13	112.03	Aug. 2	121.11	Oct. 26	118.95
16	115.03	30	111.67	9	a132.97	Nov. 14	a131.26
26	114.56	Apr. 13	111.82	Sept. 14	122.37	Dec. 7	119.40
Feb. 6	113.81	May 22	114.02	15	122.28	8	118.88
16	113.18	June 23	117.30	Oct. 5	122.42	28	118.19
Mar. 9	112.29	July 10	a130.74	16	119.29		

72c. San Jacinto Valley at Perris, Riverside County. Water levels, in feet below measuring point, 1939: Feb. 14, 72.30; May 31, 72.64; Aug. 17, 72.73; Nov. 15, 72.72.

## Tia Juana River Basin

0118b. Owens ranch. Water levels, in feet below measuring point, 1939: Feb. 23, 11.79; Apr. 19, 11.17; June 29, 13.63; Sept. 9, 16.04; Nov. 18, 15.50.

0120. Hewitt Bros. hog ranch. Water levels, in feet below measuring point, 1939: Feb. 23, 12.31; Apr. 19, 11.20; June 29, b/12.34; Sept. 9, 13.68; Nov. 18, 14.82.

a Pumping.

b Pump operating in nearby well.

## Tia Juana River Basin--Continued

0125. Evans ranch. Water levels, in feet below measuring point, 1939: Feb. 23, 11.15; Apr. 19, 10.93; June 29, 13.16; Sept. 9, 13.98; Nov. 18, 12.50.

0130b. Nestor Bridge. Water levels, in feet below measuring point, 1939: Feb. 23, 10.75; Apr. 19, 11.18; June 29, 14.34; Sept. 9, 15.74; Nov. 18, 13.98.

0140b. Mrs. A. W. Jackson. Water levels, in feet below measuring point, 1939: Feb. 23, 7.33; Apr. 19, 7.63; June 29, 8.43; Sept. 9, 8.79; Nov. 18, 8.11.

## Otay River Basin

039a. N. Bard. Water levels, in feet below measuring point, 1939: Feb. 23, 33.31; Apr. 19, 32.77; June 29, 33.09; Sept. 9, dry; Nov. 18, dry.

089a. G. W. St. Clair. Water levels, in feet below measuring point, 1939: Feb. 23, 24.65; Apr. 19, 24.51; June 29, 25.38; Sept. 9, 26.73; Nov. 18, 26.13.

## Sweetwater River Basin

018c. L. C. Kincaid. Water levels, in feet below measuring point, 1939: Feb. 23, 11.05; Apr. 19, 11.61; June 29, 13.17; Sept. 9, 14.20; Nov. 18, 14.45.

## San Diego River Basin

L28. San Diego County, El Monte Park.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 20	19.39	Apr. 28	10.02	Aug. 1	18.20	Dec. 1	(a)
Mar. 18	10.14	June 21	14.96	Oct. 24	21.51		

L29. Pratt test well.

Water level, in feet below measuring point, 1939

Jan. 20	6.42	Apr. 28	6.85	Aug. 1	8.17	Dec. 1	7.02
Mar. 18	6.51	June 21	7.25	Oct. 24	7.20		

L30. Irrigation District well No. 6.

Water level, in feet below measuring point, 1939

Jan. 20	3.50	Apr. 28	3.57	Aug. 1	5.73	Dec. 1	5.29
Mar. 18	3.47	June 21	4.59	Oct. 24	5.41		

L31. Truttman ranch.

Water level, in feet below measuring point, 1939

Jan. 20	3.70	Apr. 28	3.74	Aug. 1	5.39	Dec. 1	5.42
Mar. 18	3.70	June 21	4.56	Oct. 24	5.53		

L32. Dr. Irely ranch.

Water level, in feet below measuring point, 1939

Jan. 20	8.94	Apr. 28	8.56	Aug. 1	9.99	Dec. 1	10.16
Mar. 18	8.57	June 21	9.31	Oct. 24	10.23		

L33. County yard.

Water level, in feet below measuring point, 1939

Jan. 20	8.62	Apr. 28	7.48	Aug. 1	9.20	Dec. 1	9.44
Mar. 18	7.53	June 21	8.44	Oct. 24	9.46		

L5a. J. F. Rickerts.

Water level, in feet below measuring point, 1939

Jan. 20	11.85	Apr. 28	10.60	Aug. 1	12.08	Dec. 1	12.12
Mar. 18	10.69	June 21	11.44	Oct. 24	12.15		

a Pump operating in well.

## San Diego River Basin--Continued

## L35. Langdon.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 20	9.58	Apr. 28	7.70	Aug. 1	9.55	Dec. 1	10.38
Mar. 18	7.90	June 21	(a)	Oct. 24	10.23		

## L37. Levi.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 20	9.38	Apr. 28	9.07	Aug. 1	11.92	Dec. 1	12.23
Mar. 18	8.98	June 21	10.57	Oct. 24	12.16		

## L39. Burch.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 20	9.31	Apr. 28	7.68	Aug. 1	9.82	Dec. 1	9.73
Mar. 18	8.57	June 21	8.86	Oct. 24	9.78		

## L2. Riverview well 2.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 20	2.68	Apr. 28	2.70	Aug. 1	5.12	Dec. 1	3.78
Mar. 18	2.29	June 21	4.11	Oct. 24	3.60		

## L44a. Riverview well 3.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 20	4.89	Apr. 28	4.02	Aug. 1	5.66	Dec. 1	5.44
Mar. 18	3.95	June 21	4.91	Oct. 24	5.43		

## L83c. Riverview well 1.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 20	0.80	Apr. 28	0.40	Aug. 1	1.91	Dec. 1	1.73
Mar. 18	.40	June 21	1.30	Oct. 24	1.89		

## L46. County Farm.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 20	7.26	Apr. 28	6.61	Aug. 1	8.31	Dec. 1	8.83
Mar. 17	6.48	June 21	7.51	Oct. 24	8.81		

## L85. William Thum.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 20	10.14	Apr. 28	(a)	Aug. 1	(a)	Dec. 1	12.29
Mar. 17	9.12	June 21	a 17.02	Oct. 24	11.84		

## K51a. Jaussaud.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 20	15.78	Apr. 28	a 20.78	Aug. 1	18.34	Dec. 1	18.01
Mar. 17	15.06	June 21	b 24.08	Oct. 24	18.02		

## K51b. Jaussaud.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 20	14.36	Apr. 28	b 15.69	Aug. 1	16.91	Dec. 1	16.59
Mar. 17	13.59	June 21	a 19.11	Oct. 24	16.62		

## K60. Bridges.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 20	1.91	Apr. 28	1.76	Oct. 24	2.68	Dec. 1	a 6.63
Mar. 17	1.65	Aug. 1	(a)				

a Pump operating in well.

b Pump operating in nearby well.

## San Diego River Basin--Continued

## K62. Madruga.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 20	9.87	Apr. 28	8.85	Aug. 1	10.23	Dec. 1	11.13
Mar. 17	8.80	June 21	9.61	Oct. 24	10.88		

## K63. Confar.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 20	12.04	Apr. 28	11.44	Aug. 1	14.63	Dec. 1	13.32
Mar. 17	10.97	June 21	12.58	Oct. 24	14.02		

## K33a. Chapman.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 20	8.79	Apr. 28	8.46	Aug. 1	8.88	Dec. 1	8.91
Mar. 17	8.32	June 21	8.85	Oct. 24	9.07		

## San Dieguito River Basin

G17a. Pratt ranch. Water levels, in feet below measuring point, 1939: Feb. 3, 0.55; Apr. 25, 1.09; June 28, 2.26; Sept. 1, 3.61; Nov. 17, a.

G17b. Pratt ranch. Water levels, in feet below measuring point, 1939: Feb. 3, 4.76; Apr. 25, 5.26; June 28, 6.47; Sept. 1, 7.69; Nov. 17, b/7.55.

H31b. Old San Pasqual Creamery. Water levels, in feet below measuring point, 1939: Feb. 3, 9.72; Apr. 25, 9.06; June 28, 8.99; Sept. 1, a/11.10; Nov. 17, a/12.14.

H1a. Fenton ford. Water levels, in feet below measuring point, 1939: Feb. 3, 4.33; Apr. 25, 4.50; June 28, 5.46; Sept. 1, 7.36; Nov. 17, 7.88.

H1b. Fenton ford. Water levels, in feet below measuring point, 1939: Feb. 3, 2.33; Apr. 25, 2.45; June 28, 4.11; Sept. 1, 6.17; Nov. 17, 6.19.

H34b. Peet ranch. Water levels, in feet below measuring point, 1939: Feb. 3, 4.88; Apr. 25, 4.99; June 28, 5.18; Sept. 1, 5.49; Nov. 17, 4.98.

## San Luis Rey River Basin

C9a. San Luis Rey ranch. Measuring point, 273.97 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 12	11.51	Apr. 14	11.74	July 14	12.64	Oct. 16	12.07
Feb. 15	11.74	May 16	12.82	Aug. 14	12.83	Nov. 13	12.10
Mar. 1	11.78	June 16	12.56	Sept. 15	12.93	Dec. 18	12.08
16	11.93						

C9b. San Luis Rey ranch. Measuring point, 284.16 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 12	8.93	Apr. 14	8.97	July 14	9.23	Oct. 16	9.16
Feb. 15	8.87	May 15	9.03	Aug. 14	9.20	Nov. 13	9.15
Mar. 1	8.94	16	9.05	Sept. 15	9.18	Dec. 18	9.19
16	8.96	June 16	9.19				

a Pump operating in well.

b Pump operating in nearby well.

## San Luis Rey River Basin--Continued

C9c. San Luis Rey ranch. Measuring point, 230.91 feet above sea level.  
Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 12	5.95	Apr. 14	5.97	July 14	6.26	Oct. 16	6.21
Feb. 15	5.87	May 15	6.09	Aug. 14	6.23	Nov. 13	6.25
Mar. 1	5.99	16	6.11	Sept. 15	6.15	Dec. 18	6.17
16	6.00	June 16	6.21				

C8. Fallbrook Public Utility District observation well on San Luis Rey ranch. Diameter 8 inches, depth 68.6 feet. Measuring point, top of 2-inch coupling at east side, 3 feet above land surface and 240.11 feet above sea level.

Water level, in feet below measuring point, 1939

Apr. 14	8.17	June 16	8.58	Sept. 15	8.99	Nov. 13	8.31
May 15	8.31	July 14	8.79	Oct. 16	8.53	Dec. 18	8.25
16	8.33	Aug. 14	9.03				

C3a. Gird ranch. Measuring point, 208.84 feet above sea level.  
Water level, in feet below measuring point, 1939

Jan. 12	8.26	Apr. 14	8.64	July 14	9.92	Oct. 16	9.53
Feb. 15	8.25	May 15	8.98	Aug. 14	10.33	Nov. 13	9.20
Mar. 1	8.51	16	9.01	Sept. 15	10.77	Dec. 18	9.05
16	8.42	June 16	9.52				

C5. Hart Incorporated. Measuring point, 194.10 feet above sea level.  
Water level, in feet below measuring point, 1939

Jan. 12	6.10	Mar. 16	6.08	June 16	6.34	Sept. 15	a 8.35
Feb. 15	6.03	Apr. 14	6.10	July 14	a 7.21	Oct. 16	6.81
Mar. 1	6.10	May 15	6.19	Aug. 14	7.87	Nov. 13	6.31

C7b. Bonsall School well. Measuring point, 162.30 feet above sea level.  
Water level, in feet below measuring point, 1939

Jan. 12	8.77	Apr. 14	8.99	July 14	10.10	Oct. 16	10.30
Feb. 15	8.29	May 15	9.44	Aug. 14	11.64	Nov. 13	10.37
Mar. 1	8.71	16	9.52	Sept. 15	10.54	Dec. 18	10.11
16	8.70	June 16	9.84				

C4. Fallbrook Public Utility District observation well on San Diego County Water Company property, 1 mile west of Bonsall Post Office and 300 yards south of State highway 395. Diameter 8 inches, depth 80 feet. Measuring point, top of 2-inch coupling at east side, 3 feet above land surface and 152.76 feet above sea level.

Water level, in feet below measuring point, 1939

Apr. 14	10.75	June 16	11.38	Sept. 15	12.99	Nov. 13	11.30
May 15	11.00	July 14	11.79	Oct. 16	11.44	Dec. 18	11.14
16	11.01	Aug. 14	12.56				

F36. City of Oceanside observation well on Stokes property, on north bank of San Luis Rey River, east of San Luis Rey. Diameter 4 inches, depth 197 feet. Measuring point, top of casing, 3.5 feet above land surface. Water levels, in feet below measuring point, 1939: Sept. 15, 13.63; Oct. 16, 14.11; Nov. 13, 14.42; Dec. 18, 14.29.

F22. Santa Fe well. Measuring point, 61.67 feet above sea level.  
Water level, in feet below measuring point, 1939

Jan. 12	9.62	Apr. 14	9.91	July 14	(b)	Oct. 16	(b)
Feb. 15	9.35	May 15	9.79	Aug. 14	(b)	Nov. 13	13.78
Mar. 1	9.43	June 16	(b)	Sept. 15	(b)	Dec. 18	13.92
16	9.42						

a Pump operating in nearby well.  
b Pump operating in well.

## San Luis Rey River Basin--Continued

F30. Carlsbad Mutual Water Company observation well near north abutment of County road bridge at San Luis Rey. Diameter 4 inches, depth 38 feet. Measuring point, top of casing, 2 feet above land surface and 59.41 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 14	7.76	June 16	8.64	Sept. 15	10.91	Nov. 13	11.40
May 15	8.00	July 14	9.25	Oct. 16	11.06	Dec. 18	11.31
16	7.98	Aug. 14	10.36				

F17. Old San Luis Rey store. Measurements have been referenced to the measuring point used prior to Dec. 30, 1929 by adding 3.1 feet.

Water level, in feet below measuring point, 1939

Jan. 12	11.05	Apr. 14	10.10	July 14	10.20	Oct. 16	11.92
Feb. 15	10.49	May 15	10.12	Aug. 14	10.77	Nov. 13	11.93
Mar. 1	10.36	June 16	10.24	Sept. 15	a 12.32	Dec. 18	12.65
16	10.27						

F32. Carlsbad Mutual Water Company observation well, 0.25 mile east of pumping plant and 100 feet north of State highway. Diameter 6 inches, depth 115 feet. Measuring point, top of casing at east side, 2 feet above land surface and 36.44 feet above sea level.

Water level, in feet below measuring point, 1939

Apr. 14	12.46	June 12	16.89	Aug. 14	19.20	Nov. 13	21.28
May 15	15.45	16	17.16	Sept. 15	22.66	Dec. 18	22.29
16	15.41	July 14	18.21	Oct. 16	18.39		

F13b. City of Oceanside. Measuring point, 27.13 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 12	11.79	Apr. 14	10.11	July 14	18.62	Oct. 16	19.35
Feb. 15	10.21	May 15	20.24	Aug. 14	16.32	Nov. 13	14.76
Mar. 1	17.70	June 16	16.93	Sept. 15	16.98	Dec. 18	15.63
16	11.61						

F13c. City of Oceanside. Measuring point, 25.47 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 12	11.91	Apr. 14	11.39	July 14	15.27	Oct. 16	13.90
Feb. 15	10.38	May 15	14.61	Aug. 14	15.00	Nov. 13	13.92
Mar. 1	10.98	June 16	14.75	Sept. 15	14.36	Dec. 18	13.24
16	11.10						

F13d. City of Oceanside. Measuring point, 24.43 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 12	11.55	Apr. 14	10.50	July 14	15.05	Oct. 16	15.03
Feb. 15	10.44	May 15	14.17	Aug. 14	14.31	Nov. 13	13.43
Mar. 1	12.81	June 16	14.13	Sept. 15	14.47	Dec. 18	13.89
16	10.31						

F13e. City of Oceanside well 3, 0.1 mile northwest of old brick pumping plant, pump removed from well. Diameter 14 inches, depth 180 feet. Measuring point, top of casing at west side, 2.5 feet above land surface and 20.71 feet above sea level.

Water level, in feet below measuring point, 1939

Mar. 16	7.78	June 16	10.90	Sept. 15	11.35	Nov. 13	11.62
Apr. 14	8.04	July 14	11.75	Oct. 16	11.83	Dec. 18	10.92
May 15	10.56	Aug. 14	11.27				

a Pump operating in well.

## Mojave River Basin

U1. Olive, formerly West. SE cor. NW $\frac{1}{4}$  sec. 13, T. 3 N., R. 4 W., on west side of road from West Fork saddle to McInnis crossing. Dug well with casing in bottom. Equipped with windmill. Measuring point through June 3, 1938, top of board cover at land surface, 3,012.47 feet above sea level. Measuring point since June 3, 1938, top of concrete platform, 0.20 foot above land surface, 3,012.67 feet above sea level.

Water level, in feet below measuring point, 1922-23, 1929-33, 1935-39

Date	Water level	Date	Water level	Date	Water level
May 15, 1922	a 69.83	Mar. 4, 1931	78.95	Dec. 14, 1933	89.70
Jan. 11, 1923	a 68.65	May 1	78.04	Jan. 16, 1935	81.95
Sept. 27	a 71.88	Nov. 13	83.70	Nov. 29	87.25
Oct. 18	a 69.67	Jan. 7, 1932	81.87	Apr. 2, 1936	79.60
Dec. 6, 1929	b 84.9	Feb. 20	80.06	Jan. 28, 1937	79.70
Mar. 5, 1930	80.54	Mar. 18	79.26	Dec. 3	78.30
Apr. 1	79.29	June 9	77.94	June 3, 1938	72.60
21	78.70	Aug. 9	78.82	Oct. 27	69.68
Dec. 11	81.05	Nov. 3	84.84	Nov. 24, 1939	69.94
Jan. 27, 1931	79.85				

U4. Near cen. SE $\frac{1}{4}$  sec. 12, T. 3 N., R. 4 W., on west side of river just upstream from McInnis crossing. Dug well, diameter 3 feet, depth 26 feet. Measuring point, top of plank cover on concrete curb, 2,955.38 feet above sea level.

Water level, in feet below measuring point, 1929-32, 1935-39

Dec. 6, 1929	b 25.9	May 1, 1931	8.40	Nov. 3, 1932	b 25+
Mar. 8, 1930	8.40	Aug. 4	20.79	Jan. 16, 1935	8.30
Apr. 1	8.26	Oct. 1	(b)	Nov. 5	(b)
12	8.11	Jan. 7, 1932	8.80	Apr. 12, 1936	9.52
21	8.52	Feb. 20	7.55	Dec. 3, 1937	(b)
Dec. 11	15.07	Mar. 18	7.85	June 3, 1938	7.55
Jan. 27, 1931	14.29	June 9	7.46	Oct. 27	7.85
Feb. 20	8.62	Aug. 9	14.92	Nov. 24, 1939	14.05
Mar. 4	8.70				

U6. Mike Spranger. Near center of east line SW $\frac{1}{4}$  sec. 6, T. 3 N., R. 3 W., near east bank of Mojave River at headgate of Laughlin ditch. Drilled well, diameter 12 inches. Steel casing, shallow timber-curbed pit. Measuring point, top of casing, about 2 feet below land surface and 2,929.28 feet above sea level.

Water level, in feet below measuring point, 1929-32, 1935-39

Dec. 1929	b 27	Oct. 8, 1931	b 27	May 8, 1935	2.57
Apr. 2, 1930	3.00	Jan. 15, 1932	4.53	Nov. 5	(b)
14	2.94	Feb. 19	2.95	Feb. 26, 1936	2.89
21	3.03	Mar. 18	2.80	Mar. 18	2.84
30	2.93	Apr. 19	2.82	Dec. 14	b 25+
Jan. 27, 1931	b 27	July 15	10.73	June 10, 1937	2.20
Feb. 12	3.92	Feb. 1, 1935	2.98	Dec. 3	(b)
20	3.50	19	2.75	Nov. 4, 1938	19.46
May 1	3.44	Mar. 13	2.60	June 15, 1939	8.89
Aug. 4	26.68	Apr. 18	2.55	Nov. 24	23.72

U9. A. W. Cole. Near NE cor. SW $\frac{1}{4}$  sec. 30, T. 4 N., R. 3 W. Dug and drilled well, 5-foot concrete pit with casing in bottom. Equipped with engine driven pump; used for irrigation. Measuring point, top of concrete curb on north side, at land surface, 2,897.33 feet above sea level. See Water-Supply Paper 578, p. 395, and pl. 22, well 16.

Water level, in feet below measuring point, 1917, 1930-32, 1934-39

Mar. 6, 1917	c 32.80	Mar. 3, 1931	44.48	Apr. 16, 1935	39.22
Jan. 18, 1930	45.62	May 1	45.10	Nov. 5	41.65
Mar. 5	46.00	July 28	45.78	Mar. 19, 1936	41.55
17	45.80	Feb. 20, 1932	45.07	May 12	38.95
22	45.74	Mar. 18	40.20	Jan. 28, 1937	44.65
Apr. 1	44.16	June 2	36.96	Dec. 3	39.37
14	42.07	Aug. 9	38.00	June 3, 1938	30.35
21	42.13	Nov. 3	40.35	Oct. 27	36.55
30	41.20	May 17, 1934	44.85	June 15, 1939	33.56
Jan. 25, 1931	45.15	Jan. 24, 1935	46.95	Nov. 24	39.36
Feb. 12	44.46				

a Measurement by W. P. Rowe. b Well dry.

c Bull. 5, Calif. State Dept. of Engineering, 1918, p. 84, well 16.



## Mojave River Basin--Continued

U13. Arrowhead Reservoir and Power Co. Near west line SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 19, T. 4 N., R. 3 W. Driven observation well, diameter 2 inches, depth 45 feet. Measuring point, top of pipe under coupling, 0.5 foot above land surface and 2,890.25 feet above sea level.

Water level, in feet below measuring point, 1905, 1907, 1930-39

Date	Water level	Date	Water level	Date	Water level
Jan. 28, 1905	a 39.57	May 26, 1932	15.25	Mar. 19, 1936	30.05
June 12, 1907	a 10.75	June 2	15.95	25	30.41
Mar. 5, 1930	39.38	July 15	22.60	Apr. 2	30.90
17	39.59	Sept. 7	27.50	8	30.92
22	39.49	Nov. 3	30.90	14	27.67
Apr. 1	33.45	Mar. 3, 1933	35.64	21	24.60
8	29.67	Apr. 18	23.56	28	23.75
14	27.61	Dec. 14	36.69	May 5	23.60
21	27.10	May 17, 1934	37.41	12	24.53
30	28.09	Jan. 7, 1935	42.08	19	25.48
May 12	24.71	Feb. 24	38.55	26	26.30
Dec. 11	35.30	Feb. 1	37.05	June 2	27.05
Jan. 28, 1931	36.89	12	32.51	9	27.79
Feb. 12	37.23	27	26.75	Dec. 14	36.98
20	37.35	Mar. 13	24.13	Jan. 27, 1937	37.71
May 1	38.51	Apr. 18	18.68	June 10	13.30
July 28	38.55	May 8	17.10	17	13.70
Nov. 13	40.40	22	17.00	30	16.10
Jan. 15, 1932	40.97	Nov. 5	32.53	Nov. 16	28.88
Feb. 19	30.42	Dec. 23	34.57	June 3, 1938	13.20
Mar. 18	22.54	Jan. 29, 1936	35.95	Oct. 29	26.32
Apr. 19	17.96	Feb. 26	35.67	Mar. 16, 1939	23.22
May 5	16.61	Mar. 5	31.89	June 8	20.75
13	16.04	11	30.33	Nov. 24	30.94

U14. O. A. Minister. Near SW cor. sec. 20, T. 4 N., R. 3 W. Dug and drilled well, diameter 12 inches. Steel casing in timber curbed pit. Measuring point through May 17, 1934, top of casing 0.5 foot below land surface and 2,887.89 feet above sea level. Measuring point since May 17, 1934, top of curb, at land surface, and 2,888.4 feet above sea level.

Water level, in feet below measuring point, 1930-39

Jan. 16, 1930	35.76	Mar. 30, 1932	25.58	Apr. 2, 1936	31.55
Feb. 11	36.50	May 5	20.75	8	31.45
Mar. 5	36.79	June 2	18.82	14	30.64
17	37.02	Sept. 7	25.57	28	27.73
22	37.06	Nov. 3	28.65	May 5	27.00
Apr. 1	36.20	Dec. 14, 1933	34.20	12	26.72
8	34.30	May 17, 1934	34.95	19	26.76
14	32.56	Jan. 24, 1935	38.65	26	26.90
21	30.96	Feb. 12	37.36	June 2	27.25
30	29.88	19	35.31	9	28.22
Dec. 11	32.84	Apr. 18	24.35	Dec. 14	35.50
Jan. 28, 1931	34.33	May 8	22.13	Jan. 27, 1937	36.41
Feb. 12	34.84	22	21.30	June 10	17.15
20	34.98	Nov. 5	31.18	17	17.10
May 1	36.33	Dec. 23	33.12	30	17.70
July 28	36.00	Jan. 29, 1936	34.44	Nov. 16	27.53
Oct. 8	37.29	Feb. 26	35.08	June 3, 1938	16.10
Nov. 13	37.83	Mar. 5	34.14	Oct. 29	25.20
Jan. 15, 1932	38.63	11	33.15	June 8, 1939	21.05
Feb. 19	35.80	19	32.23	Nov. 24	29.72
Mar. 18	27.87	25	31.80		

a Lowest and highest water levels Jan. 1905 to Dec. 1920; from records of Arrowhead Reservoir and Power Co.

## Mojave River Basin--Continued

U15. J. M. Allison. Near center of south line NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 20, T. 4 N., R. 3 W. Abandoned drilled well, diameter 10 inches. Measuring point, top of casing, 0.9 foot above land surface and 2,887.83 feet above sea level.

Water level, in feet below measuring point, 1923, 1930-39

Date	Water level	Date	Water level	Date	Water level
Jan. 9, 1923	a 23.73	May 5, 1932	28.06	Apr. 2, 1936	35.02
Jan. 18, 1930	38.20	June 2	25.97	8	34.87
Mar. 5	38.97	Sept. 13	29.89	14	34.64
17	39.15	Nov. 3	32.05	28	33.00
22	39.17	Dec. 21, 1933	37.05	May 5	32.19
Apr. 1	39.09	May 17, 1934	37.76	12	31.65
8	38.39	Jan. 24, 1935	41.59	19	31.38
14	37.40	Feb. 12	40.36	26	31.34
21	37.24	19	39.40	June 2	31.30
30	35.12	Apr. 18	30.66	9	31.55
Dec. 11	35.74	May 8	28.60	Dec. 14	37.15
Jan. 28, 1931	36.95	22	27.54	Jan. 27, 1937	38.10
Feb. 12	37.30	Nov. 5	33.50	June 10	23.57
20	37.46	Dec. 23	35.00	17	23.30
May 1	38.78	Jan. 29, 1936	36.10	30	23.34
July 28	38.95	Feb. 26	36.80	Nov. 16	30.10
Nov. 13	40.21	Mar. 5	36.60	June 3, 1938	22.05
Jan. 15, 1932	40.85	10	36.20	Oct. 29	27.76
Feb. 19	40.18	19	35.68	June 8, 1939	25.01
Mar. 18	34.44	25	35.30	Nov. 24	31.61
30	32.45				

U16. N. F. Marsh. Near center of south line NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 20, T. 4 N., R. 3 W. Used drilled irrigation well, depth 180 feet. Measuring point, top of concrete pump base, 0.1 foot above land surface and 2,970.97 feet above sea level. Equipped with electric turbine pump.

Water level, in feet below measuring point, 1931-33, 1935-37, 1939

Jan. 28, 1931	121.40	May 5, 1932	118.10	Dec. 23, 1935	119.70
Mar. 4	122.15	July 15	115.10	Apr. 2, 1936	120.90
July 28	123.80	Sept. 13	116.17	May 12	119.45
Jan. 15, 1932	124.75	Mar. 3, 1933	120.10	Jan. 27, 1937	122.23
Feb. 19	124.60	Dec. 21	121.40	Mar. 16, 1939	115.90
Mar. 18	122.65	Jan. 24, 1935	125.48	Nov. 24	116.35
30	121.50				

U17. W. O. Wade. SW cor. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 21, T. 4 N., R. 3 W. Abandoned dug and drilled irrigation well, depth 650 feet. Timber-curbed pit with steel casing in bottom. Measuring point, top of north curb, at land surface, and 3,100.53 feet above sea level. See Water-Supply Paper 578, p. 396, and pl. 22, well 77.

Water level, in feet below measuring point, 1917, 1923, 1930-39

Mar. 1, 1917	b 242.0	June 2, 1932	254.10	June 3, 1936	254.0
Jan. 9, 1923	a 247.60	July 20	253.05	July 7	254.5
Jan. 31, 1930	255.74	Sept. 13	253.00	Jan. 27, 1937	256.0
Dec. 17	254.97	Mar. 2, 1933	254.55	June 30	251.8
Mar. 10, 1931	255.70	Dec. 21	255.40	Dec. 3	252.0
May 11	256.58	May 17, 1934	256.5	June 3, 1938	250.2
Aug. 4	257.20	Jan. 24, 1935	258.6	Mar. 16, 1939	251.3
Jan. 20, 1932	257.95	May 8	255.3	June 8	250.0
Mar. 25	256.75	Dec. 23	254.2	Nov. 24	251.3
Apr. 29	255.60	Apr. 2, 1936	255.6		

a Measurement by W. P. Rowe.

b Bull. 5, Calif. State Dept. of Engineering, 1918, p. 86, well 77.

## Mojave River Basin--Continued

U18a. W. E. Tussing. NE cor. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 10, T. 4 N., R. 3 W., 0.25 mile northeast of ranch buildings. Unused drilled irrigation well, diameter 12 inches. Measuring point, top of casing, 1.0 foot above land surface and 3,078.75 feet above sea level. Irrigation well and pumping plant, 0.25 mile south.

Water level, in feet below measuring point, 1931-33, 1935-39

Date	Water level	Date	Water level	Date	Water level
May 13, 1931	a 238.62	Jan. 24, 1935	239.60	June 29, 1937	239.15
Aug. 4	238.00	May 8	239.70	Dec. 3	238.50
Jan. 26, 1932	239.00	Dec. 23	239.25	June 3, 1938	238.00
Mar. 30	239.20	Apr. 2, 1936	239.30	Oct. 4	236.60
June 2	a 239.10	June 3	a 239.60	June 8, 1939	236.90
July 28	239.16	Jan. 27, 1937	239.15	Nov. 24	236.54
Mar. 3, 1933	238.47				

U19. E. D. S. Pope. Near SW cor. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 1, T. 4 N., R. 3 W. Abandoned drilled irrigation well, depth 730 feet. Measuring point, top of concrete slab, 0.2 foot above land surface and 3,044.03 feet above sea level.

Water level, in feet below measuring point, 1930-33, 1935-39

Jan. 31, 1930	202.68	June 2, 1932	202.61	June 3, 1936	203.00
Dec. 17	202.38	July 28	202.42	Jan. 27, 1937	203.75
Mar. 11, 1931	202.80	Mar. 2, 1933	202.40	Dec. 3	201.10
May 13	203.53	Feb. 21, 1935	204.75	June 3, 1938	199.63
Aug. 4	204.22	May 8	203.10	Oct. 4	200.66
Jan. 26, 1932	204.25	Dec. 23	202.90	June 8, 1939	198.80
Mar. 30	203.70	Apr. 2, 1936	203.35	Nov. 23	200.00
Apr. 29	203.24				

U21. A. B. Sheridan. SW cor. sec. 5, T. 4 N., R. 2 W. Abandoned drilled irrigation well, diameter 12 inches, depth 311 feet. Measuring point, top of casing, 2.5 feet above land surface and 3,085.54 feet above sea level. No pump in well.

Water level, in feet below measuring point, 1923, 1930-33, 1935-39

Feb. 13, 1923	b 232.85	Apr. 29, 1932	237.25	Jan. 27, 1937	238.20
Jan. 21, 1930	235.72	July 28	237.17	June 29	238.15
Dec. 17	236.32	Mar. 2, 1933	237.25	Dec. 3	237.95
Mar. 3, 1931	236.48	Feb. 21, 1935	238.05	June 3, 1938	237.66
May 13	236.55	Dec. 23	237.95	Oct. 4	238.46
Aug. 4	236.70	Apr. 2, 1936	238.22	June 8, 1939	236.63
Jan. 26, 1932	237.09	June 3	238.15	Nov. 24	236.10

U23. G. W. McLister. Near center south line NE $\frac{1}{4}$  sec. 19, T. 4 N., R. 3 W. Drilled domestic well, diameter 10 inches. Measuring point through Dec. 14, 1936, top of casing, 0.5 foot below land surface and 2,890.01 feet above sea level. Measuring point since Dec. 14, 1936, top of casing, 1.3 feet above land surface and 2,891.8 feet above sea level. Equipped with windmill; used infrequently. See Water-Supply Paper 578, p. 395, and pl. 22, well 18.

Water level, in feet below measuring point, 1917, 1931-32, 1935-37, 1939

Feb. 26, 1917	c 22.7	Apr. 19, 1932	18.78	May 22, 1935	19.35
Jan. 28, 1931	34.80	June 2	17.85	Nov. 5	31.70
Feb. 12	35.06	Sept. 13	27.63	Mar. 19, 1936	31.19
20	35.12	Nov. 3	29.97	June 3	28.20
May 1	35.94	Feb. 19, 1935	28.60	Dec. 14	35.28
July 28	37.00	Apr. 18	19.80	Nov. 16, 1937	30.00
Jan. 15, 1932	38.24	May 8	18.42	Nov. 24, 1939	31.44
Feb. 19	28.30				

a Nearby well pumping.

b Measurement by W. P. Rowe.

c Bull. 5, Calif. State Dept. of Engineering, 1918, p. 84, well 18.

## Mojave River Basin--Continued

U26. Arrowhead Reservoir and Power Co. Near NW cor. SW $\frac{1}{4}$  sec. 17, T. 4 N., R. 3 W., on west side of old road from Hesperia crossing to Apple Valley. Driven observation well, diameter 2 inches, depth 26.5 feet. Measuring point, top of coupling under plug, 0.4 foot above land surface and 2,865.55 feet above sea level.

Water level, in feet below measuring point, 1906, 1916, 1922-23, 1930-39

Date	Water level	Date	Water level	Date	Water level
Jan. 28, 1905	a 25.62	Mar. 18, 1932	22.90	Feb. 26, 1936	24.13
May 30, 1916	a 8.80	Apr. 19	19.87	Mar. 19	23.92
Aug. 9, 1922	b 10.05	May 13	18.20	Apr. 18	23.77
Jan. 9, 1923	b 13.78	June 2	17.18	May 14	23.71
Jan. 18, 1930	25.32	Sept. 13	19.72	June 3	22.00
Dec. 11	23.93	Nov. 3	21.08	Dec. 14	24.80
Jan. 28, 1931	24.52	Dec. 21, 1933	24.89	June 10, 1937	14.34
Feb. 12	24.70	May 17, 1934	25.18	Nov. 16	19.15
20	24.76	Jan. 16, 1935	(c)	June 3, 1938	13.25
May 1	c 26.5	Apr. 18	21.47	Oct. 29	17.06
July 28	(c)	May 8	19.77	June 15, 1939	15.34
Jan. 15, 1932	(c)	Nov. 5	22.22	Nov. 24	20.08
Feb. 19	(c)				

U27. Arrowhead Reservoir and Power Co. Near NW cor. NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 18, T. 4 N., R. 3 W., 300 feet south and 20 feet east of southeast corner of Evans ranch fence. Driven observation well, diameter 2 inches, depth 31 feet. Measuring point, top of coupling, 0.3 foot above land surface and 2,869.24 feet above sea level.

Water level, in feet below measuring point, 1905, 1911, 1930-38

Jan. 28, 1905	d 28.40	Feb. 19, 1932	10.50	Nov. 5, 1935	22.33
Nov. 13, 1911	d 7.00	Mar. 25	7.72	Jan. 29, 1936	25.24
Jan. 18, 1930	27.82	Sept. 13	18.70	Feb. 26	21.17
Apr. 3	15.34	Nov. 3	21.00	Mar. 19	21.27
Jan. 28, 1931	26.10	Dec. 21, 1933	27.33	Apr. 8	20.90
Feb. 12	26.53	May 17, 1934	26.15	June 3	18.58
20	26.70	Jan. 16, 1935	28.00	Dec. 14	26.75
May 1	25.79	Apr. 18	7.60	Nov. 16, 1937	20.19
July 28	28.04	May 8	6.74	Oct. 29, 1938	(e)
Oct. 8	29.15	22	10.10		

U28. C. O. Evans. Near SE cor. SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 18, T. 4 N., R. 3 W. Used drilled irrigation well, diameter 12 inches, depth 100 feet. Measuring point, hole in pump base for air-line, 1.0 foot above land surface and 2,867.58 feet above sea level. Equipped with engine driven pump. Companion well to U27.

Water level, in feet below measuring point, 1930-32, 1935, 1938-39

Jan. 18, 1930	29.85	Oct. 8, 1931	31.84	Apr. 18, 1935	22.50
Jan. 28, 1931	29.48	Jan. 15, 1932	31.48	May 8	21.14
Feb. 12	29.25	Feb. 19	27.00	22	21.70
20	29.32	Mar. 25	22.60	Oct. 29, 1938	23.12
May 1	30.30	May 5	21.84	June 7, 1939	21.05
July 28	31.38	Sept. 13	25.01	Nov. 24	25.24

U31. Center of east line of SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 5, T. 4 N., R. 3 W. Unused drilled domestic well. Casing in shallow concrete pit. Measuring point, top of iron clamp on timber across casing, 3.2 feet below land surface and 2,999.51 feet above sea level. Equipped with windmill.

Water level, in feet below measuring point, 1931-32, 1939

Jan. 27, 1931	168.90	Aug. 4, 1931	169.98	July 20, 1932	169.00
Mar. 6	169.00	Mar. 24, 1932	169.59	June 20, 1939	165.35
May 7	169.34	June 2	168.32		

a Lowest and highest water levels 1905 to 1919; from records of Arrowhead Reservoir and Power Co. test well 8; observations made monthly.

b Measurement by W. P. Rowe.

c Well dry.

d Lowest and highest water levels 1905 to 1920; from records of Arrowhead Reservoir and Power Co. test well 9; observations made monthly.

e Well destroyed.

## Mojave River Basin--Continued

U43. A. W. Phillips. Near NE cor. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 6, T. 4 N., R. 3 W. Used drilled domestic well, diameter 10 inches, depth 100 feet. Steel casing set in a concrete block. Measuring point, crack in windmill foundation, 1.5 feet above land surface, 0.5 foot above concrete block and 2,873.02 feet above sea level. Equipped with cylinder pump and windmill. See Water-Supply Paper 578, p. 396, and pl. 22, well 67.

Water level, in feet below measuring point, 1917, 1930-39

Date	Water level	Date	Water level	Date	Water level
Feb. 24, 1917	a 51.5	July 20, 1932	56.20	Nov. 5, 1935	b 56.19
Jan. 25, 1930	56.32	Sept. 13	56.34	Mar. 19, 1936	55.54
Jan. 26, 1931	56.19	Oct. 8	56.16	Dec. 14	56.30
Feb. 17	56.12	Nov. 3	55.80	June 29, 1937	b 54.0
May 7	56.82	Dec. 21, 1933	56.26	Nov. 16	54.30
July 28	b 58.95	May 17, 1934	57.60	June 3, 1938	b 53.0
Nov. 18	57.68	Jan. 16, 1935	57.35	Oct. 29	53.92
Jan. 7, 1932	57.34	May 8	55.68	June 8, 1939	54.00
Feb. 19	56.87	22	55.54	Nov. 25	54.69
May 27	b 56.30				

U44. A. J. Lintner. Near NE cor. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 6, T. 4 N., R. 3 W. Used drilled irrigation well, diameter 12 inches. Measuring point, edge of hole in pump base, 0.5 foot above land surface and 2,872.41 feet above sea level. Equipped with electric turbine pump.

Water level, in feet below measuring point, 1931-32, 1934-39

Jan. 26, 1931	54.24	Mar. 24, 1932	54.37	June 3, 1936	55.30
Feb. 17	54.20	May 27	54.10	Dec. 14	54.61
May 7	55.20	Sept. 13	54.49	June 29, 1937	53.10
Aug. 24	56.62	Nov. 3	53.76	Nov. 16	52.52
Nov. 18	55.72	May 17, 1934	55.49	June 3, 1938	52.05
Jan. 17, 1932	55.45	May 22, 1935	55.00	Oct. 29	53.84
Feb. 19	55.20	Mar. 18, 1936	54.18	Nov. 24, 1939	52.07

U55. F. A. Fletcher. Near center west line SE $\frac{1}{4}$  sec. 9, T. 5 N., R. 3 W. Abandoned dug and drilled irrigation well, depth 458 feet. Steel casing in bottom of timber-curbed pit. Measuring point, top of 12-inch timber across pit, 1.0 foot above land surface and 2,919.09 feet above sea level. See Water-Supply Paper 578, p. 397, and pl. 22, well 131.

Water level, in feet below measuring point, 1917, 1930-33, 1935, 1937-39

Mar. 5, 1917	c 90.1	Aug. 3, 1931	88.98	June 29, 1937	89.70
Jan. 31, 1930	88.80	Apr. 29, 1932	89.06	Dec. 7	89.70
Dec. 17	88.88	Feb. 17, 1933	89.20	June 8, 1938	89.75
Jan. 30, 1931	88.88	Feb. 21, 1935	89.40	Oct. 27	89.82
May 14	89.00	Nov. 29	89.50	Nov. 24, 1939	89.80

U57. J. D. Humiston. SE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 18, T. 5 N., R. 3 W. Drilled irrigation well, diameter 14 inches, depth 464 feet. Measuring point through Feb. 13, 1923, top of concrete pipe, 1.0 foot above land surface, 7.25 feet above top of steel casing and 2,910.41 feet above sea level. Measuring point since Feb. 13, 1923, top of concrete pipe, 0.3 foot below land surface, 5.95 feet above top of steel casing and 2,909.11 feet above sea level. Equipped with windlass and bucket for domestic supply in 1938. See Water-Supply Paper 578, p. 397 and pl. 22, well 123.

Water level, in feet below measuring point, 1917, 1923, 1930-33, 1935, 1937-39

Feb. 27, 1917	d 98.0	Aug. 3, 1931	106.60	June 29, 1937	104.40
13, 1923	e 104.20	Apr. 29, 1932	105.42	Dec. 7	104.45
Jan. 25, 1930	105.44	July 28	105.30	June 7, 1938	103.65
Jan. 30, 1931	105.42	Mar. 2, 1933	105.10	Mar. 16, 1939	104.18
May 15	106.20	Feb. 21, 1935	106.20	Nov. 24	104.30

a Bull. 5, Calif. State Dept. of Engineering, 1918, p. 85, well 67.

b Pump operating in well.

c Bull. 5, Calif. State Dept. of Engineering, 1918, p. 87, well 131; measurement corrected to present measuring point.

d Bull. 5, Calif. State Dept. of Engineering, 1918, p. 87, well 123; measurement corrected to measuring point 2,910.41 feet above sea level.

e Measurement by W. P. Rowe.

## Mojave River Basin--Continued

U59. Lee Saul. SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 11, T. 5 N., R. 4 W. Used drilled domestic well, diameter 8 inches, depth 65 feet. Measuring point, top of casing, 2.6 feet above land surface and 2,788.27 feet above sea level. Equipped with cylinder pump and windmill.

Water level, in feet below measuring point, 1931-32, 1935, 1937-39

Date	Water level	Date	Water level	Date	Water level
Jan. 30, 1931	56.40	Mar. 22, 1932	55.29	June 7, 1938	a 56.40
Feb. 14	a 55.80	June 15	55.22	Oct. 27	56.65
May 14	55.85	May 8, 1935	55.45	June 20, 1939	56.73
July 28	56.10	Nov. 16, 1937	55.25	Nov. 24	56.60
Nov. 13	55.90				

U59a. Lee Saul. SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 11, T. 5 N., R. 4 W., 400 feet east of well U59. Used drilled irrigation well, diameter 16 inches, depth 323 feet. Measuring point, edge of hole in pump base, 0.5 foot above land surface, 0.1 foot above concrete foundation and 2,791.05 feet above sea level. Equipped with engine driven pump.

Water level, in feet below measuring point, 1930-32, 1935-39

1930	b 18	Mar. 22, 1932	27.87	June 29, 1937	36.15
Jan. 30, 1931	29.66	June 15	27.65	Nov. 16	36.30
May 22	31.26	May 8, 1935	33.40	Oct. 27, 1938	42.70
July 28	29.82	Nov. 5	31.27	June 20, 1939	46.75
Nov. 13	28.87	June 3, 1936	36.17	Nov. 24	43.60

U61. SW $\frac{1}{4}$  sec. 10, T. 5 N., R. 4 W., on hill in Victorville, 3 blocks southeast of U. S. Highway 66. Used dug domestic well. Measuring point, top of timber cover, 2.15 feet above land surface and 2,767.61 feet above sea level. Equipped with windmill.

Water level, in feet below measuring point, 1930-32, 1935, 1937-39

Dec. 20, 1930	45.62	Nov. 5, 1935	45.94	Oct. 27, 1938	45.83
May 15, 1931	45.74	Dec. 7, 1937	45.67	June 8, 1939	45.80
Nov. 12	46.05	June 7, 1938	45.50	Nov. 25	45.76
June 15, 1932	c 45.66				

U68. A. Sorensen, Verde ranch. Near NW cor. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 35, T. 5 N., R. 4 W., at milk house and west of wells on canal. Used drilled irrigation well, diameter 10 inches. Oil well casing. Measuring point,  $\frac{1}{4}$ -inch fitting on wood cap, 2.0 feet above land surface and 2,804.33 feet above sea level. See Water-Supply Paper 578, pp. 396, 403-404, and pl. 22, well 47. Water levels, in feet above measuring point: Apr. 12, 1917, de; Feb. 19, 1930, 10.0; Jan. 28, 1931, e; May 15, 1931, e; Nov. 12, 1931, e.

U72. Verde ranch. Near SW cor. sec. 36, T. 5 N., R. 4 W. Used dug and drilled irrigation well, diameter 12 inches, depth 306 feet. Casing in timber-curbed pit. Measuring point, 3 notches in top of west curb, 0.2 foot above land surface and 2,824.79 feet above sea level. Equipped with centrifugal pump and electric motor. See Water-Supply Paper 578, p. 396, and pl. 22, well 52.

Water level, in feet below measuring point, 1917, 1930-39

Apr. 12, 1917	f 4.0	Nov. 12, 1931	8.00	Nov. 29, 1935	6.72
Feb. 1, 1930	6.32	Jan. 7, 1932	7.40	Mar. 19, 1936	6.22
Apr. 3	6.62	Feb. 24	5.77	June 3	6.69
Jan. 28, 1931	8.44	Apr. 29	6.00	June 29, 1937	4.61
Feb. 14	8.38	Sept. 13	7.81	Dec. 3	4.57
20	8.32	Mar. 24, 1933	5.32	Oct. 27, 1938	3.74
May 2	9.43	Dec. 21	6.22	June 8, 1939	3.94
Aug. 4	10.65	May 17, 1934	6.90	Nov. 25	4.11
Oct. 8	8.47	May 22, 1935	5.50		

a Pump operating in well U59a.

b Reported by owner: after completion of drilling, before perforation of casing, water level in casing rose to 18 feet below land surface but dropped when the casing was perforated to 56 to 68 feet.

c Pump operating in well.

d Bull. 5, Calif. State Dept. of Engineering, 1918, p. 85, well 47.

e Found flowing; head not measured.

f Bull. 5, Calif. State Dept. of Engineering, 1918, p. 85, well 52.

## Mojave River Basin--Continued

M3. John Bennette. SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 19, T. 6 N., R. 4 W. Used dug domestic and stock well. Measuring point, top of wooden curb at ladder, 2.5 feet above land surface. Equipped with windmill.  
Water level, in feet below measuring point, 1930-32, 1934-39

Date	Water level	Date	Water level	Date	Water level
Sept. 4, 1930	19.90	Feb. 23, 1932	a 20.79	Mar. 26, 1936	a 19.40
Dec. 12	18.30	June 1	a 22.38	Jan. 15, 1937	20.13
May 20, 1931	a 18.86	Sept. 7	19.82	June 7, 1938	a 21.30
Aug. 5	19.38	Jan. 10, 1934	18.65	Nov. 11	22.62
Nov. 12	a 18.11	Jan. 21, 1935	18.39	May 25, 1939	20.01
Jan. 14, 1932	a 19.05	Nov. 12	a 18.68	Nov. 29	a 22.35

M7. NE cor. NW $\frac{1}{4}$  sec. 30, T. 7 N., R. 4 W. Abandoned drilled irrigation well. Measuring point, top of steel casing, 0.6 foot above land surface and 2,562.10 feet above sea level. Equipped with pump and gasoline engine.

Water level, in feet below measuring point, 1930-32, 1935-39

Sept. 4, 1930	57.62	Nov. 12, 1931	57.62	Nov. 12, 1935	58.25
Oct. 4	57.52	Dec. 23	57.46	Mar. 26, 1936	58.05
Dec. 12	57.37	Jan. 27, 1932	57.36	Jan. 14, 1937	58.00
Feb. 6, 1931	57.19	Feb. 23	57.34	June 21	58.30
Mar. 20	57.30	Mar. 23	57.40	Dec. 8	58.20
Apr. 24	57.30	Apr. 21	57.40	June 7, 1938	57.60
May 21	57.30	June 1	57.65	Oct. 4	57.62
July 29	57.89	Dec. 8	57.68	May 24, 1939	57.35
Sept. 2	57.81	Jan. 21, 1935	58.06	Nov. 25	57.71
Oct. 2	57.81				

M15. SE cor. sec. 31, T. 8 N., R. 4 W. Unused dug and drilled irrigation well, diameter 14 inches. Measuring point, top of concrete curb, at land surface, and 10.71 feet above top of steel casing in pit. No pump in well.

Water level, in feet below measuring point, 1930-32, 1934-39

Sept. 5, 1930	16.87	Feb. 23, 1932	14.40	Jan. 14, 1937	15.41
Dec. 13	15.00	Mar. 23	14.37	June 21	15.42
Mar. 20, 1931	14.48	June 23	14.97	Dec. 8	15.88
May 20	14.82	Sept. 7	16.07	June 7, 1938	15.20
Aug. 4	15.87	Jan. 10, 1934	15.05	Oct. 4	16.01
Oct. 2	15.97	Jan. 21, 1935	15.05	May 24, 1939	15.28
Nov. 5	15.42	Nov. 12	16.24	Nov. 25	15.71
Jan. 7, 1932	14.76	Mar. 26, 1936	15.02		

M19. F. H. Merrell. In center and near west line of NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 31, T. 8 N., R. 4 W., at ranch buildings. Used dug caisson-type irrigation and domestic well, diameter 8 feet, depth 68 feet. Measuring point, red arrow on top of concrete curb, 1.0 foot above land surface. Equipped with centrifugal pump and gasoline engine. Used chiefly for domestic supply from 1930 through 1939.

Water level, in feet below measuring point, 1930-32, 1939

Sept. 10, 1930	44.97	Aug. 5, 1931	44.88	May 26, 1932	44.10
Dec. 13	45.03	Nov. 5	44.90	July 6	44.35
Mar. 19, 1931	44.50	Jan. 7, 1932	44.65	Dec. 8	44.64
May 20	44.79	Mar. 4	44.32	Nov. 25, 1939	45.00

M22. Lord. In center and near south line SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 20, T. 8 N., R. 4 W. Used dug irrigation and domestic well. Measuring point, top of concrete curb on north side, about 9 feet below land surface. Equipped with centrifugal pump and electric motor.

Water level, in feet below measuring point, 1930-32, 1934-39

Dec. 13, 1930	3.00	May 26, 1932	2.06	Dec. 8, 1937	4.15
Mar. 26, 1931	2.49	Jan. 10, 1934	2.47	June 2, 1938	3.30
Oct. 2	3.45	Jan. 21, 1935	2.49	Oct. 4	a 4.58
Nov. 5	3.25	Nov. 12	3.48	May 24, 1939	3.40
Jan. 13, 1932	2.52	Mar. 26, 1936	2.80	Nov. 24	4.74
Mar. 8	2.01	Jan. 15, 1937	3.47		

a Pump operating in well.

## Mojave River Basin--Continued

M26. Near SW cor. SE $\frac{1}{4}$  sec. 2, T. 8 N., R. 4 W., north of road and power line. Unused dug well. Measuring point, top of south curb, 0.5 foot above land surface. No pump in well.

Water level, in feet below measuring point, 1930-32, 1934-39

Date	Water level	Date	Water level	Date	Water level
Sept. 16, 1930	26.00	Mar. 8, 1932	23.88	Jan. 15, 1937	25.32
Apr. 1, 1931	24.06	May 25	24.15	Dec. 8	25.92
May 20	24.33	Jan. 10, 1934	25.40	June 2, 1938	24.05
Aug. 5	25.74	Nov. 12, 1935	27.00	May 24, 1939	24.34
June 13, 1932	24.45	Mar. 26, 1936	24.15	Nov. 25	26.20

M30. Holcomb Brothers, formerly J. A. Decrow. SW cor. SE $\frac{1}{4}$  sec. 12, T. 8 N., R. 4 W. Used dug caisson-type irrigation well. Measuring point, top of concrete curb, about 1.0 foot above land surface.

Water level, in feet below measuring point, 1931-32, 1935-37, 1939

Apr. 3, 1931	9.04	Jan. 13, 1932	9.66	Nov. 12, 1935	11.00
May 20	9.54	Mar. 17	8.64	Mar. 26, 1936	9.41
Aug. 5	10.46	May 18	8.43	Jan. 15, 1937	10.19
Oct. 7	11.95	Nov. 15	9.92	Dec. 8	10.57
Nov. 17	10.63	Mar. 8, 1935	9.55	Nov. 25, 1939	10.83

M38. Everett Swing. SE cor. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 4, T. 8 N., R. 3 W., north of railroad at gates. Unused dug well, diameter 6 feet. Steel casing in bottom of timber-curbed pit. Measuring point, 3 notches in top of timber across pit, at land surface. Companion well to M40.

Water level, in feet below measuring point, 1930-33, 1939

Jan. 24, 1930	15.25	Aug. 5, 1931	15.26	May 18, 1932	13.26
Sept. 11	15.42	Mar. 23	15.69	Mar. 2, 1933	13.35
Apr. 2, 1931	13.62	June 14, 1932	15.10	Nov. 25, 1939	15.25
May 21	13.81	Mar. 17	13.38		

M40. L. S. Emerson. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 34, T. 9 N., R. 3 W., on south side of highway, east of ranch house. Dug irrigation well. Measuring point, 3 notches in northwest corner, top of curb at land surface, 2,273.37 feet above sea level. Unused since 1932. See Water-Supply Paper 578, p. 435 and pl. 17, well 79.

Water level, in feet below measuring point, 1919, 1923, 1930-33, 1935-39

Dec. 15, 1919	16.1	Dec. 23, 1931	17.08	Apr. 17, 1935	12.42
Jan. 14, 1923 a	13.05	Feb. 15, 1932	12.58	Nov. 12	15.67
Jan. 24, 1930	16.49	23	12.91	Mar. 12, 1936	12.80
Sept. 11	15.54	Mar. 17	11.98	26	12.65
Dec. 12	16.71	Apr. 6	11.92	Jan. 14, 1937	16.70
Feb. 13, 1931	14.68	May 18	12.02	June 21	12.10
Mar. 17	13.48	Sept. 23	14.76	Dec. 8	15.25
May 6	13.92	Nov. 15	15.48	June 7, 1938	12.10
Aug. 5	15.65	Mar. 2, 1933	12.54	Nov. 11	15.68
Oct. 7	16.92	Dec. 14	16.75	May 24, 1939 b	12.8
Nov. 17	17.28	Jan. 21, 1935	16.89		

M41a. Nellie Storey. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 34, T. 9 N., R. 3 W. Abandoned dug well. Measuring point, top of circular concrete curb, at land surface, 2,381.41 feet above sea level.

Water level, in feet below measuring point, 1930-33, 1935-36, 1938-39

Sept. 19, 1930	126.28	Mar. 22, 1933	126.13	Nov. 11, 1938	126.38
Apr. 19, 1931	126.54	Mar. 1, 1935	126.55	May 24, 1939	125.84
Feb. 23, 1932	126.82	June 24, 1936	126.50	Nov. 25	125.70
Apr. 7	126.68	June 7, 1938	125.80		

a Measurement by W. P. Rowe.

b Well caved; moist earth in bottom.



## Mojave River Basin--Continued

M43. Shobel. Near NE cor. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 19, T. 9 N., R. 2 W. Near power line of Southern Sierra Power Co. and west of aviation field. Domestic well. Measuring point, top of wooden pump base, 1.2 feet above land surface and 2,256.01 feet above sea level. Equipped with hand pump. Water level, in feet below measuring point, 1930-32, 1935, 1937-39

Date	Water level	Date	Water level	Date	Water level
Sept. 11, 1930	65.78	Sept. 22, 1932	66.04	Nov. 11, 1938	65.94
May 27, 1931	66.49	Jan. 21, 1935	67.65	May 24, 1939	66.20
Aug. 19	66.78	Nov. 12	67.36	Nov. 25	65.69
Mar. 17, 1932	67.15	June 22, 1937	67.50		

M51. J. Slagill. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 28, T. 9 N., R. 3 W., on west bank of Mojave River. Used dug and drilled irrigation well. Measuring point, top of cover, at land surface.

Water level, in feet below measuring point, 1930-36, 1938-39

Sept. 11, 1930	16.99	Jan. 7, 1932	20.35	Feb. 8, 1935	6.23
Feb. 13, 1931	6.66	Feb. 4	14.52	Jan. 3, 1936	19.30
Mar. 17	4.62	Mar. 4	3.37	Mar. 26	8.50
Aug. 5	20.15	Jan. 10, 1933	11.38	June 1, 1938	4.80
Oct. 7	22.15	Feb. 9, 1934	4.29	Nov. 25, 1939	5.00
Dec. 23	22.53	Jan. 7, 1935	a 21.90		

M52. SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 10, T. 9 N., R. 3 W. Abandoned drilled irrigation well. Measuring point through Dec. 22, 1932, hole in steel casing, 0.5 foot above land surface and 2,292.18 feet above sea level. Measuring point since Dec. 22, 1932, top of casing, 1.3 feet above land surface and 2,293.02 feet above sea level.

Water level, in feet below measuring point, 1930-32, 1934-39

Apr. 4, 1930	90.77	Dec. 22, 1932	91.46	June 21, 1937	92.85
Feb. 25, 1931	91.35	Feb. 9, 1934	91.88	Dec. 8	92.45
Aug. 6	91.42	Jan. 21, 1935	92.35	June 1, 1938	92.00
Mar. 10, 1932	91.70	Feb. 8	92.40	Nov. 11	91.74
29	91.69	Jan. 3, 1936	92.50	May 24, 1939	91.09
July 26	92.54	Jan. 15, 1937	92.80	Nov. 25	90.80

M52b. Near center of north line NW $\frac{1}{4}$  sec. 32, T. 10 N., R. 3 W. Abandoned dug and drilled irrigation well. Steel casing in bottom of timber curbed pit. Measuring point, top of curb, at land surface, 2,219.22 feet above sea level.

Water level, in feet below measuring point, 1931-32, 1934, 1936-39

Feb. 25, 1931	54.70	Dec. 22, 1932	55.38	Dec. 8, 1937	56.78
Aug. 11	54.75	Feb. 9, 1934	55.72	June 1, 1938	56.85
Mar. 10, 1932	55.10	Jan. 3, 1936	56.27	Nov. 11	56.96
29	55.11	Jan. 15, 1937	56.50	May 24, 1939	57.17
July 26	55.23	June 21	56.55	Nov. 25	57.11

M53. NE cor. sec. 10, T. 9 N., R. 3 W., on edge of slope to Mojave River. Unused drilled domestic well, diameter 6 inches. Measuring point, top of steel casing, at land surface, 2,256.02 feet above sea level.

Water level, in feet below measuring point, 1930-32, 1935-39

Apr. 4, 1930	77.87	July 26, 1932	78.45	Apr. 16, 1937	81.10
Dec. 19	79.01	Dec. 22	77.33	Dec. 8	77.25
Mar. 17, 1931	79.34	Jan. 21, 1935	80.22	June 1, 1938	75.73
Aug. 6	79.90	Nov. 12	79.65	Nov. 11	74.21
Feb. 4, 1932	80.80	Mar. 26, 1936	79.95	May 24, 1939	74.13
Mar. 4	80.78	Jan. 15, 1937	81.00	Nov. 25	74.50
29	80.42				

a Well dry.

## Mojave River Basin--Continued

M56. Osborn. SE cor. sec. 10, T. 9 N., R. 3 W. Abandoned dug and drilled irrigation well. Steel casing bottom of timber-curbed pit. Measuring point, top of east curb, at land surface, and 2,209.17 feet above sea level.

Water level, in feet below measuring point, 1930-32, 1935-39

Date	Water level	Date	Water level	Date	Water level
Sept. 11, 1930	20.45	Mar. 29, 1932	17.83	June 22, 1937	12.75
Dec. 19	21.02	July 26	13.13	Dec. 8	13.02
Mar. 17, 1931	21.61	Jan. 7, 1935	21.06	June 1, 1938	9.05
Aug. 5	22.25	Feb. 8	21.21	Nov. 11	10.17
Feb. 4, 1932	22.75	Mar. 26, 1936	19.78	May 24, 1939	10.67
Mar. 4	18.40	Jan. 15, 1937	22.35	Nov. 25	13.10

M56a. Bullock. SW cor. NW $\frac{1}{4}$  sec. 14, T. 9 N., R. 3 W., at ranch buildings. Used dug and drilled irrigation well. Steel casing in bottom of pit. Measuring point, top of 2-inch wooden cover at land surface.

Water level, in feet below measuring point, 1930-32, 1934-39

Dec. 19, 1930	23.82	Dec. 22, 1932	16.05	Mar. 26, 1936	22.00
Mar. 17, 1931	24.35	Jan. 10, 1934	19.68	Jan. 15, 1937	25.35
Aug. 5	24.92	Jan. 7, 1935	23.9	Dec. 8	<sup>a</sup> 15
Feb. 4, 1932	25.00	Feb. 8	23.8	June 1, 1938	8.2
Mar. 4	17.26	Apr. 1	22.3	Nov. 11	12.47
29	15.98	17	18.32	May 24, 1939	11.02
July 26	13.02	23	17.82	Nov. 25	14.82
Oct. 5	14.20	Nov. 12	20.70		

M64. NE cor. SE $\frac{1}{4}$  sec. 28, T. 11 N., R. 3 W. Abandoned drilled well. Six-inch steel casing in a 12-inch steel casing. Measuring point, top of 12-inch casing, 1.2 feet above land surface and 2,080.57 feet above sea level.

Water level, in feet below measuring point, 1930-32, 1934-39

May 31, 1930	42.83	Dec. 22, 1932	43.17	June 21, 1937	43.75
Feb. 25, 1931	42.87	Feb. 9, 1934	43.63	June 1, 1938	44.15
Mar. 10, 1932	43.05	Mar. 1, 1935	43.37	Nov. 18	44.12
29	43.05	Jan. 3, 1936	43.45	May 23, 1939	44.48
July 6	43.07	Jan. 15, 1937	43.65	Nov. 25	44.17

M64a. Near NE cor. SE $\frac{1}{4}$  sec. 28, T. 11 N., R. 3 W., 175 feet west of well M64. Abandoned drilled well, diameter 6 inches. Measuring point, top of steel casing, 1.3 feet above land surface and 2,079.10 feet above sea level. Companion well to M64.

Water level, in feet below measuring point, 1930-32, 1935-39

May 31, 1930	41.39	Mar. 1, 1935	41.90	June 1, 1938	42.50
Feb. 25, 1931	41.43	Jan. 3, 1936	42.10	Nov. 18	42.58
Mar. 10, 1932	41.57	Jan. 15, 1937	42.23	May 23, 1939	41.90
29	41.60	June 21	42.35	Nov. 25	43.00
July 6	41.63				

M65. S. F. Edwards. About 600 feet north of SE cor. sec. 28, T. 11 N., R. 3 W., on west side of road, in grove. Used dug irrigation well, depth 105 feet. Measuring point, top of 2-inch wooden cover on pit, at land surface, 2,073.47 feet above sea level.

Water level, in feet below measuring point, 1930-32, 1935-39

May 31, 1930	21.28	July 6, 1932	22.12	Jan. 15, 1937	22.90
Feb. 25, 1931	21.40	Dec. 22	22.87	June 1, 1938	23.00
Aug. 27	22.40	Mar. 1, 1935	22.38	Nov. 18	23.43
Mar. 10, 1932	22.25	Jan. 3, 1936	22.29	May 23, 1939	23.53

<sup>a</sup> Reported by owner.

## Mojave River Basin--Continued

M66. Near center of south line SE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 34, T. 11 N., R. 3 W., 300 feet east of road. Abandoned dug irrigation well. Measuring point through Mar. 1, 1935, top of 12-inch timber across pit, 1.5 feet above land surface and 2,086.93 feet above sea level. Measuring point, since Mar. 1, 1935, top of curb, at land surface, 2,085.46 feet above sea level.

Water level, in feet below measuring point, 1930-32, 1934-39

Date	Water level	Date	Water level	Date	Water level
May 31, 1930	29.53	Dec. 22, 1932	30.00	June 21, 1937	29.85
Feb. 25, 1931	29.70	Feb. 9, 1934	30.24	June 1, 1938	30.15
Aug. 27	29.70	Mar. 1, 1935	30.49	Nov. 18	30.30
Mar. 10, 1932	29.95	Jan. 3, 1936	29.40	May 23, 1939	30.62
29	29.87	15, 1937	29.69	Nov. 25	30.70

M71. A. H. Harris. Near SW cor. sec. 23, T. 10 N., R. 3 W., in grove, north of rock hill and east of road. Unused dug irrigation well. Measuring point through May 23, 1939, top of east curb, at land surface. Measuring point since May 23, 1939, top of 4-inch Ell fitting on 4-inch pipe, 1.7 feet above land surface.

Water level, in feet below measuring point, 1930-32, 1935-39

Sept. 19, 1930	26.90	Mar. 29, 1932	28.18	Dec. 8, 1937	32.10
Dec. 19	26.93	Dec. 22	28.50	June 1, 1938	32.15
June 4, 1931	27.40	Mar. 1, 1935	30.70	May 23, 1939	34.14
Aug. 11	28.04	Jan. 3, 1936	31.25	Nov. 25	34.92
Mar. 10, 1932	28.00	Jan. 15, 1937	32.05		

M74. J. D. Rich. SE cor. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 30, T. 10 N., R. 2 W., at residence. Used domestic well. Measuring point, top of wood clamp, 2.0 feet above land surface, 0.47 foot above top of concrete pipe casing, 2,178.96 feet above sea level. Equipped with cylinder pump and windmill. Irrigation well and pumping plant about 0.12 mile west.

Water level, in feet below measuring point, 1930-39

Apr. 4, 1930	20.07	Apr. 21, 1932	a 22.42	Mar. 26, 1936	a 24.00
Dec. 19	20.81	May 12	c 21.78	Jan. 14, 1937	b 25.20
May 27, 1931	21.62	July 6	b 25.11	Apr. 6	22.85
Aug. 13	22.30	Jan. 11, 1933	20.65	Dec. 8, 1937	22.35
Nov. 17	22.42	Jan. 10, 1934	20.90	Nov. 11, 1938	b 25.95
Mar. 4, 1932	21.45	Jan. 21, 1935	21.60	May 23, 1939	22.18
29	a 21.89	Nov. 12	22.62	Nov. 25	21.29

M75. Loftus. NE cor. SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 19, T. 10 N., R. 2 W., in grove on hillside, north of schoolhouse. Used drilled domestic well. Measuring point through Mar. 1, 1935, top of wooden clamp, 0.6 foot above land surface, 2,216.96 feet above sea level. Measuring point since Mar. 1, 1935, top of steel casing, at land surface, 2,216.34 feet above sea level.

Water level, in feet below measuring point, 1930-33, 1935, 1937-39

Apr. 4, 1930	63.19	July 6, 1932	b 67.10	June 1, 1938	66.55
Dec. 19	63.59	Jan. 11, 1933	64.90	Nov. 18	66.67
May 21, 1931	63.93	Mar. 1, 1935	66.20	Mar. 23, 1939	67.89
Aug. 13	64.17	Jan. 15, 1937	66.25	Nov. 25	66.54
Mar. 10, 1932	64.52	Dec. 8	66.57		

M82. Water Company in Barstow. Near center of west line NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 6, T. 9 N., R. 1 W., at abandoned ice plant between railroad tracks. Abandoned drilled industrial and domestic well, diameter 18 inches. Measuring point, top of steel casing, level with land surface, 0.34 foot below concrete floor, 2,094.48 feet above sea level. Barstow public supply well and pumping plant 300 feet northwest.

Water level, in feet below measuring point, 1930-32, 1934-39

Sept. 19, 1930	10.70	May 10, 1932	a 7.28	Jan. 14, 1937	9.44
Dec. 19	a 9.35	Aug. 8	8.05	June 22	a 6.33
May 27, 1931	a 9.54	Nov. 15	8.40	Dec. 9	7.66
Aug. 13	10.49	Jan. 23, 1934	a 8.22	May 27, 1938	a 5.43
Nov. 24	10.04	Jan. 21, 1935	9.00	May 22, 1939	6.21
Mar. 17, 1932	a 7.47	Nov. 12	a 9.61	Nov. 29	a 7.37
Apr. 27	a 6.95	Mar. 12, 1936	8.45		

a Nearby well pumping.

b Pump operating in well.

## Mojave River Basin--Continued

M84. Nelson, formerly Gilham. SE cor. NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 31, T. 10 N., R. 1 W., in pump house in grove near north line. Used drilled irrigation well. Measuring point, edge of hole in steel pump base, about 1.0 foot above land surface, 0.50 feet above top of concrete foundation, 2,130.66 feet above sea level. Equipped with electric turbine pump.

Water level, in feet below measuring point, 1930-32, 1935, 1938-39

Date	Water level	Date	Water level	Date	Water level
Apr. 4, 1930	48.60	Apr. 27, 1932	47.08	June 1, 1938	45.30
Dec. 19	49.63	May 10	46.95	Nov. 19	47.20
May 27, 1931	50.14	Aug. 8	48.84	May 23, 1939	46.55
Aug. 13	51.00	Nov. 15	48.67	Nov. 25	47.90
Mar. 16, 1932	47.76	Jan. 21, 1935	49.46		

M85. E. M. Hawes. SE cor. NE $\frac{1}{4}$  sec. 31, T. 10 N., R. 1 W., in Barstow near Barstow-Hinckley highway. Unused drilled domestic well. Measuring point, top of wooden clamp at land surface, 2,094.07 feet above sea level. See Water-Supply Paper 578, p. 435 and pl. 17, well 60.

Water level, in feet below measuring point, 1919, 1930-32, 1934-37

Oct. 20, 1919	11.6	Mar. 17, 1932	9.05	Jan. 21, 1935	11.05
Apr. 4, 1930	9.99	Apr. 27	8.40	Nov. 12	11.69
Dec. 19	11.46	May 10	8.28	Mar. 12, 1936	10.77
May 27, 1931	11.89	Aug. 8	10.58	Jan. 14, 1937	11.70
Aug. 13	12.70	Nov. 15	10.40	Dec. 8	9.80
Oct. 7	12.70	Jan. 23, 1934	10.24	May 27, 1938	(a)

M88. Sandoz. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 33, T. 10 N., R. 1 W., north of U. S. highway 91. Abandoned drilled well, diameter 12 inches. Measuring point through Dec. 27, 1935, top of wooden clamp, 1.6 feet above land surface, 0.65 foot above top of steel casing. Measuring point since Dec. 27, 1935, top of casing, 1.0 foot above land surface.

Water level, in feet below measuring point, 1930-32, 1935, 1937-39

May 30, 1930	30.32	Feb. 15, 1935	30.73	May 27, 1938	25.55
Jan. 21, 1931	30.77	Dec. 27	30.87	Nov. 19	26.14
Nov. 24	31.76	Jan. 16, 1937	30.65	May 23, 1939	26.21
Mar. 23, 1932	29.52	June 22	26.96	Nov. 29	27.20

M91. R. Harlan. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 10, T. 9 N., R. 1 W., at ranch buildings. Used dug and drilled irrigation well. Steel casing in timber-curbed pit. Measuring point, top of north curb, 1.4 feet above land surface, 6.25 feet above top casing.

Water level, in feet below measuring point, 1924-25, 1927-28, 1930-32, 1935, 1937-39

June 12, 1924	b 11.4	Nov. 24, 1931	16.00	Apr. 1935	b 12
Sept. 12, 1925	c 13.41	Mar. 23, 1932	8.75	Jan. 16, 1937	15.55
Oct. 11, 1927	c 9.83	May 1	b 6	May 27, 1938	4.20
Oct. 6, 1928	c 12.91	26	7.10	Nov. 19	7.20
May 30, 1930	d 28.00	Nov. 15	10.08	May 23, 1939	7.13
Jan. 21, 1931	14.89	Feb. 15, 1935	15.13		

M92. Gibbs. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 10, T. 9 N., R. 1 W., 200 feet south of residence. Used dug domestic well. Small wooden-curbed pit below underground pump house. Measuring point, top of curb about 7 feet below land surface, 7.3 feet lower than cover over pump house. Equipped with centrifugal pump which is belted through inclined passage to electric motor.

Water level, in feet below measuring point, 1925, 1927-28, 1930-32, 1935, 1937-39

Sept. 12, 1925	c 10	Mar. 23, 1932	5.16	Jan. 16, 1937	10.60
Oct. 11, 1927	c 4.67	May 26	3.23	May 27, 1938	1.50
Oct. 6, 1928	c 7.75	Nov. 15	5.07	Nov. 19	2.63
May 30, 1930	9.93	Feb. 15, 1935	10.37	May 23, 1939	2.95
Jan. 21, 1931	10.20	May 29	10.88	Nov. 29	4.10
Nov. 24	10.69	Dec. 27	10.40		

a Well filled with silt during flood of March 1938.

b Reported by owner.

c Measurement by Dix Van Dyke.

d Pump operating in well.

## Mojave River Basin--Continued

M97. Greystone Auto Camp. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 10, T. 9 N., R. 1 W. Used drilled domestic well. Measuring point, top of plank cover, 0.8 foot above land surface and 0.14 foot above top of steel casing. Equipped with cylinder pump, windmill, and small electric motor.

Water level, in feet below measuring point, 1930, 1932, 1935, 1938-39

Date	Water level	Date	Water level	Date	Water level
Sept. 19, 1930	59.35	Feb. 15, 1935	59.10	May 23, 1939	51.58
Mar. 17, 1932	a 52.30	Nov. 19, 1938	52.72	Nov. 29, 1939	53.01
Apr. 28	51.20				

M100. F. Ryerse. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 13, T. 9 N., R. 1 W., in grove near Van Dyke ditch. Dug and drilled irrigation well. Twelve-inch steel casing in bottom of timber-curbed pit. Measuring point, bottom of timber cover, 0.4 foot above land surface, 8.87 feet above top casing, 2,001.81 feet above sea level.

Water level, in feet below measuring point, 1925-28, 1930-32, 1935, 1938-39

Sept. 12, 1925	b 12.9	Sept. 23, 1928	b 22.37	Nov. 13, 1931	30.11
Mar. 20, 1926	b 23.71	Oct. 23	b 22.87	Feb. 16, 1932	21.20
Feb. 16, 1927	b 18.29	Jan. 20, 1930	27.37	Apr.	b 8.9
28	b 8.9	Feb. 27	26.65	Jan. 22, 1935	27.55
Mar. 12	b 8.9	May 30	27.39	Nov. 19, 1938	8.7
June 22	b 10.20	Jan. 21, 1931	28.49	May 23, 1939	10.08
Oct. 11	b 13.87	Aug. 13	30.13	Nov. 30	12.87

L21. Lyle Graham. Near NW cor. NE $\frac{1}{4}$  sec. 4, T. 8 N., R. 3 E. Used drilled irrigation well, depth 16 feet. Ten-inch steel casing inside of 12-inch steel casing. Measuring point, top of 10-inch casing, at land surface, 1,818.98 feet above sea level. Equipped with cylinder pump and windmill.

Water level, in feet below measuring point, 1930-32, 1935-39

Feb. 20, 1930	2.29	Apr. 28, 1932	2.72	May 26, 1938	a 4.80
Apr. 15	2.36	Jan. 30, 1935	3.27	Nov. 25	4.31
June 5, 1931	2.92	Jan. 10, 1936	3.50	May 15, 1939	4.39
Dec. 7	3.00	Jan. 21, 1937	2.80	Nov. 30	4.26
Feb. 26, 1932	.54	June 3	3.95		

L22. Lyle Graham. Near NW cor. NE $\frac{1}{4}$  sec. 4, T. 8 N., R. 3 E., in pump house near ranch house. Used dug and drilled irrigation well, depth 50 feet. Steel casing in bottom of concrete pit. Measuring point, top of pit at floor, level with land surface, 1,819.56 feet above sea level. Equipped with engine driven centrifugal pump.

Water level, in feet below measuring point, 1922, 1930-32, 1935-36, 1938-39

May 22, 1922	c 3.07	June 5, 1931	3.30	Jan. 30, 1935	3.90
Sept. 13	d 4.47	Dec. 7	3.45	Jan. 10, 1936	3.62
Dec. 16	c 3.55	Jan. 21, 1932	2.46	Nov. 25, 1938	4.43
Feb. 20, 1930	2.32	Feb. 26	.95	May 15, 1939	3.93
Apr. 15	2.28	Mar. 23	1.78	Nov. 30	4.52
Oct. 9	4.50	Apr. 28	2.60		

L23. C. W. Beaverstock. SW cor. NW $\frac{1}{4}$  sec. 3, T. 8 N., R. 3 E., 150 feet northeast of road intersection. Used drilled well, diameter 9 inches. Measuring point, top of casing, at land surface, 1,819.65 feet above sea level.

Water level, in feet below measuring point, 1930-32, 1935-39

Mar. 1, 1930	4.49	Dec. 9, 1932	5.27	May 26, 1938	5.70
Apr. 15	4.02	Mar. 14, 1935	4.29	Nov. 25	7.02
Apr. 23, 1931	3.88	Jan. 10, 1936	5.43	May 15, 1939	5.72
Apr. 28, 1932	3.80	Jan. 21, 1937	5.85	Nov. 30	6.97

a Pump operating in well.

b Measurement by Dix Van Dyke.

c Measurement by W. P. Rowe.

d Measurement by W. A. Foster.

## Mojave River Basin--Continued

L24. SE cor. NW $\frac{1}{4}$  sec. 3, T. 8 N., R. 3 E., just north of small rock hill. Used drilled domestic well, depth 32 feet. Seven-inch steel casing inside of 10-inch steel casing. Measuring point, top of 10-inch casing, 2.0 feet above land surface and 1,826.04 feet above sea level.

Water level, in feet below measuring point, 1930-32, 1935-39

Date	Water level	Date	Water level	Date	Water level
May 29, 1930	22.67	Mar. 14, 1935	23.95	Nov. 25, 1938	23.70
Apr. 23, 1931	a 23.30	Jan. 10, 1936	23.90	May 15, 1939	23.46
Apr. 28, 1932	22.45	Jan. 21, 1937	23.6	Nov. 30	23.85
Dec. 9	a 23.43	May 26, 1938	23.5		

L28. C. E. Burckhardt. Near SW cor. SW $\frac{1}{4}$  sec. 7, T. 8 N., R. 4 E., in grove near old highway. Abandoned dug and drilled irrigation well. Pit curbed with 36-inch iron casing, smaller steel casing in bottom. Measuring point, top of 36-inch casing, 1.4 feet above land surface and 1,820.09 feet above sea level.

Water level, in feet below measuring point, 1930-32, 1935-39

Feb. 20, 1930	37.51	Apr. 28, 1932	37.39	May 26, 1938	37.75
Apr. 15	37.58	Mar. 14, 1935	37.49	Nov. 26, 1938	38.70
May 29	37.55	Jan. 10, 1936	37.60	May 15, 1939	38.49
Apr. 23, 1931	37.55	Jan. 21, 1937	37.65	Nov. 30	38.27
Jan. 28, 1932	37.45				

L31. A. M. Monroe. Near NW cor. SE $\frac{1}{4}$  sec. 31, T. 9 N., R. 4 E., in yard, southwest of ranch house. Unused drilled well, diameter 12 inches, depth 25 feet. Measuring point, top of steel casing, 3.20 feet above land surface and 1,791.62 feet above sea level.

Water level, in feet below measuring point, 1930-32, 1935-39

May 1, 1930	15.75	June 23, 1932	15.60	May 26, 1938	15.75
Oct. 9	16.17	Dec. 9	15.58	Nov. 26	15.91
Apr. 23, 1931	16.17	Jan. 30, 1935	15.55	May 15, 1939	15.80
Jan. 28, 1932	15.61	Jan. 10, 1936	15.59	Nov. 30	16.12
Apr. 28	15.40	Jan. 21, 1937	15.45		

L32. Near SW cor. SW $\frac{1}{4}$  sec. 4, T. 8 N., R. 4 E., north of U. S. highway 66, 1,600 feet west of bridge. Abandoned dug well. Timber-curbed pit. Measuring point, top of curb at southwest corner, at land surface, 1,777.24 feet above sea level.

Water level, in feet below measuring point, 1930-32, 1935-39

Feb. 20, 1930	6.01	Apr. 28, 1932	5.20	May 26, 1938	5.72
May 29	5.69	Dec. 9	5.87	Nov. 26	6.11
Oct. 9	5.69	Mar. 14, 1935	5.93	May 15, 1939	6.33
Apr. 22, 1931	5.62	Jan. 10, 1936	5.93	Nov. 30	6.50
Jan. 28, 1932	5.70	Jan. 21, 1937	5.75		

L37. Mojave Camp Service station. Near center SW $\frac{1}{4}$  sec. 12, T. 8 N., R. 4 E., across highway from station. Used dug domestic well, depth 35 feet. Measuring point, top of cover over pit, at land surface, 1,810.08 feet above sea level. Equipped with pump and windmill.

Water level, in feet below measuring point, 1930, 1932, 1935-39

Feb. 20, 1930	32.58	Mar. 14, 1935	a 32.70	May 26, 1938	33.15
Jan. 28, 1932	32.74	Jan. 10, 1936	33.00	Nov. 26	33.71
Apr. 28	32.32	Jan. 21, 1937	32.83	Nov. 30, 1939	33.01
Dec. 9	32.55				

a Pump operating in well.

## Mojave River Basin--Continued

L42. G. Linguenfelder. Near center SW $\frac{1}{4}$  sec. 15, T. 9 N., R. 1 E., north of Van Dyke ranch. Abandoned dug and drilled irrigation well. Twelve-inch steel casing in shallow timber-curbed pit. Measuring point, top of concrete slab on west side of curb, at land surface, 5.90 feet above top of casing and 1,963.69 feet above sea level.

Water level, in feet below measuring point, 1925-28, 1930-32, 1934-39

Date	Water level	Date	Water level	Date	Water level
Aug. 14, 1925	a 69.15	Feb. 16, 1932	79.15	Mar. 12, 1936	81.70
Apr. 15, 1926	a 71.90	27	77.50	Jan. 14, 1937	83.00
Feb. 16, 1927	a 74.15	Mar. 24	73.62	May 26	50.60
Oct. 10	a 69.48	Apr. 21	68.06	Dec. 9	64.60
Oct. 21, 1928	a 70.73	Jan. 23, 1934	75.85	May 26, 1938	47.05
Feb. 1, 1930	74.40	Jan. 22, 1935	79.15	Nov. 26	59.75
May 23	75.16	May 29	80.30	May 22, 1939	66.00
Apr. 22, 1931	77.82	Dec. 20	80.90	Nov. 29	b 68.6
Dec. 7	79.08				

L43. Near SW cor. NW $\frac{1}{4}$  sec. 13, T. 9 N., R. 1 E., east of the Funk ranch house and about 1/8 mile south of the south bank of Mojave River. Abandoned drilled irrigation well, diameter 12 inches. Measuring point, top of steel casing, 1.2 feet above land surface and 1,949.88 feet above sea level.

Water level, in feet below measuring point, 1925-28, 1930-39

Sept. 14, 1925	a 61.50	Mar. 17, 1932	68.95	Apr. 23, 1936	74.07
Mar. 7, 1926	a 63.67	24	68.39	Jan. 16, 1937	75.28
Oct. 10, 1927	a 61.25	Apr. 21	66.66	June 2	62.33
Oct. 6, 1928	a 64.65	Jan. 11, 1933	67.00	May 26, 1938	56.00
May 22, 1930	68.31	Jan. 23, 1934	70.20	Nov. 26	61.30
Jan. 22, 1931	69.65	Jan. 22, 1935	72.15	May 22, 1939	62.74
Dec. 7	71.20	Dec. 20	73.66	Nov. 30	65.10

L43a. Near SW cor. NW $\frac{1}{4}$  sec. 13, T. 9 N., R. 1 E., 300 feet south of well L43. Abandoned drilled irrigation well, diameter 12 inches. Measuring point, top of steel casing, 0.7 foot above land surface and 1,950.32 feet above sea level. Companion well to L43.

Water level, in feet below measuring point, 1925-27, 1930-33, 1935-39

Sept. 14, 1925	a 63.58	Mar. 24, 1932	69.22	Jan. 16, 1937	75.65
Mar. 7, 1926	a 64.17	Apr. 21	67.51	June 2	63.48
Oct. 10, 1927	a 61.25	Jan. 11, 1933	68.40	May 26, 1938	57.10
May 22, 1930	68.74	Jan. 22, 1935	72.60	Nov. 26	60.77
Jan. 22, 1931	70.08	Dec. 20	74.10	May 22, 1939	63.19
Dec. 7	71.62	Apr. 23, 1936	74.52	Nov. 30	65.48
Mar. 17, 1932	69.70				

L47. Near NW cor. NW $\frac{1}{4}$  sec. 12, T. 9 N., R. 1 E., east of ranch house. Used drilled irrigation and domestic well. Measuring point, bottom of iron pump base, 0.6 foot above land surface.

Water level, in feet below measuring point, 1930, 1932, 1934-35, 1937-39

May 23, 1930	46.45	Jan. 16, 1937	53.00	Nov. 19, 1938	39.65
May 4, 1932	45.59	June 22	42.48	May 22, 1939	41.58
Mar. 30, 1934	48.83	May 25, 1938	37.15	Nov. 30	43.55
Jan. 29, 1935	50.40				

L49. Yermo Mutual Water Co. SE cor. SW $\frac{1}{4}$  sec. 32, T. 10 N., R. 2 E., south of Union Pacific tracks and at upper end of ditch. Abandoned drilled irrigation well, diameter 16 inches, depth 413 feet. Measuring point through Jan. 22, 1920, top of casing, at land surface. Measuring point since Jan. 22, 1920, top of concrete pump base, 0.2 foot above land surface and 1,905.70 feet above sea level. Measurements made from red arrow marked on concrete pump base at outer edge of steel pump base; corrected for horizontal offset by subtracting 0.45 foot. See Water-Supply Paper 578, p. 490 and pl. 24, well 9.

Water level, in feet below measuring point, 1919-20, 1920-22, 1924, 1929-39

Nov. 4, 1919	23.0	Sept. 11, 1922	d 19.55	Dec. 5, 1929	c 28.86
Jan. 22, 1920	23.0	Dec. 15	c 18.53	May 23, 1930	29.16
May 17, 1922	c 19.06	June 5, 1924	c 21.50	Jan. 22, 1931	30.57

a Measurement by Dix Van Dyke.

b Caved; dry.

c Measurement by W. P. Rowe.

d Measurement by W. A. Foster.

## Mojave River Basin--Continued

## L49. Yermo Mutual Water Co.--Continued

Water level, in feet below measuring point, 1919-20, 1920-22, 1924, 1929-39

Date	Water level	Date	Water level	Date	Water level
Sept. 24, 1931	31.84	Dec. 27, 1935	33.83	May 25, 1938	25.55
Apr. 27, 1932	29.55	June 11, 1936	34.10	Nov. 19	25.32
Feb. 22, 1933	30.03	Jan. 16, 1937	34.78	May 22, 1939	25.96
Mar. 30, 1934	31.45	June 22	29.55	Nov. 30	27.86
Jan. 29, 1935	32.55	Dec. 9	29.05		

L50. Near NW cor. NW $\frac{1}{4}$  sec. 4, T. 9 N., R. 2 E., south of road, about 0.75 mile east of well L49. Abandoned drilled irrigation well, diameter 16 inches. Measuring point, top of steel casing, 0.1 foot above land surface. Companion well to L49.

Water level, in feet below measuring point, 1930-32, 1934-35, 1937-39

May 23, 1930	21.11	Jan. 29, 1935	24.32	May 25, 1938	18.13
Jan. 22, 1931	22.04	Dec. 27	25.33	Nov. 19	18.01
Sept. 24	23.00	Jan. 16, 1937	26.56	May 22, 1939	18.54
Apr. 27, 1932	21.54	Dec. 9	21.30	Nov. 30	19.66
Mar. 30, 1934	23.32				

L51. Bruce McCormick. Near center NE $\frac{1}{4}$  sec. 3, T. 9 N., R. 2 E., near corral and southeast of ranch house. Used dug and drilled domestic well, diameter 12 inches. Measuring point in 1919, top of curb, 2 feet above land surface. Measuring point since 1919, top of casing, 0.9 foot above land surface and 1,843.97 feet above sea level. See Water-Supply Paper 578, p. 467 and pl. 24, well 55a.

Water level, in feet below measuring point, 1919, 1922, 1930-35, 1937-39

Nov. 1, 1919	14.2	Jan. 21, 1932	19.50	Jan. 14, 1937	25.55
May 17, 1922	a 5.49	Apr. 27	16.72	Dec. 9	20.75
Dec. 15	a 6.64	Jan. 11, 1933	18.65	May 25, 1938	14.40
May 23, 1930	16.50	Jan. 23, 1934	20.52	Nov. 19	16.69
Jan. 22, 1931	19.00	Jan. 30, 1935	21.90	May 22, 1939	16.43
Sept. 24	20.17	Dec. 20	23.90	Nov. 30	18.28

L51a. Bruce McCormick. Near center NE $\frac{1}{4}$  sec. 3, T. 9 N., R. 2 E., at east end of ranch house. Used drilled domestic well, diameter 12 inches. Measuring point, top of casing, 0.8 foot above land surface and 1,846.16 feet above sea level. Companion well to L51.

Water level, in feet below measuring point, 1931-35, 1937-39

Jan. 22, 1931	21.27	Jan. 23, 1934	23.95	May 25, 1938	17.94
Sept. 24	23.40	Jan. 30, 1935	25.67	Nov. 19	20.63
Jan. 21, 1932	b 23.60	Dec. 20	27.53	May 22, 1939	19.18
Apr. 27	19.95	Jan. 14, 1937	28.95	Nov. 30	21.88
Jan. 11, 1933	22.10	Dec. 9	24.25		

L54. Near center SW $\frac{1}{4}$  sec. 34, T. 10 N., R. 2 E., near power line of Los Angeles Bureau of Power and Light. Abandoned drilled irrigation well. Measuring point in 1919, top of casing, about 1.0 foot below land surface. Measuring point since 1919, top of timber on south side of casing, 1.2 feet above top of casing and 1,876.16 feet above sea level. See Water-Supply Paper 578, p. 466, and pl. 24, well 52.

Water level, in feet below measuring point, 1919, 1922, 1930-32, 1934-35, 1937-39

Nov. 11, 1919	49.4	Apr. 27, 1932	57.90	May 25, 1938	58.30
May 17, 1922	a 47.43	Mar. 30, 1934	60.40	Nov. 19	58.10
Dec. 15	a 47.32	Dec. 27, 1935	63.12	May 22, 1939	57.84
May 23, 1930	56.05	Jan. 16, 1937	64.60	Nov. 30	59.18
Sept. 24, 1931	58.94				

a Measurement by W. P. Rowe.

b Pump operating in well.



## Mojave River Basin--Continued

L63. Near center sec. 18, T. 9 N., R. 2 E., north of power line of Los Angeles Bureau of Power and Light. Abandoned drilled irrigation well, diameter 12 inches. Measuring point, top of steel casing, 1.0 foot above land surface and 1,934.67 feet above sea level.

Water level, in feet below measuring point, 1924-28, 1930-39

Date	Water level	Date	Water level	Date	Water level
June 13, 1924	a 48.0	Mar. 17, 1932	58.47	Apr. 23, 1936	62.31
Sept. 13, 1925	b 52.0	Apr. 21	57.44	Jan. 14, 1937	63.18
Mar. 15, 1926	b 50.25	Nov. 2	57.50	June 2	57.11
Mar. 3, 1927	b 52.5	Jan. 11, 1933	57.80	Dec. 9	56.55
Sept. 12, 1928	a 54.1	Jan. 23, 1934	59.25	May 26, 1938	51.90
Feb. 28, 1930	56.73	Jan. 22, 1935	60.70	Nov. 26	52.96
May 8	57.06	May 29	61.20	May 22, 1939	53.57
Jan. 22, 1931	58.20	Dec. 20	61.86	Nov. 30	54.95

L1. B. A. Funk. SW cor. NW $\frac{1}{4}$  sec. 18, T. 9 N., R. 1 E., south side of Van Dyke ditch. Dug and drilled irrigation well. Steel casing in timber-curbed pit. Measuring point through Jan. 14, 1937, top of south curb at land surface, 1,996.78 feet above sea level. Measuring point since Jan. 14, 1937, top of casing, 3.7 feet above land surface and 2,000.48 feet above sea level. Unused in 1939.

Water level, in feet below measuring point, 1925-28, 1930-32, 1934-39

Sept. 12, 1925	b 25.75	Mar. 19, 1930	30.06	May 29, 1935	31.40
Mar. 21, 1926	b 26.00	Apr. 16	32.03	Dec. 20	33.00
Feb. 16, 1927	b 20.00	May 7	30.75	Mar. 12, 1936	33.64
Mar. 12	b 10.33	29	30.80	June 11	34.20
June 22	b 10.75	Jan. 21	30.80	Jan. 14, 1937	35.27
Oct. 11	b 15.17	Apr. 23	32.28	May 26	11.70
Nov. 23, 1928	b 25.75	Aug. 12	33.18	Dec. 9	15.10
Dec. 12	b 25.75	Nov. 23	33.66	May 25, 1938	11.12
Jan. 20, 1930	29.58	Feb. 16, 1932	25.90	Nov. 19	13.26
Feb. 21	29.97	Apr. 6	11.40	June 7, 1939	15.60
27	30.00	Mar. 30, 1934	24.90	Nov. 30	19.05
Mar. 7	30.00	Jan. 22, 1935	29.85		

L8. Center of west line NW $\frac{1}{4}$  sec. 24, T. 9 N., R. 1 E., near abandoned ditch excavation. Abandoned drilled well, diameter 6 inches. Measuring point, top of steel casing, 0.5 foot above land surface, 1,953.57 feet above sea level.

Water level, in feet below measuring point, 1930, 1932-39

Feb. 20, 1930	71.76	Jan. 22, 1935	76.19	Dec. 9, 1937	69.70
May 22	72.27	Dec. 20	77.63	May 26, 1938	64.55
Mar. 17, 1932	74.70	Apr. 23, 1936	78.06	Nov. 26	65.05
July 21	71.74	Jan. 16, 1937	79.15	May 16, 1939	67.03
Jan. 11, 1933	72.25	June 2	71.35	Nov. 30	69.20
Jan. 23, 1934	74.27				

L10. E. D. Barry. Near NW cor. SW $\frac{1}{4}$  sec. 20, T. 9 N., R. 2 E., at abandoned ranch buildings. Abandoned drilled irrigation well, diameter 24 inches, depth 200 feet. Measuring point, top of steel casing, 0.5 foot above land surface and 1,927.47 feet above sea level. See Water-Supply Paper 578, p. 467, and pl. 24, well 61.

Water level, in feet below measuring point, 1919, 1925-28, 1930-32, 1934-39

Oct. 24, 1919	48.0	May 7, 1931	52.80	Jan. 21, 1937	57.27
Oct. 1, 1925	b 46.75	Mar. 17, 1932	53.62	June 3	54.63
Mar. 13, 1926	b 46.75	July 13	52.65	Dec. 9	52.55
Mar. 6, 1927	b 48.33	Oct. 5	52.57	May 26, 1938	50.24
May 5, 1928	b 48.33	Feb. 14, 1934	53.85	Nov. 26	49.00
Sept. 12	b 48.83	Jan. 22, 1935	54.95	May 15, 1939	49.19
May 22, 1930	51.45	Jan. 10, 1936	56.10	Nov. 30	50.00
Jan. 22, 1931	52.43				

a Measurement by F. L. Sellew.

b Measurement by Dix Van Dyke.

## Mojave River Basin--Continued

L10a. E. D. Barry. Near NW cor. SW $\frac{1}{4}$  sec. 20, T. 9 N., R. 2 E., 50 feet west of well L10. Abandoned drilled irrigation well, diameter 16 inches, depth 500 feet. Measuring point, top of casing, 2.0 feet above land surface and 1,929.36 feet above sea level. See Water-Supply Paper 578, p. 467, and pl. 24, well 60.

Water level, in feet below measuring point, 1931-32, 1934-39

Date	Water level	Date	Water level	Date	Water level
May 7, 1931	54.77	Jan. 22, 1935	56.95	May 26, 1938	52.10
Mar. 17, 1932	55.52	Jan. 10, 1936	58.10	Nov. 26	50.86
July 13	54.57	Jan. 21, 1937	59.25	May 15, 1939	51.07
Oct. 5	54.55	June 3	56.40	Nov. 30	52.00
Feb. 14, 1934	55.98	Dec. 9	54.45		

L13. D. E. Thompson. In NW cor. SE $\frac{1}{4}$  sec. 27, T. 9 N., R. 2 E., near U. S. highway 66. Abandoned dug well, diameter 36 inches, depth 46 feet. Measuring point, top of iron casing, 1.5 feet above land surface and 1,903.10 feet above sea level. See Water-Supply Paper 578, p. 490, and pl. 24, well 71.

Water level, in feet below measuring point, 1917, 1919, 1922, 1926, 1929-30, 1932, 1935-39

Sept. 1, 1917	29.9	Jan. 21, 1932	36.30	June 3, 1937	39.04
Oct. 25, 1919	31.2	Apr. 28	36.06	Dec. 9	38.10
May 23, 1922	a 31.50	July 13	36.07	May 26, 1938	37.13
Mar. 13, 1926	a 31.92	Sept. 23	36.10	Nov. 26	36.44
Feb. 24, 1929	a 33.60	Mar. 14, 1935	37.61	May 16, 1939	35.64
Feb. 20, 1930	34.52	Jan. 10, 1936	38.35	Nov. 30	35.38
May 29	34.78	Jan. 21, 1937	39.31		

L19. Clinkenbeard. NW cor. NW $\frac{1}{4}$  sec. 34, T. 9 N., R. 3 E., in rear of grove. Used dug and drilled domestic well. Steel casing in bottom of wooden curbed pit. Measuring point in 1919, top of cover, at land surface. Measuring point since 1919, top of curb, 0.3 foot above land surface and 1,827.87 feet above sea level. See Water-Supply Paper 578, p. 469, and pl. 24, well 111.

Water level, in feet below measuring point, 1919, 1922, 1930-32, 1934-39

Nov. 18, 1919	29.1	Apr. 27, 1932	28.50	Dec. 9, 1937	30.10
May 22, 1922	a 29.20	Feb. 14, 1934	29.15	May 26, 1938	30.45
Feb. 20, 1930	28.22	Jan. 30, 1935	29.40	Nov. 25	31.30
Aug. 19, 1931	28.49	Jan. 10, 1936	b 30.20	May 15, 1939	30.71
Jan. 28, 1932	b 28.85	Jan. 21, 1937	29.70	Nov. 30	30.15
Mar. 23	28.60	June 3	30.35		

L64. Annie Escholtz. Near center SE $\frac{1}{4}$  sec. 8, T. 9 N., R. 2 E., easterly of 2 wells, at ranch buildings. Used drilled domestic well, diameter 12 inches, depth 171 feet. Measuring point in 1919, top of casing, at land surface. Measuring point since 1919, top of cover, 0.2 foot above top of casing and 1,915.60 feet above sea level. Equipped with cylinder pump and windmill. Irrigation well and pumping plant a short distance west. See Water-Supply Paper 578, p. 467, well 64a.

Water level, in feet below measuring point, 1919, 1925, 1928, 1930-33, 1935-39

Oct. 28, 1919	35.3	Mar. 17, 1932	41.85	Dec. 9, 1937	45.43
Oct. 1, 1925	a 37.0	Apr. 21	c 41.46	Nov. 26, 1938	38.50
Sept. 12, 1928	a 39.17	Jan. 11, 1933	b 43.60	May 22, 1939	39.02
Feb. 28, 1930	41.10	Jan. 30, 1935	44.82	Nov. 30	40.10
Jan. 22, 1931	43.77	Jan. 10, 1936	b 46.00		
Sept. 24	43.26	Jan. 16, 1937	46.90		

- a Measurement by Dix Van Dyke.
- b Pump operating in well.
- c Nearby well pumping.

## Mojave River Basin--Continued

L66. Hunter. Near SW cor. SW $\frac{1}{4}$  sec. 12, T. 9 N., R. 2 E., north of ranch house. Abandoned dug and drilled domestic well, diameter 12 inches, shallow depth. Measuring point, top of cover, at land surface, 1,867.33 feet above sea level. See Water-Supply Paper 578, p. 468, and pl. 24, well 79a.

Water level, in feet below measuring point, 1919, 1922, 1924, 1930-35, 1937-38

Date	Water level	Date	Water level	Date	Water level
Oct. 29, 1919	13.2	Aug. 26, 1931	14.90	Feb. 14, 1934	15.24
May 21, 1922	a 12.54	Feb. 26, 1932	14.60	Jan. 30, 1935	15.7
June 13, 1924	b 15.0	Apr. 27	13.40	Dec. 20	16.5
Feb. 28, 1930	13.80	July 13	14.80	Dec. 9, 1937	c 15
May 22	13.94	Jan. 11, 1933	14.82	Nov. 26, 1938	(d)
Jan. 22, 1931	13.98				

L67. Hunter. Near SW cor. SW $\frac{1}{4}$  sec. 12, T. 9 N., R. 2 E., 250 feet south of well L66. Abandoned drilled irrigation well, diameter 12 inches, depth 195 feet. Measuring point in 1919, top of well head, about 2 feet above sill of house and land surface. Measuring point since 1919, top of 12-inch casing, at land surface, 1,871.58 feet above sea level. See Water-Supply Paper 578, p. 468, and pl. 24, well 79.

Water level, in feet below measuring point, 1919, 1924-27, 1930-35, 1937-39

Oct. 29, 1919	6.3	Aug. 26, 1931	7.17	Dec. 20, 1935	8.90
June 13, 1924	e 2.0	Feb. 26, 1932	6.95	Jan. 14, 1937	9.67
Sept. 13, 1925	b 4.0	Apr. 27	6.62	Dec. 9	7.35
Mar. 15, 1926	b 3.83	July 13	6.96	May 26, 1938	5.55
Mar. 3, 1927	b 3.67	Jan. 11, 1933	6.77	Nov. 26	4.94
Feb. 28, 1930	5.67	Feb. 14, 1934	7.52	May 15, 1939	5.06
May 22	5.96	Jan. 30, 1935	8.12	Nov. 30	4.95
Jan. 22, 1931	6.45				

L68. Scobel and Haimut. Near SW cor. SW $\frac{1}{4}$  sec. 14, T. 9 N., R. 2 E., in grove north of ranch house. Used drilled domestic well, diameter 12 inches, depth 95 feet. Measuring point, top of board cover, at land surface, 1,888.54 feet above sea level. Equipped with cylinder pump and windmill. Irrigation well, 413 feet deep, and pumping plant about 100 feet east; pumped heavily throughout irrigation seasons. See Water-Supply Paper 578, p. 467, and pl. 24, well 73.

Water level, in feet below measuring point, 1919, 1922, 1930, 1932-33, 1935, 1938-39

Oct. 29, 1919	26.5	Mar. 17, 1932	f 26.20	Nov. 26, 1938	f 25.20
May 23, 1922	a 22.07	Jan. 11, 1933	25.45	May 15, 1939	f 24.44
Oct. 9, 1930	24.00	Dec. 27, 1935	26.91	Nov. 30	

L68a. Scobel and Haimut. Near SW cor. SW $\frac{1}{4}$  sec. 14, T. 9 N., R. 2 E., about 200 feet northeast of well L68 and north of pumping plant. Unused drilled irrigation well, diameter 12 inches, depth 300 feet. Measuring point, top of casing, at land surface, 1,885.97 feet above sea level. Companion well to L68.

Water level, in feet below measuring point, 1925, 1927-28, 1930-35, 1937-39

Nov. 10, 1925	b 15.75	Mar. 17, 1932	g 22.62	Jan. 16, 1937	23.33
Mar. 7, 1927	b 16.58	Jan. 11, 1933	19.80	Dec. 9	20.53
Sept. 12, 1928	b 20.33	Feb. 14, 1934	20.75	May 26, 1938	g 21.80
Feb. 28, 1930	21.10	Jan. 30, 1935	21.54	Nov. 26	g 20.78
Oct. 9	19.00	May 29	g 24.74	May 15, 1939	g 21.17
Aug. 26, 1931	g 22.85	Dec. 27	22.26	Nov. 30	18.50
Jan. 28, 1932	20.25				

a Measurement by W. P. Rowe.

b Measurement by Dix Van Dyke.

c Well plugged; dry.

d Well filled; measurements discontinued.

e Measurement by F. L. Sellew.

f Irrigation well 100 feet east pumping.

g Irrigation well pumping.

## Mojave River Basin--Continued

L68c. Scobel and Haimut. Near SW cor. SW $\frac{1}{4}$  sec. 14, T. 9 N., R. 2 E., in poultry yards southeast of well L68 and south of pumping plant. Used drilled, poultry supply well, depth 173 feet. Measuring point, top of casing, at land surface, 1,883.18 feet above sea level. Equipped with hand pump. Companion well to L68 and L68a.

Water level, in feet below measuring point, 1924-28, 1930-33, 1935, 1937-39

Date	Water level	Date	Water level	Date	Water level
June 13, 1924	a 14.0	Jan. 22, 1931	18.77	Dec. 27, 1935	21.55
Nov. 10, 1925	a 15.75	Aug. 26	b 19.32	Jan. 16, 1937	22.40
Mar. 15, 1926	a 15.83	Jan. 28, 1932	19.45	Dec. 9	21.18
Mar. 7, 1927	a 16.33	Mar. 17	b 19.58	May 26, 1938	b 21.28
Sept. 12, 1928	a 17.25	Jan. 11, 1933	19.70	Nov. 26	b 19.51
Feb. 28, 1930	18.05	Jan. 30, 1935	21.00	May 15, 1939	b 19.11
Oct. 9	19.49	May 29	b 21.30	Nov. 30	19.00

L76. Bozarth. Near center west line NW $\frac{1}{4}$  sec. 10, T. 9 N., R. 3 E., northeast of ruins of adobe buildings. Abandoned drilled irrigation well. Measuring point, top of suction column inside of casing, 2.0 feet below land surface, 0.40 foot above top of casing, 1,823.94 feet above sea level. Measurements made in suction column.

Water level, in feet below measuring point, 1922, 1930-35, 1937-39

May 22, 1922	c 29.64	Feb. 15, 1933	33.00	Dec. 9, 1937	34.55
Mar. 7, 1930	31.96	Feb. 14, 1934	33.20	May 26, 1938	34.30
May 8	31.96	Jan. 30, 1935	33.70	Nov. 25	34.31
Sept. 24, 1931	32.52	Dec. 27	34.00	May 16, 1939	34.20
Jan. 28, 1932	32.70	Jan. 21, 1937	34.50	Nov. 30	34.39
May 19	32.64				

L77. NW cor. sec. 3, T. 9 N., R. 3 E., at ranch buildings near corner of road. Used drilled irrigation well, diameter 12 inches. Measuring point, top of steel casing, at land surface, 1,823.19 feet above sea level. Equipped with pump and windmill in 1931. See Water-Supply Paper 578, p. 469, and pl. 24, well 90.

Water level, in feet below measuring point, 1919, 1926, 1930-35, 1937-39

Nov. 25, 1919	42.0	Feb. 15, 1933	42.30	Dec. 9, 1937	43.45
Mar. 7, 1926	a 40.33	Feb. 14, 1934	42.64	May 26, 1938	d 43.5
Mar. 1, 1930	41.49	Jan. 30, 1935	43.01	Nov. 25	42.95
Sept. 24, 1931	42.18	Jan. 14, 1937	43.70	May 16, 1939	40.86
Jan. 28, 1932	42.24	June 3	43.80	Nov. 30	42.85
Apr. 28	42.02				

L78. Henderson. South of center NW $\frac{1}{4}$  sec. 34, T. 10 N., R. 3 E., at south edge of the Mojave River bottom land. Used dug domestic well, diameter 14 inches. Measuring point, top of casing, about 0.5 foot above land surface and 1,774.89 feet above sea level. See Water-Supply Paper 578, p. 465, and pl. 24, well 24.

Water level, in feet below measuring point, 1919, 1930-35, 1937-39

Nov. 25, 1919	12.0	Feb. 14, 1934	8.94	Dec. 9, 1937	10.00
Mar. 1, 1930	8.24	Jan. 30, 1935	9.12	May 26, 1938	8.60
Sept. 24, 1931	9.80	Dec. 27	9.62	Nov. 25	9.19
Apr. 28, 1932	8.51	Jan. 16, 1937	9.50	May 16, 1939	8.60
Feb. 15, 1933	8.75	June 3	9.12	Nov. 30	9.17

L83. H. G. Tienken. Near SW cor. NW $\frac{1}{4}$  sec. 18, T. 9 N., R. 4 E., southerly of two wells at ruins of ranch buildings. Abandoned dug and drilled irrigation well, depth 196 feet. Measuring point, bottom of stringer over curb on north side, at land surface, 1,801.41 feet above sea level. See Water-Supply Paper 578, p. 470, and pl. 24, well 128.

Water level, in feet below measuring point, 1919, 1922, 1930-32, 1935, 1937-39

Nov. 20, 1919	24.6	Aug. 25, 1931	26.23	Jan. 21, 1937	24.90
May 23, 1922	c 24.43	May 18, 1932	24.21	May 26, 1938	25.25
Feb. 28, 1930	24.23	Jan. 30, 1935	24.80	Nov. 25	25.51
May 16	24.18	Dec. 27	25.60	Nov. 30, 1939	25.40

a Measurement by Dix Van Dyke.

b Irrigation well pumping.

c Measurement by W. P. Rowe.

d Pump operating in well.

## Mojave River Basin--Continued

L93. B. Nicholas. SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 12, T. 9 N., R. 3 E., at ranch buildings. Used drilled domestic and irrigation well. Steel casing in shallow concrete pit. Measuring point, top of 6-inch timber on curb, 0.7 foot above land surface and 1,801.23 feet above sea level.

Water level, in feet below measuring point, 1922, 1930-33, 1935, 1937-39

Date	Water level	Date	Water level	Date	Water level
Mar. 23, 1922	a 23.84	Feb. 15, 1933	24.78	May 26, 1938	25.10
May 8, 1930	24.64	Jan. 30, 1935	25.10	Nov. 25	25.42
Aug. 25, 1931	26.95	Jan. 21, 1937	24.40	May 16, 1939	25.17
May 18, 1932	b 27.65	June 3	31.60	Nov. 30	25.40
July 21	24.55				

L97. G. F. Getty. Near NE cor. sec. 21, T. 10 N., R. 3 E., at abandoned buildings southeast of Harvard railroad station. Measuring point in 1919, top of 4-inch timber on top of casing. Measuring point since 1919, top of casing, 0.30 foot above land surface, 1,820.25 feet above sea level. See Water-Supply Paper 578, p. 464, and pl. 24, well 12. Water level, in feet below measuring point, 1919, 1922, 1930, 1933-35, 1938-39

Nov. 12, 1919	83.0	Feb. 23, 1933	80.80	Dec. 27, 1935	81.00
May 17, 1922	a 80.89	Mar. 30, 1934	81.00	May 25, 1938	81.15
Dec. 15	a 80.78	Jan. 29, 1935	81.00	May 22, 1939	81.13
May 24, 1930	80.89				

## SAN JOAQUIN COUNTY

## MOKELUMNE AREA

By A. M. Piper

During 1939 the program of water-level measurements in wells in the Mokelumne area, California, was continued by the East Bay Municipal Utility District on about the same scope as in 1938. The records obtained by the Utility District for 24 selected observation wells in San Joaquin County have been taken in earlier water-level reports and in this report to represent average water-level fluctuations of the area. The causes of these fluctuations were treated at some length in a recent report.<sup>1/</sup> The 24 records also serve roughly as an index to changes in ground-water storage in the area.

The water level in one of the 24 wells was measured weekly until mid-May, and monthly thereafter; in the remaining 23 wells, quarterly to monthly. Altogether, 269 water-level measurements were made during the year. No water-level recorders or float gages were operated.

<sup>1/</sup> Piper, A. M., Gale, H. S., Thomas, H. E., and Robinson, T. W., Geology and ground-water hydrology of the Mokelumne area, California; U. S. Geol. Survey Water-Supply Paper 780, pp. 130-196, 206-216, 1939.

a Measurement by W. P. Rowe.

b Pump operating in well.

The following table shows the averages of the year-end water levels in the 24 wells beginning with 1933. It indicates that the substantial upward trend of water levels, which began in 1935 and continued unchecked through 1938, has ceased and that the recent trend has been sharply downward. Indeed, the year-end water level of 1939 was only slightly higher than the corresponding level of 1935, when the upward trend began.

Average ground-water levels, in feet above mean sea level,  
in 24 observation wells of the Mokelumne  
area, on or about December 31, 1933-39

Year	Water level (feet)	Rise (+) or decline (-) during the year (feet)
1933	30.38	....
1934	29.66	-0.72
1935	29.73	+ .07
1936	31.26	+1.53
1937	32.43	+1.17
1938	33.67	+1.24
1939	30.09	-3.58

Another table, which follows, compares net water-level changes during the periods from January to May, inclusive, and from June to December, inclusive, 1937-1939. During the first period the aggregate withdrawal from wells for irrigation ordinarily increases to a maximum and during the second period the withdrawal diminishes to a minimum. The table indicates that in the first period in 1939 the increasing withdrawal depleted ground-water storage considerably, whereas in 1937 and 1938 replenishment exceeded withdrawal. Thus, in 1939 either the withdrawal was considerably greater and occurred earlier or the replenishment was relatively small and came late in the year, or both.

Summary of net water-level changes, in feet, at 24  
observation wells in the Mokelumne area, 1937-1939

Period	Greatest rise or least recession	Greatest recession	Average
1937			
Jan. 1 to May 31 (period of increasing withdrawals) . . . . .	+6.08	-7.31	+1.28
June 1 to Dec. 31 (period of diminishing withdrawals) . . . . .	+8.03	-5.36	-1.03
The year . . . . .	+4.16	-.43	+1.17
1938			
Jan. 1 to May 31 . . . . .	+9.32	-5.52	+2.60
June 1 to Dec. 31. . . . .	+7.14	-9.07	-1.37
The year . . . . .	+2.72	-.32	+1.24
1939			
Jan. 1 to May 31 . . . . .	+1.35	-12.59	-4.32
June 1 to Dec. 31. . . . .	+8.78	-4.32	+.79
The year . . . . .	-1.08	-5.53	-3.58

## 3631L3. F. B. Mills.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	27.54	May 3	23.54	Aug. 1	24.58	Nov. 1	26.75
Feb. 2	27.27	June 6	25.57	Sept. 1	26.21	Dec. 1	26.06
Apr. 3	26.47	July 1	24.05	Oct. 4	26.75		

## 3617A1. Otto Helmie.

Water level, in feet above mean sea level, 1939

Jan. 3	12.31	Feb. 21	12.63	Apr. 11	12.46	July 1	8.26
10	12.35	28	12.71	18	11.52	Aug. 1	6.16
17	12.38	Mar. 7	12.68	25	11.43	Sept. 1	5.84
24	12.39	14	12.76	May 2	11.07	Oct. 4	7.58
31	12.51	21	12.84	9	11.01	Nov. 1	8.44
Feb. 7	12.58	28	12.89	June 1	9.72	Dec. 1	9.74
14	12.58	Apr. 4	12.87				

## 3636R2. Leland W. Bunch.

Water level, in feet above mean sea level, 1939

Jan. 9	21.55	June 1	20.49	Aug. 1	19.16	Nov. 1	19.30
Apr. 5	21.27	July 1	18.91	Sept. 1	18.30	Dec. 1	a 19.81

## 373B1. Jacob Knoll.

Water level, in feet above mean sea level, 1939

Jan. 10	46.85	July 1	46.26	Sept. 1	44.21	Nov. 1	43.71
Apr. 7	47.96	Aug. 1	44.96	Oct. 5	43.83	Dec. 1	43.67
June 1	47.87						

## 376J8. R. E. and Ruth F. Coker.

Water level, in feet above mean sea level, 1939

Jan. 3	31.89	Apr. 7	29.67	July 1	28.94	Oct. 6	28.44
Feb. 2	31.89	May 4	30.89	Aug. 1	28.38	Nov. 1	28.77
Mar. 2	31.38	June 1	29.83	Sept. 1	28.02	Dec. 1	29.08

a Pump in observation well stopped a few minutes before measurement.

## San Joaquin County--Continued

377JL. J. and Rachel K. Goetken.

Water level, in feet above mean sea level, 1938-39

Date	Water level	Date	Water level	Date	Water level
Jan. 4, 1938	25.65	May 4, 1939	18.82	Sept. 1, 1939	a 19.16
Jan. 12, 1939	27.03	June 1	20.71	Oct. 6	19.85
Feb. 2	27.22	July 1	19.00	Nov. 1	20.33
Mar. 2	26.38	Aug. 1	19.24	Dec. 1	20.92
Apr. 7	21.19				

3710K3. Edward Preszler.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 12	37.26	May 3	21.12	Aug. 1	26.68	Oct. 6	30.66
Feb. 3	37.00	June 1	25.46	Sept. 1	26.40	Nov. 1	31.14
Mar. 2	32.14	July 1	26.58	Oct. 3	30.32	Dec. 1	31.81
Apr. 6	a 21.06						

3710K4. Edward Preszler.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 12	37.24	May 3	20.90	Aug. 1	25.58	Oct. 6	30.52
Feb. 3	36.89	June 1	24.65	Sept. 1	17.61	Nov. 1	31.97
Mar. 2	31.36	July 1	26.33	Oct. 3	30.45	Dec. 1	32.59
Apr. 6	a 21.34						

3715P2. Eugene R. Hieb.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 12	31.39	July 1	23.80	Sept. 1	23.59	Nov. 1	26.12
Apr. 6	a 19.77	Aug. 1	a 22.69	Oct. 6	25.45	Dec. 1	26.93
June 1	24.03						

3719A2. C. M. Ferdun.

Water level, in feet above mean sea level, 1938-39

Date	Water level	Date	Water level	Date	Water level
Jan. 4, 1938	22.01	July 1, 1939	18.41	Oct. 7, 1939	17.20
Jan. 9, 1939	23.80	Aug. 1	18.32	Nov. 1	17.89
Apr. 5	20.99	Sept. 1	17.23	Dec. 1	18.63
June 1	19.74				

3727F3. John F. Heitzmann.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 11	28.43	July 1	25.55	Sept. 1	24.33	Nov. 1	24.40
Apr. 5	28.73	Aug. 1	24.90	Oct. 6	24.21	Dec. 1	24.66
June 1	26.60						

3730E2. W. L. Flanigan.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 5	22.88	Apr. 6	21.25	Aug. 14	12.91	Nov. 1	16.98
Feb. 2	22.92	June 6	16.30	Sept. 1	13.42	Dec. 1	17.84
Mar. 1	22.64	July 1	13.64	Oct. 7	15.80		

4612R1. G. A. Jahant.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 5	30.16	July 1	25.76	Sept. 1	22.83	Nov. 1	23.80
Apr. 5	28.80	Aug. 1	23.55	Oct. 6	23.30	Dec. 1	24.28

a Pump operating in nearby well.



## San Joaquin County--Continued

4634R1. E. M. Smith.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 4	31.28	Apr. 3	29.76	July 1	30.76	Oct. 4	a 30.77
Feb. 2	30.49	May 2	30.21	Aug. 1	30.62	Nov. 1	30.98
Mar. 1	29.84	June 1	30.84	Sept. 1	30.54	Dec. 1	30.87

4636A1. D. D. Smith and S. H. and I. Zimmerman.

Water level, in feet above mean sea level, 1939

Jan. 6	30.87	Apr. 7	26.94	July 1	25.37	Oct. 6	28.51
Feb. 3	29.66	May 2	22.91	Aug. 1	25.79	Nov. 1	28.88
Mar. 1	30.50	June 1	27.65	Sept. 1	29.67	Dec. 1	28.06

4715C3. Robert L. Carter.

Water level, in feet above mean sea level, 1939

Jan. 9	44.84	July 1	35.64	Sept. 1	59.94	Nov. 1	41.14
Apr. 10	45.57	Aug. 1	40.34	Oct. 4	40.53	Dec. 1	41.69
June 1	43.39						

4718N3. Martha Eddlemon.

Water level, in feet above mean sea level, 1939

Jan. 6	29.50	July 1	19.43	Sept. 1	18.68	Nov. 1	22.11
Apr. 7	24.35	Aug. 1	18.29	Oct. 5	20.80	Dec. 1	22.74
June 1	23.85						

4722Q4. Adolphus Eddlemon.

Water level, in feet above mean sea level, 1939

Jan. 9	46.71	May 2	44.07	July 1	40.66	Oct. 5	41.66
Feb. 3	46.91	June 1	42.53	Aug. 1	40.52	Nov. 1	42.08
Mar. 1	46.79	6	42.38	Sept. 1	40.34	Dec. 1	42.52
Apr. 10	45.71						

4722Q5. Adolphus Eddlemon.

Water level, in feet above mean sea level, 1939

Jan. 9	46.42	May 2	35.03	July 1	28.25	Oct. 5	40.92
Feb. 3	46.66	June 1	b 34.01	Aug. 1	34.71	Nov. 1	41.80
Mar. 1	45.35	6	c 35.53	Sept. 1	34.82	Dec. 1	42.10
Apr. 10	41.95						

4727P1. Frank H. and Leonard W. Buck.

Water level, in feet above mean sea level, 1939

Jan. 9	49.26	July 1	47.11	Sept. 1	46.72	Nov. 1	46.83
Apr. 10	48.60	Aug. 1	46.95	Oct. 5	46.97	Dec. 1	46.94
June 1	47.74						

4730J2. Clara A. Barton.

Water level, in feet above mean sea level, 1939

Jan. 6	31.75	Aug. 1	d 22.23	Sept. 1	23.03	Nov. 1	25.51
Apr. 7	27.88	14	22.67	Oct. 6	24.74	Dec. 1	26.20
June 6	21.97						

4731J3. Charles H. Woest.

Water level, in feet above mean sea level, 1939

Jan. 6	34.64	Apr. 7	32.65	July 1	31.35	Oct. 6	e 33.13
Feb. 3	34.49	May 2	31.32	Aug. 1	31.92	Nov. 1	32.85
Mar. 1	34.10	June 1	31.32	Sept. 1	32.36	Dec. 1	32.45

4731N5. Jacob Geohring.

Water level, in feet above mean sea level, 1939

Jan. 5	35.08	Apr. 6	e 35.86	July 1	36.25	Oct. 6	e 35.76
Feb. 2	34.81	May 3	37.42	Aug. 1	35.83	Nov. 1	35.37
Mar. 1	34.75	June 1	36.43	Sept. 1	35.74	Dec. 1	33.69

4734G1. John J. Schmiedt.

Water level, in feet above mean sea level, 1939

Jan. 12	49.62	July 1	50.94	Sept. 1	47.67	Nov. 1	47.60
Apr. 7	49.15	Aug. 1	47.80	Oct. 5	48.04	Dec. 1	47.81
June 1	48.08						

a Water in adjacent intermittent pond.

b Pump operating in nearby well.

c Adjacent land being irrigated.

d Pump in observation well stopped a few minutes before measurement.

e Adjacent land flooded by stream.

## CONNECTICUT

### NEW HAVEN COUNTY

By John G. Ferris

An investigation of ground-water conditions in Connecticut was started in October 1934 as a project of the Federal Relief Administration (replaced by the Works Progress Administration in 1935), under the sponsorship of the State Planning Board and the State Water Commission, and under the technical direction of the Federal Geological Survey. The inventory of wells and springs and a tabulation of periodic measurements of water levels in selected wells, collected through December 1937, were published in November 1938 as Bulletins GW-1 to GW-6<sup>1/</sup> of the Works Progress Administration for Connecticut.

Detailed investigations of the ground-water resources of the New Haven area in 1919 indicated that local over-pumping had already resulted in salt water intrusion.<sup>2/</sup> The more recent work of the Works Progress Administration indicated that conditions are now more critical than they were in 1919. Moreover, it seemed likely that further over-development would take place with the rapid increase in use of ground water for air conditioning. These conditions indicated the desirability of starting a systematic program of collecting basic data that would show the trend of over-development. In 1939, it became necessary to curtail the work being carried on by the Works Progress Administration. Accordingly, cooperation was arranged between the Federal Geological Survey and the Connecticut State Water Commission for the purpose of obtaining water-level measurements in observation wells selected to give a comprehensive picture of the effects of the pumping for industrial purposes and for air conditioning.

Wherever possible, observations have been made in wells at industrial plants listed in Water-Supply Paper 540. The numbers assigned to wells in that report refer to the establishment or owner and include all wells at that location or under that ownership. In the present report a separate number has been given to each well, and cross reference to the numbering system used in Water-Supply Paper 540 is given in the descriptive headings.

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<sup>1/</sup> Listed in water levels and artesian pressure in observation wells in the United States in 1938: U. S. Geol. Survey Water-Supply Paper 845, pp. 48-49, 1939.

<sup>2/</sup> Brown, J. S., A study of coastal ground water, with special reference to Connecticut: U. S. Geol. Survey Water-Supply Paper 537, 1925.

Brown, J. S., Ground water in the New Haven area, Conn.: U. S. Geol. Survey Water-Supply Paper 540, 1928.

At the end of 1939 one automatic water-stage recorder was in operation and weekly water-level measurements by the wetted-tape method were being made in 23 additional observation wells in New Haven. A total of about 630 individual water-level measurements were made in 1939. The measurements were made from clearly marked substantial points at or near the top of the well, such as top of casing, top of coupling, or top of recorder shelf. Instrumental levels were run to each well to determine the altitude of the measuring point above mean sea level. Reference bench marks were set at all wells.

The precipitation at New Haven was about normal in 1939. However, the first four months of the year had more than average precipitation, the excess at the end of April being more than 5 inches above the average. May, June, and July were deficient in precipitation, with a total for the three months of almost 7 inches below normal.

The records of ground-water level here given do not cover a period long enough to warrant conclusions or summaries.

NHn 101. One of group of 6 wells described in Water-Supply Paper 540, p. 106, no. 12. Dillon Estate. 46 George Street. Industrial driven well, diameter 2 inches, measured depth 43.3 feet. Measuring point, top of 2-inch tee, 0.7 foot below compressor room floor, 0.5 foot above land surface and 18.04 feet above mean sea level. Used occasionally. First measured May 11, 1939. Water level May 11, 1939, 17.82 feet below measuring point and 0.22 foot above mean sea level.

Water level, in feet, with reference to mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 11	+0.22	July 21	-1.26	Sept. 15	(a)	Nov. 9	-0.49
22	+ .04	28	-1.36	22	(a)	16	- .37
31	- .19	Aug. 4	-1.50	28	-1.33	22	- .34
June 6	- .36	11	(a)	Oct. 6	-1.08	29	- .47
12	- .57	18	(a)	13	-1.01	Dec. 6	- .56
22	- .72	25	(a)	20	-1.42	13	(a)
30	- .78	31	(a)	27	- .81	20	- .45
July 7	(a)	Sept. 8	(a)	Nov. 2	- .72	27	- .21
14	(a)						

NHn 105. At plant described in Water-Supply Paper 540, p. 106, no. 14. Whiting Realty Co. 14 Whiting Street, 40 feet west of well NHn 103 and 60 feet south of well NHn 107. Unused industrial driven well, diameter 2 inches, measured depth 33.9 feet. Measuring point, top of 2-inch tee, 0.8 foot above compressor room floor, 1.6 feet above land surface and 19.18 feet above mean sea level. First measured May 11, 1939. Water level May 11, 1939, 18.12 feet below measuring point and 1.06 feet above mean sea level.

Water level, in feet, with reference to mean sea level, 1939

May 11	+1.06	July 21	-0.18	Sept. 15	-0.20	Nov. 9	+0.33
22	+ .96	28	- .25	22	- .26	16	+ .45
31	+ .78	Aug. 4	- .35	28	- .26	22	+ .50
June 6	+ .66	11	- .44	Oct. 6	- .08	29	+ .43
12	+ .48	18	- .55	13	- .05	Dec. 6	+ .36
22	+ .26	25	- .53	20	- .08	13	+ .41
30	+ .13	31	- .31	27	+ .02	20	+ .41
July 7	+ .05	Sept. 8	- .30	Nov. 2	+ .15	27	+ .56
14	- .08						

a Well in use.

NHn 107. At plant described in Water-Supply Paper 540, p. 106, no. 14. Whiting Realty Co. 14 Whiting Street, 60 feet north of well NHn 105 and 40 feet west of well NHn 108. Unused industrial driven well, diameter 2 inches, measured depth 32.1 feet. Measuring point, top of 2-inch nipple, 1.0 foot above basement floor, 6.6 feet below land surface and 10.93 feet above mean sea level. First measured, May 12, 1939. Water level May 12, 1939, 10.05 feet below measuring point and 0.88 foot above mean sea level.

Water level, in feet, with reference to mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 12	+0.88	July 21	-0.37	Sept. 15	-0.39	Nov. 9	+0.20
22	+0.80	28	-.44	22	-.45	16	+0.32
31	+0.62	Aug. 4	-.55	28	-.44	22	+0.37
June 6	+0.49	11	-.64	Oct. 6	-.25	29	+0.29
12	+0.29	18	-.76	13	-.20	Dec. 6	+0.21
22	+0.10	25	-.73	20	-.30	13	+0.25
30	-.03	31	-.52	27	-.11	20	+0.28
July 7	-.13	Sept. 8	-.49	Nov. 2	+0.01	27	+0.44
14	-.26						

NHn 108. At plant described in Water-Supply Paper 540, p. 106, no. 14. Whiting Realty Co. 14 Whiting Street, 40 feet east of well NHn 107 and 10 feet north of well NHn 105. Unused industrial driven well, diameter 2 inches, measured depth 38.0 feet. Measuring point, top of 2-inch nipple, 2.1 feet above boiler room floor, 2.0 feet above land surface and 17.86 feet above mean sea level. First measured May 12, 1939. Water level May 12, 1939, 16.99 feet below measuring point and 0.87 foot above mean sea level.

Water level, in feet, with reference to mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 12	+0.87	July 21	-0.39	Sept. 15	-0.39	Nov. 9	+0.19
22	+0.80	28	-.45	22	-.45	16	+0.31
31	+0.60	Aug. 4	-.57	28	-.44	22	+0.36
June 6	+0.47	11	-.65	Oct. 6	-.25	29	+0.28
12	+0.29	18	-.76	13	-.21	Dec. 6	+0.20
22	+0.08	25	-.73	20	-.28	13	+0.25
30	-.05	31	-.52	27	-.13	20	+0.27
July 7	-.14	Sept. 8	-.50	Nov. 2	0.00	27	+0.43
14	-.27						

NHn 110. At plant described in Water-Supply Paper 540, p. 106, no. 15. Federal Packing Co. 149 State Street. Unused industrial driven well, diameter 2 inches, measured depth 20.5 feet. Measuring point, top of 2-inch coupling, 0.7 foot above basement floor, 0.9 foot below land surface and 10.50 feet above mean sea level. First measured May 12, 1939. Water level May 12, 1939, 9.99 feet below measuring point and 0.51 foot above mean sea level.

Water level, in feet, with reference to mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 12	+0.51	July 21	-0.27	Sept. 15	-0.85	Nov. 9	-0.85
24	+0.44	28	-.36	22	-.89	16	-.79
31	+0.37	Aug. 4	-.46	28	-.91	22	-.75
June 6	+0.31	11	-.56	Oct. 6	-.93	29	-.71
12	+0.24	18	-.64	13	-.93	Dec. 6	-.68
22	+0.11	25	-.73	20	-.92	13	-.64
30	0.00	31	-.77	27	-.92	20	-.60
July 7	-.09	Sept. 8	-.82	Nov. 2	-.90	27	-.55
14	-.18						

NHn 116. One of group of five wells described in Water-Supply Paper 540, p. 106, no. 9, and incorrectly reported to be 4 inches in diameter. Liberty Building. 152 Temple Street. Unused industrial drilled well, diameter 8 inches, measured depth 57.8 feet. Measuring point, top of 8-inch casing, 0.5 foot above floor of well pit, 7.2 feet below land surface and 20.54 feet above mean sea level. First measured May 22, 1939. Water level May 22, 1939, 12.43 feet below measuring point and 8.11 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 22	8.11	July 7	7.01	Aug. 18	6.27	Nov. 22	6.24
31	7.98	14	6.88	Oct. 20	6.68	29	6.19
June 6	7.85	21	6.58	27	6.54	Dec. 6	6.23
12	7.68	28	6.47	Nov. 2	6.36	13	6.25
22	7.39	Aug. 4	6.36	9	6.31	20	6.26
30	7.23	11	6.33	16	6.30	27	6.15

NHn 117. One of two wells described in Water-Supply Paper 540, p. 107, no. 19. The New York, New Haven and Hartford Railroad Co. 311 State Street. Unused industrial driven well, diameter  $2\frac{1}{2}$  inches, measured depth 31.8 feet. Measuring point, top of  $2\frac{1}{2}$ -inch nipple, 1.2 feet above basement floor, 5.4 feet below land surface and 12.62 feet above mean sea level. First measured May 31, 1939. Water level May 31, 1939, 10.80 feet below measuring point and 1.92 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 31	1.82	July 28	0.76	Sept. 22	0.79	Nov. 16	1.26
June 6	1.62	Aug. 4	.63	28	.91	22	1.27
12	1.49	11	.66	Oct. 6	1.14	29	1.18
22	1.34	18	.55	13	1.02	Dec. 6	1.21
30	1.31	25	1.12	20	1.04	13	1.23
July 7	1.07	31	1.00	27	1.03	20	1.20
14	.96	Sept. 8	.84	Nov. 2	1.20	27	1.26
21	.85	15	.79	9	1.27		

NHn 120. Roger Sherman Theatre. 70 College Street. Unused industrial driven well, diameter 3 inches, measured depth 57.0 feet. Measuring point, top of 3-inch coupling flush with boiler room floor, 9.6 feet below land surface and 28.02 feet above mean sea level. First measured May 23, 1939. Water level May 23, 1939, 18.78 feet below measuring point and 9.24 feet above mean sea level.

Water level, in feet above mean sea level, 1939

May 23	9.24	July 21	7.15	Sept. 15	7.02	Nov. 9	7.34
31	8.45	28	6.97	22	7.07	16	7.37
June 6	8.49	Aug. 4	6.79	28	7.09	22	7.39
12	8.26	11	6.67	Oct. 6	7.19	29	7.42
22	7.89	18	6.22	13	7.25	Dec. 6	7.44
30	7.76	25	6.38	20	7.29	13	7.41
July 7	7.53	31	6.66	27	7.32	20	7.39
14	7.27	Sept. 8	6.81	Nov. 2	7.32	27	7.42

NHn 128. United Restaurant. Chapel and York Streets. Unused industrial driven well, diameter 2 inches, measured depth 29.9 feet. Measuring point, top of 2-inch casing, 0.2 foot above basement floor, 7.0 feet below land surface and 36.78 feet above mean sea level. First measured May 31, 1939. Water level May 31, 1939, 19.12 feet below measuring point and 17.66 feet above mean sea level.

Water level, in feet above mean sea level, 1939

May 31	17.66	July 21	16.57	Sept. 8	15.99	Oct. 27	15.83
June 6	17.64	28	16.42	15	15.99	Nov. 22	15.74
12	17.17	Aug. 4	16.27	22	16.06	29	15.71
22	17.03	11	16.25	28	16.02	Dec. 6	15.71
30	16.86	18	16.08	Oct. 6	15.97	13	15.67
July 7	16.79	25	15.96	13	15.89	20	15.63
14	16.66	31	16.25	20	15.63	27	15.61

NHn 131. At plant described in Water-Supply Paper 540, p. 111, no. 38. New Haven Clock Co. 133 Hamilton Street. Unused industrial driven well, diameter  $2\frac{1}{2}$  inches, measured depth 40.0 feet. Measuring point, top of  $2\frac{1}{2}$ -inch nipple, 0.8 foot below buffing room floor, 3.0 feet below land surface and 14.23 feet above mean sea level. First measured June 1, 1939. Water level June 1, 1939, 17.49 feet below measuring point and 3.26 feet below mean sea level.

Water level, in feet, with reference to mean sea level, 1939

June 1	-3.26	July 28	-3.59	Sept. 22	-4.45	Nov. 16	-4.72
6	-3.20	Aug. 4	-4.00	28	-4.59	22	-4.54
12	-3.26	11	-4.17	Oct. 6	-4.81	29	-4.52
22	-3.35	18	-4.10	13	-4.68	Dec. 6	-4.03
30	-3.08	25	-4.14	20	-4.73	13	-3.93
July 7	-2.78	31	-4.10	27	-4.83	20	-4.05
14	-2.84	Sept. 8	-4.08	Nov. 2	-4.82	27	-3.86
21	-3.29	15	-4.38	9	-4.75		

NHn 140. One of east group of wells described in Water-Supply Paper 540, p. 111, no. 37. New Haven Pulp and Board Co. 136 East Street. Unused industrial driven well, diameter  $2\frac{1}{2}$  inches, measured depth 38.0 feet. Measuring point, top of  $2\frac{1}{2}$ -inch coupling, 2.8 feet above basement floor, 2.8 feet below land surface and 6.22 feet above mean sea level. First measured June 6, 1939. Water level June 6, 1939, 11.88 feet below measuring point and 5.66 feet below mean sea level.

Water level, in feet, with reference to mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
June 6	-5.66	Aug. 4	-9.76	Sept. 28	-8.53	Nov. 16	-9.46
12	-5.92	11	-9.40	Oct. 6	-9.65	22	-9.06
22	-5.99	18	-9.20	13	-9.09	29	-9.10
30	-6.28	25	-9.01	20	-8.88	Dec. 6	-7.51
July 7	-3.92	31	-8.97	27	-9.71	13	-7.29
14	-6.66	Sept. 8	-8.72	Nov. 2	-9.30	20	-8.03
21	-8.33	15	-9.49	9	-9.51	27	-6.53
28	-8.48	22	-8.21				

NHn 149. Seamless Rubber Co. 253 Hallock Avenue. Unused industrial drilled well, diameter 6 inches, measured depth 53.7 feet. Measuring point, top of 6-inch casing, 5.6 feet below land surface and 17.40 feet above mean sea level. First measured June 13, 1939. Water level June 13, 1939, 14.71 feet below measuring point and 2.69 feet above mean sea level.

Water level, in feet above mean sea level, 1939

June 13	2.69	Aug. 11	2.53	Sept. 28	1.80	Nov. 16	1.81
22	2.82	18	2.57	Oct. 6	1.84	22	1.87
30	3.25	25	2.40	13	1.98	29	1.95
July 7	2.66	31	1.94	20	1.66	Dec. 6	1.99
14	2.46	Sept. 8	1.74	27	1.61	13	2.07
21	2.58	15	1.75	Nov. 2	1.90	20	1.88
28	2.49	22	1.71	9	1.73	27	2.48
Aug. 4	2.75						

NHn 152. A. C. Gilbert Co. Blatchley Avenue and Peck Street. Unused industrial drilled well, diameter 8 inches, measured depth 288.3 feet. Measuring point, top of 8-inch coupling, 6.2 feet above basement floor, 1.7 feet above land surface and 44.18 feet above mean sea level. First measured June 13, 1939. Water level June 13, 1939, 28.47 feet below measuring point and 15.71 feet above mean sea level.

Water level, in feet above mean sea level, 1939

June 13	15.71	Aug. 11	14.39	Sept. 28	14.30	Nov. 16	14.58
22	15.53	18	14.14	Oct. 6	14.31	22	14.48
30	15.46	25	14.27	13	14.37	29	14.22
July 7	15.30	31	14.78	20	14.22	Dec. 6	13.92
14	15.17	Sept. 8	14.79	27	14.04	13	13.65
21	14.98	15	14.65	Nov. 2	13.92	20	13.41
28	14.82	22	14.50	9	14.35	27	13.41
Aug. 4	14.61						

NHn 158. National Folding Box Co. James and Alton Streets, 330 feet west of well NHn 160 and 250 feet south of well NHn 159. Unused industrial driven well, diameter  $1\frac{1}{2}$  inches, measured depth 101.3 feet. Measuring point, top of  $1\frac{1}{2}$ -inch pipe, 1.2 feet below land surface and 7.12 feet above mean sea level. First measured June 7, 1939. Water level June 7, 1939, 11.06 feet below measuring point and 3.94 feet below mean sea level.

Water level, in feet, with reference to mean sea level, 1939

June 7	-3.94	Aug. 4	-4.57	Sept. 28	-5.14	Nov. 16	-4.91
12	-3.57	11	-4.69	Oct. 6	-5.08	22	-4.69
22	-4.16	18	-4.94	13	-5.25	29	-4.78
30	-4.56	25	-4.86	20	-5.31	Dec. 6	-4.36
July 7	-4.04	31	-4.89	27	-5.40	13	-4.45
14	-4.31	Sept. 8	-4.61	Nov. 2	-5.32	20	-4.34
21	-4.41	15	-4.88	9	-5.14	27	-3.73
28	-4.48	22	-5.07				

NHn 159. One of west group of wells described in Water-Supply Paper 540, p. 108, no. 24. National Folding Box Co. James and Alton Streets, 200 feet north of well NHn 160 and 340 feet east of well NHn 158. Unused industrial driven well, diameter 3 inches, measured depth 51.8 feet. Measuring point, top of 3-inch casing, 0.5 foot above land surface and 7.33 feet above mean sea level. First measured June 7, 1939. Water level June 7, 1939, 14.62 feet below measuring point and 7.29 feet below mean sea level.

Water level, in feet, with reference to mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
June 7	-7.29	Aug. 4	-7.65	Sept. 28	-8.37	Nov. 16	-8.06
12	-4.11	11	-7.84	Oct. 6	-8.24	22	-7.87
22	-7.55	18	-8.07	13	-8.44	29	-7.77
30	-7.90	25	-7.94	20	-8.46	Dec. 6	-7.54
July 7	-7.18	31	-7.96	27	-8.49	13	-7.62
14	-7.46	Sept. 8	-7.54	Nov. 2	-8.49	20	-7.40
21	-7.58	15	-7.86	9	-8.32	27	-6.58
28	-7.67	22	-8.12				

NHn 160. One of west group of wells described in Water-Supply Paper 540, p. 108, no. 24. National Folding Box Co. James and Alton Streets, 330 feet east of well NHn 158 and 200 feet south of well NHn 159. Unused industrial driven well, diameter 3 inches, measured depth 76.0 feet. Measuring point, top of 3-inch casing, 0.2 foot above land surface and 6.89 feet above mean sea level. First measured June 7, 1939. Water level June 7, 1939, 4.92 feet below measuring point and 1.97 feet above mean sea level.

Water level, in feet above mean sea level, 1939

June 7	1.97	Aug. 4	1.19	Sept. 28	2.43	Nov. 16	2.77
12	1.81	11	1.56	Oct. 6	3.15	22	2.53
22	1.86	18	1.43	13	2.50	29	2.29
30	1.98	25	3.92	20	2.15	Dec. 6	2.76
July 7	1.72	31	2.62	27	2.14	13	2.67
14	1.62	Sept. 8	2.22	Nov. 2	3.29	20	2.63
21	1.42	15	2.19	9	3.26	27	2.76
28	1.30	22	2.06				

NHn 168. Story's Dairy. 192 Bailey Street. Unused industrial drilled well, diameter 8 inches, measured depth 482.8 feet below measuring point. Measuring point, top of 8-inch casing, 0.4 foot above land surface and 44.72 feet above mean sea level. First measured June 22, 1939. Water level June 22, 1939, 36.18 feet below measuring point and 8.54 feet above mean sea level.

Water level, in feet above mean sea level, 1939

June 22	8.54	Aug. 11	7.87	Sept. 28	7.70	Nov. 16	7.43
30	8.61	18	7.84	Oct. 6	7.71	22	7.54
July 7	8.32	25	7.94	13	7.63	29	7.38
14	8.34	31	8.03	20	7.44	Dec. 6	7.36
21	8.18	Sept. 8	7.87	27	7.45	13	7.45
28	8.13	15	7.73	Nov. 2	7.37	20	7.36
Aug. 4	8.04	22	7.69	9	7.44	27	7.20

NHn 170. One of group of 7 wells described in Water-Supply Paper 540, p. 106, no. 8. Yale University. Dining hall, Grove and College Streets. Unused industrial driven well, diameter 2 inches, measured depth 13.6 feet. Measuring point, top of 2-inch coupling flush with engine room floor, 17.7 feet below land surface and 23.39 feet above mean sea level. First measured June 23, 1939. Water level June 23, 1939, 4.98 feet below measuring point and 18.41 feet above mean sea level.

Water level, in feet above mean sea level, 1939

June 23	18.41	Aug. 11	17.70	Sept. 28	17.29	Nov. 16	16.93
30	18.31	18	17.61	Oct. 6	17.21	22	16.91
July 7	18.19	25	17.56	13	17.15	29	16.89
14	18.09	31	17.56	20	17.09	Dec. 6	16.87
21	17.98	Sept. 8	17.51	27	17.04	13	16.86
28	17.89	15	17.43	Nov. 2	16.98	20	16.83
Aug. 4	17.80	22	17.36	9	16.95	27	16.80

NHn 175. Monarch Laundry. 149 Derby Avenue. Unused industrial drilled well, diameter 6 inches, measured depth 54.3 feet. Measuring point, top of recorder shelf, 1.0 foot above land surface and 33.34 feet above mean sea level. First measured June 23, 1939. Water level June 23, 1939, 29.33 feet below measuring point and 4.51 feet above mean sea level. Automatic water-stage recorder installed Oct. 6, 1939.

Lowest daily water level, in feet above mean sea level, 1939  
(Record from June 23 to October 6 based on weekly tape measurements;  
from October 7 through December 31 on recorder charts.)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
June 23	4.51	Oct. 17	3.74	Nov. 12	3.53	Dec. 7	3.54
30	4.43	18	3.73	13	3.53	8	3.54
July 7	4.38	19	3.72	14	3.57	9	3.54
14	4.33	20	3.71	15	3.57	10	3.54
21	4.26	21	3.70	16	3.57	11	3.54
28	4.19	22	3.69	17	3.57	12	3.54
Aug. 4	4.14	23	3.69	18	3.56	13	3.54
11	4.07	24	3.68	19	3.56	14	3.54
18	4.01	25	3.67	20	3.56	15	3.53
25	3.97	26	3.66	21	3.56	16	3.53
31	3.95	27	3.65	22	3.55	17	3.53
Sept. 8	3.97	28	3.64	23	3.55	18	3.53
15	3.93	29	3.64	24	3.55	19	3.52
22	3.86	30	3.63	25	3.55	20	3.52
28	3.81	31	3.62	26	3.55	21	3.52
Oct. 6	3.77	Nov. 1	3.62	27	3.55	22	3.51
7	3.84	2	3.62	28	3.55	23	3.51
8	3.83	3	3.61	29	3.55	24	3.51
9	3.83	4	3.60	30	3.55	25	3.50
10	3.82	5	3.60	Dec. 1	3.55	26	3.50
11	3.80	6	3.60	2	3.55	27	3.49
12	3.79	7	3.60	3	3.55	28	3.48
13	3.78	8	3.60	4	3.55	29	3.48
14	3.77	9	3.59	5	3.54	30	3.48
15	3.76	10	3.59	6	3.54	31	3.48
16	3.75	11	3.58				

NHn 176. New Haven Clock Co. 133 Hamilton Street. Unused industrial drilled well, diameter 8 inches, measured depth 99.8 feet. Measuring point, top of 1½-inch coupling welded to cap of 8-inch casing, 1.1 feet above land surface and 22.37 feet above mean sea level. First measured June 30, 1939. Water level June 30, 1939, 22.71 feet below measuring point and 0.34 foot below mean sea level.

Water level, in feet, with reference to mean sea level, 1939

June 30	-0.34	Aug. 18	-0.44	Oct. 6	-0.45	Nov. 22	-0.77
July 7	-.31	25	-.20	13	-.49	29	-.81
14	-.31	31	-.21	20	-.55	Dec. 6	-.85
21	-.32	Sept. 8	-.25	27	-.59	13	-.88
28	-.35	15	-.29	Nov. 2	-.64	20	-.91
Aug. 4	-.37	22	-.35	9	-.69	27	-.93
11	-.40	28	-.39	16	-.73		

NHn 177. City of New Haven, Department of Parks. Church and Chapel Streets. Unused public supply drilled well, diameter 5 inches, measured depth 112.8 feet. Measuring point, top of 5-inch casing, 4.6 feet below land surface and 18.16 feet above mean sea level. First measured July 14, 1939. Water level July 14, 1939, 12.33 feet below measuring point and 5.83 feet above mean sea level.

Water level, in feet above mean sea level, 1939

July 14	5.83	Oct. 13	5.18	Nov. 9	5.13	Dec. 6	5.22
21	5.50	20	5.13	16	5.14	13	5.23
28	5.28	27	5.12	22	5.17	20	5.22
Aug. 4	5.11	Nov. 2	5.11	29	5.19	27	5.22



NHn 178. One of group of 5 wells described in Water-Supply Paper 540, p. 109, no. 27. Connecticut Co. Grand Avenue and Haven Street, 20 feet east of well NHn 179. Unused industrial driven well, diameter 3 inches, measured depth 74.4 feet. Measuring point, top of 3-inch casing, 0.6 foot above land surface and 14.36 feet above mean sea level. First measured July 21, 1939. Water level July 21, 1939, 15.41 feet below measuring point and 1.05 feet below mean sea level.

Water level, in feet, with reference to mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
July 21	-1.05	Sept. 8	-1.57	Oct. 20	-1.91	Nov. 29	-1.62
28	-1.50	15	-1.44	27	-2.21	Dec. 6	-1.67
Aug. 11	-1.70	22	-1.93	Nov. 2	-1.86	13	-1.89
18	-1.39	28	-2.06	9	-2.25	20	-1.54
25	-1.81	Oct. 6	-1.64	16	-1.75	27	-1.77
31	-1.47	13	-2.03	22	-1.89		

NHn 179. One of group of 5 wells described in Water-Supply Paper 540, p. 109, no. 27. Connecticut Co. Grand Avenue and Haven Street, 20 feet west of well NHn 178. Unused industrial driven well, diameter 3 inches, measured depth 64.7 feet. Measuring point, top of 3-inch casing, 0.4 foot above land surface and 14.35 feet above mean sea level. First measured July 21, 1939. Water level July 21, 1939, 15.55 feet below measuring point and 1.20 feet below mean sea level.

Water level, in feet, with reference to mean sea level, 1939

July 21	-1.20	Sept. 8	-1.55	Oct. 20	-1.92	Nov. 29	-1.77
28	-1.29	15	-1.62	27	-1.95	Dec. 6	-1.67
Aug. 11	-1.51	22	-1.74	Nov. 2	-1.99	13	-1.63
18	-1.56	28	-1.77	9	-1.96	20	-1.65
25	-1.61	Oct. 6	-1.75	16	-1.81	27	-1.58
31	-1.52	13	-1.78	22	-1.73		

NHn 182. Frank X. Hald (formerly Staehly Brewing Co., originally Baumann Rubber Co., Factory no. 2). 370-376 Davenport Avenue. Unused industrial driven well, diameter 2 inches, measured depth 25.8 feet. Measuring point, top of 2-inch nipple, 1.2 feet above pump room floor, 4.6 feet below land surface and 19.32 feet above mean sea level. First measured Sept. 28, 1939. Water level Sept. 28, 1939, 14.77 feet below measuring point and 4.55 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Sept. 28	4.55	Oct. 27	4.42	Nov. 22	4.60	Dec. 13	4.49
Oct. 6	4.52	Nov. 2	4.42	29	4.57	20	4.44
13	4.48	9	4.55	Dec. 6	4.56	27	4.44
20	4.46	16	4.59				

## FLORIDA

By W. P. Cross and H. H. Cooper, Jr.

Observations of water levels and artesian pressure in wells in Florida were continued during 1939 in connection with the cooperative ground-water investigations by the Florida Geological Survey, Herman Gunter, State Geologist, and the Federal Geological Survey. Measurements of water levels in wells were made also in Dade and Broward Counties in connection with a ground-water investigation started in 1939 by the Geological Survey in cooperation with the cities of Miami, Miami Beach, and Coral Gables, and with Dade County. A brief statement of the work and availability of records of water level in wells in Florida prior to 1936 is given in Water-Supply Paper 777; observations made in 1936, 1937, and 1938 on the Sharpes Ferry well (Marion County 5) and the Blue Grotto sinkhole, in Marion County, are given in Water-Supply Papers 817, 840, and 845. A graph showing fluctuations of artesian pressure from 1933 to 1937, inclusive, in the Sharpes Ferry well is included in Water-Supply Paper 840.

During 1939, observations by the district office of the Federal Geological Survey at Ocala, Fla., were continued on the Sharpes Ferry well and the Blue Grotto sinkhole. A recording pressure gage was operated on a well owned by C. S. Lee near Oviedo, in Seminole County.

Most of the wells in Dade and Broward Counties vary in depth from a few feet to about 250 feet and tap water in limestone or sand of Miocene, Pliocene, and Pleistocene ages.<sup>1/</sup> A few of the wells, however, are as much as 1,000 feet deep and tap artesian water<sup>2/</sup> in limestone of Eocene and Miocene ages. The artesian water, however, is generally too highly mineralized to be satisfactory for domestic and public consumption.<sup>3/</sup>

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<sup>1/</sup> Cooke, C. W., and Mossom, Stuart, *Geology of Florida*: Florida Geol. Survey 20th Ann. Rept., pp. 150-215 and pl. 2, 1929.

Mansfield, W. C., *Notes on the upper Tertiary and Pleistocene mollusks of peninsular Florida*: Florida Geol. Survey Bull. 11, 1933.

<sup>2/</sup> Stringfield, V. T., *Artesian water in the Florida peninsula*: U. S. Geol. Survey Water-Supply Paper 773-C, pp. 115-195, 1936.

Sellards, E. H., and Gunter, Herman, *The artesian water supply of eastern and southern Florida*: Florida Geol. Survey 5th Ann. Rept., pp. 103-290, 1913.

Matson, G. C., and Sanford, Samuel, *Geology and ground waters of Florida*: U. S. Geol. Survey Water-Supply Paper 319, 1913.

<sup>3/</sup> Collins, W. D., and Howard, C. S., *Chemical character of waters of Florida*: U. S. Geol. Survey Water-Supply Paper 596-G, pp. 210-211, 1927.

Periodic measurements of water level were being made by the Federal Geological Survey in 68 observation wells in Dade and Broward Counties at the end of 1939. Four of the wells are equipped with automatic water-stage recorders, and the rest are measured weekly. About 790 individual water-level measurements were made during the year in connection with the observation-well program.

Subnormal precipitation during the first 4 months of 1939 created some concern regarding ground-water supplies for the cities of Miami and Miami Beach, and as a result periodic observations of water levels in selected observation wells and canals in these cities were begun. Ground-water levels during May were in general the lowest for the year. Rainfall during the rainy season--June to September--caused considerable recovery of water levels, and heavy rains in October produced the highest water levels of the year. Water levels were receding rapidly at the end of 1939.

The rainfall at Miami during 1939 was 57.39 inches, compared with a 33-year average of 58.82 inches. Precipitation during the first 4 months, however, was only 3.40 inches, compared with a normal of 9.61 inches. Rainfall during the rainy period from June to September, when about half the annual precipitation usually occurs, was about normal. Rainfall during the last 3 months of 1939 was considerably above normal.

#### Dade County

F25. City of Opa Locka. Northeast corner of Dunad Avenue and Sabur Lane, in Opa Locka. Drilled fire well, diameter 6 inches, depth 100 feet. Measuring point, lip of hydrant, 2.9 feet above land surface. Measurements from June through August are furnished by City of Miami Beach.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
June 27	9.41	Aug. 9	8.67	Nov. 6	6.84	Dec. 4	7.79
30	9.11	15	8.68	9	7.14	11	8.07
July 11	8.30	23	8.69	20	7.32	19	8.29
20	8.77	29	8.20	27	7.57	26	8.44
27	9.12	Nov. 4	6.65				

F9. City of Miami Springs. Northwest corner of DeSoto and Oakwood Drives, in Miami Springs. Drilled fire well, diameter 6 inches, depth 49 feet. Measuring point, lip of hydrant, 2.4 feet above land surface. Measurements from July through August are furnished by City of Miami Beach.

Water level, in feet below measuring point, 1939

July 6	6.04	Aug. 14	6.89	Nov. 20	5.15	Dec. 11	6.35
12	6.42	21	7.03	27	5.70	19	6.56
13	5.56	29	7.04	Dec. 4	5.98	28	6.79
28	7.12	Nov. 3	4.74	8	6.27		

## Dade County--Continued

F12. City of Miami Springs. Northeast corner of Hunting Lodge Drive and the Esplanade, in Miami Springs. Drilled fire well, diameter 6 inches, depth 57 feet. Measuring point, lip of hydrant, 2.0 feet above land surface. Measurements from June through August are furnished by City of Miami Beach.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
June 28	10.80	July 13	8.40	Aug. 14	10.21	Dec. 8	9.60
29	10.55	21	10.15	21	10.60	19	10.14
July 6	9.15	28	10.33	28	10.53	26	10.34
12	9.65	Aug. 3	11.41	Nov. 3	7.72		

S18. Model Dairy. In pasture, 0.2 mile east of 27th Ave., 0.15 mile south of Golden Glades Drive, 0.85 mile north of City of Opa Locka. Abandoned drilled supply well, diameter 8 inches, depth 53 feet. Measuring point, top of casing, 1.0 foot above land surface. Measurements from June through August furnished by City of Miami Beach. Water-stage recorder installed Dec. 13.

Water level, in feet below measuring point, 1939

June 22	10.90	July 27	8.71	Nov. 6	6.74	Dec. 19	8.35
23	9.30	Aug. 9	8.22	17	7.30	26	b 8.53
24	9.47	15	8.31	20	7.12	28	b 8.59
July 1	9.00	23	8.34	Dec. 2	7.36	31	a 8.44
11	7.77	30	8.52	13	a 8.14		

S19. City of Miami. In northeast corner of intersection of Lenape Drive and extension of Oakwood Drive, 1,000 feet south of intersection of Carlisle Drive, Hunting Lodge Drive and city limits of Miami Springs. Drilled test well, diameter 6 inches, depth 77 feet. Measuring point, top of casing, 1.2 feet above land surface. Recorder installed Dec. 14. Water level affected by pumping in nearby City of Miami supply wells.

Water level, in feet below measuring point, 1939

Nov. 20	5.74	Dec. 19	b 7.23	Dec. 26	b 7.46	Dec. 31	a 7.26
Dec. 14	a 6.93	19	a 7.12	29	b 7.61		

D151. Peoples Water and Gas Company. In Fulford plant, on West Dixie highway, 0.25 mile south of Sunny Isles Road, North Miami Beach. Abandoned drilled drainage well, diameter 8 inches, depth 176 feet. Measuring point, top of casing, about 1 foot above land surface. Recorder installed Dec. 21, 1939. Water level affected by tides, passing railroad trains, nearby pumping, and possibly by changes in atmospheric pressure. Highest and lowest water level, from recorder charts, in feet below measuring point, 1939: Dec. 21, 19.03; Dec. 24, 11.05; Dec. 28, 11.10; Dec. 30, 10.74.

F284. North Miami. Northwest corner of N.W. 121st Street and 11th Avenue, North Miami. Drilled fire well, diameter 6 inches, depth 61 feet. Measuring point, lip of hydrant, 2.2 feet above land surface. Water levels, in feet below measuring point, 1939: Dec. 7, 11.68; Dec. 22, 12.23; Dec. 29, 12.21.

F288. North Miami Beach. Southwest corner of N.E. 170th Street and 3rd Court, North Miami Beach. Drilled fire well, diameter 6 inches, depth 65 feet. Measuring point, lip of hydrant, 2.0 feet above land surface. Water levels, in feet below measuring point, 1939: Dec. 5, 8.67; Dec. 22, 9.36.

F186. City of Miami. Northwest corner of S.W. 4th Street and 58th Avenue, Miami. Drilled fire well, diameter 6 inches, depth 63 feet. Measuring point, lip of hydrant, 2.3 feet above land surface.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Nov. 18	10.61	Dec. 4	11.06	Dec. 19	11.84
27	10.62	11	11.48	26	12.08

a Highest level in week, from recorder chart.  
b Lowest level in week, from recorder chart.

## Dade County--Continued

F62. City of Miami. About 75 feet north of N.W. 54th Street, on west side of 9th Avenue, Miami. Drilled fire well, diameter 6 inches, depth 83 feet. Measuring point, lip of hydrant, 2.0 feet above land surface.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Nov. 7	9.33	Nov. 20	10.41	Dec. 4	11.19	Dec. 18	11.95
13	10.18	27	10.84	11	11.62	26	12.20

D8. City of Miami. Southwest corner of N.W. 16th Street and 1st Avenue, Miami. Drilled drainage well, diameter 8 inches, depth 112 feet. Measuring point, manhole rim, level with sidewalk and 2.4 feet above top of casing. Water levels, in feet below measuring point, 1939: Dec. 1, 10.87; Dec. 11, 11.56; Dec. 18, 11.69; Dec. 26, 11.72.

D70. City of Miami. Southeast corner of S.W. 3rd Avenue and 24th Road, Miami. Drilled drainage well, diameter 12 inches, depth 91 feet. Measuring point, manhole rim, level with sidewalk and 5.7 feet above top of casing. Water levels, in feet below measuring point, 1939: Dec. 5, 8.49; Dec. 11, 8.60; Dec. 19, 8.70; Dec. 26, 8.74.

F233. City of Miami. On west side of 31st Avenue, 500 feet north of N.W. 7th Street, Miami. Drilled fire well, diameter 6 inches, depth 49 feet. Measuring point, lip of hydrant, 1.5 feet above land surface.

Water level, in feet below measuring point, 1939

Nov. 14	10.27	Nov. 27	10.43	Dec. 11	11.04	Dec. 26	11.31
20	9.84	Dec. 4	10.73	19	11.26		

F268. City of Hialeah. Southeast corner of East 1st Avenue and 5th Street, Hialeah. Drilled fire well, diameter 6 inches, depth 55 feet. Measuring point, lip of hydrant, 2.0 feet above land surface. Water levels, in feet below measuring point, 1939: Nov. 22, 6.15; Dec. 9, 6.98; Dec. 19, 7.40; Dec. 27, 7.63.

F240. City of Hialeah. Southeast corner of East 8th Avenue and 30th Street, Hialeah. Drilled fire well, diameter 6 inches, depth 60 feet. Measuring point, lip of hydrant, 2.8 feet above land surface.

Water level, in feet below measuring point, 1939

Nov. 20	8.09	Nov. 27	8.24	Dec. 9	8.77	Dec. 19	9.21
25	8.15	Dec. 4	8.52	11	8.89	27	9.45

F109. City of Miami. Southeast corner of N.W. 79th Street and 19th Avenue, Miami. Drilled fire well, diameter 6 inches, depth 51 feet. Measuring point, lip of hydrant, 1.8 feet above land surface.

Water level, in feet below measuring point, 1939

Nov. 10	8.53	Nov. 27	9.26	Dec. 11	9.87	Dec. 26	10.32
20	8.90	Dec. 4	9.53	18	10.18		

## Marion County

Sharpes Ferry well (Marion County 5).

Water level, in feet above measuring point, 1939

Jan. 7	6.6	Mar. 11	5.4	May 27	4.2	Aug. 4	5.75
14	6.5	17	5.3	June 3	4.0	12	5.9
21	6.4	25	5.25	9	4.1	19	6.35
28	6.2	Apr. 1	5.1	17	4.05	26	6.5
Feb. 4	6.15	8	5.0	24	4.4	Sept. 2	6.75
11	5.9	29	4.7	July 1	4.55	9	7.1
18	5.75	May 6	4.5	8	4.95	16	7.25
25	5.8	13	4.3	17	5.3	23	7.1
Mar. 4	5.55	20	4.25	23	5.35	30	7.35

## Marion County--Continued

Blue Grotto sinkhole near Belleview. Water levels, in feet above zero of staff gage, 1939: May 18, 0.6; June, 0.5; July 21, 2.4; Aug. 1, 2.5.

## Seminole County

Seminole County 35 (well 1, farm 3 of C. S. Lee).

Highest and lowest weekly water level,  
in feet above measuring point, 1939  
(from recorder charts)

Week	Highest water level	Lowest water level	Week	Highest water level	Lowest water level
Feb. 9-15	19.4	18.0	July 20-26	21.1	20.6
Feb. 16-22	18.8	17.2	July 27-Aug. 2	21.0	20.5
Feb. 23-Mar. 1	18.5	17.2	Aug. 3-9	21.0	20.5
Mar. 2-8	18.7	17.5	10-16	21.1	20.3
Mar. 9-15	18.8	17.5	17-23	21.3	20.1
Mar. 16-22	18.1	17.3	24-30	21.5	20.2
Mar. 23-29	18.3	17.4	Aug. 31-Sept. 6	21.7	21.1
Mar. 30-Apr. 5	18.9	17.3	Sept. 7-13	21.5	20.8
Apr. 6-12	19.3	17.8	14-20	21.3	20.8
Apr. 13-19	19.1	17.9	Oct. 2-8	21.3	20.9
Apr. 20-26	19.7	18.5	9-15	21.2	20.4
Apr. 27-May 3	19.8	19.2	16-22	21.5	20.4
May 4-10	19.9	19.0	23-29	21.4	20.3
May 11-17	20.0	19.5	Oct. 30-Nov. 5	20.9	20.1
May 18-24	19.8	19.3	Nov. 6-12	20.5	19.8
May 25-31	19.8	19.4	13-19	21.2	19.9
June 8-14	19.9	18.8	20-26	21.1	20.1
June 15-21	20.4	19.9	Nov. 27-Dec. 3	20.6	19.7
June 22-28	20.7	20.2	Dec. 11-17	20.3	19.4
June 29-July 5	20.8	20.3	18-24	20.4	19.3
July 6-12	21.0	20.6	25-31	20.4	18.9
July 13-19	21.0	20.6			

## GEORGIA

By M. A. Warren and A. C. Munyan

Measurements of water level and artesian pressure in wells in the Coastal Plain of Georgia<sup>1/</sup> were continued during 1939 as part of a cooperative ground-water investigation by the Federal Geological Survey and the Division of Mines, Mining, and Geology of the Georgia Department of Natural Resources. The measurements were made in wells in counties bordering the Atlantic Coast and in Dougherty County in southwestern Georgia. The work in the coastal area was by M. A. Warren of the Federal Survey and that in Dougherty County was by A. C. Munyan, Geologist of the State Division of Mines, Mining, and Geology.

Water-stage recorders on well 8, Chatham County, and well 3, Dougherty County, and a pressure recorder on well 3, Glynn County, were continued in operation during 1939. Approximately 460 individual measurements of water level were made in 48 observation wells in 1939.

The piezometric surface of the artesian water in 1939, or the height to which water would rise with reference to sea level in tightly cased wells that penetrate the Ocala limestone, is represented by contours in the accompanying figure. The contours conform in a general way to the structure of the Ocala limestone and indicate that the movement of the artesian water in general is toward the coast. One of the most conspicuous features shown by the contours is the effect of heavy withdrawals of water from wells in the Savannah area. The piezometric surface in this area is now 65 feet or more below its original level and is at places as much as 30 feet below sea level.

### Bryan County

27. Henry Ford. About 8 miles south of Ways Station, 1 mile southwest from Kellar, 0.3 mile south of Belfast Road, near west edge of Tivolia River marsh. Used jetted domestic well, diameter 3 inches, depth about 375 feet. Measuring point, top of 3-inch tee, 2 feet above land surface and about 17 feet above mean sea level. Well flows about 30 gallons a minute. Water level, in feet above measuring point: Dec. 22, 1938, 7.4; Apr. 10, 1939, 8.8; Aug. 15, 1939, 7.0.

41. Mrs. D. B. Gill. About 5 miles northwest Ways Station, at Roding, northeast of intersection of State highway 63 and Hancock Road. Used jetted domestic well, diameter 4 inches, reported depth 400 feet, cased 160 feet. Measuring point, faucet in front yard, 3 feet above land surface, 1.68 feet above top of 4-inch coupling on 4-inch well casing, 5.09 feet above top railroad spike in base of east side of water oak on west side of highway 63, 17.52 feet above mean sea level. Water level, in feet above measuring point, 1939: Jan. 5, 15.2; Oct. 27, 13.8.

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<sup>1/</sup> See Water-Supply Paper 845.

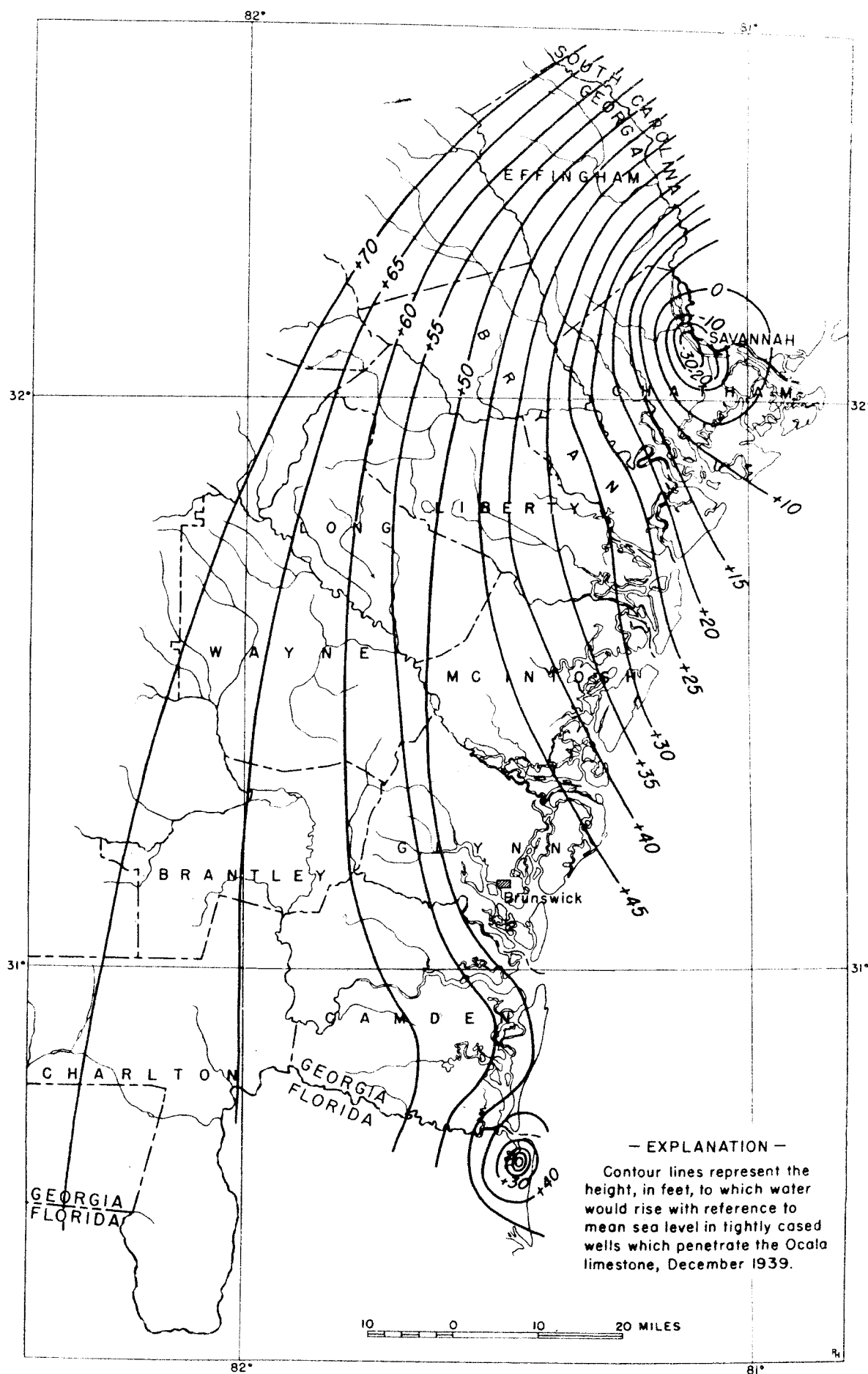


Figure 1.—Map of piezometric surface of artesian water in the Ocala limestone in the southeastern part of the Coastal Plain of Georgia.



## Bryan County--Continued

51. W. H. Davis. About 600 feet south of Clyde Schoolhouse, Clyde. Used jetted domestic well, diameter ~~3~~ inches, depth 500 feet. Measuring point, top of 3-inch tee on 3-inch well casing, about 1 foot above land surface and about 24 feet above mean sea level. Water level, in feet above measuring point, 1939: Jan. 6, 12.5; Oct. 27, 12.2.

52. Clyde Consolidated School. East side of school building, at Clyde. Used jetted public well, diameter 3 inches, reported depth 500 feet. Measuring point, top of 3-inch tee, 1.5 feet above land surface and about 28 feet above mean sea level. Water level, in feet above measuring point, 1939: Jan. 6, 9.3; Oct. 27, 8.6.

87. Henry Ford. South of intersection of U. S. highway 17 and Bryan Neck Road, west side of Bryan Neck Road, Ways Station. Used jetted domestic well, diameter 4 inches, depth 580 feet, cased 113 feet. Measuring point, top of 4-inch cross on 4-inch well casing, 2.5 feet above land surface and 24.44 feet above mean sea level.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 5	1.87	Sept. 12	1.80	Oct. 20	1.81	Oct. 31	2.03
Aug. 15	1.92	18	1.47	27	1.83	Dec. 4	1.79
28	1.72	30	1.81				

## Camden County

8. M. L. Hill. Kingsland, at residence of M. L. Hill, about 300 feet south from St. Marys Road, about 300 feet east of U. S. highway 17. Used jetted domestic well, diameter 2 inches, depth 486 feet, cased 300 feet. Measuring point, top of 1 by 2-inch bushing in 2-inch cross, 1 foot above land surface.

Water level, in feet above measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
Nov. 14, 1938	24.6	Sept. 19, 1939	24.7	Dec. 7, 1939	24.1
June 23, 1939	25.0	Nov. 2	24.3		

18. L. O. Harris. East side of highway, 0.75 mile north of Riverview Hotel, St. Marys. Used jetted domestic well, diameter 2 inches, depth 450 feet. Measuring point, top of 2-inch cross, 0.8 foot above land surface.

Water level, in feet above measuring point, 1938-39

Nov. 15, 1938	44.2	June 23, 1939	43.8	Nov. 3, 1939	42.2
Mar. 8, 1939	43.4	Sept. 19	44.5	Dec. 7	40.2

19. Camden Training School. Behind school building on east side of highway, about 1 mile north from Riverview Hotel. Used jetted public well, diameter 2 inches, depth about 500 feet. Measuring point, top of 2-inch tee, 2 feet above land surface.

Water level, in feet above measuring point, 1938-39

Nov. 15, 1938	42.0	June 23, 1939	43.1	Nov. 3, 1939	41.6
Mar. 8, 1939	42.6	Sept. 19	43.5	Dec. 7	39.5

20. Town of St. Marys. East side of highway, 0.25 mile north from Riverview Hotel, St. Marys. Used jetted municipal well, diameter 6 inches, reported depth 539 feet, cased 345 feet. Measuring point, top of 6-inch tee, 2.3 feet above land surface and about 14 feet above mean sea level. Water level, in feet above measuring point: Nov. 15, 1938, 39.1; Mar. 8, 1939, 39.1.

32. Camden County. In front of Camden County Courthouse, about 0.2 mile east of Seaboard R.R., Woodbine. Used jetted domestic well, diameter 2 inches, depth 480 feet, cased 260 feet. Measuring point, faucet in front of Camden County Courthouse, 4 feet above land surface. Water level, in feet above measuring point: Nov. 15, 1938, 42.8; Mar. 7, 1939, 42.3; June 22, 1939, 41.7.

## Camden County--Continued

39. Holland and Halter Fishery. West side of North River, 1.5 miles north of Riverview Hotel, St. Marys. Used jetted domestic well, diameter 8 inches, depth 535 feet. Measuring point, top of 6-inch tee, 2.7 feet above land surface and about 12 feet above mean sea level.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 8	41.6	Sept. 19	43.4	Dec. 7	38.9
June 23	42.9	Nov. 3	41.7		

66. Arthur Lucas. Point Peter, well at house, about 2 miles east of St. Marys. Used jetted domestic well, diameter 2 inches, reported depth 500 feet, cased 250 feet. Measuring point, top of 2-inch tee, 2 feet above land surface and about 12 feet above mean sea level. Water levels, in feet above measuring point, 1939: June 23, 38.8; Dec. 7, 32.5.

## Chatham County

8. City of Savannah well 8. Measuring point, top edge of horizontal iron bar that supports air line in well, 8.32 feet above mean sea level. Water level affected by nearby pumping.

Highest and lowest weekly water level, in feet below measuring point, 1939 (from recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 2	35.85	Apr. 2	36.18	July 4	36.68	Sept. 29	45.96
3	40.27	3	40.98	7	44.87	Oct. 1	43.26
8	35.55	9	34.82	10	38.59	6	a 33.52
12	40.52	14	40.62	14	44.92	8	a 30.73
14	39.63	16	35.39	15	39.17	9	a 35.50
20	a 28.84	22	41.15	20	44.66	15	33.17
22	a 27.98	23	36.14	24	38.06	20	38.51
27	36.56	27	41.20	28	44.15	22	35.35
29	33.40	30	36.07	31	38.84	27	42.02
Feb. 2	40.42	May 5	41.92	Aug. 2	45.87	29	36.46
5	34.59	7	35.70	7	39.50	Nov. 3	41.31
8	40.27	12	42.0	10	47.07	5	37.23
12	35.12	14	35.69	13	40.12	10	43.25
17	40.01	19	41.93	17	45.36	12	37.56
19	34.43	21	36.18	21	38.85	17	43.57
23	39.06	26	44.88	24	46.10	19	37.09
26	34.55	28	37.86	28	38.39	21	41.61
28	41.06	June 1	44.18	29	44.47	26	37.25
Mar. 5	34.39	4	37.57	Sept. 4	38.23	Dec. 1	41.52
11	39.65	9	46.33	8	46.28	3	37.21
12	34.85	11	38.90	10	41.04	6	42.37
17	40.32	12	44.83	11	47.28	10	37.21
18	36.04	18	37.72	18	b 40.62	11	42.03
22	44.26	23	44.83	18	c 45.63	18	41.78
26	36.78	25	39.25	24	39.97	19	37.13
29	42.64	29	44.93				

28. Reliance Fertilizer Co. Approximately 300 feet south of Louisville Road, 2 miles west of West Broad Street, Savannah. Used drilled industrial well, diameter 8 inches, reported depth 480 feet, cased 160 feet. Measuring point, hole in pump-base plate, 1.5 feet above land surface, 17.87 feet above mean sea level. Water level affected by pumpage in Savannah and vicinity. Water-level measurements prior to 1939 furnished through courtesy of J. W. Middleton.

Water level, in feet below measuring point, 1932, 1937-39

Date	Water level	Date	Water level	Date	Water level
Jan. , 1932	10.0	Mar. 31, 1938	45.3	Jan. 26, 1939	40.40
Jan. 10, 1937	26.8	Sept. 26	48.7	26	d 44.70
May 27,	29.5	Jan. 20, 1939	a 33.08	28	41.44
July 13,	37.8	22	ad 37.35	Feb. 6	43.24

a Pumps of Union Bag and Paper Corp., Savannah, shut down.

b Water level at 12:30 a.m.

c Water level at 4:30 p.m.

d Pumping.

## Chatham County--Continued

## 28. Reliance Fertilizer Co.--Continued

Water level, in feet below measuring point, 1932, 1937-39

Date	Water level	Date	Water level	Date	Water level
Feb. 11, 1939	a 49.0	June 17, 1939	45.99	Oct. 5, 1939	b 37.72
13	44.33	24	46.44	6	b 37.08
18	44.65	July 1	47.54	7	b 36.35
25	43.9	15	46.62	11	b 34.75
Mar. 4	43.74	22	47.03	14	38.76
11	44.37	29	47.05	16	42.06
18	45.00	Aug. 5	47.90	20	44.07
25	45.85	12	48.68	28	45.39
Apr. 1	44.70	19	47.54	Nov. 4	45.84
8	42.98	26	47.47	11	46.52
15	42.71	Sept. 2	45.32	18	47.06
29	42.81	9	48.38	25	46.40
May 6	43.67	16	48.83	Dec. 2	46.87
13	43.32	23	49.16	9	46.77
20	a 48.96	26	48.99	16	47.46
27	45.44	30	49.16	23	46.65
June 3	44.58	Oct. 3	b 40.99	30	44.69
10	46.85	4	b 39.14		

30. Dixie Asphalt Products Corp. Near west bank of Savannah River, 1 mile northeast of U. S. highway 17, 3.4 miles northwest of Savannah City Hall. Used drilled industrial well, diameter 12 inches, depth 620 feet. Measuring point, hole in pump-base plate, 0.2 foot above land surface, 11.5 feet above mean sea level. Water level affected by pumpage in Savannah and vicinity.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 20	b 24.7	May 13	a 41.66	Aug. 26	a 44.5	Oct. 14	a 34.92
22	b 25.42	20	a 41.55	26	40.65	16	35.84
Feb. 6	36.76	27	38.01	Sept. 2	a 41.83	20	37.34
11	37.60	June 3	37.90	2	37.7	28	a 42.5
18	36.37	10	39.38	9	41.2	Nov. 4	38.87
25	36.16	17	38.56	16	41.52	11	39.02
Mar. 4	36.35	24	a 43.42	23	42.14	18	39.92
11	36.90	July 1	39.78	30	41.75	25	39.44
18	a 43.25	15	39.12	Oct. 3	b 32.25	Dec. 2	39.93
Apr. 1	37.37	22	a 43.3	4	b 30.03	9	40.2
8	35.74	29	39.68	5	b 28.32	16	40.44
15	37.41	Aug. 5	a 43.4	6	ab 31.86	23	39.98
29	36.68	12	40.84	7	b 27.7	30	37.05
May 6	36.82	19	a 44.00	11	b 25.0		

46. Union Bag and Paper Corp. well 5. In front of main building of Union Bag and Paper Corp., 1 mile northeast of U. S. highway 17, 2.4 miles northwest from Savannah City Hall. Used drilled industrial well, diameter 20 inches, depth 1,010 feet. Measuring point, hole in pump-base plate, about 10.5 feet above mean sea level. Water level affected by pumpage in Savannah and vicinity. Water levels, in feet below measuring point, 1939: Jan. 4, 40.2; Jan. 20, b/28.98; Jan. 25, 40.23.

47. National Gypsum Co. Near west bank of Savannah River, 1 mile northeast of U. S. highway 17, 3.25 miles northwest from Savannah City Hall. Used drilled industrial well, diameter 12 inches, depth 601 feet, cased 238 feet. Measuring point, hole in pump-base plate, 3 feet above land surface, 12.0 feet above mean sea level. Water level affected by pumpage in Savannah and vicinity.

Water level, in feet below measuring point, 1939

Jan. 20	b 25.44	Feb. 25	38.28	Apr. 1	39.33	May 13	c 39.79
22	b 26.82	Mar. 4	38.46	8	38.61	20	c 39.65
Feb. 6	a 41.56	11	38.92	15	38.64	27	a 43.42
11	39.49	18	c 41.69	29	38.65	27	40.1
18	38.37	25	40.9	May 6	38.85	June 3	39.87

a Pumping.

b Pumps of Union Bag and Paper Corp., Savannah, shut down.

c Pumps of Dixie Asphalt Products Corp., operating.

## Chatham County--Continued

50. Hercules Powder Company. South side Louisville Road, 3.2 miles west from West Broad Street, Savannah. Unused drilled industrial well, diameter 4 inches, reported depth 420 feet, cased 80 feet. Measuring point, top of 4-inch casing, 1.0 foot above land surface, 14.83 feet above mean sea level. Water level affected by pumpage in Savannah and vicinity. Measurements made while well about 480 feet west was pumping. Water-stage recorder operated on well from Nov. 22 to Dec. 21, 1939.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 20	a 24.74	June 17	34.71	Oct. 11	a 25.35	Dec. 4	b 34.99
26	28.94	24	34.59	14	27.31	5	b 35.35
Feb. 6	31.59	July 1	35.80	16	30.67	6	b 35.59
11	33.33	15	34.69	20	32.66	7	b 35.92
18	33.17	22	34.68	28	34.07	8	b 35.84
25	32.27	29	34.87	Nov. 4	34.67	9	b 35.51
Mar. 4	32.74	Aug. 5	35.54	11	35.12	10	b 34.87
11	32.90	12	36.14	18	35.61	11	b 35.16
18	33.94	19	35.64	22	b 35.39	12	b 35.26
25	34.44	26	35.44	23	b 34.84	13	b 35.71
Apr. 1	33.64	Sept. 2	34.02	24	b 35.33	14	b 36.25
8	32.41	9	35.88	25	b 35.32	15	b 36.43
15	31.83	16	36.26	26	b 34.55	16	b 35.97
29	32.10	23	37.20	27	b 35.06	17	b 35.16
May 6	32.55	30	37.24	28	b 35.32	18	b 35.34
13	32.44	Oct. 3	a 31.86	29	b 35.49	19	b 35.59
20	33.47	4	a 30.10	30	b 35.66	20	b 35.49
27	33.92	5	a 28.70	Dec. 1	b 35.54	21	b 35.68
June 3	33.38	6	a 27.98	2	b 35.48	23	35.45
10	34.81	7	a 27.30	3	b 34.74	30	32.87

61. Colonial Ice Company. In engine room of plant, north of intersection of Indian and McGuire Streets, Savannah. Used drilled industrial well, diameter 10 inches, reported depth 500 feet, cased 80 feet. Measuring point, hole in pump-base plate, 0.2 foot above concrete floor, 17.2 feet above mean sea level. Water level affected by pumpage in Savannah and vicinity. Water levels, in feet below measuring point, 1939: Feb. 24, 44.97; June 2, 51.01; Oct. 18, 44.90.

62. Colonial Ice Company. In east part of building, north of intersection of Indian and McGuire Streets, Savannah. Unused drilled industrial well, diameter 8 inches, depth about 500 feet. Measuring point, lower inside edge of 8-inch elbow, 7 feet above land surface, 26.06 feet above mean sea level. Water level affected by pumpage in Savannah and vicinity. Water levels, in feet below mean sea level, 1939: Feb. 24, 27.74; June 2, 32.57; Oct. 18, 27.66.

65. Standard Oil Company. Near south bank of Savannah River, 2.9 miles east of Savannah City Hall. Used drilled industrial well, diameter 8 inches, depth 475 feet, cased 205 feet. Measuring point, hole in pump-base plate, 1 foot above land surface, 5.9 feet above mean sea level. About 11.6 feet of lubricating oil floating on water level in well, May 13, 1939. About 13.65 feet of lubricating oil floating on water level in well, Oct. 7, 1939. Density of lubricating oil 0.89.

Oil level, in feet below measuring point, 1939

Date	Oil level	Date	Oil level	Date	Oil level	Date	Oil level
Feb. 24	17.55	July 29	20.70	Oct. 7	a 18.00	Nov. 11	18.43
Mar. 25	18.10	Aug. 19	19.65	14	16.65	25	18.68
May 13	18.87	Sept. 23	20.82	18	17.23	Dec. 9	18.40
June 3	19.32	Oct. 5	a 19.15	28	17.96	23	19.17
July 1	20.65						

a Pumps of Union Bag and Paper Corp., Savannah, shut down.  
b Lowest daily water level.

## Chatham County--Continued

74. Certainteed Products Corp. In boiler room of plant near west bank of Savannah River, 3 miles northwest from Savannah City Hall, 1 mile northeast of U. S. highway 17. Used drilled industrial well, diameter 12 inches, depth 550 feet. Measuring point, hole in pump-base plate, 2.3 feet above land surface, 13.2 feet above mean sea level. Several feet of oil floating on water level in well. Water level affected by pumpage in Savannah and vicinity.

Oil level, in feet below measuring point, 1939

Date	Oil level	Date	Oil level	Date	Oil level	Date	Oil level
Mar. 4	45.59	June 24	48.67	Sept. 16	51.3	Oct. 20	a 51.26
18	49.47	July 1	49.06	23	52.46	28	a 52.1
25	49.03	15	48.54	30	51.85	Nov. 4	48.60
Apr. 1	45.91	22	49.18	Oct. 3	ab 39.76	11	48.93
15	45.26	29	49.52	4	b 33.26	18	49.4
29	45.8	Aug. 5	50.20	5	b 32.07	25	48.97
May 13	46.46	12	a 54.42	6	b 31.06	Dec. 2	50.07
20	46.0	19	49.53	7	b 31.39	9	50.30
27	47.10	26	49.95	11	ab 34.0	16	50.3
June 3	a 49.8	Sept. 2	46.60	14	39.90	23	50.26
10	49.27	9	51.21	16	a 48.7	30	46.70
17	48.15						

79. Georgia Ice Company. Southwest of intersection of Bull Street and Victory Drive, Savannah. Unused drilled industrial well, diameter 12 inches, depth 495 feet. Measuring point, top edge of 12-inch coupling. Water level affected by pumpage in Savannah and vicinity. Water-stage recorder operated on well Dec. 21 to Dec. 31, 1939.

Lowest daily water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Dec. 21	58.77	Dec. 24	58.56	Dec. 27	56.34	Dec. 30	56.91
22	59.08	25	57.74	28	56.71	31	56.72
23	58.47	26	55.88	29	56.83		

103. Water level, in feet above measuring point, 1939: Jan. 22, 1.50.

105. Pratt Gay. Measuring point, 11.56 feet above mean sea level. Water level, in feet, with reference to measuring point, 1939

Jan. 16	+0.91	Aug. 5	+0.10	Sept. 28	-0.41	Oct. 11	b +1.21
18	b +1.40	12	- .29	30	- .41	14	+1.50
20	b +1.46	19	- .16	Oct. 3	b - .45	16	+1.55
22	+1.90	26	- .22	4	b - .34	20	+1.33
Feb. 6	+1.97	Sept. 2	- .09	5	b - .15	27	+ .98
June 6	+ .85	9	- .08	6	b + .13	Nov. 4	+ .57
July 20	+ .20	23	- .43	7	b + .24	18	+ .30

109. Measuring point, 7.9 feet above mean sea level. Water level affected by tide in river and pumpage in Savannah and vicinity. Water levels, in feet below measuring point, 1939: Jan. 21, 7.43; Apr. 15, 9.26; July 21, 10.26; Oct. 18, 7.54.

121. Robert Schneider. Northwest part of Tybee Island, about 50 feet north of Tybee Road. Used jetted domestic well, diameter 2 inches, depth 187 feet. Measuring point, top of 1-inch cross, level with land surface and about 5 feet above mean sea level. Water level affected by tide. Water levels, in feet below measuring point, 1939: Aug. 3, 4.17; Sept. 23, 1.37; Oct. 5, 3.43; Nov. 7, 1.64.

123. Henry Walthour. Wilmington Island, east side of earth road, about 0.5 mile south of Tybee Road, near head of Bates Creek. Unused jetted domestic well, diameter 3 inches, reported depth 250 feet. Measuring point, top of 3-inch tee, about 0.5 foot above land surface and about 6 feet above mean sea level. Water level affected by tide.

Water level, in feet below measuring point, 1939

Jan. 19	4.68	June 2	5.22	Sept. 23	5.18	Oct. 12	4.09
May 9	4.32	Aug. 1	5.80	Oct. 5	5.40	Nov. 7	4.77

a Pumping.

b Pumps of Union Bag and Paper Corp., Savannah, shut down.

## Chatham County--Continued

128. Water level affected by tide.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 10	12.82	June 2	13.60	Sept. 23	13.14
May 9	12.87	Aug. 1	14.20		

131. C. E. Oliver. East of Augusta Road, 0.75 mile north from grade crossing of Atlantic Coast Line R.R. at Monteith. Used jetted domestic well, diameter 3 inches, reported depth 300 feet, cased 40 feet. Measuring point, top of 3-inch cross, 1.5 feet above land surface and 14.31 feet above mean sea level. Water levels, in feet below measuring point: Nov. 23, 1938, 2.99; Oct. 26, 1939, 2.78.

143. Mills B. Lane. About 600 feet north of station of Seaboard R.R. at Anderson, about 8 miles southwest of Savannah, at Lebanon Plantation. Used jetted domestic well, diameter 4 inches, depth about 600 feet. Measuring point, top of 4-inch tee, 2.6 feet above land surface and 7.07 feet above mean sea level. Water levels, in feet above measuring point: Nov. 28, 1938, 7.65; Mar. 10, 1939, 7.30; Sept. 29, 1939, 6.84.

145. A. G. Gillespie. About 0.25 mile northeast of bridge on Ogeeche Road over Little Ogeeche River, about 8.5 miles southwest of Savannah. Used jetted domestic well, diameter 3 inches, depth 380 feet, cased about 67 feet. Measuring point, top of 3-inch tee, 1.8 feet above land surface and about 13 feet above mean sea level.

Water level, in feet above measuring point, 1938-39

Nov. 28, 1938	3.56	Aug. 28, 1939	2.46	Oct. 27, 1939	3.55
Aug. 15, 1939	2.10	Sept. 12	2.80	31	3.6
24	2.72	Oct. 20	3.70	Dec. 4	3.15

194. Mrs. W. W. Kellar, Sr. Drakie's Bluff, about 600 feet west of Savannah River, about 9 miles northwest of Savannah. Used jetted domestic well, diameter 4 inches, depth 350 feet, cased 60 feet. Measuring point, top of 4-inch tee, 2.7 feet above land surface and 16.1 feet above mean sea level. Water levels, in feet below measuring point: Dec. 7, 1938, 14.10; Oct. 18, 1939, 12.66.

199. Mrs. H. F. Kellar. Mienhard, about 750 feet west of S. and A. R.R., 0.25 mile south from Monteith Road. Used jetted domestic well, diameter 5 inches, reported depth 375 feet, cased 40 feet. Measuring point, top of bushing in 5-inch tee, 3 feet above land surface and 20.27 feet above mean sea level. Water levels, in feet below measuring point: Dec. 7, 1938, 6.70; Oct. 26, 1939, 6.58.

203. Measuring point, 31.10 feet above mean sea level. Water levels, in feet below measuring point, 1939: Jan. 20, 25.94; July 21, 28.04; Oct. 18, 26.16.

213. J. L. Budreau. Southwest of intersection of Borroughs and Ogeeche Roads, about 12 miles southwest of Savannah. Used jetted domestic well, diameter 3 inches, reported depth 420 feet, cased 120 feet. Measuring point, top of 1-inch coupling, 2.5 feet above land surface.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 9	2.9	Aug. 28	1.69	Oct. 20	2.34	Oct. 31	2.37
Aug. 15	1.60	Sept. 12	1.65	27	2.20	Dec. 4	1.99
24	1.58	18	1.55				

221. J. L. Joyce. Coffee Bluff, about 100 feet northeast of Forest River, about 10 miles south from Savannah. Used jetted domestic well, diameter  $3\frac{1}{2}$  inches, reported depth 360 feet. Measuring point, top of  $3\frac{1}{2}$ -inch coupling on casing, about 1 foot above land surface and about 17 feet above mean sea level. Water level affected by tide. Water levels, in feet below measuring point, 1939: Jan. 7, 4.67; Aug. 2, 4.90.

## Chatham County--Continued

275. R. J. Travis. Avalon, about 0.1 mile north from right angle bend in road to Vernon View, about 2 miles south of Savannah. Used jetted domestic well, diameter 4 inches. Measuring point, top end of 4-inch overflow pipe into fish pond, about level with land surface and about 6 feet above mean sea level. Well flows about 30 gallons a minute. Water levels, in feet above measuring point, 1939: May 26, 1.58; Aug. 2, 0.90; Sept. 23, 1.03.

## Dougherty County

3.

Water level, in feet below measuring point, 1939  
(from recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	35.93	Mar. 29	27.76	June 3	30.3	Aug. 7	34.29
6	37.0	30	26.67	8	31.59	12	33.85
8	35.81	Apr. 1	29.6	9	30.83	14	34.76
21	37.64	4	30.74	16	31.79	23	34.12
22	36.38	8	29.05	17	30.46	26	32.99
28	37.22	15	30.8	23	31.96	30	34.06
31	36.41	19	30.05	28	33.24	Sept. 2	36.61
Feb. 6	37.59	21 a	31.07	30	31.94	6	34.2
9	36.11	21 b	30.49	July 6	31.87	11	45.+?
11	39.01	24	31.68	10	33.08	13	36.3
15	37.71	28	30.98	15	32.03	16	42.18
20	38.99	May 4	31.96	19	33.33	27	36.84
22	37.97	8	32.83	22	32.71	Oct. 2	35.88
Mar. 3	29.9	10	30.04	24	34.1	6	36.07
7	27.21	20	28.61	28	32.57	10	36.9
12	27.48	26	30.96	Aug. 1	33.98	12	37.04
17	30.1	29	30.81	5	32.91	14	36.12
20	29.05	June 1	29.55				

## Effingham County

7. Central of Ga. R.R. Between Central of Ga. R.R. and Seaboard R.R., about 300 feet north of station at Meldrim. Used drilled industrial well, diameter 8 inches, depth 431 feet, cased 273 feet. Measuring point, top of 8-inch cap over 8-inch tee, 2.25 feet above land surface and about 33.8 feet above mean sea level. Water-level measurements prior to 1939 furnished through courtesy of Central of Ga. R.R.

Water level, in feet above measuring point, 1926, 1930-32, 1939

Date	Water level	Date	Water level	Date	Water level
July , 1926	11.7	Sept. 29, 1931	8.6	Apr. 5, 1939	2.96
Dec. 9, 1930	9.5	Nov. 10, 1932	7.8	Dec. 23,	2.53

10. H. M. Edwards. About 100 feet north of U. S. highway 80, 2.2 miles north from Bloomingdale. Used jetted domestic well, diameter 3 inches, depth 440 feet, cased 90 feet. Measuring point, top of 3-inch casing, 2 feet above land surface. Water levels, in feet below measuring point: Dec. 6, 1938, 7.48; Dec. 23, 1939, 7.97.

a Water level at 9:00 a.m.  
b Water level at 12:30 p.m.

## Glynn County

3. Atlantic Refining Co. well 3. At plant in Brunswick. Unused drilled industrial well, diameter 12-inches, depth 983 feet, cased 501 feet. Measuring point, center of recording pressure gage, 7 feet above land surface, 5.12 feet above floor of pump house and about 19 feet above mean sea level.

Water level, in feet above measuring point, 1939  
(from recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 11	23.5	Mar. 16	28.8	May 23	25.9	July 22	26.9
13	26.3	18	23.9	25	23.9	24	25.0
16	23.5	20	24.0	27	24.1	29	28.0
17	25.1	25	28.0	June 2	31.2	Aug. 1	25.1
22	23.8	26	25.9	3	31.7	5	25.3
28	26.0	31	24.1	4	31.0	11	27.7
29	26.5	Apr. 5	24.0	9	25.0	13	27.7
31	23.8	7	28.0	12	27.0	18	24.9
Feb. 5	26.4	13	27.0	13	24.6	19	26.8
7	25.8	14	24.0	17	26.9	22	24.8
9	23.8	17	24.3	22	24.4	26	24.6
12	23.6	18	25.8	24	26.0	30	26.1
15	25.2	26	27.0	25	24.2	Sept. 6	26.9
23	23.6	27	24.3	July 1	24.4	7	24.9
25	27.7	May 2	26.0	5	27.0	9	24.6
26	26.8	4	24.0	9	27.3	14	27.1
Mar. 2	23.2	8	26.4	15	28.9	18	27.1
9	26.9	10	24.4	16	26.0	21	24.9
10	23.8	19	26.0				

33. Sea Island Yacht Club. South side of Brunswick to St. Simons Island Causeway, west side Frederica River. Used jetted domestic well, diameter 3 inches, reported depth 600 feet. Measuring point, top of 3-inch tee on 3-inch casing, 0.5 foot above land surface and about 8 feet above mean sea level. Water level affected by tide. Water levels, in feet above measuring point, 1939: Jan. 11, 39.3; Aug. 17, 40.5; Aug. 28, 41.1; Dec. 4, 40.0.

44. Sea Island Gun Club. St. Simons Island, north side of road, 0.5 mile west of Cloister Hotel. Used jetted well, diameter 3 inches, depth about 650 feet. Measuring point, top of 3-inch cross, 1 foot above land surface and about 7.5 feet above mean sea level. Water level affected by tide.

Water level, in feet above measuring point, 1939

Jan. 11	40.0	Aug. 28	40.0	Aug. 30 a	40.1	Dec. 4	38.7
Aug. 17	38.7	29	39.0	30 b	39.4		

100. New England Tourist Camp. East side of U. S. highway 17, 6 miles south of Altamaha River. Used jetted domestic well, diameter 3 inches, reported depth about 600 feet. Measuring point, top of 3-inch tee, 1.6 feet above land surface.

Water level, in feet above measuring point, 1939

Apr. 13	23.4	Aug. 18	22.4	Sept. 13	21.9	Oct. 31	22.4
June 20	23.5	28	23.0	18	22.2	Dec. 4	22.1

138. G. F. Cowman. East side of U. S. highway 17, southwest edge of South Brunswick River marsh, about 5 miles west of Brunswick. Used jetted domestic well, diameter 3 inches, depth 665 feet. Measuring point, top of 3-inch cross, 1.5 feet above land surface and about 7.5 feet above mean sea level. Water level affected by tides.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Aug. 17	33.2	Sept. 18	35.0	Dec. 5	33.9
Sept. 14	34.7	Nov. 1	34.0	6	33.2

a Water level at 9:15 a.m.

b Water level at 1:10 p.m.



## Liberty County

53. Lionel Tester. About 100 feet west of U. S. highway 17, 2.5 miles south of Midway Church. Used jetted domestic well, diameter 3 inches, depth 408 feet, cased 180 feet. Measuring point, top of 2 by 3-inch reducer on 3-inch casing, 2 feet above land surface and about 13 feet above mean sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 1	27.3	Aug. 28	27.3	Sept. 18	27.0	Dec. 4	27.1
Aug. 18	27.6	Sept. 13	27.0	Oct. 31	27.2		

## McIntosh County

11. C. A. Stebbins. Southeast of State highway 131, northeast of city park, about 25 feet west of swimming pool, Darien. Used jetted domestic well, diameter 3 to 2 inches, depth 965 feet, cased 636 feet. Measuring point, top of 3-inch tee, 2.5 feet above land surface and about 35 feet above mean sea level.

Water level, in feet below measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
Nov. 1, 1938	10.4	Aug. 18, 1939	9.6	Sept. 18, 1939	9.2
Mar. 20, 1939	9.8	28	9.4	Oct. 31	9.1
Apr. 28	10.2	Sept. 13	9.2	Dec. 4	8.9
June 13	10.8				

## HAWAII

By H. T. Stearns

### ISLAND OF OAHU

During 1939 the Geological Survey made 297 monthly measurements of water level in 24 wells on the island of Oahu. The Board of Water Supply, city and county of Honolulu, made 208 measurements in 103 wells within the district of Honolulu, of which 97 wells were measured more than once, and the Board maintained automatic water-level recorders on 9 wells. One additional recorder was operated by the Geological Survey. In 1939 the Honolulu Board of Water Supply pumped 6,200,000,000 gallons, and private wells in Honolulu yielded 5,200,000,000 gallons.

Six of the 12 artesian areas on Oahu had a gain in ground-water storage in 1939; in the other areas the loss in storage was small.

The following table summarizes water levels in wells in Oahu for the period 1935-39. The highs recorded from 1937 to 1939 exceeded previous high water levels in some of the wells as far back as 1917. This resulted from a series of very wet years beginning in 1936 as shown by the high average annual rainfall in the Territory listed in the following table. The period of low rainfall from 1931 to 1935 caused heavy pumpage on all the plantations, which, combined with the low recharge in the intake region of the artesian areas, caused the water levels to reach very low stages in 1935 and 1936. In areas 7, 8, and 11 these lows exceeded any since 1911, when monthly measurements were begun.

Average rainfall, in inches, in the Territory of Hawaii

(Records furnished by the U. S. Weather Bureau)

Year	Rainfall	Year	Rainfall	Year	Rainfall	Year	Rainfall
1930	99.76	1933	64.01	1936	100.77	1938	92.14
1931	73.71	1934	78.15	1937	107.41	1939	91.50
1932	88.08	1935	74.48				

## Oahu--Continued

High and low water levels, in feet, in wells in Oahu for 1935 to 1939,  
and dates of previous higher and lower levels <sup>1/</sup>

Artesian area	Well	Highest level 1935-39	Date	Date of previous high level	Lowest level 1935-39	Date	Date of previous low level
1	9	30.72	Dec. 1939	(a)	22.48	Aug. 1936	Oct. 1934
2	81	33.04	Dec. 1938	(b)	26.42	do	Sept. 1929
3	119	32.25	Feb. 1938	Mar. 1933	25.91	do	Jan. 1927
4	153	29.25	Apr. 1938	Dec. 1918	23.80	Aug. 1935	Sept. 1926
5	1B	8.91	Sept. 1938	(c)	7.89	June 1936	Jan. 1934
	187B	27.10	Feb. 1937	.....	20.40	Aug. 1936	Nov. 1934
6	190	25.41	do	(d)	19.58	do	Oct. 1929
	193	24.91	do	(e)	18.38	Aug. 1935	Aug. 1934
	201	23.54	Mar. 1937	Dec. 1930	17.57	June 1936	do
	244	25.89	Feb. 1938	May 1918	18.37	do	Sept. 1929
	266	26.19	Feb. 1937	Dec. 1918	16.71	Aug. 1936	do
7	326	12.97	Oct. 1939	July 1917	10.04	June 1935	(f)
8	337	15.42	do	Nov. 1932	12.13	July 1935	(g)
	356	15.15	Dec. 1939	Mar. 1933	11.41	June 1935	(f)
	396	22.28	Apr. 1938	Mar. 1932	18.66	Aug. 1935	(f)
9	405	21.07	June 1938	.....	17.50	Oct. 1936	.....
10	406	18.37	July 1938	(d)	14.09	Feb. 1935	Nov. 1934
11	276	14.80	Feb. 1937	July 1931	12.28	July 1936	(f)
12	286	18.91	Jan. 1939	(d)	16.34	June 1936	Aug. 1929
	308	20.64	Oct. 1939	(a)	17.71	do	July 1934

Time of high and low water levels in artesian areas and net gain or loss in static level, in feet, for 1939 as shown by typical wells on the island of Oahu

Area	Name	Well	High	Low	Gain <sup>2/</sup>
1	St. Louis Heights	2	December	August	h 1.57
2	Makiki-Pacific Heights	83	February	do	-.14
3	Kapalama	132	March	do	-.12
4	Moanalua	144	April	do	.29
5	Wilhelmina Rise	1A	February	do	.15
6	Pearl Harbor	201	April	do	.31
		244	December	do	.25
		266	do	June	-.10
7	Waialua	326	October	August	.53
8	Kahuku	356	December	do	-.91
		396	March	do	.07
9	1 Kahana	405	do	October	-.15
10	Kaaawa	406	May	December	-.18
11	Gilbert	T5	April	September	....
12	Mokuleia	286	January	May	.30
		308	October	April	.25

<sup>1/</sup> Measurements prior to 1935 published in Stearns, H. T., and Vaksvik, K. N., Records of drilled wells on Oahu, Hawaii: Hawaii Div. of Hydrography, Bull. 4, 1938.

<sup>2/</sup> Gain was determined for wells 201 to 308 by subtracting measurements for December 1938 from measurements for January 4 and 5, 1940.

a Highest level since monthly measurements were begun in 1924 occurred in 1935-39 period.

b Highest level since monthly measurements were begun in 1930 occurred in 1935-39 period.

c Highest level since monthly measurements were begun in 1934 occurred in 1935-39 period.

d Highest level since monthly measurements were begun in 1929 occurred in 1935-39 period.

e Highest level since monthly measurements were begun in 1932 occurred in 1935-39 period.

f Lowest level since monthly measurements were begun in 1911 occurred in 1935-39 period.

g Lowest level since monthly measurements were begun in 1929 occurred in 1935-39 period.

h The gain for this well in 1938 should have read minus 0.30 instead of plus 0.30.

i On page 55 in Water-Supply Paper 845, area 9 Kahana should have been one line lower, even with well 405.

## Oahu--Continued

In the following records the head of the water in the wells is expressed in feet with reference to mean sea level. In some of the wells this is the measured water level in the well; in others, it is the height to which the water would rise in a casing or tube, as indicated by the shut-in pressure.

## Schofield Barracks shaft 4.

Water level, in feet above mean sea level, 1939  
(from recorder charts)

Date	Head	Date	Head	Date	Head	Date	Head
Jan. 7	281.98	Apr. 8	280.88	July 8	281.05	Oct. 7	281.59
14	282.00	15	280.85	15	281.09	14	281.57
21	281.68	22	280.83	22	(a)	21	281.57
28	281.68	29	280.84	29	(a)	28	281.55
Feb. 4	281.54	May 6	280.84	Aug. 5	281.33	Nov. 4	281.49
11	281.40	13	280.83	12	281.40	11	281.52
18	281.32	20	280.90	19	281.45	18	281.49
25	281.19	27	280.92	26	281.43	25	281.50
Mar. 4	281.12	June 3	280.90	Sept. 2	281.50	Dec. 2	281.50
11	281.04	10	280.94	9	281.52	9	281.43
18	281.02	17	280.95	16	281.56	16	281.51
25	280.92	24	280.98	23	281.58	23	281.53
Apr. 1	280.96	July 1	281.02	30	281.62	30	281.54

Water level, in feet, in five wells in the Honolulu District, 1939  
(Mean daily measurements furnished by Board of Water Supply,  
City and County of Honolulu, from recorder charts.)

Area	1	2	3	4	5	Area	1	2	3	4	5
Well	2	83	132	144	1A	Well	2	83	132	144	1A
Jan. 4	29.50	31.83	31.22	28.50	.....	July 12	28.78	30.74	29.87	.....	.....
11	29.57	31.84	31.20	28.32	.....	19	28.72	30.55	29.67	27.15	.....
18	29.72	31.88	31.16	28.24	.....	26	.....	30.31	29.33	27.03	8.75
25	29.84	31.87	.....	28.35	.....	Aug. 2	28.50	29.96	29.11	26.85	8.69
Feb. 1	30.02	31.95	.....	28.45	8.95	9	.....	29.80	28.98	26.76	8.67
8	30.15	32.02	.....	.....	9.03	16	28.26	29.69	28.90	26.71	8.70
15	30.22	31.97	.....	.....	8.99	23	28.10	29.56	28.85	26.70	8.76
22	30.04	32.00	31.27	28.48	8.98	30	28.03	29.42	28.81	26.61	8.71
Mar. 1	29.87	32.03	31.21	28.35	8.97	Sept. 6	28.32	29.44	28.94	26.81	.....
8	29.87	31.89	31.23	28.54	8.94	13	28.42	29.48	29.04	26.88	8.71
15	29.68	31.92	31.29	.....	8.87	20	28.24	29.52	29.10	26.81	8.68
22	29.53	31.84	31.18	28.47	8.86	27	28.13	29.53	29.11	26.73	.....
29	29.22	31.78	31.08	28.29	8.87	Oct. 4	28.13	29.50	29.09	26.76	.....
Apr. 5	29.32	31.76	31.01	28.30	.....	11	28.45	.....	29.10	26.82	.....
12	29.58	31.81	31.10	28.60	.....	18	28.58	29.63	29.17	26.87	.....
19	29.64	31.86	31.24	28.76	.....	25	29.10	29.73	29.33	27.20	8.93
26	29.57	31.86	31.24	28.59	.....	Nov. 1	29.50	29.87	29.53	27.69	8.92
May 3	29.61	31.82	31.12	28.42	8.85	8	29.79	30.05	29.78	27.93	8.88
10	29.58	31.75	31.02	28.22	.....	15	29.90	30.30	30.05	28.17	8.89
17	29.41	31.69	30.92	.....	.....	22	29.92	30.59	30.23	28.28	.....
24	29.33	31.61	30.90	.....	.....	29	30.42	30.89	30.50	28.50	.....
31	29.14	31.49	30.73	27.92	8.90	Dec. 6	30.67	31.09	30.70	28.68	8.96
June 7	29.01	31.34	30.60	27.72	.....	13	30.73	31.25	30.82	28.75	8.97
14	28.90	31.15	30.43	27.58	.....	20	30.77	31.39	30.91	28.72	.....
21	28.83	31.03	30.26	27.48	.....	27	30.85	.....	31.03	28.66	.....
28	28.97	30.98	30.17	.....	.....	31	30.97	31.61	31.01	28.64	9.01
July 5	29.12	30.93	30.17	27.46	.....						

a Pumping.

b Water level for Jan. 2, 1940.

## Oahu--Continued

Artesian head, in feet, and chloride, in parts per million, in typical wells in Oahu, 1939

## Well 1B (area 5).

Date	Head	Chloride	Date	Head	Chloride	Date	Head	Chloride
Jan. 27	8.87	173	May 27	8.88	193	Sept. 26	8.60	220
Feb. 25	8.85	172	June 30	8.63	175	Oct. 27	8.82	176
Mar. 30	8.79	198	July 25	8.74	207	Dec. 9	8.89	164
Apr. 29	8.89	192	Aug. 28	8.57	214			

## Well 9 (area 1).

Jan. 29	29.86	56	May 27	28.82	56	Sept. 26	27.92	51
Feb. 25	29.50	57	June 30	28.83	55	Oct. 27	29.04	54
Mar. 30	28.87	55	July 25	28.33	53	Dec. 9	30.72	53
Apr. 29	29.22	55	Aug. 28	27.93	53			

Well 81 (area 2). New bench mark, top of vertical flange on valve, 16.43 feet above sea level.

Jan. 27	31.82	41	Mar. 30	28.58	..	May 27	28.33	38
Feb. 25	31.26	41	Apr. 29	28.83	38	Dec. 9	30.96	36

## Well 119 (area 3).

Jan. 26	30.68	334	May 27	30.39	326	Sept. 26	28.79	320
Feb. 25	30.83	337	June 30	29.57	324	Oct. 27	29.06	329
Mar. 30	30.59	320	July 25	28.61	307	Dec. 9	30.34	323
Apr. 29	30.79	326	Aug. 29	28.20	313			

## Well 153 (area 4).

Jan. 26	28.16	58	May 29	27.82	57	Sept. 25	26.62	54
Feb. 27	28.23	60	June 28	27.21	56	Oct. 27	27.23	55
Mar. 29	28.13	56	July 25	26.88	55	Dec. 8	28.54	54
Apr. 27	28.38	57	Aug. 28	26.53	56			

## Well 187B (area 6).

Jan. 26	24.20	102	May 15	23.75	101	Sept. 26	22.28	96
Feb. 28	24.20	105	June 27	22.90	123	Oct. 27	24.55	95
Mar. 25	24.70	98	July 25	22.52	117	Dec. 6	26.02	96
Apr. 21	24.60	100	Aug. 28	22.35	99			

## Well 190 (area 6).

Jan. 26	23.06	62	May 26	22.58	63	Sept. 26	21.41	57
Feb. 27	23.53	63	June 27	21.91	60	Oct. 27	23.23	57
Mar. 29	22.97	60	July 25	21.44	59	Dec. 6	24.64	58
Apr. 27	23.22	62	Aug. 28	21.52	58			

## Well 193 (area 6).

Jan. 26	22.44	115	May 26	22.01	113	Aug. 28	20.58	103
Feb. 27	22.53	120	June 27	21.37	110	Sept. 26	20.49	104
Mar. 29	22.30	115	July 19	20.88	...	Oct. 27	22.60	115
Apr. 27	22.72	119	25	20.86	106	Dec. 6	23.99	110

## Well 201 (area 6).

Jan. 26	21.30	500	May 26	20.66	594	Sept. 26	19.21	435
Feb. 24	21.30	571	June 27	19.94	525	Oct. 27	21.23	519
Mar. 29	21.15	566	July 25	19.32	482	Dec. 7	22.31	611
Apr. 27	21.68	600	Aug. 28	19.17	447			

a Casing leaking; well recased in Nov. 1939.

## Oahu--Continued

Artesian head, in feet, and chloride, in parts per million, in typical wells in Oahu, 1939

## Well 244 (area 6).

Date	Head	Chloride	Date	Head	Chloride	Date	Head	Chloride
Jan. 26	23.10	137	May 26	22.06	143	Aug. 28	20.22	131
Feb. 24	23.30	144	June 27	20.94	138	Sept. 26	20.27	130
Mar. 29	22.75	135	July 13	20.59	...	Oct. 25	23.15	136
Apr. 27	23.58	140	25	20.42	131	Dec. 7	25.11	132

## Well 266 (area 6).

Jan. 26	21.41	185	June 27	19.07	182	Sept. 26	18.32	178
Feb. 24	21.56	184	July 14	18.56	...	Oct. 12	18.62	...
Mar. 29	21.00	180	25	18.16	177	25	22.24	172
Apr. 27	21.97	172	Aug. 28	18.10	174	Dec. 7	25.16	168
May 26	19.94	184						

Well 276 (area 11). Pumped nearly continuously; measurements discontinued on December 7 and well T5 substituted.

Jan. 26	.....	607	May 26	.....	603	Sept. 25	.....	583
Feb. 24	.....	637	June 27	.....	596	Oct. 25	14.14	514
Mar. 29	.....	603	July 25	.....	586	Dec. 7	14.52	530
Apr. 27	.....	637	Aug. 28	.....	578			

Test boring Oahu T5 (area 11). County of Honolulu, south side of main highway to Waianae near Makaiwa Gulch, 65 feet east of electric pole 155. Drilled Aug. 1938 by W. M. Mullin. Depth 100 feet, diameter 6 inches. Cased with 85 feet of 6-inch galvanized steel pipe. Aquifer Waianae basalt. The water is tributary to artesian area 11. Bench mark, top of 6-inch coupling on casing, 80.13 feet above sea level.

Water level, in feet, and chloride, in parts per million, 1939

Jan. 30	4.86	241	May 26	4.71	150	Sept. 25	4.57	158
Feb. 24	4.77	215	June 27	2.53	143	Oct. 25	5.03	a 10
Mar. 29	4.88	151	July 25	4.81	146	Nov. 9	5.03	11
Apr. 27	4.87	156	Aug. 28	4.68	156	Dec. 7	5.31	11

## Well 286 (area 12).

Artesian head, in feet, and chloride, in parts per million, 1939

Jan. 25	18.91	123	May 25	17.43	113	Sept. 25	17.64	116
Feb. 27	17.73	123	June 28	17.51	128	Oct. 26	18.18	121
Mar. 28	17.47	119	July 24	17.48	116	Dec. 8	18.19	126
Apr. 25	17.58	118	Aug. 25	17.72	124			

## Well 308 (area 12).

Jan. 25	19.40	87	May 25	19.20	99	Sept. 25	19.55	92
Feb. 27	19.05	93	June 28	19.33	95	Oct. 26	20.64	96
Mar. 28	18.99	87	July 24	19.12	96	Dec. 8	20.45	90
Apr. 25	18.90	96	Aug. 28	19.37	95			

## Well 326 (area 7).

Jan. 25	11.93	83	May 25	11.59	79	Sept. 25	11.39	73
Feb. 27	11.78	86	June 28	11.56	79	Oct. 26	12.97	76
Mar. 28	11.79	80	July 24	11.59	76	Dec. 8	12.73	74
Apr. 25	11.66	80	Aug. 25	11.26	77			

## Well 337 (area 8).

Jan. 25	14.70	198	May 25	14.67	190	Aug. 25	14.46	168
Feb. 27	14.60	198	June 28	14.37	209	Sept. 25	14.32	138
Mar. 27	14.63	190	July 24	14.43	169	Dec. 8	14.57	150
Apr. 26	14.57	194						

a Decrease in chloride due to very heavy rain.

## Oahu---Continued

Artesian head, in feet, and chloride, in parts per million, in typical wells in Oahu, 1939

## Well 356 (area 8).

Date	Head	Chloride	Date	Head	Chloride	Date	Head	Chloride
Jan. 25	14.16	132	May 25	12.49	121	Sept. 25	11.88	136
Feb. 27	13.07	68	June 28	12.11	131	Oct. 26	14.15	136
Mar. 27	12.92	131	July 24	12.24	135	Dec. 8	15.15	122
Apr. 26	13.02	136	Aug. 25	11.66	137			

## Well 396 (area 8).

Jan. 25	20.98	50	May 25	20.19	50	Sept. 25	19.61	49
Feb. 27	20.97	51	June 28	20.14	52	Oct. 26	20.23	51
Mar. 27	21.37	48	July 24	19.42	50	Dec. 8	20.97	50
Apr. 26	21.15	47	Aug. 25	19.35	50			

## Well 405 (area 9).

Jan. 25	19.25	42	May 25	19.40	43	Sept. 25	18.10	39
Feb. 27	19.33	43	June 28	18.88	42	Oct. 26	18.09	41
Mar. 27	19.63	41	July 24	18.72	40	Dec. 8	18.20	40
Apr. 26	19.62	41	Aug. 25	18.26	40			

Well 406 (area 10). New bench mark, chiseled cross in top of concrete at well, 12.67 feet above sea level.

Jan. 25	17.10	168	May 25	17.23	172	Sept. 25	16.02	183
Feb. 27	16.99	182	June 28	16.93	201	Oct. 26	16.16	189
Mar. 27	17.12	176	July 24	16.77	193	Dec. 8	15.98	188
Apr. 26	17.13	179	Aug. 25	16.37	193			

## Oahu T1 (tributary to area 12).

Jan. 3	18.39	49.87	May 1	18.43	53.0	Sept. 12	18.30	49.87
Feb. 2	18.31	42.60	June 3	18.40	42.60	Oct. 2	18.36	46.76
Mar. 2	18.46	42.60	July 5	18.40	39.48	Nov. 1	18.50	42.60
Apr. 1	17.93	42.60	Aug. 7	18.33	45.72	Dec. 1	18.48	42.60

## Oahu T2 (tributary to area 7).

Jan. 4	5.36	134.03	May 1	5.14	152.73	Sept. 12	6.18	134.03
Feb. 2	5.37	141.30	June 3	6.04	141.30	Oct. 2	6.25	117.41
Mar. 2	5.37	134.03	July 5	6.03	130.91	Nov. 1	6.87	126.76
Apr. 1	5.43	141.30	Aug. 7	6.06	135.07	Dec. 1	6.64	126.76

## ISLAND OF MAUI

As elsewhere in the Territory the increased rainfall beginning in 1936 caused a rise in the water levels in wells in Maui. This rise was not so great as in Oahu because the Maui wells are not artesian, and hence the water levels in them do not fluctuate as widely as those on Oahu. Moreover, the water table in Maui was not greatly drawn down by pumping during the preceding dry years. In 1936 the water level rose, in 1937 it was practically unchanged, in 1938 it declined, and in 1939 it rose. Starting in the winter of 1939 a period of antitrade-wind weather caused very dry weather on the windward slopes of all the islands, but most plantations on the lee slopes, such as the Pioneer Mill Company, benefited from the so-called "Kona" showers. These rains decreased pumpage.

## Maui--Continued

The East Maui Irrigation Co. delivered 82,801.11 million gallons of water to central Maui during 1939. The pumping season of the Maui Agricultural Co. began in January but all of the pumps were not running until May. The pumps were shut down in November and December. All the pumps of the Hawaiian Commercial and Sugar Co. except No. 8, which was started on May 18 and shut down on November 16, were started the first week of January and were shut down at the end of December.

The chloride content, in parts per million, for the Maui Agricultural Co.'s wells on December 31, 1939, was as follows: 366 at Lower Paia (Nos. 1, 2, 4, and 6), 197 at Upper Paia (No. 7), 197 at Kuuu (No. 12), and 166 at Kaheka (Nos. 3 and 5).

The data in the following table were furnished by H. J. Eby, R. E. Hughes, and C. A. Brown.

Pumpage, in million gallons, from wells on the island of Maui during 1939, and water levels, in feet above mean sea level, on December 31, 1939

Maui Agricultural Co.			Hawaiian Commercial & Sugar Co.			Pioneer Mill Co.	
Pump	Pumpage	Water level	Pump	Pumpage	Water level <sup>a</sup> / <sub></sub>	Pump	Pumpage
1	540	4.46	1 (Kihei)	1,397.680	4.55	A	2,098.77
2	511	4.46	2	2,826.483	5.06	B	1,785.84
b 3	781	5.38	3	2,208.660	4.45	C	2,107.34
4	367	4.46	4	1,306.125	3.47	D	1,867.93
c 5	1,542	5.38	5	1,455.374	4.57	E	289.21
6	1,210	4.46	6	4,762.020	5.30	F	528.86
7	2,493	4.17	7	7,321.464	5.93	G	810.61
8	1,578	.....	8	1,785.380	.....	H	1,638.73
9	1,693	.....	3 (Kihei)	5,140.480	6.95	L	186.74
10	617	.....				M	1,036.25
11	304	.....				N	334.59
12	1,231	4.67				O	45.52
						P	172.57
						U	0.0
Total	12,867		Total	28,203.666		Total	12,902.96

The following table, a continuation of the table on page 61 of Water-Supply Paper 845, shows a gain in water level in all wells both while pumping and when shut down, except at the mill. The pumping season began in the first week of January and ended during the last week of December.

Chloride, in parts per million, and water levels, in feet above sea level, and net gain in static level, in feet, at the Pioneer Mill Co.'s Maui-type wells, West Maui  
(Records furnished by the Pioneer Mill Co.)

Well location	Chloride	December 31, 1939		Gain or loss 1939	
		Pumping	Shut down	Pumping	Shut down
Kaanapali	661	1.64	2.20	+0.52	+0.64
Kahoma	278	2.20	2.95	+0.44	+0.60
Lahaina	636	1.65	2.54	+0.33	+0.54
Mill	653	1.52	3.60	-.94	+0.60
Olowalu	187	2.75	3.75	+0.60	+0.57
Ukumehame	438	5.30	5.95	+1.03	+1.20

<sup>a</sup> Water levels for Hawaiian Commercial & Sugar Co. for December 31, 1938 published on page 61 of Water-Supply Paper 845 should be corrected to read as follows: pump 4, 3.02; pump 5, 4.34; pump 6, 4.92; pump 7, 5.67; pump 3 (Kihei), 6.61.

<sup>b</sup> Formerly pump 13.

<sup>c</sup> Formerly pump 14.



## ISLAND OF MOLOKAI

The two years' records of water level in the wells on Molokai indicate only very small fluctuations. The most important change has been the slow increase in the chloride content in T1 due apparently to the slow dispersion of the fresh water used for drilling the hole in June 1938.

A test hole that encountered perched water at depths of 157 and 174 feet was bored at the Kaunakakai shaft. Basal water was struck at about 9 feet above sea level with only about 30 parts per million of chloride. The unusually high head and low chloride may result from the perched water running down the hole.

Water level, in feet, and chloride content, in parts per million, in observation wells on Molokai, 1939

Molokai T1.  
(Measurements made by Mitchell Pauole, Hawaiian Homes Commission.)

Date	Head	Chloride	Date	Head	Chloride	Date	Head	Chloride
Jan. 16	4.94	245	May 16	4.65	481	Sept. 19	4.52	510
Feb. 16	4.89	290	June 15	4.94	492	Oct. 18	4.65	523
Mar. 15	4.94	383	July 15	4.69	482	Nov. 15	5.48	503
Apr. 15	4.94	444	Aug. 15	3.94	521	Dec. 20	5.24	512

Water levels, in feet, in observation wells on Molokai, 1939  
(Measurements made by H. Wilson)

Connant well.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 15	1.50	Apr. 15	1.50	July 15	1.42	Oct. 15	1.50
Feb. 15	1.50	May 15	1.75	Aug. 15	1.67	Nov. 15	1.42
Mar. 15	1.25	June 15	1.58	Sept. 15	1.75	Dec. 15	1.50

Kamalo well.

Jan. 15	1.83	Apr. 15	1.83	July 15	1.83	Oct. 15	1.27
Feb. 15	1.83	May 15	1.83	Aug. 15	1.27	Nov. 15	1.27
Mar. 15	1.27	June 15	1.27	Sept. 15	1.27	Dec. 15	1.83

Ulapue well.

Jan. 15	4.25	Apr. 15	4.25	July 15	4.42	Oct. 15	4.42
Feb. 15	4.25	May 15	4.25	Aug. 15	4.42	Nov. 15	4.42
Mar. 15	4.42	June 15	4.42	Sept. 15	4.42	Dec. 15	4.42

## ISLAND OF LANAI

Tunnel 1 yielded 125,148,135 gallons and pumpage from shaft 2 amounted to 8,328,940 gallons,<sup>3/</sup> distributed as follows: April, 485,440 gallons; July, 2,413,500 gallons; August, 4,179,500 gallons; December, 479,500 gallons. This is all the ground water used on Lanai in 1939. No appreciable change has occurred in the water level in shaft 1 since March 1937, when measurements were begun.

a Observer found error of 1 foot in measuring device, which may have happened in August.

<sup>3/</sup> All pumpage figures published on page 63, Water-Supply Paper 845 for this shaft should read thousand gallons instead of million gallons.

## Lanai--Continued

Water level, in feet, in the Maunalei shaft 1, Lanai, 1939  
(Records furnished by Hawaiian Pineapple Co. Datum is mean sea level.)

Date	Head	Date	Head	Date	Head	Date	Head
Jan. 3	2.44	Apr. 1	2.51	July 1	2.46	Oct. 2	2.56
Feb. 1	2.42	May 1	2.54	Aug. 1	2.53	Nov. 1	2.53
Mar. 1	2.45	June 1	2.50	Sept. 1	2.55	Dec. 1	2.61

## ISLAND OF HAWAII

On March 6, 1939, following a period of heavy rain, the water level in the Olaa shaft reached the unprecedented altitude of 25.86 feet or 9.51 feet above the pump chamber floor. Each year since 1937 the water level has reached a progressively higher peak. The shaft at Kaiwiki has shown no appreciable change in water level since measurements were begun in January 1938.

Water level, in feet above sea level, in Olaa shaft, Hawaii, 1939  
(Records furnished by the Olaa Sugar Co. Datum is mean sea level.)

Jan. 6	15.96	Apr. 7	19.65	July 7	16.38	Oct. 6	15.19
13	17.38	14	18.86	14	16.32	13	15.27
20	17.26	21	19.23	21	16.32	20	15.13
27	17.31	28	19.44	28	16.17	27	15.20
Feb. 3	17.68	May 5	19.30	Aug. 4	16.28	Nov. 3	15.07
10	17.84	12	19.07	11	16.23	10	15.11
17	19.11	19	18.72	18	16.30	17	15.19
24	18.69	26	18.32	25	16.15	24	15.03
Mar. 3	21.19	June 2	17.86	Sept. 1	15.96	Dec. 1	15.36
6	25.86	9	17.45	8	15.73	8	15.36
10	23.86	16	17.10	15	15.71	15	15.36
17	21.92	23	16.80	22	15.53	22	15.28
24	21.14	30	16.51	29	15.25	29	15.28
31	20.26						

Water level, in feet above sea level, and chloride content, in parts per million, in Kaiwiki shaft, Hawaii, 1939

(Records furnished by Kaiwiki Sugar Co. Measurements of head made while pumps were operating; owner reports that pumping does not affect static level.)

Date	Head	Chloride	Date	Head	Chloride	Date	Head	Chloride
Jan. 9	6.00	14.55	May 5	5.67	20.78	Sept. 5	5.83	15.59
17	6.09	13.51	12	5.33	13.51	19	5.67	18.70
23	3.91	14.55	17	5.67	18.70	22	6.75	15.59
30	6.25	14.55	24	5.59	14.55	Oct. 19	5.42	14.55
Feb. 6	5.67	13.51	30	5.75	14.55	23	5.33	14.55
17	5.50	13.51	June 8	5.75	12.47	30	5.59	15.59
21	5.21	15.59	15	5.59	14.55	Nov. 4	5.42	14.55
27	5.33	14.55	22	5.67	13.51	11	5.59	15.59
Mar. 6	....	14.55	27	5.33	13.51	17	5.54	15.59
13	....	23.90	July 10	5.50	13.51	24	5.50	13.51
20	....	17.66	17	5.50	11.43	Dec. 4	5.33	15.59
28	....	14.55	25	5.25	11.43	11	5.59	15.59
Apr. 5	5.59	12.99	Aug. 14	5.83	15.59	18	5.59	14.55
13	4.50	17.66	23	5.54	15.59	28	5.33	15.59
17	5.42	14.55						

## ISLAND OF KAUAI

The artesian head in the Kealia, Koloa, and Wailua areas has not changed since 1937, but near Kekaha it has declined nearly 1.5 feet. The head in well 56,  $7\frac{1}{2}$  miles northwest of Kekaha, has risen slightly since 1937.

Artesian head, in feet, and chloride content, in parts per million, in typical artesian wells in Kauai, 1939

## Well 2F. At Kealia, Kauai.

Date	Head	Chloride	Date	Head	Chloride	Date	Head	Chloride
Jan. 24	10.20	43	May 22	10.22	44	Sept. 25	10.44	40
Feb. 20	10.15	46	June 20	10.21	43	Oct. 26	10.28	41
Mar. 21	10.15	43	July 21	10.15	40	Nov. 27	9.32	43
Apr. 21	9.99	41	Aug. 25	10.09	42	Dec. 22	10.30	41

## Well 7. At Wailua, Kauai.

Jan. 16	.....	140	May 17	.....	133	Sept. 16	.....	127
Feb. 16	.....	138	June 16	.....	138	Oct. 16	.....	134
Mar. 16	.....	138	July 15	.....	131	Nov. 16	.....	131
Apr. 17	.....	136	Aug. 15	.....	129	Dec. 16	.....	135

## Well 8. At Wailua, Kauai.

Jan. 16	12.47	104	May 17	12.23	103	Sept. 16	12.55	98
Feb. 16	12.38	105	June 16	12.08	105	Oct. 16	12.67	99
Mar. 16	12.41	111	July 15	12.19	102	Nov. 16	12.56	104
Apr. 17	12.23	107	Aug. 15	12.28	103	Dec. 16	12.63	102

Well 14N. At Koloa, Kauai. Records furnished by Koloa Sugar Co. Artesian head, in feet, and chloride content, in parts per million, 1938

Jan. 20	31.27	45.72	May 16	31.19	42.60	Sept. 26	a22.02	41.56
Feb. 26	31.44	46.76	June 15	31.35	42.60	Oct. 31	a11.10	42.60
Mar. 18	.....	.....	July 28	31.52	44.68	Nov. 22	a13.22	41.56
Apr. 18	31.27	46.76	Aug. 30	31.52	45.72	Dec. 27	a12.35	44.68

Artesian head, in feet, and chloride content, in parts per million, 1939

Jan. 26	30.52	44.68	May 29	31.52	44.68	Sept. 29	a 9.77	43.64
Feb. 28	a12.85	42.60	June 29	31.52	42.60	Oct. 30	29.94	43.64
Mar. 27	31.02	43.64	July 31	31.52	42.60	Nov. 29	30.60	42.60
Apr. 28	31.35	.....	Aug. 31	a11.15	43.64	Dec. 29	31.02	43.64

Artesian head, in feet above sea level, and chloride, in parts per million, in the Kekaha Sugar Co.'s artesian wells, Kauai, 1939  
(Records furnished by the Kekaha Sugar Co.)

## Well 35.

Feb. 15	10.47	178.7	June 14	9.62	267.0	Oct. 16	9.92	243.1
Apr. 15	10.47	212.0	July 15	9.38	224.4	Nov. 18	9.72	339.8
May 21	9.92	243.1	Aug. 19	9.52	428.1	Dec. 19	9.05	267.0

## Well 37.

Feb. 15	10.40	118.5	June 14	9.08	260.8	Oct. 16	9.58	194.3
Apr. 15	10.08	133.0	July 15	9.78	145.5	Nov. 18	8.98	267.0
May 21	8.13	260.8	Aug. 19	8.88	230.7	Dec. 19	9.48	248.3

## Well 43.

Apr. 15	9.52	66.5	Aug. 19	9.57	60.3	Nov. 18	9.57	66.5
June 14	10.62	60.3	Oct. 16	9.32	66.5	Dec. 19	(b)	
July 15	9.52	60.3						

## Well 56.

Feb. 15	9.42	290.9	June 14	9.62	284.7	Oct. 16	9.57	293.0
Apr. 15	9.57	290.9	July 15	9.72	279.5	Nov. 18	9.52	267.0
May 21	9.42	297.2	Aug. 19	9.57	290.9	Dec. 19	9.55	333.5

a Pump running.

b Well stopped flowing when plug was inserted for measurement; resumed flow 3 days later when long sticks were poked down the well.

By A. M. Piper

Although no current State-wide observation-well program exists in Idaho, some continuing water-level records have been obtained in two areas of that State in connection with projects whose areas lie chiefly in Washington. The two areas are (1) the Rathdrum Prairie region, in Bonner and Kootenai Counties, which is an eastward extension of and possibly the principal area of ground-water recharge for the Spokane Valley of Washington; and (2) the higher part of the basin of the South Fork of the Palouse River, in Latah County, which is adjacent to Whitman County, Wash. The purpose and status of the cooperative investigations through which water-level records are being collected in these two areas in Idaho are given in the Washington section of this volume.

In the Rathdrum Prairie region measurements of water level were made in five wells about once a month during 1939; in all, 54 measurements were made in 1939. No water-level recorders or float gages were maintained in the region. In four of the five wells, the water level fluctuated relatively little during the year and was about midway between the highest and lowest levels yet observed in those wells; the following table summarizes the water-level fluctuations. In the fifth well, the water level rose nearly 100 feet between January and April and has remained high thereafter; a wholly adequate explanation for this inordinate rise is not yet at hand.

Fluctuations, in feet, of water levels in four wells  
in the Rathdrum Prairie area, 1939

Change from year-end water level of 1938 to highest level of 1939	
Maximum rise.....	2.06
Maximum decline.....	2.12
Mean (decline).....	.17
Decline from highest level to year-end level, 1939	
Maximum.....	5.31
Minimum.....	3.73
Mean.....	4.32
Net decline during 1939	
Maximum.....	6.02
Minimum.....	3.25
Mean.....	4.49

In that part of the Palouse River Basin which lies in Latah County, Idaho, records of water level were obtained in 1939 for 12 observation wells, of which 10 wells tap unconfined water (water-table condition) and 2 wells tap confined water (artesian condition). A water-level recorder

was operated throughout the year on 1 of the water-table wells. Measurements of water level were made once a week in 2 other water-table wells and about once a month in the remaining 7 water-table wells and the 2 artesian wells. Altogether, 233 water-level measurements were made in the year. Observations were discontinued on 1 water-table well in 1939, so that 9 water-table wells and 2 artesian wells were under observation at the end of December.

The following table summarizes the water-level fluctuations during the year: Unlike the contiguous area to the west, the water table in Latah County did not rise unusually high at any time and fluctuated only moderately; at two wells it declined to the lowest level yet observed. But like the contiguous area, on the other hand, water levels in the artesian wells in Latah County continued their downward trends.

Summary of water-level changes, in feet,  
in observation wells in Latah County, 1939

Well	Highest level, spring of 1939		Lowest level, autumn of 1939	
	Rise since autumn of 1938	Net rise (+) or decline (-) from high level of 1938	Decline since spring of 1939	Net rise (+) or decline (-) from low level of 1938
<u>Water-table wells</u>				
7A	4.84	+0.03	5.16	-0.32
8	5.01	-0.59	4.26	+0.75
12	10.02	-1.18	9.65	+0.37
27	6.27	-1.40	6.91	a -0.64
32	4.00	-3.85	4.37	-0.37
41	1.28	-3.43	1.16	+0.12
42	.98	-.71	1.05	-.07
44	.26	-.21	.65	a -0.39
48	1.43	-5.32	1.81	-0.38
49	6.06	-1.47	7.26	-1.20
Average	4.02	-1.81	4.23	-.21
<u>Confined (artesian) wells</u>				
39/5-7R1	2.60	-1.61	4.56	a -1.96
39/6-1Q1	1.41	-1.10	2.10	a -.69
Mean	2.00	-1.36	3.33	-1.32

#### Bonner County

##### Rathdrum prairie region

54/5W-27M1. J. C. Natvig. Local datum, 2,000 feet above preliminary sea-level datum and 1,996.95 feet above sea-level datum of 1929.

Water level, in feet above a local datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 20	94.53	Apr. 26	193.31	July 5	192.72	Oct. 10	190.72
Apr. 6	b 193.52	May 26	193.17	25	192.23	Nov. 22	190.82
26	193.40	June 7	192.93	Sept. 15	191.34	Dec. 12	190.15

a Declined to lowest stage on record.

b Inordinate rise of water level confirmed by subsequent measurements; explanation not yet known

## Kootenai County

50/5W-1A1. Washington Water Power Co. well 96. Post Falls Irrigated District. Local datum, 1,950 feet above preliminary sea-level datum.

Water level, in feet above a local datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 20	a 50.93	Apr. 5	a 49.33	June 7	a 50.57	Sept. 15	a 51.41
Feb. 16	a 49.95	26	a 49.39	July 5	a 52.02	Oct. 10	50.40
Mar. 2	a 49.94	May 26	a 50.35	25	a 52.58	Dec. 12	48.85

51/5W-33D1. Washington Water Power Co. well 58. Spokane International Railway Co. Local datum, 1,900 feet above preliminary sea-level datum.

Water level, in feet above a local datum, 1939

Jan. 20	70.14	Apr. 6	70.45	June 7	73.02	Sept. 16	71.03
Feb. 16	70.15	26	71.35	July 5	72.53	Nov. 21	68.55
Mar. 2	70.10	May 26	73.56	25	71.95	Dec. 12	68.25

52/4W-11N1. H. G. Bings. Local datum, 1,950 feet above preliminary sea-level datum.

Water level, in feet above a local datum, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 20	56.26	June 7	54.81	Sept. 15	55.66
Apr. 26	54.61	July 25	56.31	Dec. 12	52.41

53/4W-24D1. Washington Water Power Co. well 91. C. T. Jurgens (formerly J. C. Arnold.) Local datum, 2,000 feet above preliminary sea-level datum and 1,996.95 feet above sea-level datum of 1929.

Water level, in feet above a local datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 20	25.15	Apr. 25	23.61	July 5	24.40	Oct. 9	22.93
Feb. 16	24.58	May 26	23.80	25	24.00	Nov. 22	21.94
Apr. 6	24.08	June 7	23.84	Sept. 15	23.96	Dec. 12	20.80

## Latah County

## Palouse River area

## Water-table observation wells

## 7A. Latah County.

Daily noon water level, in feet above assumed datum, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	12.43	12.71	13.71	16.19	15.17	13.79	13.31	12.57	11.86	11.79	11.84	11.87
2	12.45	12.71	13.74	16.13	15.12	13.77	13.29	12.53	11.85	11.79	11.84	11.87
3	12.48	12.71	13.78	16.08	15.06	13.77	13.29	12.50	11.84	11.79	11.84	11.87
4	12.48	12.72	13.80	16.01	15.01	13.75	13.29	12.46	11.84	11.80	11.84	11.86
5	12.49	12.73	13.80	15.96	14.96	13.73	13.27	12.44	11.84	11.82	11.84	11.87
6	12.49	12.75	13.80	15.91	14.92	13.71	13.25	12.41	11.83	11.83	11.84	11.88
7	12.48	12.75	13.82	15.88	14.86	13.70	13.22	12.38	11.83	11.83	11.85	11.88
8	12.48	12.75	13.83	15.85	14.81	13.67	13.20	12.35	11.82	11.83	11.85	11.89
9	12.49	12.74	13.84	15.81	14.76	13.66	13.18	12.33	11.81	11.83	11.86	11.91
10	12.49	12.74	13.86	15.77	14.70	13.64	13.17	12.31	11.81	11.82	11.86	11.94
11	12.51	12.71	13.95	15.74	14.65	13.63	13.15	12.28	11.82	11.82	11.86	11.97
12	12.51	.....	14.12	15.72	14.58	13.62	13.12	12.25	11.82	11.81	11.86	11.96
13	12.51	.....	14.30	15.79	14.52	13.61	13.10	12.22	11.82	11.81	11.86	11.95
14	12.52	12.93	14.45	15.83	14.46	13.60	13.07	12.20	11.82	11.82	11.86	11.95
15	12.54	13.37	14.60	15.84	14.41	13.60	13.05	12.17	11.82	11.82	11.86	11.97
16	12.55	13.41	14.73	15.79	14.35	13.60	13.02	12.15	11.81	11.82	11.86	12.03
17	12.56	13.42	15.01	15.75	14.29	13.57	12.99	12.12	11.81	11.83	11.86	12.06
18	12.57	13.46	16.06	15.71	14.25	13.55	12.98	12.10	11.81	11.83	11.86	12.05
19	12.59	13.52	16.90	15.66	14.22	13.54	.....	12.08	11.81	11.83	11.85	12.03
20	12.60	13.52	.....	15.62	14.17	13.52	.....	12.06	11.81	11.83	11.85	12.03
21	12.61	13.56	.....	15.59	14.13	13.50	.....	12.04	11.80	11.83	11.85	12.03
22	12.62	13.57	16.95	15.55	14.11	13.48	12.85	12.02	11.80	11.83	11.85	12.02
23	12.63	13.59	16.82	15.50	14.06	13.47	12.85	12.00	11.80	11.83	11.85	12.02

a Pump operating in well.

## Latah County--Continued

## Water-table observation wells

## 7A. Latah County.--Continued

Daily noon water level, in feet above assumed datum, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
24	12.63	13.61	16.73	15.46	14.02	13.45	12.82	11.99	11.80	11.84	11.85	12.02
25	12.63	13.65	16.66	15.42	13.98	13.43	12.80	11.97	11.80	11.85	11.86	12.02
26	12.63	13.66	16.61	15.40	13.94	13.42	12.77	11.95	11.80	11.85	11.87	12.03
27	12.65	13.69	16.52	15.36	13.91	13.40	12.74	11.93	11.80	11.86	11.87	12.03
28	12.68	13.71	16.45	15.32	13.89	13.38	12.70	11.92	11.80	11.85	11.86	12.04
29	12.70	.....	16.38	15.27	13.87	13.37	12.67	11.90	11.80	11.84	11.86	12.03
30	12.71	.....	16.31	15.21	13.84	13.34	12.64	11.89	11.79	11.84	11.87	12.03
31	12.72	.....	16.25	.....	13.82	.....	12.61	11.87	.....	11.84	.....	12.03

## 8. School District.

Water level, in feet above an assumed datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	8.21	Feb. 28	9.45	Apr. 25	11.65	June 26	9.95
11	8.09	Mar. 7	9.71	May 2	11.12	July 21	9.18
17	8.35	14	10.23	9	11.00	28	9.14
24	8.28	21	11.44	16	10.86	Aug. 4	8.90
31	8.26	28	12.59	23	10.88	11	8.73
Feb. 7	8.53	Apr. 4	11.75	30	10.74	18	8.56
14	8.25	11	11.94	June 6	10.17	Sept. 3	a 8.33
21	8.98	18	11.47				

## 12. G. Mix.

Water level, in feet above an assumed datum, 1939

Jan. 23	8.39	Apr. 24	18.03	July 21	12.86	Oct. 15	9.61
Feb. 20	9.12	May 22	17.61	Aug. 17	11.72	Dec. 18	8.76
Mar. 27	18.41	June 26	14.73	Sept. 3	11.35		

## 14. J. I. Heick. No measurements made in 1939.

## 26. A. Snow. Measurements discontinued April 28, 1937.

## 27. F. B. Laney. Correction: Water level Aug. 31-Sept. 2, 1936, 6.87 feet.

Water level, in feet above an assumed datum, 1939

Jan. 4	6.59	Mar. 22	11.65	May 31	10.25	Oct. 28	5.30
11	6.68	29	11.92	June 7	9.87	Nov. 4	5.24
18	6.77	Apr. 5	11.80	26	8.71	11	5.22
25	6.80	12	11.80	July 15	7.72	18	5.10
Feb. 1	6.87	19	11.65	27	7.07	25	5.07
8	6.92	26	11.51	Aug. 3	7.04	Dec. 2	5.01
17	7.40	May 3	11.25	10	6.82	11	5.04
22	8.30	10	11.05	17	6.57	16	5.17
Mar. 1	8.55	17	10.74	Sept. 3	6.00	21	5.12
8	8.81	24	10.52	Oct. 22	5.33	30	5.10
17	10.90						

## 32. Federal Geological Survey.

Water level, in feet above an assumed datum, 1939

Jan. 24	9.39	Apr. 25	13.39	July 13	10.89	Oct. 15	9.56
Feb. 21	9.50	May 23	12.10	Aug. 15	10.11	Dec. 18	9.02
Mar. 28	12.96	June 26	11.09	Sept. 3	9.87		

## 41. E. Snow.

Water level, in feet above an assumed datum, 1939

Jan. 25	12.52	Apr. 26	13.42	July 15	13.80	Oct. 15	13.34
Feb. 22	12.62	May 22	13.76	Aug. 14	13.77	Dec. 18	12.64
Mar. 29	13.63	June 26	13.69	Sept. 3	13.55		

a Measurements discontinued.

## Latah County--Continued

## 42. South Moscow School.

Water level, in feet above an assumed datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 25	12.62	Apr. 26	13.29	July 14	13.60	Oct. 15	13.06
Feb. 22	12.71	May 22	13.33	Aug. 14	13.51	Dec. 18	12.55
Mar. 29	13.17	June 26	13.53	Sept. 3	13.28		

## 44. J. L. Naylor.

Water level, in feet above an assumed datum, 1939

Jan. 24	13.48	Apr. 24	13.10	July 17	13.23	Sept. 10	13.28
Feb. 21	13.55	May 22	12.90	25	13.25	Oct. 15	13.22
Mar. 27	13.47	June 26	13.33	Aug. 15	13.27	Dec. 18	13.36

## 48. Ida Peterson. Correction: Water level Feb. 16, 1938, 13.92 feet.

Water level, in feet above an assumed datum, 1939

Jan. 25	11.31	Apr. 26	12.70	July 21	11.89	Oct. 15	11.22
Feb. 22	11.27	May 24	12.51	Aug. 17	11.64	Dec. 18	10.89
Mar. 28	11.99	June 26	12.18	Sept. 3	11.51		

## 49. S. Gerke.

Water level, in feet above an assumed datum, 1939

Jan. 23	8.73	Apr. 24	13.07	July 21	9.68	Oct. 15	7.19
Feb. 20	10.54	May 22	11.81	Aug. 17	8.71	Dec. 18	6.76
Mar. 27	14.02	June 26	10.79	Sept. 3	8.13		

## Artesian observation wells

## 39/5-7R1. Inland Motor Freight, Moscow, Idaho.

Water level, in feet above mean sea level minus 2,000, 1939

Jan. 14	509.04	Mar. 24	508.08	May 31	507.08	Sept. 3	505.26
27	509.22	Apr. 3	508.94	June 26	507.56	Oct. 22	505.85
Feb. 10	508.71	21	508.15	July 17	505.95	Nov. 18	506.23
24	508.03	May 5	507.19	Aug. 1	504.93	Dec. 2	506.51
Mar. 10	509.22	19	507.45	17	504.66	21	506.79

## 39/6-1Q1. G. P. Mix, Moscow, Idaho.

Water level, in feet above mean sea level minus 2,000, 1939

Jan. 23	501.45	Apr. 24	501.88	July 21	500.90	Oct. 15	499.86
Feb. 20	501.76	May 22	501.48	Aug. 17	500.17	Dec. 18	500.24
Mar. 27	501.86	June 26	501.05	Sept. 3	499.78		



## INDIANA

By C. L. McGuinness

The cooperative program of water-level measurements in observation wells in Indiana, <sup>1/</sup> begun in 1935, was continued in 1939 by the Federal Geological Survey and the Division of Geology of the Indiana Department of Conservation. The detailed investigation of ground-water conditions in the Indianapolis area, begun in 1938, was also continued in 1939.

Water-level measurements, though discontinued in several observation wells in the State in 1939, were begun in 8 wells in Indianapolis. Measurements were made at least once in about 75 wells. At the end of the year water levels were being measured periodically in about 60 wells. As measurements are made voluntarily by members of the State Department of Conservation, the Civilian Conservation Corps, and municipal water departments, acknowledgment is due these organizations for their cooperation.

Measurements are made twice a month in most of the wells; once a month, in a few wells; once a week in a few other wells; and daily in one well in Indianapolis. About 1,500 individual measurements were made in 1939. Two float-type automatic water-stage recorders were in operation on wells in Indianapolis during the year.

Essentially complete water-level records were obtained for 42 wells in 1939. Thirty-five wells showed net declines in water level for the year, 6 wells showed net rises, and 1 well had the same level at the end of the year as at the beginning. In the 6 wells showing net rises in water level, the rises ranged from 0.2 foot to about 2.5 feet. In the 35 wells showing net declines in water level, the declines ranged from less than 0.1 foot to 5.65 feet.

There was an average net decline in water level of about 1.45 feet in the 42 wells.

Of 14 wells in northern Indiana, 4 showed net rises in water level, 9 showed declines, and 1 showed no net change. For the 14 wells the average net decline was about 0.6 foot. Of 24 wells in central Indiana, 2 showed net rises in water level, and 22 showed net declines. For the 24 wells the average net decline was about 2.05 feet. Four wells in southern Indiana showed net declines in water level that averaged 0.95 foot.

Precipitation in the State during the year was about a half inch below normal. It was above normal from January through July, except for May, when there was a deficiency of nearly  $2\frac{1}{2}$  inches. The accumulated excess

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<sup>1/</sup> See Water-Supply Papers 777, 817, 840, and 845.

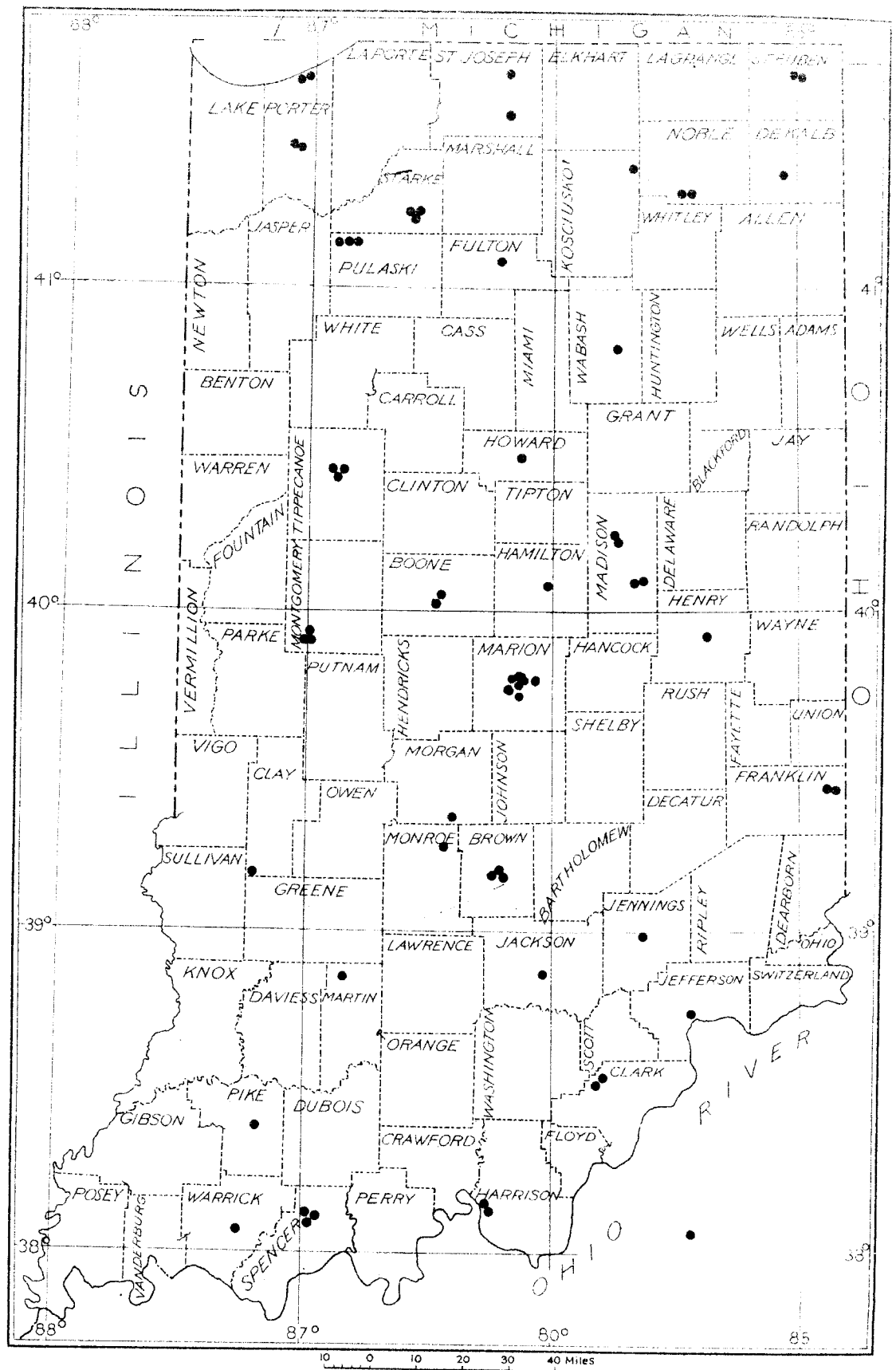


Figure 2.-Map of Indiana showing distribution of observation wells.

at the end of July was nearly 6 inches. The precipitation was below normal during the last 5 months of the year, when the deficiencies ranged from a few hundredths of an inch in October to  $2\frac{1}{2}$  inches in September.

Water levels in most of the wells that showed seasonal fluctuations were at the highest stages of the year during the middle of March, although in several wells the water levels reached their highest stages in the middle of April or in the early part of May. The lowest stages were reached in most wells rather late in the year, and in about 20 wells the water levels were still declining at the end of the year. The lowest water levels during the period of record were reached in about 20 wells late in 1939 or early in 1940. Previous record low stages in most wells were reached in the summer and fall of 1936--in about 10 wells in 1936 low stages are still the lowest of record.

The average total range of fluctuation in the 42 wells for which the records of 1939 are essentially complete was about 6.6 feet--0.4 foot more than the 1938 average. Fluctuations in individual wells ranged from 0.8 foot to about 19 feet. Twenty-two water-table wells, presumably not affected by pumping, showed fluctuations that ranged from about 1.2 feet to about 19 feet--an average of about 7.5 feet, or 0.5 foot more than the 1938 average.

In the following pages the wells are listed by counties. Descriptions are given for only those wells whose records do not appear in Water-Supply Papers 817, 840, and 845. Names of the observers are given for each well or group of wells, except for wells in which the only measurements for 1939 were made by G. F. Fix, Assistant State Geologist, or by the writer.

#### Boone County

Boone 1. Metropolitan Life Insurance Co. At residence of John Feeney, about 3 miles south of Lebanon along State road 39, NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 23, T. 18 N., R. 1 W.

Boone 2. R. W. Gorrell. At east end of school house on south side of State road 32, about 3 miles east of Lebanon, SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 4, T. 18 N., R. 1 E.

Measurements in wells 1 and 2 made by C. R. Brown, technical foreman, CCC camp D-7, Lebanon.

Water levels in wells 1 and 2, in feet,  
below measuring points, 1939

Date	Boone 1	Boone 2	Date	Boone 1	Boone 2	Date	Boone 1	Boone 2
Jan. 6	9.5	4.86	May 16	4.44	4.4	Sept. 9	9.9	9.24
16	7.86	4.84	June 1	5.4	6.5	15	8.6	8.58
Feb. 4	3.7	3.58	15	6.38	6.35	30	10.05	....
15	3.8	4.28	July 5	6.6	6.9	Oct. 14	10.7	....
Mar. 4	3.1	3.48	15	7.9	7.75	Nov. 4	11.9	9.22
18	3.38	3.9	Aug. 3	7.1	6.95	17	11.7	9.55
Apr. 1	3.7	5.34	19	8.1	7.1	Dec. 2	10.92	9.15
14	3.9	4.25	26	8.38	7.46	16	11.15	9.33
May 2	4.2	4.1						

## Brown County

Brown 1. Brown County State Park. In pump house on Salt Creek Water level, in feet below measuring point, 1939: Jan. 15, 5.5.

Brown 2. Brown County State Park. Near head of valley northwest of Blockhouse. Water level, in feet below measuring point, 1939: Jan. 15, 3.7.

Brown 3. Brown County State Park. In front of Hoosier's Nest cabin, near tower at entrance to Brown County State Game Preserve. Water levels, in feet below measuring point, 1939: Jan. 15, 10.4, Aug. 23, 10.32.

Measurements made by J. C. Setser, custodian, Brown County State Park.

## Clark County

Clark 1. Clark County State Forest. Schlamm well, west side of trail 9, about 1/8 mile north of trail 10, sec. 36, T. 2 N., R. 6 E.

Clark 2. Clark County State Forest. At Purdue camp site.

Measurements made by Thomas Coomes and V. M. Clark, CCC camp S-51-A, Clark County State Forest, C. R. Lindemuth, superintendent.

Water levels in wells 1 and 2, in feet  
below measuring points, 1939

Date	Clark 1	Clark 2	Date	Clark 1	Clark 2	Date	Clark 1	Clark 2
Jan. 6	22.2	10.0	Mar. 7	3.9	4.1	Sept. 5	20.2	10.2
19	21.8	11.1	15	3.9	2.1	25	20.7	10.6
Feb. 2	11.8	10.8	Aug. 24	19.84	9.47	Oct. 5	20.9	10.7

## Clay County

Clay 1. Shakamak State Park. In pump house at headquarters of CCC camp SP-3. Measurements made by G. L. Taylor, assistant superintendent, and V. E. Coleman, CCC camp SP-3, Shakamak State Park, Ed. McQuade, superintendent.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 5	26.93	Apr. 4	27.34	July 18	27.37	Sept. 15	28.16
20	27.23	15	26.98	31	27.46	29	28.34
Feb. 1	26.82	May 3	27.25	Aug. 18	27.65	Oct. 31	28.52
Mar. 6	26.99	15	27.21	25	27.77	Nov. 21	28.55
16	27.13	June 16	26.95	31	27.84	30	28.54

## De Kalb County

De Kalb 1. Auburn Water Department. Well 3 at Auburn waterworks. Measurements made by members of Auburn Water Department, Ted Haynes, superintendent.

Water levels, in feet below measuring point, 1939

Date	Static level	Pumping level	Date	Static level	Pumping level
Jan. 10	9.5	17.5	July 25	9.5	18.5
25	10.5	18.5	Aug. 10	8.5	17.5
Feb. 13	7.5	15.5	26	10.5	18.5
27	9.5	17.5	Sept. 11	8.5	16.5
Mar. 10	9.5	18.5	25	9.5	17.5
25	8.5	17.5	Oct. 10	9.5	17.5
May 16	9.5	17.5	25	10.5	17.5
26	8.5	17.5	Nov. 13	9.5	17.5
June 10	9.5	17.5	27	7.5	16.5
26	8.5	17.5	Dec. 11	9.5	17.5
July 10	10.5	18.5	26	8.5	17.5

## Dubois County

Dubois 1. No measurements made in 1939.

Dubois 2. No measurements made in 1939.

## Franklin County

Franklin 1. Brookville Water Department. At south end of pumping plant, Brookville. Measurements made by W. L. Dare, engineer in charge, Brookville Water Department.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 2	31.87	Mar. 21	29.30	June 10	31.67	Aug. 31	32.18
17	31.59	Apr. 5	30.34	26	30.17	Sept. 30	32.62
Feb. 1	29.69	26	28.24	July 11	31.10	Oct. 16	32.71
18	29.51	May 10	30.24	31	31.24	30	32.63
Mar. 7	28.96	26	31.24	Aug. 15	31.71	Nov. 15	32.56

Franklin 2. Rebecca Barbour. On farm about 7 miles east of Brookville, NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 10, T. 9 N., R. 1 W. Measurements made by Frank M. Clark, CCC camp Co. 1596, Brookville, J. M. McCold, superintendent. Measurements discontinued after Sept. 30.

Water level, in feet below measuring point, 1939

Jan. 1	8.3	Mar. 15	2.8	June 1	7.5	Aug. 15	8.0
16	7.75	31	3.85	15	6.6	Sept. 1	8.3
Feb. 1	4.3	Apr. 15	1.95	July 1	4.9	15	9.3
15	3.45	May 1	5.6	16	6.75	30	6.75
28	2.85	15	6.55	Aug. 1	6.8		

## Fulton County

Fulton 3. City of Rochester. At Federal Fish Hatchery east of Rochester. Measurements made by C. H. Walker, foreman, Federal Fish Hatchery, Rochester. Water levels for 1938, reported on page 72 of Water-Supply Paper 845, are in error. The corrected measurements appear below, together with the 1939 measurements.

Water level, in feet below measuring point, 1938-39

May 4, 1938	8.0	Jan. 1, 1939	11.6	May 1, 1939	9.45	Aug. 1, 1939	9.98
June 1	9.4	Feb. 1	11.4	June 1	9.0	Sept. 1	11.1
July 1	7.7	Mar. 1	10.3	Aug. 1	9.5	Oct. 20	11.83
Sept. 1	10.6	Apr. 1	10.3				

## Hamilton County

Hamilton 2. Public Service Co. of Indiana. At water plant, Noblesville. Measurements made by A. L. Wana, engineer, Noblesville water plant, Public Service Co. of Indiana.

Water level, in feet below measuring point, 1939

Jan. 2	23.37	Apr. 16	20.29	July 15	22.59	Oct. 16	23.46
15	23.32	May 15	21.84	Aug. 3	22.48	Nov. 4	23.18
Apr. 2	21.22	June 3	21.40	Oct. 3	23.16	Dec. 16	23.58

## Harrison County

Harrison 1. Harrison County State Forest. On south side of road near Lowe Pond, NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 23, T. 4 S., R. 2 E.

Harrison 3. Harrison County State Forest. On south side of truck trail 1, SE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 2, T. 4 S., R. 2 E. Measurements made by Dewey N. Hickman, custodian, Harrison County State Forest.

## Harrison County--Continued

## Harrison 3--Continued

Water levels in wells 1 and 3, in feet  
below measuring points, 1939

Date	Harrison 1	Harrison 3	Date	Harrison 1	Harrison 3
Jan. 11	1.00	4.69	July 15	3.10	7.44
Feb. 1	0.50	3.08	31	3.48	5.40
15	0.00	2.99	Aug. 15	2.54	5.73
28	0.00	3.09	31	3.10	5.99
Mar. 21	2.00	0.80	Sept. 15	2.48	6.62
31	0.00	3.08	Oct. 1	3.08	7.03
Apr. 15	0.00	3.05	15	4.25	6.66
30	0.80	4.30	31	4.70	6.80
May 15	2.10	3.90	Nov. 15	3.61	6.82
June 1	3.10	3.27	30	2.94	6.98
15	4.88	5.17	Dec. 15	2.60	6.90
July 1	2.68	4.03	31	2.55	6.89

## Henry County

Henry 1. City of New Castle, at waterworks. Measurements made by Nelson Howard, engineer, New Castle Water and Light Department, C. E. Scholl, superintendent.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 4	16.0	Apr. 3	14.0	July 1	24.0	Oct. 2	25.0
16	16.0	15	15.0	14	23.0	16	24.0
30	16.0	May 3	14.0	31	13.0	31	24.0
Feb. 14	15.0	15	21.0	Aug. 14	17.0	Nov. 16	23.0
Mar. 2	25.0	June 3	16.0	31	23.0	Dec. 4	24.0
20	15.0	16	23.0	Sept. 16	21.0		

## Howard County

Howard 1. Pittsburg Plate Glass Co. On north side of creek, about 0.1 mile west of Kokomo waterworks. Measurements made by W. O. Thompson, engineer, Kokomo waterworks, F. P. Stradling, superintendent.

Water level, in feet below measuring point, 1939

Jan. 3	17.9	Apr. 17	10.9	Aug. 15	18.0	Sept. 30	19.1
17	16.1	May 2	13.6	21	17.8	Oct. 15	17.8
31	15.0	18	15.4	Sept. 2	18.4	Nov. 17	17.0
Feb. 28	13.7	June 18	16.3	8	19.2	Dec. 1	16.0
Mar. 15	9.5	July 10	16.0	14	19.4	15	16.6
Apr. 1	13.5	Aug. 1	16.4				

## Jackson County

Jackson 1. Jackson County State Forest. Near northeast corner of office of CCC camp S-55. Measurements made by George Coverdill, Abe Zimmerman, K. Vernon, and F. W. Crozier, CCC camp S-55, Jackson County State Forest, A. C. Foley, superintendent.

Water level, in feet below measuring point, 1939

Jan. 2	7.5	Apr. 3	4.5	July 5	6.75	Sept. 29	8.6
16	7.7	15	1.2	14	7.0	Oct. 16	8.65
Feb. 2	4.25	May 1	5.7	Aug. 1	7.0	Nov. 1	8.85
15	4.25	15	6.5	15	7.0	15	8.85
Mar. 2	4.1	June 1	7.3	31	8.25	30	8.85
15	3.5	15	7.6	Sept. 15	8.15	Dec. 15	8.5

## Jasper County

Jasper 1. No measurements made in 1939.

## Jefferson County

Jefferson 2. Clifty Falls State Park. At custodian's house. Measurements made by M. L. Carr, and V. E. Hyden, custodian, Clifty Falls State Park.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Dec. 29, 1938	31.0	Aug. 2	28.0	Nov. 1	30.0
Jan. 27, 1939	30.0	Sept. 2	30.0	Dec. 9	31.0
Feb. 10	29.5	Oct. 10	30.0		

## Jennings County

Jennings 1. Muscatatuck State Park. In Northwest corner of park, near North Vernon, SE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 3, T. 6 N., R. 8 E. Measurements made by Charles Vogel, Muscatatuck State Park.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 15	2.06	Apr. 30	5.83	July 31	7.55	Sept. 30	13.49
28	1.99	May 15	6.59	Aug. 15	9.39	Oct. 15	14.01
Mar. 15	3.14	31	8.19	31	11.98	31	14.49
31	4.47	June 15	7.33	Sept. 15	12.61	Nov. 15	14.96
Apr. 15	4.79	July 15	8.26				

## Kosciusko County

Kosciusko 1. No measurements made in 1939.

Kosciusko 2. Wawasee State Fish Hatchery. Flowing well at sunken garden. Measurement made by Maurice Lung, superintendent, Wawasee State Fish Hatchery. Water level, in feet above measuring point, 1939: Jan. 15, 2.80.

## Madison County

Madison 1. Mounds State Park. Measurements made by personnel of Mounds State Park, Mrs. Anne Norton, custodian.

Water level, in feet below measuring point, 1939

Jan. 3	7.48	Apr. 1	6.42	July 1	3.54	Oct. 2	6.27
16	7.64	15	1.42	15	3.87	17	6.56
Feb. 1	7.38	May 1	1.12	Aug. 1	3.58	Nov. 1	6.83
16	7.12	15	2.26	15	3.44	16	7.27
Mar. 1	6.36	June 1	2.73	Sept. 1	2.64	Dec. 1	7.34
15	4.16	15	2.76	17	5.82	15	7.58

Madison 2. Anderson Water Department. Well 2 at Anderson waterworks. Measurements made by B. E. Burrows, chief engineer, Anderson Water Department, W. J. Norton, superintendent.

Water level, in feet below measuring point, 1939

Jan. 1	15.5	Apr. 1	14.9	July 1	14.75	Oct. 2	16.09
16	15.9	15	14.7	17	15.1	16	16.21
Feb. 1	15.7	May 1	13.96	Aug. 1	15.0	Nov. 1	16.23
15	15.53	15	14.2	15	15.4	16	16.49
Mar. 1	15.2	June 3	14.55	Sept. 1	15.57	Dec. 1	16.53
16	14.6	16	14.85	16	15.81	16	16.71

Madison 3. Albert Closser. About 2 blocks east of CCC camp SCS-21, Frankton. An obstruction has prevented measurements since Aug. 31. Measurements made by Louis B. Samms, foreman, Kurt E. Haigis, camp engineer, Henry L. Schultheis, and Wilbert Lightle, CCC camp SCS-21, Frankton, H. C. List, superintendent.

## Madison County--Continued

Madison 4. Walter McCoy. About 3 blocks south of CCC camp SCS-21, Frankton. Measurements made by Louis B. Samms, foreman, Kurt E. Haignis, camp engineer, Henry L. Schultheis, and Wilbert Lightle, CCC camp SCS-21, Frankton, H. C. List, superintendent.

Water level, in feet below measuring point, 1939

Date	Madison 3	Madison 4	Date	Madison 3	Madison 4
Jan. 3	25.24	9.17	June 16	18.89	6.25
16	24.42	5.42	30	22.12	5.52
Feb. 2	23.88	2.25	July 18	.....	7.25
16	23.46	4.61	31	22.27	7.75
Mar. 2	22.65	2.96	Aug. 31	23.00	8.30
16	21.64	3.86	Sept. 30	.....	9.76
Apr. 3	21.88	5.56	Oct. 14	.....	10.05
17	21.27	2.16	31	.....	10.28
May 1	20.94	5.13	Nov. 15	.....	10.56
16	21.31	6.48	30	.....	10.78
June 1	21.84	7.60	Dec. 12	.....	10.92

## Marion County

Marion 1. Indianapolis Water Co. "Motor well 15". At intersection of 18th and Harding Streets, in Riverside well field, Indianapolis. Water-level measurements made by Indianapolis Water Co., W. C. Mabee, chief engineer. Altitude of measuring point (zero of gauge), 683.00 feet above mean sea level.

Water level, in feet, with reference to measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	-2.36	-1.98	-.26	....	....	-.50	-1.06	....	....	....	....	-2.60
2	....	-2.36	-.48	....	+.62	....	-.76	....	....	-2.40	-2.38	....
3	....	....	-1.98	....	+.40	....	-.92	-1.22	-1.70	-2.37	....	....
4	....	-2.39	+.16	....	+.54	....	-.90	-1.20	....	-2.58	....	-2.35
5	....	-2.08	+.30	-.06	+.60	....	-.94	....	....	-4.42	....	-2.32
6	....	-1.90	-1.30	-.08	+.65	-.76	-1.46	....	....	....	-2.30	....
7	....	-2.74	-2.09	....	+.58	-5.89	-1.38	-1.30	....	....	-2.42	-2.54
8	....	-.92	....	....	+.80	-1.10	-1.36	-1.38	....	....	-2.58	....
9	....	-.70	-.50	+.02	+.50	-1.08	-1.12	-1.47	-2.10	....	....	....
10	-1.50	-.78	....	....	+.35	-.98	-1.28	-1.50	-2.04	-3.66	-2.54	....
11	-1.32	-2.08	....	-.16	+.20	-.68	-1.44	....	-2.07	-3.70	-3.96	-2.52
12	-1.26	-1.97	....	-.14	....	-1.00	-1.48	....	-2.21	-2.58	-3.91	-2.52
13	....	-1.97	....	-.14	....	-1.02	-1.54	....	....	....	....	-2.50
14	-1.34	-2.53	-5.54	-.16	....	-1.02	....	-1.48	....	....	....	-2.56
15	-1.08	....	-6.05	-.04	....	....	....	-1.20	....	-2.30	....	....
16	....	....	....	....	+.01	-1.84	....	-1.66	....	-2.47	-5.46	....
17	-1.54	....	....	+.13	+.10	-1.06	....	....	....	-3.80	....	....
18	-1.54	....	....	+.14	+.02	-.85	....	-1.68	....	-2.54	....	....
19	-1.62	....	-.58	....	....	-1.00	-1.24	-1.78	-2.30	-2.60	....	....
20	-1.50	....	....	+.08	....	-1.18	....	-.96	-2.36	-2.54	....	-2.84
21	-1.32	....	+.30	+.30	....	-1.02	-1.20	-.90	....	-2.42	-2.64	-2.66
22	-1.30	-2.28	+.35	....	....	-.86	-1.22	-.85	....	....	-2.64	....
23	-1.33	....	+.30	....	-.18	-1.02	-1.10	....	-2.10	-2.30	....	-2.50
24	-1.29	....	+.25	....	....	-.74	-1.44	-1.62	....	-2.58	....	-2.46
25	....	....	+.32	....	-.32	-.84	-1.60	....	-2.18	....	....	-2.40
26	....	....	+.62	+.00	-.36	-1.02	-1.58	....	-2.76	-2.58	....	-2.36
27	....	-.42	+.40	+.00	+.32	....	....	....	-2.48	....	-2.50	-2.69
28	....	-.56	+.21	....	+.14	-1.12	-1.54	-2.08	-3.79	....	-2.62	....
29	....	....	....	+.00	+.38	-1.10	-1.10	-2.68	-4.02	....	....	....
30	....	....	....	+.20	....	-1.08	-.68	-3.44	....	....	-2.69	....
31	....	....	....	....	-.30	....	-.86	-2.10	....	....	....	....

Marion 2. Security Trust Bank Building, 130 East Washington Street, Indianapolis. Continuous water-stage recorder installed Dec. 20, 1939. Measuring point 688.27 feet above mean sea level. Measurements given in Water-Supply Paper 845 for Nov. 25 and 30, and Dec. 7, 14, 22, and 28, 1938, should be corrected by subtracting 0.49 foot.

Marion 3. Manual Training High School. In north room of school building, South Meridian and Henry Streets, Indianapolis. Measuring point 704.93 feet above mean sea level.



## Marion County--Continued

Marion 4. Layne-Northern Co., Inc. In valley of Lick Creek, about 100 feet north of creek, about 700 feet west of South Meridian Street (4200 block), and about 350 feet south of Edwards Avenue, Indianapolis. Equipped with automatic water-stage recorder from Dec. 11, 1937, to Dec. 20, 1939. Artesian well, diameter 8 inches, depth 304 feet. Penetrates limestone. Measuring point, top of the casing, about 5 feet above land surface and 698.2 feet above mean sea level. Water is under sufficient head to flow at the surface during periods of high water level. Water level greatly affected by pumping from a well 1,000 feet north, at the greenhouse of Fred Magendanz. The Magendanz well is 4 inches in diameter and 368 feet deep and penetrates limestone; is equipped with an engine-driven lift pump with a capacity of about 30 gallons a minute; is used for sprinkling both indoors and outdoors, and for washing vegetables; and is pumped when required for sprinkling from an hour or two to as much as 18 hours a day. A record of the times at which the pump on the Magendanz well was started and stopped was kept for a period of about seven weeks during July and August 1939, and for every pumping period the water level in well 4 showed a marked and continuous decline until the pumping stopped, when the water level almost immediately stopped declining and began to rise. This indicates that at least the major fluctuations in water level in well 4, observed during the summers of 1938 and 1939, were probably caused by the pumping of the Magendanz well.

The fluctuations of water level in well 4 caused by pumping from the Magendanz well ranged from a few tenths of a foot to more than 5 feet, depending largely upon the length of the pumping period and the position of the water level before pumping started. The largest daily fluctuation in 1938 was 6.24 feet on Aug. 30, and in 1939 was 5.98 feet on May 24. The total annual range of fluctuation was 10.32 feet in 1938, from 1.25 to 11.57 feet below measuring point, and 11.11 feet in 1939, from 3.18 to 14.29 feet below measuring point. According to the recorder charts, the Magendanz well was pumped about 150 times during the period Apr. 19-Nov. 1, 1938, for a total of about 600 hours; during the period May 4-Oct. 17, 1939, the well was pumped only about 130 times, but for a total of about 700 hours. Before and after the limiting dates during both years the pump was seldom operated more than about an hour.

The water level in well 4 appears to be affected also by pumping from one or more unidentified wells, probably wells penetrating limestone at distances greater than 1,000 feet, but the fluctuations produced by such pumping are relatively small in comparison to the fluctuations caused by pumping from the Magendanz well. The water level in well 4 is also apparently affected by changes in barometric pressure, but these fluctuations are generally apparent only during the winter months when the Magendanz well is seldom pumped. The water level is not affected greatly, if at all, by pumping from nearby wells penetrating sand and gravel overlying the limestone. Water levels in well 4 were consistently lower in 1939 than in 1938, but that this was not caused entirely by the longer total period of pumping from the Magendanz well during the summer of 1939 is shown by the fact that water levels in several other rock wells in Indianapolis were somewhat lower in 1939 than in 1938.

Marion 5. No measurements made in 1939.

Marion 6. Polar Ice and Fuel Co. At Artificial Plant, west of building near railroad track, 317 West Ohio Street, Indianapolis. Measuring point 707.79 feet above mean sea level.

Marion 7. Pennsylvania Railroad. In old railroad yards (Beville Street) east of Willard Park, 275 feet south of East Washington Street and just east of Willard Park fence. Measuring point 755.88 feet above mean sea level.

Marion 8. Pennsylvania Railroad. In old railroad yards (Beville Street) east of Willard Park, 500 feet south of East Washington Street and just east of Willard Park fence, Indianapolis. Measuring point 753.88 feet above mean sea level.

Marion 9. At former American Brewery, West Ohio Street at Indianapolis Water Co. canal, Indianapolis. About 250 feet south of well 6. Abandoned drilled well, diameter 8 inches, depth 225± feet. Measuring point, top of cap on casing, 0.5 foot above land surface and 708.45 feet above mean sea level.

## Marion County--Continued

Marion 10. U. S. Federal Building. In basement of building, Indianapolis. Abandoned drilled well, diameter 8 inches, depth 304 or 314 feet. Measuring point, top of coupling on 4-inch discharge pipe, 0.7 foot above floor, about 10 feet below land surface and 707.51 feet above mean sea level.

Measurements in wells 2, 3, 4, 6, 7, 8, 9 and 10 made by J. R. Harris and G. F. Fix, Division of Geology, State Department of Conservation.

Water levels in wells 2, 3, 6, 7, 8, 9, and 10, in feet below measuring points, 1939

Date	Marion 2	Marion 3	Marion 6	Marion 7	Marion 8	Marion 9	Marion 10
Jan. 4	24.33	53.78	41.45	51.35	49.40		
10	24.40	53.55	41.60	51.63	49.67	.....	.....
17	23.29	51.84	41.41	51.62	49.66	.....	.....
25	23.91	52.05	41.34	51.50	49.59	.....	.....
Feb. 2	23.96	52.01	41.15	51.65	50.20	.....	.....
8	23.78	49.86	43.16	51.96	50.00	.....	.....
15	23.61	49.42	43.35	51.33	49.36	.....	.....
23	23.56	49.95	43.43	51.62	49.66	.....	.....
Mar. 3	23.46	51.48	43.18	52.11	50.17	.....	.....
8	23.53	48.95	43.38	51.75	49.75	.....	.....
16	23.30	51.70	43.30	51.02	49.04	.....	.....
22	23.23	52.04	43.15	54.59	52.64	.....	.....
28	23.81	51.44	43.20	55.15	53.16	.....	.....
Apr. 4	23.52	51.86	43.16	55.33	53.35	.....	.....
12	23.46	51.89	43.12	54.89	52.94	.....	.....
19	23.41	49.78	43.04	54.85	52.87	.....	.....
26	24.33	51.35	43.12	54.70	52.72	.....	.....
May 17	23.74	52.45	43.30	54.67	52.75	.....	.....
23	25.90	51.70	43.48	54.40	52.30	.....	.....
31	28.44	50.85	43.91	54.71	52.77	.....	.....
June 7	29.14	53.29	44.50	55.24	53.30	.....	.....
15	29.26	.....	44.67	55.00	53.05	.....	.....
23	30.06	54.17	45.02	59.18	57.22	.....	.....
26	30.99	55.50	45.60	55.59	54.56	.....	.....
July 3	31.97	53.98	46.07	55.56	53.59	.....	.....
9	.....	.....	46.22	55.56	53.59	.....	.....
10	.....	52.33	.....	.....	.....	.....	.....
11	32.19	53.27	46.49	55.79	53.84	.....	.....
19	32.28	54.54	46.43	56.46	54.48	.....	.....
25	32.48	53.69	46.88	56.29	54.34	.....	.....
26	.....	.....	.....	.....	.....	.....	.....
Aug. 2	.....	.....	.....	.....	.....	47.72	.....
3	32.51	54.12	47.10	56.45	54.51	.....	50.73
10	32.09	57.175	47.26	56.855	54.88	47.79	.....
16	32.96	57.58	47.49	56.325	54.35	47.95	50.40
29	32.51	56.24	47.42	55.65	54.83	48.05	48.63
Sept. 2	33.15	54.48	47.59	57.01	55.05	48.16	49.60
19	33.39	57.28	47.35	57.45	55.475	48.255	51.16
26	33.21	55.24	48.47	55.40	53.45	49.05	51.60
Oct. 2	32.24	.....	48.54	.....	.....	49.15	48.125
10	34.04	57.92	47.22	57.64	55.42	49.195	47.44
24	33.03	57.61	46.48	54.12	52.62	49.20	51.80
Nov. 8	28.94	57.67	48.20	54.43	52.45	49.10	44.80
15	28.31	57.50	47.90	54.33	52.37	48.85	45.03
29	27.25	54.88	47.44	54.49	52.49	48.56	44.27
Dec. 12	26.89	55.70	47.10	55.14	52.49	48.08	43.46
20	26.81	54.10	47.10	55.78	53.17	47.43	43.28
					53.825	47.715	43.215

Lowest level in well 4 each day of record, in feet below measuring point, 1939  
(From recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	6.47	5.96	4.88	4.13	3.82	8.93	12.00	5.28	.....	8.58	.....	7.63
2	6.45	5.90	5.01	4.16	3.51	7.93	9.55	5.77	.....	9.34	.....	7.19
3	6.38	5.84	5.32	4.21	3.73	6.33	12.55	5.28	.....	8.05	.....	7.25
4	6.38	5.89	4.95	.....	.....	5.12	.....	5.59	.....	9.65	.....	7.67
5	6.33	6.13	4.89	.....	8.58	5.00	.....	5.27	.....	8.17	.....	7.35
6	6.80	5.88	4.87	.....	7.65	4.65	12.21	5.22	.....	11.15	.....	7.28
7	6.43	5.72	4.80	.....	5.03	8.85	13.23	5.18	13.64	8.96	.....	7.29

## Marion County--Continued

Lowest level in well 4 each day of record, in feet below  
measuring point, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
8	6.42	5.58	4.88	....	4.13	9.09	11.40	5.14	14.16	9.37	....	7.78
9	6.66	5.56	4.75	....	3.62	10.88	8.14	5.35	13.97	9.44	7.06	7.47
10	6.27	5.50	5.12	....	7.65	8.47	9.17	5.22	12.81	8.05	7.24	7.37
11	6.27	6.66	4.82	....	9.72	6.30	9.80	8.73	14.20	....	6.99	7.40
12	6.26	5.78	4.42	4.21	....	5.64	12.14	(a)	13.97	7.65	7.00	7.38
13	6.17	5.64	4.36	4.44	....	5.01	13.03	....	13.75	8.07	7.05	7.52
14	6.20	5.45	4.37	4.52	....	4.97	13.50	....	14.06	7.30	7.22	7.41
15	6.20	5.78	4.29	4.27	....	4.64	13.97	....	12.36	7.07	7.30	7.94
16	6.25	5.48	4.26	4.11	....	....	12.69	7.55	10.50	7.41	7.11	7.52
17	6.20	6.13	4.64	4.14	9.10	6.94	13.39	9.49	8.78	7.56	7.45	7.60
18	6.17	5.49	4.34	3.89	10.56	5.66	10.92	11.29	12.55	....	7.10	7.94
19	6.17	5.35	4.24	....	9.44	7.94	....	8.07	13.42	....	7.12	7.64
20	6.55	5.32	4.29	....	11.01	5.93	7.22	6.66	14.29	....	7.11	(c)
21	6.23	5.21	4.22	....	8.03	....	7.43	6.85	13.61	....	7.63	....
22	6.23	....	4.18	....	6.50	4.93	6.94	8.59	13.98	....	(b)	....
23	6.21	5.12	4.13	....	5.21	8.37	6.53	11.73	11.67	....	....	....
24	6.06	5.39	4.50	....	10.23	6.32	6.25	12.55	9.42	....	....	....
25	6.17	5.12	4.19	....	11.25	5.15	9.40	12.79	12.31	....	....	....
26	6.18	5.01	4.22	....	11.48	9.18	7.01	13.20	9.62	....	....	....
27	6.51	4.99	4.21	3.51	10.72	10.76	6.44	11.48	13.09	....	....	....
28	6.28	4.88	4.07	3.67	8.96	12.00	6.63	12.32	12.62	....	....	....
29	6.15	....	4.82	3.47	9.16	12.26	5.75	12.55	13.10	....	....	....
30	5.95	....	4.17	3.39	....	11.25	5.60	....	10.37	....	7.19	....
31	5.99	....	4.30	....	....	....	5.43	12.88	....	....	....	....

Marion 11. Indianapolis Sanitation Plant. Owner's well 3. In dehydration building, about 500 feet west of power house. Abandoned drilled well, diameter 12 inches, depth 315 feet. Taps water in limestone. Measuring point, top of iron bar welded to legs of iron recorder table, about 2 feet above floor and 685.11 feet above mean sea level. Equipped with automatic water-stage recorder.

Lowest level in well 11 each day of record, in feet below  
measuring point, 1939  
(from recorder charts)

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	25.20	25.96	25.82	25.95
2	.....	24.13	.....	25.91	25.89	25.92
3	.....	24.21	.....	25.89	25.93	26.00
4	.....	24.29	.....	25.88	.....	25.97
5	.....	24.34	.....	25.87	.....	25.93
6	.....	24.38	.....	25.92	.....	26.03
7	.....	24.43	.....	25.95	.....	26.12
8	.....	24.47	.....	26.00	.....	26.12
9	.....	24.58	.....	26.04	.....	26.03
10	.....	24.67	25.59	26.10	.....	26.07
11	.....	24.69	25.65	26.09	.....	26.12
12	.....	24.73	25.66	26.11	26.00	26.12
13	.....	24.75	25.71	26.16	26.00	26.22
14	.....	24.76	25.72	26.16	25.97	.....
15	.....	24.78	25.76	26.16	25.99	.....
16	.....	24.82	25.76	26.07	25.99	26.11
17	.....	24.83	25.78	26.09	25.94	26.17
18	.....	24.82	25.81	26.10	25.92	26.17
19	.....	24.79	25.79	26.04	25.92	26.18
20	.....	24.70	25.79	26.06	.....	26.22
21	.....	24.57	25.80	26.02	.....	26.40
22	.....	24.59	25.83	26.08	.....	26.39
23	.....	24.62	25.81	26.10	.....	26.38
24	.....	24.71	25.82	26.09	.....	26.33
25	.....	24.80	25.83	26.09	26.22	26.33
26	.....	24.88	25.87	26.06	26.22	26.22
27	.....	24.88	25.89	26.00	26.15	26.24
28	.....	24.92	25.89	26.01	26.08	26.29
29	.....	24.99	.....	25.97	26.02	26.31
30	24.17	25.07	.....	25.78	25.98	26.20
31	24.10	25.13	.....	25.78	.....	26.19

a Aug. 12-15, highest water level 5.12 feet; lowest water level 8.73 feet.

b Nov. 22-29, highest water level 6.93 feet; lowest water level 7.63 feet.

## Marion County--Continued

Marion 12. Indianapolis Sanitation Plant. Owner's well 11 (?). About 300 feet southeast of power plant and about 50 feet north of re-settler tank. Abandoned drilled well, diameter 12 inches, depth 107 feet. Probably taps water in unconsolidated deposits. Measuring point, top of casing, 1.3 feet above land surface and 684.68 feet above mean sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Aug. 5	23.76	Sept. 16	25.09	Oct. 28	25.21	Dec. 1	25.36
12	24.20	23	25.20	Nov. 4	25.11	8	25.30
19	24.34	Oct. 4	25.22	13	25.18	15	25.40
26	24.22	9	25.19	17	25.27	22	25.53
Sept. 2	24.68	14	25.30	24	25.35	29	25.58
9	24.91	21	25.40				

Marion 13. Indianapolis Sanitation Plant. "East" observation well, about 500 feet east of power plant. Driven test well, diameter 8 inches, depth about 11 feet. Taps water in unconsolidated deposits. Measuring point, top of casing, about 5 feet above land surface and 673.40 feet above mean sea level.

Marion 14. Indianapolis Sanitation Plant. "Resettler" observation well, about 400 feet southeast of power plant, at southeast edge of re-settler tank. Driven test well, diameter 2 inches, depth 23 feet. Taps water in unconsolidated deposits. Measuring point, top of casing, level with land surface and 685.68 feet above mean sea level.

Marion 15. Indianapolis Sanitation Plant. "No. 2 driven well", about 550 feet north of power plant and 64 feet northeast of supply well 6. Driven test well, diameter 2 inches, depth 28 feet. Taps water in unconsolidated deposits. Measuring point, top of casing, about 2 feet above land surface and 689.22 feet above mean sea level.

Water levels in wells 13-15 are affected by pumping from six supply wells and a gravel pit that tap water in unconsolidated deposits. Five of the supply wells are in a group that extends from 300 to 700 feet north of the power plant and the other well is about 600 feet northeast of the power plant. The gravel pit is about 1,500 feet northwest of the power plant. The water level in well 11, which penetrates bedrock, is presumably not greatly affected by pumping from the unconsolidated deposits; the nearest known pumping rock wells are more than a mile distant. Well 12 presumably taps water in unconsolidated deposits, but the major water level fluctuations in it are apparently more similar to those in well 11 than to those in wells 13-15.

Measurements in wells 11-15 were made by P. W. Richards, George Ferguson, and D. O. Bender, Indianapolis Sanitation Plant.

Water levels in wells 13, 14, and 15, in feet below measuring point, 1928-39

Date	Marion 13	Marion 14	Marion 15	Date	Marion 13	Marion 14	Marion 15
Jan. 12, 1928	11.12	.....	.....	Nov. 7, 1929	9.57	21.76	25.68
Feb. 1	9.21	.....	.....	Dec. 3	8.72	20.97	24.82
23	7.18	.....	.....	Jan. 8, 1930	6.40	15.96	20.70
Mar. 1	7.53	.....	.....	Feb. 16	7.64	.....	23.66
28	8.67	.....	.....	Mar. 19	7.42	.....	23.47
Apr. 9	8.06	.....	.....	Apr. 10	8.02	20.20	23.60
May 5	8.42	.....	.....	May 14	8.42	21.00	24.44
June 2	9.49	.....	.....	June 16	9.37	21.55	25.24
July 12	7.28	.....	.....	July 28	9.75	22.37	27.14
Aug. 27	9.22	.....	.....	Aug. 3	Dry	22.89	(c)
Sept. 11	9.76	.....	.....	Sept. 22	(a)	(b)	(c)
Oct. 5	10.30	.....	.....	Nov. 1	10.87	(b)	(c)
24	10.49	.....	.....	Dec. 9	10.76	21.61	26.85
Nov. 7	10.37	.....	.....	Jan. 7, 1931	10.77	20.48	26.80
Dec. 9	10.35	.....	.....	Feb. 12	10.12	21.42	25.86
June 3 1929	6.38	19.15	25.29	Apr. 3	10.41	21.56	25.84
July 3	7.07	16.81	24.67	June 9	10.83	21.94	25.87
Aug. 1	7.30	21.36	25.44	Aug. 24	10.72	21.88	25.88
Sept. 6	9.12	22.15	27.71	Oct. 20	10.02	21.59	24.65
Oct. 8	9.97	22.69	28.03	Dec. 30	8.03	19.13	24.67

## Marion County--Continued

Water levels in wells 13, 14, and 15, in feet below  
measuring point, 1928-39

Date	Marion 13	Marion 14	Marion 15	Date	Marion 13	Marion 14	Marion 15
Jan. 20, 1932	2.81	14.68	20.00	Nov. 2, 1936	8.95	20.74	24.83
Mar. 8	6.94	18.40	22.13	Dec. 4	8.00	20.21	24.00
Apr. 26	8.33	21.02	24.93	Jan. 5, 1937	5.94	18.50	21.17
May 20	9.09	20.94	25.75	18	....	11.75	15.68
June 30	8.02	20.40	25.70	Feb. 5	4.20	16.00	19.96
Aug. 18	8.50	20.91	25.41	Mar. 5	6.32	17.63	21.60
Oct. 20	8.24	20.05	25.74	Apr. 8	2.91	15.12	20.33
Nov. 28	5.45	18.93	23.08	May 10	6.33	18.00	22.25
Feb. 24, 1933	7.71	19.82	23.71	June 7	7.54	19.52	24.12
Apr. 28	6.44	17.82	21.54	July 12	7.46	19.83	24.00
May 27	4.69	15.13	18.93	Aug. 5	7.17	20.00	22.73
July 5	8.22	19.52	22.13	Sept. 6	8.83	20.08	25.50
Aug. 2	8.20	20.11	23.72	Oct. 5	8.83	20.50	25.75
12	8.80	20.28	23.59	Nov. 13	8.37	20.08	25.29
Nov. 2	8.85	20.01	24.91	Jan. 6, 1938	6.84	18.70	22.20
Jan. 5, 1934	8.50	20.83	26.25	Feb.	6.71	19.81	23.27
Feb. 28	7.14	19.00	24.09	Mar. 7	5.04	17.04	....
Mar. 6	8.02	.....	.....	May	7.29	18.87	23.16
Apr. 30,	9.14	18.50	22.75	June	6.46	17.00	23.23
May 31	8.40	20.07	24.09	July	6.75	17.66	22.25
Sept. 22	9.21	21.06	24.13	Aug. 23	7.95	19.37	24.04
Feb. 2, 1935	6.75	19.66	22.58	Sept. 5	8.41	20.60	24.78
Apr. 13	7.32	18.38	23.69	Oct. 11	8.28	20.52	25.39
June 5	6.17	18.42	22.50	Nov. 8	8.93	20.62	25.24
Aug. 5	7.43	19.00	.....	Dec. 19	6.85	20.08	25.54
Sept. 17	8.90	19.70	23.70	Feb. 1, 1939	5.62	17.58	23.50
Oct. 14	8.45	20.67	24.60	Mar. 15	....	15.33	21.46
Dec. 9	7.38	19.75	22.50	May 3	6.94	17.20	21.38
Jan. 20, 1936	7.45	19.67	23.88	June 7	....	19.70	24.25
Mar. 1	3.80	15.20	20.40	July 7	....	20.00	24.60
Apr. 8	7.02	19.00	23.60	17	....	20.40	25.06
May 4	5.56	18.17	22.02	29	....	19.85	24.45
June 2	7.79	19.75	23.68	Aug. 3	....	19.60	24.25
July 1	8.75	20.50	24.40	Sept. 8	....	20.93	25.49
14	8.79	20.65	24.58	Oct. 2	9.25	21.35	25.90
Aug. 1	9.00	20.94	24.90	Nov. 7	9.20	21.24	26.05
Sept. 7	8.96	20.90	25.17	Dec. 6	9.30	21.42	26.25
Oct. 1	9.48	21.50	25.42				

## Martin County

Martin 2. U. S. Department of Agriculture, Farm Security Administration. On north side of road, about 0.8 mile east of headquarters building of Farm Security Administration, near Burns City, SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 13, T. 5 N., R. 4 W. Well destroyed after Mar. 15.

Measurements made by L. C. Pickett, project engineer, U. S. Department of Agriculture, Farm Security Administration.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 15	4.9	Feb. 15	4.2	Mar. 15	4.6
31	4.6	Mar. 1	4.6		

## Monroe County

Monroe 1. Morgan-Monroe State Forest. At old camp site, north of Bean Blossom Road, near head of shallow draw, Morgan-Monroe State Forest. Northwesternmost of three dug wells. Water level, in feet below measuring point, 1939: Aug. 23, 0.77.

- a Dry 11.00 feet below measuring point.
- b Dry 22.96 feet below measuring point.
- c Dry 28.03 feet below measuring point.

## Porter County

Porter 1. Valparaiso Water Department. Test well at well 1 pump house at Flint Lake, about 3 miles north of Valparaiso along State highway 49. Water-level measurements made by J. F. Bradley, engineer, Valparaiso Water Department.

Porter 2. Indiana Dunes State Park. At Waverly Beach.

Porter 3. Indiana Dunes State Park. Near grocery store on picnic ground.

Porter 4. Farmers State Bank. In southern part of Valparaiso near city limits, near intersection of old road and creek. Well covered after July 15 due to construction work on U. S. Highway 30.

Porter 5. A. A. Hanrahan. At residence of A. A. Hanrahan, north of Valparaiso, NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 36, T. 36 N., R. 6 W.

Measurements in wells 2 and 3 made by Ben Wiseman, Indiana Dunes State Park. Water-level measurements in wells 4 and 5 made by Guy Tindle, CCC camp SCS-20, Valparaiso, Sam Wearley, superintendent.

Water level in well 1, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 1	52.00	Apr. 2	52.17	July 15	51.46	Oct. 16	52.41
16	51.83	15	51.96	Aug. 1	51.42	Nov. 2	51.18
Feb. 1	51.91	May 15	51.68	15	57.32	16	51.30
15	51.74	June 1	51.66	27	51.40	Dec. 2	51.57
Mar. 2	51.62	16	51.20	Sept. 1	51.34	15	51.32
16	52.08	July 1	51.55	Oct. 2	51.54		

Water levels in wells 2 and 3, in feet below measuring point, 1939

Date	Porter 2	Porter 3	Date	Porter 2	Porter 3	Date	Porter 2	Porter 3
Feb. 1	13.9	17.7	July 1	14.0	17.1	Sept. 15	13.2	16.9
Apr. 1	14.3	16.9	Aug. 1	13.8	17.3	Nov. 15	13.0	17.0
May 1	14.2	16.8	27	13.70	17.84	Dec. 2	13.2	17.3
June 1	14.2	16.7	Sept. 1	13.65	17.9			

Water levels in wells 4 and 5, in feet below measuring point, 1939

Date	Porter 4	Porter 5	Date	Porter 4	Porter 5	Date	Porter 4	Porter 5
Jan. 1	4.21	43.70	May 5	3.91	43.15	Aug. 27	.....	43.42
14	3.99	43.60	15	4.00	43.30	Sept. 15	.....	43.53
Feb. 1	4.16	43.60	31	4.07	48.50	Oct. 4	.....	43.53
15	3.80	43.65	June 15	3.85	43.35	16	.....	43.62
Mar. 1	3.60	43.70	July 3	3.73	43.60	Nov. 7	.....	43.65
15	3.49	43.35	15	3.95	43.25	15	.....	43.95
Apr. 1	3.84	43.25	Aug. 1	....	43.25	Dec. 1	.....	43.85
15	3.40	43.28	15	....	43.30	15	.....	43.92

## Pulaski County

Pulaski 1. Jasper-Pulaski State Game Preserve. In basement of custodian's residence.

Pulaski 3. Jasper-Pulaski State Game Preserve. Near north boundary line of preserve, SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 6.

Pulaski 4. On Charles Alberding farm, about 50 feet south of road and Starke County line. Measurements in wells 1, 3, and 4 made by C. E. Paul, engineer, CCC camp S-56, Jasper-Pulaski State Game Preserve.

## Montgomery County

Montgomery 1. W. H. Moore. At site of burned house, NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 36, T. 17 N., R. 6 W., Waveland.

Montgomery 2. Vandalia Railroad. In old railroad stock pen, north side of railroad track, Waveland.

Montgomery 3. Charles Lamson. At residence, about 0.4 mile north of Waveland.

Montgomery 4. Mrs. W. L. Glenn. At residence, about 2 miles north of Waveland.

Measurements made by Gabor Koncz, Jr., assistant technician, CCC camp SCS-3, near Waveland.

Water levels in wells 1, 2, 3, and 4, in feet  
below measuring point, 1939

Date	Well 1	Well 2	Well 3	Well 4	Date	Well 1	Well 2	Well 3	Well 4
Jan. 3	13.21	3.74	10.90	10.56	July 5	11.64	3.95	9.23	9.03
16	11.03	3.09	8.60	9.89	18	12.60	3.17	9.69	9.60
31	8.66	.46	.90	9.76	31	12.28	3.85	9.36	9.76
Feb. 16	8.74	2.67	3.43	9.48	Aug. 17	12.35	3.94	10.71	10.33
Mar. 2	7.62	1.89	1.25	8.16	Sept. 2	13.55	4.34	12.30	11.25
15	6.91	2.04	1.26	2.76	22	14.71	4.77	13.30	13.09
Apr. 1	9.75	3.36	6.34	5.22	30	15.06	4.86	13.49	13.70
15	9.62	.63	7.54	6.10	Oct. 16	15.73	4.96	14.08	14.50
May 2	8.93	3.18	5.35	3.50	Nov. 2	16.12	4.60	14.06	14.81
18	10.84	3.72	8.60	5.15	19	16.25	4.49	14.19	14.78
31	11.88	3.90	10.00	6.60	Dec. 2	16.15	4.41	14.13	14.76
June 15	11.78	3.76	10.08	7.77	21	16.40	4.26	14.20	14.57

## Morgan County

Morgan 1. Morgan-Monroe State Forest. South of trail 3, in front of Shady Rest cabin, SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 27, T. 11 N., R. 1 E. Water level, in feet below measuring point, 1939: Aug. 23, 7.53.

## Noble County

Noble 1. No measurements made in 1939.

Noble 2. Lawrence Ott. About 0.8 mile east of State highway 9 and about 0.2 mile west of State highway 102, about 300 feet north of county-line road, SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 35, T. 33 N., R. 9 E.

Noble 3. Della May Kitt. Across road from residence, about 1.1 miles southwest of Merriam. Measurements in wells 2 and 3 made by personnel of the Tri-Lakes Fish Hatchery, Columbia City, James Bodley, superintendent.

Water levels in wells 2 and 3, in feet  
below measuring point, 1939

Date	Noble 2	Noble 3	Date	Noble 2	Noble 3	Date	Noble 2	Noble 3
Jan. 15	25.0	24.4	May 31	11.1	21.0	Sept. 17	19.8	22.6
Feb. 2	22.0	23.3	June 16	14.6	21.6	Oct. 16	21.5	23.1
Mar. 1	22.2	23.9	July 1	14.9	21.2	Nov. 3	22.8	22.8
18	12.7	14.6	15	15.6	21.3	16	22.8	22.8
Apr. 2	11.3	22.10	Aug. 1	16.8	21.6	30	23.8	23.9
16	5.9	21.7	15	17.4	21.8	Dec. 16	24.3	24.1
May 15	11.1	21.0	Sept. 1	18.7	22.4			

## Pike County

Pike 1. A. J. Heuring. In front of residence, Lafayette and Main Streets, Winslow. Water level, in feet below measuring point, 1939: Aug. 24, 9.50.

## Pulaski County--Continued

Water levels in wells 1, 3, and 4, in feet below measuring point, 1939

Date	Pulaski 1	Pulaski 3	Pulaski 4	Date	Pulaski 1	Pulaski 3	Pulaski 4
Jan. 14	4.36	8.40	5.38	July 14	3.86	8.60	6.00
30	3.96	8.68	5.66	30	4.18	8.80	6.40
Feb. 15	3.13	8.16	5.04	Aug. 14	4.51	8.37	6.70
Mar. 1	3.18	8.13	4.99	25	4.89	9.26	7.05
14	2.90	7.60	4.54	26	4.90	9.30	7.05
31	2.66	7.70	4.55	Sept. 15	5.16	9.30	7.38
Apr. 14	2.76	7.90	4.85	30	5.19	9.10	7.34
29	2.56	7.70	4.55	Oct. 16	5.51	9.44	7.34
May 14	3.02	8.36	5.30	Nov. 2	4.44	9.74	7.19
30	3.26	8.40	5.26	16	5.39	9.55	7.54
June 10	3.52	8.46	5.62	30	5.66	9.28	7.32
29	3.34	8.48	5.58	Dec. 14	5.19	9.68	7.96

## St. Joseph County

St. Joseph 1. Mishawaka Water and Light Department. At pumping plant, Mishawaka. Measurements made by personnel of Mishawaka Water and Light Department, A. R. Klein, superintendent.

Water levels in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 2	10.00	Apr. 15	8.42	July 15	9.75	Oct. 2	10.35
16	11.16	May 2	8.33	Aug. 1	10.48	16	10.92
Feb. 1	10.04	15	9.18	16	9.35	Nov. 1	10.90
14	9.18	June 1	10.32	22	8.58	16	10.50
Mar. 1	8.75	16	10.45	Sept. 1	10.42	Dec. 1	10.74
16	7.34	July 1	8.84	16	11.68	16	9.92
Apr. 1	8.59						

St. Joseph 3. John Hensler farm, on Quinn road 13 miles south of South Bend, SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 33, T. 36 N., R. 3 E. Measurements made by Willard E. McCalment, CCC camp D-3, South Bend, Elmer G. Fuller, superintendent. Measurements discontinued after Aug. 21.

Water level, in feet below measuring point, 1939

Jan. 5	7.25	Feb. 18	6.88	Apr. 15	1.05	June 13	5.48
14	7.48	28	3.46	29	2.25	29	5.95
28	7.27	Mar. 13	1.05	May 13	3.42	July 14	6.57
Feb. 10	7.1	Apr. 1	2.16	June 1	4.78	Aug. 21	7.60

## Spencer County

Spencer 1. Nancy Hanks Lincoln Memorial Park. About 300 yards north-west of ranger's cabin and north of Buckhorn Lake.

Spencer 2. Nancy Hanks Lincoln Memorial Park. Just southwest of well 1.

Spencer 3. Nancy Hanks Lincoln Memorial Park. About 250 yards south-east of ranger's cabin.

Measurements in wells 1, 2, and 3 made by W. R. Ritchie, custodian, and J. R. Ritchie, Nancy Hanks Lincoln Memorial Park.

Water levels in wells 1, 2, and 3, in feet below measuring point, 1939

Date	Spencer 1	Spencer 2	Spencer 3	Date	Spencer 1	Spencer 2	Spencer 3
Jan. 3	2.1	1.9	2.1	Mar. 2	2.3	2.1	2.1
16	1.9	1.7	1.8	15	2.5	2.2	2.3
Feb. 1	1.9	2.2	2.1	31	1.9	1.8	1.6
13	1.6	1.8	2.0	Apr. 16	1.7	1.7	1.6



## Starke County

Starke 1. Joe Tomassi. At Bass Lake Fish Hatchery, about 200 feet north of custodian's house.

Starke 2. S. A. Craigmile. At mint still about 0.25 mile northeast of owner's residence, near junction of State roads 10 and 29. Six-inch well.

Starke 3. S. A. Craigmile. About 1 foot from well 2. Two-inch well.

Measurements in wells 1, 2, and 3 made by John M. Metz (deceased Mar. 28) and Richard Good, Bass Lake Fish Hatchery, P. J. Lavery, superintendent.

Water levels in wells 1, 2, and 3, in feet  
below measuring point, 1939

Date	Starke 1	Starke 2	Starke 3	Date	Starke 1	Starke 2	Starke 3
Jan. 17	13.35	3.61	5.39	Aug. 15	13.20	4.98	6.20
Feb. 3	13.12	3.39	5.12	21	13.38	5.08	6.87
Mar. 1	12.42	2.59	4.34	Sept. 18	14.29	5.69	7.47
May 9	12.10	3.50	3.50	Oct. 2	12.99	5.69	7.47
17	12.12	3.85	5.57	16	14.62	5.52	7.35
June 1	12.24	4.03	5.78	Nov. 29	14.70	5.08	6.85
July 12	12.50	4.25	6.00	Dec. 18	14.72	4.97	6.55
Aug. 2	12.89	7.59	6.89				

## Steuben County

Steuben 1. Pokagon State Park. Near custodian's house on south side of area formerly used for buffalo pen.

Steuben 2. Pokagon State Park. On north side of area formerly used for buffalo pen.

Measurements in wells 1 and 2 made by E. E. Phillips and H. H. Morgan, project superintendents, and R. J. Lang, CCC camp SP-7, Pokagon State Park.

Water levels in wells 1 and 2, in feet  
below measuring point, 1939

Date	Steuben 1	Steuben 2	Date	Steuben 1	Steuben 2	Date	Steuben 1	Steuben 2
Mar. 21	2.0	3.5	July 15	3.6	6.75	Oct. 16	5.50	8.65
31	1.65	3.25	31	4.05	6.05	30	5.4	8.7
Apr. 15	1.35	2.85	Aug. 15	4.35	7.6	Nov. 16	5.45	8.8
May 1	1.58	3.08	31	4.65	7.85	30	5.4	8.8
15	1.9	3.75	Sept. 15	5.35	8.35	Dec. 15	5.4	8.8
31	3.25	4.0	30	5.50	8.5	30	5.5	8.9

## Tippecanoe County

Tippecanoe 1. Tippecanoe Township School. In basement of school house at Battleground.

Tippecanoe 2. Ben Connelly. At residence, NE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 18, T. 24 N., R. 4 W. Measurements discontinued after May 2.

Tippecanoe 3. Lafayette Loan and Trust Co. At residence of Hershell Byers, NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 17, T. 24 N., R. 4 W. Measurements in wells 1, 2, and 3 made by J. W. Slater, superintendent, CCC camp SCS-2, Lafayette.

Water levels in wells 1, 2, and 3, in  
feet below measuring point, 1939

Date	Tippe- canoe 1	Tippe- canoe 2	Tippe- canoe 3	Date	Tippe- canoe 1	Tippe- canoe 2	Tippe- canoe 3
Jan. 3	34.30	27.70	10.82	July 1	33.05	.....	7.53
16	34.32	27.32	8.79	17	33.38	.....	8.14
31	33.47	27.17	6.49	31	33.22	.....	7.99
Feb. 17	.....	26.56	5.26	Aug. 16	33.46	.....	8.86
28	33.66	25.10	4.29	31	33.66	.....	9.54
Mar. 14	32.93	15.94	.99	Sept. 15	33.89	.....	10.33
31	32.89	23.36	5.74	30	33.92	.....	10.77
Apr. 15	33.06	16.02	.00	Oct. 16	34.20	.....	11.07
May 2	33.8	22.96	5.66	31	34.24	.....	12.72
15	32.31	.....	6.70	Nov. 15	34.36	.....	11.54
June 2	32.78	.....	7.43	30	34.51	.....	11.74
15	32.82	.....	5.96	Dec. 15	34.62	.....	11.98

## Wabash County

Wabash 1. Salamonie River State Forest. At Shipley house, CCC camp S-94, Salamonie River State Forest. New Measuring point, top of well pit, 4.00 feet above old measuring point. Measurements Dec. 20 and 30, 1938, were made from new measuring point; measurement Oct. 20, 1938, made from old measuring point.

Measurements made by H. A. Stahl and H. H. Oetting, CCC camp S-94, W. E. Hanson, superintendent.

Water level in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	33.20	(a) Mar. 14	31.10	Apr. 26	29.30	June 20	31.90
21	33.11	20	30.55	May 4	30.00	27	32.40
Feb. 7	32.90	26	30.80	12	30.30	July 6	31.60
14	32.35	Apr. 2	31.20	20	31.00	11	32.4
21	32.00	8	31.40	(a) 28	31.20	18	32.3
Mar. 1	31.60	14	31.30	June 6	31.50	25	32.6
8	31.10	20	31.10	13	32.20	Aug. 1	32.7

## Warrick County

Warrick 1. Sunlight Stripper Co. On east side of railroad track, about 0.7 mile north of Boonville along Folsomville road and about 0.1 mile east of road, north of Scales Lake State Forest. Water level, in feet below measuring point, 1939: Aug. 24, 21.43.

## Whitley County

Whitley 1. No measurements made in 1939.

a Dates approximate from Mar. 14 to May 28, inclusive.

# IOWA

## STATE-WIDE PROJECT

By T. W. Robinson

An agreement for a cooperative investigation of the ground-water resources of Iowa <sup>1/</sup> was entered into in 1938 by the Federal Geological Survey and the Iowa Geological Survey, and work was begun September 1, 1938. The investigation is conducted under the general supervision of O. E. Meinzer, geologist in charge, Division of Ground Water, of the Federal Survey, and A. C. Trowbridge, State Geologist and Director of the State Survey. The purpose of the investigation is to obtain data on past and present pumpage of water from underground sources and to correlate and interpret these data with reference to fluctuations of water level in wells and with the geologic source of water supplies. Geologic phases of the investigation are conducted chiefly by H. G. Hershey, of the State Survey; and hydraulic engineering phases, chiefly by the writer.

The water supplies of Iowa are obtained mostly from wells. Large quantities of water have been and are being pumped in many places, chiefly by municipalities but also by industrial concerns, from many water-bearing formations of different character and geologic age that occur in the State. It is planned to study each of the important water-bearing formations as a unit and to obtain, so far as possible, records of past water levels and estimates of past pumpage, and it is further planned to keep the records current. A substantial start has been made on this part of the project by securing the cooperation of water superintendents of municipalities in furnishing past records of pumpage, in keeping records of current pumpage, and in making measurements of water level in wells. As a result of earlier work of the Iowa Geological Survey on the geology of the State and the collection and interpretation of well logs and well cuttings, the formations from which municipal wells derive their water

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<sup>1/</sup> The results of a previous cooperative ground-water investigation between the Federal Geological Survey and the Iowa Geological Survey were published in 1912 as U. S. Geol. Survey Water-Supply Paper 293 and as Iowa Geological Survey Report XXI.

are known more or less definitely, but current geologic studies of recent ground-water developments are contributing further information in regard to the geologic sources of ground water.

Another phase of the cooperative investigation involves the periodic collection of water-level records in wells unaffected by heavy pumping-- both in shallow wells that penetrate alluvium or glacial drift and in deep wells that penetrate older formations. In addition to current water levels in these wells, records of past water levels are obtained wherever possible.

With the exception of a small area in the northeast corner of the State, known as the "driftless area," the older consolidated rocks of Iowa are covered by glacial drift, which generally contains deposits of sand or gravel that yield moderate supplies of water to wells. The consolidated rocks of Cambrian, Ordovician, Silurian, Devonian, Carboniferous, and Cretaceous Age likewise generally include one or more water-bearing beds. Most of the water in the consolidated rocks and much of the water in the drift is under artesian pressure, but usually the pressure is not sufficient to cause the wells to flow at the surface. Water is found also in the alluvium of the larger streams and in the flood plain of the Mississippi and Missouri Rivers.

By the end of 1939, about 160 individual measurements of water level had been made in 32 observation wells in connection with the cooperative investigation. This does not include many pressure-gage readings that were made on wells equipped with air lines and pressure gages. The length of the air line in such wells is usually unknown, and hence the pressure readings cannot be converted into depths to water level. The pressure readings are permanently recorded, however, so that they can be so converted when the length of the air line is ascertained. It is often difficult or impossible to obtain measurements of water-level in municipal wells unless they are equipped with an air line of known length and a pressure gage, either because of the construction of the wells or because they are sealed at the top to avoid contamination. Many drilled farm and industrial wells are difficult to measure because the casings are small or because the pump covers the top of the casing.

Water-level measurements are made once a month in all those wells for which local observers are available except the ones equipped with water-level recorders. For the three wells on which weekly automatic water-level recorders are in operation, measurements are made once a week. For the more remote wells, water levels are measured at irregular intervals.

During 1938 and 1939, six pumping tests were made to determine water-yielding capacities of wells and water-bearing formations; and in the summer of 1939 an investigation was begun to determine ground-water conditions in the Dakota sandstone of northwestern Iowa. The study of the Dakota sandstone includes the determination of the position, slope, and shape of the piezometric surface; the direction of movement of the water; and the probable areas of recharge and discharge. A paper by the writer entitled "Artesian water in the Dakota sandstone in northwestern Iowa" was presented at the meeting of the Society of Economic Geologists in Minneapolis, Minn., on December 28, 1939.

During the winter and spring of 1939, a study was made of the fluctuations of water-level, registered by an automatic water-stage recorder, in a well owned by the State University of Iowa at Iowa City. The fluctuations, which are approximately semidiurnal in period, were correlated with the transit of the moon and were concluded to be "earth-tides" produced by the attraction of the moon and sun.<sup>2/</sup>

According to records of the United States Weather Bureau, the precipitation in Iowa in 1939 was only about 80 percent of the average. The precipitation in September was only 0.82 inch, which was the least recorded for that month in 67 years of record and was 3.02 inches below normal. For the period from September to November the precipitation for the State was only 36 percent of normal. Water levels in shallow water-table wells in glacial drift, particularly those in the western part of the State where the fall drought was most severe, declined to low stages as a result of the subnormal precipitation. Water levels in the deep wells that tap water in the consolidated rocks were not, however, appreciably affected.

Records for the observation wells are listed alphabetically by county name on the following pages. All water levels are expressed in feet below the measuring points, except the water levels in well 76-6-10 N1, in Johnson County, which are expressed in feet above the measuring point.

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<sup>2/</sup> Robinson, T. W., Earth-tides shown by fluctuations of water levels in wells in New Mexico and Iowa: Am. Geophys. Union Trans., pt. 4, pp. 656-666, 1939.

## Benton County

85-10-16 M3. Owner's number 3. City of Vinton. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 16, T. 85 N., R. 10 W. Drilled well, diameter 12 inches, depth 1505 feet. Measuring point, top of pump base at hole, 1 foot above land surface. Equipped with 20 horse-power turbine pump. One of three wells used for city water supply. Taps water in St. Peter sandstone and Jordan sandstone. Water level in feet below measuring point, 1939: Aug. 23, 30.93.

## Carroll County

84-34-25 F1. Owner's test hole 1. City of Carroll. SE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 25, T. 85 N., R. 34 W. Unused drilled test well, diameter 8 inches, depth 120 feet. Measuring point, top of casing, 0.5 foot above land surface. Taps water in Dakota sandstone. Water level affected by pumping from nearby city wells. Water levels, in feet below measuring point, 1939: Sept. 22, 47.43; Oct. 19, 45.09; Nov. 4, 41.60.

## Cerro Gordo County

96-20-16 J1. Owner's number 11. City of Mason City. NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 16, T. 96 N., R. 20 W. Drilled well, diameter 20 inches, depth 1305 feet. Measuring point, top of pump base at hole. Equipped with 150 horse power turbine. One of a group of wells used for city supply. Taps water in Jordan sandstone. Water levels affected by pumping. Water levels, in feet below measuring point, 1939: Nov. 23, 210.19; Nov. 25, 209.9.

## Cherokee County

92-40-26 P1. Owner's number 2 South. City of Cherokee. SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 26, T. 92 N., R. 40 W. Drilled well, diameter 10 inches, depth 200.5 feet. Measuring point, land surface. Equipped with 15 horse power turbine. Used for city water supply. Taps water in Dakota sandstone. Water levels affected by pumping. Water-level measurements reported by J. A. Carey, water superintendent. Water levels, in feet below measuring point, 1912, 12; 1926, 13.7; Aug. 1936, 18; Spring 1938, 21; Dec. 1939, 16.83.

## Emmet County

100-32-11 R1. Okamanpedan State Park. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 11, T. 100 N., R. 32 W. Drilled well, depth 277 feet. Measuring point, top of casing 0.25 foot above concrete platform and land surface. Equipped with lift pump. Taps water in Dakota sandstone. Water level, in feet below measuring point, 1939: Nov. 10, 62.39.

99-34-14 B1. Owner's number 3. City of Estherville. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 14, T. 99 N., R. 34 W. Drilled well, diameter 20 inches, original depth 408, backfilled with gravel to 383. Measuring point, top of pump base at hole, 0.9 foot above concrete floor and land surface. Equipped with 100 horse power turbine. Taps water in Dakota sandstone. Used partly for city supply. Water level affected by pumping. Water level, in feet below measuring point, 1939: Nov. 10, 110.30.

## Hamilton County

86-25-5 E1. Owner's number 3. City of Stanhope. SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 5, T. 86 N., R. 25 W. Unused drilled well, diameter 10 inches, depth 601 feet. Measuring point, top of casing, 2.3 feet above land surface. Water levels, in feet below measuring point: Nov. 9, 1938, 110.22; Aug. 27, 1939, 109.03.

## Harrison County

81-42-31 D1. Mutual Benefit Life Insurance Company. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 31, T. 81 N., R. 42 W. Used dug domestic and stock well, diameter 48 inches, depth 44.5 feet. Measuring point, top of brick well curb, 0.2 foot above land surface. Equipped with force pump operated by windmill. Water level, in feet below measuring point, 1939: Dec. 19, 38.84.

## Harrison County--Continued

80-41-20-N1. Mutual Benefit Life Insurance Company. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 20, T. 80 N., R. 41 W. Used bored domestic and stock well, diameter 18 inches, depth 91 feet. Measuring point, top of brick curb, 0.5 foot above land surface. Taps water in glacial drift. Equipped with force pump operated by windmill. Water level, in feet below measuring point, 1939: Dec. 19, 68.76.

79-41-34 N1. Mutual Benefit Life Insurance Company. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 34, T. 79 N., R. 41 W. Used dug domestic and stock and bored well, diameter 36 inches, depth 75 feet. Measuring point, top of plank platform at land surface. Taps water in glacial drift. Equipped with lift pump. Water level, in feet below measuring point, 1939: Dec. 18, 53.05.

78-42-12 Q1. Mutual Benefit Life Insurance Company. SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 12, T. 78 N., R. 42 W. Used bored domestic and stock well, diameter 18 inches, depth 29 feet. Measuring point, top of well curb, about at land surface. Taps water in glacial drift. Water level, in feet below measuring point, 1939: Dec. 18, 25.95.

78-42-11 A1. Mutual Benefit Life Insurance Company. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 11, T. 78 N., R. 42 W. Used bored domestic and stock well, diameter 12 inches, depth 44.5 feet. Measuring point, top of brick curb of pump pit. Taps water in glacial drift. Water level, in feet below measuring point, 1939: Dec. 18, 40.12.

## Ida County

89-40-35 D1. Owner's number 3. City of Holstein. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 35, T. 89 N., R. 40 W. Drilled well, diameter 16 inches, depth 644.5 feet. Measuring point, top of pump base at hole, 1 foot above concrete floor and land surface. Equipped with 30 horse power turbine. Taps water in Dakota sandstone. Used for city water supply. Water level, in feet below measuring point, 1939: Nov. 2, 321.95.

87-39-12 L1. Keith Laundry and Cleaning Company. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 12, T. 87 N., R. 39 W. Drilled industrial well, diameter 8 inches, depth 219 feet. Measuring point, top inside lip of manhole cover directly above well, at land surface. Taps water in Dakota sandstone. Water level, in feet below measuring point, 1939: Sept. 21, 80.30.

## Johnson County

80-5-9 K1. Mrs. Evelyn Snyder. NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 9, T. 80 N., R. 5 W. Unused dug domestic well, diameter 18 inches, depth 11 feet. Measuring point to October 5, 1939, top of casing, 0.3 foot above land surface. Measuring point since October 5, 1939, top of instrument platform, 0.07 foot above top of casing. Water level recorder maintained on well since October 5, 1939.

Water level, in feet below measuring point, 1939

Date	Hour	Water level	Date	Hour	Water level
July 6	.....	5.48	Nov. 12	11:15 a.m.	6.51
Sept. 6	.....	5.04	19	10:00 a.m.	6.37
Oct. 5	4:00 p.m.	6.38	26	10:00 a.m.	6.26
11	10:15 a.m.	6.51	Dec. 3	12:01 p.m.	6.31
15	11:45 a.m.	6.43	10	8:00 a.m.	6.25
22	12:30 p.m.	6.32	17	9:00 a.m.	6.21
29	1:00 p.m.	6.55	24	9:15 a.m.	6.15
Nov. 5	10:00 a.m.	6.36	31	2:00 p.m.	6.14

79-6-10 N1. Owner's number 5. State University of Iowa. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec 10, T. 79 N., R. 6 W. Unused drilled well, diameter 10 inches, depth 840 feet. Taps water in Galena limestone. Measuring point, top of second-story floor of State University heating plant, 8 feet above land surface and 662.25 feet above mean sea level. Water level affected by changes in atmospheric pressure and by earth-tides. Water level recorder maintained on well since Mar. 3, 1939.

## Johnson County--Continued

79-6-10 N1.

Water level, in feet above measuring point, 1939

Date	Hour	Water level	Date	Hour	Water level
Mar. 3	3:25 p.m.	3.89	July 24	12:01 p.m.	8.16
8	9:25 a.m.	4.23	31	9:15 a.m.	8.24
8	11:00 a.m.	4.16	Aug. 7	10:00 a.m.	8.50
9	8:30 a.m.	4.14	14	12:01 p.m.	8.40
11	11:20 a.m.	4.64	21	1:10 p.m.	8.52
13	10:35 a.m.	4.71	28	5:30 p.m.	8.56
20	9:10 a.m.	4.98	Sept. 4	10:30 a.m.	8.54
27	10:10 a.m.	5.56	7	4:30 p.m.	8.84
April 3	10:10 a.m.	5.48	11	5:15 p.m.	8.67
10	10:50 a.m.	6.06	18	10:35 a.m.	8.26
17	10:00 a.m.	6.71	25	10:00 a.m.	8.42
24	10:10 a.m.	6.70	Oct. 2	11:45 a.m.	8.46
May 1	10:00 a.m.	6.54	9	1:00 p.m.	8.82
8	10:00 a.m.	6.94	16	10:45 a.m.	8.54
15	1:10 p.m.	6.78	23	4:55 p.m.	8.92
17	4:50 p.m.	6.70	30	1:25 p.m.	8.80
22	8:00 a.m.	6.97	Nov. 6	2:30 p.m.	8.94
29	8:00 a.m.	6.86	13	3:05 p.m.	8.84
June 5	2:35 p.m.	7.54	20	1:10 p.m.	8.94
12	5:35 p.m.	7.79	27	1:05 p.m.	8.62
19	1:30 p.m.	8.00	Dec. 4	1:00 p.m.	9.34
26	11:50 a.m.	8.05	11	8:50 a.m.	9.19
July 3	12:01 p.m.	8.01	18	1:30 p.m.	9.58
10	8:55 a.m.	7.82	25	10:10 p.m.	9.07
17	11:35 a.m.	8.08			

## Keokuk County

76-10-25 D1. City of Keota. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 25, T. 76 N., R. 10 W. Drilled test well, diameter 8 inches, depth 138 feet. Measuring point, top of casing, 2.0 feet above land surface. Water level, in feet below measuring point, 1939: Feb. 22, 50.80.

## Lyon County

98-48-24 M1. A. C. Hanson. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 24, T. 98 N., R. 48 W. Used dug stock well, diameter 24 inches, depth 24.5 feet. Measuring point, top of concrete tile casing, 1.8 feet above land surface. Equipped with lift pump operated by electric motor. Water level, in feet below measuring point, 1939: Aug. 25, 21.38.

## Mahaska County

74-14-14 H1. City of Fremont. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 14, T. 74 N., R. 14 W. Drilled test well, diameter 6 inches, depth 140 feet. Measuring point, bottom of 6 by 6-inch timber at land surface. Water level, in feet below measuring point, 1938: Nov. 28, 14.6.

## Marion County

77-18-34 C1. Rich Launpebaugh. NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 34, T. 77 N., R. 18 W. Used drilled stock well, diameter 5 inches, depth 119 feet. Measuring point, top of casing, 0.4 foot above land surface. Taps water in Pella beds. Water level, in feet below measuring point, 1939: July 13, 102.43.

## Muscatine County

76-2-14 D1. Owner's test well 4. City of Muscatine. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 14, T. 76 N., R. 2 W. Drilled test well, diameter 2 inches, depth 40.5 feet. Measuring point, top of casing 1.9 feet above land surface. Water levels affected by pumping from city well field. Water levels, in feet below measuring point: Dec. 2, 1938, 12.13; Jan. 5, 1939, 14.07; Nov. 15, 1939, 13.68.



## Osceola County

99-41-18 C1. City of Sibley. NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 18, T. 99 N., R. 41 W., in concrete pit at north end of old pump house on golf course. Unused drilled well, diameter 8 inches, depth 118 feet. Measuring point, top of casing, 4.55 feet below concrete curb which is 0.6 foot above land surface. Taps water in glacial drift.

Water level, in feet below measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
Nov. 11, 1938	16.24	Oct. 12, 1939	16.10	Dec. 2, 1939	16.06
Aug. 25, 1939	15.98	Nov. 3	16.42		

## Plymouth County

91-48-19 M1. Joe Tracy. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 19, T. 91 N., R. 48 W. Unused drilled well, diameter 4 inches, depth 90 feet. Measuring point, top of concrete curb, 2.1 feet above land surface. Taps water in Dakota sandstone. Water level, in feet below measuring point, 1939: Nov. 7, 58.58.

## Sac County

89-38-26 A1. City of Schaller. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 26, T. 89 N., R. 38 W. Drilled test well, diameter 4 inches, depth 352 feet. Measuring point, top of casing 2.0 feet above land surface. Taps water in Dakota sandstone. Water level, in feet below measuring point, 1939: Dec. 20, 220.54.

86-36-3-H1. Blackhawk Lake Preserve. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 3, T. 86 N., R. 36 W. Drilled well, diameter 6 inches, depth 158.5 feet. Measuring point, top of casing, 1 foot above land surface. Taps water in Dakota sandstone. Water levels, in feet below measuring point, 1939: Oct. 19, 49.38, Nov. 2, 49.57.

## Sioux County

95-45-5 A1. City of Sioux Center. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 5, T. 95 N., R. 45 W. Unused drilled well, diameter 5 inches, depth 456 feet. Measuring point, top of casing, 3.75 feet below land surface. Taps water in Dakota sandstone. Water level, in feet below measuring point, 1939: Nov. 9, 263.80.

94-45-17 A1. City of Maurice. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 17, T. 94 N., R. 45 W. Drilled well, diameter 6 inches, depth 234 feet. Measuring point, center line of pressure gage, 1 foot above land surface. Equipped with 7 $\frac{1}{2}$  horse power turbine. Taps water in Dakota sandstone. Used for city water supply. Water level, in feet below measuring point, 1939: Nov. 9, 122.

## Story County

83-24-4 Q1. Iowa State College. SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 4, T. 83 N., R. 24 W. Unused drilled well, diameter 12 inches, depth 2,250 feet. Measuring point, top flange of old air-lift discharge pipe, 3.3 feet above land surface. Taps water in Jordan sandstone. Water levels affected by changes in atmospheric pressure. Water level recorder maintained on well since Sept. 28, 1939.

Water level, in feet below measuring point, 1939

Date	Hour	Water level	Date	Hour	Water level
July 14	11:30 a.m.	46.93	Nov. 1	9:10 a.m.	46.43
Aug. 17	3:35 p.m.	46.51	5	10:30 a.m.	46.50
Sept. 15	8:35 a.m.	46.95	12	1:20 p.m.	46.57
28	8:10 a.m.	46.22	18	10:10 a.m.	46.39
28	5:00 p.m.	46.20	25	6:30 p.m.	46.59
29	9:25 a.m.	46.41	Dec. 2	8:30 a.m.	46.20
Oct. 4	9:17 a.m.	46.34	9	10:30 a.m.	46.14
11	9:25 a.m.	46.52	16	11:30 a.m.	46.22
18	4:30 p.m.	46.25	22	5:00 p.m.	46.44
25	10:30 a.m.	46.13	30	8:30 a.m.	46.21

## Story County--Continued

S3-24-17 R1. Agronomy Farm. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 17, T. 83 N., R. 24 W. Drilled domestic and stock well, diameter 5-5/8 inches, depth 228.5 feet. Measuring point, top of casing, 0.8 foot above land surface. Water levels, in feet below measuring point, 1939: Aug. 17, 77.11; Sept. 15, 81.41.

S3-24-20 J1. Agricultural Engineering Experiment Station. NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 20, T. 83 N., R. 24 W. Dug domestic well, diameter 36 inches, depth 38.5 feet. Measuring point, top of iron ring of concrete curb, 0.3 foot above land surface.

## Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
June 23	a 22.66	Aug. 17	23.64	Sept. 15	25.74
July 14	a 26.09	27	22.50	Oct. 19	25.70

## Woodbury County

89-48-23 B1. Owner's Riverside Station west well, City of Sioux City. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 23, T. 89 N., R. 48 W. Drilled well, diameter 12 inches, depth 260 feet. Measuring point, top of concrete curb, 8.0 feet below land surface. Taps water in Dakota sandstone. Standby well for city water supply, pumped only a few hours each month, except for emergencies. Water-level measurements by Ed. Harbeck, Sioux City Water Works.

## Water level, in feet below measuring point, 1939

Aug. 16	6.05	Oct. 2	7.33	Nov. 2	8.08
Sept. 2	6.75	13	7.41	Dec. 2	8.00

89-47-22 B1. Owner's Lowell 4. City of Sioux City. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 22, T. 89 N., R. 47 W., in Lowell well field. Drilled well, diameter 26 inches, depth 349 feet. Measuring point, top of concrete floor of pump station at land surface. Taps water in Dakota sandstone. Pumped for city supply. Water levels affected by pumping. Water-level measurements by N. L. Nelson, chief engineer, Sioux City Water Works.

## Water level, in feet below measuring point, 1938-39

Dec. 2, 1938	31.25	May 4, 1939	32.25	Sept. 2, 1939	b 38.17
Jan. 2, 1939	31.83	June 2,	b 35.25	Oct. 3	37.00
Feb. 2,	32.17	July 2,	b 33.50	Nov. 2	37.67
Mar. 2,	31.83	Aug. 2,	b 40.60	Dec. 2	36.75
Apr. 2,	b 32.25				

a Recently pumped.

b Nearby wells pumping.

# IOWA AND MISSOURI

## TARKIO CREEK AREA OF SOIL CONSERVATION SERVICE

By V. C. Fishel, G. N. Mesnier, and W. T. Wilson

The observation-well program in the Tarkio Creek area <sup>1/</sup>was continued in 1939 by the Federal Geological Survey in cooperation with the Soil Conservation Service. Of 73 wells under observation at the beginning of 1939, 3 wells (11, 23, and 51) were dropped during the year. Records of water level in 7 wells (43a, 44a, 83-87) are included for the first time in this report. Wells 1 and 2 were equipped with water-stage recorders throughout the year. Water-level measurements in 12 wells (1, 2, 5-7, 10-12, and 14-17) were used in computing average water levels in 1938 and 1939, except that well 11 was dropped September 19, 1939. The measurements were made by W. M. Mulnix, of the Geological Survey.

The precipitation was much below normal in the area, during both 1938 and 1939, and as a result the water levels were at low stages during this period. They were lower during the spring of 1938 than at any other time on record, but in the 12 wells they had an average net rise of 0.44 foot in 1938 as a result of the precipitation during spring and summer.

Water levels in these wells declined an average of 0.36 foot from January 1, 1939, to February 15, 1939. They rose 2.09 feet by March 15 and declined 0.78 foot by June 6, and then rose sharply 1.75 feet by July 5. As the precipitation for the last half of 1939 was very low, they declined an average of 2.83 feet from July 5 to the end of the year. For 1939 their average net decline was 0.13 foot.

Average water levels, in feet above assumed datum planes, in  
12 observation wells, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3-4	9.31	May 1-2	10.71	July 24-26	11.54	Oct. 16-17	9.81
9-10	9.25	8-9	10.67	31-Aug. 2	11.40	23-24	9.71
30-31	9.03	15-16	10.58	Aug. 14-16	11.08	30-31	9.60
Feb. 13-15	8.95	23-24	10.43	28-29	10.66	Nov. 13-14	9.47
Mar. 13-15	11.04	29-31	10.33	Sept. 11-12	10.28	20-21	9.41
20-21	10.47	June 5-6	10.26	18-19	10.06	27-28	9.34
Apr. 3-4	10.56	26-27	11.77	26-27	10.16	Dec. 4-5	9.26
10-11	10.64	July 3-6	12.01	Oct. 2-3	10.03	11-12	9.22
18-19	10.61	10-11	11.96	9-10	9.97	18-19	9.18
24-25	10.79	17-18	11.83				

<sup>1/</sup> See Water-Supply Papers 777, 817, 840, and 845.

## 1. W. R. Marshall.

Water level, in feet above assumed datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	8.91	May 1	10.46	July 17	11.42	Oct. 9	10.39
9	8.86	8	10.44	24	11.40	16	9.69
30	8.73	15	10.40	31	11.36	23	9.51
Feb. 13	8.70	23	10.43	Aug. 7	11.28	30	9.31
Mar. 13	10.05	29	10.47	14	11.41	Nov. 13	8.99
20	9.41	June 5	10.51	21	11.22	20	8.88
27	9.53	12	10.61	28	11.03	27	8.76
Apr. 3	9.88	19	10.78	Sept. 11	10.67	Dec. 4	8.63
10	10.21	26	11.63	18	10.39	11	8.65
18	9.55	July 3	11.28	26	10.15	18	8.56
24	10.68	10	11.32	Oct. 2	9.96		

## 2. H. W. Klutas.

Water level, in feet above assumed datum, 1939

Jan. 3	10.55	May 1	11.38	July 17	11.03	Oct. 9	10.34
9	10.59	8	11.25	24	10.85	16	10.42
30	10.53	15	11.10	31	10.72	23	10.38
Feb. 13	10.49	23	10.98	Aug. 7	10.63	30	10.36
Mar. 13	11.45	29	10.95	14	10.71	Nov. 13	10.31
20	11.43	June 5	10.90	21	10.63	20	10.30
27	11.24	12	10.88	28	10.56	27	10.31
Apr. 3	11.24	19	10.89	Sept. 11	10.45	Dec. 4	10.31
10	11.43	26	11.26	18	10.38	11	10.30
17	11.45	July 3	11.24	26	10.34	18	10.29
24	11.52	10	11.17	Oct. 2	10.33		

## 5. John Toft.

Water level, in feet above assumed datum, 1939

Jan. 3	6.35	May 1	8.57	July 17	11.54	Oct. 9	8.46
9	6.27	8	8.54	24	11.02	16	8.31
30	6.09	15	8.39	31	11.16	23	8.23
Feb. 13	5.97	23	8.24	Aug. 14	10.38	30	8.05
Mar. 14	8.69	29	8.20	21	10.17	Nov. 13	7.94
20	9.60	June 6	8.78	28	9.97	20	7.86
27	9.39	12	9.67	Sept. 11	9.37	27	7.80
Apr. 3	8.50	20	9.80	18	9.01	Dec. 4	7.66
11	8.48	26	11.98	26	8.79	11	7.58
18	8.53	July 3	12.80	Oct. 2	8.60	18	7.52
24	8.65	10	12.69				

## 6. T. Slickerveer.

Water level, in feet above assumed datum, 1939

Jan. 4	9.00	Apr. 24	9.77	July 26	11.51	Oct. 10	9.57
10	8.91	May 2	9.75	Aug. 2	11.23	17	9.50
23	8.77	9	9.87	9	11.01	24	9.56
31	8.73	16	10.02	16	10.78	31	9.55
Feb. 8	8.59	24	10.01	23	10.56	Nov. 14	9.52
15	8.54	31	9.98	29	10.39	21	9.49
Mar. 15	9.55	June 6	10.13	Sept. 12	10.25	28	9.47
21	10.10	27	11.57	19	10.07	Dec. 5	9.41
Apr. 5	9.54	July 6	12.09	27	9.73	12	9.39
11	9.61	11	12.00	Oct. 3	9.64	19	9.38
19	9.68	18	11.94				

## 7. E. F. Holquist.

Water level, in feet above assumed datum, 1939

Jan. 4	10.07	May 9	9.34	Aug. 1	11.18	Oct. 17	9.87
10	9.92	16	9.28	9	11.05	24	9.76
31	9.74	24	9.23	15	11.03	31	9.76
Feb. 14	9.56	31	9.28	23	10.90	Nov. 14	9.72
Mar. 15	9.45	June 6	8.96	29	10.73	21	9.69
21	9.50	27	10.65	Sept. 12	10.44	28	9.54
Apr. 4	9.49	July 5	10.96	19	10.24	Dec. 5	9.40
11	9.48	11	11.30	27	10.17	12	9.26
19	9.48	18	11.38	Oct. 3	10.05	19	9.22
25	9.46	25	11.19	10	10.01		

## 10. R. Palmquist.

Water level, in feet above assumed datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	10.22	May 2	10.17	July 25	10.74	Oct. 17	10.54
10	10.22	9	10.15	Aug. 1	10.77	24	10.50
31	10.20	16	10.14	8	10.81	31	10.52
Feb. 14	10.21	24	10.12	15	10.81	Nov. 14	10.51
Mar. 15	10.26	31	10.19	29	10.81	21	10.49
20	10.31	June 6	10.31	Sept. 12	10.75	28	10.39
Apr. 4	10.14	27	10.29	19	10.78	Dec. 5	10.33
11	10.23	July 5	10.67	27	10.66	12	10.29
19	10.20	11	10.54	Oct. 3	10.63	19	10.25
25	10.16	18	10.68	10	10.58		

## 11. R. Palmquist.

Water level, in feet above assumed datum, 1939

Jan. 3	10.34	Apr. 19	10.33	June 6	10.00	Aug. 8	14.03
10	10.31	25	10.38	27	11.33	15	10.54
31	10.15	May 2	10.27	July 5	11.52	29	9.80
Feb. 14	10.08	9	10.19	11	11.33	Sept. 12	8.92
Mar. 15	11.32	16	10.09	18	11.06	19	8.80
Apr. 4	10.21	24	9.94	25	10.98		(a)
11	10.27	31	10.04	Aug. 1	10.68		

## 12. Amil Windhorst.

Water level, in feet above assumed datum, 1939

Jan. 4	12.47	May 2	13.67	July 25	16.33	Oct. 10	12.56
10	12.35	9	13.46	Aug. 1	15.96	17	12.33
31	11.23	16	13.09	8	15.68	24	11.92
Feb. 14	11.11	24	12.87	15	15.39	31	11.60
Mar. 15	11.26	31	12.59	22	15.18	Nov. 4	11.35
21	12.63	June 6	11.96	29	14.72	21	11.21
Apr. 4	13.92	27	15.62	Sept. 12	14.13	28	11.18
11	14.05	July 5	16.26	19	13.71	Dec. 5	11.16
19	13.97	11	16.44	27	13.27	12	11.13
25	13.89	18	16.45	Oct. 3	12.93	19	11.07

## 13. Amil Windhorst.

Water level, in feet above assumed datum, 1939

Jan. 4	11.77	May 2	11.90	July 25	12.01	Oct. 10	11.19
10	11.74	9	11.89	Aug. 1	11.91	16	11.13
31	11.61	16	11.86	8	11.90	24	11.23
Feb. 14	11.49	24	11.72	15	11.79	31	11.10
Mar. 15	12.15	31	11.62	22	11.75	Nov. 14	10.96
21	12.19	June 6	11.66	29	11.65	21	10.92
Apr. 4	12.19	27	12.32	Sept. 12	11.55	28	10.86
11	12.18	July 5	12.26	19	11.34	Dec. 5	10.83
19	12.15	11	12.06	27	11.35	12	10.80
25	12.12	18	12.08	Oct. 3	11.31	19	10.72

## 14. Floyd Hoskins.

Water level, in feet above assumed datum, 1939

Jan. 3	7.72	May 1	14.46	July 17	13.60	Oct. 9	9.92
9	7.61	8	14.41	24	13.24	16	9.64
30	7.39	15	14.29	31	12.87	23	9.43
Feb. 13	7.30	23	13.43	Aug. 7	12.53	30	9.19
Mar. 14	11.68	29	12.58	14	12.33	Nov. 13	9.03
20	12.79	June 6	11.82	21	11.99	20	8.63
27	13.45	12	11.66	28	11.67	27	8.45
Apr. 3	15.19	20	11.62	Sept. 11	11.10	Dec. 4	8.34
11	14.68	26	12.82	18	10.74	11	8.28
18	14.64	July 3	13.68	26	10.40	18	8.06
24	14.56	10	13.43	Oct. 2	10.14		

a Measurements discontinued.

## 15. Metropolitan Life Insurance Co.

Water level, in feet above assumed datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	9.61	May 1	10.73	July 17	12.23	Oct. 9	9.77
9	9.58	8	10.67	24	11.78	16	9.78
30	9.43	15	10.55	31	11.85	23	9.85
Feb. 13	9.37	23	10.50	Aug. 7	11.39	30	9.82
Mar. 13	10.86	29	10.39	14	11.32	Nov. 13	9.74
20	10.32	June 6	10.63	21	11.08	20	9.84
27	10.23	12	10.96	28	10.81	27	9.81
Apr. 3	10.16	20	10.87	Sept. 11	10.30	Dec. 4	9.78
10	10.58	26	13.27	18	9.96	11	9.76
18	10.75	July 3	12.76	26	9.86	18	9.76
24	10.90	10	12.67	Oct. 2	9.79		

## 16. Metropolitan Life Insurance Co.

Water level, in feet above assumed datum, 1939

Jan. 3	8.42	May 1	10.04	July 17	10.98	Oct. 9	(a)
9	8.30	8	10.18	24	9.93	16	(a)
30	8.23	15	10.14	31	9.62	23	(a)
Feb. 13	8.06	23	10.11	Aug. 7	9.23	30	(a)
Mar. 13	7.96	29	10.05	14	9.08	Nov. 13	(a)
20	9.18	June 5	10.00	21	8.80	20	(a)
27	9.02	12	10.23	28	8.52	27	(a)
Apr. 3	8.94	19	10.61	Sept. 11	8.27	Dec. 4	(a)
10	9.06	26	11.06	18	8.15	11	(a)
18	9.10	July 3	11.13	26	(a)	18	(a)
24	9.92	10	11.01	Oct. 2	(a)		

## 17. Albert Nordholm.

Water level, in feet above assumed datum, 1939

Jan. 3	8.03	May 1	9.61	July 17	9.67	Oct. 9	8.06
9	8.12	8	9.50	24	9.49	16	8.00
30	7.94	15	9.42	31	9.37	23	7.92
Feb. 13	7.98	23	9.35	Aug. 7	9.29	30	7.86
Mar. 13	8.93	29	9.20	14	9.23	Nov. 13	7.77
20	9.40	June 5	9.11	21	8.93	20	7.69
27	9.49	12	9.06	28	8.93	27	7.64
Apr. 3	9.48	19	9.08	Sept. 11	8.70	Dec. 4	7.61
10	9.56	26	9.73	18	8.52	11	7.59
18	9.60	July 3	9.78	26	8.25	18	7.68
24	9.63	10	9.62	Oct. 2	8.18		

## 20.

Water level, in feet above assumed datum, 1939

Jan. 3	7.50	May 1	11.14	July 17	9.68	Oct. 9	8.89
9	7.38	8	10.63	24	9.56	16	7.51
30	7.32	15	10.03	31	9.29	23	7.23
Feb. 13	7.10	23	9.70	Aug. 7	9.00	30	7.11
Mar. 13	15.98	29	9.69	14	9.05	Nov. 13	7.05
20	12.83	June 5	9.46	21	8.67	20	6.94
27	10.98	12	9.40	28	8.41	27	6.90
Apr. 3	10.98	19	9.18	Sept. 11	8.05	Dec. 4	6.90
10	11.53	26	10.91	18	7.83	11	6.91
18	11.79	July 3	10.59	26	7.60	18	6.79
24	12.12	10	9.94	Oct. 2	7.48		

## 21.

Water level, in feet above assumed datum, 1939

Jan. 3	7.69	May 1	8.38	July 17	9.33	Oct. 9	8.13
9	7.49	8	8.30	24	9.23	16	7.68
30	7.43	15	8.22	31	9.12	23	7.56
Feb. 13	....	23	8.21	Aug. 7	9.04	30	7.45
Mar. 13	9.68	29	8.67	14	9.13	Nov. 13	7.13
20	8.48	June 5	8.61	21	8.97	20	(a)
27	8.19	12	8.68	28	8.83	27	(a)
Apr. 3	7.84	19	8.93	Sept. 11	8.53	Dec. 4	(a)
10	8.08	26	9.59	18	8.33	11	(a)
18	8.31	July 3	9.53	26	8.02	18	(a)
24	8.53	10	9.37	Oct. 2	7.95		

a Well dry.

## 22. J. A. McAllister.

Water level, in feet above assumed datum, 1939							
Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	9.00	May 1	11.16	July 17	10.55	Oct. 9	9.16
9	8.84	8	10.84	24	10.23	16	9.49
30	8.69	15	10.49	31	9.95	23	9.22
Feb. 13	8.53	23	10.20	Aug. 7	9.72	30	9.02
Mar. 13	12.18	29	10.50	14	10.99	Nov. 13	8.77
20	11.75	June 5	10.53	21	10.50	20	8.69
27	11.37	12	10.57	28	10.08	27	8.65
Apr. 3	10.98	19	10.76	Sept. 11	9.53	Dec. 4	8.53
10	11.26	26	11.81	18	9.33	11	8.50
18	11.35	July 3	11.33	26	9.18	18	8.42
24	11.49	10	10.90	Oct. 2	9.14		

## 23. J. A. McAllister.

Water level, in feet above assumed datum, 1939							
Jan. 3	8.31	Mar. 13	10.06	Apr. 3	8.71	Apr. 24	8.94
9	8.16	20	9.31	10	8.73	May 1	8.46
30	8.08	27	8.98	18	8.77	8	8.30
						15	(a)

## 24.

Water level, in feet above assumed datum, 1939							
Jan. 9	6.03	May 8	8.05	July 24	9.50	Oct. 9	9.37
30	5.98	15	8.11	31	9.53	16	9.29
Feb. 13	6.69	23	8.26	Aug. 7	9.52	23	9.18
Mar. 13	7.10	29	8.38	14	9.74	30	9.12
20	7.23	June 5	8.45	21	9.72	Nov. 13	8.98
27	7.36	12	8.59	28	9.70	20	8.88
Apr. 3	7.49	19	8.69	Sept. 11	9.56	27	8.84
10	7.69	26	9.24	18	9.40	Dec. 4	8.83
17	7.80	July 3	9.39	26	9.40	11	8.73
24	7.94	10	9.42	Oct. 2	9.35	18	8.61
May 1	8.08	17	9.52				

## 25. Edwin Rolf.

Water level, in feet above datum of well 1, 1939							
Jan. 3	28.85	May 1	31.91	July 17	32.25	Oct. 9	29.83
9	28.77	8	31.72	24	31.72	16	29.22
30	28.74	15	31.20	31	31.45	23	29.06
Feb. 13	28.63	23	31.09	Aug. 7	30.88	30	28.75
Mar. 13	31.62	29	31.06	14	31.83	Nov. 13	28.60
20	32.61	June 5	31.10	21	31.20	20	28.52
27	32.04	12	31.26	28	30.72	27	28.40
Apr. 3	31.74	19	31.57	Sept. 11	29.96	Dec. 4	28.38
10	32.24	26	33.22	18	29.70	11	28.37
18	32.27	July 3	33.03	26	29.32	18	28.26
24	32.37	10	32.58	Oct. 2	29.32		

## 26. Edwin Rolf.

Water level, in feet above datum of well 1, 1939							
Jan. 3	(b)	May 1	15.22	July 17	16.57	Oct. 9	(b)
9	(b)	8	15.14	24	16.55	16	(b)
30	(b)	15	15.10	31	16.46	23	(b)
Feb. 13	(b)	23	15.01	Aug. 7	16.38	30	(b)
Mar. 13	(b)	29	(b)	14	16.43	Nov. 13	(b)
20	(b)	June 5	(b)	21	16.34	20	(b)
21	(b)	12	(b)	28	16.19	27	(b)
Apr. 3	(b)	19	15.32	Sept. 11	15.87	Dec. 4	(b)
10	15.58	26	16.27	18	15.66	11	(b)
18	15.61	July 3	16.46	26	15.45	18	(b)
24	15.58	10	16.53	Oct. 2	(b)		

a Obstruction in well; measurements discontinued.  
 b Well dry.

## WATER LEVELS AND ARTESIAN PRESSURE, 1939

## 27. Edwin Rolf.

Water level, in feet above datum of well 1, 1939							
Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	28.02	Apr. 24	28.91	July 3	30.54	Sept. 18	29.33
9	28.12	May 1	28.86	10	30.42	Oct. 30	28.90
30	28.09	8	28.89	17	30.35	Nov. 13	28.88
Feb. 13	27.92	15	28.82	24	30.21	20	28.80
Mar. 13	29.66	23	28.71	31	30.09	27	28.75
20	29.35	29	28.70	Aug. 7	30.04	Dec. 4	28.73
27	29.27	June 5	28.80	14	30.07	11	28.72
Apr. 3	29.19	12	29.03	21	29.93	18	28.61
10	29.04	19	29.46	28	29.84		

## 28. Edwin Rolf.

Water level, in feet above datum of well 1, 1939							
Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	45.58	May 1	48.13	July 17	52.16	Oct. 9	48.98
9	46.53	8	47.92	24	51.41	16	48.66
30	46.48	15	47.75	31	50.82	23	48.46
Feb. 13	46.37	23	47.74	Aug. 7	50.35	30	48.29
Mar. 13	46.36	29	47.75	14	50.67	Nov. 13	48.03
20	46.92	June 5	47.70	21	50.40	20	47.91
27	47.30	12	47.82	28	50.04	27	47.88
Apr. 3	47.31	19	48.07	Sept. 11	49.47	Dec. 4	47.82
10	47.30	26	53.40	18	49.19	11	47.68
18	47.68	July 3	54.32	26	48.96	18	47.56
24	47.96	10	53.15	Oct. 2	48.88		

## 29. Edwin Rolf.

Water level, in feet above datum of well 1, 1939							
Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	31.34	Apr. 24	31.78	July 10	32.78	Oct. 2	30.78
9	31.51	May 1	31.67	17	32.51	9	31.14
16	31.43	8	31.56	24	32.36	16	31.25
30	31.55	15	31.42	31	32.09	23	31.35
Feb. 13	31.26	23	31.34	Aug. 7	31.79	30	31.43
Mar. 13	31.73	29	31.23	14	32.60	Nov. 13	31.52
20	31.47	June 5	31.26	21	32.15	20	31.48
27	31.60	12	30.48	28	31.73	27	31.46
Apr. 3	31.29	19	31.83	Sept. 11	31.16	Dec. 4	31.53
10	31.50	26	33.93	18	30.90	11	31.51
18	31.69	July 3	33.14	26	30.82	18	31.50

## 30. W. F. Marshall.

Water level, in feet above datum of well 1, 1939							
Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	15.21	May 1	18.04	July 17	18.75	Oct. 9	16.35
9	15.23	8	17.65	24	18.81	16	16.14
30	15.19	15	17.21	31	18.04	23	15.94
Feb. 13	15.18	23	16.95	Aug. 7	17.71	30	15.72
Mar. 13	20.18	29	17.08	14	18.89	Nov. 13	15.47
20	19.42	June 5	17.23	21	18.09	20	15.38
27	18.72	12	17.67	28	17.60	27	15.33
Apr. 3	18.12	19	18.09	Sept. 11	17.11	Dec. 4	15.30
10	18.62	26	20.71	18	16.76	11	15.29
17	18.45	July 3	19.68	26	16.51	18	15.22
24	18.61	10	19.16	Oct. 2	16.37		

## 31. W. F. Marshall.

Water level, in feet above datum of well 1, 1939							
Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	10.36	May 1	10.98	July 17	11.76	Oct. 9	10.37
9	10.07	8	10.95	24	11.63	16	10.25
30	10.01	15	10.80	31	11.54	23	10.17
Feb. 13	9.67	23	10.75	Aug. 7	11.41	30	10.06
Mar. 13	9.95	29	10.65	14	11.50	Nov. 13	9.94
20	10.50	June 5	10.57	21	11.39	20	9.78
27	10.77	12	10.61	28	11.23	27	9.74
Apr. 3	10.81	19	10.65	Sept. 11	10.92	Dec. 4	9.71
10	10.93	26	11.39	18	10.68	11	9.55
18	11.00	July 3	11.65	26	10.55	18	9.44
24	11.03	10	11.70	Oct. 2	10.45		



## 32. W. F. Marshall.

Water level, in feet above datum of well 1, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	2.63	May 1	3.92	July 17	4.58	Oct. 9	2.44
9	2.61	8	3.54	24	3.96	16	2.35
30	2.54	15	3.23	31	3.83	23	2.27
Feb. 13	2.84	23	3.07	Aug. 7	3.52	30	2.06
Mar. 13	6.63	29	3.10	14	4.40	Nov. 13	2.08
20	4.48	June 5	3.17	21	3.79	20	1.78
27	4.04	12	3.41	28	3.46	27	1.75
Apr. 3	3.66	19	3.88	Sept. 11	2.97	Dec. 4	1.76
10	4.81	26	6.68	18	2.78	11	1.74
18	4.82	July 3	5.70	26	2.61	18	1.58
24	4.88	10	5.28	Oct. 2	2.49		

## 33. W. F. Marshall.

Water level, in feet, with reference to datum of well 1, 1939

Jan. 3	-0.95	May 1	-1.37	July 17	-1.48	Oct. 9	-1.99
9	-0.77	8	-1.69	24	-1.70	16	-2.09
30	-0.99	15	-1.90	31	-1.55	23	-2.11
Feb. 13	-0.99	23	-2.03	Aug. 7	-1.89	30	-2.15
Mar. 13	+3.86	29	-1.92	14	-1.18	Nov. 13	-2.15
20	+5.57	June 5	-1.76	21	-1.48	20	-2.16
27	-0.87	12	-0.91	28	-1.70	27	-2.14
Apr. 3	-1.32	19	+1.13	Sept. 11	-1.95	Dec. 4	-2.15
10	-1.07	26	+1.71	18	-2.04	11	-2.15
18	-1.11	July 3	-0.51	26	-2.07	18	-2.21
24	-1.19	10	-0.96	Oct. 2	-2.04		

## 34. W. F. Marshall.

Water level, in feet above datum of well 1, 1939

Jan. 3	5.43	May 1	7.22	July 17	6.58	Oct. 9	5.63
9	5.34	8	(a)	24	6.42	16	5.25
30	5.13	15	(a)	31	6.51	23	5.00
Feb. 13	4.98	23	(a)	Aug. 7	6.26	30	4.88
Mar. 13	7.90	29	5.93	14	6.86	Nov. 13	4.77
20	6.72	June 5	5.96	21	6.45	20	4.69
27	6.10	12	6.25	28	6.18	27	4.63
Apr. 3	5.73	19	6.12	Sept. 11	5.69	Dec. 4	4.60
10	6.94	26	7.18	18	5.47	11	4.59
18	7.58	July 3	6.85	26	5.27	18	4.44
24	8.87	10	6.78	Oct. 2	5.16		

## 35. W. F. Marshall.

Water level, in feet above datum of well 1, 1939

Jan. 3	49.05	May 1	53.24	July 17	52.13	Oct. 9	48.60
9	48.84	8	52.26	24	51.55	16	48.49
30	48.69	15	52.05	31	51.07	23	48.60
Feb. 13	48.17	23	51.64	Aug. 7	50.73	30	48.52
Mar. 13	55.02	29	52.03	14	50.95	Nov. 13	48.15
20	53.88	June 5	51.88	21	50.48	20	48.06
27	53.16	12	51.92	28	50.17	27	48.02
Apr. 3	52.78	19	52.64	Sept. 11	49.65	Dec. 4	47.99
10	53.75	26	55.05	18	49.31	11	47.80
18	54.01	July 3	53.78	26	49.03	18	47.72
24	53.58	10	52.83	Oct. 2	48.78		

## 36. George Rolf.

Water level, in feet above datum of well 1, 1939

Jan. 3	86.77	May 1	86.54	July 17	86.71	Oct. 9	86.81
9	86.82	8	86.55	24	86.73	16	86.80
30	86.74	15	86.55	31	86.76	23	86.79
Feb. 13	86.78	23	86.63	Aug. 7	86.76	30	86.76
Mar. 13	86.63	29	86.59	14	86.79	Nov. 13	86.65
20	86.61	June 5	86.60	21	86.78	20	86.64
27	86.58	12	86.61	28	86.78	27	86.64
Apr. 3	86.60	19	86.63	Sept. 11	86.73	Dec. 4	86.63
10	86.60	26	86.67	18	86.83	11	86.62
18	86.58	July 3	86.68	26	86.82	18	86.59
24	86.56	10	86.66	Oct. 2	86.81		

a Obstruction in well.

37.

Water level, in feet above datum of well 1, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	82.89	May 1	84.64	July 17	84.37	Oct. 9	83.21
9	82.92	8	84.41	24	84.16	16	83.13
30	82.85	15	84.15	31	84.00	23	83.21
Feb. 13	82.70	23	83.98	Aug. 7	83.88	30	83.07
Mar. 13	85.48	29	83.96	14	83.99	Nov. 13	82.96
20	85.93	June 5	83.93	21	83.83	20	82.94
27	85.33	12	83.90	28	83.71	27	82.93
Apr. 3	84.80	19	83.92	Sept. 11	83.57	Dec. 4	82.91
10	85.08	26	84.88	18	83.36	11	82.87
18	85.09	July 3	84.85	26	83.31	18	82.81
24	85.14	10	84.54	Oct. 2	83.26		

38. Elsie Nordstrom.

Water level, in feet above assumed datum, 1939

Jan. 3	68.53	May 2	68.35	Aug. 2	74.56	Oct. 24	71.36
10	68.34	8	68.26	8	74.72	31	71.28
31	68.21	15	68.12	15	74.52	Nov. 14	71.19
Feb. 14	68.10	24	68.07	23	74.32	21	71.15
Mar. 14	68.22	31	68.03	30	74.08	27	71.14
21	68.28	June 20	69.20	Sept. 12	73.39	Dec. 5	71.09
31	68.69	27	71.87	20	72.79	12	71.04
Apr. 4	68.61	July 5	73.01	26	71.48	19	70.96
12	68.60	11	73.48	Oct. 3	72.27		
19	68.57	18	74.08	10	71.91		
24	68.53	25	74.41	17	71.49		

39. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1939

Jan. 3	68.16	May 2	67.51	July 25	74.12	Oct. 10	71.14
10	67.52	8	(a)	Aug. 2	74.29	17	70.83
31	67.20	15	(a)	8	74.41	24	70.72
Feb. 14	66.97	24	(a)	15	74.18	31	70.69
Mar. 14	67.69	31	(a)	23	73.85	Nov. 14	70.67
21	68.12	June 20	67.99	30	73.45	21	70.62
31	68.01	27	70.28	Sept. 12	73.07	27	70.44
Apr. 4	67.69	July 5	72.18	20	72.08	Dec. 5	70.35
12	67.88	11	72.89	26	71.81	12	70.16
19	67.82	18	73.63	Oct. 3	71.48	19	70.07
24	67.68						

40. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1939

Jan. 3	67.21	May 2	68.26	July 25	73.29	Oct. 10	70.36
10	67.17	8	68.35	Aug. 2	73.68	17	70.12
31	67.12	15	68.41	8	73.82	24	70.05
Feb. 14	67.14	24	68.06	15	73.68	31	69.97
Mar. 14	72.05	31	68.04	23	73.32	Nov. 14	69.91
21	73.87	June 20	67.97	30	72.90	21	69.84
31	71.82	27	69.92	Sept. 12	72.41	27	69.79
Apr. 4	71.73	July 5	71.75	20	71.47	Dec. 5	69.75
12	70.35	11	72.34	26	71.19	12	69.71
19	69.96	18	72.95	Oct. 3	70.80	19	69.62
24	69.41						

41. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1939

Jan. 3	66.03	May 2	66.24	July 25	73.82	Oct. 10	69.32
10	65.73	8	66.03	Aug. 2	73.85	17	69.09
31	65.58	15	65.79	8	73.84	24	68.82
Feb. 14	65.20	24	65.66	15	73.58	31	68.63
Mar. 14	65.53	31	65.64	23	72.86	Nov. 14	68.57
21	66.01	June 20	69.23	30	72.28	21	68.51
31	66.76	27	75.04	Sept. 12	72.02	27	68.35
Apr. 4	66.82	July 5	74.01	20	70.63	Dec. 5	68.28
12	66.61	11	73.72	26	70.48	12	68.22
19	66.50	18	73.81	Oct. 3	70.16	19	68.13
24	66.33						

a Obstruction in well.

## 42. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 10	64.82	May 2	65.21	July 25	72.97	Oct. 10	67.52
31	64.75	8	64.86	Aug. 2	72.92	17	66.85
Feb. 14	64.62	15	64.81	8	72.57	24	66.66
Mar. 14	65.85	24	64.57	15	71.79	31	66.60
21	66.36	31	65.12	23	71.00	Nov. 14	66.48
31	66.21	June 20	70.11	30	70.33	21	66.44
Apr. 4	66.16	27	73.00	Sept. 12	69.62	27	66.29
12	65.63	July 5	73.40	20	68.57	Dec. 5	66.24
19	65.52	11	73.26	26	68.26	12	66.14
24	65.32	18	73.23	Oct. 3	68.17	19	66.02

## 43. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1937

Jan. 3	66.39	May 2	65.48	July 25	72.68	Oct. 10	68.44
10	66.13	8	65.46	Aug. 2	72.57	17	68.17
31	65.72	15	65.38	8	72.41	24	68.02
Feb. 14	65.23	24	65.36	15	71.90	31	67.92
Mar. 14	65.42	31	65.35	23	71.31	Nov. 14	67.84
21	65.33	June 20	65.68	30	70.77	21	67.79
31	65.42	27	67.20	Sept. 12	70.29	27	67.66
Apr. 4	65.40	July 5	71.68	20	69.46	Dec. 5	67.62
12	65.48	11	72.75	26	69.13	12	67.56
19	65.50	18	72.96	Oct. 3	68.75	19	67.48
24	65.51						

43A. Elsie Nordstrom. Four feet east of well 43. Bored well, diameter 3 inches, depth 28.5 feet. Measuring point, top edge of cover, 0.8 foot above land surface and 87.52 feet above datum of well 38.

Water level, in feet above datum of well 38, 1938-39

Date	Water level	Date	Water level	Date	Water level
Nov. 9, 1938	60.08	Apr. 4, 1939	63.42	July 25, 1939	72.62
17	60.66	12	63.84	Aug. 2	72.52
22	60.94	19	63.99	8	72.29
29	61.26	24	64.05	15	71.64
Dec. 7	61.48	May 2	64.00	23	71.00
13	61.76	8	64.05	30	70.48
20	62.07	15	64.19	Sept. 12	69.88
28	62.13	24	64.23	20	69.28
Jan. 3, 1939	62.11	31	64.32	26	69.03
10	62.41	June 20	65.87	Oct. 3	68.75
31	62.27	27	72.09	10	68.52
Feb. 14	61.92	July 5	72.94	17	68.31
Mar. 14	63.24	11	72.97	24	68.18
21	63.15	18	72.96	31	68.07
31	63.52				

## 44. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	63.75	May 2	64.24	July 25	71.61	Oct. 10	66.10
10	63.38	8	64.07	Aug. 2	72.80	17	65.78
31	63.23	15	63.86	8	71.00	24	65.50
Feb. 14	63.19	24	63.71	15	69.99	31	65.28
Mar. 14	66.57	31	64.49	23	69.25	Nov. 14	65.22
21	66.45	June 20	71.92	30	68.61	21	65.18
31	65.65	27	73.90	Sept. 12	67.77	27	65.07
Apr. 4	65.44	July 5	73.41	20	67.01	Dec. 5	65.01
12	64.74	11	72.76	26	66.75	12	64.92
19	64.67	18	72.14	Oct. 3	66.44	19	64.86
24	64.38						

44A. Elsie Nordstrom. Seven feet west of well 45. Bored well, diameter 6 inches, depth 30.3 feet. Measuring point, top edge of cover, 0.6 foot above land surface and 83.54 feet above datum of well 38.

Water level, in feet above datum of well 38, 1938-39

Date	Water level	Date	Water level	Date	Water level
Oct. 18, 1938	64.02	Apr. 4, 1939	65.45	Aug. 15, 1939	68.69
27	64.75	12	64.24	23	67.64
Nov. 1	64.70	19	63.63	30	66.90
9	65.95	24	63.53	Sept. 12	66.45
17	65.40	May 2	63.50	20	65.41
22	65.23	8	62.87	26	65.11
29	64.35	15	62.71	Oct. 3	65.81
Dec. 7	63.97	24	62.52	10	65.44
13	63.50	31	62.74	17	65.30
20	63.24	June 20	72.98	24	65.04
28	63.24	27	74.14	31	64.84
Jan. 3, 1939	63.22	July 5	72.79	Nov. 14	64.76
10	62.41	11	71.88	21	64.73
31	61.97	18	70.97	27	64.60
Feb. 14	61.91	25	70.13	Dec. 5	64.57
Mar. 14	67.34	Aug. 2	70.71	12	64.56
21	67.77	8	69.70	19	64.48
31	65.57				

45. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	62.79	May 2	62.40	July 25	69.43	Oct. 10	63.96
10	61.78	8	62.24	Aug. 2	69.96	17	63.73
31	61.33	15	61.98	8	69.02	24	63.55
Feb. 14	61.15	24	61.79	15	67.97	31	63.33
Mar. 14	66.60	31	62.85	23	67.02	Nov. 14	63.19
21	67.04	June 20	72.44	30	66.30	21	63.16
31	64.72	27	73.42	Sept. 12	65.61	27	63.10
Apr. 4	64.59	July 5	72.02	20	64.78	Dec. 5	63.07
12	63.27	11	71.13	26	64.52	12	63.03
19	63.46	18	70.14	Oct. 3	64.30	19	62.97
24	62.68						

46. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	60.29	May 2	59.23	July 25	65.62	Oct. 10	60.54
10	58.25	8	58.78	Aug. 2	65.47	17	60.17
31	57.87	15	58.58	8	64.61	24	60.02
Feb. 14	57.77	24	58.35	15	63.96	31	59.86
Mar. 14	62.35	31	60.31	23	63.21	Nov. 14	59.69
21	62.88	June 20	67.16	30	62.70	21	59.65
31	60.96	27	68.34	Sept. 12	62.47	27	59.56
Apr. 4	60.88	July 5	67.19	20	61.38	Dec. 5	59.58
12	59.82	11	66.21	26	61.16	12	59.53
19	59.64	18	65.46	Oct. 3	60.96	19	59.45
24	59.52						

47. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	54.99	May 2	54.72	July 25	60.28	Oct. 10	56.58
10	54.09	8	54.40	Aug. 2	60.78	17	56.03
31	53.72	15	54.14	8	60.33	24	55.73
Feb. 14	53.37	24	53.95	15	59.68	31	55.54
Mar. 14	55.79	31	54.65	23	58.93	Nov. 14	55.37
21	56.26	June 20	58.72	30	58.38	21	55.29
31	55.55	27	60.78	Sept. 12	57.88	27	55.24
Apr. 4	55.42	July 5	61.21	20	57.05	Dec. 5	55.27
12	54.93	11	61.06	26	56.83	12	55.21
19	54.89	18	60.75	Oct. 3	56.54	19	55.14
24	54.77						

## 48. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	40.66	May 15	39.82	Aug. 8	42.81	Oct. 17	(a)
Mar. 14	40.81	24	40.11	15	42.41	24	(a)
21	41.29	31	40.36	23	41.96	31	(a)
31	40.86	June 20	44.39	30	41.54	Nov. 14	(a)
Apr. 4	40.75	27	46.56	Sept. 12	41.10	21	(a)
12	40.43	July 5	45.19	20	(a)	27	(a)
19	40.62	11	44.56	26	(a)	Dec. 5	(a)
24	40.68	18	43.83	Oct. 3	(a)	12	(a)
May 2	40.46	25	43.27	10	(a)	19	(a)
8	40.14	Aug. 2	43.13				

## 49. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1939

Jan. 3	68.16	May 2	67.16	July 25	70.11	Oct. 10	70.28
10	67.89	8	67.07	Aug. 2	70.42	17	70.16
31	67.64	15	66.85	8	70.60	24	70.08
Feb. 14	67.50	24	66.74	15	70.74	31	70.01
Mar. 14	66.99	31	66.00	23	70.81	Nov. 14	69.94
21	67.04	June 20	67.19	30	70.81	21	69.91
31	67.31	27	67.54	Sept. 12	70.65	27	69.89
Apr. 4	67.35	July 5	68.88	20	70.04	Dec. 5	69.88
12	67.16	11	69.36	26	70.55	12	69.85
19	67.16	18	69.77	Oct. 3	70.44	19	69.81
24	67.18						

## 50. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1939

Jan. 10	60.48	May 2	60.13	July 25	62.69	Oct. 10	61.21
31	59.93	8	60.00	Aug. 2	62.36	17	61.14
Feb. 14	59.85	15	59.92	8	62.23	24	61.06
Mar. 14	60.25	24	59.86	15	62.02	31	61.01
21	60.38	31	59.87	23	61.91	Nov. 14	60.90
31	60.34	June 20	61.22	30	61.79	21	60.86
Apr. 4	60.31	27	67.24	Sept. 12	61.63	27	60.88
12	60.26	July 5	64.83	20	60.95	Dec. 5	60.93
19	60.22	11	63.66	26	61.40	12	60.90
24	60.16	18	63.14	Oct. 3	61.32	19	60.83

51. ----- Water levels, in feet, 1939: Jan. 10, 55.01; Jan. 31, 54.48; Feb. 14, 54.14. Well caved.

## 52. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1939

Jan. 10	(a)	Mar. 31	(a)	July 18	56.61	Sept. 26	(a)
31	(a)	June 27	(a)	25	(a)	Oct. 31	(a)
Feb. 14	(a)	July 5	56.71	Aug. 2	(a)	Nov. 27	(a)
Mar. 14	(a)	11	56.68	30	(a)	Dec. 19	(a)

## 54. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1939

Jan. 10	60.22	Apr. 4	58.38	May 15	56.88	Aug. 23	57.73
31	59.79	12	57.88	24	56.64	30	57.64
Feb. 14	59.71	19	57.80	31	(a)	Sept. 12	(a)
Mar. 14	59.79	24	57.78	July 25	(a)	Oct. 31	(a)
21	59.88	May 2	57.75	Aug. 2	57.69	Nov. 27	(a)
31	58.12	8	57.36	15	57.60	Dec. 19	(a)

## 55. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1939

Jan. 10	55.49	May 2	54.41	Aug. 2	57.67	Oct. 17	56.53
31	55.32	8	(a)	8	57.57	24	56.50
Feb. 14	55.22	15	(a)	15	57.47	31	56.48
Mar. 14	56.02	24	(a)	23	57.36	Nov. 14	56.45
21	56.00	31	(a)	30	57.22	21	56.40
31	55.24	June 20	57.73	Sept. 12	57.13	27	56.42
Apr. 4	55.21	27	59.80	20	56.39	Dec. 5	56.46
12	55.06	July 5	58.47	26	56.76	12	56.35
19	54.55	11	58.36	Oct. 3	56.64	19	56.27
24	54.48	18	58.21	10	56.57		

## WATER LEVELS AND ARTESIAN PRESSURE, 1939

## 56. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1939							
Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 10	(a)	June 27	(a)	Aug. 8	54.04	Sept. 20	52.38
31	(a)	July 5	54.80	15	53.84	26	51.97
Feb. 14	(a)	11	54.42	23	53.57	Oct. 3	(a)
Mar. 31	(a)	18	54.29	30	53.33	Nov. 14	(a)
May 31	(a)	Aug. 2	54.20	Sept. 2	52.94	Dec. 19	(a)

## 57. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1939							
Jan. 10	45.22	May 2	45.09	July 25	47.42	Oct. 10	46.49
31	45.06	8	45.06	Aug. 2	47.44	17	46.44
Feb. 14	44.99	15	45.00	8	47.25	24	46.41
Mar. 14	46.26	24	44.95	15	46.99	31	46.42
21	46.34	31	44.94	23	46.91	Nov. 14	46.39
31	45.65	June 20	47.72	30	46.83	21	46.34
Apr. 4	45.57	27	51.75	Sept. 12	46.79	27	46.29
12	45.26	July 5	48.82	20	46.63	Dec. 5	46.24
19	45.18	11	48.43	26	46.55	12	46.20
24	45.14	18	47.92	Oct. 3	46.52	19	46.08

## 58. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1939							
Jan. 10	40.85	May 2	42.63	July 25	42.62	Oct. 10	39.84
31	40.73	8	42.27	Aug. 2	42.40	17	39.80
Feb. 14	40.65	15	42.00	8	42.13	24	39.76
Mar. 14	42.63	24	41.84	15	41.96	31	39.75
21	43.36	31	41.95	23	41.58	Nov. 14	39.73
31	42.61	June 20	43.80	30	41.23	21	39.70
Apr. 4	42.67	27	45.16	Sept. 12	41.00	27	39.68
12	42.41	July 5	44.16	20	40.75	Dec. 5	39.64
19	42.58	11	43.85	26	40.03	12	39.61
24	42.66	18	43.57	Oct. 3	39.88	19	39.56

## 59. Frank Goodner.

Water level, in feet above datum of well 38, 1939							
Jan. 3	37.40	May 2	37.11	July 25	37.06	Oct. 9	36.99
10	37.38	8	37.10	Aug. 2	37.01	17	36.98
31	33.36	15	37.08	8	37.04	24	36.97
Feb. 14	32.48	24	37.07	15	37.01	31	36.96
Mar. 15	36.96	29	37.07	23	37.02	Nov. 14	36.87
20	37.21	June 20	37.07	29	37.02	21	36.85
31	37.18	27	37.03	Sept. 11	37.00	27	36.84
Apr. 4	37.17	July 5	37.05	18	37.00	Dec. 4	36.83
12	37.15	11	37.01	26	36.99	12	36.82
19	37.15	18	37.00	Oct. 2	37.00	18	36.83
24	37.14						

## 69. Frank Goodner.

Water level, in feet above datum of well 38, 1939							
Jan. 3	2.71	May 2	4.88	July 25	4.30	Oct. 9	2.51
10	2.68	8	4.76	Aug. 2	4.44	17	2.27
31	2.59	15	4.53	8	4.03	24	2.04
Feb. 14	2.45	24	4.37	15	3.62	31	1.92
Mar. 15	5.01	29	4.34	23	3.56	Nov. 14	1.78
20	5.15	June 20	5.59	29	3.34	21	1.74
31	4.96	27	5.98	Sept. 11	3.05	27	1.69
Apr. 4	4.83	July 5	5.86	18	2.87	Dec. 4	1.66
12	5.05	11	5.12	26	2.66	12	1.62
19	5.07	18	4.42	Oct. 2	2.49	18	1.56
24	5.16						

a Well dry.

## 70. John Snyder.

Water level, in feet above assumed datum, 1939

Jan.	3	8.98	May	2	10.37	July	25	10.49	Oct.	9	9.29
	10	8.96		10	10.04	Aug.	1	10.96		16	9.16
	30	8.93		16	9.60		8	10.49		23	9.12
Feb.	13	8.87		24	9.39		15	10.12		31	9.08
Mar.	15	10.19		29	9.38		21	9.75	Nov.	13	9.02
	20	11.61	June	6	9.23		28	9.48		21	8.99
	31	10.64		20	11.41	Sept.	11	9.32		27	8.97
Apr.	4	10.45		27	13.02		18	9.25	Dec.	4	8.91
	12	10.27	July	5	12.68		26	9.21		11	8.90
	19	10.65		11	11.93	Oct.	2	9.19		18	8.83
	24	10.79		18	11.09						

## 71. John Snyder.

Water level, in feet above assumed datum, 1939

Jan.	3	8.82	May	2	8.88	July	25	10.48	Oct.	9	9.87
	10	8.84		10	8.89	Aug.	1	11.22		16	9.78
	30	8.79		16	8.90		8	10.10		23	9.72
Feb.	13	8.77		24	8.88		15	10.05		31	9.69
Mar.	15	9.29		29	8.93		21	10.00	Nov.	13	9.65
	20	9.12	June	6	9.10		28	9.98		21	9.62
	31	8.94		20	10.40	Sept.	11	9.93		27	9.61
Apr.	4	8.90		27	10.50		18	9.76	Dec.	4	9.58
	12	8.89	July	5	10.66		26	9.80		11	9.56
	19	9.07		11	10.45	Oct.	2	9.80		18	9.51
	24	9.14		18	10.14						

## 72. O. A. Milner.

Water level, in feet above assumed datum, 1939

Jan.	4	9.65	May	2	10.29	July	26	13.79	Oct.	10	11.47
	11	9.53		9	10.20	Aug.	2	13.83		17	11.02
	23	9.52		17	10.07		9	13.71		24	10.59
Feb.	1	9.44		24	10.80		16	13.84		31	10.42
	15	9.56		31	11.94		22	13.76	Nov.	14	10.29
Mar.	15	9.84	June	6	12.09		29	13.44		21	10.20
	21	9.68		21	12.81	Sept.	12	12.67		28	10.12
Apr.	4	9.45		27	14.06		19	12.30	Dec.	5	10.03
	11	9.51	July	6	14.44		27	11.90		12	9.98
	19	9.82		11	14.28	Oct.	3	11.74		19	9.86
	25	10.16		18	13.87						

## 73. -----.

Water level, in feet above assumed datum, 1939

Jan.	4	9.73	May	2	10.80	July	26	11.59	Oct.	10	8.66
	11	9.72		9	10.71	Aug.	2	11.35		17	8.53
	23	9.72		17	10.50		9	11.04		24	8.42
Feb.	1	9.66		24	10.28		16	11.36		31	8.39
	15	9.52		31	10.05		22	11.14	Nov.	14	8.29
Mar.	15	12.10	June	6	10.33		29	10.83		21	8.24
	21	11.40		21	11.02	Sept.	12	10.57		28	8.22
Apr.	4	10.96		27	13.25		19	9.95	Dec.	5	8.12
	11	10.82	July	6	13.08		27	9.20		12	8.06
	19	10.86		11	12.45	Oct.	3	8.99		19	8.01
	24	10.96		18	12.05		10	8.66			

## 74. Fred Miller.

Water level, in feet above assumed datum, 1939

Jan.	3	6.91	May	1	10.14	July	17	14.74	Oct.	9	11.04
	9	6.63		8	10.13		24	14.62		16	10.55
	30	5.90		15	10.11		31	14.52		23	10.13
Feb.	13	5.73		23	10.08	Aug.	8	14.42		30	9.67
Mar.	14	15.96		29	10.04		14	14.15	Nov.	13	9.75
	20	14.66	June	6	11.22		21	13.93		20	9.40
	27	13.31		12	13.95		28	13.65		27	8.65
Apr.	3	12.00		20	13.07	Sept.	18	12.29	Dec.	4	7.81
	11	11.12		26	15.34		26	12.16		11	7.46
	18	10.86	July	3	14.94	Oct.	2	11.48		18	7.18
	24	10.35		10	14.65						

## 75. I. W. Runyon.

Water level, in feet above assumed datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	9.15	May 1	10.13	July 17	11.32	Oct. 9	9.61
9	9.20	8	10.05	24	10.95	16	9.46
30	9.15	15	9.86	31	10.77	23	9.39
Feb. 13	9.11	23	9.71	Aug. 7	10.66	30	9.33
Mar. 14	9.37	29	9.63	14	10.51	Nov. 13	9.22
20	9.26	June 6	9.61	21	10.35	20	9.15
27	9.10	12	9.63	28	10.18	27	9.12
Apr. 3	9.36	20	10.03	Sept. 11	9.95	Dec. 4	9.10
11	9.46	26	13.01	18	9.78	11	9.06
18	9.84	July 3	12.81	26	9.70	18	9.04
24	10.23	10	11.93	Oct. 2	9.44		

## 76. Metropolitan Life Insurance Co.

Water level, in feet above assumed datum, 1939

Jan. 3	10.34	May 1	11.06	July 17	10.96	Oct. 9	9.49
9	10.34	8	10.93	24	10.65	16	9.57
30	10.18	15	10.72	31	10.46	23	9.65
Feb. 13	10.09	23	10.60	Aug. 7	10.38	30	9.75
Mar. 13	10.23	29	10.53	14	10.45	Nov. 13	9.90
20	10.41	June 6	10.46	21	10.33	20	9.93
27	10.52	12	10.42	28	10.12	27	9.93
Apr. 3	10.56	20	10.35	Sept. 11	9.69	Dec. 4	9.95
11	10.72	26	11.16	18	9.45	11	9.93
18	11.73	July 3	11.68	26	9.37	18	9.96
24	10.78	10	11.36	Oct. 2	9.38		

## 77. C. A. Swanson.

Water level, in feet above assumed datum, 1939

May 11	11.72	July 18	13.13	Sept. 12	13.52	Oct. 31	13.07
16	11.64	25	13.29	19	13.41	Nov. 14	13.05
24	11.78	Aug. 1	13.46	27	13.37	21	13.02
31	11.71	9	13.52	Oct. 3	13.32	28	12.78
June 6	11.83	15	13.55	10	13.27	Dec. 5	12.43
27	11.99	23	13.60	17	13.15	12	12.39
July 5	12.63	29	13.59	24	13.08	19	12.33
11	12.86						

## 78. Mainquist.

Water level, in feet above assumed datum, 1939

Jan. 4	9.73	May 2	9.96	July 25	10.20	Oct. 10	9.18
10	9.51	9	9.89	Aug. 1	10.11	17	9.28
31	9.41	16	9.83	9	10.00	24	9.29
Feb. 14	9.38	24	9.73	15	9.87	31	9.34
Mar. 15	11.76	31	9.72	23	9.72	Nov. 14	9.36
21	10.99	June 6	9.51	29	9.49	21	9.33
Apr. 4	10.47	27	10.62	Sept. 12	8.92	28	9.10
11	10.20	July 5	10.74	19	8.73	Dec. 5	8.93
19	10.18	11	10.54	27	8.77	12	8.87
25	10.14	18	10.56	Oct. 3	8.89	19	8.79

## 79. -----.

Water level, in feet above assumed datum, 1939

Jan. 4	8.60	May 2	11.32	July 25	10.53	Oct. 10	8.24
10	8.18	9	11.03	Aug. 1	10.08	17	8.26
31	7.41	16	10.41	9	9.65	24	8.24
Feb. 14	7.19	24	9.90	15	9.45	31	7.58
Mar. 15	7.40	31	9.50	23	9.53	Nov. 14	7.47
21	8.26	June 6	9.44	29	9.39	21	7.43
Apr. 4	8.47	27	11.76	Sept. 12	9.08	28	8.02
11	8.40	July 5	12.11	19	8.79	Dec. 5	6.88
19	8.79	11	11.61	27	8.52	12	6.85
25	11.94	18	11.10	Oct. 3	8.30	19	6.81



## 80. Burton.

Water level, in feet above assumed datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 4	(a)	May 2	10.27	July 25	11.45	Oct. 17	(a)
10	(a)	9	9.87	31	11.51	24	(a)
31	(a)	16	9.04	Aug. 8	11.36	31	(a)
Feb. 14	(a)	24	(a)	15	11.45	Nov. 14	(a)
Mar. 15	14.37	31	(a)	22	11.09	21	(a)
21	11.61	June 6	(a)	29	10.72	28	(a)
31	11.76	20	11.88	Sept. 12	10.11	Dec. 5	(a)
Apr. 4	11.82	27	13.60	19	9.98	12	(a)
11	12.39	July 5	14.00	27	(a)	19	(a)
19	12.01	11	11.98	Oct. 3	(a)		
25	11.88	18	11.59	10	(a)		

## 81. L. G. Bergen.

Water level, in feet above assumed datum, 1939

Jan. 4	10.43	May 2	10.77	July 25	10.91	Oct. 10	9.97
10	10.42	9	10.68	Aug. 1	10.77	17	10.04
31	10.48	16	10.57	9	10.77	24	10.06
Feb. 14	10.64	24	10.54	15	10.71	31	10.08
Mar. 15	11.84	31	10.53	23	10.63	Nov. 14	10.14
21	11.22	June 6	10.51	29	10.49	21	10.10
Apr. 4	11.00	27	11.77	Sept. 12	10.15	Dec. 5	10.09
11	10.96	July 5	11.85	19	9.96	12	10.06
19	10.94	11	11.25	27	9.88	19	10.01
25	10.94	18	10.91	Oct. 3	9.86		

## 82. -----.

Water level, in feet above assumed datum, 1939

Jan. 4	3.79	May 2	3.75	July 26	13.90	Oct. 10	10.69
11	3.36	9	3.63	Aug. 2	13.62	17	9.91
23	3.31	17	3.01	9	13.31	24	9.54
Feb. 1	3.28	24	2.79	16	15.69	31	8.94
15	3.35	31	2.46	22	14.81	Nov. 14	8.68
Mar. 15	13.69	June 6	7.50	29	14.14	21	7.57
21	10.22	21	16.61	Sept. 12	13.24	28	6.80
Apr. 4	6.05	27	13.88	19	12.69	Dec. 5	6.47
11	5.03	July 6	19.49	27	12.05	12	6.38
19	4.36	11	16.49	Oct. 3	11.42	19	6.30
25	4.17	18	14.93				

83. Elsie Nordstrom. About 550 feet east of S.W. Cor. NW $\frac{1}{4}$ NW $\frac{1}{4}$ , sec. 35, T. 69 N., R. 39 W. Bored well, diameter 3 inches, depth 33.4 feet. Measuring point, top edge of cover, 0.9 foot above land surface and 100.00 feet above assumed datum.

Water level, in feet above assumed datum, 1938-39

Date	Water level	Date	Water level	Date	Water level
Oct. 18, 1938	70.67	Apr. 4, 1939	68.54	Aug. 15, 1939	69.19
27	70.41	12	68.39	23	69.15
Nov. 1	70.36	19	68.37	29	69.08
9	70.18	24	68.30	Sept. 12	68.95
17	70.15	May 2	68.23	20	68.72
22	69.88	8	68.18	26	68.69
29	69.84	15	68.12	Oct. 3	68.61
Dec. 7	69.82	24	68.08	10	68.58
13	69.55	31	68.07	17	68.53
20	69.45	June 20	68.10	24	68.50
28	69.18	27	68.44	Nov. 1	68.46
Jan. 3, 1939	69.11	July 5	68.98	14	68.42
10	68.96	11	69.06	21	68.36
31	68.59	18	69.18	28	68.35
Feb. 14	68.35	25	69.20	Dec. 4	68.31
Mar. 14	68.48	Aug. 1	69.23	12	68.30
21	68.53	8	69.30	19	68.27
31	68.53				

a Well dry.

84. Elsie Nordstrom. About 40 feet east of well 83. Bored well, diameter 3 inches, depth 27.8 feet. Measuring point, top edge of cover, 0.9 foot above land surface and 98.60 feet above datum of well 83.

Water level, in feet above datum of well 83, 1938-39

Date	Water level	Date	Water level	Date	Water level
Oct. 18, 1938	70.66	Apr. 4, 1939	68.52	Aug. 15, 1939	69.13
27	70.38	12	68.36	23	69.06
Nov. 1	70.35	19	68.32	29	68.96
9	70.16	24	68.25	Sept. 12	68.87
17	70.10	May 2	68.15	20	68.60
22	70.12	8	68.09	26	68.58
29	69.75	15	68.02	Oct. 3	68.48
Dec. 7	69.62	24	67.97	10	68.38
13	69.37	31	67.93	17	68.26
20	69.21	June 20	68.02	24	66.99
28	69.12	27	68.58	Nov. 1	66.68
Jan. 3, 1939	69.00	July 5	69.08	14	66.56
10	68.83	11	69.12	21	66.52
31	68.43	18	69.17	28	66.50
Feb. 14	68.30	25	69.15	Dec. 4	66.47
Mar. 14	68.35	Aug. 1	69.20	12	66.43
21	68.48	8	69.24	19	66.38
31	68.49				

85. Elsie Nordstrom. About 40 feet east of well 84. Bored well, diameter 6 inches, depth 24.0 feet. Measuring point, top edge of cover, 1.1 feet above land surface and 95.57 feet above datum of well 83.

Water level, in feet above datum of well 83, 1938-39

Date	Water level	Date	Water level	Date	Water level
Oct. 18, 1938	70.60	Apr. 4, 1939	68.35	Aug. 15, 1939	69.09
27	70.27	12	68.29	23	69.02
Nov. 1	70.24	19	68.22	29	68.86
9	70.06	24	68.14	Sept. 12	68.59
17	69.98	May 2	68.01	20	68.47
22	70.16	8	67.90	26	68.41
29	69.66	15	67.84	Oct. 3	68.32
Dec. 7	69.45	24	67.80	10	68.37
13	69.22	31	67.89	17	68.29
20	69.09	June 20	68.23	24	68.22
28	68.90	27	68.77	Nov. 1	68.16
Jan. 3, 1939	68.80	July 5	69.29	14	68.07
10	68.64	11	69.17	21	68.00
31	68.23	18	69.20	28	68.01
Feb. 14	67.88	25	70.26	Dec. 4	67.98
Mar. 14	68.47	Aug. 1	69.25	12	67.92
21	68.56	8	69.44	19	67.88
31	68.47				

86. Elsie Nordstrom. About 40 feet east of well 85. Bored well, diameter 3 inches, depth 27.1 feet. Measuring point, top edge of cover, 0.7 foot above land surface and 91.80 feet above datum of well 83.

Water level, in feet above datum of well 83, 1938-39

Date	Water level	Date	Water level	Date	Water level
Oct. 18, 1938	70.64	Apr. 4	68.44	Aug. 15	69.10
27	70.31	12	68.42	23	68.98
Nov. 1	70.26	19	68.36	29	68.86
9	70.13	24	68.20	Sept. 12	68.72
17	69.99	May 2	68.02	20	68.45
22	69.72	8	67.97	26	68.40
29	69.62	15	67.84	Oct. 3	68.20
Dec. 7	69.51	24	67.80	10	68.10
13	69.44	31	67.75	17	68.09
20	69.36	June 20	68.00	24	68.04
28	69.31	27	69.05	Nov. 1	67.97
Jan. 3, 1939	68.79	July 5	69.38	14	67.91
10	68.62	11	69.30	21	67.88
31	68.44	18	69.25	28	67.85
Feb. 14	68.33	25	69.21	Dec. 4	67.81
Mar. 14	68.40	Aug. 1	69.31	12	67.76
21	68.48	8	69.28	19	67.69
31	68.50				

87. Elsie Nordstrom. About 40 feet east of well 86. Bored well, diameter 3 inches, depth 24.7 feet. Measuring point, top edge of cover, 0.9 foot above land surface, and 88.30 feet above datum of well 83.

Water level, in feet above datum of well 83, 1938-39

Date	Water level	Date	Water level	Date	Water level
Oct. 18, 1938	72.18	Apr. 4	69.93	Aug. 15	70.76
27	71.77	12	69.90	23	70.57
Nov. 1	71.75	19	69.88	29	70.40
9	71.53	24	69.83	Sept. 12	70.17
17	71.48	May 2	69.59	20	69.93
22	71.11	8	69.38	26	69.87
29	71.07	15	69.30	Oct. 3	69.75
Dec. 7	70.83	24	69.25	10	69.65
13	70.65	31	69.23	17	69.56
20	70.54	June 20	70.20	24	69.48
28	70.19	27	71.59	Nov. 1	69.36
Jan. 3, 1939	70.20	July 5	71.60	14	69.27
10	70.09	11	71.18	21	69.21
31	69.55	18	71.00	28	69.18
Feb. 14	69.39	25	71.03	Dec. 4	69.13
Mar. 14	69.77	Aug. 1	71.41	12	69.12
21	69.85	8	71.07	19	69.07
31	70.00				

# KANSAS

## FINNEY COUNTY

By B. F. Latta

An observation-well program was started in Finney County, Kans., in September 1939 by the Federal Geological Survey in cooperation with the Kansas State Geological Survey and the Kansas State Board of Health. The investigation is being made under the supervision of S. W. Lohman, Federal geologist in charge of ground-water investigations in Kansas.

Finney County, in the southwestern part of the State, lies in the Great Plains province and is characterized by wide areas of flat to rolling surfaces. It is underlain by the Carlile shale and Niobrara chalk of Cretaceous age, the Ogallala formation of Tertiary age, Quaternary dune sand, and alluvium.

The Ogallala formation and the alluvium are the most productive water-bearing beds in the county. Most of the domestic and stock wells and many irrigation wells obtain water from sands and gravels of this formation. Alluvium is the chief source of water in the Arkansas Valley and supplies water to many irrigation wells.

In September 1939, 26 wells were selected at strategic points in Finney County, and periodic measurements of water levels were started. Well 28 was added to the program in December. The wells were measured once a month by the wetted-tape method. Five of these (13, 15, 17, 18, 25) are shallow wells in the Arkansas Valley. Well 10 is in the Arkansas Valley, but it is a deep well that taps water in the Ogallala formation. A total of 130 wetted-tape measurements was made in 1939. All water-level measurements prior to November were made by the writer; those during and after November, by R. B. Christy.

A continuous automatic water-stage recorder has been maintained on a well in Finney County since July 17, 1936, by the Division of Water Resources of the Kansas State Board of Agriculture. Descriptions and complete water-level records of this well have been made available through the courtesy of Mr. G. S. Knapp, Chief Engineer, and are included in this report. K. D. McCall, assistant engineer of the Division of Water Resources, has serviced the recorder.

## Water-level fluctuations

The United States Weather Bureau maintains a rain gage at Garden City, in Finney County. In 1939 the total precipitation was 10.45 inches, or 9.77 inches below normal. The monthly precipitation for the first 3 months of the year was above normal; during the remaining months, with the exception of December, the monthly precipitation was much below normal.

Of the 26 wells under observation from September through December, water levels in 19 showed net declines ranging from 0.03 foot to 0.92 foot. Water levels in 7 wells showed net rises ranging from 0.02 foot to 0.91 foot. Water levels in three of the five wells that tap water in alluvium in the Arkansas Valley showed net rises ranging from 0.22 foot to 0.91 foot.

The water level in well 1, which taps water in alluvium in the Arkansas Valley, showed a net decline of 1.22 feet for the period from January 10 to December 31, 1939. The water level in this well rose steadily 0.46 foot from January 10 until May 11; from May 11 until September 1 it fluctuated erratically due to nearby pumping for irrigation; and from September 1 to the end of the year it declined 1.51 feet. During 1939 the water level had a maximum range in fluctuation of 2.01 feet. Well 1 reached the highest water level observed during its entire period of record--11.12 feet above datum--August 6, 1937; and its lowest observed water level--8.97 feet above datum--December 31, 1939. A net decline in water level of 1.38 feet occurred during the period from July 17, 1936, to December 31, 1939.

## Well descriptions and water-level measurements

On the following pages are given descriptions and water levels for the 28 wells under observation at the end of the year. The well observed by the Division of Water Resources has been designated as well 1. Original field numbers are used for the other wells. Water levels in well 1 are expressed in feet above an arbitrary datum; those in all other wells are given in feet below the measuring point.

1. Mrs. A. M. Reid. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 9, T. 24 S., R. 33 W. Drilled observation well, diameter 15 inches, depth 21.5 feet. Measuring point, top of 15-inch galvanized-iron casing at east side, 0.4 foot above land surface, 0.03 foot above bench mark, 20.00 feet above arbitrary datum, 2,862.40 feet above sea level. Bench mark, concrete floor inside well shelter, 19.97 feet above datum, 2,862.37 feet above sea level. Water level July 16, 1936, 9.65 feet below measuring point, 10.35 feet above datum. Highest observed water level, 11.12 feet above datum Aug. 6, 1937; lowest observed water level, 8.97 feet above datum Dec. 31, 1939. Stevens 90-day automatic water-stage recorder maintained on well since July 17, 1936. Water-level measurements supplied through courtesy of the Division of Water Resources of the Kansas State Board of Agriculture.

## 1. Mrs. A. M. Reid.--Continued

Mean daily water level, in feet above datum, 1936

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Day	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	10.11	9.91	9.82	9.94	10.02	17	10.35	9.99	9.86	9.89	9.98	10.05
2	.....	10.10	9.90	9.83	9.95	10.03	18	10.34	9.99	9.86	9.89	9.98	10.05
3	.....	10.09	9.90	9.83	9.95	10.03	19	10.33	9.98	9.86	9.90	9.98	10.05
4	.....	10.09	9.90	9.83	9.95	10.03	20	10.34	9.97	9.86	9.91	9.98	10.06
5	.....	10.16	9.89	9.83	9.95	10.03	21	10.33	9.98	9.86	9.91	9.98	10.07
6	.....	10.14	9.89	9.83	9.96	10.03	22	10.31	10.10	9.86	9.91	9.99	10.07
7	.....	10.14	9.89	9.83	9.96	10.03	23	10.28	10.08	9.86	9.91	9.99	10.08
8	.....	10.13	9.90	9.83	9.97	10.03	24	10.26	10.04	9.85	9.92	9.99	10.08
9	.....	10.11	9.90	9.84	9.97	10.03	25	10.24	10.01	9.85	9.91	10.00	10.09
10	.....	10.09	9.90	9.84	9.97	10.03	26	10.22	9.98	9.84	9.91	10.00	10.10
11	.....	10.07	9.89	9.85	9.97	10.04	27	10.20	9.96	9.84	9.92	10.01	10.10
12	.....	10.06	9.89	9.85	9.98	10.04	28	10.18	9.94	9.84	9.93	10.01	10.11
13	.....	10.04	9.89	9.86	9.98	10.04	29	10.16	9.93	9.84	9.93	10.02	10.12
14	.....	10.02	9.88	9.86	9.98	10.04	30	10.14	9.92	9.83	9.94	10.02	10.12
15	.....	10.01	9.87	9.87	9.98	10.04	31	10.13	9.92	.....	9.94	.....	10.12
16	.....	10.00	9.87	9.88	9.98	10.04							

Mean daily water level, in feet above datum, 1937

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	10.12	10.20	10.29	10.38	10.43	10.46	10.56	10.41	10.17	9.89	9.77	.....
2	10.12	10.21	10.29	10.38	10.43	10.57	10.56	10.42	10.24	9.89	9.77	.....
3	10.12	10.21	10.30	10.39	10.43	10.61	10.57	10.45	10.38	9.88	9.76	.....
4	10.13	10.22	10.29	10.39	10.43	10.62	10.56	10.58	10.35	9.88	9.76	.....
5	10.13	10.22	10.29	10.39	10.44	10.62	10.55	10.83	10.29	9.88	9.76	.....
6	10.13	10.23	10.30	10.40	10.44	10.61	10.53	all 1.12	10.24	9.87	9.76	.....
7	10.13	10.23	10.30	10.40	10.43	10.60	10.53	11.00	10.20	9.87	9.76	.....
8	10.13	10.23	10.30	10.40	10.43	10.60	10.52	10.86	10.18	9.86	9.76	9.74
9	10.13	10.23	10.30	10.40	10.43	10.60	10.51	10.72	10.16	9.85	9.76	.....
10	10.14	10.23	10.30	10.40	10.44	10.59	10.50	10.68	10.14	9.85	9.76	.....
11	10.15	10.23	10.30	10.41	10.45	10.60	10.50	10.61	10.12	9.85	9.75	.....
12	10.15	10.23	10.31	10.41	10.45	10.60	10.49	10.55	10.10	9.84	9.75	.....
13	10.15	10.23	10.32	10.42	10.45	10.59	10.49	10.51	10.09	9.83	9.75	.....
14	10.16	10.24	10.32	10.42	10.45	10.59	10.49	10.47	10.06	9.83	9.75	.....
15	10.16	10.24	10.32	10.42	10.46	10.59	10.49	10.44	10.04	9.82	9.75	9.76
16	10.17	10.24	10.33	10.43	10.46	10.59	10.48	10.41	10.02	9.82	9.75	.....
17	10.17	10.25	10.34	10.43	10.47	10.59	10.48	10.38	10.01	9.81	.....	9.76
18	10.17	10.25	10.35	10.43	10.47	10.59	10.47	10.36	10.00	9.81	.....	9.76
19	10.18	10.25	10.35	10.44	10.48	10.59	10.54	10.35	9.99	9.80	.....	9.76
20	10.18	10.26	10.35	10.44	10.48	10.59	10.57	10.34	9.98	9.80	.....	9.76
21	10.18	10.26	10.35	10.44	10.48	10.58	10.53	10.32	9.97	9.79	.....	9.76
22	10.17	10.26	10.36	10.44	10.47	10.58	10.50	10.30	9.96	9.79	.....	9.77
23	10.18	10.27	10.36	10.43	10.46	10.59	10.48	10.29	9.95	9.78	.....	9.77
24	10.18	10.27	10.37	10.43	10.45	10.59	10.47	10.27	9.94	9.78	.....	9.77
25	10.18	10.27	10.36	10.43	10.45	10.59	10.46	10.25	9.93	9.78	.....	9.78
26	10.18	10.28	10.36	10.43	10.44	10.58	10.45	10.24	9.93	9.78	.....	9.78
27	10.19	10.28	10.36	10.44	10.44	10.58	10.45	10.22	9.92	9.78	.....	9.78
28	10.19	10.28	10.37	10.44	10.43	10.58	10.44	10.21	9.91	9.78	.....	9.78
29	10.19	.....	10.37	10.44	10.42	10.58	10.43	10.20	9.91	9.78	.....	9.78
30	10.20	.....	10.37	10.44	10.42	10.57	10.43	10.19	9.90	9.78	.....	9.79
31	10.20	.....	10.38	.....	10.41	.....	10.42	10.18	.....	9.77	.....	9.79

Mean daily water level, in feet above datum, 1938

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	9.79	9.88	9.94	9.97	10.02	10.03	10.08	10.35	10.03	9.92	9.99	10.07
2	9.80	9.88	9.94	9.97	10.02	10.03	10.07	10.35	10.02	9.92	9.99	10.08
3	9.80	9.88	9.95	9.98	10.02	10.04	10.06	10.50	10.01	9.92	9.99	10.08
4	.....	9.88	9.95	9.98	10.02	10.04	10.05	10.66	10.00	9.92	10.00	10.09
5	.....	9.89	9.95	9.98	10.02	10.05	10.05	10.60	9.99	9.92	10.00	10.09
6	.....	9.89	9.95	9.99	10.02	10.06	10.11	10.51	9.98	9.92	10.00	10.09
7	.....	9.89	9.95	9.99	10.02	10.06	10.16	10.50	9.97	9.92	10.00	10.09
8	.....	9.90	9.95	9.98	10.02	10.07	10.18	10.71	9.96	9.92	10.00	10.10
9	.....	9.90	9.96	9.97	10.02	10.08	10.18	all 0.73	9.95	9.92	10.01	10.10
10	.....	9.90	9.96	9.97	10.03	10.08	10.18	10.60	9.94	9.91	10.01	10.10
11	.....	9.91	9.96	9.97	10.03	10.08	10.15	10.51	9.93	9.91	10.01	10.10
12	.....	9.91	9.96	9.97	10.04	10.09	10.16	10.45	9.93	9.91	10.01	10.10
13	9.84	9.91	9.96	9.97	10.04	10.09	10.17	10.40	9.93	9.91	10.01	10.10

a Apparently received recharge from nearby irrigation.

## 1. Mrs. A. M. Reid.--Continued

Mean daily water level, in feet above datum, 1938

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
14	9.84	....	9.96	9.96	10.05	10.10	10.17	10.35	9.93	9.91	10.02	10.10
15	9.84	....	9.96	9.95	10.05	10.10	10.35	10.29	9.93	9.92	10.02	10.11
16	9.85	....	9.96	9.95	10.06	10.10	10.47	10.25	9.93	9.92	10.02	10.11
17	9.85	....	9.97	9.94	10.06	10.10	10.39	10.21	9.93	9.92	10.03	10.11
18	9.85	....	9.97	9.93	10.06	10.10	10.35	10.18	9.93	9.92	10.03	10.11
19	9.85	....	9.97	9.93	10.06	10.10	10.32	10.15	9.93	9.93	10.03	10.12
20	9.86	....	9.97	9.92	10.05	10.10	10.31	10.12	9.93	9.93	10.04	10.12
21	9.86	....	9.98	9.92	10.04	10.10	10.34	10.10	9.93	9.94	10.04	10.13
22	9.86	....	9.98	9.93	10.03	10.10	10.32	10.08	9.93	9.94	10.04	10.13
23	9.86	....	9.98	9.94	10.03	10.10	10.29	10.07	9.92	9.95	10.05	10.13
24	....	....	9.99	9.95	10.03	10.10	10.26	10.06	9.92	9.95	10.05	10.13
25	....	9.93	9.99	9.96	10.03	10.09	10.24	10.05	9.92	9.96	10.06	10.14
26	....	9.93	9.97	9.97	10.02	10.09	10.22	10.04	9.92	9.96	10.06	10.14
27	....	9.93	9.97	9.98	10.02	10.09	10.25	10.05	9.92	9.97	10.06	....
28	....	9.93	9.97	9.99	10.02	10.08	10.39	10.18	9.92	9.98	10.06	....
29	....	....	9.97	10.00	10.02	10.08	10.53	10.17	9.92	9.98	10.07	....
30	....	....	9.97	10.01	10.02	10.08	10.47	10.10	9.92	9.98	10.07	....
31	9.88	....	9.97	....	10.03	....	10.39	10.06	....	9.99	....	....

Mean daily water level, in feet above datum, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	....	10.28	10.37	10.51	10.61	10.50	10.52	10.82	10.48	9.73	9.39	9.13
2	....	10.29	10.37	10.51	10.62	10.50	10.54	10.71	10.39	9.72	9.38	9.12
3	....	10.29	10.38	10.52	10.62	10.51	10.53	10.65	10.35	9.70	9.37	9.12
4	....	10.29	10.38	10.52	10.63	10.53	10.54	10.82	10.29	9.69	9.36	9.11
5	....	10.30	10.38	10.53	10.64	10.53	10.54	10.72	10.26	9.67	9.35	9.10
6	....	10.30	10.39	10.53	10.64	10.53	10.52	10.65	10.22	9.66	9.34	9.09
7	....	10.31	10.39	10.53	10.64	10.53	10.52	10.59	10.18	9.65	9.33	9.08
8	....	10.31	10.40	10.53	10.64	10.53	10.52	10.56	10.15	9.64	9.32	9.08
9	....	10.32	10.40	10.54	10.65	10.53	10.51	10.53	10.12	9.62	9.31	9.07
10	10.19	10.32	10.41	10.54	10.65	10.52	10.49	10.49	10.09	9.60	9.30	9.07
11	10.20	10.32	10.42	10.54	10.65	10.51	10.47	10.47	10.07	9.59	9.28	9.06
12	10.20	10.33	10.42	10.55	10.63	10.52	10.48	10.45	10.04	9.58	9.27	9.06
13	10.20	10.33	10.42	10.56	10.62	10.52	10.52	10.44	10.02	9.57	9.26	9.05
14	10.20	10.34	10.42	10.56	10.61	10.52	10.64	10.52	10.00	9.56	9.25	9.05
15	....	10.34	10.42	10.57	10.60	10.53	10.82	10.74	9.98	9.55	9.24	9.04
16	....	10.34	10.43	10.57	10.59	10.54	10.98	10.69	9.96	9.54	9.23	9.04
17	....	10.34	10.44	10.58	10.58	10.57	10.89	10.63	9.94	9.54	9.23	9.04
18	....	10.35	10.45	10.58	10.57	10.57	10.80	10.57	9.92	9.52	9.22	9.03
19	10.25	10.35	10.45	10.58	10.57	10.58	10.75	10.55	9.90	9.51	9.21	9.03
20	....	10.34	10.45	10.58	10.56	10.57	10.72	10.52	9.89	9.50	9.20	9.01
21	....	10.34	10.46	10.58	10.57	10.55	10.68	10.48	9.88	9.49	9.19	9.01
22	....	10.34	10.47	10.59	10.56	10.53	10.65	10.45	9.87	9.48	9.19	9.00
23	....	10.34	10.47	10.59	10.55	10.53	10.62	10.41	9.86	9.47	9.18	9.00
24	....	10.34	10.48	10.60	10.54	10.53	10.59	10.38	9.84	9.46	9.18	8.99
25	....	10.34	10.48	10.60	10.53	10.52	10.56	10.35	9.82	9.45	9.17	8.99
26	....	10.35	10.48	10.60	10.51	10.51	10.54	10.32	9.79	9.44	9.17	8.98
27	....	10.36	10.48	10.60	10.50	10.51	10.56	10.29	9.78	9.44	9.16	8.98
28	10.26	10.37	10.49	10.60	10.50	10.50	10.61	10.28	9.76	9.43	9.15	8.98
29	10.27	....	10.49	10.60	10.50	10.51	10.65	10.36	9.75	9.42	9.14	8.98
30	10.27	....	10.50	10.61	10.50	10.52	10.80	10.52	9.74	9.41	9.13	8.98
31	10.28	....	10.50	....	10.49	....	10.90	10.57	....	9.40	....	8.97

2. Maggie B. Smith. NE cor. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 30, T. 26 S., R. 32 W., about 15 feet south of center line of section road. Abandoned drilled well, diameter 8 inches, depth 112.5 feet. Measuring point, top of casing at northwest side, 0.5 foot above land surface. No pump in well. Water level Dec. 17, 1890, reported 107 feet below land surface by W. W. Follett, in Nettleton, Edwin S., Artesian and underflow investigation: Final report of the chief engineer to the Secretary of Agriculture; 52nd Cong., 1st Session, Ex. Doc. 41, pt. 2, appendix 26, well 169, 1892.

Water level, in feet below measuring point, 1934, 1939

Date	Water level	Date	Water level	Date	Water level
Dec., 1934	b 110	Oct. 2, 1939	109.69	Nov. 17, 1939	109.67
Sept. 19, 1939	109.66	26	109.71	Dec. 18	109.70

a Apparently received recharge from nearby irrigation.

b Measured below land surface by Kenneth D. McCall, Division of Water Resources, Kansas State Board of Agriculture.

3. Nora Will. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 35, T. 23 S., R. 33 W., about 50 feet northwest of barn and about 100 feet south of irrigation ditch. Unused drilled well, diameter 3 inches, depth 97.5 feet. Measuring point, top of casing at north side, 1.0 foot above land surface. No pump or pipe in well.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Sept. 20	45.59	Oct. 26	43.30	Dec. 18	43.29
Oct. 2	46.26	Nov. 11	a 55.85		

4. Garden City Company. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 18, T. 22 S., R. 33 W., about 100 feet south of house, beneath large tower. Unused drilled irrigation well, diameter 24 inches, depth 112.5 feet. Measuring point, top of concrete pump base, south side, 1.0 foot above land surface. No pipe or pump in well.

Water level, in feet below measuring point, 1934, 1939

May 19, 1934	b 34.9	Oct. 2, 1939	36.43	Nov. 17, 1939	35.92
Sept. 20, 1939	36.53	26	36.12	Dec. 18	35.63

5. E. Alberta Reeves. SE $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 19, T. 21 S., R. 32 W., about 20 feet southeast of ruins of old house. Abandoned drilled domestic well, diameter 6 inches, depth 32.5 feet. Measuring point, top of casing at west side, 1.0 foot above land surface. No pipe or pump in well.

Water level, in feet below measuring point, 1939

Sept. 20	23.45	Oct. 26	23.48	Dec. 19	25.52
Oct. 2	23.45	Nov. 17	23.51		

6. T. A. Meakel. NW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 36, T. 21 S., R. 29 W., about 75 feet east of State Highway 23. Unused drilled stock well, diameter 8 inches, depth 26 feet. Measuring point, top of casing at east side, 2.0 feet above land surface. No pipe or pump in well.

Water level, in feet below measuring point, 1939

Sept. 20	18.14	Oct. 26	18.34	Dec. 14	18.58
Oct. 2	18.18	Nov. 13	18.45		

7. Marion Russell. NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 2, T. 26 S., R. 33 W., about 50 feet southwest of ruins of old house. Unused drilled domestic well, diameter 6 inches, depth 86.5 feet. Measuring point, top of casing at southwest side, level with land surface. No pipe or pump in well.

Water level, in feet below measuring point, 1939

Sept. 19	78.09	Oct. 26	78.13	Dec. 18	73.17
Oct. 2	78.10	Nov. 11	78.13		

8. O. G. Reeve. SW $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 13, T. 25 S., R. 33 W., in draw, about 300 feet west of U. S. Highway 83. Abandoned drilled stock well, diameter 6 inches, depth 83 feet. Measuring point, top of casing at south side, 1.5 feet above land surface. No pipe or pump in well.

Water level, in feet below measuring point, 1939

Sept. 21	76.54	Oct. 26	76.57	Dec. 18	76.69
Oct. 2	76.54	Nov. 11	76.57		

9. L. L. Jones. NW $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 2, T. 26 S., R. 34 W., beneath wind-mill tower, about 100 feet south of county road. Unused drilled stock well, diameter 6 inches, depth 73.5 feet. Measuring point, top of casing at northeast side, 1.5 feet above land surface. No pipe or pump in well.

Water level, in feet below measuring point, 1939

Sept. 21	73.23	Oct. 26	73.29	Dec. 18	73.21
Oct. 2	73.15	Nov. 11	73.01		

a Irrigation well about 200 yards east pumping.

b Measured by H. A. Waite, United States Geological Survey; corrected to new measuring point.



10. L. R. McBeth. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 9, T. 24 S., R. 33 W., about 150 feet south of U. S. Highway 50. Unused drilled and driven domestic well, diameter 1.5 inches, depth 92.5 feet. Measuring point, top rim of pump at north side, 2.0 feet above land surface. Equipped with pitcher pump.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Sept. 21	12.62	Oct. 26	12.93	Dec. 18	12.25
Oct. 2	12.64	Nov. 11	a 14.02		

11. P. A. Wiens. NE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 24, T. 22 S., R. 31 W., about 100 feet west-southwest of southwest corner of abandoned house. Unused drilled domestic well, diameter 6 inches, depth 85 feet. Measuring point, top of casing at west side, level with land surface. Equipped with cylinder pump and windmill.

Water level, in feet below measuring point, 1939

Sept. 21	76.70	Oct. 26	76.69	Dec. 18	76.75
Oct. 2	76.70	Nov. 17	76.72		

12. Nellie Handy. NW $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 3, T. 25 S., R. 31 W., about 75 feet south of house on west side of U. S. Highway 50. Unused drilled domestic well, diameter 6 inches, depth 115.5 feet. Measuring point, top of plant beneath pump base, level with land surface. Equipped with cylinder pump and windmill.

Water level, in feet below measuring point, 1939

Sept. 23	107.89	Oct. 26	107.87	Dec. 18	108.01
Oct. 2	107.88	Nov. 17	107.90		

13. Edwin Wehrley. NE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 13, T. 25 S., R. 31 W., south edge of Pierceville, about 30 feet east of county road. Unused dug stock well, diameter 24 inches, depth 5.5 feet. Measuring point, top of casing at east side, 1.0 foot above land surface. No pipe or pump in well.

Water level, in feet below measuring point, 1939

Sept. 23	5.63	Oct. 26	5.22	Dec. 18	4.72
Oct. 2	5.56	Nov. 17	5.02		

14. John A. Hunter. NE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 4, T. 26 S., R. 32 W. Unused drilled domestic well, diameter 6 (?) inches, depth 52.5 feet. Measuring point, top of tin plate covering casing, level with land surface. Equipped with cylinder pump and windmill.

Water level, in feet below measuring point, 1939

Sept. 23	47.53	Oct. 26	47.53	Dec. 18	47.57
Oct. 2	47.53	Nov. 17	47.58		

15. Floyd A. Edwards. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 2, T. 24 S., R. 33 W., about 50 feet north of U. S. Highway 50, southernmost well in battery of 12. Unused drilled irrigation well, diameter 36 inches, depth 24.5 feet. Measuring point, lower edge of west concrete lid at east side, 1.0 foot above land surface. Battery of 12 wells equipped with 8-inch horizontal centrifugal pump.

Water level, in feet below measuring point, 1934, 1939

May 21, 1934	b 13.34	Oct. 2, 1939	14.92	Nov. 11, 1939	14.82
Sept. 26, 1939	14.86	26	14.97	Dec. 18	14.64

16. George L. Meeker. NW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 6, T. 24 S., R. 34 W., about 200 yards south of U. S. Highway 50. Unused drilled domestic well, depth 51 feet. Measuring point, top edge of hole in center of wooden well platform at east side, 1.0 foot above land surface. Equipped with cylinder pump, hand operated.

Water level, in feet below measuring point, 1939

Sept. 26	39.05	Oct. 26	38.92	Dec. 18	39.97
Oct. 2	39.00	Nov. 17	39.39		

- a Probably affected by large irrigation plant about 2 miles northeast.  
b Measured by H. A. Waite, United States Geological Survey.

17. SE $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 7, T. 24 S., R. 33 W., south edge of Holcomb, about 0.3 mile north of river, and about 50 feet east of county road. Unused drilled stock well, diameter 6 inches, depth 10 feet. Measuring point, top of casing at east side, 2.0 feet above land surface. Equipped with cylinder pump and windmill.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Sept. 26	9.73	Oct. 26	9.81	Dec. 18	9.25
Oct. 2	9.77	Nov. 11	9.60		

18. A. Finnup. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 17, T. 24 S., R. 34 W., northernmost well in battery of 7. Abandoned drilled irrigation well, diameter 16 inches, depth 35 feet. Measuring point, lower edge of concrete lid covering well, level with land surface. Equipped with horizontal centrifugal pump.

Water level, in feet below measuring point, 1939

Sept. 26	11.71	Oct. 26	11.79	Dec. 18	12.20
Oct. 2	11.77	Nov. 11	12.05		

19. N. E. Ramsay. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 10, T. 23 S., R. 34 W. Unused drilled domestic and stock well, diameter 6 inches, depth 45.5 feet. Measuring point, lower edge of pump base at south side, 0.5 foot above land surface. Equipped with cylinder pump and windmill.

Water level, in feet below measuring point, 1939

Sept. 26	30.63	Oct. 26	30.80	Dec. 18	31.14
Oct. 2	30.62	Nov. 17	31.01		

20. C. R. Rixon. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 12, T. 23 S., R. 27 W., about 200 feet northeast of house. Unused drilled domestic and stock well, diameter 6 inches, depth 72 feet. Measuring point, lower edge of pump base at north side, 0.5 foot above land surface. Equipped with cylinder pump and windmill.

Water level, in feet below measuring point, 1939

Sept. 27	68.83	Oct. 26	68.83	Dec. 14	68.90
Oct. 2	68.83	Nov. 13	68.83		

21. Lena Ramsey. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 18, T. 23 S., R. 28 W., about 50 feet southeast of house. Unused drilled domestic well, diameter 6 inches, depth 133 feet. Measuring point, lower edge of hole in east side of casing, 0.5 foot above land surface. Equipped with cylinder pump and windmill.

Water level, in feet below measuring point, 1939

Sept. 27	100.33	Oct. 26	100.33	Dec. 14	100.38
Oct. 2	100.33	Nov. 13	100.32		

22. Jacob Eichhorn. NW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 18, T. 24 S., R. 31 W., in field, about 350 yards north of U. S. Highway 50S. Unused drilled stock well, diameter 6 inches, depth 123 feet. Measuring point, top of wooden pipe clamp, 2.0 feet above land surface.

Water level, in feet below measuring point, 1939

Sept. 28	120.14	Oct. 26	120.17	Dec. 18	120.86
Oct. 2	120.14	Nov. 17	120.86		

23. J. E. Ely. SE $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 4, T. 23 S., R. 32 W., about 50 feet north of house. Unused drilled domestic well, diameter 6 inches, depth 59.5 feet. Measuring point, top of hole in metal plate covering casing, 0.5 foot above land surface. Equipped with cylinder pump and windmill.

Water level, in feet below measuring point, 1939

Sept. 28	45.69	Oct. 26	45.74	Dec. 18	45.72
Oct. 2	45.68	Nov. 17	45.78		

24. C. N. Ingle. NE cor. NE $\frac{1}{4}$  sec. 24, T. 21 S., R. 34 W., about 50 feet southeast of stone school house. Unused drilled public supply well, diameter 6 inches, depth 39 feet. Measuring point, top of north pipe clamp, south side, 0.5 foot above land surface. Equipped with cylinder pump and windmill.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Sept. 28	34.52	Oct. 26	34.56	Dec. 18	34.61
Oct. 2	34.52	Nov. 17	34.60		

25. George H. Mack. SW cor. SW $\frac{1}{4}$  sec. 10, T. 24 S., R. 32 W., north well of two wells on east side of earth-filled reservoir. Abandoned drilled well, diameter 6 inches, depth 10.5 feet. Measuring point, top of casing at south side, 3.8 feet above land surface.

Water level, in feet below measuring point, 1939

Sept. 29	9.40	Oct. 26	9.52	Dec. 18	9.82
Oct. 2	9.40	Nov. 17	9.77		

26. Garden City Experiment Station. SW $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 3, T. 24 S., R. 32 W. Unused drilled irrigation well, diameter 26 inches, depth 196 feet. Measuring point, top of steel base plate of pump at west side, 1.0 foot above land surface. Equipped with turbine pump and electric motor.

Water level, in feet below measuring point, 1934, 1939

May 19, 1934	a 69.24	Oct. 26, 1939	72.11	Dec. 18, 1939	71.72
Sept. 30, 1939	72.35	Nov. 17	71.95		

27. Farmers and Bankers Life Insurance Company. SE $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 34, T. 26 S., R. 31 W., about 50 feet north of northwest corner of dug-out house. Unused drilled domestic well, diameter 6 inches, depth 90 feet. Measuring point, top of casing, north side, 0.5 foot above land surface. No pump or pipe in well.

Water level, in feet below measuring point, 1939

Sept. 30	76.17	Oct. 26	76.17	Dec. 18	76.20
Oct. 2	76.17	Nov. 17	76.18		

28. Andrew Layman. SW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 36, T. 24 S., R. 34 W., about 200 feet north of county road. Abandoned drilled stock well, diameter 6 inches, depth 38.5 feet. Measuring point, top of casing, northeast side, 1.0 foot above land surface. Equipped with cylinder pump; no power. Water level, in feet below measuring point, 1939: Dec. 18, 36.98.

a Measured by H. A. Waite, United States Geological Survey.

## FORD COUNTY

By H. A. Waite

The observation-well program in Ford County, Kans., <sup>1/</sup> was continued in 1939 by the Federal Geological Survey in cooperation with the Kansas State Geological Survey and the Division of Sanitation of the Kansas State Board of Health. The investigation in Ford County is being made by the writer, under the general supervision of S. W. Lohman, Federal geologist in charge of ground-water investigations in Kansas.

The inventory of the wells in Ford County was completed August 31, 1939. The altitudes of measuring points of about 370 wells, including all observation wells, were established by means of a plane table in September, October, and November, the instrumental levels being run by D. O. Branson, Everett Johnson, and C. C. Williams. Ten rotary test holes were drilled in the county in November and December by a drilling rig purchased with cooperative funds. Additional test holes will be drilled in the county in 1940.

At the beginning of 1939, water-level measurements were being made in 37 wells. Observations during the year were discontinued on wells 24, 36, 68, and 100 and were begun on wells 13, 32, 68A, 237, 343, and 359. At the end of 1939 the water-level program included 39 observation wells. Three automatic water-stage recorders were maintained on 4 wells. On January 16, 1939, the recorder on well 17 was moved to well 59, in the Arkansas Valley near Howell. After September 5 the recorders on wells 10 and 25 were moved to Scott County, and the recorder on well 59 was moved to Meade County. A total of 468 wetted-tape measurements were made during 1939. Measurements from January 1 to March 31 were made by P. H. Brockhausen; from April 1 to November 9 by the writer; and from November 10 to December 31 by R. B. Christy.

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<sup>1/</sup> See U. S. Geol. Survey Water-Supply Paper 845, pp. 93-100.

## Water-level fluctuations

Of the four wells on which water-stage recorders were operated in 1939, the water levels in three (wells 10, 17, and 59) were affected by changes in atmospheric pressure. Wells 17 and 59 penetrate the Ogallala formation, and well 10 taps the Dakota sandstone. The fourth well (well 25) is shallow and penetrates alluvium; the water level in it responds rapidly to recharge from rainfall and is affected by pumping from nearby irrigation and industrial wells.

Of 33 wells for which water-level measurements are available for the entire year, 5 are on the upland north of the Arkansas Valley, 21 are in the Arkansas Valley, and 7 are on the upland south of the valley. The water levels in all except 2 of the wells showed net declines ranging from 0.11 foot to 1.70 feet from January 3 to December 12-13, 1939. Wells 10 and 60 had net rises in water level of 0.59 and 0.26 foot, respectively. The water levels in 4 of the 5 wells on the upland north of the Arkansas Valley declined an average of 0.63 foot. The difference between the highest and lowest stages reached during the period of record in the 5 wells ranged from 0.55 foot to 2.25 feet, but in 3 of them the difference was less than 1 foot.

Water levels in 20 of the 21 wells in the Arkansas Valley registered an average net decline of 0.68 foot. In this group the difference between the highest and lowest levels reached during the period of record ranged from 0.46 foot to 4.79 feet, but in most of the wells the difference was less than 2 feet. The maximum difference of 4.79 feet occurred in well 79B and was due to heavy pumping nearby. Four wells in the group (wells 72, 76, 79B, and 79C) are in the valley between Dodge City and Fort Dodge and are affected by heavy pumping from nearby irrigation and industrial wells. Water levels in these 4 wells show an average net decline of 1.33 feet for the period January 3 to December 12-13, 1939.

In the same period, water levels in the seven wells on the uplands south of the Arkansas Valley declined an average of 0.29 foot. The difference between the highest and lowest water levels observed during the period of record in the wells ranged from 0.32 foot to 1.75 feet, and in five of the seven wells the difference was less than a foot.

Precipitation at Dodge City in 1939, as reported by the United States Weather Bureau, was 12.98 inches, of which 8.27 inches were recorded during the first half of the year. With precipitation 7.53 inches below normal,

1939 was the ninth driest year of record. During the first 3 months of the year the precipitation was slightly above average, the greatest excess occurring as the result of heavy snowfall near the end of February. From April through December the precipitation was below average, the greatest deficiencies occurring in April, July, September, and October. Precipitation during July was 2.21 inches below normal.

Although water levels in most of the wells in the Arkansas Valley rose only slightly from January through March, nevertheless those in 19 of the 21 wells in the valley reached their highest stage on or about March 31. In April the water levels in most of the wells began a decline that did not end until October or November, at which time the lowest stages of the year were recorded. A part of the decline is believed to be a result of subnormal precipitation, although water levels in many of the wells were affected by pumping also. Water levels in most of these wells rose moderately in December.

The water levels in two wells on the uplands north of the Arkansas Valley, in the northeastern quarter of the county, declined steadily for the entire year. The water level in well 47, in the same part of the county, declined for about 10 months but rose moderately from November through December. The water level in well 10 rose gradually from March until the middle of June; then it declined until the first week in July. A subsequent rise carried the water level to its highest stage on August 19, after which it gradually declined during the rest of the year.

Six of the seven wells on the uplands south of the Arkansas Valley are pumped for irrigation, and hence the fluctuation of water levels in them during the pumping season may not reflect regional fluctuations of ground-water level. Water levels in most of these wells declined until about October 1, after which they rose through December. The water level in the seventh well (well 26) was unaffected by pumping, fluctuated very little from May through October, and showed a slight decline for the year.

#### Well descriptions and water-level measurements

On the following pages are given descriptions of all wells added to the observation-well program in Ford County in 1939, together with records of water levels for all wells under observation during the year. Included for the first time are altitudes of all measuring points. The water-level records are grouped under three headings as follows: (1) Observation wells

on the uplands north of the Arkansas Valley, (2) observation wells in the Arkansas Valley, and (3) observation wells on the uplands south of the Arkansas Valley. Field numbers of the wells are used.

Attention is called to the following sentence at the bottom of page 94, in Water-Supply Paper 845, "Descriptions and measurements within each group are listed in order from east to west." This statement is incorrect and should be deleted.

Observation wells on the uplands north of the Arkansas Valley

10. Ed. Sayre. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 11, T. 25 S., R. 24 W. Measuring point, 2,363.0 feet above sea level. Water level affected by changes in atmospheric pressure. Water-stage recorder removed Sept. 6, 1939; measurements made monthly thereafter. Highest observed water level, 14.49 feet below measuring point Aug. 19, 1939; lowest observed water level, 16.16 feet below measuring point Feb. 16, 1939.

Lowest daily water level, in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	16.04	16.09	16.11	15.61	15.41	15.31	15.82	14.59	14.73	.....	.....	.....
2	16.04	16.11	16.07	15.64	15.42	15.37	15.61	14.64	14.74	bl5.10	.....	.....
3	15.97	16.11	15.97	15.65	15.41	15.40	15.64	14.62	14.79	.....	.....	.....
4	16.04	16.03	15.98	15.62	15.41	15.37	15.60	14.59	14.85	.....	.....	.....
5	16.06	15.99	16.04	15.67	15.34	15.39	al5.59	14.57	bl4.81	.....	.....	.....
6	16.07	16.03	16.08	15.74	15.36	15.42	al5.50	14.56	.....	.....	.....	.....
7	16.12	16.06	16.05	15.67	15.38	15.43	al5.46	14.63	.....	.....	.....	.....
8	16.09	16.10	16.02	15.61	15.44	15.44	al5.42	14.67	.....	.....	bl5.05	.....
9	16.04	16.03	16.05	15.57	15.42	15.43	al5.38	14.65	.....	.....	.....	.....
10	16.07	16.10	15.93	15.68	15.31	15.49	15.34	14.64	.....	.....	.....	.....
11	16.08	16.12	15.99	15.74	15.32	15.50	15.30	14.67	.....	.....	.....	.....
12	16.02	16.12	16.02	15.74	15.33	15.50	15.26	14.67	.....	.....	.....	bl5.38
13	16.03	16.05	15.97	15.63	15.34	15.50	15.21	14.69	.....	.....	.....	.....
14	16.07	16.05	16.06	15.56	15.31	15.45	15.17	14.66	.....	.....	.....	.....
15	16.07	16.04	16.07	15.59	15.27	15.49	15.08	14.66	.....	.....	.....	.....
16	16.00	16.16	16.04	15.61	15.26	15.48	15.01	14.57	.....	.....	.....	.....
17	16.03	16.16	15.99	15.60	15.25	15.80	14.98	14.55	.....	.....	.....	.....
18	16.05	16.12	15.96	15.54	15.26	15.81	14.96	14.50	.....	.....	.....	.....
19	16.05	16.05	15.89	15.54	15.29	15.82	14.94	14.49	.....	.....	.....	.....
20	16.06	16.09	15.94	15.54	15.29	15.82	14.88	14.55	.....	.....	.....	.....
21	16.10	16.09	15.90	15.55	15.38	15.77	14.81	14.51	.....	.....	.....	.....
22	16.13	16.09	15.85	15.48	15.37	15.76	14.79	14.51	.....	.....	.....	.....
23	16.05	16.01	15.82	15.43	15.33	15.77	14.72	14.52	.....	.....	.....	.....
24	16.12	16.04	15.78	15.42	15.35	15.78	14.64	14.53	.....	.....	.....	.....
25	16.12	16.04	15.74	15.45	15.36	15.78	14.61	14.57	.....	.....	.....	.....
26	16.16	16.00	15.78	15.50	15.36	15.80	14.59	14.58	.....	.....	.....	.....
27	16.09	16.00	15.78	15.52	15.35	15.83	14.56	14.56	.....	.....	.....	.....
28	15.96	16.10	15.75	15.50	15.36	15.82	14.56	14.56	.....	.....	.....	.....
29	16.05	.....	15.73	15.49	15.33	15.82	14.57	14.59	.....	.....	.....	.....
30	16.05	.....	15.68	15.44	15.31	15.86	14.57	14.60	.....	.....	.....	.....
31	16.01	.....	15.61	.....	15.32	.....	14.57	14.71	.....	.....	.....	.....

a Interpolated.

b Wetted-tape measurement.

32. John Drewes. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 24, T. 25 S., R. 26 W. Dug and drilled well. Diameter 5 $\frac{1}{2}$  inches, depth 74.3 feet (originally 80 feet). Measuring point, top of 5 $\frac{1}{2}$ -inch iron casing at east side, 0.5 foot above land surface and 2,614.3 feet above sea level. Pumped occasionally with windmill for irrigation. Water levels, in feet below measuring point: Oct. 11, 1938, 68.28; Oct. 19, 1938, 68.16; Nov. 8, 1939, 68.14; Dec. 12, 1939, 68.19.

35. Joseph N. Shean. NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 22, T. 26 S., R. 23 W. Measuring point, 2,451.0 feet above sea level. Highest observed water level, 39.32 feet below measuring point Oct. 12, 1938; lowest observed water level, 40.57 feet below measuring point Dec. 12, 1939.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	39.14	May 4	39.90	Aug. 2	40.11	Nov. 8	40.44
Feb. 1	39.32	June 1	40.01	Sept. 5	40.17	Dec. 12	40.57
Mar. 31	39.31	July 1	40.15	Oct. 2	40.28		

36. R. D. Buell. NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 2, T. 26 S., R. 24 W. Measuring point, 2,507.0 feet above sea level. Measurements discontinued. Casing sealed. Water levels, in feet below measuring point, 1939: Jan. 3, 62.52; Feb. 1, 62.50; June 1, 63.05.

38. F. Burns. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 1, T. 26 S., R. 24 W. Measuring point, 2,474.6 feet above sea level. Highest observed water level, 41.43 feet below measuring point Oct. 12, Oct. 20, and Nov. 1, 1938; lowest water level, 42.01 feet below measuring point Nov. 8 and Dec. 12, 1939.

Water level, in feet below measuring point, 1939

Jan. 3	41.52	May 4	41.76	Aug. 2	41.89	Nov. 8	42.01
Feb. 1	41.49	June 1	41.82	Sept. 5	41.92	Dec. 12	42.01
Mar. 31	41.70	July 1	41.89	Oct. 2	41.96		

41. J. J. Burghardt. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 11, T. 25 S., R. 21 W. Measuring point, 2,312.3 feet above sea level. Highest observed water level, 46.98 feet below measuring point Nov. 1, 1938; lowest observed water level, 47.53 feet below measuring point July 1, 1939.

Water level, in feet below measuring point, 1939

Jan. 3	47.07	Mar. 31	47.26	July 1	47.53	Oct. 2	47.03
Feb. 1	47.25	May 3	47.35	Aug. 1	47.45	Nov. 8	47.12
Mar. 3	47.17	June 1	47.40	Sept. 5	47.13	Dec. 12	47.21

47. R. C. Sturgeon. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 18, T. 25 S., R. 21 W. Measuring point, 2,354.3 feet above sea level. Highest observed water level, 49.76 feet below measuring point Nov. 1, 1938; lowest observed water level, 50.50 feet below measuring point Nov. 8, 1939.

Water level, in feet below measuring point, 1939

Jan. 3	49.85	May 3	50.14	Aug. 2	50.45	Nov. 8	50.50
Feb. 1	49.94	June 1	50.27	Sept. 5	50.46	Dec. 12	50.33
Mar. 31	49.95	July 1	50.40	Oct. 2	50.45		

237. A. T. & S. F. Ry. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 28, T. 25 S., R. 22 W. Unused drilled industrial well, formerly used as railroad supply at Spearville, Kansas. Diameter 10 inches, measured depth 166.5 feet (originally drilled to a depth of 389 feet). Measuring point, painted orange arrow on top of concrete floor at north edge of 2-foot square pit, 0.5 foot above land surface and 2,459.6 feet above sea level. Pump removed. Water levels, in feet, 1939: Apr. 5, 86.49; Nov. 8, 86.92; Dec. 12, 86.63.

343. B. A. Schuette. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 1, T. 26 S., R. 26 W. Unused drilled stock well, diameter 4 $\frac{1}{2}$  inches, depth 132.2 feet. Measuring point, top of 4 $\frac{1}{2}$ -inch iron casing on east side at painted orange arrow, 0.6 foot above land surface and 2,608.7 feet above sea level. Water levels, in feet, 1939: May 15, 76.68; Nov. 8, 76.70; Dec. 12, 76.79.

359. W. C. Gould. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 6, T. 26 S., R. 26 W. Unused drilled stock well, diameter 5 $\frac{1}{2}$  inches, depth 123.4 feet. Measuring point, top of 5 $\frac{1}{2}$ -inch galvanized casing on north side at painted orange arrow, 0.4 foot above land surface and 2,671.7 feet above sea level. Water levels, in feet, 1939: May 19, 109.15; Nov. 8, 109.17; Dec. 12, 109.19.



## Observation wells in the Arkansas Valley

2. L. A. Lamb. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 4, T. 28 S., R. 22 W. Measuring point, 2,386.2 feet above sea level. Highest observed water level, 28.26 feet below measuring point Mar. 3, 1939; lowest observed water level unaffected by pumping, 28.78 feet below measuring point Sept. 5, 1939.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	28.35	Mar. 31	a 28.60	June 30	28.51	Nov. 8	28.61
Feb. 1	28.30	May 3	a 28.91	Sept. 5	28.78	Dec. 12	28.55
Mar. 3	28.26	June 2	a 29.09	Oct. 2	28.65		

a Recently pumped.

8. F. H. Diehl. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 34, T. 26 S., R. 25 W. Measuring point, 2,491.0 feet above sea level. Highest observed water level, 6.84 feet below measuring point Mar. 31, 1939; lowest observed water level, 8.97 feet below measuring point Nov. 7, 1939.

Water level, in feet below measuring point, 1939

Jan. 3	7.13	Mar. 31	6.84	June 30	8.00	Nov. 7	8.97
Feb. 1	7.06	May 3	7.04	Aug. 4	8.20	Dec. 12	7.82
Mar. 2	6.97	June 1	a 7.99	Sept. 5	8.26		

a Recently pumped.

9. Albert Miller. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 16, T. 26 S., R. 26 W. Measuring point, 2,544.9 feet above sea level. Highest observed water level, 7.01 feet below measuring point Mar. 31, 1939; lowest observed water level, 9.71 feet below measuring point Sept. 5, 1939.

Water level, in feet below measuring point, 1939

Jan. 3	7.24	Mar. 2	7.02	May 3	7.81	Oct. 2	9.45
Feb. 1	7.18	31	7.01	Sept. 5	9.71	Nov. 7	8.36

11. Geo. W. Molitor. SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 36, T. 21 S., R. 21 W. Measuring point, 2,279.7 feet above sea level. Highest observed water level, 12.78 feet below measuring point Oct. 5, 1938; lowest observed water level, 13.24 feet below measuring point Dec. 12, 1939.

Water level, in feet below measuring point, 1939

Jan. 3	12.92	Mar. 31	12.89	July 1	12.89	Oct. 2	13.12
Feb. 1	12.94	May 3	12.90	Aug. 1	12.98	Nov. 8	13.18
Mar. 3	12.95	June 1	12.93	Sept. 5	13.06	Dec. 12	13.24

24. Jess Staggs. NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 32, T. 26 S., R. 24 W. Measuring point, 2,475.0 feet above sea level. Measurements discontinued after June 1, 1939.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 3	22.79	Mar. 2	21.94	May 3	(a)
Feb. 1	22.80	31	21.84	June 1	(a)

a Pumping.

25. Judge Karl Miller. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 2, T. 27 S., R. 24 W. Measuring point, 2,448.7 feet above sea level. Water-stage recorder removed Sept. 6, 1939; measurements made monthly thereafter. Highest observed water level, 11.14 feet below measuring point May 27, 1939; lowest observed water level, 12.11 feet below measuring point Nov. 8, 1939.

## 25. Judge Karl Miller--Continued

Lowest daily water level, in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	11.61	11.52	11.59	11.32	11.64	11.41	11.77	11.35	11.87	.....	.....	.....
2	11.61	11.52	11.59	11.32	11.64	11.46	.....	.....	11.88	11.99	.....	.....
3	11.61	11.52	11.60	11.32	11.64	11.47	.....	.....	11.91	.....	.....	.....
4	11.62	11.53	11.60	11.33	11.65	11.49	.....	.....	11.92	.....	.....	.....
5	11.62	11.53	11.61	11.36	11.65	11.50	.....	.....	11.92	.....	.....	.....
6	11.60	11.55	11.61	11.36	11.67	11.53	.....	.....	.....	.....	.....	.....
7	11.60	11.56	11.60	11.35	11.67	11.55	.....	11.64	.....	.....	.....	.....
8	11.58	11.56	11.57	11.35	11.67	11.57	.....	11.66	.....	.....	.....	.....
9	11.56	11.56	11.55	11.37	11.67	11.59	.....	11.69	.....	.....	12.11	.....
10	11.56	11.57	11.51	11.42	11.65	11.60	11.54	11.72	.....	.....	.....	.....
11	11.55	11.58	11.48	11.43	11.64	11.62	11.57	11.74	.....	.....	.....	.....
12	11.53	11.58	11.47	11.44	11.64	11.63	11.59	11.77	.....	.....	.....	.....
13	11.52	11.59	11.44	11.43	11.66	11.64	11.61	11.79	.....	.....	.....	12.09
14	11.52	11.59	11.42	11.44	11.67	11.63	11.64	11.81	.....	.....	.....	.....
15	11.52	11.58	11.41	11.46	11.69	11.59	11.66	11.82	.....	.....	.....	.....
16	11.50	11.60	11.39	11.47	11.70	11.59	11.68	11.84	.....	.....	.....	.....
17	11.50	11.60	11.37	11.48	11.71	11.60	11.72	11.85	.....	.....	.....	.....
18	11.50	11.57	11.35	11.48	11.70	11.58	11.74	11.86	.....	.....	.....	.....
19	11.50	11.56	11.32	11.48	11.68	11.61	11.76	11.88	.....	.....	.....	.....
20	11.50	11.56	11.30	11.51	11.65	11.56	11.77	11.89	.....	.....	.....	.....
21	11.50	11.55	11.29	11.51	11.65	11.62	11.79	11.89	.....	.....	.....	.....
22	11.50	11.55	11.28	11.52	11.66	11.65	11.81	11.70	.....	.....	.....	.....
23	11.50	11.56	11.28	11.53	11.68	11.66	11.82	11.61	.....	.....	.....	.....
24	11.50	11.57	11.28	11.54	11.64	11.69	11.82	11.52	.....	.....	.....	.....
25	11.50	11.57	11.28	11.56	11.40	11.72	11.82	11.60	.....	.....	.....	.....
26	11.50	11.56	11.29	11.58	11.32	11.73	11.82	11.65	.....	.....	.....	.....
27	11.48	11.59	11.29	11.59	11.14	11.74	11.77	11.70	.....	.....	.....	.....
28	11.49	11.59	11.30	11.61	11.15	11.76	11.51	11.76	.....	.....	.....	.....
29	11.51	.....	11.31	11.61	11.23	11.77	11.16	11.80	.....	.....	.....	.....
30	11.50	.....	11.30	11.62	11.29	11.77	11.17	11.82	.....	.....	.....	.....
31	11.49	.....	11.31	.....	11.35	.....	11.28	11.85	.....	.....	.....	.....

a Wetted-tape measurement.

43. Ralph Williams. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 10, T. 27 S., R. 25 W. Measuring point, 2,540.1 feet above sea level. Highest observed water level, 62.20 feet below measuring point Nov. 15, 1938; lowest observed water level, 62.70 feet below measuring point Oct. 2, 1939.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	62.24	May 2	a 63.22	Aug. 1	62.45	Nov. 8	62.68
Feb. 1	62.25	June 30	62.44	Sept. 5	62.40	Dec. 13	62.52
Mar. 31	62.22	July 22	62.36	Oct. 2	62.70		

a Recently pumped.

48. G. D. Cochran. NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 16, T. 27 S., R. 23 W. Measuring point, 2,404.0 feet above sea level. Highest observed water level, 9.32 feet below measuring point Mar. 31, 1939; lowest observed water level, 10.85 feet below measuring point Oct. 2, 1939.

Water level, in feet below measuring point, 1939

Jan. 3	9.78	Mar. 31	9.32	June 30	10.69	Oct. 2	10.85
Feb. 1	9.61	May 3	9.88	Aug. 1	10.71	Nov. 8	10.74
Mar. 3	9.50	June 1	10.54	Sept. 5	10.62	Dec. 12	10.39

52. John A. Matthews (former owner); Dwight Zink (new owner). SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 29, T. 26 S., R. 25 W. Measuring point, 2,504 feet above sea level. Highest observed water level, 2.42 feet below measuring point Mar. 31, 1939; lowest observed water level, 3.48 feet below measuring point Aug. 9, 1939.

Water level, in feet below measuring point, 1939

Jan. 3	2.56	Mar. 31	2.42	Aug. 9	3.48	Dec. 12	3.03
Feb. 1	2.58	July 18	3.06	Oct. 2	3.37		

53. Chas. Staples. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 30, T. 26 S., R. 25 W. Measuring point, 2,507.3 feet above sea level. Highest observed water level, 4.80 feet below measuring point Mar. 31, 1939; lowest observed water level, 5.69 feet below measuring point Sept. 5, 1939.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	4.97	Mar. 31	4.80	Sept. 5	5.69	Nov. 7	5.34
Feb. 1	4.95	Aug. 4	5.60	Oct. 2	5.58	Dec. 12	5.42

57. Andrew Bogner. NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 22, T. 26 S., R. 26 W. Measuring point, 2,534.6 feet above sea level. Highest observed water level, 8.76 feet below measuring point Oct. 21, 1938; lowest observed water level, 10.93 feet below measuring point Oct. 2, 1939.

Water level, in feet below measuring point, 1939

Jan. 3	9.09	Mar. 31	8.91	June 30	9.43	Oct. 2	10.93
Feb. 1	9.08	May 3	9.04	Aug. 4	10.14	Nov. 7	9.91
Mar. 2	9.07						

59. Ward Byers estate. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 21, T. 26 S., R. 26 W. Altitude of measuring point, 2,551.5 feet above sea level. Equipped with Stevens 8-day automatic water-stage recorder from Jan. 23 to Aug. 28, 1939. Water level affected by changes in atmospheric pressure. Highest observed water level, 17.43 feet below measuring point Mar. 25, 1939; lowest observed water level, 18.21 feet below measuring point Sept. 5, 1939.

Lowest daily water level, in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	17.60	17.58	17.52	17.62	18.05	17.91	17.97	.....	.....	.....	.....
2	.....	17.60	17.51	17.58	17.75	18.01	17.81	18.09	.....	18.08	.....	.....
3	17.46	17.60	17.46	17.53	17.81	18.00	17.80	18.03	.....	.....	.....	.....
4	.....	17.57	17.46	17.52	17.82	17.94	.....	18.08	.....	.....	.....	.....
5	.....	17.56	17.53	17.53	17.83	17.88	.....	18.09	18.21	.....	.....	.....
6	.....	17.58	17.53	17.60	17.84	17.89	.....	18.09	.....	.....	.....	.....
7	.....	17.59	17.52	17.52	17.84	17.86	.....	18.10	.....	18.04	.....	.....
8	.....	17.60	17.48	17.49	17.90	17.86	.....	18.15	.....	.....	.....	.....
9	.....	17.54	17.52	17.47	17.92	17.82	.....	18.17	.....	.....	.....	.....
10	.....	17.59	17.46	17.57	17.95	17.85	17.90	18.20	.....	.....	.....	.....
11	.....	17.60	17.45	17.61	17.94	17.85	17.95	18.17	.....	.....	.....	.....
12	.....	17.59	17.46	17.58	17.96	17.90	17.97	18.03	.....	.....	18.04	.....
13	.....	17.56	17.46	17.51	17.96	17.98	17.98	17.99	.....	.....	.....	.....
14	.....	17.55	17.50	17.52	17.94	17.98	17.99	17.94	.....	.....	.....	.....
15	.....	17.55	17.50	17.53	17.85	17.99	18.00	17.94	.....	.....	.....	.....
16	.....	17.62	17.49	17.54	17.90	17.99	18.00	17.95	.....	.....	.....	.....
17	.....	17.62	17.52	17.60	17.95	17.96	18.00	17.94	.....	.....	.....	.....
18	.....	17.58	17.59	17.62	17.96	17.97	18.04	17.94	.....	.....	.....	.....
19	.....	17.59	17.48	17.57	17.93	18.02	18.04	17.95	.....	.....	.....	.....
20	.....	17.60	17.51	17.61	18.05	18.02	18.05	17.94	.....	.....	.....	.....
21	.....	17.59	17.50	17.60	18.05	18.08	18.11	17.88	.....	.....	.....	.....
22	.....	17.58	17.48	17.60	17.94	18.07	18.13	17.88	.....	.....	.....	.....
23	17.52	17.52	17.48	17.58	18.00	18.02	18.06	17.89	.....	.....	.....	.....
24	17.61	17.59	17.47	17.60	18.04	18.04	18.00	17.85	.....	.....	.....	.....
25	17.59	17.54	17.43	17.61	18.05	18.04	18.06	17.87	.....	.....	.....	.....
26	17.61	17.52	17.54	17.65	18.04	17.98	18.10	17.87	.....	.....	.....	.....
27	17.55	17.51	17.52	17.64	18.09	17.96	18.11	17.87	.....	.....	.....	.....
28	17.50	17.58	17.54	17.66	18.08	18.00	18.12	17.86	.....	.....	.....	.....
29	17.56	.....	17.51	17.64	17.99	18.01	18.11	.....	.....	.....	.....	.....
30	17.55	.....	17.51	17.65	18.02	17.97	18.11	.....	.....	.....	.....	.....
31	17.49	.....	17.52	.....	18.05	.....	17.99	.....	.....	.....	.....	.....

a Wetted-tape measurement.

60. Maurice H. Thompson (first name spelled incorrectly in Water-Supply Paper 845). NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 21, T. 26 S., R. 26 W. (incorrectly given as NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 21, T. 26 N., R. 26 W. in Water-Supply Paper 845). Measuring point, 2,542.8 feet above sea level. Highest observed water level, 6.66 feet below measuring point May 3, 1939; lowest observed water level, 8.62 feet below measuring point Nov. 15, 1938.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	7.74	Mar. 2	7.70	May 3	6.66	Aug. 8	8.50
Feb. 1	7.76	31	7.45	June 30	7.48	Dec. 12	7.48

65. John N. Clark. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 33, T. 26 S., R. 25 W. Measuring point, 2,511.0 feet above sea level. Measuring point after Aug. 1, 1939, 0.1 foot higher than the original measuring point; description remains the same. Highest observed water level, 17.59 feet below measuring point Mar. 2, 1939; lowest observed water level, 18.70 feet below measuring point Oct. 2, 1939.

Water level, in feet below measuring point, 1939

Jan. 3	17.67	Mar. 31	17.61	June 30	18.18	Nov. 8	18.58
Feb. 1	17.65	May 2	17.76	Oct. 2	a 18.80	Dec. 13	13.46
Mar. 2	17.59	June 1	18.14				

a Measuring point raised 0.1 foot.

68. Mrs. R. E. Pennington. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 1, T. 27 S., R. 26 W. Measuring point, 2,568.6 feet above sea level. Measurements discontinued after February 1, 1939. Water level, in feet, 1939: Jan. 3, 56.20.

68A. Mrs. R. E. Pennington. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 1, T. 27 S., R. 26 W., situated 28 feet south of well 68. Unused drilled well, diameter 6 inches, depth 66.8 feet. Measuring point, top of 6-inch galvanized-iron casing on north side at painted orange arrow, 0.3 foot above land surface and 2,567.4 feet above sea level.

Water level, in feet below measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
Oct. 24, 1938	55.92	June 30, 1939	56.04	Oct. 2, 1939	56.09
May 2, 1939	56.10	Aug. 1	a 57.20	Nov. 8	56.11
June 1	56.03	Sept. 5	b 56.45	Dec. 13	56.14

a Well 68 pumping.

b Well 68 shut down one hour before measurement.

72. H. Wilkinson. SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 32, T. 26 S., R. 24 W. Measuring point, 2,487.8 feet above sea level. Highest observed water level, 33.61 feet below measuring point Jan. 3, 1939; lowest observed water level unaffected by pumping, 35.20 feet below measuring point Nov. 8, 1939.

Water level, in feet below measuring point, 1939

Jan. 3	33.61	May 3	b 34.92	Nov. 8	35.20
Feb. 1	a 34.64	June 1	a 35.23	Dec. 12	35.03
Mar. 31	34.31	Aug. 1	a 36.04		

a Recently pumped.

b Pump shut down one hour before measurement.

76. William R. Cook. NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 32, T. 26 S., R. 24 W. Measuring point, 2,487.8 feet above sea level. Highest observed water level, 27.66 feet below measuring point Mar. 31, 1939; lowest observed water level, 29.51 feet below measuring point Nov. 8, 1939.

Water level, in feet below measuring point, 1939

Jan. 3	27.98	Mar. 31	27.66	Dec. 12	29.13
Feb. 1	27.78	Nov. 8	29.51		

79B. O. N. Nevins. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 23, T. 26 S., R. 24 W., 5 feet north of well 79C. Taps water in Ogallala formation. Measuring point, 2,453.6 feet above sea level. Highest observed water level, 11.30 feet below measuring point Dec. 2, 1938; lowest observed water level, 16.09 feet below measuring point Aug. 1, 1939.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	11.45	May 3	13.52	Aug. 1	a 16.09	Nov. 8	13.03
Feb. 1	12.78	June 1	14.63	Oct. 2	13.48	Dec. 12	13.15
Mar. 31	12.24	30	a 15.36				

a Affected by pumping from nearby irrigation and industrial wells.

79C. O. N. Nevins. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 23, T. 26 S., R. 24 W., 5 feet south of well 79B. Taps water in alluvium. Measuring point, 2,453.9 feet above sea level. Highest observed water level, 8.97 feet below measuring point Mar. 31, 1939; lowest observed water level, 10.69 feet below measuring point Oct. 2, 1939.

Water level, in feet below measuring point, 1939

Jan. 3	9.18	May 3	9.12	Aug. 1	9.93	Nov. 8	10.40
Feb. 1	9.00	June 1	9.55	Oct. 2	10.69	Dec. 12	10.22
Mar. 31	8.97	30	9.78				

86. G. D. Cochran. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 23, T. 27 S., R. 23 W., first well south of the pumphouse. Measuring point, top of square concrete curb on south side at painted orange arrow, level with land surface and 2,392.3 feet above sea level. Highest observed water level, 7.77 feet below measuring point Mar. 31, 1939; lowest observed water level, 9.34 feet below measuring point Aug. 1, 1939.

Water level, in feet below measuring point, 1939

Jan. 3	7.93	May 3	a 12.68	Aug. 1	9.34	Nov. 8	8.57
Feb. 1	7.94	June 2	8.66	Sept. 5	b 8.60	Dec. 12	8.51
Mar. 31	7.77	30	b 11.17	Oct. 2	8.60		

a Pumping.

b Recently pumped.

89. E. V. Melia. SE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 11, T. 28 S., R. 22 W. Measuring point, 2,375.7 feet above sea level. Highest observed water level, 25.20 feet below measuring point Mar. 31, 1939; lowest observed water level unaffected by pumping, 26.11 feet below measuring point Aug. 1, 1939.

Water level, in feet below measuring point, 1939

Jan. 3	25.69	May 3	25.67	Aug. 1	26.11	Nov. 8	25.91
Feb. 1	25.68	June 2	a 26.11	Oct. 2	26.04	Dec. 12	25.82
Mar. 31	25.20	30	25.62				

a Pumped on June 1.

96. Henry Hattrup (surname misspelled in Water-Supply Paper 845). SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 23, T. 26 S., R. 21 W. Measuring point, 2,263.2 feet above sea level. Highest observed water level, 10.51 feet below measuring point Mar. 31, 1939; lowest observed water level, 11.02 feet below measuring point Sept. 5, 1939.

Water level, in feet below measuring point, 1939

Jan. 3	10.46	Mar. 31	10.41	Aug. 1	10.82	Nov. 8	10.80
Feb. 1	10.47	June 1	10.68	Sept. 5	11.02	Dec. 12	10.82
Mar. 3	10.47	July 1	10.57	Oct. 2	10.82		

101. Warner Jochems. NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 2, T. 27 S., R. 21 W. Measuring point, 2,283.1 feet above sea level. Highest observed water level, 9.34 feet below measuring point Mar. 31, 1939; lowest observed water level, 9.99 feet below measuring point Oct. 2, 1939.

Water level, in feet below measuring point, 1939

Jan. 3	9.53	Mar. 31	9.34	July 1	9.48	Oct. 2	9.99
Feb. 1	9.50	May 3	9.44	Aug. 1	9.66	Nov. 8	9.98
Mar. 3	9.46	June 1	9.54	Sept. 5	9.89	Dec. 12	9.93

Observation wells on the uplands south of the Arkansas Valley

4. John E. Wagner. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 7, T. 27 S., R. 26 W. Measuring point, 2,655.6 feet above sea level. Highest observed water level, 103.62 feet below measuring point Nov. 15 and Dec. 2, 1938; lowest observed water level unaffected by pumping, 103.94 feet below measuring point Oct. 2, 1939.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	103.64	May 2	103.66	July 26	103.92	Oct. 2	103.94
Feb. 1	103.67	June 1	103.76	Aug. 1	103.83	Nov. 7	103.82
Mar. 31	103.63	30	103.72	Sept. 5 a	104.55	Dec. 12	103.83

a Pumped on Sept. 4.

5. W. S. Johnson. SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 6, T. 27 S., R. 26 W. Highest observed water level, 95.89 feet below measuring point Jan. 3, 1939; lowest observed water level unaffected by pumping, 96.70 feet below measuring point Oct. 2, 1939.

Water level, in feet below measuring point, 1939

Jan. 3	95.89	May 2 a	96.35	Aug. 1	96.03	Nov. 7	96.12
Feb. 1	95.90	June 1 a	96.86	Sept. 5	96.65	Dec. 12	96.08
Mar. 31	95.92	30	96.13	Oct. 2	96.70		

a Irrigation well 200 feet northeast pumping.

6. Joseph Lutz. NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 15, T. 29 S., R. 26 W. Measuring point, 2,556.2 feet above sea level. Highest observed water level, 45.42 feet below measuring point Nov. 1, 1938; lowest observed water level, 45.88 feet below measuring point Oct. 2, 1939.

Water level, in feet below measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
Nov. 1, 1938	45.42	Mar. 31, 1939	45.51	Aug. 1, 1939	45.81
Jan. 3, 1939	45.47	May 2	45.52	Oct. 2	45.88
Feb. 1	45.50	June 30	45.76	Nov. 9	45.75
Mar. 2	45.48	July 27	45.77	Dec. 13	45.58

7. W. A. Long. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 35, T. 29 S., R. 26 W. Measuring point, 2,530.3 feet above sea level. Highest observed water level, 22.38 feet below measuring point Mar. 31, 1939; lowest observed water level, 23.57 feet below measuring point Sept. 5, 1939.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	22.47	Mar. 31	22.38	Aug. 1	22.76	Nov. 9	22.90
Feb. 1	22.49	May 2	22.46	Sept. 5	23.57	Dec. 13	22.85
Mar. 2	22.46	June 30	22.94	Oct. 2	23.46		

13. Ira Paulin. SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 9, T. 28 S., R. 23 W. Drilled irrigation well, diameter 16 inches, depth 116 feet. Measuring point, top of small oval hole in base of pumphead, 0.4 foot above land surface and 2,496.2 feet above sea level.

Water level, in feet below measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
Oct. 20, 1938	85.57	June 29, 1939	85.61	Nov. 8, 1939	85.64
Dec. 7	85.51	Aug. 5	85.81	Dec. 12	85.64
May 4, 1939	86.52				

15. George Lutz. SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 24, T. 29 S., R. 26 W. Measuring point, 2,540.4 feet above sea level. Highest observed water level, 35.17 feet below measuring point Jan. 3, 1939; lowest observed water level, 36.92 feet below measuring point Sept. 5, 1939.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	35.17	Mar. 31	35.47	June 30	35.66	Oct. 2	36.20
Feb. 1	35.21	May 2	35.19	Aug. 1	36.61	Nov. 9	35.60
Mar. 2	35.47	June 1	35.40	Sept. 5	36.92	Dec. 13	35.54

17. E. B. Spahr. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 17, T. 29 S., R. 24 W. Measuring point to March 6, 1939, brass plate at edge of square opening in 4-foot square wooden platform, 0.8 foot above land surface. Measuring point since March 6, 1939, top of 1-inch hole in pumphead base just south of drive-shaft housing, 0.8 foot above old measuring point, 1.6 feet above land surface and 2,590.2 feet above sea level. Recorder removed Jan. 16, 1939. Well is now used for irrigation. Highest observed water level, (referred to new measuring point) 135.29 feet below measuring point Jan. 23, 1939; lowest observed water level 135.76 feet below measuring point Dec. 13, 1939.

Lowest daily water level, in feet below measuring point, 1939

Jan. 1	134.67	Jan. 7	134.74	Jan. 13	134.72	Mar. 6	a 135.48
2	134.62	8	134.60	14	134.80	27	a 135.38
3	134.63	9	134.80	15	134.73	June 28	a 135.70
4	134.78	10	134.76	16	a 134.58	Nov. 9	a 135.71
5	134.75	11	134.71	23	a 134.49	Dec. 13	a 135.76
6	134.74	12	134.66	30	a 134.56		

a Wetted-tape measurement.

b Measuring point raised 0.8 foot.

26. M. L. Gilliom. NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 25, T. 28 S., R. 21 W. Measuring point, 2,375.8 feet above sea level. Highest observed water level, 83.11 feet below measuring point Jan. 3, 1939; lowest observed water level, 83.54 feet below measuring point Dec. 12, 1939.

Water level, in feet below measuring point, 1939

Jan. 3	83.11	Mar. 31	83.34	June 30	83.44	Oct. 2	83.44
Feb. 1	83.37	May 3	83.42	Aug. 1	83.44	Nov. 8	83.48
Mar. 3	83.36	June 1	83.44	Sept. 5	83.42	Dec. 12	83.54

100. J. E. Bunnell. SE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 21, T. 27 S., R. 26 W. Measuring point, 2,672.4 feet above sea level. Measurements discontinued May 2, 1939. Well partly filled with stones.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 3	131.04	Mar. 2	131.00	May 2	131.00
Feb. 1	131.11	31	131.04		

## GRAY COUNTY

By B. F. Latta

In October 1939 an observation-well program was started in Gray County, Kans., by the Federal Geological Survey in cooperation with the Kansas State Geological Survey and the Kansas State Board of Health. The work was done under the direction of S. W. Lohman, Federal geologist in charge of ground-water investigations in Kansas.

Gray County is in the southwestern part of the State and is a part of the Great Plains province. With the exception of an area of sand hills south of the Arkansas River, which has a dune topography, the county has a flat to rolling surface. It is underlain by sands, gravels, silts, and clays of the Ogallala formation of Tertiary age, by Quaternary dune sand, and by alluvium. Most of the wells in the county obtain water from the Ogallala formation. The alluvium, however, is more productive than the Ogallala and yields water to many irrigation wells in the Arkansas Valley. The dune sand is unimportant as a water-bearing formation.

At the end of the year 26 wells, of which 6 are in the Arkansas Valley, were being measured monthly by the wetted-tape method. A total of 100 individual measurements were made from October 5 to December 31, 1939. Measurements from October 5 to November 8 were made by the writer; those on and after November 8, by R. B. Christy.

In 1939 the precipitation recorded by the United States Weather Bureau at Cimarron, Gray County, was 6.91 inches below normal. Of the 26 observation wells, only well 26 has been under observation for a sufficient period to permit a correlation to be made of the fluctuations in water level in it with the precipitation. The water level in this well declined 7.36 foot from October 11, 1938, to December 14, 1939.

#### Well descriptions and water-level measurements

On the following pages are given descriptions and water levels for the 26 observation wells in Gray County listed numerically according to field number. Water levels are given in feet below the measuring point at each well.

1. G. A. Hard. NW $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 20, T. 25 S., R. 29 W., about 150 feet south of railroad track and about 0.25 mile east-southeast of farm house. Unused drilled stock well, diameter 5.5 inches, depth 11.5 feet. Measuring point, top of casing at south side, 1.0 foot above land surface. Equipped with cylinder pump and windmill. Water levels, in feet below measuring point, 1939: Oct. 5, 8.34; Oct. 18, 8.35; Nov. 17, 8.22; Dec. 14, 7.93.



3. N. A. Mans. NE $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 7, T. 28 S., R. 27 W., about 200 feet southwest of barn. Unused drilled stock well, depth 201 feet. Measuring point, lower edge of 2-inch board beneath pump at north side, level with land surface. Equipped with force pump and windmill. Water levels, in feet below measuring point, 1939: Oct. 6, 165.03; Oct. 18, 164.98; Nov. 13, 164.70; Dec. 14, 164.76.

4. F. Luther. NW $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 10, T. 26 S., R. 28 W., about 30 feet south of old United States Highway 50S and about 1 mile west of Cimarron, Kansas. Unused drilled irrigation well, diameter 24 inches, depth 58 feet. Measuring point, top of west steel cross-bar pump support at west side, 2.0 feet below land surface. Equipped with turbine pump and electric motor. Water levels, in feet below measuring point, 1939: Oct. 6, 18.37; Oct. 18, 18.20; Nov. 13, 18.04; Dec. 14, 17.89.

6. S. Dirks. SE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 5, T. 28 S., R. 29 W., in field about 100 yards west of north-south section road and about 50 feet north of demolished house. Abandoned drilled well, diameter 5.5 inches, depth 91 feet. Measuring point, top of casing at east side, 0.5 foot above land surface. No pump in well. Water levels, in feet below measuring point, 1939: Oct. 6, 88.19; Oct. 18, 88.20; Nov. 17, 88.22; Dec. 14, 88.21.

7. P. Brietenbach et al. SE $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 36, T. 26 S., R. 29 W., about 100 feet north of northeast corner of abandoned house. Unused drilled domestic well, diameter 5.5 inches, depth 85.5 feet. Measuring point, top of west pipe clamp at west side, 1.0 foot above land surface. Equipped with force pump. Water levels, in feet below measuring point, 1939: Oct. 6, 78.48; Oct. 18, 78.47; Nov. 17, 78.54; Dec. 14, 78.56.

8. ----- NW $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 11, T. 26 S., R. 28 W., in Cimarron, Kansas, about 0.1 mile north of Arkansas River, about 0.1 mile south of welding shop, and about 100 feet east of State Highway 23, behind abandoned house. Unused driven domestic well, diameter 2 inches, depth 15.5 feet. Measuring point, top inside edge of pump spout, 2.5 feet above land surface. Equipped with pitcher pump. Water levels, in feet below measuring point, 1939: Oct. 7, 10.70; Oct. 18, 10.63; Nov. 13, 10.47; Dec. 14, 10.24.

9. L. Naftziger. NE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 24, T. 24 S., R. 29 W. Unused drilled domestic well, diameter 6 inches, depth 101 (?) feet. Measuring point, hole in west side of pump jacket, 1.5 feet above land surface. Equipped with hand pump and windmill. Water levels, in feet below measuring point, 1939: Oct. 10, 90.88; Oct. 18, 90.87; Nov. 13, 90.86; Dec. 14, 90.92.

11. J. D. Wetmore. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 35, T. 29 S., R. 28 W., in draw about 200 feet west of State Highway 23 and about 300 feet northwest of bridge. Abandoned drilled stock well, diameter 5.5 inches, depth 61 feet. Measuring point, top of casing at east side, 1.0 foot above land surface. No pump in well. Water levels, in feet below measuring point, 1939: Oct. 10, 59.64; Oct. 18, 59.63; Nov. 13, 59.70; Dec. 14, 59.73.

12. Mary Hill. SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 26, T. 28 S., R. 27 W., about 100 feet east of abandoned farm house. Unused drilled domestic well, diameter 6 inches, depth 138 feet. Measuring point, top of casing at east side, 0.5 foot above land surface. Equipped with force pump and windmill. Water levels, in feet below measuring point, 1939: Oct. 10, 134.24; Oct. 18, 133.89; Nov. 13, 133.65; Dec. 14, 133.77.

13. G. Bowser. SW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 24, T. 24 S., R. 28 W., about 5 feet south of shed and about 50 feet south of house. Unused drilled domestic well, diameter 6 inches, depth 94 feet. Measuring point, top of north pipe clamp at south side, 0.8 foot above land surface. Equipped with cylinder pump and windmill. Water levels, in feet below measuring point, 1939: Oct. 11, 77.85; Oct. 18, a/79.73; Nov. 13, 79.35; Dec. 14, 77.88.

14. Sarah Marney. SE cor. SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 25, T. 29 S., R. 27 W., about 100 feet southwest of southwest corner of old shack. Unused drilled domestic well, diameter 3 inches, depth 51.5 feet. Measuring point, top of casing at west side, 0.5 foot above land surface. Equipped with force pump.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
June 21	46.16	Oct. 18	46.27	Dec. 14	46.21
Oct. 11	46.20	Nov. 13	46.49		

a Pumped just prior to measurement.

15. N. C. Diven. Center NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 17, T. 25 S., R. 30 W., about 20 feet north of stucco house on north side of United States Highway 50S. Unused drilled domestic and stock well, diameter 6 inches, depth 43.1 feet. Measuring point, top of 1 by 6-inch board on west side of pipe, 1.2 feet above land surface. Equipped with cylinder pump and windmill. Water levels, in feet below measuring point, 1939: Oct. 12, 36.34; Oct. 18, 36.86; Nov. 17, 37.01; Dec. 14, 36.95.
16. Ed Wallace. NE cor. NW $\frac{1}{4}$  sec. 19, T. 29 S., R. 30 W., about 30 feet southwest of southwest corner of house. Unused drilled domestic well, diameter 5.5 inches, depth 142 feet. Measuring point, top of casing at east side, 0.5 foot above land surface. Equipped with force pump and windmill. Water levels, in feet below measuring point, 1939: Oct. 12, 139.03; Oct. 18, 138.37; Nov. 13, 138.36; Dec. 14, 138.33.
17. V. E. Yeager. NE cor. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 31, T. 28 S., R. 29 W., about 50 feet west of house. Unused drilled domestic and stock well, diameter 6 inches, depth 103.5 feet. Measuring point, southeast bolt hole in pump base, 0.4 foot above land surface. Equipped with force pump and windmill. Water levels, in feet below measuring point, 1939: Oct. 12, 85.02; Oct. 18, 85.02; Nov. 13, 85.08; Dec. 14, 85.10.
18. W. H. Mace. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 25, T. 29 S., R. 29 W., about 20 feet south of southeast corner of schoolhouse. Abandoned drilled school well, diameter 5 inches, depth 57.6 feet. Measuring point, top of casing at south side, 0.8 foot above land surface. No pump in well. Water levels, in feet below measuring point, 1939: Oct. 12, 49.79; Oct. 18, 49.73; Nov. 13, 49.77; Dec. 14, 49.76.
19. M. E. Kraushaar. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 35, T. 25 S., R. 29 W., about 100 feet northwest of railroad bridge. Unused driven stock well, diameter 1 $\frac{1}{4}$  inches, depth 17.5 feet. Measuring point, top of 1 $\frac{1}{4}$ -inch pipe at east side, 1.5 feet above land surface. No pump. Windmill tower over well. Water levels, in feet below measuring point, 1939: Oct. 13, 14.87; Oct. 18, 14.83; Nov. 17, 14.70; Dec. 14, 14.60.
20. R. and E. Fischer. SE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 23, T. 25 S., R. 30 W., about 100 feet south of railroad tracks. Northernmost well in battery of six. Unused drilled irrigation well, diameter 18 inches, depth 35.6 feet. Measuring point, top of inside hub of old wagon wheel covering casing, at west side, 0.5 foot above land surface. Battery of 6 wells equipped with horizontal centrifugal pump and stationary engine. Water levels, in feet below measuring point, 1939: Oct. 13, 21.90; Oct. 18, 21.92; Nov. 17, 21.96; Dec. 14, 21.90.
21. C. M. Davis. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 7, T. 26 S., R. 29 W., about 150 feet east of section road. Unused drilled stock well, diameter 6 inches, depth 100.4 feet. Measuring point, top of north pipe clamp at south side, 1.0 foot above land surface. Equipped with cylinder pump and windmill. Water levels, in feet below measuring point, 1939: Oct. 13, 89.83; Oct. 18, 89.79; Nov. 17, 89.78; Dec. 14, 89.83.
22. C. Salem. SW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 15, T. 27 S., R. 27 W., 1 foot west of concrete tank. Unused drilled domestic well, diameter 4 inches, depth 139 feet. Measuring point, top of iron casing at west side, 0.5 foot above land surface. Equipped with cylinder pump. Water levels, in feet below measuring point, 1939: Oct. 13, 127.01; Oct. 18, 126.93; Nov. 13, 126.93; Dec. 14, 127.02.
23. Fry. NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 24, T. 28 S., R. 29 W., in Montezuma, 10 feet south of yellow stucco house which is second house from east end of block, south side of street, one block east of Ford Garage. Abandoned drilled domestic well, diameter 5 inches, depth 122.2 feet. Measuring point, top of casing at east side, level with land surface. No pump in well. Water levels, in feet below measuring point, 1939: Oct. 13, 111.99; Oct. 18, 113.10; Nov. 13, 111.70; Dec. 14, 111.52.
24. J. W. Herb. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 3, T. 27 S., R. 27 W. Unused drilled domestic and stock well, diameter 5 inches, depth 78(?) feet. Measuring point, top of casing at southwest side, 0.3 foot above land surface. Equipped with cylinder pump and windmill. Water levels, in feet below measuring point, 1939: Oct. 14, 76.49; Oct. 18, 76.43; Nov. 13, 76.50; Dec. 14, 76.55.

a Windmill, 200 feet west, pumping.

25. Charles Sturevant. SE $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 10, T. 26 S., R. 27 W., about 300 feet northwest of farm house. Unused drilled stock well, diameter 3 inches, depth 46.4 feet. Measuring point, top of 3-inch iron pipe at east side, 2.5 feet above land surface. Equipped with working barrel and windmill. Water levels, in feet below measuring point, 1939: Oct. 17, 36.65; Oct. 18, 36.65; Nov. 8, 36.56; Dec. 14, 36.51.

26. Arthur Adams. NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 2, T. 26 S., R. 27 W., about 20 feet west of northwest corner of house. Abandoned drilled well, diameter 3 inches, depth 134.7 feet. Measuring point, top of 3-inch iron casing at north side, 2.6 feet above land surface. No pump in well.

Water level, in feet below measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
Oct. 11, 1938	113.36	Oct. 17, 1939	113.53	Nov. 8, 1939	113.58
19	113.40	18	113.53	Dec. 14	113.72
31	113.45				

27. H. E. Hettrick. NW $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 36, T. 26 S., R. 28 W., about 50 feet east of State Highway 23. Unused drilled stock well, diameter 3 inches, depth 68(?) feet. Measuring point, top of pipe cap at north side, about 3 feet above land surface. Equipped with working barrel and windmill. Water levels, in feet below measuring point, 1939: Oct. 17, 60.58; Oct. 18, 60.58; Nov. 13, 60.68; Dec. 14, 60.74.

28. W. H. McLaughlin. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 14, T. 27 S., R. 29 W., about 300 feet north of abandoned house. Unused drilled domestic well, diameter 3 inches, depth 85(?) feet. Measuring point, top of pump jacket at north side, 2.5 feet above land surface. Equipped with force pump. Windmill dismantled. Water levels, in feet below measuring point, 1939: Oct. 18, 82.56; Nov. 17, 82.59; Dec. 14, 82.60.

29. A. F. Hohner. SE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 2, T. 28 S., R. 30 W., in field about 500 yards south of east-west county road. Drilled irrigation well, diameter 16 inches, depth 165 feet. Measuring point, hole in north side of pump, 1.0 foot above land surface. Equipped with turbine pump and gasoline engine. Water level, in feet below measuring point, 1939: Dec. 14, 112.25.

#### HAMILTON AND KEARNY COUNTIES

By T. G. McLaughlin

An observation-well program was begun in Hamilton and Kearny Counties, Kans., in the fall of 1939 by the Federal Geological Survey in cooperation with the Kansas State Geological Survey and the Kansas State Board of Health. The investigation was made under the supervision of S. W. Lohman, Federal geologist in charge of ground-water investigations in Kansas. Ground-water investigations were made in this area by Slichter <sup>1/</sup> in 1906 and by Darton <sup>2/</sup> in 1913. Hamilton and Kearny are adjoining counties in the southwestern part of Kansas, and Hamilton County is bordered on the west by the State of Colorado. The surface is a flat to rolling plain except south of the Arkansas River, where there is an area of sand dunes. The counties are drained by the Arkansas River, which flows from west to east across the middle of the two counties.

<sup>1/</sup> Slichter, C. S., The underflow in Arkansas Valley in western Kansas: U. S. Geol. Survey Water-Supply Paper 153, 1906.

<sup>2/</sup> Darton, N. H., U. S. Geol. Survey Geol. Atlas, Syracuse-Lakin folio (No. 212), 1920.

The counties are underlain principally by the Ogallala formation of Tertiary age and by Quaternary sand dunes. Upper Cretaceous formations, including the Dakota, Graneros, Greenhorn, Carlile, and Niobrara, crop out along the Arkansas River and at isolated localities both north and south of the river. The Dakota sandstone, the Ogallala formation, and the alluvium along the Arkansas River supply most of the wells in these counties.

Of the 44 wells selected for monthly observation, 21 were in Hamilton County and 23 were in Kearny County. During the year, 152 individual measurements of water level were made in the wells. All measurements before November 1 were made by the writer; all after November 1, by R. B. Christy.

The precipitation in Hamilton County in 1939 was 8.07 inches--9.13 inches below normal. This was the lowest precipitation of any county in Kansas. The precipitation in Kearny County was 8.26 inches--7.26 inches below normal.

The water levels in 7 of the 10 observation wells along the Arkansas Valley declined steadily during the period of observation. On the uplands the water levels declined in 18 of 33 wells and rose slightly or remained the same in the 15 other wells.

#### Well descriptions and water-level measurements

In the pages that follow are given descriptions and water levels of the 44 observation wells. The wells are listed by field numbers. The water level in each well is expressed in feet below the measuring point.

#### Hamilton County

1. R. E. Bray, Jr., et al. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 32, T. 23 S., R. 41 W. Unused dug domestic and stock well, diameter 4 feet, depth 26.5 feet. Measuring point, top of platform over well, 0.3 foot above land surface. Equipped with lift pump and windmill. Water levels, in feet, 1939: Sept. 21, 26.15; Oct. 10, 26.37; Nov. 16, 25.77; Dec. 15, 25.90.
2. R. Holdren. NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 23, T. 23 S., R. 43 W. Unused dug stock well, diameter 4.5 feet, depth 33.2 feet. Measuring point, top of plank over well, 0.2 foot above land surface. Equipped with lift pump. Water levels, in feet, 1939: Sept. 21, 27.21; Oct. 10, 27.36; Nov. 16, 27.41; Dec. 15, 27.39.
3. B. Rees. SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 8, T. 24 S., R. 40 W. Unused dug irrigation well, diameter 5 feet, depth 24.7 feet. Measuring point, top of bolt in concrete wall at west side, 0.2 foot above land surface. Water levels, in feet, 1939: Oct. 10, 14.42; Nov. 16, 14.92; Dec. 19, 14.75.
4. Continental Life Insurance Co. NW $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 14, T. 24 S., R. 40 W., about 120 feet north of U. S. Highway 50. Unused drilled stock well, diameter 5 $\frac{1}{2}$  inches, depth 24.1 feet. Measuring point, top of casing at north side, 1.0 foot above land surface. Equipped with lift pump and windmill. Water levels, in feet, 1939: Sept. 21, 21.09; Oct. 10, 21.28; Nov. 16, 21.66; Dec. 19, 21.67.

## Hamilton County--Continued

5. W. A. Dunn.  $SE\frac{1}{4}SE\frac{1}{4}NE\frac{1}{4}$  sec. 20, T. 24 S., R. 39 W., about 100 feet north of U. S. Highway 50. Unused drilled stock well, diameter  $5\frac{1}{2}$  inches, depth 20.8 feet. Measuring point, top of pipe coupling at east side, 2.4 feet above land surface. Equipped with lift pump and windmill. Water levels, in feet, 1939: Sept. 21, 17.31; Oct. 10, 17.58; Nov. 16, 17.88; Dec. 19, 17.73.

6. Bell Heinlen.  $SW\frac{1}{4}SW\frac{1}{4}SE\frac{1}{4}$  sec. 24, T. 24 S., R. 39 W. Unused drilled stock well, diameter  $5\frac{1}{2}$  inches, depth 106.4 feet. Measuring point, top of casing at south side, 1.3 feet above land surface. Equipped with lift pump. Water levels, in feet, 1939: Sept. 21, 54.74; Oct. 10, 54.87; Nov. 16, 54.04; Dec. 19, 55.02.

7. I. E. Martin.  $NW\frac{1}{4}SW\frac{1}{4}$  sec. 16, T. 23 S., R. 40 W., in southwest corner of lot enclosed by concrete wall. Unused drilled domestic and stock well, diameter  $4\frac{1}{2}$  inches, depth 61.1 feet. Measuring point, top of casing, south side, level with land surface. Equipped with lift pump. Water levels, in feet, 1939: Sept. 22, 45.77; Oct. 10, 45.76; Nov. 16, 45.76; Dec. 19, 45.77.

8. R. D. Woodman.  $SW\frac{1}{4}SW\frac{1}{4}NW\frac{1}{4}$  sec. 21, T. 22 S., R. 40 W. Unused drilled domestic and stock well, diameter  $4\frac{1}{2}$  inches, depth 159.9 feet. Measuring point, top of casing at east side, 0.4 foot above land surface. Equipped with lift pump and windmill. Water levels, in feet, 1939: Sept. 22, 147.22; Oct. 10, 147.66; Nov. 16, 147.35; Dec. 19, 147.53.

9. Inez Dikeman.  $SE\frac{1}{4}SE\frac{1}{4}SE\frac{1}{4}$  sec. 21, T. 21 S., R. 40 W., about 30 feet northwest of house. Unused drilled domestic well, diameter  $4\frac{1}{2}$  inches, depth 223.7 feet. Measuring point, top of casing at south side, 0.3 foot above land surface. Water levels, in feet, 1939: Sept. 23, 190.32; Oct. 10, 190.60; Nov. 16, 190.28; Dec. 19, 190.35.

11. M. Williamson.  $NE\frac{1}{4}NE\frac{1}{4}NW\frac{1}{4}$  sec. 18, T. 26 S., R. 40 W. Drilled domestic and stock well, diameter  $4\frac{1}{2}$  inches, depth 134.4 feet. Measuring point, top of bolt in pipe clamp at north side, 1.0 foot above land surface. Equipped with lift pump and windmill. Water levels, in feet, 1939: Sept. 28, 124.60; Nov. 16, a/; Dec. 19, 116.26.

12. I. E. Martin.  $NE\frac{1}{4}NE\frac{1}{4}SW\frac{1}{4}$  sec. 2, T. 22 S., R. 41 W. Unused drilled domestic and stock well, depth 149.9 feet. Measuring point, top of pipe coupling at north side, 4.1 feet above land surface. Equipped with lift pump. Water levels, in feet, 1939: Sept. 29, 144.12; Oct. 10, 144.09; Dec. 15, 144.20.

13. Carl Lewis.  $SE\frac{1}{4}SE\frac{1}{4}SW\frac{1}{4}$  sec. 13, T. 21 S., R. 42 W. Unused dug domestic and stock well, diameter 2.5 feet, depth 60.4 feet. Measuring point, top of casing at east side, 0.4 foot above land surface. Water levels, in feet, 1939: Sept. 27, 57.24; Oct. 10, 57.27; Nov. 16, 57.32; Dec. 15, 57.35.

16. Chas. H. Miller.  $SE\frac{1}{4}SE\frac{1}{4}SW\frac{1}{4}$  sec. 22, T. 25 S., R. 39 W., beside large concrete tank about 100 feet west of barn and 200 feet north of road. Unused drilled stock well, diameter  $4\frac{1}{2}$  inches, depth 100.1 feet. Measuring point, top of casing at west side, 0.1 foot above land surface. Equipped with lift pump. Water levels, in feet, 1939: Sept. 30, 85.82; Nov. 16, 85.82; Dec. 19, 85.74.

17. Thos. A. Wells.  $NE\frac{1}{4}NW\frac{1}{4}NW\frac{1}{4}$  sec. 11, T. 25 S., R. 39 W. Unused drilled domestic and stock well, diameter  $4\frac{1}{2}$  inches, depth 49.1 feet. Measuring point, top of casing at north side, 1.0 foot above land surface. Equipped with lift pump and windmill. Water levels, in feet, 1939: Sept. 30, 44.26; Nov. 16, 44.28; Dec. 19, 44.33.

19. W. E. Bereman.  $NE\frac{1}{4}NW\frac{1}{4}NE\frac{1}{4}$  sec. 26, T. 26 S., R. 39 W. Unused drilled stock well, depth 167.9 feet. Measuring point, top of outer casing at northeast side, 0.3 foot above land surface. Equipped with lift pump and windmill. Water levels, in feet, 1939: Oct. 4, 129.13; Nov. 16, 129.13; Dec. 19, 129.11.

20. Alpha H. Bennett.  $NW\frac{1}{4}SW\frac{1}{4}SW\frac{1}{4}$  sec. 2, T. 24 S., R. 43 W. Unused drilled domestic and stock well, diameter  $4\frac{1}{2}$  inches, depth 35.5 feet. Measuring point, top of casing, west side, 0.5 foot above land surface. No pipe in casing. Water levels, in feet, 1939: Oct. 5, 33.85; Nov. 16, 33.39; Dec. 15, 33.94.

a Windmill pumping.

## Hamilton County--Continued

22. T. J. Crist. NW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 26, T. 24 S., R. 43 W. Unused drilled stock well, diameter 4 $\frac{1}{2}$  inches, depth 132.1 feet. Measuring point, top of 4 $\frac{1}{2}$ -inch hole in concrete at north side, 0.4 foot above land surface. No pump in well. Water levels, in feet, 1939: Oct. 5, 116.17; Nov. 18, 114.82; Dec. 15, 113.82.

24. Eugene Scherick. NE $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 5, T. 26 S., R. 42 W. Drilled domestic and stock well, diameter 5 $\frac{1}{2}$  inches, depth 68.4 feet. Measuring point, top of casing at south side, 1.0 foot above land surface. Equipped with lift pump and windmill. Water levels, in feet, 1939: Oct. 5, 59.39; Nov. 16, a/; Dec. 15, 59.38.

26. J. C. Kitch. SW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 23, T. 26 S., R. 42 W., about 125 feet northeast of house and 10 feet north of old reservoir. Unused drilled stock well, diameter 5 $\frac{1}{2}$  inches, depth 76.8 feet. Measuring point, top of casing at east side, level with land surface. No pump in well. Water levels, in feet, 1939: Oct. 6, 64.48; Nov. 16, 64.50; Dec. 15, 64.52.

27. B. M. Rupert. NE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 24, T. 25 S., R. 40 W., about 30 feet west of northwest corner of house and 150 feet west of road. Unused drilled domestic and stock well, diameter 5 $\frac{1}{2}$  inches, depth 189.1 feet. Measuring point, top of casing at east side, 1.2 feet above land surface. Equipped with lift pump. Water levels, in feet, 1939: Oct. 7, 171.30; Nov. 16, 171.78; Dec. 19, 171.48.

28. A. S. and F. J. Gilliam. SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 13, T. 22 S., R. 39 W. Unused drilled domestic and stock well, diameter 4 $\frac{1}{2}$  inches, depth 225.6 feet. Measuring point, top of iron clamp at north side, 0.3 foot above land surface. Equipped with lift pump and windmill. Water levels, in feet, 1939: Oct. 9, 221.77; Nov. 16, 221.63; Dec. 19, 221.70.

## Kearny County

1. R. T. Beaty. NW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 34, T. 24 S., R. 36 W., about 20 feet east of road and 40 feet southeast of old windmill tower. Unused drilled irrigation well, diameter 16 inches, depth 94.6 feet. Measuring point, top of 16-inch hole in concrete block at south side, 0.5 foot above land surface. Water levels, in feet, 1939: Oct. 16, 11.83; Oct. 25, 11.77; Nov. 11, 11.65; Dec. 20, 11.49.

2. C. E. Worthen. SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 16, T. 24 S., R. 36 W. Unused drilled stock well, diameter 5 $\frac{1}{2}$  inches, depth 64.2 feet. Measuring point, top of casing at south side, 0.2 foot above land surface. Equipped with lift pump and windmill. Water levels, in feet, 1939: Oct. 16, 58.68; Oct. 25, 57.94; Nov. 11, 57.94; Dec. 20, 57.75.

3. F. G. Worthen. SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 10, T. 23 S., R. 36 W. Unused drilled domestic and stock well, diameter 5 $\frac{1}{2}$  inches, depth 97.9 feet. Measuring point, top of casing at east side, 0.6 foot above land surface. Equipped with lift pump and windmill. Water levels, in feet, 1939: Oct. 16, 94.63; Oct. 25, 94.40; Nov. 11, 94.09; Dec. 20, 92.34.

4. C. W. Walker. NW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 11, T. 21 S., R. 37 W., about 6 feet west of rectangular concrete tank and 25 feet west of circular concrete tank. Unused drilled domestic and stock well, diameter 4 $\frac{1}{2}$  inches, depth 112.3 feet. Measuring point, top of casing at north side, 0.3 foot below land surface. No pump in well. Water levels, in feet, 1939: Oct. 16, 106.97; Oct. 25, 106.95; Nov. 11, 106.93; Dec. 20, 106.92.

6. Meta Kettler. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 26, T. 24 S., R. 37 W. Unused drilled domestic and stock well, diameter 5 $\frac{1}{2}$  inches, depth 173.5 feet. Measuring point, top of casing at east side, 0.5 foot above land surface. Equipped with lift pump and windmill. Water levels, in feet, 1939: Oct. 16, 154.88; Oct. 25, 154.66; Nov. 11, 154.83; Dec. 20, 154.55.

7. C. H. Browne. NW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 8, T. 25 S., R. 37 W., about 50 feet east of house beside a concrete tank. Unused drilled domestic and stock well, diameter 4 $\frac{1}{2}$  inches, depth 74.2 feet. Measuring point, top of casing at east side, 0.5 foot above land surface. Water levels, in feet, 1939: Oct. 16, 53.87; Oct. 25, 53.73; Nov. 11, 53.80; Dec. 20, 53.70.

a Windmill pumping.

## Kearny County--Continued

9. R. Bentrup. NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 2, T. 24 S., R. 35 W. Unused drilled domestic and stock well, diameter 8 $\frac{1}{2}$  inches, depth 30.8 feet. Measuring point, top of casing at west side, 0.2 foot above land surface. Equipped with lift pump and windmill. Water levels, in feet, 1939: Oct. 17, 26.52; Oct. 25, 26.64; Nov. 10, 26.80; Dec. 19, 27.04.

10. Phoenix State Land Bank. NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 13, T. 24 S., R. 35 W., 3 feet north of old windmill tower and 50 feet west of road. Abandoned drilled well, diameter 5 $\frac{1}{2}$  inches, depth 13.4 feet. Measuring point, top of casing at southeast side, 2 feet above land surface. Water levels, in feet, 1939: Oct. 17, 6.65; Oct. 25, 6.77; Nov. 11, 6.96; Dec. 19, 7.07.

11. P. J. Fichter. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 11, T. 25 S., R. 36 W., about 15 feet east of road. Unused dug irrigation well, diameter 5 feet, depth 32.8 feet. Measuring point, top of bolt in concrete wall at west side, 0.5 foot above land surface. Equipped with centrifugal pump. Water levels, in feet, 1939: Oct. 17, 14.68; Oct. 25, 14.75; Nov. 11, 14.77; Dec. 19, 14.94.

12. J. E. Beymer. SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 22, T. 24 S., R. 35 W., second south well of battery of five wells. Dug and drilled irrigation well, diameter 15 inches, depth 46.7 feet. Measuring point, top of concrete wall at west side, 0.4 foot above land surface. Equipped with centrifugal pump. Water levels, in feet: May 23, 1934, 10.29; Oct. 17, 1939, 14.62; Oct. 25, 1939, 14.97; Nov. 11, 1939, a; Dec. 19, 1939, 14.86.

13. D. S. Nicholson. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 15, T. 25 S., R. 37 W., one-half block south of Hartland depot on east side of road. Dug irrigation well, diameter 4 feet, depth 15.7 feet. Measuring point, top of barrel casing at southwest side, 0.4 foot below land surface. Equipped with 2-inch centrifugal pump. Water levels, in feet, 1939: Oct. 18, 8.16; Oct. 25, 8.22; Nov. 11, 8.30; Dec. 20, 8.53.

14. W. H. Ploeger. SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 32, T. 22 S., R. 38 W., under old wooden windmill tower about 225 feet northeast from southwest corner of section. Abandoned drilled well, diameter 4 $\frac{1}{2}$  inches, depth 249.9 feet. Measuring point, top of casing, 0.3 foot above land surface. Water levels, in feet, 1939: Oct. 18, 227.12; Oct. 25, 226.98; Nov. 16, 227.28; Dec. 20, 227.14.

15. Joseph McNellis. SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 36, T. 22 S., R. 35 W. Unused drilled domestic and stock well, diameter 5 inches, depth 84.7 feet. Measuring point, top of 1-inch board over casing at north side, 0.1 foot above land surface. Equipped with lift pump. Water levels, in feet, 1939: Oct. 19, 71.73; Oct. 25, 71.74; Dec. 19, 71.80.

16. G. B. Campbell. SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 15, T. 23 S., R. 35 W. Unused drilled domestic and stock well, diameter 6 inches, depth 59.8 feet. Measuring point, top of casing at north side, 0.3 foot above land surface. Equipped with lift pump and windmill. Water levels, in feet, 1939: Oct. 19, 45.78; Oct. 25, 45.75; Dec. 19, 46.14.

17. A. G. Campbell. NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 15, T. 21 S., R. 35 W. Unused drilled stock well, diameter 5 $\frac{1}{2}$  inches, depth 122.9 feet. Measuring point, top of casing at north side, level with land surface. Equipped with lift pump and windmill. Water levels, in feet, 1939: Oct. 19, 91.48; Oct. 25, 91.49; Nov. 11, 91.52; Dec. 20, 91.60.

18. M. H. Carey. SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 25, T. 24 S., R. 38 W. Unused drilled domestic and stock well, diameter 5 $\frac{1}{2}$  inches, depth 92.7 feet. Measuring point, top of casing at northeast side, 0.4 foot above land surface. Equipped with lift pump and windmill. Water levels, in feet, 1939: Oct. 20, 72.30; Nov. 11, 72.27; Dec. 20, 72.24.

19. E. M. Beymer. NE $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 8, T. 26 S., R. 38 W. Unused drilled domestic and stock well, depth 151.7 feet. Measuring point, top of galvanized-iron plate over the casing at south side, level with land surface. Equipped with lift pump and windmill. Water levels, in feet, 1939: Oct. 23, 130.87; Nov. 11, 131.11; Dec. 19, 131.16.

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a Well pumping.

## Kearny County--Continued

21. B. P. Aubun. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 19, T. 21 S., R. 33 W. Unused drilled domestic and stock well, depth 162.3 feet. Measuring point, top of bolt in clamp at southwest side, 0.8 foot above land surface. Equipped with lift pump and windmill. Water levels, in feet, 1939: Oct. 23, 156.07; Nov. 16, 156.21; Dec. 20, 156.14.

22. J. A. Denslow. SE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 6, T. 22 S., R. 33 W. Unused drilled domestic and stock well, diameter 4 $\frac{1}{2}$  inches, depth 188.4 feet. Measuring point, top of casing at southwest side, 0.5 foot above land surface. Equipped with lift pump and windmill. Water levels, in feet, 1939: Oct. 23, 182.80; Nov. 16, 182.88; Dec. 20, 182.85.

23. James Coghill. SW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 18, T. 26 S., R. 37 W. Unused drilled domestic and stock well, diameter 5 $\frac{1}{2}$  inches, depth 205.5 feet. Measuring point, top of casing at east side, 2.0 feet above land surface. Equipped with lift pump. Water levels, in feet, 1939: Oct. 24, 174.63; Nov. 11, 174.94; Dec. 19, 174.96.

25. ----- NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 5, T. 27 S., R. 36 W. Unused drilled domestic and stock well, diameter 4 $\frac{1}{2}$  inches, depth 163.3 feet. Measuring point, top of casing at north side, 4.5 feet above land surface. Equipped with lift pump and windmill. Water levels, in feet, 1939: Oct. 24, 123.99; Nov. 11, 123.92; Dec. 19, 123.96.

26. Anna Davidson. SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 22, T. 26 S., R. 37 W., in clump of trees about 200 feet north from road and 50 feet west of house. Abandoned drilled well, diameter 4 $\frac{1}{2}$  inches, depth 100.1 feet. Measuring point, top of casing at south side, 0.4 foot above land surface. No pump in well. Water levels, in feet, 1939: Oct. 24, 86.30; Nov. 11, 86.32; Dec. 19, 86.36.

28. Harry Tate. NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 26, T. 22 S., R. 37 W., beside old concrete tank about 200 feet east of section-line road. Abandoned drilled well, diameter 6 inches, depth 133 feet. Measuring point, top of casing, 0.5 foot above land surface. Water level, in feet, 1939: Dec. 20, 124.27.

## LIMESTONE CREEK AREA OF SOIL CONSERVATION SERVICE

By H. A. Waite and C. W. Stewart

The observation-well program in the Limestone Creek area, Jewell County, Kansas, <sup>1/</sup> was continued in 1939 by the Federal Geological Survey in cooperation with the Soil Conservation Service. Water-level measurements were being made in 42 wells at the beginning of the year. Wells 58, 59, and 60 were discontinued during 1939, after they had been damaged by livestock, and hence at the end of the year 39 wells were under observation. An automatic water-stage recorder was maintained on well 51 during the first half of the year, but the record for the most part was unsatisfactory; therefore only the periodic wetted-tape measurements for this well are included. About 1,560 wetted-tape measurements were made in 1939. Measurements of water level were made about weekly during the first half of the year and twice monthly for the remainder of the year. Most of the measurements were made by Charles W. Stewart, John H. Diamond, and Orin L. Dawes, and a few were made by W. H. Hardin, Edward Smerchek, and Edward A. Balty, all of the Soil Conservation Service. Records of the precipitation recorded at 32 stations in the Limestone Creek area were furnished by the Soil Conservation Service.

<sup>1/</sup> See Water-Supply Papers 777, 817, 840, and 845.



Several of the wells in the vicinity of the Beeler Pond were damaged by livestock during the year and levels were run to reestablish the altitude of measuring points with reference to the bench mark. Included for the first time are descriptions of bench marks that were established during the year to replace those that had been previously destroyed. The altitudes and descriptions of the bench marks are given in the following table:

Altitude and description of bench marks  
(The altitude of the bench mark is given in feet above the assumed datum.)

Well	Bench mark	Altitude	Location
14	1	44.68	Top of railroad spike in 15-inch boxelder stump, 200 feet due south of well.
	2	47.21	Top of nail in telephone pole, 3 feet above land surface, 200 feet south and 50 feet west of well.
18	1	48.42	Nail at base of 10-inch osage-orange tree, 250 feet south and 75 feet west of well.
	2	48.81	Top of railroad spike in triple elm tree (dead) along north-south fence line 210 feet southwest of well.
25	1	30.47	Top of 1½-inch pipe along fence line 220 feet north and 75 feet east of well.
	2	30.42	Top of nail in bridge plank at south end of road culvert 230 feet north and 75 feet west of well.
40	1	61.39	(Original bench mark destroyed.) Chiseled cross on top of front doorstep rock of abandoned house 200 feet northwest of well.
	2	50.37	Nail in top of osage-orange gate post 90 feet east and 10 feet north of well.
44	1	39.89	(Original bench mark intact.) Nail in base of twin mulberry tree 80 feet southwest of well.
	2	a 40.34	Nail in base of 20-inch boxelder tree 65 feet west and 25 feet south of well.

#### Water-level fluctuations

According to records of 32 stations, 30 of which are maintained by the Soil Conservation Service, the average precipitation in the Limestone Creek area in 1939 was 21.04 inches. Of this, 15.54 inches or about 70 percent of the total precipitation, occurred from May through August. The water levels in 13 of the 39 wells under observation at the end of the year showed net rises from January 4, 1939 to December 20, 1939, ranging from 0.09 foot to 3.10 feet; the water levels in the remaining 26 wells showed net declines for the same period ranging from 0.02 foot to 8.30 feet. The greatest net decline in water level, 8.30 feet, occurred in well 8. In

a Altitude does not agree with that of 39.89 feet given in Water-Supply Paper 817, p. 67; it is not known whether the bench mark or the measuring point was altered.

1938, the maximum net rise--16.21 feet--occurred in this well in response to recharge from heavy precipitation. The decline in water level in the well during 1939, therefore, represents a gradual return to normal conditions following the abnormally high stage of the previous year. The highest and lowest water levels in 1939 in each of the 38 wells, the dates on which they occurred, and the net changes in water level for the period from January 4 to December 20, 1939, are given in the following table.

Highest and lowest water levels and net changes in water level in 39 wells in the Limestone Creek area during the period January 4, 1939, to December 20, 1939, in feet above datum.

Well	Highest level	Date	Lowest level	Date.	Difference	Net rise or decline
4	18.40	Aug. 30	15.85	Dec. 20	2.55	-1.47
6	8.62	Dec. 20	8.19	Jan. 10	.43	+ .42
8	34.13	Jan. 4	25.83	Dec. 20	8.30	-8.30
12	13.78	Sept. 27	10.33	Mar. 29 Apr. 12	3.45	+1.79
14	10.16	Nov. 22 Dec. 20	9.94	Mar. 29	.22	+ .13
18	10.50	Dec. 20	10.11	May 17	.39	+ .22
22	13.43	Aug. 17	11.89	Aug. 2	1.54	+ .24
25	a 12.29	Aug. 30	9.91	Aug. 2	2.38	- .72
30	11.16	June 14	8.22	Sept. 27	2.94	- .21
34	95.84	July 5	89.90	June 7	5.94	-1.14
34A	101.55	July 5	95.94	Mar. 16	5.61	- .98
34B	104.41	June 28	95.97	May 31	8.44	-1.89
34C	104.05	June 28	96.24	May 31	7.81	- .63
40	10.14	June 14 Oct. 25	9.79	Jan. 18	.35	+ .09
41	10.85	Oct. 17	9.01	Oct. 25	1.84	b -1.32
42	13.79	Aug. 17	10.85	Feb. 21	2.94	+ .46
43	16.40	Aug. 17	13.53	May 10 June 7	2.87	- .75
44	17.37	Dec. 20	13.96	Jan. 10	3.41	+3.10
45	9.58	May 3 May 10	7.88	Dec. 6	1.70	-1.19
46	a 20.91	June 14	17.33	Feb. 21	3.58	+ .18
47	a 18.41	June 14	12.65	May 24	5.76	- .32
48	10.86	Dec. 20	9.37	Aug. 2	1.49	+ .71
49	30.66	June 28	26.29	Mar. 7	4.37	- .44
50	16.95	June 14	12.68	Oct. 25	4.27	- .52
51	101.58	Mar. 16	96.52	Sept. 27 Dec. 20	5.06	-1.03
52	103.18	Oct. 11	100.70	Aug. 17	2.48	+1.10
53	103.18	Apr. 5	99.05	Dec. 20	4.13	-2.44

a Highest water level that was not caused by flood.  
b For period Jan. 4 to Nov. 8, 1939.

Highest and lowest water levels and net changes in water level in 39 wells in the Limestone Creek area during the period January 4, 1939, to December 20, 1939, in feet above datum--Continued

Well	Highest level	Date	Lowest level	Date	Difference	Net rise or decline
54	104.11	Apr. 5	99.78	Dec. 20	4.33	-2.49
55	102.32	Mar. 29	99.81	Dec. 20	2.51	-1.75
56	101.68	Mar. 29	98.30	Dec. 20	3.38	-2.81
57	101.05	Jan. 4	99.57	Dec. 20	1.48	-1.48
61	87.81	Dec. 6	86.96	Feb. 21	.85	- .02
62	86.10	July 5	85.33	Dec. 20	.77	- .29
63	95.03	Apr. 5	90.93	Oct. 25	4.10	-1.99
64	17.51	June 14	10.96	Feb. 1	6.55	+ .94
65	13.26	June 14	c 5.32	Dec. 6	7.94	+1.68
66	9.24	Jan. 4	7.29	Oct. 25	1.95	- .25
67	9.10	Apr. 5	6.11	Nov. 22	2.99	-2.87
69	11.05	Aug. 17	c 8.44	July 6	2.61	- .91

The average of the water levels in 12 wells (6, 12, 18, 22, 25, 30, 40, 41, 42, 45, 48, and 50), in 1939, are given in the following table.

Average of the water levels in 12 observation wells in the Limestone Creek area, Kansas, in 1939, in feet above datum

Date	Water level	Date	Water level	Date	Water level
Jan. 4	10.65	Apr. 18-19	10.88	July 19	10.68
10	10.61	26-27	10.92	Aug. 2	10.51
18	10.64	May 3	10.95	17	a 11.11
24	10.62	10	10.94	30	10.99
Feb. 1	10.67	17	10.87	Sept. 13	10.70
7	10.69	24	10.86	27	10.54
14	10.68	31	10.78	Oct. 11	10.40
21	10.65	June 7	10.83	25	10.47
Mar. 7-8	10.68	14	11.12	Nov. 8	10.46
16	10.72	21	10.86	22	b 10.65
29	10.82	28	10.95	Dec. 6	b 10.72
Apr. 5	10.87	July 5	10.89	20	b 10.78
12	10.85				

In general, the average of the water levels in the 12 wells fluctuated less in 1939 than in any previous year of record. From January 4 to June 7, 1939, the average water level rose 0.18 foot. Precipitation in May was only 3.02 inches, which was insufficient to cause a rise in average water level, but an abrupt rise occurred after June 7 and the water levels reached the highest average stage of the year on June 14. Precipitation in June was 6.23 inches. Only 0.65 inch of rain fell in July, and the water levels declined steadily until about August 2. Precipitation in August was 5.64 inches, and the second highest stage of the year was reached on August 17.

- a Average of water levels in 11 wells; well 25 flooded.  
 b Average of water levels in 11 wells; well 41 dry.  
 c Water level affected by pumping from well.

After August 17 the average of the water levels declined steadily to the lowest stage of the year on October 11, when it was 0.72 foot lower than the highest stage of June 14, and 0.25 foot lower than on January 4. The water levels rose an average of 0.32 foot from November 8 to December 20 and on the latter date averaged 0.13 foot higher than on January 4, 1939, and 0.78 foot higher than on January 1, 1935.

In Water-Supply Paper 845, pages 104-108: The words "Carlyle shale" appearing in several paragraph descriptions, should read "Carlile shale".

Water level, in feet above datum, 1939

Date	4	6	8	12	14	18	25
Jan. 4	17.32	8.20	34.13	10.92	10.03	10.28	10.74
10	17.16	8.19	33.75	10.88	10.03	10.27	10.71
18	16.99	8.22	33.14	10.84	10.03	10.27	10.65
24	16.85	8.22	32.57	10.81	10.04	10.22	10.59
Feb. 1	16.85	8.27	31.91	10.75	10.02	10.25	10.59
7	16.70	8.26	30.61	10.71	10.00	10.25	10.56
14	16.50	8.26	30.61	10.66	9.99	10.27	10.45
21	16.33	8.40	30.75	10.59	10.10	10.22	10.43
Mar. 7	16.16	8.29	29.65	10.50	9.99	10.23	10.29
16	16.03	8.29	29.28	10.43	9.96	10.19	10.29
29	16.14	8.38	28.98	10.33	9.94	10.18	10.43
Apr. 5	16.30	8.35	29.98	10.34	9.96	10.19	10.38
12	16.31	8.39	28.80	10.33	9.96	10.18	10.37
18	16.54	8.44	28.70	10.36	9.96	10.18	10.09
27	16.48	8.44	28.54	10.41	9.98	10.19	10.42
May 3	16.40	8.44	28.37	10.46	10.19	10.20	10.32
10	16.53	8.46	28.24	10.48	9.97	10.23	10.37
17	16.52	8.46	27.99	10.47	9.96	10.11	10.27
24	16.59	8.49	27.84	10.51	9.99	10.29	10.27
31	16.65	8.47	27.64	10.56	10.00	10.27	10.23
June 7	16.69	8.49	27.55	10.68	10.00	10.28	10.19
14	17.22	8.46	27.56	11.04	10.04	10.33	10.18
21	17.77	8.44	27.45	11.19	10.03	10.31	10.17
28	18.10	8.44	27.49	11.85	10.03	10.36	10.13
July 5	17.53	8.44	27.60	12.06	10.06	10.33	10.10
19	18.14	8.42	27.76	12.82	10.07	10.28	9.99
Aug. 2	17.87	8.40	27.81	13.14	10.06	10.21	9.91
17	17.59	8.42	27.76	13.34	10.09	10.26	a 18.40
30	18.40	8.41	27.76	13.71	10.08	10.27	12.29
Sept. 13	18.37	8.41	27.74	13.70	10.12	10.33	11.22
27	18.01	8.43	27.72	13.78	10.12	10.25	10.67
Oct. 11	17.75	8.44	27.49	13.65	10.13	10.15	10.56
25	17.60	8.47	27.18	13.49	10.15	10.20	10.46
Nov. 8	16.63	8.45	26.81	13.26	10.14	10.32	10.26
22	16.38	8.51	26.44	13.08	10.16	10.47	10.15
Dec. 6	16.08	8.55	26.18	12.90	10.15	10.43	10.13
20	15.85	8.62	25.83	12.71	10.16	10.50	10.02

Water level, in feet above datum, 1939

Date	40	41	42	43	44	45	46	47
Jan. 4	9.98	10.47	11.02	14.29	14.27	9.09	17.78	13.64
10	9.88	10.47	10.95	14.13	13.96	9.10	17.55	13.47
18	9.79	10.51	10.93	14.10	14.54	9.13	16.54	13.38
24	9.85	10.52	10.91	14.00	14.50	9.14	17.45	13.27
Feb. 1	10.05	10.43	10.97	14.01	14.67	9.17	17.59	13.27
7	9.92	10.48	10.95	13.99	14.62	9.18	17.49	13.25
14	9.88	10.58	10.90	13.94	14.95	9.20	17.38	13.16
21	9.91	10.48	10.85	13.76	14.78	9.21	17.33	13.03
Mar. 7-8	9.89	10.43	10.89	.....	.....	9.26	17.68	13.02
16	9.86	10.65	10.87	14.26	15.44	9.35	18.88	13.10
29	9.90	10.70	11.08	14.05	15.47	9.39	18.54	13.10

a Well flooded.

Water level, in feet above datum, 1939--Continued

Date	40	41	42	43	44	45	46	47
Apr. 5	9.95	10.72	11.03	13.94	15.62	9.45	13.33	12.94
12	9.97	10.70	11.02	13.82	15.37	9.47	13.19	12.93
19	9.97	10.75	11.02	13.82	15.57	9.50	13.22	12.93
26-27	9.99	10.77	11.10	13.79	14.71	9.54	13.13	12.93
May 3	9.96	10.77	11.07	13.74	14.71	9.58	13.08	12.81
10	10.04	10.74	11.03	13.53	14.92	9.58	13.05	12.77
17	10.03	10.63	10.97	13.65	14.34	9.52	13.02	12.73
24	10.08	10.62	11.21	13.63	15.13	9.48	12.97	12.65
31	10.02	10.38	11.27	13.58	15.11	9.34	12.87	12.67
June 7	10.04	10.33	11.51	13.53	15.12	9.30	12.81	13.74
14	10.14	10.59	12.08	13.84	15.37	9.37	12.91	13.41
21	9.99	9.53	11.79	14.00	15.02	9.27	12.68	13.18
23	9.93	10.22	11.87	15.51	14.87	9.21	12.36	15.66
July 5	10.03	9.98	11.69	15.08	14.78	9.13	12.20	15.11
19	10.01	9.77	11.31	14.67	14.19	8.91	12.57	14.44
Aug. 2	9.95	9.65	11.27	14.32	14.08	8.74	12.08	14.09
17	9.90	10.85	13.79	16.40	14.56	8.58	12.10	19.58
30	9.96	10.14	12.56	15.40	14.79	8.47	12.13	16.14
Sept. 13	10.00	9.62	12.17	14.92	14.27	8.34	12.27	15.03
27	10.03	9.22	11.95	14.51	14.70	8.20	12.93	14.67
Oct. 11	9.92	9.12	11.74	14.29	14.98	8.07	12.49	14.16
25	10.14	9.01	11.65	14.19	15.39	7.96	12.45	14.03
Nov. 8	10.03	9.15	11.59	13.96	15.85	7.93	12.24	13.79
22	9.96	(a)	11.54	13.78	16.47	7.91	12.15	13.67
Dec. 6	10.05	(a)	11.54	13.70	16.99	7.88	12.09	13.51
20	10.07	(a)	11.48	13.54	17.37	7.90	12.96	13.32

Water level, in feet above datum, 1939

Date	48	49	50	64	b 65	66	67	b 69
Jan. 4	10.15	27.40	14.52	11.15	8.02	9.24	9.06	10.38
10	10.08	27.17	14.55	11.09	8.72	9.23	9.00	10.09
18	10.07	27.05	14.75	11.05	7.76	9.16	9.02	10.18
24	10.02	26.91	14.79	11.05	9.28	9.14	9.00	10.02
Feb. 1	10.05	26.90	15.10	10.96	9.51	....	9.05	10.20
7	10.03	26.72	15.19	11.06	8.91	....	9.04	10.24
14	9.96	26.58	15.27	b 11.01	8.42	....	9.00	10.09
21	9.90	26.42	15.32	11.00	9.14	....	8.96	9.90
Mar. 7-8	9.87	26.29	15.63	11.06	9.12	9.12	8.99	10.09
16	10.08	27.77	15.74	12.12	10.24	....	9.08	10.13
29	10.52	28.80	16.05	12.38	10.52	....	9.09	10.26
Apr. 5	10.59	28.87	16.06	12.97	10.14	....	9.10	10.14
12	10.58	28.74	16.17	12.72	10.80	....	9.06	10.12
18-19	10.68	28.68	16.35	12.64	11.08	9.14	9.02	10.13
26-27	10.70	28.67	16.33	12.50	9.27	9.15	9.02	10.11
May 3	10.68	28.65	16.52	12.44	10.05	9.12	8.99	10.13
10	10.64	28.26	16.44	12.36	9.35	9.08	8.79	10.01
17	10.53	28.09	16.38	b 12.22	9.65	8.92	8.66	10.03
24	10.43	28.60	16.18	b 14.03	10.83	9.71	8.55	9.93
31	10.21	29.23	16.10	b 14.87	11.55	8.62	8.43	9.89
June 7	10.17	29.62	15.95	b 16.93	12.25	8.59	8.46	9.84
14	10.22	30.44	16.95	b 17.51	13.26	8.82	8.62	10.71
21	10.23	30.49	16.33	b 17.46	12.84	8.78	8.42	10.24
28	10.20	30.66	16.26	b 17.29	12.90	8.52	8.30	9.78
July 5	10.06	30.62	16.19	b 16.54	12.49	8.37	8.18	8.44
19	9.65	30.01	15.36	b 15.28	11.50	7.93	7.82	8.70
Aug. 2	9.37	29.31	14.56	b 14.52	11.13	7.72	7.53	7.83
17	10.11	30.34	13.99	b 14.82	11.39	7.84	7.84	11.05
30	10.44	30.63	13.76	14.96	10.46	7.90	8.07	9.17
Sept. 13	10.22	29.82	13.42	14.14	9.44	7.57	7.61	6.16
27	9.93	28.98	13.12	13.45	9.98	7.40	6.95	9.47
Oct. 11	9.66	28.33	12.87	13.13	9.28	7.30	7.15	9.41
25	9.59	27.95	12.68	12.88	7.89	7.29	6.98	8.82
Nov. 8	9.85	27.60	12.97	12.90	8.28	7.49	7.15	7.92
22	10.21	27.48	13.35	12.50	7.75	8.90	6.11	9.15
Dec. 6	10.56	27.13	13.65	12.27	5.32	8.92	6.17	9.45
20	10.86	26.96	14.00	12.09	9.70	8.99	6.19	9.47

a Well dry.

b Water level affected by pumping from well.

c Well flooded.

## WATER LEVELS AND ARTESIAN PRESSURE, 1939

Water level, in feet above datum, 1939							
Date	22	30	a 34	a 34A	a 34B	a 34C	a Pond staff gage
Jan. 4	12.34	10.05	93.19	97.26	97.90	97.31	115.30
10	12.26	10.03	93.03	97.12	97.62	97.16	115.25
18	12.29	10.19	92.93	97.11	97.59	97.08	115.20
24	12.23	10.11	92.84	96.98	97.44	96.97	115.20
Feb. 1	12.29	10.16	92.92	97.01	97.52	96.94	115.15
7	12.35	10.42	92.76	96.90	97.42	96.88	115.10
14	12.30	10.38	92.62	96.76	97.13	96.76	115.05
21	12.22	10.32	92.41	96.57	96.88	96.70	115.10
Mar. 7-8	12.28	10.55	92.26	96.45	96.68	96.50	115.20
16	12.32	10.53	92.11	95.94	97.02	96.44	115.80
29	12.32	10.60	93.07	98.72	98.78	97.04	115.60
Apr. 5	12.25	10.71	93.45	98.52	99.44	97.42	115.40
12	12.20	10.76	93.53	98.14	98.86	97.14	115.40
18-19	12.37	10.89	93.53	97.72	98.59	97.04	115.35
26-27	12.26	10.91	93.45	97.29	98.00	96.52	115.10
May 3	12.28	11.07	93.11	96.95	97.52	96.66	114.90
10	12.24	10.99	92.44	96.67	97.09	96.48	114.70
17	12.24	10.86	89.96	96.42	96.64	96.39	114.55
24	12.21	10.52	90.88	96.18	96.24	96.33	115.50
31	12.18	10.55	90.37	96.03	95.97	96.24	115.90
June 7	12.53	10.40	89.90	97.23	97.99	97.36	117.00
14	12.91	11.16	91.75	98.64	101.88	101.42	118.40
21	12.66	10.44	93.97	100.89	103.79	103.39	118.50
28	12.71	10.18	95.26	101.48	104.41	104.05	117.30
July 5	12.59	10.05	95.84	101.55	103.74	103.67	118.00
19	12.16	9.47	94.76	100.40	101.85	101.86	117.39
Aug. 2	11.89	8.99	93.81	99.19	100.23	100.45	117.05
17	13.43	9.53	93.32	98.62	99.16	99.45	117.40
30	12.96	8.93	92.70	98.56	99.00	99.23	117.10
Sept. 13	12.68	8.24	91.72	98.20	98.33	98.70	117.50
27	12.60	8.22	91.18	97.62	97.75	98.12	116.40
Oct. 11	12.40	8.27	91.05	97.14	97.12	97.67	116.10
25	12.46	8.52	91.16	96.80	96.84	98.00	115.70
Nov. 8	12.47	9.19	91.60	96.92	96.48	97.15	114.50
22	12.53	9.42	91.74	96.47	96.43	96.99	.....
Dec. 6	12.57	9.64	91.67	96.39	96.27	96.85	.....
20	12.58	9.84	92.05	96.28	96.01	96.68	.....

Water level in wells near Beeler Pond, in feet above zero of pond staff gage, 1939

Date	57	56	55	Pond staff gage	54	53	52
Jan. 4	101.05	101.11	101.56	106.80	102.27	101.49	101.23
10	100.69	100.92	101.37	106.70	102.31	101.55	101.09
18	100.71	100.93	101.39	106.65	102.31	101.52	101.13
24	100.48	100.77	101.19	106.65	102.18	101.52	100.98
31	100.92	100.94	101.35	106.60	102.26	101.51	101.22
Feb. 7	100.78	100.82	101.20	106.55	102.15	101.37	101.09
14	100.66	100.70	101.11	106.50	101.93	101.22	100.98
21	100.26	100.50	100.88	106.50	101.81	101.06	100.76
Mar. 7-8	100.41	100.55	101.08	.....	102.10	101.36	100.86
16	100.70	101.30	101.64	106.90	103.35	102.50	101.34
29	100.70	101.68	102.32	106.70	103.98	103.15	102.10
Apr. 5	100.72	101.60	102.20	106.60	104.11	103.18	102.16
12	100.65	101.41	101.86	106.50	103.89	102.95	102.11
19	100.95	101.49	101.88	106.45	103.57	102.85	102.21
27	100.62	101.27	102.04	106.30	102.99	102.33	101.89
May 3	100.60	101.10	c 101.43	106.10	102.70	102.15	101.82
10	b 100.70	101.21	101.21	104.90	102.33	101.61	101.55
17	100.67	100.71	101.01	104.70	102.06	101.59	101.43
24	100.66	100.56	100.95	105.80	101.94	101.45	101.24
31	100.61	100.51	100.92	105.90	101.84	101.32	101.21
June 7	100.47	100.77	100.89	106.60	101.93	101.33	101.19
14	100.51	100.49	101.03	107.40	102.22	101.41	101.17
21	100.33	100.42	101.06	107.40	102.21	101.41	101.13
28	100.22	100.45	101.02	107.70	102.29	101.46	101.06

a Kindler Pond wells; assumed altitude of zero level on pond staff gage, 100.00 feet.

b Measuring point lowered 2.84 feet May 10.

c Measuring point lowered 2.93 feet May 3.

d Measuring point lowered 2.8 feet Apr. 27.

Water level in wells near Beeler Pond, in feet above zero of pond staff gage, 1939--Continued

Date	57	56	<del>55</del>	Pond staff gage	54	53	52
July 5	100.42	100.54	101.17	107.55	102.28	101.51	101.15
19	100.19	100.23	100.84	107.05	101.77	101.12	100.89
Aug. 2	100.09	99.97	100.52	106.88	101.42	100.80	100.78
17	100.26	99.96	100.68	108.04	101.69	100.81	100.70
30	100.13	100.35	100.94	107.70	102.03	101.20	100.83
Sept. 13	99.90	99.89	100.57	107.20	101.43	100.71	(b)
27	100.08	a 99.00	100.34	106.80	101.05	100.39	(b)
Oct. 11	99.70	98.65	100.14	106.60	100.74	100.07	103.18
25	99.84	98.63	100.10	106.40	100.57	99.86	103.00
Nov. 8	99.91	98.52	100.01	105.20	100.69	99.94	103.10
22	99.68	98.45	99.95	108.00	100.09	99.43	102.61
Dec. 6	99.68	98.44	99.92	106.40	100.01	99.20	102.49
20	99.57	98.30	99.81	105.70	99.78	99.05	102.33

Water level in wells near Beeler Pond, in feet above zero of pond staff gage, 1939

Date	51	58	59	60	61	62	63
Jan. 4	97.55	99.97	105.38	103.75	87.73	85.62	93.24
10	97.43	99.72	105.25	103.58	87.30	85.62	93.18
18	97.50	99.75	105.24	103.59	87.40	85.66	93.20
24	97.45	99.57	105.08	103.44	87.09	85.59	93.16
31	97.66	99.91	105.28	103.66	87.72	85.71	93.23
Feb. 7	97.56	99.81	105.12	103.55	87.63	85.72	93.23
14	97.39	99.63	104.95	103.41	87.38	85.68	93.19
21	97.57	99.37	104.87	103.18	86.96	85.57	93.10
Mar. 8	100.54	99.50	105.02	103.27	87.32	85.70	93.22
16	101.58	99.37	105.45	103.57	87.03	85.72	93.57
29	99.83	99.79	105.90	104.28	87.24	85.73	93.92
Apr. 5	99.64	99.72	105.84	104.35	87.19	85.78	95.03
12	99.54	99.71	105.80	104.31	86.98	85.76	94.26
19	99.14	99.95	(d)	104.34	87.38	85.90	94.20
27	98.41	99.77	.....	104.04	87.12	85.81	94.28
May 3	98.03	99.77	.....	(d)	87.14	85.86	94.16
10	97.70	99.70	.....	.....	87.21	85.87	93.96
17	97.46	99.69	.....	.....	87.22	85.87	93.84
24	97.26	99.64	.....	.....	87.33	85.93	93.69
31	97.64	99.61	.....	.....	87.37	85.97	93.58
June 7	97.27	99.53	.....	.....	87.33	86.01	93.44
14	97.43	(c)	.....	.....	87.39	86.04	93.33
21	97.18	.....	.....	.....	87.25	86.03	93.14
28	97.13	.....	.....	.....	87.17	86.06	93.04
July 5	97.10	.....	.....	.....	87.42	86.10	92.92
19	96.74	.....	.....	.....	87.23	85.92	92.43
Aug. 2	96.62	.....	.....	.....	87.25	85.89	91.95
17	97.91	.....	.....	.....	87.42	86.04	91.59
30	96.77	.....	.....	.....	87.52	85.96	91.35
Sept. 13	96.54	.....	.....	.....	87.49	85.73	91.14
27	96.52	.....	.....	.....	87.66	85.73	91.10
Oct. 11	96.60	.....	.....	.....	87.33	85.57	91.05
25	96.78	.....	.....	.....	87.31	85.62	90.93
Nov. 8	96.62	.....	.....	.....	87.56	85.56	91.08
22	96.60	.....	.....	.....	87.66	85.46	91.25
Dec. 6	96.60	.....	.....	.....	87.81	85.43	91.31
20	96.52	.....	.....	.....	87.71	85.33	91.25

a Measuring point lowered 2.8 feet Sept. 27.

b Well clogged.

c Pipe broken off at land surface; well clogged; measurements discontinued.

d Well clogged; measurements discontinued.

## MEADE COUNTY

By J. C. Frye

An investigation of the ground-water resources of Meade County, Kans., was started in 1939 by the Federal Geological Survey in cooperation with the Kansas State Geological Survey and the Kansas State Board of Health. Detailed field work was begun July 5, 1939, by the writer under the direction of S. W. Lohman, Federal geologist in charge of ground-water investigations in Kansas. In 1939, the depth to water level or artesian pressure was measured in about 90 percent of the 326 wells that were visited.

Meade County, situated in southwestern Kansas just north of Beaver County, Okla., is at the east edge of the High Plains province. It is drained by the Cimarron River, which flows across the southern part of the county, and by Crooked Creek and Sand Creek, which are tributaries of the Cimarron. Most of Meade County is underlain by Tertiary and Pleistocene rocks, but it also has outcrops of Permian rocks in the southeastern part. Although most of the wells derive their water from the Tertiary and Pleistocene formations, a few tap water in the Permian rocks, and some penetrate Cretaceous formations that are not exposed in the county. Most of the domestic and stock supplies and the municipal supplies of Fowler, Meade, and Plains are obtained from wells. Only eight wells are pumped for irrigation.

A shallow artesian basin occurs along the valley of Crooked Creek, in the northeastern part of the county. Since 1886, when the first flowing well was drilled on the farm of B. F. Cox, nearly 1,000 wells have been constructed in the basin. Only about 250 of these wells, however, were in usable condition in 1939. Inasmuch as many of the wells are allowed to flow throughout the year, considerable water has been wasted. The maximum artesian head measured in the basin during the present investigation was sufficient to raise the water level 17.4 feet above the land surface. The greatest depth to water level--220 feet below the land surface--was measured west of the artesian basin.

At the end of 1939, periodic water-level measurements were being made in 28 wells near the edges of the artesian basin, on the high plains, and in the dissected southeastern part of the county. The wells were measured monthly in 1939 by the wetted-tape method. Measurements prior to November 1 were made by the writer; those for November and December, by R. B. Christy.



A Stevens 8-day automatic water-stage recorder has been maintained on well 234, at the east side of the artesian basin, since August 31. This recorder was serviced by the writer prior to November 1, and since that date by Christopher Sobba. A total of 272 individual measurements of water level were made from July 5 to the end of the year.

#### Water-level fluctuations

During the last 6 months of 1939 there was a general decline in water levels in the southwestern part of the county; there were only small fluctuations in the northern part, and there were irregular fluctuations in the eastern part. For the period of record, 15 wells showed net rises in water level ranging from 0.04 foot to 3.81 feet, and 13 wells showed net declines ranging from 0.07 foot to 3.85 feet. The maximum fluctuation of water level observed from July through December in wells unaffected by pumping was 6.23 feet, in well 76; the minimum fluctuation was 0.09 foot, in well 61. There was an average net decline in water level of 0.07 foot in the 28 wells. The decline in water level appears to have resulted partly from a deficiency in precipitation and partly from pumpage for irrigation. Precipitation in 1939 was 8.65 inches below normal.

#### Well descriptions and water-level measurements

On the following pages are given descriptions and water levels for the 28 wells under observation at the end of the year. All measurements are given in feet below the measuring points. Field numbers of the wells are used.

2. William A. Ellison. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 5, T. 30 S., R. 26 W. Drilled irrigation well, diameter 16 inches, depth 210 feet. Measuring point, top of 20-inch oil drum set in concrete pump base, 0.5 foot above land surface. Equipped with turbine pump and pump house.

#### Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
June 21	21.40	Aug. 3	22.14	Nov. 9	21.34
July 15	21.27	Sept. 29	22.18	Dec. 13	21.26

3. H. L. Salmon. NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 4, T. 30 S., R. 27 W. Drilled irrigation well, diameter 16 inches, depth 185 feet. Measuring point, top of 16-inch casing, east side, 0.7 foot above land surface. Equipped with turbine pump and concrete discharge trough.

#### Water level, in feet below measuring point, 1939

July 15	29.27	Sept. 5	30.14	Dec. 14	30.00
Aug. 2	29.98	29	30.19		

10. Fred Borchers. SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 29, T. 33 S., R. 28 W. Drilled irrigation well, diameter 16 inches, depth 160 feet. Measuring point, top of iron casing at northeast side, 1.0 foot above land surface. Equipped with turbine pump.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 18	19.15	Sept. 5	16.88	Nov. 9	15.44
Aug. 3	19.91	30	15.90	Dec. 13	15.34

11. J. E. Lutz. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 4, T. 30 S., R. 26 W. Drilled irrigation well, diameter 16 inches, depth 228 feet. Measuring point, top edge of rectangular opening at east side of pump base, 1.0 foot above land surface. Equipped with turbine pump and pump house.

Water level, in feet below measuring point, 1939

July 17	10.40	Sept. 29	14.24	Dec. 13	12.70
Aug. 31	14.09	Nov. 9	12.89		

16. B. A. Cordes. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 25, T. 33 S., R. 29 W. Drilled irrigation well, diameter 5 $\frac{1}{2}$  inches, depth 16 feet. Measuring point, top of 5 $\frac{1}{2}$ -inch galvanized iron casing at east side, 0.1 foot above land surface. Equipped with fixed-direction windmill and lift pump.

Water level, in feet below measuring point, 1939

July 18	13.38	Sept. 1	14.45	Nov. 9	15.24
Aug. 2	13.80	30	15.02	Dec. 13	15.27

23. L. L. Ming. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 18, T. 30 S., R. 26 W., 200 feet west of road, 50 feet north of section line. Unused driven domestic well, diameter 2 $\frac{1}{2}$  inches, depth 14 feet. Measuring point, top of 2 $\frac{1}{2}$ -inch iron casing at south side, 2.5 feet above land surface. No pump on well.

Water level, in feet below measuring point, 1939

July 19	11.51	Aug. 31	11.90	Nov. 9	11.60
Aug. 2	11.79	Sept. 29	12.32	Dec. 13	11.87

27. Ira C. Rees. SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 9, T. 30 S., R. 26 W. Unused drilled stock well, diameter 4 inches, depth 31 feet. Measuring point, top of 4-inch galvanized-iron casing at west side, 2.0 feet above land surface. Pump removed. Windmill tower over well.

Water level, in feet below measuring point, 1939

July 19	20.46	Aug. 31	20.47	Nov. 9	20.48
Aug. 2	20.32	Sept. 29	20.54	Dec. 13	20.46

33. H. L. Woodruff. NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 34, T. 33 S., R. 26 W., 100 yards south of farm house. Unused drilled stock well, diameter 5 inches, depth 68 feet. Measuring point, top of 5-inch galvanized-iron casing at northeast side, 0.7 foot above land surface. New well, pump not installed.

Water level, in feet below measuring point, 1939

July 20	38.29	Aug. 31	38.19	Nov. 9	38.17
Aug. 2	38.29	Sept. 29	38.34	Dec. 13	38.20

34. District school. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 17, T. 33 S., R. 27 W. Drilled domestic well, diameter 6 inches, depth 169 feet. Measuring point, top of  $\frac{1}{2}$ -inch hole in base of pump at southeast side, 0.8 foot above land surface. Equipped with lift pump and windmill.

Water level, in feet below measuring point, 1939

July 20	147.48	Aug. 31	147.55	Nov. 9	147.07
Aug. 2	147.66	Sept. 29	151.19	Dec. 13	147.73

36. Tony Steinke. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 24, T. 32 S., R. 27 W. Unused drilled domestic well, diameter 5 $\frac{1}{2}$  inches, depth 159 feet. Measuring point, top galvanized-iron casing at north side, 0.5 foot above land surface. Pump removed. Windmill tower over well.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 20	158.81	Aug. 31	157.94	Nov. 9	158.02
Aug. 2	158.15	Sept. 29	157.19	Dec. 13	157.43

37. J. H. Clay. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 11, T. 33 S., R. 26 W. Drilled domestic well, diameter 6 inches, depth 83 feet. Measuring point, top of galvanized-iron casing at south side, 0.4 foot above land surface. Well equipped with lift pump and windmill.

Water level, in feet below measuring point, 1939

July 20	34.31	Aug. 31	34.95	Nov. 9	35.50
Aug. 3	35.52	Sept. 29	a 41.72	Dec. 13	35.30

40. J. A. and D. F. Collingwood. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 30, T. 31 S., R. 29 W. Unused drilled domestic well, diameter 4 inches, depth 173 feet. Measuring point, top of 4-inch iron casing at southwest side, 0.7 foot above land surface. Pump pipe in well. Steel drum covers top of casing.

Water level, in feet below measuring point, 1939

July 21	130.79	Sept. 1	130.57	Dec. 14	130.55
Aug. 2	130.76	Nov. 9	130.42		

41. D. L. Shranner. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 20, T. 30 S., R. 30 W., 200 feet southwest of shed. Unused drilled stock well, diameter 5 $\frac{1}{2}$  inches, depth 180 feet. Measuring point, top of galvanized-iron casing at southwest side, 0.3 foot above land surface. Concrete paving around well. Casing covered with galvanized-iron plate.

Water level, in feet below measuring point, 1939

July 21	158.12	Sept. 1	158.21	Nov. 9	158.30
Aug. 3	158.21	30	157.83	Dec. 14	158.20

42. H. Jenkinson. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 23, T. 30 S., R. 29 W. Unused drilled stock well, diameter 3 inches, depth 149 feet. Measuring point, top of 3-inch iron casing at west side, 1.0 foot above land surface. Casing covered with concrete slab.

Water level, in feet below measuring point, 1939

July 21	133.43	Sept. 1	133.37	Nov. 9	133.31
Aug. 3	133.44	30	133.54	Dec. 14	133.23

45. Joseph Rocke. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 31, T. 30 S., R. 27 W. Unused drilled domestic well, diameter 3 inches, depth 200 feet. Measuring point, top of 3-inch iron casing at north side, 0.8 foot above land surface. Equipped with hand lift pump.

Water level, in feet below measuring point, 1939

July 22	4.17	Aug. 31	4.90	Nov. 13	4.67
Aug. 8	4.48	Sept. 29	4.81	Dec. 14	4.53

47. C.A. Harner. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 18, T. 30 S., R. 27 W. Unused drilled domestic well, diameter 6 inches, depth 57 feet. Measuring point, top of iron casing at north side, 1.4 feet above land surface. Well equipped with lift pump and windmill. Used occasionally for stock.

Water level, in feet below measuring point, 1939

July 22	44.39	Aug. 31	43.94	Nov. 13	43.75
Aug. 3	44.02	Sept. 29	43.89	Dec. 14	43.80

a Windmill stopped for measurement.

55. C. W. Farris. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 15, T. 30 S., R. 26 W. Unused drilled domestic well, diameter 3 inches, depth 134 feet. Measuring point, top of iron casing at south side, 0.6 foot above land surface. Top of casing closed with wooden plug.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 24	86.37	Sept. 1	86.40	Nov. 13	86.45
Aug. 3	86.39	30	86.47	Dec. 14	86.44

57. Plains State Bank. SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 18, T. 33 S., R. 30 W. Unused drilled domestic well, diameter 5 inches, depth 181 feet. Measuring point, top of 2-inch galvanized-iron pipe clamped in casing, 3.2 feet above land surface.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 24	159.98	Sept. 1	170.06	Nov. 9	170.42
Aug. 2	169.94	30	170.30	Dec. 13	170.72

59. R. R. Singley. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 20, T. 33 S., R. 29 W., 25 yards east of unoccupied farm house. Unused drilled domestic well, diameter 5 inches, depth 125 feet. Measuring point, top of  $\frac{1}{4}$ -inch bolt through wooden pipe clamp at west side of well, 0.2 foot above land surface. Pump pipe suspended in well; pump removed.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 25	119.18	Sept. 1	121.12	Nov. 9	122.36
Aug. 2	121.76	30	121.38	Dec. 13	123.03

61. John Meyer. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 26, T. 31 S., R. 27 W. Unused drilled domestic well, diameter 6 inches, depth 87 feet. Measuring point, top of 6-inch iron casing at south side, 0.6 foot above land surface. Top of casing closed with a wooden plug.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 26	61.16	Aug. 31	61.16	Nov. 9	61.12
Aug. 2	61.21	Sept. 29	61.20	Dec. 13	61.12

62. H. L. Salmon. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 7, T. 31 S., R. 26 W. Unused drilled domestic well, diameter 6 inches, depth 50+ feet. Measuring point, top of iron casing at east side, 0.5 foot above land surface. Casing extends above basement floor of wrecked house.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 26	26.61	Aug. 31	26.51	Nov. 9	26.41
Aug. 2	26.62	Sept. 29	26.57	Dec. 13	26.44

73. A. M. and O. M. Eubank. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 11, T. 34 S., R. 28 W. Unused drilled stock well, diameter 5 $\frac{1}{2}$  inches, depth 50+ feet. Measuring point, top of galvanized-iron casing at north side, 0.3 foot above land surface. Pump removed. Windmill tower on side.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 27	33.49	Sept. 1	33.43	Nov. 11	33.18
Aug. 2	33.74	30	33.47	Dec. 13	33.40

76. R. L. L. Barnstable. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 3, T. 34 S., R. 28 W. Unused drilled stock well, diameter 5 inches, depth 95 feet. Measuring point, top of galvanized-iron casing at east side, 1.6 feet above land surface. Pump removed. Windmill tower over well.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 27	31.47	Sept. 1	27.70	Nov. 9	32.85
Aug. 2	30.53	30	30.28	Dec. 13	33.93

77. J. W. Wood. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 4, T. 32 S., R. 28 W. Unused drilled domestic and stock well, diameter 3 inches, depth 126 feet. Measuring point, bottom of opening in tee in 3-inch galvanized-iron casing, 2.6 feet above land surface.

## 77. J. W. Wood.--Continued

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 23	65.72	Sept. 1	65.78	Nov. 13	65.56
Aug. 2	65.71	30	65.88	Dec. 14	65.53

88. H. V. Gulick. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 14, T. 31 S., R. 28 W., 150 yards north of house on hilltop. Unused drilled domestic well, diameter 6 inches, depth 95 feet. Measuring point, top of 6-inch iron casing at south side, level with land surface. Well not in use.

Water level, in feet below measuring point, 1939

July 29	44.44	Aug. 31	44.54	Nov. 13	44.30
Aug. 2	44.39	Sept. 29	44.70	Dec. 14	43.79

101. West and Higenbotham. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 29, T. 34 S., R. 26 W. Unused drilled stock well, diameter 5 $\frac{1}{2}$  inches, depth 110 feet. Measuring point, top of 5 $\frac{1}{2}$ -inch galvanized-iron casing at south side, 0.3 foot above land surface. Windmill tower on side.

Water level, in feet below measuring point, 1939

Aug. 2	87.92	Sept. 29	87.99	Dec. 13	88.01
31	87.76	Nov. 9	87.38		

234. Christopher Sobba. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 23, T. 30 S., R. 27 W., 320 feet north of large irrigation well. Unused drilled irrigation well, diameter 16 inches, depth 210 feet. Measuring point, top edge of wooden platform at east side, 0.15 foot above concrete paving which is level with land surface. Water level affected by changes in atmosphere pressure. Automatic water-stage recorder maintained on well since August 31, 1939.

Lowest daily water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Aug. 31	a 15.72	Oct. 21	14.87	Nov. 14	14.84	Dec. 8	14.82
Sept. 21	15.18	22	14.87	15	14.84	9	14.78
22	15.13	23	14.85	16	14.84	10	14.80
23	15.08	24	14.82	17	14.83	11	14.80
24	15.07	25	14.83	18	14.82	12	14.85
25	15.03	26	14.83	19	14.82	13	14.86
26	15.04	27	14.87	20	14.82	14	14.81
30	15.42	28	14.88	21	14.82	15	14.81
Oct. 1	15.30	29	14.88	22	14.81	16	14.80
2	15.21	30	14.88	23	14.83	17	14.80
7	15.32	31	14.86	24	14.86	18	14.83
8	15.27	Nov. 1	14.86	25	14.87	19	14.83
9	15.17	2	14.90	26	14.87	20	14.81
10	15.14	3	14.89	27	14.86	21	14.81
11	15.10	4	14.86	28	14.82	22	14.81
12	15.04	5	14.85	29	14.87	23	14.80
13	14.99	6	14.82	30	14.76	24	14.81
14	15.01	7	14.83	Dec. 1	14.79	25	14.80
15	14.98	8	14.83	2	14.80	26	14.75
16	14.97	9	14.81	3	14.80	27	14.78
17	14.93	10	14.85	4	14.80	28	14.79
18	14.91	11	14.86	5	14.80	29	14.78
19	14.87	12	14.85	6	14.79	30	14.77
20	14.88	13	14.86	7	14.82	31	14.78

304. A. W. Adams. NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 27, T. 34 S., R. 30 W., 1.3 miles west of road. Unused drilled stock well, diameter 6 inches, depth 240 feet. Measuring point, top of bolt through wooden pipe clamp at north side of casing, 2.5 feet above land surface. Pump pipe in casing. Large windmill tower over well. Water levels, in feet below measuring point, 1939: Sept. 4, 220.13; Nov. 9, 218.81.

a Wetted-tape measurement.

## MORTON COUNTY

By T. G. McLaughlin

An investigation of the ground-water resources of Morton County, Kans., was made in 1939 by the Federal Geological Survey in cooperation with the Kansas State Geological Survey and the Kansas State Board of Health. The work was carried on under the supervision of S. W. Lohman, Federal geologist in charge of ground-water investigations in Kansas.

Morton County, a nearly flat, featureless area in the extreme southwest corner of the State, is bordered by Colorado on the west and by Oklahoma on the south. It is drained by the Cimarron River and its tributaries. It is underlain principally by the Ogallala formation and by dune sand, although it has outcrops of Dakota sandstone in several places along the North Fork of the Cimarron and of Triassic (?) red beds at Point Rock along the Cimarron River. A thin mantle of loess covers the north half of the county. Of the wells in Morton County, about two-thirds tap water in the Ogallala formation and about one-third tap water in the Dakota sandstone. A few wells, however, obtain supplies from the alluvium of the Cimarron River or possibly from the red beds in the southwestern part of the county.

Water levels in 113 wells in Morton County were measured at least once as a part of the present investigation. Of these wells, 19 were selected for periodic observation, and, beginning July 1, the water levels in them were measured once each month in 1939. A total of 112 individual measurements of water level were made in the observation wells. Measurements prior to November 1 were made by the writer; those after November 1, by R. B. Christy.

## Well descriptions and water-level measurements

Descriptions and water levels for the 19 observation wells are given on the following pages. The wells are listed by townships from north to south and by ranges from east to west. Within a township the wells are listed by section number. Publication numbers of the wells are used. The water level in each well is expressed in feet below the measuring point.

8. C. M. Crocker. NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 15, T. 31 S., R. 40 W. Unused drilled domestic and stock well, diameter 4.5 inches, depth 188.1 feet. Measuring point, bottom edge of floor flange at south side, 0.8 foot above land surface. Equipped with lift pump.

## 8. C. M. Crocker.--Continued

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 25	152.31	Sept. 26	152.22	Nov. 15	152.19
Aug. 25	152.32	Oct. 27	152.52	Dec. 16	152.22

11. Mrs. Leo Everett. SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 9, T. 31 S., R. 41 W. Unused drilled domestic and stock well, diameter 5.5 inches, depth 216 feet. Measuring point, top of casing at east side, 0.7 foot above land surface. Equipped with lift pump.

Water level, in feet below measuring point, 1939

July 25	111.58	Sept. 25	111.47	Nov. 14	111.56
Aug. 24	111.54	Oct. 27	111.53	Dec. 16	111.34

21. J. W. Bitner. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 3, T. 31 S., R. 43 W. Unused drilled domestic and stock well, diameter 5.5 inches, depth 76.9 feet. Measuring point edge of 5 $\frac{1}{2}$ -inch hole in concrete block, 0.6 foot above land surface. Equipped with lift pump.

Water level, in feet below measuring point, 1939

July 25	70.11	Sept. 25	70.12	Nov. 14	70.07
Aug. 24	70.11	Oct. 27	70.18	Dec. 15	70.05

22. E. A. Wilcox. SW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 14, T. 31 S., R. 43 W., about 150 feet north of road. Abandoned drilled well, diameter 5.5 inches, depth 86.8 feet. Measuring point, top of casing at south side, 1.2 feet above land surface.

Water level, in feet below measuring point, 1939

July 25	74.75	Sept. 25	74.85	Nov. 14	74.67
Aug. 24	74.71	Oct. 27	75.24	Dec. 15	74.67

28. G. L. Hayward. SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 2, T. 32 S., R. 40 W. Unused domestic and stock well, diameter 4.5 inches, depth 150.1 feet. Measuring point, top of casing at north side, level with land surface. No pump in well.

Water level, in feet below measuring point, 1939

July 25	138.97	Sept. 26	138.91	Nov. 15	138.94
Aug. 24	138.95	Oct. 27	139.04	Dec. 16	138.90

42. Lucy Hobbs. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 13, T. 32 S., R. 42 W., about 20 feet south of barn. Unused drilled stock well, diameter 4.5 inches, depth 104.9 feet. Measuring point, top of casing at east side, 1.2 feet above land surface. No pump in well.

Water level, in feet below measuring point, 1939

July 25	68.86	Sept. 25	68.80	Nov. 14	68.80
Aug. 24	68.81	Oct. 27	68.86	Dec. 16	68.80

54. V. W. Dickinson. SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 13, T. 33 S., R. 40 W. Unused drilled domestic and stock well, diameter 4.5 inches, depth 82.4 feet. Measuring point, top of casing at east side, 0.5 foot above land surface. No pump in well.

Water level, in feet below measuring point, 1939

July 25	76.90	Sept. 26	76.78	Nov. 15	76.68
Aug. 24	76.84	Oct. 27	76.72	Dec. 16	76.60

65. John Hentschel. SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 8, T. 33 S., R. 42 W. Unused drilled domestic and stock well, diameter 5.5 inches, depth 61.7 feet. Measuring point, top of casing at north side, 0.4 foot above land surface. Equipped with lift pump.

Water level, in feet below measuring point, 1939

July 25	53.59	Sept. 25	53.60	Nov. 14	53.71
Aug. 24	53.55	Oct. 27	53.73	Dec. 15	53.79

69. George B. Pate. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 32, T. 33 S., R. 42 W. Unused drilled domestic and stock well, diameter 4.5 inches, depth 119.9 feet. Measuring point, top of casing at north side, 1.2 feet above land surface. Equipped with lift pump and windmill.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 25	67.51	Sept. 25	67.54	Nov. 14	67.53
Aug. 24	67.48	Oct. 26	67.49	Dec. 16	67.61

74. Thomas A. Ball. NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 17, T. 33 S., R. 43 W. Unused drilled domestic and stock well, diameter 4.5 inches, depth 93.3 feet. Measuring point, top of casing at south side, 2.4 feet above land surface. No pump in well.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 25	88.01	Sept. 25	87.96	Dec. 16	87.88
Aug. 24	87.96	Nov. 14	87.87		

77. Ethyl B. Weber. NW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 7, T. 34 S., R. 39 W. Unused drilled domestic and stock well, diameter 4.5 inches, depth 163.4 feet. Measuring point, top of casing at west side, 0.4 foot above land surface. Equipped with lift pump.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 25	147.42	Sept. 26	147.52	Nov. 15	147.69
Aug. 24	147.65	Oct. 27	147.87	Dec. 16	147.63

87. G. L. Hayward. SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 1, T. 34 S., R. 41 W. Unused drilled domestic and stock well, diameter 4.5 inches, depth 140.4 feet. Measuring point, top of casing at south side, 0.8 foot above land surface. Equipped with lift pump and windmill.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 25	129.68	Sept. 26	129.67	Dec. 16	129.60
Aug. 24	129.67	Nov. 15	129.60		

93. Ira Webb. NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 28, T. 34 S., R. 41 W. Unused drilled domestic and stock well, diameter 5.5 inches, depth 188.4 feet. Measuring point, top of casing at south side, 1.5 feet above land surface. Equipped with lift pump and windmill.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 25	159.94	Sept. 26	159.90	Nov. 14	159.83
Aug. 24	159.93	Oct. 27	160.14	Dec. 16	159.82

97. W. B. Cushman. SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 22, T. 34 S., R. 42 W. Unused drilled stock well, diameter 4.5 inches, depth 136.1 feet. Measuring point, top of casing at south side, 1.3 feet above land surface. No pump in well.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 26	113.98	Sept. 26	113.87	Nov. 14	113.78
Aug. 25	113.89	Oct. 26	113.76	Dec. 16	113.80

104. Wm. Dulahahn. NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 35, T. 34 S., R. 43 W. Unused drilled domestic and stock well, diameter 4.5 inches, depth 95.9 feet. Measuring point, top of casing at south side, 1.0 foot above land surface. No pump in well.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 25	90.13	Sept. 25	90.16	Nov. 14	90.11
Aug. 24	90.12	Oct. 26	90.03	Dec. 16	90.16

105. S. J. Willits. NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 5, T. 35 S., R. 39 W., about 30 feet east of house and 50 feet south of road. Abandoned drilled well diameter 4.5 inches, depth 215.3 feet. Measuring point, top of casing at east side, 0.2 foot above land surface. Equipped with lift pump.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 25	198.86	Sept. 26	198.40	Nov. 15	198.59
Aug. 25	198.73	Oct. 26	198.51	Dec. 16	198.54



114. J. L. Kniffen. SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 13, T. 35 S., R. 41 W. Unused drilled stock well, diameter 4.5 inches, depth 252.4 feet. Measuring point, top of casing at east side, 1.0 foot above land surface. No pump in well.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 25	226.88	Sept. 26	226.86	Nov. 14	226.86
Aug. 25	226.62	Oct. 26	226.83	Dec. 16	226.89

117. W. C. Washburn. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 4, T. 35 S., R. 42 W. Unused drilled domestic and stock well, diameter 6 inches, depth 215.9 feet. Measuring point, top of iron casing at west side, 1.2 feet above land surface. Equipped with lift pump.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 26	167.39	Sept. 25	167.25	Nov. 14	167.11
Aug. 25	167.35	Oct. 26	167.20	Dec. 16	167.16

127. J. M. Hardwick. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 21, T. 35 S., R. 43 W. Unused drilled domestic and stock well, diameter 4.5 inches, depth 227.1 feet. Measuring point, top of plank on which metal pipe clamp rests, 0.6 foot above land surface. Equipped with lift pump and windmill.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 25	211.11	Sept. 25	210.98	Nov. 14	211.11
Aug. 24	211.85	Oct. 26	211.65	Dec. 16	211.91

## SCOTT COUNTY

By H. A. Waite

A cooperative investigation of the ground-water resources of Scott County was started in September 1939 by the Federal Geological Survey, the Kansas State Geological Survey, and the Division of Sanitation of the Kansas State Board of Health. A preliminary investigation of the ground-water resources of the shallow-water basin in Scott and Finney Counties was made by Moss in the summer of 1933.<sup>1/</sup> In May 1934 a reconnaissance of the Scott County shallow-water basin was made by the writer in connection with an investigation of the ground-water conditions in the southern part of the High Plains.<sup>2/</sup> The water levels were measured in about 12 irrigation wells in the pumping district. Three of these wells are included in the present water-level observation program. Additional studies were made in the Scott County shallow-water basin in November 1936 by W. R. Stanley, under the direction of H. P. Burleigh, for the Resettlement Administration. In the fall of 1939 an observation-well program in Scott County was started by the writer under the direction of S. W. Lohman, Federal geologist in charge of ground-water investigations in Kansas. It is planned to complete a detailed ground-water investigation in Scott County during the field season of 1940.

At the start of the present investigation, 29 wells were selected at strategic points in the county for periodic water-level observation. Two of these wells, 32 and 33, were equipped with Stevens 8-day automatic water-stage recorders. A total of 147 wetted-tape measurements was made in 1939. All water-level measurements until November were made by the writer; all measurements thereafter, by R. B. Christy. The two recorders maintained by the Geological Survey were serviced each week by J. R. Haverfield.

Continuous automatic water-stage recorders have been maintained on two wells in Scott County for several years by the Division of Water Resources of the Kansas State Board of Agriculture. Descriptions and complete water-level records of both wells have been made available through the courtesy of Mr. G. S. Knapp, Chief Engineer, and are included in this report. Well 1 has been observed continuously since October 23, 1931, and well 2 has been observed continuously since April 18, 1934. These two recorders are being serviced by K. D. McCall, assistant engineer of the Division of Water Resources.

<sup>1/</sup> Moss, R. G., Preliminary report on ground-water resources of the shallow-water basin in Scott and Finney Counties, Kans.: Kans. Geol. Survey Min. Resources Circ. 5, 7 pp., Oct. 1, 1933.

<sup>2/</sup> Theis, C. V., Burleigh, H. P., and Waite, H. A., Ground water in the southern high plains: U. S. Dept. Interior Mem. for the Press, Oct. 30, 1935.

The Ogallala formation, which supplies nearly all the wells in Scott County, is the chief source of water in the shallow-water basin. The shallow-water basin derives its name from the fact that there is no surface drainage from the area and from the fact that water is obtained at depths ranging from 20 to 90 feet, in contrast to surrounding areas in which water stands from 90 to 150 feet below the surface. The development and use of ground water for supplemental irrigation in the shallow-water basin began about 1910. Probably the greatest development took place as a result of prolonged droughts during the last decade. At the end of 1936 there were about 40 irrigation wells in operation in the area, whereas at the end of 1933 there were more than 60. Additional irrigation wells were drilled during 1939. The yields of irrigation wells in the shallow-water basin range from about 500 to 2,000 gallons a minute.

The following table is based on records of the Division of Water Resources of the Kansas State Board of Agriculture and shows the increase in irrigated acreage during the last 9 years.

Irrigated acreage in the Scott County shallow-water basin, 1931-39

Year	Acres	Year	Acres	Year	Acres
1931	2,262	1934	3,859	1937	6,328
1932	1,021	1935	4,234	1938	10,355
1933	2,035	1936	3,849	1939	12,000

#### Water-level fluctuations

The following discussion is based largely upon the water-level records of wells 1 and 2, furnished by the Division of Water Resources, since they extend over a period of several years. The water-level records of the observation wells established in 1939 cover only the period from September through December. Wells 1 and 2 are both within the pumping district, the former near the southwestern margin and the latter about 1 mile south of Scott City, near the middle of the pumping area. The water levels in both wells are affected by pumping in nearby wells, the greatest effect being recorded in well 2.

The United States Weather Bureau maintains a rain gage at Scott City, in the middle of Scott County. In 1939 the total precipitation was 14.63 inches, or 5.22 inches below normal. The greatest deficiencies occurred during July, September, and October. Of the total annual precipitation, 9.17 inches fell during the first half of the year. Subnormal precipitation during 1939 was doubtless responsible for the heavy pumping for irrigation.

The water levels in wells 1 and 2 showed net declines of 0.79 foot and 2.07 feet, respectively, for the period from January 1 to December 31, 1939. The water level in well 1 rose 0.38 foot from January 1 until May 6, after which it declined steadily until December 31, with a maximum range in fluctuation during 1939 of 1.17 feet. The water level in well 2 rose 0.49 foot from January 1 until April 25, after which it declined steadily until December 15. The maximum fluctuation in well 2 during 1939 was 2.61 feet. In well 1, the highest observed water level during its entire period of record--14.12 feet above datum--occurred May 14 and 16, 1934; and its lowest observed water level--10.41 feet above datum--occurred December 30 and 31, 1939. Well 2 reached the highest observed water level during its entire period of record--13.85 feet above datum--April 25, 1939; and its lowest observed water level--11.24 feet above datum--December 15-23, 1939. A net decline in water level of 3.23 feet in well 1 occurred during the period from October 23, 1931, to December 31, 1939; a net decline of 2.06 feet in well 2 was recorded for the period from April 18, 1934, to December 31, 1939.

In general, the water levels in the 29 wells selected in 1939 for periodic observation were declining during the period from September through December. During the period of observation, the water levels in 22 wells of this group showed net declines ranging from 0.01 foot to 3.94 feet; water levels in the 7 other wells showed net rises ranging from 0.01 foot to 1.06 feet. Out of 18 wells in the pumping district, the water levels in 12 showed net declines ranging from 0.19 foot to 3.94 feet.

Wells 32 and 33, equipped with automatic water-stage recorders, are within the pumping district; water levels in them are affected by pumping in nearby irrigation wells and by changes in barometric pressure.

#### Well descriptions and water-level measurements

On the following pages are given descriptions and water levels of the 31 wells under observation at the end of 1939. The older of the two recorder wells observed by the Division of Water Resources has been designated as well 1; the other as well 2. For the remainder of the wells, original field numbers are used.

1. Mrs. Rosine Smith. NW cor. sec. 9, T. 20 S., R. 33 W. Unused drilled irrigation well, diameter 26 inches, depth 100+ feet. Measuring point to May 28, 1935, top of square iron rim of cast-iron pump base, 1.0 foot above land surface, 1.02 feet above bench mark 1, 0.06 foot below bench mark 2, 71.02 feet above arbitrary datum, 2,974.52 feet above sea level. Measuring point since May 28, 1935, top of circular edge of old pump base at west side, 0.8 foot above land surface, 0.81 foot above bench mark 1, 0.27 foot below bench mark 2, 70.81 feet above arbitrary datum, 2,974.31 feet above sea level. Bench mark 1, cross cut in concrete at northwest corner of well shelter, 70.00 feet above datum, 2,973.50 feet above sea level. Bench mark 2, top of northwest stud in engine base east of shelter, 71.08 feet above datum, 2,974.58 feet above sea level. Water level Oct. 23, 1931, 57.33 feet below original measuring point, 13.69 feet above datum. Highest observed water level, 14.12 feet above datum May 14 and 16, 1934; lowest observed water level, 10.41 feet above datum Dec. 30 and 31, 1939. Stevens 90-day automatic water-stage recorder maintained on well since Oct. 23, 1931. Water-level measurements supplied through courtesy of the Division of Water Resources of the Kansas State Board of Agriculture.

Mean daily water level, in feet above datum, 1931

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Oct. 23	13.69	Nov. 10	13.65	Nov. 28	13.68	Dec. 15	13.72
24	13.69	11	13.64	29	13.69	16	13.72
25	13.69	12	13.64	30	13.70	17	13.72
26	13.69	13	13.64	Dec. 1	13.70	18	13.73
27	13.70	14	13.64	2	13.70	19	13.73
28	13.70	15	13.65	3	13.70	20	13.72
29	13.70	16	13.65	4	13.70	21	13.72
30	13.69	17	13.65	5	13.70	22	13.72
31	13.68	18	13.65	6	13.70	23	13.72
Nov. 1	13.68	19	13.66	7	13.70	24	13.72
2	13.67	20	13.69	8	13.70	25	13.73
3	13.66	21	13.69	9	13.70	26	13.74
4	13.66	22	13.70	10	13.70	27	13.75
5	13.66	23	13.70	11	13.70	28	13.76
6	13.65	24	13.69	12	13.70	29	13.80
7	13.65	25	13.68	13	13.71	30	13.80
8	13.65	26	13.68	14	13.71	31	13.80
9	13.65	27	13.68				

Mean daily water level, in feet above datum, 1932

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	13.79	13.92	14.00	14.02	14.00	14.01	13.84	13.58	13.44	13.40	13.48	13.49
2	13.78	13.92	14.00	14.01	14.01	.....	13.84	13.59	13.43	13.39	13.46	13.51
3	13.78	13.93	14.01	14.00	14.01	.....	13.83	13.59	13.43	13.39	13.45	13.54
4	13.78	13.93	14.01	14.00	14.02	.....	13.82	13.60	13.41	13.41	13.43	13.55
5	13.80	13.96	14.00	13.99	14.03	14.10	13.82	13.64	13.40	13.41	13.41	13.57
6	13.80	13.95	.....	14.00	14.04	14.09	13.78	13.68	13.41	13.41	13.41	13.58
7	13.80	13.96	.....	14.00	14.05	14.06	13.76	13.69	13.42	13.41	13.40	13.60
8	13.80	13.97	.....	13.99	14.07	14.03	13.75	13.71	13.42	13.43	13.40	13.60
9	13.80	13.96	.....	13.98	14.07	14.02	13.74	13.77	13.43	13.43	13.39	.....
10	13.80	13.97	.....	13.99	14.05	14.02	13.72	13.79	13.45	13.41	13.40	.....
11	13.80	13.97	.....	14.00	14.05	.....	13.72	13.80	13.45	13.42	13.39	.....
12	13.80	13.97	.....	14.00	14.03	.....	13.71	13.81	13.45	13.42	13.40	.....
13	13.80	13.97	.....	14.00	14.01	.....	13.71	13.80	13.46	13.43	13.40	.....
14	13.80	13.95	.....	14.00	14.00	13.98	13.70	13.80	13.48	13.44	13.40	.....
15	13.80	13.95	.....	14.00	14.00	13.97	13.70	13.80	13.48	13.45	13.40	.....
16	13.80	13.96	.....	14.00	13.99	13.96	13.67	13.77	13.47	13.46	13.40	.....
17	13.80	13.97	.....	14.00	13.99	13.96	13.67	13.76	13.47	13.48	13.41	.....
18	13.81	13.98	.....	14.00	13.99	.....	13.66	13.74	13.46	13.51	13.41	.....
19	13.81	13.98	.....	14.00	13.99	.....	13.66	13.72	13.46	13.54	13.42	.....
20	13.81	13.98	.....	14.00	13.99	13.91	13.64	13.71	13.46	13.58	13.42	.....
21	13.82	13.98	.....	14.00	13.99	13.91	13.64	13.68	13.45	13.59	13.43	.....
22	13.83	13.98	.....	14.00	13.99	13.92	13.63	13.64	13.44	13.58	13.43	.....
23	13.84	13.99	.....	13.99	14.00	13.90	13.63	13.60	13.42	13.58	13.43	.....
24	13.86	13.99	.....	13.99	14.00	13.90	13.62	13.57	13.40	13.58	13.44	.....
25	13.88	13.99	.....	13.99	14.00	13.90	13.63	13.54	13.39	13.57	13.44	.....
26	13.89	14.00	.....	14.00	13.99	13.89	13.62	13.51	13.39	13.55	13.42	.....
27	13.90	14.00	.....	14.01	13.99	13.88	13.61	13.50	13.39	13.51	13.45	.....
28	13.90	14.00	.....	14.00	14.00	13.87	13.61	13.48	13.39	13.51	13.45	.....
29	13.91	14.00	.....	13.99	14.00	13.87	13.61	13.47	13.38	13.50	13.46	.....
30	13.90	.....	.....	14.00	14.01	13.85	13.60	13.45	13.39	13.50	13.47	.....
31	13.90	.....	.....	.....	14.01	.....	13.60	13.43	.....	13.49	.....	.....

## WATER LEVELS AND ARTESIAN PRESSURE, 1933

## 1. Mrs. Rosine Smith.--Continued

Mean daily water level, in feet above datum, 1933

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	13.83	13.76	13.79	13.67	13.57	13.45	13.31	13.27	.....	13.46	13.36
2	.....	13.80	13.76	13.80	13.66	13.58	13.43	13.32	13.26	.....	13.45	13.36
3	.....	13.78	13.75	13.80	13.67	13.57	13.42	.....	13.26	.....	13.43	13.37
4	.....	13.76	13.75	13.80	13.65	13.57	13.41	.....	13.26	.....	13.40	13.38
5	.....	13.75	13.74	13.80	13.66	13.58	13.41	.....	13.25	.....	13.35	13.39
6	.....	13.74	13.75	13.80	13.66	13.60	13.41	.....	13.26	.....	13.31	13.40
7	.....	13.73	13.75	13.80	13.64	13.61	13.40	.....	13.26	.....	13.26	13.41
8	.....	.....	13.76	13.80	13.63	13.60	13.40	.....	13.26	.....	13.21	13.41
9	13.87	.....	13.76	13.80	13.63	13.60	13.40	.....	13.26	.....	13.16	13.42
10	13.89	.....	13.78	13.80	13.63	13.61	13.40	.....	13.27	.....	13.12	13.43
11	13.91	.....	13.78	13.80	13.63	13.62	13.40	.....	13.28	.....	13.09	13.43
12	13.94	.....	13.79	13.80	13.63	13.62	13.40	.....	13.28	.....	13.03	13.43
13	13.97	.....	13.80	13.80	13.62	13.63	13.38	.....	13.29	.....	13.01	13.40
14	13.99	.....	13.80	13.80	13.62	13.64	13.36	.....	13.30	.....	13.01	13.37
15	14.01	.....	13.84	13.81	13.62	13.66	13.34	.....	13.30	.....	13.02	13.35
16	14.03	.....	13.87	13.81	13.62	13.67	13.32	.....	.....	.....	13.04	13.35
17	14.03	.....	13.89	13.81	13.62	13.67	13.31	.....	.....	.....	13.06	13.35
18	14.03	.....	13.89	13.81	13.62	13.67	13.30	.....	.....	.....	13.09	13.35
19	14.03	.....	13.88	13.81	13.62	13.66	13.30	.....	.....	.....	13.13	13.34
20	14.02	.....	13.88	13.77	13.62	13.64	13.30	.....	.....	.....	13.16	13.33
21	14.02	.....	13.88	13.75	13.62	13.60	13.30	13.32	.....	13.35	13.20	13.33
22	14.00	.....	13.87	13.74	13.62	13.59	13.30	13.32	.....	.....	13.26	13.33
23	13.99	13.73	13.85	13.73	13.61	13.57	13.28	13.31	.....	13.35	13.29	13.33
24	13.98	13.74	13.85	13.71	13.61	13.55	13.29	13.31	.....	13.35	13.32	13.33
25	13.97	13.74	13.84	13.71	13.60	13.53	13.29	13.30	.....	13.37	13.33	13.33
26	13.96	13.75	13.83	13.70	13.59	13.51	13.29	13.30	.....	13.39	13.34	13.33
27	13.94	13.76	13.82	13.69	13.58	13.50	13.30	13.30	.....	13.40	13.34	13.33
28	13.93	13.76	13.79	13.68	13.57	13.49	13.31	13.30	.....	13.42	13.34	13.33
29	13.91	.....	13.78	13.69	13.56	13.47	13.30	13.30	.....	13.44	13.35	13.34
30	13.87	.....	13.80	13.67	13.55	13.46	13.31	13.29	.....	13.46	13.35	13.36
31	13.86	.....	13.79	.....	13.55	.....	13.30	13.28	.....	13.46	.....	13.37

Mean daily water level, in feet above datum, 1934

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	13.39	13.45	13.70	13.76	13.86	13.66	13.30	12.86	12.65	.....	.....	12.49
2	13.42	13.45	13.69	13.77	13.87	13.64	13.29	12.87	12.64	.....	.....	12.50
3	13.45	13.46	13.69	13.81	13.87	.....	13.29	12.89	12.64	.....	.....	12.49
4	13.47	13.47	13.69	13.82	13.87	.....	13.27	12.91	12.63	.....	.....	12.48
5	13.50	13.50	13.69	13.83	13.87	.....	13.26	12.92	12.63	.....	.....	12.50
6	13.55	13.53	13.70	.....	13.98	.....	13.25	12.93	12.62	.....	12.40	12.51
7	13.59	13.55	13.70	.....	13.90	.....	13.25	12.93	12.62	.....	12.40	12.51
8	13.64	13.56	13.71	.....	13.92	13.62	13.25	12.92	12.62	.....	12.41	12.51
9	13.67	13.58	13.72	.....	13.94	13.60	13.24	12.94	12.61	.....	12.43	12.52
10	13.69	13.60	13.72	.....	13.97	13.58	13.21	12.92	12.60	.....	12.43	12.53
11	13.70	13.62	13.72	.....	14.00	13.58	13.19	12.90	12.58	.....	12.44	12.54
12	13.71	13.62	13.69	.....	14.05	13.57	13.19	12.85	12.56	.....	12.44	12.56
13	13.71	13.62	13.69	.....	14.10	13.57	13.18	12.79	12.56	.....	12.45	12.58
14	13.71	13.62	13.69	.....	14.12	13.55	13.16	12.76	12.55	12.51	12.45	12.58
15	13.70	13.61	13.69	13.84	.....	13.47	13.11	12.74	12.54	12.49	12.46	12.57
16	13.70	13.62	13.70	13.83	14.12	13.46	13.09	12.73	12.53	12.50	12.46	12.55
17	13.70	13.63	13.71	13.82	14.11	13.43	13.05	12.71	12.51	12.51	12.47	12.53
18	13.69	13.65	13.71	13.80	14.09	13.42	13.03	12.68	12.49	12.48	12.47	12.52
19	13.68	13.64	13.70	13.78	14.06	13.42	12.99	12.68	12.48	12.45	12.47	12.50
20	13.67	13.64	13.70	13.78	14.03	13.40	12.96	12.68	12.48	.....	12.46	12.48
21	13.65	13.63	13.70	13.77	14.00	13.39	12.93	12.71	.....	.....	12.45	12.48
22	13.64	13.65	13.70	13.76	13.97	13.38	12.90	12.74	.....	.....	12.45	12.48
23	13.61	13.66	13.71	13.76	13.93	13.38	12.86	12.74	.....	.....	12.45	12.49
24	13.58	13.68	13.72	13.76	13.89	13.36	12.85	12.77	.....	.....	12.45	12.50
25	13.55	13.69	13.72	13.77	13.85	13.36	12.83	12.74	.....	.....	12.44	12.51
26	13.52	13.68	13.74	13.78	13.81	13.36	12.82	12.70	.....	12.45	12.44	12.52
27	13.49	13.68	13.75	13.77	13.78	13.36	12.80	12.68	.....	12.45	12.45	12.54
28	13.46	13.69	13.76	13.79	13.74	13.35	12.81	12.67	.....	.....	12.45	12.55
29	13.45	.....	13.77	13.82	13.72	13.33	12.82	12.66	.....	.....	12.45	12.56
30	13.45	.....	13.77	13.83	13.70	13.31	12.83	12.66	.....	.....	12.48	12.56
31	13.45	.....	13.76	.....	13.68	.....	12.85	12.65	.....	.....	.....	12.56

## 1. Mrs. Rosine Smith.--Continued

Mean daily water level, in feet above datum, 1935

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	12.56	.....	12.84	12.96	13.02	12.93	12.99	12.66	12.43	12.24	12.30	12.35
2	12.57	.....	12.86	12.97	13.01	12.92	12.98	12.66	12.42	12.23	12.29	12.37
3	12.57	.....	12.88	12.96	13.00	12.90	12.98	12.65	12.41	12.22	12.28	12.38
4	12.58	.....	12.89	12.94	13.00	12.89	12.98	12.65	12.40	12.22	12.28	12.39
5	12.58	.....	12.90	12.91	12.99	12.86	12.97	12.65	12.39	12.22	12.31	12.40
6	12.59	.....	12.93	12.89	13.00	12.88	12.97	12.63	12.38	12.22	12.27	12.40
7	12.59	.....	12.93	12.88	13.00	12.90	12.96	12.61	12.37	12.22	12.26	12.40
8	12.59	.....	12.92	12.87	13.00	12.91	12.95	12.60	12.36	12.24	12.25	12.40
9	12.62	.....	12.91	12.86	13.00	12.92	12.94	12.58	12.35	12.25	12.24	12.42
10	12.64	.....	12.89	12.88	.....	12.95	12.93	12.57	12.34	12.25	12.24	12.42
11	12.65	.....	12.88	12.95	.....	12.97	12.92	12.57	12.32	12.24	12.23	12.42
12	12.67	12.79	12.88	12.92	.....	13.00	12.91	12.56	12.31	12.25	12.21	12.42
13	12.69	12.79	12.88	12.90	.....	13.00	12.90	12.56	12.30	12.24	12.19	12.43
14	12.70	12.78	12.87	12.92	.....	13.00	12.89	12.56	12.29	12.24	12.17	12.44
15	12.72	12.78	12.86	12.92	.....	13.01	12.88	12.56	12.27	12.24	12.17	12.44
16	12.75	12.77	.....	12.94	.....	13.01	12.87	12.53	12.26	12.26	12.16	12.45
17	12.76	12.77	12.85	12.94	.....	13.02	12.85	12.53	12.26	12.27	12.16	12.45
18	12.78	12.76	12.86	12.96	.....	13.03	12.83	12.51	12.25	12.27	12.16	12.45
19	12.79	12.76	12.85	12.97	.....	13.03	12.83	12.50	12.25	12.27	12.17	12.45
20	12.79	12.77	12.81	12.99	.....	13.03	12.83	12.49	12.25	12.28	12.17	12.46
21	.....	12.77	12.81	13.00	.....	13.03	12.82	12.49	12.26	12.28	12.17	12.46
22	.....	12.78	12.83	13.02	.....	13.03	12.79	12.48	12.26	12.30	12.17	12.46
23	.....	12.78	12.86	13.03	.....	13.02	12.77	12.47	12.28	12.30	12.18	12.47
24	.....	12.79	12.89	13.03	.....	13.01	12.76	12.47	12.27	12.30	12.21	12.48
25	.....	12.79	12.89	13.03	.....	13.01	12.75	12.46	12.27	12.29	12.23	12.48
26	.....	12.79	12.93	13.05	.....	13.00	12.74	12.45	12.26	12.29	12.26	12.48
27	.....	12.80	12.93	13.04	.....	13.00	12.74	12.45	12.26	12.29	12.29	12.48
28	.....	12.82	12.95	13.03	12.96	13.00	12.73	12.45	12.26	12.29	12.29	.....
29	.....	.....	12.95	13.04	12.96	13.00	12.72	12.45	12.25	12.28	12.31	.....
30	.....	.....	12.95	13.04	12.95	12.99	12.72	12.46	12.26	12.28	12.32	.....
31	.....	.....	12.95	.....	12.94	.....	12.69	12.43	.....	12.30	.....	.....

Mean daily water level, in feet above datum, 1936

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	12.51	12.60	13.01	13.06	12.88	12.86	12.59	12.17	12.13	12.07	12.06
2	.....	12.50	12.60	13.01	13.03	12.89	12.85	12.56	12.17	12.17	12.07	12.04
3	.....	12.53	12.62	13.00	13.02	12.91	12.84	12.54	12.17	12.17	12.05	12.05
4	.....	12.57	12.62	12.99	13.99	12.92	12.84	12.50	12.16	12.15	12.04	12.06
5	.....	.....	12.61	13.00	12.95	12.92	12.84	12.49	12.15	12.13	12.04	12.07
6	.....	.....	12.62	13.00	12.94	12.91	12.84	12.50	12.15	12.14	12.04	12.08
7	.....	.....	12.61	12.99	12.94	12.90	12.83	12.51	12.17	12.15	12.05	12.09
8	.....	.....	12.63	12.99	12.95	12.89	12.83	12.51	12.19	12.14	12.03	12.09
9	12.54	.....	12.64	13.01	12.94	12.86	12.82	12.49	12.20	12.12	12.01	12.09
10	12.54	.....	12.67	13.02	12.94	.....	12.82	12.48	12.20	12.10	12.00	12.10
11	12.55	.....	12.67	13.01	12.93	12.84	12.82	12.47	12.21	12.08	11.99	12.10
12	12.55	.....	12.67	13.00	12.87	12.85	12.81	12.46	12.23	12.05	11.98	12.11
13	12.55	.....	12.67	13.01	12.84	12.85	12.81	12.45	12.24	12.04	11.98	12.11
14	12.55	.....	12.66	13.00	12.83	12.86	12.80	12.46	12.25	12.03	11.97	12.12
15	12.55	.....	12.66	13.00	12.82	12.87	12.79	12.46	12.25	12.03	11.96	12.12
16	12.55	.....	12.68	13.01	12.81	12.88	12.79	12.45	12.26	12.03	11.96	12.13
17	.....	.....	12.67	13.02	12.82	12.88	12.78	12.43	12.28	12.04	11.95	12.13
18	.....	.....	12.67	13.02	12.82	12.88	12.77	12.43	12.28	12.04	11.96	12.13
19	.....	.....	12.68	13.02	12.82	12.89	12.77	12.42	12.28	12.04	11.96	12.13
20	.....	.....	12.67	13.03	12.82	12.88	12.76	12.40	12.27	12.05	11.95	12.14
21	.....	.....	12.66	13.04	12.83	12.88	12.75	12.40	12.27	12.06	11.95	12.14
22	.....	.....	12.67	13.04	12.83	12.88	12.73	12.40	12.27	12.06	11.97	12.14
23	.....	.....	12.67	13.04	12.82	12.89	12.69	12.38	12.27	12.06	11.99	12.14
24	.....	.....	12.66	13.05	12.82	12.88	12.69	12.36	12.26	12.07	12.00	12.15
25	12.56	.....	12.65	13.06	12.84	12.87	12.69	12.32	12.25	12.07	12.03	12.16
26	12.56	.....	12.64	13.08	12.84	12.87	12.67	12.30	12.25	12.08	12.04	12.16
27	12.55	12.57 <sup>a</sup>	12.98	13.08	12.86	12.87	12.66	12.28	12.25	12.09	12.05	12.16
28	12.53	12.58	12.98	13.07	12.86	12.87	12.65	12.25	12.25	12.10	12.06	12.17
29	12.53	12.60	12.98	13.06	12.86	12.87	12.62	12.23	12.23	12.09	12.06	12.18
30	12.53	.....	12.99	13.06	12.88	12.87	12.63	12.20	12.19	12.09	12.06	12.19
31	12.52	.....	13.00	.....	12.88	.....	12.62	12.17	.....	12.08	.....	12.19

<sup>a</sup> Changes due to correction for error in tape previously used.

## 1. Mrs. Rosine Smith.--Continued

Mean daily water level, in feet above datum, 1937

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	12.19	12.33	12.52	12.63	12.73	12.77	.....	11.97	11.85	.....	11.56	.....
2	12.20	12.34	12.52	12.64	12.74	12.75	.....	11.97	11.84	.....	11.55	.....
3	12.20	12.34	12.52	12.65	12.75	12.72	.....	11.97	11.84	.....	11.54	.....
4	12.20	12.35	12.52	12.66	12.75	12.70	.....	11.97	.....	.....	11.56	.....
5	12.20	12.35	12.51	12.66	12.75	12.69	.....	11.96	.....	.....	11.55	.....
6	12.20	12.37	12.51	12.67	12.75	12.65	.....	11.95	.....	.....	11.56	.....
7	12.22	12.33	12.50	12.63	12.76	12.60	.....	11.92	.....	.....	11.55	.....
8	12.23	12.38	12.51	12.69	12.77	12.57	.....	11.91	.....	.....	11.54	.....
9	.....	12.38	12.52	12.69	12.78	12.53	12.15	11.91	.....	.....	11.55	11.51
10	.....	12.38	12.53	12.68	12.80	12.49	12.16	11.91	.....	.....	11.55	11.51
11	.....	12.41	12.54	12.69	12.80	12.43	12.16	11.91	.....	.....	11.55	.....
12	.....	12.42	12.54	12.69	12.80	.....	12.14	11.90	.....	11.65	11.55	.....
13	.....	12.43	12.55	12.69	12.81	.....	12.13	11.89	.....	11.65	11.54	.....
14	.....	12.45	12.55	12.69	12.81	.....	12.12	11.91	.....	11.67	11.55	.....
15	.....	12.46	.....	12.69	12.82	.....	12.10	11.91	.....	11.68	11.54	.....
16	.....	12.46	.....	12.70	12.83	.....	12.07	11.91	.....	11.69	11.54	.....
17	.....	12.47	.....	12.70	12.84	.....	12.08	11.90	.....	11.68	11.54	.....
18	.....	12.47	.....	12.71	12.84	.....	12.06	11.90	.....	11.66	11.54	.....
19	.....	12.50	.....	12.72	12.85	.....	12.07	11.90	.....	11.65	.....	.....
20	.....	12.51	.....	12.73	12.86	.....	12.08	11.89	.....	11.63	.....	.....
21	.....	12.52	.....	12.73	12.86	.....	12.07	11.88	.....	11.64	.....	.....
22	.....	12.52	.....	12.72	12.88	.....	12.07	11.89	.....	11.64	.....	.....
23	.....	12.52	.....	12.74	12.88	.....	12.05	11.88	.....	11.63	.....	11.57
24	.....	12.52	.....	12.75	12.89	.....	12.05	11.89	.....	11.61	.....	.....
25	.....	12.52	12.59	12.74	12.89	.....	12.05	11.88	.....	11.61	.....	.....
26	12.29	12.52	12.60	12.74	12.87	.....	12.05	11.87	.....	11.60	.....	.....
27	12.29	12.52	12.61	12.75	12.85	.....	12.02	11.86	.....	11.59	.....	.....
28	12.29	12.52	12.61	12.75	12.83	.....	12.02	11.86	.....	11.59	.....	.....
29	12.30	.....	12.62	12.75	12.80	.....	12.01	11.86	11.69	11.57	.....	.....
30	12.31	.....	12.62	12.74	12.79	.....	12.01	11.86	.....	11.56	.....	.....
31	12.32	.....	12.62	.....	12.77	.....	12.00	11.85	.....	11.57	.....	.....

Mean daily water level, in feet above datum, 1933

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	11.80	11.93	12.05	12.06	12.09	11.93	11.58	11.39	11.30	11.22	11.16
2	.....	11.80	11.93	12.05	12.06	12.10	11.92	.....	11.38	11.29	11.21	11.16
3	.....	11.81	11.94	12.05	12.07	12.10	11.90	.....	11.33	11.29	11.20	11.17
4	.....	11.81	11.94	12.06	12.07	12.09	11.89	.....	11.38	11.29	11.21	11.17
5	.....	11.81	11.94	12.06	12.08	12.11	11.88	11.52	11.37	11.23	11.20	11.17
6	.....	11.82	11.95	12.06	12.09	12.11	11.87	11.52	11.37	11.23	11.21	11.17
7	.....	11.83	11.96	12.07	12.10	12.10	11.84	11.51	11.37	11.23	11.20	11.17
8	.....	11.83	11.96	12.08	12.10	12.11	11.83	11.50	11.36	11.23	11.21	11.17
9	.....	11.83	11.96	12.07	12.10	12.12	11.82	11.50	11.36	11.27	11.21	11.18
10	.....	11.84	11.96	12.07	12.10	12.11	11.81	11.49	11.36	11.27	11.20	11.18
11	11.64	11.84	11.96	12.05	12.10	12.10	11.80	11.48	11.36	11.27	11.20	11.18
12	11.63	11.84	11.97	12.06	12.10	12.09	11.78	11.48	11.35	11.26	11.19	11.18
13	11.64	11.84	11.97	12.07	12.10	12.09	11.77	11.48	11.35	11.26	11.19	11.18
14	11.64	11.85	11.98	12.07	12.10	12.09	11.76	11.48	11.34	11.26	11.19	11.18
15	11.64	11.86	11.98	12.06	12.10	12.08	11.75	11.48	11.34	11.26	11.20	11.18
16	11.65	11.87	11.98	12.07	12.11	12.07	11.74	11.48	11.34	11.25	11.19	11.17
17	11.64	11.87	11.99	12.06	12.10	12.06	11.73	11.47	11.34	11.25	11.19	11.17
18	11.66	11.87	11.98	12.05	12.10	12.05	11.72	11.47	11.33	11.24	11.18	11.18
19	11.68	11.87	11.99	12.06	12.10	12.05	11.71	11.46	11.33	11.24	11.18	11.18
20	11.69	11.87	12.00	12.07	12.10	12.03	11.70	11.45	11.33	11.24	11.18	11.18
21	11.69	11.88	12.00	12.07	12.10	12.02	11.69	11.44	11.33	11.24	11.18	11.19
22	11.70	11.89	12.00	12.07	12.10	12.00	11.68	11.44	11.33	11.23	11.17	11.19
23	11.72	11.89	12.01	12.06	12.09	12.00	11.67	11.43	11.33	11.23	11.17	11.18
24	11.74	11.89	12.02	12.05	12.09	11.99	11.66	11.43	11.33	11.24	11.17	11.19
25	11.75	11.90	12.03	12.05	12.09	11.98	11.65	11.42	11.33	11.24	11.17	11.20
26	11.76	11.91	12.02	12.05	12.10	11.97	11.64	11.42	11.32	11.24	11.16	11.19
27	11.77	11.92	12.03	12.06	12.09	11.96	11.63	11.42	11.32	11.24	11.16	11.20
28	11.78	11.92	12.05	12.05	12.09	11.96	11.62	11.41	11.31	11.24	11.16	11.21
29	11.79	.....	12.04	12.05	12.09	11.95	11.61	11.40	11.30	11.24	11.16	11.20
30	11.79	.....	12.04	12.05	12.09	11.94	11.60	11.40	11.30	11.24	11.16	11.20
31	11.80	.....	12.05	.....	12.08	.....	11.59	11.40	.....	11.23	.....	11.20



## 1. Mrs. Rosine Smith.-- Continued

Mean daily water level, in feet above datum, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	11.20	11.27	11.39	11.48	11.55	11.37	11.12	11.03	10.94	10.86	10.71	10.55
2	11.20	11.27	.....	11.48	11.56	11.36	11.12	11.03	10.94	10.86	10.71	10.54
3	11.21	11.28	.....	11.49	11.56	11.35	11.11	11.03	10.94	10.85	10.70	10.54
4	11.21	11.28	.....	11.49	11.56	11.34	11.10	11.03	10.94	10.85	10.69	10.53
5	11.20	11.29	.....	11.49	11.57	11.32	11.10	11.03	10.94	10.84	10.69	10.53
6	11.20	11.29	.....	11.50	11.58	11.31	11.09	11.03	10.93	10.83	10.69	10.52
7	11.20	11.30	.....	11.51	11.58	11.31	11.09	11.02	10.93	10.83	10.68	10.52
8	11.21	11.30	11.39	11.51	11.57	11.31	11.09	11.02	10.92	10.83	10.68	10.52
9	11.21	11.30	11.39	11.52	11.57	11.31	11.09	11.02	10.92	10.82	10.67	10.51
10	11.21	11.30	11.40	11.52	11.57	11.31	11.09	11.00	10.92	10.83	10.66	10.51
11	11.21	11.29	11.40	11.53	11.56	11.30	11.09	11.00	10.92	10.83	10.66	10.50
12	11.21	11.30	11.40	11.54	11.56	11.30	11.08	11.00	10.92	10.83	10.66	10.49
13	11.21	11.31	11.41	11.55	11.55	11.30	11.08	11.00	10.91	10.82	10.65	10.49
14	11.21	11.31	11.41	11.55	11.55	11.30	11.08	10.99	10.91	10.82	10.65	10.48
15	11.22	11.32	11.41	11.55	11.54	11.29	11.08	10.99	10.90	10.81	10.64	10.48
16	11.23	11.32	11.41	11.54	11.54	11.28	11.07	10.99	10.90	10.80	10.64	10.48
17	11.23	11.33	11.42	11.55	11.54	11.27	11.07	10.98	10.89	10.80	10.63	10.48
18	11.23	11.34	11.43	11.55	11.53	11.26	11.06	10.98	10.89	10.80	10.63	10.47
19	.....	11.35	11.44	11.56	11.52	11.24	11.06	10.98	10.89	10.79	10.62	10.45
20	.....	11.35	11.44	11.56	11.51	11.23	11.06	10.98	10.89	10.78	10.62	10.44
21	.....	11.35	11.45	11.55	11.50	11.21	11.06	10.98	10.89	10.78	10.61	10.44
22	.....	11.36	11.45	11.55	11.49	11.20	11.06	10.98	10.88	10.77	10.61	10.44
23	.....	11.37	11.46	11.55	11.47	11.20	11.06	10.97	10.88	10.77	10.60	10.44
24	.....	11.36	11.46	11.55	11.46	11.17	11.05	10.97	10.87	10.77	10.60	10.43
25	.....	11.37	11.47	11.55	11.45	11.16	11.05	10.97	10.87	10.76	10.59	10.43
26	.....	11.38	11.46	11.54	11.44	11.15	11.04	10.97	10.87	10.75	10.59	10.43
27	.....	11.38	11.47	11.54	11.43	11.14	11.04	10.96	10.87	10.74	10.59	10.42
28	.....	11.38	11.48	11.54	11.42	11.14	11.04	10.96	10.87	10.74	10.59	10.42
29	.....	.....	11.48	11.55	11.40	11.13	11.04	10.95	10.86	10.73	10.57	10.42
30	11.27	.....	11.48	11.55	11.39	11.13	11.04	10.95	10.86	10.73	10.56	10.41
31	11.27	.....	11.48	.....	11.38	.....	11.04	10.94	.....	10.72	.....	10.41

2. E. E. Coffin. NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 25, T. 18 S., R. 33 W. Just east of A.T. & S.F. Railroad and at southwest corner of earth reservoir. Unused drilled irrigation well, diameter 18 inches, depth 44 feet. Measuring point, top edge of 18-inch galvanized-iron casing at south side, 0.2 foot above land surface, 0.73 foot above bench mark, 45.00 feet above arbitrary datum, 2,951.91 feet above sea level. U. S. Coast and Geodetic Survey bench mark U6, standard bronze disk set in concrete post 25 feet southwest of well, 44.27 feet above datum, 2,951.18 feet above sea level. Water level Apr. 18, 1934, 31.65 feet below measuring point, 13.35 feet above datum. Highest observed water level, 13.85 feet above datum Apr. 25, 1939; lowest observed water level, 11.24 feet above datum Dec. 15-23, 1939. Stevens 90-day automatic water-stage recorder maintained on well since Apr. 18, 1934. Water-level measurements supplied through courtesy of the Division of Water Resources of the Kansas State Board of Agriculture.

Mean daily water level, in feet above datum, 1934

Day	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	13.54	13.52	13.18	12.82	12.26	11.98	11.85	12.03
2	.....	13.55	13.50	13.17	12.80	12.25	11.96	11.86	12.04
3	.....	13.55	13.49	13.16	12.77	12.24	11.96	11.87	12.04
4	.....	13.55	13.47	13.15	12.75	12.23	11.94	11.87	12.05
5	.....	13.55	13.46	13.14	12.72	12.22	11.92	11.88	12.06
6	.....	13.54	13.45	13.13	12.71	12.21	11.90	11.88	12.07
7	.....	13.54	13.45	13.12	12.70	12.20	11.88	11.89	12.07
8	.....	13.54	13.44	13.11	12.68	12.20	11.86	11.89	12.08
9	.....	13.54	13.42	13.10	12.65	12.20	11.85	11.90	12.09
10	.....	13.53	13.41	13.09	12.63	12.18	11.84	11.91	12.10
11	.....	13.54	13.41	13.08	12.61	12.18	11.82	11.91	12.10
12	.....	13.55	13.41	13.06	12.60	12.18	11.82	11.91	12.11
13	.....	13.55	13.40	13.05	12.58	12.17	11.81	11.92	12.13
14	.....	13.55	13.40	13.05	12.56	12.17	11.80	11.93	12.13
15	.....	13.56	13.39	13.04	12.54	12.16	11.80	11.93	12.14
16	.....	13.57	13.38	13.03	12.52	12.15	11.80	11.95	12.14
17	.....	13.57	13.37	13.02	12.51	12.13	11.80	11.95	12.16
18	13.35	13.57	13.36	13.01	12.49	12.13	11.80	11.96	12.16
19	13.35	13.56	13.35	13.00	12.47	12.12	11.80	11.97	12.17

## 2. E. E. Coffin.--Continued

Mean daily water level, in feet above datum, 1934

Day	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
20	13.37	13.55	13.34	12.99	12.45	12.09	11.80	11.97	12.13
21	13.39	13.53	13.32	12.98	12.44	12.08	11.80	11.97	12.13
22	13.40	13.52	13.31	12.96	12.42	12.07	11.81	11.97	12.19
23	13.41	13.52	13.29	12.95	12.40	12.06	11.81	11.98	12.20
24	13.42	13.51	13.28	12.94	12.39	12.04	11.82	11.99	12.20
25	13.44	13.51	13.26	12.93	12.36	12.03	11.83	11.98	12.21
26	13.45	13.51	13.25	12.92	12.35	12.02	11.85	11.99	12.22
27	13.46	13.50	13.23	12.90	12.33	12.01	11.85	12.00	12.22
28	13.48	13.50	13.22	12.88	12.32	12.00	11.85	12.00	12.23
29	13.50	13.50	13.21	12.86	12.30	11.99	11.85	12.01	12.23
30	13.52	13.51	13.19	12.85	12.29	11.99	11.85	12.02	12.25
31	.....	13.52	.....	12.84	12.28	.....	11.85	.....	12.25

Mean daily water level, in feet above datum, 1935

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	12.26	12.43	12.57	12.73	12.85	12.92	13.01	12.92	12.41	12.42	.....	12.72
2	12.27	12.44	12.57	12.74	12.86	12.92	13.02	12.90	12.40	12.42	.....	12.73
3	12.27	12.45	12.57	12.74	12.87	12.93	13.03	12.88	12.39	12.43	.....	12.74
4	12.28	12.45	12.58	12.75	12.87	12.93	13.03	12.86	12.38	12.45	.....	12.75
5	12.28	12.46	12.58	12.76	12.87	12.94	13.04	12.85	12.37	12.45	.....	12.76
6	12.29	12.46	12.58	12.77	12.88	12.94	13.04	12.83	12.36	12.45	.....	12.77
7	12.30	12.47	12.59	12.78	12.88	12.94	13.06	12.82	12.35	12.46	12.62	12.77
8	12.30	12.48	12.60	12.79	12.89	12.94	13.06	12.81	12.35	12.46	12.62	12.77
9	12.31	12.49	12.61	12.80	12.89	12.95	13.07	12.80	12.36	12.46	12.62	12.78
10	12.32	12.49	12.61	12.80	12.89	12.95	13.08	12.80	12.36	12.47	12.62	12.79
11	12.32	12.50	12.62	12.78	12.89	.....	13.09	12.80	12.36	12.49	12.62	12.79
12	12.33	12.51	12.62	12.79	12.89	.....	13.10	12.79	12.37	12.49	12.62	12.80
13	12.33	12.52	12.63	12.80	12.89	.....	13.10	12.78	12.37	12.49	12.62	12.80
14	12.34	12.53	12.64	12.80	12.89	.....	13.11	12.78	12.38	12.50	12.63	12.80
15	12.34	12.52	12.65	12.80	12.89	.....	13.12	12.78	12.38	12.50	12.63	12.80
16	12.35	12.52	12.65	12.81	12.89	.....	13.13	12.76	12.40	12.50	12.64	12.80
17	12.35	12.52	12.65	12.81	12.90	.....	13.14	12.74	12.40	12.50	12.64	12.81
18	12.36	12.53	12.66	12.81	12.90	.....	13.14	12.72	12.39	12.51	12.65	12.81
19	12.37	12.53	12.66	12.82	12.90	.....	13.13	12.70	12.39	12.52	12.66	12.82
20	12.37	12.52	12.67	12.82	12.90	.....	13.13	12.67	12.39	12.52	12.66	12.82
21	12.38	12.53	12.67	12.82	12.90	13.00	13.12	12.63	12.39	12.53	12.67	12.83
22	12.38	12.54	12.68	12.83	12.90	13.00	13.12	12.61	12.38	12.53	12.68	12.83
23	12.38	12.55	12.68	12.83	12.90	12.99	13.10	12.59	12.38	12.53	12.69	12.83
24	12.39	12.55	12.69	12.83	12.90	12.99	13.08	12.56	12.38	12.54	12.70	12.84
25	12.39	12.54	12.69	12.83	12.90	12.98	13.06	12.53	12.38	12.55	12.70	12.85
26	12.40	12.54	12.69	12.85	12.90	12.98	13.05	12.50	12.37	12.55	12.71	12.86
27	12.40	12.55	12.70	12.84	12.91	12.99	13.02	12.47	12.38	12.55	12.71	12.86
28	12.41	12.56	12.70	12.84	12.91	12.99	13.00	12.45	12.40	.....	12.71	12.87
29	12.42	.....	12.71	12.84	12.91	13.00	12.98	12.43	12.40	.....	12.72	12.87
30	12.43	.....	12.72	12.86	12.92	13.01	12.96	12.42	12.40	.....	12.72	12.87
31	12.43	.....	12.72	.....	12.92	.....	12.94	12.42	.....	.....	.....	12.88

Mean daily water level, in feet above datum, 1936

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	12.88	13.06	13.12	13.45	13.56	13.62	13.68	13.56	13.39	13.33	13.45	13.50
2	12.90	13.07	13.12	13.45	13.57	13.62	13.68	13.55	13.39	13.34	13.45	13.50
3	12.90	13.07	13.12	13.47	13.57	13.62	13.68	13.55	13.38	13.34	13.43	13.50
4	12.90	13.08	13.12	13.47	13.58	13.62	13.68	13.54	13.38	13.34	13.44	13.50
5	12.90	13.08	13.12	13.47	13.58	13.62	13.69	13.53	13.38	13.34	13.45	13.51
6	12.90	13.09	13.12	13.47	13.59	13.63	13.70	13.52	13.37	13.32	13.45	13.50
7	12.91	13.09	13.13	13.48	13.59	13.63	13.70	13.52	13.37	13.33	13.45	13.51
8	12.91	13.09	13.13	13.49	13.59	13.63	13.70	13.51	13.37	13.34	13.46	13.51
9	12.92	13.10	13.14	13.49	13.60	13.63	13.70	13.50	13.37	13.34	13.47	13.51
10	12.93	.....	13.14	13.49	13.60	13.63	13.70	13.50	13.37	13.33	13.47	13.51
11	12.94	.....	13.15	13.49	13.60	13.64	13.69	13.49	13.37	13.34	13.48	13.52
12	12.95	.....	13.16	13.49	13.60	13.64	13.68	13.49	13.36	13.35	13.48	13.52
13	12.95	.....	13.17	13.50	13.60	13.64	13.68	13.48	13.36	13.35	13.48	13.52
14	12.95	.....	13.18	13.50	13.61	13.64	13.67	13.48	13.36	13.36	13.48	13.53
15	12.96	.....	13.18	13.50	13.61	13.65	13.66	13.47	13.35	13.37	13.48	13.53
16	12.97	.....	13.19	13.51	13.61	13.65	13.66	13.47	13.35	13.37	13.49	13.54
17	12.98	.....	13.19	13.52	13.60	13.64	13.66	13.47	13.34	13.37	13.50	13.54
18	12.98	.....	13.19	13.53	13.59	13.65	13.66	13.47	13.34	13.38	13.48	13.54

## 2. E. E. Coffin.--Continued

Mean daily water level, in feet above datum, 1936

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
19	12.99	.....	13.20	13.53	13.59	13.66	13.66	13.46	13.34	13.40	13.48	13.55
20	13.00	.....	13.20	13.53	13.60	13.65	13.65	13.45	13.34	13.40	13.48	13.55
21	13.00	.....	13.21	13.53	13.59	13.66	13.64	13.44	13.34	13.39	13.48	13.55
22	13.01	.....	13.21	13.54	13.60	13.65	13.63	13.43	13.34	13.39	13.48	13.55
23	13.02	.....	13.22	13.55	13.59	13.66	13.63	13.43	13.34	13.39	13.48	13.55
24	13.02	.....	13.22	13.55	13.59	13.67	13.62	13.43	13.34	13.40	13.49	13.56
25	13.04	.....	13.23	13.55	13.59	13.67	13.62	13.42	13.35	13.41	13.49	13.57
26	13.05	.....	13.24	13.55	13.60	13.67	13.61	13.41	13.34	13.41	13.49	13.57
27	13.05	13.11a	13.43	13.56	13.60	13.67	13.60	13.41	13.33	13.42	13.49	13.57
28	13.05	13.12	13.43	13.56	13.60	13.68	13.59	13.40	13.34	13.42	13.49	13.58
29	13.05	13.12	13.44	13.56	13.60	13.68	13.57	13.40	13.33	13.43	13.49	13.59
30	13.06	.....	13.44	13.56	13.60	13.68	13.56	13.40	13.33	13.43	13.50	13.59
31	13.06	.....	13.45	.....	13.62	.....	13.56	13.40	.....	13.44	.....	13.59

Mean daily water level, in feet above datum, 1937

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	13.59	.....	13.77	13.75	13.54	13.36	13.31	13.40	13.39	13.43	13.07	13.18
2	13.59	.....	13.77	13.76	13.53	13.35	13.31	13.40	13.39	13.43	13.07	13.19
3	13.60	13.69	13.78	13.75	13.52	13.35	13.31	13.40	13.40	13.44	13.06	13.20
4	13.61	13.69	13.77	13.74	13.51	13.35	13.32	13.40	13.40	13.44	13.06	13.20
5	13.61	13.70	13.78	13.73	13.50	13.34	13.32	13.40	13.40	13.43	13.07	13.20
6	13.61	13.70	13.78	13.74	13.49	13.33	13.32	13.40	13.40	13.40	13.08	13.21
7	13.61	13.72	13.78	13.73	13.48	13.32	13.32	13.41	13.40	13.38	13.08	13.22
8	13.61	13.70	13.78	13.70	13.47	13.31	13.32	13.40	13.40	13.36	13.07	13.23
9	13.62	13.69	13.78	13.70	13.46	13.30	13.32	13.41	13.41	13.33	13.07	13.23
10	13.62	13.69	13.79	13.69	13.46	13.30	13.32	13.40	13.40	13.31	13.07	13.24
11	13.63	13.71	13.78	13.69	13.45	13.30	13.32	13.40	13.41	13.29	13.08	13.25
12	13.63	13.73	13.78	13.68	13.45	13.30	13.32	13.40	13.41	13.27	13.10	13.26
13	13.65	13.72	13.78	13.70	13.44	13.29	13.32	13.40	13.42	13.26	13.10	13.27
14	13.64	13.73	13.77	13.70	13.45	13.29	13.32	13.40	13.42	13.24	13.10	13.27
15	13.64	13.72	13.77	13.70	13.44	13.29	13.33	13.40	13.41	13.23	13.10	13.28
16	13.65	13.73	13.78	13.71	13.43	13.28	13.33	13.39	13.42	13.21	13.11	13.29
17	13.65	13.73	13.79	13.68	13.43	13.30	13.33	13.39	13.43	13.20	13.12	13.29
18	13.65	13.74	13.79	13.67	13.43	13.29	13.33	13.39	13.43	13.19	13.12	13.30
19	13.66	13.74	13.80	13.68	13.43	13.30	13.33	13.39	13.43	13.17	13.12	13.30
20	13.66	13.75	13.76	13.68	13.42	13.30	13.33	13.38	13.43	13.15	13.13	13.31
21	13.66	13.75	13.76	13.67	13.42	13.30	13.34	13.37	13.43	13.14	13.14	13.32
22	13.66	13.75	13.77	13.67	13.41	13.30	13.34	13.37	13.43	13.13	13.14	13.32
23	13.67	13.75	13.79	13.65	13.41	13.31	13.34	13.38	13.44	13.12	13.14	13.33
24	.....	13.76	13.79	13.64	13.41	13.31	13.35	13.38	13.42	13.12	13.15	13.33
25	.....	13.76	13.75	13.62	13.41	13.30	13.35	13.38	13.41	13.11	13.15	13.34
26	.....	13.76	13.74	13.61	13.40	13.30	13.35	13.38	13.42	13.11	13.16	13.35
27	.....	13.76	13.74	13.61	13.40	13.30	13.36	13.38	13.43	13.10	13.16	13.35
28	.....	13.76	13.74	13.60	13.40	13.30	13.37	13.39	13.43	13.09	13.17	13.35
29	.....	.....	13.74	13.58	13.39	13.30	13.38	13.39	13.44	13.08	13.17	13.36
30	.....	.....	13.75	13.56	13.38	13.30	13.38	13.39	13.44	13.08	13.18	13.37
31	.....	.....	13.75	.....	13.37	.....	13.39	13.39	.....	13.08	.....	13.37

Mean daily water level, in feet above datum, 1938

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	13.38	13.55	13.69	13.48	13.45	13.57	13.71	13.79	13.55	13.29	13.12	13.17
2	13.38	13.56	13.70	13.48	13.46	13.59	13.72	13.80	13.53	13.29	13.12	13.17
3	13.39	13.56	13.70	13.47	13.46	13.59	13.72	13.79	13.51	13.29	13.11	13.18
4	13.40	13.57	13.71	13.47	13.47	13.59	13.73	13.78	13.50	13.30	13.11	13.19
5	13.40	13.58	13.70	13.47	13.47	13.60	13.73	13.79	13.49	13.30	13.10	13.20
6	13.40	13.57	13.70	13.46	13.47	13.60	13.73	13.79	13.47	13.30	13.09	13.20
7	13.41	13.58	13.71	13.45	13.47	13.60	13.73	13.79	13.46	13.29	13.09	13.21
8	13.42	13.59	13.72	13.45	13.47	13.61	13.74	13.77	13.45	13.29	13.09	13.22
9	13.43	13.60	13.72	13.44	13.48	13.62	13.74	13.77	13.44	13.23	13.09	13.23
10	13.44	13.60	13.72	13.45	13.49	13.61	13.75	13.77	13.43	13.28	13.09	13.24
11	13.44	13.61	13.71	13.44	13.50	13.61	13.75	13.76	13.41	13.23	13.09	13.25
12	13.45	13.62	13.71	13.44	13.50	13.63	13.75	13.76	13.39	13.28	13.09	13.25
13	13.45	13.62	13.70	13.45	13.50	13.64	13.76	13.77	13.38	13.27	13.08	13.26
14	13.45	13.62	13.69	13.45	13.50	13.64	13.75	13.77	13.38	13.26	13.03	13.27
15	13.46	13.63	13.67	13.45	13.51	13.64	13.76	13.76	13.36	13.25	13.09	13.28
16	13.47	13.63	13.65	13.44	13.52	13.65	13.76	13.75	13.36	13.24	13.10	13.28
17	13.47	13.64	13.65	13.43	13.52	13.65	13.76	13.74	13.36	13.23	13.11	13.28
18	13.48	13.64	13.63	13.44	13.53	13.66	13.75	13.74	13.36	13.22	13.10	13.29
19	13.43	13.65	13.62	13.43	13.53	13.66	13.75	13.75	13.33	13.21	13.11	13.30

a Change due to correction for tape previously used.

## 2. E. E. Coffin.--Continued

Mean daily water level, in feet above datum, 1938

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
20	13.49	13.65	13.61	13.43	13.53	13.66	13.76	13.73	13.32	13.20	13.12	13.30
21	13.49	13.66	13.60	13.43	13.53	13.66	13.76	13.70	13.32	13.19	13.12	13.30
22	13.50	13.67	13.58	13.43	13.54	13.67	13.77	13.69	13.32	13.18	13.11	13.31
23	13.51	13.67	13.56	13.43	13.55	13.68	13.77	13.67	13.32	13.17	13.11	13.31
24	13.51	13.67	13.56	13.43	13.56	13.68	13.77	13.65	13.32	13.16	13.12	13.31
25	13.52	13.68	13.54	13.43	13.57	13.68	13.77	13.64	13.31	13.15	13.12	13.32
26	13.52	13.68	13.53	13.43	13.58	13.68	13.77	13.63	13.30	13.15	13.12	13.32
27	13.52	13.68	13.52	13.44	13.58	13.68	13.77	13.61	13.29	13.14	13.13	13.33
28	13.53	13.68	13.54	13.43	13.58	13.69	13.77	13.59	13.29	13.13	13.14	13.33
29	13.54	.....	13.52	13.44	13.58	13.70	13.77	13.57	13.29	13.13	13.15	13.34
30	13.54	.....	13.50	13.44	13.58	13.71	13.78	13.56	13.29	13.13	13.16	13.35
31	13.55	.....	13.49	.....	13.58	.....	13.78	13.55	.....	13.12	.....	13.35

Mean daily water level, in feet above datum, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	13.36	13.50	.....	13.75	13.84	13.12	12.68	12.52	12.37	12.13	11.70	11.34
2	13.37	13.50	.....	13.75	13.83	13.09	12.67	12.52	12.37	12.11	11.68	11.33
3	13.38	13.51	13.65	13.76	13.82	13.07	12.67	12.52	12.36	12.10	11.67	11.32
4	13.38	13.52	13.65	13.76	13.81	13.05	12.66	12.51	12.36	12.08	11.66	11.31
5	13.38	13.53	13.66	13.77	13.80	13.03	12.66	12.50	12.35	12.07	11.65	11.31
6	13.38	13.54	13.66	13.77	13.78	13.02	12.65	12.49	12.34	12.05	11.63	11.30
7	13.38	13.54	13.67	13.77	13.74	13.00	12.65	12.49	12.32	12.03	11.62	11.30
8	13.39	13.54	13.68	13.78	13.71	12.98	12.64	12.49	12.31	12.01	11.61	11.29
9	13.39	.....	13.69	13.79	13.69	12.96	12.64	12.48	12.30	12.00	11.59	11.28
10	13.40	.....	13.69	13.78	13.66	12.94	12.63	12.48	12.29	11.99	11.58	11.28
11	13.40	.....	13.70	13.77	13.64	12.93	12.63	12.48	12.29	11.98	11.56	11.27
12	13.41	.....	13.69	13.79	13.61	12.91	12.62	12.47	12.28	11.96	11.55	11.26
13	13.41	.....	13.70	13.79	13.53	12.89	12.62	12.46	12.28	11.95	11.54	11.26
14	13.42	.....	13.69	13.80	13.56	12.89	12.61	12.46	12.28	11.94	11.52	11.26
15	13.42	.....	13.69	13.80	13.54	12.88	12.61	12.45	12.27	11.92	11.51	11.24
16	13.43	.....	13.70	13.81	13.52	12.87	12.61	12.45	12.26	11.91	11.50	11.24
17	13.43	.....	.....	13.81	13.49	12.86	12.61	12.45	12.25	11.90	11.48	11.24
18	13.44	.....	.....	13.81	13.45	12.84	12.60	12.44	12.25	11.88	11.47	11.24
19	13.44	.....	.....	13.82	13.42	12.82	12.59	12.43	12.24	11.87	11.45	11.24
20	13.45	13.60	.....	13.82	13.40	12.80	12.58	12.43	12.24	11.86	11.44	11.24
21	13.45	.....	13.72	13.83	13.37	12.79	12.57	12.43	12.23	11.85	11.43	11.24
22	13.45	.....	13.71	13.83	13.35	12.77	12.57	12.43	12.22	11.84	11.42	11.24
23	13.46	.....	13.71	13.84	13.34	12.76	12.57	12.42	12.21	11.83	11.41	11.24
24	13.46	.....	13.70	13.84	13.32	12.76	12.56	12.42	12.20	11.81	11.40	11.25
25	13.46	.....	13.71	13.85	13.29	12.74	12.56	12.41	12.19	11.80	11.39	11.25
26	13.47	.....	13.71	13.84	13.25	12.72	12.55	12.41	12.18	11.78	11.38	11.26
27	13.48	.....	13.72	13.84	13.22	12.71	12.55	12.40	12.17	11.77	11.37	11.26
28	13.48	.....	13.72	13.84	13.19	12.70	12.54	12.39	12.16	11.75	11.36	11.27
29	13.49	.....	13.73	13.84	13.17	12.70	12.54	12.39	12.15	11.74	11.35	11.28
30	13.50	.....	13.74	13.84	13.16	12.69	12.53	12.38	12.14	11.72	11.35	11.28
31	13.51	.....	13.75	.....	13.14	.....	12.53	12.38	.....	11.71	.....	11.29

3. Claude Hughes. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 21, T. 18 S., R. 33 W. Drilled irrigation well, diameter 18 inches, depth 138.2 feet. Measuring point, top of 3/4-inch hole in pumphead base at painted orange arrow, 1.0 foot above land surface. Equipped with turbine pump.

Water level, in feet below measuring point, 1934, 1939

Date	Water level	Date	Water level	Date	Water level
May 30, 1934	a 69.44	Sept. 30, 1939	(b)	Dec. 11, 1939	70.46
Sept. 6, 1939	71.28	Nov. 6	70.79		

4. W. N. Robinson. SE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 31, T. 18 S., R. 34 W. Drilled irrigation well, diameter 24 inches, depth 134.3 feet. Measuring point, top of 1/2-inch hole in pumphead base at painted orange arrow, 1.7 feet above land surface. Equipped with turbine pump. Well has not been used for several years.

Water level, in feet below measuring point, 1934, 1939

May 28, 1934	91.84	Sept. 30, 1939	91.51	Dec. 11, 1939	91.47
Sept. 6, 1939	91.48	Nov. 6	91.49		

a Measuring point 0.5 foot higher than that in 1939.  
b Pumping.

5. Mrs. Rosine Smith. SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 25, T. 19 S., R. 33 W. Drilled irrigation well, diameter 24 inches, depth 116.5 feet. Measuring point painted orange arrow on top edge of square steel base plate at middle of west side, 2.0 feet above land surface. Equipped with turbine pump.

Water level, in feet below measuring point, 1934, 1939

Date	Water level	Date	Water level	Date	Water level
May 30, 1934	39.79	Sept. 30, 1939	43.23	Dec. 11, 1939	43.63
Sept. 8, 1939	43.13	Nov. 6	43.44		

6. American Life Insurance Co. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 29, T. 19 S., R. 33 W. Drilled irrigation well, diameter 24 inches depth 110.7 feet. Measuring point, top of 6-inch slot in round pump base, 1.2 feet above land surface. Equipped with turbine pump. Used considerably.

Water level, in feet below measuring point, 1929, 1936, 1939

July 22, 1929	a 75.2	Sept. 8, 1939	c 81.18	Sept. 30, 1939	77.36
Apr. 13, 1936	a 71.0	18	d 77.55	Nov. 6	78.03
Sept. 7,	b 71.77	21	77.47	Dec. 11	77.74

8. Mrs. Rosine Smith. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 35, T. 19 S., R. 33 W. Unused drilled irrigation well, diameter 24 inches, depth 72.7 feet (probably drilled deeper originally; considerable debris in bottom of well). Measuring point, top of 24-inch boiler-steel casing, southeast side, at painted orange arrow, 1.5 feet above land surface. No pump in well. Water levels, in feet below measuring point, 1939: Sept. 8, 49.42; Sept. 30, 49.58; Nov. 6, 49.89; Dec. 11, 50.20.

9. Mrs. Rosine Smith. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 35, T. 19 S., R. 33 W. Unused drilled irrigation well, diameter 24 inches, depth 140.2 feet. Measuring point, top of 24-inch boiler-steel casing, north side, at painted orange arrow, 0.3 foot above land surface. Formerly equipped with turbine pump; pump removed. Water levels, in feet below measuring point, 1939: Sept. 8, 48.07; Sept. 30, 48.81; Nov. 6, 49.12; Dec. 11, e/50.03.

13. Mrs. Rosine Smith. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 2, T. 20 S., R. 33 W. Unused drilled irrigation well, diameter 24 inches, depth 99.7 feet. Measuring point, top of 24-inch boiler-steel casing, north side, at painted orange arrow, 1.9 feet below land surface. Equipped with partly dismantled turbine pump. Water levels, in feet below measuring point, 1939: Sept. 9, 51.56; Sept. 30, f/53.05; Nov. 6, f/54.50; Dec. 11, g/55.50.

17. H. E. Trout. NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 30, T. 19 S., R. 32 W. Drilled irrigation well, diameter 24 inches, depth 81 feet. Measuring point, top edge of 3/4-inch hole in round steel base of pumphead, at painted orange arrow, 0.5 foot below land surface. Equipped with turbine pump. Water levels, in feet below measuring point, 1939: Sept. 9, 34.36; Sept. 30, 34.64; Nov. 6, 34.24; Dec. 11, 34.21.

19. J. Dyer. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 12, T. 18 S., R. 33 W. Drilled irrigation well, diameter 24 inches, reported depth 78 feet, measured depth 71.1 feet. Measuring point, top of  $\frac{1}{2}$ -inch hole in base of pumphead, at painted orange arrow, 1.0 foot above land surface. Equipped with turbine pump. Water levels, in feet below measuring point, 1939: Sept. 11, 48.09; Sept. 30, 47.50; Nov. 6, 47.16; Dec. 11, 47.03.

23. ----- SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 24, T. 18 S., R. 33 W. Unused drilled domestic well, diameter 5 $\frac{1}{2}$  inches, depth 59.5 feet. Measuring point, top edge of break in lift-type pumphead, 0.52 foot above top of square concrete platform, at painted orange arrow, 0.8 foot above land surface. Water levels, in feet below measuring point, 1939: Sept. 11, 43.99; Sept. 30, 44.25; Nov. 6, 44.63; Dec. 11, 44.29.

a Measurement by W. D. Luke, then manager of former Mark ranch.

b Measurement by Wyatt R. Stanley, assistant engineer, Bureau of Agricultural Economics, Amarillo, Texas.

c Pump operating 24 hours a day for about 10 weeks prior to measurement; pump shut down 15 minutes before measurement was made.

d Pump shut down 5 days prior to measurement.

e Irrigation well 300 yards south pumping.

f Several nearby irrigation wells pumping.

g Irrigation well about  $\frac{1}{4}$  mile southeast pumping.

24. Elvin Deng. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 30, T. 18 S., R. 32 W. Unused drilled stock well, diameter 6 inches, depth 65.7 feet. Measuring point, top edge of 6-inch galvanized-iron casing at west side, at painted orange arrow, 2.5 feet above land surface. No pump in well. Water levels, in feet below measuring point, 1939: Sept. 11, 35.19; Sept. 30, a/38.47; Nov. 6, a/40.82; Dec. 11, 36.22.

27. Anson Mark. NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 15, T. 18 S., R. 33 W. Unused drilled stock well, diameter 5 $\frac{1}{2}$  inches, depth 90.2 feet. Measuring point, top edge of 5 $\frac{1}{2}$ -inch galvanized-iron casing at west side, at painted orange arrow, 0.5 foot above land surface. No pump in well. Water levels, in feet below land surface, 1939: Sept. 18, 58.39; Sept. 30, 58.42; Nov. 6, 58.54; Dec. 11, 58.61.

32. E. J. Roark. NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 25, T. 19 S., R. 33 W., in town of Shallow Water. Unused drilled irrigation well, diameter 14 inches, depth 44.7 feet. Measuring point, top of 14-inch galvanized casing at west side, at painted orange arrow, level with land surface. No pump in well. Equipped with Stevens Type "F" 8-day automatic water-stage recorder.

Lowest daily water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Sept. 20	37.79	Oct. 16	37.91	Nov. 11	37.97	Dec. 7	38.06
21	37.79	17	37.91	12	37.97	8	38.06
22	37.79	18	37.91	13	37.97	9	38.07
23	37.80	19	37.92	14	37.98	10	38.07
24	37.81	20	37.92	15	37.98	11	38.07
25	37.82	21	37.92	16	37.98	12	38.07
26	37.82	22	37.92	17	37.99	13	38.07
27	37.83	23	37.92	18	37.99	14	38.07
28	37.84	24	37.93	19	38.00	15	38.08
29	37.84	25	37.93	20	38.00	16	38.08
30	37.84	26	37.94	21	38.01	17	38.08
Oct. 1	37.84	27	37.95	22	38.01	18	38.09
2	37.84	28	37.95	23	38.02	19	38.09
3	37.85	29	37.95	24	38.03	20	38.09
4	37.86	30	37.95	25	38.03	21	38.10
5	37.86	31	37.95	26	38.03	22	38.10
6	37.86	Nov. 1	37.96	27	38.03	23	38.10
7	37.86	2	37.96	28	38.03	24	38.11
8	37.87	3	37.96	29	38.04	25	38.11
9	37.88	4	37.96	30	38.04	26	38.11
10	37.88	5	37.96	Dec. 1	38.05	27	38.11
11	37.89	6	37.96	2	38.05	28	38.11
12	37.89	7	37.96	3	38.05	29	38.12
13	37.90	8	37.97	4	38.05	30	38.12
14	37.90	9	37.97	5	38.05	31	38.12
15	37.90	10	37.97	6	38.06		

33. American Life Insurance Co. NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 31, T. 19 S., R. 33 W., near the north bank of Whitewoman Creek. Unused drilled irrigation well. Diameter 24 inches, depth 78.2 feet. Measuring point, top of 24-inch boiler-steel casing at west side, at painted orange arrow, 0.5 foot above land surface. No pump in well. Equipped with Stevens Type "F" 8-day automatic water-stage recorder.

Lowest daily water level, in feet below measuring point, 1939

Sept. 25	73.23	Oct. 11	73.30	Oct. 27	73.37	Nov. 12	73.46
26	73.23	12	73.30	28	73.37	13	73.47
27	73.23	13	73.30	29	73.39	14	73.47
28	73.25	14	73.30	30	73.39	15	73.48
29	73.25	15	73.30	31	73.39	16	73.48
30	73.24	16	73.31	Nov. 1	73.40	17	73.49
Oct. 1	73.24	17	73.31	2	73.41	18	73.49
2	73.25	18	73.32	3	73.41	19	73.50
3	73.25	19	73.32	4	73.42	20	73.51
4	73.26	20	73.33	5	73.42	21	73.51
5	73.26	21	73.33	6	73.43	22	73.52
6	73.26	22	73.34	7	73.44	23	73.53
7	73.27	23	73.34	8	73.44	24	73.53
8	73.27	24	73.34	9	73.46	25	73.54
9	73.29	25	73.35	10	73.45	26	73.55
10	73.29	26	73.36	11	73.46	27	73.55

a Irrigation well about 100 yards southeast pumping.

## 33. American Life Insurance Co.--Continued

Lowest daily water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Nov. 28	73.55	Dec. 7	73.61	Dec. 16	73.64	Dec. 24	73.69
29	73.56	8	73.61	17	73.64	25	73.70
30	73.56	9	73.61	18	73.65	26	73.70
Dec. 1	73.58	10	73.62	19	73.66	27	73.71
2	73.58	11	73.62	20	73.66	28	73.72
3	73.58	12	73.63	21	73.67	29	73.72
4	73.59	13	73.63	22	73.67	30	73.72
5	73.59	14	73.63	23	73.69	31	73.73
6	73.60	15	73.64				

34. H. M. A. Hess et al. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 19, T. 18 S., R. 34 W. Unused drilled domestic well, diameter 5 $\frac{1}{2}$  inches, depth 102.1 feet. Measuring point, top edge of 5 $\frac{1}{2}$ -inch galvanized-iron casing at north side, at painted orange arrow, 0.1 foot above land surface. No pump in well. Water levels, in feet below measuring point, 1939: Sept. 22, 83.90; Sept. 30, 83.93; Nov. 6, 83.94; Dec. 11, 83.93.

35. Mrs. Lily Miller. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 18, T. 16 S., R. 34 W. Unused drilled stock well, diameter 5 $\frac{1}{2}$  inches, depth 140.1 feet. Measuring point, top edge of 5 $\frac{1}{2}$ -inch galvanized-iron casing, north side, at painted orange arrow, 0.4 foot above land surface. No pump in well. Water levels, in feet below measuring point, 1939: Sept. 22, 117.70; Sept. 30, 117.74; Nov. 6, 117.83; Dec. 11, 117.78.

36. Henry S. Mix. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 11, T. 16 S., R. 34 W. Unused drilled domestic well, diameter 5 $\frac{1}{2}$  inches, depth 137.8 feet. Measuring point, top edge of 6-inch hole in concrete platform, under pump base at south side, at painted orange arrow, 1.0 foot above land surface. Equipped with partly dismantled lift pump. Water levels, in feet below measuring point, 1939: Sept. 22, 126.14; Sept. 30, 126.18; Nov. 6, 126.28; Dec. 11, 126.20.

37. Joseph Hickey estate. NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 16, T. 17 S., R. 33 W. Unused drilled domestic well, diameter 5 $\frac{1}{2}$  inches, depth 99.2 feet. Measuring point, top of second layer of square wooden platform at south side, at painted orange arrow, 1.9 feet above land surface. Equipped with partly dismantled lift pump. Water levels, in feet below measuring point, 1939: Sept. 22, 97.78; Sept. 30, 97.86; Nov. 6, 98.53; Dec. 11, 98.80.

38. Brandt. NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 24, T. 17 S., R. 33 W. Unused drilled domestic well, diameter 5 $\frac{1}{2}$  inches, depth 83.7 feet. Measuring point, bottom edge of pump base at southwest side, at painted orange arrow, 1.3 feet above land surface. Equipped with lift pump. Water levels, in feet below measuring point, 1939: Sept. 22, 72.33; Sept. 30, 72.33; Nov. 6, 72.68; Dec. 11, 72.36.

39. Henry F. Poos estate. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 26, T. 18 S., R. 31 W. Unused drilled stock well, diameter 5 $\frac{1}{2}$  inches, depth 82.2 feet. Measuring point, top of 5 $\frac{1}{2}$ -inch galvanized-iron casing at northeast side, at painted orange arrow, 0.7 foot above land surface. No pump in well. Water levels, in feet below measuring point, 1939: Sept. 23, 69.23; Sept. 30, 69.23; Nov. 6, 69.24; Dec. 11, 69.24.

40. Michael McLaughlin. SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 2, T. 17 S., R. 31 W. Unused drilled domestic well, diameter 5 $\frac{1}{2}$  inches, depth 119.7 feet. Measuring point, top of wooden 3 by 3-inch pipe clamp at north side, at painted orange arrow, 0.9 foot above land surface. Equipped with 1 $\frac{1}{4}$ -inch pipe and cylinder near bottom of well. Water levels, in feet below measuring point, 1939: Sept. 23, 111.15; Sept. 30, 111.12; Nov. 6, 111.18; Dec. 11, 111.16.

41. Almada King. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 12, T. 17 S., R. 32 W. Unused drilled stock well, diameter 5 $\frac{1}{2}$  inches, depth 144.8 feet. Measuring point, top of 5 $\frac{1}{2}$ -inch galvanized-iron casing at south side, at painted orange arrow, level with land surface. No pump in well. Water levels, in feet below measuring point, 1939: Sept. 23, 131.76; Sept. 30, 131.77; Nov. 6, 131.80; Dec. 11, 131.80.

42. Mrs. Rosine Smith. SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 26, T. 19 S., R. 33 W. Drilled well, used for irrigation, diameter 24 inches, depth 115.1 feet. Measuring point, top of square steel base of pumphead at north side, at painted orange arrow, 1.8 feet above land surface. Equipped with turbine pump. Water levels, in feet below measuring point, 1939: Sept. 23, 53.02; Sept. 30, 53.11; Nov. 6, 53.61; Dec. 11, 54.07.
44. Melchior Lang. SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 2, T. 20 S., R. 34 W. Drilled well, diameter 18 inches, depth 92.1 feet. Originally constructed for irrigation; later abandoned. Measuring point, top of inside edge of 18-inch cast-iron casing at north side, at painted orange arrow, 0.5 foot above land surface. No pump in well. Water levels, in feet below measuring point, 1939: Sept. 27, 68.87; Nov. 6, 68.60; Dec. 11, 68.45.
45. M. E. Halley. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 7, T. 19 S., R. 32 W. Unused drilled stock well, diameter 4 $\frac{1}{2}$  inches, depth 30.4 feet. Measuring point, top of 4 $\frac{1}{2}$ -inch galvanized-iron casing, west side, at painted orange arrow, 0.8 foot above land surface. No pump in well. Water levels, in feet below measuring point, 1939: Sept. 27, 21.53; Sept. 30, 21.44; Nov. 6, 21.52; Dec. 11, 21.23.
47. Federal Land Bank, Wichita, Kansas. SE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 29, T. 18 S., R. 32 W. Unused drilled stock well, diameter 8 inches, depth 60.6 feet. Measuring point, top of 8-inch galvanized-iron casing at north side, at painted orange arrow, 1.5 feet above land surface. No pump in well. Water levels, in feet below measuring point, 1939: Sept. 28, 32.50; Sept. 30, 32.53; Nov. 6, 32.65; Dec. 11, 32.76.
48. P. Roark. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 25, T. 20 S., R. 33 W. Unused drilled domestic and stock well, diameter 5 $\frac{1}{2}$  inches, depth 34.9 feet. Measuring point, top of 5 $\frac{1}{2}$ -inch galvanized-iron casing at north side, at painted orange arrow, 2.0 feet above land surface. No pump in well. Water levels, in feet below measuring point, 1939: Sept. 28, 32.52; Nov. 6, 32.58; Dec. 11, 32.61.
49. Geo. M. Crofton. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 22, T. 20 S., R. 31 W. Unused drilled domestic and stock well, diameter 5 $\frac{1}{2}$  inches, depth 41.2 feet. Measuring point, top of 5 $\frac{1}{2}$ -inch galvanized-iron casing at south side, at painted orange arrow, level with land surface. Equipped with 1 $\frac{1}{4}$ -inch pump pipe and cylinder. Water levels, in feet below measuring point, 1939: Sept. 29, 34.98; Nov. 6, 34.99; Dec. 11, 35.01.
50. F. M. Houston. SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 28, T. 19 S., R. 32 W. Unused drilled domestic and stock well, diameter 5 $\frac{1}{2}$  inches, depth 129.1 feet. Measuring point, top of 5 $\frac{1}{2}$ -inch galvanized-iron casing at south side, at painted orange arrow, 0.7 foot above land surface. Equipped with lift pump. Water levels, in feet below measuring point, 1939: Sept. 29, 98.44; Nov. 6, 98.42; Dec. 11, 98.41.

## SOUTH-CENTRAL KANSAS

By S. W. Lohman and G. H. von Hein

The observation-well program in south-central Kansas <sup>1/</sup> was continued in 1939 by the Federal Geological Survey in cooperation with the Kansas State Geological Survey, with the Division of Sanitation of the Kansas State Board of Health, and with the city of Wichita.

Field work in the "Equus beds" area was resumed in June 1939. J. C. Frye, B. F. Latta, and C. C. Williams spent several weeks running barometric levels. With a rotary drilling machine purchased from cooperative funds, 43 test holes were drilled in the area by a crew comprising Ellis Gordon,

<sup>1/</sup> See U. S. Geol. Survey Water-Supply Papers 840, 845.



Perry McNally, and Fred Holden. The city of Wichita drilled and tested 25 permanent municipal wells and 50 observation wells in southern Harvey County and drilled about 20 observation wells near the Burrton oil field.

At the beginning of 1939, a total of 55 wells were under observation, including 34 wells observed monthly (erroneously given as 33 in Water-Supply Paper 845, p. 116), 13 wells and one lake observed weekly, and 7 wells equipped with recorders. During the year the staff gage at Lake Inman (No. 511, McPherson County) was discontinued, and 7 wells were discontinued as observation wells, as follows: Wells 105, 156, and 737, Harvey County; and wells 27, 54, 183, and 232, Sedgwick County. The recorder on well 19, McPherson County, was moved to well 877, Harvey County, and the recorder on well 309, McPherson County, was removed. Periodic water-level measurements were begun in 36 new observation wells as follows: Wells 821, 831, 832, 833, 852, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 899, and 1,112, in Harvey County; and wells 802, 826, 842, 845, 846, and 847, in Sedgwick County. At the end of the year a total of 83 wells were under observation, including 6 wells observed quarterly, 38 wells observed monthly, 33 wells observed weekly, and 6 wells equipped with automatic water-stage recorders. A total of about 4,087 wetted-tape measurements were made in 1939, 2,137 of which are included in the present report. Mr. G. H. von Hein, who made all the periodic water-level measurements and took care of the recorders, was employed by the Federal Geological Survey during the first quarter of the year and by the city of Wichita during the last three-quarters of the year. Most of the 36 new wells added to the program in 1939 are test wells that were drilled in the winter of 1938-39, but a few are privately-owned wells located and described by Mr. von Hein. In addition to the 83 wells under observation at the close of the year, 75 municipal wells were observed weekly by Mr. von Hein during the last half of the year. The descriptions and water levels of these 75 wells are not included in the present report, but they may be included in the report for 1940.

#### Water-level fluctuations

Water levels in four of the six wells equipped with recorders (wells 12, 294, 307, and 506) show decided barometric effects. Well 26, in Sedgwick County, is near the middle of the old well field of the Wichita Water Company; hence the water-level fluctuations in this well are mainly the result of intermittent pumping from four or five wells nearby.

The United States Weather Bureau maintains rain gages at Wichita, Sedgwick County; at Sedgwick and Newton, Harvey County; and at McPherson, McPherson County. In 1939 the average annual rainfall deficiency for the four stations amounted to 3.12 inches, and the deficiency at each of the four stations was: 1.46 inches at Wichita, 4.24 inches at Sedgwick, 2.98 inches at Newton, and 3.79 inches at McPherson.

The following comments are based on water-level fluctuations in the 43 wells for which water-level measurements are available for the entire year and which were not appreciably affected by pumping during the year. During the year the water levels in 36 of the 43 wells showed net declines ranging from 0.05 foot to 2.50 feet, and the average net decline was 0.80 foot. In 7 of the wells, however, the water levels showed net rises ranging from 0.08 foot to 1.41 feet, and the average net rise in the 7 wells was 0.42 foot. The greatest net decline in water level--2.50 feet--occurred in well 824, Harvey County; and the greatest net rise--1.43 feet--occurred in well 310, McPherson County. Although well 310, a deep well in shale, showed the greatest net rise in water level during the year, well 311, a shallow well in sand just a few feet from well 310, showed next to the greatest net decline in water level--2.41 feet--during the same period. Apparently, well 310 was receiving recharge at the close of the year from precipitation that fell much earlier, probably in August; whereas well 311 was affected by the drought during the last 4 months of the year. The highest and lowest water level in each of the 43 wells, the dates upon which they occurred, and the net changes in water level during the year are given by counties in the following tables.

Highest and lowest water levels and net changes in water level in 14 wells in Harvey County, in feet below measuring point, 1939						
Well No.	Highest water level	Date	Lowest water level	Date	Difference between highest and lowest water levels	Net rise (+) Net decline (-)
72	24.11	Apr. 30	25.46	June 4	1.35	-0.31
136	12.41	Oct. 3	13.27	Feb. 1	.86	+.49
294	40.60	Jan. 4	42.20	{Dec. 24 Dec. 29	1.60	-1.49
325	a 13.05	Apr. 30	14.05	July 5	1.00	-.80
506	15.47	Aug. 18	18.69	Sept. 28	3.22	-.72
507	7.93	Aug. 18	11.03	May 13	3.10	-.15
718	14.07	Apr. 30	14.90	Dec. 5	.83	-.47
737	18.29	Sept. 1	18.75	June 24	.46	-.28
817	15.65	Aug. 18	17.54	Oct. 27	1.89	-.27
823	21.13	July 5	22.85	Nov. 2	1.72	-.77
824	17.06	{Mar. 31 Apr. 30	19.74	Nov. 2	2.68	-2.50
839	10.62	Aug. 21	14.41	June 5	3.79	+.28
853	9.31	Aug. 18	11.11	June 24	1.80	-.30
854	13.57	Mar. 4	15.09	Dec. 22	1.52	-1.15

a Corrected level below new measuring point.

Highest and lowest water levels and net changes in water level in  
7 wells in McPherson County, in feet below measuring point, 1939

Well No.	Highest water level	Date	Lowest water level	Date	Difference between highest and lowest water levels	Net rise (+) Net decline (-)
19	69.40	Aug. 11	70.55	Oct. 6	1.15	-0.46
243	82.62	Feb. 1	82.85	Dec. 31	.23	-.05
252	8.12	Mar. 13	10.67	Feb. 1	2.55	-.13
262	28.76	Mar. 13	30.89	Dec. 31	2.13	-1.58
309	34.74	Jan. 3	36.93	June 4	2.19	-1.31
310	10.84	Dec. 31	12.27	Jan. 3	1.43	+1.43
311	11.10	Mar. 31	14.26	Dec. 31	3.16	-2.41

Highest and lowest water levels and net changes in water level in  
22 wells in Sedgwick County, in feet below measuring point, 1939

11	60.01	Oct. 3	60.24	Dec. 5	0.23	-0.06
12	20.02	Aug. 30	20.94	{Dec. 27 Dec. 28	.92	-.73
28	18.07	Mar. 31	19.62	Dec. 5	1.55	-1.29
307	11.96	Aug. 23	14.00	{June 3 June 4	2.14	+.29
800	19.40	Sept. 6	20.25	June 4	.85	-.54
804	3.32	Mar. 13	4.78	Dec. 5	1.46	-1.26
805	6.45	July 5	8.24	June 4	1.79	-.84
806	16.89	Sept. 6	17.56	Dec. 5	.67	-.39
807	22.02	Nov. 2	23.25	Dec. 5	1.23	-.31
808	21.04	Nov. 2	24.11	{Jan. 3 Feb. 1 June 4	3.07	+.17
809	15.44	{Jan. 14 Jan. 28	17.69	Dec. 5	2.25	-2.17
810	11.82	July 1	14.40	Dec. 22	2.58	-.69
811	8.65	July 1	9.82	Dec. 31	1.17	-.94
812	11.85	Aug. 18	12.89	Dec. 31	1.04	-.82
813	17.26	Jan. 3	17.80	Dec. 5	.54	-.54
814	16.66	Jan. 3	17.41	Dec. 5	.75	-.75
815	14.40	Sept. 1	15.13	June 3	.73	-.73
816	11.27	Aug. 18	13.48	Apr. 15	2.21	+.23
825	13.86	Apr. 30	14.98	Nov. 2	1.12	-.69
830	26.12	Sept. 9	30.07	June 4	3.95	-.37
834	10.99	July 5	12.52	{Nov. 2 Dec. 5	1.53	-.30
838	25.79	Sept. 6	27.03	Mar. 13	1.24	+.08

Water levels in most of the wells were declining slowly at the beginning of the year. During the period from January through May the precipitation generally was insufficient to produce much recharge, and the water levels in most wells continued to decline. In some wells the water levels reached the lowest stages of the year early in June. In June an average of 8.22 inches of rain was recorded at the four stations, which was 3.76 inches above normal, and the water levels in most of the wells rose appreciably. In July, however, the precipitation was again below normal and most of the water levels declined. In August the average precipitation at the four stations was 2.96 inches above normal, and the water levels in most wells reached the highest stages of the year. As widespread drought conditions prevailed during the remaining 4 months of the year, water levels in most wells declined sharply and reached the lowest stages of the year in December.

## WATER LEVELS AND ARTESIAN PRESSURE, 1939

## Harvey County

72. SW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 16, T. 22 S., R. 1 W. Highest observed water level, 23.60 feet below measuring point July 4, 1938; lowest observed water level, 25.85 feet below measuring point Oct. 7, 1937.  
Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	24.43	Mar. 31	24.16	Aug. 11	24.26	Nov. 2	25.06
Feb. 1	24.29	Apr. 30	24.11	Sept. 8	24.54	Dec. 1	24.78
Mar. 1	24.42	June 4	25.46	Oct. 6	24.93	31	24.74
13	24.29	July 5	24.27				

105. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 16, T. 24 S., R. 1 W. Water levels, in feet below measuring point, 1939: Jan. 3, 29.97; Feb. 1, 30.44; Mar. 13, 30.40.  
Measurements discontinued.

136. NW cor. sec. 19, T. 23 S., R. 3 W. Highest observed water level, 12.41 feet below measuring point Oct. 3, 1939; lowest observed water level, 14.65 feet below measuring point Apr. 1, 1938. Well was not pumped in 1939.  
Water level, in feet below measuring point, 1939

Jan. 3	13.24	Mar. 31	13.22	July 5	12.73	Oct. 3	12.41
Feb. 1	13.27	Apr. 30	13.11	Aug. 5	12.54	Nov. 2	12.62
Mar. 13	13.25	June 4	13.03	Sept. 6	12.42	Dec. 5	12.75

156. SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 8, T. 23 S., R. 1 W. Water levels, in feet below measuring point, 1939: Jan. 3, 31.34; Feb. 1, 31.45; Mar. 13, 31.83.  
Two to four barrels of water pumped daily. Measurements discontinued.

294. SE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 17, T. 22 S., R. 3 W. Highest observed water level, 39.75 feet below measuring point Aug. 20, 1938; lowest observed water level, 43.92 feet below measuring point Aug. 3-5, 1938.  
Lowest daily water level, in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	40.71	40.79	.....	40.77	40.77	41.19	41.02	41.25	40.91	41.63	41.98	42.06
2	40.68	40.84	.....	40.76	40.78	41.19	40.98	41.27	40.94	41.63	42.02	42.05
3	40.64	40.88	.....	40.77	40.79	41.20	40.94	41.28	40.97	41.63	42.04	42.06
4	40.60	40.89	40.98	40.77	40.79	41.21	40.88	41.29	41.02	41.63	42.05	42.07
5	40.64	40.89	40.98	40.76	40.79	41.21	40.85	41.30	41.06	41.65	42.05	42.07
6	40.67	40.88	41.02	40.75	40.79	41.20	40.85	41.31	41.08	41.66	42.04	42.08
7	40.73	40.88	41.03	40.75	40.79	41.19	40.87	41.31	41.12	41.67	42.02	42.10
8	40.74	40.94	41.03	40.72	40.79	41.20	40.89	41.31	41.16	41.69	42.01	42.11
9	40.73	40.94	41.02	40.68	40.81	41.20	40.91	41.31	41.19	41.70	42.01	42.11
10	40.74	40.96	41.02	40.61	40.83	41.17	40.93	41.30	41.22	41.72	41.93	42.10
11	40.77	41.02	40.97	40.65	40.87	41.16	40.95	41.28	41.23	41.74	41.99	42.10
12	40.78	41.04	40.91	40.69	40.91	41.17	40.97	41.27	41.26	41.76	42.00	42.12
13	40.77	41.02	40.92	40.69	40.94	41.17	40.98	41.24	41.29	41.77	42.01	42.15
14	40.77	40.96	40.91	40.68	40.94	41.17	41.01	41.22	41.32	41.79	42.02	42.16
15	40.78	40.96	40.96	40.65	40.94	41.15	41.02	41.19	41.36	41.79	42.03	42.16
16	40.79	40.99	40.99	40.61	40.94	41.14	41.04	41.12	41.40	41.79	42.03	42.16
17	40.78	41.05	41.00	40.61	40.95	41.14	41.05	41.03	41.43	41.81	42.04	42.16
18	40.78	41.05	41.00	40.62	40.96	41.15	41.08	40.95	41.46	41.82	42.04	42.16
19	40.79	41.02	40.99	40.63	40.96	41.18	41.11	40.90	41.48	41.83	42.03	42.16
20	40.81	41.02	40.95	40.63	40.96	41.22	41.13	40.88	41.51	41.84	42.03	42.17
21	40.81	41.07	40.96	40.66	40.97	41.24	41.14	40.87	41.52	41.85	42.03	42.18
22	40.87	41.10	40.96	40.66	40.97	41.27	41.17	40.86	41.53	41.86	42.04	42.19
23	40.87	41.10	40.95	40.66	40.97	41.28	41.20	40.84	41.53	41.86	42.04	42.19
24	40.87	41.05	40.92	40.66	41.00	41.29	41.20	40.84	41.53	41.86	42.04	42.20
25	40.89	41.04	40.89	40.65	41.04	41.30	41.20	40.83	41.54	41.85	42.06	42.20
26	40.93	.....	40.84	40.67	41.07	41.30	41.21	40.84	41.54	41.86	42.09	42.20
27	40.94	.....	40.84	40.70	41.10	41.25	41.22	40.85	41.55	41.90	42.10	42.19
28	40.89	.....	40.85	40.73	41.13	41.17	41.23	40.85	41.55	41.93	42.10	42.20
29	40.79	.....	40.82	40.76	41.15	41.11	41.24	40.86	41.58	41.94	42.10	42.20
30	40.82	.....	40.82	40.77	41.16	41.07	41.25	40.87	41.62	41.96	42.08	.....
31	40.82	.....	40.81	.....	41.18	.....	41.25	40.89	.....	41.97	.....	.....

## Harvey County--Continued

325. SW corner SE $\frac{1}{4}$  sec. 19, T. 23 S., R. 3 W. New measuring point beginning June 4, 1939, top of casing, 0.2 foot above old measuring point, 2.0 feet below bench mark, 2.7 feet above land surface, 1,459.0 feet above sea level. Highest observed water level, 12.85 feet below measuring point Apr. 30, 1939; lowest observed water level unaffected by pumping, 14.12 feet below measuring point Apr. 1, 1938.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	12.98	Mar. 31	12.90	July 5	14.05	Oct. 3	13.83
Feb. 1	12.99	Apr. 30	12.85	Aug. 5	13.98	Nov. 2	13.95
Mar. 13	a 16.55	June 4	b 14.21	Sept. 6	13.84	Dec. 5	13.98

506. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 28, T. 23 S., R. 2 W. Highest observed water level, 15.47 feet below measuring point Aug. 18, 1939; lowest observed water level, 18.69 feet below measuring point Sept. 28, 1939.

Lowest daily water level, in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	17.49	17.61	17.71	17.47	18.05	18.61	15.95	17.79	17.09	18.34	18.26	18.30
2	17.48	17.63	17.70	17.52	18.12	18.51	16.03	17.83	17.28	18.28	18.27	18.28
3	17.47	17.63	17.65	17.53	18.10	18.44	16.02	17.86	17.46	18.26	.....	18.26
4	17.49	17.63	17.64	17.52	18.07	18.44	16.00	17.87	17.58	18.26	.....	18.41
5	17.53	17.60	17.67	17.52	18.14	18.49	16.15	17.89	17.52	18.26	.....	18.48
6	17.55	17.59	17.68	17.55	18.20	18.56	16.31	17.91	17.72	18.26	.....	.....
7	17.57	17.74	17.67	17.52	18.17	18.54	16.48	17.92	17.89	18.26	.....	.....
8	17.56	17.74	17.62	17.48	18.26	18.40	16.71	17.83	17.84	18.26	.....	18.51
9	17.51	17.65	17.56	17.46	18.37	18.28	16.96	17.66	17.80	18.23	.....	18.51
10	17.54	17.67	17.49	17.45	18.47	18.18	17.21	17.41	17.75	18.23	18.16	18.45
11	17.56	17.69	17.40	17.58	18.46	17.99	17.22	17.38	17.89	18.22	18.16	18.47
12	17.55	17.68	17.45	17.59	18.40	17.95	17.23	17.38	18.10	18.22	18.16	18.55
13	17.54	17.85	17.44	17.58	18.28	18.10	17.31	17.38	18.13	18.24	18.16	18.55
14	17.56	17.95	17.46	17.53	18.17	18.10	17.47	17.31	18.10	18.24	18.14	18.55
15	17.57	17.99	17.49	17.54	18.33	18.28	17.47	16.80	17.92	18.22	18.14	18.56
16	17.57	17.94	17.50	17.59	18.43	18.40	17.74	16.14	17.88	18.24	18.14	18.54
17	17.55	17.84	17.52	17.62	18.38	18.40	17.87	15.78	17.88	18.24	18.13	18.44
18	17.56	17.78	17.53	17.63	18.18	18.36	18.01	15.47	17.90	18.22	18.12	18.34
19	17.57	17.72	17.53	17.63	18.12	18.30	18.21	15.69	17.91	18.23	18.12	18.46
20	17.58	17.74	17.80	17.67	18.08	18.30	18.31	15.87	18.18	18.24	18.12	18.53
21	17.60	.....	17.77	17.79	18.06	18.28	18.43	15.99	18.35	18.24	.....	18.59
22	17.62	.....	17.66	17.78	18.29	18.25	18.52	16.16	18.39	18.24	.....	18.58
23	17.59	.....	17.63	17.74	18.41	18.45	18.55	16.21	18.52	18.24	.....	18.57
24	17.60	.....	17.62	17.70	18.48	18.43	18.56	16.38	18.52	18.25	18.46	18.39
25	17.60	.....	17.58	17.68	18.48	18.35	18.00	16.46	18.51	18.27	18.52	18.36
26	17.63	.....	17.63	17.84	18.40	18.24	17.86	16.58	18.60	18.27	18.48	18.30
27	17.62	.....	17.64	17.83	18.47	17.52	17.75	16.66	18.66	18.31	18.50	18.25
28	17.53	.....	17.63	17.87	18.48	16.49	17.69	16.75	18.69	18.31	18.50	18.26
29	17.58	.....	17.59	17.91	18.57	16.29	17.73	16.84	18.66	18.27	18.51	18.24
30	17.59	.....	17.55	17.88	18.65	15.95	17.76	16.93	18.44	18.27	18.47	18.22
31	17.59	.....	17.42	.....	18.65	.....	17.78	17.01	.....	18.26	.....	18.21

507. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 28, T. 23 S., R. 2 W. Highest observed water level, 7.93 feet below measuring point Aug. 18, 1939; lowest observed water level, 11.03 feet below measuring point May 13, 1939.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	10.11	Apr. 8	9.91	July 7	9.09	Oct. 6	10.21
14	10.12	15	10.02	14	9.78	13	10.28
21	10.13	22	10.30	21	10.05	20	10.27
28	10.12	29	10.16	28	9.75	27	10.27
Feb. 4	10.20	May 6	10.90	Aug. 4	9.94	Nov. 3	10.27
11	10.29	13	11.03	11	9.56	10	10.16
18	10.25	20	10.56	18	7.93	17	10.20
27	10.23	27	10.58	25	8.88	24	10.24
Mar. 4	10.16	June 3	10.42	Sept. 1	9.28	Dec. 1	10.21
11	10.02	10	10.16	8	9.66	8	10.28
18	10.11	17	10.28	15	9.86	15	10.30
25	10.10	24	10.43	22	10.00	22	10.31
Apr. 1	9.98	July 1	8.50	29	10.23	31	10.26

a Pumping; temporarily equipped with pump. b New measuring point.

## Harvey County--Continued

701. NE cor. NW $\frac{1}{4}$  sec. 3, T. 23 S., R. 1 W. Highest observed water level, 38.06 feet below measuring point Dec. 5, 1939; lowest observed water level, 44.73 feet below measuring point Nov. 2, 1938. Some water pumped daily during January, February, and March, 1939.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	44.21	Mar. 31	43.19	July 5	42.43	Oct. 3	39.32
Feb. 1	43.80	Apr. 30	43.57	Aug. 5	41.35	Nov. 2	38.44
Mar. 13	43.43	June 4	44.15	Sept. 6	40.19	Dec. 5	38.06

718. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 15, T. 24 S., R. 3 W. Highest observed water level, 14.07 feet below measuring point Apr. 30, 1939; lowest observed water level, 14.90 feet below measuring point Dec. 5, 1939.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	14.43	Mar. 31	14.22	July 5	14.28	Oct. 3	14.64
Feb. 1	14.46	Apr. 30	14.07	Aug. 5	14.63	Nov. 2	14.84
Mar. 13	14.34	June 4	14.66	Sept. 6	14.25	Dec. 5	14.90

737. NW cor. NW $\frac{1}{4}$  sec. 25, T. 23 S., R. 3 W. Highest observed water level, 18.19 feet below measuring point Sept. 17, 1938; lowest observed water level, 18.75 feet below measuring point June 24, 1939. Well removed by owner in December 1939.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	18.36	Apr. 1	18.39	June 24	18.75	Sept. 15	18.41
14	18.32	8	18.33	July 1	18.70	22	18.36
21	18.37	15	18.36	7	18.65	29	18.35
28	18.36	22	18.50	14	18.70	Oct. 6	18.39
Feb. 4	18.43	29	18.43	21	18.68	13	18.51
11	18.49	May 6	18.41	28	18.62	20	18.51
18	18.48	13	18.62	Aug. 4	18.67	27	18.60
27	18.49	20	18.64	11	18.71	Nov. 3	18.66
Mar. 4	18.46	27	18.68	18	18.44	10	18.57
11	18.41	June 3	18.74	25	18.32	17	18.63
18	18.49	10	18.68	Sept. 1	18.29	24	18.66
25	18.42	17	18.70	8	18.35	Dec. 1	18.64

817. NW cor. NW $\frac{1}{4}$  sec. 1, T. 24 S., R. 2 W. Highest observed water level, 15.65 feet below measuring point Aug. 18, 1939; lowest observed water level, 17.60 feet below measuring point Oct. 22, 1938.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	16.71	Apr. 8	16.22	July 7	15.99	Oct. 6	17.42
14	16.54	15	16.31	14	16.54	13	17.45
21	16.55	22	16.42	21	17.07	20	17.47
28	16.47	29	16.52	28	16.89	27	17.54
Feb. 4	16.57	May 6	16.59	Aug. 4	17.18	Nov. 3	17.46
11	16.67	13	16.71	11	16.75	10	17.30
18	16.60	20	16.73	18	15.65	17	17.19
27	16.61	27	16.85	25	16.24	24	17.16
Mar. 4	16.52	June 3	17.18	Sept. 1	16.43	Dec. 1	17.03
11	16.20	10	17.15	8	16.87	8	17.09
18	16.39	17	17.20	15	17.14	15	17.06
25	16.32	24	17.35	22	17.25	22	17.05
Apr. 1	16.27	July 1	15.70	29	17.37	31	16.98

821. City of Wichita. NW cor. sec. 6, T. 24 S., R. 2 W. In right of way of County road, 2 feet east of corner fence post. Driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 19.0 feet. Measuring point, top of pipe, 1.0 foot above land surface, 1.03 feet below bench mark, 1,429.47 feet above sea level. Bench mark 6Y, established Sept. 3, 1938, square cut in southwest corner of east headwall of concrete culvert, 0.30 foot above land surface, 180 feet north-northwest of well, 1,430.50 feet above sea level.

## Harvey County--Continued

## 821. City of Wichita.--Continued

Water level, in feet below measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
Aug. 31, 1938	13.26	July 18, 1939	13.56	Oct. 16, 1938	13.36
Mar. 11, 1939	13.16	31	13.41	23	13.28
31	13.21	Aug. 7	13.41	30	13.15
Apr. 30	13.26	21	13.03	Nov. 13	13.40
May 22	13.32	28	13.08	20	13.40
29	13.44	Sept. 5	13.10	27	13.48
June 5	13.47	11	13.11	Dec. 4	13.42
13	13.52	18	13.19	11	13.40
20	13.57	25	13.18	18	13.44
July 3	13.41	Oct. 2	13.21	27	13.46
11	13.55	9	13.35		

823. NE cor. sec. 29, T. 24 S., R. 1 W. Highest observed water level, 20.65 feet below measuring point Sept. 1, 1938; lowest observed water level, 22.85 feet below measuring point Nov. 2, 1939.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	21.99	Mar. 31	22.12	July 5	21.13	Oct. 3	22.60
Feb. 1	22.17	Apr. 30	22.36	Aug. 5	22.22	Nov. 2	22.85
Mar. 13	22.09	June 4	22.63	Sept. 6	22.04	Dec. 5	22.77

824. SE cor. sec. 22, T. 24 S., R. 1 W. Highest observed water level, 16.79 feet below measuring point Sept. 7, 1938; lowest observed water level, 19.74 feet below measuring point Nov. 2, 1939.

Water level, in feet below measuring point, 1939

Jan. 3	17.22	Mar. 31	17.06	July 5	17.43	Oct. 3	19.24
Feb. 1	17.31	Apr. 30	17.06	Aug. 5	18.62	Nov. 2	19.74
Mar. 13	17.17	June 4	17.76	Sept. 6	17.42	Dec. 5	19.72

831. City of Wichita. NE cor. sec. 19, T. 24 S., R. 1 W. In right of way of Township road, 72 feet west of section line, 12 feet west of well 832. Driven observation well, diameter  $1\frac{1}{4}$  inches, depth 41.0 feet. Measuring point, top of pipe, 1.0 foot above land surface, 0.28 foot above bench mark, 1,382.65 feet above sea level. Bench mark 13B, established Oct. 1, 1938, railroad spike in east root of 40-inch cottonwood tree at SE cor. sec. 18, T. 24 S., R. 1 W., 1,382.37 feet above sea level.

Water level, in feet below measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
Sept. 1, 1938	19.85	Sept. 6, 1939	20.42	Nov. 2, 1939	21.27
Aug. 5, 1939	20.84	Oct. 3	20.97	Dec. 5	21.34

832. Owner, location, and bench mark same as for well 831. Twelve feet east of well 831. Drilled test well, total depth 177 feet, with  $1\frac{1}{4}$ -inch pipe and well point in sand at depth of 129.0 feet. Measuring point, top of pipe, 0.5 foot above land surface, 0.42 foot above bench mark, 1,382.79 feet above sea level. Log on file.

Water level, in feet below measuring point, 1938-39

Sept. 8, 1938	19.18	Sept. 6, 1939	19.80	Nov. 2, 1939	20.57
Aug. 5, 1939	20.10	Oct. 3	20.29	Dec. 5	20.57

833. City of Wichita. SW cor. sec. 19, T. 24 S., R. 1 W. Five feet north of corner fence post. Drilled test well, total depth 187 feet, with  $1\frac{1}{4}$ -inch pipe and well point in sand at depth of 57.0 feet. Measuring point, top of pipe, 1.0 foot above land surface, 0.20 foot below bench mark, 1,381.67 feet above sea level. Bench mark 10F, established Sept. 21, 1938, railroad spike in base of corner fence post at NW cor. sec. 30, T. 24 S., R. 1 W., 50 feet south of well, 1,381.87 feet above sea level. Log on file.

Water level, in feet below measuring point, 1938-39

Sept. 10, 1938	9.26	Sept. 6, 1939	9.06	Nov. 2, 1939	10.38
Aug. 5, 1939	9.76	Oct. 3	9.80	Dec. 5	10.46

## Harvey County--Continued

839. NE cor. sec. 35, T. 24 S., R. 2 W. Highest observed water level, 10.62 feet below measuring point Aug. 21, 1939; lowest observed water level, 14.41 feet below measuring point June 5, 1939.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	13.77	Apr. 8	13.80	July 10	12.80	Oct. 9	13.06
14	13.68	15	13.73	17	13.08	16	13.08
21	13.74	22	13.85	24	13.26	23	13.13
28	13.67	29	13.97	31	12.97	30	13.33
Feb. 4	13.85	May 6	13.94	Aug. 7	13.20	Nov. 6	13.28
11	13.98	13	14.11	21	10.62	13	13.41
18	13.90	22	14.13	23	11.18	21	13.37
27	14.02	29	14.29	Sept. 5	11.77	27	13.53
Mar. 4	13.90	June 5	14.41	11	12.09	Dec. 4	13.47
11	13.70	12	14.38	18	12.48	11	13.51
18	13.93	19	14.29	25	12.66	18	13.50
25	13.83	July 3	12.17	Oct. 2	12.77	27	13.49
Apr. 1	13.94						

852. City of Wichita. NW cor. sec. 29, T. 24 S., R. 1 W. In right of way of Township road, 2 feet south of corner fence post. Driven observation well, diameter  $1\frac{1}{4}$  inches, depth 37.2 feet. Measuring point, top of pipe, 1.0 foot above land surface, 0.02 foot above bench mark, 1,380.27 feet above sea level. Bench mark 10E, established Sept. 21, 1933, spike and washer marked "USGS-BM" in top of hedge stump, 5 feet northeast of corner fence post at NE cor. sec. 30, T. 24 S., R. 1 W., 1,380.25 feet above sea level.

Water level, in feet below measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
Nov. 16, 1938	16.15	Sept. 6, 1939	16.06	Nov. 2, 1939	17.03
Aug. 5, 1939	16.63	Oct. 3	16.63	Dec. 5	17.14

853. NW cor. sec. 13, T. 24 S., R. 2 W. Highest observed water level, 9.31 feet below measuring point Aug. 18, 1939; lowest observed water level, 11.11 feet below measuring point June 24, 1939.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	10.64	Apr. 8	10.40	July 7	10.05	Oct. 6	10.53
14	10.56	15	10.47	14	10.36	13	10.66
21	10.60	22	10.64	21	10.53	20	10.70
28	10.55	29	10.77	28	10.36	27	10.81
Feb. 4	10.70	May 6	10.73	Aug. 4	10.54	Nov. 3	10.87
11	10.80	13	10.92	11	10.43	10	10.75
18	10.76	20	10.90	18	9.31	17	10.82
27	10.82	27	10.96	25	9.66	24	10.87
Mar. 4	10.67	June 3	11.08	Sept. 1	9.88	Dec. 1	10.77
11	10.51	10	10.99	8	10.16	8	10.93
18	10.67	17	11.00	15	10.31	15	10.90
25	10.61	24	11.11	22	10.41	22	10.97
Apr. 1	10.56	July 1	9.74	29	10.52	31	10.94

854. SW cor. sec. 23, T. 23 S., R. 2 W. Highest observed water level, 13.14 feet below measuring point Nov. 17, 1938; lowest observed water level, 15.09 feet below measuring point Dec. 22, 1939.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	13.87	Mar. 11	13.57	May 13	14.17	July 14	14.37
14	13.73	18	13.86	20	14.14	21	14.57
21	13.76	25	13.74	27	14.21	28	14.46
28	13.66	Apr. 1	13.75	June 3	14.43	Aug. 4	14.58
Feb. 4	13.89	8	13.60	10	14.42	11	14.51
11	14.08	15	13.63	17	14.46	18	13.71
18	13.94	22	13.82	24	14.54	25	14.02
27	13.90	29	13.95	July 1	13.99	Sept. 1	14.13
Mar. 4	13.90	May 6	13.90	7	14.11	8	14.43



## Harvey County--Continued

854.--Continued

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Sept. 15	14.62	Oct. 13	14.95	Nov. 10	15.04	Dec. 8	15.04
22	14.72	20	14.93	17	14.97	15	15.06
29	14.85	27	15.08	24	15.04	22	15.09
Oct. 6	14.85	Nov. 3	15.08	Dec. 1	14.93	31	15.02

872. Owner of well, City of Wichita; owner of property, D. C. Buller. SE cor. sec. 31, T. 23 S., R. 2 W. Drilled test well, total depth 260 feet, with three 1 $\frac{1}{4}$ -inch observation wells (872-874) of different depths in same hole. Southwest well, depth 31.0 feet, taps sand between depths of 10.0 and 31.0 feet. Measuring point, top of pipe, 0.5 foot above land surface, 1.12 feet below bench mark, 1,431.67 feet above sea level. Bench mark 6Z, established Sept. 6, 1938, square cut in southeast corner of north headwall of concrete culvert, 0.2 foot above land surface, 60 feet west of intersection, 45 feet southeast of wells, 1,432.79 feet above sea level.

Water level, in feet below measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
Dec. 2, 1938	18.20	July 24, 1939	18.99	Oct. 16, 1939	18.73
Mar. 11, 1939	18.15	31	18.90	23	18.68
31	18.20	Aug. 7	18.85	30	18.81
Apr. 30	18.31	21	18.52	Nov. 6	18.75
May 22	18.86	28	18.46	13	18.80
29	19.27	Sept. 5	18.49	21	18.74
June 5	19.17	11	18.52	27	18.84
12	19.12	18	18.63	Dec. 4	18.75
19	19.11	25	18.65	11	18.75
July 3	18.97	Oct. 2	18.67	18	18.75
10	19.12	9	18.66	27	18.76
17	19.09				

873. Owner, location, diameter, and bench mark same as for well 872. East well, depth 63.0 feet, taps sand and gravel between depths of 36 and 74 feet. Measuring point, top of pipe, 0.5 foot above land surface, 1.20 feet below bench mark, 1,431.59 feet above sea level.

Water level, in feet below measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
Dec. 2, 1938	18.14	July 24, 1939	18.94	Oct. 16, 1939	18.68
Mar. 11, 1939	18.11	31	18.84	23	18.66
31	18.17	Aug. 7	18.81	30	18.76
Apr. 30	18.31	21	18.47	Nov. 6	18.71
May 22	18.80	28	18.42	13	18.75
29	19.27	Sept. 5	18.44	21	18.69
June 5	19.10	11	18.47	27	18.80
12	19.10	18	18.57	Dec. 4	18.71
19	19.10	25	18.58	11	18.71
July 3	18.94	Oct. 2	18.57	18	18.70
10	19.07	9	18.63	27	18.70
17	19.03				

874. Owner, location, diameter, and bench mark same as for wells 872 and 873. North well, depth 201.0 feet, taps sand and gravel between depths of 182 and 230 feet. Measuring point, top of pipe, 0.5 foot above land surface, 1.09 feet below bench mark, 1,431.70 feet above sea level.

Water level, in feet below measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
Dec. 2, 1938	21.68	July 24, 1939	21.33	Oct. 16, 1939	21.19
Mar. 11, 1939	21.76	31	21.36	23	22.16
31	21.82	Aug. 7	21.26	30	21.29
Apr. 30	21.99	21	20.90	Nov. 6	21.21
May 22	23.15	28	20.83	13	21.27
29	22.32	Sept. 5	20.89	21	21.27
June 5	21.77	11	20.95	27	21.32
12	21.64	18	21.07	Dec. 4	21.30
19	21.62	25	21.10	11	21.24
July 3	21.44	Oct. 2	21.10	18	21.23
10	21.55	9	21.23	27	21.23
17	21.50				

## Harvey County--Continued

875. Owner of well, City of Wichita; owner of property, A. B. Havelly. SE cor. sec. 17, T. 23 S., R. 3 W., 4.5 feet south of wells 876 and 877. Driven observation well, diameter  $1\frac{1}{4}$  inches, depth 12.6 feet. Measuring point, top of pipe, 1.7 feet above land surface, 1.14 feet above bench mark, 1,453.87 feet above sea level. Bench mark 6JJ, established Jan. 31, 1939, curled 60d spike in corner fence post, 18 feet south of timber culvert, 78 feet south of well, at NE cor. sec. 20, T. 23 S., R. 3 W., 1,452.73 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 11	6.32	May 27	6.71	Aug. 11	5.95	Oct. 27	7.30
18	6.77	June 3	7.07	18	4.99	Nov. 3	7.21
25	6.41	10	7.00	25	5.37	10	7.19
Apr. 1	6.48	17	6.88	Sept. 1	5.59	17	6.98
8	6.20	24	7.06	8	6.13	24	7.08
15	6.01	July 1	6.43	15	6.39	Dec. 1	6.88
22	6.18	7	6.55	22	6.47	8	7.00
29	6.29	14	6.81	29	6.82	15	7.00
May 6	6.08	21	7.03	Oct. 6	6.80	22	7.03
13	6.48	28	6.29	13	7.02	31	6.96
20	6.53	Aug. 4	6.28	20	6.95		

876. Owner, location, and bench mark same as for well 875. Drilled test well, total depth 255 feet, with two observation wells, 876 and 877, of different depths in same hole. Diameter  $1\frac{1}{4}$  inches, depth 246 feet, taps sand and gravel between depths of 234 and 245 feet. Measuring point, top of instrument shelf in wooden shelter, 2.7 feet above land surface, 2.29 feet above bench mark, 1,454.99 feet above sea level.

Water level, in feet below measuring point, 1939

Mar. 11	27.65	May 27	28.49	Aug. 11	28.48	Oct. 27	28.70
18	27.27	June 3	28.53	18	28.44	Nov. 3	28.75
25	27.12	10	28.55	25	28.39	10	28.77
Apr. 1	27.89	17	28.55	Sept. 1	28.39	17	28.77
8	28.17	24	28.57	8	28.41	24	28.78
15	28.24	July 1	28.53	15	28.45	Dec. 1	28.80
22	28.28	7	28.48	22	28.53	8	28.83
29	28.33	14	28.48	29	28.57	15	28.84
May 6	28.39	21	28.54	Oct. 6	28.62	22	28.86
13	28.42	28	28.50	13	28.64	31	28.85
20	28.45	Aug. 4	28.44	20	28.67		

877. Owner, location, measuring point, and bench mark same as for well 876. Diameter 6 inches, depth 47.3 feet, finished with 5-foot brass screen in sand and gravel. Taps water-bearing beds between depths of 26 and 46 feet. Equipped with Stevens 8-day recorder beginning Apr. 15, 1939. Lowest daily water level, in feet below measuring point, 1939

Day	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	a17.47	17.39	17.46	17.33	17.20	16.88	16.98	17.10	17.11
2	.....	.....	17.39	17.47	17.31	17.20	16.88	16.95	17.13	17.12
3	.....	.....	17.39	17.50	17.28	17.20	16.88	16.94	17.13	17.13
4	.....	.....	17.40	17.49	17.26	17.20	16.90	16.94	17.12	17.13
5	.....	.....	17.41	17.47	17.26	17.20	16.90	16.97	17.09	17.13
6	.....	.....	17.43	17.46	17.27	17.18	16.89	16.97	17.08	17.14
7	.....	.....	17.38	17.46	17.28	17.18	16.89	16.96	17.07	17.16
8	.....	a17.42	17.39	17.48	17.28	17.12	16.91	16.96	17.09	17.16
9	.....	.....	17.39	17.40	17.28	17.12	16.90	16.97	17.07	17.14
10	.....	.....	17.40	17.46	17.28	17.12	16.90	17.00	17.05	17.14
11	a17.46	.....	17.40	17.46	17.28	17.12	16.90	17.01	17.05	17.14
12	.....	.....	17.40	17.46	17.28	17.10	16.90	17.02	17.09	17.20
13	.....	.....	17.43	17.46	17.28	17.07	16.92	17.06	17.09	17.20
14	.....	.....	17.45	17.46	17.28	17.07	16.92	17.06	17.11	17.19
15	.....	17.35	17.45	17.44	17.27	16.99	16.92	17.04	17.12	17.19
16	.....	17.36	17.42	17.44	17.26	16.99	16.94	17.04	17.10	17.18
17	.....	17.36	17.41	17.44	17.26	16.98	16.94	17.04	17.10	17.18
18	a17.57	17.36	17.41	17.44	17.27	16.96	16.94	17.03	17.11	17.19

a Wetted-tape measurement.

## Harvey County--Continued

877.--Continued

Lowest daily water level, in feet below measuring point, 1939

Day	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
19	.....	17.36	17.43	17.45	17.28	16.95	16.95	17.02	17.11	17.21
20	.....	17.36	17.43	17.46	17.28	16.94	16.95	17.02	17.12	17.21
21	.....	17.39	17.45	17.46	17.28	16.94	16.95	17.02	17.12	17.21
22	.....	17.39	17.45	17.47	17.28	16.93	16.95	17.02	17.13	17.21
23	.....	17.39	17.45	17.47	17.28	16.93	16.95	17.02	17.13	17.21
24	.....	17.39	17.46	17.46	17.28	16.92	16.94	17.02	17.13	17.21
25	a 17.47	17.37	17.46	17.46	17.22	16.91	16.94	17.02	17.13	17.20
26	.....	17.38	17.46	17.33	17.18	16.91	16.94	17.05	17.14	17.21
27	.....	17.39	17.46	17.33	17.20	16.90	16.94	17.08	17.14	17.21
28	.....	17.42	17.46	17.33	17.20	16.90	16.94	17.08	17.14	17.20
29	.....	17.40	17.46	17.33	17.20	16.89	16.97	17.08	17.14	17.21
30	.....	17.40	17.46	17.33	17.20	16.89	16.99	17.08	17.11	17.22
31	.....	.....	17.46	.....	17.20	16.88	.....	17.08	.....	17.21

878. Owner of well, City of Wichita; owner of property, C. Cadwell. SE cor. sec. 1, T. 24 S., R. 3 W. Drilled test well, total depth 274 feet, with two 1½-inch observation wells, 878 and 879, of different depths in same hole. South well, depth 45.0 feet, taps sand and gravel between depths of 30 and 64.7 feet. Measuring point, top of pipe, 0.3 foot above land surface, 0.61 foot below bench mark, 1,431.73 feet above sea level. Bench mark 9C, established Sept. 17, 1938, square cut in southwest corner of east head-wall of concrete culvert, 0.2 foot above land surface, 70 feet north of intersection, 65 feet east-northeast of well, in SW¼SW¼ sec. 6, T. 24 S., R. 2 W., 1,432.34 feet above sea level.

Water level, in feet below measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
Dec. 9, 1938	16.78	July 31, 1939	17.29	Oct. 16, 1939	17.23
Mar. 31, 1939	16.73	Aug. 7	17.22	23	17.10
Apr. 30	16.84	21	16.71	30	17.28
June 5	17.34	28	16.76	Nov. 13	17.22
13	17.55	Sept. 5	16.86	20	17.25
20	17.59	11	16.91	27	17.29
July 3	17.24	18	17.11	Dec. 4	17.20
11	17.48	25	17.03	11	17.12
18	17.52	Oct. 2	17.03	18	17.20
25	17.50	9	17.21	27	17.23

879. Owner, location, and bench mark same as for well 878. North well, depth 241.0 feet, taps sand between depths of 232 and 254 feet. Measuring point, top of pipe, 0.5 foot above land surface, 0.79 foot below bench mark, 1,431.55 feet above sea level.

Water level, in feet below measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
Dec. 9, 1938	18.38	July 31, 1939	18.80	Oct. 16, 1939	18.69
Mar. 31, 1939	18.25	Aug. 7	18.70	23	18.64
Apr. 30	18.40	21	18.23	30	18.77
June 5	18.94	28	18.25	Nov. 13	18.74
13	19.38	Sept. 5	18.33	20	18.78
20	19.20	11	18.41	27	18.82
July 3	18.79	18	18.15	Dec. 4	18.68
11	19.08	25	18.55	11	18.66
18	18.99	Oct. 2	18.56	18	18.68
25	18.90	9	18.71	27	18.70

a Wetted-tape measurement.

## Harvey County--Continued

880. Owner of well, City of Wichita; owner of property, Peter Miller. SE cor. sec. 11, T. 24 S., R. 3 W. Drilled test well, total depth 255 feet, with two  $1\frac{1}{2}$ -inch observation wells, 880 and 881, of different depths in same hole. South well, depth 15.0 feet, taps sand and gravel between depths of 6 and 32 feet. Measuring point, top of pipe, 1.3 feet above land surface, 0.33 foot below bench mark 9G, 0.67 foot below bench mark 9H, 1,425.40 feet above sea level. Bench mark 9G, established Sept. 17, 1938, curled 60d spike in corner fence post, in SW cor. sec. 12, T. 24 S., R. 3 W., 1,424.57 feet above sea level. Bench mark 9H, curled 60d spike and washer marked "USGS-BM," in corner fence post, level with land surface, in NW cor. sec. 13, T. 24 S., R. 3 W., 1,424.73 feet above sea level. Log on file.

Water level, in feet below measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
Nov. 11, 1938	7.35	July 31, 1939	6.40	Oct. 16, 1939	7.20
Mar. 31, 1939	6.25	Aug. 7	6.73	23	7.13
Apr. 30	6.44	21	5.46	30	7.23
June 5	7.15	28	5.98	Nov. 13	7.19
13	7.32	Sept. 5	6.40	20	7.16
20	7.45	11	6.64	27	7.17
July 3	6.09	18	6.84	Dec. 4	7.08
11	6.74	25	6.98	11	7.00
18	7.00	Oct. 2	7.02	18	7.00
25	6.94	9	7.12	27	7.01

881. Owner, location, and bench marks same as for well 880. North well, depth 57.0 feet, taps sand and gravel between depths of 48 and 61 feet. Measuring point, top of pipe, 1.3 feet above land surface, 0.89 foot below bench mark 9G, 0.73 foot below bench mark 9H, 1,425.46 feet above sea level.

Water level, in feet below measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
Nov. 11, 1938	7.12	July 31, 1939	6.64	Oct. 16, 1939	7.07
Mar. 31, 1939	6.24	Aug. 7	6.71	23	7.02
Apr. 30	6.36	21	5.64	30	7.10
June 5	7.20	28	6.02	Nov. 13	7.00
13	7.25	Sept. 5	6.40	20	6.99
20	7.31	11	6.61	27	7.01
July 3	6.23	18	6.80	Dec. 4	6.96
11	6.76	25	6.89	11	6.93
18	7.03	Oct. 2	6.94	18	6.93
25	6.98	9	7.03	27	6.94

883. Owner of well, City of Wichita; owner of property, Maggie Holle. NW cor. sec. 26, T. 24 S., R. 2 W. Drilled test well, total depth 187 feet, with three  $1\frac{1}{2}$ -inch observation wells, 883, 884, and 885, in same hole. South well, depth 38.0 feet, taps sand and gravel between depths of 25 and 47 feet. Measuring point, top of pipe, 0.7 foot above land surface, 3.61 feet above bench mark, 1,399.23 feet above sea level. Bench mark 11A, established Sept. 23, 1938, railroad spike in base of telephone pole, level with land surface, 80 feet west-northwest of well, in NE cor. sec. 27, T. 24 S., R. 2 W., 1,395.62 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 14	15.83	May 22	16.24	Aug. 7	15.66	Oct. 23	15.36
Mar. 18	16.06	29	16.29	21	14.05	30	15.56
25	15.92	June 5	16.30	28	14.22	Nov. 6	15.49
Apr. 1	16.01	12	16.73	Sept. 5	14.48	13	15.60
8	15.90	19	16.42	11	14.64	21	15.55
15	15.84	July 3	14.96	18	14.92	27	15.71
22	15.97	10	15.30	25	15.03	Dec. 4	15.62
29	16.10	17	15.38	Oct. 2	15.10	11	15.66
May 6	16.11	24	15.51	9	15.37	18	15.64
15	16.17	31	15.36	16	15.46	27	15.63

## Harvey County--Continued

884. Owner, location, and bench mark, same as for well 883. Middle well, depth 60.0 feet, taps sand and gravel between depths of 59 and 71 feet. Measuring point, top of pipe, 0.6 foot above land surface, 3.55 feet above bench mark, 1,399.17 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 14	15.76	May 22	16.16	Aug. 7	15.58	Oct. 23	15.27
Mar. 18	15.99	29	16.23	21	13.94	30	15.48
25	15.96	June 5	16.22	28	14.13	Nov. 6	15.41
Apr. 1	15.94	12	16.65	Sept. 5	14.40	13	15.52
8	15.83	19	16.35	11	14.56	21	15.47
15	15.77	July 3	14.94	18	14.83	27	15.61
22	15.91	10	15.23	25	14.93	Dec. 4	15.53
29	16.03	17	15.29	Oct. 2	15.01	11	15.56
May 6	16.04	24	15.43	9	15.27	18	15.55
15	16.11	31	15.28	16	15.34	27	15.55

885. Owner, location, and bench mark same as for wells 883 and 884. North well, depth 99.0 feet, taps sand and gravel between depths of 94 and 100 feet. Measuring point, top of pipe, 0.6 foot above land surface, 3.55 feet above bench mark, 1,399.17 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 14	15.66	May 22	16.02	Aug. 7	15.47	Oct. 23	15.15
Mar. 18	15.88	29	16.06	21	13.82	30	15.36
25	15.75	June 5	16.09	28	14.00	Nov. 6	15.29
Apr. 1	15.82	12	16.47	Sept. 5	14.29	13	15.40
8	15.71	19	16.22	11	14.44	21	15.34
15	15.64	July 3	14.77	18	14.72	27	15.48
22	15.76	10	15.11	25	14.83	Dec. 4	15.41
29	15.89	17	15.18	Oct. 2	14.89	11	15.44
May 6	15.90	24	15.31	9	15.16	18	15.43
15	15.96	31	15.16	16	15.22	27	15.43

886. Owner of well, City of Wichita; owner of property, F. H. Haiber. NE cor. NW $\frac{1}{4}$  sec. 16, T. 24 S., R. 2 W. One hundred feet south of section-line fence, 15 feet west of half-mile line fence. Drilled test well, total depth 222 feet, with two  $\frac{1}{4}$ -inch observation wells, 886 and 887, in same hole. North well, depth 57.0 feet, taps sand and gravel between depths of 37 and 72 feet. Measuring point, top of pipe, 0.8 foot above land surface, 1.67 feet below bench mark, 1,403.03 feet above sea level. Bench mark 17D, established Dec. 13, 1938, copper nail and washer marked "USGS-BM," in stub of corner fence post, 2.3 feet above land surface, 100 feet north of wells, 1,404.70 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 14	4.25	May 22	4.67	Aug. 21	3.14	Oct. 23	4.28
Mar. 18	4.15	29	4.72	28	3.45	30	4.35
25	4.12	June 5	4.75	Sept. 5	3.72	Nov. 13	4.27
Apr. 1	4.01	13	4.81	11	3.86	20	4.26
8	a 3.89	20	5.36	18	4.08	27	4.22
15	3.85	July 3	3.79	25	4.14	Dec. 4	4.25
22	4.26	11	b 4.39	Oct. 2	4.17	11	4.24
29	b 5.51	18	4.14	9	4.31	18	4.25
May 6	5.46	31	3.81	16	4.26	27	4.26
15	4.66	Aug. 7	3.99				

887. Owner, location, and bench mark same as for well 886. South well, depth 111.0 feet, taps sand and gravel between depths of 103 and 147.5 feet. Measuring point, top of pipe, 0.8 foot above land surface, 1.63 feet below bench mark, 1,403.07 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 14	4.28	Apr. 22	4.38	June 5	4.84	July 31	3.94
Mar. 18	4.21	29	b 5.82	13	4.94	Aug. 7	4.08
25	4.13	May 6	4.49	20	5.55	21	3.27
Apr. 1	4.01	15	4.78	July 3	3.93	28	3.51
8	a 3.99	22	4.73	11	b 4.59	Sept. 5	3.80
15	3.90	29	4.81	18	4.32	11	3.91

a Some artificial recharge from City well 14, 0.5 mile west, under 36 hour pumping test on Apr. 4-6.

b Some drawdown due to pumping test on nearby City wells.

## Harvey County--Continued

887.--Continued

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Sept. 18	4.20	Oct. 16	4.36	Nov. 20	4.32	Dec. 11	4.30
25	4.21	23	4.32	27	4.35	18	4.31
Oct. 2	4.24	30	4.42	Dec. 4	4.30	27	4.32
9	4.36	Nov. 13	4.35				

888. Owner of well, City of Wichita; owner of property, C. K. Ellis. NW cor. sec. 17, T. 23 S., R. 2 W. Drilled test well, total depth 174 feet, with two 1½-inch observation wells in same hole. East well, depth 12.0 feet, taps sand and gravel between depths of 2 and 13.3 feet. Measuring point, top of pipe, 0.7 foot above land surface, 0.46 foot below bench mark, 1,406.68 feet above sea level. Bench mark 46G, established Jan. 31, 1939, half-inch square iron rod in blazed south root of 46-inch cottonwood stump, level with land surface, 50 feet north of wells, at fence corner, in SW cor. sec. 8, T. 23 S., R. 2 W., 1,407.14 feet above sea level.

Water level, in feet below measuring point, 1939

Feb. 2	5.73	May 27	5.97	Aug. 11	8.39	Oct. 27	9.65
Mar. 18	6.36	June 3	6.36	18	7.72	Nov. 3	9.32
25	6.10	10	6.46	25	8.05	10	9.06
Apr. 1	4.87	17	6.74	Sept. 1	8.53	17	8.86
8	3.89	24	7.10	8	9.06	24	8.83
15	4.14	July 1	6.99	15	9.44	Dec. 1	8.71
22	4.44	7	7.47	22	9.48	8	8.70
29	4.66	14	8.10	29	9.59	15	8.70
May 6	4.81	21	8.47	Oct. 6	9.62	22	8.71
13	5.30	28	8.35	13	9.46	31	8.54
20	5.53	Aug. 4	8.58	20	9.47		

889. Owner, location, and bench mark same as for well 888. West well, depth 151.0 feet, taps medium-grained sand between depths of 123 and 164 feet. Measuring point, top of pipe, 1.0 foot above land surface, 0.17 foot below bench mark, 1,406.97 feet above sea level.

Water level, in feet below measuring point, 1939

Feb. 2	5.40	May 27	6.54	Aug. 11	6.67	Oct. 27	7.38
Mar. 18	6.27	June 3	6.65	18	5.91	Nov. 3	7.50
25	6.22	10	6.60	25	5.94	10	7.35
Apr. 1	6.09	17	6.66	Sept. 1	6.18	17	7.40
8	5.90	24	6.85	8	6.57	24	7.43
15	5.75	July 1	5.98	15	6.82	Dec. 1	7.38
22	5.96	7	6.00	22	7.00	8	7.44
29	6.01	14	6.50	29	7.09	15	7.45
May 6	6.09	21	6.77	Oct. 6	7.23	22	7.46
13	6.51	28	6.71	13	7.26	31	7.43
20	6.48	Aug. 4	6.82	20	7.30		

890. Owner of well, City of Wichita; owner of property, J. F. Jorgenson. NE cor. SE¼SE¼ sec. 21, T. 24 S., R. 3 W. Twenty-four feet south of center line of road to Patterson, 60 feet west of center line of section road. Drilled test well, total depth 163 feet, with one 1½-inch observation well, depth 14.5 feet, tapping sand and gravel between depths of 9.5 and 67 feet. Measuring point, top of pipe, 0.3 foot above land surface, 0.52 foot above bench mark, 1,432.09 feet above sea level. Bench mark 9N, established Sept. 19, 1938, railroad spike in corner fence post at southeast corner of road intersection, 100 feet east-southeast of well, in NW cor. SW¼SW¼ sec. 22, T. 24 S., R. 3 W., 1,431.57 feet above sea level.

Water level, in feet below measuring point, 1939

Mar. 31	5.67	July 5	6.20	Sept. 6	6.07	Nov. 2	6.50
Apr. 30	5.79	Aug. 5	6.29	Oct. 3	6.42	Dec. 5	6.45
June 4	6.60						

## Harvey County--Continued

891. Owner of well, City of Wichita; owner of property, Arthur McMurry. SE cor. sec. 31, T. 24 S., R. 3 W. Nine feet southwest of well 893, 24 feet north of center line of township road. Driven observation well, diameter  $1\frac{1}{4}$  inches, depth 7.0 feet. Measuring point, top of pipe, 0.7 foot above land surface, 0.97 foot above bench mark, 1,435.24 feet above sea level. Bench mark 11P, established Sept. 27, 1938, square cut in south end of east headwall of concrete culvert, 70 feet east of wells, SW cor. sec. 32, T. 24 S., R. 3 W., 1,434.27 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
June 4	4.58	Aug. 5	3.87	Oct. 3	4.43	Dec. 5	4.25
July 5	3.31	Sept. 6	4.01	Nov. 2	4.39		

892. Owner, location, and bench mark same as for well 891. Drilled test well, total depth 272 feet, with two  $1\frac{1}{4}$ -inch observation wells in same hole. East well, depth 106.0 feet, taps sand and gravel between depths of 81 and 131 feet. Measuring point, top of pipe, 1.8 feet above land surface, 0.11 foot below bench mark, 1,434.16 feet above sea level.

Water level, in feet below measuring point, 1939

June 4	5.44	Aug. 5	4.78	Oct. 3	5.35	Dec. 5	5.18
July 5	4.03	Sept. 6	4.83	Nov. 2	5.38		

893. Owner, location, and bench mark same as for wells 891 and 892. West well, 9 feet northeast of well 891, depth 163.0 feet, taps sand and gravel between depths of 143 and 205 feet. Measuring point, top of pipe, 1.9 feet above land surface, 0.19 foot below bench mark, 1,434.08 feet above sea level.

Water level, in feet below measuring point, 1939

June 4	4.95	Aug. 5	4.69	Oct. 3	5.00	Dec. 5	5.07
July 5	4.42	Sept. 6	4.45	Nov. 2	5.20		

894. Owner of well, City of Wichita; owner of property, H. A. Lawrence. NE cor. sec. 18, T. 24 S., R. 2 W. Three feet south of and 30 feet west of corner fence post. Drilled test well, total depth 249 feet, with two  $1\frac{1}{4}$ -inch observation wells in same hole. South well, depth 59.3 feet, taps sand and gravel between depths of 53 and 88 feet. Measuring point, top of pipe, 3.1 feet above land surface, 3.56 feet above bench mark, 1,421.50 feet above sea level. Bench mark 17A, established Oct. 6, 1938, railroad spike in leaning telephone pole, at SW cor. sec. 8, T. 24 S., R. 2 W., 1,417.94 feet above sea level.

Water level, in feet below measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
Nov. 22, 1938	14.30	Sept. 5, 1939	13.19	Oct. 30, 1939	13.84
July 3, 1939	13.65	11	13.31	Nov. 13	13.77
11	14.24	18	13.53	20	13.74
18	13.99	25	13.57	27	13.80
25	13.91	Oct. 2	13.59	Dec. 4	13.70
31	13.58	9	13.74	11	13.67
Aug. 7	13.58	16	13.70	18	13.68
21	12.83	23	13.70	27	13.69
28	12.94				

895. Owner, location, and bench mark same as for well 894. North well, depth 238.4 feet, taps sand and gravel between depths of 233 and 244 feet. Measuring point, top of pipe, 2.7 feet above land surface, 3.05 feet above bench mark, 1,420.99 feet above sea level.

Water level, in feet below measuring point, 1938-39

Nov. 22, 1938	13.91	Sept. 5, 1939	13.22	Oct. 30, 1939	13.91
July 3, 1939	13.75	11	13.36	Nov. 13	13.80
11	15.00	18	13.56	20	13.77
18	14.07	25	13.62	27	13.84
25	13.93	Oct. 2	13.63	Dec. 4	13.74
31	13.60	9	13.77	11	13.72
Aug. 7	13.59	16	13.80	18	13.72
21	12.88	23	13.72	27	13.73
28	13.01				

## Harvey County--Continued

899. Owner, L. U. Becker; tenant, J. B. Becker. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 30, T. 23 S., R. 2 W. About 150 feet northeast of Wichita well M4, in about the middle of the southeast 40-acre tract. Unused driven well, diameter 1 $\frac{1}{2}$  inches, depth 16.2 feet. Measuring point, top of pipe, 1.2 feet above land surface, 3.20 feet above bench mark, 1,430.53 feet above sea level. Bench mark, railroad spike in southeast side of 20-inch hedge tree, at southeast corner of same section, 1,427.33 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Sept. 11	15.31	Oct. 9	15.44	Nov. 6	15.40	Dec. 4	15.32
18	15.40	16	15.45	13	15.36	11	15.32
25	15.42	23	15.47	21	15.34	18	15.32
Oct. 2	15.42	30	15.47	27	15.34	27	15.32

1,112. Owner, M. H. Miller; tenant, A. C. Unruth. NW cor. NE $\frac{1}{4}$  sec. 31, T. 23 S., R. 2 W. Between wash house and cyclone cellar. Driven domestic well, diameter 1 $\frac{1}{2}$  inches, depth 22.7 feet. Measuring point, top of pipe (pump removed), 1.8 feet above land surface, 7.69 feet above bench mark, 1,435.02 feet above sea level. Bench mark same as for well 899. Equipped with pitcher pump. Pumped weekly for washing clothes.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Sept. 11	19.20	Oct. 9	19.40	Nov. 6	19.40	Dec. 4	19.33
18	19.35	16	19.43	13	19.38	11	19.32
25	19.35	23	19.43	21	19.37	18	19.35
Oct. 2	19.38	30	19.45	27	19.37	27	19.36

## McPherson County

19. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 29, T. 19 S., R. 3 W. Automatic water-stage recorder and shelter removed Mar. 11, 1939; measured by wetted-tape method thereafter. New measuring point beginning Mar. 31, 1939, top of casing, 1.0 foot above land surface, 1.60 feet below old measuring point, 0.08 foot below bench mark, 1,498.62 feet above sea level. Highest observed water level, 69.40 feet below new measuring point, Aug. 11, 1939; lowest observed water level, 71.69 feet below old measuring point Sept. 1, 1937.

Lowest daily water level, in feet below measuring point, 1939

Jan. 1	71.58	Jan. 21	71.47	Feb. 9	71.37	Mar. 3	71.27
2	71.57	22	71.47	10	71.37	4	71.28
3	71.57	23	71.46	11	71.36	5	71.27
4	71.56	24	71.45	12	71.36	6	71.26
5	71.56	25	71.45	13	71.35	7	71.24
6	71.56	26	71.44	14	71.34	8	71.23
7	71.55	27	71.43	15	71.34	9	71.22
8	71.55	28	71.42	16	71.33	10	71.20
9	71.54	29	71.42	17	71.32	11	71.19
10	71.53	30	71.41	18	71.31	31	a 69.60
11	71.53	31	71.41	19	71.31	Apr. 30	a 69.59
12	71.52	Feb. 1	71.41	20	71.30	June 4	a 70.05
13	71.51	2	71.40	21	71.30	July 5	a 70.21
14	71.50	3	71.40	22	71.29	Aug. 11	a 69.40
15	71.50	4	71.39	23	71.29	Sept. 8	a 70.51
16	71.49	5	71.39	24	71.28	Oct. 6	a 70.55
17	71.49	6	71.38	25	71.27	Nov. 3	a 70.54
18	71.48	7	71.38	Mar. 1	71.26	Dec. 1	a 70.47
19	71.48	8	71.37	2	71.26	31	a 70.44
20	71.47						

243. SE $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 5, T. 19 S., R. 3 W. Highest observed water level, 82.49 feet below measuring point Sept. 2, 1938; lowest observed water level, 83.49 feet below measuring point Oct. 28, 1937. Not pumped in 1939.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 3	82.80	Mar. 13	82.66	Dec. 31	82.85
Feb. 1	82.62	Oct. 6	82.74		

a Wetted-tape measurement.



## McPherson County--Continued

249. SE cor. sec. 5, T. 18 S., R. 3 W. Highest observed water level, 33.81 feet below measuring point July 4, 1938; lowest observed water level, 39.93 feet below measuring point Mar. 3, 1938. Small quantities of water pumped each morning.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 3	35.31	Mar. 13	37.93	Dec. 31	38.99
Feb. 1	36.99	Oct. 6	37.64		

250. NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 30, T. 19 S., R. 4 W. Highest observed water level, 42.12 feet below measuring point Nov. 2, 1938; lowest observed water level, 46.67 feet below measuring point (measured while pumping), July 29, 1938. Small quantity of water pumped each morning.

Water level, in feet below measuring point, 1939

Jan. 3	42.68	Mar. 13	42.71	Dec. 31	42.53
Feb. 1	42.57	Oct. 6	42.22		

252. SE cor. sec. 14, T. 19 S., R. 5 W. Highest observed water level, 5.58 feet below measuring point June 3, 1938; lowest observed water level, 11.18 feet below measuring point Feb. 1, 1938.

Water level, in feet below measuring point, 1939

Jan. 3	10.39	Mar. 13	8.12	Dec. 31	10.26
Feb. 1	10.67	Oct. 6	9.90		

260. SE cor. sec. 33, T. 17 S., R. 4 W. Highest observed water level, 24.21 feet below measuring point July 4, 1938; lowest observed water level, 29.35 feet below measuring point Nov. 4 and Dec. 4, 1937. Some water pumped on most days.

Water level, in feet below measuring point, 1939

Jan. 3	26.79	Mar. 13	27.21	Dec. 31	28.52
Feb. 1	28.00	Oct. 6	28.28		

262. NE $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 1, T. 18 S., R. 5 W. Highest observed water level, 28.68 feet below measuring point Sept. 2, 1938; lowest observed water level, 41.35 feet below measuring point (measured while pumping), Nov. 2, 1938. Some water pumped on most days.

Water level, in feet below measuring point, 1939

Jan. 3	29.31	Mar. 13	28.76	Dec. 31	30.89
Feb. 1	30.27	Oct. 6	b 31.87		

309. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 9, T. 21 S., R. 4 W. Automatic water-stage recorder removed July 28, 1939; wetted-tape measurements made thereafter. Measuring point unchanged. Highest observed water level, 33.55 feet below measuring point Sept. 10, 1938; lowest observed water level, 40.29 feet below measuring point Mar. 26, 1938.

Lowest daily water level, in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	34.98	35.30	36.06	35.85	36.18	36.54	36.24	.....	a35.09	.....	.....	a35.81
2	34.91	35.45	36.00	36.08	36.26	36.71	36.17	.....	.....	.....	.....	.....
3	34.74	35.46	35.68	36.11	36.26	36.93	36.06	.....	.....	.....	a36.23	.....
4	34.82	35.45	35.56	36.04	36.22	36.87	35.95	a35.57	.....	.....	.....	.....
5	35.04	35.31	35.85	36.06	36.14	36.68	35.93	.....	.....	.....	.....	.....
6	35.17	35.36	35.99	36.30	36.03	36.51	36.00	.....	.....	a35.29	.....	.....
7	35.31	35.46	35.97	36.16	35.96	36.63	36.05	.....	.....	.....	.....	.....
8	35.28	35.68	35.94	35.90	36.14	36.70	36.08	.....	a35.27	.....	.....	a36.14
9	35.06	35.53	36.05	35.69	36.18	36.58	36.10	.....	.....	.....	.....	.....
10	35.20	35.73	35.90	35.97	36.29	36.63	36.07	.....	.....	.....	a35.98	.....
11	35.27	35.84	35.64	36.31	36.44	36.69	36.05	a35.49	.....	.....	.....	.....
12	35.18	35.83	35.95	36.32	36.54	36.64	35.98	.....	.....	.....	.....	.....
13	35.11	35.48	35.92	36.17	36.56	36.65	35.92	.....	.....	a35.70	.....	.....
14	35.18	35.53	36.02	35.87	36.44	36.59	35.93	.....	.....	.....	.....	.....
15	35.29	35.56	36.16	35.70	36.27	36.38	35.87	.....	a35.29	.....	.....	a36.20
16	35.26	35.92	36.19	35.85	36.25	36.39	35.75	.....	.....	.....	.....	.....
17	35.14	35.98	36.20	36.00	36.33	36.35	35.72	.....	.....	.....	a35.93	.....

a Wetted-tape measurement.

b Pumping.

## McPherson County--Continued

309.--Continued

Lowest daily water level, in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
18	35.18	35.87	36.16	36.04	36.34	36.36	35.80	a35.27	.....	.....	.....	.....
19	35.21	35.67	35.99	36.02	36.31	36.54	35.83	.....	.....	.....	.....	.....
20	35.28	35.97	36.16	36.04	36.32	36.58	35.86	.....	.....	a35.47	.....	.....
21	35.44	36.03	36.14	36.15	36.35	36.58	35.78	.....	.....	.....	.....	.....
22	35.59	36.09	36.06	36.07	36.31	36.64	35.84	.....	a35.36	.....	.....	a36.23
23	35.33	35.87	36.02	35.95	36.26	36.61	35.83	.....	.....	.....	.....	.....
24	35.54	35.80	35.96	35.87	36.43	36.46	35.75	.....	.....	.....	a35.95	.....
25	35.54	35.80	35.72	35.82	36.41	36.41	35.70	a35.22	.....	.....	.....	.....
26	.....	.....	35.87	36.05	36.51	36.36	35.75	.....	.....	.....	.....	.....
27	35.56	.....	35.92	36.14	36.58	36.42	35.70	.....	.....	a35.84	.....	.....
28	35.00	.....	36.03	36.22	36.63	36.39	35.69	.....	.....	.....	.....	.....
29	35.21	.....	35.99	36.27	36.57	36.36	.....	.....	a35.41	.....	.....	.....
30	35.28	.....	35.96	36.20	36.53	36.36	.....	.....	.....	.....	.....	.....
31	35.24	.....	35.79	.....	36.52	.....	.....	.....	.....	.....	.....	a36.29

310. SW $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 23, T. 21 S., R. 2 W. Highest observed water level, 10.84 feet below measuring point Dec. 31, 1939; lowest observed water level, 19.39 feet below measuring point Nov. 4, 1937.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	12.27	Mar. 31	11.32	Aug. 11	11.16	Nov. 3	11.18
Feb. 1	11.87	Apr. 30	11.27	Sept. 8	11.28	Dec. 1	10.94
Mar. 1	11.72	June 4	11.23	Oct. 6	11.24	31	10.84
13	11.47	July 5	11.09				

311. SW $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 23, T. 21 S., R. 2 W. Highest observed water level, 10.14 feet below measuring point July 4, 1938; lowest observed water level, 14.26 feet below measuring point Dec. 31, 1939.

Water level, in feet below measuring point, 1939

Jan. 3	11.85	Apr. 30	11.17	Aug. 11	12.50	Nov. 3	14.24
Feb. 1	11.70	June 4	11.65	Sept. 8	13.18	Dec. 1	14.24
Mar. 1	11.75	July 5	11.23	Oct. 6	13.95	31	14.26
31	11.10						

511. NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 12, T. 21 S., R. 4 W. Staff gage stolen by vandals sometime after Sept. 8, 1939.

Water level, in feet above zero of staff gage, 1939

Jan. 7	2.46	Mar. 11	c 2.5	May 13	1.96	July 14	4.10
14	2.50	18	2.42	20	1.90	21	3.70
21	2.44	25	2.36	27	c 1.8	28	3.68
28	2.38	Apr. 1	2.50	June 3	1.96	Aug. 4	3.60
Feb. 4	b 2.36	8	2.46	10	c 2.1	11	3.70
11	b 2.32	15	2.44	17	2.36	18	3.72
18	2.28	22	2.38	24	2.28	25	3.66
27	(b)	29	2.30	July 1	2.32	Sept. 1	3.54
Mar. 4	(b)	May 6	c 2.1	7	d 4.58	8	3.36

a Wetted-tape measurement.

b Lake frozen.

c High waves.

d Lake overflowing at southeast and northeast edges.

## Sedgwick County

11. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 22, T. 26 S., R. 3 W. Highest observed water level, 60.01 feet below measuring point Oct. 3, 1939; lowest observed water level, 61.84 feet below measuring point July 4, 1938.  
Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	60.18	Mar. 13	60.12	Oct. 3	60.01	Dec. 5	60.24
Feb. 1	60.16	Sept. 6	60.02	Nov. 2	60.22		

12. NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 26, T. 25 S., R. 1 W. Highest observed water level, 19.84 feet below measuring point Sept. 25, 26, 27-30, 1938; lowest observed water level, 21.98 feet below measuring point Apr. 1, 2, 8, 9, 11, 12, 1938.

Lowest daily water level, in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	20.20	20.40	20.54	20.60	20.68	20.81	20.53	20.31	20.03	20.38	20.68	20.83
2	20.20	20.41	20.51	20.61	20.69	20.82	20.45	20.34	20.05	20.38	20.69	20.84
3	20.19	20.42	20.52	20.61	20.70	20.84	20.40	20.34	20.07	20.39	20.69	20.85
4	20.22	20.42	20.52	20.60	20.69	20.83	20.36	20.33	20.09	20.40	20.67	20.85
5	20.24	20.40	20.57	20.61	20.70	20.81	20.32	20.33	20.09	20.43	20.68	20.85
6	20.25	20.42	20.57	20.63	20.70	20.82	20.29	20.34	20.11	20.42	20.67	20.85
7	20.27	20.43	20.57	20.65	20.71	20.84	20.27	20.35	20.13	20.44	20.69	20.87
8	20.26	20.44	20.56	20.57	20.72	20.84	20.27	20.37	20.14	20.45	20.71	20.87
9	20.27	20.42	20.58	20.55	20.73	20.82	20.26	20.37	20.15	20.47	20.70	20.85
10	20.28	20.46	20.55	20.61	20.73	20.84	20.25	20.37	20.16	20.49	20.73	20.88
11	20.29	20.46	20.51	20.64	20.74	20.84	20.23	20.38	20.16	20.49	20.74	20.88
12	20.27	20.45	20.55	20.64	20.75	20.82	20.23	20.36	20.18	20.50	20.75	20.91
13	20.29	20.43	20.54	20.62	20.75	20.82	20.22	20.38	20.20	20.52	20.75	20.92
14	20.30	20.44	20.55	20.58	20.73	20.81	20.21	20.38	20.21	20.53	20.76	20.89
15	20.31	20.46	20.56	20.58	20.73	20.78	20.21	20.36	20.22	20.51	20.76	20.90
16	20.31	20.48	20.56	20.61	20.75	20.78	20.20	20.32	20.24	20.54	20.77	20.90
17	20.31	20.49	20.56	20.64	20.75	20.80	20.20	20.24	20.23	20.54	20.76	20.90
18	20.32	20.45	20.56	20.64	20.76	20.79	20.20	20.19	20.25	20.54	20.76	20.92
19	20.33	20.48	20.55	20.64	20.76	20.83	20.21	20.14	20.25	20.55	20.77	20.92
20	20.34	20.50	20.58	20.65	20.76	20.84	20.23	20.11	20.26	20.56	20.78	20.92
21	20.31	20.51	20.58	20.66	20.77	20.84	20.22	20.09	20.27	20.56	20.78	20.93
22	20.36	20.51	20.57	20.65	20.77	20.84	20.25	20.06	20.28	20.57	20.78	20.92
23	20.33	20.48	20.58	20.64	20.77	20.84	20.26	20.05	20.29	20.56	20.78	20.92
24	20.37	20.50	20.57	20.64	20.78	20.85	20.26	20.04	20.29	20.57	20.80	20.93
25	20.38	20.49	20.54	20.65	20.78	20.85	20.25	20.04	20.31	20.59	20.81	20.93
26	20.38	20.49	20.58	20.67	20.79	20.85	20.29	20.04	20.32	20.60	20.82	20.90
27	20.37	20.55	20.59	20.68	20.80	20.84	20.28	20.04	20.32	20.63	20.83	20.94
28	20.33	20.55	20.59	20.68	20.80	20.77	20.28	20.03	20.34	20.64	20.81	20.94
29	20.37	.....	20.60	20.69	20.80	20.69	20.30	20.03	20.37	20.65	20.80	20.93
30	20.39	.....	20.60	20.67	20.80	20.61	20.32	20.02	20.38	20.65	20.80	.....
31	20.38	.....	20.58	.....	20.81	.....	20.30	20.03	.....	20.65	.....	.....

26. SW $\frac{1}{4}$  sec. 18, T. 27 S., R. 1 W. Water level affected by pumping in nearby city wells. Highest observed water level 15.66 feet below measuring point, June 28, 1938; lowest observed water level 26.60 feet below measuring point, June 8, 1939.

Lowest daily water level, in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	21.76	22.48	20.94	22.16	24.44	25.88	21.45	23.95	21.20	23.67	.....	24.37
2	21.59	22.58	21.01	22.09	25.18	26.01	21.21	24.10	21.32	23.11	.....	24.39
3	21.40	22.65	21.05	22.83	25.60	26.04	21.10	24.28	21.68	23.23	24.43	24.37
4	21.63	22.67	21.06	22.83	25.72	26.12	21.28	24.52	22.08	23.43	24.46	24.22
5	22.01	22.71	21.08	22.33	25.68	26.19	21.32	24.69	22.50	23.58	24.46	24.40
6	22.08	22.60	21.08	22.20	25.78	26.36	20.15	24.72	22.92	23.35	24.09	24.53
7	22.06	22.58	21.08	22.08	25.84	26.48	20.15	24.67	23.34	23.66	24.32	24.64
8	21.68	22.65	21.11	22.00	25.28	26.60	21.35	24.21	23.83	23.80	24.38	24.69
9	21.57	22.68	21.11	21.95	25.41	26.45	21.51	23.99	24.21	23.60	24.47	24.72
10	21.52	22.80	21.12	21.87	25.41	26.42	21.62	23.84	24.31	23.34	24.51	24.48
11	21.78	22.76	21.16	21.78	25.44	26.12	21.92	23.88	24.22	23.56	24.51	24.48
12	21.65	22.81	21.16	21.77	25.32	25.68	22.14	23.13	24.25	23.64	24.44	24.66
13	21.41	22.44	21.13	21.80	25.24	25.68	22.44	23.18	24.24	23.74	24.28	24.75
14	21.83	22.48	21.14	21.86	24.20	25.41	22.72	23.20	24.54	23.80	24.34	24.81
15	21.86	22.50	21.20	21.86	24.92	25.64	23.06	22.74	24.71	23.66	24.39	24.81

## Sedgwick County--Continued

26.--Continued

Lowest daily water level, in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
16	20.60	22.40	21.25	21.83	25.19	25.56	23.13	21.24	24.80	23.64	24.44	24.84
17	21.75	21.56	21.29	21.70	25.04	25.42	23.30	19.40	24.67	23.76	24.47	24.80
18	22.05	23.04	21.30	21.56	24.78	25.37	23.48	18.55	24.10	23.87	24.47	24.72
19	21.91	22.40	21.33	21.52	24.82	25.25	23.41	18.17	24.25	23.96	24.40	24.88
20	21.96	22.62	21.35	21.52	24.79	25.17	23.44	17.80	24.28	24.04	24.09	24.96
21	22.12	22.72	21.42	21.52	24.58	25.02	23.64	17.55	23.90	24.10	24.21	25.03
22	22.17	22.77	21.71	21.55	24.77	24.93	23.89	17.48	23.89	24.14	24.25	25.03
23	22.16	21.36	22.01	21.65	25.08	24.83	23.93	17.53	24.19	24.18	24.38	24.98
24	22.12	21.08	22.14	21.67	25.27	24.78	23.69	17.68	24.23	24.27	24.41	24.76
25	22.27	20.94	22.14	21.92	25.44	24.75	23.64	19.35	24.12	24.29	24.48	24.51
26	22.39	.....	22.08	22.20	25.20	24.22	23.67	19.54	23.80	24.32	24.49	.....
27	22.38	20.97	21.91	22.80	25.41	24.02	23.64	18.60	23.84	24.34	24.44	.....
28	22.39	20.88	21.87	23.14	25.52	23.83	23.76	19.97	24.01	24.36	24.47	23.91
29	22.46	.....	21.93	23.55	25.62	22.24	23.78	20.00	24.14	24.36	24.52	24.31
30	22.40	.....	21.97	23.54	25.77	22.12	23.69	19.46	23.69	24.19	24.54	.....
31	22.60	.....	22.01	.....	25.72	.....	23.68	20.87	.....	24.48	.....	.....

27. NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 19, T. 25 S., R. 1 E. Water levels, in feet below measuring point, 1939: Jan. 3, 24.12; Feb. 1, 21.73; Mar. 13, 24.67; Mar. 31, 24.79. Well filled with earth, no measurements made after Mar. 31, 1939.

28. NE $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 1, T. 25 S., R. 1 W. Highest observed water level, 17.24 feet below measuring point June 3, 1938; lowest observed water level, 20.78 feet below measuring point Feb. 1, 1938.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	18.33	Mar. 31	18.07	July 5	18.71	Oct. 3	19.46
Feb. 1	18.44	Apr. 30	18.19	Aug. 5	19.02	Nov. 2	19.76
Mar. 1	18.50	June 4	19.03	Sept. 6	18.90	Dec. 5	19.62
13	18.11						

54. NW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 18, T. 25 S., R. 2 W. Water level, in feet below measuring point, 1939: Jan. 3, 13.04. Well removed by owner in Jan. 1939.

183. SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 32, T. 25 S., R. 1 E. Well filled with earth by owner in May 1939; measurements discontinued.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 3	21.50	Mar. 13	22.36	Apr. 30	22.59
Feb. 1	21.73	31	22.41		

232. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 10, T. 26 S., R. 3 W. Water levels, in feet below measuring point, 1939: Jan. 3, 45.07; Feb. 1, 44.40; Mar. 13, 45.36. Measurements discontinued after Mar. 13, 1939.

307. NW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 1, T. 25 S., R. 2 W. Highest observed water level, 11.96 feet below measuring point Aug. 23, 1939; lowest observed water level, 15.65 feet below measuring point Apr. 1, 1938.

Lowest daily water level, in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	13.36	13.45	13.60	13.58	13.61	13.88	13.17	13.21	12.03	12.47	12.80	12.90
2	13.34	13.49	13.60	13.61	13.62	13.97	13.13	13.23	12.04	12.46	12.81	12.91
3	13.32	13.49	13.55	13.61	13.62	14.00	13.12	13.23	12.11	12.49	12.81	12.92
4	13.37	13.49	13.55	13.59	13.63	14.00	13.14	13.24	12.12	12.50	12.78	12.92
5	13.40	13.46	13.59	13.57	13.63	13.94	13.16	13.25	12.12	12.53	12.76	12.92
6	13.41	13.48	13.60	13.57	13.63	13.95	13.17	13.26	12.13	12.53	12.75	12.92
7	13.42	13.48	13.58	13.53	13.64	13.96	13.20	13.27	12.17	12.57	12.77	12.94
8	13.40	13.53	13.55	13.48	13.67	13.97	13.21	13.26	12.20	12.57	12.79	12.95
9	13.39	13.50	13.57	13.45	13.67	13.93	13.21	13.17	12.22	12.60	12.75	12.92
10	13.40	13.53	13.53	13.52	13.69	13.95	13.21	13.12	12.22	12.61	12.81	12.94

## Sedgwick County--Continued

307.--Continued

Lowest daily water level, in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
11	13.41	13.56	13.52	13.56	13.70	13.95	13.22	13.11	12.20	12.60	12.81	12.95
12	13.39	13.54	13.57	13.56	13.72	13.94	13.23	13.10	12.26	12.61	12.82	12.96
13	13.39	13.50	13.56	13.54	13.71	13.94	13.23	13.06	12.29	12.64	12.82	12.97
14	13.41	13.52	13.58	13.59	13.70	13.94	13.24	13.01	12.29	12.64	12.81	12.98
15	13.42	13.52	13.60	13.48	13.69	13.86	13.24	12.77	12.31	12.60	12.82	12.99
16	13.42	13.58	13.60	13.51	13.71	13.84	13.25	12.19	12.33	12.65	12.82	12.99
17	13.41	13.58	13.59	13.54	13.72	13.88	13.27	12.05	12.34	12.65	12.82	12.99
18	13.41	13.55	13.59	13.54	13.73	13.86	13.28	11.99	12.34	12.63	12.81	13.03
19	13.42	13.56	13.58	13.54	13.73	13.91	13.29	11.98	12.35	12.65	12.83	13.03
20	13.42	13.58	13.62	13.55	13.74	13.91	13.29	11.98	12.37	12.67	12.85	13.02
21	13.46	13.59	13.61	13.57	13.75	13.92	13.33	11.97	12.37	12.67	12.85	13.02
22	13.47	13.59	13.60	13.56	13.75	13.92	13.37	11.97	12.38	12.68	12.85	13.03
23	13.42	13.55	13.60	13.54	13.78	13.92	13.36	11.96	12.40	12.67	12.86	13.04
24	13.46	13.55	13.59	13.54	13.79	13.92	13.35	11.98	12.40	12.68	12.88	13.06
25	13.46	13.54	13.55	13.54	13.86	13.93	13.36	11.98	12.43	12.72	12.90	13.05
26	13.48	.....	13.60	13.57	13.87	13.91	13.35	11.98	12.43	12.73	12.90	13.01
27	13.45	.....	13.60	13.59	13.85	13.80	13.25	11.98	12.41	12.79	12.90	13.06
28	13.39	.....	13.61	13.60	13.84	13.46	13.22	11.98	12.43	12.79	12.89	13.08
29	13.42	.....	13.59	13.62	13.84	13.28	13.20	11.99	12.50	12.77	12.86	13.07
30	13.45	.....	13.59	13.61	13.87	13.20	13.20	12.00	12.50	12.77	12.86	.....
31	13.44	.....	13.57	.....	13.87	.....	13.20	12.02	.....	12.77	.....	.....

800. SW cor. sec. 33, T. 26 S., R. 1 E. Highest observed water level, 18.76 feet below measuring point Aug. 27, 1938; lowest observed water level, 20.25 feet below measuring point June 4, 1939.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	19.62	Feb. 11	19.86	Mar. 31	20.05	Sept. 6	19.40
14	19.66	18	19.91	Apr. 30	20.10	Oct. 3	19.65
21	19.70	27	19.99	June 4	20.25	Nov. 2	19.92
28	19.75	Mar. 4	20.01	July 5	19.51	Dec. 5	20.16
Feb. 4	19.80	11	19.98	Aug. 5	19.80		

802. Owner, City of Wichita. NW cor. sec. 1, T. 27 S., R. 1 W. In right of way of Township road, 1 foot north of corner fence post. Driven observation well, diameter  $1\frac{1}{4}$  inches, depth 25.5 feet. Measuring point, top of pipe, 0.8 foot above land surface, 0.94 foot below bench mark, 1,321.40 feet above sea level. Bench mark 1E, established Aug. 17, 1938, square chiseled into top of south end of east headwall of concrete culvert, in the SW cor. sec. 36, T. 26 S., R. 1 W., 1,322.34 feet above sea level.

Water level, in feet below measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
Aug. 15, 1938	5.48	Sept. 6, 1939	6.80	Nov. 2, 1939	7.71
Aug. 5, 1939	6.99	Oct. 3	7.55	Dec. 5	7.70

804. SE cor. sec. 16, T. 26 S., R. 1 W. Highest observed water level, 2.69 feet below measuring point Aug. 16, 1938; lowest observed water level, 4.78 feet below measuring point, Dec. 5 1939.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	3.52	Mar. 13	3.32	Sept. 6	3.99	Nov. 2	4.77
Feb. 1	3.55	Aug. 5	3.99	Oct. 3	4.53	Dec. 5	4.78

805. NW cor. NE $\frac{1}{4}$  sec. 19, T. 26 S., R. 1 W. Highest observed water level, 6.41 feet below measuring point Aug. 17, 1938; lowest observed water level, 8.24 feet below measuring point June 4, 1939.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	7.07	Mar. 31	7.13	July 5	6.45	Oct. 3	7.86
Feb. 1	7.17	Apr. 30	7.48	Aug. 5	7.62	Nov. 2	7.97
Mar. 13	6.98	June 4	8.24	Sept. 6	7.37	Dec. 5	7.91

## Sedgwick County--Continued

806. NW cor. SW $\frac{1}{4}$  sec. 15, T. 26 S., R. 2 W. In Water-Supply Paper 845, p. 130, near end of description of well 806, read "Aug. 18, 17.80," instead of "Aug. 18, 8.47." Highest observed water level, 16.89 feet below measuring point Sept. 6, 1939; lowest observed water level, 17.80 feet below measuring point Aug. 18, 1938.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	17.17	Mar. 13	17.25	Sept. 6	16.89	Nov. 2	17.43
Feb. 1	17.29	Aug. 5	17.15	Oct. 3	17.19	Dec. 5	17.56

807. NW cor. sec. 10, T. 26 S., R. 2 W. Highest observed water level, 22.02 feet below measuring point Nov. 2, 1939; lowest observed water level, 23.29 feet below measuring point Aug. 18, 1938.

Water level, in feet below measuring point, 1939

Jan. 3	22.94	Mar. 13	23.06	Sept. 6	22.31	Nov. 2	22.02
Feb. 1	23.04	Aug. 5	22.70	Oct. 3	22.71	Dec. 5	23.25

808. SW cor. NW $\frac{1}{4}$  sec. 18, T. 26 S., R. 2 W. Highest observed water level, 21.04 feet below measuring point Nov. 2, 1938; lowest observed water level, 24.44 feet below measuring point Aug. 19, 1938.

Water level, in feet below measuring point, 1939

Jan. 3	24.11	Mar. 31	24.05	July 5	23.89	Oct. 3	23.82
Feb. 1	24.11	Apr. 30	24.04	Aug. 5	23.91	Nov. 2	23.94
Mar. 13	24.04	June 4	24.11	Sept. 6	23.77	Dec. 5	23.94

809. NW cor. sec. 21, T. 26 S., R. 1 E. In Water-Supply Paper 845, p. 131, in next to last line of description for well 809, read "14.98 feet below measuring point," instead of "14.98 feet above measuring point." Highest observed water level, 14.98 feet below measuring point Oct. 29, 1938; lowest observed water level, 17.69 feet below measuring point Dec. 5, 1939.

Water level, in feet below measuring point, 1939

Jan. 7	15.52	Feb. 11	15.67	Mar. 31	15.74	Sept. 6	16.68
14	15.44	18	15.65	Apr. 30	15.77	Oct. 3	17.03
21	15.48	27	15.60	June 4	16.21	Nov. 2	17.40
28	15.44	Mar. 4	15.65	July 5	15.95	Dec. 5	17.69
Feb. 4	15.61	11	15.55	Aug. 5	16.71		

810. NE cor. SE $\frac{1}{4}$  sec. 35, T. 25 S., R. 1 W. Highest observed water level, 11.82 feet below measuring point July 1, 1939; lowest observed water level, 14.40 feet below measuring point Dec. 22, 1939.

Water level, in feet below measuring point, 1939

Jan. 7	13.69	Apr. 8	13.76	July 7	12.52	Oct. 6	14.09
14	13.70	15	13.82	14	13.08	13	14.19
21	13.73	22	13.93	21	13.46	20	14.22
28	13.71	29	13.99	28	13.62	27	14.32
Feb. 4	13.79	May 6	14.09	Aug. 4	13.77	Nov. 3	14.33
11	13.84	13	14.16	11	13.80	10	14.35
18	13.86	20	14.20	18	12.21	17	14.33
27	13.99	27	14.26	25	12.84	24	14.37
Mar. 4	13.86	June 3	14.32	Sept. 1	13.18	Dec. 1	14.36
11	13.70	10	14.36	8	13.50	8	14.37
18	13.79	17	14.16	15	13.70	15	14.39
25	13.84	24	14.34	22	13.83	22	14.40
Apr. 1	13.85	July 1	11.82	29	13.98	31	14.38

## Sedgwick County--Continued

811. SE cor. sec. 33, T. 25 S., R. 1 W. Highest observed water level, 7.83 feet below measuring point Sept. 24, 1938; lowest observed water level, 9.82 feet below measuring point Dec. 31, 1939.  
Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	8.88	Apr. 8	8.97	July 14	8.94	Oct. 6	9.44
14	8.89	15	9.00	21	9.03	13	9.50
21	8.91	22	9.11	28	9.15	20	9.54
28	8.93	29	9.16	Aug. 4	9.26	27	9.59
Feb. 4	8.98	May 6	9.18	11	9.33	Nov. 3	9.64
11	9.04	20	9.30	18	8.75	10	9.64
18	9.03	27	9.39	25	8.82	17	9.66
27	9.06	June 3	9.46	Sept. 1	8.93	24	9.69
Mar. 4	9.03	10	9.49	8	9.11	Dec. 1	9.70
11	8.91	17	9.31	15	9.22	15	9.74
18	9.03	24	9.40	22	9.30	22	9.77
25	9.01	July 1	8.65	29	9.37	31	9.82
Apr. 1	9.08	7	8.79				

812. NW cor. sec. 27, T. 25 S., R. 1 W. Highest observed water level, 11.57 feet below measuring point Nov. 5, 1938; lowest observed water level, 12.89 feet below measuring point Dec. 31, 1939.  
Water level, in feet below measuring point, 1939

Jan. 7	12.07	Apr. 8	12.36	July 7	12.12	Oct. 6	12.40
14	12.15	15	12.39	14	12.22	13	12.50
21	12.19	22	12.48	21	12.29	20	12.53
28	12.17	29	12.53	28	12.35	27	12.60
Feb. 4	12.29	May 6	12.50	Aug. 4	12.43	Nov. 3	12.65
11	12.41	13	12.60	11	12.46	10	12.68
18	12.34	20	12.62	18	11.85	17	12.69
27	12.35	27	12.57	25	11.98	24	12.73
Mar. 4	12.38	June 3	12.72	Sept. 1	12.02	Dec. 1	12.74
11	12.26	10	12.66	8	12.13	8	12.80
18	12.42	17	12.59	15	12.20	15	12.84
25	12.40	24	12.67	22	12.28	22	12.87
Apr. 1	12.45	July 1	12.09	29	12.37	31	12.89

813. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 24, T. 25 S., R. 1 W. Highest observed water level, 17.17 feet below measuring point Dec. 2, 1938; lowest observed water level, 17.80 feet below measuring point Aug. 23, 1938, and Dec. 5, 1939.  
Water level, in feet below measuring point, 1939

Jan. 3	17.26	Mar. 31	17.49	July 5	17.41	Oct. 3	17.50
Feb. 2	17.37	Apr. 30	17.57	Aug. 5	17.60	Nov. 2	17.67
Mar. 13	17.45	June 4	17.68	Sept. 6	17.33	Dec. 5	17.80

814. SE cor. sec. 13, T. 25 S., R. 1 W. Highest observed water level, 16.64 feet below measuring point Dec. 2, 1938; lowest observed water level, 17.41 feet below measuring point Dec. 5, 1939.  
Water level, in feet below measuring point, 1939

Jan. 3	16.66	Mar. 31	16.88	July 5	16.94	Oct. 3	17.06
Feb. 1	16.75	Apr. 30	16.99	Aug. 5	17.14	Nov. 2	17.27
Mar. 13	16.86	June 4	17.18	Sept. 6	16.92	Dec. 5	17.41

815. NE cor. sec. 17, T. 25 S., R. 1 W. Highest observed water level, 14.40 feet below measuring point Sept. 1, 1939; lowest observed water level, 15.13 feet below measuring point June 3, 1939.  
Water level, in feet below measuring point, 1939

Jan. 7	14.69	Mar. 4	14.92	Apr. 29	15.03	July 1	14.73
14	14.74	11	14.87	May 6	15.03	7	14.66
21	14.74	18	14.95	13	15.07	14	14.60
28	14.73	25	14.96	20	15.06	21	14.60
Feb. 4	14.82	Apr. 1	14.99	27	15.10	28	14.63
11	14.84	8	14.98	June 3	15.13	Aug. 4	14.67
18	14.87	15	14.96	10	15.03	11	14.71
Mar. 1	14.91	22	15.01	17	14.90	18	14.49

## Sedgwick County--Continued

## 315.--Continued

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Aug. 25	14.42	Sept. 29	14.50	Nov. 3	14.72	Dec. 8	14.86
Sept. 1	14.40	Oct. 6	14.55	10	14.73	15	14.87
8	14.44	13	14.62	17	14.75	22	14.91
15	14.44	20	14.64	24	14.80	31	14.93
22	14.49	27	14.68	Dec. 1	14.82		

816. SW cor. sec. 7, T. 25 S., R. 1 W. Highest observed water level, 11.27 feet below measuring point Aug. 18, 1939; lowest observed water level, 13.48 feet below measuring point Apr. 15, 1939.

Water level, in feet below measuring point, 1939

Jan. 7	12.50	Apr. 8	12.66	July 7	11.67	Oct. 6	11.78
14	12.47	15	13.48	14	11.86	13	11.85
21	12.50	22	12.67	21	11.98	20	11.89
28	12.48	29	12.71	28	12.09	27	11.99
Feb. 4	12.58	May 6	12.68	Aug. 4	12.20	Nov. 3	12.03
11	12.65	13	12.75	11	12.24	10	12.05
18	12.61	20	12.77	18	11.27	17	12.05
27	12.58	27	12.82	25	11.29	24	12.12
Mar. 4	12.64	June 3	12.90	Sept. 1	11.34	Dec. 1	12.11
11	12.58	10	12.59	8	11.48	8	12.19
18	12.69	17	12.32	15	11.58	15	12.22
25	12.67	24	12.41	22	11.65	22	12.25
Apr. 1	12.69	July 1	11.50	29	11.73	31	12.26

825. NE cor. sec. 3, T. 25 S., R. 1 W. Highest observed water level, 13.86 feet below measuring point Apr. 30, 1939; lowest observed water level, 14.98 feet below measuring point Nov. 2, 1939.

Water level, in feet below measuring point, 1939

Jan. 3	14.05	Mar. 31	13.93	July 5	14.21	Oct. 3	14.86
Feb. 1	14.07	Apr. 30	13.86	Aug. 5	14.64	Nov. 2	14.98
Mar. 1	14.15	June 4	14.12	Sept. 6	14.62	Dec. 5	14.74
13	14.01						

826. City of Wichita. NE cor. sec. 5, T. 25 S., R. 1 W. In right of way of Township road, 16.3 feet northwest of telephone pole west of curve in road. Driven observation well, diameter  $1\frac{1}{4}$  inches, depth 13.2 feet. Measuring point, top of pipe, 2.0 feet above land surface, 1.53 feet above bench mark, 1,369.80 feet above sea level. Bench mark 10M, established Sept. 22, 1938, cross cut near south end of west headwall of concrete culvert, north of well and near northeast corner of same section, 1,368.27 feet above sea level.

Water level, in feet below measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
Sept. 7, 1938	12.26	Sept. 18, 1939	13.31	Nov. 13, 1939	13.51
July 31, 1939	13.23	25	13.40	20	13.45
Aug. 7	13.37	Oct. 2	13.44	27	13.45
14	13.21	9	13.20	Dec. 4	13.39
21	12.35	16	13.54	11	13.37
28	12.67	23	13.55	18	13.35
Sept. 5	12.95	30	13.57	27	13.33
11	13.12	Nov. 6	13.53		

830. SW cor. sec. 30, T. 25 S., R. 2 W. Highest observed water level, 26.12 feet below measuring point Sept. 9, 1938; lowest observed water level, 30.07 feet below measuring point June 4, 1939.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	29.36	Mar. 31	29.20	July 5	28.46	Oct. 3	29.45
Feb. 1	29.41	Apr. 30	29.43	Aug. 5	29.48	Nov. 2	29.81
Mar. 13	29.27	June 4	30.07	Sept. 6	28.78	Dec. 5	29.73



## Sedgwick County--Continued

834. SW cor. sec. 9, T. 25 S., R. 3 W. Highest observed water level, 10.99 feet below measuring point July 5, 1939; lowest observed water level, 12.52 feet below measuring point Nov. 2 and Dec. 5, 1939.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	12.22	Mar. 31	11.87	July 5	10.99	Nov. 2	12.52
Feb. 1	12.24	Apr. 30	12.13	Sept. 6	11.65	Dec. 5	12.52
Mar. 13	12.01	June 4	12.77	Oct. 3	12.36		

838. NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 33, T. 25 S., R. 3 W. Highest observed water level, 25.79 feet below measuring point Sept. 6, 1939; lowest observed water level, 27.03 feet below measuring point Mar. 13, 1939.

Water level, in feet below measuring point, 1939

Jan. 3	26.83	Mar. 13	27.03	Oct. 3	26.20	Dec. 5	26.75
Feb. 1	26.99	Sept. 6	25.79	Nov. 2	26.58		

842. City of Wichita. NW cor. sec. 16, T. 25 S., R. 2 W. In right of way of Township road, about 50 feet south of section corner. Driven observation well, diameter  $1\frac{1}{4}$  inches, depth 15.0 feet. Measuring point, top of pipe, 1.3 feet above land surface, 1.58 feet above bench mark, 1,398.30 feet above sea level. Bench mark 26C, established Oct. 17, 1938, railroad spike in 8-inch hedge fence post, NE cor. sec. 17, T. 25 S., R. 2 W., 1,396.72 feet above sea level.

Water level, in feet below measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
Oct. 11, 1938	7.55	Sept. 6, 1939	6.57	Nov. 2, 1939	7.71
Aug. 5, 1939	7.23	Oct. 3	7.38	Dec. 5	7.78

845. City of Wichita. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 5, T. 27 S., R. 1 E. At north-west corner of intersection of Bell and Kansas City Avenues, 4 feet west of corner telephone pole. Driven observation well, diameter  $1\frac{1}{4}$  inches, depth 25.1 feet. Measuring point, top of pipe, 1.0 foot above land surface, 0.34 foot above bench mark, 1,311.10 feet above sea level. Bench mark 44E, established Nov. 14, 1938, railroad spike in corner telephone pole, 4 feet east of well, 1,310.76 feet above sea level.

Water level, in feet below measuring point, 1938-39

Nov. 11, 1938	15.77	Sept. 6, 1939	15.24	Nov. 2, 1939	15.58
Aug. 5, 1939	15.43	Oct. 3	15.50	Dec. 5	16.58

846. City of Wichita. SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 6, T. 27 S., R. 1 E. In right of way of West 21st Street, 3 feet west of corner power pole, 252 feet west of bridge across Little Arkansas River. Driven observation well, diameter  $1\frac{1}{4}$  inches, depth 32.2 feet. Measuring point, top of pipe, 1.0 foot above land surface, 1.49 feet above bench mark, 1,314.16 feet above sea level. Bench mark 44F, established Nov. 14, 1938, half-inch square iron bar in north root of 18-inch elm tree, south side of 21st Street, 30 feet west of fence corner of first street west of the river, 80 feet southeast of well, NE $\frac{1}{4}$  sec. 7, T. 27 S., R. 1 E., 1,312.67 feet above sea level.

Water level, in feet below measuring point, 1938-39

Nov. 11, 1938	17.08	Sept. 6, 1939	17.32	Nov. 2, 1939	17.86
Aug. 5, 1939	17.54	Oct. 3	17.70	Dec. 5	18.16

847. City of Wichita. SW cor. SE $\frac{1}{4}$  sec. 6, T. 27 S., R. 1 E. In right of way of West 21st Street, at northeast corner of intersection with township road. Driven observation well, diameter  $1\frac{1}{4}$  inches, depth 25.2 feet. Measuring point, top of pipe, 1.0 foot above land surface, 0.32 foot above bench mark, 1,315.73 feet above sea level. Bench mark 44G, established Nov. 14, 1938, half-inch square iron rod in southwest root of 24-inch elm tree, 31 feet north-northwest of well, 1,315.41 feet above sea level.

Water level, in feet below measuring point, 1938-39

Nov. 11, 1938	17.15	Sept. 6, 1939	17.35	Nov. 2, 1939	18.26
Aug. 5, 1939	17.71	Oct. 3	17.98	Dec. 5	18.46

## STANTON COUNTY

By B. F. Latta

An investigation of the ground-water resources of Stanton County, Kans., was made during the summer of 1939 by the Federal Geological Survey in cooperation with the Kansas State Geological Survey and the Kansas State Board of Health. The work was carried on under the supervision of S. W. Lohman, Federal geologist in charge of ground-water investigations in Kansas. It is the first investigation of the ground-water resources of the area since the early survey by Darton, <sup>1/</sup> which included the northern part of the county.

Stanton County, a sparsely populated county in southwestern Kansas, borders on Colorado. It is a part of the Great Plains province and has a flat to rolling surface. With the exception of two small areas in the southwestern part, where the Dakota group is exposed, the county is underlain by sands, gravels, silts, and clays of the Ogallala formation. About one-fourth of the wells in the county obtain water from the Dakota sandstone; the remainder, including the five irrigation wells, tap water in the Ogallala formation. Three of these five irrigation wells were drilled late in 1939.

The water levels in 111 wells were measured at least once during the investigation, and the water levels in 17 other wells were measured regularly about once a month. From July 19 to December 31, 1939, 101 measurements of water level were made in these 17 observation wells. Measurements prior to November 15 were made by the writer; those on and after November 15, by R. B. Christy.

## Well descriptions and water-level measurements

On the following pages are given descriptions and water levels for the 17 observation wells in Stanton County. Descriptions and measurements are listed in order by townships from north to south and by ranges from east to west. Within a township they are listed according to section number. Water levels are given in feet below the measuring points.

4. G. L. Warner. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 17, T. 27 S., R. 39 W. Unused drilled domestic well, diameter 5 $\frac{1}{2}$  inches, depth 65 feet. Measuring point, square hole in tin plate covering casing at south side, 1.0 foot above land surface. Equipped with cylinder pump and windmill.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 25	55.92	Sept. 8	55.87	Nov. 15	55.82
Aug. 8	55.92	Oct. 9	55.89	Dec. 16	55.86

<sup>1/</sup> Darton, N. H., U. S. Geol. Survey Geol. Atlas, Syracuse-Lakin folio (No. 212), pp. 9-10, 1920.

13. L. Y. Carrithers. NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 21, T. 27 S., R. 40 W., about 25 feet northwest of northwest corner of abandoned house. Unused drilled domestic well, diameter 6 inches, depth 55 feet. Measuring point, lower edge of north wooden pipe clamp, at north side, 1.0 foot above land surface. Equipped with cylinder pump and windmill.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 25	52.33	Sept. 8	51.60	Nov. 15	52.45
Aug. 8	51.53	Oct. 9	52.44	Dec. 16	52.57

29. W. Ward. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 12, T. 27 S., R. 42 W., about 30 feet southeast of southeast corner of abandoned house, in middle of concrete platform. Abandoned drilled domestic well, diameter 5 $\frac{1}{2}$  inches, depth 130 feet. Measuring point, top of casing, at northeast side, level with land surface. No pump in well.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 24	100.33	Sept. 8	100.33	Nov. 15	100.41
Aug. 8	100.34	Oct. 9	100.43	Dec. 15	100.38

35. H. S. Weir. NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 26, T. 27 S., R. 43 W., in field about 200 feet west of section road. Abandoned drilled well, diameter 5 $\frac{1}{2}$  inches, depth 236 feet. Measuring point, hole in top of bucket covering casing at east side, 0.5 foot above land surface. No pump in well.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 29	179.06	Sept. 8	179.03	Nov. 15	178.98
Aug. 8	179.07	Oct. 9	179.12	Dec. 15	179.00

47. Southwestern College. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 35, T. 28 S., R. 39 W., about 200 feet south of U. S. Highway 160 and about 1 foot west of 4 wooden anchor posts, in middle of concrete platform. Abandoned drilled well, diameter 5 $\frac{1}{2}$  inches, depth 87.5 feet. Measuring point, top of casing at east side, 0.3 foot above land surface. No pump in well.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 25	70.89	Sept. 8	70.91	Nov. 15	70.94
Aug. 8	70.91	Oct. 9	70.92	Dec. 16	70.91

48. J. Snyder. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 13, T. 28 S., R. 40 W. Unused drilled domestic well, diameter 5 $\frac{1}{2}$  inches, depth 97 feet. Measuring point, top of north bolt hole in pump base at north side, 0.5 foot above land surface. Equipped with cylinder pump and windmill.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 28	78.32	Sept. 8	78.29	Nov. 15	78.34
Aug. 8	78.25	Oct. 9	78.28	Dec. 16	78.29

54. L. R. Smith. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 36, T. 28 S., R. 40 W., about 20 feet south of abandoned dugout house. Unused drilled domestic well, diameter 5 $\frac{1}{2}$  inches, depth 125.5 feet. Measuring point, top of casing at east side, level with land surface. Equipped with cylinder pump and windmill.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 21	102.62	Sept. 8	102.44	Nov. 15	102.51
Aug. 8	102.55	Oct. 9	102.58	Dec. 16	102.51

57. J. Wilson. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 13, T. 28 S., R. 41 W., about 150 feet west-southwest of southwest corner of barn, northern windmill. Unused drilled domestic well, diameter 6 inches, depth 164 feet. Measuring point, lower edge of pump base at north side, 0.5 foot above land surface. Equipped with cylinder pump and windmill.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 24	150.55	Sept. 8	150.39	Nov. 15	150.34
Aug. 8	150.49	Oct. 9	150.52	Dec. 16	a 150.90

a Pumped just prior to measurement.

62. H. Bearman. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 29, T. 28 S., R. 41 W. Unused drilled domestic well, diameter 8 inches, depth 156 feet. Measuring point, top of casing at north side, level with land surface. Equipped with cylinder pump and windmill.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 22	140.53	Sept. 8	140.72	Nov. 15	140.39
Aug. 8	140.73	Oct. 9	140.65	Dec. 15	140.39

68. C. D. Wartman. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 29, T. 28 S., R. 42 W., about 200 feet north of United States Highway 160 and about 200 feet east of section road. Abandoned drilled well, diameter 5 $\frac{1}{2}$  inches, depth 169 feet. Measuring point, top of uppermost west rivet inside of casing, 0.3 foot above land surface. No pump in well.

Water level, in feet below measuring point, 1939

July 29	137.98	Sept. 8	138.02	Nov. 15	137.89
Aug. 8	138.03	Oct. 9	137.94	Dec. 15	137.90

84. J. C. Jones. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 23, T. 29 S., R. 39 W., about 10 feet east of house. Unused drilled domestic well, diameter 6 inches, depth 61.5 feet. Measuring point, top of pipe coupling at west side, 3.5 feet above land surface. Equipped with cylinder pump and windmill.

Water level, in feet below measuring point, 1939

July 21	60.44	Sept. 8	60.46	Dec. 16	60.61
Aug. 8	60.43	Oct. 9	60.53		

93. J. Plummer. Center NE $\frac{1}{4}$  sec. 11, T. 29 S., R. 41 W., about 440 yards west of State Highway 27 and about 440 yards south of section road. Abandoned drilled well, used only during drilling of gas test well, diameter 8 inches, depth 234 feet. Measuring point, top of casing at south side, 1.0 foot above land surface. No pump in well.

Water level, in feet below measuring point, 1939

Aug. 24	176.45	Oct. 9	176.60	Dec. 15	176.42
Sept. 8	176.39	Nov. 15	176.44		

117. Z. B. Nicholas. NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 14, T. 30 S., R. 39 W., about 100 feet northeast of old shed. Unused drilled domestic and stock well, diameter 6 inches, depth 78 feet. Measuring point, top of north wooden pipe clamp at south side, level with land surface. Equipped with cylinder pump and windmill.

Water level, in feet below measuring point, 1939

July 20	63.91	Sept. 8	63.91	Nov. 15	63.93
Aug. 8	63.95	Oct. 9	63.93	Dec. 16	63.92

124. F. H. Staker. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 3, T. 30 S., R. 40 W., about 100 feet west of abandoned house. Unused drilled domestic well, diameter 6 inches, depth 146 feet. Measuring point, top of lower pipe coupling at east side, 1.1 feet above land surface. Equipped with cylinder pump and windmill.

Water level, in feet below measuring point, 1939

July 28	138.83	Sept. 8	138.79	Nov. 15	138.78
Aug. 8	138.80	Oct. 9	138.85	Dec. 16	138.70

128. A. J. Doughty. SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 8, T. 30 S., R. 41 W., about 150 feet east of abandoned house. Unused drilled domestic and stock well, diameter 5 $\frac{1}{2}$  inches, depth 195 feet. Measuring point, top of casing at north side, 1.0 foot above land surface. Equipped with cylinder pump and windmill.

Water level, in feet below measuring point, 1939

July 28	182.47	Sept. 8	182.45	Nov. 15	182.42
Aug. 8	182.43	Oct. 9	182.35	Dec. 15	182.21

141. C. F. Wendf. SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 2, T. 30 S., R. 43 W., about 200 feet north of abandoned house and about 300 feet northeast of barn. Unused drilled domestic and stock well, diameter 6 inches, depth 162 feet. Measuring point, top of west bolt hole in pump base, 0.5 foot above land surface. Equipped with cylinder pump and windmill.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 19	153.05	Sept. 8	153.15	Nov. 15	153.02
Aug. 8	153.11	Oct. 9	153.04	Dec. 15	152.89

146. C. M. Harrison. SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 27, T. 30 S., R. 43 W., about 100 feet northeast of abandoned house. Unused drilled domestic well, diameter 5 $\frac{1}{2}$  inches, depth 55 feet. Measuring point, top of pipe coupling at east side, 0.5 foot above land surface. Equipped with cylinder pump and windmill.

Water level, in feet below measuring point, 1939

July 21	46.73	Sept. 8	46.74	Nov. 15	46.76
Aug. 8	46.73	Oct. 9	46.76	Dec. 15	46.77

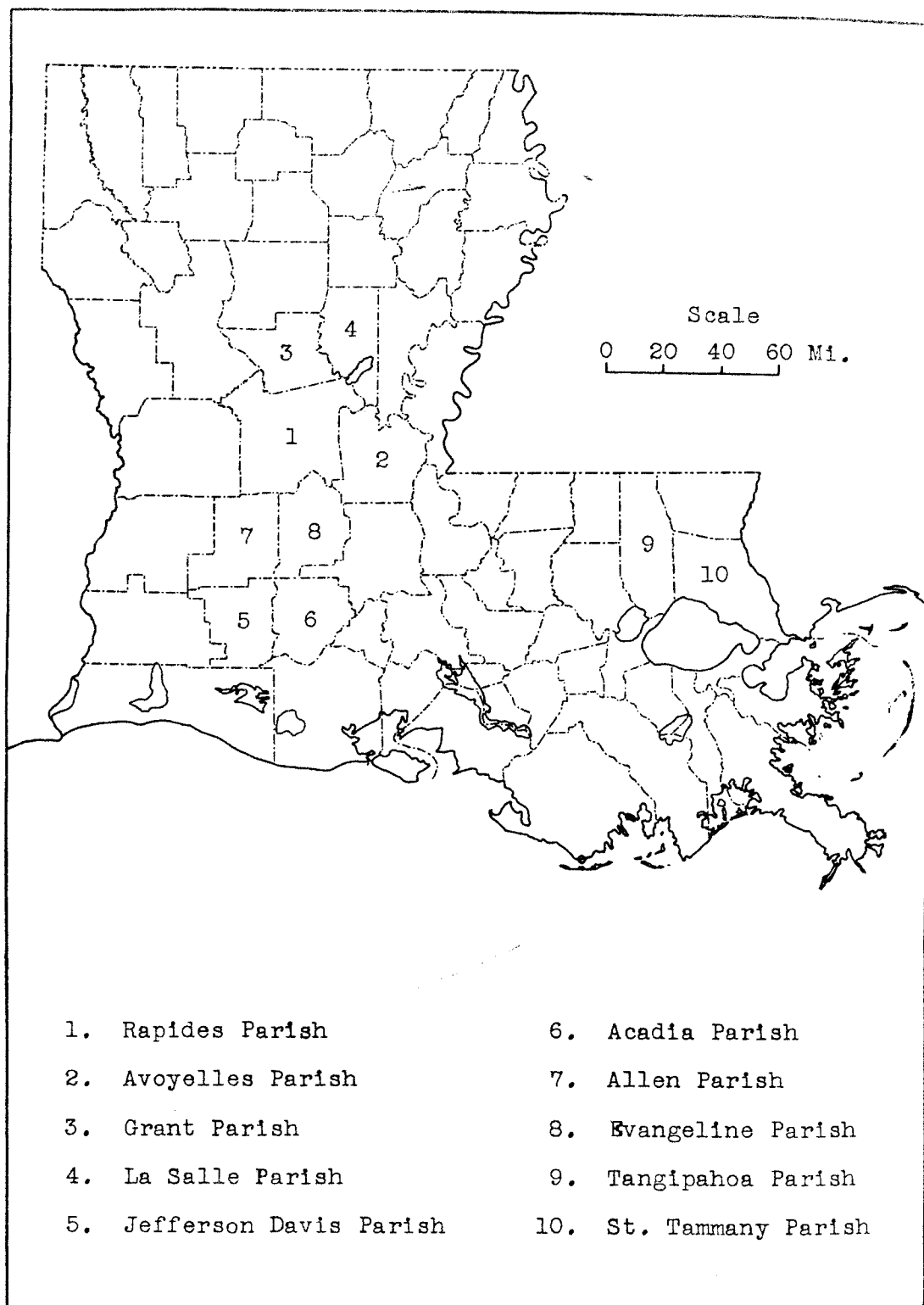


Figure 3.—Index map of Louisiana showing parishes in which observation wells are situated.

# LOUISIANA

By J. C. Maher and T. B. Stanley, Jr.

## Introduction

The program of water-level measurements in observation wells in Louisiana, <sup>1/</sup> conducted in connection with the cooperative ground-water investigations by the Federal Geological Survey and the Louisiana Department of Conservation, was expanded in 1939 to include observation wells in Allen, Evangeline, La Salle, St. Tammany, and Tangipahoa Parishes. At the end of the year observations were being made periodically on 116 wells in 10 parishes (see fig. 3); whereas observations at the end of 1938 were being made on only 90 wells in 5 parishes. Measurements were made weekly in 9 wells near Alexandria, in Rapides Parish, and biweekly in 13 other wells in Grant, La Salle, and Rapides Parishes. Water-stage recorders were operated on 5 observation wells in Rapides Parish, on 2 in Jefferson Davis Parish, on 1 in Acadia Parish, and on 1 in Allen Parish. The other observation wells in the State were measured from one to seven times in 1939. Approximately 1,224 individual measurements of water level were made in the observation wells during 1939.

During the past year areal ground-water investigations were completed in Rapides, Grant, and La Salle Parishes, and a report on the water resources of Rapides Parish was sent to press in December to be published as a State bulletin. Detailed field work was continued, however, in Rapides Parish in connection with the municipal water supply for Alexandria. Two brief reports, one concerning the general ground-water program in the State <sup>2/</sup> and the other dealing with the occurrence of fluoride in the ground water of Avoyelles and Rapides Parishes, <sup>3/</sup> were published during the year.

## Central Louisiana

The water-level observation program in central Louisiana was extended from Grant Parish into La Salle Parish in the summer of 1939. The ground-water supplies of La Salle Parish are drawn from sands of four ages: Eocene (Cockfield formation), Miocene (Catahoula formation), Pliocene ?,

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<sup>1/</sup> See Water-Supply Paper 845.

<sup>2/</sup> Stringfield, V. T., and Maher, J. C., Investigation of ground-water supplies in Louisiana: Louisiana Cons. Rev., spring issue, pp. 35-38, 1939.

<sup>3/</sup> Maher, J. C., Fluoride in the ground water of Avoyelles and Rapides Parishes, La.: Louisiana Dept. Cons. Geol. Pamphlet 1, 1939.

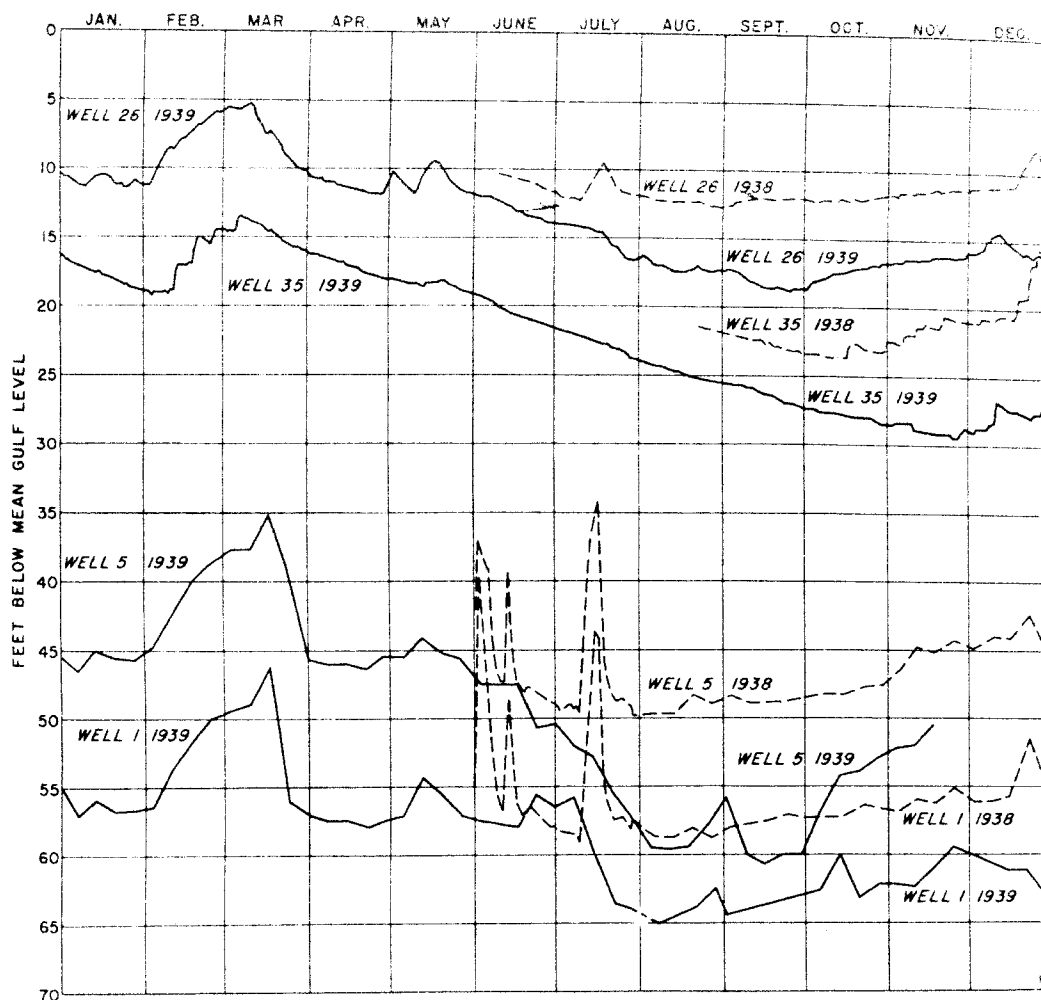


Figure 4.--Graph showing water levels in 1938 and 1939 in wells 1, 5, 26, and 35, Alexandria, Louisiana.

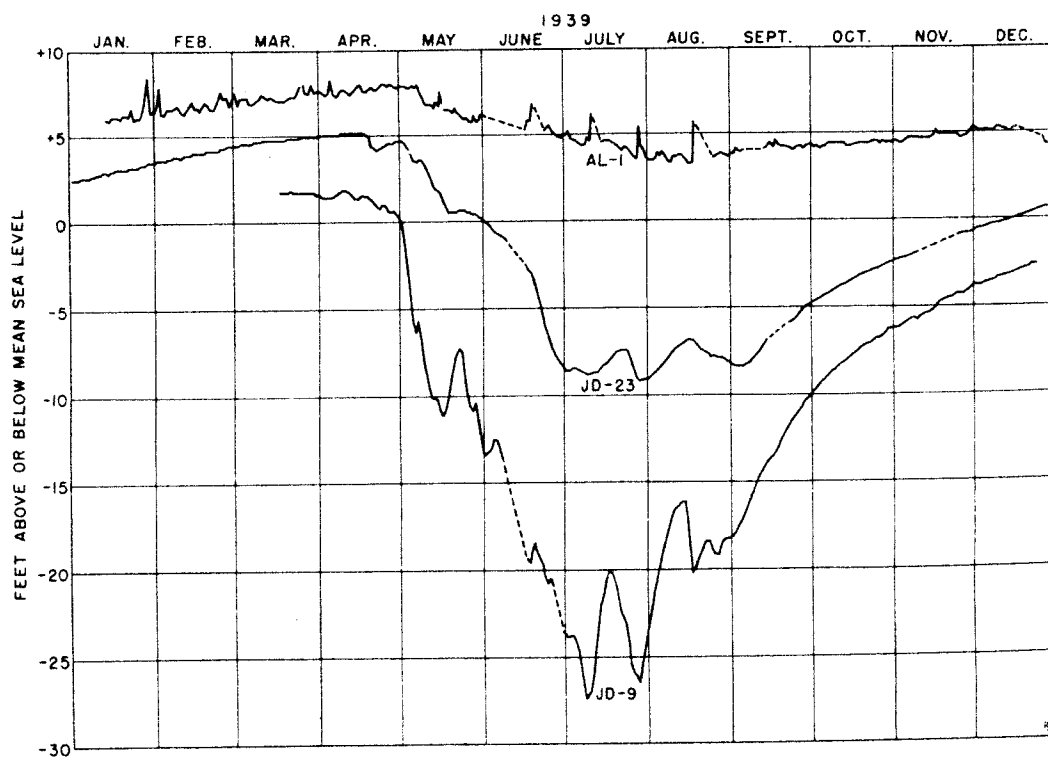


Figure 5.--Graph showing influence of pumpage on water levels in wells in the rice-irrigation district of southwestern Louisiana.



and Pleistocene. Wells tapping these sands are chiefly drilled or bored, and they range from about 15 feet to 600 feet in depth and from  $1\frac{1}{2}$  to 10 inches in diameter. Most of the wells, however, are less than 150 feet deep and obtain soft water from the Pliocene ? sands that mantle the highlands. A total of 111 measurements were made in 1939 in 3 wells in La Salle Parish and in 11 wells in Grant Parish. Insufficient measurements were made in Grant Parish during 1938 to permit comparison with water levels in 1939.

In Rapides Parish, water levels in the "1,000-foot" sand, which supplies most of the water used in Alexandria and vicinity, continued the general decline observed in 1938, although they staged a small recovery in the early part of 1939 (see fig. 4). At the end of the year, water levels in wells 1, 5, 26, and 35, all of which are within the Alexandria city limits, were 5 to 11 feet lower than at the end of 1938. The annual pumpage for the city waterworks increased only about 10,100,000 gallons--from about 1,119,500,000 gallons in 1938 to about 1,129,600,000 gallons in 1939.

The rainfall recorded at the station of the U. S. Weather Bureau in Alexandria was 49.80 inches in 1939, in contrast to 66.28 inches in 1938. The following table gives data on the decline in water levels:

Comparison of average water levels in selected wells in Rapides Parish in 1938 and 1939, in feet below measuring points

Well	Water level, Aug-Dec. 1938	Water level, Aug-Dec. 1939	Net decline (feet)
1	140.34	150.22	9.88
5	127.69	137.16	9.47
26	94.97	100.37	5.40
35	98.99	104.63	5.64

#### Southwestern Louisiana

In 1939, a total of 431 individual measurements of water level were made in 45 key wells in the rice-irrigation district of southwestern Louisiana. Three of the key wells are in southern Allen and Evangeline Parishes; the remainder are in Jefferson Davis and Acadia Parishes, where the pumpage is greatest. The irrigation wells of the district yield large quantities of hard water under artesian pressure from thick sands and gravels of Pleistocene age encountered at depths from 150 to 500 feet. Figure 5 is a graph of the fluctuations of water level in 1939 in three wells equipped with water-stage recorders. Well A1-1, in the southern part of Allen Parish, shows the least effect of the heavy summer pumping for irrigation because it is near the north edge of the principal rice-farming area.

## Southeastern Louisiana

Sands and gravels at depths of 50 to 2,000 feet supply large quantities of soft water to wells in southeastern Louisiana. Most of the wells penetrating the deeper sands and gravels flow at the surface and have closed-in pressures of 5 to 40 pounds to the square inch. A few shallow wells just north of Lake Ponchartrain also flow and have closed-in pressures of about 5 pounds to the square inch. Shallow flowing wells furnish water for irrigating the many truck farms in the area south of Hammond, which is known as the "strawberry belt." Twenty-one observation wells were established in Tangipahoa and St. Tammany Parishes in 1939.

## Well descriptions and water-level measurements

Records of water levels measured in the 116 observation wells during 1939 are given on the following pages. Complete descriptions are included only for those wells whose descriptions are not given in Water-Supply Paper 845. All water levels are expressed with reference to the measuring point. The measuring point for most of the irrigation wells in the rice-farming area is the bottom edge of the discharge pipe, which extends obliquely upward from the vertical well casing. A bench mark at or near the land surface has been established on each well, and the distance measured along the discharge pipe between the measuring point and the bench mark is recorded in the table of wells. The position of the water level below the bench mark can be computed merely by subtracting from the water-level measurement the recorded distance between the measuring point and the level of the bench mark.

## Acadia Parish

Ac-1. Measurements discontinued.

Ac-2. Measurements discontinued.

Ac-5. Mrs. W. S. Brunner. NW $\frac{1}{4}$  sec. 15, T. 8 S., R. 2 E. Drilled irrigation well, depth 390 feet. Measuring point, bottom edge of inclined discharge pipe. Bench mark at land surface, 46.51 feet above mean sea level. Tape distance along discharge pipe from measuring point to level of bench mark, 3.7 feet.

## Water level, in feet below measuring point, 1939

Date	Hour	Water level	Date	Hour	Water level
Jan. 2	.....	48.78	Oct. 27	9:00 a.m.	51.49
Apr. 18	10:50 a.m.	47.25	Nov. 24	8:45 a.m.	50.13
Sept. 16	9:40 a.m.	54.48	Dec. 20	10:00 a.m.	49.16
29	8:45 a.m.	53.11			

## Acadia Parish--Continued

Ac-7. Jules Baronet. NE $\frac{1}{4}$  sec. 9, T. 10 S., R. 3 E. Drilled irrigation well, diameter 12 inches, depth 365 feet. Measuring point, bottom edge of inclined discharge pipe. Bench mark at land surface, 29.43 feet above mean sea level. Tape distance along discharge pipe from measuring point to level of bench mark, 2.9 feet.

Water level, in feet below measuring point, 1939

Date	Hour	Water level	Date	Hour	Water level
Jan. 2	.....	32.20	Oct. 27	8:30 a.m.	34.94
Sept. 15	10:00 a.m.	38.66	Nov. 24	8:15 a.m.	33.60
29	7:55 a.m.	36.46	Dec. 18	12:40 p.m.	32.77

Ac-19. Joseph Ohlenforst. SE $\frac{1}{4}$  sec. 42, T. 7 S., R. 1 W. Drilled irrigation well. Measuring point, bottom edge of inclined discharge pipe. Bench mark at land surface, 41.17 feet above mean sea level. Tape distance along discharge pipe from measuring point to level of bench mark, 3.0 feet. Water levels, in feet below measuring point, 1939: Feb. 10, 41.59; Apr. 17, 9:45 a.m., 41.15; Sept. 16, 1:10 p.m., 51.58; Dec. 21, 8:30 a.m., 43.85.

Ac-22. Harry Frey. Sec. 19, T. 7 S., R. 1 E. Drilled irrigation well, depth 300 feet. Measuring point, bottom edge of inclined discharge pipe. Bench mark at land surface, 44.59 feet above mean sea level. Tape distance along discharge pipe from measuring point to level of bench mark, 3.5 feet.

Water level, in feet below measuring point, 1939

Feb. 15	.....	43.48	Oct. 27	10:00 a.m.	49.48
Apr. 18	9:30 a.m.	44.62	Nov. 24	9:45 a.m.	47.56
Sept. 16	11:30 a.m.	54.86	Dec. 21	10:55 a.m.	46.29
29	9:50 a.m.	52.16			

Ac-32. John Wilfert. SW $\frac{1}{4}$  sec. 10, T. 7 S., R. 1 W. Drilled irrigation well. Measuring point, bottom edge of inclined discharge pipe. Bench mark at land surface, 46.77 feet above mean sea level. Tape distance along discharge pipe from measuring point to level of bench mark, 3.3 feet. Water levels, in feet below measuring point, 1939: Feb. 16, 45.96; Apr. 17, 11:10 a.m., 45.14; Sept. 16, 1:35 p.m., 56.85; Dec. 20, 4:25 p.m., 48.41.

Ac-34. Dr. F. N. Hayes. SW $\frac{1}{4}$  sec. 10, T. 7 S., R. 2 W. Drilled irrigation well, diameter 12 inches depth 323 feet. Measuring point, bottom edge of inclined discharge pipe. Bench mark on top of metal pump base, 0.5 foot above land surface and 43.83 feet above mean sea level. Tape distance along discharge pipe from measuring point to level of bench mark, 6.4 feet.

Water level, in feet below measuring point, 1939

Feb. 17	.....	46.55	Oct. 27	11:55 a.m.	51.50
Apr. 15	10:10 a.m.	45.27	Nov. 24	11:59 a.m.	49.91
Sept. 16	2:10 p.m.	55.61	Dec. 20	5:10 p.m.	48.76
29	12:30 p.m.	53.80			

Ac-35. Onezime Doucet. NW $\frac{1}{4}$  sec. 22, T. 8 S., R. 2 W. Drilled irrigation well, diameter 12 inches, depth 300 feet. Measuring point, bottom edge of inclined discharge pipe. Bench mark at land surface, 38.86 feet above mean sea level. Tape distance along discharge pipe from measuring point to level of bench mark, 2.2 feet.

Water level, in feet below measuring point, 1939

Feb. 17	.....	39.36	Oct. 27	11:30 a.m.	44.90
Apr. 15	9:35 a.m.	38.12	Nov. 24	11:30 a.m.	43.23
Sept. 16	2:30 p.m.	49.43	Dec. 20	2:25 p.m.	41.99
29	11:40 a.m.	47.54			

## Acadia Parish--Continued

Ac-40. H. A. Kerr. NE $\frac{1}{4}$  sec. 1, T. 9 S., R. 1 W. Drilled irrigation well, diameter 8 inches, depth 303 feet. Measuring point, bottom of recorder shelter,  $\frac{1}{2}$  inch above top of 8-inch casing which is flush with land surface, 31.91 feet above mean sea level. Equipped with water-stage recorder.

Water level, in feet below measuring point, 1939

Date	Hour	Water level	Date	Hour	Water level
Feb. 18	.....	30.51	Aug. 4	8:30 a.m.	46.89
Mar. 7	10:00 a.m.	29.53	11	1:45 p.m.	44.64
10	1:05 p.m.	29.46	18	8:20 a.m.	46.17
17	1:00 p.m.	29.36	25	9:00 a.m.	44.47
24	11:30 a.m.	29.38	Sept. 1	9:00 a.m.	43.29
31	11:30 a.m.	29.07	8	11:15 a.m.	42.26
Apr. 7	1:00 p.m.	29.63	15	11:00 a.m.	40.69
14	10:45 a.m.	32.80	22	1:30 p.m.	39.17
21	11:30 a.m.	33.95	29	10:30 a.m.	37.97
28	11:00 a.m.	32.60	Oct. 6	8:30 a.m.	37.11
May 5	9:35 a.m.	36.38	13	8:30 a.m.	36.39
12	8:00 a.m.	46.62	20	8:30 a.m.	35.83
19	10:40 a.m.	46.40	27	10:30 a.m.	35.35
26	9:00 a.m.	46.29	Nov. 3	8:30 a.m.	35.06
June 2	9:00 a.m.	45.29	10	8:00 a.m.	34.57
16	9:20 a.m.	41.94	17	2:30 p.m.	34.01
23	9:00 a.m.	44.86	24	10:45 a.m.	33.65
30	8:30 a.m.	50.86	Dec. 1	3:15 p.m.	33.24
July 7	9:00 a.m.	51.21	8	9:15 a.m.	32.98
14	2:00 p.m.	46.90	15	8:40 a.m.	32.78
21	7:45 a.m.	46.67	22	11:10 a.m.	32.39
28	1:20 p.m.	49.26	29	9:45 a.m.	32.02

Ac-56. Henry Bieber. NW $\frac{1}{4}$  sec. 36, T. 7 S., R. 1 E. Drilled irrigation well, diameter 12 inches, depth 300 feet. Measuring point, bottom edge of inclined discharge pipe. Bench mark at land surface, 49.30 feet above mean sea level. Tape distance along discharge pipe from measuring point to level of bench mark, 4.3 feet.

Water level, in feet below measuring point, 1939

Mar. 16	.....	48.81	Oct. 27	9:35 a.m.	54.17
Apr. 18	9:15 a.m.	50.00	Nov. 24	9:30 a.m.	52.56
Sept. 16	10:45 a.m.	59.20	Dec. 20	1:20 p.m.	51.36
29	9:25 a.m.	56.50			

Ac-104. Hartwell. SW $\frac{1}{4}$  sec. 2, T. 9 S., R. 1 E. Drilled irrigation well. Measuring point, bottom edge of inclined discharge pipe. Bench mark on top of pump base at land surface, 36.37 feet above mean sea level. Tape distance along discharge pipe from measuring point to level of bench mark, 2.8 feet. Water levels, in feet below measuring point, 1939: Mar. 27, 36.81; Apr. 19, 10:25 a.m., 38.75; Sept. 15, 47.35; Dec. 19, 8:20 a.m., 39.73.

Ac-139. Emil Petitjean. SE $\frac{1}{4}$  sec. 13, T. 9 S., R. 2 E. Drilled irrigation well. Measuring point, bottom edge of inclined discharge pipe. Bench mark at land surface, 34.84 feet above mean sea level. Tape distance along discharge pipe from measuring point to level of bench mark, 2.3 feet. Water levels, in feet below measuring point, 1939: Apr. 3, 34.85; Apr. 19, 2:40 p.m., 34.48; Sept. 16, 8:25 a.m., 41.07; Dec. 18, 2:35 p.m., 36.63.

Ac-145. A. F. Horns. NW $\frac{1}{4}$  sec. 11, T. 10 S., R. 1 E. Drilled irrigation well. Measuring point, bottom edge of inclined discharge pipe. Bench mark on top of steel pit at land surface, 23.55 feet above mean sea level. Tape distance along discharge pipe from measuring point to level of bench mark, 2.9 feet. Water levels, in feet below measuring point, 1939: Apr. 4, 25.55; Apr. 20, 9:30 a.m., 26.40; Sept. 15, 9:30 a.m., 33.80; Dec. 18, 10:20 a.m., 27.37.

## Acadia Parish--Continued

Ac-147. Ed. Faulk. SW $\frac{1}{4}$  sec. 34, T. 10 S., R. 1 E. Drilled irrigation well, diameter 10 inches, depth 298 feet. Measuring point, bottom edge of inclined discharge pipe. Bench mark at land surface, 17.78 feet above mean sea level. Tape distance along discharge pipe from measuring point to level of bench mark, 3.0 feet. Water levels, in feet below measuring point, 1939: Apr. 4, 19.44; Sept. 15, 26.42; Dec. 18, 9:30 a.m., 21.60.

Ac-152. L. W. Hoyt. NE $\frac{1}{4}$  sec. 4, T. 11 S., R. 1 W. Drilled irrigation well. Measuring point, bottom edge of inclined discharge pipe. Bench mark at land surface, 15.50 feet above mean sea level. Tape distance along discharge pipe from measuring point to level of bench mark, 3.7 feet.

Water level, in feet below measuring point, 1939

Date	Hour	Water level	Date	Hour	Water level
May 2	.....	19.14	Oct. 27	7:45 a.m.	23.12
Sept. 15	.....	26.03	Nov. 24	7:30 a.m.	21.85
30	1:10 p.m.	24.53	Dec. 18	8:20 a.m.	21.04

Ac-175. Leon Lapleau. North line sec. 46, T. 10 S., R. 2 W. Drilled irrigation well, diameter 12 inches, depth 320 feet. Measuring point, bottom edge of inclined discharge pipe. Tape distance along discharge pipe from measuring point to level of bench mark, 21.24 feet. Water level, in feet below measuring point, 1939: Dec. 28, 23.78.

Ac-179. Dr. F. N. Hayes. NW $\frac{1}{4}$  sec. 34, T. 8 S., R. 1 W. Drilled irrigation well, diameter 12 inches, depth 333 feet. Measuring point, bottom edge of inclined discharge pipe. Bench mark on pump base at land surface, 34.41 feet above mean sea level. Tape distance along discharge pipe from measuring point to level of bench mark, 6.5 feet.

Water level, in feet below measuring point, 1939

Jan. 2	.....	40.89	Oct. 27	11:00 a.m.	44.73
Apr. 15	9:05 a.m.	39.05	Nov. 24	11:00 a.m.	42.98
Sept. 16	12:15 p.m.	49.58	Dec. 20	1:55 p.m.	41.80
29	11:00 a.m.	47.25			

## Allen Parish

Al-1. McClelland. SE $\frac{1}{4}$  sec. 35, T. 6 S., R. 3 W. Drilled irrigation well. Measuring point, floor of recorder shelter at land surface, 54.53 feet above mean sea level. Equipped with water-stage recorder.

Water level, in feet below measuring point, 1939

Jan. 14	1:40 p.m.	48.55	July 21	9:00 a.m.	50.33
21	1:15 p.m.	48.40	28	2:25 p.m.	51.06
28	8:45 a.m.	48.04	Aug. 4	9:45 a.m.	50.81
Feb. 4	12:30 p.m.	48.37	11	3:00 p.m.	50.89
11	1:35 p.m.	48.28	18	9:15 a.m.	49.02
18	1:10 p.m.	47.98	25	10:00 a.m.	50.89
24	8:40 a.m.	47.72	Sept. 1	11:59 a.m.	50.82
Mar. 3	1:30 p.m.	47.58	13	8:30 a.m.	50.40
10	2:25 p.m.	47.46	15	1:40 p.m.	50.23
17	2:20 p.m.	47.55	22	2:30 p.m.	50.40
24	12:55 p.m.	47.23	29	1:00 p.m.	50.30
31	1:15 p.m.	47.14	Oct. 6	10:30 a.m.	50.37
Apr. 7	2:00 p.m.	47.34	13	11:30 a.m.	50.30
14	12:05 p.m.	47.02	20	10:00 a.m.	50.12
21	10:15 a.m.	46.89	27	12:30 p.m.	50.06
28	12:40 p.m.	46.73	Nov. 3	10:00 a.m.	50.12
May 5	9:40 a.m.	46.76	10	9:30 a.m.	49.77
12	9:00 a.m.	47.68	17	3:45 p.m.	49.53
19	11:50 a.m.	47.87	24	12:45 p.m.	49.60
26	10:00 a.m.	48.69	Dec. 1	2:15 p.m.	49.28
June 2	10:00 a.m.	48.48	8	10:30 a.m.	49.44
16	10:30 a.m.	49.23	15	9:40 a.m.	49.33
23	9:45 a.m.	49.09	22	9:50 a.m.	49.14
30	9:30 a.m.	49.60	26	2:10 p.m.	48.39
July 7	10:00 a.m.	50.20	29	10:45 a.m.	49.19
14	3:00 p.m.	50.14			

## WATER LEVELS AND ARTESIAN PRESSURE, 1939

## Avoyelles Parish

Av-5. Measurements discontinued.

Av-7. No measurements made in 1939.

Av-18. Haas Investment Company. Shirley Plantation, on parish line, sec. 28, T. 1 S., R. 2 E. Water level, in feet below measuring point, 1939: Aug. 3, 12.80.

## Evangeline Parish

Ev-1. John LaHaye. SW $\frac{1}{4}$  sec. 20, T. 4 S., R. 1 E. Drilled irrigation well, diameter 10 inches, depth 140 feet. Measuring point, bottom edge of inclined discharge pipe. Tape distance along discharge pipe from measuring point to level of bench mark, 2.1 feet. Water level, in feet below measuring point, 1939: Dec. 7, 45.22.

Ev-2. Dorestant Ardoin. North end sec. 37, T. 6 S., R. 1 W. Drilled irrigation well, depth 160 (?) feet. Measuring point, bottom edge of inclined discharge pipe. Tape distance along discharge pipe from measuring point to level of bench mark, 2.5 feet. Water level, in feet below measuring point, 1939: Dec. 7, 54.15.

## Grant Parish

G-2. Carnahan, Hunthunce, and Hargiss. Sec. 5, T. 5 N., R. 3 W. Water level, in feet below measuring point, 1939

Date	Hour	Water level	Date	Hour	Water level
July 7	.....	3.20	Oct. 18	10:00 a.m.	5.17
Aug. 10	10:25 a.m.	4.38	Nov. 1	10:15 a.m.	5.12
25	2:30 p.m.	4.22	16	10:40 a.m.	5.04
Sept. 7	10:10 a.m.	4.52	30	12:40 p.m.	5.02
21	10:15 a.m.	4.82	Dec. 14	10:00 a.m.	5.48
Oct. 4	9:55 a.m.	5.00	27	10:15 a.m.	3.52

G-9. City of Colfax. Pumping station. Water levels, in feet below measuring point, 1939: June 28, 25.30; Dec. 13, 9:10 a.m., 31.49; Dec. 27, 10:40 a.m., 31.32.

G-11. City of Colfax. Behind pumping station.

Water level, in feet below measuring point, 1939

May 26	1:30 p.m.	21.40	Oct. 4	10:20 a.m.	27.32
June 28	.....	23.16	18	10:40 a.m.	27.80
Aug. 10	10:50 a.m.	25.15	Nov. 1	10:40 a.m.	29.25
25	2:50 p.m.	25.72	16	11:10 a.m.	28.62
Sept. 7	10:40 a.m.	26.28	30	1:50 p.m.	30.01
18	2:30 p.m.	28.48	Dec. 13	9:15 a.m.	29.30
21	10:35 a.m.	26.81	27	10:30 a.m.	29.11

G-19. W. C. Maxwell. Sec. 28, T. 7 N., R. 2 W. Water level, in feet below measuring point, 1939: June 28, 10:30 a.m., 15.70.

G-21. United States Department of Agriculture. Catahoula Fire Tower, Pollock. Water level, in feet below measuring point, 1939

June 27	9:05 a.m.	138.24	Oct. 4	12:55 p.m.	138.89
Aug. 10	11:35 a.m.	140.16	18	1:15 p.m.	139.00
Sept. 7	12:50 p.m.	139.90	Nov. 15	10:35 a.m.	138.35
21	1:15 p.m.	142.69			

G-27. 4-H Club Camp. SE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 4, T. 6 N., R. 1 E., Fishville. Water level, in feet above measuring point, 1939: July 12, 1.70.

G-30. Rock Hill School on Highway 71. Water levels, in feet below measuring point, 1939: July 11, 8:00 a.m., 23.50; Nov. 16, 3:35 p.m., 25.63.

## Grant Parish--Continued

G-38. Grant Utilities Company. Montgomery, northwest well behind power plant. Abandoned drilled public supply well, diameter 6 inches, depth 110 feet. Measuring point, top of 6-inch casing, 6 feet above land surface and 145 feet above mean gulf level.

Water level, in feet below measuring point, 1939

Date	Hour	Water level	Date	Hour	Water level
July 7	.....	19.78	Nov. 1	11:25 a.m.	19.48
Aug. 7	.....	22.11	16	11:55 a.m.	18.89
Sept. 22	11:15 a.m.	21.86	30	3:10 p.m.	20.57
Oct. 4	11:00 a.m.	21.99	Dec. 13	9:45 a.m.	19.35
18	11:20 a.m.	20.23	27	11:10 a.m.	16.20

G-41. I. C. Honeycutt. 0.5 mile south of Bentley on Highway 165. Water level, in feet below measuring point, 1939: June 27, 37.58.

G-44. Louisiana and Arkansas Railway Company. NW $\frac{1}{4}$  sec. 8, T. 6 N., R. 1 W., Bentley, 30 feet east of railroad tracks. Abandoned drilled industrial well, diameter 12 inches, depth 210.8 feet. Measuring point, top of 12-inch casing, 1.6 feet above land surface and 208 feet above mean gulf level.

Water level, in feet below measuring point, 1939

June 27	.....	37.98	Oct. 18	12:50 p.m.	37.99
Aug. 10	11:25 a.m.	37.86	Nov. 1	12:50 p.m.	38.05
25	4:05 p.m.	37.80	15	10:20 a.m.	38.16
Sept. 7	12:30 p.m.	37.90	29	10:15 a.m.	38.15
21	1:00 p.m.	37.86	Dec. 13	10:40 a.m.	38.38
Oct. 4	12:40 p.m.	37.95	28	9:25 a.m.	38.38

G-61. Oakgrove Church. NW $\frac{1}{4}$  sec. 11, T. 6 N., R. 2 W., on State Highway 19 behind church. Bored well, diameter 6 inches, depth 48.5 feet. Measuring point, top of south side of wood curb, 2.4 feet above the land surface and 200 feet above mean gulf level.

Water level, in feet below measuring point, 1939

July 7	.....	38.44	Oct. 18	12:35 p.m.	39.65
Aug. 10	.....	38.86	Nov. 1	12:35 p.m.	39.73
25	.....	38.95	15	10:10 a.m.	39.82
Sept. 7	12:50 p.m.	39.15	29	10:00 a.m.	39.87
27	12:45 p.m.	39.33	Dec. 13	10:20 a.m.	39.98
Oct. 4	12:25 p.m.	39.47	28	9:15 a.m.	39.39

## Jefferson Davis Parish

JD-1. Latrielle Estate. NW $\frac{1}{4}$  sec. 26, T. 9 S., R. 4 W. Water level, in feet below measuring point, 1939: Jan. 18, 31.81.

JD-3. Measurements discontinued.

JD-4. Measurements discontinued.

JD-5. Gulf States Utilities. Lake Arthur, air lift well behind office 108 feet southwest of the city well. Drilled public supply well, diameter 8 inches, depth 293 feet. Measuring point, union in air line. Bench mark at land surface, 9.02 feet above mean gulf level. Tape distance along discharge pipe from measuring point to level of bench mark, 4.1 feet.

Water level, in feet below measuring point, 1939

Jan. 13	1:25 p.m.	14.02	Sept. 14	1:20 p.m.	21.22
Apr. 11	1:20 p.m.	12.18	14	1:25 p.m.	21.24
Aug. 14	2:20 p.m.	21.65	14	1:30 p.m.	21.27
Sept. 14	1:15 p.m.	21.09	Dec. 15	.....	15.73

## Jefferson Davis Parish--Continued

JD-6. Latrielle Estate. NW $\frac{1}{4}$  sec. 8, T. 8 S., R. 4 W. Drilled irrigation well, diameter 12 inches, depth 340 feet. Measuring point, bottom edge of inclined discharge pipe. Bench mark at land surface, 42.39 feet above mean sea level. Tape distance along discharge pipe from measuring point to level of bench mark, 2.0 feet. Water levels, in feet below measuring point, 1939: Jan. 12, 44.17; Apr. 6, 9:40 a.m., 41.69; May 3, 41.91.

JD-7. Latrielle Estate. NW $\frac{1}{4}$  sec. 14, T. 8 S., R. 4 W. Water level, in feet below measuring point, 1939: Jan. 12, 45.24.

JD-8. William Koll. SW $\frac{1}{4}$  sec. 3, T. 9 S., R. 3 W. Drilled irrigation well, diameter 10 inches, depth 325 (?) feet. Measuring point, bottom edge of inclined discharge pipe. Tape distance along discharge pipe from measuring point to level of bench mark, 6.6 feet. Water level, in feet above measuring point, 1939: Jan. 12, 37.40.

JD-9. Calcasieu-Marine National Bank. NW $\frac{1}{4}$  sec. 34, T. 9 S., R. 4 W. Measuring point, top of concrete pump base, 0.6 foot above land surface, 24.70 feet above mean sea level. Equipped with water-stage recorder.

Water level, in feet below measuring point, 1939

Date	Hour	Water level	Date	Hour	Water level
Mar. 17	11:00 a.m.	23.03	Aug. 18	11:30 a.m.	44.98
24	5:45 p.m.	23.05	25	12:15 p.m.	43.60
31	5:30 p.m.	23.06	Sept. 1	1:45 p.m.	42.81
Apr. 7	7:15 p.m.	23.12	8	5:00 p.m.	40.49
14	3:30 p.m.	23.36	15	4:00 p.m.	38.36
21	12:50 p.m.	23.64	22	4:00 p.m.	36.52
28	2:25 p.m.	24.13	29	3:30 p.m.	34.93
May 5	11:25 a.m.	29.68	Oct. 6	2:00 p.m.	33.75
12	10:20 a.m.	34.56	13	1:30 p.m.	32.78
19	1:45 p.m.	34.19	20	12:30 p.m.	32.00
26	2:20 p.m.	35.08	27	3:45 p.m.	31.33
June 2	12:40 p.m.	38.34	Nov. 3	12:30 p.m.	30.85
16	12:30 p.m.	43.68	10	11:45 a.m.	30.31
23	11:00 a.m.	44.68	17	4:45 p.m.	29.50
30	11:00 a.m.	47.82	24	4:15 p.m.	29.00
July 7	11:00 a.m.	51.17	Dec. 1	12:45 p.m.	28.52
14	5:30 p.m.	46.90	8	2:35 p.m.	28.18
21	12:01 p.m.	46.54	15	11:10 a.m.	27.83
28	6:00 p.m.	51.15	22	7:40 a.m.	27.43
Aug. 4	11:00 a.m.	45.31	29	12:20 p.m.	27.03
11	5:30 p.m.	41.17			

JD-10. Calcasieu-Marine National Bank. NE $\frac{1}{4}$  sec. 33, T. 9 S., R. 4 W. Drilled irrigation well, diameter 12 inches, depth 317 feet. Measuring point, top of concrete pump base, 0.6 foot above land surface, 24.43 feet above mean sea level. Water levels, in feet below measuring point, 1939: Apr. 11, 11:50 a.m., 23.10; Sept. 14, 2:30 p.m., 38.84; Dec. 16, 9:15 a.m., 28.12.

JD-11. Mrs. Linscomb. NE $\frac{1}{4}$  sec. 28, T. 7 S., R. 3 W. Drilled irrigation well, diameter 12 inches, depth 307 feet. Measuring point, bottom edge of inclined discharge pipe. Bench mark at land surface, 46.70 feet above mean sea level. Tape distance along discharge pipe from measuring point to level of bench mark, 4.0 feet.

Water level, in feet below measuring point, 1939

Apr. 5	3:05 p.m.	45.70	Oct. 27	1:00 p.m.	51.64
May 17	2:00 p.m.	52.91	Nov. 24	1:15 p.m.	50.37
Sept. 15	1:15 p.m.	54.39	Dec. 12	8:15 a.m.	49.73
29	1:30 p.m.	53.27			

JD-12. B. Gabrino. Center of east line sec. 6, T. 7 S., R. 3 W. Drilled irrigation well, diameter 10 inches, depth 330 feet. Measuring point, bottom edge of inclined discharge pipe. Bench mark at land surface, 48.79 feet above mean sea level. Tape distance along discharge pipe from measuring point to level of bench mark, 5.4 feet. Water levels, in feet below measuring point, 1939: Apr. 5, 10:00 a.m., 46.58; Sept. 13, 9:25 a.m., 51.03; Dec. 12, 9:25 a.m., 49.58.



## Jefferson Davis Parish--Continued

JD-13. Gibbs farm. Center of south line sec. 6, T. 8 S., R. 3 W. Water level, in feet below measuring point, 1939: Jan. 24, 9:00 a.m., 47.99.

JD-14. Calcasieu-Marine National Bank. NE $\frac{1}{4}$  sec. 21, T. 7 S., R. 4 W. Drilled irrigation well, diameter 12 inches, depth 350 (?) feet. New measuring point, bottom edge of inclined discharge pipe. Bench mark at land surface, 48.00 feet above mean sea level. Tape distance along discharge pipe from measuring point to level of bench mark, 5.4 feet. Water levels, in feet below measuring point, 1939: Apr. 6, 8:45 a.m., 42.72; May 3, 3:15 p.m., 44.58; Sept. 13, 11:00 a.m., 51.67; Dec. 12, 11:45 a.m., 48.28.

JD-15. A. R. McBirney. NE $\frac{1}{4}$  sec. 33, T. 7 S., R. 4 W. Drilled irrigation well, diameter 10 inches, depth 505 feet. Measuring point, bottom edge of inclined discharge pipe. Bench mark at land surface, 39.23 feet above mean sea level. Tape distance along discharge pipe from measuring point to level of bench mark, 7.0 feet. Water levels, in feet below measuring point, 1939: Apr. 6, 9:15 a.m., 38.07; May 3, 3:05 p.m., 38.00; Sept. 13, 10:15 a.m., 46.90; Dec. 12, 11:59 a.m., 42.17.

JD-16. Measurements discontinued.

JD-17. C. E. Monger. SE $\frac{1}{4}$  sec. 15, T. 8 S., R. 5 W. Drilled irrigation well, diameter 8 inches, depth 322 feet. Measuring point, bottom edge of inclined discharge pipe. Bench mark at land surface, 35.23 feet above mean sea level. Tape distance along discharge pipe from measuring point to level of bench mark, 3.5 feet.

Water level, in feet below measuring point, 1939

Date	Hour	Water level	Date	Hour	Water level
Jan. 5	9:30 a.m.	37.23	Sept. 13	1:55 p.m.	47.74
Apr. 6	1:10 p.m.	34.34	Dec. 12	2:05 p.m.	39.74
May 3	1:45 p.m.	34.66			

JD-18. William Fenton. SE $\frac{1}{4}$  sec. 8, T. 8 S., R. 5 W. Drilled irrigation well, diameter 16 inches, depth 300 feet. Measuring point, bottom edge of inclined discharge pipe. Bench mark at land surface, 37.16 feet above mean sea level. Tape distance along discharge pipe from measuring point to level of bench mark, 4.5 feet. Water levels, in feet below measuring point, 1939: Jan. 12, 10:30 a.m., 37.86; Apr. 6, 1:25 p.m., 34.39; Sept. 13, 2:00 p.m., 45.94; Dec. 12, 2:25 p.m., 40.57.

JD-19. Luma Bourgeois. SW $\frac{1}{4}$  sec. 18, T. 9 S., R. 5 W. Drilled irrigation well, diameter 12 inches, depth 311 feet. Measuring point, bottom edge of inclined discharge pipe. Bench mark at land surface, 24.68 feet above mean sea level. Tape distance along discharge pipe from measuring point to level of bench mark, 3.8 feet.

Water level, in feet below measuring point, 1939

Jan. 12	11:00 a.m.	26.98	Oct. 27	2:30 p.m.	33.61
Apr. 11	10:00 a.m.	24.39	Nov. 24	2:45 p.m.	31.35
Sept. 13	2:30 p.m.	40.61	Dec. 12	3:05 p.m.	30.24
30	9:15 a.m.	36.60			

JD-20. Calcasieu-Marine National Bank. NE $\frac{1}{4}$  sec. 14, T. 10 S., R. 6 W. Drilled irrigation well, diameter 10 inches. Measuring point, top of 24-inch steel pit at land surface, 14.98 feet above mean sea level. Water levels, in feet below measuring point, 1939: Apr. 13, 9:00 a.m., 11.90; Sept. 14, 9:15 a.m., 25.27; Dec. 14, 3:40 p.m., 17.20.

JD-21. John Miller. SE $\frac{1}{4}$  sec. 10, T. 10 S., R. 5 W. Water levels, in feet below measuring point, 1939: Apr. 13, 9:45 a.m., 21.49; Dec. 14, 4:00 p.m., 26.82.

## Jefferson Davis Parish--Continued

JD-23. Calcasieu-Marine National Bank. NE $\frac{1}{4}$  sec. 4, T. 10 S., R. 3 W. Drilled irrigation well, diameter 16 inches, depth 353 feet. Measuring point, top of concrete pump foundation at land surface, 25.71 feet above mean sea level. Equipped with water-stage recorder.

Water level, in feet below measuring point, 1939

Date	Hour	Water level	Date	Hour	Water level
Jan. 3	9:00 a.m.	23.18	July 7	11:30 a.m.	34.84
7	3:00 p.m.	23.06	14	5:00 p.m.	34.26
14	3:00 p.m.	22.77	21	11:30 a.m.	33.19
21	2:30 p.m.	22.57	28	5:20 p.m.	34.34
28	10:00 a.m.	22.33	Aug. 4	11:30 a.m.	34.33
Feb. 4	2:30 p.m.	21.06	11	5:00 p.m.	33.01
11	2:45 p.m.	21.82	18	11:05 a.m.	32.65
18	2:20 p.m.	21.65	25	11:45 a.m.	33.52
24	9:40 a.m.	21.53	Sept. 1	2:30 p.m.	33.98
Mar. 3	2:50 p.m.	21.23	8	4:00 p.m.	33.74
10	3:30 p.m.	21.07	15	3:30 p.m.	32.63
17	3:30 p.m.	20.96	22	3:30 p.m.	31.64
24	5:10 p.m.	20.87	29	4:20 p.m.	30.65
31	5:00 p.m.	20.72	Oct. 6	1:00 p.m.	30.00
Apr. 7	6:45 p.m.	20.65	13	12:45 p.m.	29.38
14	3:00 p.m.	20.59	20	11:30 a.m.	28.84
21	1:25 p.m.	21.42	27	3:00 p.m.	28.35
28	1:50 p.m.	21.16	Nov. 3	11:30 a.m.	27.98
May 5	10:50 a.m.	21.98	10	11:00 a.m.	27.58
12	10:50 a.m.	23.32	24	3:30 p.m.	26.64
19	1:10 p.m.	25.28	Dec. 1	1:15 p.m.	26.28
26	1:50 p.m.	25.21	8	2:00 p.m.	26.00
June 2	1:25 p.m.	25.84	15	10:45 a.m.	25.74
16	1:00 p.m.	28.12	22	8:30 a.m.	25.40
23	12:01 p.m.	31.41	29	11:45 a.m.	25.06
30	2:00 p.m.	34.06			

JD-26. I. L. Hebert. NE $\frac{1}{4}$  sec. 21, T. 10 S., R. 3 W. Drilled irrigation well. Measuring point, bottom edge of inclined discharge pipe. Bench mark at land surface, 19.63 feet above mean sea level. Tape distance along discharge pipe from measuring point to level of bench mark, 5.2 feet.

Water level, in feet below measuring point, 1939

Apr. 11	12:50 p.m.	24.46	Oct. 28	7:30 a.m.	30.96
Sept. 14	12:55 p.m.	35.44	Nov. 25	9:15 a.m.	29.38
30	11:00 a.m.	33.11	Dec. 15	3:10 p.m.	28.50

JD-32. Petitjean. SE $\frac{1}{4}$  sec. 12, T. 11 S., R. 5 W. Drilled irrigation well. Measuring point, bottom edge of inclined discharge pipe. Bench mark at land surface, 8.65 feet above mean sea level. Tape distance along discharge pipe from measuring point to level of bench mark, 3.5 feet.

Water level, in feet below measuring point, 1939

Jan. 3	.....	13.66	Sept. 30	10:10 a.m.	20.44
Apr. 12	10:50 a.m.	11.43	Oct. 28	8:15 a.m.	18.34
May 11	8:45 a.m.	12.68	Nov. 25	8:30 a.m.	16.50
18	9:15 a.m.	14.05	Dec. 15	2:00 p.m.	15.65
Sept. 14	10:05 a.m.	22.22			

JD-41. J. P. Campbell. NW $\frac{1}{4}$  sec. 18, T. 9 S., R. 4 W. Drilled irrigation well, diameter 12 inches, depth 375 feet. Measuring point, bottom edge of inclined discharge pipe. Bench mark on top of concrete pump base at land surface, 22.87 feet above mean sea level. Tape distance along discharge pipe from measuring point to level of bench mark, 3.9 feet.

Water level, in feet below measuring point, 1939

Jan. 4	.....	27.11	Sept. 13	3:20 p.m.	41.98
Apr. 7	10:00 a.m.	24.44	Dec. 14	11:10 a.m.	30.00
May 22	4:15 p.m.	34.14			

## Jefferson Davis Parish--Continued

JD-43. C. Leger. NE $\frac{1}{4}$  sec. 24, T. 8 S., R. 6 W. Drilled irrigation well. Measuring point, bottom edge of inclined discharge pipe. Bench mark on top of concrete pump base at land surface, 32.19 feet above mean sea level. Tape distance along discharge pipe from measuring to level of bench mark, 3.1 feet.

Water level, in feet below measuring point, 1939

Date	Hour	Water level	Date	Hour	Water level
Jan. 5	.....	33.01	Oct. 27	2:15 p.m.	37.70
Apr. 11	10:40 a.m.	30.09	Nov. 24	2:30 p.m.	36.22
Sept. 13	2:10 p.m.	41.04	Dec. 12	2:45 p.m.	35.45
30	8:50 a.m.	40.35			

JD-50. Dr. G. L. Shoemaker. NE $\frac{1}{4}$  sec. 2, T. 10 S., R. 4 W. Drilled irrigation well, diameter 12 inches, depth 310 feet. Measuring point, bottom edge of inclined discharge pipe. Bench mark on top of steel pump base at land surface, 17.31 feet above mean sea level. Tape distance along discharge pipe from measuring point to level of bench mark, 4.9 feet. Water levels, in feet below measuring point, 1939: Jan. 7, 21.66; Apr. 13, 2:20 p.m., 19.73; Sept. 14, 7:00 a.m., 33.46; Dec. 16, 9:45 a.m., 24.00.

JD-63. J. E. McGowan. NW $\frac{1}{4}$  sec. 36, T. 8 S., R. 4 W. Drilled irrigation well, depth 270 feet. Measuring point, bottom edge of inclined discharge pipe. Bench mark at land surface, 34.77 feet above mean sea level. Tape distance along discharge pipe from measuring point to level of bench mark, 5.5 feet.

Water level, in feet below measuring point, 1939

Jan. 10	.....	39.54	Sept. 13	1:25 p.m.	50.47
Apr. 8	9:30 a.m.	37.15	Dec. 14	10:00 a.m.	41.97
May 17	10:45 a.m.	46.49			

JD-65. DeWitt Smith. SW $\frac{1}{4}$  sec. 3, T. 11 S., R. 3 W. Drilled irrigation well, diameter 12 inches, depth 400 feet. Measuring point, bottom edge of inclined discharge pipe. Bench mark at land surface, 15.25 feet above mean sea level. Tape distance along discharge pipe from measuring point to level of bench mark, 2.4 feet.

Water level, in feet below measuring point, 1939

Jan. 11	.....	18.80	Oct. 28	8:00 a.m.	22.60
Apr. 11	1:10 p.m.	16.96	Nov. 25	9:00 a.m.	21.32
Sept. 14	1:05 p.m.	26.31	Dec. 15	3:00 p.m.	20.63
30	10:40 a.m.	24.21			

JD-115. Calcasieu-Marine National Bank. NE $\frac{1}{4}$  sec. 34, T. 9 S., R. 5 W. Drilled irrigation well. Measuring point, bottom edge of inclined discharge pipe. Bench mark on top of concrete pump base at land surface, 30.20 feet above mean sea level. Tape distance along discharge pipe from measuring point to level of bench mark, 4.8 feet. Water levels, in feet below measuring point, 1939: Jan. 25, 33.89; Apr. 11, 11:45 a.m., 31.64; Sept. 13, 3:00 p.m., 50.99; Dec. 12, 4:00 p.m., 37.54.

## La Salle Parish

La-18. Good Pine Lumber Company. NE $\frac{1}{4}$  sec. 9, T. 8 N., R. 3 W., Good Pine, under derrick on pond behind boiler room. Abandoned drilled industrial well, diameter 16 inches, depth 156 feet. Measuring point, top of 16-inch casing, 3.2 feet above land surface and 176 feet above mean gulf level.

Water level, in feet below measuring point, 1939

July 19	.....	34.20	Oct. 18	2:40 p.m.	34.72
24	.....	34.19	Nov. 1	2:20 p.m.	34.53
Aug. 10	12:50 p.m.	34.20	15	11:45 a.m.	34.64
25	5:50 p.m.	34.46	29	11:45 a.m.	34.38
Sept. 7	2:15 p.m.	34.69	Dec. 13	11:55 a.m.	34.77
21	2:35 p.m.	34.31	28	10:45 a.m.	34.86
Oct. 4	2:05 p.m.	34.57			

## La Salle Parish--Continued

La-41. Louisiana Delta Hardwood Lumber Company. NE $\frac{1}{4}$  sec. 8, T. 8 N., R. 3 E., Trout, at west road entrance to mill. Abandoned drilled industrial well, diameter 16 inches, depth 59 feet. Measuring point, top of 18-inch casing, 2.5 feet above land surface and 180 feet above mean gulf level.

Water level, in feet below measuring point, 1939

Date	Hour	Water level	Date	Hour	Water level
July 24	.....	28.82	Oct. 18	2:00 p.m.	30.58
Aug. 10	12:20 p.m.	29.03	Nov. 1	1:45 p.m.	30.32
25	5:20 p.m.	29.31	15	11:15 a.m.	30.13
Sept. 7	1:45 p.m.	29.56	29	11:10 a.m.	29.92
21	1:55 p.m.	30.23	Dec. 13	11:25 a.m.	29.75
Oct. 4	1:35 p.m.	30.48	28	10:15 a.m.	29.59

La-42. Louisiana Delta Hardwood Lumber Company. NE $\frac{1}{4}$  sec. 8, T. 8 N., R. 3 E., Trout, under derrick at lumber shed. Abandoned drilled industrial well, diameter 10 inches, depth 72 feet. Measuring point, top of 10-inch casing, 3 feet above land surface and 182 feet above mean gulf level.

Water level, in feet below measuring point, 1939

July 21	.....	33.43	Oct. 18	2:15 p.m.	35.85
24	.....	33.44	Nov. 1	1:55 p.m.	35.04
Aug. 10	.....	33.68	15	11:25 a.m.	34.76
25	.....	33.93	29	11:45 a.m.	34.46
Sept. 7	1:55 p.m.	34.18	Dec. 13	11:35 a.m.	34.27
21	2:10 p.m.	36.78	28	10:25 a.m.	34.09
Oct. 4	1:45 p.m.	35.74			

## Rapides Parish

## 1. City of Alexandria, St. Ann St. and levee.

Water level, in feet below measuring point, 1939

Jan. 6	9:10 a.m.	144.99	June 16	9:55 a.m.	146.05
13	8:55 a.m.	143.96	23	9:10 a.m.	143.77
20	9:05 a.m.	144.78	30	12:35 p.m.	144.51
27	8:25 a.m.	144.63	July 7	9:50 a.m.	143.87
Feb. 3	9:05 a.m.	144.38	14	9:35 a.m.	147.59
10	9:00 a.m.	141.49	22	9:55 a.m.	151.67
17	9:05 a.m.	139.78	28	10:10 a.m.	152.05
24	9:07 a.m.	138.11	Aug. 7	9:15 a.m.	153.17
Mar. 3	8:40 a.m.	137.28	21	11:15 a.m.	151.91
10	9:10 a.m.	136.99	28	11:26 a.m.	150.62
17	9:10 a.m.	134.12	Sept. 1	10:00 a.m.	152.48
24	9:05 a.m.	144.14	Oct. 6	10:00 a.m.	150.68
31	9:05 a.m.	145.25	13	10:25 a.m.	148.11
Apr. 7	9:10 a.m.	145.59	20	5:00 p.m.	151.15
14	9:25 a.m.	145.52	27	10:00 a.m.	150.28
21	9:30 a.m.	145.99	Nov. 3	9:40 a.m.	150.32
28	9:35 a.m.	145.63	10	10:05 a.m.	150.44
May 5	10:50 a.m.	145.25	17	10:10 a.m.	149.09
12	9:20 a.m.	142.47	24	9:55 a.m.	147.55
19	9:35 a.m.	143.72	Dec. 1	10:10 a.m.	148.11
26	10:00 a.m.	145.19	15	9:55 a.m.	149.27
June 2	9:15 a.m.	145.59	22	10:05 a.m.	149.24
9	9:30 a.m.	145.77	29	9:50 a.m.	151.10

## 3. City of Alexandria, 4th and Monroe Sts. Water-stage recorder removed March 3, 1939.

Water level, in feet below measuring point, 1939

Jan. 3	8:30 a.m.	62.03	Jan. 27	8:15 a.m.	61.20
6	9:00 a.m.	62.70	31	8:35 a.m.	62.52
10	8:25 a.m.	61.90	Feb. 3	11:55 a.m.	63.77
13	9:50 a.m.	61.58	7	8:55 a.m.	62.48
17	8:35 a.m.	60.51	10	8:45 a.m.	66.19
20	8:30 a.m.	60.60	14	8:30 a.m.	64.47
24	8:30 a.m.	61.05	17	8:30 a.m.	62.72

## Rapides Parish--Continued

## 3. City of Alexandria.--Continued

Water level, in feet below measuring point, 1939

Date	Hour	Water level	Date	Hour	Water level
Feb. 21	8:20 a.m.	62.77	July 23	9:55 a.m.	92.26
24	8:30 a.m.	61.87	Aug. 4	10:00 a.m.	93.12
28	8:35 a.m.	61.87	11	10:05 a.m.	93.68
Mar. 3	10:05 a.m.	61.57	18	9:55 a.m.	92.16
10	8:50 a.m.	61.77	25	9:30 a.m.	89.79
17	9:10 a.m.	62.23	Sept. 1	9:45 a.m.	91.60
24	8:20 a.m.	62.56	8	9:45 a.m.	89.76
31	8:50 a.m.	68.49	15	9:55 a.m.	94.92
Apr. 7	11:05 a.m.	69.05	22	9:45 a.m.	94.30
14	9:40 a.m.	68.76	29	9:45 a.m.	93.03
21	9:20 a.m.	67.45	Oct. 6	9:45 a.m.	83.55
28	9:25 a.m.	66.28	13	10:05 a.m.	86.50
May 5	9:55 a.m.	69.33	20	4:55 p.m.	77.67
12	9:10 a.m.	70.37	27	9:45 a.m.	79.49
19	9:25 a.m.	69.58	Nov. 3	9:25 a.m.	77.73
26	9:50 a.m.	68.89	10	9:50 a.m.	73.40
June 2	9:25 a.m.	68.77	17	9:55 a.m.	75.01
9	9:40 a.m.	79.55	24	9:40 a.m.	70.83
16	9:45 a.m.	74.30	Dec. 1	9:55 a.m.	67.12
23	9:20 a.m.	90.17	8	9:10 a.m.	65.62
30	12:20 p.m.	83.10	15	9:40 a.m.	64.56
July 7	9:35 a.m.	87.97	22	9:50 a.m.	65.22
14	9:20 a.m.	89.25	29	9:35 a.m.	61.98
21	9:40 a.m.	91.10			

## 4. City of Alexandria, 4th and Monroe Sts. Water-stage recorder installed March 6, 1939.

Water level, in feet below measuring point, 1939

Jan. 6	8:45 a.m.	27.92	June 23	9:00 a.m.	14.70
13	8:40 a.m.	27.58	30	12:01 p.m.	15.25
20	8:55 a.m.	27.80	July 7	9:15 a.m.	15.28
27	8:40 a.m.	21.59	14	9:00 a.m.	15.65
31	8:40 a.m.	21.28	21	9:20 a.m.	16.20
Feb. 3	8:55 a.m.	21.09	28	9:35 a.m.	16.60
10	8:40 a.m.	20.89	Aug. 4	9:40 a.m.	16.65
14	8:45 a.m.	20.77	11	9:35 a.m.	17.02
21	8:35 a.m.	20.41	18	9:35 a.m.	17.29
24	8:55 a.m.	19.96	25	9:20 a.m.	17.49
28	8:45 a.m.	15.50	Sept. 1	9:25 a.m.	17.80
Mar. 3	8:30 a.m.	11.63	8	9:25 a.m.	18.06
6	4:00 p.m.	10.73	15	9:35 a.m.	18.42
10	8:40 a.m.	9.62	22	9:25 a.m.	18.66
17	8:55 a.m.	9.51	29	9:25 a.m.	18.98
24	8:40 a.m.	10.53	Oct. 6	9:25 a.m.	19.14
31	8:20 a.m.	11.24	13	9:45 a.m.	19.33
Apr. 7	8:40 a.m.	10.37	20	4:40 p.m.	19.64
14	9:00 a.m.	9.89	27	9:25 a.m.	19.22
21	9:00 a.m.	9.73	Nov. 3	9:05 a.m.	19.36
28	9:05 a.m.	9.35	10	9:30 a.m.	19.53
May 5	9:30 a.m.	9.96	17	9:35 a.m.	19.68
12	8:50 a.m.	11.28	24	9:30 a.m.	19.57
19	9:05 a.m.	12.54	Dec. 1	9:45 a.m.	19.75
26	9:30 a.m.	12.72	8	9:00 a.m.	19.88
June 2	8:55 a.m.	13.22	15	9:30 a.m.	20.05
9	9:20 a.m.	13.26	22	9:40 a.m.	20.13
16	9:25 a.m.	14.10	29	9:25 a.m.	18.98

## Rapides Parish--Continued

5. Louisiana Ice and Electric Company. Fourth and Monroe Sts.,  
Alexandria. Casing pulled Dec. 10, 1939.

Water level, in feet below measuring point, 1939

Date	Hour	Water level	Date	Hour	Water level
Jan. 6	8:35 a.m.	127.12	June 16	9:35 a.m.	129.16
13	8:30 a.m.	125.54	23	9:10 a.m.	131.28
20	8:45 a.m.	126.21	30	12:10 p.m.	131.03
27	8:25 a.m.	126.09	July 7	9:25 a.m.	132.63
Feb. 3	8:45 a.m.	125.28	14	9:10 a.m.	133.40
10	8:30 a.m.	122.66	21	9:30 a.m.	135.94
17	8:45 a.m.	120.55	28	9:45 a.m.	137.79
24	8:45 a.m.	119.36	Aug. 4	9:50 a.m.	140.01
Mar. 3	8:20 a.m.	118.32	11	9:45 a.m.	140.19
10	.....	118.25	18	9:45 a.m.	140.08
17	9:00 a.m.	115.68	25	9:20 a.m.	138.44
24	8:50 a.m.	122.38	Sept. 1	9:35 a.m.	136.45
31	8:35 a.m.	126.30	8	9:35 a.m.	140.45
Apr. 7	8:55 a.m.	126.63	15	9:45 a.m.	141.27
14	9:10 a.m.	126.54	22	9:35 a.m.	140.61
21	9:10 a.m.	126.96	29	9:35 a.m.	140.59
28	9:15 a.m.	126.06	Oct. 6	9:35 a.m.	137.25
May 5	9:45 a.m.	126.12	13	9:55 a.m.	134.76
12	9:00 a.m.	124.72	20	4:47 p.m.	134.42
19	9:15 a.m.	125.83	27	9:35 a.m.	133.47
26	9:40 a.m.	126.26	Nov. 3	9:15 a.m.	132.86
June 2	9:05 a.m.	128.06	10	9:40 a.m.	132.58
9	9:30 a.m.	128.18	17	9:45 a.m.	131.10

7. Measurements discontinued.

11. Measurements discontinued.

12. Measurements discontinued.

20. City of Alexandria. SW cor. old swimming pool in City Park.  
Water-stage recorder installed May 19, 1939.

Water level, in feet below measuring point, 1939

Jan. 6	10:20 a.m.	83.44	July 7	8:35 a.m.	76.05
13	10:25 a.m.	83.34	14	8:25 a.m.	75.98
20	10:35 a.m.	83.42	21	8:40 a.m.	75.98
27	10:30 a.m.	83.35	28	9:00 a.m.	75.55
Feb. 3	10:25 a.m.	83.24	Aug. 4	9:00 a.m.	75.04
10	10:25 a.m.	82.74	11	9:00 a.m.	75.18
17	11:20 a.m.	82.57	18	8:50 a.m.	74.48
24	11:30 a.m.	82.07	25	8:45 a.m.	73.89
Mar. 3	11:00 a.m.	81.89	Sept. 1	8:45 a.m.	73.47
10	11:15 a.m.	81.79	8	8:45 a.m.	73.24
17	1:00 p.m.	81.65	15	8:56 a.m.	73.14
24	10:45 a.m.	81.30	22	8:40 a.m.	73.28
31	12:20 p.m.	80.80	29	8:45 a.m.	73.38
Apr. 7	11:25 a.m.	80.49	Oct. 6	8:45 a.m.	73.28
14	11:25 a.m.	80.16	13	8:45 a.m.	72.87
21	11:00 a.m.	79.74	20	4:15 p.m.	72.87
28	2:10 p.m.	80.98	27	8:35 a.m.	72.63
May 5	1:00 p.m.	78.17	Nov. 3	8:30 a.m.	72.85
12	11:10 a.m.	79.36	10	8:50 a.m.	72.87
19	2:25 p.m.	78.86	17	8:35 a.m.	72.59
23	12:05 p.m.	78.49	24	8:55 a.m.	72.46
26	9:00 a.m.	78.35	Dec. 1	9:10 a.m.	72.34
June 2	8:20 a.m.	77.76	8	8:35 a.m.	72.16
9	8:45 a.m.	77.49	15	8:50 a.m.	72.28
16	8:45 a.m.	76.92	22	9:00 a.m.	72.49
23	8:20 a.m.	76.58	29	8:45 a.m.	72.06
30	11:20 a.m.	76.55			

## Rapides Parish--Continued

21. City of Alexandria. Fourth and St. James Sts.  
Water level, in feet below measuring point, 1939

Date	Hour	Water level	Date	Hour	Water level
Jan. 6	9:25 a.m.	76.74	July 7	10:00 a.m.	73.22
13	9:10 a.m.	76.00	14	9:50 a.m.	73.30
20	9:20 a.m.	75.64	21	10:10 a.m.	72.59
27	9:10 a.m.	75.65	28	10:30 a.m.	73.60
Feb. 3	9:20 a.m.	75.49	Aug. 4	10:20 a.m.	73.35
10	9:10 a.m.	75.01	11	10:15 a.m.	73.36
17	9:13 a.m.	75.26	13	10:20 a.m.	73.30
24	9:17 a.m.	74.62	25	9:55 a.m.	73.26
Mar. 3	9:25 a.m.	73.82	Sept. 1	10:15 a.m.	73.08
10	9:25 a.m.	73.78	8	10:10 a.m.	73.00
17	9:25 a.m.	74.03	15	10:15 a.m.	72.95
24	9:30 a.m.	73.89	22	10:10 a.m.	73.18
31	9:45 a.m.	73.52	29	10:10 a.m.	73.94
Apr. 7	9:30 a.m.	73.13	Oct. 6	10:15 a.m.	72.19
14	9:55 a.m.	72.93	13	10:35 a.m.	71.57
21	9:40 a.m.	72.88	20	5:08 p.m.	70.90
28	9:50 a.m.	72.04	27	10:15 a.m.	70.25
May 5	10:05 a.m.	72.68	Nov. 3	10:00 a.m.	70.12
12	9:30 a.m.	72.70	10	10:20 a.m.	69.35
19	9:45 a.m.	72.08	17	10:25 a.m.	68.86
26	10:15 a.m.	71.98	24	10:15 a.m.	68.73
June 2	10:00 a.m.	72.60	Dec. 1	10:25 a.m.	68.07
9	10:00 a.m.	72.47	8	9:40 a.m.	67.57
16	10:10 a.m.	72.56	13	10:10 a.m.	67.23
23	9:40 a.m.	73.03	22	10:20 a.m.	66.74
30	1:30 p.m.	73.06	29	10:05 a.m.	66.00

22. J. N. Balls, Alexandria, Kent Park at Texas Avenue. Water level, in feet below measuring point, 1939: Aug. 15, 9:00 a.m., 23.55.

26. Missouri Pacific R. R., Alexandria, abandoned roundhouse on N. 13th St. Equipped with water-stage recorder.

Water level, in feet below measuring point, 1939

Jan. 6	10:40 a.m.	94.44	July 7	9:00 a.m.	97.53
13	10:50 a.m.	94.38	14	8:45 a.m.	97.87
20	11:00 a.m.	94.47	21	9:00 a.m.	98.70
27	10:55 a.m.	94.63	28	9:20 a.m.	100.02
Feb. 3	10:50 a.m.	94.68	Aug. 4	9:21 a.m.	99.85
10	1:00 p.m.	91.94	11	9:20 a.m.	100.66
17	10:30 a.m.	91.02	18	9:10 a.m.	100.91
24	11:00 a.m.	89.89	25	9:05 a.m.	100.76
Mar. 3	8:55 a.m.	89.11	Sept. 1	9:05 a.m.	100.79
10	10:20 a.m.	88.80	8	9:05 a.m.	101.24
17	10:30 a.m.	90.88	15	9:15 a.m.	101.93
24	11:00 a.m.	92.76	22	9:05 a.m.	102.10
31	10:30 a.m.	93.76	29	9:05 a.m.	102.15
Apr. 7	10:20 a.m.	94.42	Oct. 6	9:05 a.m.	101.40
14	8:40 a.m.	94.79	13	9:25 a.m.	100.93
21	8:30 a.m.	95.16	20	4:25 p.m.	100.62
28	8:45 a.m.	95.33	27	9:05 a.m.	100.27
May 5	8:45 a.m.	94.44	Nov. 3	8:50 a.m.	100.17
12	8:40 a.m.	94.16	10	9:10 a.m.	99.91
19	8:50 a.m.	93.20	17	9:10 a.m.	99.80
26	9:15 a.m.	94.86	24	9:10 a.m.	99.70
June 2	8:40 a.m.	95.47	Dec. 1	9:30 a.m.	99.30
9	9:05 a.m.	95.68	8	8:50 a.m.	98.42
16	9:10 a.m.	96.34	15	9:10 a.m.	98.42
23	8:45 a.m.	96.98	22	9:20 a.m.	99.38
30	11:45 a.m.	97.33	29	9:50 a.m.	99.47

## Rapides Parish--Continued

28. Rock Island R. R. Shop on Maple St., Alexandria.

Water level, in feet below measuring point, 1939

Date	Hour	Water level	Date	Hour	Water level
Jan. 17	10:00 a.m.	0.86	Apr. 14	10:10 a.m.	1.07
Feb. 17	9:30 a.m.	.85	June 20	10:00 a.m.	1.05
Mar. 3	9:35 a.m.	.86	Aug. 3	10:35 a.m.	1.20

29. Measurements discontinued.

30. Bailey Gaunce Refinery. Ninth Street near Maple Street, Alexandria. Water levels, in feet below measuring point, 1939: Jan. 17, 10:30 a.m., 8.08; Aug. 3, 11:00 a.m., 14.56.

33. Measurements discontinued.

35. Pine Products Company, Alexandria. Equipped with water-stage recorder.

Water level, in feet below measuring point, 1939

Jan. 6	10:00 a.m.	94.42	July 7	10:15 a.m.	99.45
13	10:10 a.m.	94.98	14	10:05 a.m.	99.94
20	10:20 a.m.	95.44	21	10:30 a.m.	100.43
27	10:15 a.m.	96.05	28	10:45 a.m.	101.10
Feb. 3	10:10 a.m.	96.55	Aug. 4	11:15 a.m.	101.58
10	10:05 a.m.	96.25	11	10:35 a.m.	101.97
17	10:05 a.m.	94.28	18	10:40 a.m.	102.49
24	10:00 a.m.	92.86	25	10:10 a.m.	102.79
Mar. 3	9:45 a.m.	92.10	Sept. 1	10:40 a.m.	103.03
10	9:50 a.m.	91.20	8	10:30 a.m.	103.25
17	10:00 a.m.	91.98	15	10:35 a.m.	103.74
24	10:20 a.m.	92.93	22	10:30 a.m.	104.25
31	10:00 a.m.	93.57	29	10:30 a.m.	104.72
Apr. 7	9:50 a.m.	93.99	Oct. 6	10:35 a.m.	105.05
14	10:25 a.m.	94.42	13	10:55 a.m.	105.24
21	10:00 a.m.	94.95	20	5:15 p.m.	105.46
28	10:30 a.m.	95.44	27	10:50 a.m.	105.74
May 5	10:15 a.m.	95.71	Nov. 3	3:55 p.m.	106.06
12	9:45 a.m.	96.01	10	10:40 a.m.	106.35
19	10:00 a.m.	95.63	17	10:50 a.m.	106.65
26	10:30 a.m.	96.24	24	10:45 a.m.	106.82
June 2	10:15 a.m.	96.68	Dec. 1	8:50 a.m.	106.45
9	10:10 a.m.	97.49	8	10:00 a.m.	105.88
16	10:25 a.m.	98.11	15	10:30 a.m.	104.78
23	10:15 a.m.	98.58	22	10:35 a.m.	105.23
30	1:40 p.m.	99.05	29	10:45 a.m.	104.43

43A. Missouri Pacific R. R., Alexandria. Water level, in feet below measuring point, 1939: Sept. 20, 5:40 p.m., 94.22.

45. Louisiana Ice and Electric Company. Ice dock, 3 miles southeast of Alexandria on Highway 71. Water level, in feet below measuring point, 1939: Sept. 20, 6:10 p.m., 66.72.

61. Measurements discontinued.

62. Measurements discontinued.

63. Measurements discontinued.

67. Louisiana Ice and Electric Company, Lecompte. Water level, in feet below measuring point, 1939: Aug. 3, 10:25 a.m., 65.04.

74. Measurements discontinued.

77. J. C. McNutt. SW cor. sec. 19, T. 1 N., R. 2 E., Cheneyville. Water level, in feet below measuring point, 1939: Aug. 3, 12:20 p.m., 17.97.

78. Percy Hoyt. SW cor. sec. 20, T. 1 N., R. 2 E., Cheneyville. Water level, in feet below measuring point, 1939: Aug. 3, 12:05 p.m., 17.88.



## Rapides Parish--Continued

82. Measurements discontinued.

83. Measurements discontinued.

85. H. K. Bubenzer. Five miles southeast of Cheneyville on Highway 71. Water level, in feet below measuring point, 1939: Aug. 3, 10:50 a.m., 18.43.

88. Measurements discontinued.

89. State Colony Farm. SE cor. sec. 39, T. 4 N., R. 2 W. Water level, in feet below measuring point, 1939: Aug. 17, 10:25 a.m., 2.82.

90. J. A. Brown. SW cor. sec. 73, T. 4 N., R. 2 W. Water level, in feet below measuring point, 1939: Aug. 17, 15.65.

92. Measurements discontinued.

98. Measurements discontinued.

106. Measurements discontinued.

115. Measurements discontinued.

124. Measurements discontinued.

133. Texas and Pacific R. R. Two hundred feet southeast of old water tank, Boyce. Water level, in feet below measuring point, 1939: Aug. 10, 10:05 a.m., 3.80.

135. Arbuthnot mill site. Sec. 61, T. 5 N., R. 3 W.  
Water level, in feet above measuring point, 1939

Date	Hour	Water level	Date	Hour	Water level
Jan. 5	.....	9.1	June 1	5:35 p.m.	8.9
12	11:25 a.m.	9.7	8	11:10 a.m.	8.9
19	11:25 a.m.	9.9	15	11:15 a.m.	8.9
27	5:35 p.m.	9.3	22	10:05 a.m.	8.3
Feb. 2	11:05 a.m.	9.5	29	11:00 a.m.	8.6
9	11:15 a.m.	9.5	July 6	10:15 a.m.	8.7
16	11:45 a.m.	9.5	13	11:15 a.m.	8.9
23	11:45 a.m.	9.7	20	2:15 p.m.	8.0
Mar. 2	10:55 a.m.	10.3	27	11:45 a.m.	7.9
9	10:45 a.m.	9.8	Aug. 10	9:45 a.m.	7.9
16	10:45 a.m.	9.5	25	2:15 p.m.	8.1
23	10:50 a.m.	9.1	Sept. 7	9:50 a.m.	8.1
30	10:55 a.m.	9.1	22	10:00 a.m.	7.6
Apr. 6	11:50 a.m.	9.9	Oct. 4	9:35 a.m.	7.3
13	11:30 a.m.	9.9	18	9:40 a.m.	7.8
21	5:55 p.m.	9.7	Nov. 1	9:55 a.m.	8.1
27	11:45 a.m.	9.5	16	9:50 a.m.	8.1
May 4	11:45 a.m.	8.9	30	12:25 p.m.	7.8
11	11:25 a.m.	8.8	Dec. 14	9:40 a.m.	7.7
18	6:10 p.m.	8.9	27	9:55 a.m.	8.6
25	10:55 a.m.	8.8			

138. Texas and Pacific R. R. Quarry station, sec. 1, T. 5 N., R. 4 W.

Water level, in feet above measuring point, 1939

Jan. 5	.....	0.70	Mar. 9	10:05 a.m.	0.87
12	.....	.82	16	10:20 a.m.	.70
19	10:30 a.m.	.77	23	10:05 a.m.	.71
27	4:55 p.m.	.78	30	.....	.76
Feb. 2	10:15 a.m.	.79	Apr. 6	11:10 a.m.	.75
9	11:15 a.m.	.76	13	10:45 a.m.	.66
16	11:00 a.m.	.68	21	5:15 p.m.	.70
23	11:00 a.m.	.76	27	11:00 a.m.	.69
Mar. 2	10:15 a.m.	.92	May 4	11:00 a.m.	.66

## Rapides Parish--Continued

## 138. Texas and Pacific R. R.--Continued

Water level, in feet above measuring point, 1939

Date	Hour	Water level	Date	Hour	Water level
May 11	10:45 a.m.	0.60	Aug. 10	9:10 a.m.	0.44
18	5:30 p.m.	.60	25	1:40 p.m.	.65
25	10:15 a.m.	.65	Sept. 7	9:05 a.m.	.49
June 2	4:55 p.m.	.65	22	9:10 a.m.	.64
8	10:25 a.m.	.67	Oct. 4	8:55 a.m.	.60
15	10:30 a.m.	.65	18	9:00 a.m.	.61
23	9:20 a.m.	.57	Nov. 1	9:05 a.m.	.66
29	10:10 a.m.	.50	16	9:05 a.m.	.67
July 6	9:30 a.m.	.60	30	11:45 a.m.	.72
13	10:30 a.m.	.56	Dec. 14	9:00 a.m.	.68
20	1:30 p.m.	.50	27	9:10 a.m.	1.13
27	11:00 a.m.	.29			

139. H. Dearborn. Quarry station, sec. 1, T. 5 N., R. 4 W.  
Water level, in feet below measuring point, 1939

Jan. 5	.....	16.83	June 1	5:05 p.m.	15.49
12	10:45 a.m.	16.50	8	10:35 a.m.	15.40
19	10:45 a.m.	16.35	15	10:40 a.m.	15.51
27	5:10 p.m.	16.28	22	9:30 a.m.	15.60
Feb. 2	10:25 a.m.	15.88	29	10:20 a.m.	15.90
9	10:40 a.m.	16.52	July 6	9:40 a.m.	15.67
16	11:10 a.m.	15.76	13	10:40 a.m.	15.87
23	11:10 a.m.	15.72	20	1:40 p.m.	15.95
Mar. 2	10:25 a.m.	15.47	27	11:10 a.m.	16.18
9	10:15 a.m.	15.35	Aug. 10	9:20 a.m.	16.43
16	10:30 a.m.	15.39	25	1:50 p.m.	16.52
24	10:15 a.m.	15.55	Sept. 7	9:15 a.m.	16.75
30	10:25 a.m.	15.37	22	9:20 a.m.	17.05
Apr. 6	11:20 a.m.	15.30	Oct. 4	9:05 a.m.	17.23
13	10:55 a.m.	15.60	18	9:10 a.m.	17.46
21	5:25 p.m.	15.54	Nov. 1	9:15 a.m.	17.59
27	11:10 a.m.	15.53	16	9:15 a.m.	17.62
May 4	11:10 a.m.	15.78	30	11:55 a.m.	17.78
11	10:55 a.m.	15.83	Dec. 14	9:10 a.m.	18.40
18	5:40 p.m.	15.88	27	9:20 a.m.	17.40
25	10:25 a.m.	15.67			

150. Grady Kelly. Sec. 82, T. 4 N., R. 1 W. Water level, in feet below measuring point, 1939: Aug. 17, 18.60.

161. Measurements discontinued.

165. Measurements discontinued.

167. Measurements discontinued.

171. Measurements discontinued.

182. Measurements discontinued.

183. O. T. Oden. Eight miles south of Alexandria on Highway 165. Water levels, in feet below measuring point, 1939: Jan. 20, 4:40 p.m., 27.42; Aug. 11, 11:50 a.m., 28.16.

184. O. T. Oden. Eight miles south of Alexandria on Highway 165. Water levels, in feet below measuring point, 1939: Jan. 20, 26.25; Aug. 11, 11:55 a.m., 27.17.

## Rapides Parish--Continued

188. J. H. Wise. Woodworth.

Water level, in feet below measuring point, 1939

Date	Hour	Water level	Date	Hour	Water level
Jan. 6	.....	9.55	June 3	8:50 a.m.	8.08
12	11:55 a.m.	9.15	9	11:35 a.m.	9.11
19	.....	8.97	16	2:30 p.m.	8.31
27	12:30 p.m.	9.10	23	12:40 p.m.	6.75
Feb. 3	12:45 p.m.	9.22	July 1	10:30 a.m.	8.30
10	11:50 a.m.	9.25	7	12:55 p.m.	8.80
17	11:50 a.m.	9.02	14	1:40 p.m.	8.65
24	11:55 a.m.	9.48	21	11:40 a.m.	8.92
Mar. 3	11:35 a.m.	9.12	28	12:10 p.m.	8.50
10	11:40 a.m.	9.31	Aug. 11	12:15 p.m.	6.21
17	1:30 p.m.	9.15	25	11:35 a.m.	7.73
24	12:45 p.m.	9.01	Sept. 8	5:00 p.m.	7.91
31	12:01 p.m.	9.17	22	12:20 p.m.	7.39
Apr. 7	11:55 a.m.	9.05	Oct. 6	1:30 p.m.	7.39
14	11:50 a.m.	9.03	21	8:50 a.m.	7.54
21	11:25 a.m.	9.00	Nov. 4	9:05 a.m.	7.55
28	3:00 p.m.	8.37	17	1:00 p.m.	5.71
May 5	5:30 p.m.	8.13	Dec. 1	12:45 p.m.	7.40
12	11:40 a.m.	8.24	14	12:40 p.m.	7.37
19	11:55 a.m.	9.09	28	12:45 p.m.	7.40
26	3:20 p.m.	9.02			

201. Louisiana Ice and Electric Company. Pineville, in street behind power plant. Abandoned drilled public supply well, diameter 10 inches, depth 1,090 feet. Measuring point, bottom edge 2-inch elbow on airline, 1.95 feet above concrete base which is 1.75 feet above land surface, and 117 feet above mean gulf level.

Water level, in feet below measuring point, 1939

Nov. 4	11:00 a.m.	140.91	Nov. 24	11:35 a.m.	139.62
9	11:00 a.m.	141.02	Dec. 1	11:15 a.m.	139.27
13	11:00 a.m.	140.76	8	11:00 a.m.	139.96
13	2:00 p.m.	140.87	15	11:25 a.m.	139.93
13	5:00 p.m.	140.80	22	11:35 a.m.	140.48
15	3:00 p.m.	140.39	29	11:40 a.m.	140.06

203. Louisiana College. Pineville. Water level, in feet below measuring point, 1939: Sept. 15, 11:45 a.m., 139.79.

207. State Hospital for Insane. Pineville. Water level, in feet below measuring point, 1939: Sept. 20, 67.05.

208. State Hospital for Insane. Pineville. Water level, in feet below measuring point, 1939: Sept. 20, 10:15 a.m., 144.20.

209. Veterans Hospital. Pineville. No measurements made in 1939.

212. Veterans Hospital. Pineville. Water level, in feet below measuring point, 1939: Aug. 18, 136.56.

218. Camp Beauregard. About 5 miles north of Pineville on Highway 165. Equipped with water-stage recorder.

Water level, in feet below measuring point, 1939

Jan. 6	11:10 a.m.	75.44	Apr. 7	10:45 a.m.	75.42
13	11:20 a.m.	75.35	14	11:00 a.m.	75.53
20	11:25 a.m.	75.42	21	10:30 a.m.	75.53
27	11:15 a.m.	75.45	28	11:20 a.m.	75.56
Feb. 3	11:20 a.m.	75.29	May 5	11:15 a.m.	75.65
10	11:15 a.m.	75.36	12	10:30 a.m.	75.68
17	10:55 a.m.	75.44	19	10:35 a.m.	73.81
24	10:35 a.m.	75.43	26	11:00 a.m.	74.14
Mar. 3	10:30 a.m.	75.38	June 2	11:40 a.m.	74.37
10	10:50 a.m.	75.35	9	10:30 a.m.	74.45
17	11:15 a.m.	75.38	16	11:10 a.m.	74.84
24	11:30 a.m.	75.38	23	10:55 a.m.	75.22
31	11:00 a.m.	75.32	30	2:05 p.m.	75.62

## WATER LEVELS AND ARTESIAN PRESSURE, 1939

## Rapides Parish--Continued

213. Camp Beauregard.--Continued

Water level, in feet below measuring point, 1939

Date	Hour	Water level	Date	Hour	Water level
July 7	10:45 a.m.	76.02	Oct. 6	11:10 a.m.	78.13
14	10:30 a.m.	76.38	13	11:30 a.m.	78.20
21	11:00 a.m.	76.77	20	5:40 p.m.	78.24
28	11:10 a.m.	77.14	27	11:00 a.m.	78.15
Aug. 4	11:45 a.m.	77.00	Nov. 3	2:40 p.m.	78.25
11	11:10 a.m.	77.27	10	11:55 a.m.	78.29
18	11:30 a.m.	77.23	17	11:15 a.m.	78.28
25	10:40 a.m.	77.33	24	11:15 a.m.	78.25
Sept. 1	11:15 a.m.	77.35	Dec. 1	10:55 a.m.	78.24
8	11:05 a.m.	77.50	8	10:35 a.m.	78.31
15	11:15 a.m.	77.68	15	11:00 a.m.	78.31
22	11:05 a.m.	77.78	22	11:10 a.m.	78.32
29	11:00 a.m.	77.90	29	11:20 a.m.	78.09

244. Measurements discontinued.

261. Measurements discontinued.

## St. Tammany Parish

St-2. Mayer Israel. NE $\frac{1}{4}$  sec. 7, T. 6 S., R. 11 E., Covington. Drilled domestic well, diameter 3 inches, depth 1,620 feet. Measuring point, gage on top of 3-inch casing, 3.5 feet above land surface. Pressure, in pounds per square inch, 1939: Sept. 11, 37.75.

St-4. Poitevent and Favre Lumber Company. SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 9, T. 7 S., R. 12 E., on north side of Highway 114. Abandoned jetted industrial well, diameter 2 $\frac{1}{2}$  inches, depth 400 (?) feet. Measuring point, gage on overflow at road, 2.5 feet above land surface. Water level, in feet above gage, 1939: Sept. 12, 8.0.

St-6. Poitevent and Favre Lumber Company. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 17, T. 7 S., R. 13 E., on south side of Highway 114. Abandoned jetted industrial well, diameter 2 inches, depth 400 (?) feet. Measuring point, gage on discharge pipe at land surface. Water level, in feet above gage, 1939: Sept. 12, 6.5.

St-9. American Creosote Company. SW $\frac{1}{4}$  sec. 3, T. 10 S., R. 14 E., Slidell, on south side Highway 34. Abandoned drilled industrial well, diameter 4 inches. Measuring point, gage on bottom of discharge pipe, 2.0 feet above land surface. Pressure, in pounds per square inch, 1939: Sept. 12, 11.5.

St-10. State Fish Hatchery. Sec. 38, T. 8 S., R. 12 E., Lacombe, south well. Drilled public supply well, diameter 6 inches, depth 1,240 feet. Measuring point, gage on 6-inch discharge pipe, at land surface. Pressure, in pounds per square inch, 1939: Sept. 12, 16.75.

St-12. Tchefuncte State Park. Sec. 43, T. 8 S., R. 12 E., Golf Course. Drilled irrigation well, diameter 6 inches, depth 1,530 feet. Measuring point, gage on valve north of pump house, 1 foot above land surface. Pressure, in pounds per square inch, 1939: Sept. 12, 21.5.

St-16. Great Southern Lumber Company. Sec. 20, T. 5 S., R. 13 E., 0.5 mile south and 1.5 mile west of Bush. Abandoned drilled industrial well, diameter 4 inches, depth 1,000 (?) feet. Measuring point, gage on discharge pipe, 4.0 feet above land surface. Pressure, in pounds per square inch, 1939: Sept. 13, 10.5.

## Tangipahoa Parish

Ta-5. Southern United Ice Company. At rear of lot behind ice plant, Amite. Abandoned drilled industrial well, diameter 4 inches, depth 990 (?) feet. Measuring point, gage, 1.5 feet above top of 4-inch casing and 4.7 feet above land surface. Water level, in feet above gage, 1939: Aug. 3, 11.75.

Ta-7. Town of Ponchatoula. About 50 feet west of pumping station. Drilled public supply well, diameter 6 inches, depth 654 feet. Measuring point, gage, 0.8 foot above land surface at discharge pipe. Water level, in feet above gage, 1939: Aug. 8, 10.75.

Ta-8. Louisiana Cypress Lumber Company. NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 45, T. 7 S., R. 8 E., Ponchatoula, about 200 yards west of Highway 122, at railroad spur on road to lumber mill. Abandoned jetted industrial well, diameter 2 inches, depth 140 feet. Measuring point, gage on 1-inch pipe, 0.5 foot above reducer which is 0.5 foot above land surface. Water level, in feet above gage, 1939: Aug. 3, 5.1.

Ta-9. Williams Lumber Company. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 45, T. 7 S., R. 8 E., Ponchatoula, in center of old mill site. Drilled industrial well, diameter 6 inches, depth 530 feet. Measuring point, gage on top at well, 2 feet above land surface. Water level, in feet above gage, 1939: Aug. 3, 16.0.

Ta-10. Williams Lumber Company. NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 45, T. 7 S., R. 8 E., one mile south of Ponchatoula at arch across Highway 122. Abandoned jetted industrial well, diameter 2 inches. Measuring point, gage on 3/4-inch pipe on side of 2-inch casing, 4.1 feet above land surface. Water level, in feet above gage, 1939: Aug. 3, 21.1.

Ta-13. Louisiana Cypress Lumber Company. Ponchatoula, behind main office on Highway 122, in stock piles. Jetted industrial well, diameter 2 inches. Measuring point, top of 2-inch elbow, 5.0 feet above land surface. Water level, in feet above measuring point, 1939: Aug. 8, 2.80.

Ta-14. Illinois Central System. NW $\frac{1}{4}$  sec. 7, T. 7 S., R. 8 E., Hammond, 300 yards north of coal chute. Drilled industrial well, diameter 8 inches, depth 375 feet. Measuring point, gage on east 6-inch discharge pipe, 2 feet above land surface. Water level, in feet above gage, 1939: Aug. 9, 41.0.

Ta-17. Carl Blumquist. Center NE $\frac{1}{4}$  sec. 6, T. 6 S., R. 8 E., in field corner. Jetted irrigation well, diameter 2 inches, depth 495 feet. Measuring point, top of 2-inch pipe, 1 foot above land surface. Water level, in feet above measuring point, 1939: Aug. 9, 3.30.

Ta-19. V. Stevens. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 26, T. 7 S., R. 8 E., in field. Jetted irrigation well, diameter 2 inches, depth 535 feet. Measuring point, gage on 2-inch discharge pipe, 0.8 foot above land surface. Water level, in feet above gage, 1939: Aug. 9, 18.3.

Ta-21. Burns Davis. N $\frac{1}{4}$  irreg. sec. 54, T. 7 S., R. 7 E., at shed. Jetted irrigation well, diameter 2 inches, depth 343 feet. Measuring point, gage on 2-inch discharge pipe, 0.8 foot above land surface. Water level, in feet above gage, 1939: Aug. 9, 8.9.

Ta-22. W. B. Cornwell. Center sec. 31, T. 6 S., R. 7 E., at rear of house. Jetted irrigation well, diameter 1 $\frac{1}{2}$  inches, depth 342 feet. Measuring point, top of 1 $\frac{1}{2}$ -inch pipe, 1 foot above land surface. Water level, in feet above measuring point, 1939: Aug. 10, 1.10.

Ta-23. Otto Bignor. South line, sec. 50, T. 7 S., R. 7 E., in field. Jetted irrigation well, diameter 2 inches, depth 400 feet. Measuring point, top of 2-inch vertical pipe, 0.4 foot above land surface. Water level, in feet above measuring point, 1939: Aug. 10, 4.9.

Ta-24. Clyde Starkey. Center sec. 53, T. 7 S., R. 7 E., in field. Jetted irrigation well, diameter 2 inches, depth 383 feet. Measuring point, top of 2-inch pipe, 0.8 foot above land surface. Water level, in feet above gage, 1939: Aug. 10, 6.3.

Ta-36. Town of Kentwood. About 20 feet north of reservoir at pumping station, 2 blocks east of Highway 51. Drilled public supply well, diameter 10 inches, depth 672 feet. Measuring point, gage on top of 6-inch discharge pipe, 1.4 feet above land surface. Water level, in feet above gage, 1939: Sept. 11, 23.1.

# MARYLAND

By A. H. Horton

Periodic measurements of water levels have been made since April 18, 1932, in one observation well in Maryland by the Federal Geological Survey in cooperation with the Maryland Geological Survey and the Maryland Department of Health.

The well is an abandoned dug well lined with loose stone, at the rear of the residence owned by Walter M. Brown, 800 feet northeast of the gaging station of the Northwest Branch of the Anacostia River,  $1\frac{1}{2}$  miles southwest of Colesville, Montgomery County. A continuous water-stage recorder was maintained on this well during 1939. Water levels are given in feet above the same datum to which is referred the gage on the Northwest Branch of the Anacostia River.

Water level, in feet above datum, 1939  
(Mean daily stage obtained from recorder chart)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	7.99	8.97	11.53	10.83	10.82	9.32	8.34	7.62	a7.20	6.97	a7.47	7.61
2	8.01	9.03	11.52	10.77	10.74	9.26	8.32	7.60	a7.19	7.19	7.47	7.59
3	8.01	9.46	11.51	10.69	10.67	9.22	8.28	7.58	a7.19	7.49	7.48	7.58
4	8.01	9.90	11.51	10.63	10.62	9.19	8.27	7.56	a7.18	7.55	7.48	7.57
5	8.01	9.91	11.54	10.58	10.56	9.15	8.25	7.53	a7.18	7.57	7.53	7.56
6	8.02	9.97	11.59	10.64	10.50	9.13	8.22	7.51	a7.17	7.57	7.71	7.55
7	8.02	10.03	11.53	10.71	10.45	9.07	8.20	7.49	a7.16	7.58	7.75	7.54
8	8.03	10.01	11.44	10.69	10.40	9.03	8.18	7.47	a7.16	7.58	7.78	7.54
9	8.03	10.02	11.48	10.67	10.37	9.00	8.16	7.45	7.15	7.58	7.78	7.53
10	8.05	10.11	11.40	10.63	10.31	8.95	8.13	7.44	7.15	7.58	7.78	7.53
11	8.04	10.42	11.35	10.61	10.24	8.92	8.11	7.41	7.14	7.58	7.80	7.52
12	8.02	10.55	11.40	10.53	10.15	8.86	8.08	7.38	7.12	7.58	7.80	7.50
13	8.02	10.62	11.52	10.41	10.12	8.81	8.06	7.36	7.11	7.56	7.80	7.50
14	8.02	10.67	11.40	10.40	10.10	8.81	8.05	7.34	7.10	7.56	7.80	7.50
15	8.00	10.77	11.38	10.40	10.07	8.75	8.01	7.32	7.10	7.55	7.79	7.49
16	8.00	10.91	11.56	10.41	10.02	8.72	7.97	7.30	7.09	7.53	7.78	7.50
17	8.00	10.93	11.59	10.65	9.98	8.69	7.95	7.28	7.09	7.52	7.79	7.51
18	8.01	11.00	11.51	10.92	9.92	8.65	7.93	7.25	7.07	a7.50	7.78	7.51
19	8.02	11.00	11.43	10.99	9.88	8.60	7.91	7.39	7.05	a7.50	7.78	7.50
20	8.00	10.99	11.42	10.91	9.84	8.59	7.88	7.39	7.04	a7.50	7.77	7.55
21	7.99	10.94	11.34	10.85	9.80	8.56	7.85	7.38	7.03	a7.49	7.75	7.64
22	8.06	10.90	11.29	10.79	9.77	8.54	7.83	7.37	7.02	a7.49	7.74	7.64
23	8.09	10.81	11.18	10.72	9.71	8.53	7.82	7.35	7.00	a7.49	7.73	7.65
24	8.10	10.80	11.14	10.70	9.64	8.50	7.80	7.34	6.98	a7.49	7.72	7.66
25	8.12	10.71	11.08	10.67	9.56	8.46	7.77	7.32	6.97	a7.49	7.70	7.67
26	8.11	10.85	11.00	10.69	9.53	8.41	7.75	7.31	6.95	a7.48	7.68	7.67
27	8.12	11.00	10.93	10.99	9.49	8.38	7.73	7.30	6.94	a7.48	7.67	7.68
28	8.12	11.14	10.87	11.01	9.49	8.36	7.71	7.27	6.91	a7.48	7.67	7.68
29	8.19	.....	10.75	10.94	9.49	8.35	7.68	7.26	6.89	a7.48	7.65	7.67
30	8.70	.....	10.81	10.91	9.42	8.37	7.67	7.25	6.90	a7.48	7.63	7.68
31	9.00	.....	10.88	.....	9.37	.....	7.68	a7.23	.....	a7.47	.....	7.69

a Interpolated.

## MASSACHUSETTS

By M. L. Brashears, Jr.

In 1938 a study of the ground-water resources of Massachusetts was started by the Federal Geological Survey in cooperation with the Massachusetts Department of Public Works. Work was begun in the Lowell and Aberjona River Valley areas, where considerable quantities of ground water are withdrawn, and also in Winchendon and Leominster, where ground-water levels are not affected by pumping. An inventory of wells was started in the Lowell area in October 1938. Observations of water levels in wells were first made in the Lowell area during May 1939; in the Aberjona River Valley during August 1939; and at Leominster and Winchendon during July 1939.

Most of the observation wells penetrate unconsolidated glacial material, which ranges in composition from stratified sand and gravel to more or less unstratified sandy clay. A few of the observation wells probably penetrate bedrock for a few feet or end at the contact of the bedrock with glacial deposits. It appears probable that well Lowell 22 penetrates bedrock to a considerable depth.

To the present time, an inventory of wells has been completed in 12 townships and partly completed in 10 townships in the Lowell area. Weekly water-level measurements were made in 10 wells in the Lowell area and in 8 wells in the Aberjona River Valley area during the last half of 1939. During the same period, three automatic water-stage recorders were operated continuously at Lowell, Leominster, and Winchendon. About 450 individual measurements of water level were made in 1939.

At the end of 1939, water levels in 5 of the 8 wells in the Aberjona River Valley and in 6 of the 11 wells in the Lowell area showed a net rise during the period of record, which began in the summer of 1939. The water level in the well at Winchendon showed a net decline and in the well at Leominster a net rise during the period of record from the summer to the end of 1939. During the same period the lowest water level measured occurred during October or November in 6 of the 8 wells in the Aberjona Valley, in 9 of the 11 wells in the Lowell area, and in the wells at Leominster and Winchendon. In general, the rainfall in the vicinity of the observation wells was below normal during the period of water-level measurements in 1939. Water levels in all the observation wells in the Lowell and Aberjona River Valley areas are probably affected by withdrawals close by, whereas water levels in the wells at Leominster and Winchendon are probably not so affected.

## WATER LEVELS AND ARTESIAN PRESSURE, 1939

## Middlesex County

Chelmsford 68. Wannalancit Trotting Park. In northeast corner of area within abandoned trotting track, 55 feet south of north end of trotting track, 2,100 feet east of Middlesex Street (United States Highway 3), 1,300 feet north of intersection of Trotting Park Lane and B. and M. Railroad tracks, and 0.5 mile north of Vinal Square, North Chelmsford. Abandoned drilled domestic well, diameter 6 inches, depth 44.6 feet below bottom of dug pit. Diameter of pit 60 inches at top, depth 5 feet. Measuring point, lowest edge of 0.14 foot hole in 6-inch cap at top of drilled well, 1.4 feet below land surface and 99.43 feet above mean sea level. First measured July 27, 1939. Water level July 27, 1939, 8.14 feet below measuring point and 91.29 feet above mean sea level.

## Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
July 27	91.29	Sept. 5	91.00	Oct. 17	90.98	Nov. 28	91.94
Aug. 1	91.28	12	91.20	24	90.85	Dec. 5	91.95
8	91.48	19	91.15	31	91.12	12	92.10
15	91.15	26	90.87	Nov. 7	91.93	19	92.10
22	91.11	Oct. 3	90.62	14	92.06	26	92.18
29	91.25	10	90.96	21	91.98		

Chelmsford 69. City of Lowell, Washington test well 2. About 2,100 feet southeast of Chelmsford Street, 300 feet southwest of Ecuador Road, and about 1.7 miles northeast of Chelmsford Center, Chelmsford. Driven test well, diameter 2 inches, depth 45.3 feet below land surface. Measuring point, top of 2-inch casing, 0.7 foot above land surface and 103.62 feet above mean sea level. First measured on Aug. 22, 1939. Water level Aug. 22, 1939, 4.46 feet below measuring point and 99.16 feet above mean sea level.

## Water level, in feet above mean sea level, 1939

Aug. 22	99.16	Sept. 26	98.71	Oct. 31	99.31	Dec. 5	99.65
29	99.11	Oct. 3	98.99	Nov. 7	100.00	12	99.61
Sept. 5	99.35	10	99.22	14	99.71	19	99.63
12	98.84	17	98.88	21	99.53	26	100.17
19	98.60	24	98.56	28	99.48		

Lowell 4. New England and Southern Mills well 1. About 135 feet north of Marginal Street, about 1,000 feet east of Pawtucket Street bridge over B. and M. Railroad tracks, Lowell. Unused dug industrial well, diameter 60 inches at top and 144 inches at bottom, depth 22.0 feet below land surface. Measuring point, top of instrument shelf, 2.2 feet above land surface, 1.90 feet above top of concrete casing, and 104.46 feet above mean sea level. Automatic water-stage recorder operated on well since May 25, 1939. Water level May 26, 1939, 11.50 feet below measuring point and 92.96 feet above mean sea level.

Lowest daily water level, in feet above mean sea level, 1939  
(from recorder charts)

Day	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1		92.82	92.28	91.58	91.01	90.48	92.18	91.49
2	.....	92.75	92.33	91.58	90.99	90.51	92.18	91.43
3	.....	92.74	92.43	91.61	91.01	90.60	92.19	91.43
4	.....	92.75	92.48	91.66	91.19	90.74	92.20	91.63
5	.....	92.73	92.50	91.69	91.34	90.88	92.22	a 91.77
6	.....	92.62	92.36	91.73	91.41	90.98	92.28	a 91.98
7	.....	92.55	92.19	91.78	91.41	91.04	92.26	92.00
8	.....	92.54	92.05	91.64	91.40	91.06	92.17	91.90
9	.....	92.53	91.98	91.47	91.41	91.16	92.17	91.85
10	.....	92.53	91.98	91.34	91.42	a 91.27	92.20	91.86
11	.....	92.62	91.98	91.27	91.56	91.23	92.21	91.95
12	.....	92.65	91.92	91.24	91.65	91.19	92.28	91.90
13	.....	92.60	91.81	91.26	91.62	91.16	92.27	91.83
14	.....	92.57	91.71	91.38	91.57	91.12	92.11	91.80
15	.....	92.55	91.64	91.38	91.49	91.12	92.02	91.78
16	.....	92.53	91.64	91.30	91.44	91.20	92.01	91.77
17	.....	92.54	91.68	91.23	91.45	91.23	91.97	91.83
18	.....	92.63	91.59	91.17	91.58	91.17	91.96	91.89
19	.....	92.68	91.53	91.11	91.65	91.08	91.96	91.86

a Estimated.



## Middlesex County--Continued

Lowell 4. New England and Southern Mills well 1.--Continued  
 Lowest daily water level, in feet above mean sea level, 1939  
 (from recorder charts)

Day	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
20	.....	92.69	91.46	91.11	91.61	90.96	92.02	91.82
21	.....	92.66	91.40	91.32	91.51	90.87	91.99	91.82
22	.....	92.62	91.39	91.41	91.35	90.87	91.94	91.83
23	.....	92.58	91.41	91.42	91.13	90.92	91.88	91.82
24	.....	92.58	91.55	91.51	90.97	90.96	91.82	91.86
25	.....	.....	91.52	91.52	90.88	91.01	91.81	91.97
26	92.96	.....	91.42	91.50	90.77	91.02	91.81	91.95
27	92.96	.....	91.36	91.51	90.69	91.03	91.91	91.87
28	92.95	92.45	91.32	91.65	90.61	91.07	91.77	91.70
29	92.91	92.36	91.32	91.55	90.54	91.09	91.61	91.46
30	92.91	92.28	91.35	91.34	90.48	91.24	91.55	91.33
31	92.88	.....	91.50	91.14	.....	91.37	.....	91.33

Lowell 9. Roark Estate. About 25 feet east of Wilder Street and 40 feet south of Parker Street, Lowell. Unused dug domestic well, diameter 36 inches, depth 15.4 feet below land surface. Measuring point, top of wood well cover, 2.0 feet above land surface and 174.47 feet above mean sea level. First measured May 29, 1939. Water level May 29, 1939, 12.11 feet below measuring point and 162.36 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 29	162.36	July 25	159.31	Sept. 19	157.21	Nov. 14	158.25
June 6	161.91	Aug. 1	158.94	26	(a)	21	158.45
13	161.41	8	158.60	Oct. 3	(a)	28	158.48
20	161.22	15	158.25	10	(a)	Dec. 5	158.55
27	160.87	22	158.00	17	(a)	12	158.75
July 4	160.56	29	157.89	24	(a)	19	158.94
11	160.11	Sept. 5	157.67	31	(a)	26	159.20
18	159.70	12	157.48	Nov. 7	157.51		

Lowell 14. Rogers Hall School. About 90 feet north of Rogers Street and about 2,000 feet east of Fort Hill Avenue, Lowell. Unused dug domestic well, diameter 24 inches, depth 29.7 feet below land surface. Measuring point, top of wood pump base, about at land surface and 157.78 feet above mean sea level. First measured May 29, 1939. Water level May 29, 1939, 10.59 feet below measuring point and 147.19 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 29	147.19	July 25	144.05	Sept. 19	143.11	Nov. 14	139.58
June 6	146.73	Aug. 1	144.04	26	142.81	21	141.01
13	146.21	8	143.88	Oct. 3	142.52	28	141.53
20	145.75	15	143.87	10	142.24	Dec. 5	141.73
27	145.33	22	144.28	17	141.98	12	141.80
July 4	144.97	29	144.03	24	141.72	19	141.85
11	144.62	Sept. 5	143.73	Nov. 7	135.32	26	141.96
18	144.28	12	143.42				

Lowell 18. Mrs. Logan. About 130 feet west of Rolfe Street and 500 feet south of Pawtucket Street, Lowell. Unused dug domestic well, diameter 24 inches, depth 36.6 feet below land surface. Measuring point, top of concrete well casing, 2.5 feet above land surface and 148.71 feet above mean sea level. First measured May 29, 1939. Water level May 29, 1939, 30.45 feet below measuring point and 118.26 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 29	118.26	July 25	118.30	Sept. 19	117.89	Nov. 14	117.85
June 6	118.21	Aug. 1	118.41	26	117.98	21	117.84
13	118.19	8	118.30	Oct. 3	117.95	28	117.84
20	118.15	15	118.18	10	117.91	Dec. 5	117.82
27	118.10	22	118.10	17	117.87	12	117.75
July 4	118.05	29	118.02	24	117.85	19	117.74
11	118.01	Sept. 5	117.98	31	117.84	26	117.72
18	118.40	12	117.95	Nov. 7	117.84		

a Dry.

## WATER LEVELS AND ARTESIAN PRESSURE, 1939

## Middlesex County--Continued

Lowell 22. Shaw Paper Co. About 70 feet south of Shaw Street and 270 feet east of Smith Street, Lowell. Unused drilled industrial well, diameter 6 inches, depth 250.2 feet below land surface. Measuring point, top of 6-inch iron casing, about at land surface and 116.88 feet above mean sea level. First measured Sept. 7, 1939. Water level Sept. 7, 1939, 8.52 feet below measuring point and 108.36 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Sept. 7	108.36	Oct. 10	108.52	Nov. 7	108.95	Dec. 5	108.83
12	108.19	17	108.27	14	109.11	12	108.79
19	108.11	24	108.02	21	108.96	19	108.86
26	108.48	31	108.08	28	108.90	26	109.07
Oct. 3	108.43						

Lowell 26. A. W. Crosby well 1. About 55 feet northeast of Pawtucket Boulevard Extension and about 4,500 feet west of East Avenue, Lowell. Unused dug domestic well, 5 inches square, depth 14.6 feet below land surface. Measuring point, top of small metal plate fastened to top of southwest side of wood casing, about at land surface and 102.26 feet above mean sea level. First measured Aug. 9, 1939. Water level Aug. 9, 1939, 10.59 feet below measuring point and 91.67 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Aug. 9	91.67	Sept. 19	90.75	Oct. 24	90.36	Nov. 28	91.67
15	91.49	26	90.67	31	90.37	Dec. 5	91.44
22	91.28	Oct. 3	90.52	Nov. 7	91.47	12	91.57
29	91.10	10	90.40	14	91.81	19	91.54
Sept. 5	90.96	17	90.39	21	91.79	26	91.74
12	90.84						

Lowell 33. Thomas Varnum. About 400 feet south of Varnum Avenue and 50 feet west of intersection of Varnum Avenue and West Meadow Road. Unused dug domestic well, diameter 27 inches, depth 13.0 feet below land surface. Measuring point, small piece of white sandstone set in large granite rock at top of south side of well casing, about at land surface and 101.83 feet above mean sea level. First measured May 29, 1939. Water level May 29, 1939, 7.75 feet below measuring point and 94.08 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 29	94.08	July 25	92.02	Sept. 19	91.70	Nov. 14	92.72
June 6	93.68	Aug. 1	91.92	26	91.51	21	92.59
13	93.34	8	92.03	Oct. 3	91.53	28	92.55
20	93.35	15	91.71	10	91.56	Dec. 5	92.88
27	93.28	22	91.70	17	91.42	12	92.93
July 4	93.07	29	91.74	24	91.33	19	92.94
11	92.68	Sept. 5	91.79	31	91.72	26	92.96
18	92.33	12	91.91	Nov. 7	92.68		

Lowell 40. City of Lowell test well 22. About 125 feet south of Pawtucket Boulevard and 300 feet west of intersection of East Avenue and Pawtucket Boulevard, Lowell. Driven test well, diameter 3 inches, depth 26.4 feet below land surface. Measuring point, top of 2 by 3-inch reducer coupling, 1.0 foot above land surface and 92.87 feet above mean sea level. First measured July 27, 1939. Water level July 27, 1939, 8.89 feet below measuring point and 83.98 feet above mean sea level. Water level affected by pumping from wells at City of Lowell Pawtucket Boulevard Well field.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
July 27	83.98	Sept. 5	85.29	Oct. 17	85.03	Nov. 28	84.42
Aug. 1	84.63	12	85.29	24	85.39	Dec. 5	84.96
8	84.92	19	85.69	31	86.14	12	84.44
15	84.73	26	84.06	Nov. 7	85.27	19	84.47
22	84.52	Oct. 3	84.01	14	85.08	26	84.09
29	84.91	10	85.41	21	85.06		

## Middlesex County--Continued

Lowell 41. City of Lowell Cook test well 3. About 50 feet north and 75 feet east from northeast corner of owner's Cook Well field pump house. Pump house about 1,300 feet southwest from intersection of Plain and Manufacturers Streets, Lowell. Driven test well, diameter 2 inches, depth 53.3 feet below land surface. Measuring point, top of 2-inch casing, 1.0 foot above land surface and 105.63 feet above mean sea level. First measured Aug. 22, 1939. Water level Aug. 22, 1939, 9.68 feet below measuring point and 95.95 feet above mean sea level. Water level affected by pumping from wells at City of Lowell Cook Well Field.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Aug. 22	95.95	Sept. 26	95.46	Oct. 31	95.52	Nov. 28	96.29
29	95.95	Oct. 3	95.49	Nov. 7	97.38	Dec. 5	96.44
Sept. 7	95.48	10	95.88	14	96.33	12	96.42
12	95.53	17	95.37	21	96.44	19	96.42
19	95.39	24	95.22				

Reading 1. William Kelch. About 50 feet northeast of West Street, 1,000 feet northwest of intersection of West and Willow Streets, and about 1.4 miles northwest of Reading. Unused dug domestic well, diameter 36 inches, depth 20.9 feet below land surface. Measuring point, top edge of stone projecting from north side of well casing, 1.0 foot above land surface, 1.2 feet below top of stone casing, and 107.94 feet above mean sea level. First measured Aug. 25, 1939. Water level Aug. 25, 1939, 21.43 feet below measuring point and 86.51 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Aug. 25	86.51	Sept. 26	86.44	Oct. 27	85.54	Dec. 1	85.39
29	86.44	29	85.90	Nov. 3	85.85	8	85.26
Sept. 5	86.33	Oct. 6	85.81	10	85.45	15	85.22
12	86.18	13	85.70	17	85.44	22	85.35
19	86.05	20	85.59	24	86.09	29	85.39

Winchester 3. Miss J. Brine. About 75 feet south of Webster Street and 150 feet east of Washington Street, Winchester. Unused driven domestic well, diameter 0.5 inch, depth 3.0 feet below land surface. Measuring point, top of 0.5 inch casing, 1.5 feet above land surface and 48.07 feet above mean sea level. First measured Aug. 22, 1939. Water level Aug. 22, 1939, 3.22 feet below measuring point and 44.85 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Aug. 22	44.85	Sept. 29	(a)	Nov. 3	44.90	Dec. 8	44.77
29	44.82	Oct. 6	45.32	10	(a)	15	44.73
Sept. 5	44.84	13	44.69	17	44.72	22	45.80
12	44.84	20	(a)	24	(a)	29	44.77
19	44.83	27	(a)	Dec. 1	44.81		

Winchester 4. Town of Winchester test well AA. About 60 feet south of Royal Street, 800 feet east of Pond Street, and 1,000 feet west of Sylvester Avenue, Winchester. Driven test well, diameter 2½ inches, depth 21.6 feet below land surface. Measuring point, top of 2½-inch casing, 1.0 foot above land surface and 43.97 feet above mean sea level. First measured Aug. 22, 1939. Water level Aug. 22, 1939, 17.30 feet below measuring point and 26.67 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Aug. 22	26.67	Sept. 26	24.45	Oct. 27	24.14	Dec. 1	24.87
29	26.47	29	24.56	Nov. 3	24.83	8	26.12
Sept. 5	29.27	Oct. 6	24.53	10	25.77	15	25.65
12	26.07	13	24.15	17	25.83	22	26.29
19	25.31	20	26.16	24	25.96	29	26.56

a Dry.

## WATER LEVELS AND ARTESIAN PRESSURE, 1939

## Middlesex County--Continued

Woburn 1. E. P. Fox. About 225 feet south of Green Street, 250 feet west from Highland Street, and 3.5 miles north of Woburn. Unused driven industrial well, diameter 3 inches, depth 25.6 feet below land surface. In pit, diameter 144 inches. Measuring point, top of 3-inch steel casing, 1.5 feet above land surface and 92.95 feet above mean sea level. First measured Aug. 14, 1939. Water level Aug. 14, 1939, 11.03 feet below measuring point and 81.92 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Aug. 14	81.92	Sept. 26	81.99	Oct. 27	82.05	Dec. 1	82.82
22	82.12	29	82.21	Nov. 3	83.61	8	83.09
29	81.99	Oct. 6	82.38	10	83.60	15	82.96
Sept. 5	81.99	13	82.21	17	83.34	22	83.85
12	82.27	20	82.12	24	82.95	29	83.41
19	82.08						

Woburn 2. Consolidated Chemical Industries Inc. About 700 feet north of Mishawum Road, 175 feet east of B. and M. Railroad tracks, 15 feet west of west shoreline of Richardson's Pond, and two miles northeast from Woburn. Unused drilled industrial well, diameter 18 inches at top and 12 inches at bottom, depth 63.6 feet below land surface. Measuring point, top of steel casing, 2.0 feet above land surface, and 56.44 feet above mean sea level. First measured Aug. 18, 1939. Water level Aug. 18, 1939, 11.23 feet below measuring point and 45.21 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Aug. 18	45.21	Sept. 26	36.53	Oct. 27	34.20	Dec. 1	48.63
22	39.68	29	36.61	Nov. 3	38.27	8	43.63
29	38.92	Oct. 6	35.93	10	41.55	15	44.04
Sept. 5	38.64	13	41.35	17	42.51	22	49.88
12	37.92	20	34.99	24	46.79	29	50.21
19	37.23						

Woburn 3. Lord Tannery. About 70 feet north of Lord Tannery well field concrete pump pit, 670 feet north of Ashburton Avenue, 200 feet east of B. and M. Railroad tracks, and 2.7 miles north of Woburn. Unused driven industrial well, diameter 24 inches, depth 19.6 feet below land surface. Measuring point, top of steel casing, 1.5 feet above land surface and 74.08 feet above mean sea level. First measured Aug. 18, 1939. Water level Aug. 18, 1939, 2.66 feet below measuring point and 71.42 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Aug. 18	71.42	Sept. 26	71.12	Oct. 27	71.08	Dec. 1	71.44
22	71.45	29	71.19	Nov. 3	71.48	8	71.47
29	71.36	Oct. 6	71.20	10	71.53	15	71.43
Sept. 5	71.41	13	71.10	17	71.52	22	71.53
12	71.24	20	71.07	24	71.49	29	71.59
19	71.14						

Woburn 4. Consolidated Chemical Industries, Inc. well 10. About 800 feet north from intersection of Merrimac and New Boston Streets, 350 feet west of New Boston Street, and 3 miles north of Woburn. Unused driven industrial well, diameter 2 inches, depth 25.0 feet below land surface. Measuring point, top of brass casing, 2.2 feet above land surface and 70.40 feet above mean sea level. First measured Sept. 12, 1939. Water level Sept. 12, 1939, 4.63 feet below measuring point and 65.77 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Sept. 12	65.77	Oct. 13	65.91	Nov. 10	66.47	Dec. 8	66.31
19	65.65	20	65.87	17	66.32	15	66.30
26	65.63	27	65.95	24	66.21	22	66.61
29	65.93	Nov. 3	66.62	Dec. 1	66.15	29	66.29
Oct. 6	66.04						

## Middlesex County--Continued

Woburn 5. Consolidated Chemical Industries, Inc. About 1,000 feet south from intersection of Merrimac and New Boston Streets, 350 feet east of New Boston Street, and 2.6 miles north of Woburn. Unused driven industrial well, diameter 2½ inches, depth 31.7 feet below land surface. Measuring point, top of steel casing, 1.4 feet above land surface and 61.01 feet above mean sea level. First measured Sept. 12, 1939. Water level Sept. 12, 1939, 2.26 feet below measuring point and 58.75 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Sept. 12	58.75	Oct. 6	58.99	Nov. 3	59.25	Dec. 1	58.99
19	58.61	13	58.91	10	59.17	8	59.03
26	58.79	20	57.89	17	59.09	15	59.01
29	58.95	27	58.95	24	59.04		

## Worcester County

Leominster 11. C. S. Pierce. About 100 feet east of Nashua Street, 300 feet west of B. and M. Railroad tracks, 0.7 mile south of North Leominster, and 1.2 miles east of Leominster. Abandoned dug domestic well, diameter 48 inches, depth 10.8 feet below land surface. Measuring point, top of horizontal 2 by 2-inch steel angle bar fastened to lower portion of instrument shelter, 1.3 feet above land surface and 364.48 feet above mean sea level. Automatic water-stage recorder operated on well since July 12, 1939. Water level July 13, 1939, 8.31 feet below measuring point and 356.17 feet above mean sea level.

Lowest daily water level, in feet above mean sea level, 1939  
(from recorder charts)

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	355.41	354.78	354.24	a 353.99	355.48
2	.....	355.38	354.76	354.23	354.03	355.48
3	.....	355.35	354.74	354.22	354.15	355.48
4	.....	355.33	354.72	354.19	354.31	a 355.49
5	.....	355.30	354.71	354.19	354.47	a 355.57
6	.....	355.28	354.69	354.18	354.64	a 355.67
7	.....	355.26	354.67	354.17	354.75	a 355.75
8	.....	355.24	354.65	354.17	354.91	a 355.85
9	.....	355.21	354.63	354.16	355.09	355.90
10	.....	355.18	354.62	354.15	355.23	355.95
11	.....	355.16	354.60	354.14	355.37	355.99
12	.....	355.13	354.58	354.13	355.45	356.00
13	356.17	355.10	354.56	354.12	355.50	356.04
14	356.13	355.08	354.54	354.10	355.55	356.12
15	356.09	355.05	354.53	354.10	355.57	356.16
16	356.04	355.03	354.51	354.09	355.58	356.23
17	355.99	355.00	354.49	354.08	355.61	356.33
18	355.94	354.98	354.46	354.07	355.61	356.40
19	355.89	354.96	354.43	354.06	355.61	356.43
20	355.86	354.95	354.41	354.06	355.61	356.49
21	355.81	354.93	354.39	354.05	355.61	356.60
22	355.78	354.92	354.37	354.04	355.61	356.71
23	355.74	354.91	354.35	354.03	355.60	356.91
24	355.70	354.90	354.35	354.02	355.57	357.08
25	355.67	354.89	354.33	354.01	355.55	357.19
26	355.63	354.88	354.32	354.01	355.55	a 357.17
27	355.59	354.87	354.30	354.00	355.55	357.11
28	355.55	354.85	354.28	353.99	355.54	357.03
29	355.52	354.83	354.26	353.98	355.51	357.00
30	355.49	354.82	354.24	353.97	355.50	356.97
31	355.45	354.80	.....	353.97	.....	356.93

a Estimated.

## Worcester County--Continued

Winchendon 13. W. B. Hart. About 10 feet east of Forristall Road, 800 feet south from intersection of Forristall and Crosby Roads, and 1.5 miles northeast of Winchendon. Unused dug domestic well, diameter 24 inches, depth 12.3 feet below land surface. Measuring point, top of horizontal 2 by 2-inch steel angle bar, fastened to lower portion of instrument shelter, 2.0 feet above land surface and 1,211.36 feet above mean sea level. Automatic water-stage recorder operated on well since July 17, 1939. Water level July 18, 1939, 12.15 feet below measuring point and 1,199.21 feet above mean sea level.

Lowest daily water level, in feet above mean sea level, 1939  
(from recorder charts)

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1,198.69	1,197.77	1,197.19	1,196.73	1,196.63
2	.....	1,198.65	1,197.74	1,197.17	1,196.72	1,196.63
3	.....	1,198.60	1,197.72	1,197.16	1,196.70	1,196.64
4	.....	1,198.58	1,197.70	1,197.14	1,196.68	1,196.65
5	.....	1,198.56	1,197.68	1,197.13	1,196.67	1,196.66
6	.....	1,198.50	1,197.66	1,197.11	1,196.67	1,196.66
7	.....	1,198.46	1,197.63	1,197.09	1,196.67	1,196.66
8	.....	1,198.42	1,197.61	1,197.08	1,196.66	1,196.67
9	.....	1,198.38	1,197.59	1,197.06	1,196.65	1,196.67
10	.....	1,198.34	1,197.57	1,197.04	1,196.64	1,196.68
11	.....	1,198.31	1,197.55	1,197.03	1,196.64	1,196.69
12	.....	1,198.28	1,197.53	1,197.01	1,196.63	1,196.70
13	.....	1,198.24	1,197.50	1,196.99	1,196.62	1,196.70
14	.....	1,198.23	1,197.48	1,196.97	1,196.62	1,196.72
15	.....	1,198.20	1,197.46	1,196.95	1,196.62	1,196.72
16	.....	1,198.17	1,197.44	1,196.93	1,196.62	1,196.73
17	.....	1,198.15	1,197.42	1,196.91	1,196.61	1,196.75
18	1,199.21	1,198.12	1,197.40	1,196.90	1,196.61	1,196.76
19	1,199.21	1,198.09	1,197.38	1,196.88	1,196.61	1,196.78
20	a 1,199.21	1,198.07	1,197.36	1,196.86	1,196.61	1,196.80
21	1,199.18	1,198.04	1,197.35	1,196.85	1,196.61	1,196.84
22	1,199.15	1,198.01	1,197.33	1,196.84	1,196.61	1,196.86
23	1,199.10	1,197.98	1,197.31	1,196.82	1,196.61	1,196.88
24	1,199.05	1,197.96	1,197.29	1,196.80	1,196.61	1,196.89
25	1,199.01	1,197.94	1,197.28	1,196.78	1,196.61	1,196.91
26	1,198.97	1,197.92	1,197.26	1,196.77	1,196.61	1,196.94
27	1,198.93	1,197.89	1,197.25	1,196.76	1,196.61	1,196.96
28	1,198.88	1,197.87	1,197.23	1,196.76	1,196.62	1,196.99
29	1,198.83	1,197.85	1,197.21	1,196.74	1,196.62	1,197.03
30	1,198.78	1,197.82	1,197.20	1,196.72	1,196.62	1,197.06
31	1,198.74	1,197.80	.....	1,196.72	.....	1,197.10

a Estimated.

## MICHIGAN

By C. L. McGuinness, O. F. Poindexter, and Norman Billings

The cooperative program of water-level measurements in observation wells in Michigan,<sup>1/</sup> begun in 1932 by the Geological Survey Division of the Michigan Department of Conservation and by the Federal Geological Survey, was continued in 1939. Areas with observation wells are shown in an accompanying figure. At the end of the year, monthly or semimonthly measurements of water level were being made in 78 wells in forested areas in the northern part of the Lower Peninsula. Regular measurements in all observation wells in Charlevoix County were discontinued at the end of 1938, but measurements in 6 wells in the county were made once in 1939. A total of about 1,700 individual measurements of water level were made during the year, mostly by members of the Michigan State Civilian Conservation Corps. A. W. Bergquist was in direct charge of the observation-well program until June 1939; Norman Billings, senior engineering aide, Michigan State Civilian Conservation Corps, during the rest of the year.

The float-type water-stage recorder that was installed in November 1934 on a well at the Forest Fire Experiment Station in Roscommon was in operation throughout the year. Weekly water levels in this well in 1939 are given in this report, and fluctuations in its water level during the period of record are shown in an accompanying figure.

In the Roscommon well there was a fairly steady decline in water level from 7.62 feet below the measuring point on September 23, 1938, to 7.95 feet on January 9, 1939. Between January 9 and January 15 the water level rose about 0.25 foot, possibly as the result of recharge from a brief thaw. It then declined to 8.02 feet below the measuring point on March 23, the lowest stage reached during 1939, but on March 23 it began to rise, apparently as the result of recharge from melting snow, and by March 26 it had reached a stage 6.99 feet below the measuring point. A slight decline followed this rise; then on April 15 the water level began to rise again so that on May 10 and 11 it reached the highest stage of the year--6.69 feet below the measuring point. A decline to 7.00 feet below the measuring point followed on June 19, when apparently as the result of rains the water level rose to 6.76 feet on June 22. It then declined until August 8, when, again apparently as the result of rains, it rose from 7.61 feet below

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<sup>1/</sup> See Water-Supply Papers 777, 817, 840, and 845.

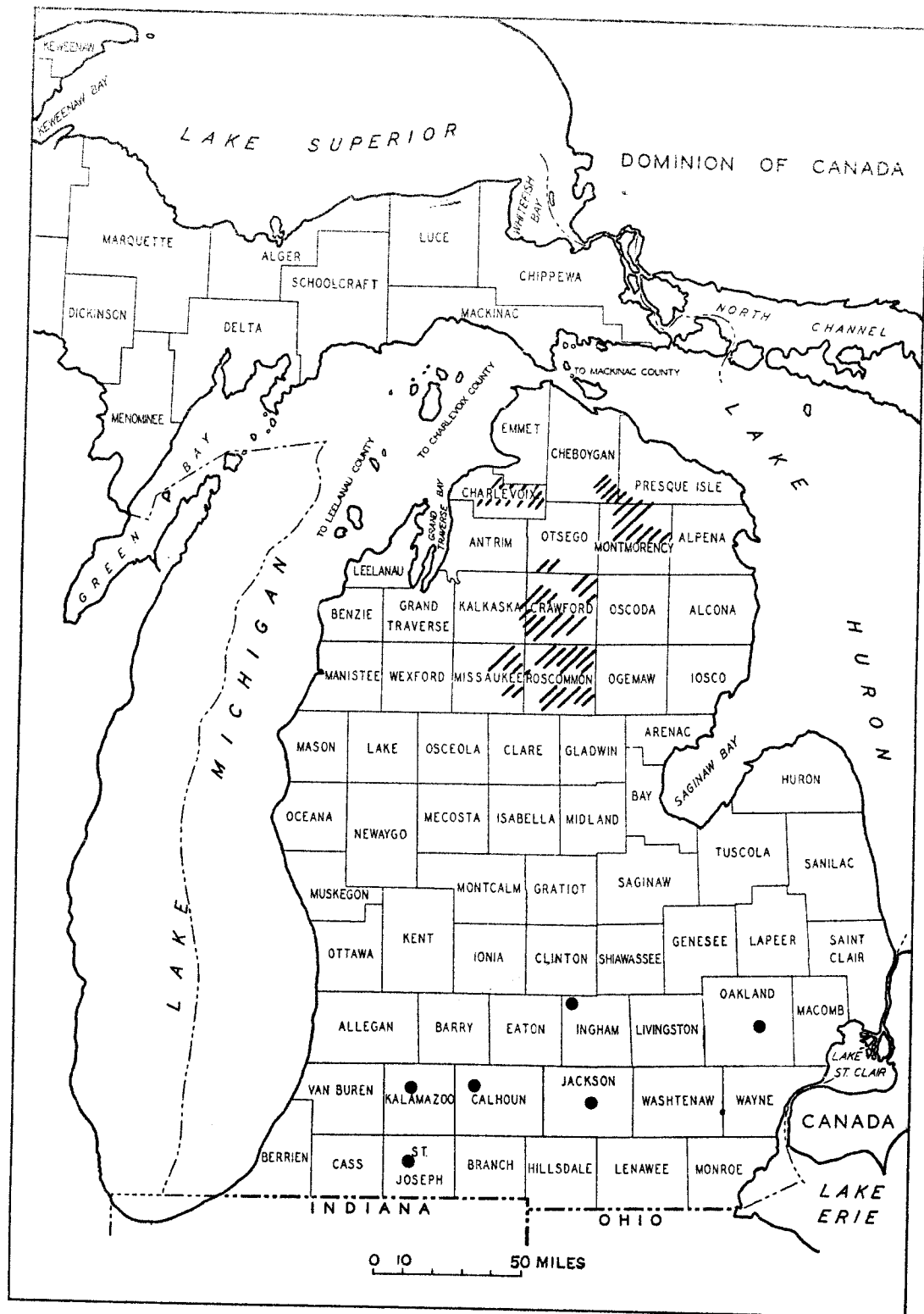


Figure 6.--Index map showing areas of observation wells in Michigan.



Depth to water level, in feet below measuring point

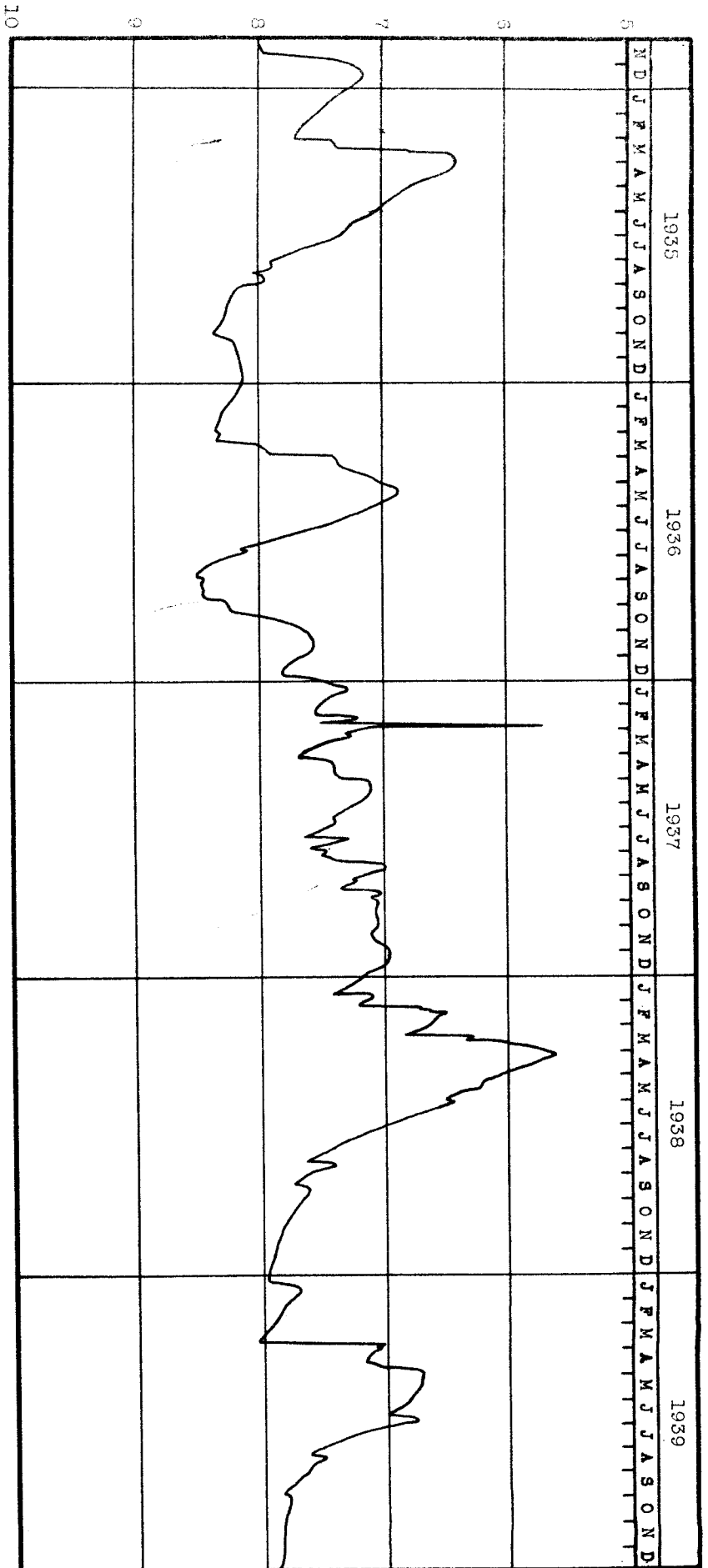


Figure 7. Hydrograph showing fluctuations of water level in Roscommon recorder well.

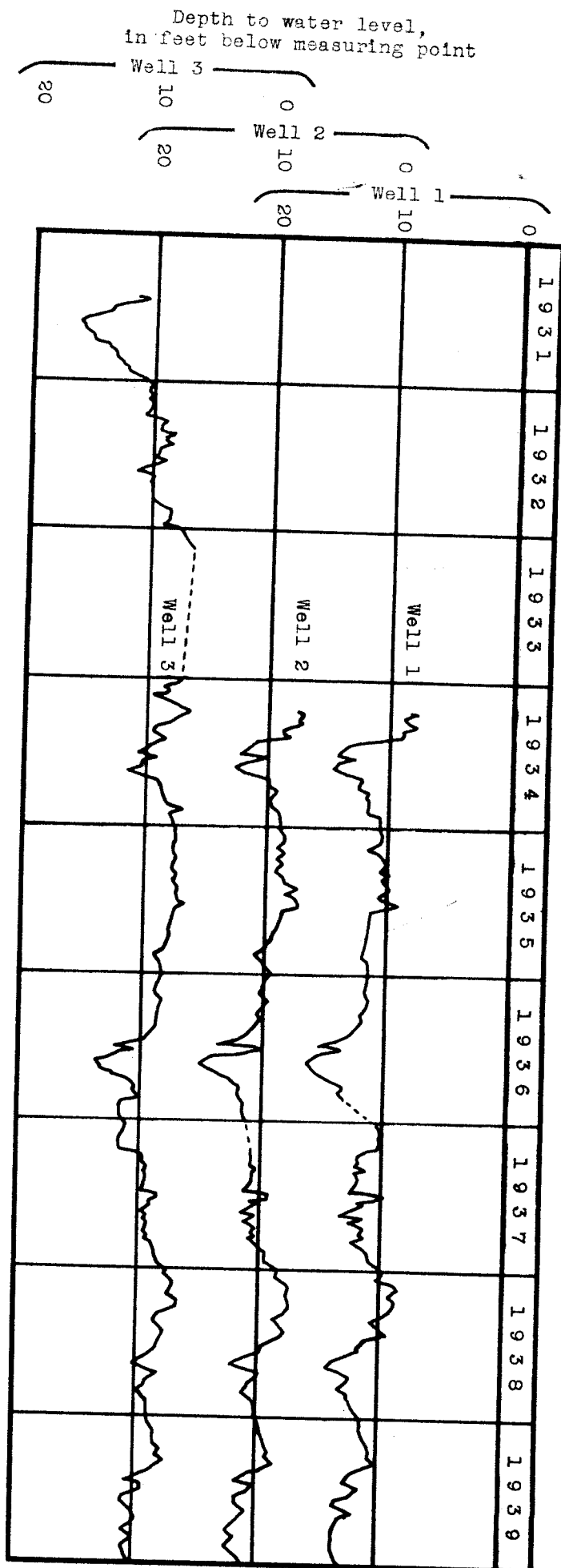


Figure 8.--Hydrographs showing fluctuations of water level in observation wells Kalamazoo 1 to 3 at Kalamazoo, Mich.

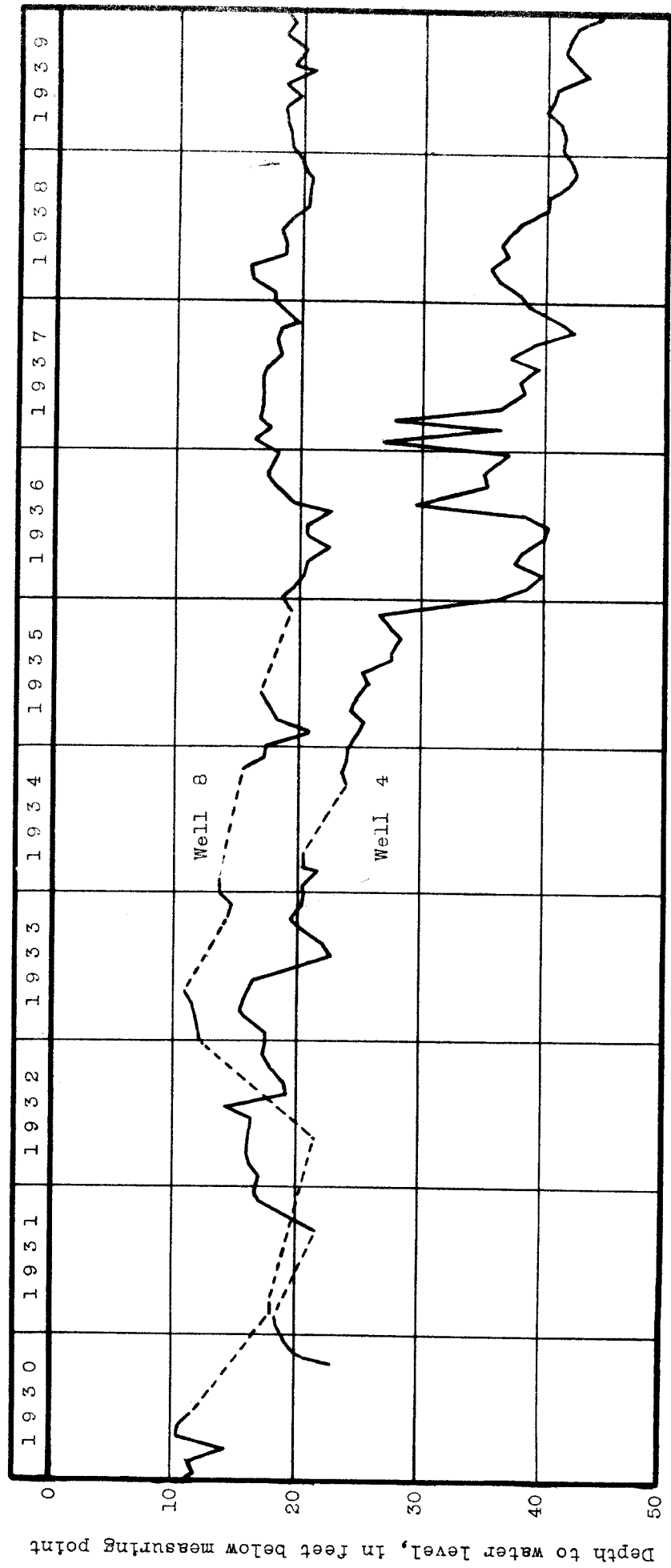


Figure 9.—Hydrographs showing fluctuations of water level in observation wells Ingham 4 and 8 at Lansing, Mich.

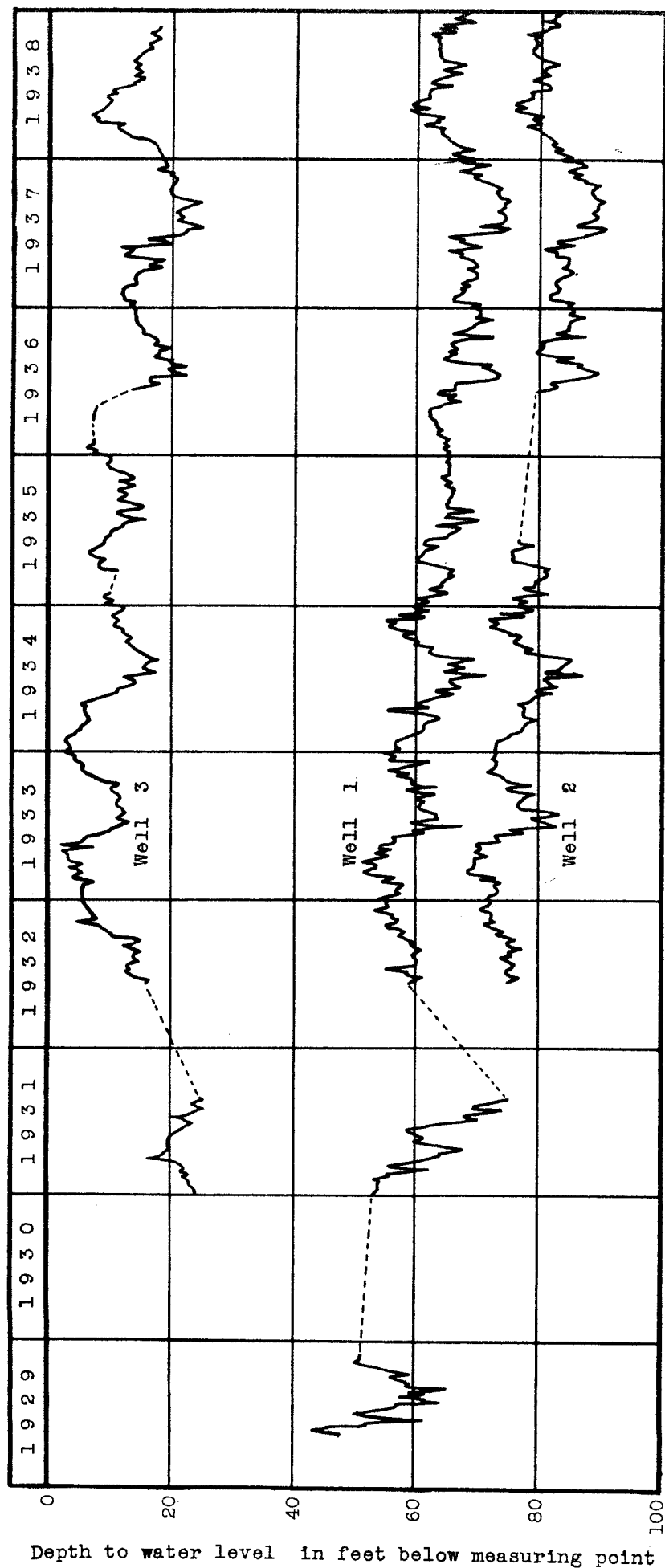


Figure 10.--Hydrographs showing fluctuations of water level in observation wells Oakland 1 to 3 at Pontiac, Mich.

the measuring point to about 7.50 feet. It then declined slowly, with minor fluctuations, until the end of the year and on December 30 was 7.89 feet below the measuring point. The range in fluctuation during 1939 was 1.33 feet, the smallest annual range on record.

During the fall of 1939 the program of water-level observations in wells was expanded to include measurements of water levels and collection of records of pumpage in a few of the larger cities in the southern part of the State that use ground water for public supply, including Lansing in Ingham County, Kalamazoo in Kalamazoo County, Pontiac in Oakland County, Battle Creek in Calhoun County, Jackson in Jackson County, and Three Rivers in St. Joseph County. The water departments of Lansing, Kalamazoo, and Pontiac have made water-level measurements in selected wells for several years. The fluctuations of water level in some of these wells are shown graphically in the accompanying three figures. Descriptions of the observation wells and of the measurements made in 1939 in all six cities are given in this report. Measurements made in observation wells in Lansing from December 1929 until the end of 1939 are included, but records prior to January 4, 1939, in Pontiac and prior to July 30, 1939, in Kalamazoo are given only in the accompanying figures.

Except in the aforementioned six cities in southern Michigan, descriptions of most of the wells for which records are given in the following pages are contained on pages 125 to 182 of Water-Supply Paper 840. Descriptions of wells not included in Water-Supply Papers 840 or 845 are given in this report.

#### Calhoun County

Calhoun 1. City of Battle Creek. Well 22 at Verona Pumping Station of city waterworks. Unused drilled public supply well, diameter 8 inches, depth 127 feet. Cased to 102.5 feet. Penetrates bedrock. Measuring point, top of 8-inch casing, 1.0 foot above land surface and 830.54 feet above mean sea level. Water level affected by discharge from wells, about 50 feet to about 0.5 mile distant, in surrounding well field. Measurements made by S. C. Einhardt, Sr., chief engineer, Verona Pumping Station.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Sept. 23	5.81	Oct. 27	5.10	Nov. 21	6.00	Dec. 11	5.78
29	6.2	Nov. 3	6.20	30	5.30	18	6.30
Oct. 13	7.81	16	4.84	Dec. 6	5.55	27	6.07

Calhoun 2. City of Battle Creek. Armstrong test well 3 at Goguac Pumping Station of city waterworks. Drilled well, diameter 2 inches, depth 70 feet. Cased full depth. Penetrates unconsolidated deposits. Measuring point, top of 2-inch casing, 2.4 feet above land surface and 917.46 feet above mean sea level. Water level affected by pumping from nearby wells, about 85 feet to about 435 feet distant, at the station. Measurements made by A. M. Stannard, chief engineer, Goguac Pumping Station.

## Calhoun County--Continued

## Calhoun 2.--Continued

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Sept. 23	32.39	Oct. 19	32.14	Nov. 15	29.90	Dec. 13	29.06
27	32.38	25	32.20	22	30.99	20	29.08
Oct. 5	32.40	Nov. 1	32.08	29	29.93	27	29.05
11	32.26	8	32.01	Dec. 6	29.14		

## Charlevoix County

Regular measurements in all observation wells were discontinued at the end of 1938.

Water level, in feet below measuring point, 1939

Date	T. 32 N., R. 4 W.		T. 32 N., R. 5 W.		T. 33 N., R. 4 W.		T. 33 N., R. 5 W.	
	1	33	15		31		4	12
Sept. 8	7.36	5.16	4.86		11.77		5.75	3.36

## Cheboygan County

Measurements in well 19, T. 34 N., R. 1 W., discontinued.

5. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 27, T. 33 N., R. 1 E., 28 feet northeast from center-line of road. Depth 15.0 feet. Measuring point, 1.82 feet above land surface. On narrow strip of sandy outwash between moraine and swamp.

11. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 11, T. 34 N., R. 1 W., at edge of esker, 40 feet north from side of road. Depth 14.0 feet. Measuring point, 1.08 feet above land surface. Measurements for 1938 given in Water-Supply Paper 845, p. 153.

19. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 11, T. 34 N., R. 1 W., at edge of highland, 25 feet from road. Depth 13.0 feet. Measuring point, 1.00 foot above land surface. Measurements for 1938 given in Water-Supply Paper 845, p. 153.

Water level, in feet below measuring point, 1939

Date	T. 33 N., R. 1 W.			T. 33 N., R. 1 E.				T. 34 N., R. 1 W.			
	2	4	11	7	8	17	5	11	18	19	33
Jan. 13	6.94	5.98	4.16	3.08	6.85	10.38	3.96	5.10	3.19	2.28	6.61
26	7.46	6.36	4.47	3.18	6.86	10.28	4.33	4.99	3.60	3.63	6.80
Feb. 9	7.68	6.59	4.72	3.28	7.01	10.53	4.28	5.09	3.66	3.78	6.90
Mar. 3	7.90	6.73	4.91	3.36	7.19	10.70	4.64	5.24	3.68	3.88	7.00
21	8.06	6.78	5.03	3.42	7.32	10.85	4.72	5.25	3.65	3.81	7.05
30	7.22	5.22	3.02	2.63	6.24	9.64	3.72	4.95	2.74	2.93	6.45
Apr. 13	7.63	5.29	3.25	2.76	6.02	9.36	4.09	4.77	3.27	3.44	6.47
June 20	7.57	4.99	3.07	2.64	5.76	7.32	4.10	4.92	3.43	....	6.40
July 7	7.74	5.82	4.00	3.11	6.19	8.16	4.46	5.02	4.17	....	6.72
21	7.94	6.80	4.69	3.61	6.66	9.07	5.11	5.30	5.17	....	7.06
Aug. 7	8.15	7.77	5.31	4.16	7.27	10.09	5.56	5.71	5.87	....	7.51
17	8.11	6.10	5.44	4.10	7.38	10.42	5.18	5.74	5.62	....	7.52
Oct. 24	8.46	6.79	6.00	3.90	7.53	11.50	4.95	4.09	4.69	....	7.49
Dec. 4	8.55	6.34	5.84	3.58	7.35	11.53	4.67	5.52	3.94	....	7.41

## Crawford County

Measurements in well 100, T. 27 N., R. 5 W., discontinued.

8. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 29, T. 25 N., R. 3 W., on flat near fence at south point of curve in road. Depth 13.0 feet. Measuring point, 1.0 foot above land surface.

51. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 14, T. 27 N., R. 4 W., on east side of U. S. Highway 27, opposite pole No. 3496.

## Crawford County--Continued

Water level, in feet below measuring point, 1939

Date	T.25N.		T.26N.		T.26 N.,	
	R.3 W.		R.2 W.		R.3 W.	
	8	9	26	28	30	
Jan. 9	11.00	6.12	11.38	8.31	11.85	
26	11.04	6.22	11.00	8.10	11.90	
Feb. 8	11.10	6.19	11.22	8.16	11.91	
21	11.12	6.19	11.35	8.30	11.91	
Mar. 7	11.18	6.13	11.45	8.40	11.97	
21	11.24	6.17	11.53	8.50	12.05	
Apr. 4	10.64	6.04	10.74	7.30	12.02	
18	10.70	5.92	10.77	7.43	11.98	
May 2	10.45	6.04	10.45	7.62	11.90	
16	10.51	6.03	10.65	7.50	11.72	
29	10.54	6.03	10.55	7.55	11.56	
June 13	10.62	4.57	10.63	7.63	11.50	
27	10.67	6.24	10.83	7.70	11.42	
July 13	10.76	6.33	11.12	7.81	11.44	
31	10.97	6.30	11.54	8.02	11.60	
Aug. 15	10.96	6.04	11.44	8.07	11.44	
30	10.97	6.15	10.90	8.10	11.43	
Sept. 13	10.98	6.03	11.11	8.09	11.50	
27	11.08	6.17	11.34	8.18	11.67	
Oct. 11	11.12	6.12	11.45	8.26	11.82	
25	11.14	6.09	11.51	8.34	11.94	
Nov. 7	11.16	6.10	11.50	8.40	11.99	
21	11.21	6.12	11.37	8.46	12.10	
Dec. 5	11.26	6.08	11.45	8.50	12.19	
22	11.33	6.09	11.54	8.57	12.27	

Water level, in feet below measuring point, 1939

Date	T. 26 N., R. 4 W.				Date	T. 26 N., R. 4 W.			
	9	10	12	18		9	10	12	18
Jan. 4	4.08	6.87	6.31	5.88	July 6	3.38	6.63	5.55	6.01
18	3.25	6.14	5.63	5.68	19	3.89	7.32	6.15	6.24
30	3.46	6.43	5.79	5.83	Aug. 2	4.32	7.92	6.69	6.37
Feb. 15	3.60	6.50	5.88	5.85	17	3.92	7.30	6.37	6.13
Mar. 2	3.78	6.68	6.10	5.88	31	3.57	6.94	5.97	5.92
17	3.88	6.69	6.20	5.94	Sept. 14	3.71	6.97	6.22	5.97
30	2.79	5.27	5.32	5.39	28	4.08	7.32	6.52	6.04
Apr. 12	2.66	5.76	5.07	....	Oct. 12	4.23	7.34	6.65	6.06
25	2.02	5.44	4.41	5.29	26	4.26	7.05	6.63	6.01
May 9	1.75	5.24	4.50	5.39	Nov. 9	3.83	6.60	6.24	5.88
23	2.35	5.27	4.56	5.48	24	3.64	6.60	6.01	5.88
June 8	2.48	5.77	4.69	5.68	Dec. 7	3.71	6.65	6.08	5.89
21	2.77	5.87	4.99	5.75	26	3.78	6.65	6.12	5.96

Water level, in feet below measuring point, 1939

Date	T. 27 N., R. 1 W.			T. 27 N., R. 4 W.			T. 28 N., T.28 N.,		
	8	22	27	20	42	51	R. 1 W.	R.4 W.	
Jan. 9	4.40	4.60	6.91	6.93	7.10	15.28	8.40	7.28	15.90
26	4.24	4.50	6.73	6.51	7.00	15.10	7.92	6.92	15.70
Feb. 8	4.50	4.65	6.83	6.75	7.10	15.24	8.06	6.92	15.75
21	4.33	4.81	6.92	6.92	7.17	15.36	8.24	6.96	15.79
Mar. 7	4.42	4.90	7.01	7.10	7.25	15.47	8.35	7.05	15.85
21	4.31	5.01	7.09	7.22	7.30	15.53	8.53	7.17	15.85
Apr. 4	4.12	4.01	6.22	6.12	6.51	14.80	7.56	6.08	15.60
18	4.27	3.87	6.10	5.97	6.56	14.83	7.26	6.14	15.48
May 2	4.25	3.74	6.07	5.67	6.55	14.70	7.06	6.02	15.28
16	4.32	3.69	6.08	5.70	6.58	14.59	7.07	6.06	15.31
23	4.37	3.74	6.16	5.67	6.68	14.68	7.20	6.12	15.45
June 13	4.44	3.98	6.33	5.92	6.83	14.81	7.40	6.24	15.55
27	4.53	4.15	6.39	6.20	7.00	14.98	7.59	6.42	15.67
July 13	4.67	4.47	6.59	6.60	7.20	15.17	7.79	6.62	15.80
31	4.81	4.79	6.79	7.15	7.45	15.44	8.05	6.87	15.96
Aug. 15	1.59	4.21	6.67	6.92	7.52	15.58	8.15	6.95	16.04
30	4.66	4.48	6.91	6.14	7.30	15.29	8.25	7.00	15.96
Sept. 13	4.65	4.50	6.94	6.47	7.39	15.47	8.32	7.06	16.00
27	4.74	4.80	7.08	6.63	7.48	15.58	8.41	7.14	16.06
Oct. 11	4.74	4.92	7.15	6.85	7.54	15.64	8.34	7.21	16.10
25	4.77	4.99	7.21	7.00	7.56	15.64	8.45	7.26	16.11
Nov. 7	4.77	5.08	7.26	6.81	7.53	15.63	8.54	7.28	16.11
21	4.75	5.15	7.29	6.49	7.31	15.32	8.60	7.27	16.11
Dec. 5	4.77	5.22	7.35	6.73	7.41	15.47	8.63	7.32	16.11
22	4.79	5.32	7.40	6.97	7.51	15.64	8.70	7.38	16.15

## Ingham County

Observation wells 1 to 3 inclusive are a part of the public water supply system of Lansing, operated by the Board of Water and Electric Light Commissioners, Lansing. All wells penetrate bedrock. Water-level measurements are made by members of the Mechanical Engineering Department, Board of Water and Electric Light Commissioners, Lansing. Measurements are generally made when all wells in the particular field or at the particular station have been shut off at least one day, but water levels may be affected by pumping from distant wells. Measurements are made with an accuracy of one-half inch, and are converted into decimal figures.

Ingham 1. Well 2 at Cedar Street pumping station, near southeast corner Cedar Street and Michigan Avenue. Drilled well, diameter 12½ inches, depth 446 feet. Measuring point, top of cap on casing, 0.7 foot above land surface and 846.76 feet above mean sea level.

Ingham 2. Well 9 at Cedar Street pumping station, near northeast corner Cedar and Kalamazoo Streets. Drilled well, diameter 12 inches, depth 423 feet. Measuring point, top of cap on casing, 2.8 feet below land surface and 845.65 feet above mean sea level.

Ingham 3. Well 5 in Pennsylvania Avenue well field, at northwest corner Pennsylvania Avenue and Grand Trunk Railroad. Drilled well, diameter 12 inches, depth 338 feet. Measuring point, top of cap on casing, 1.3 feet above land surface and 824.09 feet above mean sea level.

Ingham 4. Well 9 in Pennsylvania Avenue well field, about 500 feet east of Pennsylvania Avenue and just north of Grand Trunk Railroad. Drilled well, diameter 6 inches, depth 218 feet. Measuring point, top of cap on casing, 0.8 foot above land surface and 830.43 feet above mean sea level.

Ingham 5. Well 7 in Riverside well field, just north of Cedar River on approximate line of Mifflin Avenue. Drilled well, diameter 12 inches, depth 457 feet. Measuring point, top of cap on casing, 1.8 feet above land surface and 826.66 feet above mean sea level.

Ingham 6. Logan well, at Logan Street pumping station, Lapeer and Logan Streets. Drilled well, diameter 20 inches, depth 424 feet. Measuring point, top of coupling on casing, 4.7 feet below floor of pumping station and 853.28 feet above mean sea level.

Ingham 7. Seymour well, at Seymour Avenue pumping station, on north side Josephine Street about 500 feet east of Seymour (Grand River) Avenue. Drilled well, diameter 14 inches, depth 395 feet. Measuring point, edge of hole in base of pump, 817.72 feet above mean sea level.

Ingham 8. Townsend well, at Townsend Street pumping station, on east side Townsend Street opposite Olds Street. Drilled well, diameter 14 inches, depth 423 feet. Measuring point, hole in base of pump, 826.53 feet above mean sea level.

The accompanying figure shows fluctuations of water levels in wells 4 and 8 from 1930 through 1939. The fluctuations shown are due mostly to the effects of pumping from other city wells. The effects of precipitation are not immediately apparent in the fluctuations.

The earliest available records of water levels in the observation wells are given below. For the Cedar Street, Pennsylvania Avenue, and Riverside fields the numbers of the wells in which water levels were measured are not known. The Seymour and Townsend wells for which water levels in 1919 are given were replaced in 1930 by the present wells, but the new wells were drilled near the old wells. The present Logan well is apparently the same well in which the 1929 measurement was made.

Field or Station	Date	Water level, in feet above mean sea level
Cedar Street	Oct. 19, 1919	811.88
Pennsylvania Avenue	Nov. 2, 1919	817.88
Riverside	Aug. 9, 1924	808.88
Seymour Avenue	Jan. 1919	812.18
Townsend Street	Jan. 1919	822.08
Logan Street	Dec. 1929	822.28



## Ingham County--Continued

The sharp decline in water level in well 4 during the latter part of 1935 probably resulted from the placing in service of several city wells situated north of the Pennsylvania Avenue well field (P.M. wells 6-13 and P.A. wells 20 and 21). The water level in well 8 does not show as large a decline during the period of record as does the water level in well 4. It is probable that the fluctuations of water level in well 8 more nearly represent the general trend than do the fluctuations in well 4.

Water levels in wells 1 to 8, in feet below measuring point, 1929-39

Date	1	2	3	4	5	6	7	8
Dec. 1929	.....	.....	.....	.....	.....	31.0	3.75	10.6
Jan. 1930	.....	.....	.....	.....	.....	.....	9.85	11.85
Feb.	.....	.....	.....	.....	.....	.....	9.75	11.25
Mar.	.....	.....	.....	.....	.....	.....	10.25	14.2
Apr.	.....	.....	.....	.....	.....	.....	11.5	10.25
May	.....	.....	.....	.....	.....	.....	6.7	10.55
June	.....	.....	.....	.....	.....	.....	10.0	11.5
July	.....	.....	.....	.....	.....	.....	14.85	.....
Oct. 15	.....	.....	15.15	22.9	.....	.....	.....	.....
Oct. 31	.....	.....	14.1	20.6	.....	.....	.....	.....
Nov. 17	.....	.....	13.0	19.85	9.35	.....	.....	.....
Dec. 18	.....	.....	12.25	19.1	.....	.....	.....	.....
Jan. 28, 1931	.....	.....	11.4	18.5	.....	.....	.....	.....
Feb. 16	.....	.....	11.35	18.4	.....	36.0	.....	18.0
Mar. 26	.....	.....	.....	.....	.....	43.0	2.0	18.0
Apr.	42.0	35.55	.....	.....	.....	.....	.....	.....
Sept.	.....	.....	.....	21.65	.....	.....	19.6	.....
Oct. 16	.....	.....	12.25	19.6	.....	.....	19.5	.....
Nov. 24	.....	.....	11.15	17.1	.....	.....	18.9	.....
Dec. 17	.....	.....	10.9	16.65	.....	.....	17.7	.....
Jan. 28, 1932	.....	.....	9.9	17.0	.....	.....	19.1	.....
Feb. 15	.....	.....	.....	.....	11.9	.....	15.9	.....
Feb. 25	.....	.....	9.45	16.35	.....	.....	.....	.....
Mar. 28	.....	.....	8.9	16.0	.....	.....	15.75	.....
Apr. 26	.....	.....	10.0	.....	.....	.....	.....	21.3
May 21	.....	.....	9.2	16.15	.....	.....	.....	.....
June 17	.....	.....	9.25	16.25	.....	.....	.....	.....
July	.....	.....	7.5	14.25	.....	.....	.....	.....
Aug.	.....	.....	11.4	19.1	.....	.....	.....	.....
Sept.	.....	.....	11.2	19.0	.....	.....	.....	.....
Oct.	.....	.....	10.4	18.0	.....	.....	.....	.....
Nov. 22	.....	.....	9.65	17.25	.....	.....	.....	.....
Dec. 19	.....	.....	9.9	17.5	.....	.....	.....	.....
Dec. 28	.....	.....	.....	.....	.....	.....	20.0	12.1
Jan. 16, 1933	.....	.....	9.95	17.6	.....	.....	20.0	12.05
Feb. 28	.....	.....	8.5	15.65	.....	.....	28.35	11.7
Mar. 18	.....	.....	8.5	15.25	.....	.....	.....	.....
Mar. 31	.....	.....	.....	.....	.....	.....	20.7	11.4
Apr. 18	.....	.....	8.9	15.75	.....	.....	.....	.....
Apr. 29	.....	.....	.....	.....	.....	.....	17.55	10.9
May 25	.....	.....	9.0	16.25	.....	.....	.....	.....
May 29	.....	.....	.....	.....	.....	42.15	19.4	.....
June 28	.....	.....	.....	.....	.....	.....	23.65	.....
July 29	.....	.....	15.1	22.6	.....	.....	.....	.....
Aug. 2	.....	.....	.....	.....	.....	.....	24.7	.....
Aug. 24	.....	.....	.....	.....	.....	.....	24.2	.....
Aug. 26	.....	.....	14.6	22.0	.....	.....	.....	.....
Sept. 21	.....	.....	.....	.....	.....	.....	21.65	.....
Sept. 26	.....	.....	12.6	20.35	.....	.....	.....	.....
Oct. 26	.....	.....	12.25	19.4	.....	.....	19.5	14.35
Nov. 23	.....	.....	.....	.....	.....	.....	21.55	14.65
Nov. 25	.....	.....	12.5	20.15	.....	.....	.....	.....
Dec. 23	.....	.....	12.5	20.35	.....	.....	.....	.....
Dec. 28	.....	.....	.....	.....	.....	.....	20.5	13.75
Jan. 16, 1934	.....	.....	12.4	20.25	.....	.....	.....	.....
Jan. 30	.....	.....	.....	.....	.....	.....	20.15	13.7
Feb. 27	.....	.....	16.5	21.6	.....	.....	20.65	.....
Mar. 9	.....	.....	11.95	20.35	.....	.....	21.6	.....
May 2	.....	.....	12.65	20.25	.....	.....	.....	.....
Sept. 28	.....	.....	16.15	23.7	.....	46.5	.....	.....

## Ingham County--Continued

Water levels in wells 1 to 8, in feet below measuring point, 1929-39								
Date	1	2	3	4	5	6	7	8
Oct. 30, 1934	.....	.....	15.5	23.45	.....	44.65	.....	15.6
Nov. 28	.....	.....	15.6	23.9	.....	44.65	19.85	17.15
Dec. 28	.....	.....	15.9	24.0	.....	44.45	18.8	17.4
Jan. 31, 1935	.....	.....	16.05	24.75	.....	45.2	22.65	20.85
Feb. 28	.....	.....	16.15	25.15	.....	45.65	.....	18.25
Mar. 28	.....	.....	14.9	24.15	.....	45.4	.....	17.75
May 10	.....	.....	15.4	24.7	.....	46.8	.....	17.0
June 1	.....	.....	16.15	25.65	.....	46.95	.....	.....
Aug. 28	.....	.....	15.95	25.05	.....	46.9	.....	.....
Aug. 1	.....	.....	18.2	27.45	.....	47.3	.....	.....
24	.....	.....	17.4	27.4	.....	.....	.....	.....
29	.....	.....	.....	.....	.....	47.95	.....	.....
Sept. 20	.....	.....	18.2	28.15	.....	47.95	.....	.....
Oct. 24	.....	.....	18.75	27.4	.....	47.55	.....	.....
Nov. 27	.....	.....	18.25	26.45	.....	.....	18.4	19.3
Dec. 28	.....	.....	28.55	36.15	.....	42.15	17.2	18.6
Jan. 24, 1936	.....	.....	31.85	38.6	.....	45.9	20.4	19.6
Feb. 26	.....	.....	31.35	39.85	.....	45.15	19.4	20.15
Mar. 31	.....	.....	29.15	37.4	.....	45.35	19.4	20.5
Apr. 29	.....	.....	29.4	38.15	.....	45.65	20.15	22.15
May 22	.....	.....	37.5	39.9	.....	47.4	23.05	20.6
June 25	.....	.....	37.15	40.3	.....	49.05	.....	20.5
July 24	.....	.....	29.05	38.2	47.3	49.95	27.4	22.4
Aug. 21	.....	.....	19.75	29.4	.....	49.95	25.3	19.3
24	.....	.....	.....	.....	39.15	.....	.....	.....
Oct. 2	.....	40.2	27.05	35.35	36.65	46.9	24.65	17.9
22	.....	40.1	27.0	35.25	41.15	46.9	24.3	17.4
Nov. 11	.....	39.9	26.75	35.05	40.2	47.25	24.6	17.65
Dec. 23	.....	.....	27.9	36.9	.....	47.55	.....	18.15
Jan. 26, 1937	49.6	39.7	17.35	26.7	23.7	47.0	23.8	16.3
Feb. 24	.....	.....	.....	.....	.....	46.45	21.8	17.6
26	51.05	40.05	27.65	36.4	43.4	.....	.....	.....
Mar. 15	49.65	38.65	18.1	27.7	35.35	47.1	22.4	16.85
Apr. 13	49.9	39.8	27.05	36.15	46.85	47.35	22.75	17.0
May 22	52.25	38.9	30.15	38.15	52.0	47.4	22.95	17.05
June 22	50.75	39.15	27.6	37.9	51.65	48.15	.....	17.05
July 21	52.5	39.9	29.25	39.55	59.95	49.5	.....	17.4
Aug. 19	52.65	39.45	28.75	37.05	33.75	48.95	.....	18.4
Sept. 23	52.65	39.65	31.3	39.05	50.85	49.2	.....	18.05
Oct. 22	59.25	41.2	35.3	42.35	38.4	48.05	.....	18.35
Nov. 10	56.15	42.7	32.85	41.65	40.9	48.05	.....	19.7
Dec. 28	53.65	42.35	30.9	38.3	31.7	47.25	.....	17.95
Jan. 18, 1938	53.65	42.35	30.75	37.95	31.7	46.8	.....	17.9
Feb. 21	.....	.....	.....	.....	.....	64.3	.....	15.95
23	53.25	40.65	28.0	36.15	30.65	.....	.....	.....
Mar. 22	53.6	40.5	28.0	35.45	27.7	63.55	.....	15.8
Apr. 29	52.15	40.5	29.15	36.9	36.75	64.45	.....	18.7
May 24	53.65	40.4	28.65	36.3	33.4	46.8	14.1	18.8
June 20	56.15	40.5	28.65	36.95	31.2	44.95	22.75	18.4
July 19	57.0	41.35	28.85	37.95	34.9	47.15	23.4	19.15
Aug. 17	58.75	42.65	31.4	40.05	39.45	48.05	24.9	20.4
Sept. 20	57.9	42.9	32.15	40.05	33.95	47.15	24.25	20.45
Oct. 25	59.75	43.45	33.6	41.65	42.65	46.7	23.4	20.7
Nov. 16	59.5	43.3	33.9	42.3	45.9	46.55	23.0	20.15
Dec. 16	58.95	42.1	32.9	42.05	53.3	45.9	21.1	19.7
Jan. 18, 1939	58.25	47.6	32.1	41.15	45.4	45.75	22.6	19.05
Feb. 14	57.5	41.4	31.85	41.4	42.0	45.65	20.65	18.95
Mar. 23	58.0	41.5	31.6	41.05	50.2	45.9	20.4	18.7
Apr. 27	58.0	40.65	30.4	39.95	54.05	46.15	23.6	18.65
May 24	58.35	41.15	31.0	40.45	55.15	48.0	26.1	19.7
June 21	59.65	.....	31.15	40.8	53.95	48.1	24.5	18.55
July 27	.....	.....	32.35	43.2	.....	50.15	29.65	20.9
Aug. 10	60.4	41.9	31.75	42.55	62.9	50.9	30.35	19.3
Sept. 15	60.35	41.8	31.85	41.2	59.25	50.75	29.9	20.05
Oct. 18	57.8	40.95	31.85	41.95	40.9	48.75	25.25	18.55
Nov. 17	57.15	41.1	32.35	42.4	61.45	48.4	24.75	19.15
Dec. 18	61.65	40.05	35.8	44.2	47.95	48.15	20.9	18.65

## Jackson County

Jackson 1. City of Jackson. Well 5 $\frac{1}{2}$  (formerly well 19), between supply wells 5 and 6 and about 1,100 feet northeast of main building of pumping station of city waterworks. Unused drilled public supply well, diameter 12 inches, depth between 383 and 412 feet. Cased to approximately 75 feet. Penetrates bedrock. Measuring point, top of 3/4-inch pipe in cap on 12-inch casing, approximately level with land surface and 930.89 feet above mean sea level. Water level affected by pumping from nearby wells, about 300 feet to about 1,200 feet distant, in the well field. Measurements made by members of the city water department, under the supervision of D. J. Stellingworth, chief engineer of pumping station, city waterworks, Jackson.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Dec. 4	37.1	Dec. 14	38.55	Dec. 19	27.10	Dec. 27	27.78
6	34.9	16	32.59	23	22.55	30	21.19
11	30.1						

## Kalamazoo County

Kalamazoo 1. City of Kalamazoo. Well B at central pumping station (Burdick Street) of city waterworks. Drilled public supply well, diameter 40 inches, depth 125 feet. Penetrates unconsolidated deposits. Measurements made in 2-inch pipe just outside well casing. Measuring point, top of 2-inch pipe, approximately level with pump house floor and 764.51 feet above mean sea level.

Kalamazoo 2. City of Kalamazoo. Well C of city waterworks, about 1,100 feet southwest of central pumping station. Drilled public supply well, diameter 40 inches, depth 137 feet. Penetrates unconsolidated deposits. Measurements made in 2-inch pipe just outside well casing. Measuring point, top of 2-inch pipe, approximately level with pump house floor and 764.97 feet above mean sea level.

Kalamazoo 3. City of Kalamazoo. At Balch Street pumping station of city waterworks, between supply wells 1 and 2. Drilled test well, diameter 2 inches, depth 30 feet. Penetrates unconsolidated deposits. Measuring point, top of 2-inch casing, approximately level with land surface and 766.78 feet above mean sea level.

Wells 1 to 3 inclusive are situated at approximately equal intervals on a line extending southwest from well 1 to well 3. Measurements are made by Floyd Rothwell, chief operator, pumping station, Leo Witters, superintendent. Measurements are generally made on Sunday, after all city wells have been shut down at least six or eight hours. Water-level fluctuations in the wells from the beginning of record through 1939 are shown in the accompanying figure.

The water level in well 3 reached its lowest stage for the period of record in August 1931. This low stage was probably the result of droughts in 1930 and 1931, together with heavy pumpage from city wells. The pumpage in July 1931 was the greatest for the period of record. Although the water level rose about 8 feet from August 1931 to May 1932, a deficiency in precipitation during the spring of 1932 probably decreased ground-water recharge and thus prevented the water level from reaching a still higher stage. The water level did not decline as low during the summer of 1932 as in 1931, possibly because the summer pumpage in 1932 was less than in 1931, although the total annual pumpage was about the same during the two years and was nearly the same as the average for the period from 1931 to 1939. The annual pumpage during 1933, 1934, and 1935 was below the average, and during 1936, 1937, 1938, and 1939 it was above the average. In the spring of 1933 the precipitation was somewhat above normal and, although water-level records are not available for most of 1933, it is possible that stages higher than any observed during the period of record were reached during that year. The pumpage during the winter of 1933-34 was the lowest for the period of record and, although precipitation was somewhat deficient during the spring of 1934, the water levels reached stages as high as at any time during the period of record. Pumpage was moderately heavy during the summer of 1934, due probably to the drought, and water

## Kalamazoo County--Continued

levels declined rather rapidly from the high stages reached during the spring. The water levels recovered to moderately high stages during the spring of 1935 and, probably because the pumpage during 1935 was the lowest during the period of record, did not fluctuate greatly during the year. Precipitation was about normal in 1935. In the spring of 1936 rainfall was deficient and the water levels did not recover greatly from the low stages reached in the latter part of 1935. Due to drought and increased pumping during the summer of 1936 the water levels declined to the lowest stages since 1931. The stages reached in 1936 were also lower than any reached since that year. In 1937 precipitation was about normal and, although the total annual pumpage was slightly greater than the average for the period of record, the water levels did not decline greatly during the year, and in well 3 the water level showed an irregular upward trend during most of the year. Stages about as high as those recorded in 1934 and 1935 were reached during the spring of 1938, but the pumpage during August was nearly as great as in August 1931, and the water levels reached slightly lower stages than in 1937. Possibly because the pumpage during the winter of 1938-39 was higher than the average, the water levels did not reach stages as high during the spring of 1939 as during the spring of 1938. The rate of pumping was maintained at a fairly high level during the summer of 1939 and the water levels declined to stages that were in general slightly lower than in 1938. At the end of the year the water levels were about 1 foot lower than at the end of 1938.

Water levels in wells Kalamazoo 1, 2, and 3, in feet below measuring point, 1939

Date	1	2	3	Date	1	2	3
July 30	13.55	11.56	10.95	Oct. 22	13.59	11.61	9.98
Aug. 20	11.95	10.78	10.05	Nov. 19	13.65	12.14	10.85
Sept. 3	13.11	11.31	9.76	Dec. 3	13.64	11.63	10.15
15	13.27	11.57	10.03	17	13.22	11.11	10.35
Oct. 8	13.69	12.13	10.87				

## Kalkaska County

100. NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 36, T. 27 N., R. 5 W. Measuring point, 1.70 feet above land surface.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 4	15.91	Apr. 12	15.61	July 19	15.32	Oct. 12	15.89
18	15.84	25	15.49	Aug. 8	15.68	26	15.97
30	15.72	May 9	15.29	17	15.82	Nov. 9	16.03
Feb. 15	15.75	23	15.25	31	15.74	24	15.97
Mar. 2	15.88	June 8	15.18	Sept. 14	15.72	Dec. 7	15.94
17	15.96	21	15.18	28	15.82	26	16.05
30	15.97	July 6	15.36				

## Missaukee County

Water levels, in feet below measuring point, 1939

Date	T.22 N., R.5 W. 1	T.23 N., R. 5 W. 9	T.23 N., R. 6 W. 17	T.24 N., R.6 W. 3 45 46
Jan. 4	4.83	5.65	3.74	.... 8.92 3.26
30	4.20	5.58	3.70	.... 8.95 3.17
Feb. 15	4.04	5.50	3.72	.... 9.00 3.20
Mar. 17	4.08	5.51	....	.... ....
30	1.84	4.75	2.33	.... .... 2.00
Apr. 12	2.15	5.27	2.76	.... 4.25 2.23
25	1.43	5.00	2.17	.... 4.92 1.76
May 9	1.28	(a)	2.32	4.90 5.42 1.60
23	1.85	....	2.70	5.09 5.76 2.09
June 8	2.28	....	2.96	5.22 6.02 2.10
21	....	....	2.60	5.07 6.10 2.03

a Well plugged.

## Missaukee County--Continued

Water levels, in feet below measuring point, 1939

Date	T. 22 N., R. 5 W.		T. 23 N., R. 5 W.		T. 23 N., R. 6 W.		T. 24 N., R. 6 W.		
	1		9		17		3	45	46
July 6	....		....		3.11		5.52	6.47	2.56
19	....		....		3.34		5.87	6.75	2.34
Aug. 2	....		....		....		6.29	6.97	3.01
17	....		....		3.69		6.57	7.05	3.04
31	....		....		3.14		5.98	6.83	2.51
Sept. 14	....		....		3.09		6.16	6.93	2.54
28	4.36		....		3.55		6.44	7.22	2.86
Oct. 12	4.44		....		3.81		6.65	7.46	2.96
26	4.12		....		3.94		6.76	7.64	3.00
Nov. 9	3.81		....		3.83		6.61	7.70	2.74
24	3.85		....		3.94		6.46	7.91	2.90
Dec. 4	3.93		....		4.05		6.49	8.05	2.90
26	4.02		....		4.21		6.58	8.25	3.05

## Montmorency County

Observations discontinued on well 17 in T. 31 N., R. 2 E., and on well 42 in T. 31 N., R. 3 E.

Water levels, in feet below measuring point, 1939

Date	T. 31 N., R. 2 E.					Date	T. 31 N., R. 2 E.				
	6	15	17	18	28		6	15	17	18	28
Jan. 16	11.39	10.47	9.56	14.67	4.60	June 20	10.55	9.75 (b)	13.48	4.29	
27	11.23	10.48	9.58	14.56	4.66	July 7	10.89	....	....	13.67	4.54
Feb. 10	11.25	10.43	9.74	14.57	4.63	21	10.55	....	....	13.88	4.66
Mar. 6	11.40	10.51	9.83	14.65	4.66	Aug. 7	11.56	10.31	....	14.14	4.70
22	11.50	10.56	9.91	14.74	4.71	18	11.69	10.47	....	14.40	4.76
31	10.81	10.17	8.78	14.15	4.24	Oct. 27	(a)	10.74	....	15.12	4.78
Apr. 14	10.52	9.98	8.80	13.79	4.35	Dec. 5	....	10.76	....	15.05	4.54

Water levels, in feet below measuring point, 1939

Date	T. 31 N., R. 3 E.				T. 31 N., R. 4 E.	
	22	30	40	42	1	12
Jan. 16	6.67	15.25	1.27	5.13	4.30	3.98
27	7.48	16.23	1.27	5.26	4.39	4.10
Feb. 10	7.48	16.24	1.23	5.33	4.50	4.03
Mar. 6	7.73	16.28	1.20	....	4.53	4.06
22	7.86	16.47	1.26	....	4.59	4.16
31	7.00	16.15	1.13	5.44	3.96	3.69
Apr. 13	6.67	16.02	1.17	4.33	4.31	3.91
June 20	6.20	15.25	1.27	(c)	4.24	3.90
July 6	6.48	15.26	1.43	....	4.60	4.24
20	6.77	15.25	1.70	....	4.85	4.38
Aug. 3	7.08	15.58	1.47	....	4.91	4.21
18	7.27	15.73	1.30	....	4.86	4.36
Oct. 27	7.78	16.34	1.25	....	4.99	4.16
Dec. 5	7.90	16.69	1.23	....	4.90	4.13

Water level in well 15 in T. 32 N., R. 2 E.,  
in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 13	18.80	Mar. 21	18.76	July 7	17.73	Aug. 17	17.90
26	18.43	30	16.10	21	17.90	Oct. 24	18.67
Feb. 9	18.53	Apr. 13	17.02	Aug. 7	18.01	Dec. 4	18.90
Mar. 3	18.70	June 20	17.50				

a Dry.

b Well destroyed.

c Well plugged.

## Oakland County

Oakland 1. City of Pontiac. Well 6 at Walnut Street pumping station, about 200 feet west of supply well 1. Unused drilled public supply well, diameter 8 inches, depth 164 feet. Penetrates unconsolidated deposits. Measuring point, top of sheet-iron cap welded to top of 8-inch casing, 2.75 feet above land surface and 924.63 feet above mean sea level.

Oakland 2. City of Pontiac. Well 21 in Walnut Street well group, about 40 feet northwest of supply well 3. Unused drilled public supply well, diameter 8 inches, depth unknown, but presumably penetrates some unconsolidated water-bearing beds as does supply well 3, which is 236 feet deep. Measuring point, top of 2-inch pipe, 1.17 feet above top of cap on 8-inch casing, 3.75 feet above land surface and 932.25 feet above mean sea level.

Oakland 3. City of Pontiac. Just outside pump house of East Boulevard supply well, near intersection of East Boulevard and Mt. Clemens Street. Drilled test well, diameter 2 inches, depth approximately 176 feet. Measuring point, top of 2-inch casing, 0.6 foot below land surface and 882.62 feet above mean sea level.

Water levels in wells 1 to 3 inclusive are affected by pumping from nearby supply wells. Measurements made by members of the Department of Water Supply, Pontiac, H. L. Monroe, superintendent, H. W. MacDuff, chief engineer. Water-level fluctuations in the wells from the beginning of record through 1938 are shown in the accompanying figure.

In 1929 the precipitation was above normal, including an excess in the spring when conditions for ground-water recharge are generally most favorable, and in May 1929 the water level in well 1 reached the highest stage during the period of record, although the total pumpage from city wells during May was greater than in any one month of any succeeding year, and the total pumpage during 1929 was more than 50 percent greater than the average yearly pumpage during the period 1929-1939. Water-level records are not available for 1930. In 1931 the pumpage was less than in 1930, but as the deficient spring precipitation in 1930 and 1931 probably resulted in greatly decreased ground-water recharge in those years, the highest stage of the water level in well 1 in 1931 was about 10 feet lower than the highest stage in 1929, and the water level in the summer reached a stage as low as that recorded at any time during the period of record. The pumpage in 1932 was the lowest for the period of record, and the water levels in wells 1 to 3 inclusive showed some recovery during the latter part of the year. In well 3 the water level reached a stage about 15 feet higher than in the spring of 1931, possibly as a result of both decreased pumpage and abnormal precipitation during the spring of 1933. In 1934 a deficiency in spring precipitation and an increase in pumpage over that of 1932 and 1933 resulted in the water levels reaching lower stages than in 1933. In 1935 the pumpage was higher than in 1934, but it was more evenly distributed throughout the year and water levels did not fluctuate greatly. Precipitation was about normal in 1935. In 1936 another drought, together with an increase in pumpage, caused a decline in water levels to stages that were lower than at any time since 1931. In 1937 precipitation was about normal, but a considerable increase in pumpage caused still lower stages to be reached during the summer and fall. In 1938 precipitation was again about normal, and pumpage decreased considerably, resulting in a rise in water levels during the spring to stages 15 feet or more higher than the low stages of 1937. In 1939, although precipitation was about normal, the water levels did not rise as high during the spring as in 1938 and they declined to somewhat lower stages in the fall, possibly as a result of increased pumpage during the year.

## Oakland County--Continued

Water levels in wells Oakland 1, 2, and 3, in feet below measuring point, 1939

Date	1	2	3	Date	1	2	3	Date	1	2	3
Jan. 4	68.5	76.7	....	May 15	63.7	72.8	11.9	Sept. 6	66.8	74.5	15.6
11	67.8	76.4	17.0	22	65.8	73.2	9.9	13	67.0	74.3	16.4
18	69.0	77.2	17.0	29	65.8	73.5	10.0	22	66.9	74.8	15.6
25	68.6	76.8	17.3	June 2	66.0	73.5	10.3	27	67.3	74.5	13.9
Feb. 1	70.0	77.8	17.0	7	67.7	76.1	12.2	Oct. 4	66.5	74.3	15.6
8	66.0	73.9	17.7	14	69.5	78.2	13.1	11	65.7	73.8	16.1
15	69.0	77.1	16.3	21	69.0	77.2	14.0	18	66.5	73.9	15.4
20	65.8	74.4	15.1	28	69.9	77.9	14.3	25	67.0	74.0	14.5
27	65.4	73.7	13.6	July 5	67.0	76.2	13.8	Nov. 1	73.0	....	19.3
Mar. 1	67.5	75.7	14.2	12	66.4	73.9	15.4	8	73.4	....	20.2
6	63.0	71.9	13.1	19	66.7	75.8	16.5	15	69.6	81.3	20.4
10	68.3	76.7	13.0	26	66.9	76.9	15.9	22	70.6	....	19.3
Apr. 5	66.2	74.3	14.3	Aug. 2	66.6	74.5	16.0	29	71.5	....	20.7
12	65.8	73.7	13.5	9	66.1	73.4	16.2	Dec. 6	68.7	....	....
19	66.7	74.1	14.2	16	67.4	73.6	14.2	13	68.7	....	....
26	65.3	73.7	13.8	23	66.7	74.2	15.1	20	67.3	....	....
May 8	65.3	74.0	13.7	30	67.4	74.5	14.5	27	66.9	....	....

## Otsego County

Water level in well 105 in T. 29 N., R. 3 W., in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 9	4.85	Apr. 4	4.17	June 27	4.55	Oct. 11	5.68
26	4.63	18	3.97	July 31	5.32	25	5.65
Feb. 8	4.62	May 2	3.90	Aug. 15	5.50	Nov. 7	5.55
21	4.62	16	3.96	30	5.46	21	5.50
Mar. 7	4.62	29	4.03	Sept. 13	5.57	Dec. 5	5.54
21	4.72	June 13	4.28	27	5.68	22	5.55

Water level in well 106 in T. 29 N., R. 3 W., in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 9	9.66	Apr. 4	8.86	June 27	8.94	Oct. 11	9.91
26	9.42	18	8.47	July 31	9.37	25	9.93
Feb. 8	9.31	May 2	8.38	Aug. 15	9.58	Nov. 7	9.94
21	9.24	16	8.44	30	9.72	21	9.95
Mar. 7	9.24	29	8.59	Sept. 13	9.81	Dec. 5	9.94
21	9.30	June 13	8.78	27	9.88	22	9.90

## Presque Isle County

Water levels, in feet below measuring point, 1939

Date	T. 33 N., R. 2 E.					
	13	17	18	19	20	23
Jan. 13	10.97	6.20	5.79	10.41	4.69	3.91
26	10.81	6.39	5.80	10.33	....	4.37
Feb. 9	10.93	6.53	5.92	10.56	....	4.69
Mar. 3	11.05	6.62	6.01	10.75	....	4.85
21	11.13	6.70	6.10	10.83	....	4.82
30	10.72	6.14	5.82	9.95	4.44	3.64
Apr. 13	10.56	6.45	5.73	9.96	4.55	4.05
June 20	10.10	6.32	4.87	9.57	4.43	4.62
July 7	10.39	6.50	4.70	9.91	4.86	5.04
21	10.65	6.73	4.75	10.21	5.39	5.38
Aug. 7	10.88	6.89	4.99	10.77	5.81	5.65
17	10.39	6.85	4.75	10.74	5.68	5.30
Oct. 24	11.00	7.16	5.20	11.03	5.69	5.37
Dec. 4	11.01	7.22	5.34	10.94	5.37	4.89

## Roscommon County

50. NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 4, T. 21 N., R. 4 W. Measuring point, 1.0 foot above land surface.

50. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 3, T. 23 N., R. 1 W.

1000. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 21, T. 24 N., R. 2 W. Measuring point, 1.50 feet above land surface.

## Water levels, in feet below measuring point, 1939

Date	T.21 N., R.3 W.		T.21 N., R.4 W.		Date	T.21 N., R.3 W.		T.21 N., R.4 W.	
	3	15	8	50		3	15	8	50
Jan. 5	16.15	12.62	....	6.72	July 5	15.76	12.50	4.73	5.32
17	16.25	12.60	5.05	6.29	17	15.81	12.65	5.24	6.02
31	16.33	12.64	5.23	6.39	Aug. 1	15.94	12.82	5.90	6.84
Feb. 14	.....	12.65	5.04	6.34	16	16.07	12.82	5.70	6.75
Mar. 1	16.48	12.66	5.14	6.46	28	16.14	12.83	5.33	6.49
15	16.53	12.65	5.05	6.39	Sept. 12	16.22	12.80	5.63	6.48
29	16.31	12.35	3.99	5.23	25	16.35	12.87	5.60	6.78
Apr. 11	16.29	12.45	4.20	5.20	Oct. 10	16.46	12.88	5.71	6.81
26	16.21	12.29	3.78	4.54	24	16.56	12.89	5.67	6.82
May 10	15.99	12.30	4.08	4.57	Nov. 6	16.65	12.86	5.29	6.61
23	15.90	12.35	3.78	4.35	22	16.75	12.89	5.25	6.60
June 9	15.85	12.33	4.37	4.74	Dec. 4	16.82	12.87	5.28	6.60
19	15.79	12.39	4.44	4.76	21	16.92	12.90	5.23	6.64

## Water levels, in feet below measuring point, 1939

Date	T.22 N. R. 1 W.		T.22 N., R.2 W.			T.22 N., R.3 W.			T.22N. R.4 W.		T.23N. R.1 W.		T.23 N., R. 3 W.	
	5	3	9	15	16	7	20	26	4	50	5	75		
Jan. 5	4.52	9.74	6.47	5.00	6.05	8.35	7.90	7.42	4.92	6.50	5.90	8.33		
17	4.17	9.21	6.22	4.60	5.40	8.14	7.80	7.47	4.40	5.83	5.63	8.06		
31	4.44	9.22	6.29	4.79	5.56	8.25	7.89	7.54	4.63	5.90	5.77	8.17		
Feb. 14	4.32	9.20	6.26	4.74	5.35	8.26	7.78	....	4.70	6.05	5.70	8.27		
Mar. 1	4.60	9.35	6.29	4.90	5.72	8.42	7.84	7.70	4.86	6.24	5.82	8.35		
15	4.55	9.36	6.31	4.88	5.76	8.43	7.78	7.76	4.88	6.33	5.77	8.39		
29	3.70	8.63	5.53	3.95	4.77	7.60	7.22	7.16	3.84	5.33	4.98	7.79		
Apr. 11	3.75	8.44	5.79	4.08	4.77	7.50	7.30	7.06	4.00	5.19	5.07	7.88		
26	3.34	7.94	5.44	3.72	4.32	7.15	6.99	6.81	3.52	4.62	4.72	7.54		
May 10	3.42	7.88	5.61	3.92	4.54	6.95	7.16	6.52	3.58	4.58	4.90	7.57		
23	3.35	7.84	5.57	3.79	4.32	6.82	7.12	6.32	3.70	4.60	5.06	7.54		
June 9	3.42	7.69	5.76	4.08	4.50	6.65	7.32	5.99	3.87	4.76	5.27	7.59		
19	3.43	7.87	5.85	4.18	4.62	6.70	7.42	5.91	3.97	4.94	5.38	7.63		
July 5	3.55	8.13	5.95	4.42	4.88	6.90	7.68	6.07	4.18	4.96	5.49	7.61		
17	4.09	8.65	6.32	4.89	5.38	7.24	8.12	6.36	4.45	5.30	6.02	7.85		
Aug. 1	4.85	9.34	6.92	5.46	5.96	7.69	8.67	6.70	4.84	5.78	6.54	8.15		
16	4.68	9.61	6.85	5.53	6.02	7.88	7.42	6.87	4.85	5.75	6.40	8.30		
28	4.97	9.77	7.01	5.54	6.03	7.98	8.34	7.01	4.61	5.95	6.38	8.38		
Sept. 12	4.92	9.88	6.93	5.56	6.14	7.81	8.34	7.20	4.71	6.09	6.29	8.47		
25	5.30	10.13	6.98	5.68	6.27	8.32	8.40	7.37	5.04	6.29	6.50	....		
Oct. 10	5.55	10.29	7.05	5.74	6.32	8.47	8.29	7.55	5.15	6.47	6.40	....		
24	5.53	10.32	6.96	5.62	6.27	8.57	8.25	7.69	5.14	6.60	6.29	....		
Nov. 6	5.28	10.19	6.78	5.38	6.07	8.61	8.09	7.79	5.02	6.67	6.13	....		
22	5.33	10.12	6.72	5.33	6.00	8.65	8.10	7.91	4.92	6.70	....	....		
Dec. 4	5.32	10.12	6.70	5.36	6.08	8.72	8.05	7.99	5.00	6.73	6.05	8.55		
21	5.35	10.15	6.70	5.37	6.17	8.81	8.05	8.12	5.13	6.82	6.05	8.62		

## Water levels, in feet below measuring point, 1939

Date	T.24 N. R. 1 W.		T. 24 N., R. 2 W.				T.24 N., R.3 W.	
	30	81	88	107	150	1000	1	7
Jan. 5	18.50	4.55	11.06	9.27	4.43	....	10.34	13.61
17	18.45	4.67	10.85	9.10	4.20	....	10.32	13.24
31	18.46	4.73	10.75	9.10	4.62	....	10.30	13.26
Feb. 14	18.52	4.81	10.75	9.05	4.55	....	10.36	13.31
Mar. 1	18.55	4.91	10.85	9.15	4.78	....	....	13.46
15	18.63	4.97	10.86	9.17	4.70	....	....	13.38
29	18.13	4.53	10.43	8.40	3.17	....	9.84	12.85



## Roscommon County--Continued

Water levels, in feet below measuring point, 1939

Date	T. 24 N., R. 1 W.		T. 24 N., R. 2 W.				T. 24 N., R. 3 W.	
	30	31	33	107	153	1000	1	7
Apr. 11	17.94	4.50	10.12	8.52	3.46	7.10	9.30	12.30
26	17.77	4.28	9.69	8.19	3.03	6.34	9.33	11.72
May 10	17.50	4.12	9.42	8.27	2.94	5.65	9.00	11.64
23	17.37	4.06	9.32	8.24	2.93	5.43	8.93	11.65
June 9	17.32	4.08	9.28	8.59	3.42	5.39	8.93	11.79
19	17.34	4.05	9.32	8.71	3.66	5.54	9.03	11.96
July 5	17.33	4.08	9.52	8.80	3.94	5.36	9.11	11.99
17	17.43	4.13	9.83	8.96	4.60	5.89	9.33	12.49
Aug. 1	17.69	4.18	10.21	9.18	5.21	6.47	9.62	13.15
16	17.82	4.26	10.46	9.30	4.59	6.87	9.84	13.35
30	17.91	4.33	10.59	9.33	4.70	7.02	9.98	13.36
Sept. 12	18.00	4.40	10.76	9.39	4.61	7.23	10.05	13.51
25	18.16	4.47	10.91	9.46	4.88	7.44	10.20	13.65
Oct. 10	18.27	4.57	11.01	9.50	4.99	7.57	10.35	13.74
24	18.34	4.67	11.08	9.50	4.90	7.71	10.47	13.80
Nov. 6	(a)	4.75	11.10	9.51	4.70	7.83	10.56	13.79
22	(a)	4.84	11.13	9.52	4.89	7.91	10.64	13.80
Dec. 4	(a)	4.92	11.15	9.53	4.83	7.95	10.66	13.85
22	.....	5.03	11.17	9.55	4.84	8.08	10.74	13.88

Water levels, in feet below measuring point, 1939

Date	T. 24 N., R. 3 W.		Date	T. 24 N., R. 3 W.		Date	T. 24 N., R. 3 W.	
	17	19		17	19		17	19
Jan. 9	15.11	7.37	May 16	14.60	7.52	Sept. 13	15.26	7.48
26	15.06	7.40	29	14.68	7.51	27	15.33	7.50
Feb. 8	15.15	7.43	June 13	14.74	7.48	Oct. 11	15.40	7.53
21	15.05	7.45	27	14.67	7.47	25	15.40	7.56
Mar. 7	15.30	7.50	July 13	14.81	7.45	Nov. 7	15.49	7.58
21	15.34	7.53	31	15.07	....	21	15.51	7.61
Apr. 4	14.83	7.55	Aug. 15	15.16	7.46	Dec. 5	15.55	7.65
18	14.82	7.55	30	15.17	7.47	22	15.61	7.70
May 2	14.51	7.55						

Roscommon recorder well.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	7.97	Apr. 8	7.13	July 7	7.08	Oct. 6	7.83
14	7.72	15	7.18	14	7.21	13	7.86
21	7.73	22	6.86	21	7.39	20	7.84
28	7.78	29	6.71	28	7.50	28	7.85
Feb. 4	7.82	May 6	6.70	Aug. 4	7.57	Nov. 4	7.84
11	7.84	13	6.70	11	7.53	11	7.83
18	7.86	20	6.74	18	7.64	18	7.82
25	7.91	27	6.76	25	7.64	25	7.83
Mar. 4	7.93	June 3	6.83	Sept. 1	7.68	Dec. 2	7.83
11	7.97	10	6.89	8	7.75	9	7.84
18	8.01	17	6.98	15	7.77	16	7.85
25	7.41	23	6.76	22	7.85	23	7.88
Apr. 1	7.13	30	6.89	29	7.83	30	7.89

## St. Joseph County

St. Joseph 1. City of Three Rivers, about 350 feet south of West Michigan Street on island at confluence of St. Joseph River and Rock River. Unused drilled public supply well, diameter 6 inches, depth 80 (?) feet. Penetrates unconsolidated deposits. Measuring point, top of 1½-inch pipe, 5.29 feet above top of cap on 6-inch casing, 2.9 feet above land surface, and 793.42 feet above mean sea level. Water level affected by pumping from two wells of the present public supply system, each of which is about 400 feet distant. Measurements made by A. C. Walls, under the supervision of O. O. Johnson, city manager, City of Three Rivers.

Water level, in feet below measuring point, 1939

Nov. 6	1.13	Nov. 20	3.10	Dec. 8	2.92	Dec. 22	2.94
13	1.13	27	.80	15	.24	29	2.94

a Dry.

## MISSISSIPPI

By G. F. Brown and V. M. Foster

The State-wide investigation of water levels in wells begun in 1938 by the Federal Geological Survey in cooperation with the Mississippi Geological Survey was continued during 1939. Most of the measurements were made in wells in counties near the Gulf Coast and in the Mississippi alluvial plain in northwestern Mississippi, but a few were made in wells in the loess hills and in the north-central hills east of the alluvial plain.

The observation-well program at the end of 1939 included 25 wells, on 6 of which water-level recorders were operated. Of the water-level recorders in operation at the end of the year, four are of the pressure type and two are of the float type.

A progress report describing general ground-water conditions in the alluvial plain and on the Gulf Coast was submitted to the State Planning Commission, Jackson, Miss., and to the State Geologist, Oxford, Miss.

The water levels in wells at Belzoni, in the south-central part of the alluvial plain, fell 1.8 feet from May to October, when the lowest stages of the year were recorded. Water levels recovered 0.6 foot from October to the end of December. The fluctuations of water levels in wells at Marks, in the northern part of the alluvial plain, were similar to those at Belzoni, except that the lowest levels were recorded in November. The water level in well LeFlore 134, at Greenwood, declined 9.24 feet from June 5 to September 10. During this period 1,100 gallons a minute was pumped nearly continuously from a well that is 0.6 mile southwest of the observation well and that penetrates the same kind of sand as that which surrounds the observation well. From September 10 to the end of the year the pump on the well close by was not operated, and the water level rose approximately to its level in June. The lowest water levels in wells at Gulfport were recorded in September.

The information obtained thus far on water levels in Mississippi shows a general decline in artesian pressure when compared with the measurements reported in Water-Supply Paper 576. Water levels appear to have fallen several tens of feet during the past 30 years, both in the alluvial plain and along the coast. Although the decline appears to have been greatest

in areas of heavy withdrawal, measurements made in connection with the present investigation have not been carried on for a sufficient period to indicate the present trends of water levels.

The water levels given on the following pages are the highest and lowest stages reached each month for those wells on which a continuous record was obtained.

## Bolívar County

18. Town of Gunnison. NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 8, T. 24 N., R. 7 W., immediately behind combination fire department and jail building in southwest part of town. Used municipal drilled well, diameter 6 inches, reported depth 1,738 feet. Measuring point, top of casing tee, level with land surface and 155 feet above mean sea level. Town supply. Water levels, in feet above measuring point, 1939: May 29, 28.9; Aug. 13, 27.2.

35. (Bolívar 4 in Water-Supply Paper 576, p. 93). Town of Beulah. SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 27, T. 22 N., R. 8 W., in northwest corner of gin lot and 300 feet southeast of railroad station. Used municipal drilled well, diameter at top 8 inches, reported depth 1,760 feet. Measuring point, top of casing elbow, 1.4 feet above land surface and 146 feet above mean sea level. Town supply. Water levels, in feet above measuring point, 1939: May 24, 28.9; Aug. 13, 28.3.

50. Jones Bayou Gin Co. NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 17, T. 21 N., R. 5 W., northeast corner of gin building and 75 feet west of Y. & M. V. R. R. at O'Reilly. Used drilled domestic well, diameter at top 3 inches, reported depth about 1,500 feet. Measuring point, top of casing elbow, 1 foot above land surface and 136 feet above mean sea level. Water levels, in feet above measuring point, 1939: May 30, 19.1; Aug. 13, 18.6.

## Grenada County

Holcomb School. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 15, T. 22 N., R. 3 E., between school building and agricultural building and 5 feet east of concrete walk, northwest part of Holcomb. Used drilled school well, diameter at top 3 inches, reported depth 983 feet. Measuring point, top of casing tee, 2.7 feet above land surface. Water levels, in feet above measuring point, 1939: Jan. 16, 24.7; Aug. 14, 27.6.

Town of Holcomb. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 22, T. 22 N., R. 3 E., 75 feet north of post office and 30 feet west of State Highway 7. Used drilled domestic well, diameter 2 inches, reported depth about 360 feet. Measuring point, top of 2-inch casing tee, 3.0 feet above land surface. Equipped with pitcher pump. Water levels, in feet below measuring point, 1939: Jan. 16, 4.20; Aug. 14, 4.63.

## Harrison County

118. (Harrison 17 in Water-Supply Paper 576, p. 195.) U. S. post office, Gulfport. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 9, T. 8 S., R. 11 W., on lawn at southwest corner of post office, 75 feet east of centerline of U. S. Highway 49 and 150 feet south of centerline of U. S. Highway 90. Unused drilled well, diameter 3 inches, reported depth 1,262 feet. Measuring point, top of cross, 1.7 feet above land surface and 18 feet above mean sea level. Water-stage recorder maintained on well since July 31, 1939. Water level, 64.3 feet above measuring point, Sept. 2, 1919.

Water level, in feet above measuring point, 1939

Date	Hour	Water level	Date	Hour	Water level
Mar. 15	.....	20.0	Sept. 13	9:00 p.m.	16.9
June 15	6:00 a.m.	24.8	Oct. 9	12:01 p.m.	23.0
25	7:15 p.m.	21.3	21	6:45 p.m.	18.4
July 1	7:30 p.m.	21.1	Nov. 3	8:00 p.m.	18.9
31	12:15 a.m.	24.6	30	2:00 a.m.	24.1
Aug. 1	1:00 p.m.	24.3	Dec. 17	3:45 p.m.	24.4
11	4:15 a.m.	18.9	22	2:45 p.m.	21.1
Sept. 2	6:00 a.m.	22.0			

a Flowing prior to measurement.

## Holmes County

38. Town of Tchula. Water level, in feet above measuring point, 1939: Nov. 1, 13.4.

59. M. L. Smith. Water level, in feet above measuring point, 1939: Feb. 15, 130.8.

## Humphreys County

4. No measurements made in 1939.

10. Wister Henry. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 35, T. 16 N., R. 3 W., 0.3 mile east of U. S. Highway 49W and 600 feet northeast of owner's house. Used drilled domestic well, diameter 2 inches, reported depth 1,627 feet. Measuring point, top of casing tee, 0.5 foot above land surface and 114 feet above mean sea level. Water level, in feet above measuring point, 1939: Nov. 1, 104.7.

18. J. C. Holbrook.

Water level, in feet above measuring point, 1939

Date	Hour	Water level	Date	Hour	Water level
May 11	3:30 p.m.	9.3	Sept. 2	4:00 p.m.	7.9
30	7:00 a.m.	7.4	27	7:00 a.m.	6.9
June 6	12:30 p.m.	8.4	Oct. 4	3:00 p.m.	7.5
13	4:45 a.m.	7.7	15	8:00 a.m.	6.6
July 1	3:00 a.m.	8.2	Nov. 3	7:00 a.m.	6.8
28	3:00 a.m.	7.6	30	4:00 a.m.	7.8
Aug. 8	3:00 a.m.	8.1	Dec. 3	1:30 p.m.	8.1
25	5:00 a.m.	7.4	14	3:00 p.m.	7.0

56. Town of Louise. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 15, T. 13 N., R. 4 W., south side of road near town hall and about 300 feet east of U. S. Highway 49W. Used drilled municipal well, diameter 6 inches, reported depth 909 feet. Measuring point, top of union on 4-inch pump discharge pipe, 2 feet above land surface. Equipped with well turbine pump. Water levels, in feet above measuring point, 1939: May 13, 21.2; Aug. 17, 22.3.

## Issaquena County

24. W. W. Gary. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 12, T. 9 N., R. 7 W., within levee of old lumber yard at Valley Park, 51 feet east of centerline of U. S. Highway 61. Used drilled domestic well, diameter 6 inches, reported depth 1,300 feet. Measuring point, top of tee, 3.3 feet above land surface and 98 feet above mean sea level. Water level, in feet above measuring point, 1939: Feb. 9, 45.3.

## LeFlore County

60. Mrs. D. B. Jameson. Water level, in feet above measuring point, 1939: Feb. 14, 12.6.

74. Rudolph Bermander. Water level, in feet above measuring point, 1939: Feb. 14, 7.4.

134. (LeFlore 9 in Water-Supply Paper 576, p. 301.) E. D. Simmons. NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 10, T. 19 N., R. 1 E., in small well house at southeast corner of yard, east end of Washington Street, Greenwood. Unused drilled domestic well, diameter 2 inches, reported depth about 600 feet. Measuring point, top of 4-inch pipe, 6.5 feet above land surface. Water-level recorder maintained on well since May 4, 1939.

Water level, in feet below measuring point, 1939

May 8	8:00 a.m.	2.18	Sept. 10	8:15 p.m.	12.98
26	7:00 p.m.	4.11	30	11:59 p.m.	7.97
June 5	2:30 p.m.	3.74	Oct. 1	12:01 a.m.	7.97
30	11:50 p.m.	6.00	31	11:59 p.m.	5.78
July 5	1:00 p.m.	5.70	Nov. 1	12:01 a.m.	5.78
31	11:59 p.m.	10.16	25	2:00 p.m.	5.05
Aug. 1	12:01 a.m.	10.16	Dec. 26	4:00 p.m.	4.55
31	4:45 p.m.	11.92			

## LeFlore County--Continued

136. (LeFlore 135 in Water-Supply Paper 845, p. 163.) C. M. Journey. Water levels, in feet above measuring point, 1939: Feb. 14, 36.3; Sept. 11, 33.9.

## Quitman County

14. Dr. J. E. Furr. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 34, T. 28 N., R. 1 W., on lawn of residence, immediately west of Marks hospital and 200 feet south of State Highway 6. Unused drilled domestic well, diameter 3 inches, reported depth 379 feet. Measuring point, top of 3-inch casing tee, 0.3 foot above land surface and 161 feet above mean sea level. Water-level recorder maintained on well since July 14, 1939.

Water level, in feet above measuring point, 1939

Date	Hour	Water level	Date	Hour	Water level
June 30	.....	20.0	Oct. 23	4:00 p.m.	18.9
July 14	5:00 p.m.	19.3	29	8:00 a.m.	18.1
25	6:00 a.m.	18.1	Nov. 4	5:00 a.m.	18.0
Aug. 18	5:00 p.m.	19.1	16	2:00 p.m.	18.8
26	5:00 p.m.	18.4	Dec. 7	3:00 p.m.	19.0
Sept. 14	5:00 p.m.	18.9	25	6:00 a.m.	18.3
22	6:00 a.m.	18.3			

32. City Cafe, Lambert. Water level, in feet above measuring point, 1939: Aug. 12, 6.1.

## Sharkey County

43. (Cary well in Water-Supply Paper 576, p. 420.) Cary Water Company. SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 9, T. 11 N., R. 7 W., on east side of Deer Creek, 22 feet west from centerline of U. S. Highway 61, in Cary, opposite gasoline service station. Used drilled municipal well, diameter 2 $\frac{1}{2}$  inches, reported depth 747 feet. Measuring point, top of casing tee, 3 feet below surface of highway and 97 feet above mean sea level. Water levels, in feet above measuring point, 1939: Feb. 10, 24.6; Aug. 17, 20.1.

## Tallahatchie County

24. Town of Tutwiler. Water level, in feet above measuring point, 1939: Feb. 13, 8.4.

171. Phillip Stave Mill Company. Water level, in feet above measuring point, 1939: Feb. 14, 12.4.

## Washington County

25. E. H. Fisher. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 10, T. 18 N., R. 6 W., 5 miles east of Leland, on crest of Indian mound west of home, 100 yards south of U. S. Highway 82. Used domestic drilled well, diameter 2 inches, reported depth 1,800 feet. Measuring point, top of casing tee, level with land surface. Water level, in feet above measuring point, 1939: May 15, 42.3; Sept. 11, 40.5.

65. W. D. Atterbury. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 25, T. 16 N., R. 7 W., at Estill in garden north of home, 100 feet west of U. S. Highway 61. Used domestic drilled well, diameter at top 5 inches, reported depth 1,950 feet. Measuring point, top of casing tee, 2.4 feet above land surface and 119 feet above mean sea level. Water level, in feet above measuring point, 1939: Mar. 8, 77.7; Aug. 16, 78.9.

## Washington County--Continued

70. Town of Hollandale. SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 6, T. 15 N., R. 6 W., immediately behind jail, at west door of power plant. Unused drilled municipal well, diameter 6 inches, depth 360.7 feet. Measuring point, top of concrete pump base, 5.2 feet above land surface. Water level affected by nearby pumpage. Water-stage recorder maintained on well since Aug. 16, 1939.

Water level, in feet below measuring point, 1939

Date	Hour	Water level	Date	Hour	Water level
Mar. 2	.....	24.18	Oct. 20	5:30 p.m.	26.27
Aug. 17	6:30 a.m.	26.24	Nov. 11	5:45 p.m.	26.60
Sept. 3	9:45 a.m.	26.11	30	2:00 p.m.	28.76
24	10:45 a.m.	27.85	Dec. 21	3:00 a.m.	28.76
Oct. 10	7:00 p.m.	28.77	31	7:00 p.m.	27.36

82. J. W. Jordan. No measurements made in 1939.

## Yazoo County

2. Town of Eden. SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 8, T. 13 N., R. 1 W. (erroneously reported in Water-Supply Paper as SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 8). Water level, in feet above measuring point, 1939: Feb. 1, 25.2.

25. Yazoo City. Water level, in feet above measuring point, 1939: Jan. 17, 22.0.

# MONTANA

## FLATHEAD VALLEY BETWEEN FLATHEAD LAKE AND KALISPELL

By R. C. Cady

The periodic measurement of water levels in 39 wells in the valley and delta area between Flathead Lake and Kalispell was continued through 1939.<sup>1/</sup> To the 147 readings that had been collected since July 1928 were added 8 other readings.

Average monthly water levels and comparisons with those of 1938 and 1929 are given in the following table. Water levels in the first half of 1939 were a fraction of a foot higher than in the corresponding part of 1938, but in the latter half of the year they were lower than in 1938. Water levels in 1939 were from 0.90 foot to 1.59 feet lower than in 1929.

It should be noted that where a measurement was missing, a calculated substitute reading was inserted in computing the average water levels for 1939. This was done by comparing the readings of the well with readings of other wells nearby. The water levels are expressed in feet above the altitude 2,800 feet above sea level.

Average monthly water levels in observation wells in Flathead Valley, Mont., in 1939, and their differences from monthly averages in 1938 and 1929

Month	Average 1939	Difference from average in 1938	Difference from average in 1929
January	--	--	--
February	86.20	--	--
March	--	--	-1.59
April	86.52	+0.14	--
May	86.86	+0.38	-1.53
June	87.04	+0.06	-1.27
July	--	--	-1.34
August	86.59	-.07	--
September	--	--	-1.00
October	86.36	-.06	--
November	--	--	.94
December	86.13	-.26	--
			-.90

<sup>1/</sup> See Water-Supply Papers 777, 817, 840, and 845 for records of water level from 1928-37.

Water levels, in feet above datum, 1939  
(2,800 feet must be added to convert water  
levels to altitudes above sea level.)

Well No.	Feb.16	Apr.11	Apr.20	May 16	June 27	Aug.13	Oct.6	Dec.4
1	86.91	87.35	87.32	87.32	87.41	87.16	86.98	86.79
2	83.81	84.38	84.43	84.29	84.27	83.76	83.85	84.12
3	81.50	81.82	81.85	81.63	81.32	80.62	80.36	82.90
4	83.61	83.97	84.00	83.80	83.81	83.20	83.27	83.60
5	87.59	88.07	88.08	88.07	88.25	87.75	87.51	87.52
7	88.45	88.72	88.66	88.69	88.62	(a)	(a)	(a)
8	88.28	88.74	88.75	88.55	88.64	87.99	88.04	88.18
9	86.54	87.06	87.06	87.10	87.27	87.17	86.98	86.79
10	86.82	87.23	87.23	87.28	87.49	87.09	86.85	86.65
11	85.14	85.76	85.76	85.70	85.51	85.09	84.96	84.95
13	83.66	84.46	84.50	84.36	84.40	83.58	83.39	83.36
14	85.35	84.96	84.95	85.84	87.23	87.00	86.39	85.56
19	86.28	87.51	87.39	86.77	86.67	84.81	85.30	85.90
20	87.21	87.54	87.49	87.44	87.58	87.23	87.21	87.22
21	86.70	86.47	86.32	86.48	87.42	87.32	87.32	86.97
22	86.55	86.35	86.31	86.97	87.67	87.65	87.44	86.76
23	85.02	85.34	85.89	92.12	90.38	88.91	87.12	85.29
25	86.91	86.38	86.41	86.96	88.28	88.50	88.19	87.45
26	86.79	86.85	86.83	87.05	87.69	88.03	87.88	84.57
27	86.06	85.51	85.56	88.37	89.90	88.98	87.84	86.40
28	86.83	86.57	86.58	87.20	87.82	87.87	87.81	87.20
29	86.23	85.76	85.84	87.88	88.72	88.26	87.56	86.54
30	86.80	86.81	86.84	86.96	87.09	87.17	87.25	87.15
31	87.15	87.29	87.33	87.37	87.32	87.28	87.35	87.29
32	88.29	90.63	90.35	89.83	89.17	88.37	87.91	87.83
33	84.15	84.77	84.82	84.67	84.34	83.40	82.99	83.51
34	87.10	87.32	87.31	87.31	87.27	87.12	87.09	87.04
35	86.62	87.32	87.32	87.28	87.12	86.91	86.74	86.63
36	85.67	85.85	85.88	85.89	85.80	85.57	85.64	85.56
37	85.09	85.62	85.60	85.59	85.47	84.93	84.77	84.82
38	85.29	85.81	85.73	85.62	85.41	84.91	84.87	84.82
39	84.73	84.95	84.92	85.17	85.54	85.28	85.04	84.76
40	84.87	85.72	85.73	86.69	87.19	85.51	84.74	84.38
41	86.62	87.23	87.23	87.18	87.11	86.64	86.63	86.50
43	87.17	87.43	87.43	87.46	87.32	87.11	87.07	87.02
44	87.92	88.51	88.44	88.24	88.13	87.88	87.81	87.76
45	88.55	88.94	88.95	88.94	88.97	88.59	88.56	88.53
46	85.62	.....	85.77	85.02	85.08	84.70	84.51	84.50
47	87.91	.....	87.93	88.55	89.93	89.27	88.64	88.07
Aver- age	86.20	86.52	86.53	86.86	87.04	86.59	86.36	86.13

a Pipe obstructed.



## NEBRASKA

By L. K. Wenzel

The State-wide program of water-level measurements in wells was continued in 1939 by the Federal Geological Survey in cooperation with the Conservation and Survey Division of the University of Nebraska.

The following tables summarize water-level fluctuations in 167 key wells throughout the State. The first table gives average water levels, in feet above assumed datum planes, in wells in the fall of the 6 years from 1934 through 1939. In four of the six sections of the State, the average fall stage was lower in 1939 than in 1938; in the other two--the north-central and south-central sections--it was slightly higher.

In all the sections of the State the average fall stage was lower in 1939 than in 1934; for the entire State it was the lowest on record. The precipitation in Nebraska in 1939 as reported by the U. S. Weather Bureau was only 69 percent of normal. The second table gives average net changes in water level, based on measurements made in the fall of each year, and also average net changes in water level from 1934 to 1939. In 1939 the averages for the eastern and western sections of the State declined, whereas for the central sections they rose. The decline in the eastern and western sections probably was caused by subnormal precipitation, but part of the rise in the north-central section may be attributed to rather large rises of water level in wells in the middle Loup Valley, where diversions of water from the Loup River were made for irrigation during the year. The rise in the south-central section--0.02 foot--is too small to be significant.

There was an average net decline in water level of 0.22 foot in 1939 in the 167 key wells in the State, a decline that contrasts with a net rise of 0.18 foot in 1938. The water levels in the wells in the fall of 1939 averaged 0.38 foot below the fall stage of 1934 and 0.62 foot below the fall stage of 1935, in which year the highest fall stage was recorded. If it is assumed that the average net decline of 0.22 foot recorded in the 167 wells in 1939 represents the average fluctuation of the water table over the State and that the specific yield of the formations in which the water occurs in Nebraska averages 15 percent--that is, that each cubic foot of material will yield or store 0.15 cubic foot of water--then the records indicate a net decrease in ground-water storage in 1939 of about 1,600,000 acre-feet.

Measurements made in 1939 of water levels in 410 observation wells are given on the following pages. Included in this group are 52 wells in Hall

and Merrick Counties that are being observed through informal cooperation with the Grand Island Water Department; 6 wells in Garden County that are being observed through informal cooperation with the Bureau of Biological Survey; and 6 wells in Keith County that are being observed through informal cooperation with the Central Nebraska Public Power and Irrigation District. Measurements in 16 of the wells in Franklin, Nuckolls, and Webster Counties were made in 1939 in connection with a detailed investigation of the geology and ground-water resources of parts of these counties by the Federal Geological Survey in cooperation with the Conservation and Survey Division of the University of Nebraska. Daily tape measurements, furnished by the Nebraska Department of Roads and Irrigation, are given for well 85, in Morrill County. During the year a total of about 1,950 individual measurements of water level were made in the 410 observation wells.

The observation wells, which are listed alphabetically by county and numerically within each county, have numbers that correspond to those given in Water-Supply Papers 817, 840, and 845. This report gives complete descriptions of only those wells whose records appear for the first time. For most wells the water levels are expressed in feet above an assumed datum, which is 100 feet below the water level on January 1, 1935. The height of the measuring point above the datum for wells that have been established since January 1, 1935, has been interpolated from the average water level in a group of similar wells on a selected date. The water levels are directly comparable even though the measuring point has been changed, because the record is given as a height above a datum that has been referred to one or more bench marks near the well.

Summary of water levels, in feet above assumed datum planes,  
in observation wells in Nebraska, 1934-39

	Number of wells	Average level, October-December					
		1934	1935	1936	1937	1938	1939
Northeast	28	99.67	99.36	98.98	99.42	99.74	99.24
Southeast	40	99.81	100.47	99.61	99.25	99.56	99.05
North-central	33	99.91	100.01	99.77	99.41	99.44	99.59
South-central	38	99.84	100.11	99.68	99.66	99.66	99.68
Northwest	15	99.99	100.45	100.05	99.77	100.13	99.79
Southwest	13	100.02	100.06	100.03	99.88	100.05	99.88
Entire State	167	99.84	100.08	99.62	99.50	99.68	99.46

Summary of changes in water levels, in feet,  
in observation wells in Nebraska, 1934-39

	Number of wells	Average of net changes					
		1935	1936	1937	1938	1939	1934-39
Northeast	28	-0.31	-0.38	+0.44	+0.32	-0.50	-0.43
Southeast	40	+ .66	- .86	- .36	+ .31	- .51	- .76
North-central	33	+ .10	- .24	- .36	+ .03	+ .15	- .32
South-central	38	+ .27	- .43	- .02	.00	+ .02	- .16
Northwest	15	+ .46	- .40	- .28	+ .36	- .34	- .20
Southwest	13	+ .04	- .03	- .15	+ .17	- .17	- .14
Entire State	167	+ .24	- .46	- .12	+ .18	- .22	- .38

## Adams County

193. No measurements made in 1939.

448. University of Nebraska. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 23, T.6 N., R.10 W. Unused observation well, diameter 1 inch, depth 17.8 feet. Measuring point, top of pipe, 3 feet above land surface and 110.06 feet above datum. Water level Dec. 15, 1936, 12.38 feet below measuring point.

## Water level, in feet above datum, 1936-39

Date	Water level	Date	Water level	Date	Water level
Dec. 15, 1936	97.68	Aug. 14, 1937	99.24	Oct. 30, 1938	99.66
Apr. 12, 1937	a 96.63	Oct. 22	99.16	June 17, 1939	99.86
June 28	99.23	June 30, 1938	99.36	Nov. 13	b 99.97

## Antelope County

111. Water levels, in feet above datum, 1939: June 3, 97.18; Nov. 27, a/96.11.

202. Water levels, in feet above datum, 1939: June 3, 99.67; Nov. 27, 99.60.

## Arthur County

250.

## Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 30	c 99.46	May 31	c 99.38	July 31	c 99.64	Oct. 28	c 99.46
Feb. 27	c 99.66	June 12	99.73	Aug. 30	c 99.53	Nov. 29	c 99.33
Apr. 3	c 99.43	June 29	c 99.65	Sept. 29	c 99.41	Dec. 5	99.30
May 1	c 99.38						

251. Water levels, in feet above datum, 1939: June 12, 99.29; Dec. 5, a/98.74.

## Banner County

238. Water levels, in feet above datum, 1939: June 13, 105.30; Dec. 6, 102.70

354. Water levels, in feet above datum, 1939: June 13, 100.53; Dec. 6, b/100.59.

## Blaine County

210. Water levels, in feet above datum, 1939: June 9, 98.73; Dec. 2, 99.20.

211. Water levels, in feet above datum, 1939: June 9, 100.60; Dec. 2, 99.61.

237. Water levels, in feet above datum, 1939: June 9, 99.11; Dec. 2, a/98.99.

a Lowest observed stage in period of record.  
b Highest observed stage in period of record  
c Measurement supplied through courtesy of Central Nebraska Public Power and Irrigation District.

## Blaine County--Continued

433. University of Nebraska. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 7, T. 24 N., R. 25 W. Un-used driven observation well, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 3 feet above land surface and 108.04 feet above datum. Water level Nov. 25, 1936, 6.42 feet below measuring point.

## Water level, in feet above datum, 1936-39

Date	Water level	Date	Water level	Date	Water level
Nov. 25, 1936 b	101.62	June 24, 1938	99.51	June 9, 1939	99.91
Apr. 2, 1937	100.15	Oct. 24	a 99.44	Dec. 2	99.68
Oct. 15	99.49				

434. University of Nebraska. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 22, T. 23 N., R. 22 W. Un-used driven observation well, diameter 1 inch, depth 22.5 feet. Measuring point, top of pipe, 2 feet above land surface and 119.10 feet above datum. Water level Nov. 25, 1936, 19.35 feet below measuring point.

## Water level, in feet above datum, 1936-39

Nov. 25, 1936	99.75	Oct. 15, 1937	99.40	June 9, 1939	99.45
Apr. 2, 1937 b	99.95	June 24, 1938	99.65	Dec. 2	a 99.35
June 17	99.73	Oct. 24	99.44		

## Boone County

200. Water levels, in feet above datum, 1939: May 26, 98.51; Nov. 24, 99.51.

201. Water levels, in feet above datum, 1939: May 26, 99.96; Nov. 23, 99.65.

207. Water levels, in feet above datum, 1939: May 26, 100.04; Nov. 24, 100.10.

425. University of Nebraska. NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 26, T. 21 N., R. 7 W. Un-used bored observation well, diameter 3 inches, depth 24.2 feet. Measuring point, top of casing, 1.9 feet above land surface and 122.71 feet above datum. Water level, Nov. 7, 1936, 21.28 feet below measuring point.

## Water level, in feet above datum, 1936-39

Date	Water level	Date	Water level	Date	Water level
Nov. 7, 1936	101.43	Oct. 10, 1937	100.05	May 26, 1939	101.85
Mar. 26, 1937 b	103.12	July 10, 1938	101.12	Nov. 23	100.86
June 9	102.36	Oct. 14	a 99.74		

426. University of Nebraska. NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 4, T. 18 N., R. 7 W. Un-used driven observation well, diameter 1 inch, depth 22.3 feet. Measuring point, top of pipe, 2.9 feet above land surface and 117.80 feet above datum. Water level, Nov. 8, 1936, 17.91 feet below measuring point.

## Water level, in feet above datum, 1936-39

Nov. 8, 1936	99.89	Oct. 10, 1937	100.06	May 26, 1939	99.90
Mar. 26, 1937 b	100.57	July 10, 1938	100.21	Nov. 24	99.82
June 10	100.15	Oct. 14	a 99.74		

## Box Butte County

1. Water level, in feet above datum, 1939: June 8, 99.35.
2. Water level, in feet above datum, 1939: June 8, 99.61.
3. Water level, in feet above datum, 1939: June 8, 99.12.
5. No measurements made in 1939.

a Lowest observed stage in period of record.

b Highest observed stage in period of record.

## Box Butte County--Continued

- 6. Water level, in feet above datum, 1939: June 8, 99.47.
- 7. Water level, in feet above datum, 1939: June 8, 99.26.
- 8. Water level, in feet above datum, 1939: June 8, 99.18.
- 9. Water level, in feet above datum, 1939: June 8, 99.25.
- 10. No measurements made in 1939.
- 12. No measurements made in 1939.
- 13. Water level, in feet above datum, 1939: June 7, 99.13.
- 15. Water level, in feet above datum, 1939: June 7, 99.20.
- 16. Water level, in feet above datum, 1939: June 7, 100.00.
- 17. No measurements made in 1939.
- 78. Measurements discontinued.
- 129. Water levels, in feet above datum, 1939: June 8, 99.66; Dec. 1, a/99.55.
- 316. Measurements discontinued.
- 338. Water levels, in feet above datum, 1939: June 7, 99.64; Dec. 1, 99.71.
- 378. Water level, in feet above datum, 1939: Dec. 1, 99.38.

## Boyd County

- 74. Water levels, in feet above datum, 1939: June 5, 100.71; Nov. 28, 99.81.
- 75. Water levels, in feet above datum, 1939: June 5, 101.13; Nov. 28, a/98.54.
- 209. Water levels, in feet above datum, 1939: June 5, 100.19; Nov. 28, 100.17.

## Brown County

- 243. Water levels, in feet above datum, 1939: June 6, 100.00; Nov. 28, 99.58.

## Buffalo County

- 52. No measurements made in 1939.
- 232. Water levels, in feet above datum, 1939: June 1, 101.27; Nov. 25, b/99.65.
- 262. Water levels, in feet above datum, 1939: May 31, 99.54; Nov. 24, 99.13.
- 263. Water levels, in feet above datum, 1939: May 31, 100.80; Nov. 24, a/99.19.
- 264. Water levels, in feet above datum, 1939: May 31, 99.75; Nov. 24, a/98.08.
- 265. Water levels, in feet above datum, 1939: May 31, 100.36; Nov. 24, 98.96.

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a Lowest observed stage in period of record.

b Recently pumped.

## Buffalo County--Continued

267. Water levels, in feet above datum, 1939: June 1, 100.17;  
Nov. 24, a/98.85.

268. Water levels, in feet above datum, 1939: June 1, 100.77;  
Nov. 24, 98.89.

269. Water levels, in feet above datum, 1939: June 1, 99.21;  
Nov. 24, 98.32.

270. Water levels, in feet above datum, 1939: June 1, 99.25;  
Nov. 24, a/98.19.

271. Measurements discontinued.

272. Water levels, in feet above datum, 1939: June 1, 98.96;  
Nov. 24, a/98.39.

273. Water level, in feet above datum, 1939: June 1, 98.70

274. Water levels, in feet above datum, 1939: June 1, 101.30;  
Nov. 25, 99.88.

278. Water levels, in feet above datum, 1939: June 1, 102.90;  
Nov. 25, 101.06.

279. Water levels, in feet above datum, 1939: June 1, 99.33;  
Nov. 25, 97.43.

## Burt County

63. Water levels, in feet above datum, 1939: May 25, 100.92;  
Nov. 22, 98.06.

64. No measurements made in 1939.

402. University of Nebraska. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 35, T. 22 N., R. 8 E.  
Unused driven observation well, diameter 1 inch, depth 24.5 feet. Measuring point, top of pipe, 3.3 feet above land surface and 108.28 feet above datum. Water level, Mar. 19, 1936, 5.65 feet below measuring point.

## Water level, in feet above datum, 1936-39

Date	Water level	Date	Water level	Date	Water level
Mar. 19, 1936	102.63	Mar. 24, 1937	98.03	July 9, 1938 b	104.35
May 23	99.42	June 8	101.19	Oct. 13	99.74
July 9	97.92	Aug. 6	101.59	May 25, 1939	99.11
Aug. 1	97.77	Oct. 9	97.98	Nov. 22 a	96.22
Oct. 24	98.08				

## Butler County

170. Water levels, in feet above datum, 1939: May 23, 97.28;  
Nov. 18, a/96.59.

## Cass County

16. Water level, in feet above datum, 1939: Nov. 18, a/98.02.

17. No measurements made in 1939.

18. Water levels, in feet above datum, 1939: May 24, 100.17;  
Nov. 20, a/96.82.

a Lowest observed stage in period of record.

b Highest observed stage in period of record.

## Cedar County

65. No measurements made in 1939.
66. Water levels, in feet above datum, 1939: May 25, 99.65;  
Nov. 23, 99.88.
369. Water levels, in feet above datum, 1939: May 25, 101.82;  
Nov. 23, 100.72.

## Chase County

152. Water levels, in feet above datum, 1939: June 14, 98.92;  
Dec. 9, a/98.87.
153. Water levels, in feet above datum, 1939: June 14, 100.06;  
Dec. 9, 100.07.

## Cherry County

115. Water levels, in feet above datum, 1939: June 6, 98.68;  
Nov. 29, a/98.45.
116. Water levels, in feet above datum, 1939: June 6, 100.82;  
Nov. 28, 99.16.
118. Water levels, in feet above datum, 1939: June 6, 99.25;  
Nov. 29, a/98.56.
256. Water levels, in feet above datum, 1939: June 6, 98.66;  
Nov. 29, a/98.14.
257. Water levels, in feet above datum, 1939: June 6, 99.61;  
Nov. 29, 99.06.
312. Water levels, in feet above datum, 1939: June 9, 98.39;  
Dec. 2, a/98.23.
399. Water levels, in feet above datum, 1939: June 6, 100.08;  
Nov. 29, 100.14.

431. University of Nebraska. NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 14, T. 34 N., R. 38 W.  
Unused driven observation well, diameter 1 inch, depth 17.3 feet.  
Measuring point, top of pipe, 2.3 feet above land surface and 108.95  
feet above datum. Water level Nov. 20, 1936, 9.69 feet below measur-  
ing point.

Water level, in feet above datum, 1936-39

Date	Water level	Date	Water level	Date	Water level
Nov. 20, 1936	99.26	Aug. 9, 1937	<sup>a</sup> 98.51	Oct. 22, 1938	99.44
Mar. 31, 1937	99.92	Oct. 14	98.75	June 6, 1939 <sup>b</sup>	100.12
June 15	100.05	July 14, 1938	99.96	Nov. 29	98.83

## Cheyenne County

86. No measurements made in 1939.
87. Water levels, in feet above datum, 1939: June 14, 100.07;  
Dec. 6, 100.30.
90. Water level, in feet above datum, 1939: Dec. 6, 99.72.
91. Water levels, in feet above datum, 1939: June 13, 99.58;  
Dec. 6, a/98.55.
92. Water levels, in feet above datum, 1939: June 14, 100.53;  
Dec. 6, b/100.54.

<sup>a</sup> Lowest observed stage in period of record.

<sup>b</sup> Highest observed stage in period of record.

## Cheyenne County--Continued

444. D. Sutphen. NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 27, T. 14 N., R. 47 W. Abandoned drilled domestic well, diameter 6 inches. Measuring point, top of pump base at edge of hole, 0.9 foot above land surface and 123.33 feet above datum. Water level Jan. 22, 1936, 24.82 feet below measuring point.

## Water level, in feet above datum, 1936-39

Date	Water level	Date	Water level	Date	Water level
Jan. 22, 1936	98.51	Dec. 4, 1936	98.57	June 28, 1938	b 101.23
Apr. 1	98.91	Apr. 8, 1937	99.63	Oct. 28	100.05
June 10	98.53	June 24	99.15	June 14, 1939	99.87
Aug. 8	97.77	Aug. 12	98.71	Dec. 7	98.61
30	a 97.50	Oct. 19	98.85		

## Clay County

391. No measurements made in 1939.

## Colfax County

37. Water level, in feet above datum, 1939: May 24, 100.35.

38. Water levels, in feet above datum, 1939: May 24, 100.60; Nov. 21, 100.38.

332. Water levels, in feet above datum, 1939: May 24, 96.54; Nov. 21, a/ 94.79.

343. Water levels, in feet above datum, 1939: May 24, 104.53; Nov. 21, 99.39.

## Cuming County

61. Water levels, in feet above datum, 1939: May 25, 99.27; Nov. 22, 97.96.

69. Water levels, in feet above datum, 1939: May 25, 98.69; Nov. 21, a/98.05.

## Custer County

53. Water levels, in feet above datum, 1939: June 2, 99.58; Nov. 25, 99.78.

195. Water levels, in feet above datum, 1939: June 1, 99.13; Nov. 25, 98.94.

196. Water levels, in feet above datum, 1939: June 9, a/98.32; Dec. 2, 98.49.

219. Water levels, in feet above datum, 1939: June 10, 100.20; Dec. 4, 99.99.

220. Water levels, in feet above datum, 1939: June 10, 100.06; Dec. 2, 99.89.

325. Water levels, in feet above datum, 1939: June 1, 98.71; Nov. 25, 98.80.

a Lowest observed stage in period of record.  
b Highest observed stage in period of record.



## Custer County--Continued

435. University of Nebraska. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 27, T. 17 N., R. 25 W. Unused driven observation well, diameter 1 inch, depth 15.1 feet. Measuring point, top of pipe, 2 feet above land surface and 110.92 feet above datum. Water level Nov. 25, 1936, 11.32 feet below measuring point.

## Water level, in feet above datum, 1936-39

Date	Water level	Date	Water level	Date	Water level
Nov. 25, 1936	99.60	Aug. 10, 1937	a 98.70	Oct. 24, 1938	99.44
Apr. 3, 1937	b 99.92	Oct. 16	99.34	June 10, 1939	99.55
June 18	99.69	June 25, 1938	99.63	Dec. 2	99.56

436. University of Nebraska. NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 35, T. 16 N., R. 23 W. Unused driven observation well, diameter 1 inch, depth 29.5 feet. Measuring point, top of pipe, 1.9 feet above land surface and 123.96 feet above datum. Water level Nov. 26, 1936, 22.61 feet below measuring point.

## Water level, in feet above datum, 1936-39

Date	Water level	Date	Water level	Date	Water level
Nov. 26, 1936	b 101.35	Aug. 10, 1937	a 98.97	Oct. 24, 1938	99.44
Apr. 3, 1937	100.28	Oct. 16	99.11	June 10, 1939	99.80
June 18	99.90	June 25, 1938	100.16	Dec. 4	99.51

## Dakota County

104. Water levels, in feet above datum, 1939: May 25, 98.43; Nov. 22, 96.90.

105. Measurements discontinued.

453. John Boyle. SE $\frac{1}{4}$  sec. 21, T. 29 N., R. 5 E. Unused drilled domestic well, diameter 4 inches, depth 38 feet. Measuring point, top of casing, 1.0 foot above land surface and 121.97 feet above datum. Water level July 9, 1938, 20.73 feet below measuring point. Water levels, in feet above datum: July 9, 1938, b/101.24; Oct. 13, 1938, 99.74; May 25, 1939, 100.40; Nov. 23, a/97.81.

## Dawes County

123. Water levels, in feet above datum, 1939: June 7, 101.53; Dec. 1, 100.63.

315. Water levels, in feet above datum, 1939: June 6, 130.32; Nov. 29, 126.26.

396. Water levels, in feet above datum, 1939: June 7, 100.44; Dec. 1, a/100.28.

## Dawson County

99. Water levels, in feet above datum, 1939: June 10, 99.58; Dec. 4, a/98.90.

233. Measurements discontinued.

280. Water levels, in feet above datum, 1939: June 10, 101.29; Dec. 4, 99.87.

283. Water levels, in feet above datum, 1939: June 10, 100.22; Dec. 4, 100.16.

284. Water levels, in feet above datum, 1939: June 10, 100.44; Dec. 4, 99.83.

285. No measurements made in 1939.

286. Water levels, in feet above datum, 1939: June 10, 99.65; Dec. 4, 99.63.

287. Water levels, in feet above datum, 1939: June 10, 98.85; Dec. 4, 99.92.

a Lowest observed stage in period of record.

b Highest observed stage in period of record.

## Dawson County--Continued

288. Water levels, in feet above datum, 1939: June 10, 98.57; Dec. 4, 99.35.

289. Water levels, in feet above datum, 1939: June 10, 99.01; Dec. 4, 100.57.

290. Water levels, in feet above datum, 1939: June 10, 100.09; Dec. 4, 101.95.

291. Water levels, in feet above datum, 1939: June 10, 99.66; Dec. 4, 100.68.

292. Water levels, in feet above datum, 1939: June 10, 99.98; Dec. 4, 99.58.

293. No measurements made in 1939.

294. Water levels, in feet above datum, 1939: June 10, 101.21; Dec. 4, 100.04.

295. Water levels, in feet above datum, 1939: June 10, 101.16; Dec. 4, 100.17.

296. Water levels, in feet above datum, 1939: June 10, 100.78; Dec. 4, 100.16.

297. Water levels, in feet above datum, 1939: June 10, 101.55; Dec. 4, 100.54.

298. Water levels, in feet above datum, 1939: June 10, 101.36; Dec. 4, 100.63.

299. Water levels, in feet above datum, 1939: June 10, 100.59; Dec. 4, 100.17.

300. Water levels, in feet above datum, 1939: June 10, 100.18; Dec. 4, 100.03.

301. Water levels, in feet above datum, 1939: June 10, 99.07; Dec. 4, 99.39.

302.

## Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 2	a 100.68	June 6	a 98.73	Aug. 10	a 97.95	Nov. 2	a 98.62
Apr. 6	a 100.50	10	99.44	Sept. 6	a 97.48	Dec. 4	99.35
May 5	a 99.50	July 5	a 99.10	Oct. 3	a 96.92	5	a 99.33

303.

## Water level, in feet above datum, 1939

Feb. 3	a 100.85	June 6	a 99.58	Aug. 10	a 98.45	Nov. 2	a 99.09
Mar. 2	a 101.19	10	100.87	Sept. 6	a 98.07	Dec. 4	99.77
May 6	a 101.25	July 5	a 99.77	Oct 3	a 97.72	5	a 99.76
Apr. 5	a 100.13						

304.

## Water level, in feet above datum, 1939

Feb. 3	a 101.18	June 6	a 99.93	Aug. 10	a 98.97	Nov. 2	a 99.21
Mar. 2	a 101.48	10	100.93	Sept. 6	a 98.29	Dec. 4	99.91
Apr. 6	a 101.26	July 5	a 100.10	Oct. 3	a 98.08	5	a 99.93
May 5	a 100.51						

a Measurement supplied through courtesy of Central Nebraska Public Power and Irrigation District.

## Dawson County--Continued

305.

Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 3	c 101.62	May 5	c 101.22	July 5	c 101.22	Nov. 2	c 99.49
Mar. 2	c 101.74	June 6	c 100.94	Sept. 6	c 99.24	Dec. 4	99.89
Apr. 6	c 101.78	10	101.02	Oct. 3	ca 99.21	5	c 99.89

306.

Water level, in feet above datum, 1939

Feb. 3	c 100.83	May 5	c 101.02	July 5	c 101.16	Nov. 2	c 97.95
Mar. 2	c 100.95	June 6	c 100.80	Sept. 6	c 99.19	Dec. 4	99.35
Apr. 6	c 101.06	10	100.82	Oct. 3	c 99.11	5	c 99.28

308. Water levels, in feet above datum, 1939: June 10, 100.98;  
Dec. 4, 101.10.

309. Water levels, in feet above datum, 1939: June 10, 101.22;  
Dec. 4, 102.10.

310. Water levels, in feet above datum, 1939: June 10, 100.35;  
Dec. 4, 100.00.

311. Water levels, in feet above datum, 1939: June 10, 101.10;  
Dec. 4, 105.42.

314. Water levels, in feet above datum, 1939: June 10, 101.57;  
Dec. 4, 100.56.

317. Water levels, in feet above datum, 1939: June 10, b/102.68;  
Dec. 4, 101.06.

318.

Water level, in feet above datum, 1939

Jan. 4	c 100.62	May 5	c 100.65	Aug. 3	c 100.11	Nov. 2	c 99.71
Feb. 3	c 100.77	June 5	c 100.46	Sept. 6	c 99.74	Dec. 4	99.99
Mar. 2	c 100.87	10	100.51	Oct. 3	c 99.51	5	c 99.98
Apr. 6	c 100.91	July 5	c 100.81				

319. Water levels, in feet above datum, 1939: June 10, 100.30;  
Dec. 4, 100.12.

## Deuel County

94. Water level, in feet above datum, 1939: Dec. 7, 99.15.

130. Water levels, in feet above datum, 1939: June 14, 100.03;  
Dec. 7, a/99.42.

## Dixon County

107. Water levels, in feet above datum, 1939: May 25, 99.82; Nov. 23, 99.84.

333. Water levels, in feet above datum, 1939: May 25, 101.77;  
Nov. 23, 100.70.

340. Water levels, in feet above datum, 1939: May 25, 99.48; Nov. 23, a/98.44.

## Dodge County

29. Water levels, in feet above datum, 1939: May 24, 100.53; Nov. 21, 99.40.

31. Water levels, in feet above datum, 1939: May 24, 101.56; Nov. 20, 100.00.

34. Water levels, in feet above datum, 1939: May 24, 98.94; Nov. 21, 99.01.

a Lowest observed stage in period of record.

b Highest observed stage in period of record.

c Measurement supplied through courtesy of Central Nebraska Public Power and Irrigation District.

## Dodge County--Continued

35. No measurements made in 1939.

401. Water levels, in feet above datum, 1939: May 24, 100.21; Nov. 21, 99.33.

420. University of Nebraska. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 6, T. 17 N., R. 6 E. Unused driven observation well, diameter 1 inch, depth 13.5 feet. Measuring point, top of pipe, 2.5 feet above land surface and 106.33 feet above datum. Water level, Oct. 21, 1936, 7.18 feet below measuring point.

## Water level, in feet above datum, 1936-39

Date	Water level	Date	Water level	Date	Water level
Oct. 21, 1936	99.15	Oct. 8, 1937	99.44	May 24, 1939	100.59
June 7, 1937	100.81	July 8, 1938	100.79	Nov. 21	99.62
Aug. 5	100.04	Oct. 12	99.74		

## Douglas County

24. Water levels, in feet above datum, 1939: May 24, 100.52; Nov. 20, 100.01.

324. Measurements discontinued.

## Dundy County

177. Water levels, in feet above datum, 1939: June 14, 99.71; Dec. 9, a/99.55.

361. Water levels, in feet above datum, 1939: June 14, 100.37; Dec. 9, 100.11.

380. Water levels, in feet above datum, 1939: June 14, 99.59; Dec. 9, 99.66.

381. No measurements made in 1939.

445. University of Nebraska. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 21, T. 1 N., R. 38 W. Unused driven observation well, diameter 1 inch, depth 17.7 feet. Measuring point, top of pipe, 3 feet above land surface and 112.79 feet above datum. Water level Dec. 7, 1936, 11.83 feet below measuring point.

## Water level, in feet above datum, 1936-39

Dec. 7, 1936	100.96	Oct. 20, 1937	100.32	June 14, 1939	100.66
Apr. 11, 1937	<sup>b</sup> 101.45	June 28, 1938	100.67	Dec. 9	100.27
June 26	100.96	Oct. 28	<sup>a</sup> 100.05		

## Fillmore County

174. Water levels, in feet above datum, 1939: May 29, a/98.41; Nov. 13, 98.67.

191. Water levels, in feet above datum, 1939: May 29, 99.33; Nov. 13, a/99.10.

192. No measurements made in 1939.

## Franklin County

10. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 13, T. 1 N., R. 13 W. Unused dug stock well, diameter 40 inches, depth 17.0 feet. Measuring point, north edge of brick curbing, 3 feet above land surface and 111.01 feet above assumed datum. Water level Sept. 11, 1939, 11.76 feet below measuring point.

## Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
July 15	100.28	Aug. 21	100.17	Sept. 25	97.92	Oct. 23	95.70
24	99.95	28	100.16	Oct. 2	97.28	30	95.28
31	99.66	Sept. 11	99.25	9	96.70	Nov. 6	94.89
Aug. 7	99.61	18	98.60	16	96.18	13	94.45
14	99.98						

<sup>a</sup> Lowest observed stage in period of record.

<sup>b</sup> Highest observed stage in period of record.

## Franklin County--Continued

11. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 33 T.1 N., R. 13 W. Unused dug stock well, diameter about 36 inches, depth 21.5 feet. Measuring point, southwest side of pump base, 3 feet above land surface and 119.02 feet above assumed datum. Equipped with force pump operated by windmill. Water level Sept. 11, 1939, 19.77 feet below measuring point.

Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
July 15	98.28	Aug. 21	99.08	Sept. 25	98.44	Oct. 23	98.11
24	98.20	28	99.05	Oct. 2	98.33	28	98.05
31	(a)	Sept. 11	99.25	9	98.51	Nov. 6	98.04
Aug. 7	(a)	18	98.58	16	98.11	13	98.02
14	98.83						

14. NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 34, T. 2 N., R. 13 W. Unused dug domestic well, diameter about 45 inches, depth 45.0 feet. Measuring point, east edge of wooden platform, 1.5 feet above land surface and 140.65 feet above assumed datum. Water level Sept. 11, 1939, 41.40 feet below measuring point.

Water level, in feet above datum, 1939

July 31	99.28	Aug. 28	99.26	Oct. 2	99.21	Oct. 30	99.29
Aug. 7	99.26	Sept. 11	99.25	9	99.25	Nov. 6	99.30
14	99.26	18	99.26	16	99.26	13	99.24
21	99.22	25	99.25	23	99.26		

15. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 33, T. 1 N., R. 13 W. Unused dug domestic well, diameter about 30 inches, depth 33.0 feet. Measuring point, wooden platform, 1 foot above land surface and 132.00 feet above assumed datum. Pump pipe and rod remain, but pump was removed. Water level Sept. 11, 1939, 32.75 feet below measuring point.

Water level, in feet above datum, 1939

July 31	100.25	Aug. 28	99.88	Oct. 2	99.60	Oct. 30	(a)
Aug. 7	100.21	Sept. 11	99.25	9	99.93	Nov. 6	(a)
14	100.19	18	99.06	16	99.20	13	(a)
21	100.19	25	99.85	23	(a)		

156.

Water level, in feet above datum, 1939

June 16	100.08	Aug. 21	99.56	Oct. 2	99.00	Oct. 30	99.12
July 17	99.64	28	99.25	9	98.96	Nov. 6	99.23
24	99.47	Sept. 11	99.10	16	99.03	13	99.30
31	99.42	18	99.04	23	99.07	Dec. 11	99.45
Aug. 14	99.34	25	b 98.95				

221.

Water level, in feet above datum, 1939

June 16	99.61	Aug. 21	99.40	Oct. 2	99.29	Oct. 30	99.12
July 24	99.55	28	99.46	9	99.25	Nov. 6	99.22
31	99.51	Sept. 11	99.40	16	99.24	13	b 99.02
Aug. 7	99.54	18	99.23	23	99.16	Dec. 11	99.10
14	99.50	25	99.34				

224. Water levels, in feet above datum, 1939: June 16, 100.46, Dec. 11, 100.59.

## Frontier County

135. Water levels, in feet above datum, 1939: June 15, 99.20; Dec. 10, 99.00.

136. Water levels, in feet above datum, 1939: June 15, 99.33; Dec. 10, 99.19.

## Furnas County

145. Water levels, in feet above datum, 1939: June 15, 99.73; Dec. 10, b/99.43.

147. Water levels, in feet above datum, 1939: June 15, 99.67; Dec. 10, 99.36.

a Nearly dry.

b Lowest observed stage in period of record.

## Furnas County--Continued

148. Water levels, in feet above datum, 1939: June 15, 101.09,  
Dec. 10, 99.77.

149. Water levels, in feet above datum, 1939: June 15, 99.56;  
Dec. 10, a/99.11.

180. Water levels, in feet above datum, 1939: June 16, 99.50; Dec. 11,  
a/99.20.

387. Water levels, in feet above datum, 1939: June 15, 99.52;  
Dec. 10, 98.89.

388. Water levels, in feet above datum, 1939: June 15, 100.02;  
Dec. 10, 98.84.

395. Water levels, in feet above datum, 1939: June 16, 99.72;  
Dec. 10, a/99.10.

## Gage County

199. Water levels, in feet above datum, 1939: May 27, 97.70;  
Nov. 17, a/96.86.

230. Water levels, in feet above datum, 1939: May 29, 100.37;  
Nov. 14, a/98.98.

231. Water levels, in feet above datum, 1939: May 29, 99.66; Nov. 14,  
a/99.55.

## Garden County

3. Water level, in feet above sea level minus 3700, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 9	84.77	May 4	84.79	June 12	84.87
15	84.79	12	84.84	29	84.89
23	84.74	29	84.80	July 11	84.76
Apr. 5	84.84	June 6	84.89	20	(b)
26	84.84				

4. Crescent Lake Migratory Bird Refuge. North side of Island Lake. Unused driven observation well, diameter 1½ inches, depth 8 feet. Measuring point, top of pipe, 4.9 feet above land surface and 3,807.89 feet above sea level. Measurements supplied through courtesy of Bureau of Biological Survey.

Water level, in feet above sea level minus 3,000, 1933-39

Nov. 19, 1933	801.29	July 1, 1934	800.07	Dec. 28, 1934	800.88
Dec. 3	802.06	8	800.79	Jan. 4, 1935	800.96
13	801.59	14	799.78	11	800.94
17	801.53	21	799.54	21	800.94
Jan. 17, 1934	801.83	29	799.42	30	801.17
28	801.84	Aug. 5	799.66	Feb. 6	801.04
Feb. 12	802.56	12	799.33	21	801.25
Mar. 1	802.45	26	799.57	Mar. 5	801.26
11	802.03	Sept. 2	799.64	16	801.03
25	801.75	8	799.80	28	800.76
Apr. 8	801.60	23	799.84	Apr. 11	801.09
19	801.13	30	799.79	May 2	801.27
May 4	802.12	Oct. 7	800.01	23	801.95
13	800.99	14	800.20	June 6	802.51
19	800.49	21	800.45	20	800.64
27	801.11	27	800.34	July 3	800.45
June 2	801.17	Nov. 11	800.40	16	799.99
11	800.04	18	800.44	24	799.74
16	800.66	26	800.47	Aug. 2	799.30
23	800.39	Dec. 17	800.91	9	799.39

a Lowest observed stage in period of record.

b Dry from July 20 through Dec. 22.

## Garden County--Continued

## 4. Crescent Lake Migratory Bird Refuge--Continued

Water level, in feet above sea level minus 3,000, 1933-39

Date	Water level	Date	Water level	Date	Water level
Aug. 19, 1935	799.24	Dec. 2, 1937	799.36	Oct. 3, 1938	798.60
26	799.22	9	799.20	11	798.53
Sept. 4	799.52	16	799.17	18	798.63
11	799.53	23	799.18	25	798.82
18	799.31	30	799.19	Nov. 10	799.07
25	799.29	Jan. 7, 1938	799.15	15	799.04
Oct. 4	799.42	13	799.17	21	799.01
16	799.63	20	799.19	30	799.09
24	799.79	28	799.15	Dec. 5	799.07
Nov. 1	799.88	Feb. 3	799.16	12	799.07
19	799.91	10	799.18	19	799.14
Dec. 3	800.38	17	799.19	27	799.24
18	800.49	24	799.20	Mar. 3, 1939	799.89
Jan. 2, 1936	800.73	Mar. 3	799.29	15	799.82
14	800.98	10	799.27	23	799.77
22	800.61	17	799.25	Apr. 5	799.86
Feb. 4	800.65	24	799.28	26	799.69
24	800.70	Apr. 1	799.28	May 4	799.69
Mar. 7	801.72	12	799.70	12	799.77
17	801.29	19	799.71	29	799.59
Apr. 20	800.97	25	799.74	June 7	799.58
May 5	800.75	May 3	800.12	13	799.74
July 22	798.87	10	799.87	26	799.37
Nov. 20	799.77	16	799.66	July 11	799.59
Feb. 9, 1937	800.69	25	800.17	21	798.94
Mar. 18	800.97	June 7	799.81	28	798.89
Apr. 21	800.48	13	799.49	Aug. 10	798.79
May 31	800.08	21	799.21	22	798.59
June 18	800.33	30	798.90	30	798.53
July 7	799.05	July 6	798.97	Sept. 6	798.49
15	798.03	11	799.21	15	798.63
Aug. 20	798.16	18	798.88	25	798.64
Sept. 18	799.09	27	798.57	30	798.64
28	799.00	Aug. 2	798.51	Oct. 7	798.47
Oct. 8	799.41	9	798.31	18	798.95
14	799.41	17	798.31	28	798.84
23	799.27	24	798.19	Nov. 10	799.19
28	799.69	Sept. 7	798.29	18	799.19
Nov. 5	799.34	14	798.49	30	799.13
11	799.99	20	798.63	Dec. 15	799.16
23	800.12	28	798.53	22	799.17

17. Crescent Lake Migratory Bird Refuge. One half mile south of Bean Lake. Unused driven observation well, diameter  $1\frac{1}{2}$  inches. Measuring point, top of pipe, 2.18 feet above land surface and 3,834.92 feet above sea level. Measurements supplied through courtesy of Bureau of Biological Survey.

Water level, in feet above sea level minus 3,800, 1934-39

Aug. 5, 1934	27.80	Dec. 17, 1934	28.10	June 6, 1935	28.92
12	27.82	28	28.13	20	28.86
26	27.74	Jan. 4, 1935	28.14	July 3	28.38
Sept. 2	27.82	11	28.16	16	28.19
8	27.78	21	28.14	24	28.12
23	27.80	30	28.21	Aug. 2	27.92
30	27.78	Feb. 2	28.24	9	27.76
Oct. 7	27.86	21	28.26	19	27.82
14	27.66	Mar. 5	28.23	26	27.81
21	27.92	16	28.20	Sept. 4	27.94
27	27.94	28	28.20	11	27.93
Nov. 11	27.96	Apr. 17	28.24	18	27.78
18	27.98	May 2	28.49	25	27.78
26	28.18	23	28.96	Oct. 4	27.83

## Garden County--Continued

## 17. Crescent Lake Migratory Bird Refuge--Continued

Water level, in feet above sea level minus 3,800, 1934-39

Date	Water level	Date	Water level	Date	Water level
Oct. 16, 1935	27.86	Dec. 24, 1937	26.86	Oct. 10, 1938	27.60
24	27.89	31	26.88	19	27.58
Nov. 1	27.94	Jan. 7, 1938	26.88	25	27.74
19	28.05	13	26.92	Nov. 16	27.72
Dec. 3	28.08	20	26.92	30	27.78
18	28.12	26	26.94	Dec. 6	28.02
Jan. 2, 1936	28.19	Feb. 4	26.94	13	27.78
14	28.24	11	26.96	20	27.80
22	28.32	18	26.92	27	27.82
Feb. 4	28.25	26	27.02	Mar. 8, 1939	28.14
24	28.40	Mar. 3	27.06	14	28.15
Mar. 7	28.45	11	27.08	23	28.16
17	28.46	18	27.08	Apr. 3	28.24
Apr. 20	28.34	25	27.02	27	28.04
May 5	28.23	Apr. 3	26.96	May 4	28.16
July 22	27.12	11	27.08	12	28.18
Oct. 20	27.26	18	27.40	29	28.02
Nov. 19	27.00	25	27.28	June 6	27.92
Feb. 8, 1937	27.56	May 2	28.04	11	27.72
Mar. 30	27.72	11	27.74	26	27.62
Apr. 22	27.58	16	27.66	July 12	27.32
May 7	27.60	23	27.88	20	27.18
28	27.25	June 6	27.96	28	27.24
June 17	27.32	13	27.78	Aug. 12	27.28
July 6	26.95	20	27.62	21	27.18
14	26.85	28	27.62	30	27.04
Aug. 19	26.72	July 8	27.76	Sept. 6	26.96
Sept. 17	26.77	12	27.74	14	26.86
27	26.75	18	27.70	22	26.92
Oct. 9	26.10	25	27.58	29	27.02
14	26.12	Aug. 1	27.60	Oct. 6	26.98
23	26.82	8	27.54	19	27.08
28	26.86	15	27.18	28	27.12
Nov. 5	26.84	23	27.48	Nov. 10	27.18
11	26.90	Sept. 7	27.64	17	27.20
23	26.88	13	27.78	29	27.22
Dec. 3	26.90	19	27.78	Dec. 14	27.24
10	26.78	26	27.74	20	27.24
17	26.84	Oct. 3	27.62		

19. Crescent Lake Migratory Bird Refuge. One mile southwest of Swan Lake. Unused driven observation well, diameter  $1\frac{1}{2}$  inches. Measuring point, top of pipe, 1.5 feet above land surface and 3,816.61 feet above sea level. Measurements supplied through courtesy of Bureau of Biological Survey.

Water level, in feet above sea level minus 3,800, 1934-39

Aug. 12, 1934	8.53	Feb. 6, 1935	9.35	Sept. 18, 1935	8.68
26	8.63	21	9.45	25	8.65
Sept. 2	8.68	Mar. 5	9.52	Oct. 4	8.78
8	8.44	16	9.53	16	8.87
23	8.54	28	9.66	24	8.94
30	8.51	Apr. 17	9.75	Nov. 1	9.03
Oct. 7	8.82	May 2	10.42	19	9.21
14	8.70	23	11.16	Dec. 3	9.27
21	8.75	June 6	11.41	18	9.35
27	8.86	20	11.14	Jan. 2, 1936	9.44
Nov. 11	8.88	July 3	10.17	14	9.53
18	8.89	16	9.71	22	9.53
26	8.99	24	9.59	Feb. 4	9.51
Dec. 17	9.12	Aug. 2	9.17	24	9.67
28	8.96	9	8.82	Mar. 7	9.84
Jan. 4, 1935	9.17	19	8.59	17	9.90
11	9.22	26	8.63	Apr. 20	10.04
21	9.22	Sept. 4	8.83	May 5	10.05
30	9.31	11	8.86	July 22	8.03



## Garden County--Continued

## 19. Crescent Lake Migratory Bird Refuge--Continued

Water level, in feet above sea level minus, 3,800, 1934-39

Date	Water level	Date	Water level	Date	Water level
Oct. 20, 1936	8.32	Mar. 11, 1938	8.86	Dec. 6, 1938	9.59
Nov. 19	8.60	18	8.91	13	9.65
Feb. 8, 1937	8.93	25	8.87	20	9.70
Mar. 30	9.52	Apr. 2	8.91	28	9.67
Apr. 22	9.34	11	9.01	Mar. 8, 1939	10.12
May 28	8.95	18	9.34	14	10.61
June 17	9.40	25	9.30	23	10.61
July 6	8.34	May 2	10.05	Apr. 3	10.91
14	8.20	11	9.78	27	10.53
Aug. 19	7.58	16	9.65	May 4	10.21
Sept. 16	7.93	23	10.24	13	10.21
27	7.91	June 6	14.60	29	9.25
Oct. 9	8.08	13	14.52	June 11	10.05
14	8.10	20	14.34	26	9.55
23	8.16	28	14.42	July 10	9.21
28	8.23	July 8	11.21	20	8.93
Nov. 5	8.32	12	9.91	28	9.11
11	8.58	18	9.83	Aug. 12	8.51
23	8.45	25	9.48	21	8.49
Dec. 3	8.44	Aug. 1	9.21	30	8.41
10	8.35	8	8.91	Sept. 6	8.31
17	8.41	15	8.71	14	8.21
24	8.56	23	8.66	22	8.21
31	8.51	Sept. 7	9.23	29	8.41
Jan. 7, 1938	8.52	13	9.48	Oct. 6	8.35
13	8.56	19	9.47	19	8.56
20	8.58	26	9.35	28	8.61
28	8.63	Oct. 3	9.19	Nov. 10	8.85
Feb. 4	8.65	10	9.16	17	8.81
11	8.67	18	9.09	29	8.91
18	8.61	25	9.09	Dec. 15	9.06
30	8.75	Nov. 16	9.46	21	9.01
Mar. 4	8.73	30	9.56		

21. Crescent Lake Migratory Bird Refuge. West of Blue Lake. Unused driven observation well, diameter  $1\frac{1}{2}$  inches. Measuring point, top of pipe, 2.1 feet above land surface and 3,798.19 feet above sea level. Measurements supplied through courtesy of Bureau of Biological Survey.

Water level, in feet above sea level minus 3,700, 1934-39

Aug. 12, 1934	91.45	Apr. 17, 1935	92.51	Jan. 14, 1936	92.45
26	91.56	May 2	93.17	22	92.45
Sept. 2	91.58	23	93.93	Feb. 4	92.59
8	91.69	June 6	94.11	24	92.71
23	91.78	20	93.62	Mar. 7	92.73
30	91.71	July 3	92.95	17	92.80
Oct. 7	92.04	16	92.53	Apr. 20	92.89
14	91.64	24	92.19	May 5	92.80
21	91.97	Aug. 2	91.80	July 22	91.53
27	91.99	9	91.60	Oct. 20	91.36
Nov. 11	92.01	19	91.65	Nov. 19	91.76
18	92.04	26	91.75	Feb. 8, 1937	91.94
26	92.08	Sept. 4	91.90	Mar. 30	92.67
Dec. 17	92.16	11	91.91	Apr. 22	92.74
28	92.06	18	91.85	May 7	92.49
Jan. 4, 1935	92.26	25	91.79	28	91.96
11	92.25	Oct. 4	91.93	June 17	91.82
21	92.25	16	92.00	July 6	91.59
30	92.32	24	92.03	14	91.26
Feb. 6	92.34	Nov. 1	92.10	Aug. 19	90.92
21	92.39	19	91.23	Sept. 16	91.29
Mar. 5	92.33	Dec. 3	92.26	27	91.37
16	92.34	18	92.26	Oct. 9	91.33
28	92.43	Jan. 1, 1936	92.34	14	91.33

## Garden County--Continued

## 21. Crescent Lake Migratory Bird Refuge--Continued

Water level, in feet above sea level minus 3,700, 1934-39

Date	Water level	Date	Water level	Date	Water level
Oct. 24, 1937	91.40	June 6, 1938	93.21	Mar. 23, 1939	92.92
28	91.43	13	92.96	Apr. 3	93.19
Nov. 11	91.52	20	92.74	27	93.09
23	91.49	28	92.87	May 4	93.09
Dec. 3	91.44	July 6	93.01	12	93.14
17	91.39	12	93.06	29	93.19
24	91.37	18	92.83	June 6	92.85
31	91.37	26	92.59	11	92.75
Jan. 7, 1938	91.41	Aug. 1	92.37	26	92.49
13	91.40	8	92.12	July 10	92.24
20	91.44	15	91.97	20	91.84
27	91.47	23	91.89	28	91.66
Feb. 4	91.45	Sept. 7	92.19	Aug. 12	91.45
11	91.49	13	92.34	21	91.36
18	91.45	19	92.42	30	91.14
26	91.47	25	92.29	Sept. 6	91.07
Mar. 4	91.53	Oct. 3	92.16	14	90.93
10	91.55	10	92.14	22	91.14
16	91.53	18	92.02	29	90.99
24	91.53	25	92.08	Oct. 6	91.19
Apr. 2	91.57	Nov. 16	92.21	19	91.35
11	91.57	30	92.23	28	91.39
18	92.06	Dec. 6	92.19	Nov. 12	91.45
25	92.06	13	92.11	17	91.52
May 2	93.06	20	92.24	29	91.56
10	92.93	28	92.31	Dec. 14	91.63
16	92.95	Mar. 8, 1939	92.69	22	91.59
23	93.23	14	92.85		

25. Crescent Lake Migratory Bird Refuge. One half mile south of Goose Lake. Unused driven observation well, diameter  $1\frac{1}{2}$  inches. Measuring point, top of pipe, 0.5 foot above land surface and 3,829.04 feet above sea level. Measurements supplied through courtesy of Bureau of Biological Survey.

Water level, in feet above sea level minus 3,800, 1934-39

Aug. 12, 1934	25.11	July 16, 1935	25.74	May 7, 1937	24.83
26	25.11	24	25.59	28	23.53
Sept. 2	25.01	Aug. 2	25.38	June 18	23.53
8	25.06	9	25.26	July 3	23.48
23	24.99	19	25.15	Aug. 20	23.18
30	24.95	26	25.08	Sept. 20	23.08
Oct. 7	25.01	Sept. 4	25.10	28	23.09
14	24.84	11	25.06	Oct. 9	22.98
21	24.95	18	24.96	14	22.97
27	24.87	25	24.92	23	23.06
Nov. 11	24.89	Oct. 4	24.89	28	23.05
18	24.91	16	24.87	Nov. 5	22.98
26	24.90	25	24.83	11	23.09
Dec. 17	24.71	Nov. 1	24.82	23	23.04
28	24.83	19	24.76	Dec. 3	22.97
Jan. 4, 1935	24.77	Dec. 3	24.68	11	22.85
11	24.75	18	24.63	17	22.85
21	24.73	Jan. 2, 1936	24.58	24	22.84
30	24.69	14	24.54	31	22.81
Feb. 6	24.69	22	24.52	Jan. 7, 1938	22.79
21	24.68	Feb. 4	24.49	13	22.78
Mar. 5	24.63	24	24.74	20	22.78
16	24.61	Mar. 7	24.59	28	22.78
28	24.56	17	24.51	Feb. 4	22.74
Apr. 17	24.68	Apr. 20	24.71	11	22.74
May 2	25.53	May 5	24.57	18	22.69
23	25.96	July 22	24.23	26	22.69
June 6	26.40	Dec. 14	23.76	Mar. 11	22.67
20	26.41	Jan. 8, 1937	23.83	18	22.66
July 3	26.00	30	23.65	25	22.66

## Garden County--Continued

## 25. Crescent Lake Migratory Bird Refuge--Continued

Water level, in feet above sea level minus 3,800, 1934-39

Date	Water level	Date	Water level	Date	Water level
Apr. 2, 1938	22.64	Sept. 10, 1938	24.72	June 6, 1939	24.35
11	22.67	21	24.62	12	24.73
18	23.49	27	24.51	26	24.54
25	23.62	Oct. 4	24.41	July 9	24.54
May 2	24.42	11	24.34	21	24.21
11	24.38	19	24.18	28	24.08
16	24.33	27	24.22	Aug. 10	23.99
23	24.49	Nov. 16	24.17	19	23.84
June 6	23.92	30	24.09	30	23.74
13	23.84	Dec. 6	24.32	Sept. 6	23.67
20	23.64	13	24.04	14	23.54
28	23.53	20	24.03	22	23.62
July 12	25.04	28	24.24	29	23.49
19	25.11	Mar. 9, 1939	24.28	Oct. 6	23.59
26	24.94	14	24.29	19	23.59
Aug. 1	24.70	23	24.30	28	23.62
8	24.64	Apr. 5	24.32	Nov. 18	23.62
15	24.51	27	24.41	29	23.49
24	24.39	May 4	24.40	Dec. 11	23.44
Sept. 7	24.56	29	24.45	20	23.44

96. Water levels, in feet above datum, 1939: June 13, 100.53;  
Dec. 5, 100.68.

218. Water levels, in feet above datum, 1939: June 13, 99.54;  
Dec. 5, 99.68.

326. Water levels, in feet above datum, 1939: June 12, 95.44;  
Dec. 5, a/ 94.17.

## Garfield County

55. Irrigation canal constructed near well. Water levels, in feet above datum, 1939: June 2, 100.86; Nov. 27, b/104.89.

## Gosper County

182. Water level, in feet above datum, 1939: Dec..4, 99.68.

183. Water levels, in feet above datum, 1939: June 16, 100.39;  
Dec. 11, 100.27.

307.

Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 2	c 100.24	June 6	c 100.33	Aug. 4	c 100.09	Nov. 2	c 98.71
Apr. 6	c 100.81	10	100.34	Sept. 6	c 99.48	Dec. 4	98.38
May 5	c 100.25	July 5	c 100.61	Oct. 3	c 99.08	5	ca 98.36

447. University of Nebraska. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 12, T. 5 N., R. 22 W. Un-used bored observation well, diameter 3 inches, depth 15 feet. Measuring point, top of casing at north side, 3.5 feet above land surface and 108.56 feet above datum. Water level Dec. 11, 1936, 8.85 feet below measuring point.

Water level, in feet above datum, 1936-39

Date	Water level	Date	Water level	Date	Water level
Dec. 11, 1936	99.71	June 29, 1938	100.09	June 16, 1939	99.61
Apr. 11, 1937	b 101.49	Oct. 29	99.66	Dec. 11	100.28
Oct. 21	a 99.53				

a Lowest observed stage in period of record.

b Highest observed stage in period of record.

c Measurement supplied through courtesy of Central Nebraska Public Power and Irrigation District.

## Grant County

215. Water levels, in feet above datum, 1939: June 9, 99.70;  
Dec. 2, 98.78.

216. Water levels, in feet above datum, 1939: June 9, 99.84;  
Dec. 2, a/ 98.97.

## Greeley County

206. Water levels, in feet above datum, 1939: June 3, 99.82;  
Nov. 27, 99.82.

347. Water levels, in feet above datum, 1939: June 3, 99.28;  
Nov. 27, a/ 98.61.

423. University of Nebraska. NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 20, T. 20 N., R. 9 W. Unused bored observation well, diameter 3 inches, depth 19.5 feet. Measuring point, top of casing, 2.2 feet above land surface and 110.62 feet above datum. Water level, Nov. 6, 1936, 12.17 feet below measuring point.

## Water level, in feet above datum, 1936-39

Date	Water level	Date	Water level	Date	Water level
Nov. 6, 1936 a	98.45	Aug. 8, 1937	99.65	Oct. 20, 1938	99.44
Mar. 29, 1937 b	100.92	Oct. 12	99.29	June 2, 1939	100.70
June 13	100.18	July 12, 1938	99.98	Nov. 27	99.05

## Hall County

244. Water levels, in feet above datum, 1939: May 31, 101.84;  
Nov. 24, 99.72.

245.

## Water level, in feet above datum, 1939

Feb. 14	c 100.57	May 31	100.60	Nov. 7	c 99.87
May 7	c 101.22	June 20	c 101.22	24	a 99.32

246. Water levels, in feet above datum, 1939: May 31, 100.51; Nov. 24, 99.44.

247. Water levels, in feet above datum, 1939: May 31, 98.82; Nov. 25, 98.46.

249. Water levels, in feet above datum, 1939: May 31, 98.62; Nov. 24, 98.44.

258. Water levels, in feet above datum, 1939: May 31, 98.91; Nov. 24, a/ 98.33.

259. Water levels, in feet above datum, 1939: May 31, 100.96;  
Nov. 24, 99.61

260. Water levels, in feet above datum, 1939: May 31, 100.16;  
Nov. 24, a/ 99.43.

261. Water levels, in feet above datum, 1939: May 31, 99.85; Nov. 24, a/ 99.13.

GI 202. Well 202 in Water-Supply Paper 836-E. City well 36. City of Grand Island. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 27, T. 12 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 16.9 feet. Measuring point, top of pipe, 0.5 foot above land surface and 109.00 feet above datum. Water level, Dec. 11, 1938, 8.10 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department. Water levels, in feet above datum: Dec. 11, 1938, 100.90; Mar. 21, 1939, 101.00; May 7, 1939, 100.90.

a Lowest observed stage in period of record.

b Highest observed stage in period of record.

c Measurement supplied through courtesy of Grand Island Water Department.

## Hall County--Continued

GI 203. Well 203 in Water-Supply Paper 836-E. City well 38. City of Grand Island. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 32, T.12 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth, 13.6 feet. Measuring point, top of pipe, 0.5 foot above land surface and 112.70 feet above datum. Water level, Apr. 17, 1938, 11.75 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements applied through courtesy of Grand Island Water Department.

Water level, in feet above datum, 1938-39

Date	Water level	Date	Water level	Date	Water level
Apr. 17, 1938	100.95	June 5, 1938	101.35	Dec. 11, 1938	100.70
24	101.15	11	101.35	Jan. 28, 1939	100.75
May 1	101.00	18	101.35	Mar. 21	100.95
8	101.15	July 2	101.30	May 7	100.80
15	101.05	Aug. 13	100.95	June 14	101.25
22	101.45	Sept. 11	100.90	Aug. 12	101.00
29	101.45	Oct. 15	100.85	Nov. 7	100.70

GI 204. Well 204 in Water-Supply Paper 836-E. City well 39. City of Grand Island. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 32, T. 12 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 12.4 feet. Measuring point, top of pipe, 0.5 foot above land surface and 112.12 feet above datum. Water level, Apr. 17, 1938, 11.80 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

Water level, in feet above datum, 1938-39

Apr. 17, 1938	100.32	June 5, 1938	100.62	Dec. 11, 1938	100.12
24	100.47	11	100.57	Jan. 28, 1939	100.27
May 1	100.32	18	100.62	Mar. 21	100.17
8	100.47	July 2	100.62	May 7	100.17
15	100.42	Aug. 13	100.42	June 14	100.27
22	100.57	Sept. 11	100.37	Aug. 12	100.37
29	100.62	Oct. 15	100.27	Nov. 7	100.12

GI 206. Well 206 in Water-Supply Paper 836-E. City well 58. City of Grand Island. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 2, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 24.5 feet. Measuring point, top of pipe, 0.5 foot above land surface and 121.10 feet above datum. Water level, Apr. 17, 1938, 20.75 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

Water level, in feet above datum, 1938-39

Apr. 17, 1938	100.35	June 11, 1938	100.70	Jan. 28, 1939	100.65
24	100.50	18	100.85	Mar. 21	100.40
May 1	100.55	July 2	100.90	May 7	100.50
8	100.55	Aug. 13	100.65	June 14	100.60
15	100.55	Sept. 11	100.35	Aug. 12	100.10
22	100.80	Oct. 15	100.35	Nov. 7	100.00
29	100.85	Dec. 11	100.25	Dec. 12	99.80
June 5	100.80				

GI 207. Well 207 in Water-Supply Paper 836-E. City well 1. City of Grand Island. SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 3, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 18.2 feet. Measuring point, top of pipe, 0.5 foot above land surface and 115.15 feet above datum. Water level Apr. 17, 1938, 15.60 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

Water level, in feet above datum, 1938-39

Apr. 17, 1938	99.55	June 11, 1938	100.15	Nov. 21, 1938	99.15
24	99.90	18	100.10	Jan. 8, 1939	99.20
May 1	99.60	July 2	100.00	Feb. 14	99.30
15	99.80	Aug. 13	99.10	May 6	99.05
29	100.15	Sept. 18	99.30	June 20	99.15
June 5	100.15	Oct. 10	99.15	Sept. 9	98.80

## Hall County--Continued

GI 208. Well 208 in Water Supply Paper 836-E. City well 4. City of Grand Island. SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 4, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 22.0 feet. Measuring point, top of pipe, 0.5 foot above land surface and 116.20 feet above datum. Water level Apr. 17, 1938, 16.10 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Date	Water level	Date	Water level	Date	Water level
Apr. 17, 1938	100.10	June 18, 1938	100.30	Jan. 8, 1939	100.10
24	100.15	July 2	100.40	Feb. 14	100.25
May 1	100.05	Aug. 13	100.20	May 6	100.20
15	100.20	Sept. 18	100.20	June 20	100.10
29	100.20	Oct. 11	100.20	Sept. 9	99.85
June 5	100.25	Nov. 21	100.10	Nov. 21	99.55
11	100.35				

GI 209. Well 209 in Water-Supply Paper 836-E. City well 5. City of Grand Island. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 4, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 19.4 feet. Measuring point, top of pipe, 0.5 foot above land surface and 117.90 feet above datum. Water level, Apr. 17, 1938, 15.45 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Apr. 17, 1938	102.45	June 11, 1938	102.65	Nov. 21, 1938	101.70
24	102.55	18	102.45	Jan. 8, 1939	101.85
May 1	102.45	July 2	102.60	Feb. 14	102.00
15	102.55	Aug. 13	101.65	May 6	101.75
29	102.65	Sept. 18	101.75	June 20	101.40
June 5	102.55	Oct. 11	101.65	Nov. 21	101.05

GI 210. Well 210 in Water Supply Paper 836-E. City well 7. City of Grand Island. NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 8, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 24.0 feet. Measuring point, top of pipe, 0.5 foot above land surface and 119.25 feet above datum. Water level, Apr. 17, 1938, 19.15 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Apr. 17, 1938	100.10	June 18, 1938	100.15	Jan. 8, 1939	99.45
24	100.05	July 2	97.60	Feb. 14	99.60
May 1	100.05	Aug. 13	97.70	May 6	98.91
15	100.15	Sept. 18	99.25	June 20	96.95
29	100.25	Oct. 11	99.20	Sept. 9	96.35
June 5	100.15	Nov. 21	99.30	Nov. 21	98.45
11	100.20				

GI 211. Well 211 in Water-Supply Paper 836-E. City well 6. City of Grand Island. NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 8, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 19.4 feet. Measuring point, top of pipe, 0.5 foot above land surface and 116.77 feet above datum. Water level, Apr. 17, 1938, 16.80 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Apr. 17, 1938	99.97	June 18, 1938	100.12	Jan. 8, 1939	99.47
24	100.17	July 2	99.97	Feb. 14	99.52
May 1	99.97	Aug. 13	99.42	May 6	99.27
15	100.07	Sept. 18	99.37	June 20	99.12
29	100.62	Oct. 11	99.37	Sept. 9	98.52
June 5	100.17	Nov. 21	99.37	Nov. 21	98.67
11	100.22				

## Hall County--Continued

GI 212. Well 212 in Water Supply Paper 836-E. City well 3. City of Grand Island. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 9, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 29.0 feet. Measuring point, top of pipe, 0.5 foot above land surface and 122.80 feet above datum. Water level, Apr. 17, 1938, 22.35 feet below measuring point. Previous measurements appear in Water Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Date	Water level	Date	Water level	Date	Water level
Apr. 17, 1938	100.45	June 18, 1938	100.15	Jan. 8, 1939	99.65
24	100.45	July 2	99.80	Feb. 14	99.85
May 1	100.50	Aug. 13	98.75	May 6	99.05
15	100.60	Sept. 18	99.25	June 20	98.80
29	100.65	Oct. 11	99.00	Sept. 9	98.05
June 5	100.55	Nov. 21	99.35	Nov. 21	97.70
11	100.45				

GI 214. Well 214 in Water-Supply Paper 836-E. City well 8. City of Grand Island. SE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 9, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 19.5 feet. Measuring point, top of pipe, 0.5 foot above land surface and 119.05 feet above datum. Water level, Apr. 17, 1938, 21.30 feet below measuring point. Previous measurements are given in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Apr. 17, 1938	97.55	June 18, 1938	97.75	Jan. 8, 1939	97.05
24	97.75	July 2	97.60	Feb. 14	97.30
May 1	97.85	Aug. 13	96.50	May 6	96.60
15	97.95	Sept. 18	96.70	June 20	96.40
29	97.95	Oct. 11	96.55	Sept. 9	95.65
June 5	97.85	Nov. 21	96.80	Nov. 21	95.60
11	97.80				

GI 215. Well 215 in Water-Supply Paper 836-E. City well 15. City of Grand Island. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 9, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 24.0 feet. Measuring point, top of pipe, 0.5 foot above land surface and 123.85 feet above datum. Water level, Apr. 17, 1938, 23.60 feet below measuring point. Previous measurements appear in Water Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Apr. 17, 1938	100.25	June 18, 1938	100.05	Jan. 8, 1939	99.45
24	100.30	July 2	99.55	14	99.60
May 1	100.05	Aug. 13	98.95	May 6	99.25
15	100.20	Sept. 18	99.15	June 20	98.85
29	100.20	Oct. 11	99.00	Sept. 9	98.10
June 5	100.20	Nov. 21	99.20	Nov. 21	98.30
11	100.15				

GI 216. Well 216 in Water Supply Paper 836-E. City well 10. City of Grand Island. NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 9, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 33.1 feet. Measuring point, top of pipe, 0.5 foot above land surface and 130.87 feet above datum. Water level Apr. 17, 1938, 29.75 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Apr. 17, 1938	101.12	June 11, 1938	100.62	Oct. 11, 1938	99.32
24	101.32	18	100.57	Nov. 21	99.37
May 1	101.02	July 2	100.42	Jan. 8, 1939	99.77
15	100.92	Aug. 13	99.57	Feb. 14	100.32
June 5	100.72	Sept. 18	99.42	June 20	99.37

## Hall County--Continued

GI 217. Well 217 in Water-Supply Paper 836-E. City well 13. City of Grand Island. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 9, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 36.1 feet. Measuring point, top of pipe, 0.5 foot above land surface and 131.30 feet above datum. Water level Apr. 17, 1939, 30.80 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Date	Water level	Date	Water level	Date	Water level
Apr. 17, 1938	100.50	June 11, 1938	99.55	Jan. 28, 1939	99.85
24	100.65	18	99.60	Mar. 21	100.60
May 1	100.35	July 2	99.45	May 7	99.45
8	100.30	Aug. 13	98.75	June 14	98.85
15	100.40	Sept. 11	98.65	Aug. 12	98.15
22	100.70	Oct. 15	98.80	Nov. 7	97.85
29	99.80	Dec. 11	98.60	Dec. 12	97.85
June 5	99.75				

GI 218. Well 218 in Water-Supply Paper 836-E. City well 2. City of Grand Island. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 10, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 30.1 feet. Measuring point, top of pipe, 0.5 foot above land surface and 124.10 feet above datum. Water level Apr. 17, 1938, 24.00 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Date	Water level	Date	Water level	Date	Water level
Apr. 17, 1938	100.10	June 11, 1938	101.35	Jan. 28, 1939	99.95
24	101.35	18	101.55	Mar. 21	99.85
May 1	101.30	July 2	101.55	May 7	100.00
8	101.35	Aug. 13	99.90	June 14	99.95
15	100.10	Sept. 11	99.80	Aug. 12	99.50
22	101.50	Oct. 15	99.80	Nov. 17	99.10
29	101.55	Dec. 11	99.70	Dec. 12	98.95
June 5	101.55				

GI 219. Well 219 in Water-Supply Paper 836-E. City well 57. City of Grand Island. SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 12, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 11.0 feet. Measuring point, top of pipe, 0.5 foot above land surface and 109.52 feet above datum. Water level, Apr. 17, 1938, 7.45 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Date	Water level	Date	Water level	Date	Water level
Apr. 17, 1938	102.07	June 11, 1938	102.67	Jan. 28, 1939	101.67
24	102.22	18	101.72	Mar. 21	102.07
May 1	102.12	July 2	102.72	June 14	102.52
15	103.32	Aug. 13	102.17	Aug. 12	101.67
22	103.27	Sept. 11	101.92	Nov. 7	101.22
29	103.07	Oct. 15	101.67	Dec. 12	101.22
June 5	102.82	Dec. 11	101.52		

GI 220. Well 220 in Water-Supply Paper 836-E. City well 11. City of Grand Island. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 14, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 12.6 feet. Measuring point, top of pipe, 0.5 foot above land surface and 108.85 feet above datum. Water level Apr. 17, 1938, 7.50 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Date	Water level	Date	Water level	Date	Water level
Apr. 17, 1938	101.35	June 11, 1938	101.85	Jan. 28, 1939	101.00
24	101.30	18	101.85	Mar. 21	101.10
May 1	101.45	July 2	101.85	June 14	101.35
15	101.85	Aug. 13	101.40	Aug. 12	100.80
22	101.85	Sept. 11	101.10	Nov. 7	100.50
29	101.90	Oct. 15	100.90	Dec. 12	100.45
June 5	101.85	Dec. 11	100.85		



## Hall County--Continued

GI 221. Well 221 in Water-Supply Paper 836-E. City well 19. City of Grand Island. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 15, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 38.8 feet. Measuring point, top of pipe, 0.5 foot above land surface and 132.75 feet above datum. Water level, Apr. 17, 1938, 32.45 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Date	Water level	Date	Water level	Date	Water level
Apr. 17, 1938	100.30	June 11, 1938	98.70	Jan. 28, 1939	100.05
24	100.40	18	98.80	Mar. 21	100.85
May 1	99.80	July 2	98.70	May 7	98.85
8	99.85	Aug. 3	98.00	June 14	98.50
15	99.90	Sept. 11	98.05	Aug. 12	97.45
22	99.20	Oct. 15	98.55	Nov. 7	97.55
29	98.85	Dec. 11	98.15	Dec. 12	97.65
June 5	98.80				

GI 222. Well 222 in Water-Supply Paper 836-E. City well 12. City of Grand Island. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 15, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 37.2 feet. Measuring point, top of pipe, 0.5 foot above land surface, and 129.25 feet above datum. Water level, Apr. 17, 1938, 28.30 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Apr. 17, 1938	100.95	June 11, 1938	100.60	Jan. 28, 1939	100.30
24	101.15	18	100.65	Mar. 21	100.75
May 1	100.95	July 2	100.60	May 7	100.15
8	101.00	Aug. 13	100.10	June 14	99.95
15	101.00	Sept. 11	99.95	Aug. 12	99.65
22	100.90	Oct. 15	99.85	Nov. 17	99.40
29	100.70	Dec. 11	99.65	Dec. 12	99.25
June 5	100.70				

GI 223. Well 223 in Water-Supply Paper 836-E. City well 29. City of Grand Island. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 15, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 18.2 feet. Measuring point, top of pipe, 0.5 foot above land surface and 115.92 feet above datum. Water level Apr. 17, 1938, 14.60 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Apr. 17, 1938	101.32	June 11, 1938	100.77	Nov. 21, 1938	99.97
24	101.27	18	100.67	Jan. 8, 1939	100.32
May 1	101.07	July 2	100.67	Feb. 14	100.52
15	101.12	Aug. 13	100.22	May 6	100.62
29	101.12	Sept. 18	100.77	June 20	100.32
June 5	100.77	Oct. 11	99.92		

GI 224. Well 224 in Water-Supply Paper 836-E. City well 30. City of Grand Island. NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 15, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 12.5 feet. Measuring point, top of pipe, 0.5 foot above land surface and 111.20 feet above datum. Water level, Apr. 17, 1938, 10.20 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Apr. 17, 1938	101.00	July 2, 1938	101.10	Feb. 14, 1939	100.65
24	101.05	Aug. 13	100.75	May 6	100.75
May 1	101.00	Sept. 18	100.65	June 20	100.60
15	101.20	Oct. 11	100.40	Sept. 9	100.10
29	101.10	Nov. 21	100.35	Nov. 21	100.00
June 5	101.10	Jan. 8, 1939	100.50	Dec. 23	99.60
18	101.10				

## Hall County--Continued

GI 225. Well 225 in Water-Supply Paper 836-E. City well 31. City of Grand Island. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 15, T.11 N., R.9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 10.5 feet. Measuring point, top of pipe, 0.5 foot above land surface and 110.45 feet above datum. Water level Apr. 17, 1938, 9.25 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Apr. 17, 1938	101.25	June 11, 1938	101.95	Dec. 11, 1938	100.90
24	101.20	18	101.95	Jan. 28, 1939	100.90
May 1	101.30	July 2	101.95	Mar. 21	101.10
15	101.65	Aug. 13	101.50	June 14	101.25
22	101.80	Sept. 11	101.30	Aug. 12	100.80
29	102.00	Oct. 15	101.15	Nov. 7	100.45
June 5	101.90				

GI 226. Well 226 in Water-Supply Paper 836-E. City well 20. City of Grand Island. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 16, T.11 N., R.9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 44.2 feet. Measuring point, top of pipe, 0.5 foot above land surface and 136.85 feet above datum. Water level Apr. 17, 1938, 37.50 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Apr. 17, 1938	99.35	June 18, 1938	96.70	Jan. 8, 1939	98.40
24	98.40	July 2	96.80	Feb. 14	100.60
May 1	98.25	Aug. 13	95.80	May 6	97.40
15	97.60	Sept. 18	96.40	June 20	96.20
29	96.95	Oct. 11	96.65	Sept. 9	94.95
June 5	96.55	Nov. 21	95.75	Nov. 21	95.40
11	96.45				

GI 227. Well 227 in Water-Supply Paper 836-E. City well 18. City of Grand Island. SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 16, T.11 N., R.9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 37.8 feet. Measuring point, top of pipe, 0.5 foot above land surface and 134.22 feet above datum. Water level, Apr. 17, 1938, 33.45 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied by courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Apr. 17, 1938	100.77	June 11, 1938	99.82	Nov. 21, 1938	100.07
24	100.62	18	99.72	Jan. 8, 1939	100.02
May 1	100.52	July 2	99.67	Feb. 14	100.12
15	100.37	Aug. 13	99.17	May 6	99.82
29	100.02	Sept. 18	98.92	Sept. 9	98.42
June 5	99.92	Oct. 11	98.92	Nov. 21	99.27

GI 228. Well 228 in Water-Supply Paper 836-E. City well 21. City of Grand Island. SE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 16, T.11 N., R.9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 43.5 feet. Measuring point, top of pipe, 0.5 foot above land surface and 139.15 feet above datum. Water level Apr. 17, 1938, 41.50 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water levels, in feet above datum, 1938-39

Apr. 17, 1938	97.65	June 5, 1938	95.85	Sept. 18, 1938	95.55
24	97.05	11	95.65	Nov. 21	97.85
May 1	97.10	18	95.65	Jan. 8, 1939	97.05
15	96.55	July 2	95.70	Feb. 14	97.00
29	95.90	Aug. 13	95.60	May 6	95.65

## Hall County--Continued

GI 229. Well 229 in Water-Supply Paper 836-E. City well 22. City of Grand Island. NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 16, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 43.8 feet. Measuring point, top of pipe, 0.5 foot above land surface and 141.27 feet above datum. Water level Apr. 17, 1938, 39.85 feet below measuring point. Previous measurements appeared in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Date	Water level	Date	Water level	Date	Water level
Apr. 17, 1938	101.42	June 18, 1938	100.37	Jan. 8, 1939	100.77
24	101.32	July 2	100.27	Feb. 14	100.17
May 1	101.52	Aug. 13	100.97	May 6	101.27
15	101.07	Sept. 18	100.77	June 20	100.27
29	100.62	Oct. 11	100.47	Sept. 9	99.47
June 5	100.52	Nov. 21	104.97	Nov. 21	99.17
11	100.42				

GI 230. Well 230 in Water-Supply Paper 836-E. City well 23. City of Grand Island. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 16, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 38.9 feet. Measuring point, top of pipe, 0.5 foot above land surface and 134.6 feet above datum. Water level Apr. 17, 1938, 33.05 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Apr. 17, 1938	101.57	June 18, 1938	101.62	Jan. 8, 1939	101.82
24	101.47	July 2	101.47	Feb. 14	100.42
May 1	101.72	Aug. 13	100.92	May 6	101.22
15	101.92	Sept. 18	100.72	June 20	100.92
29	101.82	Oct. 11	100.62	Sept. 9	100.27
June 5	101.87	Nov. 21	101.42	Nov. 21	99.77
11	101.77				

GI 231. Well 231 in Water-Supply Paper 836-E. City well 28. City of Grand Island. NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 16, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 39.0 feet. Measuring point, top of pipe, 0.5 foot above land surface, and 135.00 feet above datum. Water level Apr. 17, 1938, 34.25 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Apr. 17, 1938	100.75	June 18, 1938	99.60	Jan. 8, 1939	100.10
24	100.55	July 2	99.60	Feb. 14	100.00
May 1	100.35	Aug. 13	99.15	May 6	99.75
15	100.15	Sept. 18	98.95	June 20	99.35
29	99.90	Oct. 11	98.05	Sept. 9	98.55
June 5	99.80	Nov. 21	100.05	Nov. 21	98.40
11	99.60				

GI 232. Well 232 in Water-Supply Paper 836-E. City well 16. City of Grand Island. NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 17, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 21.6 feet. Measuring point, top of pipe, 0.5 foot above land surface and 119.07 feet above datum. Water level Apr. 17, 1938, 19.20 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Apr. 17, 1938	99.87	June 18, 1938	100.37	Jan. 8, 1939	99.52
24	100.02	July 2	99.92	Feb. 14	99.52
May 1	99.87	Aug. 13	99.52	May 6	99.37
15	100.12	Sept. 18	99.67	June 20	99.07
29	100.22	Oct. 11	99.57	Sept. 9	98.42
June 5	100.32	Nov. 21	99.42	Nov. 21	98.62
11	100.37				

## Hall County--Continued

GI 233. Well 233 in Water-Supply Paper 836-E. City well 17. City of Grand Island. SE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 17, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 28.3 feet. Measuring point, top of pipe, 0.5 foot above land surface and 124.10 feet above datum. Water level Apr. 17, 1938, 23.35 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Date	Water level	Date	Water level	Date	Water level
Apr. 17, 1938	100.75	June 18, 1938	101.20	Jan. 8, 1939	99.90
24	100.80	July 2	101.00	Feb. 14	99.70
May 1	101.05	Aug. 13	100.15	May 6	100.35
15	101.40	Sept. 18	99.85	June 20	99.55
29	101.55	Oct. 11	99.70	Sept. 9	99.25
June 5	101.65	Nov. 21	99.55	Nov. 21	99.10
11	101.45				

GI 234. Well 234 in Water-Supply Paper 836-E. City well 24. City of Grand Island. SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 17, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 31.4 feet. Measuring point, top of pipe, 0.5 foot above land surface and 133.35 feet above datum. Water level Apr. 17, 1938, 26.70 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Apr. 17, 1938	106.65	June 18, 1938	103.00	Jan. 8, 1939	103.45
24	107.25	July 2	102.70	Feb. 14	102.80
May 1	108.80	Aug. 13	100.85	May 6	101.55
15	108.40	Sept. 18	99.90	June 20	100.85
29	108.25	Oct. 11	99.80	Sept. 9	100.35
June 5	108.75	Nov. 21	101.90	Nov. 21	102.45
11	106.30				

GI 236. Well 236 in Water-Supply Paper 836-E. City well 25. City of Grand Island. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 20, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 28.5 feet. Measuring point, top of pipe, 0.5 foot above land surface and 125.30 feet above datum. Water level Apr. 17, 1938, 23.80 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Apr. 17, 1938	101.50	June 18, 1938	102.20	Jan. 8, 1939	99.45
24	101.60	July 2	102.30	Feb. 14	98.90
May 1	101.80	Aug. 13	101.90	May 6	101.05
15	102.10	Sept. 18	101.65	June 20	100.80
29	102.30	Oct. 11	101.00	Sept. 9	100.75
June 5	102.35	Nov. 21	99.70	Nov. 21	99.30
11	102.35				

GI 237. Well 237 in Water-Supply Paper 836-E. City well 27. City of Grand Island. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 21, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 34.8 feet. Measuring point, top of pipe, 0.5 foot above land surface and 131.57 feet above datum. Water level Apr. 17, 1938, 30.70 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Apr. 17, 1938	100.87	June 18, 1938	100.67	Jan. 8, 1939	99.97
24	100.82	July 2	100.52	Feb. 14	99.67
May 1	100.77	Aug. 13	99.92	May 6	100.57
15	101.22	Sept. 18	100.12	June 20	100.22
29	101.17	Oct. 11	100.22	Sept. 9	99.57
June 5	100.97	Nov. 21	100.37	Nov. 21	99.17
11	100.92				

## Hall County--Continued

GI 238. Well 238 in Water-Supply Paper 836-E. City well 33. City of Grand Island. SE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 21, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 34.2 feet. Measuring point, top of pipe, 0.5 foot above land surface and 131.25 feet above datum. Water level Apr. 17, 1938, 30.70 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Date	Water level	Date	Water level	Date	Water level
Apr. 17, 1938	100.55	June 18, 1938	99.35	Jan. 8, 1939	100.05
24	100.65	July 2	98.85	Feb. 14	99.85
May 1	100.95	Aug. 13	98.15	May 6	100.60
15	101.15	Sept. 18	99.70	June 20	99.45
29	101.25	Oct. 11	100.35	Sept. 9	99.10
June 5	100.15	Nov. 21	100.25	Nov. 21	99.30
11	100.30				

GI 239. Well 239 in Water-Supply Paper 836-E. City well 32. City of Grand Island. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 22, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 11.0 feet. Measuring point, top of pipe, 0.5 foot above land surface and 110.08 feet above datum. Water level Apr. 17, 1938, 9.25 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Apr. 17, 1938	100.83	June 11, 1938	101.63	Jan. 28, 1939	100.88
24	100.83	18	101.68	Mar. 21	100.88
May 1	100.98	July 2	101.78	May 7	100.88
8	101.08	Aug. 13	101.38	June 14	100.88
15	101.03	Sept. 11	101.13	Aug. 12	100.58
29	101.43	Oct. 15	100.78	Nov. 7	100.03
June 5	101.53	Dec. 11	100.78	Dec. 12	100.03

GI 240. Well 240 in Water-Supply Paper 836-E. City well 54. City of Grand Island. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 20, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 10.0 feet. Measuring point, top of pipe, 0.5 foot above land surface and 107.83 feet above datum. Water level Apr. 17, 1938, 6.05 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Apr. 17, 1938	101.78	June 11, 1939	102.63	Jan. 28, 1939	101.68
24	101.83	18	102.58	Mar. 21	101.88
May 1	101.93	July 2	102.58	June 14	102.05
15	102.28	Aug. 13	102.05	Aug. 12	101.53
22	102.38	Sept. 11	101.83	Nov. 7	100.93
29	102.58	Oct. 15	101.63	Dec. 12	100.78
June 5	102.58	Dec. 11	101.58		

GI 241. Well 241 in Water-Supply Paper 836-E. City well 34. City of Grand Island. NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 28, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches depth 10.7 feet. Measuring point, top of pipe, 0.5 foot above land surface and 109.42 feet above datum. Water level Apr. 17, 1938, 8.15 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Apr. 17, 1938	101.27	June 11, 1938	101.97	Jan. 28, 1939	101.72
24	101.32	18	101.57	Mar. 21	101.72
May 1	101.37	July 2	101.77	May 7	101.07
8	101.42	Aug. 13	101.67	June 14	101.17
15	101.42	Sept. 11	101.42	Aug. 12	100.82
29	101.82	Oct. 15	101.27	Nov. 7	100.27
June 5	101.92	Dec. 11	101.82	Dec. 12	100.02

## Hall County--Continued

GI 242. Well 242 in Water-Supply Paper 836-E. City well 35. City of Grand Island. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 29, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 23.8 feet. Measuring point, top of pipe, 0.5 foot above land surface and 123.90 feet above datum. Water level Apr. 17, 1938, 22.75 feet below measuring point. Measurements supplied through courtesy of Grand Island Water Department.

Water level, in feet above datum, 1938-39

Date	Water level	Date	Water level	Date	Water level
Apr. 17, 1938	101.15	June 11, 1938	101.60	Dec. 11, 1938	100.30
24	101.10	18	101.70	Jan. 28, 1939	100.30
May 1	101.65	July 2	101.85	May 7	100.65
8	101.40	Aug. 13	102.10	June 14	101.00
15	101.35	Sept. 11	102.05	Aug. 12	101.15
29	101.50	Oct. 15	101.45	Nov. 7	100.40
June 5	101.55				

GI 243. Well 243 in Water-Supply Paper 836-E. City well 45. City of Grand Island. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 32, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 9.9 feet. Measuring point, top of pipe, 0.5 foot above land surface and 106.85 feet above datum. Water level Apr. 17, 1938, 3.80 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements applied through courtesy of Grand Island Water Department.

Water level, in feet above datum 1938-39

Apr. 17, 1938	103.05	June 11, 1938	103.50	Jan. 28, 1939	102.25
24	103.10	18	103.55	Mar. 21	102.75
May 1	103.00	July 2	103.35	May 7	103.05
15	103.05	Aug. 13	102.35	June 14	102.75
22	104.25	Sept. 11	102.00	Aug. 12	101.30
29	104.45	Oct. 15	101.40	Nov. 7	100.65
June 5	103.90	Dec. 11	101.95	Dec. 12	100.95

GI 244. Well 244 in Water-Supply Paper 836-E. City well 53. City of Grand Island. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 34, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 10.3 feet. Measuring point, top of pipe, 0.5 foot above land surface and 107.42 feet above datum. Water level Apr. 17, 1938, 5.90 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

Water level, in feet above datum, 1938-39

Apr. 17, 1938	101.52	June 11, 1938	102.32	Jan. 28, 1939	101.47
24	101.57	18	102.37	Mar. 21	101.62
May 1	101.67	July 2	102.62	June 14	101.87
15	102.02	Aug. 13	102.07	Aug. 12	101.22
22	102.12	Sept. 11	103.52	Nov. 7	100.77
29	102.27	Oct. 15	101.42	Dec. 12	100.52
June 5	102.27	Dec. 11	101.32		

GI 246. Well 246 in Water-Supply Paper 836-E. City well 49. City of Grand Island. NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 34, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 10.4 feet. Measuring point, top of pipe, 0.5 foot above land surface and 107.52 feet above datum. Water level Apr. 17, 1938, 5.80 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

Water level, in feet above datum, 1938-39

Apr. 17, 1938	101.72	June 11, 1938	102.62	Jan. 28, 1939	101.72
24	101.77	18	102.57	Mar. 21	101.77
May 1	101.77	July 2	102.82	May 7	101.97
15	101.82	Aug. 13	102.22	June 14	102.02
22	102.17	Sept. 11	101.87	Aug. 12	101.52
29	102.47	Oct. 15	101.52	Nov. 7	100.92
June 5	102.52	Dec. 11	101.52	Dec. 12	100.72

## Hall County--Continued

GI 247. Well 247 in Water-Supply Paper 836-E. City well 52. City of Grand Island. SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 35, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 10.7 feet. Measuring point, top of pipe, 0.5 foot above land surface and 106.68 feet above datum. Water level April 17, 1938, 3.85 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Date	Water level	Date	Water level	Date	Water level
Apr. 17, 1938	102.83	June 11, 1938	102.68	Jan. 28, 1939	102.38
24	102.83	18	102.48	Mar. 21	102.93
May 1	102.78	July 2	102.58	June 14	102.34
15	103.13	Aug. 13	101.68	Aug. 12	101.33
22	103.28	Sept. 11	101.38	Nov. 7	100.78
29	103.48	Oct. 15	101.68	Dec. 12	100.68
June 5	102.88	Dec. 11	102.03		

GI 248. Well 248 in Water-Supply Paper 836-E. City well 50. City of Grand Island. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 3, T. 10 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 10.4 feet. Measuring point, top of pipe, 0.5 foot above land surface and 107.50 feet above datum. Water level Apr. 17, 1938, 5.35 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Apr. 17, 1938	102.15	June 11, 1938	102.80	Jan. 28, 1939	102.20
24	102.20	18	101.65	Mar. 21	102.50
May 1	102.35	July 2	102.95	May 7	102.50
15	102.20	Aug. 13	102.05	June 14	102.45
22	102.90	Sept. 11	101.70	Aug. 12	101.60
29	105.05	Oct. 15	101.65	Nov. 7	101.05
June 5	102.85	Dec. 11	101.85	Dec. 12	100.90

GI 249. Well 249 in Water-Supply Paper 836-E. City well 47. City of Grand Island. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 4, T. 10 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 10.4 feet. Measuring point, top of pipe, 0.5 foot above land surface and 107.65 feet above datum. Water level Apr. 17, 1938, 5.35 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Apr. 17, 1938	102.30	June 11, 1938	102.85	Jan. 28, 1939	102.20
24	102.25	18	102.80	Mar. 21	102.45
May 1	102.50	July 2	103.15	May 7	102.65
15	102.30	Aug. 13	102.10	June 14	102.45
22	103.10	Sept. 11	102.10	Aug. 12	101.75
29	104.20	Oct. 15	101.75	Nov. 7	101.15
June 5	103.10	Dec. 11	101.95	Dec. 12	101.15

GI 250. Well 250 in Water-Supply Paper 836-E. City well 46. City of Grand Island. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 8, T. 10 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 10.5 feet. Measuring point, top of pipe, 0.5 foot above land surface and 107.10 feet above datum. Water level Apr. 17, 1938, 4.50 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Apr. 17, 1938	102.60	June 11, 1938	103.75	Jan. 28, 1939	102.30
24	102.55	18	103.05	Mar. 21	103.05
May 1	102.80	July 2	103.30	May 7	103.70
15	102.60	Aug. 13	101.75	June 14	103.40
22	103.50	Sept. 11	101.35	Aug. 12	101.45
29	104.70	Oct. 15	101.55	Nov. 7	100.75
June 5	104.20	Dec. 11	101.85	Dec. 12	100.80

## Hall County--Continued

GI 251. Well 251 in Water-Supply Paper 836-E. City well 40. City of Grand Island. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 1, T. 12 N., R. 10 W. Unused driven observation well, diameter 1 $\frac{1}{2}$  inches, depth 12.6 feet. Measuring point, top of pipe, 0.5 foot above land surface and 110.60 feet above datum. Water level Apr. 17, 1938, 10.85 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Date	Water level	Date	Water level	Date	Water level
Apr. 17, 1938	99.75	June 11, 1938	100.20	Jan. 28, 1939	99.70
24	100.00	18	100.25	Mar. 21	99.60
May 1	99.85	July 2	100.25	May 7	99.50
8	99.90	Aug. 13	99.80	June 14	99.45
15	99.90	Sept. 11	99.90	Aug. 12	99.60
22	100.20	Oct. 15	99.80	Nov. 7	99.40
29	100.20	Dec. 11	99.60	Dec. 12	99.25
June 5	100.15				

GI 252. Well 252 in Water-Supply Paper 836-E. City well 41. City of Grand Island. SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 11, T. 12 N., R. 10 W. Unused driven observation well, diameter 1 $\frac{1}{2}$  inches, depth 10.5 feet. Measuring point, top of pipe, 0.5 foot above land surface and 110.50 feet above datum. Water level Apr. 17, 1938, 11.00 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Apr. 17, 1938	99.50	June 11, 1938	99.75	Jan. 28, 1939	99.40
24	99.50	18	99.80	Mar. 21	99.20
May 1	99.50	July 2	99.75	May 7	99.20
8	99.55	Aug. 13	99.85	June 14	99.05
15	99.50	Sept. 11	99.70	Aug. 12	99.16
22	99.65	Oct. 15	99.50	Nov. 7	98.95
29	99.85	Dec. 11	99.45	Dec. 12	98.80
June 5	99.80				

GI 253. Well 253 in Water-Supply Paper 836-E. City well 42. City of Grand Island. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 13, T. 11 N., R. 10 W. Unused driven observation well, diameter 1 $\frac{1}{2}$  inches depth 15.5 feet. Measuring point, top of pipe, 0.5 foot above land surface and 113.65 feet above datum. Water level Apr. 17, 1938, 14.15 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Apr. 17, 1938	99.50	June 11, 1938	99.90	Jan. 28, 1939	99.40
24	99.45	18	99.90	Mar. 21	99.25
May 1	99.65	July 2	99.90	May 7	99.25
8	99.70	Aug. 13	99.70	June 14	99.15
15	99.70	Sept. 11	99.60	Aug. 12	99.05
22	99.80	Oct. 15	99.55	Nov. 7	98.90
29	99.90	Dec. 11	99.40	Dec. 12	98.70
June 5	99.85				

GI 254. Well 254 in Water-Supply Paper 836-E. City well 43. City of Grand Island. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 24, T. 11 N., R. 10 W. Unused driven observation well, diameter 1 $\frac{1}{2}$  inches, depth 23.0 feet. Measuring point, top of pipe, 0.5 foot above land surface and 117.40 feet above datum. Water level Apr. 17, 1938, 18.45 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.



## Hall County--Continued

GI 254 --Continued

Water level, in feet above datum, 1938-39

Date	Water level	Date	Water level	Date	Water level
Apr. 17, 1938	98.95	June 11, 1938	99.30	Jan. 28, 1939	98.65
24	99.00	18	99.40	Mar. 21	98.60
May 1	99.10	July 2	99.40	May 7	98.60
8	99.10	Aug. 13	99.45	June 14	98.60
15	99.10	Sept. 11	99.45	Aug. 12	98.55
22	99.20	Oct. 15	99.10	Nov. 7	98.25
29	99.25	Dec. 11	98.80	Dec. 12	98.05
June 5	99.25				

GI 255. Well 255 in Water-Supply Paper 836-E. City well 44. City of Grand Island. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 26, T. 11 N., R. 10 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches depth 19.6 feet. Measuring point, top of pipe, 0.5 foot above land surface and 111.15 feet above datum. Water level Apr. 17, 1938, 10.40 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

Water level, in feet above datum, 1938-39

Apr. 17, 1938	100.75	May 15, 1938	100.90	June 11, 1938	101.20
24	100.85	22	101.00	18	100.65
May 1	100.85	29	101.65	July 2	101.25
8	100.90	June 5	101.15	May 7, 1939	100.65

## Hamilton County

158. Measuring point destroyed; altitude of new measuring point not yet determined.

159. Water levels, in feet above datum, 1939: June 17, 99.30; Nov. 13, a/ 99.22.

160. Water levels, in feet above datum, 1939: June 17, 98.70; Nov. 13, 98.40.

173. Water levels, in feet above datum, 1939: June 17, 100.54; Nov. 13, 100.25.

330. Water levels, in feet above datum, 1939: May 31, 99.44; Nov. 13, a/ 97.64.

## Harlan County

155. Water levels, in feet above datum, 1939: June 16, 101.27; Dec. 11, 100.62.

222. Water levels, in feet above datum, 1939: June 16, 100.12; Dec. 11, 99.75.

329. Water levels, in feet above datum, 1939: June 16, 99.76 Dec. 11, a/ 99.67.

389. Water levels, in feet above datum, 1939: June 16, 99.77; Dec. 11, 99.66.

## Hayes County

141. Water levels, in feet above datum, 1939: June 15, 99.61; Dec. 10, a/ 99.48.

142. Water levels, in feet above datum, 1939: June 15, 100.08; Dec. 10, b/ 100.96.

a Lowest observed stage in period of record.

b Highest observed stage in period of record.

## WATER LEVELS AND ARTESIAN PRESSURE, 1939

## Hayes County--Continued

446. University of Nebraska. SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 31, T. 5 N., R. 33 W. Unused driven observation well, diameter 1 inch, depth 23 feet. Measuring point, top of pipe, 2.7 feet above land surface and 115.30 feet above datum. Water level Dec. 7, 1936, 15.28 feet below measuring point.

Water level, in feet above datum, 1936-39

Date	Water level	Date	Water level	Date	Water level
Dec. 7, 1936	100.02	Aug. 13, 1937	100.33	Oct. 28, 1938	99.66
Apr. 9, 1937	b105.96	Oct. 20	a 99.19	June 14, 1939	100.32
June 25	100.53	June 28, 1938	100.86	Dec. 9	100.03

## Hitchcock County

140. Water levels, in feet above datum, 1939: June 15, a/ 98.82; Dec. 10, 99.05.

178. Water levels, in feet above datum, 1939: June 14, 100.94; Dec. 9, 100.19.

362. Water levels, in feet above datum, 1939: June 14, 100.42; Dec. 9, a/ 99.54.

## Holt County

112. Water levels, in feet above datum, 1939: June 5, 99.41; Nov. 28, a/ 99.06.

113. Water levels, in feet above datum, 1939: June 5, 99.54; Nov. 28, 99.67.

203. Water levels, in feet above datum, 1939: June 3, 100.02; Nov. 27, 99.44.

373. Water levels, in feet above datum, 1939: June 5, 100.88; Nov. 28, a/ 99.64.

374. Water levels, in feet above datum, 1939: June 5, 99.28; Nov. 28, 98.41.

424. University of Nebraska. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 24, T. 26 N., R. 12 W. Unused driven observation well, diameter 1 inch, depth 12.3 feet. Measuring point, top of pipe, 2.0 feet above land surface and 106.43 feet above datum. Water level, Nov. 7, 1936, 4.98 feet below measuring point.

Water level, in feet above datum, 1936-39

Nov. 7, 1936	101.45	Aug. 8, 1937	98.89	Oct. 20, 1938	99.44
Mar. 29, 1937	100.78	Oct. 12	a 98.39	June 3, 1939	100.03
June 13	100.71	July 12, 1938	b101.56	Nov. 27	98.44

428. University of Nebraska. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 27, T. 27 N., R. 9 W. Unused driven observation well, diameter 1 inch, depth 14.5 feet. Measuring point, top of pipe, 1.5 feet above land surface and 107.84 feet above datum. Water level, Nov. 10, 1936, 9.46 feet below measuring point.

Water level, in feet above datum, 1936-39

Nov. 10, 1936	98.38	Oct. 12, 1937	98.85	June 3, 1939	98.36
Mar. 30, 1937	99.14	July 12, 1938	b100.52	Nov. 27	a 97.80
June 13	98.64	Oct. 20	99.44		

## Hooker County

214. Water levels, in feet above datum, 1939: June 9, 94.83; Dec. 2, a/ 94.41.

a Lowest observed stage in period of record.

b Highest observed stage in period of record.

## Howard County

46. Water levels, in feet above datum, 1939: June 2, 101.22;  
Nov. 27, 100.07.
51. Water levels, in feet above datum, 1939: May 31, 98.93;  
Nov. 24, a/ 98.30.
59. Water levels, in feet above datum, 1939: June 2, 99.58;  
Nov. 27, 99.30.
98. Water levels, in feet above datum, 1939: June 1, 100.23;  
Nov. 25, 99.78.
346. Water levels, in feet above datum, 1939: June 3, 103.00;  
Nov. 27, 100.55.

## Jefferson County

226. Water levels, in feet above datum, 1939: May 29, 102.46;  
Nov. 14, 100.91.
227. Water levels, in feet above datum, 1939: May 29, 99.98;  
Nov. 14, 100.11.
228. Water levels, in feet above datum, 1939: May 29, a/ 98.49;  
Nov. 14, 98.52.
229. Water levels, in feet above datum, 1939: May 29, 99.91;  
Nov. 14, a/ 99.68.

## Johnson County

2. Water levels, in feet above datum, 1939: May 27, 99.08; Nov. 17,  
a/ 98.84.
3. Water levels, in feet above datum, 1939: May 27, 99.52; Nov. 17,  
a/ 97.32.

## Kearney County

181. Water levels, in feet above datum, 1939: June 16, 100.22;  
Dec. 11, b/ 100.37.
266. Water levels, in feet above datum, 1939: June 1, 101.38; Nov.  
24, 99.74.

## Keith County

93. No measurements made in 1939.
255. Water levels, in feet above datum, 1939: June 12, a/ 99.31;  
Dec. 5, 99.65.
348. Water levels, in feet above datum, 1939: June 12, 102.87;  
Dec. 5, 102.09.
349. No measurements made in 1939.
350. Water levels; in feet above datum, 1939: June 12, 101.65;  
Dec. 5, a/ 99.66.
351. Water levels, in feet above datum, 1939: June 12, 99.91;  
Dec. 5, 99.26.
- 352.

## Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 30	c 101.05	May 31	c 100.94	July 31	c 98.72	Oct. 28	c 98.99
Feb. 27	c 101.25	June 12	100.39	Aug. 30	ca 98.27	Nov. 29	c 99.42
Apr. 3	cb 101.60	29	c 99.90	Sept. 29	c 98.40	Dec. 5	99.46
May 1	c 101.12						

a Lowest observed stage in period of record.

b Highest observed stage in period of record.

c Measurement supplied through courtesy of Central Nebraska Public Power and Irrigation District.

## Keith County--Continued

355. No measurements made in 1939.
356. No measurements made in 1939.
357. No measurements made in 1939.
358. Water levels, in feet above datum, 1939: June 14, 99.15;  
Dec. 7, a/ 98.12.
359. Measurements discontinued.
360. Water levels, in feet above datum, 1939: June 14, b/ 100.29;  
Dec. 9, 100.10.

N 11. Central Nebraska Public Power and Irrigation District. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 9, T.16 N., R.38 W. Bored observation well, diameter 4 inches, depth 16.5 feet. Measuring point, top of casing, 3,485.65 feet above sea level. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1936-39

Date	Water level	Date	Water level	Date	Water level
June 24, 1936	15.10	Mar. 2, 1937	15.42	Aug. 30, 1938	15.34
26	15.10	Apr. 1	15.43	Sept. 29	15.34
30	15.05	May 4	15.51	Oct. 31	15.39
July 3	15.05	June 2	15.50	Nov. 29	15.48
7	15.05	July 8	15.56	Dec. 29	15.54
16	15.05	Aug. 4	15.59	Jan. 30, 1939	15.60
30	15.00	Sept. 8	15.46	Feb. 27	15.66
Aug. 13	15.10	Nov. 2	15.43	Apr. 3	15.74
28	15.11	Dec. 1	15.58	May 1	15.75
Sept. 14	15.10	30	15.60	31	15.70
Oct. 1	15.17	Jan. 31, 1938	15.62	June 29	15.70
16	15.17	Feb. 28	15.69	July 31	15.68
Nov. 4	15.21	Mar. 31	15.64	Aug. 30	15.77
30	15.25	May 4	15.67	Sept. 29	15.80
Jan. 4, 1937	15.27	31	15.69	Oct. 28	15.84
Feb. 2	15.36	June 30	15.50	Nov. 29	15.92

N 35. Central Nebraska Public Power and Irrigation District. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 17, T.16 N., R.40 W., at upper end of Otter Creek near bottom of Canyon. Bored observation well, diameter 4 inches, depth 14.5 feet. Measuring point, top of casing, 3,477.87 feet above sea level. Measurements supplied through courtesy of Central Public Power and Irrigation District.

Water level, in feet below measuring point, 1936-39

Sept. 30, 1936	7.26	Dec. 2, 1937	7.12	Nov. 30, 1938	7.04
Oct. 16	7.25	31	7.16	Dec. 30	7.05
Nov. 30	7.22	Feb. 1, 1938	7.18	Jan. 31, 1939	7.00
Dec. 31	7.19	Mar. 1	7.14	Feb. 28	7.05
Mar. 1, 1937	7.18	Apr. 1	7.18	Apr. 4	7.01
Apr. 2	7.13	May 5	7.14	May 2	6.98
May 4	7.18	June 1	6.95	June 1	6.99
June 1	7.17	July 1	7.05	30	7.02
July 8	7.23	Aug. 31	7.09	Aug. 1	7.07
Aug. 4	7.18	Sept. 30	7.05	31	7.06
Sept. 7	7.17	Nov. 1	7.03	Oct. 30	7.07
Nov. 3	7.14				

N 37. Central Nebraska Public Power and Irrigation District. NW cor. SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 34, T.16 N., R.41 W. Bored observation well, diameter 4 inches, depth 29 feet. Measuring point, top of casing, 3,297.48 feet above sea level. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

- a Lowest observed stage in period of record.
- b Highest observed stage in period of record.

## Keith County--Continued

N 37.--Continued

Water level, in feet below measuring point, 1936-39

Date	Water level	Date	Water level	Date	Water level
Sept. 30, 1936	20.46	Nov. 3, 1937	16.88	Dec. 30, 1938	15.50
Oct. 16	17.21	Dec. 2	16.17	Jan. 31, 1939	14.33
Nov. 5	16.48	31	15.54	Feb. 28	12.74
30	15.77	Feb. 1, 1938	14.74	Apr. 4	10.62
Dec. 31	15.36	Apr. 1	10.95	May 2	10.58
Feb. 2, 1937	14.03	May 5	10.68	June 1	12.63
Mar. 1	11.42	June 1	11.92	30	15.50
Apr. 2	10.66	July 1	14.50	Aug. 1	18.38
May 3	10.76	Aug. 31	18.69	31	19.73
June 1	11.24	Sept. 30	18.81	Sept. 30	19.95
July 7	15.77	Nov. 1	16.87	Oct. 30	17.26
Aug. 3	17.62	30	15.95	Dec. 1	16.80
Sept. 8	17.76				

S 18. Central Nebraska Public Power and Irrigation District. NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 17, T. 14 N., R. 38 W. Drilled observation well, diameter 1 $\frac{1}{4}$  inches, depth 179 feet. Measuring point, top of pipe, 3,358.52 feet above sea level. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1936-39

Nov. 30, 1936	162.48	Dec. 30	162.76	Jan. 31, 1939	162.35
Dec. 31	162.70	Jan. 31, 1938	162.78	Feb. 27	162.75
Feb. 1, 1937	162.18	Feb. 28	162.78	Apr. 3	162.90
Mar. 1	163.00	Mar. 31	162.94	May 1	162.82
Apr. 2	162.43	May 4	162.58	31	162.59
May 3	163.18	31	162.77	June 29	163.00
June 1	163.04	June 30	162.54	July 31	162.67
July 7	162.75	Aug. 30	162.65	Aug. 30	162.80
Aug. 3	162.75	Sept. 29	162.61	Sept. 29	162.44
Sept. 8	162.93	Oct. 31	162.40	Oct. 28	163.02
Nov. 3	162.80	Nov. 29	162.61	Nov. 29	162.54
Dec. 1	163.00	Dec. 29	163.00		

S 21. Central Nebraska Public Power and Irrigation District. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 4, T. 14 N., R. 39 W. Drilled observation well, diameter 1 $\frac{1}{4}$  inches, depth 132.5 feet. Measuring point, top of pipe, 3,335.51 feet above sea level. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1936-39

Nov. 30, 1936	105.33	Dec. 30, 1937	104.92	Jan. 31, 1939	105.10
Dec. 31	104.37	Jan. 31, 1938	105.25	Feb. 28	105.48
Feb. 1, 1937	104.45	Feb. 28	104.90	Apr. 4	105.33
Mar. 1	105.32	Apr. 1	105.45	May 2	105.46
Apr. 2	105.10	May 4	105.29	June 1	105.40
May 3	105.40	June 1	105.56	30	105.36
June 1	105.56	July 1	105.45	Aug. 1	105.42
July 7	105.32	Aug. 31	105.47	31	105.43
Aug. 3	105.41	Sept. 30	105.44	Sept. 30	105.58
Sept. 8	105.31	Nov. 1	105.19	Oct. 30	105.50
Nov. 3	105.19	30	105.36	Dec. 1	105.44
Dec. 2	105.22	Dec. 30	105.50		

S 23. C. Samuelson. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 27, T. 15 N., R. 40 W. Unused drilled well, diameter 1 $\frac{1}{4}$  inches, depth 122 feet. Measuring point, top of casing, 3,343.02 feet above sea level. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

## Keith County--Continued

S 23.--Continued

Water level, in feet below measuring point, 1936-39

Date	Water level	Date	Water level	Date	Water level
Dec. 31, 1936	112.88	Feb. 1, 1938	112.85	Jan. 31, 1939	113.00
Feb. 1, 1937	113.02	Mar. 1	112.89	Feb. 28	112.55
Mar. 1	112.30	Apr. 1	113.24	Apr. 4	113.02
Apr. 2	112.61	May 5	113.12	May 2	112.88
May 3	112.89	June 1	113.24	June 1	113.22
June 1	112.91	July 1	113.16	June 30	112.84
July 7	112.94	Aug. 31	113.24	Aug. 1	113.03
Aug. 3	112.95	Sept. 30	113.23	Aug. 31	113.04
Sept. 8	113.06	Nov. 1	113.05	Sept. 30	112.96
Nov. 3	113.15	30	112.58	Oct. 30	113.02
Dec. 2	112.91	Dec. 30	112.94	Dec. 1	113.11
31	113.18				

## Keyapaha County

76. No measurements made in 1939.

375. Water levels, in feet above datum, 1939: June 5, 100.10; Nov. 28, 100.56.

## Kimball County

88. Water levels, in feet above datum, 1939: June 13, 100.21; Dec. 6, a/ 99.61.89. Water levels, in feet above datum, 1939: June 13, b/ 100.33; Dec. 6, 100.31.327. Water levels, in feet above datum, 1939: June 13, 99.34; Dec. 6, a/ 99.01.

344. No measurements made in 1939.

394. No measurements made in 1939.

## Knox County

67. Water levels, in feet above datum, 1939: May 25, 100.10; Nov. 23, 100.10.

71. Water levels, in feet above datum, 1939: June 5, 99.99; Nov. 28, 99.53.

335. Water levels, in feet above datum, 1939: June 5, 99.60; Nov. 28, a/ 97.39.

336. Water levels, in feet above datum, 1939: June 5, 103.50; Nov. 28, 100.52.

370. Water level, in feet above datum, 1939: Nov. 23, a/ 99.35.

429. University of Nebraska. SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 30, T. 33 N., R. 7 W. Unused bored observation well, diameter 3 inches, depth 19.5 feet. Measuring point, top of casing at west side, 2.7 feet above land surface and 116.39 feet above datum. Water level, Nov. 11, 1936, 16.50 feet below measuring point.

Water level, in feet above datum, 1936-39

Nov. 11, 1936	99.89	Oct. 13, 1937 <u>a</u>	99.17	June 5, 1939	100.48
Mar. 30, 1937	100.07	July 13, 1938 <u>b</u>	100.68	Nov. 29	99.19
June 14	100.11	Oct. 21	99.74		

a Lowest observed stage in period of record.b Highest observed stage in period of record.

## Lancaster County

1. No measurements made in 1939.
13. Water levels, in feet above datum, 1939: May 23, 99.17;  
Nov. 17, 98.66.
14. Water levels, in feet above datum, 1939: May 23, 99.80;  
Nov. 18, 99.22.
366. Water levels, in feet above datum, 1939: May 27, 102.48;  
Nov. 17, 100.60.
367. Water levels, in feet above datum, 1939: May 23, a/ 101.68;  
Nov. 18, 101.23.

## Lincoln County

131. No measurements made in 1939.
133. No measurements made in 1939.
134. Water levels, in feet above datum, 1939: June 15, 100.73;  
Dec. 10, 100.74.
143. Water levels, in feet above datum, 1939: June 15, 100.93;  
Dec. 10, a/ 100.97.
144. Water levels, in feet above datum, 1939: June 15, 100.14;  
Dec. 10, 100.40.
241. Water levels, in feet above datum, 1939: June 10, 99.63;  
Dec. 4, 99.60.
242. Water levels, in feet above datum, 1939: June 12, 100.20;  
Dec. 4, a/ 100.38.
252. Water levels, in feet above datum, 1939: June 12, 99.67;  
Dec. 5, 99.52.
253. Water levels, in feet above datum, 1939: June 12, 99.89;  
Dec. 5, b/ 99.73.
383. Water level, in feet above datum, 1939: June 12, a/ 102.42.
384. Water levels, in feet above datum, 1939: June 12, 100.55;  
Dec. 10, a/ 100.88.
385. Water levels, in feet above datum, 1939: June 12, 99.77;  
Dec. 10, 99.64.
405. University of Nebraska. NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 17, T. 14 N., R. 33 W.  
Unused driven observation well, diameter 1 inch, depth 14.6 feet.  
Measuring point, top of pipe, 1.6 feet above land surface and 104.73  
feet above datum. Water level, Mar. 30, 1936, 5.35 feet below measur-  
ing point.

Water level, in feet above datum, 1936-39

Date	Water level	Date	Water level	Date	Water level
Mar. 30, 1936	99.38	Oct. 17, 1937	100.44	June 26, 1939	100.61
June 7	<u>a</u> 100.82	June 26, 1938	100.61	July 1	<u>c</u> 100.76
Aug. 6	99.61	Oct. 26	99.66	Aug. 2	<u>c</u> 99.43
Sept. 17	99.16	Feb. 2, 1939	<u>c</u> 99.04	Sept. 1	<u>c</u> 99.56
Nov. 28	<u>b</u> 99.03	Mar. 1	<u>cb</u> 99.03	30	<u>c</u> 100.13
Apr. 5, 1937	99.46	Apr. 5	<u>c</u> 99.91	Oct. 26	99.66
June 23	100.17	May 3	<u>c</u> 99.51	31	<u>c</u> 100.10
Aug. 11	100.79	June 3	<u>c</u> 100.68	Dec. 2	<u>c</u> 99.66

a Highest observed stage in period of record.

b Lowest observed stage in period of record.

c Measurement supplied through courtesy of Central Nebraska  
Public Power and Irrigation District.

## Lincoln County--Continued

406. University of Nebraska. SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 32, T.14 N., R. 33 W. Unused driven observation well, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 1.2 feet above land surface and 103.03 feet above datum. Water level, Mar. 30, 1936, 3.65 feet below measuring point.

Water level, in feet above datum, 1936-39

Date	Water level	Date	Water level	Date	Water level
Mar. 30, 1936	99.43	Apr. 5, 1937 a	100.29	June 26, 1938	100.20
June 7	99.95	June 23	99.39	Oct. 26	99.66
Sept. 17	99.23	Aug. 11 b	99.14	June 12, 1939	99.83
Nov. 28	99.53	Oct. 17	99.36	Dec. 4	99.38

## Logan County

404. University of Nebraska. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 5, T.17 N., R. 27 W. Unused driven observation well, diameter 1 inch, depth 23.4 feet. Measuring point, top of pipe, 114.17 feet above datum. Water level Mar. 28, 1936, 14.16 feet below measuring point.

Water level, in feet above datum, 1936-39

Mar. 28, 1936	100.01	Nov. 25, 1936	99.42	June 24, 1938	99.88
June 4	a 100.16	Apr. 3 1937	99.48	Oct. 24	99.77
July 22	100.05	June 18	99.48	June 9, 1939	99.66
Aug. 26	99.81	Oct. 16	99.07	Dec. 2	b 99.02

## Loup County

234. Water levels, in feet above datum, 1939: June 2, 99.38; Nov. 25, b/ 98.98.

345. Water levels, in feet above datum, 1939: June 2, 100.08; Nov. 25, 99.96.

422. University of Nebraska. SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 26, T.21 N., R. 18 W. Unused driven observation well, diameter 1 inch, depth 22 feet. Measuring point, top of pipe, 0.9 foot above land surface and 113.31 feet above datum. Water level, Nov. 5, 1936, 15.29 feet below measuring point.

Water level, in feet above datum, 1936-39

Nov. 5, 1936	98.02	July 12, 1938	99.18	June 2, 1939 a	101.67
June 12, 1937	98.66	Oct. 20	99.44	Nov. 25	100.90
Oct. 11	b 97.57				

## McPherson County

254. Water levels, in feet above datum, 1939: June 12, 100.21; Dec. 5, b/ 99.74.

## Madison County

108. Water levels, in feet above datum, 1939: June 3, 99.20; Nov. 27, 99.47.

109. No measurements made in 1939.

110. Water levels, in feet above datum, 1939: May 26, 100.11; Nov. 23, 99.31.

334. No measurements made in 1939.

## Merrick County

42. Water levels, in feet above datum, 1939: May 26, 101.55; Nov. 24, 100.02.

48. Water levels, in feet above datum, 1939: May 26, 100.29; Nov. 24, 99.74.

49. Water levels, in feet above datum, 1939: May 26, 100.41; Nov. 24, 99.47.

50. Water levels, in feet above datum, 1939: May 26, 100.43; Nov. 24, b/ 99.65.

a Highest observed stage in period of record.  
b Lowest observed stage in period of record.



## Merrick County--Continued

GI 200. Well 200 in Water-Supply Paper 836-E. City well 56. City of Grand Island. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 18, T.11 N., R.8 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 11.0 feet. Measuring point, top of pipe, 0.5 foot above land surface and 108.00 feet above datum. Water level Apr. 17, 1938, 5.55 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Date	Water level	Date	Water level	Date	Water level
Apr. 17, 1938	102.45	June 11, 1938	102.90	Jan. 28, 1939	102.10
24	102.55	18	102.90	Mar. 21	102.45
May 1	102.55	July 2	102.85	June 14	102.60
15	103.70	Aug. 13	102.45	Aug. 12	101.85
22	103.65	Sept. 11	101.90	Nov. 7	101.40
29	103.50	Oct. 15	101.80	Dec. 12	101.35
June 5	103.05	Dec. 11	101.50		

GI 201. Well 201 in Water-Supply Paper 836-E. City well 55. City of Grand Island. SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 19, T. 11 N., R. 9 W. Unused driven observation well, diameter 1 $\frac{1}{4}$  inches, depth 13.1 feet. Measuring point, top of pipe, 0.5 foot above land surface and 111.92 feet above datum. Water level Apr. 17, 1938, 9.45 feet below measuring point. Previous measurements appear in Water-Supply Paper 836-E. Measurements supplied through courtesy of Grand Island Water Department.

## Water level, in feet above datum, 1938-39

Apr. 17, 1938	102.47	June 11, 1938	102.87	Jan. 28, 1939	102.37
24	102.47	18	102.72	Mar. 21	102.57
May 1	102.52	July 2	102.62	June 14	102.27
15	102.92	Aug. 13	101.97	Aug. 12	101.42
22	102.97	Sept. 11	101.57	Nov. 7	100.87
29	103.02	Oct. 15	101.47	Dec. 12	100.92
June 5	102.82	Dec. 11	102.87		

## Morrill County

84. Water levels, in feet above datum, 1939: June 13, a/100.77; Dec. 6, 100.74.

85. Measurements supplied through courtesy of State Department of Roads and Irrigation.

## Water level, in feet above datum, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June
1	100.17	.....	100.25	100.60	99.85	99.71
2	100.22	.....	100.27	100.54	99.82	99.94
3	100.25	100.20	100.32	100.51	99.80	100.05
4	100.25	100.17	100.34	100.46	99.78	100.05
5	100.27	100.19	100.30	.....	99.76	100.06
6	100.25	100.21	100.31	100.37	99.73	100.02
7	100.28	100.21	100.40	.....	99.72	99.97
8	.....	100.22	100.54	100.32	99.70	99.94
9	.....	100.15	100.60	.....	99.69	99.91
10	.....	100.08	100.67	100.25	99.66	99.83
11	100.32	100.05	100.72	100.35	99.63	99.85
12	100.31	100.10	100.75	100.43	99.62	99.87
13	100.32	100.13	100.76	100.42	99.62	.....
14	.....	100.15	100.68	100.37	99.61	99.99
15	.....	100.22	100.65	100.45	99.59	99.82
16	100.26	.....	100.60	100.29	99.58	99.83
17	100.22	100.20	100.62	100.24	99.55	99.81
18	100.20	100.24	100.61	100.22	99.54	99.79
19	100.19	.....	100.59	100.21	99.52	99.77
20	100.23	100.23	100.58	100.17	99.51	99.76
21	.....	100.22	100.57	100.15	99.50	100.12
22	100.23	100.22	100.55	100.12	99.49	100.20

a Highest observed stage in period of record.

## WATER LEVELS AND ARTESIAN PRESSURE, 1939

## Morrill County--Continued

85.--Continued

Water level, in feet above datum, 1939						
Day	Jan.	Feb.	Mar.	Apr.	May	June
23	100.19	100.21	100.62	100.10	99.48	100.22
24	100.18	100.22	100.49	.....	99.47	100.20
25	100.20	100.25	100.48	100.03	99.46	100.16
26	100.20	100.35	100.43	99.99	99.45	100.11
27	.....	.....	.....	99.96	99.44	100.07
28	100.17	100.26	100.49	99.94	99.45	100.01
29	100.25	.....	100.48	99.99	99.45	99.96
30	100.28	.....	100.70	99.89	99.44	99.91
31	100.30	.....	100.67	.....	99.43	.....

Water level, in feet above datum, 1939						
Day	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	99.86	99.17	99.35	99.77	100.02	100.06
2	99.79	99.16	99.36	99.77	100.02	100.07
3	99.75	99.16	99.37	99.79	100.03	100.05
4	99.69	99.15	99.37	99.81	100.02	100.04
5	99.63	99.15	99.38	99.83	100.04	100.04
6	99.64	99.20	99.40	99.84	100.04	100.05
7	99.84	99.23	99.42	99.86	100.04	100.04
8	99.89	99.25	99.46	99.86	100.05	100.05
9	99.88	99.27	99.49	99.92	100.04	100.04
10	99.83	99.27	99.51	99.94	100.03	100.03
11	99.78	99.26	99.51	99.96	100.03	100.03
12	99.72	99.25	99.51	99.98	100.03	100.02
13	99.66	99.21	99.48	99.99	100.03	100.02
14	99.61	99.19	99.47	100.00	100.04	100.02
15	99.57	99.19	99.46	100.00	100.04	100.02
16	99.53	99.20	99.47	100.00	100.04	100.02
17	99.51	99.18	99.46	100.02	100.03	100.02
18	99.49	99.32	99.49	100.01	100.03	100.03
19	99.45	99.30	99.49	100.02	100.02	.....
20	99.42	99.42	99.51	100.01	100.02	100.02
21	99.39	99.42	99.53	100.01	100.02	100.01
22	99.36	99.42	99.55	100.01	100.02	100.01
23	99.33	99.42	99.58	100.02	100.02	100.01
24	99.31	99.41	99.59	100.02	100.02	100.01
25	99.28	99.37	99.62	100.02	100.02	.....
26	99.26	99.34	99.66	100.02	100.03	.....
27	99.24	99.32	99.68	100.01	100.04	.....
28	99.22	99.31	99.71	100.02	100.04	.....
29	99.20	99.30	99.73	100.02	100.05	99.97
30	99.18	99.31	99.75	100.02	100.06	.....
31	99.17	99.33	.....	100.02	.....	.....

97. Water levels, in feet above datum, 1939: June 13, 99.91; Dec. 6, 100.07.

## Nance County

43. Water levels, in feet above datum, 1939: May 26, 101.32; Nov. 24, 100.27.

44. Water level, in feet above datum, 1939: July 10, 100.29.

45. No measurements made in 1939.

371. Water levels, in feet above datum, 1939: May 26, 98.99; Nov. 24, a/ 98.69.

## Nemaha County

11. Water levels, in feet above datum, 1939: May 27, 103.03; Nov. 17, 99.49.

a Lowest observed stage in period of record.

## Nuckolls County

6. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 32, T.2 N., R. 7 W. Unused drilled stock well, diameter 6 inches, depth 23.0 feet. Measuring point, east side of top of galvanized casing, 1 foot above land surface and 116.25 feet above assumed datum. Equipped with force pump. Water level, Sept. 11, 1939, 17.00 feet below measuring point.

## Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Aug. 21	99.24	Sept. 18	99.07	Oct. 9	99.18	Oct. 30	99.09
28	99.24	25	99.05	16	99.13	Nov. 6	99.14
Sept. 11	99.25	Oct. 2	99.20	23	99.19	13	99.07

7. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 28, T. 2 N., R. 5 W. Unused drilled domestic well, diameter 8 inches, depth 99.0 feet. Measuring point, northeast edge of man-hole in concrete platform, 1 foot above land surface, and 167.12 feet above assumed datum. Equipped with force pump and windmill. Water level probably affected by changes in barometric pressure. Water level, Sept. 11, 1939, 67.87 feet below measuring point.

## Water level, in feet above datum, 1939

July 24	99.27	Aug. 21	99.25	Sept. 25	99.24	Oct. 23	99.21
31	99.27	28	99.23	Oct. 2	99.24	30	99.16
Aug. 7	99.25	Sept. 11	99.25	9	98.93	Nov. 6	99.23
14	99.25	18	99.25	16	99.22	13	99.21

164.

## Water level, in feet above datum, 1939

May 29	99.86	Aug. 14	99.60	Sept. 25	99.04	Oct. 23	99.11
July 15	99.93	21	99.61	Oct. 2	99.06	30	99.10
24	99.82	28	99.48	9	99.07	Nov. 6	99.16
31	99.72	Sept. 11	99.24	16	99.07	13	99.13
Aug. 7	99.53	18	99.12				

165. Water level probably affected by changes in barometric pressure.

## Water level, in feet above datum, 1939

May 29	101.04	Aug. 15	99.38	Sept. 25	98.74	Oct. 30	a 97.10
July 15	100.14	21	98.31	Oct. 2	100.47	Nov. 6	100.60
24	100.14	28	100.18	9	98.62	13	97.86
31	101.27	Sept. 11	101.40	16	97.45	14	98.97
Aug. 7	99.93	18	99.31	23	100.56		

392. Measurements discontinued.

393. Water levels, in feet above datum, 1939: May 29, 98.94; Nov. 13, a/ 98.80.

407. University of Nebraska. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 36, T.1 N., R.7 W. Driven observation well, depth 17 feet. Diameter 1 inch. Measuring point, top of pipe, 1.3 feet above land surface and 111.06 feet above assumed datum. Water level, Sept. 11, 1939, 11.81 feet below measuring point.

## Water level, in feet above datum, 1936-39

Date	Water level	Date	Water level	Date	Water level
Apr. 6, 1936	99.47	May 29, 1939	99.42	Sept. 18	99.06
June 16	99.67	July 15	b 100.06	25	99.06
Aug. 13	97.99	24	99.89	Oct. 2	99.04
Sept. 23	97.42	31	99.75	9	98.98
Dec. 17	97.31	Aug. 7	99.64	16	98.94
Apr. 14, 1937	a 96.46	14	99.59	23	98.87
June 29	98.27	21	99.53	30	98.86
Oct. 23	98.14	28	99.44	Nov. 6	98.84
July 1, 1938	99.78	Sept. 11	99.25	13	98.85
Oct. 17	99.31				

a Lowest observed stage in period of record.

b Highest observed stage in period of record.

## Otoe County

8. No measurements made in 1939.
9. Water levels, in feet above datum, 1939: May 27, 100.07;  
Nov. 17, a/ 97.21.
10. Water levels, in feet above datum, 1939: May 27, 97.81;  
Nov. 17, a/ 97.41.

## Pawnee County

4. Water levels, in feet above datum, 1939: May 27, 102.62;  
Nov. 17, 98.22.

## Perkins County

151. Water levels, in feet above datum, 1939: June 14, 101.91;  
Dec. 9, b/ 102.14.
364. No measurements made in 1939.

## Phelps County

157. Water levels, in feet above datum, 1939: June 16, 99.86;  
Dec. 11, 98.87.
184. No measurements made in 1939.
275. Water levels, in feet above datum, 1939: June 1, 100.56;  
Nov. 25 a/ 99.03.
276. Water levels, in feet above datum, 1939: June 1, 99.55;  
Nov. 25 a/ 99.01.
277. Water levels, in feet above datum, 1939: June 1, 100.58;  
Nov. 25, 99.32.

## Pierce County

68. Dry on May 25 and Nov. 23, 1939.
70. Water levels, in feet above datum, 1939: June 5, 99.82;  
Nov. 28, 99.40.

## Platte County

39. Water levels, in feet above datum, 1939: May 24, 102.54;  
Nov. 21, 102.13.
40. Water levels, in feet above datum, 1939: May 24, 100.75;  
Nov. 21, 100.16.
41. Water levels, in feet above datum, 1939: May 24, 100.90;  
Nov. 21, a/ 99.31.
339. No measurements made in 1939.
342. Water levels, in feet above datum, 1939: May 24, 99.78;  
Nov. 21, a/ 98.30.
368. Water levels, in feet above datum, 1939: May 24, 105.44;  
Nov. 21, 100.58.

## Redwillow County

137. Water levels, in feet above datum, 1939: June 15, 100.43;  
Dec. 10, 99.72.
139. Water levels, in feet above datum, 1939: June 15, 98.61;  
Dec. 9, 98.60.
150. No measurements made in 1939.

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a Lowest observed stage in period of record.

b Highest observed stage in period of record.

## Redwillow County--Continued

179. Water levels, in feet above datum, 1939: June 15, a/ 99.57;  
Dec. 9, 99.63.

328. No measurements made in 1939.

## Richardson County

5. Water levels, in feet above datum, 1939: May 27, 101.59;  
Nov. 17, 99.90.

7. No measurements made in 1939.

408. S. A. Miles. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 11, T.1 N., R.14 E. Used bored stock well, diameter 6 inches, depth 40 feet. Measuring point, top of casing at arrow, 2.5 feet above land surface and 116.38 feet above datum. Water level, Mar. 16, 1936, 10.25 feet below measuring point.

## Water level, in feet above datum, 1936-39

Date	Water level	Date	Water level	Date	Water level
Mar. 16, 1936	106.13	Mar. 18, 1937	103.02	July 6, 1938	100.63
May 19	b 109.03	June 2	104.17	Oct. 10	99.56
July 6	105.45	Aug. 3	103.18	May 27, 1939	100.69
28	104.48	Oct. 6	101.31	Nov. 17	a 98.62
Aug. 24	103.50				

416. Mrs. Wittler. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 22, T. 2 N., R. 14 E. Unused dug domestic well, diameter 30 inches, depth 24.8 feet. Measuring point, top of 1 by 6 plank on west side of cover, 2.4 feet above land surface and 118.94 feet above datum. Water level, Oct. 12, 1936, 12.31 feet below measuring point.

## Water level, in feet above datum, 1936-39

Oct. 12, 1936	106.63	Aug. 3, 1937	107.42	Oct. 10, 1938	a 99.56
Mar. 18, 1937	106.88	Oct. 6	104.12	May 27, 1939	102.36
June 2	b 108.36	July 6, 1938	104.43	Nov. 17	99.86

418. University of Nebraska. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 13, T. 1 N., R. 15 E. Unused bored observation well, diameter 3 inches, depth 23 feet. Measuring point, top of casing, 2.2 feet above land surface and 115.95 feet above datum. Water level, Oct. 13, 1936, 17.53 feet below measuring point.

## Water level, in feet above datum, 1936-39

Oct. 13, 1936	a 98.42	Aug. 3, 1937	99.55	Oct. 11, 1938	99.56
Mar. 18, 1937	98.68	Oct. 7	99.00	May 27, 1939	99.75
June 2	100.15	July 6, 1938	b 100.24	Nov. 17	99.74

419. University of Nebraska. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 12, T. 1 N., R. 15 E. Unused bored observation well, diameter 3 inches, depth 17.3 feet. Measuring point, top of casing, 2.4 feet above land surface and 107.44 feet above datum. Water level, Oct. 14, 1936, 8.33 feet below measuring point.

## Water level, in feet above datum, 1936-39

Oct. 14, 1936	99.11	Aug. 3, 1937	100.60	Oct. 11, 1938	99.56
Mar. 18, 1937	100.76	Oct. 6	99.62	May 27, 1939	100.14
June 2	b 101.20	July 6, 1938	101.07	Nov. 17	a 97.89

## Rock County

117. Water levels, in feet above datum, 1939: June 5, 101.20,  
Nov. 28, 100.20.

198. No measurements made in 1939.

a Lowest observed stage in period of record.  
b Highest observed stage in period of record.

## Saline County

194. Water levels, in feet above datum, 1939: May 29, 103.80;  
Nov. 14, 100.15.
341. Water levels, in feet above datum, 1939: May 29, 97.61;  
Nov. 14, a/ 97.27.

## Sarpy County

26. No measurements made in 1939.
27. Water levels, in feet above datum, 1939: May 24, 100.29;  
Nov. 20, 100.03.
323. Water levels, in feet above datum, 1939: May 24, 98.04;  
Nov. 20, a/ 94.34.

## Saunders County

19. Water levels, in feet above datum, 1939: May 23, 100.35;  
Nov. 18, 99.85.
21. Water levels, in feet above datum, 1939: May 23, 100.94;  
Nov. 18, a/ 96.76.
22. Water levels, in feet above datum, 1939: May 23, 100.51;  
Nov. 18, 100.06.
331. Water levels, in feet above datum, 1939: May 23, 98.99;  
Nov. 18, ab/.

## Scotts Bluff County

No measurements were made in 1939 in the following wells in Scotts Bluff County: 1, 2, 4, 6, 7A, 7B, 9, 10, 11, 12, 13, 15, 17, 18, 19, 20, 21, 23, 24, 25, 26, 27, 28, 29, 31, 32, 43, 50, 76, 166, 196, 259, 310, 353, 398, and 437.

240. Water levels, in feet above datum, 1939: June 13, 97.47;  
Dec. 6, 100.23.
438. Water levels, in feet above datum, 1939: June 13, 101.87;  
Dec. 6, 100.60.
439. Water levels, in feet above datum, 1939: June 13, 100.85;  
Dec. 6, 100.46.
440. Water levels in feet above datum, 1939: June 13, 100.15;  
Dec. 6, 100.38.
441. Water levels, in feet above datum, 1939: June 13, 100.57;  
Dec. 6, 100.53.
442. Water levels, in feet above datum, 1939: June 13, 103.83;  
Dec. 6, 102.35.

## Seward County

171. Water levels, in feet above datum, 1939: May 26, 99.44;  
Nov. 13, 99.32.
172. Water levels, in feet above datum, 1939: May 26, 100.05;  
Nov. 14, 99.83.

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a Lowest observed stage in period of record.  
b Dry.

## Sheridan County

82. No measurements made in 1939.

120. No measurements made in 1939.

217. Water levels, in feet above datum, 1939: June 9, 99.43;  
Dec. 2, a/ 98.05.

376. Water levels, in feet above datum, 1939: June 6, 100.38;  
Nov. 29, 99.72.

379. Water levels, in feet above datum, 1939: June 9, 100.56;  
Dec. 2, 99.25.

432. University of Nebraska. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 8, T. 31 N., R. 46 W.  
Unused driven observation well, diameter 1 inch, depth 14.7 feet.  
Measuring point, top of pipe, 3 feet above land surface and 108.78  
feet above datum. Water level Mar. 22, 1936, 8.27 feet below measur-  
ing point.

## Water level, in feet above datum, 1936-39

Date	Water level	Date	Water level	Date	Water level
Nov. 22, 1936	100.51	Oct. 14, 1937	100.18	June 6, 1939	101.87
June 16, 1937 <sup>b</sup>	101.98	July 14, 1938	100.69	Nov. 29	100.61
Aug. 9	100.26	Oct. 22	<sup>a</sup> 100.13		

## Sherman County

58. Water levels, in feet above datum, 1939: June 1, 99.72;  
Nov. 25, 100.37.

## Sioux County

1. No measurements made in 1939.

2. No measurements made in 1939.

80. Measurements discontinued.

81. Water levels, in feet above datum, 1939: June 7, a/ 99.30;  
Dec. 1, 99.42.

125. Water levels, in feet above datum, 1939: June 7, ac/ 97.72;  
Dec. 1, 98.87.

239. No measurements made in 1939.

377. Water levels, in feet above datum, 1939: June 7, 100.47;  
Dec. 1, 101.03.

## Stanton County

208. Water levels, in feet above datum, 1939: May 26, 98.88; Nov.  
23, a/97.83.

421. University of Nebraska. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 11, T. 23 N., R. 3 E.  
Unused driven observation well, diameter 1 inch, depth 12.9 feet.  
Measuring point, top of pipe, 1.8 feet above land surface and 107.69  
feet above datum. Water level, Oct. 26, 1936, 8.31 feet below measuring  
point.

## Water level, in feet above datum, 1936-39

Oct. 26, 1936	99.38	Aug. 7, 1937	99.41	May 26, 1939	100.23
Mar. 25, 1937	101.25	Oct. 10	99.55	Nov. 23	99.58
June 9	100.40	Oct. 14, 1938	99.74		

<sup>a</sup> Lowest observed stage in period of record.

<sup>b</sup> Highest observed stage in period of record.

<sup>c</sup> Recently pumped.

## Thayer County

166. Water levels, in feet above datum, 1939: May 29, 99.38;  
Nov. 14, a/ 99.45.

187. Water levels, in feet above datum, 1939: May 29, 99.22;  
Nov. 13, 99.19.

452. University of Nebraska. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 22, T. 4 N., R. 4 W.  
Unused driven observation well, diameter 1 inch, depth 18 feet. Measuring point, top of pipe, 1.9 feet above land surface and 110.71 feet above datum. Water level Dec. 18, 1936, 12.89 feet below measuring point.

## Water level, in feet above datum, 1936-39

Date	Water level	Date	Water level	Date	Water level
Dec. 18, 1936	97.82	Oct. 23, 1937	97.88	May 29, 1939	99.56
Apr. 3, 1937	97.64	July 1, 1938	102.55	Nov. 13	98.78
June 28	98.51	Oct. 18	99.26		

## Thomas County

212. Water levels, in feet above datum, 1939: June 9, 100.01;  
Dec. 2, 99.98.

213. Water levels, in feet above datum, 1939: June 9, 99.96;  
Dec. 2, 99.90

## Thurston County

60. No measurements made in 1939.

102. Water levels, in feet above datum, 1939: May 25, 97.75;  
Nov. 23, 96.04.

103. Water levels, in feet above datum, 1939: May 25, 98.67;  
Nov. 22, 97.61.

## Valley County

54. Water levels, in feet above datum, 1939: June 1, 100.99;  
Nov. 25, 101.76.

56. Water levels, in feet above datum, 1939: June 2, 99.76; Nov.  
27, b/ 101.13.

57. Water levels, in feet above datum, 1939: June 2, 100.19;  
Nov. 27, b/ 103.74.

## Washington County

32. Water levels, in feet above datum, 1939: May 24, 100.00;  
Nov. 20, 98.91.

33. Water levels, in feet above datum, 1939: May 24, 99.27,  
Nov. 20, 97.95.

## Wayne County

100. Water levels, in feet above datum, 1939: May 25, 101.21;  
Nov. 23, a/ 99.16.

101. Measurements discontinued.

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a Lowest observed stage in period of record.  
b Highest observed stage in period of record.



## Webster County

1. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 32, T.2 N., R.10 W. Unused drilled stock well, depth 130 feet, diameter 6 inches. Measuring point, top of casing, east side, 0.5 foot above land surface and 116.45 feet above assumed datum. Equipped with force pump and broken windmill. Water level Sept. 11, 1939, 17.20 feet below measuring point.

Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
July 19	99.42	Aug. 21	99.36	Sept. 25	99.03	Oct. 23	98.98
24	99.42	28	99.35	Oct. 2	99.03	30	98.97
31	99.39	Sept. 11 a	99.25	9	99.02	Nov. 6	99.02
Aug. 7	99.32	18	99.03	16	98.98	13	99.10
14	99.34						

2. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 14, T. 2 N., R.10 W. Unused drilled domestic well, depth 140 feet, diameter 4 inches. Measuring point, west side of pump base, 1 foot above land surface and 220.35 feet above assumed datum. Equipped with force pump. Water level Sept. 11, 1939, 121.10 feet below measuring point.

Water level, in feet above datum, 1939

July 17	99.30	Aug. 21	99.23	Sept. 25	99.22	Oct. 23	99.19
24	99.23	28	99.22	Oct. 2	99.20	30	99.20
31	99.23	Sept. 11	99.25	9	99.18	Nov. 6	99.18
Aug. 7	99.26	18	99.24	16	99.19	13	99.20
14	99.27						

3. SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 3, T.1 N., R.9 W. Unused drilled domestic well, depth 57 feet, diameter 4 inches. Measuring point, east edge of pump base at hole in wooden platform, 1 foot above land surface and 139.87 feet above assumed datum. Equipped with force pump and windmill tower. Water level Sept. 11, 1939, 40.62 feet below measuring point.

Water level, in feet above datum, 1939

July 14	99.75	Aug. 14	99.49	Aug. 28	99.42	Sept. 18	99.22
24	99.63	21	99.49	Sept. 11	99.25	25	99.18
31	99.51						

4. Mr. Brumbaugh. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 31, T.1 N., R.9 W. Unused dug stock well, depth 9 feet, diameter about 36 inches. Measuring point, wooden platform, 0.5 foot above land surface and 106.44 feet above assumed datum. Equipped with force pump and windmill. Water level Sept. 11, 1939, 7.19 feet below measuring point.

Water level, in feet above datum, 1939

July 14	101.04	Aug. 21	99.93	Sept. 25	99.44	Oct. 23	100.22
24	100.64	28	99.67	Oct. 2	99.75	30	100.30
31	100.27	Sept. 11	99.25	9	99.94	Nov. 6	100.35
Aug. 14	99.97	18	99.11	16	100.11		

5. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 12, T.1 N., R.11 W. Unused driven well in top of dike on banks of Republican River, depth 23.0 feet, diameter 1 $\frac{1}{4}$  inches. Measuring point, east side of top of pipe, 1.5 feet above top of dike and 118.85 feet above assumed datum. Water level Sept. 11, 1939, 19.60 feet below measuring point.

Water level, in feet above datum, 1939

Aug. 15	100.54	Sept. 18	99.11	Oct. 9	99.05	Oct. 30	99.10
21	100.16	25	99.06	16	99.05	Nov. 6	99.17
28	99.71	Oct. 2	99.03	23	99.04	13	99.28
Sept. 11	99.25						

a Measuring point disturbed 0.05 foot or less.

## Webster County--Continued

9. Bernard McNenny. SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 34, T. 2 N., R. 12 W. Unused drilled domestic and stock well, depth 31 feet, diameter 4 inches. Measuring point, top of casing at east side, level with land surface and 118.81 feet above assumed datum. Equipped with force pump and windmill. Water level Sept. 11, 1939, 19.56 feet below measuring point.

## Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
July 17	99.30	Aug. 21	99.28	Sept. 25	99.26	Oct. 23	99.24
24	99.32	28	99.27	Oct. 2	99.19	30	99.30
31	99.36	Sept. 11	99.25	9	99.25	Nov. 6	99.28
Aug. 7	99.38	18	99.24	16	99.20	13	99.29
14	99.39						

12. SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 1, T. 1 N., R. 10 W. Unused bored irrigation well, depth 18 feet, diameter 36 inches. Measuring point, southwest edge of wooden casing, 1 foot above land surface and 111.10 feet above assumed datum. Equipped with horizontal centrifugal pump. Water level Sept. 11, 1939, 11.85 feet below measuring point.

## Water level, in feet above datum, 1939

July 31	99.44	Aug. 28	99.35	Oct. 2	99.19	Oct. 30	99.26
Aug. 7	99.39	Sept. 11	99.25	9	99.19	Nov. 6	99.27
14	99.38	18	99.20	16	99.21	13	99.29
21	99.37	25	99.18	23	99.23		

13. SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 1, T. 1 N., R. 10 W. Unused bored irrigation well, depth 26 feet, diameter 36 inches. Measuring point, southwest edge of wooden casing, 3 feet above land surface and 119.81 feet above assumed datum. Water level Sept. 11, 1939, 20.56 feet below measuring point.

## Water level, in feet above datum, 1939

July 31	99.47	Aug. 28	99.32	Oct. 2	99.13	Oct. 30	99.10
Aug. 7	99.41	Sept. 11	99.25	9	99.11	Nov. 6	99.14
14	99.38	18	99.18	16	99.11	13	99.16
21	99.37	25	99.14	23	99.13		

161.

## Water level, in feet above datum, 1939

July 15	98.79	Aug. 21	98.78	Sept. 25	98.56	Oct. 23	98.91
24	98.71	28	98.65	Oct. 2	98.79	30	98.56
31	98.68	Sept. 11	98.86	9	98.59	Nov. 6	98.91
Aug. 7	98.62	18	98.63	16	a 98.49	13	98.69
14	98.60						

162. Measuring point destroyed.

163.

## Water level, in feet above datum, 1939

June 16	100.46	Sept. 18	99.91	Oct. 16	98.36	Nov. 6	99.74
Aug. 14	99.88	25	99.87	23	99.87	13	99.81
21	100.00	Oct. 2	99.88	30	99.82	Dec. 11	100.77
Sept. 11	b 99.79						

## Wheeler County

204. Water levels, in feet above datum, 1939: June 3, 100.24; Nov. 27, 99.15.

205. Water levels, in feet above datum, 1939: June 3, 99.59; Nov. 27, 99.21.

a Lowest observed stage in period of record.  
b Recently pumped.

## NEW JERSEY

By H. C. Barksdale and E. J. Schaefer

Measurements of water level and artesian pressure in wells in New Jersey were continued during 1939, as a part of a cooperative investigation of the State's ground-water resources, by the Federal Geological Survey and the New Jersey State Water Policy Commission. The main purpose of the investigation is to determine as closely as possible the safe yield of the more important aquifers in the State. Most of the work has been concentrated in a few areas in which critical ground-water problems appear to have developed, but the investigations are being extended over larger areas as fast as available funds and personnel will permit. The areas in which water-level observations have been made during the year are indicated by shading on the accompanying map. As records for all the wells that are being measured in the State have not yet been reported in the series of annual reports on water levels and artesian pressure, shaded areas are shown in some counties in the accompanying figure for which no records have yet been published.

Most of the wells measured in New Jersey during 1939 are in areas where quantitative investigations are being made and where water levels are affected to some extent by pumping. A few observation wells are outside the influence of artificial withdrawals of water and are observed primarily for the purpose of studying the effect of climate on ground-water recharge, discharge, and storage.

At the end of the year, 148 observation wells were being measured at more or less regular intervals. Most of the wells were measured monthly, a few weekly, and two at least once a day. Water-stage recorders were maintained on 50 wells. Of the recorders, 40 are the property of the State and Federal governments, and 10 are owned by municipalities, water-supply companies, and industrial companies. About 5,600 individual measurements of water level were made during the year.

A study was begun in 1939 in the vicinity of Penns Grove, Salem County, N. J., to determine the effect of pumping from two new-type wells or "water collectors" in which several screens many feet long radiate from a central collecting well or shaft. No investigations were terminated in 1939. Quantitative studies in the Atlantic City, Camden, Asbury Park, Runyon,

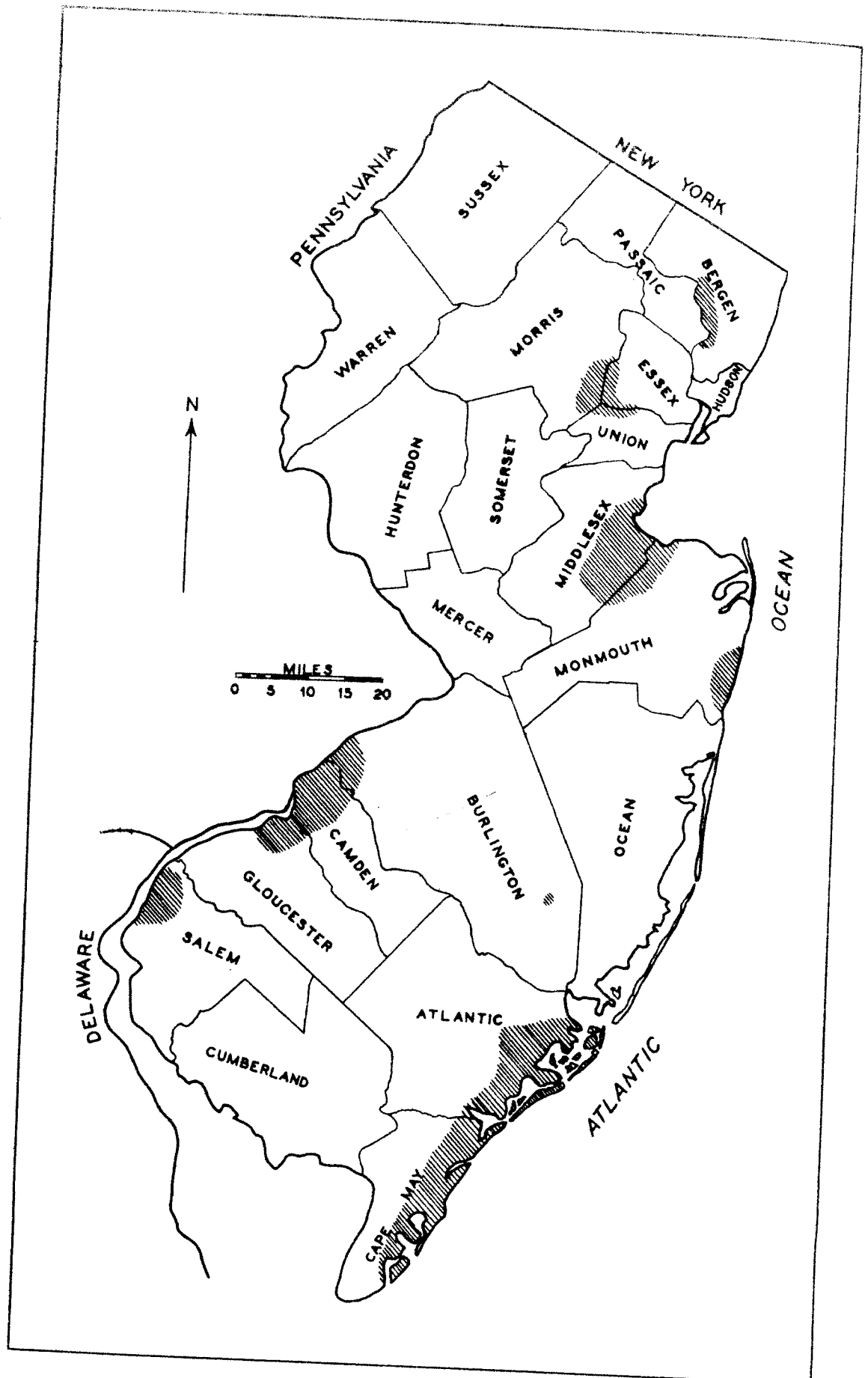


Figure 11.--Map showing areas of observation wells in New Jersey.

Cancee Brook, and East Paterson areas were continued. In the Atlantic City and Runyon areas, where serious problems of salt-water intrusion exist, special studies were made to observe or predict the advance of salt water into sands that have heretofore yielded fresh water.

In most of the observation wells that tap artesian aquifers, the major fluctuations of water level during the year were produced by pumping. In the Atlantic City area, water levels in wells that tap the so-called 800-foot sand were higher during the first part of 1939 than during the corresponding period in 1938 but were lower during the last part of 1939 than during the last part of 1938. Water levels in wells that tap the No. 1 sand in the Runyon area were much lower during the first 10 months of the year than in 1938, but thereafter they were much higher than in 1938. The fluctuations of water level in both areas appear to be in direct response to changes in the rate of pumping from the two sands. Similarly, the head in other artesian aquifers appeared to respond primarily to fluctuations in pumping.

During the first 4 months of the year the precipitation in New Jersey was about normal; and the water table, where not affected by pumping, stood at approximately average levels. For the rest of the year the precipitation was much below normal, and at the end of the year the water table was unusually low. In the northern part of the State the water levels in surface reservoirs that are usually fed chiefly by ground-water run-off during the growing season likewise were at exceptionally low levels at the end of the year.

A water-stage recorder has been maintained continuously on the Morrell well, in Middlesex County, since August 1923. Fluctuations of water level in this well during 1939 are compared with those during preceding years of record in the accompanying figure. On 109 days in 1939 the water level in this well was lower than on corresponding days in any previous year of record. The downward trend of water level in the well was interrupted by heavy rains near the end of August, however, and the lowest stage of the year was much higher than the lowest stage on record. Fluctuations of water level in this well are believed to be typical of those in wells in parts of the New Jersey coastal plain, where the water table is relatively near the surface. The August rains produced much less recharge in areas where the water table was farther below the surface, and in several water-table wells the lowest water level on record occurred near the end of 1939.

In this report the wells are listed alphabetically by counties to conform with the practice now general for other States. The wells in the New Jersey report have heretofore been listed alphabetically by areas. In order

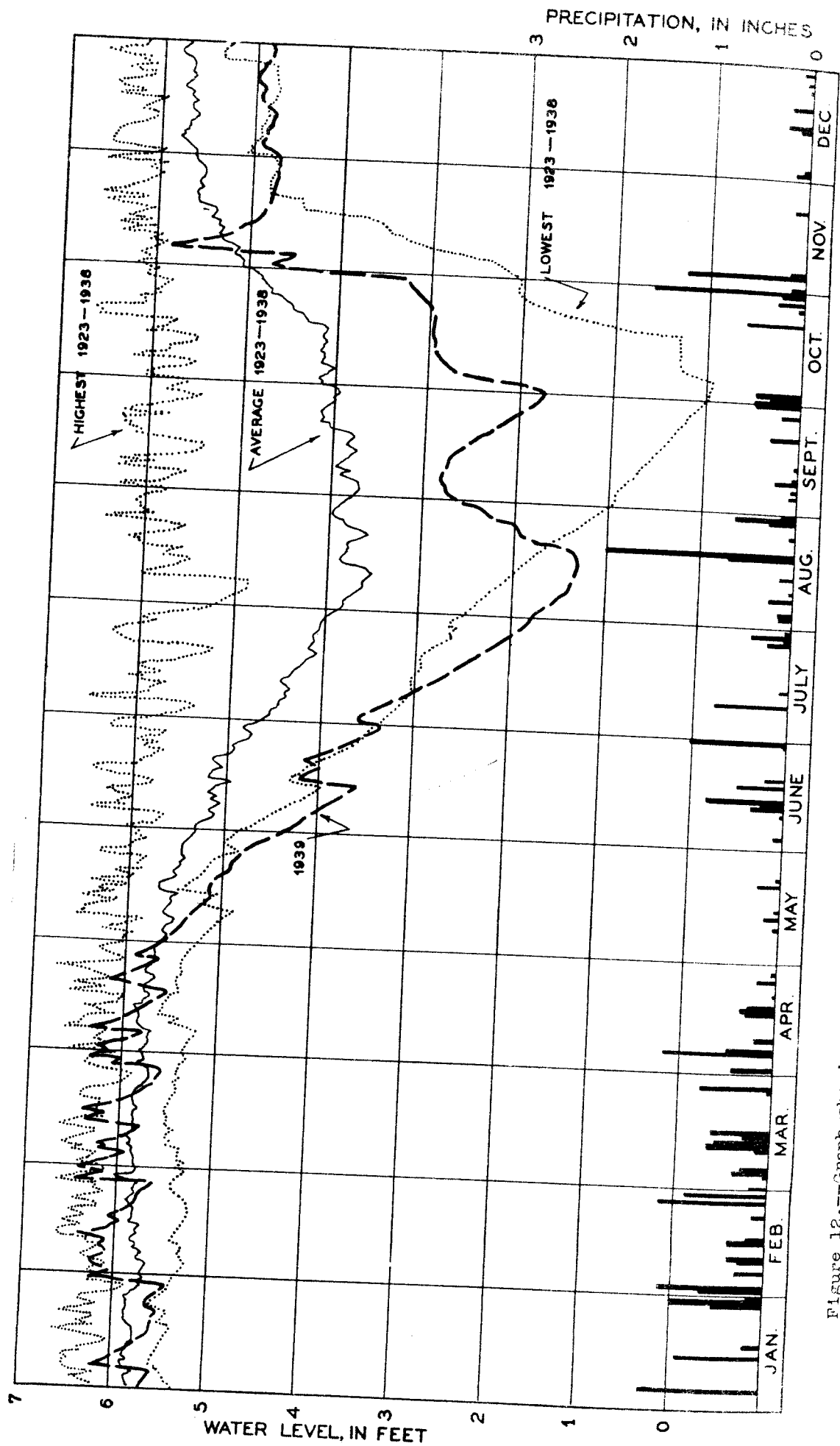


Figure 12.--Graph showing water level for several periods in Morrell well, Middlesex County, N. J.

to provide cross references between this report and previous reports, the county name is given at the top of each page, and the name of the area in which the well is situated is given in the descriptive text for that well. The following table gives the principal ground-water areas and the counties that lie partly within them.

Location, by counties, of ground-water areas in New Jersey

Ground-water area	County	Ground-water area	County
Asbury Park	Monmouth	Canoe Brook	Essex Morris Union
Atlantic City	Atlantic Cape May	East Paterson	Bergen
Camden	Burlington Camden Gloucester	Runyon	Middlesex Monmouth

At the beginning of the records for Middlesex County a table is included that gives average water levels during 1939 in dug wells in the Runyon area near Runyon. A description of the method of preparing these averages is given in Water-Supply Paper 845. The water levels in wells that are more than 25 feet deep appear to fluctuate differently from those in wells whose depths are less. The wells have therefore been segregated into two groups, as was done in former years, and the water levels in them have been averaged separately.

Most of the water levels given in the following tables are expressed in feet above or below mean sea level. For wells where the altitude of the reference point has not been satisfactorily determined, however, the water levels are given in depths below the measuring point. For wells equipped with water-stage recorders, a daily water level is given--usually the one judged to be most significant. For most wells whose water levels are affected by pumping or by tides, the lowest water level each day is given. An exception to this rule is well 36.23.1.9.6 at Longport, Atlantic County, for which the daily average of water levels at the two high tides and two low tides is reported.

During 1937 the level net in the Runyon area was completed and adjusted. The records for three wells, 29.1.4.3.9 (F-3), 29.1.4.4.1.A (S-1), and 29.1.5.7.2 (F-14), all in Middlesex County, were reported in Water-Supply Paper 840 before the adjustment had been made. In Water-Supply Paper 845 the altitudes of the measuring points on these wells were not corrected. The records of water level for the first two of these wells, however, were reported in Water-Supply Paper 845 on the basis of the corrected altitudes of measuring points, but the water levels in well 29.1.5.1.7.2 were reported on the basis of the unadjusted level net. The corrected altitudes of measuring points are given in this report in the descriptive text for the wells.

## Atlantic County

36.13.2.9.1. Incorrectly given 36.1.3.8.9.1 in Water-Supply Paper 845.  
Atlantic City Area. Atlantic City Water Works 600-foot well. Description  
given in Water-Supply Paper 845.  
Water level at the end of day, in feet below mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	19.27	18.46	17.83	17.25	17.02	17.46	18.49	20.32	21.99	22.75	22.27	21.12
2	19.20	18.42	17.90	17.22	17.07	17.45	18.58	20.37	22.12	22.60	22.50	21.12
3	19.19	18.29	17.91	17.26	17.06	17.48	18.68	20.41	22.15	22.57	22.30	21.17
4	19.18	18.30	17.87	17.29	17.04	17.48	18.72	20.49	22.17	22.57	22.21	.....
5	19.17	18.33	17.78	17.31	17.04	17.49	18.76	20.53	22.24	22.57	21.95	21.20
6	19.10	18.26	17.69	17.26	17.04	17.50	18.82	20.62	22.34	22.56	22.01	21.19
7	19.06	18.22	17.74	17.24	17.06	17.57	18.88	20.69	22.39	22.62	22.00	21.05
8	19.02	18.25	17.80	17.24	17.08	17.58	18.92	20.72	22.44	22.63	22.04	21.14
9	19.02	18.28	17.76	17.23	17.07	17.60	18.78	20.78	22.57	22.61	22.10	21.05
10	18.94	18.21	17.76	17.24	17.07	17.62	18.90	20.89	22.54	22.55	21.97	20.94
11	18.92	18.16	17.74	17.24	17.10	17.64	18.99	21.01	22.66	22.59	22.08	21.01
12	18.94	18.17	17.57	17.26	17.18	17.70	19.07	21.25	22.69	22.59	22.02	20.93
13	18.91	18.17	17.49	17.35	17.21	17.70	19.15	21.30	22.74	22.57	22.00	20.82
14	18.86	18.13	17.54	17.38	17.21	17.80	19.13	21.35	22.73	22.60	22.02	21.08
15	18.86	18.05	17.54	17.35	17.21	17.88	19.22	21.44	22.78	22.58	21.97	20.83
16	18.85	18.17	17.50	17.37	17.20	17.91	19.28	21.45	22.72	22.51	21.88	20.73
17	18.85	18.18	17.51	17.36	17.18	17.93	19.33	21.54	22.79	22.56	21.87	20.71
18	18.74	18.12	17.53	17.27	17.18	18.00	19.37	21.62	22.85	22.55	21.85	20.73
19	18.69	18.09	17.58	17.22	17.20	18.02	19.45	.....	22.84	22.51	21.83	20.64
20	18.69	18.06	17.56	17.22	17.22	18.02	19.56	20.97	22.80	22.50	21.69	20.55
21	18.69	18.02	17.56	17.24	17.22	18.07	19.61	21.28	22.78	22.46	21.61	20.56
22	18.63	17.99	.....	17.25	17.21	18.11	19.64	21.46	22.85	22.42	21.58	20.60
23	18.70	18.04	.....	17.28	17.15	18.12	19.71	21.62	22.87	22.50	21.58	20.62
24	18.66	18.04	.....	17.28	17.18	18.18	19.79	21.71	22.88	22.56	21.58	20.64
25	18.66	18.07	17.47	17.26	17.25	18.23	19.87	21.77	22.86	22.56	21.54	20.50
26	18.69	18.00	17.45	17.20	17.37	18.31	19.94	21.85	22.85	22.49	21.48	20.48
27	18.70	17.99	17.43	17.13	17.37	18.38	19.97	21.89	22.75	22.37	21.44	20.38
28	18.72	17.93	17.41	17.09	17.34	18.42	20.04	21.90	22.90	22.45	21.42	20.37
29	18.70	.....	17.44	17.05	17.35	18.46	20.07	21.71	22.77	22.48	.....	20.22
30	18.49	.....	17.32	17.02	17.35	18.46	20.12	21.76	22.76	22.23	.....	20.15
31	18.42	.....	17.26	.....	17.39	.....	20.19	21.86	.....	22.12	.....	20.13

36.23.1.9.6. Atlantic City Area. Longport 14th Avenue well. Description given in Water-Supply Paper 817. Daily tidal fluctuations ranged from 1.5 to 3 feet during 1939. The heading for the table of water levels for this well in Water-Supply Paper 845 should read "Average daily water level, in feet below mean sea level, 1938."  
Average daily water level, in feet, with reference to mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	-32.0	-30.5	-30.7	-29.0	-30.1	-35.1	.....	-47.4	-48.4	-42.9	-38.9	-35.3
2	-31.9	-30.5	-30.6	-29.0	-30.4	-34.9	.....	-47.7	-48.7	.....	-38.9	-34.9
3	-31.6	-30.2	-30.3	-29.5	-29.9	-35.1	.....	-48.1	-49.1	.....	-38.8	-35.5
4	-31.6	-30.3	.....	-29.7	-30.0	-35.5	.....	-48.1	-49.3	.....	-38.7	-35.4
5	-31.5	-30.5	.....	-29.5	-30.6	-35.6	-42.3	-47.9	-49.6	-42.1	-37.7	-35.1
6	-31.4	-30.3	.....	-29.4	-30.9	-35.9	.....	-48.3	-49.5	-41.9	-38.3	-34.8
7	-31.7	-30.2	.....	-29.6	-31.0	-36.3	.....	-48.7	-49.3	-41.7	-38.6	-34.7
8	-31.9	-30.4	.....	-29.5	-31.0	-36.5	.....	.....	-48.7	-41.7	-38.4	-35.4
9	-31.8	-30.5	.....	-29.6	-31.0	-36.7	-42.9	.....	-48.5	-41.6	-38.5	-35.1
10	-31.5	-29.9	.....	-29.6	-31.1	-37.4	-42.6	-49.0	-48.6	-41.4	-37.9	-34.5
11	-31.8	-30.3	.....	-29.9	-31.3	-37.7	-43.2	-49.4	-48.5	-41.3	-37.9	-34.0
12	-31.9	-30.9	-29.5	-30.1	-31.5	-37.9	-43.7	-49.7	-48.2	-41.1	-37.7	-33.9
13	-31.8	-31.1	-29.9	-30.7	-31.6	-37.9	-43.8	.....	-47.8	-41.0	-37.5	-33.9
14	-31.2	-30.7	-29.4	-30.3	-31.5	-37.6	-43.8	.....	.....	-40.9	-37.7	-34.4
15	-31.6	-30.3	-29.3	-30.2	-31.3	-37.3	-43.5	-49.9	.....	-40.8	-37.3	-34.5
16	-31.4	-31.2	-29.5	-30.1	-31.3	.....	-44.0	.....	.....	-40.6	-37.2	.....
17	-31.5	-31.1	-29.7	-30.0	-31.4	-38.0	-44.7	.....	-46.9	-40.4	-37.1	.....
18	-30.6	-30.8	-29.7	-29.9	-31.9	.....	-45.1	-50.4	-46.5	-40.4	-36.7	-34.1
19	-30.8	-30.5	-29.8	-30.0	-32.3	-38.0	-44.9	-50.4	-46.3	-40.3	-36.5	-33.9
20	-31.1	-30.5	-29.8	-30.2	-32.8	-37.4	-45.2	-50.2	-46.2	-40.3	-35.7	-33.5
21	-30.8	-30.0	-29.6	-30.3	-32.8	.....	-45.3	-50.2	-45.6	-40.0	-35.4	-34.0
22	-30.9	-30.2	-29.4	-30.5	-32.9	-38.0	-45.1	-50.4	-45.2	-39.5	-35.3	-34.4



## Atlantic County--Continued

36.23.1.9.6.--Continued

Average daily water level, in feet, with reference to mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
23	-31.7	-30.7	-29.5	-30.9	-32.7	.....	-44.5	-50.7	-45.2	-39.7	-35.7	-34.1
24	-30.9	-30.6	-29.4	-30.7	-32.4	-38.4	-45.1	-50.9	-45.3	-40.0	-35.8	-33.5
25	-31.7	-30.5	-28.9	-30.5	-33.0	.....	-45.4	-50.8	-45.1	-39.9	-35.1	-33.8
26	-31.5	-29.9	-28.8	-30.1	-33.5	.....	-45.7	-50.2	-44.8	-39.5	-35.1	-33.5
27	-31.2	-30.9	-29.1	-30.0	-33.5	.....	-45.9	-49.6	-43.9	-39.2	-35.7	-33.1
28	-31.1	-30.9	-28.8	-29.7	-33.7	.....	-45.9	.....	-43.8	-39.3	-35.5	-33.2
29	-31.2	.....	-29.0	-29.7	-34.1	-40.5	-45.7	-48.5	-43.5	-39.4	-35.6	-33.3
30	-30.1	.....	-29.0	-30.1	-34.3	-39.8	-46.1	-48.1	-43.1	-38.5	-35.5	-32.9
31	-30.1	.....	-29.2	.....	-34.9	.....	-46.7	-48.2	.....	-38.1	.....	-32.9

## Bergen County

26.3.1.7.3. East Paterson Area. Garfield well 11. Description given in Water-Supply Paper 817. Daily fluctuations ranged from less than a foot to about 11 feet during 1939.

Lowest daily water level, in feet above mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	17.1	15.3	.....	24.2	26.5	20.7	15.1	11.3	.....	.....	4.6	4.0
2	18.2	15.3	.....	25.5	26.8	20.6	14.7	10.9	.....	.....	4.6	4.3
3	17.5	15.9	.....	24.8	26.6	20.5	14.6	10.9	.....	.....	5.0	3.9
4	17.1	15.7	.....	23.9	26.2	20.5	14.5	11.4	.....	5.9	5.0	3.8
5	17.1	15.5	.....	23.6	26.0	21.2	14.2	11.1	.....	5.7	5.0	3.8
6	17.5	15.9	.....	23.7	25.3	17.7	14.2	11.0	.....	5.7	4.8	3.7
7	17.2	15.9	.....	24.4	25.0	17.0	14.1	11.1	.....	5.7	4.6	...
8	17.2	16.8	.....	24.4	25.1	16.8	14.1	.....	.....	5.7	4.5	...
9	17.5	17.4	24.0	24.7	25.1	16.3	14.0	.....	.....	5.6	4.5	...
10	17.1	17.7	24.3	24.2	22.4	16.0	13.8	.....	.....	5.6	4.5	...
11	17.0	18.4	25.2	24.2	21.8	16.1	13.7	.....	.....	5.6	4.9	...
12	17.0	18.6	26.6	24.5	21.4	18.4	13.6	.....	.....	5.6	4.8	...
13	16.9	19.3	25.2	25.3	21.2	19.0	13.6	.....	.....	5.8	4.7	...
14	17.2	19.2	25.3	27.1	21.7	19.2	13.6	.....	.....	5.7	4.5	...
15	17.2	20.2	26.4	27.2	20.7	17.5	13.7	.....	.....	5.5	4.5	...
16	17.7	20.5	26.5	27.5	20.3	16.3	14.5	.....	.....	5.4	4.5	...
17	17.7	21.0	26.5	27.6	20.5	15.7	13.6	.....	.....	5.2	4.5	...
18	17.7	20.9	26.6	28.0	20.0	15.6	13.5	.....	.....	5.1	4.7	...
19	17.8	20.9	27.2	27.7	19.3	15.7	13.3	.....	.....	5.0	4.6	...
20	17.8	21.0	27.0	27.2	19.0	15.7	13.3	.....	.....	5.0	4.3	...
21	17.7	21.0	26.9	27.3	18.9	15.7	13.2	.....	.....	5.0	4.4	...
22	18.0	21.2	27.0	27.0	20.6	15.5	13.2	.....	.....	4.9	4.6	...
23	17.3	21.4	.....	.....	21.8	15.3	13.0	.....	.....	4.9	4.3	...
24	17.1	21.4	25.2	27.3	22.3	15.3	13.0	.....	.....	4.9	4.1	...
25	17.4	21.4	24.4	27.0	22.2	15.2	13.2	.....	.....	5.0	4.1	...
26	17.4	22.2	25.1	27.4	22.1	14.9	13.0	.....	.....	4.9	4.8	2.8
27	17.0	21.4	25.3	27.0	22.1	14.9	13.0	.....	.....	4.8	4.3	2.6
28	16.9	21.4	24.8	26.7	21.8	14.7	12.3	.....	.....	4.7	4.2	2.6
29	17.0	.....	24.2	26.3	21.7	14.7	11.8	.....	.....	4.7	4.1	2.5
30	16.7	.....	24.9	27.3	21.3	14.8	11.8	.....	.....	4.7	4.0	2.5
31	16.0	.....	23.6	.....	21.0	.....	11.9	.....	.....	4.7	...	2.5

## Camden County

31.2.2.5.2. Camden Area. Morris Station test well 3. Description given in Water-Supply Papers 817 and 840. Daily fluctuations ranged from less than a foot to about 6 feet during 1939.

Lowest daily water level, in feet, with reference to mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	-5.8	-8.0	-7.5	-6.7	-7.5	-7.1	-6.1	-7.8	-7.0	-6.9	-6.9	-6.8
2	-6.0	-6.5	-7.6	-6.8	-7.5	-7.0	-5.8	-7.9	-6.8	-7.0	-7.3	-6.7
3	-6.2	-6.3	-7.4	-7.4	-7.4	-6.6	-6.9	-6.5	-6.6	-7.1	-7.7	-6.3
4	-6.3	-6.0	-7.5	-7.7	-7.3	-6.6	-6.1	-6.3	-6.4	-6.8	-6.9	-7.2

## Camden County--Continued

## 31.2.2.5.2.--Continued

Lowest daily water level, in feet, with reference to mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
5	-6.3	-6.0	-6.9	-7.1	-7.5	-7.0	-6.4	-6.4	-7.4	-8.4	-6.5	-7.4
6	-6.0	-7.7	-7.5	-6.7	-7.4	-7.3	-6.3	-5.9	-8.1	-7.1	-7.8	-7.9
7	-6.2	-8.4	-7.8	-6.8	-7.1	-7.3	-6.3	-7.3	-7.5	-7.0	-7.3	-7.1
8	-5.7	-8.1	-7.8	-6.1	-7.7	....	-6.6	-8.3	-6.8	-6.1	-7.7	-9.0
9	-7.2	-7.9	-7.5	-6.5	-7.4	....	-6.3	-8.6	-10.0	-7.1	-7.4	-6.8
10	-6.9	-7.8	-7.6	-6.9	-7.5	-6.5	-9.2	-8.1	-6.7	-7.0	-6.9	-6.8
11	-6.9	-7.6	-7.8	-6.7	-7.8	-6.2	....	-8.3	-7.7	-6.7	-6.9	-7.3
12	-7.3	-7.8	-7.5	-7.2	-7.8	-7.4	....	-7.3	-7.5	-9.4	-6.8	-7.3
13	-7.2	-8.1	-7.5	-7.4	-7.7	-7.4	....	-4.5	-7.6	-9.8	-7.4	-6.7
14	-7.0	-7.8	-7.7	-7.5	-7.3	-6.7	....	-9.4	-7.3	-9.5	-7.4	-6.7
15	-7.2	-7.7	-7.5	-7.1	-7.7	-7.3	-8.5	-9.9	-7.7	-9.6	-7.2	-6.7
16	-8.0	-8.3	-7.4	-7.4	-7.5	-6.9	-8.0	-10.0	-7.4	....	-6.9	-6.6
17	-7.5	-8.3	-7.7	-7.1	-7.5	-6.3	-8.1	....	-6.8	....	-7.6	-6.4
18	-7.3	-7.7	....	-7.0	-7.7	-5.7	-8.3	....	-7.6	....	-7.0	-7.8
19	-7.2	-7.6	....	-6.2	-7.6	-6.3	-8.4	....	-7.4	....	-6.8	-7.5
20	-7.1	-8.1	....	-6.7	-7.6	-6.4	-8.2	-6.1	-7.4	....	-8.8	-7.5
21	-6.7	-7.9	-8.0	-6.4	-7.3	-6.4	-8.1	-10.3	-7.5	....	-7.3	-6.8
22	-6.9	-8.0	-7.7	-6.5	-8.0	-6.8	-7.3	-10.1	-8.1	-6.4	-6.8	-8.2
23	-7.9	-8.1	-7.6	-7.0	-7.0	-6.7	-6.8	-11.4	-7.6	-7.1	-6.6	-7.0
24	-7.6	-8.3	-7.9	-7.4	-7.0	-6.2	-8.1	-7.8	-6.6	-7.2	-7.7	-6.6
25	-8.0	-7.8	-7.9	-7.6	-6.2	-5.9	-7.7	-7.4	-10.8	-7.0	-6.9	-6.6
26	-7.8	-7.8	-7.6	-7.3	-6.6	-6.9	-8.2	-7.3	-9.3	-6.6	-6.6	-8.9
27	-8.1	-7.6	-5.8	-7.4	-6.6	-8.6	-9.7	-5.9	-7.4	-5.6	-7.5	-7.2
28	-7.5	-7.6	-5.6	-7.4	-6.6	-7.7	....	-10.5	-7.4	....	-7.5	-9.5
29	-7.7	....	-6.4	-7.2	-6.4	-6.4	....	-10.2	-7.6	....	-7.1	-9.6
30	-6.9	....	-6.9	-6.9	-6.9	-6.3	-5.7	-10.7	-7.2	....	-7.5	....
31	-6.8	....	....	....	-7.2	....	-6.5	-10.0	....	-7.2	....	....

31.2.4.5.1. Camden Area. New Jersey Water Company well 10. Description given in Water-Supply Paper 845. Highest observed water level, 1.26 feet above mean sea level Mar. 19, 1933; lowest, 16.0 feet below mean sea level Aug. 5, 6, 19, and 20, 1937. Daily fluctuations ranged from 3.0 to 10.4 feet during 1939. Altitude of the measuring point incorrectly given 5.13 feet above mean sea level in Water-Supply Paper 845. Correct altitude, 5.59 feet above mean sea level. All water levels reported for this well in Water-Supply Paper 845 should be 0.46 foot higher.

Lowest daily water level, in feet, with reference to mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	May	June	July	Aug.	Sept.	Oct.	Dec.
1	-7.09	-8.64	-7.64	....	-12.24	-10.99	-12.09	-12.84	-8.09	....
2	-7.24	-8.39	-7.64	....	-8.14	-7.69	-12.54	-12.64	-8.79	....
3	-9.39	-8.44	-7.54	....	-9.99	-11.09	-11.84	-8.99	-11.14	....
4	-7.94	-8.49	....	....	-7.94	-7.84	-11.19	-11.74	....	....
5	-7.79	-8.74	....	....	-11.39	-10.79	-11.79	-12.99	....	....
6	-8.19	-8.24	....	....	-11.69	-11.64	-10.44	-12.29	....	....
7	-8.24	-8.04	....	....	-11.74	-12.09	-12.44	-12.49	....	....
8	-7.84	-8.34	....	....	-11.94	-11.94	-10.99	-12.99	....	....
9	-9.89	-8.24	....	....	-13.64	-11.29	-13.19	-12.49	....	....
10	-8.14	-8.14	....	....	-12.94	-12.99	-13.64	-7.94	....	....
11	-8.09	-8.09	....	....	-10.89	-12.54	-14.44	-11.49	....	....
12	-9.74	-8.04	....	....	-12.14	-13.79	-13.74	-11.09	....	....
13	-8.19	-9.39	....	....	-11.39	-12.04	-12.44	-12.39	....	....
14	-8.19	-7.84	....	....	-7.99	-12.99	-13.94	-12.19	....	....
15	-8.14	-7.89	....	....	-10.64	-11.49	-14.09	-12.74	....	....
16	-8.14	-7.84	....	....	-12.34	-10.84	-13.59	-11.99	....	....
17	-8.49	-8.19	....	....	-12.19	-13.09	-13.84	-8.29	....	....
18	-8.49	-7.89	....	....	-8.44	-12.14	-13.99	-12.84	....	....
19	-8.19	-7.94	....	-8.94	-7.99	-12.69	-12.04	-12.14	....	....
20	-8.44	-7.89	....	-7.99	-10.84	-12.29	-10.84	-12.69	....	....
21	-8.49	-8.09	....	-7.49	-11.89	-12.59	-13.64	-11.94	....	....
22	-8.14	-8.04	....	-9.64	-11.59	-11.04	-13.74	-12.24	....	....
23	-10.24	-8.04	....	-8.64	-11.34	-10.89	-13.59	-11.54	....	....
24	-9.14	-8.29	....	-8.49	-10.64	-13.34	-13.44	-10.69	....	....
25	-8.59	-8.34	....	-10.89	-10.74	-13.54	-12.74	-13.09	....	....
26	-9.09	-7.99	....	-11.14	-12.14	-13.54	-12.54	-12.84	....	....
27	-8.74	-9.39	....	-11.24	-11.89	-11.94	-10.74	-11.89	....	....
28	-9.09	-7.44	....	-10.69	-12.29	-11.44	-12.64	-12.14	....	....
29	-8.84	....	....	-11.89	-11.19	-10.64	-11.59	-11.64	....	....
30	-9.74	....	....	-10.99	-11.24	-8.29	-11.99	-11.09	....	-9.10
31	-8.24	....	....	-12.99	....	-11.64	-11.64	....	....	....

## Cape May County

36.31.9.1.9. Atlantic City Area. Sea Isle City Water Department well 1. Description given in Water-Supply Paper 845. Daily tidal fluctuations ranged from 0.3 foot to 1.6 feet during 1939.

Lowest daily water level, in feet below top of casing, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	14.7	14.5	14.5	13.9	14.6	16.6	17.3	17.9	17.9	17.7	16.0	15.1
2	14.8	14.4	14.5	13.9	15.1	16.3	17.4	17.8	18.0	17.4	16.0	15.0
3	14.8	14.3	14.5	15.0	14.6	15.1	17.4	17.8	18.1	16.4	15.9	15.0
4	14.8	14.5	14.4	15.5	13.9	....	17.5	17.8	18.1	16.1	15.8	15.1
5	14.7	14.5	....	15.6	13.9	....	17.5	17.8	18.2	16.0	15.6	15.1
6	14.7	14.4	....	14.8	14.8	....	17.5	17.9	18.2	16.0	15.7	15.1
7	14.7	14.4	....	14.3	15.2	....	17.5	18.0	18.3	16.3	15.7	15.1
8	14.8	14.4	....	14.2	15.3	....	17.5	18.0	18.3	17.2	15.7	15.3
9	14.8	14.4	....	14.0	15.7	16.4	17.6	18.0	18.2	17.5	15.8	15.3
10	14.6	14.3	....	14.0	15.8	16.6	17.5	18.1	17.4	17.5	15.8	15.2
11	14.7	14.3	....	14.0	14.7	16.7	17.6	18.2	17.2	16.5	15.7	15.0
12	14.7	14.4	....	14.0	14.4	16.8	17.6	18.2	16.9	16.7	15.7	15.0
13	14.7	14.4	....	14.1	15.2	16.8	17.6	18.3	16.8	17.3	15.7	15.0
14	14.5	14.3	....	14.1	15.8	16.8	17.6	18.3	16.6	17.6	15.7	15.0
15	14.6	14.3	....	14.0	14.8	16.9	17.6	18.3	16.9	17.7	15.7	15.0
16	14.5	14.6	....	14.0	14.3	16.9	17.7	18.3	17.6	17.1	15.5	15.0
17	14.5	14.5	14.0	14.0	14.9	17.0	17.8	18.3	17.8	16.4	15.5	14.9
18	14.5	14.5	14.1	13.9	15.7	17.1	17.3	18.2	18.0	16.2	15.4	15.0
19	14.3	14.4	14.1	13.8	16.1	16.8	17.5	18.2	17.4	16.1	15.3	14.9
20	14.3	14.4	14.1	13.8	16.3	17.0	17.6	18.0	16.7	16.4	15.2	14.8
21	14.3	14.3	14.1	13.9	16.3	17.0	17.7	18.0	16.8	17.1	15.0	15.0
22	14.5	14.4	14.1	13.8	15.6	17.1	17.7	18.1	17.5	17.4	15.0	15.1
23	14.6	14.5	14.1	13.9	14.8	17.1	17.6	18.2	17.8	17.7	15.1	15.1
24	14.5	14.5	14.1	13.9	14.5	17.1	17.7	18.2	17.9	17.7	15.1	15.0
25	14.6	14.4	14.0	14.2	15.4	17.2	17.7	18.2	17.9	16.7	15.1	15.0
26	14.7	14.3	13.9	15.0	15.9	17.2	17.8	18.2	16.8	16.3	15.0	15.0
27	14.6	14.5	13.9	14.5	16.1	17.3	17.8	18.2	16.5	16.1	15.1	15.0
28	14.6	14.3	13.8	13.9	16.4	17.3	17.8	18.1	17.0	16.7	15.1	15.0
29	14.6	....	13.9	13.7	16.5	17.3	17.8	18.0	17.4	17.3	15.1	15.0
30	14.4	....	13.8	13.7	15.9	17.3	17.8	17.9	17.6	17.4	15.1	14.8
31	14.4	....	13.9	....	16.4	....	17.8	17.9	....	16.3	....	14.8

## Essex County

25.15.7.5.4. Canoe Brook Area. Commonwealth Water Company well 30. Commonwealth Water Company. About 0.3 mile north of the Canoe Brook pumping station of the Commonwealth Water Company, 0.8 mile west of the White Oak Ridge pumping station of the East Orange Water Department and about 1.4 miles northeast of the Town of Chatham. Diameter 10 inches, depth about 130 feet. Measuring point prior to Jan. 11, 1926, top of casing, about 2.5 feet above land surface. Casing extended 2.03 feet Jan. 11, 1926. Measurements since then made from the top of extended casing. First measured Sept. 24, 1925. Highest observed water level 16.3 feet below top of casing Aug. 25, 1931; lowest, 67.9 feet below top of casing Sept. 5, 1929. Daily water-level fluctuations caused by pumping of nearby wells have ranged from less than a foot to as much as 17 feet during period of record. During 1939 they ranged from less than a foot to as much as 14 feet.

Lowest daily water level, in feet below top of casing, 1925  
(from recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Sept. 24	40.3	Oct. 11	36.7	Oct. 31	37.6	Nov. 13	37.6
25	39.0	12	36.6	Nov. 1	37.8	14	35.8
26	38.4	13	36.9	2	38.4	15	37.2
27	39.0	14	37.0	3	39.6	16	37.4
28	39.4	17	36.8	4	40.2	17	38.5
29	41.3	18	36.8	5	39.6	18	38.6
30	39.1	24	38.4	6	36.2	19	38.8
Oct. 1	39.9	25	34.6	7	37.4	20	36.5
2	39.8	26	37.4	8	36.0	21	37.0
3	39.8	27	36.0	9	38.0	22	36.5
4	39.4	28	37.2	10	36.6	23	40.8
5	39.6	29	37.8	11	39.0	24	40.2
6	40.2	30	37.2	12	36.0		

## Essex County--Continued

25.15.7.3.4.--Continued

Water level, in feet below top of casing, 1926  
(tape measurements)

Date	Hour	Water level	Date	Hour	Water level
Jan. 11	8:44 a.m.	35.36	Jan. 13	1:38 p.m.	43.58
	9:17 a.m.	35.52		2:54 p.m.	44.00
	11:10 a.m.	35.94	Jan. 14	5:07 p.m.	43.98
	12:28 p.m.	35.88		11:46 a.m.	42.00
	1:22 p.m.	38.52		12:07 p.m.	41.67
	2:45 p.m.	39.71		2:31 p.m.	42.13
Jan. 12	4:24 p.m.	37.70	Jan. 15	3:18 p.m.	42.19
	8:50 a.m.	37.20		8:57 a.m.	36.01
	9:14 a.m.	38.11		9:39 a.m.	36.24
	11:08 a.m.	39.34		10:07 a.m.	36.31
	12:10 p.m.	40.11		10:44 a.m.	36.45
Jan. 13	2:19 p.m.	39.53	Jan. 25	11:26 a.m.	36.52
	8:57 a.m.	38.42		10:20 a.m.	38.92
	9:16 a.m.	39.37		11:30 a.m.	40.00
	9:45 a.m.	40.12		12:55 p.m.	40.83
	10:16 a.m.	38.93		2:10 p.m.	41.17
	11:11 a.m.	40.19	Aug. 17	3:15 p.m.	41.42
	11:50 a.m.	41.05		12:55 p.m.	37.97
	12:34 p.m.	42.21			

Lowest daily water level, in feet below top of casing, 1926  
(from recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	46.4	Mar. 3	36.5	Apr. 27	42.2	July 1	50.2
27	41.1	4	39.4	28	38.2	2	52.1
28	41.4	5	36.6	29	37.7	3	52.9
29	40.9	6	36.4	30	42.4	4	47.4
30	42.4	30	42.0	May 18	46.1	5	47.9
Feb. 1	42.5	31	37.2	19	45.8	6	47.4
2	42.3	Apr. 1	36.8	20	42.4	7	47.8
6	40.4	2	36.9	21	42.1	8	46.5
7	41.0	3	36.8	22	41.5	9	52.2
8	41.9	4	36.7	23	42.5	14	50.6
9	41.5	5	36.7	24	41.2	15	49.1
10	41.6	6	37.2	25	45.3	16	46.4
11	39.7	7	37.1	26	46.0	17	45.9
12	40.8	8	36.7	27	46.3	18	40.8
13	41.0	9	36.7	28	49.8	19	41.2
14	38.8	10	37.1	29	49.4	20	42.3
15	41.1	11	37.2	30	50.3	21	47.1
16	42.0	12	37.5	31	47.8	22	50.2
17	41.0	13	42.3	June 1	43.1	23	53.2
18	40.8	14	38.6	2	42.2	24	48.2
19	37.5	15	37.9	3	42.2	25	46.6
20	37.2	16	37.6	4	38.6	26	47.0
21	37.2	17	41.9	5	42.2	27	45.8
22	36.9	18	37.8	6	37.0	28	43.4
23	41.2	19	41.3	7	41.6	29	41.2
24	37.4	20	42.4	8	44.8	30	43.2
25	36.6	21	37.7	9	46.4	Aug. 1	41.6
26	36.4	22	42.2	26	47.6	2	40.3
27	36.3	23	42.7	27	44.0	3	45.7
28	35.5	24	45.9	28	47.2	4	48.4
Mar. 1	35.9	25	41.6	29	48.1	5	51.8
2	36.3	26	42.6	30	48.5	6	49.4

## Essex County--Continued

25.15.7.5.4.--Continued

Lowest daily water level, in feet below top of casing, 1927  
(from recorder charts)

Day	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	....	40.8	39.0	40.6	45.8	44.3	38.4	44.7	47.2	46.3
2	....	41.4	42.5	41.9	47.2	39.6	....	43.2	46.2	45.4
3	....	40.0	42.0	45.9	39.3	39.0	42.2	45.7	45.6	45.0
4	....	42.8	42.7	42.1	39.1	39.6	40.2	44.7	45.2	43.9
5	40.9	40.7	41.5	42.5	43.3	35.0	....	44.0	45.9	45.9
6	41.8	40.8	....	47.4	48.2	35.6	42.7	43.2	44.6	44.5
7	41.5	41.7	42.0	47.6	45.4	35.5	49.4	42.4	45.9	45.0
8	41.2	40.2	42.8	42.6	45.6	42.5	....	41.3	45.9	43.0
9	44.6	42.6	40.8	50.4	45.6	36.0	....	40.8	45.9	....
10	40.4	40.8	37.8	53.0	38.6	38.0	41.6	42.5	45.9	....
11	41.8	39.8	44.2	50.4	45.2	37.0	39.6	42.5	45.4	....
12	40.7	42.9	42.8	46.5	42.8	37.6	42.3	42.0	45.4	....
13	40.3	42.0	43.0	47.9	49.8	....	42.7	41.6	44.4	....
14	40.5	42.1	40.2	45.0	51.0	....	44.2	41.1	47.8	....
15	40.8	45.0	37.4	40.3	54.2	....	44.6	43.8	47.7	....
16	39.0	42.6	44.2	43.0	54.5	....	45.8	40.5	46.4	....
17	41.8	42.8	41.0	44.8	42.2	....	44.2	43.7	45.9	....
18	42.0	43.0	42.9	43.2	50.0	....	41.1	40.0	46.7	....
19	39.8	42.8	42.2	39.6	48.7	....	42.4	....	47.0	....
20	40.2	45.3	42.2	46.4	46.2	41.2	43.3	27.1	45.9	....
21	39.8	44.4	46.6	47.0	49.7	38.0	42.9	24.1	48.1	....
22	42.0	43.3	46.6	41.6	42.0	40.1	41.1	24.0	47.3	....
23	41.9	41.1	47.8	45.7	41.4	40.0	41.4	26.8	46.0	....
24	41.0	44.0	42.9	46.4	....	41.5	40.6	....	44.3	....
25	41.4	42.8	37.6	45.6	34.2	39.6	39.6	28.9	44.9	....
26	41.7	47.3	36.5	39.2	35.8	41.6	42.1	39.4	45.2	....
27	40.3	39.2	....	46.0	35.8	43.1	43.4	40.9	44.6	....
28	42.7	44.5	38.6	48.0	42.4	41.0	43.0	....	45.3	....
29	42.1	42.1	32.9	48.5	48.2	39.1	43.6	46.0	45.5	....
30	40.8	40.3	35.1	41.8	48.4	44.0	43.3	44.4	46.3	....
31	42.4	....	39.3	....	43.8	47.0	....	48.3	....	....

Lowest daily water level, in feet below top of casing, 1928  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	....	46.2	46.9	49.3	50.0	....	....	53.1	....	52.0	54.1	54.6
2	....	46.7	46.2	50.0	50.5	51.0	....	54.6	50.2	52.0	54.0	54.8
3	....	45.9	46.9	48.9	50.1	51.4	....	....	46.3	52.9	53.6	55.2
4	....	44.9	46.7	49.8	50.6	51.5	....	....	47.6	54.0	53.8	54.8
5	44.4	45.4	48.4	50.2	49.8	50.4	....	....	47.8	54.2	55.2	55.0
6	43.9	46.9	47.5	49.7	51.0	50.0	....	....	47.9	55.2	55.5	54.6
7	....	45.6	46.6	50.1	50.9	50.7	....	....	....	54.7	55.2	54.6
8	43.7	45.2	47.5	....	51.4	51.8	50.6	....	....	54.7	54.8	54.0
9	45.3	41.3	46.6	....	51.2	52.5	51.9	....	49.8	55.8	55.0	53.4
10	42.9	43.5	....	....	51.3	52.2	53.1	....	52.2	55.0	53.9	52.6
11	45.6	44.5	....	....	49.5	51.6	....	52.6	52.0	54.9	53.3	53.6
12	47.3	44.9	48.4	....	50.6	51.7	....	50.9	52.3	....	53.4	53.2
13	45.8	47.4	47.9	....	50.5	51.0	....	50.9	52.9	54.1	54.1	53.4
14	....	46.1	48.9	....	50.6	51.5	....	51.6	53.2	54.1	....	55.3
15	45.9	45.4	46.8	....	50.3	51.0	....	52.7	52.1	53.4	53.4	56.4
16	....	46.2	47.9	....	50.0	52.6	50.6	54.1	50.5	....	53.4	55.8
17	....	45.7	48.0	48.5	50.0	52.0	52.0	53.9	53.6	....	53.0	56.3
18	45.0	....	46.3	47.8	50.0	50.5	51.8	52.8	52.2	56.0	52.4	56.1
19	45.0	46.8	49.4	50.4	50.2	50.7	52.6	53.6	52.1	55.3	53.7	56.1
20	44.5	47.6	48.8	50.3	50.0	50.8	53.9	53.0	50.7	54.8	54.7	55.9
21	44.9	46.8	49.3	50.9	49.8	50.0	....	....	50.4	54.7	54.5	55.5
22	44.4	47.2	47.5	49.9	51.4	49.5	....	....	50.4	54.6	54.3	55.4
23	....	42.2	47.9	50.7	51.2	49.9	....	....	50.0	54.4	53.9	55.3
24	....	44.9	47.4	46.8	50.8	49.5	....	....	51.4	54.8	53.8	55.2
25	45.3	....	46.5	....	51.1	50.9	....	....	50.9	54.4	53.4	54.8
26	45.6	....	49.2	....	50.4	51.4	....	43.4	51.2	54.0	55.2	54.7
27	46.6	....	50.4	....	50.5	51.5	....	44.0	51.0	53.6	55.0	54.6
28	44.2	47.0	50.1	....	....	52.5	....	....	51.6	53.8	55.5	52.6
29	44.5	46.9	50.2	49.9	....	52.1	52.8	....	51.7	54.5	55.2	53.7
30	44.5	....	49.1	51.1	....	....	53.2	....	51.3	55.1	54.9	54.1
31	46.2	....	49.7	....	....	....	53.3	....	....	54.5	....	54.5

## WATER LEVELS AND ARTESIAN PRESSURE, 1939

## Essex County--Continued

25.15.7.5.4.--Continued

Lowest daily water level, in feet below top of casing, 1929  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	54.0	56.0	53.2	54.8	55.6	58.1	....	66.2	61.7	60.7	55.1	51.5
2	53.5	55.9	52.0	55.6	55.6	57.3	56.1	64.6	60.5	59.5	57.3	52.0
3	54.4	56.0	52.3	55.6	55.9	58.3	55.7	62.8	63.0	54.0	58.6	52.1
4	54.5	56.1	53.9	55.0	....	57.7	55.4	59.9	66.9	45.9	55.9	47.0
5	54.2	56.6	53.5	54.3	....	56.8	55.5	60.8	67.9	44.9	50.8	46.4
6	52.5	56.3	52.7	53.5	....	57.4	55.3	62.2	63.1	43.8	49.8	45.6
7	52.1	56.2	54.3	53.3	....	58.3	55.6	63.2	64.6	47.3	48.2	47.7
8	52.6	55.6	54.9	55.7	....	59.0	56.5	63.7	65.0	55.3	48.6	52.6
9	52.0	55.2	55.0	55.9	....	58.5	59.2	64.1	63.1	56.6	48.2	57.0
10	52.5	55.6	55.2	55.2	....	58.7	60.4	65.2	62.9	58.5	50.1	....
11	52.4	55.7	55.2	54.6	55.7	60.3	63.0	62.6	62.8	59.5	51.5	....
12	52.3	55.2	55.2	53.7	55.4	61.2	....	63.2	62.7	59.6	51.5	....
13	51.8	55.2	55.2	53.9	55.8	62.3	....	62.9	61.3	60.3	50.3	....
14	51.7	55.7	54.9	53.9	55.8	62.3	....	63.0	60.9	60.9	49.4	....
15	51.9	56.0	54.6	54.5	54.2	62.3	62.4	59.7	58.7	60.9	49.4	57.8
16	52.7	55.9	54.7	53.8	55.9	60.4	63.1	59.9	58.8	60.3	48.9	58.4
17	52.6	56.3	55.0	53.6	56.3	61.0	63.2	....	57.8	61.1	48.7	58.4
18	52.7	57.1	55.3	54.2	57.2	63.0	63.8	....	58.6	62.7	47.5	58.2
19	54.0	56.6	54.8	55.0	58.0	64.0	63.8	60.9	....	65.1	45.7	57.9
20	54.5	....	54.8	55.8	57.1	64.2	63.1	59.7	....	65.2	40.8	58.2
21	54.2	....	54.5	56.4	55.1	62.5	61.4	61.1	59.1	63.9	44.5	58.3
22	54.9	56.5	54.0	55.8	55.5	62.1	61.0	62.7	60.4	64.4	46.3	59.4
23	55.0	56.7	53.7	57.1	56.0	58.5	61.3	61.9	60.4	62.9	46.9	58.6
24	54.5	56.2	54.3	56.3	56.6	58.4	64.9	61.8	58.2	50.8	48.1	60.1
25	54.3	56.7	55.0	54.7	56.2	58.0	66.2	59.9	59.4	52.7	48.8	59.7
26	54.8	56.6	55.2	53.7	56.1	58.3	66.9	63.6	61.2	54.9	49.0	59.2
27	54.5	55.9	55.6	54.1	57.0	59.0	67.2	66.0	60.2	55.4	53.9	57.2
28	55.3	54.8	55.5	53.6	58.0	58.3	67.5	66.3	60.9	54.5	52.0	57.2
29	56.3	....	55.0	55.9	57.9	57.0	66.7	66.3	63.1	51.4	51.8	56.9
30	55.7	....	54.4	55.9	56.5	....	66.1	65.4	61.9	51.5	51.6	58.3
31	56.0	....	54.6	....	57.4	....	66.6	65.0	....	51.5	....	59.7

Lowest daily water level, in feet below top of casing, 1930  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	59.8	50.0	46.2	33.2	34.7	34.2	....	....	....	59.0	57.3	50.2
2	58.8	49.4	44.6	31.9	33.6	43.2	....	56.0	....	58.5	57.9	50.6
3	59.2	50.7	45.0	45.1	35.5	46.0	....	55.1	....	58.6	58.7	49.8
4	58.7	51.8	45.3	45.0	34.7	49.8	....	56.5	....	58.9	55.6	....
5	58.3	52.5	44.8	35.1	39.3	52.1	....	57.9	53.2	58.9	56.4	....
6	58.6	52.8	44.6	33.3	44.6	52.4	....	58.3	51.5	60.0	59.8	49.3
7	58.9	52.2	44.2	32.6	46.6	51.8	55.7	58.1	50.1	61.5	58.9	48.5
8	58.7	51.8	43.0	31.7	46.4	45.2	52.6	57.9	....	....	59.4	49.5
9	58.7	52.0	41.9	31.9	47.1	42.5	53.7	58.1	....	....	58.2	49.7
10	59.2	52.6	42.1	31.6	48.7	39.5	46.5	57.3	51.1	....	59.7	50.7
11	59.0	52.6	41.5	31.6	43.9	43.9	45.0	51.6	56.7	60.8	58.6	52.6
12	58.7	....	40.3	31.6	46.4	41.4	45.5	50.0	56.6	59.2	58.4	50.3
13	59.1	....	39.8	31.3	47.2	40.0	42.8	49.5	55.6	59.4	58.5	52.5
14	....	....	39.1	32.9	45.7	42.4	45.1	48.8	....	59.7	58.5	56.4
15	59.1	44.2	39.9	33.1	41.6	40.7	47.0	43.4	54.1	57.9	57.3	56.3
16	59.2	43.9	38.9	33.3	....	46.4	50.3	41.3	....	58.7	57.7	55.6
17	59.1	46.0	38.0	32.4	45.5	45.9	51.9	40.7	....	57.4	58.0	55.8
18	59.1	45.6	38.7	30.6	44.0	44.1	55.3	....	....	57.7	....	56.2
19	58.7	45.5	37.8	29.7	43.3	44.8	57.8	....	....	55.6	....	54.9
20	59.4	45.5	37.5	30.1	40.9	46.7	57.4	47.5	54.2	58.8	....	55.5
21	59.2	45.5	36.3	30.6	38.4	46.6	58.5	48.8	60.1	59.2	61.1	60.3
22	56.8	45.5	36.3	30.4	41.7	43.3	....	53.6	....	59.3	62.6	60.2
23	54.9	45.7	36.3	30.4	44.8	47.8	....	53.2	....	59.0	....	57.8
24	53.6	46.3	37.1	30.4	44.0	50.5	....	53.5	....	57.3	....	58.7
25	53.2	46.3	36.3	30.6	39.6	55.2	....	....	....	58.2	....	58.3
26	53.2	46.3	35.9	30.5	42.2	57.2	52.2	....	....	58.5	55.8	57.0
27	53.8	46.3	35.7	30.5	41.3	51.8	50.0	....	59.4	59.2	55.7	54.9
28	54.1	46.1	....	31.0	39.1	....	51.5	....	57.7	58.4	....	52.0
29	53.7	....	....	31.1	35.3	....	....	52.1	58.8	56.9	....	52.9
30	53.7	....	35.7	31.1	34.5	....	....	....	59.9	57.5	....	52.0
31	52.3	....	36.7	....	33.8	....	....	....	56.1	....	....	52.9

## Essex County--Continued

25.15.7.5.4.--Continued

Lowest daily water level, in feet below top of casing, 1931  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	53.6	44.5	44.3	37.0	42.8	37.1	54.3	33.2	26.0	34.0	32.2	40.0
2	55.6	47.2	47.7	36.3	....	36.7	49.6	27.6	26.2	40.5	39.4	42.4
3	55.9	47.4	46.7	36.3	....	33.8	43.7	37.4	40.6	36.5	39.0	43.2
4	54.4	45.6	46.0	35.9	....	35.2	39.4	33.8	34.4	33.9	40.1	41.9
5	55.6	46.1	45.4	35.0	....	37.8	38.2	39.0	27.1	41.7	37.5	42.5
6	53.8	46.5	43.4	38.7	....	37.8	30.8	42.5	25.0	43.7	43.2	44.2
7	52.0	47.3	41.8	36.9	....	35.1	34.1	46.6	26.6	38.3	45.2	47.6
8	51.9	44.4	41.2	36.8	....	27.5	29.8	53.9	35.0	36.1	43.9	46.0
9	52.4	45.4	43.2	37.0	28.8	24.2	40.6	52.9	40.5	35.7	44.9	46.0
10	53.4	45.1	41.8	37.2	28.6	17.9	30.5	36.9	43.3	35.1	43.6	47.7
11	52.5	44.5	41.2	36.7	28.4	23.3	43.3	31.8	47.0	33.9	47.0	47.6
12	52.6	42.2	40.8	35.8	27.2	25.7	48.2	25.5	51.3	37.5	43.4	48.2
13	52.3	42.6	41.0	38.2	30.0	28.3	40.8	24.6	45.2	35.3	37.9	48.2
14	52.8	42.7	42.6	39.4	28.2	27.2	34.5	27.5	50.6	37.1	36.8	47.7
15	56.3	40.9	42.1	36.9	25.9	25.7	31.9	25.1	48.9	49.5	36.6	47.9
16	54.0	44.9	44.9	34.7	33.7	24.4	32.8	25.2	41.5	41.6	36.7	48.2
17	54.9	44.5	41.9	39.0	34.8	30.8	36.7	30.5	38.4	36.3	36.6	47.8
18	53.3	43.7	41.9	35.9	35.6	....	33.5	34.6	37.7	36.2	36.7	47.7
19	52.5	43.0	40.9	34.6	32.2	....	28.3	32.1	35.6	35.2	37.5	47.3
20	51.6	42.8	40.4	47.3	28.7	37.8	32.6	29.2	37.4	36.8	....	46.7
21	47.7	42.1	39.7	47.0	33.2	34.5	33.2	27.6	46.7	38.3	40.6	52.6
22	48.6	41.1	39.5	46.6	27.0	34.9	39.9	24.9	53.4	36.8	38.1	52.8
23	48.6	45.8	43.2	42.2	25.5	31.6	45.0	22.9	51.5	36.6	40.0	48.4
24	50.7	46.0	40.6	35.8	24.8	30.0	33.5	23.0	44.9	36.6	37.7	47.5
25	49.7	45.4	40.3	36.1	25.3	29.7	29.9	25.7	40.1	36.2	37.1	47.9
26	50.7	45.3	39.8	35.6	....	32.0	26.5	28.3	36.6	37.4	36.7	48.1
27	47.3	45.5	39.3	39.7	....	39.2	34.1	24.8	33.5	37.2	36.1	47.3
28	....	46.2	38.9	38.5	....	39.9	43.0	25.5	39.2	35.6	35.3	48.2
29	46.5	....	38.0	39.6	....	44.8	44.0	25.6	42.2	31.7	35.5	52.3
30	45.2	....	42.7	42.6	36.6	51.0	35.8	26.2	43.8	29.7	36.0	53.0
31	46.2	....	39.2	....	32.6	....	35.1	28.6	....	30.1	....	51.1

Lowest daily water level, in feet below top of casing, 1932  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	49.2	34.9	32.2	23.3	20.7	37.5	56.8	54.5	50.0	a47.0	....	39.1
2	48.8	35.3	31.5	23.6	21.2	41.2	54.3	56.4	49.2	....	....	38.2
3	50.1	34.7	31.1	24.3	19.8	39.2	50.3	54.6	54.3	....	....	38.3
4	49.4	33.8	30.2	26.7	19.1	46.1	45.8	55.3	51.1	....	....	37.9
5	48.0	33.9	32.0	27.1	19.8	43.6	47.4	52.3	43.6	....	a44.2	39.6
6	49.7	33.6	31.4	29.4	19.8	47.1	47.3	49.2	47.0	....	....	43.5
7	48.5	33.8	31.7	28.2	19.7	46.9	48.3	49.2	45.5	....	....	42.5
8	49.8	34.0	31.7	28.9	18.7	42.8	49.4	51.4	43.7	a44.6	....	39.6
9	47.0	34.5	28.5	29.8	19.4	45.6	50.1	51.5	....	....	....	37.9
10	41.9	34.0	28.1	30.2	19.2	47.8	49.3	50.6	46.8	....	....	37.0
11	45.9	33.5	26.3	29.7	23.3	45.8	53.6	49.0	46.0	....	....	38.6
12	43.4	33.9	26.1	29.4	35.5	45.0	54.6	48.6	50.7	....	a41.1	39.6
13	40.4	38.8	25.0	29.9	31.4	46.2	56.0	48.2	54.9	....	....	39.8
14	41.7	38.8	26.7	30.1	31.1	47.1	58.4	48.1	55.7	....	....	38.3
15	38.1	40.2	26.3	30.5	31.2	41.8	60.1	53.3	52.6	a44.6	....	37.4
16	39.5	38.8	32.7	24.5	34.5	39.6	60.2	53.2	50.5	....	....	38.4
17	37.5	38.8	34.2	21.8	37.0	40.0	60.2	55.8	46.2	....	....	37.2
18	35.8	34.1	38.1	22.4	37.5	37.8	58.3	54.6	46.1	....	....	36.6
19	37.5	33.2	38.5	22.7	37.3	35.7	58.4	48.6	47.8	....	a40.4	....
20	....	31.8	31.4	22.6	37.0	42.1	61.8	45.8	48.5	....	....	....
21	....	32.1	30.0	22.7	38.4	47.7	....	45.0	49.8	....	....	....
22	....	32.4	29.3	21.8	38.1	47.4	....	49.4	....	a41.9	....	37.8
23	....	32.1	29.6	21.1	38.8	47.3	55.3	51.0	....	....	....	36.8
24	....	31.9	40.8	20.7	39.0	50.9	52.5	51.2	a50.0	....	....	35.4
25	....	31.8	38.3	20.1	40.7	52.2	53.9	51.1	....	....	38.2	37.0
26	....	31.4	31.9	19.5	41.0	49.8	56.2	50.2	....	....	38.0	37.5
27	....	33.4	28.4	18.5	40.9	56.3	53.8	48.3	....	....	38.0	36.5
28	....	31.9	27.1	19.4	39.0	55.2	52.6	47.6	....	....	40.4	36.6
29	34.2	33.2	27.5	20.3	37.4	55.7	51.5	50.1	....	a44.9	40.4	36.6
30	34.0	....	26.3	21.2	38.1	52.4	52.6	48.6	....	....	39.7	36.5
31	33.7	....	24.0	....	36.6	....	51.5	48.7	....	....	....	36.7

a Tape measurement.

## Essex County--Continued

25.15.7.5.4.--Continued

Lowest daily water level, in feet below top of casing, 1933  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	37.2	32.0	39.3	37.2	35.6	35.6	40.5	52.6	44.1	47.3	45.8	47.6
2	35.0	36.4	38.6	37.2	34.9	36.3	38.1	53.5	44.5	46.4	46.2	49.4
3	34.9	37.9	36.1	32.5	35.0	36.5	38.1	52.1	46.2	....	44.7	49.7
4	34.7	38.1	35.8	32.2	34.4	36.5	38.1	51.7	45.6	46.8	45.5	50.1
5	37.3	38.2	36.3	32.2	34.1	36.3	37.1	46.6	45.0	46.6	44.3	50.2
6	35.3	37.9	35.4	34.5	34.2	35.3	37.1	47.0	45.5	45.2	45.1	48.6
7	36.3	36.5	36.6	34.5	32.8	35.1	38.1	47.7	46.2	....	45.5	49.8
8	35.9	35.7	34.0	31.9	32.2	34.6	39.4	48.1	46.7	....	46.2	48.8
9	36.9	35.7	33.0	32.4	34.2	38.2	39.6	49.6	47.1	....	46.8	....
10	36.8	33.7	35.6	33.9	34.2	37.6	41.0	50.2	46.1	....	47.4	....
11	37.8	32.0	35.7	33.4	32.9	36.0	40.3	49.6	45.8	....	46.7	....
12	38.4	32.7	35.1	32.4	33.1	35.2	38.4	47.2	43.9	....	46.0	....
13	38.2	....	35.2	30.1	32.1	36.1	37.6	46.1	44.6	....	45.6	....
14	37.2	....	34.5	29.0	31.8	37.0	38.1	45.0	44.9	....	45.0	....
15	35.4	....	33.0	29.6	31.9	37.4	44.1	47.9	43.6	47.2	45.4	....
16	36.4	....	32.4	29.2	35.0	38.1	41.4	49.0	41.7	46.9	45.8	....
17	36.9	....	33.8	28.6	36.2	38.0	40.6	49.0	41.3	....	45.5	....
18	37.2	....	34.5	29.1	36.6	41.4	37.0	47.2	42.5	46.9	45.8	....
19	36.6	33.9	35.3	33.2	36.6	41.6	38.1	50.0	42.9	47.7	47.7	....
20	37.4	32.6	34.0	32.9	39.3	40.3	39.7	48.6	43.3	47.4	47.7	....
21	37.4	32.7	32.8	30.1	38.3	40.4	40.1	45.4	42.7	47.2	43.3	....
22	33.1	33.5	34.9	32.2	35.9	40.9	42.1	45.5	44.4	46.4	43.2	....
23	36.0	32.7	34.7	33.8	35.8	41.1	42.0	44.8	44.3	46.1	42.2	50.7
24	36.0	31.2	34.2	33.8	36.0	42.6	46.1	43.5	44.1	46.0	44.1	50.7
25	34.7	32.2	32.2	31.3	36.0	42.0	46.1	....	45.0	46.2	43.3	50.9
26	33.9	32.9	31.5	31.2	35.3	39.5	41.4	....	46.2	46.1	42.3	50.1
27	33.7	33.9	31.7	31.5	37.3	39.1	46.9	43.2	46.5	45.8	43.8	50.6
28	31.1	35.2	32.6	33.5	37.3	39.4	48.7	44.4	46.2	43.4	42.9	....
29	32.0	....	33.4	34.6	37.9	41.8	44.5	44.7	46.7	43.3	42.2	....
30	31.7	....	32.9	35.1	37.0	40.2	44.5	43.8	48.8	43.5	41.9	....
31	30.6	....	33.4	....	35.5	....	45.9	43.7	....	45.9	....	47.7

Lowest daily water level, in feet below top of casing, 1934  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	51.0	....	....	37.6	47.9	46.8	49.2	47.8	47.7	46.5	47.6	48.8
2	51.3	....	....	44.8	47.8	45.9	48.8	47.7	47.7	46.1	47.9	49.0
3	51.3	44.1	....	46.9	47.1	45.8	51.0	47.4	47.4	44.5	47.9	47.8
4	51.4	48.1	....	47.9	46.7	46.2	49.9	47.4	47.5	40.3	47.8	45.9
5	50.7	50.2	....	48.4	46.4	48.3	47.4	47.3	48.0	39.7	48.1	46.2
6	50.1	50.4	....	48.3	47.8	49.4	47.6	47.5	48.2	39.7	48.1	47.0
7	50.0	50.2	....	45.8	50.5	53.2	48.8	48.3	48.1	37.6	47.7	47.7
8	49.2	50.7	....	46.5	49.9	54.1	48.6	49.3	47.6	38.1	45.6	....
9	49.3	....	....	45.0	48.8	53.1	48.2	49.0	47.1	38.1	47.2	....
10	49.3	50.4	....	47.4	47.4	50.0	51.4	49.0	46.3	37.3	47.3	....
11	49.0	51.2	....	47.4	47.5	48.7	51.4	54.4	46.2	37.4	47.5	....
12	49.3	51.3	....	45.7	....	48.1	47.3	54.9	46.8	38.1	47.7	....
13	49.0	51.5	....	45.0	....	47.4	47.2	49.5	47.0	38.3	47.7	....
14	48.9	51.5	....	45.8	....	47.1	47.6	47.0	38.3	....	....	....
15	50.4	51.5	....	45.8	....	48.2	47.0	47.4	46.5	38.6	....	47.5
16	50.6	....	....	45.7	....	49.5	46.8	47.2	46.7	38.8	....	48.3
17	50.9	....	....	46.4	....	49.1	47.6	46.8	46.4	38.8	....	48.3
18	50.7	....	40.5	46.5	....	48.0	48.3	47.0	45.6	38.8	47.3	48.3
19	....	....	40.5	46.6	47.0	46.7	49.0	47.0	45.5	38.5	48.0	48.3
20	....	....	40.5	47.5	47.0	46.6	50.0	46.8	45.9	....	48.0	47.3
21	42.6	....	40.5	47.4	47.7	47.4	51.2	46.8	48.6	....	48.0	47.5
22	41.8	....	40.4	47.7	48.1	47.9	50.7	46.9	49.1	....	45.9	47.5
23	43.2	....	43.9	47.7	47.3	47.5	49.8	47.1	49.1	....	46.8	47.5
24	42.9	....	47.3	48.1	47.2	47.4	49.5	47.1	47.6	....	47.0	47.3
25	42.4	....	49.6	48.1	46.9	47.2	48.1	47.1	47.3	....	47.6	47.3
26	42.2	....	49.7	47.1	45.0	47.2	48.1	47.1	47.1	....	48.0	46.7
27	42.2	....	41.2	47.2	46.0	46.7	48.8	46.8	47.3	46.7	48.0	46.5
28	41.9	....	39.3	47.9	47.5	46.7	48.6	46.9	47.5	47.5	48.2	46.4
29	42.0	....	36.5	48.0	46.9	47.8	47.5	47.0	47.5	47.6	48.2	46.1
30	....	....	37.3	47.9	46.2	49.4	47.2	47.3	46.2	47.9	48.0	47.2
31	....	....	37.6	....	46.8	....	47.2	47.4	....	47.9	....	47.2



## Essex County--Continued

25.15.7.5.4.--Continued

Lowest daily water level, in feet below top of casing, 1935  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	46.4	....	42.5	43.6	47.3	49.9	49.6	50.5	....	52.8	....	51.0
2	46.9	....	43.1	43.8	47.4	49.2	49.6	50.9	....	53.0	51.8	51.7
3	47.1	47.0	43.0	44.0	46.4	50.3	49.0	50.9	....	53.0	51.9	51.7
4	47.2	47.0	44.1	44.1	47.1	50.8	49.2	50.3	....	53.1	53.4	51.8
5	47.2	46.9	43.9	43.4	47.2	56.2	50.2	50.1	....	53.2	52.9	51.7
6	47.3	49.5	42.8	....	46.8	53.6	53.4	51.0	....	53.2	53.1	51.8
7	47.2	....	42.1	....	47.2	51.5	52.1	51.0	....	54.6	53.1	51.8
8	47.2	....	42.3	....	47.0	51.2	50.0	52.3	50.5	54.0	53.4	51.6
9	45.4	....	42.6	....	47.2	50.7	49.5	55.8	50.1	53.1	53.5	51.4
10	45.4	46.7	43.6	....	46.6	49.9	49.5	59.9	50.4	53.1	52.8	51.0
11	46.4	....	42.6	....	46.4	49.0	49.5	59.0	50.6	53.3	52.5	51.2
12	47.2	....	43.4	....	46.4	49.0	49.4	51.9	50.7	53.8	52.4	51.4
13	47.2	47.4	53.7	46.8	46.0	49.4	49.2	51.8	50.6	53.4	52.6	51.8
14	47.1	47.4	52.3	47.3	46.5	50.0	49.4	58.0	50.7	54.3	52.6	51.8
15	47.2	46.8	43.1	47.6	47.2	50.6	49.3	59.8	50.6	54.6	52.4	51.6
16	47.1	46.2	42.9	47.5	47.3	50.4	49.5	58.5	50.5	54.3	52.4	51.6
17	47.1	46.2	42.9	47.6	47.1	50.0	50.3	54.6	50.8	53.5	52.4	51.6
18	46.6	....	43.5	47.8	....	50.1	51.0	52.9	50.8	54.0	51.7	51.7
19	47.3	....	42.4	47.8	....	50.0	51.4	52.3	50.8	55.9	51.5	51.6
20	47.4	....	42.5	47.8	48.1	50.1	51.3	52.0	50.7	55.0	51.3	51.2
21	46.9	....	42.5	47.8	49.1	50.2	51.3	51.6	50.7	55.2	51.0	51.6
22	46.9	43.8	45.1	47.5	48.5	50.0	50.1	51.5	50.7	53.8	51.4	51.7
23	46.7	43.2	46.6	47.5	48.5	50.0	50.2	53.1	50.9	52.3	51.9	51.9
24	....	44.4	47.2	47.8	48.4	49.6	49.7	52.1	50.9	52.4	51.9	51.9
25	....	44.9	47.9	48.2	50.2	49.6	49.5	51.7	50.8	52.4	52.0	51.8
26	46.8	44.9	47.7	48.6	50.7	50.1	49.5	51.1	51.2	52.8	52.0	51.5
27	47.0	44.2	46.3	54.5	51.3	49.9	50.2	51.2	52.0	52.8	51.2	51.4
28	47.2	44.0	43.6	54.5	51.8	49.7	49.6	....	52.2	54.6	51.6	49.5
29	47.3	....	44.2	49.5	53.9	49.7	49.7	....	52.2	53.9	51.1	49.5
30	47.2	....	43.7	48.2	51.6	49.7	49.7	....	52.8	53.2	51.0	49.3
31	47.1	....	43.6	....	50.0	....	50.0	....	....	51.9	....	49.6

Lowest daily water level, in feet below top of casing, 1936  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	49.5	....	48.6	48.2	49.5	50.7	49.1	52.0	49.8	50.3	49.2	49.3
2	49.3	....	48.3	47.2	49.7	52.0	49.3	51.9	49.9	50.3	50.8	49.2
3	....	....	45.3	47.1	49.7	53.7	49.7	54.7	50.0	49.4	50.2	49.3
4	46.9	....	43.7	49.4	49.5	53.2	49.7	55.8	50.2	49.1	49.3	50.2
5	47.1	....	43.2	49.6	50.0	53.8	49.7	54.4	50.1	50.5	49.4	52.0
6	47.0	....	43.2	49.5	49.3	54.9	49.5	52.4	50.2	49.5	49.5	51.7
7	47.0	....	43.1	49.2	50.4	54.6	49.6	52.0	49.7	49.0	49.5	52.0
8	49.1	....	43.2	49.5	50.5	54.4	49.8	51.8	50.4	49.4	49.3	53.0
9	49.1	....	43.2	49.7	50.5	53.6	....	55.4	52.7	53.3	49.5	52.7
10	....	....	45.2	48.5	51.1	52.3	57.1	58.3	52.5	52.4	49.6	52.1
11	47.7	....	44.3	48.8	50.9	51.2	54.8	53.9	51.3	50.5	49.6	51.6
12	48.0	....	....	48.9	49.8	50.7	51.9	58.5	51.0	50.0	49.5	52.5
13	....	....	....	48.9	48.9	50.4	51.0	....	51.5	50.2	49.5	51.9
14	....	....	48.6	41.1	50.3	49.9	51.1	....	51.2	50.0	49.5	56.3
15	....	....	50.0	39.7	50.6	49.9	51.8	....	51.1	50.4	49.3	52.1
16	....	....	51.6	39.2	50.7	49.9	51.6	45.7	50.8	50.7	49.6	51.6
17	....	....	51.8	47.1	50.6	49.9	51.5	44.2	50.9	49.7	49.6	51.9
18	....	....	51.5	48.2	50.9	49.9	51.3	43.8	50.5	49.5	49.5	51.8
19	47.8	....	51.0	49.0	51.1	49.9	51.2	42.2	....	51.0	49.6	51.4
20	48.2	....	51.1	49.3	51.3	49.7	51.4	40.6	51.0	50.2	49.3	49.8
21	48.4	....	51.7	42.2	50.3	49.3	51.6	47.2	49.9	50.5	49.3	51.1
22	47.7	49.2	51.0	39.5	51.3	49.0	56.2	49.1	50.3	50.4	49.2	50.9
23	....	49.2	49.5	38.8	51.3	49.2	53.4	49.4	50.2	49.6	49.4	51.3
24	....	49.1	49.5	38.7	51.3	49.1	51.3	49.3	50.2	49.7	49.4	51.4
25	....	49.0	48.2	38.5	50.2	49.0	51.3	49.6	50.0	49.7	49.4	50.6
26	....	49.1	46.6	38.3	51.1	49.1	51.2	49.7	49.8	49.3	49.4	51.6
27	....	49.0	....	46.0	51.4	49.1	50.4	49.7	49.8	49.6	49.4	51.0
28	....	49.0	46.0	48.5	50.9	49.0	50.7	49.7	50.0	49.6	49.4	....
29	....	49.0	47.2	48.8	50.9	49.1	51.3	49.8	50.0	49.1	49.2	52.6
30	....	....	48.7	49.2	50.9	49.0	51.7	49.7	49.8	49.1	49.3	51.8
31	....	....	47.8	....	50.8	....	52.0	50.0	....	49.2	....	52.0

## Essex County--Continued

25.15.7.5.4.--Continued

Lowest daily water level, in feet below top of casing, 1937  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	....	46.4	45.1	44.3	45.8	46.2	41.6	46.8	44.6	42.4	41.4	....
2	50.6	46.5	45.1	43.5	45.3	46.5	41.1	47.5	44.8	45.2	42.5	44.2
3	47.8	46.5	45.1	44.1	46.2	56.3	41.4	48.0	44.4	44.2	43.1	43.6
4	....	45.2	44.9	44.2	46.3	49.4	41.3	48.5	44.3	44.4	42.8	43.7
5	46.8	44.5	45.2	43.8	46.3	46.1	40.9	48.1	43.0	43.2	41.3	43.7
6	47.6	44.5	48.0	43.8	46.3	46.1	41.3	48.2	42.2	42.5	41.2	42.5
7	47.6	44.6	47.8	43.6	....	45.8	41.9	47.5	42.3	42.4	41.0	42.9
8	47.2	44.5	45.7	41.9	....	46.0	45.4	46.1	43.7	42.9	42.7	53.9
9	46.9	44.5	45.1	41.4	44.8	46.2	46.9	44.6	45.1	42.9	41.4	43.2
10	47.0	44.6	45.1	42.9	45.9	46.3	47.3	44.7	43.2	42.4	41.1	43.0
11	46.9	44.8	45.0	43.3	46.6	46.4	46.5	44.7	42.2	42.3	41.1	42.9
12	....	44.8	44.9	45.4	46.7	46.0	53.5	47.8	42.1	42.3	51.4	53.0
13	47.2	45.2	....	44.4	44.2	45.3	51.4	46.8	42.2	42.1	....	53.3
14	47.2	45.2	....	43.8	44.2	43.0	44.4	45.1	52.6	42.2	....	53.1
15	46.9	44.9	....	43.6	....	42.5	42.2	44.6	45.6	42.0	....	44.0
16	47.0	45.1	....	43.7	....	42.8	41.2	44.2	42.8	44.1	....	43.6
17	47.1	45.5	....	44.8	....	42.5	44.3	45.2	42.2	42.7	....	42.9
18	46.5	45.5	....	44.6	....	42.5	45.3	45.3	42.2	42.3	....	42.8
19	46.7	45.5	....	45.7	....	42.2	45.3	44.7	42.0	42.3	....	43.1
20	46.7	45.6	....	44.6	....	42.1	45.2	45.0	44.0	41.8	....	53.3
21	46.4	45.4	44.4	....	....	41.9	44.6	45.2	43.4	42.0	....	43.4
22	46.2	44.8	44.4	....	....	42.2	46.1	44.0	43.2	41.7	....	43.4
23	46.1	44.7	44.4	....	....	42.2	47.7	43.0	42.2	41.3	....	43.6
24	46.1	44.4	44.6	....	44.2	42.1	48.4	42.5	43.9	41.4	....	43.5
25	46.3	44.4	44.4	43.8	44.3	42.0	48.4	41.9	43.6	41.5	....	43.6
26	46.5	44.5	44.7	45.6	44.4	41.8	48.3	41.8	42.7	41.3	....	42.8
27	46.7	45.0	44.6	44.8	44.4	41.8	47.0	42.0	44.3	41.1	....	54.2
28	46.4	45.2	44.1	49.6	45.7	41.3	45.4	43.9	43.3	40.9	....	53.2
29	46.8	....	46.5	50.1	46.5	41.5	48.7	42.7	42.7	41.0	....	45.5
30	49.9	....	45.2	....	46.5	41.7	49.2	42.2	42.5	41.1	....	53.6
31	48.6	....	44.6	....	46.0	....	49.1	44.3	....	41.3	....	55.9

Lowest daily water level, in feet below top of casing, 1938  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	45.0	36.4	39.5	31.9	39.5	35.7	37.0	38.2	38.3	....	35.9	34.9
2	39.4	36.4	37.5	33.2	39.9	37.3	36.9	38.1	37.3	....	35.6	34.7
3	40.4	36.2	35.9	32.2	41.1	37.5	37.0	38.9	38.3	....	35.6	34.8
4	40.5	36.1	35.6	34.2	39.7	37.3	34.8	38.4	36.7	....	36.1	35.9
5	40.8	36.0	35.7	32.8	38.3	37.6	36.8	50.9	37.3	34.9	....	36.4
6	40.6	35.8	36.5	32.3	41.1	38.3	38.2	41.1	39.8	34.4	....	34.1
7	38.2	35.8	37.9	34.2	53.1	38.6	40.8	36.5	38.7	34.5	....	33.2
8	39.3	35.9	36.6	32.8	49.8	39.0	40.9	38.6	36.5	34.4	....	44.1
9	39.3	35.9	28.4	....	41.1	37.9	....	36.4	53.7	34.2	....	47.7
10	40.8	36.0	26.7	....	38.4	37.9	....	35.6	....	....	....	46.5
11	38.8	36.0	25.9	....	38.0	38.5	38.6	35.4	....	35.3	....	46.7
12	37.3	36.0	32.7	....	36.4	39.4	37.7	35.5	....	34.8	....	50.9
13	37.3	35.7	34.8	....	38.0	39.1	38.1	35.5	....	....	....	51.6
14	37.3	35.8	34.9	....	38.4	39.3	50.0	35.2	....	....	....	51.7
15	37.2	36.0	28.4	....	38.9	39.1	43.9	38.4	....	....	....	51.9
16	37.2	35.8	27.4	32.3	38.6	50.0	38.2	38.4	....	....	....	51.7
17	36.9	35.9	26.3	32.3	37.4	39.0	37.9	38.9	....	....	....	51.7
18	37.4	35.7	26.1	32.3	37.9	38.5	37.2	37.1	....	....	....	51.8
19	37.0	35.7	....	34.8	38.8	37.8	37.3	35.9	....	....	....	52.0
20	37.1	35.3	....	36.6	40.1	38.6	37.0	35.6	....	....	....	52.0
21	37.1	35.7	....	37.3	42.0	38.6	36.9	35.6	....	35.4	....	52.0
22	36.8	35.7	....	37.0	41.1	38.6	36.8	37.8	....	35.8	37.2	52.1
23	36.8	35.7	....	37.5	38.9	38.1	....	37.0	....	35.9	36.8	52.1
24	36.9	35.4	....	37.7	39.2	38.6	....	36.5	36.1	35.8	35.4	51.9
25	36.8	35.2	....	38.3	39.5	42.2	....	35.9	35.0	35.9	34.9	52.1
26	35.8	35.4	34.9	38.0	39.2	41.1	....	35.9	36.2	....	....	52.2
27	35.6	35.4	34.7	38.4	38.1	38.4	....	38.1	34.8	36.0	34.8	....
28	34.8	37.9	34.0	38.5	37.6	37.5	....	37.9	34.3	....	34.8	....
29	34.7	....	33.0	38.8	....	36.9	....	38.5	34.2	36.0	37.1	....
30	....	....	32.4	40.6	35.3	37.3	39.1	38.9	....	35.9	35.7	....
31	35.7	....	32.2	....	35.7	....	37.1	39.3	....	35.8	....	....

## Essex County--Continued

25.15.7.5.4.--Continued

Lowest daily water level, in feet below top of casing, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	....	35.5	34.3	....	....	36.7	34.3	36.6	36.6	....	....	....
2	....	34.8	33.4	....	....	35.5	33.8	36.3	36.8	....	....	....
3	....	34.9	32.7	....	....	42.5	35.5	35.5	36.8	....	....	50.0
4	....	....	32.6	....	44.1	38.0	33.4	33.1	36.4	47.8	51.4	50.7
5	....	....	32.6	....	39.0	35.8	35.4	32.2	36.5	47.9	50.4	50.9
6	....	....	32.5	....	....	37.2	36.3	32.0	46.7	48.5	....	50.0
7	....	....	32.6	....	....	37.5	37.3	35.3	40.6	47.8	....	49.5
8	....	....	32.6	....	....	37.7	42.6	34.0	37.6	48.3	50.9	50.0
9	35.8	....	32.4	....	....	44.5	39.0	32.6	37.9	47.5	....	49.7
10	34.2	....	32.4	....	....	44.7	45.1	35.6	37.9	47.8	49.1	49.7
11	33.3	....	32.2	....	32.4	39.3	38.8	36.6	37.6	48.3	50.9	50.3
12	33.0	....	31.9	....	31.8	44.0	37.9	37.0	38.4	47.9	50.1	50.4
13	33.7	....	31.9	....	....	39.4	37.9	35.2	38.8	50.2	51.0	49.6
14	34.0	....	....	....	....	44.7	37.6	35.1	38.8	51.2	51.1	49.7
15	34.1	....	....	....	....	38.0	37.6	36.6	38.8	51.2	50.8	49.7
16	34.2	....	....	....	....	37.9	37.2	36.4	38.6	49.3	50.9	49.3
17	34.2	....	....	....	32.0	38.0	37.5	37.2	38.7	49.5	51.3	49.8
18	34.1	....	....	....	31.4	36.4	37.9	38.5	38.9	49.6	50.6	50.0
19	33.6	....	....	....	31.3	36.0	38.0	38.6	38.9	....	50.8	50.1
20	33.7	....	....	....	....	34.0	38.1	35.2	39.0	....	51.0	49.6
21	33.7	....	....	....	....	35.6	38.1	37.0	39.0	....	50.9	50.0
22	33.5	43.1	....	....	....	36.8	38.1	37.2	39.2	51.6	50.9	50.4
23	35.7	45.0	....	....	....	36.0	37.9	36.9	39.0	51.7	51.0	50.4
24	34.4	47.2	....	....	....	35.2	....	37.2	38.6	51.1	50.1	50.3
25	33.9	47.3	....	....	....	34.7	....	37.8	38.6	....	....	50.2
26	34.0	43.9	....	....	....	35.0	....	37.2	....	51.1	....	50.1
27	34.0	42.3	....	....	30.8	35.3	....	36.6	....	51.6	....	50.3
28	34.0	39.7	....	....	32.8	36.9	39.1	35.9	....	....	....	50.1
29	34.0	....	....	....	33.7	37.3	46.2	36.6	....	....	....	50.1
30	33.9	....	....	....	34.7	34.9	36.2	36.4	....	....	....	49.8
31	35.5	....	....	....	37.7	....	36.4	36.0	....	....	....	50.2

25.15.7.5.1. Canoe Brook Area. Commonwealth Water Company well 35. Commonwealth Water Company. About 0.6 mile north of the Canoe Brook pumping station of the Commonwealth Water Company, 0.9 mile northwest of the White Oak Ridge pumping station of the City of East Orange and about 1.5 miles northeast of the town of Chatham. Diameter 10 inches, depth about 135 feet. Measuring point top of casing, about 4.5 feet above land surface and 170.28 feet above mean sea level. First measured Oct. 2, 1925. Well now covered over and cannot be measured. Fluctuations of water level, as much as 13 feet in a day, were caused by pumping of nearby wells.

Water level, in feet below top of casing, 1925  
(tape measurements)

Date	Hour	Water level	Date	Hour	Water level
Oct. 2	2:45 p.m.	30.44	Oct. 3	10:51 p.m.	28.80
	4:25 p.m.	30.62		11:09 p.m.	28.81
	5:40 p.m.	30.77		11:16 p.m.	28.83
	9:10 p.m.	30.98		11:20 p.m.	28.85
	9:25 p.m.	30.97		11:24 p.m.	28.87
Oct. 3	9:35 p.m.	30.96	Oct. 4	10:10 a.m.	28.26
	9:24 a.m.	28.49		11:22 a.m.	28.54
	10:35 a.m.	28.83		11:56 a.m.	28.75
	11:47 a.m.	29.17		2:58 p.m.	29.18
	2:20 p.m.	29.80	Oct. 5	9:30 a.m.	26.43
	3:20 p.m.	29.98		9:44 a.m.	26.53
	4:24 p.m.	30.04		12:31 p.m.	27.56
	5:08 p.m.	30.08		2:48 p.m.	28.25
	5:50 p.m.	30.13		5:25 p.m.	28.77
	8:00 p.m.	30.33	Oct. 6	9:00 p.m.	29.13
	9:47 p.m.	30.25		8:45 a.m.	27.79
	9:54 p.m.	30.11		9:33 a.m.	28.21
	10:01 p.m.	29.93		10:35 a.m.	28.42
	10:16 p.m.	29.43		11:28 a.m.	28.90
	10:20 p.m.	29.26		4:40 p.m.	29.34
	10:26 p.m.	29.10		5:27 p.m.	29.46
	10:32 p.m.	28.96	Oct. 7	8:55 p.m.	29.62
	10:40 p.m.	28.86		9:00 a.m.	28.20

## Essex County--Continued

25.15.7.5.1.--Continued

Water level, in feet below top of casing, 1925  
(from recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Dec. 17	28.4	Dec. 21	29.6	Dec. 25	29.0	Dec. 29	31.6
18	28.2	22	29.3	26	29.2	30	31.5
19	28.3	23	28.9	27	28.4	31	30.8
20	29.2	24	30.0	28	30.5		

Lowest daily water level, in feet below top of casing, 1926  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	31.4	30.5	....	....	35.4	....	....	40.4	41.3	41.0	....	39.0
2	30.5	30.4	....	....	32.0	....	....	40.2	40.6	40.5	....	38.8
3	30.4	29.7	....	....	30.6	....	....	43.3	39.3	40.4	....	38.2
4	31.4	27.1	....	....	34.9	....	....	45.7	....	42.3	....	....
5	31.2	27.3	....	....	32.1	31.5	....	45.3	....	42.0	....	37.7
6	30.8	28.1	....	....	31.4	28.3	....	44.5	....	37.4	40.1	39.4
7	30.7	29.0	....	....	36.0	30.7	....	42.6	....	37.1	40.1	40.0
8	30.7	29.8	....	....	35.6	34.8	....	....	....	36.5	41.4	40.2
9	29.8	29.8	....	....	35.6	36.4	....	43.5	....	36.4	41.0	39.8
10	27.4	29.8	....	....	31.8	36.8	51.7	45.0	....	34.9	39.6	38.6
11	28.1	30.4	....	....	26.5	37.3	49.7	45.9	....	35.7	39.8	38.9
12	35.3	29.0	....	....	....	37.2	45.2	46.8	....	36.1	39.6	38.1
13	37.5	27.7	....	....	....	37.3	45.1	....	....	36.1	40.5	39.2
14	30.8	25.3	....	....	....	36.9	44.6	....	....	36.4	40.0	40.3
15	28.5	....	....	28.3	33.4	37.6	....	....	....	36.2	41.1	40.0
16	30.7	....	....	28.0	28.3	37.7	....	....	....	37.0	40.0	39.8
17	29.6	....	....	29.8	30.3	35.5	41.5	....	....	36.5	39.7	....
18	28.4	....	....	28.0	35.3	37.6	40.1	....	39.9	36.1	39.1	38.7
19	31.7	....	....	29.2	35.1	37.6	40.7	....	39.3	36.8	36.7	38.9
20	33.4	....	....	30.6	30.8	38.1	42.0	....	40.7	32.7	....	39.8
21	33.3	....	....	28.0	30.3	38.1	44.8	38.2	40.8	36.0	....	41.1
22	28.2	....	....	30.6	33.0	38.2	48.0	37.1	42.1	36.2	....	40.0
23	....	....	....	31.0	31.1	38.1	49.6	37.8	40.8	35.9	....	40.0
24	....	....	....	....	29.9	37.0	44.8	38.2	39.8	35.3	....	39.7
25	30.3	....	....	....	35.0	36.6	40.0	37.2	41.0	35.4	....	....
26	41.2	....	....	....	37.6	37.1	43.1	38.3	40.6	36.5	....	....
27	31.6	....	....	....	36.3	32.4	43.2	38.9	41.4	36.4	38.6	40.8
28	29.6	....	....	....	43.9	36.6	42.0	39.4	41.0	37.0	39.3	39.4
29	29.2	....	....	....	....	37.5	40.7	39.4	40.5	36.0	40.3	38.9
30	30.2	....	....	....	....	37.9	43.5	41.2	40.4	....	38.8	38.5
31	30.6	....	....	....	....	....	40.7	42.4	....	....	....	37.5

Lowest daily water level, in feet below top of casing, 1927  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July
1	....	44.4	40.0	39.7	31.1	....	44.7
2	....	43.5	38.8	40.3	33.4	....	45.0
3	....	43.3	38.7	39.4	33.0	....	42.8
4	....	42.7	38.3	41.7	33.7	....	41.3
5	....	41.1	39.2	40.0	32.5	....	42.6
6	....	41.9	40.1	40.2	31.6	....	45.9
7	....	42.9	40.1	41.1	33.3	....	44.0
8	....	43.4	38.9	39.7	33.8	....	44.3
9	....	43.2	35.4	41.7	32.5	....	....
10	....	41.9	....	41.0	32.2	....	....
11	40.8	40.3	....	40.4	34.4	47.5	....
12	40.2	40.0	....	43.7	33.6	47.0	....
13	40.0	38.2	....	41.4	34.3	45.7	....
14	39.8	42.3	....	41.2	40.1	45.6	....
15	40.0	42.1	....	44.8	41.1	42.0	....
16	39.2	40.4	....	44.0	35.1	42.8	....
17	40.8	40.8	....	42.3	40.4	44.4	....
18	41.1	38.2	....	42.9	36.4	44.3	....

## Essex County--Continued

25.15.7.5.1.--Continued

Lowest daily water level, in feet below top of casing, 1927  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July
19	41.4	40.2	39.4	43.2	33.3	43.7	....
20	41.2	38.9	39.3	45.1	32.7	45.3	....
21	40.6	40.6	39.6	....	....	45.7	....
22	40.1	39.8	....	....	....	45.2	....
23	40.8	38.9	....	40.8	....	44.6	....
24	30.8	40.2	....	43.4	....	45.5	....
25	32.3	39.9	....	42.4	....	43.8	....
26	38.7	39.0	40.8	44.4	....	41.3	....
27	40.1	36.9	39.0	40.2	....	45.0	....
28	39.8	40.0	41.6	....	....	46.8	....
29	40.3	....	41.5	....	....	46.8	....
30	40.9	....	39.5	32.5	....	46.1	....
31	42.2	....	41.5	....	....	....	....

26.21.1.5.6. Canoe Brook Area. Short Hills test well 10. Description given in Water-Supply Papers 817 and 845. Lowest water level, 28.95 feet below top of casing Dec. 6, 1939.

Water level, in feet below top of casing, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 9	20.02	June 6	21.33	Aug. 7	25.94	Nov. 9	28.64
Mar. 7	17.99	July 17	24.79	Oct. 3	28.24	Dec. 6	28.95
May 4	11.07						

26.21.1.5.8. Canoe Brook Area. Short Hills well 14. Description given in Water-Supply Paper 817. Water level, in feet below top of casing, 1939: Jan. 9, 23.82; Mar. 7, 21.33; May 4, 15.20; June 6, a.

## Middlesex County

Average of water levels in water-table wells in Runyon Area

near Runyon, N. J., in feet above an assumed datum, 1939

Date	Wells less than 25 feet in depth		Wells 25 feet or more in depth	
	Number of wells	Water level	Number of wells	Water level
Jan. 4	19	12.33	6	10.35
12	2	12.89	...	....
Feb. 14	4	13.84	...	....
20	19	13.24	6	11.21
Mar. 10	5	13.35	...	....
17	17	13.94	6	11.81
Apr. 11	20	13.75	6	12.13
27	4	13.07	...	....
May 4-5	21	12.63	6	13.13
June 17-18	21	10.95	6	11.81
July 12	19	9.75	6	11.24
25	4	10.36	...	....
Aug. 5	19	8.79	6	10.50
26	4	9.94	...	....
Sept. 20-22	21	8.93	6	9.06
Oct. 28-29	21	9.29	6	8.86
Nov. 16	19	10.41	6	8.09
29	4	9.99	...	....
Dec. 16	19	9.90	...	....
29	3	8.77	...	....

a Casing obstructed 23.24 feet below measuring point.

## Middlesex County--Continued

28.5.4.6.2.A. (B-2). Runyon Area. Description given in Water-Supply Paper 845. Lowest water level, 1.08 feet above mean sea level Dec. 29, 1939.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 14	10.14	May 5	9.68	Aug. 26	3.86	Nov. 29	3.50
Mar. 10	9.94	June 18	6.49	Sept. 22	3.27	Dec. 29	1.08
Apr. 27	10.04	July 25	5.12	Oct. 29	2.98		

28.5.4.6.2.B. (B-3). Runyon Area. Description given in Water-Supply Paper 845. Highest water level, 10.59 feet above mean sea level May 5, 1939.

Water level, in feet above mean sea level, 1939

Feb. 14	10.44	May 5	10.59	Aug. 26	4.13	Nov. 29	2.51
Mar. 10	10.30	June 18	7.37	Sept. 22	4.14	Dec. 29	3.86
Apr. 27	10.19	July 25	5.65	Oct. 29	3.52		

28.5.4.6.5. (B-4). Runyon Area. Description given in Water-Supply Paper 845.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 14	11.27	Apr. 27	11.00	June 18	10.94
Mar. 10	11.34	May 5	10.74	July 25	7.19

29.1.4.6.8. Runyon Area. Browntown test well. Description given in Water-Supply Paper 840. Highest water level, 28.14 feet above mean sea level Apr. 9 and 10, 1939.

Water level at end of day, in feet above mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	26.68	26.75	27.69	27.96	28.08	27.34	26.60	25.79	25.11	24.57	24.20	24.11
2	26.67	26.84	27.69	27.97	28.07	27.31	26.58	25.77	25.09	24.56	24.19	24.11
3	26.66	27.11	27.69	27.97	28.06	27.28	26.56	25.74	25.08	24.55	24.18	24.11
4	26.65	27.26	27.69	27.97	28.04	27.26	26.54	25.71	25.06	24.53	24.18	24.10
5	26.63	27.27	27.70	27.97	28.03	27.24	26.51	25.69	25.05	24.52	24.17	24.09
6	26.63	27.35	27.81	28.02	28.00	27.22	26.49	25.66	25.03	24.51	24.17	24.09
7	26.64	27.39	27.81	28.10	27.98	27.20	26.47	25.64	25.02	24.50	24.17	24.09
8	26.67	27.39	27.81	28.12	27.96	27.17	26.44	25.60	25.00	24.49	24.17	24.08
9	26.67	27.39	27.80	28.14	27.94	27.15	26.41	25.58	24.99	24.47	24.17	24.08
10	26.73	27.39	27.80	28.14	27.92	27.13	26.39	25.56	24.97	24.46	24.16	24.07
11	26.73	27.45	27.80	28.13	27.90	27.10	26.37	25.53	24.95	24.45	24.15	24.07
12	26.73	27.45	27.80	28.13	27.85	27.07	26.35	25.49	24.94	24.44	24.15	24.06
13	26.72	27.45	27.81	28.13	27.79	27.04	26.33	25.46	24.92	24.42	24.15	24.06
14	26.72	27.45	27.81	28.13	27.75	27.01	26.30	25.43	24.90	.....	24.15	24.05
15	26.71	27.51	27.85	28.13	27.71	26.99	26.25	25.41	24.88	.....	24.14	24.04
16	26.70	27.51	27.97	28.13	27.68	26.96	26.22	25.38	24.83	.....	24.14	24.03
17	26.69	27.51	27.98	28.12	27.65	26.94	26.17	25.35	24.82	.....	24.14	24.03
18	26.69	27.51	27.98	28.12	27.62	26.92	26.14	25.33	24.80	.....	24.12	24.02
19	26.68	27.51	27.98	28.12	27.58	26.89	26.11	25.31	24.78	.....	24.12	24.01
20	.....	27.51	27.98	28.11	27.56	26.87	26.09	25.29	24.76	.....	24.12	24.01
21	26.66	27.51	27.97	28.11	27.54	26.85	26.07	25.28	24.75	24.31	24.12	24.00
22	26.65	27.51	27.97	28.11	27.52	26.83	.....	25.26	24.73	24.30	24.12	23.99
23	26.64	27.50	27.97	28.11	27.50	26.80	.....	25.25	24.71	24.29	24.12	23.98
24	26.63	27.50	27.97	28.11	27.48	26.78	.....	25.23	24.69	24.28	24.12	23.98
25	26.62	27.49	27.96	28.11	27.46	26.75	.....	25.21	24.67	24.26	24.12	23.97
26	26.58	27.49	27.96	28.11	27.43	26.73	.....	25.20	24.66	24.25	24.12	23.96
27	26.56	27.48	27.96	28.10	27.43	26.70	.....	25.19	24.64	24.24	24.12	23.96
28	.....	27.61	27.96	28.10	27.41	26.67	25.90	25.17	24.62	24.24	24.11	23.95
29	26.61	.....	27.96	28.09	27.39	26.65	25.87	25.15	24.61	24.23	24.11	23.94
30	26.66	.....	27.95	28.09	27.37	26.63	25.84	25.14	24.59	24.21	24.11	23.94
31	26.70	.....	27.95	.....	27.36	.....	25.82	25.12	.....	24.21	.....	23.93

## Middlesex County--Continued

28.5.4.3.7. (C-1). Runyon Area. Description given in Water-Supply Paper 845. Lowest water level, 2.91 feet above mean sea level Dec. 29, 1939.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 14	6.28	May 5	5.33	Aug. 26	3.86	Nov. 29	4.06
Mar. 10	5.09	June 18	4.68	Sept. 22	3.60	Dec. 29	2.91
Apr. 27	5.46	July 25	4.37	Oct. 29	3.51		

28.5.4.3.7.A. (C-2). Runyon Area. Description given in Water-Supply Paper 845. Lowest water level, 3.05 feet above mean sea level Sept. 22, 1939.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 14	6.15	May 5	5.35	Aug. 26	3.86	Nov. 29	4.01
Mar. 10	5.83	June 18	4.73	Sept. 22	3.05	Dec. 29	3.45
Apr. 27	5.66	July 25	4.15	Oct. 29	4.55		

28.5.4.3.6. (D-1). Runyon Area. Description given in Water-Supply Paper 845.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 12	9.53	Apr. 27	11.46	July 25	9.13	Nov. 29	8.71
Feb. 14	11.53	May 5	10.13	Aug. 26	9.13	Dec. 29	6.41
Mar. 10	11.70	June 18	9.31	Oct. 29	8.78		

28.5.4.3.2. (D-2). Runyon Area. Description given in Water-Supply Paper 845. Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 12	12.54	Apr. 27	13.92	July 25	10.87	Oct. 29	10.54
Feb. 14	13.78	May 5	13.54	Aug. 26	10.90	Nov. 29	11.04
Mar. 10	14.04	June 18	11.54	Sept. 22	10.49	Dec. 29	9.74

28.5.4.8.1. Runyon Area. Duhermal observation well 1. Description given in Water-Supply Paper 845. Highest water level, 7.58 feet above mean sea level Apr. 18, 1939; lowest water level, 4.43 feet above mean sea level Dec. 26, 1939.

Water level at end of day, in feet above mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	6.16	6.02	6.92	7.37	7.24	6.48	5.79	5.24	5.05	4.72	4.57	4.73
2	6.11	6.08	6.92	7.30	7.22	6.46	5.76	5.22	5.03	4.74	4.55	4.75
3	6.11	6.17	6.94	7.26	7.26	6.43	5.74	5.20	4.99	4.77	4.52	4.72
4	6.10	6.27	7.00	7.22	7.22	6.40	5.72	5.18	4.96	4.77	4.51	4.68
5	6.13	6.37	7.05	7.21	7.18	6.37	5.70	5.16	4.94	4.74	4.55	4.65
6	6.14	6.51	7.08	7.26	7.14	6.34	5.67	5.13	4.93	4.72	4.57	4.65
7	6.18	6.63	7.07	7.25	7.10	6.31	5.64	5.12	4.90	4.71	4.56	4.66
8	6.16	6.76	7.10	7.34	7.08	6.28	5.62	5.10	4.89	4.70	....	4.60
9	6.13	6.83	7.13	7.36	7.07	6.25	5.59	5.08	4.88	4.69	....	4.58
10	6.13	6.91	7.14	7.44	7.03	6.22	5.57	5.05	4.88	4.70	....	4.58
11	6.08	6.94	7.18	7.49	6.98	6.19	5.55	5.04	4.88	4.70	....	4.61
12	6.05	6.96	7.23	7.52	6.94	6.15	5.53	5.03	4.88	4.71	....	4.63
13	6.04	6.97	7.21	7.53	6.92	6.13	5.51	5.02	4.88	4.71	....	4.63
14	6.03	6.99	7.21	7.56	6.89	6.10	5.51	5.01	4.88	4.72	4.53	4.60
15	6.00	6.98	7.24	7.56	6.86	6.08	5.50	5.02	4.86	4.69	4.54	4.57
16	6.00	6.93	7.22	7.54	6.85	6.06	5.48	5.03	4.86	4.68	4.54	4.54
17	6.00	6.96	7.21	7.55	6.84	6.06	5.47	5.03	4.84	4.67	4.53	4.53
18	6.03	6.96	7.21	7.58	6.81	6.05	5.47	5.02	4.83	4.65	4.53	4.51
19	6.05	6.99	7.23	7.56	6.80	6.03	5.47	5.05	4.82	4.63	4.53	4.50
20	6.05	6.98	7.26	7.51	6.77	6.02	5.46	5.06	4.79	4.62	4.58	4.50
21	6.05	7.03	7.29	7.49	6.76	5.99	5.45	5.05	4.79	4.60	4.64	4.48
22	6.04	6.98	7.33	7.42	6.74	5.97	5.45	5.02	4.78	4.60	4.69	4.47
23	5.98	6.95	7.37	7.37	6.72	5.95	5.42	4.99	4.77	4.58	4.69	4.45
24	5.98	6.93	7.41	7.34	6.68	5.93	5.40	4.98	4.75	4.57	4.70	4.45
25	5.94	6.88	7.43	7.31	6.66	5.90	5.38	4.97	4.73	4.55	4.74	4.44
26	5.92	6.93	7.43	7.31	6.63	5.88	5.35	4.96	4.72	4.55	4.77	4.43
27	5.91	6.86	7.40	7.27	6.61	5.87	5.34	4.95	4.74	4.54	4.77	....
28	5.90	6.94	7.39	7.28	6.57	5.85	5.33	4.95	4.73	4.54	4.76	....
29	5.88	....	7.36	7.29	6.55	5.83	5.31	5.01	4.73	4.52	4.75	....
30	5.92	....	7.39	7.28	6.53	5.82	5.30	5.04	4.73	4.54	4.74	....
31	5.99	....	7.34	....	6.50	....	5.26	5.06	....	4.58	....	....

## Middlesex County--Continued

28.5.4.8.7. Runyon Area. Duhermal observation well 2. Description given in Water-Supply Paper 845. Highest water level, 15.65 feet above mean sea level Apr. 11, 1939; lowest water level, 9.62 feet above mean sea level Dec. 23, 1939.

Water level at end of day, in feet above mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	13.07	12.93	14.59	15.19	14.76	13.39	12.27	11.25	10.56	10.05	9.71	9.94
2	12.93	13.11	14.65	15.05	14.72	13.35	12.21	11.22	10.56	10.04	9.70	9.99
3	12.90	13.39	14.68	15.03	14.72	13.34	12.21	11.20	10.54	10.04	9.72	9.92
4	12.83	13.50	14.79	14.98	14.66	13.31	12.20	11.17	10.56	10.04	9.76	9.89
5	12.91	13.78	14.82	14.96	14.62	13.30	12.15	11.12	10.48	10.05	9.85	9.87
6	12.91	13.97	14.80	15.21	14.59	13.17	12.11	11.10	10.48	10.04	9.84	9.84
7	13.04	13.83	14.70	15.38	14.54	13.17	12.09	11.07	10.48	10.00	9.86	9.91
8	12.98	13.99	14.80	15.60	14.52	13.18	12.07	11.05	10.44	10.00	9.85	9.81
9	13.06	14.00	14.79	15.54	14.51	13.10	12.04	11.03	10.43	9.99	9.84	9.86
10	.....	14.16	14.69	15.64	14.41	13.06	11.96	10.97	10.42	9.99	9.96	9.86
11	.....	14.15	14.83	15.64	14.30	13.03	11.94	10.94	10.35	9.97	9.89	9.74
12	.....	14.26	14.94	15.47	14.22	12.95	11.91	10.93	10.34	9.97	9.94	9.78
13	.....	14.29	14.83	15.40	14.22	12.97	11.93	10.93	10.34	9.94	9.94	9.80
14	.....	14.33	14.83	15.52	14.22	12.89	11.86	10.89	10.34	9.91	9.93	9.71
15	.....	14.25	15.05	15.34	14.17	12.91	11.79	10.86	10.33	9.89	9.96	9.74
16	12.92	14.20	15.11	15.24	14.13	12.85	11.77	10.85	10.34	.....	10.00	9.80
17	12.92	14.39	15.14	15.30	14.11	12.78	11.74	10.81	10.25	.....	9.97	9.76
18	12.96	14.36	15.12	15.36	14.01	12.75	11.71	10.78	10.22	.....	9.98	9.71
19	12.84	14.42	15.16	15.30	14.01	12.73	11.66	10.81	10.25	.....	9.94	9.74
20	.....	14.32	15.13	15.21	13.97	12.69	11.61	10.79	10.26	.....	9.96	9.76
21	.....	14.45	15.17	15.23	13.93	12.64	11.58	10.76	10.25	.....	9.98	9.73
22	.....	14.23	15.08	15.11	13.92	12.64	11.58	10.73	10.21	.....	9.93	9.63
23	12.76	14.25	15.12	15.11	13.85	12.58	11.55	10.71	10.19	9.79	9.95	9.68
24	12.85	14.18	15.13	15.16	13.74	12.55	11.52	10.69	10.16	9.76	9.94	9.72
25	12.65	14.20	15.01	15.06	13.72	12.48	11.47	10.67	10.17	9.79	9.93	9.68
26	12.72	14.32	15.00	15.04	13.70	12.42	11.44	10.66	10.12	9.77	9.96	9.65
27	12.62	14.23	14.87	14.96	13.72	12.40	11.42	10.65	10.12	9.82	9.94	9.65
28	12.65	14.64	14.84	14.93	13.68	12.38	11.38	10.64	10.08	9.70	9.94	9.62
29	12.66	.....	14.89	14.94	13.58	12.38	11.36	10.64	10.10	9.71	9.92	9.70
30	12.89	.....	15.10	14.88	13.55	12.35	11.34	10.60	10.03	9.76	9.92	9.66
31	12.80	.....	15.05	.....	13.48	.....	11.28	10.58	.....	9.75	.....	9.63

28.5.4.7.7. Runyon Area. Duhermal observation well 3. Description given in Water-Supply Paper 845. Lowest water level, 1.30 feet above mean sea level Aug. 1 and 2, 1939. Heading for the table of water levels in Water-Supply Paper 845 should read: "Lowest daily water level, in feet above mean sea level, 1938 (from recorder charts)."

Lowest daily water level, in feet above mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.10	.....	4.10	3.35	2.95	1.80	.....	1.30	2.20	1.70	2.55	1.70
2	2.10	.....	3.25	3.20	2.85	1.55	.....	1.30	2.00	1.85	2.10	1.75
3	2.10	.....	2.95	3.15	2.90	1.60	.....	1.35	1.90	2.45	1.90	1.80
4	2.25	.....	2.90	2.50	3.00	1.60	1.70	1.40	1.85	2.25	1.75	1.65
5	2.20	.....	2.90	2.80	2.75	1.60	1.50	1.35	1.75	2.00	1.95	1.65
6	2.40	.....	3.40	2.85	2.65	1.85	1.45	1.45	1.65	1.85	2.60	1.65
7	3.90	3.40	2.95	3.50	2.60	1.85	1.50	1.45	1.50	1.80	2.35	1.60
8	3.00	3.40	2.70	4.05	2.55	1.75	1.50	1.45	1.60	1.75	2.15	1.45
9	2.85	3.10	2.70	3.70	2.30	1.85	1.45	1.50	1.65	1.70	1.80	1.40
10	2.60	3.30	2.60	3.55	2.10	1.85	.....	1.40	1.70	1.70	1.75	1.45
11	2.40	3.80	2.60	3.25	2.05	1.60	.....	1.40	1.65	1.75	1.75	1.65
12	2.25	3.40	3.10	2.05	2.30	1.80	.....	1.40	1.65	1.70	1.70	1.65
13	2.20	2.90	3.85	2.20	2.30	1.55	.....	1.40	1.70	1.75	1.70	1.80
14	2.30	2.90	3.45	2.75	2.25	1.95	.....	1.50	1.70	1.75	1.60	1.60
15	2.15	2.90	3.30	2.90	2.25	2.15	.....	1.60	1.70	1.65	1.55	1.80
16	2.20	3.05	3.40	2.75	2.30	1.95	.....	1.70	1.60	1.60	1.60	1.55
17	2.15	2.70	3.45	2.90	2.30	1.90	.....	1.70	1.55	1.60	1.60	1.55
18	2.20	2.70	3.05	3.10	2.25	2.10	1.85	1.70	1.55	1.55	1.60	1.45
19	2.45	2.70	2.90	3.35	2.25	2.05	1.90	1.70	1.60	1.45	1.65	1.50
20	2.30	2.65	2.85	3.50	2.15	2.05	1.70	2.90	1.55	1.45	2.10	1.60



## Middlesex County--Continued

28.5.4.7.7.--Continued

Lowest daily water level, in feet above mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
21	2.20	2.65	2.70	3.25	2.25	1.90	1.65	2.65	1.60	1.55	2.25	1.50
22	2.25	2.65	2.75	3.10	2.30	1.60	1.60	2.15	1.60	1.70	2.05	1.35
23	2.05	2.45	2.70	2.85	2.30	1.60	1.70	1.90	1.50	1.55	1.90	1.35
24	2.05	2.35	2.70	2.75	2.25	1.70	1.55	1.75	1.45	1.45	1.80	1.40
25	1.95	2.35	2.70	2.80	1.95	1.60	1.40	1.70	1.50	1.40	2.00	1.35
26	1.75	2.40	2.70	3.10	1.85	....	....	1.75	1.50	1.45	2.10	1.35
27	1.80	3.45	2.60	3.10	1.80	....	....	1.80	1.70	1.50	1.80	1.40
28	1.75	3.20	3.15	3.20	1.95	....	....	1.85	1.70	1.60	1.75	1.50
29	1.80	....	3.10	3.10	1.80	....	....	2.05	1.70	1.50	1.75	1.45
30	2.35	....	3.10	2.95	1.85	....	....	2.40	1.70	1.50	1.70	1.55
31	....	....	3.60	....	1.85	....	....	2.35	....	2.00	....	1.55

28.4.9.3.5. Runyon Area. Duhermal observation well 4. Description given in Water-Supply Paper 845. Highest water level, 11.75 feet above mean sea level Apr. 20, 1939; lowest water level, 4.55 feet above mean sea level July 28, 1939.

Water level at end of day, in feet above mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	....	9.04	9.93	9.77	10.12	7.45	8.55	6.15	6.90	7.30	5.00	4.70
2	7.67	9.04	9.90	9.73	10.04	6.40	8.50	6.20	7.30	7.40	5.00	4.75
3	7.62	9.45	9.84	9.66	10.00	6.30	8.40	6.60	7.25	6.70	4.95	5.00
4	7.93	10.03	9.81	9.76	9.92	6.45	8.25	6.05	7.15	6.65	4.95	4.90
5	8.08	9.84	9.86	9.57	9.84	6.35	8.15	6.90	6.35	6.70	5.35	5.00
6	8.45	9.87	9.88	9.93	9.78	7.00	6.90	6.75	6.10	7.00	5.05	4.85
7	8.66	9.87	9.80	10.89	9.73	5.90	6.60	6.95	5.90	7.15	5.30	4.90
8	8.64	9.89	9.75	11.03	9.03	5.70	6.35	6.60	5.75	8.20	5.25	4.95
9	8.32	9.84	9.73	10.98	9.61	5.30	6.30	6.35	6.15	8.40	4.95	5.20
10	8.22	9.88	9.60	10.76	6.75	5.15	7.35	6.15	6.40	7.50	5.05	5.40
11	8.18	9.99	9.64	10.62	8.75	5.20	7.60	6.15	6.25	7.75	....	5.20
12	8.09	10.02	9.77	10.85	8.87	5.75	7.65	6.90	5.70	7.25	....	5.10
13	7.94	9.92	9.82	11.32	8.98	5.65	7.65	7.50	5.75	7.30	....	5.10
14	8.46	9.82	9.81	11.48	9.02	7.15	7.70	6.35	5.55	7.35	....	5.10
15	8.49	9.78	9.85	11.54	9.02	7.50	7.75	6.25	5.30	7.75	....	5.20
16	8.50	9.45	10.01	11.58	8.95	7.50	7.75	6.00	5.90	7.15	5.30	5.40
17	8.50	9.65	10.01	11.64	8.96	7.65	7.85	6.80	6.05	6.20	5.15	5.60
18	8.55	9.66	9.92	11.70	8.85	7.70	8.00	6.95	5.90	6.00	5.35	5.20
19	8.54	9.66	9.83	11.73	8.85	7.70	7.90	7.10	5.65	5.80	5.70	5.05
20	8.52	9.61	9.85	11.75	8.85	5.75	7.85	7.50	5.50	5.60	5.40	4.95
21	8.51	9.63	9.81	11.74	8.85	6.10	6.65	6.85	5.50	5.75	5.10	5.20
22	8.51	9.54	9.78	11.68	8.90	7.00	6.40	6.50	5.60	5.95	5.35	5.20
23	8.43	9.49	9.76	11.64	8.80	7.50	6.25	6.30	5.90	5.35	5.80	5.55
24	8.51	9.44	9.74	11.60	8.70	7.80	5.85	6.25	6.00	5.20	5.20	6.05
25	8.47	9.40	9.69	11.13	7.95	8.10	5.65	6.50	5.90	5.15	5.35	5.90
26	8.44	9.58	9.64	10.76	8.25	8.15	5.55	6.45	6.40	5.00	5.50	5.45
27	8.39	9.61	9.62	10.12	6.50	8.10	4.80	8.10	6.20	4.95	5.05	5.60
28	8.36	9.79	9.70	9.86	8.00	8.20	4.55	7.90	6.25	5.05	4.85	5.60
29	8.41	....	9.68	10.26	8.10	8.30	5.30	8.30	5.90	5.70	4.75	5.30
30	8.80	....	9.79	10.20	8.20	8.45	6.15	8.25	6.55	5.05	4.70	5.40
31	9.11	....	9.79	....	8.20	....	6.00	7.85	....	5.20	....	6.00

28.5.7.1.5. Runyon Area. Duhermal observation well 5. E. I. du Pont de Nemours and Co., Hercules Powder Co., and National Lead Co. Approximately 300 yards north of Iresick Brook, 300 yards southwest of the road running from Old Bridge to Englishtown, and 1.1 miles south of the Town of Old Bridge. Diameter 6 inches, depth 72 feet. Drilled in 1939 to observe the fluctuations of water level in no. 3 sand. Measuring point, top of casing 1 foot above land surface and 22.08 feet above mean sea level. First measured Feb. 21, 1939. Highest observed water level, 14.94 feet above mean sea level Apr. 7 and 8, 1939; lowest, 10.26 feet above mean sea level Oct. 30, 1939.

## Middlesex County--Continued

28.5.7.1.5.--Continued

Water level at the end of day, in feet above mean sea level, 1939  
(from recorder charts)

Day	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	14.50	14.44	14.17	12.88	12.10	11.07	11.11	10.69	10.48	10.44
2	.....	14.50	14.46	14.12	12.85	12.06	11.05	11.16	10.75	10.48	10.46
3	.....	.....	14.42	14.08	12.83	12.03	11.04	11.17	10.78	10.48	10.46
4	.....	.....	14.33	14.03	12.83	12.00	11.09	11.13	10.80	10.49	10.46
5	.....	.....	14.30	14.00	12.79	11.91	11.14	11.03	10.80	10.60	10.47
6	.....	14.50	14.75	13.96	12.72	11.83	11.16	10.96	10.73	10.66	10.48
7	.....	14.40	14.94	13.92	12.67	11.83	11.27	10.89	10.73	10.70	10.50
8	.....	14.35	14.94	13.87	12.64	11.82	11.19	10.83	10.74	10.73	10.49
9	.....	14.30	14.88	13.85	12.59	11.80	11.20	10.89	10.74	10.72	10.50
10	.....	14.20	14.85	13.66	12.55	11.76	11.19	10.90	10.74	10.72	10.51
11	.....	14.20	14.78	13.68	12.54	11.74	11.18	10.91	10.75	10.71	10.50
12	.....	14.35	14.70	13.64	12.50	11.71	11.18	10.89	10.73	10.75	10.50
13	.....	14.50	14.68	13.62	12.50	11.69	11.19	10.81	10.77	10.72	10.51
14	.....	14.50	14.68	13.59	12.53	11.67	11.20	10.78	10.79	10.67	10.51
15	.....	14.60	14.63	13.53	12.46	11.64	11.13	10.79	10.80	10.64	10.51
16	.....	14.80	14.58	13.49	12.41	11.60	11.09	10.85	10.83	10.60	10.52
17	.....	14.66	14.59	13.46	12.38	11.56	11.02	10.86	10.76	10.56	10.53
18	.....	14.59	14.66	.....	12.36	11.54	11.05	10.81	10.66	10.54	10.51
19	.....	14.54	14.72	.....	12.31	11.49	11.14	10.76	10.58	10.54	10.51
20	.....	14.50	14.71	.....	12.21	11.45	11.26	10.74	10.54	10.51	10.51
21	14.10	14.43	14.69	.....	12.15	11.41	11.24	10.79	10.53	10.47	10.49
22	14.00	14.36	14.62	13.30	12.14	11.37	11.16	10.77	10.51	10.45	10.47
23	13.95	14.31	14.57	13.26	12.15	11.33	11.08	10.80	10.47	10.43	10.47
24	13.90	14.27	14.56	13.21	12.14	11.23	11.02	10.82	10.42	10.44	10.50
25	13.85	14.20	14.47	13.16	12.13	11.17	11.01	10.80	10.38	10.41	10.55
26	14.15	14.16	14.45	13.14	12.12	11.10	11.03	10.70	10.34	10.40	10.51
27	14.10	14.13	14.39	13.10	12.09	11.06	11.07	10.66	10.32	10.40	10.46
28	14.45	14.24	14.34	13.07	12.07	11.06	11.11	10.61	10.28	10.42	10.40
29	.....	14.22	14.30	13.03	12.07	11.09	11.15	10.57	10.23	10.44	10.34
30	.....	14.45	14.25	13.00	12.12	11.11	11.21	10.66	10.26	10.44	10.30
31	.....	14.43	.....	12.91	.....	11.09	11.24	.....	10.36	.....	10.29

28.4.9.5.1. Runyon Area. Duhermal observation well 9. E. I. du Pont de Nemours and Co., Hercules Powder Co., and National Lead Co. In Spotswood, N. J., on the south side of Manalapan Brook about 0.25 mile above junction of the Manalapan and the Matchaponix Brooks. Diameter 6 inches, depth 80 feet. Drilled in 1939 to observe water-level fluctuations in no. 3 sand. First measured Feb. 21, 1939. Highest observed water level, 14.5 feet above mean sea level Apr. 7, 1939; lowest, 11.4 feet above mean sea level May 25, 1939.

Water level at the end of day, in feet above mean sea level, 1939  
(from recorder charts)

Day	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	....	13.9	12.7	12.4	11.9	12.4	12.5	13.4	13.3	13.7	13.5
2	....	13.2	12.8	12.3	12.1	12.1	12.5	13.4	13.5	13.6	13.5
3	....	12.9	12.6	12.2	12.3	11.9	12.6	13.4	13.5	13.6	13.5
4	....	12.8	12.5	12.2	12.6	11.7	12.8	13.4	13.5	13.6	13.5
5	....	12.9	12.4	12.1	12.2	11.7	12.9	13.3	13.5	13.7	13.5
6	....	13.0	13.3	12.1	12.0	11.7	13.0	13.3	13.5	13.8	13.5
7	....	12.9	14.5	12.0	11.9	11.7	13.0	13.3	13.4	13.8	13.5
8	....	.....	14.0	12.0	11.9	11.7	13.1	13.3	13.4	13.7	13.5
9	....	.....	13.4	12.0	11.8	11.6	13.1	13.3	13.4	13.6	13.5
10	....	12.5	13.1	11.9	11.8	11.7	13.1	13.3	13.4	13.6	13.5
11	....	12.5	12.9	11.9	12.1	11.7	13.1	13.3	13.3	13.6	13.5
12	....	12.9	13.0	11.8	11.9	11.6	13.1	13.3	13.3	13.6	13.5
13	....	13.1	13.3	11.9	11.9	11.6	13.1	13.3	13.3	13.6	13.5
14	....	13.1	13.4	11.9	12.3	11.6	.....	13.3	13.3	13.6	13.5
15	....	13.1	13.4	11.8	12.1	11.6	.....	13.3	13.3	13.5	13.5
16	....	13.5	13.4	11.8	11.9	11.5	.....	13.3	13.3	13.5	13.5
17	....	13.4	13.4	11.7	11.8	12.0	.....	13.2	13.3	13.5	13.5
18	....	12.9	13.5	11.7	11.8	12.0	.....	13.2	13.3	13.5	13.5
19	....	12.8	13.6	11.6	11.8	11.6	.....	13.2	13.3	13.5	13.5
20	....	12.7	13.6	11.6	11.8	11.5	.....	13.2	13.3	13.5	13.5

## Middlesex County--Continued

## 28.4.9.5.1.--Continued

Water level at the end of day, in feet above mean sea level, 1939  
(from recorder charts)

Day	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
21	12.5	12.6	13.5	11.6	11.7	11.5	13.6	13.2	13.3	13.5	13.5
22	12.5	12.6	13.4	11.6	11.7	11.5	13.5	13.2	13.4	13.5	13.5
23	12.4	12.6	13.3	11.6	12.0	11.5	13.4	13.2	13.4	13.5	13.5
24	12.4	12.5	13.3	11.5	12.1	11.5	13.4	13.2	13.3	13.5	13.5
25	12.3	12.4	13.0	11.5	12.3	11.6	13.4	13.2	13.3	13.5	13.5
26	13.1	12.4	12.8	11.7	12.1	11.6	13.4	13.2	13.3	13.5	13.5
27	13.1	12.4	12.8	12.0	11.8	11.7	13.4	13.2	13.4	13.5	13.4
28	13.5	12.9	12.7	12.0	11.8	11.8	13.4	13.2	13.4	13.5	13.4
29	....	12.7	12.6	12.0	11.9	12.0	13.4	13.2	13.4	13.5	13.4
30	....	13.1	12.5	12.0	12.3	12.3	13.4	13.3	13.4	13.5	13.4
31	....	13.1	....	12.0	....	12.4	13.4	....	13.7	....	13.4

28.4.9.8.2. Runyon Area. Duhermal observation well 10. Description given in Water-Supply Paper 845. Highest observed water level, 21.89 feet above mean sea level Apr. 7 and 8, 1939; lowest, 19.68 feet above mean sea level Sept. 26 and 27, 1939.

Water level at the end of day, in feet above mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	20.48	21.12	....	21.44	21.14	20.73	20.53	19.95	20.10	19.79	20.03	20.08
2	20.47	21.00	....	21.44	21.11	20.73	20.44	19.94	20.08	19.89	20.00	20.10
3	20.46	21.30	21.36	21.35	21.09	20.73	20.36	19.94	20.05	19.92	20.00	20.10
4	20.42	....	21.34	21.22	21.05	20.77	20.32	19.97	20.04	19.89	19.99	20.09
5	20.42	....	21.41	21.20	21.02	20.76	20.28	19.98	20.00	19.87	20.18	20.08
6	20.97	....	....	21.51	21.00	20.64	20.25	19.97	19.97	19.85	20.25	20.06
7	21.05	....	21.33	21.89	20.98	20.61	20.23	19.93	19.96	19.83	20.22	20.07
8	20.90	....	21.27	21.74	20.94	20.61	20.20	19.96	19.94	19.82	20.23	20.04
9	20.74	....	21.25	21.58	20.94	20.57	20.18	19.98	19.94	19.82	20.20	20.04
10	20.68	....	21.19	21.53	20.86	20.55	20.19	19.96	19.95	19.82	20.21	20.04
11	20.62	....	21.19	21.54	20.82	20.59	20.19	19.94	19.90	19.80	20.20	20.01
12	20.57	....	21.40	21.48	20.82	20.56	20.13	19.93	19.89	19.77	20.20	20.01
13	20.60	....	....	21.48	20.82	20.58	20.13	19.91	19.87	19.77	20.20	20.01
14	20.55	....	....	21.48	20.82	20.71	20.13	19.92	19.86	19.75	20.19	20.01
15	20.53	....	....	21.47	20.73	20.69	20.09	19.91	19.84	19.75	20.18	20.00
16	20.52	....	....	21.43	20.77	20.61	20.06	19.90	19.83	19.75	20.18	20.00
17	20.49	....	21.51	21.45	20.74	20.55	20.08	19.89	19.81	19.72	20.18	20.00
18	20.49	....	21.44	21.51	20.72	20.56	20.09	19.87	19.76	19.72	20.18	19.99
19	20.46	....	21.39	21.55	20.68	20.55	20.03	20.18	19.76	19.72	20.17	19.99
20	20.44	21.16	21.36	21.54	20.68	20.55	19.99	20.30	19.76	19.72	20.16	20.02
21	20.43	21.15	21.32	21.50	20.67	20.51	19.96	20.27	19.76	19.76	20.16	20.02
22	20.44	21.11	21.29	21.43	20.67	20.48	19.96	20.21	19.73	19.78	20.16	20.00
23	....	21.08	21.27	21.40	20.64	20.48	19.94	20.16	19.73	19.76	20.16	19.99
24	....	21.04	21.26	21.39	20.57	20.48	19.91	20.13	19.72	19.74	20.14	19.99
25	....	21.02	21.23	21.34	20.60	20.48	19.89	20.14	19.70	19.74	20.13	19.97
26	20.38	21.31	21.21	21.31	20.74	20.43	19.88	20.14	19.68	19.74	20.13	19.96
27	20.34	21.39	21.18	21.31	20.82	20.38	19.91	20.13	19.70	19.76	20.12	19.95
28	20.31	....	21.34	21.28	20.82	20.36	19.91	20.11	19.71	19.77	20.11	19.94
29	20.35	....	21.33	21.23	20.83	20.39	19.94	20.10	19.71	19.76	20.08	19.94
30	21.02	....	21.48	21.21	20.80	20.54	19.97	20.14	19.75	19.81	20.08	19.95
31	21.34	....	21.50	....	20.77	....	19.97	20.13	....	19.98	....	19.94

28.4.9.3.1. Runyon Area. Duhermal observation well 11. E. I. du Pont de Nemours and Co., Hercules Powder Co., and National Lead Co. On bluff overlooking Duhermal Pond, about 1 mile northeast of Spotswood. Diameter 6 inches, depth 72 feet. Measuring point, 1 foot above land surface and 36.42 feet above mean sea level. First measured Mar. 16, 1939. Highest observed water level, 13.88 feet above mean sea level Apr. 20, 21, 22 and 24, 1939; lowest, 10.43 feet above mean sea level June 22, 1939. Fluctuations of water level in this well are affected by the level of the Duhermal Pond and by occasional pumping from a nearby well.

## Middlesex County--Continued

29.4.9.3.1.--Continued

Water level at end of day, in feet above mean sea level, 1939  
(from recorder charts)

Day	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	11.82	12.40	10.85	11.47	11.35	12.67	12.63	12.72	12.61
2	.....	11.82	12.29	11.18	11.30	11.43	12.67	12.75	12.71	12.65
3	.....	11.75	12.24	11.41	11.08	11.63	12.67	12.78	12.71	12.67
4	.....	11.76	12.17	11.66	10.72	11.74	12.67	12.77	12.70	12.64
5	.....	11.87	12.08	11.40	10.70	11.94	12.60	12.75	12.80	12.65
6	.....	12.22	12.01	10.99	10.79	12.01	12.57	12.74	12.83	12.64
7	.....	13.24	11.96	10.87	10.75	12.04	12.57	12.72	12.83	12.66
8	.....	13.24	11.84	10.82	10.70	12.07	12.56	12.73	12.83	12.61
9	.....	13.08	11.94	10.73	10.65	12.12	12.58	12.76	12.80	12.64
10	.....	12.82	11.64	10.78	10.70	12.14	12.62	12.76	12.80	12.67
11	.....	12.59	11.68	11.17	10.70	12.16	12.58	12.73	12.81	12.62
12	.....	12.66	11.60	10.95	10.75	12.21	12.55	12.71	12.84	12.60
13	.....	13.31	11.56	10.84	10.65	12.24	12.55	12.71	12.84	12.63
14	.....	13.53	11.56	11.22	10.62	12.27	12.51	12.71	12.82	12.59
15	.....	13.53	11.51	11.14	10.64	12.28	12.52	12.70	12.77	12.59
16	12.04	13.62	11.44	10.81	10.58	12.28	12.56	12.69	12.74	12.64
17	11.96	13.71	11.40	10.84	10.84	12.32	12.52	12.62	12.72	12.65
18	11.81	13.78	11.35	10.72	11.00	12.33	12.48	12.59	12.72	12.60
19	11.76	13.84	11.31	10.70	.....	12.51	12.48	12.59	12.72	12.61
20	11.71	13.88	11.27	10.54	.....	12.60	12.49	12.57	12.72	12.61
21	11.65	13.88	11.24	10.47	.....	12.62	12.48	12.60	12.71	12.59
22	11.65	13.88	11.24	10.62	10.62	12.59	12.47	12.62	12.71	12.59
23	11.61	13.85	11.18	11.02	10.62	12.55	12.50	12.57	12.77	12.59
24	11.60	13.88	11.14	11.24	10.58	12.54	12.51	12.55	12.71	12.63
25	11.58	13.55	10.92	11.42	10.64	12.54	12.53	12.54	12.69	12.61
26	11.52	13.06	10.82	11.22	10.66	12.56	12.52	12.54	12.71	12.58
27	11.48	13.00	10.85	11.06	10.64	12.58	12.54	12.53	12.69	12.57
28	11.72	12.82	10.85	11.12	10.74	12.62	12.54	12.53	12.67	12.56
29	11.70	12.67	10.85	11.19	10.95	12.63	12.54	12.53	12.60	12.55
30	11.86	12.52	10.85	11.39	11.17	12.68	12.61	12.57	12.61	12.57
31	11.94	.....	10.82	.....	11.25	12.70	.....	12.69	.....	12.59

29.1.4.5.1. (F-1). Runyon Area. Description given in Water-Supply Paper 845.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 4	17.84	Apr. 27	18.78	July 25	14.74	Oct. 29	14.72
12	18.5	May 4	18.21	Aug. 5	14.73	Nov. 16	15.83
Feb. 14	18.87	5	18.13	26	14.80	29	15.95
20	18.83	June 17	16.23	Sept. 20	14.81	Dec. 16	14.83
Mar. 10	18.68	18	16.28	22	14.81	29	14.77
Apr. 11	19.13	July 12	15.73				

29.1.4.5.2. (F-2). Runyon Area. Description given in Water-Supply Paper 845.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 4	20.45	Apr. 27	21.37	July 25	16.22	Oct. 29	15.86
12	21.06	May 4	21.16	Aug. 5	16.16	Nov. 16	16.26
Feb. 14	21.56	5	21.12	26	15.86	29	16.34
20	21.66	June 17	18.46	Sept. 20	15.76	Dec. 16	15.66
Mar. 10	21.76	18	18.54	22	15.33	29	15.70
Apr. 11	22.16	July 12	16.72				

29.1.4.3.9. (F-3). Runyon Area. Description given in Water-Supply Papers 817 and 845. Adjusted altitude of measuring point, 70.21 feet above mean sea level (see text). Highest water level, 31.91 feet above mean sea level June 17, 1939.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 4	29.69	Apr. 11	30.61	July 12	31.59	Oct. 28	30.71
Feb. 20	29.68	May 4	31.55	Aug. 5	31.22	Nov. 16	27.87
Mar. 17	29.99	June 17	31.91	Sept. 20	30.11	Dec. 16	29.21

## Middlesex County--Continued

29.1.5.1.4. (F-4). Runyon Area. Description given in Water-Supply Paper 845. Highest water level, 29.47 feet above mean sea level July 12, 1939.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 4	27.22	Apr. 11	27.59	July 12	29.47	Oct. 28	28.01
Feb. 20	27.99	May 4	28.09	Aug. 5	28.69	Nov. 16	27.47
Mar. 17	27.36	June 17	29.44	Sept. 20	26.66	Dec. 16	26.64

29.1.5.1.9. (F-5). Runyon Area. Description given in Water-Supply Paper 845.

Water level, in feet above mean sea level, 1939

Jan. 4	102.35	Apr. 11	104.20	July 12	100.35	Oct. 28	99.18
Feb. 20	103.70	May 4	103.10	Aug. 5	99.32	Nov. 16	101.23
Mar. 17	104.55	June 17	101.29	Sept. 20	99.34	Dec. 16	100.25

29.1.5.6.3. (F-9). Runyon Area. Description in Water-Supply Paper 845. Lowest water level, 98.57 feet above mean sea level Oct. 28, 1939.

Water level, in feet above mean sea level, 1939

Jan. 4	105.11	Apr. 11	106.46	July 12	101.14	Oct. 28	98.57
Feb. 20	106.01	May 4	105.38	Aug. 5	99.17	Nov. 16	104.59
Mar. 17	106.68	June 17	102.01	Sept. 20	100.08	Dec. 16	101.51

29.1.5.6.3.A. (F-10). Runyon Area. Description given in Water-Supply Paper 845. Lowest water level, 119.55 feet above mean sea level Aug. 5, 1939.

Water level, in feet above mean sea level, 1939

Jan. 4	125.21	Apr. 11	125.95	July 12	121.61	Oct. 28	123.30
Feb. 20	125.95	May 4	124.95	Aug. 5	119.55	Nov. 16	124.86
Mar. 17	126.15	June 17	122.55	Sept. 20	119.83	Dec. 16	123.22

29.1.5.4.6. (F-11). Runyon Area. Description given in Water-Supply Paper 845.

Water level, in feet above mean sea level, 1939

Jan. 4	29.23	Apr. 11	32.30	July 12	29.99	Oct. 28	26.87
Feb. 20	31.05	May 4	32.13	Aug. 5	29.18	Nov. 16	26.42
Mar. 17	31.59	June 17	30.85	Sept. 20	27.76	Dec. 16	25.90

29.1.5.4.8. (F-12). Runyon Area. Description given in Water-Supply Paper 845. Highest water level, 34.98 feet above mean sea level May 4, 1939.

Water level, in feet above mean sea level, 1939

Jan. 4	32.37	Apr. 11	34.04	July 12	33.24	Oct. 28	30.10
Feb. 20	32.66	May 4	34.98	Aug. 5	32.82	Nov. 16	28.67
Mar. 17	33.44	June 17	33.76	Sept. 20	30.61	Dec. 16	30.76

29.1.5.4.8.A. (F-13). Runyon Area. Description given in Water-Supply Paper 845.

Water level, in feet above mean sea level, 1939

Jan. 4	43.62	Apr. 11	45.57	July 12	42.76	Oct. 28	42.52
Feb. 20	45.12	May 4	44.32	Aug. 5	41.70	Nov. 16	43.52
Mar. 17	46.12	June 17	43.17	Sept. 20	42.37	Dec. 16	43.17

29.1.5.7.2. (F-14). Runyon Area. Description given in Water-Supply Papers 817 and 845. Adjusted altitude of measuring point, 43.52 feet above mean sea level (see text).

Water level, in feet above mean sea level, 1939

Jan. 4	37.02	Apr. 11	38.86	July 12	33.77	Oct. 28	29.86
Feb. 20	38.00	May 4	37.82	Aug. 5	31.64	Nov. 16	30.72
Mar. 17	38.52	June 17	35.42	Sept. 20	30.90	Dec. 16	30.12

## Middlesex County--Continued

29.1.5.7.5.A. (F-16). Runyon Area. Description given in Water-Supply Paper 845. Highest water level, 89.34 feet above mean sea level Mar. 17, 1939.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 4	87.69	Apr. 11	88.76	July 12	85.84	Oct. 28	86.24
Feb. 20	88.66	May 4	87.89	Aug. 5	85.45	Nov. 16	87.71
Mar. 17	89.34	June 17	86.41	Sept. 20	85.70	Dec. 16	88.19

29.1.4.7.6. (F-20). Runyon Area. Description given in Water-Supply Paper 845. Highest water level, 36.62 feet above mean sea level Apr. 11, 1939.

Water level, in feet above mean sea level, 1939

Jan. 4	34.08	Apr. 11	36.62	July 12	32.74	Oct. 28	29.90
Feb. 20	35.02	May 4	35.77	Aug. 5	31.50	Nov. 16	30.10
Mar. 17	36.37	June 17	34.02	Sept. 20	30.60	Dec. 16	29.77

29.1.4.9.8. (F-21). Runyon Area. Description given in Water-Supply Paper 845.

Water level, in feet above mean sea level, 1939

Jan. 4	64.73	Apr. 11	65.31	July 12	62.18	Oct. 28	63.63
Feb. 20	65.49	May 4	64.97	Aug. 5	61.53	Nov. 16	64.77
Mar. 17	65.63	June 17	63.23	Sept. 20	63.07	Dec. 16	64.13

29.1.7.3.5. (F-22). Runyon Area. Description given in Water-Supply Paper 845.

Water level, in feet above mean sea level, 1939

Jan. 4	86.48	Apr. 11	87.39	July 12	83.75	Oct. 28	84.01
Feb. 20	87.31	May 4	86.16	Aug. 5	81.40	Nov. 16	85.94
Mar. 17	87.81	June 17	84.41	Sept. 20	80.81	Dec. 16	85.18

29.11.1.2.5. (F-26). Runyon Area. Description given in Water-Supply Paper 845. Highest water level, 88.10 feet above mean sea level Apr. 11, 1939.

Water level, in feet above mean sea level, 1939

Jan. 4	87.71	Apr. 11	88.10	July 12	85.87	Oct. 28	85.96
Feb. 20	88.08	May 4	87.66	Aug. 5	85.76	Nov. 16	85.88
Mar. 17	87.76	June 17	86.71	Sept. 20	85.43	Dec. 16	85.49

29.11.1.2.5.A. (F-27). Runyon Area. Description given in Water-Supply Paper 845. Highest water level, 88.00 feet above mean sea level Apr. 11, 1939.

Water level, in feet above mean sea level, 1939

Jan. 4	86.46	Apr. 11	88.00	July 12	85.40	Oct. 28	84.98
Feb. 20	87.58	May 4	87.36	Aug. 5	88.38	Nov. 16	84.93
Mar. 17	87.88	June 17	86.28	Sept. 20	84.91	Dec. 16	85.23

28.4.4.2.1. Incorrectly given 28.4.1.7.8 in Water-Supply Paper 845. Runyon Area. Fischer test well. Description given in Water-Supply Paper 845. Deepened 2 feet Nov. 3, 1939. Highest water level, 12.58 feet below measuring point Apr. 26 and 27, 1939; lowest water level, 17.68 feet below measuring point Dec. 31, 1939.

Water level at the end of day, in feet below measuring point, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	15.07	15.32	14.02	.....	12.69	13.44	.....	15.21	16.04	16.71	.....	17.42
2	15.08	15.27	13.99	.....	12.73	13.48	.....	15.24	16.06	16.74	.....	17.42
3	15.10	15.10	13.94	.....	12.74	13.50	.....	15.26	16.08	16.75	17.24	17.42
4	15.14	15.07	13.87	.....	12.76	13.53	.....	15.29	16.10	16.77	17.25	17.43
5	15.14	14.94	13.82	.....	12.78	13.54	.....	15.32	16.12	16.79	17.21	17.44
6	15.14	14.81	13.80	.....	12.80	13.59	.....	15.35	16.14	16.80	17.24	17.46
7	15.14	14.76	13.80	.....	12.82	13.62	.....	15.38	16.16	16.82	17.28	17.47

## Middlesex County--Continued

## 28.4.4.2.1.--Continued

Water level at the end of day, in feet below measuring point, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
8	15.14	14.72	13.77	.....	12.83	13.63	.....	15.40	16.18	16.84	17.28	17.49
9	15.15	14.68	13.73	.....	12.82	13.66	.....	15.42	16.21	16.86	17.29	17.50
10	15.13	14.62	13.72	.....	12.87	13.70	14.57	15.46	16.22	16.88	17.26	17.50
11	15.15	14.58	13.69	12.73	12.92	13.73	14.60	15.50	16.26	16.90	17.28	17.52
12	15.18	14.54	13.64	12.74	12.96	13.77	14.62	15.52	16.28	16.92	17.28	17.53
13	15.17	14.50	13.65	12.74	12.98	13.78	14.65	15.54	16.30	16.94	17.29	17.54
14	15.18	14.44	13.66	12.70	12.99	13.83	14.67	15.56	16.32	16.96	17.30	17.55
15	15.20	14.39	13.60	12.70	13.00	.....	14.71	15.60	16.34	16.98	17.30	17.56
16	15.20	14.40	13.56	12.70	13.02	.....	14.74	15.62	16.36	17.00	17.30	17.56
17	15.21	14.33	13.52	12.67	13.03	.....	14.77	15.64	16.38	17.00	17.31	17.56
18	15.18	14.28	13.46	12.64	13.07	.....	14.80	15.68	16.42	17.02	17.31	17.56
19	15.22	14.24	13.41	12.63	13.08	.....	14.83	15.67	16.43	17.01	17.32	17.57
20	15.23	14.22	13.35	12.66	13.11	.....	14.86	15.69	16.44	17.02	17.33	17.58
21	15.24	14.18	13.32	12.65	13.13	.....	14.90	15.72	16.46	.....	17.34	17.58
22	15.22	14.17	13.30	12.66	13.15	.....	14.92	15.80	16.50	.....	17.34	17.59
23	15.26	14.16	13.26	12.64	13.18	.....	14.94	15.82	16.52	.....	17.35	17.60
24	15.22	14.11	13.22	12.60	13.23	.....	14.97	15.86	16.54	.....	17.36	17.61
25	15.27	14.10	13.22	12.59	13.25	.....	15.02	15.88	16.56	.....	17.36	17.62
26	15.28	14.06	13.21	12.58	13.28	.....	15.04	15.90	16.58	.....	17.37	17.63
27	15.30	14.08	13.21	12.60	13.29	.....	15.07	15.92	16.60	.....	17.38	17.64
28	15.32	14.00	13.21	12.63	13.31	.....	15.10	15.94	16.62	.....	17.39	17.65
29	15.30	.....	13.21	12.61	13.34	.....	15.13	15.96	16.67	.....	17.40	17.66
30	15.25	.....	13.20	12.62	13.36	.....	15.15	15.98	16.69	.....	17.41	17.67
31	15.30	.....	.....	.....	13.40	.....	15.18	16.01	.....	.....	.....	17.68

29.1.1.7.8. (G-1). Runyon Area. Description given in Water-Supply Paper 845. Lowest water level, 18.11 feet above mean sea level Dec. 29, 1939.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 12	21.37	Apr. 27	22.34	July 25	20.38	Oct. 29	19.24
Feb. 14	21.94	May 5	21.54	Aug. 26	19.59	Nov. 29	20.09
Mar. 10	21.94	June 18	20.64	Sept. 22	19.26	Dec. 29	18.11

29.1.1.7.8.A. (G-2). Runyon Area. Description given in Water-Supply Paper 845. Water level, in feet above mean sea level, 1939

Jan. 12	24.40	Apr. 27	25.28	July 25	23.18	Oct. 29	22.55
Feb. 14	24.76	May 5	24.65	Aug. 26	23.25	Nov. 29	23.23
Mar. 10	24.80	June 18	24.05	Sept. 22	22.48	Dec. 29	22.41

29.1.1.7.9. (G-3). Runyon Area. Description given in Water-Supply Paper 845. Water level, in feet above mean sea level, 1939

Jan. 12	27.46	Apr. 27	28.23	July 25	26.78	Oct. 29	26.06
Feb. 14	27.88	May 5	27.98	Aug. 26	26.51	Nov. 29	26.52
Mar. 10	27.98	June 18	27.48	Sept. 22	26.13	Dec. 29	25.78

29.1.1.8.4. (G-4). Runyon Area. Description given in Water-Supply Paper 845. Lowest water level, 28.07 feet above mean sea level Sept. 22, 1939.

Water level, in feet above mean sea level, 1939

Jan. 12	30.31	Apr. 27	31.53	July 25	30.03	Oct. 29	28.79
Feb. 14	31.16	May 5	31.46	Aug. 26	29.53	Nov. 29	29.12
Mar. 10	31.01	June 18	31.01	Sept. 22	28.07	Dec. 29	28.51

29.1.4.1.4. (J-1). Runyon Area. Description given in Water-Supply Paper 845. Lowest water level, 9.28 feet above mean sea level Dec. 29, 1939.

Water level, in feet above mean sea level, 1939

Jan. 12	14.10	Apr. 27	14.60	July 25	11.89	Oct. 29	11.38
Feb. 14	13.10	May 5	14.35	Aug. 26	11.75	Nov. 29	12.02
Mar. 10	15.08	June 18	12.30	Sept. 22	11.28	Dec. 29	9.28

## Middlesex County--Continued

29.1.4.1.6. Incorrectly given 29.1.4.1.5 in Water-Supply Paper 845.  
(J-2). Runyon Area. Description given in Water-Supply Paper 845.  
Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 12	15.38	Apr. 27	16.05	July 25	13.57	Oct. 29	13.22
Feb. 14	16.44	May 5	15.82	Aug. 26	13.38	Nov. 29	13.96
Mar. 10	16.30	June 18	14.32	Sept. 22	12.92	Dec. 29	12.64

29.1.4.2.7. Incorrectly given 29.1.4.1.6 in Water-Supply Paper 845.  
(J-3). Runyon Area. Description given in Water-Supply Paper 845.  
Water level, in feet above mean sea level, 1939

Jan. 12	16.77	Apr. 27	16.35	Aug. 26	14.47	Nov. 29	15.11
Feb. 14	17.37	May 5	17.24	Sept. 22	14.13	Dec. 29	14.07
Mar. 10	17.41	July 25	14.78	Oct. 29	14.23		

29.1.4.5.1.A. (J-4). Runyon Area. Description given in Water-Supply Paper 845.  
Water level, in feet above mean sea level, 1939

Jan. 12	17.23	Apr. 27	17.84	July 25	15.24	Oct. 29	14.61
Feb. 14	17.93	May 5	17.49	Aug. 26	14.79	Nov. 29	15.69
Mar. 10	17.89	June 18	16.04	Sept. 22	14.47	Dec. 29	14.59

29.1.4.5.2.A. (J-5). Runyon Area. Description given in Water-Supply Paper 845.  
Water level, in feet above mean sea level, 1939

Feb. 14	19.45	May 5	19.23	Aug. 26	16.75	Oct. 29	16.35
Mar. 10	19.55	June 18	17.98	Sept. 22	16.29	Nov. 29	17.06
Apr. 27	19.50	July 25	17.25				

28.5.4.5.6. (L-1). Runyon Area. Description given in Water-Supply Paper 845. Lowest water level 3.79 feet above mean sea level Sept. 22, 1939.

Water level, in feet above mean sea level, 1939							
Feb. 14	6.99	May 5	6.74	Aug. 26	4.09	Nov. 29	4.16
Mar. 10	7.04	June 18	5.16	Sept. 22	3.79	Dec. 29	4.34
Apr. 27	7.12	July 25	4.45	Oct. 29	3.84		

28.5.4.6.7.A. (L-2). Runyon Area. Description given in Water-Supply Paper 845. Water levels, in feet above mean sea level, 1939: Apr. 27, 8.58; May 5, 7.16.

28.5.4.6.7.B. (L-3). Runyon Area. Description given in Water-Supply Paper 845. Water level, in feet above mean sea level, 1939: Feb. 14, 10.91; Mar. 10, 11.16; Apr. 27, 11.11; May 5, 11.01.

29.11.1.2.3. Runyon Area. Morrell well. Description given in Water-Supply Papers 817 and 845.

Water level on the first day of each month, January 1939 to January 1940, and average water levels on the same dates for preceding years of record, in feet above mean sea level

Date	Water level	Average water level for preceding years of record	Number of years of record included in average
Jan. 1, 1939	73.79	73.94	15
Feb. 1	74.15	73.80	15
Mar. 1	74.30	73.94	15
Apr. 1	74.40	73.90	15
May 1	73.65	73.73	15
June 1	72.38	73.43	15
July 1	71.72	72.72	15
Aug. 1	69.86	71.96	15
Sept. 1	70.84	71.86	15
Oct. 1	69.86	72.27	15
Nov. 1	72.90	73.19	16
Dec. 1	72.83	73.72	16
Jan. 1, 1940	72.91	73.93	16



## Middlesex County--Continued

29.11.1.2.3.--Continued

Water level at end of day, in feet above mean sea level, 1930  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	73.79	74.15	74.30	74.40	73.65	72.38	71.72	69.86	70.84	69.86	72.90	72.83
2	73.76	74.32	74.17	74.21	73.61	72.32	71.75	69.79	70.89	70.08	72.76	72.92
3	73.72	74.38	74.08	74.08	73.57	72.25	71.67	69.74	70.90	70.46	72.66	73.03
4	73.67	74.34	74.02	73.97	73.54	72.25	71.59	69.69	70.92	70.69	72.61	73.03
5	73.65	74.23	74.26	73.89	73.51	72.17	71.49	69.60	70.93	70.82	73.97	73.01
6	74.34	74.20	74.27	74.49	73.47	72.09	71.40	69.58	70.93	70.91	73.78	72.98
7	74.22	74.30	74.12	74.27	73.45	72.04	71.33	69.52	70.93	70.97	73.60	72.99
8	74.12	74.24	74.02	74.19	73.42	71.98	71.25	69.50	70.90	71.00	73.44	72.95
9	74.06	74.21	73.95	74.11	73.40	71.90	71.17	69.49	70.87	71.03	73.30	72.93
10	74.04	74.38	73.88	74.08	73.34	71.84	71.10	69.48	70.87	71.05	73.25	72.94
11	73.96	74.36	73.84	74.01	73.30	71.80	71.04	69.48	70.84	71.06	73.16	72.90
12	73.88	74.19	74.47	73.92	73.25	71.74	70.97	69.45	70.82	71.07	73.12	72.89
13	73.84	74.12	74.38	73.84	73.25	71.69	70.90	69.45	70.78	71.07	73.06	72.92
14	73.79	74.06	74.28	73.78	73.28	72.28	70.84	69.44	70.74	71.09	73.00	73.02
15	73.73	74.19	74.51	73.72	73.25	72.37	70.78	69.44	70.69	71.09	72.98	73.03
16	73.72	74.12	74.34	73.67	73.23	72.24	70.72	69.44	70.64	71.09	72.96	73.06
17	73.69	74.01	74.19	73.79	73.20	72.13	70.64	69.44	70.57	71.09	72.93	73.06
18	73.69	73.96	74.08	74.05	73.14	72.14	70.57	69.44	70.48	71.09	72.91	73.03
19	73.68	73.92	73.99	74.37	73.10	72.20	70.51	69.58	70.42	71.09	72.89	73.02
20	73.68	73.90	73.93	74.18	73.04	72.30	70.44	69.79	70.36	71.09	72.88	73.08
21	73.62	73.87	73.86	74.07	73.05	72.14	70.38	69.95	70.32	71.09	72.88	73.12
22	73.76	73.86	73.82	73.98	73.04	72.04	70.32	70.04	70.26	71.13	72.88	73.10
23	73.76	73.80	73.76	73.89	73.02	71.96	70.28	70.07	70.19	71.17	72.88	73.06
24	73.73	73.74	73.74	73.82	72.97	71.87	70.22	70.08	70.12	71.20	72.86	73.05
25	73.68	73.68	73.70	73.75	72.92	71.77	70.16	70.12	70.06	71.23	72.84	73.03
26	73.64	74.41	73.68	73.98	72.86	71.68	70.10	70.28	70.00	71.26	72.84	72.99
27	73.60	74.22	73.78	73.90	72.80	71.62	70.04	70.39	69.96	71.31	72.84	72.99
28	73.51	74.53	74.17	73.83	72.72	71.55	70.00	70.46	69.93	71.35	72.84	72.95
29	73.92	.....	74.05	73.78	72.64	71.50	69.98	70.52	69.90	71.37	72.83	72.94
30	74.40	.....	74.39	73.71	72.55	71.58	69.93	70.66	69.87	71.43	72.83	72.95
31	74.25	.....	74.22	.....	72.46	.....	69.91	70.78	.....	72.67	.....	72.93

28.4.3.1.5. Runyon Area. National Fireproofing Corporation dug well.  
Description given in Water-Supply Paper 845.Water level at end of day, in feet below measuring point, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	10.06	9.66	8.78	8.76	9.03	9.67	9.82	10.35	10.51	10.83	10.71	10.93
2	10.06	9.61	8.75	8.73	9.05	9.69	9.84	10.36	10.53	10.80	10.68	10.93
3	10.09	9.14	8.76	8.73	9.08	9.72	9.88	10.37	10.55	10.76	10.69	10.94
4	10.12	8.86	8.77	8.78	9.10	9.72	9.91	10.38	10.57	10.76	10.72	10.96
5	10.13	8.76	8.78	8.84	9.12	9.74	9.94	10.40	10.58	10.77	10.61	10.97
6	10.00	8.72	8.78	8.56	9.16	9.75	9.96	10.42	10.60	10.78	10.54	10.99
7	9.91	8.80	8.88	8.39	9.18	9.78	9.98	10.43	10.61	10.81	10.50	10.99
8	9.88	8.83	8.92	8.33	9.20	9.78	10.00	10.44	10.62	10.83	10.48	11.03
9	9.86	8.89	8.94	8.36	9.20	9.80	10.02	10.45	10.64	10.85	10.52	11.02
10	9.85	8.87	9.00	8.37	9.24	9.82	10.03	10.47	10.65	10.86	10.55	11.03
11	9.88	8.84	9.02	8.40	9.26	9.83	10.04	10.49	10.66	10.87	10.58	11.05
12	9.92	8.81	8.97	8.50	9.30	9.84	10.05	10.50	10.67	10.88	10.61	11.06
13	9.93	8.84	8.89	8.58	9.32	9.85	10.06	10.51	10.69	10.90	10.66	11.06
14	9.97	8.88	8.86	8.62	9.35	9.66	10.07	10.53	10.70	10.92	10.69	11.08
15	10.00	8.90	8.74	8.69	9.37	9.63	10.08	10.55	10.71	10.93	10.72	11.09
16	10.02	8.98	8.57	8.76	9.39	9.65	10.10	10.55	10.72	10.94	10.73	11.11
17	10.05	8.98	8.53	8.80	9.40	9.69	10.12	10.57	10.74	10.96	10.75	11.11
18	10.04	9.01	8.56	8.75	9.43	9.74	10.14	10.58	10.76	10.97	10.77	.....
19	10.08	9.03	8.62	8.72	9.45	9.77	10.16	10.36	10.77	10.98	10.80	.....
20	10.09	9.08	8.67	8.72	9.45	9.79	10.18	10.31	10.78	10.99	10.82	.....
21	10.10	9.10	8.71	.....	9.47	9.83	10.20	10.31	10.77	10.99	10.83	.....
22	10.10	9.16	8.78	8.77	9.48	9.84	10.22	10.34	10.78	10.96	10.84	.....
23	10.14	9.20	8.81	8.79	9.50	9.84	10.24	10.39	10.79	10.98	10.85	11.16
24	10.12	9.26	8.84	8.80	9.53	9.87	10.25	10.43	10.80	11.01	10.87	11.17
25	10.16	9.31	8.91	8.84	9.55	9.89	10.27	10.46	10.81	11.02	10.88	11.18
26	10.17	9.20	8.94	8.86	9.57	9.91	10.28	10.49	10.82	11.03	10.89	11.20
27	10.20	9.13	.....	8.90	9.58	9.93	10.29	10.52	10.82	11.04	10.90	11.20
28	10.23	8.92	.....	8.92	9.58	9.94	10.31	10.53	10.84	11.03	10.91	11.22
29	10.24	.....	.....	8.96	9.61	9.95	10.31	10.54	10.85	11.05	10.92	11.22
30	9.98	.....	8.85	9.00	9.62	9.86	10.32	10.52	10.83	11.04	10.93	11.22
31	9.73	.....	8.80	.....	9.65	.....	10.33	10.51	.....	10.77	.....	11.22

## Middlesex County--Continued

28.5.4.7.2. Runyon Area. Old Bridge observation well. Description given in Water-Supply Paper 845. Lowest water level, 1.7 feet below mean sea level Dec. 24 and 25, 1939.

Lowest daily water level, in feet, with reference to mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	-0.7	+0.9	+0.5	0.0	-0.5	-1.1	-1.1	-1.4	-0.4	-0.9	-0.4	-1.2
2	-.7	+1	0.0	0.0	-.6	-1.5	-.9	-1.3	-.7	-.8	-.8	-.8
3	-.7	+1	-.4	-.3	-.6	-1.4	-1.0	-1.3	-.7	+1	-.9	-1.2
4	-.5	+2.0	-.4	-1.0	-.5	-1.3	-1.2	-1.1	-.8	-.1	-.9	-1.3
5	....	+1.8	-.3	-.6	-.7	-1.3	-1.1	-1.1	-.8	-.5	-.3	-1.2
6	....	+1.3	+1	-.5	-.7	-.9	-1.2	-.9	-.9	-.6	-.4	-3.7
7	....	-.1	-.2	+1.3	-.7	-.9	-1.1	-.8	-1.2	-.3	-.6	-3.7
8	....	-.1	-.5	+1.6	-.6	-1.0	-1.1	-.9	-.8	-1.1	-.9	-1.6
9	....	-.3	-.5	+1	-.5	-.8	-1.0	-.9	-.9	-1.3	-1.2	....
10	....	+1.3	-.5	+1.2	-.6	-.6	-1.0	-1.0	-1.1	-1.2	-1.2	....
11	....	+1.3	...	-.1	-.7	-.7	-.8	-1.3	-1.5	-1.3	-1.3	....
12	....	-.1	...	-1.7	-.8	-.8	-1.1	-1.4	-1.5	....	-1.3	....
13	....	-.4	...	-1.4	-.7	-.8	-1.1	-1.5	-1.5	....	-1.3	....
14	....	-.5	...	-.7	-.9	-1.0	-1.3	-1.6	-1.4	-1.4	-1.4	....
15	-.7	-.3	...	-.7	-.8	-.9	-1.3	-1.4	-1.5	-1.5	-1.4	-1.3
16	-.8	-.4	...	-.8	-.6	-.8	-1.4	-1.4	-1.5	-1.3	-1.1	-1.1
17	-.8	-.7	...	-.5	-.8	-1.2	-1.4	-1.4	-1.5	-1.4	-1.0	-.7
18	-.8	-.7	...	-.2	-1.0	-1.1	-1.2	-1.3	-1.0	-.9	-.9	-1.1
19	-.4	-.6	...	-.2	-1.0	-1.0	-1.2	-1.0	-.8	-1.1	-.7	-.7
20	-.7	-.6	...	0.0	-1.1	-1.0	-1.2	-.1	-.7	-1.0	+1.4	-.9
21	-.7	-.6	...	-.3	-1.0	-1.1	-1.3	-.1	-.7	-.7	+1.6	-1.5
22	....	-.6	...	-.4	-.9	-1.1	-1.1	-.5	-.5	-.6	-.3	-1.6
23	....	-.7	...	...	-.8	-1.3	-.7	-.8	-.9	-1.3	-.9	-1.6
24	....	-.8	...	-.7	-.7	-1.0	-.8	-.7	-1.2	-1.4	-1.0	-1.7
25	....	-.8	-.6	-.7	-1.1	-1.2	-1.1	-.8	-1.1	-1.5	-.1	-1.7
26	....	-.6	-.4	-.2	-1.4	-.6	-1.0	-1.0	-1.0	-1.4	-.5	-1.6
27	....	+1	-.5	-.3	-1.2	-.8	-1.0	-.8	-.3	-1.3	-1.2	-1.5
28	....	0.0	+1.3	-.1	-1.2	-1.1	-.8	-.6	-.9	-1.4	-1.1	-1.5
29	....	...	-.1	-.3	-1.3	-1.2	-.9	-.1	-.9	-1.5	-1.2	-1.5
30	+1.8	...	-.1	-.4	-1.2	-.8	-.8	+1	-.9	-1.3	-1.2	-1.4
31	+1.2	...	+1.3	...	-1.3	...	-1.0	0.0	...	-.5	....	-1.4

28.5.4.3.9. Runyon Area. Runyon old deep well 1. Description given in Water-Supply Paper 845. During 1939 the daily fluctuation ranged from less than a foot to as much as 20 feet.

Lowest daily water level, in feet, with reference to mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	-3.3	....	-4.7	-3.9	-3.2	-7.0	....	-36.0	....	-33.5	-29.7	+0.8
2	-2.1	....	-5.0	-3.5	-3.3	-7.7	....	-36.4	....	-34.3	-9.6	+1.7
3	-2.6	....	-6.0	-2.7	-3.8	-8.2	....	-36.5	....	-34.4	-7.3	+1.8
4	-3.6	....	-6.0	-2.9	-5.1	-8.1	....	-36.4	....	-34.0	-6.2	+1.9
5	-3.8	....	-5.2	-3.3	-5.9	-7.0	....	-36.8	....	-34.3	-5.6	+1.6
6	-4.4	....	-4.3	-3.6	-5.6	-7.5	....	-36.6	....	-34.8	-3.9	+1.2
7	-4.4	-3.7	-4.8	-4.2	-4.5	-8.2	....	-35.3	....	-35.5	-3.4	-.3
8	-13.5	-3.9	-4.9	-4.2	-4.9	-8.6	....	-35.6	....	-35.5	-3.4	-1.4
9	-3.7	-4.0	-5.3	-3.1	-5.5	-9.4	....	-35.4	....	-35.6	-3.5	-1.5
10	-3.7	-4.6	-5.9	-1.8	-6.1	-10.0	....	-34.8	....	-35.7	-3.8	-1.2
11	-4.1	-4.7	-5.9	-2.7	-6.9	-9.8	....	-34.7	....	-35.9	-3.0	+1
12	-5.2	-4.6	-5.2	-3.2	-7.5	-8.6	....	-34.6	....	-36.4	-3.0	-.6
13	-5.2	-3.5	-4.7	-3.9	-7.5	-9.0	....	-34.4	....	-36.4	-1.7	-1.1
14	-4.9	-4.0	-4.9	-4.2	-7.4	-8.5	....	-34.8	....	-37.1	-1.7	-1.9
15	....	-4.3	-5.1	-4.0	-5.7	....	....	-34.9	....	-37.1	-1.9	-2.1
16	....	-4.5	-5.5	-3.1	-6.0	....	....	-33.5	....	-36.7	-1.3	-2.1
17	....	-4.7	-5.6	-1.7	-6.2	....	....	-33.7	....	-36.7	-1.8	-2.1
18	....	-4.5	-5.7	-17.2	-6.5	-11.5	....	-33.8	....	-36.4	-1.3	-1.6
19	....	-4.6	-4.4	-2.7	-7.3	-8.5	....	-33.6	-30.8	-35.1	-1.1	-2.5
20	....	-4.4	-3.7	-3.8	-7.9	-8.1	....	-33.5	-30.6	-34.3	0.0	-2.8
21	....	-5.3	-4.2	-4.3	-8.1	-7.5	....	-33.1	-30.2	-33.2	+1.4	-3.3
22	....	-5.4	-4.0	-4.3	-7.3	...	....	-33.0	-30.6	....	0.0	....
23	....	-5.6	-4.2	-3.3	-7.1	...	....	-33.0	-31.7	....	...	....

## Middlesex County--Continued

28.5.4.3.9.--Continued

Lowest daily water level, in feet, with reference to mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
24	....	....	-4.1	-2.5	-7.7	-8.6	....	-33.0	-32.1	....	....	....
25	....	....	-4.0	-3.4	-8.0	-7.6	....	....	-32.5	....	....	-1.4
26	....	....	-3.9	-4.2	-8.7	....	....	....	-32.6	-31.8	....	-8
27	....	-4.5	-3.2	-5.5	-8.7	....	....	....	-32.5	-30.5	....	-21.0
28	....	-4.6	-3.6	-5.5	-7.6	....	....	....	-32.7	-30.0	+1.5	-23.6
29	....	....	-3.7	-5.2	-6.4	....	....	....	-32.6	-29.9	+1.3	-24.3
30	....	....	-3.8	-4.8	-5.8	....	....	....	-33.4	-29.7	+1.1	-25.6
31	....	....	-3.9	....	-5.6	....	....	....	....	-29.9	....	-25.5

29.1.4.1.1. Runyon Area. Runyon old deep well 8. Description given in Water-Supply Paper 840. New measuring point established Oct. 27, 1938, top of well casing extension, about 1.7 feet above land surface and 19.70 feet above mean sea level. During 1939 the daily fluctuations in this well ranged from less than a foot to 7.6 feet.

Lowest daily water level, in feet, with reference to mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	-7.6	-7.5	....	-8.5	-7.5	-12.2	-24.6	-26.7	-28.8	-24.7	-19.6	-2.9
2	-6.4	-7.8	....	-8.0	-8.0	-12.9	-24.6	-27.4	-26.8	-25.6	-13.6	-3.0
3	-7.1	-9.4	....	-7.1	-8.4	-13.5	-22.7	-27.5	-25.4	-25.7	-11.3	-3.0
4	-8.2	-9.4	....	-7.4	-10.2	-13.2	-21.9	-28.2	-23.5	-25.1	-10.3	-1.6
5	-8.5	-7.9	-10.2	-7.9	-11.1	-12.0	-22.6	-28.5	-21.5	-25.3	-9.1	-3.3
6	-9.3	-6.8	-8.8	-8.4	-11.0	-12.6	-22.9	-28.4	-20.7	-26.0	-7.1	-3.6
7	-9.3	-8.5	-9.7	-8.9	-9.3	-13.4	-23.8	-26.5	-20.1	-26.8	-6.9	-4.4
8	-9.0	-8.5	-9.8	-8.5	-9.9	-14.1	-25.2	-26.5	-20.0	-26.9	-7.3	-5.5
9	-8.1	-8.8	-10.3	-7.5	-10.7	-14.8	-25.2	-26.1	-22.2	-27.1	-7.3	-5.9
10	-8.3	-9.4	-10.9	-6.2	-11.3	-15.5	-24.1	-26.1	-22.2	-27.2	-7.3	-5.2
11	-8.9	-9.6	-11.0	-7.2	-12.2	-15.3	-25.6	-25.9	-21.3	-27.3	-6.8	-3.6
12	-10.0	-9.2	-10.0	-7.9	-12.9	-13.7	-26.4	-25.7	-22.0	-28.1	-6.8	-4.5
13	-10.0	-8.0	-9.5	-8.5	-12.8	-14.1	-27.2	-25.5	-21.3	-28.1	-5.2	-5.2
14	-9.8	-8.7	-9.7	-9.1	-12.6	-13.7	-27.8	-25.2	-20.8	-28.9	-5.4	-6.1
15	-8.9	-9.0	-9.9	-8.9	-10.4	-18.2	-28.3	-25.3	-20.8	-28.9	-5.8	-6.4
16	-7.6	-9.1	-10.3	-7.6	-11.0	-20.5	-28.3	-24.6	-22.1	-28.0	-5.6	-6.3
17	-8.3	-9.4	-10.0	-5.8	-11.3	-20.8	-26.8	-24.3	-22.1	-28.0	-5.6	-6.4
18	-8.3	-9.3	-10.4	-6.8	-11.6	-16.4	-27.8	-24.4	-21.3	-27.3	-5.0	-5.7
19	-8.9	-9.3	-8.8	-7.5	-12.5	-13.1	....	-24.2	-21.2	-25.5	-4.7	-6.7
20	-9.6	-9.4	-8.2	-8.7	-13.3	-13.1	....	-24.1	-20.8	-25.0	-3.3	-7.1
21	-9.7	-10.0	-8.9	-9.4	-13.4	-12.1	....	-23.6	-20.4	-24.0	-3.0	-7.5
22	....	....	-8.7	-9.4	-12.3	-12.3	....	-23.4	-21.0	-23.4	-3.5	-8.7
23	....	....	-8.9	-7.9	-12.2	-13.9	....	-23.4	-22.6	-21.7	-3.5	-8.7
24	....	....	-8.8	-7.2	-13.0	-13.9	....	-23.2	-23.1	-21.5	-2.3	-7.0
25	....	....	-8.8	-8.2	-13.3	-12.2	....	-23.2	-23.5	-21.5	-2.4	....
26	....	-10.7	-8.4	-9.1	-14.0	-17.7	....	-23.0	-23.6	-21.1	-2.3	-4.8
27	....	-8.9	-7.8	-10.6	-14.1	-19.8	....	-23.0	-23.5	-20.3	-1.4	-10.3
28	....	-9.1	-8.3	-10.6	-12.6	-21.8	....	-25.1	-23.6	-20.0	-2.0	....
29	-8.4	....	-8.3	-10.0	-11.0	-22.6	....	-26.7	-23.4	-19.7	-2.3	-15.1
30	-7.3	....	-8.5	-9.2	-10.4	-23.6	-27.5	-27.9	-24.6	-19.4	-2.5	-15.1
31	-7.0	....	-8.5	....	-10.5	....	-26.4	-28.8	....	-19.6	....	-14.9

28.5.4.7.3. Incorrectly given 28.5.4.7.2A in Water-Supply Paper 845. Runyon Area. Runyon well 123. Description given in Water-Supply Paper 845. Lowest water level, 0.9 foot above mean sea level Dec. 22, 23, 24 and 25, 1939.

Lowest daily water level, in feet above mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	...	2.4	2.4	2.3	2.2	1.8	...	1.6	2.1	1.6	1.5	1.4
2	...	2.1	2.2	2.3	2.1	1.8	1.8	1.6	1.9	1.7	1.4	1.6
3	...	2.1	2.0	2.2	2.2	1.8	1.7	1.6	1.8	2.1	1.4	1.3
4	...	1.9	2.0	1.9	2.4	1.9	1.7	1.7	1.8	2.0	1.4	1.3
5	...	2.5	2.1	2.0	2.2	1.8	1.7	1.7	1.7	1.8	1.8	1.3
6	...	2.4	2.3	2.1	2.2	1.8	1.7	1.7	1.6	1.7	1.6	1.4
7	...	2.3	2.2	2.4	2.1	1.9	1.7	1.7	1.5	1.7	1.4	1.3

## Middlesex County--Continued

## 28.5.4.7.3.--Continued

Lowest daily water level, in feet above mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
8	...	2.3	1.9	2.5	2.2	1.9	1.7	1.6	1.6	1.5	1.3	1.0
9	...	2.2	2.0	2.3	2.3	1.9	1.6	1.6	1.6	1.4	1.2	.9
10	...	2.6	2.0	2.4	2.2	2.0	1.6	1.6	1.6	1.4	1.2	1.0
11	...	2.4	2.2	2.2	2.1	2.0	1.8	1.5	1.4	1.4	1.2	1.3
12	...	2.2	2.7	1.7	2.0	1.9	1.6	1.4	1.4	1.4	1.2	1.4
13	...	2.1	2.5	1.7	2.0	1.8	1.6	1.4	1.4	1.5	1.2	1.6
14	...	2.1	2.5	1.9	1.9	1.7	1.5	1.4	1.5	1.5	1.1	1.3
15	...	2.2	2.6	2.0	2.1	1.8	1.6	1.5	1.4	1.3	1.1	1.3
16	...	2.0	2.5	2.0	2.1	1.6	1.6	1.6	1.3	1.4	1.4	1.3
17	...	1.9	2.2	2.1	2.0	1.7	1.6	1.6	1.4	1.4	1.3	1.3
18	...	1.9	2.1	2.3	1.9	1.8	1.7	1.7	1.6	1.5	1.4	1.3
19	...	1.9	2.0	2.3	1.9	1.8	1.7	1.8	1.7	1.4	1.5	1.4
20	...	1.9	2.0	2.4	1.8	1.8	1.8	2.1	1.7	1.4	2.0	1.4
21	...	1.9	1.9	...	1.8	1.8	1.8	2.0	1.7	1.6	2.1	1.0
22	...	1.9	2.0	2.1	2.0	1.8	1.8	1.8	1.7	1.6	1.9	.9
23	...	1.8	2.0	2.0	2.0	1.8	2.0	1.7	1.6	1.3	1.6	.9
24	...	1.8	2.0	2.0	2.1	1.9	1.8	1.7	1.4	1.2	1.6	.9
25	...	1.8	2.2	2.0	1.9	1.8	1.7	1.7	1.5	1.1	1.9	.9
26	...	2.0	2.3	2.3	1.8	1.9	1.8	1.6	1.5	1.2	1.9	.9
27	...	2.1	2.2	2.3	1.8	1.8	1.8	1.7	1.8	1.3	1.5	1.2
28	...	2.2	2.5	2.5	1.8	1.8	1.8	1.8	1.7	1.5	1.5	1.3
29	1.5	...	2.3	2.4	1.7	1.7	1.8	2.1	1.7	1.1	1.4	1.3
30	1.7	...	2.4	2.3	1.8	...	1.8	2.3	1.7	1.3	1.4	1.3
31	2.5	...	2.3	...	1.7	...	1.7	2.2	...	1.7	...	1.3

29.1.4.4.1.A. (S-1). Runyon Area. Description given in Water-Supply Papers 817 and 845. Adjusted altitude of measuring point, 16.52 feet above mean sea level (see text).

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 28	7.92	Apr. 27	9.82	July 25	6.51	Oct. 29	3.70
Feb. 14	9.39	May 5	9.47	Aug. 26	4.80	Nov. 29	4.36
Mar. 10	9.37	June 18	5.52	Sept. 22	3.52	Dec. 29	(a)
Apr. 11	10.12						

28.5.1.8.4. Runyon Area. Sayreville Borough test well 4. Borough of Sayreville, N. J. Approximately 1.5 miles southeast of Town of South River, about 240 feet west of Jernees Mill Road and 300 feet north of Duck Creek. Abandoned well, diameter 6 inches, depth about 160 feet taps no. 1 sand. First measured Nov. 13, 1931. Measuring point to Nov. 10, 1937, top of casing, about 0.5 foot above land surface, 6.23 feet above mean sea level; Nov. 10, 1937 to Oct. 2, 1939, door sill of shelter, 10.93 feet above mean sea level; since Oct. 2, 1939, top of instrument shelf, 12.20 feet above mean sea level. Highest observed water level, 3.18 feet above mean sea level Feb. 20, 1933; lowest, 32.9 feet below mean sea level Oct. 25, 1935. Fluctuations of water level, daily range 1 to 2 feet and seasonal range 12 to 23 feet, caused mainly by regional pumping from no. 1 sand. Lowest daily water level, in feet, with reference to mean sea level, 1931-32 (from recorder charts)

Date	Water level	Date	Water level	Date	Water level
Nov. 13, 1931	b -11.35	Dec. 4, 1932	-3.17	Dec. 18, 1932	-2.92
Jan. 22, 1932	b -2.78	5	-2.32	19	-1.52
Feb. 24	b + .99	6	-4.17	20	-2.87
Apr. 15	b +1.16	7	-5.07	21	-3.47
May 10	b -3.48	8	-5.17	22	-5.42
June 13	b -7.42	9	-5.12	23	-7.27
Aug. 18	b -8.73	10	-3.87	24	-6.17
Nov. 10	b -11.69	11	-3.32	25	-4.72
28	-1.27	12	-1.72	26	-2.07
29	-1.32	13	-2.67	27	-1.37
30	-2.42	14	-5.27	28	-3.47
Dec. 1	-7.07	15	-6.27	29	-5.07
2	-9.07	16	-6.47	30	-5.27
3	-3.92	17	-5.37	31	-5.37

a Dry.

b Tape measurement.

## Middlesex County--Continued

28.5.1.8.4.--Continued

Lowest daily water level, in feet, with reference to mean sea level, 1933  
(from recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 1	-4.27	Jan. 18	-3.47	Feb. 8	-4.77	Feb. 25	+1.13
2	-1.87	19	-3.27	9	-4.92	26	+.88
3	-1.82	20	-2.47	10	-4.17	27	-.42
4	-2.37	21	-2.07	11	-2.82	28	-2.52
5	-4.37	22	-1.52	12	-.92	Mar. 1	-3.12
6	-6.42	23	-1.87	14	-.87	2	-3.72
7	-4.92	24	-2.47	15	-2.52	3	-4.22
8	-3.57	25	-2.42	16	-3.92	4	-3.87
9	-2.22	30	-.62	17	-2.67	5	-2.37
10	-3.67	31	-2.67	18	-1.42	6	-1.87
11	-4.22	Feb. 1	-5.22	19	+.23	7	-2.77
12	-4.52	2	-6.42	20	+2.33	8	-3.22
13	-3.27	3	-6.27	21	+1.13	9	-3.47
14	-3.62	4	-4.82	22	+.43	10	-3.17
15	-2.77	6	-2.62	23	+.48	19	-1.44
16	-1.87	7	-4.12	24	+1.03	20	-.93
17	-2.67						

Lowest daily water level, in feet, with reference to mean sea level, 1934  
(from recorder charts)

July 12	a 14.62	Sept. 21	-12.0	Oct. 25	-8.0	Nov. 28	-9.7
22	-21.0	22	-11.7	26	-7.7	29	-10.1
23	-20.6	23	-9.6	27	-7.0	30	-8.1
24	-21.4	24	-8.9	28	-5.9	Dec. 1	-8.2
Aug. 17	-15.3	25	-10.3	29	-5.2	2	-7.1
18	-13.5	26	-10.5	30	-6.5	3	-6.6
19	-12.5	27	-11.0	31	-7.3	4	-7.8
24	-14.5	28	-11.7	Nov. 1	-7.2	5	-8.9
25	-14.8	29	-11.1	2	-7.4	6	-10.0
26	-13.5	30	-9.2	3	-7.1	7	-10.7
27	-12.4	Oct. 1	-8.3	4	-5.9	8	-10.6
28	-14.2	2	-9.6	5	-5.7	9	-8.3
29	-15.7	3	-10.4	6	-7.1	10	-7.1
30	-15.2	4	-11.0	7	-8.1	11	-8.3
31	-14.8	5	-11.5	8	-8.2	12	-9.1
Sept. 1	-12.6	6	-10.7	9	-8.1	13	-9.3
2	-9.3	7	-9.4	10	-6.5	14	-9.7
3	-6.3	8	-9.4	11	-4.7	15	-10.1
4	-7.6	9	-10.4	12	-4.3	16	-9.6
5	-9.7	10	-10.8	13	-5.1	17	-7.4
6	-11.7	11	-11.0	14	-6.7	18	-8.6
7	-13.4	12	-11.4	15	-7.4	19	-8.9
8	-14.0	13	-11.0	16	-7.8	20	-9.2
9	-12.5	14	-9.3	17	-7.6	21	-9.3
10	-12.3	15	-8.2	18	-6.1	22	-9.3
11	-12.9	16	-9.9	19	-6.4	23	-10.1
12	-12.3	17	-10.2	20	-7.9	24	-9.1
13	-12.2	18	-10.2	21	-8.6	25	-7.0
14	-12.1	19	-10.2	22	-8.9	26	-6.2
15	-12.1	20	-10.0	23	-9.8	27	-8.2
16	-11.1	21	-8.7	24	-10.2	28	-8.7
17	-9.6	22	-6.6	25	-9.4	29	-8.9
18	-10.9	23	-7.8	26	-7.8	30	-9.4
19	-11.2	24	-8.5	27	-8.6	31	-8.3
20	-12.1						

a Tape measurement.

## Middlesex County--Continued

## 23.5.1.8.4.--Continued

Lowest daily water level, in feet, with reference to mean sea level, 1936  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	-6.8	-14.7	-14.0	-15.6	-17.9	-11.4	-16.2	-24.2	-25.5	-29.0	-31.2	-27.5
2	-8.1	-14.2	-14.7	-16.2	-18.3	-10.6	-17.5	-24.1	-25.7	-29.7	-31.2	-27.6
3	-8.8	-13.7	-13.4	-16.2	-18.7	-10.7	-17.6	-23.2	-26.1	-29.6	-30.1	-25.6
4	-9.3	-12.7	-13.0	-16.3	-18.4	-13.3	-16.9	-23.8	-24.7	-29.9	-27.6	-25.1
5	-9.9	-13.5	-13.4	-16.1	-16.4	-13.9	-14.0	-23.3	-25.7	-29.8	-27.7	-24.3
6	-9.6	.....	-14.0	-16.4	-15.7	-14.9	-15.4	-24.8	-26.1	-29.0	-28.3	-24.2
7	-8.9	.....	-14.4	-15.2	-16.9	-15.9	-17.2	-25.5	-26.6	-29.1	-28.5	-24.6
8	-9.9	.....	-14.0	-16.0	-17.6	-15.4	-18.0	-25.8	-25.4	-29.9	-28.6	-23.9
9	-10.1	.....	-13.4	-15.7	-17.8	-13.9	-15.8	-25.9	-24.5	-30.2	-28.3	-24.0
10	-10.1	.....	-12.6	-15.0	-17.5	-13.5	-14.4	-25.9	-26.1	-30.2	-27.5	-24.0
11	-10.2	.....	-11.1	-14.8	-17.0	-15.2	-16.0	-25.2	-27.2	-30.3	-26.2	-23.3
12	-10.8	.....	-12.4	-14.8	-14.5	-16.0	-16.0	-23.8	-28.5	-30.4	-27.0	-22.6
13	-10.3	.....	-12.5	-15.3	-13.6	-16.6	-17.1	-25.3	-29.0	-29.9	-26.6	-21.8
14	-9.4	.....	-12.8	-16.4	-15.5	-17.1	-14.0	-26.2	-28.5	-29.3	-26.1	-21.6
15	-10.8	.....	-14.6	-16.7	-15.9	-16.5	-14.3	-25.9	-27.7	-30.4	-25.9	-19.6
16	-11.3	.....	-16.3	-14.9	-16.1	-15.4	-18.2	-25.0	-25.6	-30.5	-26.1	-19.6
17	-11.6	.....	-16.1	-14.4	-16.2	-14.5	-20.7	-24.2	-27.7	-30.5	-25.2	-20.7
18	-11.9	.....	-15.0	-14.1	-15.4	-15.7	-22.4	-20.8	-28.6	-30.7	-24.0	-22.0
19	-12.2	.....	-15.4	-15.4	-12.5	-16.0	-23.7	-20.2	-29.1	-31.3	-24.3	-22.6
20	-10.3	.....	-15.7	-16.4	-12.2	-15.9	-23.1	-22.7	-29.6	-30.8	-25.0	-22.8
21	-8.9	.....	-16.2	-15.2	-14.3	-16.2	-21.7	-25.1	-30.0	-30.5	-24.5	-22.7
22	-10.3	.....	-15.9	-12.6	-15.3	-16.1	-22.3	-26.6	-28.6	-31.1	-24.6	-21.1
23	-11.4	.....	-14.6	-14.1	-15.1	-14.4	-23.8	-27.5	-27.0	-31.3	-24.4	-19.4
24	-12.2	.....	-12.1	-15.3	-15.4	-14.1	-23.9	-27.5	-27.6	-31.9	-24.5	-20.8
25	-12.6	-9.5	-11.4	-16.0	-14.8	-15.7	-23.9	-26.3	-28.1	-32.9	-25.1	-19.5
26	-12.0	-10.0	-13.5	-17.4	-14.1	-17.0	-23.8	-25.8	-28.0	-32.4	-24.7	-17.3
27	-11.1	-10.7	-14.2	-18.1	-13.3	-18.4	-24.0	-26.3	-28.8	-31.8	-24.5	-19.1
28	-10.8	-11.3	-14.9	-16.9	-15.6	-18.9	-22.8	-26.3	-28.6	-30.8	-26.3	-20.5
29	-12.6	.....	-15.9	-16.3	-16.0	-19.0	-20.9	-27.0	-27.4	-30.7	-26.3	-19.8
30	-13.5	.....	-16.8	-17.0	-15.7	-17.8	-22.8	-27.0	-26.9	-30.7	-25.7	-18.7
31	-14.5	.....	-16.8	.....	-12.8	.....	-23.2	-26.6	.....	-30.8	.....	-19.8

Lowest daily water level, in feet, with reference to mean sea level, 1936  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
1	-20.3	-22.8	-23.5	-19.4	.....	-22.0	.....	-26.2	-28.9	-25.7
2	-19.6	-22.2	-22.9	-19.2	.....	-23.5	.....	-25.8	-29.4	-26.9
3	-19.0	-21.8	-22.3	-19.6	-23.6	-24.0	.....	-24.2	-29.7	-28.0
4	-18.5	-22.2	-21.9	-19.2	-22.4	-24.9	.....	-26.2	-29.6	-27.7
5	-17.4	-23.1	-21.8	-17.4	-23.0	-25.3	-18.1	-27.6	-29.0	-24.9
6	-16.8	-23.7	-22.0	-15.9	-24.2	-25.1	-16.5	-27.7	-28.7	-26.4
7	-17.8	-23.3	-22.2	-16.8	-25.0	-22.8	-17.5	-28.2	-25.4	-27.0
8	-18.6	-23.4	-21.5	-18.5	-25.5	-21.6	-18.2	-29.1	-25.5	.....
9	-18.7	-22.7	-19.7	-20.0	-25.7	-23.0	-19.2	-28.8	-27.6	.....
10	-19.5	-22.5	-20.8	-21.6	-25.6	-22.9	-20.3	-27.6	-28.5	.....
11	-18.8	-23.0	-22.2	-21.6	-24.3	-23.3	-20.0	-28.3	-28.8	.....
12	-17.9	-23.8	-22.6	-20.6	-24.3	-23.7	-18.5	-28.1	-28.8	.....
13	-17.7	-24.3	-22.9	-18.3	-23.8	-23.4	-16.5	-28.5	-27.7	.....
14	-19.2	-24.2	-22.6	-17.8	-23.8	-22.6	-17.8	-29.5	-27.1	.....
15	-19.6	-25.5	-21.7	-19.0	-23.8	-22.0	-17.8	-28.7	-27.7	.....
16	-20.7	-26.4	-20.8	-21.3	-23.7	-22.6	-18.1	-27.7	-27.9	.....
17	-20.4	-27.9	-21.5	-22.7	-22.6	-22.9	-18.3	-27.1	-29.2	.....
18	-20.0	-28.8	-22.0	-23.1	-22.4	-22.9	-18.6	-26.9	-28.2	.....
19	-19.5	-29.8	-22.0	-23.1	-23.2	-23.4	-18.4	-25.6	-28.7	.....
20	-17.4	-30.5	-22.5	-21.9	-23.9	-23.3	-17.9	-26.4	-28.6	.....
21	-18.1	-31.4	-22.1	-22.0	-23.8	-22.6	-20.5	-28.1	-25.9	.....
22	-18.6	-30.8	-20.1	-23.8	-23.2	-21.8	-21.8	-26.3	-26.2	.....
23	-19.5	-29.2	-18.6	-24.6	-23.0	-22.4	-22.2	-24.6	-25.2	.....
24	-20.0	-27.4	-18.9	-24.8	-25.0	-21.8	-22.5	.....	-24.6	.....
25	-19.6	-26.5	-19.8	-24.8	-25.1	-21.4	-22.8	-27.0	-24.4	.....
26	-19.1	-26.2	-20.6	-24.0	-25.1	-21.8	-22.3	-27.7	-24.0	.....
27	-18.4	-25.0	-20.5	-22.7	-25.3	-21.5	-22.4	-27.4	-23.2	.....
28	-19.7	-24.2	-19.8	-22.6	-25.2	-19.1	-22.4	-28.3	-24.1	.....
29	-20.5	-23.8	.....	-23.2	-25.2	.....	-23.3	-30.4	-25.3	.....
30	-21.2	.....	-18.3	.....	-24.0	.....	-24.2	-30.4	-25.7	.....
31	-21.9	.....	-19.3	.....	-22.2	.....	-25.5	-28.9	.....	.....

## Middlesex County--Continued

28.5.1.8.4.--Continued

Lowest daily water level, in feet, with reference to mean sea level, 1937  
(from recorder charts)

Day	Jan.	Mar.	Apr.	May	June	July	Nov.	Dec.
1	.....	.....	.....	-19.3	-19.5	-27.4	.....	-15.8
2	.....	.....	.....	-18.8	-21.9	-27.1	.....	-15.7
3	.....	-18.9	.....	-17.3	-22.0	-26.1	.....	-15.9
4	.....	-19.5	.....	-18.3	-22.1	-25.2	.....	-15.5
5	.....	.....	.....	-19.1	-22.9	-23.7	.....	-13.9
6	.....	.....	.....	-19.1	-22.9	-23.2	.....	-12.6
7	.....	.....	.....	-19.0	-20.7	-25.3	.....	-14.1
8	.....	.....	.....	-19.3	-21.5	-27.5	.....	-15.2
9	.....	.....	.....	-19.2	-21.5	-28.8	.....	.....
10	.....	.....	.....	-17.0	-23.4	-29.7	.....	.....
11	.....	.....	.....	-17.7	-24.9	-29.4	-23.7	.....
12	.....	.....	.....	-18.5	-25.9	.....	-23.9	-11.9
13	.....	.....	.....	-18.6	-25.9	.....	-23.0	-11.1
14	.....	.....	.....	-19.0	-22.7	.....	-21.3	-12.1
15	.....	.....	.....	-19.4	-24.3	.....	-20.0	-12.5
16	-19.5	.....	.....	-18.9	-25.8	.....	-18.3	-12.8
17	-19.2	.....	.....	-17.3	-26.7	.....	-18.1	-12.8
18	-16.5	.....	.....	-18.0	-27.4	.....	-18.5	-11.3
19	-17.6	.....	.....	-18.3	-27.9	.....	-18.6	-9.3
20	.....	.....	.....	-18.8	-27.4	.....	-18.5	-8.5
21	.....	.....	.....	-18.7	-24.7	.....	-15.8	-10.6
22	.....	.....	.....	-19.4	-25.5	.....	-15.1	-10.2
23	.....	.....	.....	-19.4	-26.1	.....	-16.0	-11.1
24	.....	.....	.....	-18.2	-26.9	.....	-16.8	-10.7
25	.....	.....	.....	-19.7	-27.6	.....	-16.4	-8.3
26	.....	.....	.....	-20.1	-27.6	.....	-14.5	-5.7
27	.....	.....	.....	-22.2	-25.1	.....	-15.1	-5.3
28	.....	.....	.....	-22.7	-24.2	.....	-15.1	-7.2
29	.....	.....	.....	-22.6	-25.2	.....	-13.6	-7.7
30	.....	.....	-19.2	-21.4	-26.9	.....	-15.4	-8.2
31	.....	.....	.....	-19.2	.....	.....	.....	-8.2

Lowest daily water level, in feet, with reference to mean sea level, 1938  
(from recorder charts)

Day	Jan.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	-6.6	.....	-0.9	-1.7	-3.6	-1.7	.....	-7.9	-8.2	-8.2
2	-5.0	.....	-.1	-2.4	-3.2	-3.6	.....	-7.5	-9.1	-8.7
3	-5.7	.....	-2.4	-3.6	-1.6	.....	.....	-5.7	-9.9	-8.1
4	-6.6	.....	-2.7	-3.4	0.0	.....	.....	-6.1	-9.6	-7.1
5	-7.0	.....	-3.6	-1.9	0.0	.....	-6.9	-6.9	-9.9	-6.4
6	-7.4	.....	-3.3	-1.4	-1.6	.....	-6.1	-7.8	-9.9	-7.7
7	-6.1	.....	-3.0	-2.9	-2.9	.....	-7.0	-8.5	.....	-8.4
8	-5.0	.....	-1.9	-3.7	.....	.....	-7.5	-9.3	.....	-8.9
9	-3.4	.....	-1.6	-4.4	.....	.....	-8.3	-9.4	.....	-9.7
10	-3.7	.....	-2.8	-5.0	.....	.....	-9.1	-7.5	-8.9	-8.7
11	-4.5	.....	-3.9	-5.5	-2.4	.....	-8.1	-8.4	-8.9	-7.9
12	-5.7	.....	-4.4	-6.3	-3.2	.....	-6.8	-8.8	-10.5	-6.6
13	-5.6	.....	-4.4	-6.4	-4.2	.....	-7.6	-9.2	-10.0	-7.5
14	-5.0	.....	-3.4	-5.0	-5.0	.....	-7.9	.....	-8.2	-8.1
15	.....	.....	-1.8	-3.6	-5.4	.....	-8.7	.....	-9.3	-8.8
16	.....	.....	-2.1	-3.0	-5.0	.....	-9.0	.....	-9.9	-8.7
17	.....	.....	-2.8	-3.7	-3.2	.....	-8.7	.....	-10.3	-9.0
18	.....	.....	-3.3	-4.8	-2.3	.....	-7.7	.....	-10.5	-8.6
19	.....	.....	-3.8	-6.2	-3.8	.....	-6.6	-8.2	-10.6	-7.1
20	.....	.....	-3.7	-6.2	-4.4	.....	-7.4	-8.7	-10.0	-7.9
21	.....	.....	-1.9	-5.3	-4.6	.....	-7.6	-8.7	-8.4	-8.1
22	.....	.....	-1.0	-4.8	-4.6	.....	-7.6	.....	-8.7	-8.5
23	.....	.....	-1.0	-5.7	-3.9	.....	-7.9	.....	-9.2	-8.1
24	.....	.....	-2.6	-5.5	-2.7	.....	-8.2	.....	-9.0	-8.3
25	.....	.....	-3.5	-4.2	-1.9	.....	-7.6	.....	.....	-6.7
26	.....	.....	-3.5	-2.9	-2.1	.....	-6.4	-7.5	.....	-4.8
27	.....	-2.6	-3.5	-1.6	-2.6	.....	-7.2	-8.3	.....	-4.4
28	.....	-3.9	-2.6	-2.5	-3.2	.....	-8.0	.....	.....	-5.6
29	.....	-3.7	-1.5	-3.0	-4.2	.....	-7.9	.....	.....	-5.6
30	.....	-2.5	-.3	-3.8	-3.7	.....	-8.1	.....	-7.2	-7.2
31	.....	.....	-0.3	.....	-2.3	.....	.....	-7.4	.....	-6.9

## Middlesex County--Continued

## 28.5.1.8.4.--Continued

Lowest daily water level, in feet, with reference to mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	-6.4	....	-7.9	-7.5	-5.9	-10.3	.....	-19.7	.....	.....	-12.8	.....
2	-5.2	....	-8.2	-6.7	-6.6	-11.7	.....	-20.2	.....	.....	-11.0	.....
3	-5.9	....	....	-5.8	-8.1	-12.7	-15.5	-20.5	.....	-18.8	-9.3	.....
4	-7.2	....	....	-6.1	-8.9	-12.1	-14.5	-21.3	.....	-18.2	-8.6	.....
5	-7.5	....	....	-6.3	-10.2	-10.5	-15.4	-22.2	-13.7	-18.4	-8.0	.....
6	-8.1	....	....	-6.9	-9.0	-11.1	-16.1	-21.5	.....	-19.2	-6.0	.....
7	-8.2	....	....	-7.7	-7.5	-12.0	.....	-19.2	.....	-20.3	-5.7	-4.5
8	-7.7	....	....	-7.5	-8.5	-12.5	.....	-19.7	.....	-20.1	-6.4	-5.7
9	-6.7	-7.3	....	-5.7	-9.3	-13.7	.....	-19.0	.....	-20.3	....	-5.8
10	-7.3	-8.1	-9.5	-4.6	-10.1	-14.4	.....	-19.0	.....	-20.2	....	-5.1
11	-7.5	-8.4	-9.7	-5.7	-11.1	-13.8	.....	-18.9	.....	-20.3	....	-3.4
12	-8.9	-7.9	-8.5	-6.5	-11.7	-12.2	.....	-18.9	.....	.....	....	-4.2
13	-8.7	-6.6	-8.3	-7.4	-11.7	-12.6	.....	-18.5	.....	-21.0	....	-5.0
14	-8.5	-7.5	-8.7	-8.1	-11.4	-11.6	.....	-17.7	.....	.....	-4.6	-6.0
15	....	-7.9	-8.7	-7.4	-8.7	-12.3	.....	-17.9	.....	.....	-4.8	-6.2
16	....	-8.0	-9.2	-5.8	-9.7	-14.0	.....	-17.2	.....	.....	-4.9	-6.2
17	....	-8.2	-9.1	-4.3	-10.0	-14.8	.....	-16.9	.....	-20.5	-4.3	-6.1
18	....	-8.0	-9.3	-5.4	-10.2	-13.9	.....	-16.9	.....	-19.7	-4.1	-5.6
19	....	-7.8	-6.9	-5.8	-11.7	-10.8	-22.0	-16.9	-14.5	-18.2	-3.7	-7.0
20	....	-7.7	-6.8	-7.4	-12.7	-11.5	-22.7	-16.5	-13.6	-18.0	-1.9	-7.5
21	....	-8.4	-7.8	-8.0	-12.4	-10.4	-22.3	-16.2	-13.2	-16.8	-2.2	-8.1
22	....	-8.3	-7.3	-8.0	-10.9	-10.6	-23.2	-16.3	.....	-16.9	-2.9	-9.3
23	....	-8.6	-7.4	....	-10.9	-12.2	-22.3	-16.1	-16.3	-15.0	-2.9	-9.0
24	....	-9.1	-7.3	....	-11.6	-11.9	-20.3	-15.9	-16.3	-15.3	-1.2	-7.5
25	....	-10.2	-7.5	-6.7	-12.0	-10.3	-20.6	-16.2	-16.9	-15.3	-2.1	-4.9
26	....	-9.0	-6.9	-7.7	-13.0	-11.7	-21.8	-15.9	-16.9	-14.3	-2.0	-4.9
27	....	-7.3	-6.4	-10.2	-12.4	-13.2	-21.7	-15.8	-16.7	-13.9	-.8	-6.6
28	....	-7.8	-6.9	-9.4	-10.7	-15.3	-21.3	.....	-16.9	-13.3	-1.6	....
29	....	....	-6.9	-8.8	-9.8	-15.9	-20.7	.....	-16.9	-13.2	-2.0	-8.3
30	....	....	-7.3	-8.6	-9.1	-16.9	-20.6	.....	.....	-13.2	-2.4	-10.3
31	....	....	-7.3	....	-9.5	.....	-19.6	.....	.....	-13.4	....	-9.6

26.41.5.9.5. Runyon Area. South Amboy water works old deep well 3.  
Description given in Water-Supply Paper 845.

Water level at end of day, in feet below measuring point, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	27.86	29.54	.....	29.58	30.49	34.39	36.27	38.48	41.02	35.20	.....	27.88
2	27.78	29.63	.....	29.77	30.47	34.63	36.66	.....	41.30	36.43	.....	27.75
3	27.44	29.58	30.34	29.84	30.05	34.79	36.76	.....	41.31	37.56	.....	27.87
4	27.42	29.91	30.22	29.82	30.79	34.91	36.70	.....	41.28	38.54	.....	28.13
5	27.48	.....	29.86	29.67	31.59	35.05	36.62	.....	41.20	39.40	.....	28.29
6	27.53	.....	29.58	29.51	31.79	35.11	36.72	.....	40.86	39.88	.....	28.55
7	27.97	.....	30.00	29.83	31.87	35.17	36.89	.....	39.66	40.18	.....	28.70
8	28.26	.....	30.08	29.89	31.89	35.26	37.06	.....	38.14	40.55	.....	29.03
9	28.24	29.87	29.92	29.97	31.81	35.38	37.18	.....	37.90	40.78	.....	29.45
10	28.15	29.98	30.02	29.77	32.00	35.74	37.19	.....	37.75	40.88	33.12	29.54
11	28.37	30.40	29.88	29.73	32.32	35.94	37.30	.....	37.33	41.18	33.61	29.13
12	28.53	.....	29.58	29.96	32.85	36.10	37.59	.....	36.88	41.50	33.84	29.02
13	28.51	.....	29.98	30.50	33.14	36.10	37.80	.....	37.24	41.74	33.93	28.82
14	28.28	.....	30.30	30.45	33.27	36.06	38.10	.....	37.45	41.99	34.05	29.08
15	28.37	.....	30.43	30.36	33.04	36.07	38.52	.....	37.66	41.76	33.82	29.29
16	28.21	.....	30.64	30.22	32.77	36.03	38.60	.....	37.90	41.86	33.35	29.42
17	28.10	.....	30.83	29.94	32.84	35.89	.....	.....	38.08	41.80	32.30	29.10
18	27.66	.....	30.95	29.65	33.14	35.91	.....	.....	38.14	41.64	31.56	29.02
19	27.66	.....	30.86	29.57	33.38	35.75	.....	.....	38.20	40.26	30.88	29.08
20	28.27	.....	30.59	29.78	33.65	35.67	.....	.....	38.26	39.46	29.83	29.12
21	28.76	.....	30.47	29.97	33.81	35.59	.....	.....	38.05	37.98	29.22	29.32
22	29.26	.....	30.23	30.21	33.83	35.39	38.56	41.54	37.78	36.68	28.64	29.62
23	29.88	.....	30.11	30.45	33.83	35.38	37.58	41.63	37.52	36.18	28.57	29.79
24	29.58	.....	29.97	30.35	34.05	35.63	36.68	41.69	37.28	36.30	28.18	29.62
25	30.10	.....	29.77	30.15	34.39	35.87	35.80	41.69	36.90	37.14	27.76	29.27
26	30.08	.....	29.62	30.04	34.69	35.81	35.17	41.62	36.72	37.45	27.54	29.54
27	29.90	.....	29.58	30.22	34.83	35.74	34.88	41.40	36.35	38.12	27.62	28.04
28	29.86	.....	29.39	30.37	34.99	35.77	34.78	40.99	35.32	38.00	27.39	28.24
29	29.97	.....	29.47	30.50	34.96	35.84	35.62	40.71	34.38	37.92	27.54	28.49
30	29.25	.....	29.39	30.51	34.73	35.92	36.88	40.66	34.14	.....	27.54	28.27
31	29.28	.....	29.62	.....	34.52	.....	37.80	40.78	.....	.....	.....	28.44



## Monmouth County

29.24.7.1.6. Asbury Park Area. Avon well 1. Description given in Water-Supply Papers 817 and 845. Water levels, in feet, with reference to mean sea level, 1939: June 22, -30.19; Aug. 9, -53.62; Nov. 28, -19.63.

29.24.4.8.4. Asbury Park Area. Bradley Beach 650-foot well. Description given in Water-Supply Papers 817 and 845. Water levels, in feet, with reference to mean sea level, 1939: June 22, -16.66; Aug. 9, -24.99; Nov. 28, -17.16.

29.11.2.1.1. (F-30). Runyon Area. Description given in Water-Supply Paper 845.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 4	65.71	Apr. 11	69.91	July 12	61.71	Oct. 28	62.31
Feb. 20	68.11	May 4	65.56	Aug. 5	60.53	Nov. 16	64.44
Mar. 17	71.01	June 17	62.56	Sept. 20	61.67	Dec. 16	63.75

29.1.8.9.4. (F-31). Runyon Area. Description given in Water-Supply Paper 845.

Water level, in feet above mean sea level, 1939

Jan. 4	83.05	Apr. 11	84.62	July 12	82.51	Oct. 28	81.00
Feb. 20	84.05	May 4	84.07	Aug. 5	80.90	Nov. 16	81.62
Mar. 17	84.60	June 17	82.92	Sept. 20	81.47	Dec. 16	81.07

29.11.1.2.9. Runyon Area. Hulsart well. Description given in Water-Supply Paper 817. Highest water level, 100.40 feet above mean sea level Apr. 19, 1939; lowest water level, 95.82 feet above mean sea level Dec. 31, 1939. Water level at the end of day, in feet above mean sea level, 1939 (from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	98.23	98.35	99.57	100.20	100.10	99.19	98.27	97.37	96.93	96.42	96.13	96.13
2	98.21	98.39	99.60	100.18	100.07	99.15	98.23	97.34	96.92	96.42	96.14	96.13
3	98.21	98.46	99.63	100.17	100.05	99.13	98.20	97.31	96.90	96.44	96.16	96.11
4	98.17	98.54	99.67	100.15	100.02	99.09	98.18	97.29	96.89	96.45	96.18	96.10
5	98.19	98.69	.....	100.14	100.00	99.08	98.15	97.24	96.87	96.46	96.20	96.09
6	98.22	98.83	.....	100.19	99.98	99.02	98.11	97.22	96.86	96.46	96.21	96.08
7	98.28	98.88	.....	100.22	99.95	98.99	98.09	97.19	96.86	96.44	96.26	96.07
8	98.29	98.94	.....	100.28	99.92	98.97	98.07	97.18	96.84	96.42	96.30	96.06
9	98.30	98.99	.....	100.31	99.91	98.93	98.03	97.15	96.82	96.41	96.32	96.05
10	98.31	99.07	.....	100.35	99.88	98.89	97.99	97.12	96.81	96.40	96.35	96.04
11	98.30	99.10	.....	100.38	99.84	98.86	97.97	97.09	96.79	96.39	96.36	96.03
12	98.28	99.16	.....	100.36	99.79	98.82	97.94	97.07	96.77	96.38	96.36	96.02
13	98.32	99.20	.....	100.35	99.76	98.81	97.91	97.04	96.74	96.36	96.36	96.01
14	98.28	99.24	.....	100.39	99.74	98.78	97.88	97.02	96.73	96.34	96.36	96.00
15	98.27	99.24	.....	100.36	99.71	98.76	97.84	96.99	96.71	96.33	96.36	95.99
16	98.27	99.26	.....	100.33	99.68	98.73	97.82	96.98	96.69	96.32	96.36	95.98
17	98.28	99.30	99.97	100.36	99.66	98.68	97.79	96.95	96.67	96.30	96.35	95.97
18	98.29	99.34	99.98	100.39	99.62	98.65	97.75	96.93	96.65	96.29	96.34	95.96
19	98.27	99.38	99.99	100.40	99.59	98.63	97.73	96.94	96.64	96.29	96.32	95.95
20	98.26	99.39	100.02	100.39	99.57	98.60	97.69	96.94	96.61	96.28	96.30	95.94
21	98.27	99.44	100.04	100.38	99.54	98.58	97.67	96.96	96.59	96.27	96.29	95.92
22	98.26	99.42	100.05	100.33	99.51	98.54	97.64	96.94	96.58	96.24	96.28	95.91
23	98.24	99.44	100.07	100.32	99.48	98.50	97.60	96.92	96.56	96.23	96.25	95.90
24	98.30	99.43	100.09	100.33	99.44	98.48	97.58	96.90	96.54	96.21	96.23	95.89
25	98.24	99.44	100.09	100.29	99.40	98.44	97.55	96.89	96.53	96.20	96.20	95.88
26	98.24	99.48	100.10	100.27	99.38	98.40	97.53	96.92	96.50	96.19	96.19	95.87
27	98.19	99.49	100.09	100.23	99.37	98.38	97.49	96.94	96.49	96.19	96.18	95.86
28	98.18	99.56	100.11	100.19	99.34	98.34	97.47	96.94	96.47	96.16	96.17	95.84
29	98.19	.....	100.12	100.19	99.30	98.32	97.45	96.94	96.45	96.14	96.15	95.84
30	98.29	.....	100.16	100.17	99.28	98.29	97.43	96.93	96.44	96.14	96.14	95.83
31	98.30	.....	100.18	.....	99.24	.....	97.39	96.93	.....	96.14	.....	95.82

## NEW MEXICO

### CHAVES AND EDDY COUNTIES

#### ROSWELL ARTESIAN BASIN

By A. M. Morgan and O. J. Loeltz

In the Roswell artesian basin practically all the land under cultivation is irrigated by water derived directly or indirectly from underground sources. The chief sources are artesian water<sup>1/</sup> in the San Andres limestone and shallow water<sup>2/</sup> in the valley fill. The minor sources of irrigation water are the spring-fed perennial flows of the lower courses of the larger tributaries of the Pecos River, the flow of drains, and the flow of the Pecos River. Most of the normal flow of the three minor sources is derived from natural ground-water seepage and return water from irrigation in the artesian basin. Beginning in 1938, releases of water from storage in Alamogordo Reservoir above Fort Sumner have been made during the irrigation season, when the lands irrigated from the Pecos River received water from outside the artesian basin.

The total acreage of irrigated land in the artesian basin in 1939 was about the same as that in 1938--106,000 acres. Some new land was irrigated for the first time in 1939, and some land previously irrigated was allowed to remain idle. About 800 acres were irrigated for the first time in 1939 by water derived from shallow wells. About 7,000 acres were irrigated by water pumped from the Pecos River, of which 2,000 acres are in Eddy County and 5,000 acres in Chaves County.

#### Fluctuations in artesian head

Fluctuations of artesian head in the Roswell artesian basin in 1939, as indicated by three representative wells equipped with water-stage recorders, are shown in the following table. The mean daily artesian head was ascertained by inspection of the recorder graph; the mean monthly head was obtained by averaging the mean daily head; and the mean annual head was determined by averaging the mean monthly head. The records of artesian head were furnished through the courtesy of E. G. Minton, Jr., artesian-well

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1/ Fiedler, A. G., and Nye, S. S., Geology and ground-water resources of the Roswell artesian basin, N. Mex.: U. S. Geol. Survey Water-Supply Paper 639, pp. 134-155, 194-260, 1933.

2/ Idem., pp. 120-128, 260-263. Morgan, A. M., Geology and shallow-water resources of the Roswell artesian basin: New Mexico State engineer 12th and 13th Bienn. Rept., pp. 155-249, 1939.

supervisor of the Roswell artesian basin. Records of artesian head in the three wells from 1925 through 1938 are given in Water-Supply Papers 777, 817, 840, and 845.

Records for 1939 for all three wells show a major seasonal fluctuation of artesian head similar to that of previous years. In all three wells the head dropped sharply in the early spring when irrigation began and rose sharply in the fall and winter. Minor fluctuations of head, caused by changes in draft brought about by changes in local precipitation, occurred in each of the wells during the summer. In the Artesia well the head increased in May and August, when precipitation was above normal in the vicinity of Artesia. In the Berrendo and Orchard Park wells the head increased in July, a month of heavy rainfall in the vicinity of Roswell.

In each of the three wells the mean annual water level for 1939 was the lowest of record. In the Berrendo well the mean water level in 1939 was 1.1 feet lower than that for 1938, and the monthly mean level in December 1939 was 1.6 feet lower than that in December 1938. In the Orchard Park well the mean stage for 1939 was 5.5 feet below that for 1938, and the mean stage for December 1939 was 3.8 feet lower than for December 1938. The lowest mean monthly water level in the period of record was reached in this well in August 1939, when it was 3.5 feet lower than the minimum monthly stage of 1938. In the Artesia well the mean stage for 1939 was 3.4 feet lower than the mean for 1938, and the mean for December 1939 was 0.6 foot below the mean for December 1938. In this well the minimum monthly stage for 1939, in July, was 4.6 feet below that for 1938.

Berrendo well. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 9, T. 10 S., R. 24 E. See Water-Supply Paper 777 for complete description. Period of record: June 1926 to December 1939. Extremes: Highest mean annual water level, 3,571.2 feet (1927). Lowest mean annual water level, 3,564.0 feet (1939). Highest mean monthly water level, 3,574.2 feet (December 1926). Lowest mean monthly water level, 3,561.0 feet (August 1938).

Mean monthly and annual artesian head, in feet above sea level, 1939

Month	Water level	Month	Water level	Month	Water level
Jan.	3,567.3	June	3,561.8	Oct.	3,563.6
Feb.	3,567.3	July	3,562.1	Nov.	3,564.6
Mar.	3,565.8	Aug.	3,562.5	Dec.	3,565.4
Apr.	3,563.7	Sept.	3,561.4	Annual	3,564.0
May	3,562.8				

Orchard Park well. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 23, T. 12 S., R. 25 E. See Water-Supply Paper 777 for complete description. Period of record: August 1925 to December 1939. Extremes: Highest mean annual water level, 3,526.2 (1932). Lowest mean annual water level, 3,516.8 (1939). Highest mean monthly water level, 3,536.6 (December 1937). Lowest mean monthly water level 3,505.1 (August 1939).

Orchard Park well.--Continued  
Mean monthly and annual artesian head, in feet above sea level, 1939

Month	Water level	Month	Water level	Month	Water level
Jan.	3,530.4	June	3,505.8	Oct.	3,521.7
Feb.	3,527.6	July	3,507.8	Nov.	3,526.1
Mar.	3,520.0	Aug.	3,505.1	Dec.	3,529.0
Apr.	3,511.7	Sept.	3,507.9	Annual	3,516.8
May	3,508.5				

Artesia well. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 5, T. 18 S., R. 26 E. See Water-Supply Paper 845 for complete description. Period of record: April 1, 1931, to December 1939. Extremes: Highest mean annual water level, 3,333.3 (1933). Lowest mean annual water level, 3,373.4 (1939). Highest mean monthly water level, 3,391.4 (January 1933). Lowest mean monthly water level, 3,366.8 (August 1935).

Mean monthly and annual artesian head, in feet above sea level, 1939

Jan.	3,385.0	June	3,372.6	Oct.	3,380.7
Feb.	3,384.5	July	3,369.8	Nov.	3,383.9
Mar.	3,380.2	Aug.	3,373.5	Dec.	3,387.8
Apr.	3,374.3	Sept.	3,372.4	Annual	3,378.4
May	3,376.2				

#### Water levels in shallow wells

The investigation of shallow ground-water resources in the Roswell basin, in Chaves and Eddy Counties, N. Mex., <sup>3/</sup> begun in 1937 in cooperation with the State engineer, was continued through 1939. The field investigation of the geology of the area and the collection of well data were essentially completed late in 1937, but the observation-well program was continued through 1938 and 1939.

Measurements of water level in 54 selected wells scattered over the basin have been made monthly or semimonthly for various periods between May 1937 and December 1939. Regular observations of water levels in 30 wells have been made since 1937. Measurements on 5 wells were discontinued in 1938 and on 5 more wells in 1939. In 1939, 14 additional wells were selected to replace observation wells that had to be abandoned and to supplement the records obtained from those remaining. At the close of 1939 the water levels in 44 wells were being measured regularly. Of the 44 wells, 33 are in Chaves County and 11 in Eddy County. Water-stage recorders have been installed on 7 of the 44 observation wells--4 in Chaves County and 3 in Eddy County.

The records of all but one of the wells in which the water levels are measured monthly show seasonal fluctuations of water level that appear to be due principally to pumping for irrigation. The water levels reach the

<sup>3/</sup> Morgan, A. M., Geology and shallow-water resources of the Roswell artesian basin, N. Mex.: New Mexico State engineer 12th and 13th Bienn. Rept., pp. 156-249, 1938.

Water levels and artesian pressure in observation wells in the United States in 1938: U. S. Geol. Survey Water-Supply Paper 845, pp. 282-300, 1939.

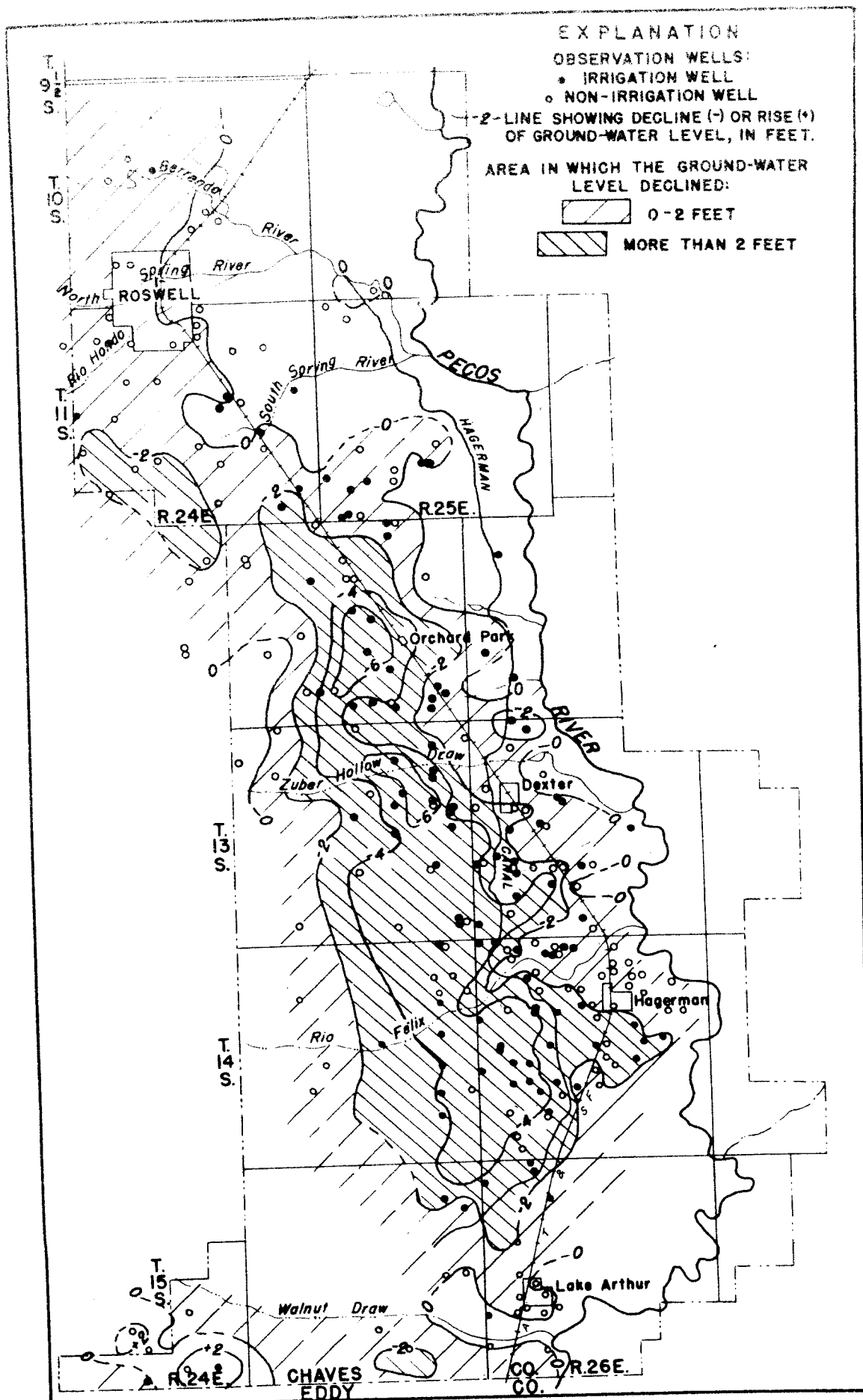


Figure 13.--Map of Chaves County portion of the Roswell Basin, New Mexico, showing change in the ground-water level from January 1939 to January 1940.

high point for the year in the winter or early spring and the low point in late summer. The amount of seasonal fluctuation varies from less than 1 foot to over 16 feet, depending on the proximity and number of irrigation wells in the vicinity. In general, the pattern of fluctuation in any well in 1939 was similar to that of the same well in previous years, but in nearly all wells the water levels at comparable periods were lower in 1939 than in 1938 or 1937.

In January and early February of 1938, 1939, and 1940, when the water levels throughout the basin were at or near the highest stage for the year, and when there was the least local disturbance of water levels by pumping, the water levels in many additional wells were measured. The following table shows the number of wells measured in each year:

County	1938	1939	1940
Chaves	290	299	298
Eddy	119	132	114
Total	409	431	412

Of the 409 wells observed in 1938, the water levels in 378 were measured in 1939, and 326 were measured again in 1940. In 1940 the water levels in 362 of the 431 wells measured in 1939 were remeasured. The change in water levels shown by these measurements were plotted on maps and contoured at 2-foot intervals. The accompanying two figures show the changes in water level from January 1939 to January 1940 that occurred in those parts of Chaves and Eddy Counties that are in the Roswell basin. Two other figures show the changes in water level that occurred in the same area from January 1938 to January 1940.

During 1939, as shown by the changes in water level from January 1939 to January 1940, the water levels lowered over practically all the area in a belt from 5 to 9 miles wide--a belt that adjoins the Pecos River and that extends from Dayton to a few miles north of Roswell, a distance of 52 miles. The belt of lowered water levels is warped along the cross tributaries to the Pecos River (in which a perennial flow is maintained by ground-water discharge), such as Berrendo River, Rio Hondo, South Spring River, Rio Felix, Walnut Draw, and Cottonwood Creek. In the northern part of the basin, near Roswell, the belt of lowered water levels swings northwestward from the Pecos River and is separated from the river by a belt, 4 to 5 miles wide, in which the water levels rose slightly.

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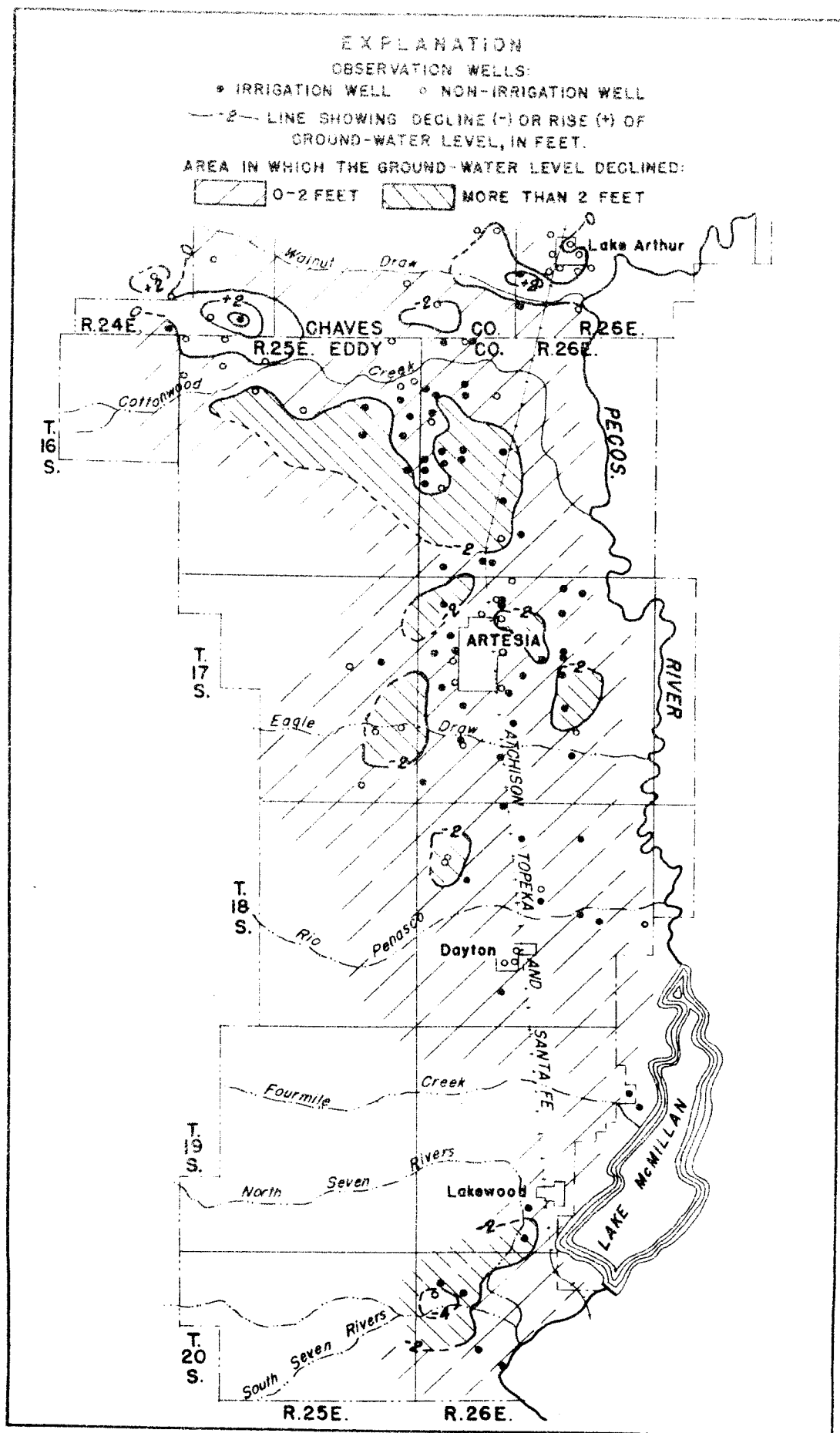


Figure 14.—Map of Eddy County portion of the Roswell Basin, New Mexico, showing change in the ground-water level from January 1939 to January 1940.

In Chaves County the change in water levels ranged from a small rise to a decline of over 6 feet. The greatest decline took place in the section of heavy shallow-water development between Lake Arthur and Orchard Park. In this section water levels fell throughout an area 6 to 9 miles wide and 22 miles long. Along the north-south axis of this area the decline was over 4 feet, and it was over 6 feet in a series of "lows" along the axis. The maximum drop measured was 7.21 feet in an irrigation well west of Dexter. The average decline in water levels in this area of about 100 square miles was about 3.5 feet.

In Eddy County the decline in water levels ranged from less than 1 foot to 3.08 feet, but it exceeded 2.5 feet in only a few wells. Lowering of over 2 feet occurred in several small isolated areas scattered over the section of general decline in water levels, the largest area of which is about 12 square miles and includes or adjoins the area of fairly intense ground-water development immediately south of Cottonwood Creek. The average decline in water levels in Eddy County amounts to about 1.5 feet over about 75 square miles.

Along the Chaves County-Eddy County line, in the southeastern part of T. 15 S., R. 24 E., and extending into the northwestern part of T. 16 S., R. 25 E., an anomalous rise of water levels ranged from 0.13 foot to 4.60 feet. Similar rises of water levels in several other small areas occurred between January 1938 and January 1939 but were largely eliminated between January 1939 and January 1940. In this small area, however, water levels rose in both years. The sharp rise of water levels in this section during a period of pronounced lowering of water levels over the greater part of the basin appears to be associated with the upward leakage of artesian water--possibly recently developed leakage from artesian wells in the vicinity.

In the period from January 1938 to January 1940, the water levels in Chaves County declined in the same areas that showed a decline from January 1939 to January 1940. The total net fall during the 2 years amounted to over 9 feet along the center line of the heavily developed section between Lake Arthur and Orchard Park. In this section the decline averaged about 5 feet over about 100 square miles. In the vicinity of Roswell the decline amounted to almost 2 feet west of the city and almost 4 feet in a few wells southwest of the city. East of Roswell the water levels rose from a few hundredths of a foot to a maximum of 2.4 feet.



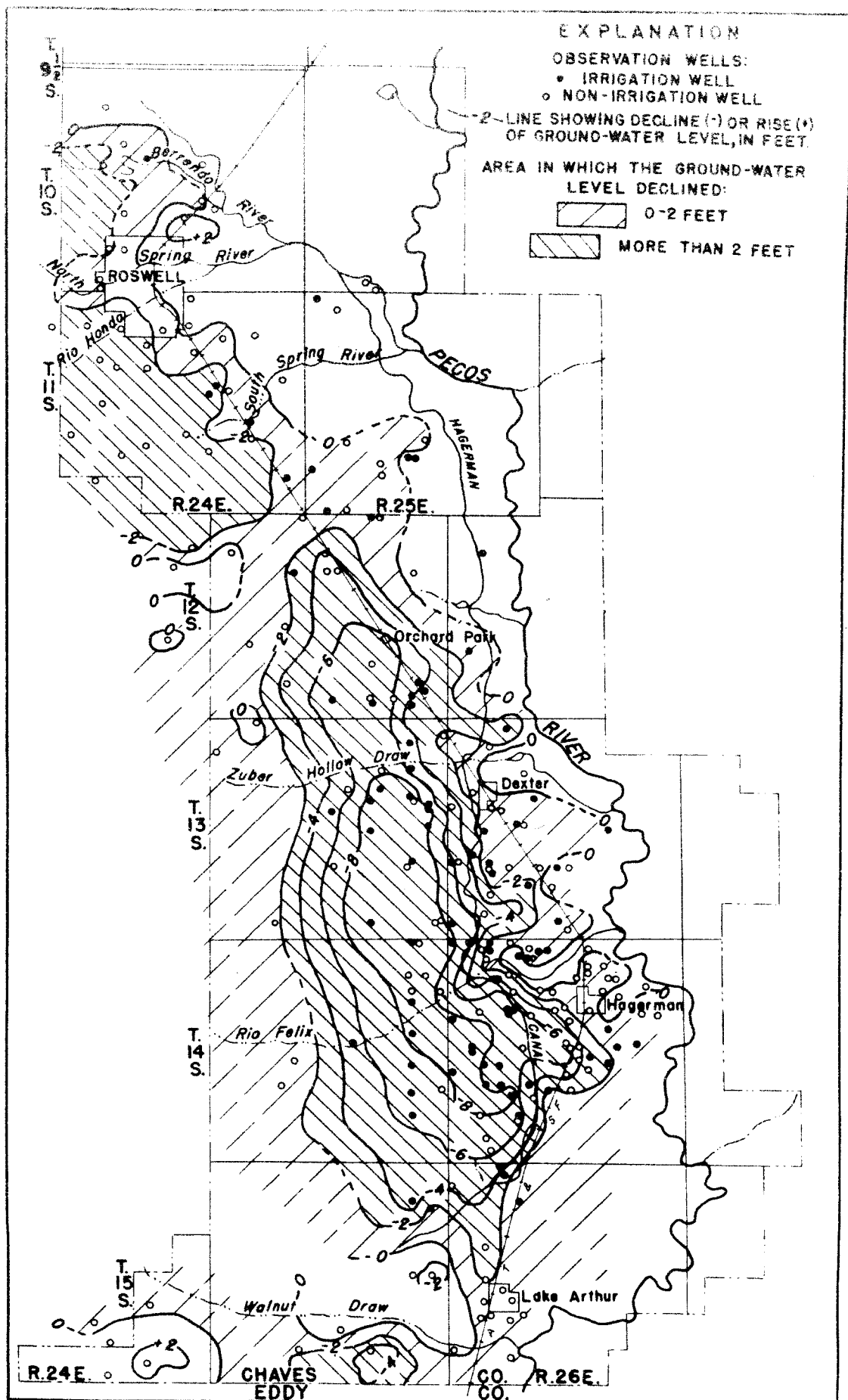


Figure 15.—Map of Chaves County portion of the Roswell Basin, New Mexico, showing change in the ground-water level from January 1938 to January 1940.

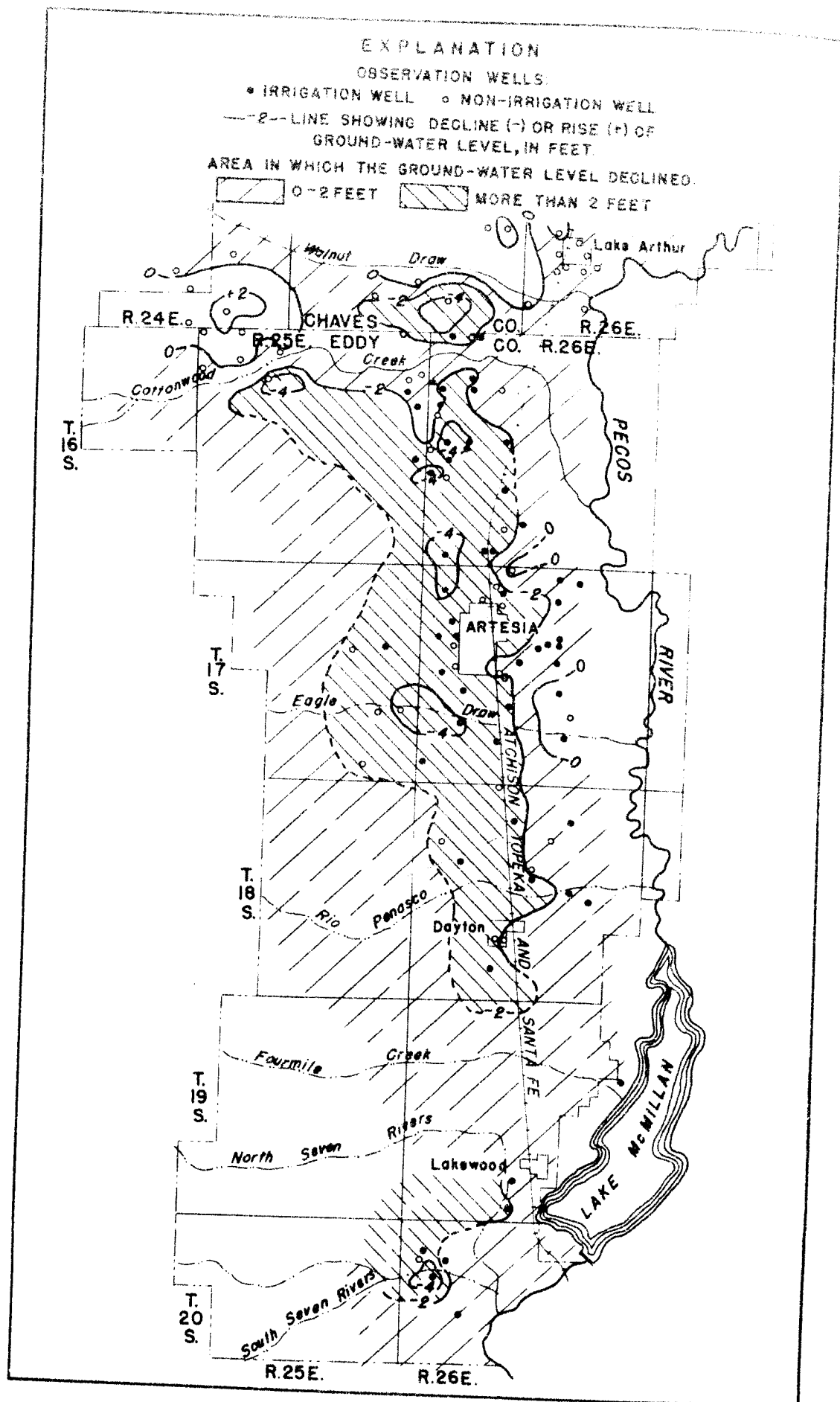


Figure 16.—Map of Eddy County portion of the Roswell Basin, New Mexico, showing change in the ground-water level from January 1938 to January 1940.

In Eddy County the water levels declined over practically all the 6- to 8-mile belt adjoining the Pecos River. The decline ranged from less than 1 foot to a maximum of 4.57 feet and amounted to over 3 feet in an area of about 25 square miles that extend from 2 miles south of Artesia northward to Cottonwood Creek.

## Chaves County

10.24.8.111. Dug stock well. Measuring point, top of platform, 0.40 foot above land surface. Equipped with windmill. Water level, in feet below land surface datum: Feb. 5, 1938, 43.03.

10.24.15.342. Tow. Domestic well. Measuring point, top of clamp, 0.50 foot above land surface. Equipped with windmill. Water level, in feet below land surface datum: Feb. 5, 1938, 8.82.

10.24.16.133. George D. Perrine. Drilled irrigation well, diameter 12 inches, depth 150 feet. Measuring point, bottom edge of mouth of discharge pipe, 2.55-foot correction to land surface. Water levels, in feet below land surface datum: Feb. 5, 1938, 27.03; Feb. 2, 1939, 27.33.

10.24.17.122. Howard. Domestic well, diameter 6 inches. Measuring point, top of casing, 0.85 foot above land surface. Equipped with hand pump in 1938; pump removed in 1939.

Water level, in feet below land surface datum, 1937-39

Date	Water level	Date	Water level	Date	Water level
Aug. 5, 1937	35.56	Feb. 2, 1939	31.00	Nov. 27, 1939	33.61
Feb. 5, 1938	30.76	Nov. 5	33.70		

10.24.17.243. George D. Perrine. See Water-Supply Paper 845 for description. Measurements discontinued after Sept. 18, 1939.

Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 2	29.79	Mar. 7	30.59	May 10	33.74	Aug. 17	34.85
21	29.92	31	32.48	June 22	36.50	Sept. 18	35.39

10.24.18.424. Domestic well, diameter 6 inches. Measuring point, top of casing flush with land surface. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 5, 1938, 41.30; Feb. 2, 1939, 42.02.

10.24.20.344. Domestic well, diameter 6 inches. Measuring point, top of clamp, 0.40 foot above land surface. Equipped with windmill. Water level, in feet below land surface datum: Feb. 5, 1938, 43.20.

10.24.20.322. H. Crile. Domestic well, diameter 6 inches. Measuring point, top of casing, 2.72 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 5, 1938, 19.02; Feb. 2, 1939, 19.52.

10.24.22.432. Fuller. See Water-Supply Paper 845 for description. Water-stage recorder installed Mar. 10, 1939.

Water level at 4:00 a.m., in feet below land surface datum, 1939  
(from recorder charts)

Day	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1			19.96	19.49	18.69	.....	17.43a	17.08	16.83	.....	.....
2	a19.33	.....	19.97	19.45	.....	.....	.....	17.08	16.82	.....	.....
3			19.98	19.43	18.65	.....	.....	17.06	16.81	.....a	18.15
4			19.99	19.41	18.62	.....	.....	17.04	16.82	.....	18.16
5			19.99	19.39	18.59	.....a	17.26	17.03	16.83	.....	18.17
6			.....	19.36	18.56	.....	17.23	17.01	16.84	.....	18.19
7		a19.75	.....	19.32	18.53	.....	17.20	16.99	.....a	17.59	18.21
8			.....	19.30	18.52a	18.10	17.18	16.98	.....	17.60	18.23
9			.....	19.27	.....	18.08	17.17	16.97	.....	17.61	18.24
10		a19.71	.....	19.25	.....	18.06	17.15	16.95	.....	17.62	18.27

a Tape measurement.

## Chaves County--Continued

10.24.22.432.--Continued

Water level at 4:00 a.m., in feet below land surface datum, 1939  
(from recorder charts)

Day	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
11	.....	.....	.....	19.24	.....	18.03	17.14	16.94	.....	17.64	18.30
12	.....	.....	.....	19.22	.....	18.01	17.13	16.93a	16.93	17.67	18.34
13	.....	.....	.....	19.21a	18.49	17.98	.....	16.93	16.93	17.69	18.36
14	.....	.....	.....	19.18	18.49	17.97	.....	16.93	16.95	17.71	18.38
15	.....	.....	.....	19.15	18.48	17.93	.....	16.93	16.97	.....	18.40
16	.....	.....	.....	19.12	18.46	17.90	.....	.....	16.98a	17.78	18.42
17	.....	.....	.....	19.09	18.45	17.88a	17.18	.....	17.00	17.80	18.44
18	.....a	19.80	.....	19.08	18.44	17.86	17.18a	16.96	.....	17.81	18.46
19	.....	19.81	.....	19.05	18.42	17.84	17.17	16.95	.....	17.82	.....
20	.....	19.81	.....	19.02	18.43	17.80	17.17	16.94	.....	17.85	.....
21	a	20.47	19.82	.....	18.99	.....	17.79	17.17	16.93	.....	17.87
22	.....	19.82	.....	18.96a	18.52	17.74	17.16	16.92	.....	17.90	.....
23	.....	19.83	.....	18.93	18.52	17.72	17.16	16.92	.....	17.94	.....
24	.....	19.83	.....	18.91	19.51	17.67	17.15	.....	.....	17.96	.....
25	.....	19.84	.....	18.88	19.50	17.64	.....	.....	.....	17.98	.....
26	.....	.....	.....	18.87	19.49	17.61	17.14	.....	.....	18.00a	18.64
27	.....	.....	a	19.63	18.85	19.47	17.59	17.13	.....	18.03	18.65
28	.....	.....	.....	19.61	18.82	19.45	17.57	17.12	.....	.....	18.67
29	.....	.....	.....	19.58	18.79	.....	17.55	17.11	.....	.....	18.68
30	.....a	19.95	19.54	18.77	.....	17.53	17.09a	16.84	.....	.....	18.70
31	.....	19.95	.....	18.73	.....	17.50	.....	.....a	17.41	.....	18.71

10.24.27.111. Domestic well, diameter 5 inches. Measuring point, top of casing, 0.40 foot above land surface. Equipped with hand pump. Water levels, in feet below land surface datum: Feb. 5, 1938, 25.17; Feb. 2, 1939, 23.55.

10.24.29.333. Domestic well. Measuring point, top of platform, 1.00 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 5, 1938, 38.30; Feb. 2, 1939, 38.99.

10.24.30.344. Domestic and stock well, diameter 6 inches. Measuring point, top of clamp, 1.00 foot above land surface, and 0.30 foot above concrete foundation. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 5, 1938, 46.97; Feb. 2, 1939, 47.71.

10.24.31.333. Williams. Domestic well. Measuring point, top of clamp, 0.20 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 5, 1938, 35.57; Feb. 2, 1939, 36.52.

10.24.31.423. Domestic well. Measuring point, top of clamp, 0.30 foot above land surface. Equipped with windmill. Water level, in feet below land surface datum: Feb. 5, 1938, 22.70.

10.24.31.444. Star Tourist Camp. See Water-Supply Paper 845 for description.

Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 2	24.36	Mar. 31	24.96	Aug. 17	25.16	Nov. 8	25.38
Feb. 21	24.05	May 10	24.64	Sept. 18	24.66	Nov. 27	25.46
Mar. 7	24.07	July 31	24.82				

10.25.32.431. Henry Russell Estate. Drilled irrigation well, diameter 12½ inches, depth 92 feet. Measuring point, bottom edge of mouth of discharge pipe, 5.60-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 5, 1938, 5.80; Feb. 2, 1939, 5.10.

a Tape measurement.

## Chaves County--Continued.

10.25.32.444. Henry Russell Estate. Domestic well, diameter 10 (?) inches. Measuring point, top of casing, 1.80 feet above land surface. Equipped with windmill. Water levels, in feet: Feb. 5, 1938, 0.20 above land surface; Feb. 2, 1939, 0.02 below land surface.

11.23.12.221. Domestic and stock well, diameter 6 inches, depth 85 feet. Measuring point, top of clamp, 1.30 feet above land surface, 0.55 foot above top of casing. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 4, 1938, 58.23; Feb. 2, 1939, 59.95.

11.24.2.322. Domestic well. Measuring point, top of casing, 1.08 feet above land surface. Equipped with windmill. Water level, in feet below land surface datum: Feb. 2, 1939, 9.83.

11.24.3.114. Domestic well, diameter 6 inches. Measuring point, top of casing, 0.20 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 4, 1938, 16.47; Feb. 2, 1939, 16.45.

11.24.3.312. Abandoned domestic well. Measuring point, top of casing, 1.06 feet above land surface. Water level, in feet below land surface datum: Feb. 2, 1939, 13.52.

11.24.3.333. Domestic well. Measuring point, top of platform, 0.50 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 4, 1938, 27.53; Jan. 31, 1939, 26.10.

11.24.6.224. Domestic well, diameter 6 (?) inches. Measuring point, top of casing, 0.98 foot above land surface. Equipped with automatic pump. Water level, in feet below land surface datum: Feb. 5, 1938, 25.62.

11.24.6.311. Domestic well. Measuring point, top of casing, 0.95 foot above land surface. Equipped with bailer. Water level, in feet below land surface datum: Feb. 2, 1939, 37.59.

11.24.6.433. Stock and domestic well, diameter 6 inches, depth 52 feet. Measuring point, top of clamp, 0.70 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 4, 1938, 37.94; Feb. 3, 1939, 39.03.

11.24.6.444. Morrie Huff. Irrigation well. Measuring point, bottom edge of mouth of discharge pipe, 3.54-foot correction to land surface. Equipped with turbine pump. Water level, in feet below land surface datum: Feb. 2, 1939, 39.55.

11.24.7.444. Abandoned domestic well, diameter 6 inches, depth 89 feet. Measuring point, top of casing, 1.23 feet above land surface. Water levels, in feet below land surface datum: Feb. 4, 1938, 58.87; Feb. 1, 1939, 60.10.

11.24.8.122. Domestic well, diameter 5 inches. Measuring point, top of clamp at east side of pump base, 0.38 foot above land surface. Equipped with hand pump. Water levels, in feet below land surface datum: Feb. 4, 1938, 31.42; Feb. 2, 1939, 32.37.

11.24.9.133. P. Caman. Stock well, diameter 6 inches. Measuring point, top of clamp, 1.55 feet above land surface, 0.32 foot above top of casing. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 4, 1938, 39.89; Feb. 4, 1939, 46.10.

11.24.9.211. Domestic well. Measuring point, top of inner edge of tile casing, 0.77 foot above land surface, and 1.12 feet below top of platform. Equipped with bucket bailer. Water levels, in feet below land surface datum: Feb. 5, 1938, 33.37; Feb. 10, 1939, 34.21.

## Chaves County--Continued

11.24.10.224. C. E. Smith. See Water-Supply Paper 845 for description.  
Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 10	a 19.61	Mar. 31	b 24.91	July 31	b 26.47	Nov. 8	c 22.66
Mar. 1	b 21.03	May 10	26.38	Aug. 17	28.54	27	b 21.82
7	b 22.54	June 22	b 30.34	Sept. 18	28.40		

11.24.10.321. Domestic well. Measuring point, top of casing, 0.50 foot above land surface. Equipped with windmill. Water level, in feet below land surface datum: Feb. 4, 1938, 27.66.

11.24.11.214. H. D. Jeffcoat. Domestic well, diameter 5 inches, depth 83 feet. Measuring point, top of clamp, 0.78 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 5, 1938, 13.16; Jan. 31, 1939, 11.65.

11.24.13.144. Frank Peters. Drilled irrigation well, diameter 12 (?) inches, depth 164 feet. Measuring point, mouth of discharge pipe, 3.50-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 5, 1938, 14.27; Jan. 31, 1939, 13.85.

11.24.14.313b. Fairbanks Filling Station. See Water-Supply Paper 845 for description.

Water level, in feet below land surface datum, 1939

Jan. 31	37.54	Mar. 31	44.45	July 31	45.34	Nov. 8	41.65
Feb. 21	38.91	May 10	47.28	Aug. 17	51.78	27	39.98
Mar. 7	41.53	June 22	51.34	Sept. 18	50.38		

11.24.14.331. Waller Feed Yard. See Water-Supply Paper 845 for description. Measurements discontinued after Dec. 2, 1938.

11.24.15.421. Mrs. M. L. Barnett. Drilled irrigation well, diameter 8 inches, depth 125 feet. Measuring point, top of 2 by 4-inch stringer over well, 0.69 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 4, 1938, 37.08; Jan. 31, 1939, 39.29.

11.24.15.431. M. L. and S. Barnett. Drilled irrigation well, diameter 12½ inches, depth 145 feet. Measuring point, bottom edge of mouth of discharge pipe, 4.03-foot correction to basal flange of pump base, 4.54-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 4, 1938, 38.17; Jan. 3, 1939, 41.66.

11.24.16.111. Domestic well, depth 80 feet. Measuring point, top of clamp, 0.45 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 4, 1938, 52.55; Feb. 1, 1939, 53.93.

11.24.17.121. D. H. Johnson. Abandoned domestic well, diameter 5 inches, depth 72 feet. Measuring point, top of casing, 0.70 foot above land surface. Equipment, none. Water levels, in feet below land surface datum: Feb. 4, 1938, 56.88; Feb. 1, 1939, 58.17.

11.24.18.333. G. V. Coker. Drilled irrigation well, diameter 14 inches, depth 167 feet. Measuring point, top of basal flange of pump head, 0.45 foot above land surface. Equipped with turbine pump. Water level, in feet below land surface datum: Feb. 1, 1939, 88.48.

11.24.19.222. Domestic and stock well. Measuring point, top of casing, 0.60 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 4, 1938, 72.77; Feb. 1, 1939, 74.40.

11.24.19.343. Domestic and stock well. Measuring point, bottom of clamp, 0.27 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 4, 1938, 95.07; Feb. 1, 1939, 96.20.

11.24.22.333. John Tweedy. Domestic and stock well, diameter 6 inches. Measuring point, top of cap over casing, 0.72 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 4, 1938, 47.48; Jan. 31, 1939, 49.90.

a Windmill shut down 15 minutes.      b Windmill pumping.  
c Windmill shut down 10 minutes.

## Chaves County--Continued

11.24.23.411a. Cornell Ranch. Drilled irrigation well, diameter 14 $\frac{1}{2}$  inches, depth 131 feet. Measuring point, bottom edge of mouth of discharge pipe, 4.00-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 5, 1938, 14.74; Jan. 31, 1939, 15.75.

11.24.23.433. Tweedy Gin. Industrial well, diameter 6 inches. Measuring point, top of concrete floor flush with land surface. Equipped with pump jack. Water levels, in feet below land surface datum: Feb. 4, 1938, 17.85; Feb. 1, 1939, 19.42.

11.24.24.144. Domestic well, diameter 6 inches. Measuring point, top of casing, 1.66 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 5, 1938, 10.20; Jan. 31, 1939, 10.95.

11.24.27.231. Copeland. Domestic well, diameter 6 inches. Measuring point, top of casing, 0.30 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 4, 1938, 44.19; Feb. 3, 1939, 46.15.

11.24.28.113. Rocky Arroyo School House. Domestic well. Measuring point, top of clamp, 2.45 feet above land surface, 0.50 foot above top of casing. Equipped with windmill.

Water level, in feet below land surface datum, 1938-39

Date	Water level	Date	Water level	Date	Water level
Feb. 4, 1938	64.53	Mar. 31, 1939	67.37	Aug. 17, 1939	a 72.72
Feb. 4, 1939	65.71	May 10	69.71	Sept. 18	73.84
21	a 66.12	June 22	a 71.75	Nov. 8	a 72.96
Mar. 7	66.13	July 31	72.66	27	71.03

11.24.29.411. Mrs. J. S. Singleton. Domestic and stock well, diameter 6 (?) inches, depth 90 feet. Measuring point, top of clamp, 0.50 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 4, 1938, 81.25; Feb. 3, 1939, 82.48.

11.24.31.221. Domestic and stock well. Measuring point, top of clamp, 1.40 feet above land surface, 0.34 foot above top of casing. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 4, 1938, 94.67; Feb. 1, 1939, 95.46.

11.24.34.411b. Domestic well. Measuring point, top of casing, 1.44 feet above land surface. Water level, in feet below land surface datum: Jan. 31, 1939, 49.43.

11.24.36.211. Russell Smith. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 220 feet. Measuring point, top of casing, 0.20 foot below land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 4, 1938, 23.48; Jan. 31, 1939, 24.40.

11.24.36.133. Wiley Grizzle. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 192 feet. Measuring point, top of casing, flush with land surface. Equipped with turbine pump. Water level, in feet below land surface datum: Jan. 31, 1939, 32.93.

11.24.36.333. Wiley Grizzle. Drilled irrigation well, diameter 15 inches, depth 225 feet. Measuring point, 1939, flush with land surface while drilling, no permanent bench mark. Equipped with turbine pump. Water level, in feet below land surface datum: Jan. 31, 1939, 35.55.

11.25.4.111. J. P. White. Drilled irrigation well, diameter 15 $\frac{1}{2}$  inches, depth 97 feet. Measuring point, top of casing, 1.43 feet above land surface to 1940. Casing pulled and well abandoned during 1939. Water levels, in feet below land surface datum: Feb. 5, 1938, 1.78; Feb. 2, 1939, 2.48.

11.25.6.114. Henry Russell Estate. Drilled irrigation well, diameter 12 (?) inches. Measuring point, top of casing, 0.30 foot above land surface. No equipment. Water levels, in feet below land surface datum: Feb. 5, 1938, 16.30; Feb. 2, 1939, 14.90.

a Windmill pumping.

## Chaves County--Continued

11.25.9.421. Dug domestic well, depth 9.6 feet. Measuring point, top of platform flush with land surface. No equipment. Water levels, in feet below land surface datum: Feb. 5, 1933, 8.34; Feb. 2, 1939, 7.86.

11.25.22.333. Mrs. Whitney. Domestic and stock well, diameter 6 inches. Measuring point, top of casing, 0.55 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 3, 1938, 7.08; Jan. 31, 1939, 6.86.

11.25.28.234. E. Whitney. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 186 feet. Measuring point, edge of north  $\frac{1}{2}$ -inch hole on west side of pump, 0.35-foot correction to top of concrete, 1.10-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 3, 1938, 7.23; Jan. 31, 1939, 6.88.

11.25.28.244. R. Whitney. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 119 feet. Measuring points, (a) bottom edge of mouth of discharge pipe, 4.45-foot correction to land surface; (b) edge of west  $\frac{1}{2}$ -inch hole in north side of pump base, 0.43-foot correction to top of concrete, 1.28-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 3, 1938, 6.95; Jan. 31, 1939, 6.70.

11.25.29.111. Oasis Gin. Industrial well, diameter 6 $\frac{1}{2}$  inches, depth 120 feet. Measuring point, top of casing, 0.25 foot above land surface. Equipped with pump jack. Water levels, in feet below land surface datum: Feb. 5, 1938, 8.65; Feb. 4, 1939, 5.47.

11.25.29.343. Albert Hobson. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 160 feet. Measuring point, top of casing, 0.60 foot above land surface, 0.80 foot above 8 by 8-inch casing clamp. Equipped with turbine pump. Water level, in feet below land surface datum: Jan. 31, 1939, 5.50.

11.25.29.422. Neil Wheeler. See Water-Supply Paper 845 for description. Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 9	6.65	Mar. 31	5.60	July 31	7.14	Nov. 8	7.56
21	6.21	May 10	6.04	Aug. 17	7.75	27	7.44
Mar. 7	5.82	June 22	6.96	Sept. 18	8.95		

11.25.29.444. Glen Wheeler. See Water-Supply Paper 845 for description. Water level, in feet below land surface datum, 1939

Jan. 31	a 7.17	Mar. 7	9.10	June 22	a 11.77	Sept. 18	a 11.96
Feb. 9	7.57	31	a 8.47	July 31	9.94	Nov. 8	9.15
21	7.67	May 10	a 9.70	Aug. 17	a 10.41	27	8.78

11.25.30.333. J. P. White Co. Drilled irrigation well, diameter 14 inches, depth 146 feet. Measuring point, bottom edge of basal flange of pump head on northwest side, 1.40-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 4, 1938, 16.88; Jan. 31, 1939, 16.97.

11.25.31.223. Irrigation well. Measuring point, bottom edge of 2 by 4-inch timber support at east side of pump, 0.35 foot above land surface. Equipped with turbine pump. Water level, in feet below land surface datum: Jan. 31, 1939, 13.90.

11.25.31.433a. Albert Watson. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 232 feet. Measuring point, top of casing, 0.35 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 3, 1938, 29.56; Jan. 30, 1939, 30.04.

11.25.31.433b. Albert Watson. Drilled irrigation well. Measuring point, bottom edge of 2 by 12-inch cover flush with land surface. No equipment. Water level, in feet below land surface datum: Jan. 30, 1939, 29.37.

a Irrigation well 600 feet distant pumping.



## Chaves County--Continued

11.25.32.333. George Bogart. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 108 feet. Measuring point, top of 6 by 8-inch timber support, 0.40 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 3, 1938, 24.96; Jan. 30, 1939, 25.87.

12.24.12.411. Little. Domestic and stock well, diameter 6 inches, depth 86.0 feet. Measuring point, top of casing, 1.13 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 4, 1938, 57.02; Jan. 31, 1939, 57.95.

12.24.23.441a. Monte Goodin. Domestic and stock well, diameter 7 inches. Measuring point, top of casing, 0.65 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 3, 1938, 81.60; Feb. 3, 1939, 82.62.

12.24.23.441b. Monte Goodin. Abandoned stock well. Measuring point, top of casing, 1.20 feet above land surface. No equipment. Water level, in feet below land surface datum: Feb. 3, 1939, 82.79.

12.25.2.Lot 3. B. F. Heine. Drilled irrigation well, diameter 15 $\frac{1}{2}$  inches, depth 109 feet. Measuring point, top of 2 by 6-inch timber, 0.23 foot above concrete which is flush with land surface. No equipment. Water levels, in feet below land surface datum: Feb. 3, 1938, 13.45; Jan. 31, 1939, 13.49.

12.25.2. Lot. 4. E. R. Duval. Drilled irrigation well, diameter 11 inches, depth 40 feet. Measuring point, top of base plate, 0.40 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 3, 1938, 11.80; Jan. 31, 1939, 11.92.

12.25.3.334. J. W. Young. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches. Measuring point, bottom edge of hole in south side of casing, 0.99 foot above land surface. Equipped with turbine pump. Water level, in feet below land surface datum: Feb. 4, 1939, 25.65.

12.25.4. Lot. 2. J. G. Smith. See Water-Supply Paper 845 for description. Measuring point, after Jan. 30, 1939, top of casing, 0.44 foot above land surface. Equipped with windmill, Jan. 1939. Measurements discontinued after May 10, 1939.

Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 30	31.43	Mar. 7	32.85	May 10	33.83
Feb. 21	32.14	31	31.90		

12.25.4. Lot. 4. Cross Roads Filling Station. Domestic well. Measuring point, top of casing, 0.23 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 8, 1938, 36.49; Jan. 1, 1939, 33.79; Nov. 6, 1939, 36.63; Nov. 27, 1939, 36.77.

12.25.7.144a. Abandoned domestic and stock well, depth 50 feet. Measuring point, top of casing, 0.30 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 4, 1938, 45.00; Jan. 31, 1939, 43.25.

12.25.7.144b. Domestic and stock well. Measuring point, top of casing, 0.30 foot above land surface. Equipped with windmill. Water level, in feet below land surface datum: Jan. 31, 1939, 42.76.

12.25.9.422. Cumberland townsite (Welty). See Water-Supply Paper 845 for description.

Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 30	41.14	Mar. 31	41.27	July 31	43.49	Nov. 8	44.68
Feb. 21	41.28	May 10	41.84	Aug. 17	43.94	27	44.53
Mar. 7	41.23	June 22	42.74	Sept. 18	44.74		

a Windmill pumping.

## Chaves County--Continued

12.25.13.111. Domestic well. Measuring point, top of casing, 0.36 foot above land surface. Water level, in feet below land surface datum: Jan. 30, 1939, 15.56.

12.25.15.112. Domestic well. Measuring point, top of clamp, 0.40 foot above land surface. Water levels, in feet below land surface datum: Feb. 8, 1938, 39.33; Jan. 30, 1939, 40.20.

12.25.15.333. G. M. Sterrett. Drilled irrigation well, diameter 12½ inches, depth 130 feet. Measuring point, top of north 6 by 6-inch timber support at west edge of basal flange of pump head, 0.50 foot above land surface. Equipped with turbine pump. Water level, in feet below land surface datum: Jan. 28, 1939, 48.40.

12.25.16.111. Ernest Nelson. Drilled irrigation well, diameter 12½ (?) inches, depth 120 feet. Measuring point, top of casing, 0.45 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 11, 1938, 32.46; Jan. 28, 1939, 32.91.

12.25.16.222. Domestic and stock well. Measuring point, top of casing, 0.55 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 3, 1938, 42.25; Feb. 1, 1939, 43.34.

12.25.20.422. Abandoned stock well, diameter 6 inches, depth 70 feet. Measuring point, top of casing, 1.60 foot above land surface. No equipment. Water levels, in feet below land surface datum: Feb. 3, 1938, 69.80; Jan. 28, 1939, 70.32.

12.25.22.231. W. T. Clardy. Irrigation well. Measuring point, top of hole in basal flange of pump head, 0.89 foot above land surface. Equipped with turbine pump. Water level, in feet below land surface datum, 1939: Jan. 28, 51.84; Nov. 3, 64.85; Nov. 8, 63.04; Nov. 27, 60.70.

12.25.23.332. See Water-Supply Paper 845 for description. Water levels, in feet below land surface datum, 1939: Jan. 28, 45.20; Feb. 21, 45.72; Mar. 7, 46.30; Mar. 31, 47.08; measurements discontinued.

12.25.25.413. Omar Leach. Drilled irrigation well, diameter 12½ inches, depth 186 feet. Measuring point, bottom edge of mouth of discharge pipe, 4.60-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 2, 1938, 19.02; Jan. 27, 1939, 20.94.

12.25.26.311. C. E. Smith. Drilled irrigation well, diameter 12 (?) inches, depth 230 feet. Measuring point, top of basal flange of pump head, 0.40 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 3, 1938, 40.62; Jan. 28, 1939, 43.00.

12.25.27.211. W. T. Clardy. Drilled irrigation well, diameter 18 inches, depth 250 feet. Measuring point, base of 2 by 12-inch timber support, 0.20 foot above land surface. Equipped with turbine pump. Water level, in feet below land surface datum: Jan. 28, 1939, 48.70.

12.25.30.222. Domestic and stock well. Measuring point, top of casing, 0.20 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 3, 1938, 80.33; Feb. 3, 1939, 80.67.

12.25.31.311. Stock well. Measuring point, top of concrete, 0.23 foot above land surface. Water level, in feet below land surface datum: Feb. 1, 1939, 71.34.

12.25.32.222. Stock well. Measuring point, top of casing, 0.45 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 3, 1938, 70.80; Feb. 3, 1939, 73.20.

12.25.33.112. W. A. McLeod. Drilled irrigation well, diameter 15 inches, depth 197 feet. Measuring point, bottom edge of basal flange of pump head under discharge pipe, 0.20-foot correction to concrete foundation flush with land surface. Equipped with turbine pump. Water level, in feet below land surface datum: Jan. 28, 1939, 67.07.

## Chaves County--Continued

12.25.33.211. Domestic well. Measuring point, top of 2 by 12-inch stringer across east side of pit flush with land surface, 0.17 foot above curb of concrete pit. Water level, in feet below land surface datum: Jan. 28, 1939, 53.11.

12.25.34.311a. W. T. Clardy. Designated 12.25.34.311 in Water-Supply Paper 845.

Water level at 4:00 a.m., in feet below land surface datum, 1939 (from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	.....	53.35	bd	c62.90	55.24	56.78	59.04	59.75	.....	.....
2	.....	.....	.....	53.35	bd	a60.55	55.18c	57.60	58.25	59.15	.....	.....
3	.....	.....	.....	53.32	.....	60.05	55.16c	58.00	58.17	58.73	.....	a53.97
4	.....	.....	.....	53.26f	63.72	59.83	55.15	a60.74	58.11	58.37	.....	53.92
5	.....	.....	.....	.....	bd	59.23	55.09c	58.80b	61.87	58.08	.....	53.90
6	a49.57	a48.87	.....	.....	bd	58.82	55.08c	58.92c	59.95	57.77	.....	.....
7	49.59	48.75	49.12	.....	bd	58.52	.....	c59.00	59.00	.....	a56.44	.....
8	49.48	48.79	49.14	.....	bd	58.25a	55.60c	59.04	58.53	.....	56.28	.....
9	49.49	48.68	.....	.....	bd	58.05	55.65c	58.85b	62.75	.....	55.95	.....
10	49.46	.....	.....	.....	bd	.....	55.70	57.71	bd	.....	55.80	.....
11	49.45	.....	.....	.....	bd	.....	55.61	57.28	bd	.....	a53.56	.....
12	.....	.....	.....	.....	bd	.....	55.64	57.00	bd	a56.82	.....	53.60
13	.....	.....	.....	.....	bd	a56.84	55.67	56.80c	61.63	56.77	.....	53.61
14	.....	.....	.....	.....	bd	56.78	55.77	56.70c	61.00	56.65	.....	53.50
15	a49.26	.....	.....	.....	bd	56.68	55.79	56.65	.....	56.50	.....	53.52
16	49.24	.....	.....	.....	bd	56.62	55.76b	61.70	.....	56.38a	54.95	53.46
17	49.26	.....	.....	.....	bd	56.56	55.80b	62.35	.....	56.30a	54.95	53.55
18	49.18	.....	b60.74	.....	bd	56.54	55.90c	59.40	abd	.....	54.92	53.45
19	.....	a49.62	57.75	.....	bd	56.48	56.00	58.37	bd	.....	54.84	.....
20	.....	49.62	57.75	.....	bd	56.45	56.00b	63.00c	62.30	.....	54.77	.....
21	.....	49.71	54.56	.....	b64.00	.....	55.90b	63.07	bd	.....	54.68	.....
22	.....	49.64	.....	.....	b64.21	.....	55.90c	61.60	bd	.....	54.60	.....
23	.....	49.50	.....	.....	bd	56.27	55.88b	61.50	bd	.....	.....	.....
24	a49.19	48.85e	56.90	.....	bd	56.20	55.88c	60.48	bd	.....	.....	.....
25	49.10	48.84	55.00	.....	bd	56.13	55.93a	59.89	bd	.....	.....	.....
26	49.12	.....	54.23f	61.43	bd	55.95b	58.45	59.50	.....	.....	.....	a53.11
27	48.99	.....	.....	b62.84	bd	55.86c	60.19	59.00	.....	.....	.....	53.13
28	48.92	.....	.....	b63.33	bd	55.72c	57.65	59.68	.....	.....	.....	53.15
29	49.04	.....	.....	b63.68	bd	55.51c	57.85	59.47a	60.83	.....	.....	53.05
30	49.00	.....	.....	b64.03	c62.70	55.41	56.90	59.30	60.47	.....	.....	53.12
31	.....	a53.36	bd	b64.04	.....	c57.80	59.15	.....	a55.77	.....	.....	53.00

12.25.34.311b. W. T. Clardy. One hundred feet south of well 12.25.34.311a. Drilled irrigation well, 144 feet of 15½-inch and 40 feet of 12-inch casing, depth 182 feet. Measuring point, top of concrete foundation, 0.30 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 11, 1938, 46.15; Jan. 28, 1939, 49.12.

12.25.34.411. Irrigation well. Measuring point, top of basal flange of pump head 0.10 foot above concrete foundation flush with land surface. Equipped with turbine pump. Water level, in feet below land surface datum: Jan. 28, 1938, 43.57.

12.25.35.311a. A. C. Stone. Designated 12.25.35.311 in Water-Supply Paper 845.

Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	40.71	Mar. 7	g 44.09	June 22	h 66.93	Sept. 18	48.58
28	40.11	31	h 61.23	July 31	52.49	Nov. 8	45.94
Feb. 21	41.86	May 10	h 64.25	Aug. 17	h 65.71	27	45.45

a Tape measurement.

b Irrigation well 100 feet south pumping.

c Irrigation well 100 feet south shut down shortly before measurement.

d Well dry at depth 64.30 feet.

e Tape measurement; irrigation well 100 feet south pumping.

f Tape measurement; irrigation well 100 feet south shut down shortly before measurement.

g Irrigation well 300 feet east pumped shortly before measurement.

h Irrigation well 300 feet east pumping.

## Chaves County--Continued

12.25.35.311b. A. C. Stone. Drilled irrigation well, diameter 10 $\frac{1}{2}$  inches, depth 190 feet. Measuring point, top of casing, flush with land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 3, 1938, 38.55; Jan. 29, 1939, 40.46.

12.25.35.411. A. C. Stone. Domestic well, diameter 8 inches. Measuring point, top of casing 0.30 foot above land surface. Equipped with windmill. Water level, in feet below land surface datum: Jan. 11, 1938, 37.59.

12.25.36.121. O. B. Berry. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 255 feet. Measuring point, bottom edge of mouth of discharge pipe, 11.43-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 2, 1938, 19.36; Jan. 27, 1939, 22.80.

12.25.36.133. H. Kuykendall. Drilled irrigation well, diameter 15 $\frac{1}{2}$  inches, depth 170 feet. Measuring point, top of basal flange of pump head, 0.55 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 2, 1938, 26.31; Jan. 26, 1939, 28.32.

12.25.36.142. O. B. Berry. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 173 feet. Measuring point, top edge of 2 by 6-inch timber under east 12 by 12-inch timber supporting pump base, flush with land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 2, 1938, 16.60; Jan. 27, 1939, 18.11.

12.25.36.313. M. L. Kuykendall. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 200 feet. Measuring point, top of casing, 0.45 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 2, 1938, 22.84; Jan. 26, 1939, 24.65.

12.26.7.421. Cecil Johnson. Drilled irrigation well. Measuring point, top of casing, 0.40 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 2, 1938, 5.6; Jan. 30, 1939, a/.

12.26.29.333. Irrigation well. Measuring point, top of platform, flush with land surface. Equipped with turbine pump. Water level, in feet below land surface datum: Jan. 27, 1939, 15.63.

12.26.30.213. S. O. Wilburn. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches. Measuring point, top of casing, flush with land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 2, 1938, 15.45; Jan. 27, 1939, 15.94.

13.25.1.111. M. L. Kuykendall. Domestic well, diameter 6 inches. Measuring point, top of clamp, 1.30 feet above land surface, 0.50 foot above top of casing. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 2, 1938, 15.42; Jan. 26, 1939, 18.15.

13.25.1.331. Will Schaaphok. Drilled irrigation well, diameter 12 inches, depth 166 feet. Measuring point, top of casing, 0.65 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 2, 1938, 11.50; Jan. 26, 1939, 13.41.

13.25.1.422. O. B. Berry. Owner given as C. B. Berry in Water-Supply Paper 845.

Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 27	8.47	Mar. 31	6.47	July 31	9.51	Nov. 3	9.80
Feb. 21	8.11	May 10	9.14	Aug. 17	10.64	27	10.07
Mar. 7	7.75	June 22	8.98	Sept. 18	11.35		

a Flowing.

## Chaves County--Continued

13.25.3.111. Stanley. Abandoned domestic well, diameter 10 inches. Measuring point, top of casing, 1.36 feet above land surface. No equipment. Water levels, in feet below land surface datum: Jan. 11, 1938, 45.40; Jan. 28, 1939, 48.69.

13.25.5.111. Stock well, diameter 6 inches. Measuring point, top of casing, 0.65 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 3, 1938, 63.50; Feb. 3, 1939, 63.04.

13.25.6.333. Stock well, diameter 6 inches. Measuring point, top of clamp, 1.06 feet above land surface, 0.36 foot above top of casing. No equipment. Water levels, in feet below land surface datum: Feb. 3, 1938, 78.22; Feb. 3, 1939, 80.46.

13.25.8.133. Abandoned domestic well. Measuring point, bottom edge of hole on east side of pump pipe, 0.37 foot above land surface. Water level, in feet below land surface datum: Feb. 1, 1939, 66.23.

13.25.10.344. Reinecke. Domestic well, diameter 6 inches. Measuring point, top of casing, 0.65 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 11, 1938, 57.30; Feb. 1, 1939, 60.18.

13.25.11.111. Mrs. Belle Hurst. Drilled irrigation well, diameter 12½ inches, depth 180 feet. Measuring point, top of casing, 0.20 foot above land surface. Equipped with turbine pump. Water level, in feet below land surface datum: Jan. 28, 1939, 37.27.

13.25.11.343. J. E. Brockman. Drilled irrigation well, diameter 12½ inches, depth 165 feet. Measuring point, top of casing, flush with land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 30, 1938, 42.63; Jan. 26, 1939, 46.39.

13.25.11.433. Beck. Abandoned well. Diameter 6 inches, depth 72.9 feet. Measuring point, top of casing, 0.50 foot above land surface. No equipment. Water levels, in feet below land surface datum, 1939: Nov. 3, 50.58; Nov. 8, 49.53; Nov. 27, 46.72.

13.25.12.133. M. E. Colclazier. Drilled irrigation well, diameter 15 inches, depth 225 feet. Measuring point, bottom edge of hole in south side of casing, 0.70 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 2, 1938, 19.32; Jan. 26, 1939, 22.21.

13.25.12.311. M. E. Colclazier. Drilled irrigation well, 67 feet of 10-inch casing, 126 feet of 12½-inch casing, depth 190 feet. Measuring point, top of basal flange of pump head, 0.63 foot above land surface. Equipped with turbine pump. Water level, in feet below land surface datum: Jan. 26, 1939, 20.33.

13.25.13.113. W. F. Kerr. Drilled irrigation well, 130 feet of 14-inch casing, 60 feet of 12-inch casing, depth 190 feet. Measuring point, top of casing, 1.00 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 2, 1938, 31.30; Jan. 26, 1939, 34.68.

13.25.13.131. Domestic well, diameter 6 inches. Measuring point, top of casing, 0.37 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 2, 1938, 31.19; Jan. 26, 1939, 34.80.

13.25.13.233a. W. F. Kerr. Drilled irrigation well, diameter 12 (?) inches. Measuring point, top of casing, 0.50 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 1, 1938, 23.43; Jan. 26, 1939, 26.38.

13.25.13.233b. W. F. Kerr. Drilled irrigation well, diameter 12 (?) inches. Measuring point, center of pump head, 1.74 feet above land surface, 1.04 feet above top of casing. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 1, 1938, 25.05; Jan. 26, 1939, 27.99.

## Chaves County--Continued

13.25.13.433. Mrs. J. W. Wier. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 146 feet. Measuring point, top of basal flange of pump head, 0.55 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 1, 1938, 27.25; Jan. 26, 1939, 30.43.

13.25.14.131. Durand and McNeil. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 122 feet. Measuring point, bottom edge of mouth of discharge pipe, 14.30-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 30, 1938, 48.71; Feb. 4, 1939, 53.05.

13.25.15.311. Roswell Insurance and Surety Company. Drilled irrigation well, 170 feet of 14-inch casing, 100 feet of 10-inch casing, depth 270 feet. Measuring point, top of basal flange of pump head, 0.45 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 30, 1938, 68.88; Jan. 26, 1939, 71.06.

13.25.15.422. Domestic well, diameter 6 inches. Measuring point, top of clamp, 0.35 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 3, 1938, 49.65; Feb. 1, 1939, 53.32.

13.25.17.411. Stock well. Measuring point, top of clamp, 0.50 foot above land surface, 0.32 foot above top of casing. Equipped with windmill. Water level, in feet below land surface datum: Feb. 3, 1939, 65.87.

13.25.23.111. I. F. Wortman. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 204 feet. Measuring point, west edge of basal flange of pump head (tape is inserted between pump head and concrete foundation), 3.18-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 30, 1938, 52.76; Jan. 25, 1939, 56.37.

13.25.24.333. Hal Bogle. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 202 feet. Measuring point, top of casing, 0.20 foot below land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 30, 1938, 43.75; Jan. 25, 1939, 46.26.

13.25.26.211. Mrs. B. Hurst. Abandoned irrigation well, diameter 10 (?) inches, depth 60 (?) feet. Measuring point, land surface. No equipment. Water levels, in feet below land surface datum: Jan. 30, 1938, 47.7; Jan. 26, 1939, 52.0.

13.25.26.222. Domestic well, diameter 6 inches. Measuring point, top of concrete, flush with land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 30, 1938, 41.95; Jan. 25, 1939, 46.30.

13.25.27.111. Hal Bogle. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 187 feet. Measuring point, top of basal flange of pump head, 0.65 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 30, 1938, 69.30; Jan. 26, 1939, 71.73.

13.25.27.211a. Hal Bogle. Designated 13.25.27.122 in Water-Supply Paper 845. Water level, in feet below land surface datum: Jan. 6, 1939, 63.22; measurements discontinued.

13.25.27.211b. Hal Bogle. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches. Measuring point, top of casing, 0.42 foot above land surface. Equipped with turbine pump. Water level, in feet below land surface datum: Jan. 26, 1939, 62.81.

13.25.32.411. Stock well, diameter 6 inches. Measuring point, top of concrete, flush with land surface. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 3, 1938, a/76.52; Jan. 26, 1939, 76.89.

13.25.34.433a. O. B. Berry. Stock well, diameter 6 inches. Measuring point, top of casing, 0.72 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 30, 1938, 61.35; Feb. 3, 1939, 63.17.

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a Pump stopped 15 minutes before measurement.

## Chaves County--Continued

13.25.35.311. W. F. Kerr. Drilled irrigation well, diameter 15 $\frac{1}{2}$  inches, depth 177 feet. Measuring point, top of basal flange at pump head, 0.65 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 30, 1938, 57.13; Jan. 25, 1939, 61.25.

13.25.36.421a. R. M. Ware. Domestic well, diameter 6 inches. Measuring point, top of casing, flush with land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 31, 1938, 39.00; Jan. 25, 1939, 42.07.

13.25.36.421b. R. M. Ware. Dug and drilled irrigation well. Measuring point, top of concrete wall of pit, flush with land surface. Equipped with turbine pump. Water level, in feet below land surface datum: Jan. 25, 1939, 43.64.

13.25.36.421c. R. M. Ware. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 120 feet. Measuring point, bottom edge of mouth of discharge pipe, 2.85-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 31, 1938, 40.02; Jan. 25, 1939, 43.30.

13.26.5.111. Robert H. Aston. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 94 feet. Measuring point, top of basal flange of pump head, 0.03 foot above concrete foundation, 0.75 foot above land surface. Equipped with turbine pump. Water level, in feet below land surface datum: Jan. 27, 1939, 9.97.

13.26.5.231a. Starrett. Abandoned domestic well, diameter 6 inches. Measuring point, top of casing, 0.45 foot above land surface. No equipment. Water levels, in feet below land surface datum: Feb. 2, 1938, 14.25; Jan. 27, 1939, 13.89.

13.26.5.231b. Starrett. Dug and drilled irrigation well, diameter 12 inches, depth 102 feet. Measuring point, top of 4 by 6-inch timber supporting pump at east edge of pump base, 0.57 foot above platform flush with land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 2, 1938, 9.48; Jan. 27, 1939, 9.67.

13.26.5.331. W. W. Harris. Drilled irrigation well, diameter 10 inches, depth 110 feet. Measuring point, top of basal flange of pump head, 0.65 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 2, 1938, 15.65; Jan. 27, 1939, 16.07.

13.26.7.333. Howard Amason. Unused domestic well, diameter 6 inches. Measuring point, top of casing, 0.60 foot above land surface. Water-stage recorder installed, March 22, 1939.

Water level at 4:00 a.m., in feet below land surface datum, 1939  
(from recorder charts)

Day	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	9.58	9.80	10.98	11.28	11.10	12.37	11.03	.....	.....
2	.....	9.65	10.27	.....	11.23	11.26	12.38	10.88	.....	.....
3	.....	9.62	10.51	8.58	11.12	11.32	12.40	10.82	.....	.....
4	.....	9.88	10.68	7.83	11.08	.....	12.20	10.84	.....	8.43
5	.....	10.02	10.60	6.27	11.07	11.46	12.02	10.81	.....	8.37
6	.....	10.32	10.57	.....	10.89	11.43	12.16	10.78	.....	8.33
7	.....	.....	10.17	7.93	.....	11.40	12.25	.....	.....	8.29
8	.....	.....	10.07	7.95	.....	11.58	12.37	.....	9.53	8.27
9	.....	.....	10.10	7.84	11.37	11.63	12.48	.....	9.48	8.23
10	.....	.....	10.10	.....	11.46	11.57	12.47	.....	9.39	8.21
11	.....	.....	10.18	.....	11.36	11.53	12.37	.....	9.34	.....
12	.....	.....	10.28	.....	11.21	11.51	12.45	10.43	9.27	8.18
13	.....	.....	10.36	10.64	11.43	11.51	12.57	10.38	9.28	8.26
14	.....	.....	10.37	10.72	11.25	11.59	12.68	.....	.....	8.31
15	.....	.....	10.21	10.79	10.86	11.49	12.71	.....	.....	8.36
16	.....	.....	9.84	10.81	10.74	11.44	.....	10.12	.....	8.44
17	.....	.....	10.08	10.84	10.64	11.40	.....	10.05	.....	8.45
18	.....	.....	10.14	10.95	10.69	11.42	.....	10.02	.....	8.41
19	.....	.....	10.13	10.95	10.84	11.43	11.85	10.00	.....	.....
20	.....	.....	10.22	10.93	10.67	11.38	11.75	.....	.....	.....

a Tape measurement.

## Chaves County--Continued

13.26.7.333.--Continued

Water level at 4:00 a.m., in feet below land surface datum, 1939  
(from recorder charts)

Day	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
21	.....	.....	10.33	.....	10.42	11.41	11.70	.....	.....	.....
22	a7.49	.....	10.21	a10.94	10.36	11.36	11.73	.....	.....	a8.25
23	7.89	.....	10.22	11.04	10.34	11.37	11.73	.....	.....	8.24
24	8.25	.....	10.95	11.06	10.28	11.52	11.60	.....	.....	8.26
25	8.28	.....	11.21	11.10	10.30	.....	11.40	.....	.....	8.27
26	8.90	.....	11.40	11.15	10.63	11.78	.....	.....	.....	8.21
27	8.60	a10.44	11.44	11.20	10.55	11.82	.....	.....	.....	8.16
28	8.69	10.70	10.91	11.19	10.54	11.87	.....	.....	.....	.....
29	9.28	10.70	10.23	11.23	10.75	11.91	.....	.....	.....	.....
30	9.17	9.73	10.72	11.31	10.95	12.14	11.12	.....	.....	.....
31	a9.11	.....	11.05	.....	11.08	12.31	.....	a10.02	.....	.....

13.26.7.433. Abandoned domestic well. Measuring point, top of casing, 0.40 foot above land surface. No equipment. Water level, in feet below land surface datum: Feb. 7, 1939, 9.56.

13.26.8.332. Domestic well. Measuring point, top of casing, 0.90 foot above surface. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 2, 1938, 10.29; Feb. 1, 1939, 6.89.

13.26.8.422. Jake Mills. See Water-Supply Paper 845 for description; correct diameter, 6 inches.

Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 27	14.65	Mar. 31	b 14.47	July 31	15.65	Nov. 8	b 14.46
Feb. 21	14.55	May 10	b 14.98	Aug. 17	15.28	27	15.42
Mar. 7	14.41	June 22	14.80	Sept. 18	16.14		

13.26.16.114a. Fish Hatchery. Fish culture well, diameter 15½ inches, depth 135 (?) feet. Measuring point, concrete floor of shed, 7.1 feet below land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 2, 1938, 10.78; Jan. 27, 1939, 9.96.

13.26.16.114b. Fish Hatchery. Fish culture well, diameter 15½ inches, depth 60 (?) feet. Measuring point, edge of pump base (tape inserted between pump base and foundation), 0.25-foot correction to top of concrete block 0.90 foot above floor of shed, 1.35-foot correction to land surface. Equipped with turbine pump. Water level, in feet below land surface datum: Jan. 27, 1939, 6.62.

13.26.16.114c. Fish Hatchery. Fish culture well, diameter 15½ inches, depth 63 (?) feet. Measuring point, top of concrete foundation at pump base, 4.36 feet below land surface. Equipped with turbine pump. Water level, in feet below land surface datum: Jan. 27, 1939, 7.16.

12.26.17.133. Mehlhop. See Water-Supply Paper 845 for description, in which name is incorrectly spelled.

Water level, in feet, with reference to land surface datum, 1939

Jan. 6	(c)	Mar. 7	(c)	June 22	-1.56	Sept. 18	-4.13
25	(c)	31	(c)	July 31	-3.01	Nov. 8	-.79
Feb. 21	(c)	May 10	+0.14	Aug. 17	-3.79	27	(c)

13.26.17.213. Domestic and stock well. Measuring point, top of casing, 1.10 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 11, 1938, 10.97; Jan. 27, 1939, 10.70.

13.26.17.321. Leo Nowak. See Water-Supply Paper 845 for description, correct diameter 8 inches.

Water level, in feet below land surface datum, 1939

Jan. 25	8.90	Mar. 31	d 27.01	July 31	d 28.04	Nov. 8	d 30.75
Feb. 21	12.71	May 10	8.98	Aug. 17	23.76	27	11.33
Mar. 7	d 27.30	June 22	d 22.90	Sept. 18	13.17		

a Tape measurement. b Pumping. c Flowing. d Windmill pumping.



Chaves County--Continued

13.26.17.443. H. Vandembout. Drilled irrigation well, diameter 12 inches, depth 130 feet. Measuring point, basal flange of pump head, flush with land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 11, 1938, 12.60; Jan. 25, 1939, 12.42.

13.26.17.444. H. Vandembout. Domestic well, diameter 6 inches. Measuring point, top of clamp, 0.45 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 11, 1938, 12.75; Feb. 1, 1939, 12.37.

13.26.18.311. W. F. Kerr. Domestic well, diameter 6 inches. Measuring point, top of casing, 0.30 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 20, 1938, 14.21; Feb. 7, 1939, 15.38.

13.26.19.222. A. T. Stone. Drilled irrigation well, diameter 12½ inches, depth 265 feet. Measuring point, bottom edge of mouth of discharge pipe, 4.35-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 1, 1938, 19.33; Jan. 25, 1939, 18.22.

13.26.19.333. Hal Bogle. Drilled irrigation well. Measuring point, bottom edge of mouth of discharge pipe, 7.0-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 2, 1938, 21.75; Jan. 25, 1939, 23.74.

13.26.19.343. Domestic well. Measuring point, top of casing, 0.50 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Feb. 2, 1938, 17.85; Jan. 25, 1939, 19.10.

13.26.19.432. George Weaver. Drilled irrigation well, diameter 12½ inches, depth 265 feet. Measuring point, top of casing, 0.09 foot below land surface, or bottom edge of mouth of discharge pipe, 5.89-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 1, 1938, 9.27; Jan. 25, 1939, 7.89.

13.26.20.113. Domestic well, diameter 6 (?) inches. Measuring point, top of casing, 0.55 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 11, 1938, 17.79; Jan. 25, 1939, 17.72.

13.26.20.333. Mrs. Lockhead. Drilled irrigation well, diameter 12½ inches, depth 157 feet. Measuring point, bottom edge of mouth of discharge pipe, 3.5-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 1, 1938, 13.96; Jan. 25, 1939, 11.30.

13.26.23.111. Zuber Hollow Corporation. Drilled irrigation well, diameter 15½ inches, depth 287 feet. Measuring point, bottom edge of mouth of discharge pipe, 4.3-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 2, 1938, 4.83; Jan. 27, 1939, 4.74.

13.26.28.111. Domestic well. Measuring point, top of clamp, 0.68 foot above land surface, 0.28 foot above top of casing. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 31, 1938, 26.02; Jan. 25, 1939, 10.81.

13.26.28.121. George Grassie. Domestic well, diameter 6 inches. Measuring point, top of casing, 0.33 foot above land surface. Equipped with pressure pump. Water levels, in feet below land surface datum: Feb. 1, 1938, 16.70; Jan. 25, 1939, 14.82; Feb. 28, 1939, 15.58; Nov. 27, 1939, a/19.72.

13.26.28.221. Hal Bogle. Drilled irrigation well, diameter 15½ inches, depth 206 feet. Measuring point, basal flange of pump head, 0.40 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 1, 1938, 9.40; Jan. 25, 1939, 7.55.

13.26.28.233. Domestic well. Measuring point, top of clamp, 1.0 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 11, 1938, 11.94; Jan. 25, 1939, 9.74.

## Chaves County--Continued

13.26.28.311. Mrs. C. L. Appleby. Drilled irrigation well, diameter 12½ inches, depth 198 feet. Measuring point, bottom edge of mouth of discharge pipe, 3.18-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 31, 1938, 18.21; Jan. 25, 1939, 10.42.

13.26.29.113. J. H. Reid. Drilled irrigation well, diameter 12 inches, depth 196 feet. Measuring point, bottom edge of mouth of discharge pipe, 2.75-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 1, 1938, 16.65; Jan. 25, 1939, 14.33.

13.26.29.211. Domestic well. Measuring point, top of casing, 0.60 foot above land surface. Water levels, in feet below land surface datum: Feb. 1, 1938, 9.50; Jan. 25, 1939, 7.22.

13.26.29.333. M. Y. Monicle. Drilled irrigation well, diameter 12½ inches, depth 171 feet. Measuring point, bottom edge of mouth of discharge pipe, 4.66-foot correction to concrete foundation, 5.11-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 31, 1938, 12.30; Jan. 25, 1939, 11.21.

13.26.31.241. Domestic well. Measuring point, top of clamp, 0.32 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 31, 1938, 7.40; Jan. 24, 1939, 8.73.

13.26.31.311. E. O. Moore. Drilled irrigation well, diameter 21½ (?) inches, depth 165 feet. Measuring point, basal flange of pump head, 0.50 foot below land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 31, 1938, 35.30; Jan. 25, 1939, 38.23.

13.26.33.421. E. P. Malone. Drilled irrigation well, diameter 12½ inches, depth 70 feet. Measuring point, top of concrete pit on north side, 0.20 foot above land surface. Water levels, in feet below land surface datum: Feb. 1, 1938, 17.18; Jan. 25, 1939, 16.30.

13.26.33.433. Abandoned domestic well. Measuring point, top of clamp, 0.85 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 31, 1938, 11.03; Jan. 25, 1939, 11.52.

13.26.34.313. Mrs. West. Domestic well. Measuring point, top of casing, 1.25 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 27, 1938, 9.39; Jan. 24, 1939, 8.28.

14.25.1.112. Gentry. See Water-Supply Paper 845 for description.

Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	33.58	Mar. 7	a 32.76	June 22	b 40.50	Sept. 18	43.55
24	33.27	31	b 35.94	July 31	41.40	Nov. 8	41.43
Feb. 21	32.62	May 10	39.00	Aug. 17	41.73	27	40.41

14.25.1.343. Wm Langnegger. Drilled irrigation well, diameter 12½ inches, depth 130 feet. Measuring point, basal flange of pump head, 0.15 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 29, 1938, 43.20; Jan. 24, 1939, 46.97.

14.25.1.344. Wm. Langnegger. See Water-Supply Paper 845 for description.

Water level, in feet below land surface datum, 1939

Jan. 6	45.89	Mar. 7	c 48.73	June 22	(c)	Sept. 18	53.66
24	44.99	31	b 50.76	July 31	52.22	Nov. 8	52.37
Feb. 3	44.65	May 10	49.71	Aug. 17	b 57.21	27	52.65
21	44.32						

a Pump stopped 15 minutes.

b Irrigation well pumping.

c Windmill pumping.

## Chaves County--Continued

14.25.2.444. J. V. Thomas. Former owner, J. W. Coffee. Domestic well. Measuring point, top of casing, 0.95 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 11, 1938, 48.50; Jan. 24, 1939, 51.95.

14.25.8.411. Stock well. Measuring point, top of casing, 1.56 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Sept. 16, 1937, 94.10; Jan. 25, 1939, 93.89.

14.25.12.133b. C. Whitman. Domestic well, diameter 6 inches. Measuring point, top of casing, 0.35 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 29, 1938, 58.17; Jan. 24, 1939, 61.61.

14.25.12.234. Domestic well. Measuring point, top of clamp, 0.60 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 29, 1938, 43.40; Jan. 24, 1939, 46.44.

14.25.12.313. L. T. Lewis. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 226 feet. Measuring point, bottom edge of mouth of discharge pipe, 6.50-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 30, 1938, 60.75; Feb. 3, 1939, 64.33.

14.25.13.311. E. O. Moore. Drilled irrigation well, diameter 15 inches, depth 148 feet. Measuring point, bottom edge of 4 by 4-inch clamp flush with land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 28, 1938, 63.33; Jan. 19, 1939, 66.83.

14.25.14.131. O. B. Berry. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 202 feet. Measuring point, bottom edge of mouth of discharge pipe, 11.42-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 27, 1939, 84.52.

14.25.15.431. H. E. Blackwelder. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 276 feet. Measuring point, top of bolt on pipe clamp, east of pump column, flush with land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 28, 1938, 92.95; Jan. 19, 1939, 95.07.

14.25.20.443. Abandoned domestic well. Measuring point, top of casing, 1.68 feet above land surface. No equipment. Water levels, in feet below land surface datum: Jan. 28, 1938, 73.65; Jan. 20, 1939, 73.39.

14.25.21.131. See Water-Supply Paper 845 for description.  
Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 20	87.85	Mar. 7	88.06	June 22	88.38	Sept. 18	88.22
Feb. 8	88.00	31	88.19	July 31	88.51	Nov. 8	88.42
21	87.37	May 10	88.35	Aug. 17	88.09	27	88.49

14.25.24.133. E. O. Moore. Drilled irrigation well, diameter 16 inches, depth 150 feet. Measuring point, top of concrete foundation, 0.20 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 28, 1938, 56.73; Jan. 19, 1939, 59.90.

14.25.25.111. John M. Norris. Drilled irrigation well, diameter 16 inches, depth 151 feet. Measuring point, bottom edge of mouth of discharge pipe, 7.05-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 28, 1938, 56.05; Jan. 19, 1939, 59.15.

## Chaves County--Continued

14.25.25.221. John M. Morris. Designated 14.25.25.112 in Water-Supply Paper 845. Recorder installed, Dec. 23, 1938.

Water level at 4:00 a.m., in feet below land surface datum, 1938  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	42.55	.....	.....	42.72	44.22	.....	45.99	46.76	47.42	47.97	.....	.....
2	42.54	.....	a42.24	42.75	.....	a45.09	46.02	46.78	47.43	47.98	.....	.....
3	.....	.....	42.25	42.79	.....	45.12	46.04	46.80	47.51	48.00	.....	47.34
4	.....	.....	42.28	42.83	a44.36	.....	46.13	46.83	47.54	48.00	.....	47.33
5	.....	.....	42.29	.....	44.38	.....	46.14	46.85	47.56	48.02	.....	47.32
6	a42.43	.....	42.31	.....	44.61	.....	.....	46.86	47.59	48.03	.....	47.35
7	42.44	a42.03	42.35	.....	44.66	.....	.....	46.88	47.62	48.04	a47.77	47.33
8	42.43	42.03	.....	.....	44.50	.....	a46.20	46.91	47.65	.....	47.77	47.31
9	42.43	42.03	.....	.....	.....	.....	.....	46.91	47.67	.....	47.74	47.29
10	42.43	42.01	.....	.....	a44.59	.....	.....	46.93	47.70	.....	47.74	47.27
11	42.42	42.01	.....	.....	44.62	.....	.....	46.95	47.72	.....	47.72	.....
12	42.40	42.01	.....	.....	44.66	.....	.....	a46.95	47.74	a43.07	47.70	a47.18
13	.....	42.01	.....	.....	44.69	a45.47	.....	47.00	47.77	48.07	47.63	47.19
14	.....	42.01	.....	.....	44.72	45.48	.....	47.02	47.79	48.08	.....	47.18
15	a42.38	.....	.....	.....	.....	45.52	.....	47.04	47.81	48.07	.....	47.16
16	.....	.....	.....	.....	.....	45.55	.....	47.05	.....	48.05	a47.62	47.15
17	.....	.....	.....	.....	.....	45.58	.....	47.07	.....	48.06	47.62	47.13
18	.....	.....	a42.47	.....	44.74	45.62	.....	47.09	a47.82	48.04	47.60	47.11
19	a42.27	a42.00	.....	.....	44.74	45.65	.....	47.11	47.82	48.03	47.58	47.14
20	.....	42.01	.....	.....	44.75	45.68	.....	47.14	47.82	.....	47.57	.....
21	.....	42.03	.....	.....	44.76	.....	.....	47.15	47.83	.....	47.55	.....
22	.....	42.04	.....	.....	44.78	a45.70	.....	47.18	47.84	.....	47.53	.....
23	.....	42.04	.....	.....	44.80	.....	.....	47.20	47.85	.....	47.50	.....
24	a42.22	42.02	.....	.....	44.83	.....	.....	.....	47.86	.....	47.52	.....
25	42.20	.....	.....	.....	a44.84	.....	.....	a47.25	47.88	.....	47.51	.....
26	42.19	.....	.....	.....	44.86	.....	.....	47.26	47.90	.....	47.50	a46.90
27	42.18	.....	.....	44.07	.....	.....	.....	47.28	.....	.....	47.49	46.90
28	42.14	.....	.....	44.10	.....	.....	a46.69	47.32	.....	.....	47.47	46.88
29	42.13	.....	.....	44.14	.....	a45.93	46.71	47.35	a47.93	.....	47.45	46.85
30	42.13	.....	.....	44.18	.....	45.95	46.72	47.38	47.96	.....	47.43	46.84
31	42.10	.....	a42.70	.....	.....	.....	46.74	47.42	.....	a47.86	.....	46.82

14.25.25.313. S. C. Bybee. Drilled irrigation well, diameter 14 inches, depth 145 feet. Measuring point, bottom edge of mouth of discharge pipe, 5.40-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 28, 1938, 52.99; Jan. 19, 1939, 55.72.

14.25.29.233. Domestic and stock well. Measuring point, top of casing flush with land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 28, 1938, 86.38; Jan. 20, 1939, 86.73.

14.26.3.111. Domestic well. Measuring point, top of platform, west edge of pipe clamp, at Geological Survey washer, 0.70 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 27, 1938, 13.73; Feb. 9, 1939, 12.03.

14.26.3.213. Domestic well. Measuring point, top of clamp, 0.70 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 27, 1938, 9.02; Feb. 9, 1939, 6.72.

14.26.3.313. Domestic well. Measuring point, top of clamp, 2.70 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 27, 1938, 16.15; Feb. 9, 1939, 16.27.

14.26.3.413. Domestic well. Measuring point, top of clamp, 0.40 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 27, 1938, 8.60; Jan. 24, 1939, 8.35.

14.26.3.433. Domestic well. Measuring point, top of 2 by 12-inch plank over oil drum used as cover over well, 1.6 feet above land surface. No equipment. Water levels, in feet below land surface datum: Jan. 27, 1938, 12.58; Jan. 24, 1939, 13.16.

a Tape measurement.

## Chaves County--Continued

14.26.3.442. Domestic well. Measuring point, top of casing, 1.8 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 23, 1938, 18.10; Jan. 24, 1939, 18.32.

14.26.4.113. Domestic well. Measuring point, land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 31, 1938, 19.0; Jan. 24, 1939, 19.0.

14.26.4.133a. Drilled irrigation well. Measuring point, bottom edge of mouth of discharge pipe, 7.20-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 31, 1938, 18.70; Jan. 24, 1939, 18.43.

14.26.4.133b. Domestic well, diameter 6 inches. Measuring point, top of clamp, 0.60 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 31, 1938, 18.50; Jan. 24, 1939, 18.24.

14.26.4.141. Roy Lockhead. Drilled irrigation well, diameter  $12\frac{1}{2}$  inches, depth 202 feet. Measuring point, bottom edge of mouth of discharge pipe, 5.35-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 31, 1938, 19.01; Jan. 24, 1939, 18.47.

14.26.4.231. George Wade. Drilled irrigation well, diameter  $15\frac{1}{2}$  inches, depth 150 feet. Measuring point, bottom edge of mouth of discharge pipe, 6.45-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 31, 1938, 16.60; Jan. 24, 1939, 15.82.

14.26.5.111. H. L. McKinstry. Drilled irrigation well, diameter 12 inches, depth 185 feet. Measuring point, bottom edge of mouth of discharge pipe, 3.50-foot correction to land surface. Equipped with turbine pump. Water level, in feet below land surface datum: Jan. 29, 1938, 26.10.

14.26.5.131. Mrs. L. Harter. Drilled irrigation well, diameter  $12\frac{1}{2}$  inches, depth 177 feet. Measuring point, bottom edge of mouth of discharge pipe, 5.00-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 29, 1938, 21.90; Jan. 21, 1939, 22.54.

14.26.5.211. McKinstry. Domestic well, diameter 6 inches. Measuring point, top of casing, 0.50 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 31, 1938, 22.93; Jan. 24, 1939, 22.52.

14.26.5.243. J. D. S. McKinstry. Drilled irrigation well, diameter  $15\frac{1}{2}$  inches, depth 100 feet. Measuring point, basal flange of pump head, 0.60 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 31, 1938, 21.20; Jan. 24, 1939, 20.00.

14.26.5.433. Domestic well. Measuring point, top of casing, 2.75 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 29, 1938, 25.62; Jan. 21, 1939, 27.39.

14.26.6.111. Wiley Grizzle. Drilled irrigation well, diameter  $12\frac{1}{2}$  inches, depth 157 feet. Measuring point, slot in basal flange of pump head flush with land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 29, 1938, 16.30; Jan. 24, 1939, 19.23.

14.26.6.211. Wiley Grizzle. Drilled irrigation well, diameter  $12\frac{1}{2}$  inches, depth 95 feet. Measuring point, basal flange of pump head, flush with land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 29, 1938, 18.54; Jan. 24, 1939, 20.40.

## Chaves County--Continued

14.26.6.241. Domestic well. Measuring point, top of clamp, 0.45 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 29, 1938, 23.80; Jan. 24, 1939, 25.00.

14.26.6.422. Domestic well. Measuring point, top of clamp, 0.50 foot above land surface, 0.35 foot above concrete base. Equipped with windmill. This well is the northwest windmill. Water levels, in feet below land surface datum: Jan. 29, 1938, 22.10; Jan. 21, 1939, 22.44.

14.26.7.333. Measurements discontinued.

14.26.7.443. W. W. Adams. See Water-Supply Paper 845 for description. Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	38.55	Mar. 7	39.52	June 22	46.32	Sept. 18	b 45.52
20	38.83	10	39.84	July 31	a 47.19	Nov. 8	44.89
Feb. 3	38.81	31	a 44.70	Aug. 16	42.83	27	45.05
21	a 40.45	May 10	44.42				

14.26.8.112. G. L. Truitt. Drilled irrigation well, diameter 12½ inches, depth 150 feet. Measuring point, bottom edge of mouth of discharge pipe, 5.50-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 9, 1938, 21.80; Jan. 21, 1939, 23.85.

14.26.8.243. Domestic well. Measuring point, top of clamp, 0.89 foot above land surface, 0.29 foot above top of casing. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 29, 1938, 19.83; Jan. 21, 1939, 21.81.

14.26.8.433a. Tom Ferguson. See Water-Supply Paper 845 for description. Correct depth 120 feet. New measuring point, top of platform north of pump at U.S.G.S. washer, flush with land surface.

Water level, in feet below land surface datum, 1939

Jan. 6	43.85	Mar. 7	44.60	June 22	(c)	Sept. 18	45.68
20	44.05	10	46.27	July 31	d 44.24	Nov. 8	d 43.04
Feb. 3	43.19	31	(c)	Aug. 16	(c)	27	d 44.32
21	43.70	May 10	(c)				

14.26.8.433b. Town of Hagerman. See Water-Supply Paper 845 for description. No measurements made in 1939.

14.26.8.433c. Town of Hagerman. See Water-Supply Paper 845 for description. No measurements made in 1939.

14.26.9.143. Domestic well. Measuring point, top of clamp, 1.04 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 29, 1938, 31.06; Jan. 21, 1939, 26.06.

14.26.9.234. Domestic well. Measuring point, top of clamp, 0.82 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 29, 1938, 10.67; Jan. 24, 1939, 9.80.

14.26.9.434. Cave Bros. Drilled irrigation well, diameter 15 inches, depth 107 feet. Measuring point, top of casing, 0.85 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 29, 1938, 8.35; Jan. 20, 1939, 9.94.

14.26.9.442. Domestic well. Measuring point, top of concrete, 0.15 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 27, 1938, 12.89; Jan. 18, 1939, 13.28.

14.26.10.121. Stock well. Measuring point, top of casing, 0.22 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 27, 1938, 13.41; Jan. 24, 1939, 12.22.

14.26.10.244. Domestic well. Measuring point, top of casing, 0.45 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 27, 1938, 12.19; Jan. 24, 1939, 11.33.

a Windmill pumping.  
c Pumping.

b Irrigation well pumping.  
d Well 800 feet southeast pumping.

## Chaves County--Continued

14.28.10.433. Mark Boyce. Abandoned irrigation well, diameter 7 inches. Measuring point, top of pump column flush with land surface. No equipment. Water levels, in feet below land surface datum: Jan. 12, 1938, 6.77; Jan. 20, 1939, 5.45.

14.26.11.111. J. Langnegger. Domestic well. Measuring point, top of casing, 0.40 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 27, 1938, 14.80; Jan. 24, 1939, 14.83.

14.26.11.121. Domestic well. Measuring point, top of wooden platform flush with land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 27, 1938, 15.39; Jan. 24, 1939, 15.13.

14.26.11.322. Stock well. Measuring point, top of casing, 3.05 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 27, 1938, 12.53; Jan. 24, 1939, 11.65.

14.26.11.444. Domestic well. Measuring point, top of casing, 1.10 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 27, 1938, 9.50; Jan. 24, 1939, 9.86.

14.26.12.131. W. E. Utterback. Owner designated as W. E. Udderback in Water-Supply Paper 845.

Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 24	21.62	Mar. 31	21.01	July 31	21.24	Nov. 8	a 27.77
Feb. 21	21.45	May 10	20.90	Aug. 17	21.04	27	21.70
Mar. 7	21.77	June 22	21.90	Sept. 18	20.97		

14.26.13.121. L. M. Lang. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 132 feet. Measuring point, bottom edge of mouth of discharge pipe, 7.0-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 27, 1938, 16.23; Jan. 24, 1939, 16.24.

14.26.14.111. Wiley Grizzle. Abandoned irrigation well. Measuring point, land surface. No equipment. Water levels, in feet below land surface datum: Jan. 27, 1938, 3.1; Jan. 20, 1939, 6.1.

14.26.14.133. Wiley Grizzle. Drilled irrigation well, depth 200 (?) feet. Measuring point, top of casing, 0.20 foot below land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 27, 1938, 7.15; Jan. 20, 1939, 5.48.

14.26.14.343. F. H. Evans. Drilled irrigation well, diameter 15 inches. Measuring point, bottom edge of basal flange of pump head on south side, 0.58-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 27, 1938, 10.48; Jan. 2, 1939, 9.94.

14.26.14.441. M. C. Brown. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 162 feet. Measuring point, top of casing, flush with land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 27, 1938, 12.51; Jan. 20, 1939, 11.35.

14.26.15.113. Domestic well. Measuring point, top of clamp, 1.30 feet above land surface, and 0.47 foot above top of casing. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 27, 1938, 14.60; Jan. 18, 1939, 14.30.

14.26.15.333. E. D. Menoud. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 178 feet. Measuring point, bottom edge of mouth of discharge pipe, 4.17-foot correction to land surface. Equipped with turbine pump.

Water level, in feet below land surface datum, 1938-39

Date	Water level	Date	Water level	Date	Water level
Jan. 27, 1938	16.42	Nov. 3, 1939	23.46	Nov. 27, 1939	23.44
Jan. 18, 1939	20.13	8	23.53		

a Windmill pumping.

## Chaves County--Continued

14.26.13.111. Marie O'Dell. Drilled irrigation well, diameter 10 inches, depth 180 feet. Measuring point, bottom edge of mouth of discharge pipe, 6.07-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 23, 1938, 23.12; Jan. 20, 1939, 25.45.

14.26.16.422. O'Dell. Domestic well. Measuring point, top of casing, 1.65 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 27, 1938, 14.95; Jan. 18, 1939, 16.99.

14.26.17.211. Wm. Saloman. Drilled irrigation well, diameter 10 inches, depth 140 feet. Measuring point, top of casing, 0.15 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 23, 1938, 41.15; Jan. 20, 1939, 44.44.

14.27.17.334. Clarence Pearson. Drilled irrigation well, diameter 16 inches, depth 174 feet. Measuring point, basal flange of pump head, 0.51 foot above land surface. Equipped with turbine pump. Water level, in feet below land surface datum: Jan. 18, 1939, 40.84.

14.26.17.444. Pearson Bros. Drilled irrigation well. Measuring point, 1938, top of casing, 0.32 foot above land surface; 1939, bottom edge of mouth of discharge pipe, 5.92-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 29, 1938, 38.42; Jan. 18, 1939, 41.58.

14.26.18.113. O. C. Yarbrough. Drilled irrigation well, diameter 10 inches. Measuring point, top of casing, flush with concrete base, 0.40 foot above land surface. Equipped with turbine pump. Water level, in feet below land surface datum: Jan. 20, 1939, 50.57.

14.26.18.433. Albert Hobson. Drilled irrigation well, diameter 12½ inches, depth 154 feet. Measuring point, basal flange of pump head, 1.0 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 28, 1938, 39.56; Jan. 20, 1939, 43.64.

14.26.19.211. Joseph Hooten. Drilled irrigation well, diameter 12½ inches, depth 150 feet. Measuring point, basal flange of pump head, 0.60 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 11, 1938, 39.68; Jan. 20, 1939, 43.14.

14.26.19.242. Oscar A. Pearson. Drilled irrigation well, diameter 12½ inches, depth 155 feet. Measuring point, top of concrete foundation, 0.50 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 11, 1938, 48.05; Jan. 18, 1939, 51.53.

14.26.19.311. W. C. West. Drilled irrigation well, diameter 12 inches, depth 138 feet. Measuring point, top of concrete foundation 0.87 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 11, 1938, 36.12; Jan. 20, 1939, 39.56.

14.26.19.444. E. E. Lane. Drilled irrigation well, diameter 12½ inches, depth 153 feet. Measuring point, basal flange of pump head, 0.40 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 27, 1938, 49.10; Jan. 18, 1939, 52.60.

14.26.20.143. Pearson Bros. Drilled irrigation well, diameter 16 inches. Measuring points: (a) top of basal flange at pump head, 0.75 foot above land surface; (b) through hole in concrete foundation, 0.5 foot west of pump, 1.08-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 29, 1938, 43.15; Jan. 18, 1939, 51.45.

14.26.20.343. E. Langnegger. Drilled irrigation well, diameter 18 inches, depth 168 feet. Measuring point, bottom edge of mouth of discharge pipe, 7.10-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 27, 1938, 50.26; Jan. 18, 1939, 59.73.

14.26.21.333. G. E. Wade. Drilled irrigation well, diameter 15½ inches, depth 243 feet. Measuring point, basal flange of pump head, 0.40 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 27, 1938, 33.67; Jan. 18, 1939, 36.58.



Wells in the 14.26.22.213. area.

14.26.22.492. Stock well. Measuring point, top of casing, 0.82 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 27, 1938, 14.82; Jan. 18, 1939, 12.81.

14.26.22.141. Irrigation well. Measuring point, bottom edge of pipe in north side of casing, 0.83 foot above land surface. No equipment. Water levels, in feet below land surface datum: Jan. 27, 1938, 24.27; Jan. 20, 1939, 24.03.

14.26.22.213. J. D. King. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 71 feet. Measuring point, bottom edge of mouth of discharge pipe, 5.2-foot correction to land surface. Equipped with turbine pump. Water level, in feet below land surface datum: Jan. 27, 1938, 23.12.

14.26.22.411. Domestic well. Measuring point, top of casing, 0.85 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 27, 1938, 16.05; Jan. 20, 1939, 17.15.

14.26.23.131. E. A. White. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 175 feet. Measuring point, top of casing, flush with land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 27, 1938, 9.30; Jan. 20, 1939, 9.67.

14.26.27.111. Domestic well. Measuring point, top of clamp, 0.70 foot above land surface, 0.28 foot above top of casing. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 12, 1938, 14.88; Jan. 21, 1939, 15.26.

14.26.28.114. Phillip Stoos. Domestic well. Measuring point, top of clamp, 1.26 feet above land surface, 0.28 foot above top of casing. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 27, 1938, 31.20; Jan. 18, 1939, 33.67.

14.26.28.211. L. T. Lewis. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 179 feet. Measuring point, basal flange of pump head, 0.10 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 27, 1938, 29.05; Jan. 18, 1939, 28.53.

14.26.29.112. Phillip Stoos. Drilled irrigation well, diameter 15 $\frac{1}{2}$  inches, depth 157 feet. Measuring point, bottom edge of mouth of discharge pipe, 4.50-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 27, 1938, 53.80; Jan. 13, 1939, 62.72.

14.26.29.213. Phillip Stoos. Drilled irrigation well, diameter 16 inches, depth 160 feet. Measuring point, top of casing, 0.20 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 27, 1938, 49.52; Jan. 18, 1939, 53.22.

14.26.29.441a. J. W. Wiggins. Drilled irrigation well, diameter 15 $\frac{1}{2}$  inches, depth 170 feet. Measuring point, basal flange of pump head, 0.20 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 27, 1938, 32.25; Jan. 18, 1939, 35.44.

14.26.29.441b. Domestic well. Measuring point, top of clamp, 0.50 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 27, 1938, 31.20; Jan. 18, 1939, 34.53.

14.26.30.441. Stock well. Measuring point, top of casing, 1.40 feet above land surface. Equipped with windmill since 1938. Water levels, in feet below land surface datum: Jan. 11, 1938, 48.90; Jan. 19, 1939, 52.63.

14.26.31.244. Abandoned domestic well, diameter 4 inches. Measuring point, top of casing, 1.0 foot above land surface. No equipment. Water levels, in feet below land surface datum: Jan. 11, 1938, 40.00; Jan. 18, 1939, dry at 41.72.

## Chaves County--Continued

14.26.32.332. B. E. Spencer. See Water-Supply Paper 845 for description.

Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 18	35.70	Mar. 31	36.08	July 31	37.96	Nov. 8	39.02
Feb. 21	35.73	May 10	36.62	Aug. 16	38.32	27	39.09
Mar. 7	35.74	June 22	37.15	Sept. 18	38.63		

14.26.35.344. Domestic well, diameter 6.0 feet. Measuring point, top of wooden casing on east side of pit, 3.0 feet above land surface. No equipment. Water level, in feet below land surface datum: Dec. 21, 1939, 68.45.

15.24.23.344. Domestic and stock well. Measuring point, top of casing, 1.57 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 25, 1938, 66.28; Jan. 17, 1939, 66.09.

15.24.27.344. Domestic and stock well. Measuring point, top of concrete flush with land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 25, 1938, 61.75; Jan. 18, 1939, 61.35.

15.24.28.244. Domestic and stock well. Measuring point, top of casing, 1.35 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 25, 1938, 86.62; Jan. 17, 1939, 91.31.

15.24.34.341. S. Lanning. Drilled irrigation well, diameter 12½ inches, depth 372 feet. Measuring point, hole in east side of basal flange of pump head, 0.20 foot above concrete foundation flush with land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 17, 1938, 30.58; Jan. 17, 1939, 38.18.

15.24.35.143. E. P. Malone. Domestic well. Measuring point, top of casing, 1.98 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 17, 1938, 27.70; Jan. 17, 1939, 26.68.

15.24.36.243. Domestic and stock well. Measuring point, top of casing, 1.05 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 25, 1938, 38.95; Jan. 17, 1939, 41.03.

15.24.36.321. Abandoned irrigation well. Measuring point, top of casing, 1.0 foot above land surface. Water level, in feet below land surface datum: Jan. 17, 1939, 28.63.

15.25.11.411. Abandoned stock well. Measuring point, top of casing, 0.70 foot above land surface. No equipment. Water levels, in feet below land surface datum: Feb. 1, 1938, 42.97; Jan. 18, 1939, 45.85.

15.25.12.111a. F. U. Gooding. Drilled irrigation well, diameter 12½ inches, depth 125 feet. Measuring point, edge of slot in basal flange on the north side of pump head, 0.50-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 23, 1938, 36.70; Jan. 18, 1939, 38.13.

15.25.12.111b. Irrigation well. Measuring point, bottom of hole in north side of casing, 0.18 foot above land surface. Water level, in feet below land surface datum: Jan. 18, 1939, 36.64.

15.25.12.231. Ben Trumen. Drilled irrigation well, diameter 12½ inches, depth 152 feet. Measuring point, top of casing, 0.20 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 28, 1938, 35.35; Jan. 18, 1939, 35.95.

15.25.24.111. Domestic well. Measuring point, top of clamp, 1.00 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 25, 1938, 13.40; Jan. 17, 1939, 13.02.

## Chaves County--Continued

15.25.24.211. Domestic well. Measuring point, top of clamp, 0.12 foot above top of casing and 0.80 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 26, 1938, 14.05; Jan. 17, 1939, 10.91.

15.25.27.321. Chas. W. Nelson. Drilled irrigation well, diameter 12½ inches, depth 320 feet. Measuring point, basal flange of pump head, 0.50 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 26, 1938, 29.66; Jan. 17, 1939, 27.90.

15.25.28.331. Carroll Jackson. Drilled irrigation well, diameter 14 inches, depth 220 feet. Measuring point, top of casing, 0.70 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 25, 1938, 31.80; Jan. 17, 1939, 33.30.

15.25.33.112. Carroll Jackson. Domestic well. Measuring point, top of casing, 0.20 foot above land surface. Equipped with windmill. Water level, in feet below land surface datum: Feb. 1, 1938, 20.33.

15.25.35.111. Moss Spence. See Water-Supply Paper 345 for description.

Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 17	21.56	Mar. 31	a 22.19	July 31	a 28.16	Nov. 8	25.77
Feb. 21	20.51	May 10	a 24.63	Aug. 16	28.66	27	a 25.32
Mar. 7	20.29	June 22	a 26.39	Sept. 18	30.79		

15.25.35.311. R. E. Coleman. Drilled irrigation well, diameter 12½ inches, depth 142 feet. Measuring point, basal flange of pump head, 0.70 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 25, 1938, 33.15; Jan. 17, 1939, 34.71.

15.25.36.333. John M. Norris. Drilled irrigation well, diameter 12½ inches, depth 265 feet. Measuring point, bottom edge of mouth of discharge pipe, 3.05-foot correction to concrete foundation, 3.55-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 26, 1938, 27.32; Jan. 17, 1939, 27.10.

15.26.5.121. B. E. Spencer. Drilled irrigation well, diameter 15 (?) inches, depth 113 feet. Measuring point, top of concrete, 0.20 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 26, 1938, 34.80; Jan. 18, 1939, 36.57.

15.26.5.142. H. S. Russell. Drilled irrigation well, depth 220 feet. Measuring point, top of basal flange of pump head, 0.20 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 26, 1938, 31.69; Jan. 18, 1939, 29.62.

15.26.6.311. Calvin Graham. Drilled irrigation well, diameter 12½ inches, depth 155 feet. Measuring point, top of casing, 0.58 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 26, 1938, 28.66; Jan. 18, 1939, 29.66.

16.26.19.411. F. M. Privett. Domestic well, diameter 6 inches. Measuring point, top of clamp, 0.95 foot above land surface, 0.45 foot above top of casing. Equipped with windmill.

Water level, in feet below land surface datum, 1937-39

Date	Water level	Date	Water level	Date	Water level
Aug. 21, 1937	36.25	Jan. 21, 1938	31.94	Nov. 3, 1939	37.25
Oct. 29	33.08	Jan. 14, 1939	34.97	8	37.12
Jan. 12, 1938	32.00	30	33.55	27	36.25

16.26.21.333. J. H. Everest. Drilled irrigation well, diameter 12½ inches, depth 131 feet. Measuring point, top of casing, 0.45 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 19, 1938, 5.91; Jan. 14, 1939, 6.10.

a Windmill pumping.

## Chaves County--Continued

16.28.09.333. Ina C. Harral. Domestic well, diameter 6 inches, depth 67 feet. Measuring point, top of iron collar, 1.75 feet above land surface. 0.50 foot above concrete base. Equipped with hand pump.

Water level, in feet below land surface datum, 1938-39

Date	Water level	Date	Water level	Date	Water level
Jan. 19, 1938	10.92	Nov. 3, 1939	15.95	Nov. 27, 1939	15.77
Jan. 14, 1939	12.43	8	15.66		

16.26.28.431. R. E. Coleman. Abandoned drilled irrigation well, diameter 16 inches, depth 200 feet. Measuring point, top of casing, 0.95 foot above land surface. No equipment. Water levels, in feet below land surface datum: Jan. 19, 1938, 12.28; Jan. 14, 1939, 12.47.

16.26.31.413. T. F. Wilson. Drilled irrigation well, diameter 12½ inches, depth 163 feet. Measuring point, top of casing flush with land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 18, 1938, 35.33; Jan. 16, 1939, 38.63.

16.26.32.311. K. A. Bivens. Drilled irrigation well, diameter 12½ inches, depth 161 feet. Measuring point, bottom edge of mouth of discharge pipe, 4.90-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 18, 1938, 24.22; Jan. 14, 1939, 26.04.

16.26.32.411. O. V. Moore. Drilled irrigation well, diameter 10 inches, depth 203 feet. Measuring point, bottom edge of mouth of discharge pipe, 5.94-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 19, 1938, 17.81; Jan. 14, 1939, 18.88.

16.26.32.421. W. W. Parker. Drilled irrigation well, diameter 12½ inches, depth 114 feet. Measuring point, east side of top of casing, 1.0 foot below land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 19, 1938, 14.48; Jan. 13, 1939, 15.77.

17.25.13.131. L. G. Mousehke. Drilled irrigation well, diameter 12½ inches, depth 280 feet. Measuring point, center of west edge of pump base, 0.50-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 20, 1938, 86.95; Jan. 13, 1939, 88.69.

17.25.14.132. Artesia Country Club. Domestic well. Measuring point, top of clamp, 1.20 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 25, 1938, 108.30; Jan. 21, 1939, 121.21.

17.25.22.223. Domestic and stock well. Measuring point, top of casing, 1.82 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 21, 1938, 140.71; Jan. 21, 1939, 144.12.

17.25.24.433. Domestic and stock well. Measuring point, top of casing, 0.68 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 21, 1938, 87.47; Jan. 13, 1939, 88.71.

17.25.26.222. Domestic and stock well. Measuring point, top of clamp, 2.25 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 21, 1938, 97.35; Jan. 21, 1939, 98.55.

17.25.35.411. Domestic and stock well. Measuring point, top of casing, 1.04 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 21, 1938, 112.55; Jan. 21, 1939, 113.59.

17.26.2.133. A. L. Jackson. Drilled irrigation well, diameter 8 inches, depth 83 feet. Measuring point, top of 4 by 6-inch timber between centrifugal pump and hand pump at U.S.G.S. washer flush with land surface. Equipped with centrifugal and hand pump. Water levels, in feet below land surface datum: Jan. 19, 1938, 8.69; Jan. 14, 1939, 9.00.

## Chaves County--Continued

17.26.3.231. H. R. Rogers. Drilled irrigation well. Measuring point, top of casing, 0.31 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 19, 1938, 8.72; Jan. 14, 1939, 9.21.

17.26.3.433. Box. Irrigation well. Measuring point, bottom edge of mouth of discharge pipe, 7.8-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 19, 1938, 8.38; Jan. 13, 1939, 8.30.

17.26.4.121. Domestic well. Measuring point, top of wooden platform, 2.90 feet above land surface. No equipment. Water levels, in feet below land surface datum: Jan. 19, 1938, 17.39; Jan. 14, 1939, 16.27.

17.26.4.331a. Howard Stroup. Drilled irrigation well, diameter 12½ inches, depth 212 feet. Measuring point, top of casing, flush with land surface. No equipment. Water levels, in feet below land surface datum: Jan. 19, 1938, 0.10; Jan. 14, 1939, 6.43.

17.26.4.331b. Howard Stroup. Drilled irrigation well. Measuring point, top of casing, flush with land surface. Equipped with turbine pump. Water level, in feet below land surface datum: Jan. 14, 1939, 6.45.

17.26.4.413. F. Crawford. Drilled irrigation well, diameter 12 inches, depth 225 feet. Measuring point, bottom edge of mouth of discharge pipe, 5.82-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 19, 1938, 13.47; Jan. 14, 1939, 12.98.

17.26.5.422. Dug domestic well. Measuring point, top of wooden platform, 2.0 feet above land surface. Equipped with bucket bailer. Water levels, in feet below land surface datum: Jan. 19, 1938, 13.30; Jan. 14, 1939, 14.32.

17.26.5.433. Stock well, diameter 6 inches. Measuring point, top of pipe clamp, 0.60 foot above top of casing, and 1.75 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 25, 1938, 28.79; Jan. 13, 1939, 30.68.

17.26.6.413. Fred Savoie. Drilled irrigation well, diameter 10 inches, depth 190 feet. Measuring point, top of casing, flush with land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 20, 1938, 35.55; Jan. 16, 1939, 37.15.

17.26.7.131. J. W. Collins. Drilled irrigation well, diameter 12½ inches, depth 150 feet. Measuring point, basal flange of pump head, 0.40 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 20, 1938, 44.07; Jan. 13, 1939, 45.81.

17.26.7.334. L. D. Jones. See Water-Supply Paper 845 for description. Measurements discontinued after July 31, 1939.

Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 13	42.57	Mar. 7 a	42.98	Mar. 31 a	44.20	June 23 a	49.16
Feb. 21	42.40	10	43.95	May 10 a	46.23	July 31 a	51.79

17.26.7.433. Everest Scoggins. Drilled irrigation well, diameter 10 inches, depth 158 feet. Measuring point, top of casing, 0.70 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 20, 1938, 30.39; Jan. 13, 1939, 32.38.

17.26.7.344. Everest Scoggins. Unused drilled irrigation well, diameter 12 inches, depth 129 feet. Measuring point, edge of hole in top of oil drum over well, 0.40 foot above top of casing, 1.20 feet above land surface. No equipment. Water levels, in feet below land surface datum, 1939: Nov. 3, 39.80; Nov. 8, 39.48; Nov. 27, 38.89.

a Pumping.

## Chaves County--Continued

17.26.7.421. J. W. Jackson. Drilled irrigation well, diameter 8 inches, depth 150 feet. Measuring point, bottom edge of east 6 by 6-inch stringer at U.S.G.S. washer, 0.30 foot above land surface. Water levels, in feet below land surface datum: Jan. 19, 1938, 22.13; Jan. 13, 1939, 24.01.

17.26.7.444. Albert Blake. Drilled irrigation well, diameter 6 inches, depth 143 feet. Measuring point, top of 2 by 4-inch stringer east of pump shaft, flush with land surface. Equipped with centrifugal pump. Water levels, in feet below land surface datum: Jan. 19, 1938, 23.23; Jan. 13, 1939, 27.89.

17.26.8.212. Domestic well. Measuring point, top of wooden platform, 1.30 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 19, 1938, 17.94; Jan. 13, 1939, 17.33.

17.26.9.111. Domestic well, diameter 6 inches. Measuring point, top of flange set in concrete platform, 0.74 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 19, 1938, 7.78; Jan. 13, 1939, 8.00.

17.26.9.333. Domestic well. Measuring point, top of clamp, 0.50 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 21, 1938, 12.21; Jan. 13, 1939, 13.25.

17.26.10.333. V. L. Gates. Drilled irrigation well, diameter 12½ inches, depth 247 feet. Measuring point, bottom edge of mouth of discharge pipe, 3.78-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum, 1939: Feb. 6, 5.82; Nov. 3, 8.55; Nov. 8, 8.56; Nov. 27, 8.48.

17.26.10.433. D. D. Sullivan. Drilled irrigation well, diameter 12½ inches, depth 210 feet. Measuring point, bottom edge of mouth of discharge pipe, 5.55-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 20, 1938, 17.83; Jan. 13, 1939, 17.27.

17.26.15.113. C. L. Allison. Drilled irrigation well, diameter 10 inches, depth 240 feet. Measuring point, bottom edge of mouth of discharge pipe, 6.75-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 22, 1938, 4.23; Jan. 13, 1939, 4.77.

17.26.15.121. Domestic well, diameter 6 inches. Measuring point, top of casing, 0.73 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 20, 1938, a/10.19; Jan. 13, 1939, 8.43.

17.26.15.211. J. M. Vogel. Drilled irrigation well, depth 225 feet. Measuring point, bottom edge of mouth of discharge pipe, 5.58-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 20, 1938, 14.82; Jan. 13, 1939, 14.24.

17.26.15.313. J. H. Holloman. Drilled irrigation well, diameter 10 inches, depth 212 feet. Measuring point, bottom edge of mouth of discharge pipe, 6.50-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 20, 1938, 8.50; Jan. 13, 1939, 8.10.

17.26.15.411. Mrs. A. J. Hardendorf. Drilled irrigation well. Measuring point, bottom edge of mouth of discharge pipe, 4.5-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 20, 1938, 14.99; Jan. 13, 1939, 14.27.

17.26.16.333. Artesia Cemetery. See Water-Supply Paper 845 for description.

Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 21	12.77	May 31	b 17.22	Aug. 17	b 17.98	Nov. 8	14.99
Mar. 7	b 14.76	June 23	b 31.81	Sept. 18	19.29	27	b 16.03
31	b 26.76	July 31	b 20.66				

a Pump stopped 18 minutes before measurement. b Windmill pumping.

## Chaves County--Continued

- 17.26.16.411. Irrigation well. Measuring point, basal flange of pump head, 0.10 foot above land surface. Equipped with turbine pump. Water level, in feet below land surface datum: Jan. 12, 1939, 15.72.
- 17.26.17.423. H. A. Denton. Irrigation well. Measuring point, floor of basement under pump house, 5.60 feet below land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 21, 1938, 19.85; Jan. 14, 1939, 19.09.
- 17.26.18.224. Domestic well. Measuring point, top of platform at U.S.G.S. washer, flush with land surface. Water levels, in feet below land surface datum: Jan. 21, 1938, 31.32; Jan. 13, 1939, 33.41.
- 17.26.18.433. Lowery and Baca. Drilled irrigation well, diameter 14 inches. Measuring point, basal flange of pump head, 1.00 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 21, 1938, 42.88; Jan. 13, 1939, 44.89.
- 17.26.18.442. Domestic well. Measuring point, top of clamp, 0.70 foot above concrete cover flush with land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 21, 1938, 30.68; Jan. 12, 1939, 32.86.
- 17.26.20.133. W. E. Ragsdale. Drilled irrigation well, depth 30.88 feet. Measuring point, top of concrete foundation, 0.82 foot above land surface; measured through slot in basal flange of pumphouse. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 21, 1938, 30.88; Jan. 12, 1939, 33.03.
- 17.26.21.112. Roger Durand. Drilled irrigation well, diameter 15½ inches, depth 232 feet. Measuring point, basal flange of pump head, 0.35 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 21, 1938, 12.30; Jan. 12, 1939, 13.82.
- 17.26.21.341. W. T. Amstutz. Drilled irrigation well, diameter 8 inches, depth 170 feet. Measuring point, bottom edge of mouth of discharge pipe, 6.9-foot correction to land surface. Water levels, in feet below land surface datum: Jan. 21, 1938, 3.43; Jan. 13, 1939, 4.83.
- 17.26.22.233. R. L. Paris. Drilled irrigation well, diameter 13 inches, depth 75 feet. Measuring point, top of concrete pit casing, flush with land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 21, 1938, 22.95; Jan. 13, 1939, 19.75.
- 17.26.27.413. W. E. Simmons. Drilled irrigation well, diameter 12½ inches, depth 128 feet. Measuring point, bottom edge of mouth of discharge pipe, 6.03-foot correction to land surface. Equipped with turbine pump. Water levels, in feet: Jan. 21, 1938, 14.87; Jan. 13, 1939, 12.82.
- 17.26.27.423. Leslie Martin. Drilled irrigation well, diameter 12 inches, depth 190 feet. Measuring point, bottom edge of mouth of discharge pipe, 8.02-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 21, 1938, 15.22; Jan. 13, 1939, 13.81.
- 17.26.28.331. Carl Martin. Drilled irrigation well, diameter 12½ inches, depth 148 feet. Measuring point, bottom edge of mouth of discharge pipe, 4.60-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 22, 1938, 14.51; Jan. 12, 1939, 17.03.
- 17.26.29.131a. Carl Martin. Drilled irrigation well, diameter 20 inches, depth 201 feet. Measuring point, top of casing, 0.52 foot above land surface. No equipment. Water levels, in feet below land surface datum: Jan. 21, 1938, 30.78; Jan. 12, 1939, 33.93.
- 17.26.29.131b. Carl Martin. Domestic well. Measuring point, top of casing, 1.10 feet above land surface. Water level, in feet below land surface datum: Jan. 12, 1939, 33.19.
- 17.26.31.133. W. Clendenen. Drilled irrigation well. Measuring point, top of casing, 1.35 feet above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 21, 1938, 61.97; Jan. 13, 1939, 63.31.

## Chaves County--Continued

18.26.2.333. S. O. Higgins. Drilled irrigation well, diameter 10 inches, depth 202 feet. Measuring point, bottom edge of mouth of discharge pipe, 10.30-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 24, 1938, 13.85; Jan. 10, 1939, 13.19.

18.26.4.111a. Frank Watkins. Abandoned dug well. Measuring point, top of floor of shed, 0.66 foot above land surface. No equipment. Water levels, in feet below land surface datum: Jan. 22, 1938, 26.71; Jan. 12, 1939, 27.84.

18.26.4.111b. Frank Watkins. See Water-Supply Paper 845 for description.

Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 12	25.52	Mar. 31	a 26.52	July 31	a 29.24	Nov. 8	28.12
Feb. 21	25.51	May 10	27.25	Aug. 17	28.39	27	a 28.70
Mar. 7	25.52	June 23	a 29.72	Sept. 18	29.27		

18.26.4.433. W. M. Schneider. Drilled irrigation well, diameter 12½ inches, depth 139 feet. Measuring point, top of casing, 0.90 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 22, 1938, 19.38; Jan. 10, 1939, 20.47.

18.26.7.234a. C. H. Hutsonpiller. C. H. Hudsonpiller designated as owner in Water-Supply Paper 845.

Water level at 4:00 a.m., in feet below land surface datum, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	50.62	.....	.....	50.65	51.91	52.32	52.88	53.65	53.92	54.62	.....	.....
2	50.59	.....	.....	50.68	51.94	.....	52.89	53.65	53.93	54.60	.....	.....
3	50.56	.....	.....	50.73	51.98	52.36	52.92	.....	53.94	54.19	.....	b53.21
4	50.54	.....	.....	50.78	52.03	52.38	52.97	.....	53.95	54.17	.....	53.20
5	.....	.....	.....	50.82	52.04	52.38	52.97	b53.67	53.96	54.17	.....	53.19
6	50.44	b50.24	.....	50.87	52.06	52.40	53.02	53.67	53.98	54.16	.....	53.16
7	50.43	50.23	50.22	50.92	52.06	52.42	.....	53.67	54.01	54.16	b53.73	53.15
8	50.41	50.22	50.20	.....	52.05	52.42	b53.12	53.66	54.04	.....	53.73	53.13
9	50.41	50.20	50.23	.....	52.05	52.43	53.14	53.64	54.08	.....	53.71	53.11
10	50.40	50.21	50.23	.....	52.05	.....	53.14	53.62	54.09	.....	53.68	53.09
11	50.39	50.23	50.21	.....	52.05	.....	53.15	53.60	54.10	.....	53.68	b53.07
12	b50.38	50.24	50.24	.....	52.06	.....	53.18	53.58	54.13	54.28	53.66	53.05
13	.....	50.22	50.26	.....	52.08	b52.49	53.20	.....	54.17	54.28	53.65	53.05
14	.....	.....	50.26	.....	52.08	52.51	53.24	.....	54.17	54.27	53.63	53.03
15	b50.37	.....	.....	.....	52.08	52.52	53.28	.....	54.19	54.24	.....	53.01
16	50.36	.....	.....	.....	52.08	52.54	53.30	b53.52	.....	54.22	b53.57	53.00
17	50.34	.....	.....	.....	52.08	52.55	53.33	53.52	.....	54.19	53.55	52.97
18	50.35	.....	b50.30	.....	52.08	52.58	53.34	53.52	b54.08	54.16	53.53	52.95
19	50.34	.....	50.30	.....	52.08	52.60	53.37	53.52	54.07	54.13	53.51	.....
20	50.34	b50.21	50.32	.....	52.08	52.64	53.38	53.52	.....	.....	53.49	.....
21	50.33	50.22	50.37	.....	52.08	.....	53.40	53.53	.....	.....	53.47	.....
22	50.31	50.23	50.38	.....	52.09	b52.70	53.42	53.57	.....	.....	53.45	.....
23	.....	50.22	50.40	.....	52.09	52.70	53.44	.....	.....	.....	53.43	.....
24	b50.31	50.20	50.40	.....	52.10	52.72	53.46	.....	.....	.....	53.42	.....
25	50.31	50.20	50.41	.....	52.14	52.72	53.49	b53.70	.....	.....	53.40	.....
26	50.29	50.20	50.42	.....	52.16	52.77	53.51	53.71	.....	.....	53.40	b52.77
27	50.31	50.18	50.45	b51.85	52.18	52.80	53.56	53.74	.....	.....	53.37	52.77
28	50.26	.....	50.49	51.87	52.22	52.84	53.58	53.82	.....	.....	53.35	52.75
29	50.24	.....	50.55	51.89	52.24	52.86	53.62	53.84	.....	.....	53.33	52.73
30	50.27	.....	50.60	51.89	52.27	52.86	53.63	53.92	54.62	.....	.....	.....
31	50.26	.....	50.62	.....	52.28	.....	53.64	53.92	.....	b53.85	.....	.....

18.26.7.234c. C. H. Hutsonpiller. C. H. Hudsonpiller designated as owner in Water-Supply Paper 845. Corrected location is 150 feet south-east of well 18.26.7.234a. Water level, in feet below land surface datum: Jan. 12, 1939, 56.83.

18.26.9.311. Irrigation well. Measuring point, top of basal flange of pump head, 0.77 foot above land surface. Equipped with turbine pump. Water level, in feet below land surface datum: Jan. 10, 1939, 33.31.

a Windmill pumping.      b Tape measurement.



## Chaves County--Continued

18.26.10.233. Muncie. Domestic well. Measuring point, top of casing, 0.60 foot above land surface. Equipped with automatic pump. Water level, in feet below land surface datum: Jan. 24, 1938, 14.45.

18.26.15.133. J. D. Terry. Domestic well, diameter 6 inches, depth 133 feet. Measuring point, top of casing, 1.92 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 24, 1938, 22.05; Jan. 10, 1939, 22.22.

18.26.15.444. Abandoned irrigation well. Measuring point, top of casing, 0.56 foot above land surface. No equipment. Water levels, in feet below land surface datum: Jan. 22, 1938, 17.19; Jan. 10, 1939, 17.96.

18.26.15.311. J. H. Everest. Drilled irrigation well, diameter 12½ inches, depth 235 feet. Measuring point, top of casing, 0.20 foot below land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 24, 1938, 18.92; Jan. 10, 1939, 20.63.

18.26.17.112. Yates. Abandoned irrigation well. Measuring point, flush with south edge of cover over well, 0.40-foot correction to land surface. No equipment. Water levels, in feet below land surface datum: Jan. 22, 1938, 36.50; Jan. 12, 1939, 41.27.

18.26.18.241. L. McCrory. Drilled irrigation well. Measuring point, top of basal flange of pump head, 0.70 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 22, 1938, 44.63; Jan. 12, 1939, 45.62.

18.26.18.323. W. D. McCrory. Drilled irrigation well, diameter 12 inches, depth 240 feet. Measuring point, top of basal flange of pump head, 1.20 feet above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 22, 1938, 50.64; Jan. 12, 1939, 51.16.

18.26.21.344. Town of Dayton. Abandoned municipal supply well, diameter 6 inches. Measuring point, top of casing, flush with land surface. Recorder installed Jan. 24, 1939.

Water level at 4:00 a.m., in feet below land surface datum, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	.....	41.24	.....	42.23	42.58	43.00	43.06	43.29	.....	.....
2	.....	.....	.....	41.24	.....	42.26	42.59	43.02	43.08	43.28	.....	.....
3	.....	.....	.....	41.24	.....	42.28	42.60	.....	43.10	43.29	.....	.....
4	.....	.....	.....	41.24	41.91	42.28	42.61	.....	43.12	43.30	.....	43.75
5	.....	.....	.....	41.25	41.93	42.28	42.62	42.99	43.12	43.30	.....	43.75
6	41.86	40.84	.....	41.26	41.93	42.30	42.64	42.99	43.14	43.30	.....	43.75
7	.....	40.84	40.93	41.28	41.96	42.32	.....	42.98	43.15	.....	43.01	43.73
8	.....	40.85	.....	.....	41.97	42.33	42.68	42.98	43.18	.....	42.98	43.72
9	.....	40.82	.....	.....	41.97	42.33	42.70	42.94	43.20	.....	42.98	43.69
10	.....	40.86	.....	.....	41.97	.....	42.71	42.96	43.21	.....	42.98	43.69
11	.....	40.86	.....	.....	41.99	.....	42.72	42.96	43.22	.....	42.97	43.70
12	40.83	40.86	.....	.....	42.00	.....	42.73	42.96	43.24	43.28	42.96	43.71
13	.....	40.85	.....	.....	42.02	42.36	42.74	42.96	43.25	43.28	42.97	43.68
14	.....	.....	.....	.....	42.01	42.38	42.76	42.95	43.26	43.29	.....	43.68
15	.....	.....	.....	.....	42.02	42.40	42.74	42.94	43.28	43.28	.....	43.67
16	.....	40.87	.....	.....	42.02	42.41	42.74	42.94	43.27	43.26	42.92	43.66
17	.....	.....	.....	.....	42.03	42.43	42.77	42.90	43.27	43.25	42.90	43.64
18	.....	.....	41.06	.....	42.04	42.44	42.80	42.90	43.27	43.24	42.89	.....
19	.....	.....	41.06	.....	42.03	42.46	42.81	42.91	43.28	43.23	42.88	.....
20	.....	40.87	41.06	.....	42.05	42.48	42.82	42.93	43.28	.....	42.87	.....
21	.....	.....	41.06	.....	42.06	.....	42.84	42.94	43.30	.....	42.86	.....
22	.....	.....	41.06	.....	42.06	42.47	42.86	42.97	43.29	.....	42.84	42.53
23	.....	.....	41.06	.....	42.07	42.47	42.88	.....	.....	.....	42.84	42.56
24	40.85	.....	41.07	.....	42.09	42.48	42.89	.....	.....	.....	42.84	42.56
25	40.85	.....	41.07	.....	42.12	42.49	42.91	42.94	.....	.....	42.84	42.53
26	40.84	.....	41.09	.....	42.12	42.50	42.94	42.97	.....	.....	42.84	42.53
27	40.83	.....	41.11	41.80	42.15	42.53	42.94	42.99	.....	.....	42.83	42.53
28	40.82	.....	41.14	.....	42.17	42.53	42.95	43.01	.....	.....	43.82	42.52
29	40.84	.....	41.16	.....	42.18	42.56	42.97	43.02	43.31	.....	43.80	42.51
30	40.85	.....	41.17	.....	42.19	42.56	42.98	43.04	43.30	.....	.....	.....
31	40.85	.....	41.23	.....	42.21	.....	42.99	43.06	.....	44.07	.....	.....

a Tape measurement.

## Chaves County--Continued

18.26.22.314. Domestic well. Measuring point, top of casing, 1.88 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 24, 1938, 11.14; Jan. 10, 1939, 11.34.

18.26.23.213. Smith and Horner. Dug irrigation well, depth 40 feet. Measuring point, bottom edge of mouth of discharge pipe, 5.0-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 23, 1938, 23.15; Jan. 10, 1939, 22.80.

18.26.24.223. Stock well. Southernmost windmill of group of three. Measuring point, top of clamp, 1.60 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Oct. 6, 1937, 11.9; Jan. 10, 1939, 4.72.

18.26.28.132. Dayton School. Domestic well, diameter 6 inches, depth 86 feet. Measuring point, top of casing, 1.11 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 24, 1938, 56.13; Jan. 10, 1939, 56.58.

18.26.28.142. Domestic well. Measuring point, top of casing, 0.69 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 24, 1938, 42.12; Jan. 12, 1939, 42.44.

18.26.33.111. Harvey Yates. Irrigation well. Measuring point bottom edge of mouth of discharge pipe, 16.76-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 24, 1938, 64.55; Jan. 12, 1939, 67.06.

19.26.12.323. E. W. Dimock. Irrigation well. Measuring point, bottom edge of 4 by 6-inch stringer west of pump shaft, flush with land surface. Water level, in feet below land surface datum: Jan. 10, 1939, 20.49.

19.26.13.211. R. L. House. Irrigation well. Measuring point, top of wooden platform, 0.57 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 25, 1938, 12.74; Jan. 10, 1939, 13.09.

19.26.14.431. Albert Lee. Drilled irrigation well, diameter 12½ inches, depth 100 feet. Measuring point, bottom edge of mouth of discharge pipe, 5.02-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 24, 1938, 12.30; Jan. 10, 1939, 11.61.

19.26.27.233. Lakewood School. See Water-Supply Paper 845 for description.

Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 10	47.19	Mar. 31	a 51.94	July 31	49.51	Nov. 8	52.76
Feb. 21	a 49.31	May 11	52.38	Aug. 16	a 52.37	27	a 55.75
Mar. 7	48.46	June 23	a 55.11	Sept. 18	51.59		

19.26.27.334. Domestic well. Measuring point, top of casing, 0.60 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 24, 1938, 54.03; Jan. 10, 1939, 54.50.

19.26.28.441. D. D. Sullivan. Irrigation well. Measuring point, bottom edge of mouth of discharge pipe, 10.80-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 24, 1938, 60.03; Jan. 10, 1939, 60.45.

19.26.33.412. E. G. Kimmell (?). Irrigation well. Measuring point, of concrete foundation, measured through hole in basal flange of pump, 0.45 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 24, 1938, 44.65; Jan. 10, 1939, 44.93.

19.26.36.431. J. G. Moutry. Drilled irrigation well, diameter 16 inches, depth 270 feet. Measuring point, bottom edge of mouth of discharge pipe, 6.35-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 24, 1938, 38.98; Jan. 10, 1939, 38.98.

pumping.

## Chaves County--Continued

20.26.7.122. Coats Filling Station. See Water-Supply Paper 845 for description.  
Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 10	39.94	Mar. 31	44.99	July 31	45.00	Nov. 8	44.73
Feb. 21	40.52	May 11	43.31	Aug. 16	45.42	27	a 44.59
Mar. 7	40.85	June 22	46.17	Sept. 18	46.97		

20.26.7.421. E. Mantei. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 187 feet. Measuring point, bottom edge of mouth of discharge pipe, 4.40-foot correction to land surface. Equipped with turbine pump. Water level, in feet below land surface datum: Jan. 24, 1938, 32.67.

20.26.8.112. J. G. Moutry. Irrigation well. Measuring point, top of basal flange of pump head, 0.20 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 24, 1938, 30.08; Jan. 10, 1939, 28.98.

20.26.17.411. Cecil E. Holeman and Roy D. Angell. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 172 feet. Measuring point, bottom edge of mouth of discharge pipe, 4.0-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 24, 1938, 46.70; Jan. 10, 1939, 45.65.

20.26.21.111. Drilled irrigation well. Measuring point, top of T-joint of pump pipe, 5.82 feet below land surface. Water level, in feet below land surface datum: Jan. 10, 1939, 18.61.

15.26.9.222. Harry Cowan. Abandoned domestic well, diameter 6 inches, depth 106 feet. Measuring point, top of casing, 0.3 foot above land surface. No equipment. Water levels, in feet below land surface datum, 1939: Nov. 3, 38.42; Nov. 8, 38.27; Nov. 27, 38.40.

15.26.18.242. A. R. Davis. Abandoned domestic well, diameter 6 inches, depth 33 feet. Measuring point, top of concrete foundation, 1.20 feet above land surface.

Water level, in feet below land surface datum, 1937-39

Date	Water level	Date	Water level	Date	Water level
Sept. 18, 1937	22.04	Jan. 18, 1939	22.25	Nov. 8, 1939	24.41
Jan. 26, 1938	21.43	Nov. 3	24.39	27	24.38

15.26.18.444. See Water-Supply Paper 845 for description. Measurements discontinued after May 10, 1939.

Water level, in feet below land surface datum, 1939

Jan. 17	29.66	Mar. 7	29.26	May 10	29.61
Feb. 21	29.39	31	29.40		

15.26.19.111. Domestic well. Measuring point, top of wooden platform at crack west of pump pipe, 0.90 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 26, 1938, 23.00; Jan. 17, 1939, 23.51.

15.26.19.224. Mrs. Ivy H. Beasley. Correct the description and measurements given in Water-Supply Paper 845 to the following: Domestic well, diameter 6 inches, depth 45.5 feet. Measuring point: (a) top of pipe clamp 3.45 feet above land surface; (b) top of casing 3.17 feet above land surface. Equipped with windmill. Annual measurements resumed in 1939.

Water level, in feet below land surface datum, 1937-39

June 10, 1937	27.41	Aug. 30, 1937	b 34.20	Dec. 21, 1937	29.14
25	(b)	Sept. 30	b 40.95	Jan. 25, 1938	29.07
July 13	28.25	Oct. 29	29.09	Jan. 17, 1939	29.57
30	28.03	Nov. 29	29.38		

a Windmill pumping.

b Pumping.

## Chaves County--Continued

15.26.19.442. Domestic well. Measuring point, top of casing, 0.40 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 26, 1938, 8.34; Jan. 17, 1939, 7.85.

15.26.20.144. Domestic well. Measuring point, top of casing, 1.00 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 26, 1938, 22.76; Jan. 17, 1939, 23.51.

15.26.20.431. Domestic well. Measuring point, bottom edge of hole on west side of casing, 0.40 foot above land surface. Equipped with hand pump. Water levels, in feet below land surface datum: Jan. 26, 1938, 13.28; Jan. 17, 1939, 13.81.

15.26.29.111. E. E. Jackson. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 120 feet. Measuring point, top of casing, 0.52 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 26, 1938, 6.23; Jan. 17, 1939, 6.38.

15.26.29.222. Domestic well. Measuring point, top of casing, 2.20 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 26, 1938, 8.70; Jan. 17, 1939, 14.42.

15.26.29.231. Domestic well. Measuring point, land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 26, 1938, 9.4; Jan. 19, 1939, 9.4.

15.26.30.131. Paul Robinson. Drilled irrigation well, diameter 14 inches, depth 256 feet. Measuring point, top of casing, flush with land surface. Equipped with turbine pump. Water level, in feet below land surface datum: Jan. 17, 1939, 5.82.

15.26.30.224. Domestic well. Measuring point, top of platform, 1.22 feet above land surface, 0.12 foot above top of casing. Equipped with hand pump. Water levels, in feet below land surface datum: Jan. 26, 1938, 9.17; Jan. 17, 1939, 9.15.

15.26.31.111. E. J. Gromo. Drilled irrigation well, diameter 14 inches, depth 162 feet. Measuring point, edge of slot in basal flange of pump head, 0.35 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 26, 1938, 13.05; Jan. 17, 1939, 12.95.

15.26.32.231. Domestic well. Measuring point, bottom edge of clamp, 0.96 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 26, 1938, 8.94; Jan. 19, 1939, 9.27.

## Eddy County

16.25.1. Lot 3. Domestic well, diameter 6 inches. Measuring point, top of casing, 1.65 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 17, 1938, 19.40; Jan. 17, 1939, 12.55.

16.25.1. Lot 12. Irrigation well. Measuring point, top of casing, 0.37 foot above land surface. Water level, in feet below land surface datum: Jan. 17, 1939, 16.19.

16.25.1. Lot 13. Abandoned domestic well, diameter 6 inches. Measuring point, top of casing, 0.70 foot above land surface. Equipped with windmill in 1938, no equipment thereafter. Water levels, in feet below land surface datum: Jan. 17, 1938, 16.00; Jan. 17, 1939, 14.06.

16.25.1.344. Domestic well, diameter 6 inches. Measuring point, top of casing, 1.6 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 18, 1938, 10.33; Jan. 16, 1939, 9.79.

16.25.1.423. O'Bannon and Meyer. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 163 feet. Measuring point, top of casing, 0.87 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 18, 1938, 13.56; Jan. 16, 1939, 13.09.

## Eddy County--Continued

16.25.2. Lot 9. Domestic well. Measuring point, top of clamp, 1.65 feet above land surface. Equipped with windmill. Water level, in feet below land surface datum: Jan. 17, 1938, 20.10.

16.25.3. Lot 9. Domestic well, diameter 6 inches. Measuring point, top of casing, 0.90 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 17, 1938, 10.18; Jan. 18, 1939, 10.07.

16.25.3.343. Domestic well, diameter 6 inches. Measuring point, top of casing, 0.20 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 17, 1938, 31.65; Jan. 17, 1939, 31.93.

16.25.4. Lot 12. Domestic well, diameter 6 inches. Measuring point, top of casing, 2.4 feet above land surface. Equipped with hand pump. Water levels, in feet below land surface datum: Jan. 17, 1938, 12.43; Jan. 17, 1939, 13.74.

16.25.5. Lot 4. Stock well, diameter 6 inches. Measuring point, top of casing, 2.12 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 17, 1938, 10.83; Jan. 17, 1939, 11.22.

16.25.5. Lot 13. Domestic well, diameter 6 inches. Measuring point, top of clamp at U.S.G.S. washer, 1.35 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 17, 1938, 15.72; Jan. 17, 1939, 13.41.

16.25.5.443. Winton Ault. Domestic well, diameter 6-5/8 inches, depth 35 feet. Measuring point, top of casing, 1.12 feet above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 17, 1938, 9.31; Jan. 17, 1939, 10.72.

16.25.6. Lot 4. Fred Nellson. See Water-Supply Paper 845 for description. Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 17	14.59	Mar. 31	14.46	July 31	a 14.44	Nov. 8	14.15
Feb. 21	a 15.00	May 10	14.61	Aug. 16	a 13.88	27	15.24
Mar. 1	14.20	June 23	a 14.44	Sept. 18	13.60		

16.25.6. Lot 8. E. P. Malone. Drilled irrigation well, diameter 12½ inches, depth 90 feet. Measuring point, top of casing, 0.70 foot above land surface. Equipped with turbine pump in 1938, no equipment thereafter. Water levels, in feet below land surface datum: Jan. 17, 1938, 14.20; Jan. 17, 1939, 13.23.

16.25.6.313. Childress. See Water-Supply Paper 845 for description. Water level at 4:00 a.m., in feet below land surface datum, 1939 (from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	29.32	.....	.....	29.25	29.24	.....	29.65	29.65	29.73	29.80	.....	.....
2	29.29	.....	.....	29.28	29.35	b29.50	29.62	29.68	29.64	29.62	.....	.....
3	29.12	.....	.....	29.33	29.36	29.61	29.63	29.71	29.62	29.64	.....	b29.73
4	.....	.....	.....	29.27	29.32	29.61	29.69	b29.68	29.68	29.65	.....	29.78
5	.....	.....	.....	29.17	29.27	29.41	29.66	29.66	29.73	29.75	.....	29.74
6	.....	b29.30	.....	29.32	29.15	29.33	29.68	29.58	29.68	29.77	.....	29.72
7	29.23	29.16	b29.40	29.52	29.09	29.42	.....	29.52	29.67	.....	b29.68	29.68
8	29.20	29.14	29.34	.....	29.17	29.47	b29.71	29.69	29.74	.....	29.68	29.76
9	29.18	28.99	29.35	.....	29.32	29.43	29.70	29.70	29.77	.....	29.58	29.63
10	29.36	29.08	29.30	.....	29.31	.....	29.72	29.62	29.78	.....	27.60	29.62
11	29.36	29.08	29.17	.....	29.30	.....	29.70	29.65	29.70	.....	29.81	b29.57
12	29.33	29.09	29.43	.....	29.35	.....	29.68	.....	29.67	b29.83	29.80	29.56
13	29.27	29.15	29.33	.....	29.52	b29.53	29.64	.....	29.76	29.80	29.84	29.88
14	.....	.....	29.18	.....	29.48	29.50	29.61	.....	29.79	29.83	29.77	29.68
15	.....	.....	.....	.....	29.35	29.45	29.63	.....	29.75	29.82	29.68	29.62
16	29.22	.....	.....	.....	29.28	29.45	29.47	b29.67	.....	29.71	29.64	29.64

a Pumping.

b Tape measurement.

## Eddy County--Continued

16.25.6.313.--Continued  
 Water level at 4:00 a.m., in feet below land surface datum, 1930  
 (from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
17	29.33	.....	.....	.....	29.31	29.43	29.45	29.65	.....	29.77	29.64	29.61
18	29.35	.....	a29.48	.....	29.30	29.50	29.48	29.62	a29.85	29.73	29.69	29.52
19	29.32	a29.12	29.43	.....	29.28	29.52	29.64	29.60	29.83	29.66	29.69	.....
20	29.27	29.17	29.38	.....	29.27	29.57	29.65	29.65	29.85	.....	29.66	.....
21	29.20	29.48	29.48	.....	29.32	.....	29.65	29.77	29.83	.....	.....	.....
22	29.37	29.48	29.42	.....	29.32	a29.67	29.66	29.67	29.76	.....	a29.76	.....
23	.....	29.33	29.38	.....	29.27	29.64	29.64	29.65	29.72	.....	29.74	.....
24	a29.59	29.11	29.30	.....	29.28	29.55	29.59	.....	29.70	.....	29.80	.....
25	29.58	29.23	29.14	.....	29.37	29.50	29.62	a29.78	29.66	.....	29.82	.....
26	29.50	29.07	29.14	.....	.....	29.55	29.70	29.78	.....	.....	29.93	a29.56
27	.....	.....	29.16	a29.42	.....	29.64	29.72	29.76	.....	.....	29.90	29.62
28	.....	.....	29.19	a29.42	.....	29.63	29.69	29.70	.....	.....	29.82	29.62
29	.....	.....	29.30	29.37	.....	29.67	.....	29.73	a29.81	.....	29.68	29.72
30	.....	.....	29.31	29.34	.....	29.66	29.64	29.75	29.85	.....	.....	29.74
31	.....	.....	29.29	.....	.....	29.65	29.64	29.75	.....	a29.80	.....	29.57

16.25.8.111. Domestic well. Measuring point, top of clamp, 1.10 feet above land surface. Equipped with windmill. Water level, in feet below land surface datum: Jan. 17, 1938, 29.60.

16.25.10.311. Abandoned well. Measuring point at land surface. Water level, in feet below land surface datum: Jan. 16, 1939, 33.7.

16.25.10.334. Clayton Gray. Drilled irrigation well, diameter 12 (?) inches, depth 204 feet. Measuring point, basal flange of pump head, 0.50 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 17, 1938, 52.80; Jan. 16, 1939, 53.64.

16.25.10.344. Domestic well. Measuring point, top of casing, 0.34 foot above land surface. Water level, in feet below land surface datum: Jan. 16, 1939, 52.56.

16.25.11.233. Noah Buck. Drilled irrigation well, diameter 15 $\frac{1}{2}$  inches, depth 133 feet. Measuring point, bottom edge of mouth of discharge pipe, 5.0-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Feb. 17, 1938, 29.75; Jan. 16, 1939, 29.30.

16.25.12.124. Buck Bros. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 127 feet. Measuring point, top of casing, 0.30 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 18, 1938, 16.40; Jan. 16, 1939, 16.38.

16.25.12.412. Terry Reser. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 177 feet. Measuring point, bottom edge of mouth of discharge pipe, 2.0-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 18, 1938, 12.00; Jan. 16, 1939, 12.33.

16.25.13.211. T. J. Terry. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 235 feet. Measuring point, bottom edge of mouth of discharge pipe, 2.6-foot correction to land surface. Equipped with turbine pump. Water level, in feet below land surface datum: Jan. 16, 1939, 23.62.

16.25.14.213. Chas. Buck. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 135 feet. Measuring point, top of casing flush with land surface. Equipped with turbine pump after 1938. Water levels, in feet below land surface datum: Feb. 17, 1938, 31.83; Jan. 16, 1939, 31.79.

16.25.15.233. J. H. Everest. Drilled irrigation well, diameter 14 inches, depth 250 feet. Measuring point, top of casing, 1.14 feet above land surface. Equipped with centrifugal pump. Water level, in feet below land surface datum: Jan. 17, 1939, 64.20.

a Tape measurement.

## Eddy County--Continued

16.25.15.331. J. W. Everest. Drilled irrigation well, diameter  $12\frac{1}{2}$  inches, depth 141 feet. Measuring point, bottom edge of mouth of discharge pipe, 3.80-foot correction to concrete foundation and land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 18, 1938, 82.78; Jan. 16, 1939, 83.40.

16.25.24.212. H. C. Powell. Drilled irrigation well, diameter  $12\frac{1}{2}$  inches, depth 148 feet. Measuring point, top of casing, 0.40 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 18, 1938, 30.90; Jan. 30, 1939, 31.70.

16.26.5. Lot 3. Taylor. Irrigation well. Measuring point, base plate of pump flush with land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 17, 1938, 26.27; Jan. 17, 1939, 26.44.

16.26.5. NW lot 4. H. V. Parker. See Water-Supply Paper 845 for description.

Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 9	29.99	Mar. 31	a 42.37	July 31	38.22	Nov. 8	38.56
21	30.59	May 11	a 36.20	Aug. 16	37.73	27	34.14
Mar. 7	32.63	June 23	36.47	Sept. 18	a 40.36		

16.26.5.331. Mrs. Nancy Eippers. Drilled irrigation well, diameter  $12\frac{1}{2}$  inches, depth 111 feet. Measuring point, top of casing, 0.57 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 21, 1938, 16.21; Jan. 16, 1939, 18.13.

16.26.6. Lot 2. H. V. Parker. Drilled irrigation well, diameter  $12\frac{1}{2}$  inches, depth 170 feet. Measuring point, bottom edge of mouth of discharge pipe, 2.75-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 17, 1938, 25.50; Jan. 17, 1939, 28.48.

16.26.6. Lot 4. Domestic well, diameter 6 inches. Measuring point, top of casing, 0.25 foot above land surface. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 17, 1938, 27.29; Jan. 17, 1939, 29.75.

16.26.6.333. O'Bannon and Meyer. Drilled irrigation well, diameter  $12\frac{1}{2}$  inches, depth 142 $\frac{1}{2}$  feet. Measuring point, top of casing flush with land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 18, 1938, 12.60; Jan. 16, 1939, 12.08.

16.26.7.121. L. Kieth. Drilled irrigation well, diameter  $12\frac{1}{2}$  inches, depth 136 feet. Measuring point: (a) bottom edge of mouth of discharge pipe, 5.50-foot correction to land surface; (b) base plate of pump, 0.15 foot above concrete foundation, and 0.75 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 12, 1938, 13.16; Jan. 16, 1939, 13.54.

16.26.7.321. C. Buck. Drilled irrigation well, diameter  $12\frac{1}{2}$  inches, depth 180 feet. Measuring point, top of casing, 0.15 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 18, 1938, 5.91; Jan. 16, 1939, 6.37.

16.26.7.332. Domestic well. Measuring point, top of casing, 1.13 feet above land surface. Equipped with hand pump. Water levels, in feet below land surface datum: Jan. 18, 1938, 12.61; Jan. 16, 1939, 14.11.

16.26.8.111. Reser and Johnson. Drilled irrigation well, diameter  $12\frac{1}{2}$  inches, depth 175 feet. Measuring point, top of casing, 0.40 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 21, 1938, 15.69; Jan. 16, 1939, 15.65.

a Pumping.

## Eddy County--Continued

16.26.8.222. I. P. Johnson. See Water-Supply Paper 845 for description. Depth 119 feet.

Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 18	14.25	Mar. 31	a 17.27	July 31	a 15.98	Nov. 8	16.78
Feb. 21	a 14.81	May 11	13.91	Aug. 10	14.78	27	a 17.54
Mar. 7	13.83	June 23	a 16.45	Sept. 18	16.63		

16.26.16.313. V. L. Gates. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 150 feet. Measuring point, top of 4 by 6-inch block, 1.00 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 18, 1938, 6.15; Jan. 14, 1939, 6.38.

16.26.17.311. J. L. Muncy. Drilled irrigation well, diameter 10 inches, depth 112 feet. Measuring point, bottom edge of mouth of discharge pipe, 6.10-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 12, 1938, 21.68; Jan. 30, 1939, 22.67.

16.26.17.331. Green. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 180 feet. Measuring point, basal flange of pump head, 0.17 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 12, 1938, 10.74; Jan. 30, 1939, 11.65.

16.26.18.331. Monroe Howard. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 160 feet. Measuring point, bottom edge of mouth of discharge pipe, 2.75-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 18, 1938, 18.59; Jan. 30, 1939, 19.49.

16.26.18.411. G. G. Golder. Drilled irrigation well, diameter 12 inches. Measuring point, top of casing, 0.75 foot above land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 18, 1938, 19.05; Jan. 30, 1939, 20.99.

16.26.19.113. Henry B. Hall. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 126 feet. Measuring point, top of casing flush with land surface. Equipped with turbine pump. Water level, in feet below land surface datum: Jan. 30, 1939, 20.17.

16.26.19.133. F. M. Privett. Drilled irrigation well, diameter 12 inches, depth 168 feet. Measuring point, bottom edge of mouth of discharge pipe, 4.60-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 18, 1938, 19.42; Jan. 30, 1939, 21.97.

16.26.19.211. H. V. Parker. Drilled irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 107 feet. Measuring point, bottom edge of mouth of discharge pipe, 3.15-foot correction to land surface. Equipped with turbine pump. Water levels, in feet below land surface datum: Jan. 18, 1938, 12.97; Jan. 30, 1939, 14.68.

a Pumping.



## LUNA COUNTY

## MIMBRES VALLEY

By C. S. Conover

The program of measuring water levels in observation wells in the Mimbres Valley and of gathering information on the amount of water pumped, along with other pertinent data, was continued during 1939 in cooperation with the State engineer of New Mexico, T. M. McClure.

The Mimbres Valley is an extensive desert plain, or bolson, in southwestern New Mexico, underlain to a considerable depth with Quaternary and older sands and gravels and clays derived from surrounding mountains. The valley is traversed by the Mimbres River, an ephemeral stream in its lower course. The normal flow of the Mimbres River sinks into the river bed shortly after leaving the bed rock of the Mimbres Mountains. Only in years of heavy rainfall does the river reach the flood plain east of the Little Florida Mountains. Basic information on the hydrology and on fluctuations of ground-water level in the Mimbres Valley has been published in the 8th to 13th Biennial Reports of the State engineer of New Mexico and in Geological Survey Water-Supply Paper 637. It is expected that the accompanying maps and water-level measurements, together with other data and a more detailed discussion, will be published in the forthcoming 14th Biennial Report of the State engineer of New Mexico.

In 1939, according to a survey by the writer, more than 10,000 acres of land were irrigated with water pumped from wells in the Mimbres Valley. This is an increase of about 1,000 acres over 1938.

The precipitation for 1939, as reported by the U. S. Weather Bureau at Deming, was 8.00 inches, or 1.00 inch below normal. This deficiency of rainfall may have caused a slight increase in pumping for the year.

At the beginning of 1940, the water-level program included about 120 observation wells. Measurements were made once (in January 1939) in 63 wells and bimonthly in the other 57 wells. The measurements made once a year are used in preparing maps that show yearly changes in ground-water levels in the valley; those made bimonthly are used for following the trend and change in ground-water levels during the year. As the observation wells are distributed over the whole area, they show changes in the entire valley. At the end of 1939 four water-stage recorders were in operation on representative wells.

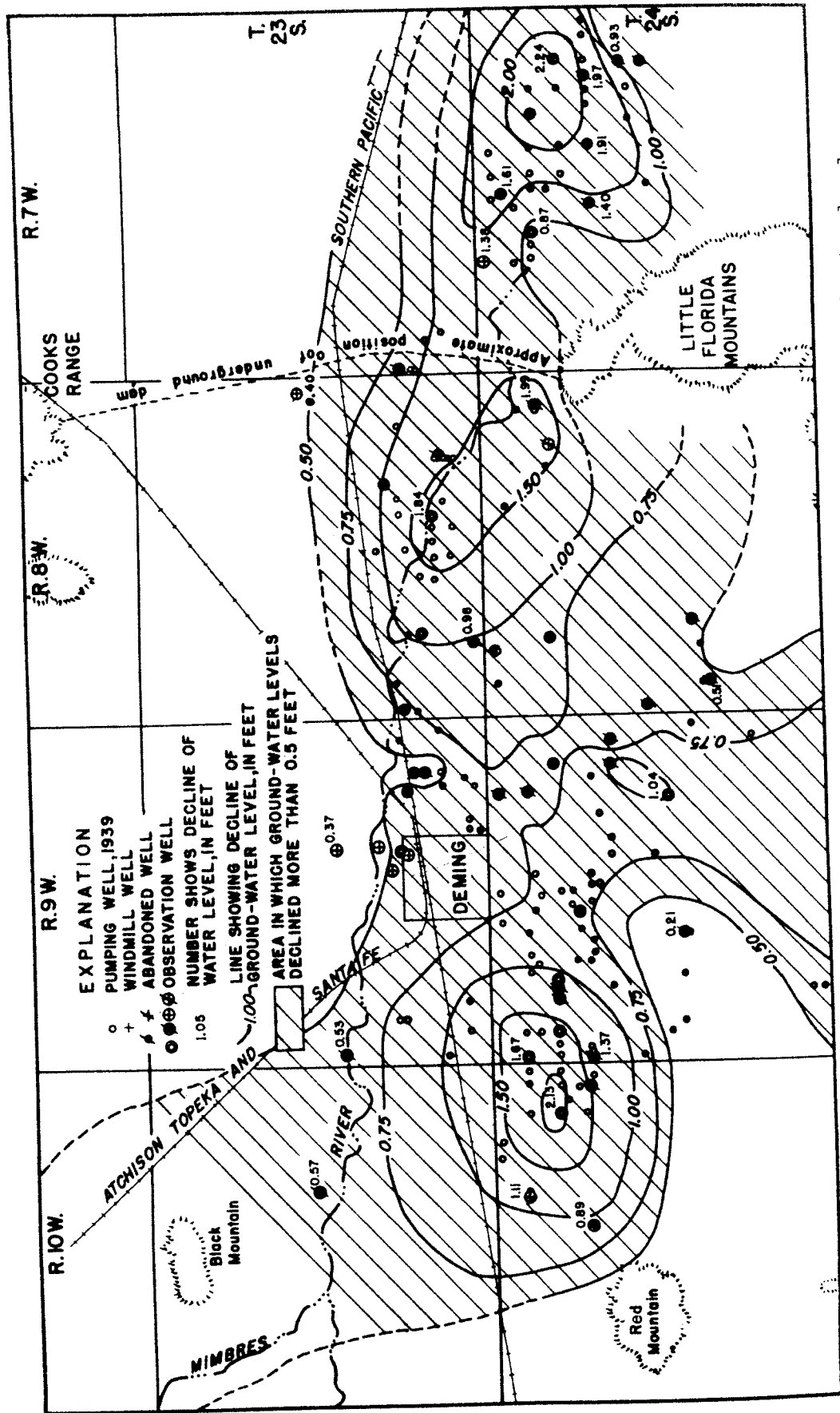


Figure 17.--Map of a part of Mimbres Valley, New Mexico, showing change in ground-water level from January 1939 to January 1940.

The change in ground-water levels in the Mimbres Valley from January 1939 to January 1940 is shown in an accompanying figure. Over the whole area under observation the ground-water level declined, but the maximum decline occurred in areas of heavy pumping. In the heavily pumped area east of the Little Florida Mountains, water levels in all the wells that were measured declined more than 0.8 foot, and the water levels in some of the wells declined more than 2 feet. In the area of heavy pumping northwest of the Little Florida Mountains the water level declined a maximum of almost two feet. In another heavily pumped area--southwest of Deming--the maximum decline of ground-water level was more than 2 feet; a decline of more than 1 foot occurred in all except one of the wells measured. In an area about 7 miles south of Deming, where the draft is less, the maximum decline of ground-water level was more than 1 foot; a decline of more than 0.7 foot occurred in all the wells measured.

The change in ground-water levels from February 1930 to January 1940 is shown in an accompanying figure. A pronounced lowering of the ground-water level has occurred over a large part of the valley in the 10-year period. In the area of heavy pumping east of the Little Florida Mountains the decline has been more than 16 feet; in the area of heavy pumping southwest of Deming it has been more than 12 feet; and in the pumped area northwest of the Little Florida Mountains it has been more than 5 feet.

In the following tables the complete records of water level are given for the observation wells. Only the measuring points now in use are described. The former well numbers referred to in the well descriptions are numbers assigned to the wells in the 9th, 10th, 11th, 12th, and 13th Biennial Reports of the State engineer of New Mexico. The altitude of the measuring points and the depths and diameters of some of the wells are taken from the 10th Biennial Report of the State engineer of New Mexico. Errors found in the reports previously published have been corrected in the accompanying descriptions and tables.

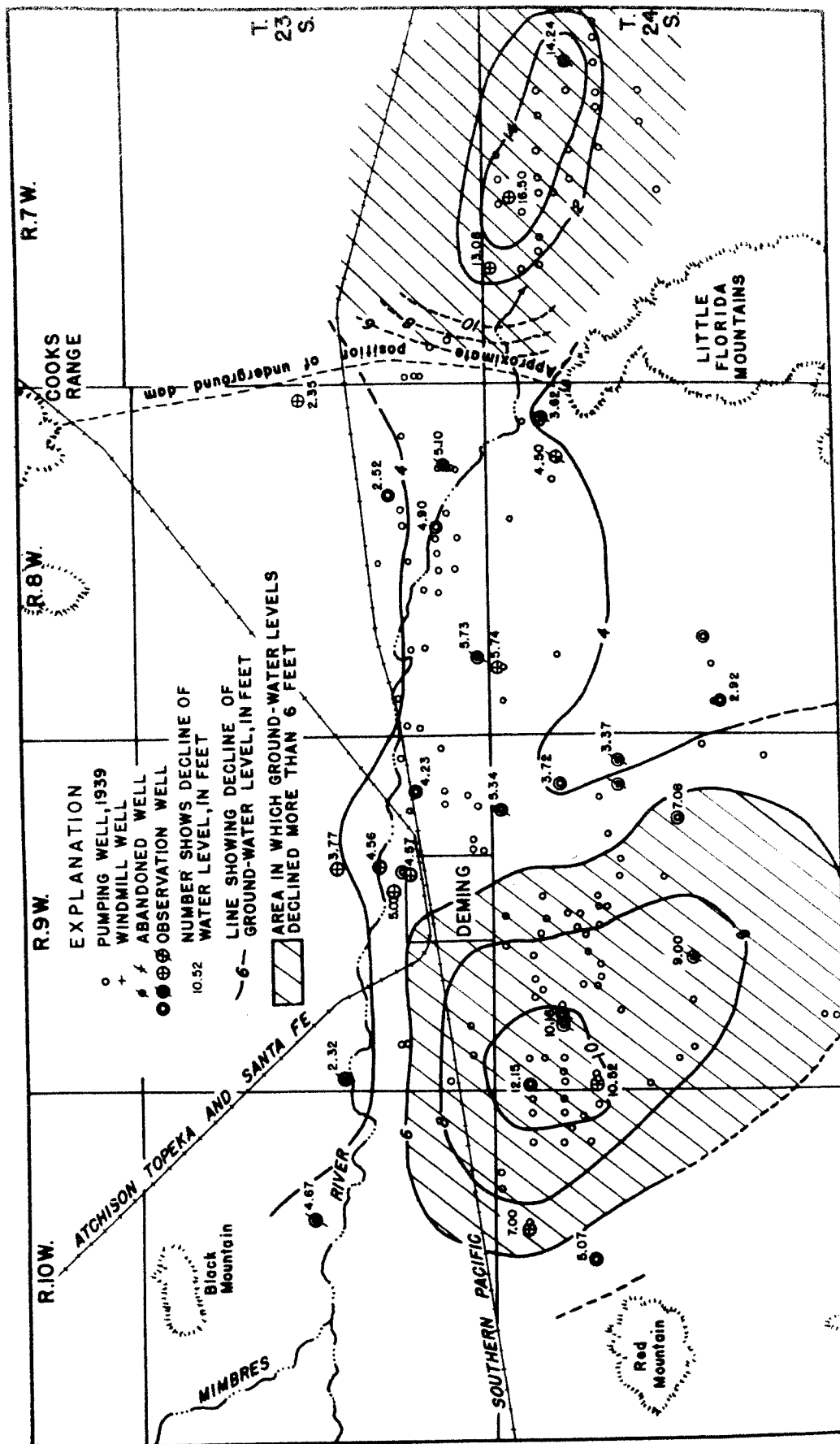


Figure 18.—Map of a part of Mimbres Valley, New Mexico, showing change in ground-water level from February 1930 to January 1940.

21.11.30. Formerly well 1. ---. Three-eighths mile east of channel of Mimbres River. Used dug and drilled irrigation well, diameter 10 feet, depth 80 feet. Measuring point, top edge of USGS washer nailed in southeast side of wooden well curbing, level with land surface datum, 0.30 foot above top of bolt on uppermost 8 by 8-inch timber of abandoned pump flooring which is 30 feet southeast of measuring point. Water level, in feet below land surface datum, 1928-39

Date	Water level	Date	Water level	Date	Water level
Aug. 17, 1928	9.14	Sept. 12, 1931	7.44	July 8, 1934	9.38
Nov. 8	8.60	Oct. 10	7.46	Oct. 2	8.84
Feb. 10, 1929	8.87	Nov. 14	7.34	Dec. 30	7.30
May 12	9.41	Dec. 12	7.12	Feb. 2, 1935	7.60
June 5	9.10	Jan. 9, 1932	7.15	June 4	8.30
Aug. 31	7.04	Feb. 13	7.13	Sept. 15	8.54
Oct. 4	7.43	May 31	7.30	Dec. 11	7.43
Dec. 30	7.31	July 6	7.42	Feb. 9, 1936	8.52
Jan. 25, 1930	7.44	Aug. 2	7.91	July 10	9.57
Feb. 23	7.56	Feb. 30	8.71	Nov. 22	b 9.62
Mar. 23	7.57	Feb. 25, 1933	8.57	Feb. 21, 1937	8.64
Apr. 19	7.70	Apr. 1	8.91	Jan. 6, 1938	8.25
May 17	7.92	May 14	7.94	Jan. 11, 1939	8.22
June 21	8.22	June 18	8.59	Mar. 16	8.53
July 22	8.79	Oct. 15	7.91	May 8	8.85
Nov. 16	7.43	Dec. 9	a 6.90	June 29	9.54
Feb. 15, 1931	7.36	Feb. 4, 1934	7.54	Sept. 8	9.41
Apr. 11	7.16	Apr. 28	8.46	Nov. 7	8.80

21.11.13. Formerly well 4. Fred Roth. Three-eighths mile east of channel of Mimbres River. Used dug and drilled irrigation well, diameter 10 feet, depth 80 feet. Measuring point, top edge of USGS washer nailed in southeast side of wooden well curbing, level with land surface datum, 0.30 foot below top of bolt on uppermost 8 by 8-inch timber of abandoned pump flooring which is 30 feet southeast of measuring point. Water level, in feet below land surface datum, 1928-39

July 26, 1928	25.93	Sept. 8, 1930	29.72	Dec. 9, 1933	29.21
Sept. 8	27.53	Nov. 16	30.24	Feb. 4, 1934	27.80
Nov. 8	28.74	Feb. 15, 1931	29.09	Apr. 23	29.11
Feb. 2, 1929	30.62	Apr. 11	26.24	July 6	30.93
Apr. 10	31.70	Aug. 25	24.40	Oct. 2	32.40
May 11	32.46	Sept. 12	24.36	Dec. 30	34.39
June 5	33.04	Oct. 10	25.10	Feb. 2, 1935	34.00
July 10	33.78	Nov. 14	25.68	June 4	36.91
Aug. 31	29.82	Dec. 12	24.55	Sept. 15	37.26
Sept. 5	28.95	Jan. 9, 1932	24.83	Dec. 11	37.16
Oct. 4	28.10	Feb. 13	23.28	Feb. 9, 1936	36.69
Dec. 30	27.34	May 31	19.51	Nov. 22	b 39.06
Jan. 25, 1930	27.35	July 6	22.25	Feb. 21, 1937	40.25
Feb. 23	26.03	Aug. 2	23.61	Jan. 6, 1938	37.90
Mar. 23	27.89	30	24.51	Jan. 11, 1939	42.26
Apr. 19	27.72	Feb. 25, 1933	28.44	Mar. 16	42.93
May 10	28.52	Apr. 1	27.19	May 8	43.49
June 21	29.40	May 14	27.22	June 29	46.34
July 22	30.55	June 18	28.00	Sept. 8	c 66.16
Aug. 21	30.62	Oct. 15	29.41	Nov. 7	44.20

21.11.35.31. Formerly well 92. ---. Nine-tenths mile southeast of Spalding, 400 feet west of railroad, 3/8 mile east of channel of Mimbres River. Unused drilled well, diameter 2.4 feet, depth 179 feet. Measuring point, top surface, east side of concrete curb, level with land surface datum, 4,711.85 feet above sea level, 2.50 feet below upper surface of concrete engine base which is 25 feet east of well. Water level, in feet below land surface datum, 1929-39

May 10, 1929	25.10	July 19, 1929	25.78	Feb. 23, 1930	19.53
June 6	24.57	Oct. 4	16.79	Mar. 23	20.66
22	25.47	Dec. 30	18.12	Apr. 19	22.30
July 10	26.03	Jan. 25, 1930	19.80	May 10	23.79

a Measurement probably inaccurate.

b Measuring point changed. New point could not be accurately referenced to old; possible discrepancy of a tenth of a foot.

c Pumping about 200 gallons a minute.

## Luna County--Continued

21.11.35.31.--Continued

Water level, in feet below land surface datum, 1929-39

Date	Water level	Date	Water level	Date	Water level
June 21, 1930	23.92	July 6, 1932	20.39	June 4, 1935	30.25
Aug. 21	15.01	Aug. 2	21.12	Sept. 15	23.60
27	14.74	30	22.21	Dec. 11	27.05
Nov. 16	19.93	Feb. 25, 1933	25.90	Feb. 9, 1936	28.08
Feb. 15, 1931	20.46	Apr. 1	21.62	July 10	28.86
Apr. 11	17.73	May 14	24.64	Nov. 22	31.05
May 17	14.92	June 18	26.00	Feb. 28, 1937	24.62
Aug. 25	17.28	Oct. 15	22.58	Jan. 6, 1938	26.54
Sept. 12	17.92	Dec. 9	25.52	Jan. 11, 1939	31.30
Oct. 10	18.66	Feb. 4, 1934	26.81	Mar. 16	31.94
Nov. 14	19.35	Apr. 28	27.95	May 8	32.31
Dec. 12	18.79	July 6	28.76	June 29	32.68
Jan. 9, 1932	18.76	Oct. 2	27.52	Sept. 8	25.05
Feb. 13	20.23	Dec. 30	29.48	Nov. 7	27.71
May 31	18.94	Feb. 2, 1935	29.95		

22.10.18.121. Formerly well 11. ----- One-fourth mile west of Vencill, 2.5 miles east of Mimbres River. Unused drilled well, diameter 2.5 feet, depth 223 feet. Measuring point, upper surface of concrete curb, north side of well, level with land surface datum, 4,652.10 feet above sea level, 2.4 feet above top of 30-inch iron casing in well, 2.14 feet below upper surface of concrete engine base which is 30 feet east of well.

Water level, in feet below land surface datum, 1928-39

July 31, 1928	69.06	Sept. 3, 1930	69.06	Feb. 4, 1934	71.11
Aug. 15	69.15	Nov. 16	68.74	Apr. 28	71.55
Oct. 1	69.23	Feb. 15, 1931	69.14	July 6	71.51
Nov. 8	69.55	Apr. 11	69.22	Oct. 2	71.79
Jan. 8, 1929	69.91	May 17	69.09	Dec. 30	71.95
Feb. 10	70.18	Aug. 25	68.82	Feb. 2, 1935	72.08
Apr. 20	70.47	Sept. 12	68.73	June 4	72.41
May 20	70.64	Oct. 10	68.60	Sept. 15	73.50
June 20	70.86	Nov. 14	68.65	Dec. 11	72.36
Aug. 1	70.99	Dec. 12	68.56	Feb. 9, 1936	73.55
28	69.01	Jan. 9, 1932	68.64	July 10	72.95
Sept. 30	68.00	Feb. 13	68.80	Nov. 22	73.34
Oct. 4	68.01	May 31	69.10	Feb. 28, 1937	73.73
Dec. 30	68.28	July 11	69.35	Sept. 16	72.23
Jan. 25, 1930	68.51	Aug. 2	69.33	Jan. 9, 1938	72.45
Feb. 23	68.34	30	69.17	Jan. 11, 1939	73.96
Mar. 23	68.65	Feb. 25, 1933	70.03	Mar. 16	74.18
Apr. 19	68.68	Apr. 1	70.12	May 8	74.32
May 10	68.66	May 14	70.42	June 29	74.52
June 20	68.74	June 18	70.48	Sept. 8	74.41
July 22	69.29	Oct. 15	70.71	Nov. 7	74.30
Aug. 21	69.22	Dec. 9	70.88		

22.11.2.21. Formerly well 9A. ----- Two miles southeast of Spalding, 50 feet west of railroad, 300 feet northwest of milepost 15, one mile east of Mimbres River. Unused drilled well, diameter 2.4 feet, depth 200 feet. Measuring point, top surface of concrete curb east side of well, level with land surface datum, 4,699.58 feet above sea level, 0.30 foot below top of bolt in southwest corner of well curbing, 2.53 feet below upper surface of concrete engine base which is 30 feet east of well.

Water level, in feet below land surface datum, 1929-39

May 2, 1929	25.74	Oct. 4, 1929	21.03	Aug. 21, 1930	22.83
10	25.79	Dec. 30	20.72	27	22.40
June 6	26.01	Jan. 25, 1930	21.11	Nov. 16	22.33
22	26.24	Feb. 23	21.69	Feb. 15, 1931	21.53
July 20	26.76	Mar. 23	22.68	Apr. 11	22.30
Aug. 1	26.42	Apr. 19	23.73	May 17	22.60
31	22.64	May 10	24.46	Aug. 25	20.95
Sept. 17	21.78	June 21	24.49	Sept. 12	21.07

## Luna County--Continued

22.11.2.21.--Continued

Water level, in feet below land surface datum, 1929-39

Date	Water level	Date	Water level	Date	Water level
Oct. 10, 1931	21.15	June 18, 1933	26.77	Feb. 9, 1936	30.33
Nov. 14	21.71	Oct. 15	26.07	July 10	29.82
Dec. 12	21.74	Dec. 9	26.86	Nov. 22	31.21
Jan. 9, 1932	22.14	Feb. 4, 1934	27.64	Feb. 28, 1937	29.65
Feb. 13	22.68	Apr. 28	28.39	Jan. 6, 1938	27.70
May 31	21.53	July 6	28.98	Jan. 11, 1939	31.70
July 6	22.58	Oct. 3	28.69	Mar. 16	32.23
Aug. 2	23.16	Dec. 30	28.81	May 8	32.59
30	24.26	Feb. 2, 1935	28.95	June 29	32.90
Feb. 25, 1933	26.44	June 4	29.27	Sept. 8	30.08
Apr. 1	25.15	Sept. 15	28.93	Nov. 7	30.29
May 14	26.16	Oct. 11	28.46		

22.11.13.122. Formerly well 13. ----- One mile west of Vencill, 1-3/4 miles east of Mimbres River. Unused drilled well, diameter 2.4 feet, depth 190 feet. Measuring point, top surface of concrete, north side of well, level with land surface datum, 4,648.69 feet above sea level, 2.49 feet below top surface of concrete engine base which is 30 feet east of well.

Water level, in feet below land surface datum, 1928-39

July 31, 1928	58.00	Sept. 3, 1930	59.41	Feb. 4, 1934	62.31
Aug. 15	58.08	Nov. 16	59.26	Apr. 28	63.22
Oct. 1	58.18	Feb. 15, 1931	59.77	July 6	63.50
Nov. 8	58.60	Apr. 11	59.87	Oct. 2	63.63
Jan. 8, 1929	59.08	May 17	59.59	Dec. 30	64.00
Feb. 10	59.35	Aug. 25	59.24	Feb. 2, 1935	64.10
Apr. 20	59.79	Sept. 12	59.08	June 4	64.71
May 20	60.06	Oct. 10	59.00	Sept. 15	65.50
June 20	60.34	Nov. 14	59.12	Dec. 11	64.35
Aug. 1	60.53	Dec. 12	59.19	Feb. 9, 1936	65.73
28	59.57	Jan. 9, 1932	59.59	July 10	65.05
Sept. 30	58.84	Feb. 13	59.66	Nov. 22	65.43
Oct. 4	58.81	May 31	59.98	Feb. 28, 1937	65.72
Dec. 30	58.92	July 11	60.30	Sept. 16	63.58
Jan. 25, 1930	59.07	Aug. 2	60.36	Jan. 9, 1938	64.10
Feb. 23	59.15	30	60.36	Jan. 11, 1939	66.01
Mar. 23	59.48	Feb. 25, 1933	61.50	Mar. 16	66.27
Apr. 19	59.71	Apr. 1	61.61	May 8	66.45
May 10	59.88	May 14	61.96	June 29	66.60
June 21	59.89	June 18	62.36	Sept. 8	66.44
July 22	60.47	Oct. 15	62.71	Nov. 7	66.31
Aug. 21	59.74	Dec. 9	62.52		

22.11.13.221. Formerly well 12. ----- Three-quarters mile west of Vencill, 2 miles east of Mimbres River. Unused drilled well, diameter 2.5+ feet, depth 225 feet. Measuring point, top surface of concrete, southeast side of well, level with land surface datum, 4,652.88 feet above sea level, 3.4 feet above top of 18-inch casing in well, 2.48 feet below upper surface of concrete engine base which is 30 feet east of well.

Water level, in feet below land surface datum, 1928-39

July 31, 1928	65.14	Jan. 25, 1930	66.06	Sept. 12, 1931	66.43
Aug. 15	65.24	Feb. 23	66.10	Oct. 10	66.35
Oct. 1	65.34	Mar. 23	66.46	Nov. 14	66.40
Nov. 8	65.66	Apr. 19	66.80	Dec. 12	66.39
Jan. 8, 1929	66.11	May 10	66.75	Jan. 9, 1932	66.77
Feb. 10	66.39	June 21	66.86	Feb. 13	66.74
Apr. 20	66.78	July 22	67.34	May 31	67.00
May 20	67.02	Aug. 21	66.72	July 11	67.33
June 20	67.28	Sept. 3	66.69	Aug. 2	67.35
Aug. 1	67.46	Nov. 16	66.44	30	67.35
28	66.72	Feb. 15, 1931	66.81	Feb. 25, 1933	68.30
Sept. 30	65.93	Apr. 11	67.00	Apr. 1	68.47
Nov. 4	65.90	May 17	66.75	May 14	68.79
Dec. 30	65.93	Aug. 25	66.61	June 18	68.87

## Luna County--Continued

22.11.13.221.--Continued

Water level, in feet below land surface datum, 1928-39

Date	Water level	Date	Water level	Date	Water level
Oct. 15, 1933	69.14	June 4, 1935	71.40	Jan. 9, 1938	71.09
Dec. 9	69.45	Sept. 13	72.63	Jan. 11, 1939	72.80
Feb. 4, 1934	69.63	Dec. 11	71.15	Mar. 16	73.05
Apr. 28	70.05	Feb. 9, 1936	72.50	May 8	73.23
July 6	70.21	July 10	71.79	June 29	73.38
Oct. 2	70.45	Nov. 22	72.26	Sept. 8	73.29
Dec. 30	70.72	Feb. 28, 1937	72.62	Nov. 7	73.19
Feb. 2, 1935	70.85	Sept. 16	70.68		

22.11.14.22. Formerly well 14. ----- One and one-half miles west of Vencill,  $1\frac{1}{4}$  miles east of Mimbres River. Unused drilled well, diameter 2.4 feet, depth 194 feet. Measuring point, top surface of concrete, northwest side of well, level with land surface datum, 4,643.92 feet above sea level, 2.44 feet below upper surface of concrete engine base which is 30 feet east of well.

Water level, in feet below land surface datum, 1928-36, 1938-39

July 31, 1928	49.42	Aug. 21, 1930	51.30	Oct. 15, 1933	54.31
Aug. 15	49.47	Sept. 3	50.82	Dec. 9	54.27
Oct. 1	49.66	Nov. 16	50.69	Feb. 4, 1934	55.06
Nov. 8	50.01	Feb. 15, 1931	51.48	Apr. 28	55.59
Jan. 8, 1929	50.78	Apr. 11	51.47	July 6	55.91
Feb. 10	51.26	May 17	50.85	Oct. 2	55.84
Apr. 20	51.82	Aug. 25	50.31	Dec. 30	56.46
May 20	52.14	Sept. 12	50.18	Feb. 2, 1935	55.72
June 20	52.49	Oct. 10	50.12	June 4	56.30
Aug. 1	52.75	Nov. 14	50.35	Sept. 15	57.45
28	51.10	Dec. 12	50.56	Dec. 11	56.46
Sept. 30	50.29	Jan. 9, 1932	50.23	Feb. 9, 1936	(a)
Oct. 4	50.25	Feb. 13	51.24	July 10	55.80
Dec. 30	50.55	May 31	51.58	Jan. 9, 1938	(a)
Jan. 25, 1930	50.80	July 11	52.01	Jan. 11, 1939	(a)
Feb. 23	50.98	Aug. 2	52.15	Mar. 16	(a)
Mar. 23	51.45	30	52.20	May 8	58.93
Apr. 19	51.71	Feb. 25, 1933	53.62	June 29	59.11
May 10	51.90	Apr. 1	53.70	Sept. 8	58.63
June 21	51.99	May 14	54.04	Nov. 7	58.52
July 22	51.67	June 18	54.20		

22.11.23.22. Formerly well 15. ----- One mile east of Mimbres River. Unused drilled well, diameter 2+ feet, depth 152 feet. Measuring point, upper surface of concrete curb east side of well, level with land surface datum, 4,631.66 feet above sea level, 1.2 feet above 18-inch metal casing in well, 2.13 feet below southwest corner of uppermost block of concrete engine base which is 30 feet east of well.

Water level, in feet below land surface datum, 1928-39

Aug. 29, 1928	51.87	Dec. 30, 1929	52.94	July 6, 1934	58.10
Oct. 1	52.14	Jan. 25, 1930	53.20	Sept. 15, 1935	59.65
10	52.18	Feb. 23	53.44	Feb. 9, 1936	60.02
Nov. 8	52.63	Sept. 12, 1931	54.31	July 10	59.57
Jan. 8, 1929	52.96	Jan. 9, 1932	53.62	Nov. 22	59.98
Feb. 5	53.36	Feb. 15	51.48	Feb. 21, 1937	60.30
Apr. 20	54.15	Apr. 11	51.47	Jan. 9, 1938	58.32
25	54.26	May 17	50.85	Jan. 11, 1939	52.61
May 20	54.47	July 11	54.56	Mar. 16	52.83
June 20	54.69	Aug. 30	54.86	May 8	53.05
July 19	54.85	Apr. 1, 1933	56.06	June 29	53.28
Aug. 28	53.22	Apr. 28, 1934	57.76	Sept. 8	52.95
Sept. 30	52.30			Nov. 7	52.80

a Obstructed; unable to measure.



## Luna County--Continued

23.7.30. Lot 16. Formerly well 60. H. T. Foster. Approximately one-quarter mile north of south side of section, most northerly of three wells, approximately 1,000 feet north of pumped well. Dug and drilled irrigation well, depth 157 feet. Measuring point, top of concrete curb at northeast side of well, about 1.0 foot above land surface datum. No pump in well.

Water level, in feet below land surface datum, 1931-39

Date	Water level	Date	Water level	Date	Water level
Aug. 27, 1931	23.11	May 22, 1933	22.45	Feb. 3, 1936	24.70
Sept. 13	23.18	June	22.53	July 14	24.30
Oct. 11	23.04	Oct. 8	23.13	Dec. 6	24.31
Nov. 15	22.91	Dec. 3	23.00	Feb. 22, 1937	24.02
Dec. 14	22.77	Feb. 10, 1934	22.94	Sept. 16	24.88
Jan. 16, 1932	22.62	Apr. 29	23.00	Jan. 11, 1938	(b)
Feb. 20	22.58	July 2	23.30	Jan. 13, 1939	24.52
June 1	(a)	Oct. 1	23.88	Mar. 18	24.27
July 7	23.89	Dec.	23.82	May 9	24.36
Aug. 3	(a)	Feb. 3, 1935	23.90	July 4	25.52
31	23.14	June 3	23.58	Sept. 10	26.35
Mar. 11, 1933	22.58	Sept. 7	24.30	Nov. 8	25.55
Apr. 9	22.53	Dec. 8	25.00		

23.8.13.4. Formerly well 47. Mr. Childs. One and one-quarter miles north of railroad, east ranch house. Dug and drilled well, diameter 5+ feet, depth 83 feet. Measuring point, top edge of USGS washer in top of 2 by 4-inch timber on east side of well, 0.15 foot above land surface datum and concrete curb; 1.83 feet below top of concrete pyramid block on east side of well. Equipped with windmill.

Water level, in feet below land surface datum, 1928-33, 1936-39

Oct. 27, 1928	34.95	Sept. 13, 1931	35.30	Jan. 8, 1938	c 36.47
Mar. 17, 1929	34.52	June 1, 1932	a 37.63	Jan. 14, 1939	36.62
Apr. 16	34.46	Aug. 31	35.69	Mar. 18	a 37.80
June 18	34.72	Apr. 9, 1933	35.11	May 9	a 36.92
July 18	34.92	29	35.19	June 30	d 37.90
Dec. 31	34.76	Dec. 6, 1936	36.38	Sept. 11	37.34
Feb. 12, 1930	34.67	Feb. 28, 1937	36.09	Nov. 9	a 38.35
Aug. 28	35.05				

23.8.26.131. Formerly well 52. L. O. Scott. Dug and drilled irrigation well. Diameter 3+ feet, depth 180 feet. Measuring point, top of circular concrete curb, east side of well, level with land surface datum, and 4,250.54 feet above sea level.

Water level, in feet below land surface datum, 1927-39

Aug. 6, 1927	28.95	Sept. 29, 1929	29.64	Feb. 10, 1934	29.40
Oct. 20	28.60	Jan. 1, 1930	29.71	Apr. 29	29.30
Nov. 3	28.55	Feb. 2	29.58	July 2	33.88
14	28.51	Mar. 1	29.54	Oct. 1	31.62
28	28.43	Apr. 5	28.34	Dec.	31.50
Dec. 12	28.37	May 30	28.90	Feb. 3, 1935	29.90
Jan. 4, 1928	28.30	Aug. 27, 1931	(a)	June 3	30.58
16	28.26	Sept. 13	30.79	Sept. 8	30.84
30	28.27	Oct. 11	29.69	Dec. 8	31.34
Feb. 22	28.16	Nov. 15	29.44	Feb. 3, 1936	30.80
Mar. 5	28.12	Dec. 13	29.25	July 14	(a)
May 26	28.70	Jan. 16, 1932	29.06	Dec. 6	31.28
June 15	(a)	Feb. 20	28.92	Feb. 22, 1937	30.74
July 31	(a)	June 1	e 30.05	Sept. 15	32.30
Sept. 14	29.56	July 7	(a)	Jan. 8, 1938	31.08
Oct. 19	29.12	Aug. 3	(a)	Jan. 13, 1939	31.19
27	29.03	Mar. 11, 1933	28.80	Mar. 18	30.94
Feb. 7, 1929	28.54	Apr. 9	29.20	May 9	31.93
Mar. 17	28.50	May 22	28.77	July 4	34.03
Apr. 30	28.70	June	29.37	Sept. 10	35.48
June 15	28.98	Oct. 8	30.20	Nov. 8	32.85
Aug. 8	29.64	Dec. 3	29.70		

a Pumping.

b Drilling rig over well.

c New measuring point. Could not be accurately referenced to old point, possible discrepancy of several tenths of a foot between preceding and succeeding record.

d Not pumping; pumped for three hours prior to measurement.

e Pumped in morning.

## Luna County--Continued

23.8.29.433. B. N. Ruebush. Used dug and drilled irrigation well. Measuring point, top edge of USGS washer in top of timber on west side of pump, 0.4 foot east of windmill pipe column, 0.84 foot below base of pump, 0.5 foot above land surface datum. Equipped with windmill and irrigation pump. Water level, in feet below land surface datum, 1939: Jan. 13, 42.56.

23.8.30.133. Thomas Smith. Used dug and drilled irrigation well. Measuring point, surface of concrete curb, south side of pit, level with land surface datum. Water level, in feet below land surface datum, 1939: Jan. 13, 44.96.

23.8.32.323. Formerly well 54. Mary Montgomery. Unused drilled well, diameter 24 inches, depth 54 feet. Measuring point, top edge of casing at south side of well, 4,276.05 feet above sea level, 2.25 feet above land surface datum, 1.27 feet above top surface of concrete engine block which is 30 feet west of well.

Water level, in feet below land surface datum, 1928-39

Date	Water level	Date	Water level	Date	Water level
Aug. 4, 1928	33.74	Nov. 30, 1930	33.54	Feb. 10, 1934	34.70
Sept. 15	34.08	Feb. 16, 1931	33.29	Apr. 29	34.54
27	34.17	Apr. 5	33.29	July 3	35.69
Oct. 17	34.20	Aug. 29	35.10	Oct. 1	36.45
Feb. 3, 1929	33.22	Sept. 13	35.25	Dec.	36.75
Apr. 17	33.06	Oct. 24	35.26	Feb. 3, 1935	35.55
30	33.09	Nov. 21	34.89	June 3	35.56
May 14	33.20	Dec. 21	34.53	Sept. 7	35.79
June 27	33.95	Jan. 17, 1932	34.15	Dec. 8	37.42
July 25	34.42	Feb. 14	34.05	Feb. 3, 1936	36.88
Sept. 2	34.73	June 2	33.87	July 14	37.02
20	34.81	July 8	34.35	Dec. 6	37.17
29	34.76	25	34.55	Feb. 22, 1937	36.62
Jan. 2, 1930	33.60	Aug. 4	34.71	Sept. 15	38.33
Feb. 2	33.35	Sept. 1	35.05	Jan. 7, 1938	37.67
Mar. 2	33.20	Mar. 11, 1933	34.00	Jan. 15, 1939	38.35
30	33.13	Apr. 8	33.92	Mar. 16	37.94
Apr. 27	33.21	May 21	33.89	May 8	37.81
June 29	33.92	June	34.36	June 30	38.95
July 29	34.39	Oct. 8	35.85	Sept. 9	39.75
Aug. 30	34.75	Dec. 3	35.20	Nov. 7	39.78

23.8.34.211. Formerly well 56. H. T. Foster. About 600 feet west of Mimbres River channel. Drilled irrigation well, depth 120 feet. Measuring point, base of Johnston pump, 1.5 feet above land surface datum, altitude same as top of east concrete block just north of pump base on which pump rests.

Water level, in feet below land surface datum, 1928-39

Sept. 11, 1928	28.74	Feb. 2, 1931	27.52	Apr. 29, 1934	29.12
Oct. 19	28.45	Mar. 23	27.48	July 2	30.20
Nov. 3	28.24	Aug. 27	(a)	Oct. 1	30.14
Feb. 7, 1929	27.50	Sept. 13	30.78	Dec. 30	30.03
Apr. 10	27.41	Oct. 11	28.61	Feb. 3, 1935	30.30
30	a 28.74	Nov. 15	29.41	June 3	(a)
May 14	28.95	Dec. 13	29.24	Sept. 7	31.23
June 17	29.20	Jan. 16, 1932	28.91	Dec. 8	31.61
July 18	29.80	Feb. 20	28.65	Feb. 3, 1936	31.15
Aug. 6	29.77	June 1	28.53	July 14	(a)
Sept. 2	27.22	July 7	29.15	Dec. 6	32.16
16	27.57	Aug. 3	29.68	Feb. 22, 1937	31.42
29	27.78	31	30.04	Sept. 15	33.00
Jan. 2, 1930	27.59	Mar. 11, 1933	28.61	Jan. 7, 1938	31.90
Feb. 2	27.55	Apr. 9	28.56	Jan. 13, 1939	31.65
Mar. 2	27.56	May 22	28.35	Mar. 18	31.61
30	27.62	June	28.77	May 9	32.78
May 29	28.08	Oct. 8	30.25	July 4	35.35
July 29	28.81	Dec. 3	29.70	Sept. 10	a 72.42
Aug. 28	a 32.10	Feb. 10, 1934	29.27	Nov. 8	34.23

a Pumping.

## Luna County--Continued

23.8.35.21. Formerly well 58. Joe Remondini. Dug and drilled well, depth 60 (?) feet. Irrigation pumping plants 500 feet south and 30 feet northwest of well. Measuring point, north edge of south 3 by 14-inch plank over 8 by 10-inch cross ties which are aligned north and south, 0.28 foot below top of concrete curb at west end of south side of pit. Concrete curb is level with land surface datum. Used for irrigation prior to 1937. Water level, in feet below land surface, 1927-34, 1936-39

Date	Water level	Date	Water level	Date	Water level
Aug. 6, 1927	25.19	Feb. 7, 1929	24.35	July 7, 1932	28.50
Oct. 20	24.92	Mar. 17	24.95	Aug. 3	29.45
Nov. 3	24.84	Sept. 29	25.62	Aug. 31	27.91
14	24.80	Jan. 2, 1930	24.31	Mar. 11, 1933	27.47
28	24.75	Feb. 2	23.98	Apr. 9	26.30
Dec. 12	24.61	Mar. 2	23.90	May 22	27.10
Jan. 4, 1928	24.50	30	23.95	June	27.18
16	24.46	Feb. 16, 1931	24.39	Oct. 8	28.25
30	24.41	Aug. 27	(a)	Dec. 3	26.49
Feb. 22	24.30	Sept. 13	27.45	Feb. 10, 1934	26.03
Mar. 5	a 37.80	Oct. 11	26.95	Apr. 29	27.58
May 26	(a)	Nov. 15	26.12	Dec. 6, 1936	29.11
June 25	(a)	Dec. 13	25.55	Feb. 22, 1937	29.12
July 26	(a)	Jan. 16, 1932	25.51	Sept. 15	30.98
Aug. 30	(a)	Feb. 20	25.57	Jan. 11, 1938	(b)
Oct. 19	25.95	June 1	28.58	Jan. 13, 1939	c 29.18

23.9.19.131. Formerly well 21. Peru Smelter. About 400 feet north of Mimbres River channel. Unused dug and drilled well, depth 150 feet. Measuring point, center of head of nail holding USGS washer, nailed in east 6 by 6-inch timber near north side of well, 4,394.81 feet above sea level, level with land surface datum, 0.49 foot above top of concrete curb which is just below measuring point. Water level, in feet below land surface datum, 1928-39

Aug. 1, 1928	70.00	Aug. 21, 1930	69.53	Feb. 4, 1934	71.23
Sept. 2	70.05	27	69.28	Apr. 28	71.40
Oct. 1	70.09	Nov. 16	69.59	July 6	71.52
26	70.11	Apr. 11, 1931	69.97	Oct. 2	70.00
Nov. 5	70.13	May 17	70.10	Dec. 30	69.85
Jan. 4, 1929	70.15	Aug. 25	70.13	Feb. 2, 1935	69.65
Feb. 5	70.18	Sept. 12	70.12	June 4	69.59
24	70.24	Oct. 10	70.16	Sept. 15	71.37
Mar. 17	70.27	Nov. 14	70.10	Dec. 11	70.30
Apr. 19	70.35	Dec. 12	70.23	Feb. 3, 1936	71.46
May 15	70.44	Jan. 9, 1932	70.40	July 10	70.44
June 15	70.54	Feb. 13	70.56	Nov. 22	70.80
July 28	70.66	May 31	70.59	Feb. 21, 1937	71.00
Aug. 6	70.57	July 6	70.64	Sept. 16	70.85
Sept. 4	69.11	Aug. 2	70.71	Jan. 8, 1938	71.30
Nov. 30	69.54	30	70.72	Jan. 12, 1939	71.61
Dec. 25	69.67	Feb. 25, 1933	70.90	Mar. 16	71.48
Jan. 25, 1930	69.82	Apr. 1	70.95	May 8	71.50
Feb. 23	69.98	May 14	70.62	June 29	72.00
Mar. 23	70.06	June 18	70.85	Sept. 7	71.90
May 10	70.31	Oct. 15	71.12	Nov. 7	72.15
June 21	70.45	Dec. 9	71.98		

23.9.22.2. Formerly well 23. ----- About 0.75 mile north of Mimbres River channel. Used dug and drilled domestic well, depth 89+ feet. Measuring point, upper edge of USGS washer nailed on top of south 8 by 8-inch timber across well, level with top of concrete curbing north side of well, 2.8 feet south of center of top of north side of concrete curbing, 1.60 feet below top of southeast corner of concrete engine base which is about 30 feet west of well. Measuring point, level with land surface datum. Equipped with pumpjack. Water level, in feet below land surface datum, 1928-39

Aug. 30, 1928	58.76	Jan. 5, 1929	58.98	June 4, 1929	59.07
Oct. 8	58.88	Feb. 24	59.01	July 16	59.12
Nov. 1	58.92	Apr. 22	59.04	28	59.16
Dec. 1	58.94	May 2	59.05	Aug. 28	58.78

a Pumping.

b Well dry; nearby pumping plants operating.

c Measuring point changed. New point could not be accurately referenced to old; possible discrepancy of a few tenths of a foot.

## Luna County--Continued

## 23.9.22.2.--Continued

Water level, in feet below land surface datum, 1928-39

Date	Water level	Date	Water level	Date	Water level
Sept. 15, 1929	58.45	Aug. 2, 1932	59.05	Sept. 15, 1935	60.62
Oct. 8	58.30	30	(b)	Dec. 11	60.43
Nov. 30	58.27	Feb. 25, 1933	(b)	Feb. 3, 1936	(b)
Dec. 31	58.29	Apr. 1	58.97	July 10	(b)
Sept. 9, 1930	58.12	May 14	59.22	Nov. 22	60.89
Aug. 25, 1931	a 58.53	June 18	59.20	Feb. 28, 1937	61.00
Sept. 12	(b)	Oct. 15	59.43	Jan. 8, 1938	61.29
Oct. 10	58.58	Dec. 9	59.52	Jan. 12, 1939	61.69
Nov. 14	58.70	Apr. 28, 1934	59.42	Mar. 16	61.62
Dec. 12	58.81	July 6	60.48	May 8	61.75
Jan. 9, 1932	58.77	Oct. 2	60.06	June 30	61.82
Feb. 13	58.84	Nov. 28	59.52	Sept. 7	61.94
May 31	58.99	June 4, 1935	59.82	Nov. 7	62.01
July 6	59.17				

23.9.25.311. Formerly well 40. Albert Ernst. Used drilled irrigation well, diameter 3 (?) feet, depth 150 feet. Measuring point, top of concrete curb at center of north side, 1.82 feet below top of old concrete engine base which is 35 feet south of well in earthen tank. Measuring point, level with land surface datum.

Water level, in feet below land surface datum, 1927-39

Aug. 5, 1927	54.00	July 25, 1929	(b)	May 22, 1933	53.00
Oct. 20	50.58	Aug. 15	(b)	June	52.74
Nov. 3	50.61	Sept. 20	(b)	Dec. 3	52.55
14	50.60	Oct. 8	50.76	Feb. 10, 1934	52.40
28	50.51	Nov. 30	50.64	Apr. 29	53.10
Dec. 12	50.48	Jan. 2, 1930	50.90	Oct. 8	(b)
Jan. 4, 1928	50.40	Feb. 2	50.68	Dec. 30	(b)
16	50.34	Nov. 30	50.72	Feb. 3, 1935	52.30
30	50.45	Mar. 23, 1931	53.15	Sept. 7	53.64
Feb. 22	50.41	Aug. 27	(b)	Dec. 8	53.67
Mar. 5	50.50	Sept. 11	(b)	Feb. 3, 1936	54.77
May 26	(b)	Oct. 10	53.30	July 14	(b)
June 15	(b)	Nov. 15	51.61	Dec. 6	53.74
July 14	(b)	Dec. 13	51.59	Feb. 22, 1937	53.64
Aug. 20	(b)	Jan. 16, 1932	51.57	Sept. 17	55.26
Sept. 15	(b)	Feb. 20	51.66	Jan. 8, 1938	54.22
Oct. 3	54.48	June 2	(b)	Jan. 12, 1939	54.66
19	51.61	July 7	52.78	Mar. 16	54.59
Feb. 7, 1929	51.22	Aug. 3	c 53.04	May 8	55.19
Mar. 17	51.19	31	52.87	June 30	b 65.65
Apr. 10	51.41	Mar. 11, 1933	52.00	Sept. 7	55.94
June 24	52.88	Apr. 9	52.93	Nov. 7	55.19
27	b 65.65				

23.9.25.33. ----- Unused dug and drilled well, diameter 24 inches. Measuring point, top edge of USGS washer in north edge of 3/4-inch board set flush with concrete on south side of well, 0.08 foot below surface of concrete curb, south side of well, 0.05 foot above land surface datum. Water level, in feet below land surface datum, 1939: Jan. 12, 58.47.

23.9.26.41. Hubert Ruebush. Used dug and drilled irrigation well. Measuring point, top edge of USGS washer in north 6 by 6-inch timber pump support, east of pump, 0.50 foot above top of concrete curb at north side, 0.50 foot above land surface datum. Water level, in feet below land surface datum, 1939: Jan. 12, 53.64.

a New measuring point. New point could not be accurately referenced to old; possible discrepancy of a tenth of a foot.

b Pumping.

c Pumped Aug. 2, 1932.

## Luna County--Continued

23.9.27.142. Formerly well 35. Mr. Gray. Used dug well, depth 56 feet. Measuring point, top south edge of 4 by 6-inch timber to the east of pump pipe, 0.97 foot above southeast corner of concrete curb, 1.32 feet above land surface datum. Equipped with pumpjack and windmill.

Water level, in feet below land surface datum, 1928-39

Date	Water level	Date	Water level	Date	Water level
Oct. 25, 1928	54.86	Dec. 12, 1931	54.82	Oct. 8, 1934	56.28
Mar. 3, 1929	54.79	Jan. 9, 1932	54.75	Feb. 2, 1935	56.42
Apr. 22	54.82	Feb. 13	54.75	Sept. 15	57.75
June 5	54.94	May 31	55.04	Dec. 10	(b)
July 16	55.17	July 6	55.25	Feb. 9, 1936	57.10
Aug. 6	55.15	Aug. 2	55.40	July 10	(b)
28	54.65	30	(b)	Nov. 29	57.18
Sept. 15	54.36	Feb. 25, 1933	(b)	Feb. 28, 1937	57.16
Nov. 30	54.15	Apr. 1	(b)	Jan. 8, 1938	57.95
Dec. 1	54.15	June 18	55.63	Jan. 12, 1939	(b)
Sept. 9, 1930	54.24	Oct. 15	56.03	Mar. 16	58.50
Nov. 30	54.61	Dec. 9	55.91	May 8	58.82
Aug. 25, 1931	a 54.78	Feb. 4, 1934	(b)	June 30	(b)
Sept. 12	(b)	July 3	(b)	Sept. 7	c 59.99
Oct. 10	(b)	8	56.28	Nov. 7	59.21
Nov. 14	54.92				

23.9.27.221. Formerly well 37A. Sam Preston. About 550 feet south of Mimbres River channel. Used drilled well, diameter 7 inches, depth 70 feet. Measuring point, top edge of casing at south side, 4,338.52 feet above sea level, 0.5 foot above land surface datum, 0.10 foot below edge of small concrete block which is about 8 feet north of well. Equipped with windmill.

Water level, in feet below land surface datum, 1928-39

Oct. 25, 1928	53.08	Sept. 12, 1931	52.16	July 6, 1934	54.53
Mar. 3, 1929	53.25	Oct. 10	(b)	Oct. 2	54.02
Apr. 26	53.37	Nov. 14	52.88	Dec. 29	53.70
June 15	53.42	Dec. 12	52.99	Feb. 2, 1935	53.90
July 15	53.48	Jan. 9, 1932	52.94	Sept. 15	55.67
Aug. 6	52.82	Feb. 13	53.09	Dec. 10	54.35
14	48.24	May 31	53.39	Feb. 3, 1936	54.50
28	48.20	July 6	(b)	July 10	(b)
Sept. 20	49.85	Aug. 2	53.62	Nov. 29	55.29
Nov. 30	51.84	30	53.70	Feb. 28, 1937	55.52
Dec. 31	52.01	Feb. 25, 1933	(b)	Jan. 8, 1938	55.79
Feb. 12, 1930	52.18	Apr. 1	53.85	Jan. 12, 1939	56.30
June 7	52.67	May 13	53.90	Mar. 16	56.36
July 7	53.09	June 18	53.97	May 8	56.44
Sept. 9	50.63	Oct. 15	(b)	June 30	56.60
Nov. 30	52.20	Dec. 9	54.14	Sept. 7	d 56.46
June 2, 1931	52.45	Feb. 4, 1934	54.15	Nov. 7	56.59
Aug. 25	51.62	Apr. 28	54.30		

23.9.27.411. Formerly well 37B. Thelma Austin. Used dug well, depth 52 feet. Measuring point, top edge of USGS washer nailed in 2 by 6-inch plank, 2 feet north of pump pipe, 0.83 foot above surface of concrete sidewalk 10 feet directly north of well, and 0.85 foot above land surface datum. Equipped with windmill.

Water level, in feet below land surface datum, 1929-36, 1933-39

Sept. 9, 1929	48.80	Oct. 10, 1931	(b)	Apr. 1, 1933	49.74
18	48.82	Nov. 15	49.56	May 14	49.82
Jan. 3, 1930	48.57	Dec. 12	49.18	June 16	50.03
June 7	49.18	Jan. 9, 1932	49.15	Oct. 15	50.34
July 7	49.52	Feb. 13	49.13	Dec. 9	50.15
Sept. 9	48.80	May 31	49.48	Feb. 4, 1934	50.22
Nov. 30	48.70	July 6	49.73	Apr. 28	50.35
June 4, 1931	49.21	Aug. 2	49.89	July 6	50.75
Aug. 25	49.39	30	50.00	Oct. 2	51.10
Sept. 12	(b)	Feb. 25, 1933	49.67	Dec. 30	50.65

a New measuring point. New point not accurately referenced to old; possible discrepancy of a few hundredths of a foot.

b Pumping.

c Windmill pumping; pumpjack stopped two minutes prior to measurement.

d Windmill pumping slowly; water leaking into well.

## Luna County--Continued

23.9.27.411.--Continued  
Water level, in feet below land surface datum, 1929-36, 1938-39

Date	Water level	Date	Water level	Date	Water level
Feb. 3, 1935	50.55	July 10, 1936	(a)	May 8, 1939	52.89
June 4	50.75	Jan. 8, 1938	52.04	June 30	53.01
Sept. 15	52.11	Jan. 12, 1939	52.58	Sept. 7	53.41
Dec. 10	50.61	Mar. 16	52.53	Nov. 7	53.25
Feb. 3, 1936	51.59				

23.9.27.412. Formerly well 37C. Pedro Hernandez. Used dug well, depth 55 feet. Measuring point, head of nail holding USGS washer nailed on inside of wood well curbing near southwest corner of well, 0.05 foot below top edge of curb, about 2.50 feet above land surface datum. Equipped with bucket and windlass.

Water level, in feet below land surface datum, 1929-39

Sept. 18, 1929	50.17	July 6, 1932	49.94	Feb. 2, 1935	50.60
Dec. 31	50.26	Aug. 2	50.08	June 4	50.90
Feb. 17, 1930	50.34	Aug. 30	50.24	Sept. 15	51.95
June 7	50.55	Feb. 26, 1933	49.82	Dec. 10	50.36
July 7	51.01	Apr. 1	49.89	Feb. 3, 1936	51.50
Nov. 30	49.94	May 13	49.99	July 10	51.59
June 2, 1931	50.35	June 17	50.22	Feb. 28, 1937	51.89
Aug. 25	49.60	Oct. 15	50.75	Jan. 8, 1938	52.15
Sept. 12	49.65	Dec. 9	50.54	Jan. 12, 1939	52.75
Oct. 10	49.69	Feb. 4, 1934	50.33	Mar. 16	52.64
Nov. 14	49.50	Apr. 28	50.45	May 8	52.88
Dec. 12	49.32	July 6	50.92	June 30	53.18
Jan. 9, 1932	49.29	Oct. 2	51.24	Sept. 7	53.56
Feb. 13	49.38	Dec. 30	50.80	Nov. 7	53.38
May 31	49.79				

23.10.15. Formerly well 19. L. O. Baker. Situated 0.37 mile from Mimbres River channel. Unused drilled well, diameter 6 inches, depth 130 feet. Measuring point, top of casing, about 1.25 feet above land surface datum.

Water level, in feet below land surface datum, 1928-39

Aug. 1, 1928	88.14	May 17, 1931	88.34	July 6, 1934	90.26
Oct. 10	88.26	Aug. 25	88.47	Oct. 2	90.38
Nov. 8	88.31	Sept. 12	88.36	Dec. 30	90.40
Jan. 10, 1929	88.44	Oct. 10	88.33	Feb. 2, 1935	90.55
Mar. 17	88.59	Nov. 14	88.44	June 4	90.65
Apr. 19	88.64	Jan. 9, 1932	88.46	Sept. 15	91.90
May 5	88.70	Feb. 13	88.55	Dec. 11	90.91
June 7	88.73	May 31	88.76	Feb. 3, 1936	92.05
15	88.76	July 6	88.83	July 10	91.15
July 10	88.80	Aug. 2	<sup>b</sup> 88.99	Nov. 22	91.32
Sept. 2	88.62	Aug. 30	89.07	Feb. 28, 1937	91.53
Nov. 30	88.49	Feb. 25, 1933	89.37	Sept. 16	91.78
Dec. 30	88.37	Apr. 1	89.52	Jan. 8, 1938	91.94
Jan. 25, 1930	88.35	May 14	89.54	Jan. 12, 1939	92.45
Feb. 23	88.27	June 18	89.61	Mar. 16	92.48
Mar. 23	88.23	Oct. 15	89.85	May 8	92.67
June 21	88.50	Dec. 9	89.95	June 29	92.67
Aug. 21	88.50	Feb. 4, 1934	90.03	Sept. 7	93.78
Nov. 16	88.32	Apr. 28	90.15	Nov. 7	92.94
Apr. 11, 1931	88.29				

a Pumping.

b New measuring point established some time in 1932; assumed to be Aug. 2. New point assumed 0.16 foot lower than previous measuring point; possible discrepancy of a few tenths of a foot.

## Luna County--Continued

24.7.4.424. Formerly well 144. G. D. Hatfield. Used drilled well, diameter 12 inches, depth 120 feet. Measuring point, top of casing, 1.0 foot above land surface datum. Unused prior to measurement on Sept. 16, 1937. Windmill installed between Feb. and Sept. 1937.

Water level, in feet below land surface datum, 1928-39

Date	Water level	Date	Water level	Date	Water level
Oct. 19, 1928	69.30	Dec. 21, 1931	69.01	Dec. 27, 1934	74.50
Feb. 16, 1929	65.36	Jan. 16, 1932	68.05	Feb. 3, 1935	69.02
Apr. 10	64.76	Feb. 14	67.44	June 3	70.95
16	64.58	June 2	67.45	Sept. 7	a 77.70
30	65.49	July 8	71.85	Dec. 8	75.11
May 3	65.67	25	71.50	Feb. 3, 1936	73.72
July 27	69.86	Aug. 4	71.95	July 14	75.50
Sept. 2	70.05	Sept. 1	74.56	Dec. 6	77.55
29	70.57	Mar. 11, 1933	67.99	Feb. 22, 1937	75.82
Sept. 1, 1930	71.05	Apr. 8	67.64	Sept. 16	84.27
18	72.11	May 21	68.54	Jan. 7, 1938	79.09
Feb. 14, 1931	66.44	June 1	69.28	Jan. 14, 1939	80.43
Apr. 5	65.65	Oct. 8	73.00	Mar. 18	78.88
May 30	66.53	Dec. 3	70.01	May 9	b 81.10
Aug. 27	72.89	Feb. 10, 1934	68.65	July 4	82.33
Sept. 13	74.83	Apr. 29	68.58	Sept. 11	87.02
Oct. 11	72.29	July 3	72.63	Nov. 9	(b)
Nov. 15	69.97	Oct. 1	77.75		

24.7.5.2. Formerly well 142. R. M. Williamson. Used domestic dug well. Measuring point, lower edge of east cross tie, altitude same as top of northeast side of concrete curb around well, 4,186.42 feet above sea level, 0.5 foot above land surface datum. Equipped with windmill.

Water level, in feet below land surface datum, 1928-39

Oct. 28, 1928	64.15	Aug. 31, 1932	67.62	Sept. 7, 1935	70.95
Apr. 30, 1929	64.60	Mar. 11, 1933	68.05	Dec. 8	72.45
Sept. 29	65.05	Apr. 9	(c)	Feb. 3, 1936	72.36
Sept. 18, 1930	65.59	May 22	(c)	July 14	72.02
Aug. 27, 1931	66.54	June 1	68.72	Dec. 6	72.68
Sept. 13	66.62	Oct. 8	68.85	Feb. 22, 1937	72.83
Oct. 11	66.69	Dec. 3	69.08	Sept. 16	(d)
Nov. 21	66.80	Feb. 10, 1934	69.06	Jan. 7, 1938	(d)
Dec. 13	66.86	Apr. 29	69.35	Jan. 14, 1939	e 76.20
Jan. 16, 1932	66.90	July 3	70.25	Mar. 18	76.26
Feb. 20	66.95	Oct. 1	69.91	May 9	76.48
June 1	67.20	Dec. 27	69.98	June 30	c 77.74
July 7	67.37	Feb. 3, 1935	70.02	Sept. 10	77.33
Aug. 3	67.47	June 3	70.05	Nov. 9	f 77.74

24.7.9.111. Smyer Bros. Used drilled irrigation well. Depth 100+ feet. Measuring point, top edge of USGS washer in top west side of east 4 by 10-inch pump support, level with land surface datum.

Water level, in feet below land surface datum, 1939

Jan. 14	77.25	May 9	76.91	Sept. 11	g 82.63
Mar. 18	77.02	June 30	(c)	Nov. 9	78.78

24.7.12.311. Formerly well 155. ----- Unused dug and drilled well, diameter 3+ feet, depth 80 feet. Measuring point, top of concrete curb at north side of well, 0.6 foot west of east face of opening, 4,142.18 feet above sea level, 2.25 feet above land surface datum, 1.40 feet above concrete platform on which curb rests.

Water level, in feet below land surface datum, 1927-39

Sept. 24, 1927	56.07	Dec. 12, 1927	55.75	Feb. 22, 1928	55.58
Oct. 21	56.00	Jan. 4, 1928	55.73	Mar. 5	55.57
Nov. 3	55.94	16	55.69	May 26	56.48
14	55.89	30	55.67	Aug. 1	56.60

- a Irrigation wells to west and east pumping.
- b Pumping; pump barrel leaking water into well.
- c Pumping.
- d Dry.
- e Well deepened.
- f Windmill stopped two minutes prior to measurement.
- g Pumping stopped Sept. 10.

## Luna County--Continued

24.7.12.311.--Continued

Water level, in feet below land surface datum, 1927-39

Date	Water level	Date	Water level	Date	Water level
Aug. 22, 1928	56.81	Sept. 13, 1931	59.36	Apr. 29, 1934	58.49
Sept. 1	56.87	Oct. 11	59.60	July 2	58.90
Oct. 19	56.02	Nov. 21	59.42	Oct. 1	59.76
Feb. 7, 1929	56.01	Dec. 21	59.24	Dec. 27	58.25
Apr. 17	55.86	Jan. 16, 1932	59.00	Feb. 3, 1935	60.47
July 18	56.57	Feb. 14	58.62	June 3	(a)
Sept. 25	57.27	June 2	58.44	July 14, 1936	b 63.33
29	57.32	July 8	58.90	Dec. 6	65.66
Feb. 2, 1930	57.11	Aug. 4	59.30	Sept. 15, 1937	68.01
Mar. 3	57.03	Sept. 1	59.61	Jan. 7, 1938	67.90
30	57.01	Mar. 11, 1933	58.91	Jan. 14, 1939	69.11
May 29	57.15	Apr. 8	58.90	Mar. 18	68.64
June 28	57.63	May 21	58.64	May 9	68.55
July 29	57.96	June 1	58.75	June 30	69.85
Sept. 1	58.06	Oct. 8	59.27	Sept. 9	71.20
Mar. 23, 1931	57.77	Dec. 3	58.94	Nov. 9	71.76
Aug. 27	59.07	Feb. 10, 1934	58.69		

24.7.13.311. ----- Unused drilled well. Measuring point, top of concrete curb at south side, 2.0 feet above land surface datum. Water level, in feet below land surface datum, 1939: Jan. 14, 69.97.

24.7.14.12. ----- Unused drilled well, diameter 28 inches. Measuring point, inside top edge of sewer tile casing, 2.00 feet above land surface datum. Automatic water-stage recorder installed Jan. 22, 1939.

Water level, in feet below land surface datum, 1939

Jan. 14	72.33	May 9	71.60	Sept. 9	74.87
Mar. 18	71.54	June 30	73.00	Nov. 9	74.89

24.7.5.211. Joe Harris. Used drilled irrigation well. Measuring point, top edge of USGS washer on north side of south 8 by 8-inch cross-timber pump support, 2.5 feet above land surface datum, 0.04 foot above west side of concrete pump base. Water level, in feet below land surface datum, 1939: Jan. 14, 79.36.

24.7.16.211. Mr. Snyder. Unused dug and drilled irrigation well. Measuring point, top of steel plate over well, 0.44 foot above west side of concrete curb, level with land surface datum.

Water level, in feet below land surface datum, 1939

Jan. 14	76.53	May 9	76.94	Sept. 9	77.40
Mar. 18	76.78	June 30	77.13	Nov. 9	77.65

24.7.24.111. ----- Unused drilled well. Measuring point, top of  $\frac{1}{2}$ -inch hole in southwest side of pump-base plate, 0.37 foot above surface of southwest corner of concrete curb, 2.2 feet above land surface datum. Water levels, in feet below land surface datum, 1939: July 3, 69.16; Sept. 9, 69.34; Nov. 9, 69.57.

24.8.1.333. Formerly well 134. F. K. Kretek. Unused dug and drilled well, depth 70 feet. Measuring point, center of nail holding USGS washer at top edge of 8 by 8-inch timber on south side of well, level with land surface datum. Pumped prior to 1939. New irrigation well drilled approximately 50 feet west of old well; used in 1939.

Water level, in feet below land surface datum, 1927-39

Oct. 21, 1927	13.02	Jan. 16, 1928	12.44	Sept. 21, 1928	14.49
Nov. 3	13.08	30	12.33	27	14.38
14	12.99	Feb. 22	12.16	Oct. 19	13.45
28	12.57	Mar. 5	12.09	Feb. 5, 1929	12.54
Dec. 12	12.72	May 26	12.13	Mar. 10	12.34
Jan. 4, 1928	12.54	Aug. 29	13.86	17	12.67

a Well dry; filled.

b Well cleaned.



## Luna County--Continued

24.8.1.333.--Continued

Water level, in feet below land surface datum, 1927-39

Date	Water level	Date	Water level	Date	Water level
July 6, 1929	14.58	Aug. 4, 1932	(b)	Sept. 7, 1935	14.97
Sept. 26	13.70	Sept. 1	14.52	Dec. 8	15.18
29	13.75	Mar. 11, 1933	12.27	Feb. 3, 1936	14.77
Feb. 2, 1930	12.81	Apr. 8	13.00	July 14	(b)
Mar. 2	12.70	May 21	(b)	Dec. 6	15.19
May 29	13.74	June 1	c 8.42	Feb. 22, 1937	14.36
Aug. 29, 1931	a 13.60	Oct. 8	13.07	Sept. 15	(b)
Sept. 13	13.97	Dec. 3	12.52	Jan. 7, 1938	15.40
Nov. 21	13.68	Feb. 10, 1934	12.19	Jan. 15, 1939	14.44
Dec. 21	13.36	Apr. 29	12.83	Mar. 17	14.57
Jan. 17, 1932	13.03	Oct. 1	14.17	May 9	16.01
Feb. 14	(b)	Dec. 30	14.10	June 30	d 19.15
June 2	13.52	Feb. 3, 1935	13.37	Sept. 9	e 22.95
July 8	(b)	June 3	16.13	Nov. 7	18.39

24.8.5.11. Formerly well 54A. Mrs. Francis Seward. Used drilled domestic well, diameter 6 inches, depth 50 feet. Measuring point, top edge of 4 by 4-inch timber over casing adjacent to tubing, 4,276.40 feet above sea level, 1 foot above land surface datum, 0.31 foot above concrete in casing. Equipped with windmill.

Water level, in feet below land surface datum, 1928-36, 1938-39

Oct. 17, 1928	35.16	Nov. 21, 1931	(b)	Apr. 29, 1934	35.86
Feb. 3, 1929	34.52	Dec. 21	(b)	Feb. 3, 1935	(b)
Apr. 30	34.41	Jan. 17, 1932	(b)	June 3	36.10
May 14	34.59	Feb. 14	(b)	Dec. 8	38.45
Sept. 2	f 37.44	June 2	(b)	Feb. 3, 1936	(b)
29	35.16	July 8	(b)	July 14	(b)
Jan. 2, 1930	35.17	Aug. 4	36.00	Dec. 6	40.25
Feb. 2	34.87	Sept. 1	36.86	Jan. 7, 1938	39.37
Mar. 2	34.73	Mar. 1, 1933	(b)	Jan. 15, 1939	40.03
30	34.64	Apr. 8	(b)	Mar. 16	39.77
May 28	34.67	May 21	(b)	May 8	39.74
July 29	38.03	June	35.50	June 30	40.81
Aug. 29, 1931	(b)	Oct. 8	36.30	Sept. 9	f 42.90
Sept. 13	39.57	Dec. 3	36.22	Nov. 7	41.16
Oct. 24	(b)	Feb. 10, 1934	35.82		

24.8.11.2. Formerly well 135. F. K. Kretek. Unused drilled well, depth 42 feet. Measuring point, top of casing marked by arrow on concrete filling at north side, between 24-inch outside casing and 6-inch inside casing, 4,222.58 feet above sea level, 2 feet above land surface datum. Well is equipped with windmill that is out of order.

Water level, in feet below land surface datum, 1928-29, 1931-39

Aug. 19, 1928	13.26	Sept. 1, 1932	14.56	June 3, 1935	16.70
29	13.15	Mar. 11, 1933	12.60	Sept. 7	15.16
Apr. 17, 1929	12.52	Apr. 8	12.93	Dec. 8	15.34
Sept. 26	13.06	May 21	13.02	Feb. 3, 1936	15.00
Aug. 29, 1931	13.86	June 1	12.45	Dec. 6	15.22
Sept. 29	13.86	Oct. 8	13.65	Feb. 22, 1937	14.57
Oct. 11	(b)	Dec. 3	12.84	Jan. 7, 1938	15.75
Dec. 21	13.52	Feb. 10, 1934	12.60	Jan. 15, 1939	15.02
Jan. 17, 1932	13.36	Apr. 29	12.89	Mar. 18	14.90
Feb. 14	13.22	July 3	14.32	May 9	15.37
June 2	13.56	Oct. 1	16.50	June 30	16.56
July 8	(b)	Dec. 30	16.46	Sept. 9	17.54
Aug. 4	(b)	Feb. 3, 1935	(b)	Nov. 7	17.30

a New measuring point. New point not accurately referenced to old; possible discrepancy of a few hundredths of a foot.

b Pumping.

c Well flooded by heavy rains.

d Irrigation well 50 feet west pumped a few hours prior to measurement.

e Irrigation well 50 feet west pumping.

f Pumping plant in operation 100 feet distant.

## Luna County--Continued

24.8.8.12. Mr. Holiday. Used dug and drilled irrigation well. Measuring point, top edge of USGS washer in top of board over well, 1.0 foot northeast of pump, 1.21 feet above top of 6 by 8-inch pump support, level with land surface datum. Water level, in feet below land surface datum, 1939: Jan. 12, 40.21.

24.8.18.331. ----- Unused dug and drilled well. Measuring point, top edge of USGS washer on south edge of cross timber, 1.00 foot below land surface datum. Bench mark, top surface of old concrete engine base 30 feet west of well, 4.24 feet above measuring point. Water level, in feet below land surface datum, 1939: Jan. 15, 50.72.

24.8.19.433. Formerly well 140. Sol Stroup (?). Unused dug well, depth 55 feet. Measuring point, center of south side of concrete curb around well, 4,623.32 feet above sea level, 1.0 foot above land surface datum, 1.7 feet above top of galvanized casing in well.

Water level, in feet below land surface datum, 1928-39

Date	Water level	Date	Water level	Date	Water level
Aug. 11, 1928	51.32	Sept. 19, 1931	51.87	July 5, 1934	52.63
20	51.33	Oct. 17	51.74	Oct. 7	53.13
Sept. 15	51.41	Nov. 22	51.84	Dec. 28	52.66
Nov. 7	51.43	Dec. 19	51.77	Feb. 1, 1935	53.21
Apr. 24, 1929	50.98	Jan. 23, 1932	51.74	June 1	53.29
May 16	50.83	Feb. 21	51.56	Sept. 7	53.09
Sept. 6	51.42	Apr. 20	51.44	Dec. 9	52.92
Oct. 7	51.60	June 3	51.66	Feb. 2, 1936	53.71
Feb. 1, 1930	51.27	July 9	51.97	July 11	53.33
Mar. 1	51.22	Aug. 5	52.06	Dec. 6	53.18
29	51.13	Sept. 2	52.24	Feb. 20, 1937	52.96
Apr. 26	51.10	Mar. 5, 1933	51.72	Sept. 15	53.55
May 30	51.08	Apr. 2	51.66	Jan. 10, 1938	53.38
June 28	51.33	May 13	51.63	Jan. 15, 1939	53.68
July 28	51.59	June 17	51.98	Mar. 17	53.62
Aug. 29	51.64	Oct. 14	52.44	May 8	53.54
Feb. 17, 1931	51.39	Dec. 1	52.38	July 2	53.83
May 1	51.22	Feb. 3, 1934	52.20	Sept. 9	54.14
June 1	51.23	Apr. 21	52.10	Nov. 8	54.26
Aug. 26	51.81				

24.8.20.411. Formerly well 141. ----- Unused dug and drilled well, depth 1,665 feet. Measuring point, bottom surface of base flange of pump, 4,257.10 feet above sea level, 1.0 foot above land surface datum. Flange of pump is 0.07 foot thick. Measuring point, 1.21 feet below northwest corner of surface of concrete engine base which is 30 feet east of well, 1.03 feet above southwest corner of concrete discharge trough which is 7 feet north of well, 0.20 foot below northeast corner of concrete block at base of northeast bolt which is 30 feet west of well.

Water level, in feet below land surface datum, 1927-39

Aug. 5, 1927	35.28	Oct. 17, 1931	36.38	Oct. 7, 1934	37.52
Nov. 7, 1928	35.85	Nov. 22	36.44	Dec. 28	37.43
Apr. 24, 1929	35.71	Dec. 19	36.48	Feb. 1, 1935	37.53
May 16	35.81	Jan. 23, 1932	36.22	June 3	37.58
Sept. 6	36.07	Feb. 21	36.16	Sept. 7	37.57
Oct. 7	36.01	June 3	36.17	Dec. 9	37.44
Feb. 1, 1930	35.82	July 9	36.34	Feb. 2, 1936	38.38
Mar. 1	35.79	Aug. 5	36.43	July 11	37.72
28	35.84	Sept. 1	36.49	Dec. 6	38.22
Apr. 26	35.79	Mar. 5, 1933	36.50	Feb. 20, 1937	38.39
May 30	35.73	Apr. 2	36.53	Sept. 15	38.90
July 25	35.68	May 13	36.50	Jan. 10, 1938	39.04
Aug. 29	35.73	June 17	36.62	Jan. 15, 1939	39.55
Feb. 17, 1931	35.69	Oct. 14	36.91	Mar. 17	39.75
May 1	35.93	Dec. 1	37.02	May 8	39.86
June 1	36.01	Feb. 3, 1934	36.83	July 2	40.15
Aug. 26	36.47	Apr. 21	36.75	Sept. 9	40.45
Sept. 19	36.28	July 5	37.18	Nov. 8	40.60

## Luna County--Continued

24.9.2.221. Formerly well 44B. L. A. Thompson (?). Unused dug and drilled well, depth 80 feet. Measuring point, top surface of concrete block on south side of well, 1.86 feet above concrete curb, 1.86 feet above land surface datum, 0.49 foot above southwest corner of concrete block which is about 15 feet north of well.

Water level, in feet below land surface datum, 1928-39

Date	Water level	Date	Water level	Date	Water level
Oct. 15, 1928	47.24	Oct. 17, 1931	48.23	July 5, 1934	48.84
Feb. 15, 1929	47.01	Nov. 21	48.28	Oct. 7	49.44
Apr. 17	46.97	Dec. 21	48.14	Feb. 1, 1935	49.39
Sept. 9	47.72	Jan. 23, 1932	48.06	June 1	49.83
18	47.75	Feb. 21	47.91	Sept. 6	49.87
Jan. 2, 1930	47.54	June 3	47.91	Dec. 9	49.96
Feb. 2	47.49	July 9	48.19	Feb. 2, 1936	50.81
Mar. 1	47.33	25	48.29	July 11	50.25
30	47.25	Aug. 5	48.33	Dec. 6	50.65
Apr. 27	47.31	Sept. 2	48.44	Feb. 20, 1937	50.49
May 29	47.32	Feb. 26, 1933	48.15	Sept. 13	51.29
June 29	47.74	Apr. 2	48.05	Jan. 10, 1938	51.24
July 29	47.82	May 13	48.07	Jan. 13, 1939	52.16
Sept. 2	48.07	June 17	48.22	Mar. 17	52.01
17	48.16	Oct. 14	48.84	May 8	52.18
Nov. 30	48.40	Dec. 1	48.79	June 30	52.40
Feb. 10, 1931	47.55	Feb. 3, 1934	48.61	Sept. 9	52.82
Aug. 29	48.05	Apr. 21	48.56	Nov. 7	52.88
Sept. 19	48.13				

24.9.2.412. ----- Unused dug well, depth 56 feet. Measuring point, surface of concrete curb east side of well, level with land surface datum. Equipped with a windmill.

Water level, in feet below land surface datum, 1931-39

Aug. 26, 1931	48.23	Feb. 26, 1933	48.10	Dec. 6, 1936	50.14
Sept. 19	48.53	Apr. 2	48.03	Feb. 20, 1937	50.13
Oct. 17	48.38	May 13	48.11	Sept. 13	50.55
Nov. 22	48.52	June 17	48.50	Jan. 10, 1938	50.75
Dec. 19	48.02	Oct. 14	48.80	Jan. 13, 1939	c 51.62
Jan. 23, 1932	48.32	Dec. 1	48.87	Mar. 17	51.38
Feb. 21	48.26	Feb. 3, 1934	(a)	May 8	c 51.85
June 3	48.11	Dec. 9, 1935	b 49.71	June 30	51.50
July 9	48.35	Feb. 2, 1936	50.62	Sept. 9	51.73
Aug. 5	48.48	July 11	49.85	Nov. 7	51.93
Sept. 2	48.52				

24.9.6.311. Formerly well 70. J. B. Wells. Used dug and drilled irrigation well. Measuring point, top of concrete curb at east side of well, 0.30 foot above land surface datum.

Water level, in feet below land surface datum, 1927-39

Oct. 20, 1927	62.13	Feb. 5, 1929	63.29	Sept. 24, 1930	65.40
Nov. 4	61.99	Mar. 3	63.15	Apr. 4, 1931	63.40
15	62.28	17	63.25	May 29	63.85
29	61.79	Apr. 11	63.40	Aug. 27	(d)
Dec. 13	61.89	June 10	65.02	Sept. 26	67.65
Jan. 3, 1928	61.69	12	67.48	Oct. 18	66.58
17	61.69	19	66.22	Nov. 27	65.83
31	61.35	Sept. 4	67.20	Dec. 24	65.53
Feb. 21	61.55	14	64.67	Jan. 24, 1932	65.15
Mar. 6	61.29	21	66.03	June 4	(d)
May 26	61.50	Oct. 5	64.12	July 11	e 68.24
July 28	67.85	Nov. 30	63.45	Aug. 8	(d)
Sept. 3	d 76.00	Jan. 3, 1930	63.43	Sept. 3	71.28
12	65.78	Feb. 4	63.19	Mar. 4, 1933	64.92
13	65.82	Mar. 9	63.18	Apr. 15	65.43
Oct. 4	63.82	June 14	64.42	May 20	66.11
22	64.66	Aug. 25	78.95	June 16	e 67.72
Jan. 1, 1929	63.42	Sept. 16	65.81	Oct. 7	69.18

a Well filled.

d Pumping.

b Well cleaned.

e Pumped previous day.

c Windmill pumping slowly.

## Luna County--Continued

## 24.9.6.311.--Continued

Water level, in feet below land surface datum, 1927-39

Date	Water level	Date	Water level	Date	Water level
Dec. 2, 1933	67.30	Sept. 6, 1935	71.60	Jan. 10, 1938	72.60
Feb. 2, 1934	66.03	Dec. 10	69.18	Jan. 17, 1939	73.91
Apr. 22	66.25	Feb. 10, 1936	68.43	Mar. 17	72.83
July 6	71.38	July 13	(a)	May 9	73.90
Oct. 8	70.10	Nov. 29	72.06	July 3	78.75
Dec. 27	68.92	Feb. 28, 1937	b 70.50	Sept. 8	a 91.55
Feb. 4, 1935	67.11	Sept. 14	79.24	Nov. 8	c 77.71
June 1	69.55				

24.9.7.211. Emanuel Vocale. Used dug and drilled irrigation well. Measuring point, base of bottom flange of discharge pipe on south side, 0.53 foot above top of concrete curb at south side, and 0.53 foot above land surface datum. Water level, in feet below land surface datum, 1939: Jan. 17, 75.72.

24.9.7.331. Formerly well 91A. C. T. O'Neal. Unused drilled well, diameter 6 inches, depth 80 feet. Measuring point, top of casing, 0.25 foot above land surface datum. Equipped with windmill. Two irrigation wells nearby; one about 60 feet northeast and the other a few hundred feet northeast.

Water level, in feet below land surface datum, 1929-39

Apr. 22, 1929	66.32	Dec. 24, 1931	67.94	Feb. 4, 1935	70.27
May 4	66.88	Jan. 24, 1932	(a)	June 1	(a)
June 21	67.94	Feb. 3	67.15	Sept. 6	71.85
July 5	68.71	June 4	68.31	Dec. 10	(a)
15	67.35	July 11	(a)	Feb. 10, 1936	71.82
17	67.28	Aug. 8	(a)	July 13	(a)
Sept. 11	67.55	Sept. 3	70.93	Nov. 29	73.05
Oct. 5	66.77	Mar. 4, 1933	67.86	Feb. 20, 1937	72.00
Jan. 1, 1930	66.10	Apr. 15	67.90	Sept. 14	(a)
Feb. 4	65.79	May 20	68.85	Jan. 10, 1938	74.48
May 10	67.22	June 16	68.63	Jan. 19, 1939	75.25
June 14	68.19	Oct. 7	70.09	Mar. 17	74.53
July 12	70.64	Dec. 2	69.32	May 9	75.78
Aug. 28, 1931	70.50	Feb. 2, 1934	69.01	July 3	d 92.35
Sept. 26	69.38	Apr. 22	67.86	Sept. 8	83.20
Oct. 18	68.71	Oct. 8	71.90	Nov. 8	77.51
Nov. 27	(a)	Dec. 27	71.05		

24.9.8.111. Formerly well 92. ----- Unused drilled well, diameter 2.5 feet, depth 140 feet. Measuring point, top edge of USGS washer nailed in west edge of south 6 by 6-inch timber, 4,354.17 feet above sea level, about level with land surface datum, 0.50 foot above concrete curb which is below measuring point.

Water level, in feet below land surface datum, 1928-39

Sept. 10, 1928	63.68	Jan. 1, 1930	63.56	June 4, 1932	64.57
Oct. 28	63.39	Feb. 4	63.55	July 11	65.32
Feb. 5, 1929	63.35	Apr. 11	63.53	25	65.64
Mar. 17	63.25	June 14	64.24	Aug. 8	65.99
Apr. 15	63.52	July 12	64.93	Sept. 3	66.42
16	63.49	Aug. 12	65.06	Mar. 4, 1933	64.95
17	63.55	25	65.35	Apr. 15	64.66
18	63.60	Nov. 8	64.59	May 20	64.70
19	63.62	Feb. 2, 1931	63.39	June 6	65.29
June 10	64.85	Mar. 23	63.28	Oct. 7	67.24
July 5	64.65	May 29	63.81	Dec. 2	66.35
22	64.55	Aug. 28	65.78	Feb. 2, 1934	66.38
Sept. 1	64.98	Sept. 26	65.92	Apr. 22	65.37
9	65.01	Oct. 18	65.49	July 6	66.98
12	65.02	Nov. 27	65.06	Oct. 8	68.60
Oct. 2	64.80	Dec. 24	64.80	Dec. 27	68.20
Dec. 1	63.83	Jan. 24, 1932	64.53	Feb. 4, 1935	65.95

a Pumping.

b Measuring point changed. New point not accurately referenced to old; possible discrepancy of a few tenths of a foot.

c Pumping stopped a few hours before measurement.

d Irrigation well 60 feet northeast pumping.

## Luna County--Continued

24.9.8.111.--Continued

Water level, in feet below land surface datum, 1928-39

Date	Water level	Date	Water level	Date	Water level
June 1, 1935	66.74	Feb. 20, 1937	69.84	May 9, 1939	72.34
Sept. 6	70.90	Sept. 14	73.04	July 3	73.87
Dec. 10	68.97	Jan. 10, 1938	71.45	Sept. 8	75.52
July 13, 1936	70.19	Jan. 17, 1939	72.64	Nov. 8	74.62
Nov. 29	71.04	Mar. 17	72.40		

24.9.8.112. Formerly well 92A. ----- Unused dug and drilled well, diameter 2.9 feet, depth 140 feet. Measuring point, top of concrete curb east side of well, marked by  $\frac{1}{2}$ -inch chiseled square, level with land surface datum, 1.00 foot above horizontal chisel cut on inside of concrete curbing.

Water level, in feet below land surface datum, 1929-39

Apr. 16, 1929	62.37	May 29, 1931	63.39	Apr. 22, 1934	63.66
26	62.58	Aug. 28	64.54	July 6	65.20
May 4	61.79	Sept. 26	64.54	Oct. 8	66.89
22	63.41	Oct. 18	64.23	Dec. 27	66.55
July 15	63.26	Nov. 27	63.95	Feb. 4, 1935	65.95
22	64.09	Dec. 24	63.75	June 1	66.66
Sept. 9	64.09	Jan. 24, 1932	63.43	Sept. 6	70.14
Oct. 2	63.77	June 4	62.95	Dec. 10	68.11
Jan. 1, 1930	62.61	July 11	64.04	Feb. 10, 1936	67.75
Feb. 4	62.35	25	64.43	July 13	69.13
Mar. 4	62.12	Aug. 8	64.60	Nov. 29	70.26
Apr. 11	62.04	Sept. 3	65.27	Feb. 28, 1937	68.75
May 10	61.98	Mar. 4, 1933	63.53	Sept. 14	a 72.11
June 14	62.23	Apr. 15	63.53	Jan. 10, 1938	70.70
July 12	63.16	May 20	63.45	Mar. 17, 1939	70.80
Aug. 12	63.37	June 16	64.01	May 9	70.60
25	63.88	Oct. 7	65.93	July 3	72.19
Nov. 8	63.49	Dec. 2	65.11	Sept. 8	74.02
Feb. 18, 1931	61.90	Feb. 2, 1934	64.03	Nov. 8	73.54

24.9.8.121. Formerly well 93. B. F. Jonas. Used dug and drilled irrigation well, depth 145 feet. Measuring point, bottom surface of timber pump support, level with land surface datum.

Water level, in feet below land surface datum, 1927-39

Oct. 20, 1927	61.40	Apr. 11, 1929	(b)	Sept. 3, 1932	67.45
Nov. 4	61.23	May 17	63.35	Mar. 4, 1933	63.95
15	61.10	June 10	65.23	Apr. 15	64.31
29	61.01	Sept. 9	c 79.19	May 20	64.15
Dec. 13	60.96	14	66.97	June 16	68.75
Jan. 3, 1928	60.82	Oct. 5	64.31	Oct. 7	67.53
17	60.77	Nov. 30	62.97	Dec. 2	65.44
31	60.83	Jan. 1, 1930	62.97	Feb. 2, 1934	(b)
Feb. 21	60.58	Feb. 4	62.82	Oct. 8	68.62
Mar. 6	b 77.00	Mar. 9	62.10	Dec. 27	68.17
May 26	(b)	Aug. 25	b 85.30	Feb. 4, 1935	66.40
June 15	(b)	Nov. 8	63.63	June 1	(b)
Aug. 17	(b)	Aug. 28, 1931	(b)	Sept. 6	70.20
Sept. 10	66.11	Sept. 26	62.71	Dec. 10	68.24
20	65.19	Oct. 18	64.90	Feb. 10, 1936	67.44
Oct. 4	65.12	Nov. 27	64.12	July 13	(b)
23	63.21	Dec. 24	64.32	Nov. 29	70.13
Nov. 5	62.85	Jan. 24, 1932	63.43	Feb. 28, 1937	68.55
Jan. 21, 1929	61.96	Feb. 4	63.15	Sept. 14	80.44
Feb. 5	61.83	June 4	d 66.18	Jan. 10, 1938	e 69.70
Mar. 3	62.40	July 11	65.45	Jan. 17, 1939	70.85
17	61.80	Aug. 8	68.71		

a Measuring point changed. New point assumed 0.25 foot below previous point; possible discrepancy of a tenth of a foot. All preceding measurements are reduced by 0.25 foot.

b Pumping.

c Stopped pumping 4 hours before measurement.

d Pumped previous day.

e Measurement probably inaccurate.

## Luna County--Continued

24.9.9.411. Joe Clary. Used drilled irrigation well. Measuring point, top of south side of concrete curb, level with land surface datum. Water level, in feet below land surface datum, 1939: Jan. 18, 65.16.

24.9.12.111. Formerly well 104. ----- Used dug and drilled domestic and irrigation well, depth 120 feet. Measuring point, surface of concrete slab on north side of well, level with land surface datum, 4,296.08 feet above sea level. Well is south of house and is not to be confused with another irrigation well that is northeast of house.

Water level, in feet below land surface datum, 1927-39

Date	Water level	Date	Water level	Date	Water level
Oct. 20, 1927	48.17	Feb. 15, 1930	48.16	Oct. 7, 1934	49.50
Nov. 4	47.98	Mar. 15	48.16	Feb. 1, 1935	49.00
15	48.06	May 10	50.03	Sept. 6	49.52
29	47.82	June 3	48.90	Dec. 9	49.81
Dec. 13	47.77	June 3, 1931	48.90	Feb. 2, 1936	50.70
Jan. 3, 1928	47.68	July 9, 1932	48.48	July 11	(a)
31	a 60.30	Aug. 5	48.59	Dec. 6	50.15
Feb. 21	47.63	Sept. 2	48.72	Feb. 20, 1937	50.14
Mar. 6	a 60.00	Feb. 26, 1933	48.45	Sept. 13	50.59
July 12	49.03	Apr. 2	48.37	Jan. 10, 1938	50.76
Oct. 18	48.48	May 13	48.35	Jan. 12, 1939	51.30
Feb. 7, 1929	47.80	June 17	48.48	Mar. 17	51.28
Mar. 10	47.67	Oct. 14	49.10	May 8	51.28
24	47.45	Dec. 1	49.03	June 30	51.40
May 5	48.82	Feb. 3, 1934	48.14	Sept. 9	51.67
Nov. 30	48.37	Apr. 21	48.71	Nov. 7	52.18
Jan. 1, 1930	48.27	July 5	48.92		

24.9.13.111. Formerly well 107. ----- Unused dug and drilled well, diameter 12 inches, depth 700+ feet. Measuring point, top of casing about 1 foot above land surface datum, 0.21 foot above top of concrete curb at south side of well where marked by  $\frac{1}{2}$ -inch square drilled hole slightly north of most easterly part of curb. Present measuring point, 0.66 foot lower than measuring point given previous to May 1931 by W. H. White in Tenth Biennial Report of State Engineer of New Mexico.

Water level, in feet below land surface datum, 1927-39

Sept. 21, 1927	16.37	Aug. 6, 1929	16.39	Oct. 14, 1933	17.31
Oct. 20	16.55	Sept. 6	16.22	Dec. 1	17.34
Nov. 4	16.33	Oct. 5	16.02	Feb. 3, 1934	17.81
15	16.27	Nov. 30	16.10	Apr. 21	17.10
29	16.19	Feb. 15, 1930	15.59	July 15	17.15
Dec. 13	15.50	June 14	16.02	Oct. 7	17.85
Jan. 3, 1928	15.45	July 12	15.99	Dec. 28	17.81
17	14.97	June 3, 1931	16.96	Feb. 1, 1935	18.00
31	14.92	Aug. 26	16.96	June 3	18.59
Feb. 21	15.22	Sept. 19	17.03	Sept. 7	18.21
Mar. 6	15.12	Oct. 17	17.12	Dec. 9	18.11
May 25	15.15	Nov. 22	16.91	Feb. 2, 1936	18.95
Aug. 11	16.02	Dec. 19	16.88	July 11	18.25
Sept. 15	16.14	Jan. 23, 1932	16.92	Dec. 6	18.78
21	16.04	Feb. 21	16.73	Feb. 20, 1937	18.52
Oct. 18	16.27	June 3	16.84	Sept. 13	19.48
Feb. 5, 1929	16.16	July 9	16.86	Jan. 10, 1938	19.21
Mar. 10	16.05	Aug. 5	16.88	Jan. 12, 1939	19.68
24	16.06	Sept. 2	17.04	Mar. 17	19.64
Apr. 18	16.17	Mar. 5, 1933	16.96	May 8	19.78
24	16.34	Apr. 2	16.97	June 30	20.24
May 10	16.25	May 12	16.89	Sept. 9	21.29
July 16	16.13	June 17	16.91	Nov. 7	21.17

a Pumping.

## Luna County--Continued

24.9.13.112. Formerly well 103. ----- Unused drilled well, diameter 24 inches. Measuring point, top edge of casing, 4,283.22 feet above sea level, level with land surface datum, 2.58 feet below upper surface of concrete engine base which is about 25 feet west of well.

Water level, in feet below land surface datum, 1927-39

Date	Water level	Date	Water level	Date	Water level
Aug. 5, 1927	46.29	Aug. 12, 1929	46.77	July 9, 1932	47.18
11	46.45	Sept. 6	46.86	Aug. 5	47.34
22	46.54	18	46.90	Sept. 2	47.46
Sept. 20	46.46	30	46.94	Mar. 5, 1933	47.05
Oct. 20	46.45	Oct. 5	46.96	Apr. 2	46.92
28	46.30	Nov. 30	46.91	May 13	46.87
Nov. 4	46.44	Jan. 1, 1930	46.81	June 17	49.91
10	46.45	Feb. 15	46.66	Oct. 14	47.64
23	46.44	Mar. 15	46.58	Dec. 1	47.53
29	46.38	May 10	46.47	Feb. 3, 1934	47.34
Dec. 6	46.35	June 14	46.72	21	47.27
13	46.38	July 7	46.85	July 5	47.65
Jan. 3, 1928	46.27	Aug. 26	46.94	Oct. 7	47.99
17	46.23	29	46.97	Dec. 28	47.96
31	46.16	Sept. 10	47.05	Feb. 1, 1935	49.00
Feb. 21	46.08	23	47.09	June 3	49.55
Mar. 6	46.04	Feb. 15, 1931	46.84	Sept. 7	50.16
May 25	45.84	Apr. 4	46.75	Dec. 9	48.31
July 12	46.26	May 1	46.65	Feb. 2, 1936	49.25
Aug. 11	46.45	June 3	46.69	July 11	48.44
22	46.63	Aug. 26	47.32	Sept. 13, 1937	49.13
Sept. 21	46.68	Sept. 19	47.55	Jan. 10, 1938	49.09
Oct. 18	46.70	Oct. 17	47.40	Jan. 12, 1939	49.57
Feb. 8, 1929	46.34	Nov. 22	47.37	Mar. 17	49.49
Apr. 18	46.12	Dec. 19	47.29	May 8	49.50
29	46.12	Jan. 23, 1932	47.27	June 30	49.73
June 19	46.34	Feb. 21	47.10	Sept. 9	50.05
July 14	46.59	June 3	46.92	Nov. 7	50.13
Aug. 6	46.74				

24.9.21.131. Formerly well 111. L. L. Gaskill. Unused dug and drilled well, depth 112 feet. Measuring point, top edge of USGS washer on 10 by 10-inch timber resting on concrete curb on east side of well, 4,317.73 feet above sea level, 1.0 foot above land surface datum, 0.50 foot above concrete curb at east side of well. Well was equipped with pump and used for irrigation until in 1938 when pump was installed on a new well about 20 feet south.

Water level, in feet below land surface datum, 1927-39

Oct. 20, 1927	59.45	Jan. 18, 1930	60.23	Oct. 14, 1933	63.40
Nov. 4	58.79	Feb. 15	60.38	Dec. 1	(a)
15	58.86	Mar. 15	60.25	Feb. 3, 1934	63.16
29	59.58	Apr. 11	60.79	Apr. 21	63.67
Dec. 13	59.35	May 10	60.49	Oct. 8	(a)
Jan. 3, 1928	59.46	June 14	60.98	Dec. 27	63.83
17	59.48	Feb. 18, 1931	61.07	Feb. 1, 1935	63.61
31	59.44	Aug. 26	(a)	Sept. 7	(a)
Feb. 21	59.41	Sept. 19	61.72	Dec. 9	65.50
Mar. 6	a 78.00	Oct. 17	61.79	Feb. 2, 1936	66.33
May 26	(a)	Nov. 22	61.75	July 11	68.60
June 15	(a)	Dec. 19	(a)	Dec. 6	66.74
July 26	(a)	Jan. 16, 1932	61.71	Feb. 20, 1937	66.54
Aug. 31	(a)	Feb. 21	61.72	Sept. 14	69.73
Oct. 24	60.47	June 3	(a)	Jan. 10, 1938	68.08
Nov. 7	60.32	July 9	(a)	Jan. 16, 1939	69.01
Jan. 21, 1929	59.33	Aug. 5	(a)	Mar. 17	69.00
Feb. 5	60.27	Sept. 2	(a)	May 9	68.51
Mar. 3	59.34	Mar. 5, 1933	62.39	July 1	b 87.29
24	59.32	Apr. 2	(a)	Sept. 9	b 87.39
Dec. 14	60.23	May 13	62.70	Nov. 8	69.94

a Pumping.

b Well 20 feet south pumping.

## Luna County--Continued

24.9.23.211. Formerly well 115. ----- Used drilled irrigation well, diameter 12 inches, depth 90 feet. Measuring point, surface of concrete slab around well, south side of well, 4,290.12 feet above sea level, level with land surface datum, 2.07 feet below surface of concrete engine base to south of well. Not used until May 1939, when a turbine pump was installed.

Water level, in feet below land surface datum, 1928-39

Date	Water level	Date	Water level	Date	Water level
Oct. 24, 1928	57.39	Dec. 19, 1931	59.45	Dec. 28, 1934	60.97
June 3, 1929	57.66	Jan. 23, 1932	59.07	Feb. 1, 1935	61.22
July 7	57.69	Feb. 21	59.61	June 3	61.30
16	57.69	June 3	59.70	Sept. 7	61.17
Sept. 17	57.83	July 9	59.76	Dec. 9	61.29
Oct. 7	57.89	Aug. 5	59.77	Feb. 2, 1936	62.87
Jan. 1, 1930	58.12	Sept. 2	59.85	July 11	62.02
Feb. 15	58.27	Mar. 5, 1933	60.24	Dec. 6	62.37
Mar. 15	58.31	Apr. 2	60.26	Feb. 20, 1937	62.40
May 10	58.42	May 13	60.28	Sept. 13	63.09
July 12	58.40	June 16	60.31	Jan. 11, 1938	63.15
Feb. 18, 1931	58.97	Oct. 14	60.52	Jan. 18, 1939	64.16
Apr. 4	59.01	Dec. 1	60.63	Mar. 17	64.27
May 29	59.12	Feb. 3, 1934	60.74	May 8	64.28
Aug. 26	59.20	Apr. 21	60.83	July 2	a 65.23
Sept. 19	59.31	July 5	60.90	Sept. 9	65.29
Oct. 17	59.43	Oct. 7	61.02	Nov. 8	65.12
Nov. 22	59.46				

24.10.3.411. Formerly well 68. Josh Bryan. Used dug domestic well. Measuring point, top of concrete curb at east side of well, level with land surface datum. Equipped with windmill. Used drilled irrigation well, 94 feet northwest of observation well, drilled in 1939.

Water level, in feet below land surface datum, 1928-39

Oct. 23, 1928	77.22	July 11, 1932	(b)	Feb. 4, 1935	82.04
Mar. 3, 1929	77.95	25	79.95	June 1	(b)
Sept. 12	78.83	Aug. 9	79.99	Sept. 6	82.60
Dec. 1	79.20	Sept. 3	80.15	Dec. 10	83.40
Jan. 3, 1930	79.17	Mar. 4, 1933	(b)	Feb. 10, 1936	84.64
Feb. 3	79.21	Apr. 15	(b)	July 13	83.95
Apr. 5	79.32	May 20	80.55	Nov. 29	84.50
Sept. 5	79.69	June 16	81.57	Feb. 20, 1937	84.71
Aug. 28, 1931	79.43	Oct. 7	81.38	Jan. 10, 1938	84.60
Sept. 26	79.46	Dec. 2	(b)	Jan. 17, 1939	85.40
Oct. 18	79.52	Feb. 2, 1934	(b)	Mar. 17	85.57
Nov. 27	79.55	Apr. 22	81.88	May 9	85.65
Dec. 24	79.59	July 6	82.86	July 3	c 86.00
Jan. 24, 1932	79.48	Oct. 8	82.50	Sept. 10	c 86.62
June 4	b 80.74	Dec. 27	(b)	Nov. 8	86.39

24.10.10.311. Formerly well 74. G. F. Ackerman. Used dug and drilled irrigation well, depth 120 feet. Measuring point, lower edge of pump base, 4,386.84 feet above sea level, level with land surface datum. Equipped with windmill and irrigation pump.

Water level, in feet below land surface datum, 1927-39

Oct. 8, 1927	76.11	Dec. 24, 1931	77.09	Dec. 28, 1934	(b)
Oct. 8, 1928	76.11	Jan. 24, 1932	77.00	Feb. 4, 1935	78.09
23	74.82	June 4	(b)	June 1	(b)
Sept. 9, 1929	76.20	July 11	77.15	Sept. 6	(b)
Jan. 1, 1930	76.53	Aug. 9	(b)	Feb. 10, 1936	(b)
Feb. 4	76.58	Sept. 3	77.29	July 13	(b)
Mar. 9	76.64	Mar. 4, 1933	(b)	Nov. 29	79.92
Apr. 5	76.37	Apr. 5	77.31	Feb. 28, 1937	80.03
June 14	76.49	May 20	77.49	Sept. 14	80.69
July 7	76.62	June 16	(b)	Jan. 9, 1938	80.20
Aug. 7	76.59	Oct. 7	77.99	Jan. 17, 1939	80.71
Feb. 16, 1931	76.84	Dec. 2	(b)	Mar. 17	80.75
Aug. 28	77.16	Jan. 2, 1934	(b)	May 9	80.82
Sept. 26	77.00	Apr. 22	79.30	July 3	d 82.60
Oct. 18	77.00	July 5	80.93	Sept. 10	d 87.08
Nov. 27	77.01	Oct. 8	78.50	Nov. 8	81.44

a Stopped pumping 16 hours prior to measurement.

b Pumping.

c Nearby irrigation well pumped from June 1 to about Sept. 11, according to owner.



## Luna County--Continued

25.9.24.222. Formerly well 174. George P. Watkins. Used dug and drilled irrigation well. Measuring point, chiseled arrow on east side of concrete curb, level with land surface datum, 4,225.70 feet above sea level, 2.80 feet below north top edge of concrete engine base which is 20 feet south of well.

Water level, in feet below land surface datum, 1927-39

Date	Water level	Date	Water level	Date	Water level
Oct. 20, 1927	42.68	Mar. 29, 1930	42.73	June 6, 1933	44.15
Nov. 4	42.65	Apr. 26	43.01	Oct. 14	44.55
15	42.59	May 30	43.30	Dec. 1	44.19
29	42.51	Sept. 10	44.08	Feb. 3, 1934	43.15
Dec. 13	42.45	Feb. 17, 1931	43.15	Apr. 21	(a)
Jan. 3, 1928	42.34	May 1	43.18	July 10	44.60
17	42.31	June 1	43.26	Feb. 1, 1935	43.13
31	42.26	Aug. 26	43.64	Sept. 7	45.49
Feb. 21	42.20	Sept. 19	43.79	Dec. 9	45.00
Mar. 6	42.18	Oct. 17	43.75	Feb. 2, 1936	45.74
May 25	(a)	Nov. 22	43.60	July 11	(a)
July 15	(a)	Dec. 20	43.52	Dec. 6	45.73
Aug. 12	(a)	Jan. 17, 1932	43.36	Feb. 20, 1937	45.43
Sept. 15	(a)	Feb. 21	43.26	Sept. 14	46.90
Nov. 7	43.02	June 3	(a)	Jan. 10, 1938	46.05
Feb. 5, 1929	42.57	July 9	(a)	Jan. 16, 1939	46.42
Mar. 24	42.70	Aug. 5	b 44.34	Mar. 17	a 58.15
Apr. 10	42.68	Sept. 2	44.40	May 10	47.25
Oct. 7	43.57	Mar. 5, 1933	43.57	July 2	(a)
Feb. 1, 1930	42.93	Apr. 2	46.60	Sept. 9	(a)
Mar. 1	42.73	May 13	43.92	Nov. 9	48.05

24.10.12.111. Morgan Garrett. Used dug and drilled irrigation well. Measuring point, top edge of USGS washer on north edge of south 10 by 10-inch timber pump support, 0.55 foot above top of concrete curb at east side, 0.55 foot above land surface datum. Water level, in feet below land surface datum, 1939: Jan. 17, 79.69.

24.10.12.431. Jon Hrna. Unused dug and drilled well, diameter 20 (?) inches, depth 132 feet. Measuring point, top edge of recorder shelter shelf, 0.86 foot above top of concrete curb at south side, 1.36 feet above land surface datum. Automatic water-stage recorder installed May 10, 1939.

Water level, in feet below land surface datum, 1939

Apr. 17	76.66	July 3	79.04	Nov. 8	79.32
May 10	76.68	Sept. 8	81.20		

25.9.6.421. Paul Yates. Used dug and drilled irrigation well. Measuring point, top edge of USGS washer on south edge of north 8 by 8-inch pump support, 0.65 foot above top of concrete curb at north side, 0.65 foot above land surface datum.

Water level, in feet below land surface datum, 1939

Jan. 18	66.41	May 10	66.88	Sept. 8	72.50
Mar. 17	66.16	July 1	(a)	Nov. 9	68.11

25.9.11.114. Mr. Anderson. Used dug and drilled irrigation well. Measuring point, lower edge of north railroad rail pump support, level with top of concrete curb and level with land surface datum.

Water level, in feet below land surface datum, 1939

Jan. 18	60.01	May 10	60.21	Sept. 9	(a)
Mar. 17	59.69	June 30	(a)	Nov. 9	61.58

25.9.13.311. -----, Unused dug and drilled well. Measuring point, top edge of USGS washer in top west edge of timber beam across east side of pit, level with land surface datum. Bench mark, upper surface of old concrete engine base at southwest corner, 25 feet west of well, 1.19 feet above measuring point. Water levels, in feet below land surface datum, 1939: July 2, 51.70; Sept. 9, 52.40; Nov. 9, 52.39.

a Pumping.

b Pumped 5 hours previous night.

## Luna County--Continued

25.9.15.211. J. M. Wimberly. Used dug and drilled irrigation well. Measuring point, top edge of USGS washer on east side of east 8 by 8-inch timber pump support, 0.28 foot above top of concrete curb at east side, and 0.28 foot above land surface datum. Water level, in feet below land surface datum, 1939: Jan. 13, 59.78.

25.9.21.311. A. W. Speir. Used dug and drilled irrigation and domestic well. Measuring point, top edge of hole in west side of pump base flange, 0.60 foot above top of concrete curb at west side, and 0.60 foot above land surface datum. Equipped with windmill and irrigation pump.

Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 16	63.48	May 10	(a)	Sept. 9	(a)
Mar. 17	62.89	July 1	(a)	Nov. 9	65.79

25.9.35.21. -----. Used dug and drilled irrigation well. Unused prior to May 1939. Measuring point, top edge of 12 by 6-inch pump support southeast side of pump, 0.50 foot above top of concrete curb at south side, and 0.50 foot above land surface datum.

Water level, in feet below land surface datum, 1939

Jan. 18	47.21	May 10	47.24	Sept. 9	(a)
Mar. 17	47.14	July 1	(a)	Nov. 9	48.30

25.10.36.222. Ike Kennedy. Used dug and drilled irrigation well, diameter 14 (?) inches, depth 97 feet. Measuring point, top edge of USGS washer in top south edge of north 8 by 8-inch pump support east of pump, 0.58 foot above concrete curb at east side, and 0.58 foot above land surface datum.

Water level, in feet below land surface datum, 1939

Jan. 18	56.94	May 10	56.80	Sept. 9	a 75.28
Mar. 17	56.84	July 1	(a)	Nov. 9	58.82

26.9.11.211. -----. Unused dug and drilled well, diameter 12 (?) inches. Measuring point, top of concrete curb at south side, flush with land surface datum. Water levels, in feet below land surface datum, 1939: Apr. 15, 36.92; July 1, 37.05; Sept. 9, 37.22; Nov. 9, 37.29.

26.10.1.1. Formerly well 180. E. F. Kimball (?). Used dug well, diameter 4+ feet, depth 63 feet in 1940. Measuring point, top edge of USGS washer on top of east-west 2 by 6-inch board, near center of well, level with land surface datum. Bench mark, surface of old concrete engine base which is 25 feet west of well, 1.52 feet above measuring point.

Water level, in feet below land surface datum, 1927-36, 1939

Aug. 8, 1927	55.48	Oct. 5, 1929	55.77	June 2, 1932	56.07
Oct. 20	55.55	Feb. 1, 1930	55.88	July 9	56.14
Nov. 4	55.69	Mar. 1	55.90	Aug. 5	56.18
15	55.56	23	55.80	Sept. 2	56.06
29	55.52	Apr. 26	55.73	Mar. 5	56.10
Dec. 13	55.49	May 23	55.89	Apr. 2	56.07
Jan. 3, 1928	55.45	June 28	55.90	May 13	56.04
17	55.44	July 28	55.82	June 16	56.08
31	55.42	Sept. 4	55.84	Oct. 14	56.40
Feb. 21	55.42	Feb. 17, 1931	56.10	Dec. 1	56.68
Mar. 6	55.44	May 1	56.13	Feb. 3, 1934	57.60
May 26	55.60	June 1	56.35	Apr. 21	56.64
Sept. 10	55.64	Aug. 26	56.09	July 10	56.47
Nov. 7	55.68	Sept. 19	56.15	Oct. 7	56.31
Jan. 2, 1929	55.60	Oct. 17	56.16	Feb. 1, 1935	56.26
Feb. 5	55.58	Nov. 22	56.18	Sept. 6	56.25
May 6	55.53	Dec. 15	56.15	Dec. 9	(b)
June 10	55.48	Jan. 17, 1932	56.46	Dec. 6, 1936	(b)
29	55.63	Feb. 21	56.15	Jan. 20, 1939	(c)
Sept. 11	55.73				

a Pumping.

b Well dry.

c Windmill pumping.

## Luna County--Continued

27.8.7.211. -----. Unused dug and drilled well, diameter 8 inches. Measuring point, top edge of USGS washer on top of west side of well box, 2.00 feet above land surface datum. Bench mark, surface of concrete porch floor of abandoned school house southeast of well, 1.97 feet below measuring point. Water levels, in feet below land surface datum, 1939: July 1, 23.93; Sept. 9, 24.03; Nov. 9, 23.97.

## ROOSEVELT COUNTY

## PORTALES VALLEY

By C. S. Conover

The program of measuring water levels in observation wells in Portales Valley and of gathering other pertinent data was continued during 1939 in cooperation with the State engineer of New Mexico, T. M. McClure.

A general statement of the geology and water resources of Portales Valley is given in Water-Supply Paper 845, pages 242, 245. It is expected that a progress report on Portales Valley covering work carried on from 1938 to 1940 will be published in the forthcoming 14th Biennial Report of the State engineer of New Mexico.

At the end of 1939 the water-level program included about 200 observation wells in which water-level measurements are made once a year--in January. These measurements are used in preparing maps that show the yearly changes in ground-water level in the valley. Water levels in 54 wells are also measured bimonthly so that the trend and change in ground-water levels may be observed during the year. The observation wells are distributed over the entire area, and thus the changes in water level in them reflect average changes in the valley. Four weekly water-stage recorders were operated during the year on representative wells in different sections of the valley.

The amount of pumping of ground water for irrigation varies each year and is influenced by the amount and distribution of rainfall and by the kind and amount of crops grown. The precipitation as reported by the U. S. Weather Bureau at Portales for 1939 was 16.89 inches, or 1.18 inches below normal. Much of the precipitation occurs during the growing season and thus makes dry farming possible in years of normal or high precipitation. According to an estimate by the Portales Chamber of Commerce and the office of the Roosevelt County Agent, about 13,000 acres were irrigated in 1939 with water pumped from wells in the Portales Valley. This is an increase of about 2,000 acres over 1938.

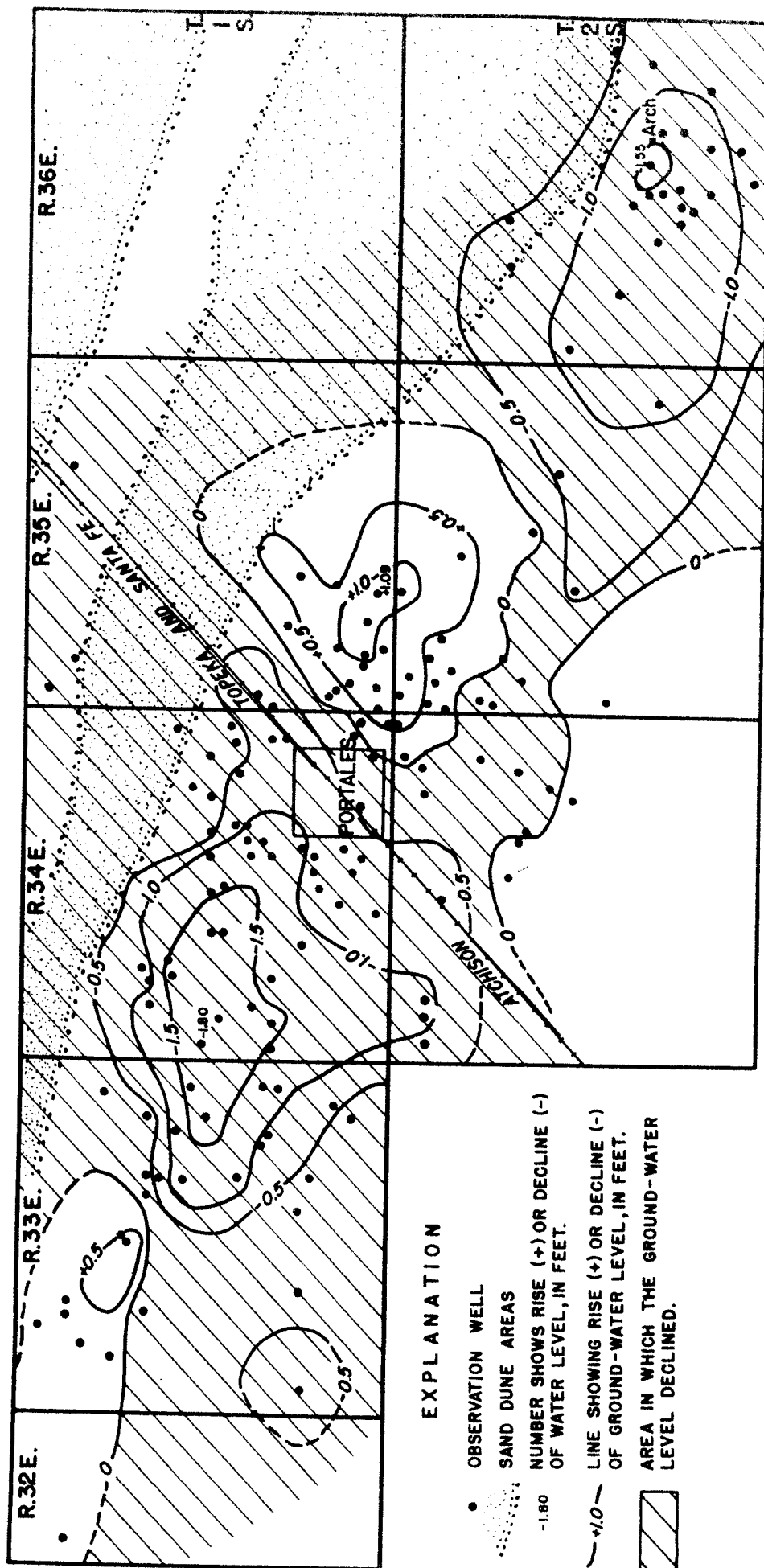


Figure 19.—Map of a part of Portales Valley, New Mexico, showing change in ground-water level from January 1939 to January 1940.

The accompanying maps show the change in ground-water level in the Portales Valley between January 1939 and January 1940 and the change between January 1932, when the program of water-level measurements was started, and January 1940.

From January 1939 to January 1940 the water levels continued to decline in an area of heavy pumping northwest of Portales. The maximum decline observed in the year was 1.80 feet in wells 1.34.18.343 and 1.34.21.141, about 5 miles and 3 miles, respectively, northwest of Portales. In another area of heavy pumping--east of Portales--the ground-water level rose between January 1939 and January 1940. The maximum rise observed was 1.09 feet in well 1.35.33.331--about 3 miles southeast of Portales. Local severe hail storms during the growing season damaged many crops in this area to the extent that the crops were abandoned and the land was not watered in the latter part of the season. Frequent rains in this area, which came when the crops needed water, reduced the amount of water pumped. The decrease in pumping due to the hail storms and rains is probably the principal cause for the net rise of ground-water level in this area during 1939.

In the neighborhood of Arch the ground-water level declined from January 1939 to January 1940. The maximum decline, amounting to 1.55 feet, occurred in well 2.36.27.211, one-half mile west of Arch. This decline follows the rise in this area during the previous 2 years.

In the period from January 1932, when the program of measurements was started, to January 1940, the water level has declined throughout an area several miles wide that extends along the axis of the valley from about 9 miles west of Portales to 8 miles east of it. The maximum decline of ground-water level during this period has been more than 8 feet and has occurred in the most heavily pumped area, 3 miles northwest of Portales. The water level has fallen more than 5 feet in an area north and northwest of Portales that has a maximum length of 7 miles and a maximum width of more than 4 miles.

In the upper and lower parts of the valley the water levels had a small net rise during this period. In the upper part of the valley the area of rise extends west from a north-south line about 9 miles west of Portales. Very little water is pumped for irrigation in this area. The maximum rise observed--1.36 feet--occurred in well 1.32.3.44. In the neighborhood of Arch, in the lower part of the valley, the maximum net

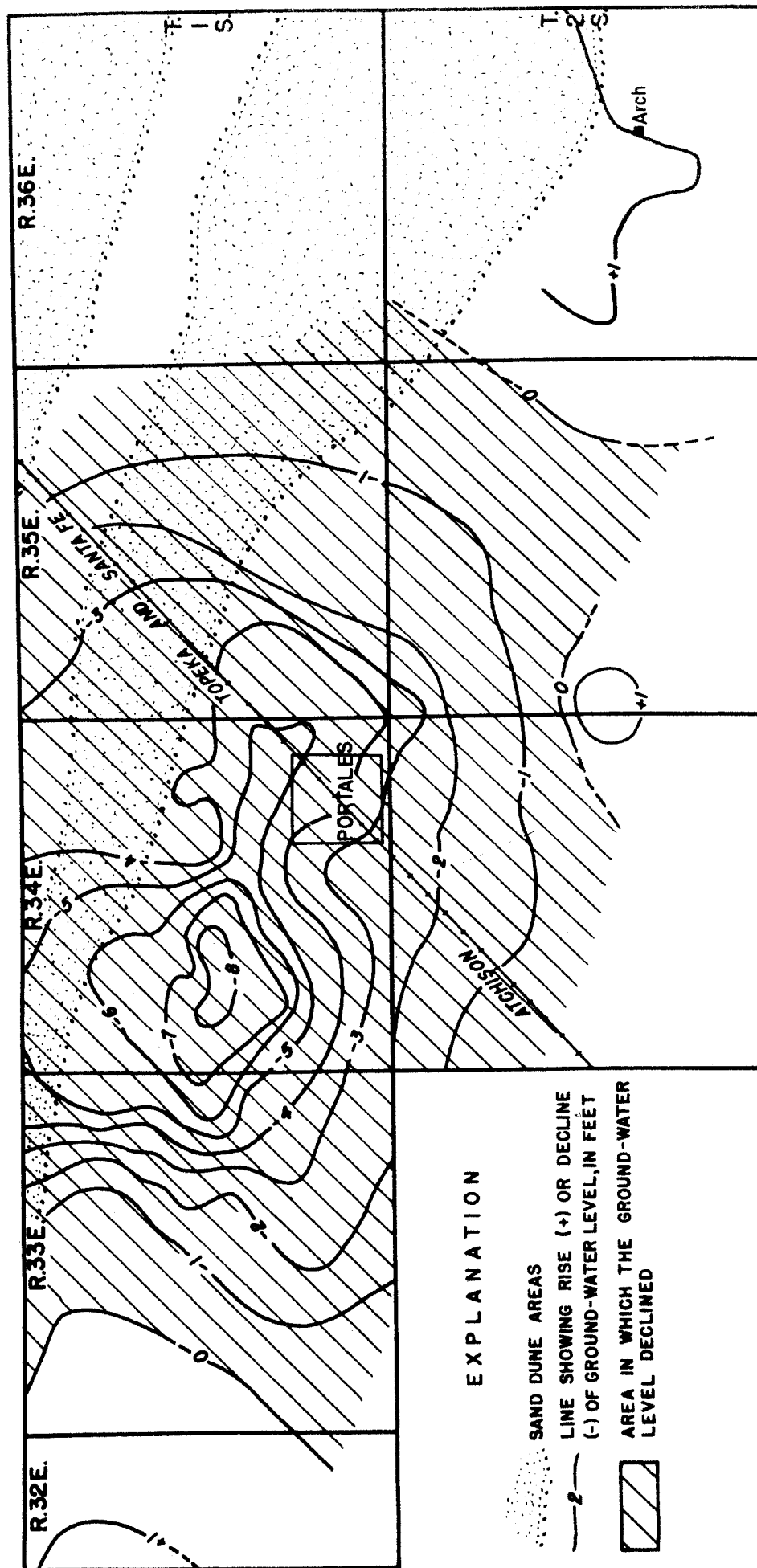


Figure 20.--Map of a part of Portales Valley, New Mexico, showing change in ground-water level from February 1932 to January 1940.

rise of water level over the 8-year period was a little more than 1 foot. In this area also comparatively little water is pumped for irrigation, although pumpage has increased somewhat since 1932.

The rise of water level in outlying, lightly pumped areas suggests that recharge to the underground reservoir has been relatively abundant, perhaps throughout the valley, but that such recharge has been more than offset by pumping in the central part of the valley.

### Roosevelt County

1N.32.7.3. W. J. Crenshaw.

Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 12	17.67	May 18	17.74	Sept. 20	18.73
Mar. 12	17.58	July 18	18.46	Nov. 17	18.44

1N.33.26.12. Ben. T. Miller. Used drilled stock well. Measuring point, top edge of steel oil drum over top of well, 1.90 feet above land surface datum. Water level, in feet below land surface datum, 1939: Jan. 25, 12.06.

1N.33.36.4a. A. C. Woodburn. Unused dug well, depth 10 feet. Measuring point raised to 0.15 foot above land surface datum and 0.57 foot above reference point. Equipped with automatic water-stage recorder. Water-level fluctuations indicate transpiration.

Water level, in feet below land surface datum, 1939

Jan. 12	5.50	May 18	5.23	Sept. 20	7.38
Mar. 12	5.72	July 18	7.34	Nov. 17	7.39

1N.33.36.4b. A. C. Woodburn.

Water level, in feet below land surface datum, 1939

Jan. 12	9.02	May 22	8.70	Sept. 20	10.92
Mar. 12	9.25	July 18	(a)	Nov. 17	10.82

1N.34.29.444. ----- Used drilled stock well. Measuring point, upper edge of USGS washer on vertical wood plank at northwest corner of well opening, level with land surface datum. Bench mark, surface of concrete curbing of well, at northwest corner, level with measuring point. Equipped with windmill. Water level, in feet below land surface datum, 1939: Jan. 24, 18.77.

1N.34.33.224. ----- Used drilled stock and domestic well. Measuring point, upper edge of 15-inch sewer tile surface casing at west side, 1.0 foot above land surface datum. Equipped with windmill. Water level, in feet below land surface datum, 1939: Jan. 24, 20.63.

1N.34.35.432. ----- Used drilled stock well, diameter 6 inches. Measuring point, upper edge of USGS washer on east pipe clamp, 0.35 foot above top of casing and 0.35 foot above land surface datum. Bench mark, surface of tombstone, southeast corner, 40 feet northwest of well, 5 feet southeast of old wooden-stave stock tank, 1.25 feet above measuring point. Equipped with windmill. Water level, in feet below land surface datum, 1939: Jan. 24, 21.54.

1.32.3.44. M. Nall.

Water level, in feet below land surface datum, 1939

Jan. 12	38.42	May 18	b 48.00	Sept. 20	38.43
Mar. 12	38.40	July 18	41.72	Nov. 17	38.39

a Well plugged.

b Pumping approximately 800 gallons a minute.

## Roosevelt County--Continued

1.32.12.13. D. A. Gordon. Pit filled with debris; measurements discontinued.

1.33.4.331. Arthur Turner. Pit filled with debris; measurements discontinued.

1.33.5.231. T. R. Willis. Bench mark, top of nail holding USGS washer, driven into concrete pump base,  $4\frac{1}{2}$  inches west of center of east edge of concrete base, level with surface of concrete base, 0.18 foot below measuring point. Water levels, in feet below land surface datum, 1939: Jan. 12, 24.24; Mar. 12, 25.72.

1.33.5.432. Clay Jones. Bench mark 2, upper edge of USGS washer on northeast side of power line pole, 15 feet southwest of well, 0.76 foot above measuring point. Water level, in feet below land surface datum, 1939: Jan. 12, 22.04.

1.33.5.442. George Thedford. Water level, in feet below land surface datum, 1939: Jan. 12, 22.96.

1.33.8.112. Andrew Q. Smith. Measurements reported in Water-Supply Paper 845, should be reduced 0.19 foot to compare with 1939 measurements. Water level, in feet below land surface datum, 1939: Jan. 11, 21.22.

1.33.8.311. W. F. Marcus. Used dug and drilled irrigation well, depth 37 (?) feet. Measuring point, upper edge of USGS washer on top west edge of east 4 by 12-inch stringer, 1 foot north of east vertical frame post, level with land surface datum. Water level, in feet below land surface datum, 1939: Jan. 12, 22.41.

1.33.8.411. Water level, in feet below land surface datum, 1939: Jan. 12, 20.22. Well filled; measurements discontinued.

1.33.9.111. Kennedy. Used dug and drilled irrigation well, diameter 12 inches, depth 90 feet. Measuring point, top of west end of bolt in north vertical frame post, just below lower edge of small upper pulley on pump shaft, 1.0 foot below land surface datum. Bench mark, lower edge of USGS washer on 2 by 4-inch beam on north side of pump shed, inside of shed, 6 feet west of northeast inside corner of shed, 2.28 feet above measuring point. Water level, in feet below land surface datum, 1938-39

Date	Water level	Date	Water level	Date	Water level
Nov. 11, 1938	22.55	May 18, 1939	21.68	Sept. 20, 1939	22.71
Jan. 12, 1939	22.11	July 18	21.86	Nov. 17	21.81
Mar. 12	21.89				

1.33.9.442. H. Redburn. Water level, in feet below land surface datum, 1939: Jan. 12, 21.81.

1.33.10.211. O. B. Sherman. Used dug and drilled irrigation well, diameter 12 inches, depth 94 feet. Measuring point, upper edge of USGS washer on east top edge of west 8 by 8-inch stringer, 1.0 foot south of northwest corner of curbing, level with land surface datum. Bench mark, upper edge of USGS washer on southeast side of power-line pole, 10 feet northwest of well, 0.79 foot above measuring point. Water level, in feet below land surface datum, 1936: Jan. 8, 25.74.

1.33.10.313. W. A. Bullock. Bench mark, upper edge of USGS washer on west side of 12-inch cottonwood tree, 25 feet northwest of well, near fence line, 7.30 feet above measuring point. Water level, in feet below land surface datum, 1939: Jan. 12, 23.36.

1.33.11.312. C. F. Williams. Measuring point, lower west edge of 9-inch steel "I" beam across top of pit, near discharge pipe, 0.42 foot above land surface datum and 0.42 foot above bench mark. No measurements made in 1939.

1.33.12.144. A. C. Woodburn. Water level, in feet below land surface datum, 1939: Jan. 12, 33.38.

a Measuring point changed. New measuring point could not be accurately referenced to old; possible discrepancy of a few tenths of a foot between preceding and succeeding record.



## Roosevelt County--Continued

1.33.13.111. E. Elkins. Water level, in feet below land surface datum, 1939: Jan. 12, 24.02.

1.33.13.431. J. S. Green. Water level, in feet below land surface datum, 1939: Jan. 13, 25.39.

1.33.14.111. R. D. Loy. Bench mark, head of nail holding USGS washer on south side of cottonwood tree, in fence line, 30 feet northeast of well, 1.56 feet above measuring point. Measuring point changed. New measuring point could not be accurately referenced to old. Water level, in feet below land surface datum, 1939: Jan. 12, 21.84.

1.33.14.131. J. V. Miller. Measuring point, top of tile curbing on east side of well, 1.5 feet north of southeast corner of pit, 0.16 foot below land surface datum. Water level, in feet below land surface datum, 1939: Jan. 13, 21.32.

1.33.14.311. J. T. Elder. Water level, in feet below land surface datum, 1939: Jan. 13, 20.14.

1.33.14.331.

Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 13	21.12	May 19	21.63	Sept. 20	23.11
Mar. 12	21.09	July 18	22.40	Nov. 17	22.62

1.33.14.421. Priddy and Jones. Water level, in feet below land surface datum, 1939: Jan. 13, 23.64.

1.33.15.212. H. O. Minick. Bench mark, upper edge of USGS washer on north side of power line pole, 10 feet southeast of well, 2.20 feet above measuring point. Measuring point changed. New measuring point could not be accurately referenced to old; possible discrepancy of several tenths of a foot with preceding record. Water level, in feet below land surface datum, 1939: Jan. 13, 21.54.

1.33.17.221. R. F. Campbell.

Water level, in feet below land surface datum, 1939

Jan. 12	19.91	May 18	19.75	Sept. 20	20.96
Mar. 12	19.97	July 18	19.97	Nov. 17	20.29

1.33.23.311. Dan Smith. Bench mark, upper edge of USGS washer on north side of telephone pole, 120 feet southwest of well, on east side of road, 2.43 feet above measuring point. Measuring point changed. New measuring point could not be accurately referenced to old; possible discrepancy of a few tenths of a foot with preceding record. Water level, in feet below land surface datum, 1939: Jan. 13, 23.58.

1.33.23.433. R. R. Francis. Water level, in feet below land surface datum, 1939: Jan. 13, 24.21.

1.33.24.111. J. E. Dictson. New bench mark, upper edge of USGS washer on inside top edge of north stringer, north of center of well, 1.54 feet below measuring point. Water level, in feet below land surface datum, 1939: Jan. 13, 28.32.

1.33.24.433. J. E. Jones. Water level, in feet below land surface datum, 1939: Jan. 13, 25.19.

1.33.25.213. Drew West. Water level, in feet below land surface datum, 1939: Jan. 13, 34.97.

1.33.26.113. Lewis Little. Measurements discontinued.

1.33.26.221. D. E. Thomas. Water level, in feet below land surface datum, 1939: Jan. 13, 24.24.

1.33.26.331. Luther Thomas. Water level, in feet below land surface datum, 1939: Jan. 13, 30.19.

## Roosevelt County--Continued

1.33.27.322. J. A. Henley. Measuring point changed. New measuring point could not be accurately referenced to old; possible discrepancy of a few tenths of a foot with preceding record. Water level, in feet below land surface datum, 1939: Jan. 13, 34.33.

1.33.28.311. R. L. Jolly. Used drilled irrigation well, diameter 15 inches, depth 116.5 feet. Measuring point, inside edge of hole in west side of pump case shell, 0.80 foot above land surface datum. Bench mark, surface of concrete pump base, 0.61 foot below measuring point.  
Water level, in feet below land surface datum, 1938-39

Date	Water level	Date	Water level	Date	Water level
Nov. 11, 1938	46.40	May 18, 1939	45.91	Sept. 20, 1939	46.78
Jan. 13, 1939	46.19	July 18	46.33	Nov. 17	46.60
Mar. 12	45.99				

1.33.30. L. K. Terrell.

Water level, in feet below land surface datum, 1939

Jan. 12	0.82	May 18	1.99	Sept. 20	3.52
Mar. 12	1.15	July 18	3.58	Nov. 17	2.45

1.33.34.211. John Plummer. Unused drilled well, diameter 12 or 14 inches. Measuring point, top north edge of casing, level with surface of concrete curb, 4.0 feet above land surface datum. Water levels, in feet below land surface datum, 1939: May 18, 27.49; July 18, 28.39; Sept. 20, 28.93; Nov. 17, 28.09.

1.33.36.112. George Johnson. Measuring point, top of 3/4-inch hole in west side of base of pump, inside of pump shell, 0.20 foot above lower surface of pump base, 0.26 foot above land surface datum. Bench mark, head of nail holding USGS washer on west side of power line pole, 15 feet east of well, 1.04 feet above measuring point.

Water level, in feet below land surface datum, 1938-39

Nov. 11, 1938	32.85	Mar. 12, 1939	31.34	July 18, 1939	(a)
Jan. 13, 1939	31.93	May 18	(a)	Nov. 17	33.18

1.33.36.133. George Johnson. Water levels, in feet below land surface datum: Nov. 11, 1938, 39.80; Jan. 13, 1939, 39.27.

1.34.8.434. W. H. Marsh. Water level, in feet below land surface datum, 1939: Jan. 16, 33.26.

1.34.13.412. Ben Donathan. Unused drilled irrigation well, diameter 15 inches, depth 157 feet. Measuring point, top edge of casing, northeast side of well, level with surface of concrete pump base, 0.10 foot below land surface datum.

Water level, in feet below land surface datum, 1938-39

Nov. 12, 1938	56.15	May 19, 1939	55.89	Sept. 23, 1939	56.07
Jan. 16, 1939	55.91	July 18	55.96	Nov. 17	56.10
Mar. 13	b 55.85				

1.34.14.432.

Water level, in feet below land surface datum, 1939

Jan. 16	46.62	May 19	(a)	Sept. 23	48.45
Mar. 13	46.28	July 18	47.52	Nov. 17	46.99

1.34.17.111. W. D. Ware. Bench mark, surface of concrete pump base, 0.06 foot below measuring point. Water level, in feet below land surface datum, 1939: Jan. 16, 32.81.

1.34.17.122. W. W. Donnell. Bench mark, surface of concrete pump base, 0.06 foot below measuring point. Water level, in feet below land surface datum, 1939: Jan. 16, 32.68.

a Pumping.

b Pump removed.

## Roosevelt County--Continued

1.34.17.233. D. L. Ray.

Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 16	30.68	May 13	31.48	Sept. 23	33.12
Mar. 13	30.38	July 18	(a)	Nov. 17	34.08

1.34.17.241. D. L. Ray. Bench mark, surface of concrete pump base, 0.08 foot below measuring point. Water level, in feet below land surface datum, 1939: Jan. 16, 27.50.

1.34.17.411. A. M. March. Measurements discontinued.

1.34.18.312. J. E. Tucker. Water level, in feet below land surface datum, 1939: Jan. 13, 29.97.

1.34.18.343. J. W. Terry. Bench mark, upper edge of USGS washer on east side of 2 by 6-inch board sill that runs along bottom of west side of pump shed, inside of shed, 5 feet southwest of pump, directly west of door in east side of pump shed, 1.23 feet above measuring point. Water level, in feet below land surface datum, 1939: Jan. 13, 37.48.

1.34.19.223. Bench mark, given in Water-Supply Paper 845 as 0.54 foot below measuring point, should read 0.21 foot below measuring point. Water level, in feet below land surface datum, 1939: Jan. 13, 25.95.

1.34.19.421. Measurements discontinued.

1.34.20.331. A. G. Ross.

Water level, in feet below land surface datum, 1939

Jan. 13	27.84	May 21	28.37	Sept. 20	(b)
Mar. 13	27.47	July 18	(a)	Nov. 17	30.39

1.34.20.441. M. E. Clower. Water level, in feet below land surface datum, 1939: Jan. 16, 27.11. Measurements discontinued.

1.34.21.121. L. H. Lee. Bench mark, surface of concrete pump base, 0.08 foot below measuring point. Water level, in feet below land surface datum, 1939: Jan. 16, 33.25.

1.34.21.141. Douglas Owens. Bench mark, surface of concrete pump base, 0.08 foot below measuring point. Water level, in feet below land surface datum, 1939: Jan. 16, 33.10.

1.34.21.211. D. M. Haynes. Measurements discontinued.

1.34.21.222. E. Tipton. Bench mark, surface of concrete pump base, 0.08 foot below measuring point. Water level, in feet below land surface datum, 1939: Jan. 16, 39.48.

1.34.22.131. J. E. Jergins. Water level, in feet below land surface datum, 1939: Jan. 16, 34.78.

1.34.22.211. Mrs. A. J. Goodwin. Water level, in feet below land surface datum, 1939: Jan. 16, 37.67.

1.34.22.222. Mrs. A. J. Goodwin.

Water level, in feet below land surface datum, 1939

Jan. 16	41.86	May 19	41.94	Sept. 23	42.78
Mar. 13	41.85	July 18	42.41	Nov. 17	42.49

1.34.22.413. J. A. Ray. Measuring point, upper edge of USGS washer on east top edge of west 6 by 6-inch timber, near center of well, 0.66 foot below land surface datum. Bench mark, upper edge of USGS washer nailed in east side of corner fence post, 35 feet northwest of well, 2.47 feet above measuring point. Water level, in feet below land surface datum, 1939: Jan. 16, 33.22.

a Pumping.

b Water level below pump.

## Roosevelt County--Continued

1.34.22.421. R. C. Grunig. Drilled irrigation well. Measuring point, top edge of 3/4-inch hole in east side of pump base flange, 1.00 foot above land surface datum. Bench mark, surface of concrete pump base, 0.08 foot below measuring point. Water level, in feet below land surface datum, 1939: Jan. 15, 34.98.

1.34.22.443. R. M. Cox. Bench mark, upper edge of USGS washer on south side of corner fence post, 20 feet northwest of well, 0.52 foot above measuring point. Measuring point changed. New measuring point could not be accurately referenced to old; possible discrepancy of several tenths of a foot with preceding record. Water level, in feet below land surface datum, 1939: Jan. 16, 32.42.

1.34.23.112. Kelly Nix. Measurements discontinued.

1.34.23.211. W. H. Marsh. Water level, in feet below land surface datum, 1939: Jan. 16, 40.61.

1.34.23.311. J. R. Mahoffey. Redrilled to 130 feet in December 1939. Bench mark, surface of concrete pump base, 0.08 foot below measuring point. Water level, in feet below land surface datum, 1939: Jan. 17, 33.84.

1.34.23.313a. Mr. Buchanan.

Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 17	33.21	May 19	32.69	Sept. 23	35.85
Mar. 13	32.79	July 18	35.00	Nov. 17	34.90

1.34.23.341. Well filled; measurements discontinued.

1.34.23.422. E. L. Yandell. Bench mark, upper edge of USGS washer on south side of largest tree, 40 feet north of well, on west trunk, 2.09 feet above measuring point. Water level, in feet below land surface datum, 1939: Jan. 17, 32.24.

1.34.23.442. Mr. Green. Water level, in feet below land surface datum, 1939: Jan. 19, 33.11.

1.34.24.112. J. H. Penson. Unused drilled well, diameter 14 inches, depth 100 feet. Measuring point, top edge of casing at west side, level with land surface datum. Bench mark, head of nail holding USGS washer on south side of corner fence post, 50 feet northwest from well, 3.86 feet above measuring point.

Water level, in feet below land surface datum, 1938-39

Nov. 4, 1938	38.93	May 19, 1939	a 38.72	Sept. 23, 1939	39.59
Jan. 16, 1939	39.00	July 18	39.36	Nov. 17	39.59

1.34.24.243. J. T. Gorrell. Bench mark, surface of concrete pump base, 0.06 foot below measuring point. Water level, in feet below land surface datum, 1939: Jan. 17, 46.72.

1.34.24.312. W. A. Cummings. Water level, in feet below land surface datum, 1939: Jan. 17, 33.21.

1.34.25.211. New recorder shelter installed May 1938. Measuring point, top of recorder shelter shelf, near recorder, 0.36 foot above land surface datum.

Water level, in feet below land surface datum, 1939

Jan. 19	37.10	May 18	36.98	Sept. 21	38.01
Mar. 13	36.87	July 20	37.69	Nov. 18	38.11

1.34.25. Hatch feed pens. Used domestic and stock well. Water level, in feet below land surface datum, 1939: Jan. 26, 34.86.

a Pump removed.

## Roosevelt County--Continued

- 1.34.25.323. E. B. Siddall. Measurements discontinued.
- 1.34.26.122. J. L. Simon. Measurements discontinued.
- 1.34.26.212. Measurements discontinued.
- 1.34.26.312. L. F. Soaps. Measurements discontinued.
- 1.34.26.313. T. E. Allen. Measurements discontinued.
- 1.34.26.342. G. N. White. Measurements discontinued.
- 1.34.26.343. W. M. Fields. Measurements discontinued.
- 1.34.27.211. J. L. Bowman.

Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 16	30.28	May 19	32.00	Sept. 23	35.27
Mar. 14	29.60	July 18	34.80	Nov. 17	32.80

- 1.34.27.313. Measurements discontinued.

1.34.27.331. ----- Used dug and drilled irrigation well. Measuring point, upper edge of USGS washer on top west side of east stringer, two feet south of east vertical frame post, 0.50 foot below land surface datum. Reference point, top of 2 by 2-inch hub, level with land surface, 1.0 foot east of fence post painted orange, on west side of road directly west of well, 0.19 foot above measuring point. Water level, in feet below land surface datum, 1939: Jan. 14, 28.48.

1.34.27.341. B. F. Smith. Bench mark, surface of old concrete engine base at southeast corner, 15 feet east of engine, 1.40 feet above measuring point. Water level, in feet below land surface datum, 1939: Jan. 16, 28.58.

1.34.27.412. J. D. Cyphers. Bench mark, upper edge of USGS washer on west side of telephone pole, 30 feet northeast of well, south side of road, 1.04 feet above measuring point. Water level, in feet below land surface datum, 1939: Jan. 16, 29.63.

1.34.27.431. ----- Water level, in feet below land surface datum, 1939: Jan. 16, 29.11.

1.34.27.444. Measurements discontinued.

1.34.28.211. No measurements made in 1939.

1.34.28.311. W. C. Fields (?). Used dug and drilled irrigation well, diameter 12 inches, depth 115 feet. Measuring point, upper edge of USGS washer nailed on east upper edge of west stringer, 1.5 feet north of west vertical frame post, 0.50 foot below land surface datum. Bench mark, top of 2 by 2-inch hub, level with land surface, 8.5 feet south of vertical discharge pipe which is near center of well, 0.27 foot above measuring point. Water levels, in feet below land surface datum: Nov. 11, 1938, 30.71; Jan. 14, 1939, 29.94.

1.34.29.211. George and King. Bench mark, surface of concrete slab, immediately north of pump, at cross mark on northwest corner, 0.38 foot above measuring point. Water level, in feet below land surface datum, 1939: Jan. 16, 26.41.

1.34.30.121. M. A. Pember. Diameter 14 inches. Bench mark, surface of concrete weir box, at center of south side, 2.36 feet above measuring point. Weir box is north of pump shed. Water level, in feet below land surface datum, 1939: Jan. 13, 25.30.

1.34.30.221. John Davidson. Measuring point, upper edge of USGS washer on south side of north post across pit, 0.46 foot below land surface datum. Bench mark, upper edge of USGS washer on west side of power line pole, 40 feet north of well, south side of road, 1.64 feet above measuring point. Water level, in feet below land surface datum, 1939: Jan. 13, 24.45.

## Roosevelt County--Continued

1.34.33.223. F. W. Nullmyer. Bench mark, surface of concrete floor of pump shed, just east of well, by the southmost rectangular hole in floor, 0.48 foot above measuring point. Water level, in feet below land surface datum, 1939: Jan. 14, 26.65.

1.34.33.431. Mr. Moore.

Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 14	16.01	May 18	15.88	Sept. 21	17.08
Mar. 13	15.84	July 18	16.76	Nov. 17	17.04

1.34.34.143. J. H. Sanders. Water level, in feet below land surface datum, 1939: Jan. 14, 31.31.

1.34.34.232. J. M. Owens. Bench mark, southwest corner of concrete engine base, 20 feet east of well at contact between lower ledge and upper pyramid, 0.33 foot above measuring point. Water level, in feet below land surface datum, 1939: Jan. 14, 28.76.

1.34.34.321. A. L. Hartzell. Water level, in feet below land surface datum, 1939: Jan. 14, 31.41.

1.34.34.411. W. L. Patton. Bench mark, top of concrete weir box west of well at southeast corner, 2.98 feet above measuring point. Water level, in feet below land surface datum, 1939: Jan. 14, 29.51.

1.34.35.111. J. H. Bonds. Water level, in feet below land surface datum, 1939: Jan. 17, 27.20. Measurements discontinued.

1.34.35.121. C. R. Dean. Measurements discontinued.

1.34.35.3. Eastern New Mexico College. Measuring point, top of  $\frac{1}{2}$ -inch hole in southwest side of pump base flange, 1.62 feet above land surface datum. Bench mark, surface of 3 by 3-foot concrete pump base, 0.06 foot below measuring point, 0.90 foot above top of concrete weir box at north side of pump base. Water level, in feet below land surface datum, 1939: Jan. 17, 27.62.

1.34.36.212. M. C. Christian. No measurements made in 1939.

1.34.36.233. Mr. Disney. New measuring point, upper edge of USGS washer on top west inside edge of east stringer, 1.0 foot north of east vertical frame post, 0.75 foot below land surface datum. Water level, in feet below land surface datum, 1939: Jan. 19, 31.22.

1.34.36.332. T. R. Chambers. Water level, in feet below land surface datum, 1939: Jan. 18, 27.72.

1.34.36.421. Earl McCollum. Bench mark, top edge of USGS washer on top of 2 by 4-inch inside sill of pump shed on west side, 4.7 feet south of northwest corner of pump shed, 4.75 feet above measuring point. Water level, in feet below land surface datum, 1939: Jan. 19, 30.45.

1.34.36.443. Foy Williams. Bench mark, surface of concrete pump base, 0.13 foot below measuring point. Water level, in feet below land surface datum, 1939: Jan. 18, 30.11.

1.35.2.3. Eastern New Mexico State Park.

Water level, in feet below land surface datum, 1939

Jan. 19	47.80	July 20	47.86	Nov. 17	47.70
May 19	47.84	Sept. 23	47.78		

1.35.6.4. -----

Water level, in feet below land surface datum, 1939

Jan. 19	14.56	May 19	14.58	Sept. 23	14.75
Mar. 13	14.67	July 18	14.62	Nov. 17	14.82

## Roosevelt County--Continued

1.35.6.141. Mr. Reynolds. Unused drilled well, diameter 6 inches, depth 18 feet. Measuring point, top of casing at west side, 0.50 foot above land surface datum. Bench mark, head of nail holding USGS washer on north side of anchor post, 6 feet southwest of well, 0.06 foot above measuring point.

Water level, in feet below land surface datum, 1938-39

Date	Water level	Date	Water level	Date	Water level
Nov. 4, 1938	9.65	May 19, 1939	9.44	Sept. 23, 1939	10.25
Jan. 19, 1939	9.55	July 18	10.04	Nov. 17	10.20
Mar. 13	9.48				

1.35.19.332. S. F. Foreman. Water level, in feet below land surface datum, 1939: Jan. 19, 41.02.

1.35.19.432. Mr. Carroll. No measurements made in 1939.

1.35.28.143. J. C. Dick.

Water level, in feet below land surface datum, 1939

Jan. 18	a 51.28	May 19	50.91	Sept. 23	51.12
Mar. 13	51.11	July 20	51.13	Nov. 18	50.58

1.35.29.231. R. E. Lee. Bench mark, surface of concrete pump base, 0.06 foot below measuring point. Water level, in feet below land surface datum, 1939: Jan. 19, 39.28.

1.35.30.111. E. F. Foreman. Water level, in feet below land surface datum, 1939: Jan. 19, 36.94.

1.35.30.343. J. A. Vick. Water level, in feet below land surface datum, 1939: Jan. 19, 29.98.

1.35.30.441. J. R. Brashears. Measurements discontinued.

1.35.31.122. A. G. Kenyon. Water level, in feet below land surface datum, 1939: Jan. 19, 30.25.

1.35.31.231. W. L. Rogers. Water level, in feet below land surface datum, 1939: Jan. 19, 29.24.

1.35.31.331. Azle Reynolds. New measuring point, upper edge of USGS washer on south inside edge of wooden curbing on north side of well, near center, 0.66 foot above land surface datum. Water level, in feet below land surface datum, 1939: Jan. 18, 29.35.

1.35.31.341. W. M. Drinkard. Bench mark, surface of old concrete engine base, 15 feet east of well, at southwest corner, 0.33 foot above measuring point. Water level, in feet below land surface datum, 1939: Jan. 18, 29.78.

1.35.31.342. E. F. Moore. Water level, in feet below land surface datum, 1939: Jan. 18, 29.21.

1.35.31.421. H. Beebe. Water level, in feet below land surface datum, 1939: Jan. 18, 28.42.

1.35.32.112. George and King. Bench mark, surface of old concrete engine base, 20 feet west of well, 0.42 foot above measuring point. Measuring point changed. New measuring point could not be accurately referenced to old; possible discrepancy of several tenths of a foot with preceding record. Water level, in feet below land surface datum, 1939: Jan. 18, 28.54.

1.35.32.211. H. M. Livingston. Water level, in feet below land surface datum, 1939: Jan. 18, 27.75. Well filled; measurements discontinued.

a Measuring point changed. New measuring point could not be accurately referenced to old; possible discrepancy of several tenths of a foot with preceding record.

## Roosevelt County--Continued

1.35.32.311. Lee Carter. Water level, in feet below land surface datum, 1939: Jan. 18, 25.97.

1.35.32.332. Lee Carter. Water level, in feet below land surface datum, 1939: Jan. 21, 26.60.

1.35.32.411. N. W. Kiker. Water level, in feet below land surface datum, 1939: Jan. 18, 24.33.

1.35.33.112. Roy Newberry. Water level, in feet below land surface datum, 1939: Jan. 18, 30.39.

1.35.33.331. S. E. Lane. Bench mark, upper edge of USGS washer on south side of power line pole, 60 feet southwest of well, 1.03 feet above measuring point. Water level, in feet below land surface datum, 1939: Jan. 18, 23.29.

1.36.5.3. Owner unknown. Used drilled stock windmill well, diameter 6 inches. Measuring point, top edge of casing at north side, 1.0 foot above land surface datum. Water levels, in feet below land surface datum, 1939: May 23, 35.60; July 20, 35.69; Sept. 23, 35.80; Nov. 17, 35.80.

1.36.6.1. -----. Used drilled stock well, diameter 4 inches. Measuring point, top edge of casing at west side, 1.5 feet above land surface datum. Equipped with windmill. Water levels, in feet below land surface datum, 1939: May 23, 40.44; July 20, 40.55; Sept. 23, 40.92; Nov. 17, 40.69.

1.36.16.1. -----. Used drilled stock well, diameter 8 (?) inches. Measuring point, top edge of casing at west side, 2.00 feet above land surface datum. Equipped with windmill, surrounded by four stock tanks and stock pen. Windmill tower painted red. Water levels, in feet below land surface datum, 1939: May 23, 23.15; July 20, 21.79; Sept. 23, a/24.00; Nov. 17, 21.39.

2.34.1.114. E. C. Murrill. Bench mark, surface of concrete pump base, 0.08 foot below measuring point. Water level, in feet below land surface datum, 1939: Jan. 20, 27.75.

2.34.1.133. Hugh Knox. Bench mark, top of 2 by 2-inch hub in ground, 1.0 foot east of north gate post, 15 feet north of northwest corner of pump shed, 3.14 feet above measuring point. Water level, in feet below land surface datum, 1939: Jan. 19, 27.14.

2.34.1.221. Foy Williams. Water level, in feet below land surface datum, 1939: Jan. 17, 29.75.

2.34.1.442. Geo. Parrish. Measurements discontinued.

2.34.2.233. Mr. Trout. Recorder well.

Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 17	42.09	May 19	42.25	Sept. 23	43.16
Mar. 14	41.83	July 20	43.60	Nov. 18	42.64

2.34.4.441. -----. On west side of small intermittent lake, east side of Portales-Roswell highway, by culvert, 1.5 feet east of fence post painted orange. Unused hand auger well, diameter 2 inches, depth 11 feet. Measuring point, top edge of casing at north side, 0.17 foot below land surface datum. Bench mark 1, top of  $\frac{1}{2}$ -inch iron pipe in ground, 0.70 foot east of above-mentioned post, 0.13 foot below measuring point. Bench mark 2, top surface of concrete culvert at center, on east side of highway, 6.46 feet above measuring point.

Water level, in feet below land surface datum, 1939

Jan. 26	3.87	May 18	3.99	Sept. 21	5.11
Mar. 14	4.13	July 18	5.33	Nov. 18	4.90

a Pumping approximately 3 gallons a minute.



## Roosevelt County--Continued

2.34.6.321. Water level, in feet below land surface datum, 1939:  
Jan. 14, 24.40.

2.34.6.412. Mr. McCalip. Measuring point and bench mark described in Water-Supply Paper 845. Bench mark, 0.39 foot below measuring point. Corrected measurements given below.

Water level, in feet below land surface datum, 1935-39

Date	Water level	Date	Water level	Date	Water level
Jan. 14, 1935	22.21	Feb. 16, 1936	23.11	Jan. 13, 1937	22.65
Feb. 16	22.27	Mar. 19	23.18	Feb. 19	22.84
Mar. 16	22.32	Apr. 20	23.47	Mar. 18	23.01
Apr. 16	22.43	May 20	23.76	Apr. 22	23.14
May 19	22.48	June 25	a 19.33	Feb. 11, 1938	21.03
June 16	22.58	July 20	22.01	Jan. 14, 1939	b 21.58
Aug. 12	24.20	Aug. 23	22.02	Mar. 13	21.81
Sept. 17	22.26	Sept. 21	22.11	May 18	21.98
Oct. 20	22.74	Oct. 20	22.17	July 18	22.09
Nov. 18	22.80	Nov. 22	22.36	Sept. 21	22.24
Jan. 13, 1936	23.21	Dec. 19	22.54	Nov. 17	22.41

2.34.6.421. Mr. McCalip. Unused drilled well, diameter 10 inches, depth 123 feet. Measuring point, upper edge of USGS washer on north-center side of south 4 by 4-inch cross brace, level with land surface datum. Bench mark, buried wooden box, northeast corner, painted orange, 17 feet northwest of well, 5 feet south of road, 0.19 foot above measuring point. Water level, in feet below land surface datum, 1939: Jan. 14, 18.90.

2.34.10.343. H. J. Bollen. Water level, in feet below land surface datum, 1939: Jan. 17, 35.64.

2.34.12.143. ----- Used dug domestic well, depth shallow. Measuring point, upper edge of USGS washer on west top side of east 2 by 4-inch board near center, inside of wooden box around top of well, 2.5 feet above land surface datum. Water level, in feet below land surface datum, 1939: Jan. 25, 18.09.

2.34.12.231. W. M. White. Water level, in feet below land surface datum, 1939: Jan. 25, 10.98.

2.34.13.111. Mr. Partin. Used dug and drilled irrigation well. New well, approximately 200 feet southwest of old well. Measuring point, top north edge of south 8-inch angle iron cross brace, 0.7 foot east of south vertical frame post, level with land surface datum. Water level, in feet below land surface datum, 1939: Jan. 17, 17.32.

2.34.14.113. E. E. McNew. Bench mark, surface of concrete well curb, south side of well, just south of pump, 1.87 feet above measuring point. Water level, in feet below land surface datum, 1939: Jan. 17, 29.03.

2.34.14.412. N. R. Blackard.

Water level, in feet below land surface datum, 1939

Jan. 17	25.47	May 19	25.52	Sept. 21	25.29
Mar. 14	25.56	July 19	25.54	Nov. 18	25.41

2.34.14.443. Well 2.34.14.434 in Water-Supply Paper 845. J. M. Shim. Measuring point, top of 3/4-inch hole in base flange of pump at west side, 0.41 foot above land surface datum. Water level, in feet below land surface datum, 1939: Jan. 17, 35.87.

2.34.15.212. R. R. Rogers. Bench mark, upper edge of USGS washer on east side of south 4 by 4-inch vertical discharge trough support, 3 feet west of well, 0.56 foot above measuring point.

Water level, in feet below land surface datum, 1939

Jan. 17	31.60	May 19	31.20	Sept. 21	33.70
Mar. 14	31.24	July 19	34.02	Nov. 18	31.48

a Measurement probably inaccurate.

b Pump removed.

## Roosevelt County--Continued

2.35.4.111. Mr. Hampton. Bench mark, surface of old buried concrete weir box, painted orange, east side, just east of engine, 20 feet west of well, 1.04 feet above measuring point.

Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 18	23.15	May 19	22.49	Sept. 21	24.89
Mar. 13	22.87	July 20	(a)	Nov. 18	22.29

2.35.5.231. G. W. Atkins. Measurements discontinued.

2.35.5.311. H. G. Black. Water level, in feet below land surface datum, 1939: Jan. 18, 23.54.

2.35.5.341. Mr. Sadler. Measuring point changed. New measuring point could not be accurately referenced to old; possible discrepancy of several tenths of a foot with preceding record. Water level, in feet below land surface datum, 1939: Jan. 18, 24.05.

2.35.5.343. Mr. Sadler. Water level, in feet below land surface datum, 1939: Jan. 18, 22.25. Measurements discontinued.

2.35.6.121. Wayne Culpepper. Bench mark, surface of concrete pump base, 0.06 foot below measuring point.

Water level, in feet below land surface datum, 1939

Jan. 18	27.79	May 19	27.07	Sept. 21	29.18
Mar. 13	27.20	July 20	29.79	Nov. 18	27.79

2.35.6.213. J. B. H. Young. Bench mark, top of weir box, at "C" of contractor described on top of east side of box, 15 feet southeast of well, 0.71 foot above measuring point. Water level, in feet below land surface datum, 1939: Jan. 18, 27.46.

2.35.6.312. Ray Snelson. Water level, in feet below land surface datum, 1939: Jan. 18, 25.36.

2.35.6.331. E. T. Moody. Bench mark, surface of concrete pump base, 0.08 foot below measuring point. Measuring point changed. New measuring point could not be accurately referenced to old, possible discrepancy of several tenths of a foot with preceding record. Water level, in feet below land surface datum, 1939: Jan. 18, 23.08.

2.35.6.411. J. L. Bowman. Used drilled irrigation well, diameter 12 inches, depth 113 feet. Measuring point, top of east 3/4-inch hole in north side of base flange of pump, level with land surface datum. Water level, in feet below land surface datum, 1939: Jan. 18, 25.15.

2.35.6.443. B. H. Howard. Bench mark, upper edge of USGS washer on southeast corner of horizontal buried 6 by 6-inch timber, 8 feet west of well, 5.73 feet above measuring point. Measuring point changed. New measuring point could not be accurately referenced to old, possible discrepancy of several tenths of a foot with preceding record. Water level, in feet below land surface datum, 1939: Jan. 18, 23.37.

2.35.7.134. Mr. Kelly. Bench mark, top of 2 by 2-inch hub in ground, 23.5 feet south of well in line with windmill in that direction, 0.10 foot above measuring point. Water level, in feet below land surface datum, 1939: Jan. 17, 33.00.

2.35.7.311. Reba Harrington.

Water level, in feet below land surface datum, 1939

Jan. 17	15.74	May 19	b 15.47	Sept. 21	16.48
Mar. 13	15.62	July 20	16.20	Nov. 18	16.12

2.35.8.331. F. W. Nullmyer. Water level, in feet below land surface datum, 1939: Jan. 17, 26.75.

a Pumping.

b Windmill removed.

## Roosevelt County--Continued

2.35.9.211. Tom Maxwell. Unused dug and drilled irrigation well. Measuring point, upper edge of USGS washer on top inside edge of wooden curb, north side of pit, just east of north vertical frame post, level with land surface datum. Bench mark, surface of old concrete house foundation, at northwest corner, painted orange, 0.54 foot above measuring point.

Water level, in feet below land surface datum, 1938-39

Date	Water level	Date	Water level	Date	Water level
Nov. 7, 1938	19.11	May 19, 1939	17.13	Sept. 21, 1939	17.59
Jan. 18, 1939	18.94	July 20	17.10	Nov. 18	18.04
Mar. 13	19.00				

2.35.14.244. ----- Three feet west of fence post painted orange, which is approximately 20 feet north of east-west fence line and gate. Unused bored well, diameter 2 inches, depth 8.5 feet. Measuring point, top north edge of casing, level with land surface datum. Bench mark, top of 2 by 2-inch hub in ground, 1.0 foot west of well, 4 feet west of orange fence post, 0.04 foot above measuring point. Water levels, in feet below land surface datum, 1939: May 22, 2.27; July 19, 3.79; Sept. 21, 3.92; Nov. 18, 3.37.

2.35.14.313. ----- Four feet north of large corner fence post painted orange, 0.25 mile north of south side of section. Unused bored well, diameter 2 inches, depth 15.5 feet. Measuring point, top edge of casing at north side, 0.17 foot below land surface datum. Bench mark, upper edge of USGS washer on north side of above corner fence post, 1.00 foot above measuring point.

Water level, in feet below land surface datum, 1939

Jan. 26	10.04	May 20	9.41	Sept. 21	11.07
Mar. 13	9.97	July 19	10.51	Nov. 18	11.08

2.35.15.131. ----- Two feet east of fence post painted orange, 0.35 mile south of north side of section along west section line, just south of caliche bluff, in meadow. Unused bored well, diameter 2 inches, depth 7.5 feet. Measuring point, top north edge of casing, 0.17 foot below land surface datum. Bench mark, top of  $\frac{3}{4}$ -inch pipe in ground, 1.0 foot west of well, 0.22 foot below measuring point.

Water level, in feet below land surface datum, 1939

Jan. 26	2.39	May 19	1.76	Sept. 21	3.36
Mar. 13	2.47	July 19	3.22	Nov. 18	2.74

2.35.16.333. ----- Two feet east of fence post painted orange, approximately 30 feet north of southwest corner of section. Unused bored well, diameter 2 inches, depth 14 feet. Measuring point, top edge of casing at north side, 0.33 foot below land surface datum. Bench mark, upper edge of USGS washer on east side of orange fence post, 0.78 foot above measuring point.

Water level, in feet below land surface datum, 1939

Jan. 26	7.46	May 20	6.81	Sept. 21	8.65
Mar. 13	7.67	July 20	8.20	Nov. 18	8.32

2.35.18.211. ----- Situated 1.5 feet south of fence post painted orange. Unused bored well, diameter 2 inches, depth 11 feet. Measuring point, top edge of casing at north side, 0.33 foot below land surface datum. Bench mark, top of pipe driven in ground, 0.60 foot south of orange fence post, 0.27 foot above measuring point.

Water level, in feet below land surface datum, 1939

Jan. 26	4.34	May 20	4.13	Sept. 21	5.91
Mar. 13	4.42	July 20	5.67	Nov. 18	5.21

2.35.19.134. ----- Unused in 1939.

Water level, in feet below land surface datum, 1939

Jan. 17	29.59	May 19	29.37	Sept. 21	28.79
Mar. 13	29.49	July 19	28.97	Nov. 18	28.84

## Roosevelt County--Continued

2.35.25.123. Dr. Buchanan. Measuring point, upper edge of USGS washer on top south edge of north 6 by 6-inch stringer, 1.3 feet west of north vertical frame post, 0.50 foot above land surface datum.

Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 20	20.98	May 19	21.18	Sept. 21	22.03
Mar. 13	21.02	July 19	21.69	Nov. 18	21.94

2.36.8.432. S. W. Davis. Used dug and drilled irrigation well, diameter 14 inches, depth 115 feet. Measuring point, top of north edge of north steel channel across pit, 1.25 feet west of north vertical channel, level with land surface datum. Bench mark, surface of concrete curb, west side of pit, 0.57 foot below measuring point.

Water level, in feet below land surface datum, 1938-39

Nov. 13, 1938	18.75	May 20, 1939	18.98	Sept. 21, 1939	20.20
Jan. 20, 1939	18.79	July 19	(a)	Nov. 18	19.44
Mar. 13	18.68				

2.36.9.431. Tom Polly. Used dug and drilled irrigation well, diameter 12 inches, depth 144 feet. Measuring point, upper edge of USGS washer on east top edge of west 6 by 8-inch cross brace, 2 feet south of west vertical frame post, 1.0 foot above land surface datum. Water levels, in feet below land surface datum: Nov. 13, 1938, 20.14; Jan. 20, 1939, 20.09.

2.36.18.341. F. H. Stokes. Unused in 1939.

Water level, in feet below land surface datum, 1939

Jan. 20	14.75	May 19	14.01	Sept. 21	15.06
Mar. 13	14.83	July 19	14.38	Nov. 18	15.50

2.36.20.321. W. O. Davis.

Water level, in feet below land surface datum, 1939

Jan. 20	13.72	May 19	(a)	Sept. 21	17.12
Mar. 13	13.50	July 19	(a)	Nov. 18	15.08

2.36.21.432. Ruelin McCarson. Used dug and drilled irrigation well, diameter 12 (?) inches, depth 110 feet. Measuring point, top edge of tin cemented into inside of south side of concrete curb near southwest corner of pit, level with top of curb and level with land surface datum. Water levels, in feet below land surface datum: Nov. 5, 1938, 14.28; Jan. 20, 1939, 14.44.

2.36.24.322. Mr. Hampton. Pump removed in 1938.

Water level, in feet below land surface datum, 1939

Jan. 20	16.24	May 20	16.10	Sept. 21	16.00
Mar. 13	16.19	July 19	15.99	Nov. 18	16.40

2.36.25.112. W. D. Pate. Used dug and drilled irrigation well, diameter 12 (?) inches, depth 90+ feet. Measuring point, top west edge of concrete curb on east side of pit, 1.0 foot north of southeast corner of pit, 1.00 foot above land surface datum. Water levels, in feet below land surface datum: Nov. 5, 1938, 14.85; Jan. 20, 1939, 14.82.

2.36.26.131. L. L. Bugg. Unused in 1939.

Water level, in feet below land surface datum, 1939

Jan. 20	11.46	May 20	11.25	Sept. 21	12.29
Mar. 13	11.41	July 19	11.52	Nov. 18	12.72

2.36.26.244. No measurements made in 1939.

2.36.26.311. G. S. Riley. Water levels, in feet below land surface datum: Nov. 5, 1938, 10.78; Jan. 20, 1939, 10.92.

a Pumping.

## Roosevelt County--Continued

2.36.27.111. B. L. Kennedy. Used dug and drilled irrigation well. Measuring point, top of concrete curb, center of north side, 1.00 foot above land surface datum. Water level, in feet below land surface datum, 1938: Nov. 5, 12.65.

2.36.27.131. B. L. Kennedy. Bench mark, upper edge of USGS washer in northeast side of forked fence post, directly west of well, west side of road, 2.11 feet above measuring point. Water level, in feet below land surface datum, 1939: Jan. 20, 12.97.

2.36.27.211. M. O. Pate. Water level, in feet below land surface datum, 1939: Jan. 20, 11.90.

2.36.27.311. J. M. Riley.

Water level, in feet below land surface datum, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 20	13.32	May 22	13.15	Sept. 21	15.20
Mar. 13	13.22	July 19	14.22	Nov. 18	14.73

2.36.28.114b. ----- Unused drilled well, diameter 12 inches, depth 20 feet. Water-stage recorder installed May 21, 1939.

Water level, in feet below land surface datum, 1939

Jan. 20	13.92	May 19	13.78	Sept. 21	15.19
Mar. 13	13.80	July 19	14.56	Nov. 18	15.22

2.36.28.411. C. A. Tivis. Water level, in feet below land surface datum, 1939: Jan. 20, 13.47.

2.36.28.421. C. A. Tivis. Bench mark, surface of northeast corner of concrete weir box, 6 feet west of well, 1.36 feet above measuring point. Water level, in feet below land surface datum, 1939: Jan. 20, 14.59.

2.36.28.441. Mr. Robinson. Water level, in feet below land surface datum, 1939: Jan. 20, 15.30.

2.36.34.221. W. H. Davenport. USGS washer at measuring point. Bench mark, surface of southwest corner of concrete weir box, 8 feet north of well, 2.35 feet above measuring point. New measuring point could not be accurately referenced to old; possible discrepancy of several tenths of a foot with preceding record. Water level, in feet below land surface datum, 1939: Jan. 20, 8.74.

2.36.34.341. W. J. Murrill. Water level, in feet below land surface datum, 1939: Jan. 20, 17.95.

2.36.34.421. J. F. Dacus. Used dug and drilled irrigation well. Measuring point, top north edge of south side of concrete curb, at point of "D" marked in curb, level with land surface. Water levels, in feet below land surface datum: Nov. 5, 1938, 8.98; Jan. 20, 1939, 8.58.

2.36.35.212. Mrs. Walker. Well redrilled and used moderately in 1939.

Water level, in feet below land surface datum, 1939

Jan. 20	8.32	May 20	8.07	Sept. 21	9.95
Mar. 13	8.15	July 19	8.97	Nov. 18	9.60

2.37.19.331. W. H. McDougal. Unused dug and drilled irrigation well, diameter 12 (?) inches, depth 92 feet. Measuring point, upper edge of USGS washer on top inside edge of wooden curbing, east side of well, one foot north of ladder, level with land surface datum. Water levels, in feet below land surface datum: Nov. 5, 1938, 18.39; Jan. 20, 1939, 18.64.

2.37.19.341. C. B. Anderson. Unused dug and drilled irrigation well, depth 68 feet. Measuring point, upper edge of USGS washer on top of west side of east 4 by 6-inch cross brace, just south of east vertical frame post, 0.50 foot above land surface datum. Bench mark, surface of concrete curb at point directly beneath and 0.45 foot below measuring point. Water levels, in feet below land surface datum: Nov. 5, 1938, 18.45; Jan. 20, 1939, 18.25.

## NEW YORK

### CENTRAL NEW YORK

By A. W. Harrington

Periodic water-level measurements in four wells in central New York were continued in 1939 by the Federal Geological Survey in cooperation with the New York State Department of Conservation, in connection with a study that is being made to determine the effects of reforestation on stream flow. Previous records are published in Water-Supply Papers 777, 817, 840, and 845. All the wells are equipped with automatic water-stage recorders, but only weekly observations are published herewith.

The land surface near the wells, which are in areas of similar topography and geology, is hilly, for the relief ranges from about 300 feet near the Sage Brook well to about 700 feet near the Shackham Brook, Cold Spring Brook, and East Homer Creek wells. The rocks of the region consist mostly of Paleozoic sandstones, shales, and limestones that are overlain by a thin mantle of glacial till. Small discontinuous deposits of alluvium also occur in the vicinities of the wells. Nearly all the unconsolidated deposits consist of unstratified glacial till that ranges from 1 foot to 30 feet in thickness, but at most places they are about 10 feet thick.

The chief water-bearing formation that the wells penetrate is the tough, compact glacial till, the pore spaces of which are small. As the water table stands close to the land surface near the wells, there is considerable evaporation and transpiration directly from the zone of saturation. As a result, fluctuations of water level in the wells are generally rapid and large.

Water levels in the four wells showed unusual fluctuations in 1939--both new high and low stages were recorded. Abnormally heavy precipitation in February caused the water levels to rise to high stages, where they were maintained throughout early spring. Unusually light precipitation in April and May resulted in a pronounced decline of water levels, and, although heavy rains occurred in June, the previous high stages were not again reached. From July through November, when the precipitation was below normal, the water levels in all the wells declined to the lowest stages on record. The Shackham well 1 became dry in early September and remained

so until early November. Water levels in the other wells reached their lowest stages in the latter part of October. The precipitation in December being heavy, the water levels rose to or nearly to their stages at the beginning of the year. Water levels in two of the wells made small net gains for the year.

Records of water level for the Shackham Brook well 1, Sage Brook well 2, and Cold Spring Brook well 1 are given in feet below the measuring points; the records for East Homer Creek well 1 are given in feet above an assumed datum.

#### Shackham Brook Well 1.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	0.51	Apr. 15	0.38	July 22	4.05	Oct. 14	(a)
14	.61	22	.66	29	4.26	21	(a)
21	1.13	29	1.14	Aug. 5	4.58	28	(a)
28	1.65	May 6	1.61	12	4.88	Nov. 1	6.13
Feb. 5	1.41	13	1.97	19	5.30	4	4.73
11	1.36	20	2.34	26	5.79	11	2.24
18	.42	27	2.60	Sept. 2	6.02	18	2.28
26	.38	June 4	2.61	9	6.14	25	2.71
Mar. 4	.43	10	3.15	16	(a)	Dec. 2	2.88
11	.48	17	2.94	23	(a)	9	1.23
18	.75	24	3.15	30	(a)	16	1.15
25	.34	July 1	3.34	Oct. 1	(a)	23	.56
Apr. 1	.33	8	3.45	7	(a)	30	.87
8	.28	15	3.68				

Sage Brook Well 2. Measuring point, about 1,452 feet (revised) above sea level. Gurley water-stage recorder installed July 20, 1935; replaced by Stevens water-stage recorder Aug. 8, 1939.

Water level, in feet below measuring point, 1939

Jan. 7	1.68	Apr. 15	1.48	July 15	4.28	Oct. 9	5.69
14	1.80	22	1.66	22	4.60	16	5.80
21	1.85	29	1.72	27	4.49	23	5.93
28	1.90	May 6	1.77	31	4.67	30	2.38
Feb. 4	1.87	13	1.82	Aug. 7	4.77	Nov. 6	1.90
11	1.86	20	1.95	14	5.02	13	1.75
18	1.72	27	1.96	21	5.19	20	1.98
25	1.70	June 3	2.35	28	4.94	27	2.09
Mar. 11	1.80	10	2.76	Sept. 4	5.04	Dec. 4	1.64
18	1.78	17	2.50	11	5.22	11	1.71
25	1.44	24	2.95	18	5.41	18	1.70
Apr. 1	1.76	July 1	2.28	25	5.60	25	1.69
8	1.76	8	3.97	Oct. 2	5.53		

Cold Spring Brook Well 1. Dug well, lined formerly with vitrified tile 18 inches in diameter, 12 feet deep, but relined with 18-inch corrugated galvanized-iron pipe June 20, 1939. Measurements made with hook rod and scale until Dec. 16, 1939, after which they were made by wetted-tape method. Measurements are distances to water level below zero of hook scale, about 2 feet above land surface, which is about 1,540 feet above sea level. Gurley water-stage recorder installed Oct. 24, 1934; replaced by Stevens water-stage recorder June 20, 1939.

Water level, in feet below measuring point, 1939

Jan. 1	7.50	Feb. 6	7.49	Mar. 13	5.33	Apr. 17	3.70
9	3.42	13	7.62	20	5.96	25	4.97
16	4.67	20	2.86	27	1.90	May 1	6.05
24	5.99	27	(b)	Apr. 3	3.12	8	6.91
30	7.10	Mar. 6	2.93	10	3.78	15	7.54

a Well considered dry when water level is more than 6.14 feet below measuring point.

b Water in well frozen.

## Cold Spring Brook Well 1.--Continued

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 22	7.97	July 17	9.89	Sept. 11	10.25	Nov. 6	4.27
29	8.22	24	9.92	18	10.61	13	3.91
June 5	8.56	31	9.66	25	10.88	20	5.41
12	8.75	Aug. 7	9.77	Oct. 2	8.86	27	6.49
20	a 10.92	14	9.93	9	6.45	Dec. 4	3.73
26	10.17	21	8.82	16	7.09	11	3.63
July 3	10.00	28	9.45	23	6.92	18	4.55
10	9.92	Sept. 4	9.95	30	3.74	26	3.86

## East Homer Creek Well 1.

Water level, in feet above zero of staff gage, 1939

Jan. 7	8.66	Apr. 8	8.38	July 15	5.39	Oct. 14	2.85
14	(b)	15	8.28	22	5.26	21	2.67
21	(b)	22	8.20	29	5.03	28	3.02
28	(b)	29	7.79	Aug. 5	4.93	Nov. 4	5.54
Feb. 4	(b)	May 7	6.32	12	4.70	11	7.48
11	(b)	13	6.14	19	4.65	18	5.91
18	(b)	20	5.79	26	4.41	25	4.82
25	(b)	27	5.74	Sept. 2	4.13	Dec. 2	5.23
Mar. 4	(b)	June 3	5.72	9	3.86	9	6.87
11	(b)	10	5.60	16	3.64	16	6.14
15	7.71	18	5.73	23	3.38	20	8.77
18	(b)	24	5.59	30	3.21	23	(b)
25	8.19	July 1	5.59	Oct. 7	3.04	30	(b)
Apr. 1	8.56	8	5.51				

## LONG ISLAND

By R. M. Leggette

The ground-water investigation on Long Island was continued during 1939 by the Federal Geological Survey in cooperation with the New York State Water-Power and Control Commission and with Nassau and Suffolk Counties. At the end of the year automatic water-stage recorders were in operation on about 25 observation wells. In addition to observations with these instruments, ~~water~~-level measurements were made weekly during the year in about 112 observation wells and monthly in 22 observation wells. A total of about 4,800 individual measurements of ground-water level were made during 1939.

In Water-Supply Paper 845 temporary well numbers were used for some observation wells. In the present report each well is designated by an official number based on a well-numbering system in general use on Long Island, and the temporary well number, if such was previously used, is given following the official number. Descriptive data are given only for those observation wells at which some change was made in 1939 or for wells whose records were not given in Water-Supply Paper 845.

a Well pumped dry between June 12 and June 20; recovery was very slow and subsequent readings may be affected.  
b Frozen.



The following table summarizes data pertaining to ground-water levels on Long Island:

Summary of ground-water-level data for Long Island, N. Y.

Well No.	First measured	Lowest observed water level with reference to mean sea level		Highest observed water level with reference to mean sea level		Net change in water level during 1939 (feet)
		Water level (feet)	Date	Water level (feet)	Date	
K 10	Nov. 8, 1937	-16.89	Sept. 30, 1939	-11.52	Mar. 26, 1938	+0.89
K 29	Nov. 8, 1937	-25.10	Sept. 16, 1938	-23.90	Apr. 9, 1938	....
K 30	June 14, 1935	-29.12	Sept. 1, 1939	a-24.34	June 14, 1935	-.69
K 65	Nov. 8, 1937	-28.34	Aug. 25, 1939	-24.01	Apr. 9, 1938	-.94
K 67	Nov. 8, 1937	-19.74	Dec. 23, 1939	-18.49	Mar. 26, 1938	-.82
K 87	Nov. 8, 1937	-9.02	Nov. 18, 1939	-7.33	July 7, 1939	-.63
K 92	Dec. 11, 1937	-29.69	Dec. 11, 1937	-23.06	Dec. 30, 1939	+1.22
K 203	Dec. 3, 1936	+2.99	Aug. 22, 1937	a+10.17	Apr. 10, 1939	....
K 463	Feb. 26, 1938	+1.46	Dec. 30, 1939	+6.18	Oct. 14, 1938	-3.16
K 532	May 29, 1935	-1.43	Dec. 30, 1939	-.17	Oct. 7, 1938	-.56
K 533	Sept. 8, 1932	-24.26	Oct. 2, 1937	a-14.22	Dec. 20, 1932	-.38
K 535	Nov. 5, 1936	+1.25	Apr. 9, 1938	+2.81	Sept. 30, 1938	....
K 537	Feb. 1, 1936	-7.07	Dec. 30, 1939	-4.77	Sept. 30, 1938	-1.09
K 921	Feb. 12, 1938	-27.23	Dec. 16, 1938	-22.77	Oct. 14, 1938	-.73
K 1057	Mar. 29, 1939	+4.51	Oct. 13, 1939	a+9.30	Mar. 30, 1939	....
K 1141	Oct. 24, 1936	-6.98	Dec. 30, 1939	-4.63	Sept. 30, 1938	-1.07
N 7	July 24, 1936	+6.21	Aug. 15, 1937	a+12.62	Mar. 18, 1937	+1.71
N 8	July 3, 1936	-21.82	Sept. 11, 1936	+24.43	Apr. 15, 1939	-1.38
N 9	July 3, 1936	+21.04	Sept. 11, 1936	+23.62	Sept. 23, 1938	-.88
N 53	Jan. 21, 1934	+12.37	Dec. 31, 1935	+16.59	Apr. 15, 1939	-2.30
N 66	Mar. 19, 1932	+3.63	Oct. 16, 1937	+11.04	Feb. 17, 1933	-.40
N 67	Mar. 16, 1932	+13.48	Aug. 15, 1937	a+18.85	Apr. 12, 1932	+1.87
N 125	Aug. 14, 1937	+7.20	Dec. 30, 1939	+9.32	Apr. 29, 1939	-.86
N 157	Sept. 22, 1932	+75.71	May 5, 1933	a+88.84	Oct. 31, 1939	+3.61
N 1101	Apr. 21, 1939	+44.18	Sept. 29, 1939	+45.64	Apr. 28, 1939	....
N 1102	Apr. 21, 1939	+57.60	Apr. 21, 1939	+58.64	July 28, 1939	....
N 1103	Apr. 21, 1939	+59.17	Dec. 29, 1939	+60.46	June 30, 1939	....
N 1104	Apr. 21, 1939	+59.02	Dec. 29, 1939	+61.15	June 2, 1939	....
N 1105	Apr. 21, 1939	+56.16	Dec. 29, 1939	+58.85	June 2, 1939	....
N 1106	Jan. 6, 1939	+51.63	Dec. 30, 1939	+54.82	May 20, 1939	-1.18
N 1107	Apr. 21, 1939	+44.34	Dec. 29, 1939	+48.21	Apr. 28, 1939	....
N 1108	Apr. 21, 1939	+39.29	Dec. 29, 1939	+43.62	Apr. 28, 1939	....
N 1109	Apr. 21, 1939	+26.26	Dec. 29, 1939	+30.04	Apr. 21, 1939	....
N 1110	Apr. 21, 1939	+18.96	Sept. 29, 1939	+21.05	Apr. 21, 1939	....
N 1111	Apr. 21, 1939	+11.95	Nov. 3, 1939	+13.83	June 2, 1939	....
N 1112	Jan. 6, 1939	+7.52	Aug. 19, 1939	+10.17	Apr. 8, 1939	-1.11
N 1113	Apr. 21, 1939	+3.98	Sept. 29, 1939	+6.76	Apr. 21, 1939	....
N 1114	Apr. 21, 1939	+8.30	Nov. 3, 1939	+11.87	Apr. 21, 1939	....
N 1115	Apr. 21, 1939	+8.94	Dec. 29, 1939	+12.93	Apr. 21, 1939	....
N 1126	Mar. 12, 1938	+56.85	June 24, 1938	+62.21	Apr. 29, 1939	-1.93
N 1132	Apr. 2, 1938	+6.64	Dec. 30, 1939	+9.77	Sept. 23, 1938	-1.88
N 1140	Jan. 7, 1939	+60.62	Dec. 30, 1939	+66.09	Apr. 29, 1939	-2.37
N 1147	Jan. 6, 1939	+17.03	Dec. 23, 1939	+19.72	Apr. 8, 1939	-1.28
N 1160	Jan. 7, 1939	+65.35	Dec. 30, 1939	+70.90	Apr. 15, 1939	-2.17
N 1167	Mar. 12, 1938	+10.19	Aug. 19, 1939	+12.92	Apr. 15, 1939	-1.23
N 1180	Mar. 5, 1938	+66.65	June 24, 1938	+71.55	Apr. 15, 1939	-1.22
N 1185	Apr. 2, 1938	+11.24	Aug. 19, 1939	+15.39	Apr. 8, 1939	-1.35
N 1198	Jan. 6, 1939	+66.86	Dec. 30, 1939	+70.49	May 6, 1939	-.52
N 1204	Jan. 6, 1939	+6.04	Dec. 30, 1939	+12.26	Apr. 8, 1939	-5.72
N 1216	Jan. 7, 1939	+65.93	Jan. 7, 1939	+69.16	May 20, 1939	+0.09
N 1222	Jan. 6, 1939	+1.39	Oct. 28, 1939	+9.67	Apr. 8, 1939	-5.06
N 1234	Jan. 7, 1939	+62.84	Dec. 23, 1939	+66.64	May 6, 1939	-.51
N 1240	Jan. 6, 1939	-.60	Sept. 23, 1939	+11.29	Apr. 8, 1939	-5.29
N 1242	Apr. 21, 1939	+27.22	Dec. 29, 1939	+27.77	Sept. 1, 1939	....
N 1247	Apr. 21, 1939	+75.26	Apr. 21, 1939	+76.98	July 28, 1939	....
N 1248	Jan. 7, 1939	+60.82	Dec. 30, 1939	+65.51	Apr. 15, 1939	-1.15
N 1250	Apr. 21, 1939	+45.53	Dec. 29, 1939	+49.64	Apr. 21, 1939	....
N 1251	Apr. 21, 1939	+37.17	Nov. 3, 1939	+40.18	Apr. 21, 1939	....
N 1253	Jan. 6, 1939	+11.88	Oct. 28, 1939	+16.89	Apr. 8, 1939	-3.17
N 1255	May 12, 1913	+59.35	Nov. 28, 1936	+65.59	Apr. 15, 1939	-2.41

a Based on instrumental records of lowest daily water level.

Summary of ground-water-level data for Long Island, N. Y.--Continued

Well No.	First measured	Lowest observed water level with reference to mean sea level		Highest observed water level with reference to mean sea level		Net change in water level during 1939 (feet)
		Water level (feet)	Date	Water level (feet)	Date	
N 1256	May 12, 1913	+70.30	Feb. 27, 1933	+80.97	May 20, 1939	+0.23
N 1257	Aug. 17, 1932	+5.87	Oct. 7, 1932	+10.17	Apr. 8, 1939	-2.05
N 1258	Oct. 8, 1931	+33.68	Dec. 28, 1931	+39.58	Apr. 8, 1939	-1.68
N 1259	Feb. 5, 1909	+47.83	Jan. 24, 1933	+56.43	Apr. 29, 1939	-1.42
N 1260	June 6, 1903	+16.52	Dec. 20, 1916	+23.68	Apr. 8, 1939	-3.19
N 1261	Mar. 7, 1932	+3.74	Aug. 21, 1937	+8.47	Apr. 8, 1939	-3.31
N 1262	Oct. 5, 1931	+32.66	Oct. 5, 1932	+36.20	Apr. 8, 1939	-.99
N 1263	Nov. 3, 1911	+46.22	Oct. 31, 1932	+54.98	Apr. 22, 1939	-1.62
N 1264	Mar. 7, 1932	+4.08	Aug. 5, 1932	+9.41	Apr. 8, 1939	-3.98
Q 268	Apr. 21, 1933	+12.80	Aug. 21, 1933	a+17.53	Apr. 11, 1939	-.26
Q 273	Mar. 15, 1935	+4.32	July 11, 1937	a+8.47	Apr. 20, 1939	-.25
Q 287	Apr. 13, 1939	+4.60	Oct. 15, 1939	a+8.87	Apr. 19, 1939	....
Q 350	Mar. 17, 1937	-.82	Aug. 21, 1937	+3.51	Apr. 29, 1939	-1.94
Q 470	Sept. 21, 1933	-12.75	July 15, 1937	.....	.....	+5.14
Q 503	Feb. 1, 1936	+10.43	Dec. 23, 1939	a+12.61	Apr. 30, 1939	-1.17
Q 543	May 17, 1932	+5.24	Aug. 25, 1938	a+10.48	Mar. 12, 1939	-1.70
Q 1089	Oct. 10, 1911	-.42	Oct. 17, 1932	+4.04	Sept. 23, 1938	....
Q 1090	Oct. 10, 1911	+1.19	Oct. 17, 1932	+8.29	May 12, 1913	-1.86
Q 1092	Apr. 8, 1939	+7.55	Aug. 19, 1939	+8.61	Apr. 8, 1939	....
S 28	Nov. 28, 1936	+93.11	Dec. 18, 1936	a+97.71	May 20, 1939	-.51
S 38	June 23, 1933	+19.69	Nov. 6, 1937	a+24.56	Sept. 23, 1938	-2.08
S 201	Apr. 16, 1937	+26.41	July 18, 1938	a+31.35	Apr. 23, 1939	-.62
S 202	Nov. 25, 1936	+36.93	Feb. 1, 1939	a+47.17	Apr. 10, 1937	-.72
S 203	Feb. 14, 1937	+70.64	Feb. 17, 1937	a+76.83	Oct. 31, 1939	+4.14
S 1803	Oct. 18, 1912	+14.94	Sept. 11, 1937	+18.19	Apr. 22, 1913	-.82
S 1804	Oct. 16, 1912	+10.10	Oct. 29, 1935	+11.47	Sept. 23, 1938	-.65
S 1805	Oct. 16, 1912	+37.90	Oct. 27, 1932	+47.01	Apr. 8, 1939	-3.11
S 1806	Oct. 18, 1912	+50.61	Jan. 5, 1933	+61.69	Apr. 22, 1939	-1.42
S 1807	Oct. 19, 1912	+20.59	Sept. 12, 1932	+23.48	Oct. 14, 1938	-.87
S 1808	Oct. 21, 1912	+9.45	Sept. 12, 1932	+12.94	Sept. 23, 1938	-.69
S 1809	Oct. 21, 1912	+25.00	Nov. 2, 1932	+32.56	Apr. 15, 1939	-2.76
S 1810	Oct. 21, 1912	+45.24	Feb. 23, 1933	+56.19	Apr. 29, 1939	-1.57
S 1811	Feb. 28, 1937	+55.19	Aug. 28, 1937	+58.76	Nov. 11, 1939	+1.51
S 1812	Apr. 17, 1937	+49.15	Feb. 12, 1938	+54.87	May 27, 1939	-.62

The water level in most of the observation wells was lower at the end of 1939 than at the beginning of the year. Most of the wells in which the water level showed a net rise during the year are either deep artesian wells or wells in the west end of Long Island, where changes in rate of pumping nearby greatly affect the fluctuations of water level in them. In Kings County, on the west end of the Island, where overdevelopment has lowered the water level below sea level, further progressive decline took place during 1939. This is indicated by the foregoing table, which shows that the water levels in most of the observation wells in Kings County reached the lowest stages on record during the last half of 1939. The highest observed water levels in most of the observation wells on Long Island for the entire period of record occurred during the spring or early summer of 1939.

a Based on instrumental records of lowest daily water level.

For several years much concern has been felt on Long Island because of the overdevelopment of ground-water resources of the western part of the Island. The excessive draft in Kings County has lowered ground-water levels to below sea level over an area of more than 40 square miles--in places to more than 29 feet below sea level. This extensive decline has resulted in considerable encroachment of salt water. The regional draw-down has, of course, spread laterally, although opinion differs greatly as to the distance that the effect has extended eastward on the Island.

The rise and fall of ground-water levels reflect changes of storage in underground reservoirs. As with surface reservoirs, the quantity of water stored in underground reservoirs varies with the amount of intake or recharge and with the amount of discharge or withdrawal. If recharge is in excess of discharge, ground-water storage will increase and ground-water levels will rise. Conversely, if discharge is greater than recharge, ground-water storage will decrease and ground-water levels will decline. Overdevelopment of the ground-water resources of an area will therefore invariably result in a progressive decline of ground-water levels. On the other hand, ground-water levels in areas where overdevelopment has not been critical will display no persistent downward trends. In critical areas, or in areas that may become critical, it is therefore desirable to follow systematically the trends of ground-water-level fluctuations.

In attempting to determine whether ground-water levels have declined progressively as a result of overpumping, one must consider all contributing factors of both recharge and discharge. Chief among the factors of recharge is precipitation, which largely determines the amount of recharge to the underground reservoir. Other factors being equal, ground-water levels will rise during or following periods of heavy precipitation and will decline during or following periods of deficient precipitation. Thus, if over a period of years there is a net decline of ground-water levels of the magnitude that might be expected because of differences of precipitation, such a decline does not indicate overdevelopment.

The trend of fluctuations of ground-water level can be observed in different ways. If periodic water-level observations are available for many wells, maps showing contours on the water table can be prepared from time to time and comparisons can be made among the maps. Such maps are very desirable for certain types of study because they show conditions over large areas on a particular date, but they have many disadvantages for determining the trend of ground-water-level fluctuations. Careful drawing

of the maps involves much work, is time consuming, and entails more or less personal interpretation. In many areas water-level measurements are not available at enough locations to provide adequate data for drawing the contours. Furthermore, an erroneous contour pattern may be obtained over a considerable area if data for one or more unsuitable wells are unknowingly used. Water levels in pumped wells, perched water-table wells, or artesian wells are obviously unsuitable for use in drawing contours on the water table because they do not indicate the true position of the main water table.

The trend of ground-water-level fluctuations may be indicated by a comparison of profiles showing water levels on different dates in a line of observation wells. The chief weakness of this comparison is that the fluctuations so shown are representative of only those in a relatively narrow band along the line of wells. This weakness can be overcome, of course, by establishing additional lines of wells; but in order to make comparisons that are representative of the area as a whole, some method for obtaining a mean of all the profiles must be used. Such a method is similar to the average water-level method described below.

Both contour and profile methods of studying ground-water-level trends are reasonably satisfactory for comparing water levels on perhaps two or three dates. Both methods become complicated, cumbersome, and confusing, however, when a comparison is made of water levels on more dates, especially on many successive dates. For example, if comparisons on a yearly basis are desired and the available records cover a period of 8 years, it would be rather difficult to obtain a clear comparison by superimposing eight profiles. If comparisons on a monthly basis are desired, the still greater number of profiles makes the comparisons even more complicated and confusing. Moreover, it may not be practicable to prepare contour maps and profiles once each month for determining changes in ground-water storage.

Trends of ground-water-level fluctuations with the passage of time are shown clearly by a simple graph in which water level is plotted against time. Such a graph shows at a glance the trends that have taken place during the period of record. If periodic measurements of water level in one observation well over a period of years are plotted against time, the graph will show the trends of the fluctuations in the area surrounding that well. An observation well in another part of the area may, of course, show somewhat different fluctuations because of differences of such factors as geology, topography, recharge, and discharge. If water-level data are

available for a sufficient number of adequately distributed observation wells, the areas represented by each well will overlap, and the total area that is represented by all the wells will be essentially equal to the entire area in which the observation wells are situated. Thus, if for any one date the measurements of water level in many observation wells distributed over an area are averaged, the result may be considered to represent the water level in a hypothetical well, in the vicinity of which such controlling factors as geology, topography, recharge, and discharge are the average for the area. The indicated fluctuations of water level in this hypothetical well are a measure of the average change in ground-water storage for the area as a whole. This is precisely the factor that is required in a study of the relation between recharge and overdevelopment.

The average water-level method of following ground-water-level trends has advantages over the other methods just mentioned. An average for any one date can be obtained quickly and without personal interpretation, which makes it feasible to keep currently informed from month to month as to the changes in ground-water storage, and thus provides a basis for studying the causes of changes in ground-water storage. The value for the average water level can be easily computed within a day or so after the individual water-level measurements have been made. If an unsuitable well is unknowingly included in determining the average, the value for the average water level is affected only in proportion to the total number of wells used. The method generally gives significant results with a much smaller number of observation wells than is needed for preparing a satisfactory contour map. Insofar as the number and distribution of observation wells is adequate, the method gives a close approximation of the true average position of the water table or piezometric surface in an area. As will be shown, even if the number of observation wells is relatively small the changes in ground-water storage from year to year may be indicated rather closely.

Obviously, the use of the average water-level method is limited. Many problems pertaining to ground-water levels can best be studied by means of contour maps and profiles. However, it is believed that the average water-level method constitutes an economical, a convenient, and a reliable method for following trends of ground-water-level fluctuations.

In the area east of Kings County, Long Island, are many observation wells in which periodic measurements of water level are made. The water-level data so obtained provide a basis for using the average water-level method to determine changes in ground water storage in the area. Such

changes in storage as may be indicated have a direct bearing on the question as to how far eastward the effect of excessive pumping in Kings County has extended or whether overpumping has taken place in the area in which the observation wells are situated.

The accompanying figure shows graphically the fluctuations of the average ground-water level on Long Island in the area east of Kings County. Before 1913, and during the period 1915 to 1918, measurements in several observation wells were made at irregular intervals; but the data are not adequate for the purpose of averaging. Unfortunately, no records of ground-water level are available for Long Island for the period 1919 to 1932. Measurements for 1912 to 1914 were made by the Department of Water Supply, Gas, and Electricity, of the city of New York. It should be noted that the graph in the figure shows fluctuations of water level with reference to an assumed datum and not with reference to mean sea level. Changes in ground-water storage indicated by this graph are in no way dependent upon the choice of any particular datum plane, because the changes would be the same irrespective of the datum used.

In a report by Meinzer and Stearns,<sup>1/</sup> individual water-level measurements in about 22 observation wells were averaged, and a curve was plotted showing average fluctuations for the entire drainage basin of about 90 square miles. This method of averaging water levels was later revised somewhat and developed further by Lohman,<sup>2/</sup> working in Pennsylvania.

In carrying out a program of periodic observations of water level in a group of wells it is inevitable that from time to time some wells will be destroyed or otherwise become unsatisfactory for purposes of observation. Moreover, it is often desirable to add observation wells to the program. Thus, if the measurements are to be used for determining averages, they should be expressed in such a manner that the effect on the averages of the dropping and adding of wells will be small. If the water levels are expressed with reference to mean sea level, the average water level may be appreciably changed if the altitude of the water level in the well being dropped or added is much greater or smaller than the average altitude. This objection can largely be overcome by arbitrarily assigning the same value to the water level in each well on a particular date and relating subsequent measurements to these assigned values.

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<sup>1/</sup> Meinzer, O. E., and Stearns, N. D., A study of ground water in the Pomperaug Basin, Conn.: U. S. Geol. Survey Water-Supply Paper 597-B, pp. 122-124, 1929.

<sup>2/</sup> Lohman, S. W., Investigations of the fluctuations of the ground-water table in Pennsylvania: Am. Geophys. Union Trans. 13th Ann. Meeting, pp. 373-375, 1932.

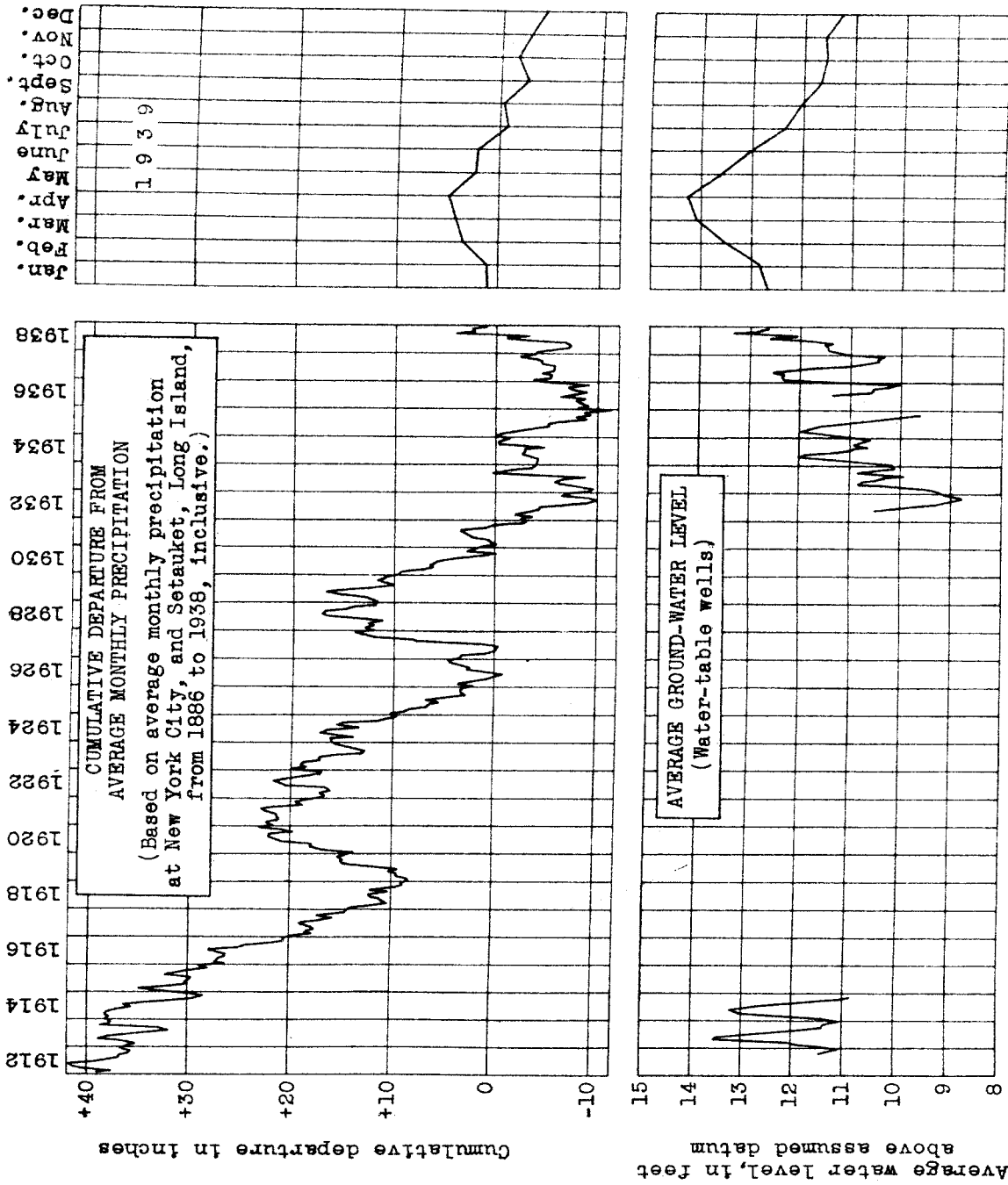


Figure 21.--Average ground-water level and cumulative departure from average monthly precipitation on Long Island, New York.

For the wells on Long Island, a zero datum was established 10.00 feet below the water level in each well on December 5, 1936. The altitude of the measuring point of each observation well, in terms of the assumed datum, was thus established as the depth to water level in the well on December 5, 1936, plus 10.00 feet. The date December 5, 1936, was chosen because the water levels were then at a low stage and because all the wells used for averaging were measured on that day. The measurements used for the averages prior to December 5, 1936, were not all made on the same day, although in general they were made within a period of about 1 week. The averages thus obtained were considered to represent the conditions on a day in about the middle of the period during which the measurements were made. This unavoidable procedure is believed to have introduced only minor inaccuracies into the results. Average water levels after 1936 are, with a few exceptions, based on measurements made on two successive days near the end of each month. Water-level measurements made before and after December 5, 1936, are all referred to the zero datum at each well. The average water level for each month was obtained by taking the arithmetical average of the sum of the individual water levels in the observation wells expressed in terms of the assumed datum.

The number of observation wells used for averaging each month was increased or decreased from time to time, depending on whether wells were added or deleted. In general, this affected the value for average water level very little. When a new well was added the water level in it was assigned a value equal to the average water level in all other wells on that date.

The observation wells on Long Island that are used for averaging are mostly driven wells of small diameter that were put down specifically for water-level observations. No pumped wells, perched water-table wells, or artesian wells are included in the averages. Most of the wells are in the central and southern part of the Island, in Queens, Nassau, and western Suffolk Counties. The area covered extends from Aqueduct, in Queens County, to Lake Ronkonkoma, in Suffolk County, a distance of about 40 miles. Of the 80 wells in the average at the end of 1939, 62 are in Nassau County, 15 in Suffolk County, and 3 in Queens County. The number of observation wells used for averaging ranged from 13 wells in 1913 to 80 wells at the end of 1939. The addition of new wells as they became available seemed desirable because, other things being equal, the greater the number of wells used the more nearly the computed average approaches the true average for



the area. The number, location, and distribution of observation wells used for averaging affects to some extent the value that is obtained for the average water level. Thus, it is to be expected that an average based on 13 wells will be somewhat different from an average based on 80 wells. The amount the average value is changed by adding new wells can be determined readily by a comparison of the average of water levels in one group of wells on a particular date with the average of a different group of wells on the same date. The following table gives such a comparison.

Comparison between averages of the water levels, in feet above an assumed datum, in different groups of observation wells						
Well group	Oct. 29, 1932	Oct. 30, 1935	Sept. 30, 1938	Apr. 29, 1939	July 1, 1939	Dec. 30, 1939
13 original wells used for 1913	8.58	9.63	13.50	14.56	13.44	11.54
20 wells used for Dec. 5, 1936	....	....	13.48	14.14	12.83	11.13
Total of 17 wells used for Oct. 29, 1932	8.78	9.53	13.31	14.29	13.04	11.21
Total of 18 wells used for Oct. 30, 1935	....	9.61	13.34	14.21	12.88	11.09
Total of 29 wells used for Sept. 30, 1938	....	....	13.35	14.11	12.81	11.06
Total of 61 wells used for Apr. 29, 1939	....	....	.....	14.26	13.01	11.20
Total of 62 wells used for July 1, 1939	....	....	.....	.....	13.01	11.22
Total of 80 wells used for Dec. 30, 1939	....	....	.....	.....	.....	11.26

The value given at the bottom of each column is the one used in the accompanying figure for that particular date. This table shows that the averages for the several groups of wells differ by only a few tenths of a foot. For example, on December 30, 1939, the average based on 80 wells was 11.26 feet above assumed datum, whereas the average on this date based on the 13 original wells used for averaging in 1913, was only 0.28 foot higher. This, and other examples in the above table, indicates that the averages based on the original 13 wells are in general slightly higher than the true average for the area as a whole. Thus, if a comparison is made between the high points for 1913 and 1939 on the average water-level graph, the net rise during the 26-year period was probably slightly greater--the graph indicates 0.3 foot--than that shown by the graph.

The relation between average ground-water level and precipitation is shown in the accompanying figure. The precipitation graph is based on the average of two stations about 50 miles apart and is believed to represent approximately the average precipitation in the intervening area. The observation wells on which the average ground-water-level graph is based are all within the area between the two precipitation stations. A comparison of the two graphs shows a rather close relation between the upward and downward trends of precipitation and ground-water level. The average ground-water level on any one date is, of course, more a function of the precipitation during the preceding few months or years than the precipitation during still earlier years or the long-time trends of departure. Thus, for example, it is not to be expected that ground-water levels would be lower in 1939 than in 1913 merely because the graph showing departures from normal precipitation has a major downward trend during that period.

In 1903 a detailed contour map of the water table covering about the west half of Long Island was prepared by the Burr-Hering-Freeman Commission.<sup>3/</sup> It seemed desirable to compare the data on this map with the average ground-water-level graph shown in the accompanying figure. The average water level on July 1, 1939, is based on measurements in 62 wells--52 in Nassau County, 9 in Suffolk County, and 1 in Queens County. The contour map of 1903 provides a basis for locating 55 of these wells (45 in Nassau County, 9 in Suffolk County, and 1 in Queens County) and for determining the altitude of the water table at those locations on July 1, 1903. The values determined in this manner were converted from Brooklyn Waterworks datum to mean sea level datum by adding 1.2 feet. As the altitude of the measuring points of these wells is known, it is therefore possible to express the values of 1903 in terms of assumed datum used in the accompanying figure. In this manner the average ground-water level on July 1, 1903, was determined to be 14.8 feet above assumed datum. Thus, during the 36-year period, July 1, 1903, to July 1, 1939, the ground-water level had a net decline of about 1.8 feet. Of the 55 locations used in determining the net change of water level during the 36-year period, about 16 are in areas that have at times been affected by nearby pumping. Therefore, as a check, average water levels for the two dates were determined without using the water levels at these 16 locations. The net decline for the 36-year period, as based on the averages of the 39 locations, was within a few hundredths of a foot of the net decline based on the 55 locations.

<sup>3/</sup> Burr, W. H., Hering, Rudolph, and Freeman, J. R., Report of the Commission on Additional Water Supply for the City of New York, pl. 8 opp. p. 810, New York, A. B. Brown Co., 1904.

The net average decline of ground-water level of about 1.8 feet during the 36-year period is of course the composite result of all the factors of recharge and discharge. In this connection consideration should be given to the departures from average precipitation during the different periods preceding July 1, 1903, and July 1, 1939. The following table provides a basis for comparing these departures.

Departure from average monthly precipitation on Long Island for different periods preceding July 1, 1903, and July 1, 1939<sup>a/</sup>

Period	Departure for periods preceding July 1, 1903 (inches)	Departure for periods preceding July 1, 1939 (inches)
1 month	+4.38	-0.10
2 months	+1.43	-2.60
3 months	+1.10	-2.04
6 months	+3.24	+1.20
1 year	+5.94	+5.46
1½ years	+7.27	+6.10
2 years	+10.45	+7.87
2½ years	+12.83	+7.83
3 years	+12.13	+8.42
4 years	+9.09	+7.25
5 years	+15.90	+4.94
6 years	+26.88	+8.82
7 years	+19.20	+6.46
8 years	+17.50	-.36
9 years	+18.16	-3.59
10 years	+13.81	-13.40

<sup>a/</sup> Figures are based on averages of monthly precipitation at New York City and Setauket, N. Y., from 1886 to 1938, inclusive.

It is apparent from this table that the precipitation during all the periods before July 1, 1903, was more above normal than it was during equivalent periods before July 1, 1939. Thus, it is to be expected that ground-water levels would be somewhat higher on July 1, 1903, than on July 1, 1939. The water-level data available for 1903 indicate that in areas where the water table was less than about 20 feet below the land surface, the excessive precipitation during June resulted in a rise of water levels of more than 1 foot in some localities.<sup>4/</sup> The water table

<sup>4/</sup> Burr, W. H., Hering, Rudolph, and Freeman, J. R., op. cit., pl. 6 opp. p. 792 and pl. 9 opp. p. 812.

on July 1, 1903, doubtless was higher, particularly in those parts of the Island where the water table was relatively near the land surface, than it would have been had the precipitation during June 1903 been normal. Furthermore, hydrographs for four wells covering the period 1898 to 1903 show that the water levels in them on July 1, 1903, were from about 0.4 foot to 1.8 feet higher than on July 1 of any of the preceding 5 years.<sup>5/</sup> If the contour map available for comparison had been based on measurements made on July 1, 1900, for example, instead of on July 1, 1903, the net decline of average water level for the 39-year period, 1900 to 1939, would doubtless have been much less than the decline of 1.8 feet indicated for the 36-year period, 1903 to 1939. Comparisons with ground-water-level data for still earlier years indicate also that July 1, 1903, was a time of unusually high ground-water levels. In 1867 a map showing contours on the water table in parts of Queens and Nassau Counties was published.<sup>6/</sup> A statement on page 59 of this report implies that the water-level measurements on which this map was based were made in the late fall of 1859 or early spring of 1860. A comparison of the data for 1903 with that of 1859-60 indicates that ground-water levels in 1903 were from 3 to 5 feet higher than in 1859-60,<sup>7/</sup> in spite of the fact that the precipitation during 1859 was more than 17 inches above normal. The low water level in 1859-60 appears to be the result of subnormal precipitation during the 3-year period preceding 1859.

The considerations given above appear to indicate rather clearly that the water table on Long Island was unusually high on July 1, 1903, and that the difference in average ground-water level on July 1, 1903, and July 1, 1939, is to a considerable extent the result of differences in antecedent precipitation.

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<sup>5/</sup> Op. cit., pl. 9 opp. p. 812.

<sup>6/</sup> Kirkwood, J. P., The Brooklyn waterworks and sewers, pl. 59, Brooklyn, D. Van Nostrand, 1867.

<sup>7/</sup> Burr-Hering-Freeman, op. cit., p. 821.

## Kings County

K 10.

Water level, in feet, with reference to mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	-14.77	Apr. 15	-13.92	July 14	-16.05	Oct. 14	-15.72
13	-15.15	21	-14.32	21	-16.22	21	-15.59
20	-14.68	28	-13.83	28	-16.73	28	-15.32
27	-15.14	May 5	-14.25	Aug. 4	-15.72	Nov. 4	-14.32
Feb. 3	-14.98	12	-14.44	11	-15.74	11	-14.48
10	-14.45	19	-14.44	18	-16.02	18	-13.96
17	-14.30	26	-14.09	25	-16.45	25	-13.73
24	-14.35	June 2	-15.15	Sept. 1	-16.41	Dec. 2	-13.30
Mar. 3	-14.80	9	-14.96	8	-16.16	9	-13.93
10	-14.82	16	-15.36	16	-15.77	16	-13.59
17	-15.04	23	-15.04	23	-16.26	23	-13.70
31	-14.33	30	-15.29	30	-16.89	30	-13.60
Apr. 8	-13.84	July 7	-15.06	Oct. 7	-15.47		

K 29. Measurements discontinued Mar. 24, 1939.

Water level, in feet, with reference to mean sea level, 1939

Jan. 6	-24.70	Jan. 27	-24.80	Feb. 17	-24.52	Mar. 10	-24.62
13	-24.68	Feb. 3	-24.54	24	-24.54	17	-24.72
20	-24.78	10	-24.50	Mar. 3	-24.59	24	-24.57

K 30.

Lowest daily water level, in feet below sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	28.10	27.81	27.61	27.61	27.45	27.57	28.26a	28.76	29.12	28.93	28.89	29.00
2	28.08	27.81	27.63	27.59	27.43	27.60	28.27a	28.78	29.11	28.88	28.92	28.99
3	28.05	27.80	27.64	27.56	27.45	27.61	28.27a	28.81	29.08	28.87	28.93	28.95
4	28.02	27.83	27.65	27.53	27.47	27.61	28.28	28.83	29.03	28.90	28.94	28.91
5	28.02	27.83	27.63	27.55	27.49	27.58	28.30	28.85	28.97	28.91	28.92	28.89
6	28.04	27.76	27.59	27.56	27.49	27.58	28.32	28.85	28.95	28.92	28.84	28.93
7	28.05	27.74	27.57	27.60	27.49	27.62	28.35	28.83	28.92	28.93	28.84	28.93
8	28.04	27.75	27.59	27.60a	27.46	27.64	28.37a	28.85	28.91	28.93	28.90	28.97
9	28.02	27.78	27.59	27.59	.....	27.67	28.37a	28.88	28.91	28.86	28.93	28.98
10	27.98	27.78	27.61	27.56	.....	27.70	28.37	28.91	28.89	28.85	28.93	28.95
11	27.99	27.78	27.62	27.50	.....	27.70	28.39	28.91	28.85	28.90	28.96	28.88
12	28.01	27.78	27.59	27.51a	27.53	27.69	28.43	28.92	28.86	28.91	28.95	28.86
13	28.02	27.72	27.53	27.52	27.53	27.72	28.45	28.92	28.90	28.93	28.90	28.89
14	28.00	27.69	27.55	27.53	27.53	27.78	28.49a	28.88	28.91	28.93	28.90	28.92
15	28.00	27.70	27.56	27.52	27.49a	27.81	28.51	28.92	28.92	28.93	28.93	28.92
16	27.97	27.76	27.59	27.52	27.49	27.85	28.51	28.93	28.92	28.87	28.96	28.89
17	27.92	27.76	27.61	27.50	27.52	27.89	28.51	28.96	28.91	28.87	28.99	28.86
18	27.91	27.73	27.62	27.47	27.56	27.89	28.53	28.98	28.87	28.90	28.99	28.83
19	27.91	27.72	27.62	27.45	27.56	27.89	28.56	28.99	28.85	28.91	28.99	28.80
20	27.92	27.68	27.58	27.49	27.57	27.91	28.60	28.98	28.89	28.93	28.94	28.83
21	27.92	27.66	27.54	27.50	27.57	27.95	28.63	28.96	28.92	28.93	28.93	28.84
22	27.91	27.67	27.57	27.50	27.53	27.99	28.64	28.98	28.94	28.90	28.97	28.87
23	27.87	27.69	27.59	27.51	27.52	28.03	28.65	29.01	28.94	28.85	28.99	28.88
24	27.84	27.69	27.60	27.47	27.57	28.06	28.64	29.02	28.93	28.87	28.97a	28.85
25	27.84	27.70	27.61	27.43	27.60	28.08	28.67	29.05	28.88	28.88	28.95a	28.82
26	27.85	27.69	27.61	27.45	27.61	28.08	28.71	29.06	28.88	28.89	28.95	28.79
27	27.87	27.62	27.56	27.48	27.62	28.11	28.73	29.06	28.91	28.89	28.90	28.76
28	27.88	27.62	27.54	27.49	27.61	28.15	28.75	29.04	28.94	28.90	28.92	28.78
29	27.87	.....	27.54	27.49	27.57	28.18	28.76a	29.05	28.95	28.90	28.96	28.79
30	27.81	.....	27.58	27.48	27.55	28.22	28.76a	29.08	28.95	28.86	28.99	28.80
31	27.79	.....	27.59	.....	27.55	.....	28.74a	29.11	.....	28.84	.....	28.79

a Estimated.

## Kings County--Continued

K 65.

Water level, in feet, with reference to mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	-24.55	Apr. 15	-24.35	July 14	-27.67	Oct. 14	-25.71
13	-24.65	21	-24.52	21	-27.94	21	-25.79
20	-24.68	28	-24.49	28	-28.02	28	-25.99
27	-24.64	May 5	-24.44	Aug. 4	-28.12	Nov. 4	-25.81
Feb. 3	-24.44	12	-24.51	11	-28.20	11	-25.70
10	-24.43	19	-24.42	18	-28.25	18	-25.71
17	-24.45	26	-24.46	25	-28.34	25	-25.75
24	-24.36	June 2	-24.41	Sept. 1	-27.89	Dec. 2	-25.67
Mar. 3	-24.49	9	-25.65	8	-26.63	9	-25.84
10	-24.49	16	-26.52	15	-26.30	16	-25.76
17	-24.51	23	-27.00	23	-26.08	23	-25.91
24	-24.40	30	-27.30	30	-25.94	30	-25.57
31	-24.41	July 7	-27.59	Oct. 7	-25.89		

K 67.

Water level, in feet, with reference to mean sea level, 1939

Jan. 6	-18.90	Apr. 28	-18.64	July 21	-19.00	Oct. 14	-19.54
13	-18.85	May 5	-18.63	28	-19.13	21	-19.62
27	-18.82	12	-18.65	Aug. 4	-19.08	28	-19.63
Feb. 3	-18.78	19	-18.62	11	-19.10	Nov. 4	-19.67
10	-18.72	26	-18.63	18	-19.23	11	-19.66
17	-18.70	June 2	-18.63	25	-19.29	18	-19.65
24	-18.75	9	-18.61	Sept. 1	-19.34	25	-19.67
Mar. 10	-18.73	16	-18.63	8	-19.43	Dec. 2	-19.66
17	-18.73	23	-18.65	16	-19.47	9	-19.67
24	-18.73	30	-18.65	23	-19.63	16	-19.70
31	-18.73	July 7	-18.85	30	-19.57	23	-19.74
Apr. 8	-18.63	14	-18.86	Oct. 7	-19.63	30	-19.72
21	-18.64						

K 87.

Water level, in feet, with reference to mean sea level, 1939

Jan. 6	-7.93	Apr. 8	-7.52	July 7	-7.33	Oct. 14	-8.98
13	-7.89	15	-7.50	28	-7.53	21	-8.92
20	-7.86	21	-7.48	Aug. 4	-7.60	28	-8.98
27	-7.85	28	-7.48	11	-7.63	Nov. 4	-8.93
Feb. 3	-7.79	May 5	-7.46	18	-7.70	11	-8.91
10	-7.74	12	-7.48	25	-7.76	18	-9.02
17	-7.72	19	-7.45	Sept. 1	-7.82	25	-8.92
24	-7.70	26	-7.41	8	-7.87	Dec. 2	-8.70
Mar. 3	-7.92	June 2	-7.39	16	-7.92	9	-8.56
10	-7.63	9	-7.38	23	-7.99	16	-8.77
17	-7.69	16	-7.36	30	-8.87	23	-8.73
24	-7.69	23	-7.33	Oct. 7	-8.82	30	-8.58
31	-7.61	30	-7.33				

K 92.

Water level, in feet, with reference to mean sea level, 1939

Jan. 6	-24.21	Apr. 8	-23.52	July 7	-23.94	Oct. 7	-24.38
13	-24.12	15	-23.37	14	-23.99	14	-24.33
20	-24.06	21	-23.40	21	-24.05	21	-24.25
27	-24.04	28	-23.35	28	-23.81	28	-24.21
Feb. 3	-23.93	May 5	-23.30	Aug. 4	-24.20	Nov. 4	-24.16
10	-23.89	12	-23.41	11	-24.24	11	-24.00
17	-23.84	19	-23.47	18	-24.25	18	-23.82
24	-23.80	26	-23.54	25	-24.29	25	-23.61
Mar. 3	-23.74	June 2	-23.64	Sept. 1	-24.32	Dec. 2	-23.40
10	-23.68	9	-23.73	8	-24.35	9	-23.21
17	-23.77	16	-23.79	16	-24.21	16	-23.14
24	-23.73	23	-23.82	23	-24.35	23	-23.07
31	-23.66	30	-23.85	30	-24.46	30	-23.06

## Kings County--Continued

K 203. As is indicated in the descriptive data for this well in Water-Supply Paper 840, the measured depth is much less than the reported depth, indicating that the well is partially filled. During 1939 observations were started on another well (K 1057) that ends in the same formation, about 3,000 feet northeast of K 203. A comparison of the water-level records for the two wells indicates clearly that K 1057 is the better observation well. Observations on K 203 have, therefore, been discontinued. The records show that the mean daily water level in K 203 is about 0.1 to 0.3 foot higher than that in K 1057. The lowest daily water level in K 203 is about 0.5 to 1.0 foot higher than that in K 1057.

Lowest daily water level, in feet above mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	Day	Jan.	Feb.	Mar.	Apr.	May
1	7.70	8.97	9.13	9.88	9.28	16	7.75	8.49	9.98	9.80	8.45
2	7.72	8.72	8.89	9.92	8.90	17	7.94	.....	9.74	9.68	8.40
3	7.60	8.90	.....	9.80	8.98	18	7.93	.....	9.55	9.87	8.14
4	7.78	8.84	9.15	9.68	9.15	19	8.65	.....	9.39	9.94	7.98
5	7.56	8.58	9.42	9.74	8.85	20	8.44	.....	9.47	9.58	7.77
6	7.85	8.90	9.69	9.85	8.81	21	8.40	9.25	9.45	9.34	7.92
7	7.55	9.26	8.93	9.87	8.85	22	8.53	9.32	9.57	9.25	8.03
8	7.54	9.09	8.68	9.90	8.88	23	7.65	8.92	9.45	9.08	8.09
9	7.42	8.89	9.15	10.13	8.88	24	8.16	9.10	9.60	9.05	7.98
10	7.88	9.12	9.47	10.17	8.82	25	7.85	9.02	9.93	9.23	7.81
11	7.62	8.91	9.54	10.16	8.63	26	7.76	9.32	10.03	9.33	7.64
12	7.43	8.87	9.77	9.86	8.34	27	8.35	9.07	9.93	9.37	7.78
13	7.47	8.93	10.10	9.48	8.26	28	8.34	9.08	10.05	9.37	7.92
14	7.70	9.03	9.93	9.56	8.23	29	8.39	.....	9.83	9.39	7.87
15	7.84	9.49	9.98	9.91	.....	30	8.43	.....	9.86	9.45	7.98
						31	9.14	.....	9.94	.....	7.91

K 463. J. S. and W. R. Eakins. Berry and North 10th Streets. Diameter 6 inches, measured depth 23.6 feet. Measuring point, top of 4-inch discharge pipe, 1.25 feet below top of 6-inch casing, 12.8 feet below curb level and 10.93 feet above mean sea level. Water level Feb. 26, 1938, 5.88 feet below measuring point and 5.05 feet above mean sea level.

Water level, in feet above mean sea level, 1938-39

Date	Water level	Date	Water level	Date	Water level
Feb. 26, 1938	5.05	Oct. 14, 1938	6.18	May 26, 1939	4.73
Mar. 5	5.07	21	5.13	June 2	4.66
12	4.96	28	5.02	9	4.67
19	4.91	Nov. 4	4.90	16	4.54
26	4.92	11	4.88	23	4.47
Apr. 2	5.01	18	4.78	30	4.44
9	5.25	25	4.69	July 7	4.29
16	4.75	Dec. 2	4.55	14	4.27
23	4.75	9	4.72	21	4.04
30	4.84	16	4.52	28	3.95
May 7	4.75	23	4.57	Aug. 4	3.91
14	4.78	30	4.62	11	3.57
21	4.58	Jan. 6, 1939	4.72	18	3.59
28	4.42	13	4.49	25	3.37
June 4	4.39	20	4.53	Sept. 1	3.36
11	4.39	27	4.53	8	3.43
18	4.38	Feb. 3	4.70	16	3.28
25	4.35	10	4.59	23	3.23
July 1	4.33	17	4.59	Oct. 4	3.10
8	4.35	24	4.73	11	2.60
15	4.35	Mar. 3	4.72	18	2.91
22	4.29	10	4.73	25	2.88
29	4.53	17	4.91	28	3.03
Aug. 5	4.60	24	5.05	Nov. 4	2.81
12	4.66	31	5.07	11	2.87
19	4.69	Apr. 8	5.08	18	2.85
26	4.71	15	5.22	25	2.72
Sept. 2	4.67	21	5.04	Dec. 2	2.82
9	4.77	28	4.98	9	1.97
16	4.90	May 5	4.96	16	1.84
23	5.16	12	4.80	23	1.57
30	5.31	19	4.82	30	1.46
Oct. 7	5.17				

a Estimated.

## Kings County--Continued

K 532.

Water level, in feet, with reference to mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	-0.89	Apr. 8	-0.39	July 8	-0.74	Oct. 7	-1.23
13	- .93	15	- .30	15	- .80	14	-1.26
20	- .98	22	- .25	22	- .86	21	-1.26
27	-1.02	29	- .22	29	-1.00	28	-1.29
Feb. 3	-1.01	May 6	- .23	Aug. 5	- .97	Nov. 4	-1.31
10	- .91	13	- .31	12	-1.03	11	-1.28
17	- .83	20	- .37	19	-1.08	18	-1.31
24	- .79	27	- .43	26	-1.08	25	-1.32
Mar. 3	- .76	June 3	- .49	Sept. 2	-1.10	Dec. 2	-1.34
10	- .71	10	- .55	9	-1.12	9	-1.36
17	- .64	17	- .60	16	-1.15	16	-1.38
24	- .56	24	- .65	23	-1.18	23	-1.41
31	- .47	July 1	- .71	30	-1.21	30	-1.43

K 533.

Lowest daily water level, in feet below sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	23.53	23.67	23.60	23.46	23.34	23.38	23.65	23.76	23.86	24.02	24.12	24.01
2	23.52	23.67	23.62	23.46	23.35	23.41	23.51	23.76	23.87	24.04	24.13	24.00
3	23.55	23.58	23.62	23.46	23.35	23.39	23.51	23.74	23.89	24.04	24.16	23.91
4	23.62	23.68	23.62	23.47	23.36	23.38	23.51	23.72	23.87	24.04	24.18	23.93
5	23.56	23.68	23.54	23.50	23.34	23.33	23.52	23.73	23.94	24.03	24.16	23.97
6	23.63	23.59	23.51	23.50	23.36	23.40	23.52	23.72	23.93	24.02	24.09	23.98
7	23.63	23.66	23.64	23.50	23.36	23.38	23.52	23.76	23.93	24.04	24.10	23.98
8	23.60	23.66	23.64	23.50	23.35	23.40	23.58	23.75	23.93	24.03	24.10	23.96
9	23.60	23.68	23.61	23.45	23.28	23.44	23.57	23.77	23.94	24.04	24.16	23.96
10	23.51	23.69	23.62	23.45	23.28	23.40	23.60	23.79	23.94	24.03	24.15	23.88
11	23.54	23.65	23.62	23.40	23.32	23.38	23.64	23.82	23.98	24.00	24.09	23.97
12	23.59	23.67	23.52	23.45	23.36	23.47	23.63	23.80	24.01	24.00	24.09	23.97
13	23.59	23.60	23.52	23.49	23.36	23.44	23.62	23.78	24.02	24.02	24.08	23.94
14	23.55	23.58	23.61	23.49	23.32	23.47	23.62	23.81	24.02	24.00	24.11	24.01
15	23.57	23.53	23.61	23.44	23.30	23.46	23.61	23.84	24.00	24.02	24.11	24.01
16	23.56	23.68	23.56	23.46	23.31	23.47	23.57	23.84	23.98	23.96	24.10	24.00
17	23.60	23.68	23.57	23.46	23.29	23.47	23.60	23.84	24.00	23.98	24.07	23.92
18	23.58	23.61	23.60	23.44	23.35	23.46	23.62	23.86	24.05	24.03	24.06	23.99
19	23.52	23.59	23.60	18.54	23.40	23.45	23.64	23.82	24.04	24.03	24.05	23.99
20	23.57	23.59	23.56	23.08	23.34	23.49	23.68	23.82	24.02	24.02	24.05	23.96
21	23.58	23.59	23.55	23.27	23.34	23.52	23.67	23.85	24.01	24.02	24.05	23.94
22	23.53	23.59	23.58	23.32	23.34	23.52	23.67	23.88	24.01	23.94	24.05	23.98
23	23.61	23.62	23.59	23.32	23.28	23.45	23.61	23.90	24.00	24.02	24.03	23.98
24	23.59	23.62	23.53	23.00	23.36	23.58	23.66	23.91	24.02	24.04	24.06	23.98
25	23.62	23.66	23.51	23.32	23.36	23.59	23.68	23.90	24.01	24.04	24.06	23.92
26	23.61	23.63	23.51	23.31	23.38	23.65	23.68	23.89	24.03	24.03	24.06	23.99
27	23.64	23.65	23.52	23.31	23.36	23.66	23.67	23.88	24.02	24.02	24.03	23.99
28	23.64	23.63	23.56	23.34	23.32	23.65	23.67	23.85	24.03	24.02	24.04	24.03
29	23.62	.....	23.57	23.32	23.35	23.65	23.71	23.87	24.03	24.08	24.04	24.03
30	23.59	.....	23.56	23.37	23.34	23.63	23.68	23.84	24.04	24.08	24.04	23.95
31	23.64	.....	23.46	.....	23.40	.....	23.74	23.84	.....	24.02	.....	23.91

K 535. Formerly K 535 No. 1. Measurements discontinued Aug. 12, 1939 because top of casing was covered over with dirt.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	2.03	Mar. 3	2.28	Apr. 29	2.57	June 24	2.09
13	1.98	10	2.31	May 6	2.55	July 1	2.13
20	1.93	17	2.40	13	2.47	8	2.02
27	1.89	24	2.50	20	2.41	15	1.99
Feb. 3	1.96	31	2.53	27	2.33	22	1.94
10	2.18	Apr. 8	2.60	June 3	2.26	29	1.84
17	2.25	15	2.65	10	2.18	Aug. 5	1.89
24	2.21	22	2.60	17	2.15	12	1.85



## Kings County--Continued

K 537. Formerly K 537 No. 5.

Water level, in feet, with reference to mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	-6.03	Apr. 8	-5.11	July 8	-5.77	Oct. 7	-6.62
13	-6.06	15	-5.02	15	-5.86	14	-6.65
20	-6.10	22	-5.01	22	-5.94	21	-6.70
27	-6.14	29	-5.05	29	-6.02	28	-6.74
Feb. 3	-6.06	May 6	-5.11	Aug. 5	-6.10	Nov. 4	-6.81
10	-5.80	13	-5.21	12	-6.18	11	-6.77
17	-5.69	20	-5.27	19	-6.24	18	-6.79
24	-5.64	27	-5.36	26	-6.26	25	-6.86
Mar. 3	-5.57	June 3	-5.43	Sept. 2	-6.32	Dec. 2	-6.90
10	-5.49	10	-5.50	9	-6.48	9	-6.92
17	-5.41	17	-5.57	16	-6.46	16	-6.98
24	-5.30	24	-5.64	23	-6.49	23	-7.03
31	-5.22	July 1	-5.71	30	-6.64	30	-7.07

K 921.

Water level, in feet, with reference to mean sea level, 1939

Jan. 6	-24.64	Apr. 8	-24.26	July 14	-24.72	Oct. 14	-24.49
13	-24.39	21	-24.33	21	-24.87	21	-24.96
20	-24.72	28	-24.27	28	-24.88	28	-25.14
27	-24.70	May 5	-24.31	Aug. 4	-24.86	Nov. 4	-25.04
Feb. 3	-24.60	12	-23.77	11	-24.67	11	-25.05
10	-24.58	19	-24.08	18	-24.95	18	-25.08
17	-24.50	26	-24.31	25	-25.00	25	-24.89
24	-24.47	June 2	-24.34	Sept. 1	-25.06	Dec. 2	-24.95
Mar. 3	-24.52	9	-24.36	8	-25.16	9	-24.92
10	-24.51	16	-24.42	16	-25.04	16	-25.01
17	-24.75	23	-24.67	23	-25.02	23	-25.05
24	-24.57	30	-24.60	30	-25.19	30	-24.94
31	-24.47	July 7	-24.70	Oct. 7	-25.05		

K 1057. Replaces K 203. Thomas F. White Estate (formerly New York Sanitary Utilization Co.) Barren Island, about 0.6 mile northeast of the Marine Parkway Bridge and about 800 feet from Jamaica Bay. Diameter 6 inches, depth about 720 feet. Measuring point, top of instrument shelf, 0.16 foot above 6-inch flange, 5.2 feet above land surface and 13.08 feet above mean sea level. Water level March 29, 1939, 3.99 feet below measuring point and 9.09 feet above mean sea level. Water level fluctuates about two feet with tide and with pumping from nearby wells.

Lowest daily water level, in feet above mean sea level, 1939  
(from recorder charts)

Day	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	....	9.01	8.48	....	....	5.94	5.48	5.25	5.38	6.37
2	....	9.02	8.11	....	....	5.81	5.27	5.32	5.35	6.77
3	....	8.87	8.14	a7.08	....	5.82	a5.33	5.69	5.42	6.60
4	....	8.72	8.37	7.14	....	5.88	a5.35	5.61	5.51	6.37
5	....	....	8.13	....	....	a5.77	5.51	5.39	6.24	6.41
6	....	....	7.99	....	....	....	a5.32	5.44	5.91	6.31
7	....	....	8.12	....	....	a5.96	a5.20	5.44	5.72	6.36
8	....	....	8.19	....	....	5.70	5.38	5.41	5.70	5.56
9	....	....	....	....	6.51	5.71	a5.27	5.37	5.22	5.53
10	....	....	....	a7.46	6.63	5.52	a5.28	5.36	5.32	6.17
11	....	....	8.11	7.28	6.46	5.36	a4.95	5.05	5.73	6.57
12	....	8.98	a7.88	7.08	6.35	5.21	a4.71	4.69	5.59	6.48
13	....	8.80	7.75	6.89	6.31	5.34	4.66	4.51	....	6.52
14	....	9.02	7.65	6.77	a6.31	5.28	a4.65	....	....	5.47
15	....	9.13	7.74	6.66	....	5.31	a4.59	....	....	5.19
16	....	8.96	7.77	6.58	....	5.28	a4.63	4.65	....	5.24
17	....	a8.96	7.73	6.62	....	5.24	a5.08	4.70	....	5.38
18	....	9.14	....	6.58	....	5.26	a5.08	4.53	a6.50	4.97
19	....	9.18	7.21	6.58	....	5.28	a5.14	4.91	6.61	5.23
20	....	8.80	6.99	6.71	....	5.58	a5.14	....	6.98	5.55
21	....	8.58	....	....	....	5.50	5.37	a5.72	7.13	4.80

a Estimated.

## Kings County--Continued

K 1057.--Continued

Lowest daily water level, in feet above mean sea level, 1939  
(from recorder charts)

Day	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
22	....	8.46	....	....	....	5.46	a5.08	5.80	6.96	4.52
23	....	8.28	....	....	....	5.31	4.68	5.33	6.40	4.52
24	....	8.28	....	....	....	a5.28	4.65	5.11	6.40	4.56
25	....	8.51	....	....	a6.28	5.27	4.79	5.10	6.81	5.13
26	....	8.67	....	a6.46	5.94	a5.26	5.06	5.51	6.93	5.19
27	....	8.70	....	....	....	5.23	5.14	5.52	6.58	5.13
28	....	8.81	....	....	6.11	5.38	a5.19	5.53	6.51	5.00
29	9.09	8.65	....	....	6.06	5.60	5.04	5.05	6.37	4.63
30	9.30	8.74	....	6.63	6.12	5.78	5.19	5.49	6.38	5.18
31	9.10	....	....	....	6.17	5.63	....	6.17	....	5.54

K 1141. Formerly K 537 No. 17.

Water level, in feet, with reference to mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	-5.96	Apr. 8	-5.01	July 8	-5.72	Oct. 7	-6.57
13	-5.98	15	-4.89	15	-5.80	14	-6.62
20	-6.02	22	-4.89	22	-5.89	21	-6.68
27	-6.06	29	-4.95	29	-5.97	28	-6.70
Feb. 3	-5.98	May 6	-5.02	Aug. 5	-6.06	Nov. 4	-6.68
10	-5.68	13	-5.12	12	-6.15	11	-6.70
17	-5.58	20	-5.20	19	-6.20	18	-6.73
24	-5.53	27	-5.28	26	-6.23	25	-6.79
Mar. 3	-5.46	June 3	-5.36	Sept. 2	-6.28	Dec. 2	-6.84
10	-5.37	10	-5.44	9	-6.31	9	-6.87
17	-5.30	17	-5.50	16	-6.39	16	-6.90
24	-5.17	24	-5.59	23	-6.47	23	-6.97
31	-5.12	July 1	-5.65	30	-6.51	30	-6.98

## Nassau County

N 7.

Lowest daily water level, in feet above mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	10.58	11.14	a11.30	12.15	11.51	a11.11	10.01	8.47	....	....	11.04	11.42
2	10.62	11.14	a11.25	12.24	11.46	a10.99	9.89	8.40	....	....	10.91	11.46
3	a10.62	11.38	a11.23	12.19	11.47	a10.88	9.84	8.40	....	....	10.79	11.71
4	....	11.35	11.23	12.12	11.52	10.89	9.85	8.38	....	a9.96	10.77	11.57
5	....	11.31	11.41	12.09	11.60	10.87	9.84	8.26	a8.67	10.06	10.81	11.46
6	10.54	11.40	11.58	12.09	11.63	10.78	9.77	8.23	8.62	10.15	11.20	11.37
7	10.53	11.38	11.41	12.08	11.67	10.72	9.73	8.22	8.65	10.22	11.14	11.37
8	10.60	11.28	11.37	12.07	11.67	10.72	9.73	8.20	8.75	10.20	11.16	11.38
9	10.57	11.17	11.38	....	11.69	10.73	9.71	8.21	8.77	10.24	10.98	11.36
10	10.63	11.16	11.46	....	....	10.65	9.63	8.15	8.82	10.33	10.98	11.48
11	10.72	11.28	11.42	....	....	10.63	9.52	8.04	8.86	10.42	11.10	11.29
12	a10.61	11.23	11.46	....	....	10.49	9.51	7.98	8.81	10.41	11.10	11.28
13	a10.60	11.29	....	....	a11.47	10.39	9.44	8.02	8.83	10.39	11.16	11.33
14	10.66	11.33	....	....	11.50	10.40	9.52	8.04	8.85	a10.40	11.13	11.26
15	10.58	11.39	....	a11.69	11.53	10.31	9.40	8.00	8.93	a10.33	11.09	11.20
16	10.58	a10.94	....	11.48	11.55	10.37	a9.31	8.01	8.99	10.32	11.13	11.21
17	10.61	a10.94	a11.70	11.43	11.58	10.32	a9.26	8.01	9.08	10.46	11.29	11.41
18	10.63	11.11	11.76	11.48	11.55	10.26	9.17	7.93	8.97	10.35	11.28	11.26
19	10.77	11.11	11.76	11.70	11.54	10.25	9.07	7.90	8.97	10.37	11.27	11.25
20	10.77	11.15	11.76	11.59	11.58	10.28	8.97	8.03	9.11	10.54	11.25	11.30
21	10.79	11.15	11.84	11.50	11.56	10.28	8.86	8.05	9.28	10.57	11.27	11.45
22	10.88	11.18	11.85	11.49	11.56	10.26	a8.83	8.02	9.35	10.72	11.35	11.28
23	10.93	11.10	11.85	11.46	11.55	10.30	....	7.96	9.37	10.78	11.49	11.16
24	10.93	11.10	11.85	11.47	a11.41	10.26	....	7.93	9.45	10.63	11.38	11.16
25	11.08	11.05	11.93	11.56	a11.39	10.19	....	7.94	9.47	10.57	11.33	11.21

a Estimated.

## Nassau County--Continued

## N 7.--Continued

Lowest daily water level, in feet above mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
26	11.01	11.05	11.93	11.53	all.36	10.09	....	7.93	9.54	10.62	11.33	11.11
27	10.95	all.12	11.94	11.53	all.32	10.02	....	7.94	9.54	10.72	11.43	11.10
28	10.90	all.12	11.93	11.46	11.40	10.00	....	7.98	9.65	10.84	11.47	11.04
29	10.95	.....	11.83	11.46	11.39	9.99	a8.51	8.07	9.65	10.70	11.42	11.02
30	11.08	.....	11.83	11.58	11.33	10.04	8.51	8.22	9.74	10.69	11.41	11.18
31	11.23	.....	12.18	.....	all.24	.....	8.52	....	....	10.91	.....	11.29

N 8. Measuring point raised 4.41 feet March 23, 1939 to prevent well from flowing. New measuring point, top of 6-inch flange, 5.1 feet above land surface and 28.40 feet above mean sea level. Water level March 24, 1939, 4.07 feet below measuring point and 24.33 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	23.55	Apr. 29	24.23	July 22	22.55	Oct. 15	22.05
13	23.50	May 6	24.12	29	22.50	21	22.05
20	23.42	13	23.95	Aug. 5	22.37	28	22.07
27	23.36	20	23.83	12	22.26	Nov. 4	22.11
Feb. 3	23.74	27	23.76	19	22.16	11	22.43
10	23.92	June 3	23.50	26	22.35	18	22.49
17	23.94	10	23.36	Sept. 2	22.33	25	22.38
24	23.97	17	23.36	9	22.22	Dec. 2	22.39
Mar. 24	24.33	24	23.22	16	22.19	9	22.27
31	24.32	July 1	23.16	23	22.05	16	22.23
Apr. 8	24.39	8	22.90	30	22.05	23	22.13
15	24.43	15	22.76	Oct. 7	22.18	30	22.17
22	24.33						

## N 9.

Water level, in feet above mean sea level, 1939

Jan. 6	22.23	Apr. 8	22.77	July 8	21.93	Oct. 7	21.29
13	22.10	15	22.73	15	21.80	15	21.15
20	22.06	22	22.66	22	21.53	21	21.13
27	22.02	29	22.56	29	21.42	28	21.19
Feb. 3	22.57	May 6	22.49	Aug. 5	21.36	Nov. 4	21.34
10	22.53	13	22.41	12	21.25	11	21.65
17	22.55	20	22.35	19	21.17	18	21.59
24	22.45	27	22.31	26	21.37	25	21.51
Mar. 3	22.63	June 3	22.20	Sept. 2	21.33	Dec. 2	21.48
10	22.61	10	22.14	9	21.29	9	21.41
17	22.71	17	22.18	16	21.21	16	21.38
24	22.66	24	22.10	23	21.14	23	21.36
31	22.70	July 1	22.10	30	21.15	30	21.31

## N 53.

Water level, in feet above mean sea level, 1939

Jan. 6	14.63	Apr. 8	16.50	July 8	14.41	Oct. 7	13.01
13	14.57	15	16.59	15	14.21	15	12.84
21	14.47	22	16.37	22	14.04	21	12.76
27	14.42	29	16.20	29	13.86	28	12.68
Feb. 3	14.78	May 6	16.05	Aug. 5	13.70	Nov. 4	12.56
10	15.22	13	15.83	12	13.53	11	13.11
17	15.32	20	15.68	19	13.39	18	13.11
24	15.36	27	15.49	26	13.53	25	12.99
Mar. 3	15.57	June 3	15.30	Sept. 2	13.39	Dec. 2	12.82
10	15.81	10	15.08	9	13.28	9	12.70
17	16.00	17	14.94	16	13.19	16	12.59
24	16.23	24	14.76	23	13.05	23	12.51
31	16.23	July 1	14.56	30	12.94	30	12.44

a Estimated.

## Nassau County--Continued

N 66.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	10.01	Apr. 8	9.58	July 8	9.90	Oct. 7	9.53
13	10.14	15	9.47	15	9.78	14	9.48
20	10.31	22	9.29	22	9.91	21	9.44
27	10.10	29	9.07	29	9.19	28	9.38
Feb. 3	10.22	May 6	8.91	Aug. 5	8.65	Nov. 4	9.44
10	9.28	13	10.30	12	8.61	11	9.84
17	10.35	20	8.66	19	8.78	18	9.85
24	9.60	27	10.15	26	9.40	25	9.92
Mar. 3	9.24	June 3	9.33	Sept. 2	9.62	Dec. 2	9.75
10	9.08	10	9.96	9	9.60	9	9.79
17	9.63	17	9.97	16	9.66	16	9.68
24	9.33	24	10.05	23	9.65	23	9.51
31	9.41	July 1	10.06	30	9.41	30	9.51

N 67.

Lowest daily water level, in feet above mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	17.12	17.35	17.51	18.24	18.11	17.48	16.65	15.31	15.26	16.42	17.24	17.79
2	17.16	17.35	17.40	18.30	17.96	17.40	16.48	15.18	15.25	16.42	17.13	17.91
3	17.12	17.63	17.39	18.23	18.00	17.34	16.41	15.22	15.23	16.49	17.06	18.15
4	16.97	17.45	17.43	18.14	18.11	17.39	16.41	15.25	15.25	16.58	17.04	17.96
5	16.96	17.42	17.68	18.10	18.06	17.35	16.35	15.15	15.28	16.60	17.15	17.89
6	17.11	17.58	17.82	18.11	17.99	17.27	16.25	15.08	15.20	16.67	17.49	17.85
7	17.07	17.59	17.49	18.12	18.00	17.23	16.23	15.04	15.24	16.70	17.42	17.85
8	17.10	17.49	17.35	18.13	17.98	17.27	16.26	15.01	15.36	16.65	17.43	17.80
9	17.07	17.39	17.54	18.12	18.08	17.28	16.24	15.06	15.39	16.72	17.22	17.78
10	17.22	17.39	17.53	18.12	18.11	17.23	16.18	14.96	15.48	16.77	17.21	17.95
11	17.21	17.44	17.52	18.26	17.97	17.22	16.08	14.88	15.45	16.82	17.32	17.83
12	17.03	17.41	17.83	18.07	17.79	17.03	16.09	14.83	15.40	16.82	17.30	17.80
13	17.03	17.50	18.02	17.84	17.77	16.95	16.06	14.89	15.41	16.79	17.34	17.93
14	17.23	17.53	17.80	17.84	17.83	17.01	16.19	14.92	15.46	16.75	17.29	17.78
15	17.14	17.70	17.79	17.93	17.81	16.90	16.09	14.91	15.52	16.67	17.23	17.67
16	17.14	17.24	17.97	17.82	17.88	16.96	15.98	14.91	15.57	16.67	17.36	17.74
17	17.19	17.22	17.87	17.78	17.94	16.95	15.94	14.94	15.59	16.76	17.50	17.97
18	17.21	17.45	17.76	17.95	17.85	16.84	15.88	14.87	15.46	16.65	17.50	17.81
19	17.43	17.49	17.67	18.19	17.82	16.82	15.80	14.84	15.51	16.71	17.55	17.82
20	17.33	17.57	17.75	18.03	17.86	16.89	15.68	15.03	15.66	16.87	17.55	17.94
21	17.33	17.50	17.82	17.93	17.86	16.83	15.58	14.99	15.83	16.89	17.64	18.07
22	17.45	17.53	17.84	17.91	17.91	16.81	15.57	14.93	15.90	17.14	17.80	17.81
23	17.13	17.40	17.78	17.85	17.90	16.89	15.63	14.86	15.94	17.07	17.78	17.73
24	17.17	17.42	17.93	17.86	17.73	16.81	15.57	14.82	15.99	16.90	17.72	17.73
25	17.19	17.29	18.00	18.01	17.65	16.77	15.52	14.85	16.05	16.86	17.72	17.85
26	17.12	17.40	18.07	18.02	17.62	16.62	15.46	14.85	16.12	16.98	17.76	17.75
27	17.08	17.38	18.02	18.05	17.63	16.53	15.43	14.87	16.14	17.06	17.84	17.73
28	17.04	17.40	18.01	18.02	17.78	16.54	15.42	14.96	16.26	17.14	17.82	17.73
29	17.13	.....	17.91	18.10	17.73	16.58	15.36	15.07	16.26	16.99	17.79	17.72
30	17.24	.....	17.94	18.23	17.70	16.71	15.39	15.27	16.40	17.00	17.81	17.92
31	17.45	.....	18.26	.....	17.66	.....	15.38	15.28	.....	17.37	.....	17.99

N 125.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	8.12	Mar. 4	8.51	Apr. 29	9.32	June 24	9.07
14	8.12	11	8.58	May 6	9.29	July 1	9.09
21	8.03	18	8.84	13	9.24	8	8.95
28	7.94	25	8.84	20	9.21	15	8.81
Feb. 4	8.14	Apr. 1	8.98	27	9.24	22	8.64
11	8.27	8	9.21	June 3	9.20	29	8.63
18	8.31	15	9.25	10	9.08	Aug. 5	8.72
25	8.31	22	9.32	17	9.08	12	8.60

## Nassau County--Continued

N 125.--Continued

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Aug. 19	8.45	Sept. 23	8.10	Oct. 28	7.74	Dec. 2	7.39
26	8.62	30	7.99	Nov. 4	7.65	9	7.35
Sept. 2	8.47	Oct. 7	8.00	11	7.66	16	7.28
9	8.43	14	7.87	18	7.57	23	7.29
16	8.27	21	7.79	25	7.48	30	7.20

N 157.

Lowest daily water level, in feet above mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	84.75	84.63	85.15	85.63	86.13	86.84	87.63	88.12	88.41	88.54	88.37	88.48
2	84.71	84.79	85.16	85.62	86.09	86.85	87.55	88.07	88.39	88.48	88.34	88.57
3	84.57	85.31	85.20	85.62	86.11	86.91	87.54	88.10	88.42	88.51	88.32	88.61
4	84.47	84.75	85.27	85.61	86.31	87.04	87.67	88.20	88.45	88.58	88.37	88.44
5	84.48	84.75	85.56	85.61	86.35	87.12	87.79	88.11	88.44	88.61	88.52	88.39
6	84.73	85.15	85.51	85.63	86.38	86.97	87.77	88.12	88.36	88.67	88.64	88.34
7	84.73	84.82	84.93	85.60	86.43	86.94	87.77	88.17	88.46	88.54	88.51	88.34
8	84.80	84.78	84.92	85.60	86.43	87.08	87.82	88.20	88.57	88.50	88.55	88.36
9	84.78	84.91	85.15	85.64	86.50	87.26	87.89	88.27	88.38	88.60	88.31	88.30
10	84.94	84.91	85.26	85.64	86.50	87.20	87.81	88.17	88.47	88.62	88.31	88.60
11	84.82	85.00	85.22	85.93	86.32	87.22	87.69	88.08	88.31	88.54	88.44	88.12
12	84.69	84.99	85.57	85.68	86.24	87.19	87.77	88.10	88.25	88.54	88.44	88.12
13	84.69	85.28	85.34	85.61	86.26	87.11	87.85	88.25	88.30	88.42	88.52	88.33
14	84.88	85.32	85.04	85.61	86.43	87.25	87.97	88.33	88.37	88.44	88.41	88.09
15	84.74	85.26	85.04	85.83	86.54	87.21	87.88	88.29	88.51	88.36	88.38	88.05
16	84.80	84.67	85.42	85.71	86.59	87.32	87.87	88.29	88.56	88.42	88.51	88.24
17	84.83	84.67	85.29	85.71	86.61	87.25	87.90	88.35	88.32	88.47	88.54	88.49
18	84.96	85.34	85.25	85.97	86.52	87.23	87.93	88.34	88.17	88.31	88.54	88.21
19	84.90	85.29	85.16	86.14	86.52	87.23	87.94	88.29	88.24	88.41	88.42	88.21
20	84.83	85.21	85.35	85.84	86.73	87.28	87.92	88.44	.....	88.65	88.42	88.39
21	84.85	85.15	85.48	85.80	86.75	87.33	87.89	88.41	.....	88.65	88.47	88.44
22	85.02	85.12	85.45	85.95	86.78	87.33	87.90	88.40	.....	88.77	88.58	88.21
23	84.62	85.01	85.41	85.95	86.80	87.34	88.06	.....	.....	88.44	88.47	88.13
24	84.75	85.09	85.60	86.07	86.62	87.40	88.07	.....	.....	88.31	88.37	88.23
25	84.75	85.01	85.59	86.25	86.62	87.47	88.04	.....	.....	88.33	88.32	88.33
26	84.72	85.19	85.59	86.21	86.72	87.44	88.03	88.39	88.45	88.56	88.36	88.14
27	84.82	85.10	85.50	86.20	86.80	87.43	88.04	88.40	88.45	88.63	88.53	88.14
28	84.76	85.10	85.46	86.13	87.07	87.51	88.09	88.46	88.48	88.40	88.52	88.09
29	84.98	.....	85.31	86.21	86.96	87.60	88.10	88.51	88.48	88.27	88.41	88.11
30	85.14	.....	85.49	86.37	86.94	87.74	88.13	88.52	88.66	88.36	88.46	88.47
31	84.76	.....	85.70	.....	86.95	.....	88.15	88.47	.....	88.84	.....	88.36

N 1101. Nassau County Department of Public Works. On north side of Valley Road, about 0.8 mile north of Willets Road, Manhasset. Diameter  $1\frac{1}{4}$  inches, depth 36.6 feet. Measuring point, top of pipe, 0.1 foot above land surface and 49.88 feet above mean sea level. Water level Apr. 21, 1939, 4.26 feet below measuring point and 45.62 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 21	45.62	June 30	44.66	Sept. 29	44.18	Dec. 1	44.58
28	45.64	July 28	44.24	Nov. 3	44.55	29	44.54
June 2	45.15	Sept. 1	44.42				

N 1102. Nassau County Department of Public Works. Forty-one feet north of Willets Road, and 149 feet west of Valley Road, Lake Success. Diameter  $2\frac{1}{2}$  inches, depth 140.0 feet. Measuring point, top of pipe, 0.3 foot above land surface and 185.82 feet above mean sea level. Water level Apr. 21, 1939, 128.22 feet below measuring point and 57.60 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 21	57.60	June 30	58.60	Sept. 29	58.51	Dec. 1	58.21
28	57.77	July 28	58.64	Nov. 3	58.31	29	58.10
June 2	58.25	Sept. 1	58.51				

a Estimated.

## Nassau County--Continued

N 1108. Nassau County Department of Public Works. At southwest corner of Jacob Street and Rosalind Avenue, Elmont. Diameter  $1\frac{1}{4}$  inches, depth 47.1 feet. Measuring point, top of pipe, 0.2 foot above land surface and 70.12 feet above mean sea level. Water level Apr. 21, 1939, 26.61 feet below measuring point and 43.51 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 21	43.51	June 30	42.20	Sept. 29	40.28	Dec. 1	39.67
28	43.62	July 28	41.39	Nov. 3	39.81	29	39.29
June 2	42.94	Sept. 1	40.71				

N 1109. Nassau County Department of Public Works. On south side of Dutch Broadway, 57 feet east of Henry Street, Elmont. Diameter  $1\frac{1}{4}$  inches, depth 37.5 feet. Measuring point, top of pipe, 0.1 foot above land surface and 42.34 feet above mean sea level. Water level Apr. 21, 1939, 12.30 feet below measuring point and 30.04 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 21	30.04	June 30	28.30	Sept. 29	26.52	Dec. 1	26.55
28	29.90	July 28	27.54	Nov. 3	26.27	29	26.26
June 2	29.00	Sept. 1	26.96				

N 1110. Nassau County Department of Public Works. On east side of Henry Street, about 500 feet south of Southern State Parkway, North Valley Stream. Diameter  $1\frac{1}{4}$  inches, depth 27.3 feet. Measuring point, top of pipe, 0.1 foot above land surface and 30.85 feet above mean sea level. Water level Apr. 21, 1939, 9.80 feet below measuring point and 21.05 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 21	21.05	July 28	19.44	Sept. 29	18.96	Dec. 1	19.38
June 2	20.35	Sept. 1	19.28	Nov. 3	19.12	29	19.23
30	19.97						

N 1111. Nassau County Department of Public Works. At northwest corner of Fletcher Avenue and Teneyck Avenue, Valley Stream. Diameter  $1\frac{1}{4}$  inches, depth 27.3 feet. Measuring point, top of pipe, 0.1 foot above land surface and 20.44 feet above mean sea level. Water level Apr. 21, 1939, 6.67 feet below measuring point and 13.77 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 21	13.77	June 30	13.79	Sept. 29	12.40	Dec. 1	13.07
28	13.60	July 28	13.62	Nov. 3	11.95	29	13.49
June 2	13.83	Sept. 1	13.71				

N 1112. Nassau County Department of Public Works. On north side of Sunrise Highway, 37 feet southeast of Second Street extended, Valley Stream. Diameter  $1\frac{1}{4}$  inches, depth 22.2 feet. Measuring point, top of pipe, 0.2 foot above land surface and 13.44 feet above mean sea level. Water level Jan. 6, 1939, 4.20 feet below measuring point and 9.24 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	9.24	Apr. 8	10.17	July 8	8.17	Oct. 7	8.17
13	9.16	15	9.81	15	7.93	15	7.95
21	9.04	22	9.64	22	7.71	21	7.81
27	9.00	29	9.50	29	7.67	28	7.95
Feb. 3	9.75	May 6	9.35	Aug. 5	7.66	Nov. 4	8.31
10	9.77	13	9.19	12	7.58	11	8.85
17	9.79	20	9.08	19	7.52	18	8.68
24	9.54	27	8.99	26	8.14	25	8.47
Mar. 3	10.01	June 3	8.85	Sept. 2	8.14	Dec. 2	8.26
10	9.77	10	8.77	9	8.14	9	7.89
17	10.15	17	8.82	16	8.00	16	8.12
24	9.82	24	8.57	23	7.78	23	8.19
31	9.97	July 1	8.36	30	7.85	30	8.13

## Nassau County--Continued

N 1103. Nassau County Department of Public Works. On north side of Marcus Avenue, 253 feet east of Lakeville Road, Lake Success. Diameter 2 inches, depth 120.8 feet. Measuring point, top of pipe, 0.2 foot above land surface and 146.12 feet above mean sea level. Water level Apr. 21, 1939, 86.78 feet below measuring point and 59.34 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 21	59.34	June 30	60.46	Sept. 29	59.92	Dec. 1	59.40
28	59.53	July 28	60.32	Nov. 3	59.59	29	59.17
June 2	60.15	Sept. 1	60.11				

N 1104. Nassau County Department of Public Works. On north side of 80th Avenue, 73 feet west of Rhodes Street, New Hyde Park. Diameter 2 inches, depth 76.6 feet. Measuring point, top of pipe, 0.1 foot above land surface and 125.37 feet above mean sea level. Water level Apr. 21, 1939, 65.36 feet below measuring point and 60.01 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Apr. 21	60.01	June 30	61.08	Sept. 29	59.74	Dec. 1	59.23
28	60.31	July 28	60.67	Nov. 3	59.45	29	59.02
June 2	61.15	Sept. 1	60.09				

N 1105. Nassau County Department of Public Works. On west side of Emerson Avenue, 41 feet north of Whittier Avenue, New Hyde Park. Diameter 2 inches, depth 61.4 feet. Measuring point, top of pipe, 0.2 foot above land surface and 108.20 feet above mean sea level. Water level Apr. 21, 1939, 49.82 feet below measuring point and 58.38 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Apr. 21	58.38	June 30	58.40	Sept. 29	56.91	Dec. 1	56.48
28	58.60	July 28	57.82	Nov. 3	56.65	29	56.16
June 2	58.85	Sept. 1	57.20				

N 1106. Nassau County Department of Public Works. On south side of Magnolia Avenue, 56 feet east of Plainfield Avenue, Floral Park. Diameter 1½ inches, depth 52.5 feet. Measuring point, top of pipe, level with land surface and 90.90 feet above mean sea level. Water level Jan. 6, 1939, 38.09 feet below measuring point and 52.81 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Jan. 6	52.81	Apr. 8	54.13	July 8	54.37	Oct. 7	52.74
13	52.78	15	54.36	15	54.17	14	52.63
21	52.70	22	54.53	22	54.02	21	52.50
27	52.62	29	54.70	29	53.93	28	52.40
Feb. 3	52.71	May 6	54.78	Aug. 5	53.78	Nov. 4	52.26
10	52.86	13	54.78	12	53.63	11	52.31
17	52.93	20	54.82	19	53.50	18	52.25
24	53.02	27	54.76	26	53.45	25	52.13
Mar. 3	53.14	June 3	54.65	Sept. 2	53.34	Dec. 2	52.02
10	53.28	10	54.60	9	53.22	9	51.96
17	53.45	17	54.56	16	53.10	16	51.84
24	53.64	24	54.46	23	52.96	23	51.73
31	53.86	July 1	54.36	30	52.82	30	51.63

N 1107. Nassau County Department of Public Works. At northeast corner of Kingston Avenue and Bertha Street, South Floral Park. Diameter 1½ inches, depth 37.2 feet. Measuring point, top of pipe, 0.1 foot above land surface and 66.41 feet above mean sea level. Water level Apr. 21, 1939, 18.30 feet below measuring point and 48.11 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Apr. 21	48.11	June 30	47.23	Sept. 29	45.49	Dec. 1	44.76
28	48.21	July 28	46.56	Nov. 3	44.96	29	44.34
June 2	47.78	Sept. 1	45.94				

## Nassau County--Continued

N 1113. Nassau County Department of Public Works. On south side of DuBois Avenue, on Drew Street extended, Gibson. Diameter  $1\frac{1}{4}$  inches, depth 22.2 feet. Measuring point, top of pipe, 0.1 foot above land surface and 10.46 feet above mean sea level. Water level Apr. 21, 1939, 3.70 feet below measuring point and 6.76 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 21	6.76	June 30	4.81	Sept. 29	3.98	Dec. 1	5.05
28	6.37	July 28	4.06	Nov. 3	4.81	29	4.86
June 3	5.29	Sept. 1	4.13				

N 1114. Nassau County Department of Public Works. On south side of West Broadway, 115 feet east of Hamilton Avenue, Hewlett. Diameter  $1\frac{1}{4}$  inches, depth 31.4 feet. Measuring point, top of pipe, 0.4 foot above land surface and 24.00 feet above mean sea level. Water level Apr. 21, 1939, 12.13 feet below measuring point and 11.87 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 21	11.87	June 30	10.30	Sept. 29	8.56	Dec. 1	8.67
28	11.82	July 28	9.61	Nov. 3	8.30	29	8.46
June 2	11.01	Sept. 1	8.93				

N 1115. Nassau County Department of Public Works. At southwest corner of Wood Street and Brower Avenue, Woodmere. Diameter  $1\frac{1}{4}$  inches, depth 19.7 feet. Measuring point, top of pipe, 0.1 foot above land surface and 22.88 feet above mean sea level. Water level Apr. 21, 1939, 9.95 feet below measuring point and 12.93 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 21	12.93	June 30	10.94	Sept. 29	9.22	Dec. 1	9.34
28	12.75	July 28	10.21	Nov. 3	9.10	29	8.94
June 2	11.68	Sept. 1	9.67				

N 1126. Formerly test well NF.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	59.46	Apr. 8	61.86	July 8	60.64	Oct. 7	58.71
13	59.44	15	62.00	15	60.44	14	58.55
21	59.36	22	62.19	22	60.24	21	58.41
27	59.29	29	62.21	29	60.06	28	58.30
Feb. 3	59.54	May 6	62.09	Aug. 5	59.87	Nov. 4	58.22
10	59.89	13	61.88	12	59.68	11	58.34
17	60.03	20	61.77	19	59.50	18	58.24
24	60.19	27	61.65	26	59.49	25	58.12
Mar. 3	60.40	June 3	61.44	Sept. 2	59.36	Dec. 2	58.04
10	60.03	10	61.26	9	59.22	9	57.93
17	61.04	17	61.15	16	59.06	16	57.81
24	61.34	24	60.98	23	58.89	23	57.70
31	61.68	July 1	60.81	30	58.75	30	57.60

N 1132. Formerly test well NA.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	8.37	Apr. 8	9.54	July 8	7.39	Oct. 7	7.14
13	8.31	15	9.38	15	7.32	15	6.77
21	8.32	22	9.17	22	7.10	21	6.66
27	8.19	29	9.05	29	7.15	28	6.66
Feb. 3	8.59	May 6	8.87	Aug. 5	7.10	Nov. 4	6.92
10	8.89	13	8.74	12	6.94	11	7.40
17	8.90	20	8.53	19	6.84	18	7.28
24	8.78	27	8.46	26	7.22	25	7.28
Mar. 3	9.16	June 3	8.11	Sept. 2	7.09	Dec. 2	6.97
10	9.17	10	7.83	9	6.88	9	6.95
17	9.38	17	7.98	16	6.82	16	6.79
24	9.27	24	7.85	23	6.78	23	6.73
31	9.25	July 1	7.71	30	6.89	30	6.64



Nassau County--Continued

N 1146. Nassau County Department of Public Works. On west side of Mallory Place, 77 feet north of Ninth Street, Garden City. Diameter  $1\frac{1}{4}$  inches, depth 48.5 feet. Measuring point, top of pipe, 0.1 foot above land surface and 61.34 feet above mean sea level. Water level Jan. 7, 1939, 23.35 feet below measuring point and 62.09 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	62.99	Apr. 8	65.45	July 3	63.47	Oct. 7	61.32
13	62.93	15	65.67	15	63.14	14	61.23
21	62.81	22	65.98	22	62.79	21	61.20
27	62.75	29	66.09	29	62.34	28	61.12
Feb. 3	62.74	May 6	66.01	Aug. 5	62.00	Nov. 4	61.01
10	63.05	13	65.83	12	61.71	11	61.00
17	63.40	20	65.63	19	61.40	18	60.95
24	63.67	27	65.39	26	61.31	25	60.90
Mar. 3	63.32	June 3	65.07	Sept. 2	61.52	Dec. 2	60.82
10	64.03	10	64.69	9	61.50	9	60.78
17	64.38	17	64.27	16	61.49	16	60.74
24	64.71	24	63.99	23	61.42	23	60.70
31	65.14	July 1	63.69	30	61.33	30	60.62

N 1147. Nassau County Department of Public Works. On north side of Seaman Avenue, 310 feet east of Knollwood Road, Baldwin. Diameter  $1\frac{1}{4}$  inches, depth 23.4 feet. Measuring point, top of pipe, 0.2 foot above land surface and 27.32 feet above mean sea level. Water level Jan. 6, 1939, 9.00 feet below measuring point and 18.32 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Jan. 6	18.32	Apr. 8	19.72	July 8	18.13	Oct. 7	17.37
13	18.23	15	19.68	15	18.02	15	17.22
21	18.23	22	19.45	22	17.92	21	17.15
27	18.20	29	19.29	29	17.85	28	17.08
Feb. 3	18.61	May 6	19.14	Aug. 5	17.78	Nov. 4	17.18
10	19.01	13	18.98	12	17.69	11	17.55
17	19.08	20	18.87	19	17.60	18	17.47
24	19.00	27	18.75	26	17.83	25	17.34
Mar. 3	19.31	June 3	18.61	Sept. 2	17.69	Dec. 2	17.25
10	19.33	10	18.53	9	17.61	9	17.18
17	18.82	17	18.49	16	17.51	16	17.12
24	18.75	24	18.37	23	17.39	23	17.03
31	19.26	July 1	18.26	30	17.35	30	17.04

N 1160. Nassau County Department of Public Works. On south side of Stewart Avenue, about 75 feet east of Mitchell Field, about 1.5 miles east of Garden City. Diameter  $1\frac{1}{4}$  inches, depth 43.5 feet. Measuring point, top of pipe, 0.1 foot above land surface and 92.57 feet above mean sea level. Water level Jan. 7, 1939, 25.05 feet below measuring point, and 67.52 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Jan. 7	67.52	Apr. 8	70.45	July 8	68.18	Oct. 7	66.23
13	67.49	15	70.90	15	67.99	14	66.13
20	67.37	22	70.74	22	67.70	21	66.01
27	67.23	29	70.56	29	67.50	28	65.89
Feb. 3	67.54	May 6	70.29	Aug. 5	67.29	Nov. 4	65.79
10	68.30	13	69.98	12	67.09	11	66.07
17	68.46	20	69.73	19	66.90	18	66.07
24	68.51	27	69.53	26	67.07	25	65.89
Mar. 3	68.74	June 3	69.26	Sept. 2	66.91	Dec. 2	65.81
10	69.24	10	69.02	9	66.79	9	65.71
17	69.47	17	68.81	16	66.35	16	65.58
24	70.07	24	68.61	23	66.50	23	65.45
31	70.08	July 1	68.39	30	66.35	30	65.35

## Nassau County--Continued

N 1167. Formerly test well NB.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	11.51	Apr. 8	12.87	July 8	10.99	Oct. 14	10.35
13	11.50	15	12.92	15	10.83	21	10.26
20	11.46	22	12.68	22	10.69	28	10.20
27	11.40	29	12.51	29	10.56	Nov. 4	10.39
Feb. 3	11.70	May 6	12.33	Aug. 5	10.44	11	10.70
10	12.08	13	12.16	12	10.32	18	10.75
17	12.20	20	12.01	19	10.19	25	10.70
24	12.21	27	11.84	Sept. 2	10.49	Dec. 2	10.62
Mar. 3	12.38	June 3	11.67	9	10.41	9	10.56
10	12.54	10	11.49	16	10.33	16	10.49
17	12.63	17	11.39	23	10.23	23	10.44
24	12.78	24	11.25	30	10.20	30	10.39
31	12.64	July 1	11.12	Oct. 7	10.39		

N 1180. Formerly test well NE.

Water level, in feet above mean sea level, 1939

Jan. 7	68.93	Apr. 15	71.55	July 15	69.86	Oct. 14	68.49
13	68.91	22	71.52	22	69.69	21	68.39
20	68.83	29	71.44	29	69.55	28	68.30
27	68.74	May 6	71.28	Aug. 5	69.42	Nov. 4	68.29
Feb. 10	69.74	13	71.11	12	69.28	11	68.57
17	69.75	20	70.98	19	69.14	18	68.42
24	69.72	27	70.86	26	69.27	25	68.26
Mar. 3	70.11	June 3	70.68	Sept. 2	69.11	Dec. 2	68.19
10	70.32	10	70.53	9	69.02	9	68.07
17	70.71	17	70.42	16	68.89	16	67.98
24	70.85	24	70.30	23	68.75	23	67.89
31	71.06	July 1	70.15	30	68.67	30	67.80
Apr. 8	71.45	8	69.99	Oct. 7	68.60		

N 1185. Formerly test well NC.

Water level, in feet above mean sea level, 1939

Jan. 6	13.28	Apr. 8	15.39	July 15	11.90	Oct. 14	11.95
13	13.23	15	14.84	22	11.65	21	11.79
20	13.15	22	14.49	29	11.48	28	11.79
27	13.08	29	14.21	Aug. 5	11.42	Nov. 4	12.15
Feb. 3	13.79	May 6	13.91	12	11.35	11	12.79
10	14.22	13	13.64	19	11.24	18	12.62
17	14.33	20	13.44	Sept. 2	11.91	25	12.43
24	14.05	27	13.29	9	11.84	Dec. 2	12.31
Mar. 3	14.82	June 3	12.99	16	11.74	9	12.24
10	14.59	10	12.75	23	11.60	16	12.14
17	15.02	24	12.52	30	11.68	23	12.12
24	14.62	July 1	12.35	Oct. 7	12.01	30	12.04
31	14.59	8	12.16				

N 1198. Nassau County Department of Public Works. On east side of Newbridge Road, 73 feet north of Motor Parkway, about 2.5 miles south of Hicksville. Diameter  $1\frac{1}{4}$  inches, depth 51.7 feet. Measuring point, top of pipe, 0.1 foot above land surface and 100.84 feet above mean sea level. Water level Jan. 6, 1939, 33.46 feet below measuring point and 67.38 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Jan. 6	67.38	Apr. 8	69.64	July 8	69.65	Oct. 7	67.90
13	67.40	15	70.00	15	69.53	14	67.79
20	67.38	22	70.27	22	69.38	21	67.67
27	67.34	29	70.44	29	69.22	28	67.55
Feb. 3	67.37	May 6	70.49	Aug. 5	69.09	Nov. 4	67.41
10	67.91	13	70.48	12	68.88	11	67.35
17	67.99	20	70.41	19	68.76	18	67.31
24	68.09	27	70.32	26	68.65	25	67.24
Mar. 3	68.20	June 3	70.25	Sept. 2	68.52	Dec. 2	67.19
10	68.41	10	70.14	9	68.40	9	67.12
17	68.72	17	70.04	16	68.27	16	67.02
24	68.98	24	69.91	23	68.14	23	66.95
31	69.37	July 1	69.79	30	68.01	30	66.86

## Nassau County--Continued

N 1204. Nassau County Department of Public Works. At northwest corner of Harris Court and John Street, Bellemore. Diameter  $1\frac{1}{4}$  inches, depth 28.6 feet. Measuring point, top of pipe, 0.1 foot above land surface and 21.47 feet above mean sea level. Water level Jan. 6, 1939, 9.71 feet below measuring point and 11.76 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	11.76	Apr. 8	12.26	July 8	8.11	Oct. 7	6.67
13	11.45	15	11.88	15	7.81	14	6.56
20	11.25	22	11.67	22	7.50	21	6.38
27	11.19	29	11.48	29	7.25	28	6.31
Feb. 3	11.60	May 6	11.54	Aug. 5	7.09	Nov. 4	6.56
10	11.80	13	10.30	12	6.92	11	7.07
17	11.77	20	10.04	19	6.75	18	7.02
24	11.53	27	9.90	26	6.98	25	7.07
Mar. 3	12.02	June 3	9.96	Sept. 2	6.82	Dec. 2	6.79
10	11.68	10	9.32	9	6.74	9	6.59
17	11.98	17	9.07	16	6.62	16	6.34
24	11.82	24	8.73	23	6.42	23	6.20
31	11.85	July 1	8.41	30	6.33	30	6.04

N 1216. Nassau County Department of Public Works. On north side of Central Boulevard, 500 feet west of Wantagh Road, Central Park. Diameter  $1\frac{1}{4}$  inches, depth 53.8 feet. Measuring point, top of pipe, 0.2 foot above land surface and 104.43 feet above mean sea level. Water level Jan. 7, 1939, 38.50 feet below measuring point and 65.93 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	65.93	Apr. 8	68.37	July 8	68.56	Oct. 7	67.01
13	65.99	15	68.58	15	68.46	14	66.88
20	66.00	22	68.83	22	68.30	21	66.78
27	65.97	29	69.03	29	68.18	28	66.70
Feb. 3	66.17	May 6	69.13	Aug. 5	68.11	Nov. 4	66.52
10	66.53	13	69.12	12	67.99	11	66.52
17	66.59	20	69.16	19	67.84	18	66.45
24	66.73	27	69.07	26	67.73	25	66.37
Mar. 3	66.86	June 3	68.97	Sept. 2	67.59	Dec. 2	66.35
10	67.09	10	68.93	9	67.46	9	66.25
17	67.38	17	68.85	16	67.35	16	66.17
24	67.68	24	68.76	23	67.24	23	66.07
31	68.05	July 1	68.69	30	67.10	30	66.02

N 1222. Nassau County Department of Public Works. At southwest corner of Cecelia Place and John Street, Seaford. Diameter  $1\frac{1}{4}$  inches, depth 28.5 feet. Measuring point, top of pipe, 0.1 foot above land surface and 21.18 feet above mean sea level. Water level Jan. 6, 1939, 14.37 feet below measuring point and 6.81 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	6.81	Apr. 8	9.67	July 8	4.98	Oct. 7	1.67
13	7.33	15	9.52	15	4.51	14	1.50
20	8.20	22	9.35	22	4.00	21	1.45
27	8.58	29	9.20	29	3.50	28	1.39
Feb. 3	9.08	May 6	8.38	Aug. 5	3.03	Nov. 4	1.55
10	8.94	13	7.86	12	2.63	11	1.92
17	9.30	20	7.63	19	2.28	18	2.05
24	9.28	27	7.88	26	2.45	25	1.88
Mar. 3	9.46	June 3	7.55	Sept. 2	2.17	Dec. 2	2.03
10	9.40	10	7.10	9	1.94	9	1.89
17	9.48	17	6.82	16	1.77	16	1.97
24	9.50	24	6.25	23	1.67	23	1.82
31	9.50	July 1	5.52	30	1.52	30	1.75

## Nassau County--Continued

N 1234. Nassau County Department of Public Works. On southwest side of Plainview Road, 400 feet northwest of Bethpage State Parkway, Central Park. Diameter  $1\frac{1}{4}$  inches, depth 85.3 feet. Measuring point, top of pipe, 0.1 foot above land surface and 101.13 feet above mean sea level. Water level Jan. 7, 1939, 37.74 feet below measuring point and 63.39 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	63.39	Apr. 8	65.75	July 8	65.79	Oct. 7	63.83
13	63.41	15	66.09	15	65.64	14	63.73
20	63.40	22	66.31	22	65.43	21	63.63
27	63.34	29	66.57	29	65.26	28	63.61
Feb. 3	63.49	May 6	66.64	Aug. 5	65.10	Nov. 4	63.31
10	63.64	13	66.51	12	64.88	11	63.36
17	63.70	20	66.63	19	64.74	18	63.34
24	64.09	27	66.51	26	64.61	25	63.16
Mar. 3	64.22	June 3	66.37	Sept. 2	64.47	Dec. 2	63.23
10	64.49	10	66.33	9	64.32	9	63.09
17	64.77	17	66.21	16	65.21	16	63.01
24	65.14	24	66.08	23	64.08	23	62.84
31	65.46	July 1	65.38	30	63.97	30	62.88

N 1240. Nassau County Department Public Works. Forty-four feet south of Sunrise Highway and 62 feet east of Manhattan Avenue, Massapequa Park. Diameter  $1\frac{1}{4}$  inches, depth 28.2 feet. Measuring point, top of pipe, 0.1 foot above land surface and 23.00 feet above mean sea level. Water level Jan. 6, 1939, 17.41 feet below measuring point and 5.59 feet above mean sea level.

Water level, in feet, with reference to mean sea level, 1939

Jan. 6	+5.59	Apr. 8	+11.29	July 8	+3.82	Oct. 7	-0.24
13	+8.03	15	+11.21	15	+3.32	14	-.57
20	+9.31	22	+11.02	22	+2.55	21	-.50
27	+9.81	29	+11.03	29	+1.93	28	-.43
Feb. 3	+10.17	May 6	+8.41	Aug. 5	+1.39	Nov. 4	-.08
10	+10.17	13	+7.70	12	+.91	11	+.38
17	+10.80	20	+7.38	19	+.46	18	+.63
24	+10.86	27	+8.02	26	+.90	25	+.47
Mar. 3	+10.87	June 3	+7.37	Sept. 2	+.37	Dec. 2	+.42
10	+11.04	10	+6.17	9	+.05	9	+.49
17	+11.10	17	+5.81	16	-.24	16	+.31
24	+11.18	24	+5.05	23	-.60	23	+.11
31	+11.08	July 1	+4.40	30	-.47	30	+.30

N 1242. Nassau County Department of Public Works. On south side of Route 25A, about 1,000 feet west of Cold Spring Harbor Road and about 1 mile south of Cold Spring Harbor. Diameter  $1\frac{1}{4}$  inches, depth 31.1 feet. Measuring point, top of pipe, 0.2 foot above land surface and 41.08 feet above mean sea level. Water level Apr. 21, 1939, 13.62 feet below measuring point and 27.46 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Apr. 21	27.46	June 30	27.64	Sept. 29	27.69	Dec. 1	27.64
28	27.50	July 28	27.66	Nov. 3	27.66	29	27.22
June 2	27.48	Sept. 1	27.77				

N 1247. Nassau County Department of Public Works. Five hundred feet north of Motor Parkway, 200 feet west of Suffolk County line, Bethpage. Diameter  $1\frac{1}{4}$  inches, depth 109.5 feet. Measuring point, top of pipe, 0.2 foot above land surface and 157.13 feet above mean sea level. Water level Apr. 21, 1939, 81.87 feet below measuring point and 75.26 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Apr. 21	75.26	June 30	76.95	Sept. 29	76.45	Dec. 1	75.80
28	75.55	July 28	76.98	Nov. 3	75.97	29	75.53
June 2	76.47	Sept. 1	76.68				

## Nassau County--Continued

N 1248. Nassau County Department of Public Works. On northwest side of Melville Road near Suffolk County line, Farmingdale. Diameter  $1\frac{1}{4}$  inches, depth 39.7 feet. Measuring point, top of pipe, 0.2 foot above land surface and 81.10 feet above mean sea level. Water level Jan. 7, 1939, 19.13 feet below measuring point and 61.97 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	61.97	Apr. 8	64.90	July 8	63.76	Oct. 7	61.64
13	61.98	15	65.51	15	63.58	14	61.57
20	61.94	22	65.46	22	63.39	21	61.45
27	61.86	29	65.39	29	63.24	28	61.35
Feb. 4	61.99	May 6	65.28	Aug. 5	63.00	Nov. 4	61.22
11	62.90	13	65.15	12	62.81	11	61.35
18	63.06	20	64.97	19	62.63	18	61.53
25	63.20	27	64.83	26	62.44	25	61.42
Mar. 4	63.37	June 3	64.67	Sept. 2	62.34	Dec. 2	61.37
11	63.85	10	64.50	9	62.22	9	61.22
18	64.07	17	64.31	16	62.04	16	61.08
25	64.62	24	64.20	23	61.89	23	60.93
Apr. 1	64.62	July 1	63.95	30	61.74	30	60.82

N 1250. Nassau County Department of Public Works. Thirty-seven feet northwest of Old Carmons Road and about 2,200 feet northeast of Great Neck Road, Farmingdale. Diameter  $1\frac{1}{4}$  inches, depth 33.5 feet. Measuring point, top of pipe, 0.3 foot above land surface and 62.24 feet above mean sea level. Water level Apr. 21, 1939, 12.60 feet below measuring point and 49.64 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Apr. 21	49.64	July 28	46.72	Sept. 29	45.66	Dec. 1	45.96
June 2	48.28	Sept. 1	46.21	Nov. 3	45.56	29	45.53
30	47.54						

N 1251. Nassau County Department of Public Works. About 275 feet west of County Line Road, about 800 feet north of Southern State Parkway and about 2 miles south of Farmingdale. Diameter  $1\frac{1}{4}$  inches, depth 28.7 feet. Measuring point, top of pipe, 0.2 foot above land surface and 48.85 feet above mean sea level. Water level Apr. 21, 1939, 8.67 feet below measuring point and 40.18 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Apr. 21	40.18	June 30	38.67	Sept. 29	37.17	Dec. 1	37.67
28	40.04	July 28	38.13	Nov. 3	37.17	29	37.29
June 2	39.11	Sept. 1	37.57				

N 1253. Nassau County Department of Public Works. At northeast corner of Clocks Boulevard and Pine Street, about one mile east of Massapequa Park. Diameter  $1\frac{1}{4}$  inches, depth 28.7 feet. Measuring point, top of pipe, 0.1 foot above land surface and 28.48 feet above mean sea level. Water level Jan. 6, 1939, 13.17 feet below measuring point and 15.31 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Jan. 6	15.31	Apr. 8	16.89	July 8	13.95	Oct. 7	12.19
13	15.20	15	16.84	15	13.60	14	12.08
20	15.37	22	16.58	22	13.30	21	11.94
27	15.48	29	16.37	29	13.02	28	11.88
Feb. 3	15.92	May 6	16.12	Aug. 5	12.70	Nov. 4	12.07
10	16.46	13	15.75	12	12.48	11	12.48
17	16.48	20	15.47	19	12.26	18	12.62
24	16.39	27	15.29	26	12.35	25	12.61
Mar. 3	16.67	June 3	15.07	Sept. 2	12.22	Dec. 2	12.52
10	16.60	10	14.83	9	12.18	9	12.43
17	16.64	17	14.61	16	12.09	16	12.34
24	16.76	24	14.37	23	12.00	23	12.26
31	16.60	July 1	14.13	30	11.90	30	12.14

## Nassau County--Continued

N 1255. Formerly test well CH 196.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	62.98	Apr. 8	65.47	July 8	63.50	Oct. 7	61.53
13	62.96	15	65.59	15	63.26	14	61.40
21	62.86	22	65.50	22	62.97	21	61.27
27	62.77	29	65.40	29	62.73	28	61.18
Feb. 3	62.99	May 6	65.26	Aug. 5	62.49	Nov. 4	61.12
10	63.57	13	65.07	12	62.25	11	61.48
17	63.79	20	64.90	19	61.98	18	61.38
24	63.86	27	64.81	26	62.19	25	61.21
Mar. 3	64.16	June 3	64.58	Sept. 2	62.09	Dec. 2	61.10
10	64.40	10	64.32	9	61.97	9	61.00
17	64.70	17	64.14	16	61.86	16	60.86
24	65.02	24	63.95	23	61.69	23	60.77
31	65.08	July 1	63.72	30	61.59	30	60.68

N 1256. Formerly test well CH 201.

Water level, in feet above mean sea level, 1939

Jan. 7	78.28	Apr. 8	80.29	July 8	80.69	Oct. 7	79.52
14	78.33	15	80.58	15	80.62	14	79.42
21	78.25	22	80.78	22	80.47	21	79.31
28	78.18	29	80.91	29	80.41	28	79.27
Feb. 4	78.38	May 6	80.96	Aug. 5	80.33	Nov. 4	79.08
11	78.62	13	80.92	12	80.20	11	79.16
18	78.78	20	80.97	19	80.12	18	79.04
25	78.88	27	80.93	26	80.11	25	78.94
Mar. 4	79.06	June 3	80.88	Sept. 2	80.03	Dec. 2	78.90
11	79.30	10	80.92	9	79.94	9	78.77
18	79.54	17	80.92	16	79.83	16	78.66
25	79.87	24	80.79	23	79.73	23	78.56
Apr. 1	80.10	July 1	80.76	30	79.61	30	78.51

N 1257. Formerly test well L 44. Measuring point raised 0.07 foot Feb. 9, 1939 when a new well was constructed 5.6 feet to the northwest to replace old well that had become clogged. Diameter of new well  $1\frac{1}{4}$  inches, depth 27.9 feet below land surface. New measuring point, top of pipe, 0.1 foot above land surface, and 21.94 feet above mean sea level. Water level Feb. 10, 1939, 12.79 feet below measuring point and 9.15 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Jan. 6	8.16	Apr. 15	9.93	July 15	6.75	Oct. 15	6.15
13	8.10	22	9.63	22	6.56	21	6.06
21	7.99	29	9.36	29	6.44	28	6.04
27	7.86	May 6	9.08	Aug. 5	6.33	Nov. 4	6.33
Feb. 10	9.15	13	9.31	12	6.18	11	7.11
17	9.28	20	8.49	19	6.10	18	6.94
24	9.05	27	8.25	26	6.43	25	6.69
Mar. 3	9.61	June 3	7.91	Sept. 2	6.38	Dec. 2	6.68
10	9.61	10	7.65	9	6.27	9	6.58
17	9.94	17	7.52	16	6.17	16	6.45
24	9.82	24	7.33	23	6.07	23	6.36
31	9.76	July 1	7.14	30	6.04	30	6.29
Apr. 8	10.17	8	6.96	Oct. 7	6.33		

N 1258. Formerly test well M 58.

Water level, in feet above mean sea level, 1939

Jan. 6	37.93	Mar. 3	39.14	Apr. 29	38.73	June 24	37.59
13	37.91	10	38.87	May 6	38.51	July 1	37.47
20	37.85	17	39.10	13	38.32	8	37.36
27	37.76	24	39.03	20	38.17	15	37.25
Feb. 3	38.33	31	38.86	27	38.04	22	37.10
10	38.75	Apr. 8	39.58	June 3	37.89	29	36.96
17	38.80	15	39.21	10	37.77	Aug. 5	36.81
24	38.57	22	38.89	17	37.69	12	36.67

## Nassau County--Continued

N 1258.--Continued

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Aug. 19	36.53	Sept. 23	36.24	Oct. 28	36.06	Dec. 2	36.67
26	36.59	30	36.13	Nov. 4	36.21	9	36.58
Sept. 2	36.49	Oct. 7	36.35	11	36.87	16	36.48
9	36.49	14	36.28	18	36.94	23	36.39
16	36.36	21	36.14	25	36.79	30	36.31

N 1259. Formerly test well M 183.

Water level, in feet above mean sea level, 1939

Jan. 6	53.62	Apr. 8	55.92	July 8	54.83	Oct. 7	52.92
13	53.55	15	56.24	15	54.65	14	52.83
20	53.47	22	56.40	22	54.45	21	52.72
27	53.39	29	56.43	29	54.27	28	52.63
Feb. 3	53.52	May 6	56.30	Aug. 5	54.10	Nov. 4	52.51
10	54.08	13	56.13	12	53.92	11	52.66
17	54.25	20	56.02	19	53.75	18	52.70
24	54.46	27	55.88	26	53.66	25	52.60
Mar. 3	54.61	June 3	55.70	Sept. 2	53.52	Dec. 2	52.56
10	54.99	10	55.55	9	53.39	9	52.48
17	55.21	17	55.37	16	53.28	16	52.40
24	55.54	24	55.19	23	53.12	23	52.31
31	55.80	July 1	55.02	30	53.03	30	52.24

N 1260. Formerly test well S 45.

Water level, in feet above mean sea level, 1939

Jan. 6	21.23	Apr. 8	23.68	July 8	20.42	Oct. 7	18.44
13	21.12	15	23.55	15	20.16	14	18.31
20	21.02	22	23.17	22	19.90	21	18.20
27	20.93	29	22.88	29	19.66	28	18.09
Feb. 3	21.39	May 6	22.56	Aug. 5	19.42	Nov. 4	18.14
10	22.43	13	22.23	12	19.20	11	18.63
17	22.50	20	21.94	19	18.97	18	18.77
24	22.33	27	21.70	26	18.96	25	18.68
Mar. 3	22.82	June 3	21.45	Sept. 2	18.85	Dec. 2	18.56
10	22.85	10	21.24	9	18.90	9	18.46
17	23.06	17	21.07	16	18.63	16	18.36
24	23.15	24	20.87	23	18.49	23	18.28
31	22.91	July 1	20.65	30	18.34	30	18.21

N 1261. Formerly test well S 143.

Water level, in feet above mean sea level, 1939

Jan. 6	7.31	Apr. 8	8.47	July 8	5.15	Oct. 7	4.91
13	7.15	15	7.69	15	4.94	14	4.67
20	7.05	22	7.47	22	4.80	21	4.50
27	7.02	29	7.30	29	4.70	28	4.46
Feb. 3	7.97	May 6	7.22	Aug. 5	4.72	Nov. 4	4.90
10	7.84	13	6.70	12	4.55	11	5.34
17	7.68	20	6.39	19	4.47	18	4.98
24	7.38	27	6.28	26	4.87	25	4.88
Mar. 3	8.08	June 3	6.04	Sept. 2	4.85	Dec. 2	4.78
10	7.62	10	5.82	9	4.67	9	4.66
17	8.25	17	5.76	16	4.54	16	4.53
24	7.58	24	5.52	23	4.42	23	4.31
31	7.98	July 1	5.35	30	4.52	30	4.06

## Nassau County--Continued

N 1262. Formerly test well S 169.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	35.41	Apr. 8	36.20	July 8	34.76	Oct. 7	34.57
13	35.14	15	36.03	15	34.68	14	34.42
20	35.09	22	35.92	22	34.58	21	34.32
27	35.02	29	35.79	29	34.53	28	34.46
Feb. 3	35.89	May 6	35.67	Aug. 5	34.60	Nov. 4	34.49
10	35.76	13	35.53	12	34.38	11	34.81
17	35.66	20	35.39	19	34.29	18	34.71
24	35.59	27	35.32	26	34.73	25	34.62
Mar. 3	35.93	June 3	35.13	Sept. 2	34.68	Dec. 2	34.56
10	35.81	10	35.03	9	34.73	9	34.50
17	36.03	17	35.03	16	34.53	16	34.43
24	35.97	24	34.93	23	34.36	23	34.38
31	36.04	July 1	34.94	30	34.43	30	34.30

N 1263. Formerly test well S 181.

Water level, in feet above mean sea level, 1939

Jan. 6	53.63	Apr. 8	54.89	July 8	53.20	Oct. 7	51.46
13	52.07	15	54.97	15	53.03	14	51.33
20	52.01	22	54.98	22	52.82	21	51.20
27	51.92	29	54.94	29	52.64	28	51.08
Feb. 3	52.25	May 6	54.79	Aug. 5	52.44	Nov. 4	50.99
10	52.88	13	54.62	12	52.27	11	51.25
17	53.02	20	54.47	19	52.11	18	51.19
24	53.17	27	54.28	26	52.07	25	51.09
Mar. 3	53.58	June 3	54.10	Sept. 2	51.95	Dec. 2	51.00
10	53.78	10	53.93	9	52.04	9	50.90
17	54.03	17	53.75	16	51.76	16	50.80
24	54.27	24	53.56	23	51.63	23	50.71
31	54.45	July 1	53.39	30	51.48	30	50.61

N 1264. Formerly test well S 183.

Water level, in feet above mean sea level, 1939

Jan. 6	8.32	Apr. 8	9.41	July 8	5.76	Oct. 7	5.30
13	8.23	15	8.71	15	5.51	14	5.10
20	8.12	22	8.50	22	5.33	21	4.93
27	8.10	29	8.34	29	5.22	28	4.89
Feb. 3	8.86	May 6	8.21	Aug. 5	5.21	Nov. 4	5.33
10	8.78	13	7.42	12	5.04	11	5.76
17	8.69	20	7.13	19	4.94	18	5.45
24	8.43	27	6.99	26	5.32	25	5.37
Mar. 3	9.05	June 3	6.86	Sept. 2	5.25	Dec. 2	5.24
10	8.63	10	6.50	9	5.12	9	5.13
17	9.18	17	6.39	16	4.99	16	4.96
24	8.62	24	6.13	23	4.86	23	4.70
31	8.97	July 1	5.92	30	4.92	30	4.46

## Queens County

Q 268. Measuring point lowered 2.87 feet Sept. 13, 1939. New measuring point, filed edge of top of 6-inch casing, 1.8 feet above land surface and 28.36 feet above mean sea level. Water level Sept. 14, 1939, 12.93 feet below measuring point and 15.43 feet above mean sea level.

Lowest daily water level, in feet above mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	16.07	16.07	16.84	17.15	17.07	15.73	15.55	15.23	.....a	15.48	15.78	.....
2	16.03	16.17	16.83	17.23	17.03	15.73	15.47	15.20	.....	.....	15.76a	15.96
3	15.95	16.44	16.85	17.24	17.07	15.75	15.45	15.24	.....	.....	15.73	15.87
4	15.86	16.39	16.88	17.21	17.11	15.79	15.54	15.27	.....	.....	15.75	15.79
5	15.90	16.39	16.96	17.21	17.11	15.78	15.50	15.20	.....	.....	15.84	15.76
6	16.09	16.66	16.89	17.21	17.09	15.66	15.48	15.20	.....	.....	16.07	15.72
7	16.24	16.33	16.65	17.41	17.08	15.66	15.48	15.22	.....a	15.56	16.03	15.73

a Estimated.



## Queens County--Continued

Q 268.--Continued

Lowest daily water level, in feet above mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
8	16.32	16.33	16.65	17.42	17.08	15.77	15.51	15.23	.....	15.59	16.03	15.72
9	16.30	16.36	16.88	17.39	17.16	15.77	15.50	15.23	.....	15.57	15.87	15.71
10	16.43	16.36	16.74	17.39	17.12	15.73	15.43	15.10	.....	15.58	15.87	.....
11	16.28	16.48	16.70	17.53	16.97	15.74	15.38	15.08	.....	15.52	15.92	.....
12	16.15	16.48	17.02	17.27	16.88	15.64	15.43	15.10	.....	15.51	15.92	.....
13	16.15	16.67	16.95	17.24	16.76	15.61	15.39	15.16	15.35	15.44	15.81	.....
14	16.18	16.69	16.83	17.24	16.85	15.74	15.44	15.14	15.43	15.57	15.86	.....
15	16.10	16.50	16.88	17.25	16.61	15.73	15.34	15.13	15.43	15.40	15.83	.....
16	16.16	16.27	17.26	17.17	16.45	15.75	15.33	15.13	15.49	15.49	15.92	15.83
17	16.10	16.32	17.24	17.17	16.38	15.64	15.33	15.29	15.43	15.47	15.91	15.83
18	16.21	16.57	17.15	17.31	16.18	15.63	15.33	15.26	15.23	15.37	15.91	15.69
19	16.12	16.55	17.07	17.35	16.18	15.64	15.30	15.22	15.33	15.48	15.82	15.69
20	16.08	16.47	17.20	17.19	16.10	15.69	15.26	15.50	15.50	15.48	15.82	15.80
21	16.10	16.44	17.11	17.15	16.05	15.63	15.25	15.53	15.50	15.53	15.86	15.86
22	16.11	16.39	17.04	17.14	16.05	15.62	15.26	15.47	15.42	15.71	15.91	15.72
23	15.91	16.35	17.02	17.14	15.98	15.63	15.33	15.41	15.41	15.50	15.85	15.69
24	16.04	16.38	17.16	17.17	15.81	15.59	15.30	15.42	15.42	15.37	15.80	15.73
25	15.95	16.30	17.01	17.23	15.80	15.53	15.28	15.45	15.51	15.44	15.76	.....
26	15.93	16.43	17.04	17.22	15.80	15.49	15.25	15.49	15.44	15.61	.....	.....
27	15.95	16.58	16.94	17.17	15.79	15.48	15.29	15.50	15.48	15.68	.....	.....
28	15.91	16.61	16.96	17.12	15.85	15.55	15.32	15.53	15.40	15.50	.....	.....
29	16.06	.....	16.90	17.20	15.81	15.57	15.30	15.54	15.44	15.43	.....	.....
30	16.14	.....	17.06	17.22	15.80	15.64	15.31	.....	15.50	15.54	15.90	15.84
31	16.11	.....	17.20	.....	15.83	.....	15.26	.....	.....	15.84	.....	15.81

Q 273. Measuring point lowered 0.28 foot Feb. 25, 1939. New measuring point, top of brass plate on instrument shelf, level with surface of sloping ground, and 25.63 feet above mean sea level. Water level Feb. 26, 1939, 18.56 feet below measuring point and 7.07 feet above mean sea level.

Lowest daily water level, in feet above mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	6.98	6.94	7.39	8.38	8.25	8.03	7.95	7.52	7.35	7.30	7.18	7.07
2	7.00	6.94	7.39	8.31	8.19	7.95	7.86	7.47	7.35	7.25	7.02	7.08
3	6.90	7.07	7.40	8.19	8.19	7.92	7.84	7.47	7.35	7.27	6.97	7.24
4	6.75	7.05	7.47	8.12	8.23	7.95	7.86	7.51	7.36	7.27	6.96	7.08
5	6.75	7.01	7.65	8.09	8.28	8.02	7.88	7.47	7.44	7.27	7.00	6.98
6	6.79	7.05	7.81	8.09	8.29	8.07	7.86	7.46	7.38	7.30	7.27	6.91
7	6.86	7.14	7.80	8.18	8.28	7.98	7.84	7.45	7.38	7.28	7.19	6.91
8	6.90	7.07	.....	8.16	8.26	7.98	7.85	7.46	7.42	7.24	7.20	6.95
9	6.90	6.97	.....	8.17	8.29	8.02	7.83	7.41	7.39	7.25	7.21	6.92
10	6.94	6.97	a7.64	8.15	8.38	7.94	7.78	a7.30	7.39	7.28	7.22	6.97
11	7.03	7.10	a7.61	8.19	8.28	7.92	7.71	a7.28	7.32	7.27	7.32	6.84
12	6.90	7.05	.....	8.19	8.19	7.91	7.69	7.23	7.24	7.24	7.22	6.76
13	6.87	7.08	.....	8.06	8.16	7.86	7.67	7.25	7.23	7.18	7.21	6.76
14	7.00	7.16	.....	8.04	8.18	7.96	7.72	7.34	7.24	7.17	7.17	6.73
15	6.90	7.25	a7.52	8.14	8.25	7.94	7.64	7.30	7.29	7.16	7.16	6.66
16	6.90	6.99	7.65	8.03	8.29	8.01	7.59	7.29	7.34	7.20	7.16	6.67
17	6.93	6.97	7.57	8.00	8.32	8.02	7.57	7.29	7.32	7.38	7.20	6.86
18	6.99	7.06	7.51	8.06	8.29	7.95	7.59	7.24	7.17	7.35	7.15	6.79
19	7.15	7.17	7.46	8.27	8.26	7.94	7.52	7.21	7.16	7.35	7.06	6.77
20	7.23	7.22	7.52	8.47	8.28	8.01	7.42	7.33	7.23	7.42	7.05	6.79
21	7.25	a7.12	7.83	8.42	8.27	8.05	7.35	7.33	7.36	7.44	7.08	6.88
22	7.36	.....	7.77	8.36	8.29	8.01	7.35	7.30	7.35	7.52	7.17	6.74
23	7.40	.....	7.73	8.29	8.36	8.03	7.39	7.29	7.33	7.36	7.11	6.63
24	7.40	.....	7.79	8.27	8.28	8.00	7.45	7.30	7.30	7.18	7.02	6.64
25	7.51	a7.06	7.81	8.32	8.25	7.92	7.43	7.29	7.30	7.14	6.96	6.70
26	7.37	7.07	7.80	8.31	8.25	7.84	7.37	7.32	7.28	7.17	6.96	6.64
27	7.17	7.21	7.80	8.30	8.26	7.81	7.35	7.30	7.28	7.22	7.00	6.62
28	7.05	7.19	7.78	8.23	8.34	7.83	7.39	7.31	7.25	7.27	7.06	6.55
29	7.05	.....	7.71	8.24	8.34	7.86	7.43	7.35	7.24	7.09	7.07	6.54
30	7.07	.....	7.79	8.30	8.27	7.90	7.48	7.41	7.32	7.09	7.06	6.62
31	7.11	.....	8.35	.....	8.19	.....	7.54	7.39	.....	7.21	.....	6.73

a Estimated.

## WATER LEVELS AND ARTESIAN PRESSURE, 1939

## Queens County--Continued

Q 287. Broad Channel Corporation well 2. On southeast side of Shad Creek Road, about 100 feet southwest of Ninth Road, Broad Channel. Diameter 8 inches, measured depth 723.6 feet below land surface, reported original depth 750 feet. Measuring point, top of instrument shelf, 0.41 foot above top of casing, 10.0 feet above land surface and 15.64 feet above mean sea level. Water level Apr. 13, 1939, 7.10 feet below measuring point and 8.54 feet above mean sea level. Water level fluctuates as much as 3.5 feet with the tide; it is also affected by pumping of wells as much as 2 miles distant.

Lowest daily water level, in feet above mean sea level, 1939  
(from recorder charts)

Day	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	....	8.48	7.52	....	5.64	5.31	5.67	6.19	6.91
2	....	8.19	7.41	....	5.58	5.17	5.73	6.22	7.25
3	....	8.23	7.34	....	....	5.27	6.11	6.29	7.09
4	....	8.45	7.41	....	....	5.30	6.08	6.37	6.89
5	....	8.26	7.38	....	....	5.53	5.95	7.05	6.91
6	....	8.16	7.52	....	....	5.35	a6.08	6.63	6.76
7	....	8.29	7.47	....	a5.83	5.21	a5.87	6.47	6.85
8	....	8.36	7.51	a7.00	5.56	5.46	5.84	6.40	6.30
9	....	8.52	7.67	a6.73	5.64	5.24	5.74	6.12	6.25
10	....	8.47	7.60	a6.86	5.37	5.22	5.68	6.21	6.75
11	....	8.46	7.55	6.59	5.20	4.99	5.33	6.42	6.90
12	....	8.15	7.29	6.52	5.08	4.83	5.01	6.28	6.88
13	8.54	8.14	7.14	6.44	a5.09	4.80	4.80	6.56	6.58
14	8.72	8.01	7.02	6.41	5.06	4.79	a4.78	6.40	5.57
15	8.80	8.09	6.92	6.21	5.06	4.79	4.60	6.50	5.24
16	8.61	8.13	6.88	6.14	4.99	4.82	5.23	6.93	5.19
17	8.56	8.10	6.90	6.00	4.94	5.22	5.15	7.01	5.40
18	8.77	7.78	6.81	5.97	4.98	5.22	5.09	7.20	5.04
19	8.87	7.61	6.77	5.93	5.04	5.34	5.54	7.26	5.44
20	8.66	7.42	6.88	5.93	5.26	5.51	5.92	7.63	5.80
21	8.48	7.43	6.77	5.81	5.22	5.74	6.28	7.70	5.08
22	8.43	7.47	6.78	5.80	5.24	5.20	6.41	7.50	4.88
23	8.27	7.61	7.02	6.10	a5.14	4.78	6.02	7.00	4.86
24	8.26	7.61	7.00	5.98	5.13	4.93	5.88	7.01	4.88
25	8.52	7.41	6.86	5.95	5.09	5.16	5.90	7.32	5.58
26	8.71	7.33	6.87	5.93	5.07	5.40	6.25	7.25	5.45
27	8.76	7.47	6.76	5.90	5.10	5.48	6.27	6.99	5.51
28	8.78	7.60	6.78	5.89	5.20	5.48	6.38	6.99	5.01
29	8.64	7.56	6.75	5.86	5.38	5.45	5.95	6.88	4.67
30	8.73	7.63	6.84	5.83	5.50	5.60	6.29	6.91	5.40
31	....	7.52	....	5.81	5.45	....	6.88	....	5.80

Q 350.

Water level, in feet, with reference to mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	+2.21	Apr. 8	+3.27	July 8	+0.36	Oct. 7	+0.27
13	+2.23	15	+3.44	15	+0.40	14	+0.38
20	+2.17	22	+3.48	22	+0.09	21	+0.18
27	+1.90	29	+3.51	29	+0.17	28	+0.29
Feb. 3	+1.82	May 6	+2.68	Aug. 5	-0.23	Nov. 4	+0.31
10	+2.09	13	+2.63	12	-0.67	11	+0.42
17	+2.18	20	+2.35	19	-0.68	18	+0.44
24	+2.44	27	+2.35	26	+0.01	25	+0.34
Mar. 3	+2.27	June 3	+1.52	Sept. 2	+0.40	Dec. 2	+0.60
10	+2.66	10	+0.60	9	-0.03	9	+0.60
17	+2.81	17	+1.13	16	+0.04	16	+0.35
24	+2.95	24	+1.38	23	-0.47	23	+0.25
31	+3.14	July 1	+1.34	30	+0.07	30	+0.19

a Estimated.

## Queens County--Continued

Q 470. Measuring point lowered 0.11 foot Oct. 11, 1939. New measuring point, same as described in Water-Supply Paper 845, 14.84 feet above mean sea level. Water level Oct. 12, 1939, 12.51 feet below measuring point and 2.33 feet above mean sea level.

Lowest daily water level, in feet, with reference to mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	-2.39	+3.10	+2.16	+3.81	-0.69 <sup>a</sup>	+3.26	+1.99	+0.87	+0.95	+1.85	+2.82	+2.62
2	-2.36	+3.12	+2.22	+3.87	+0.20	+3.20 <sup>a</sup>	+1.98	+0.81	+0.96	+1.87	+2.77	+2.62
3	-2.30	+3.16	+2.23	+3.90	+0.85	+3.16 <sup>a</sup>	+1.97	+0.75	+0.97	+1.93	+2.72	+2.62
4	-2.28	+2.52	+2.27	+3.89	+1.39	+3.14	+1.96	+0.71	+0.98	+2.01	+2.68	+2.60
5	-2.35	+1.71	+2.35	+3.68	+1.83	+3.19	+1.96	+0.67	+1.05	+2.09	+2.67	+2.59
6	-2.40	+1.05	+2.47	+2.95	+2.13	+3.24	+1.94	+0.66	+1.16	+2.13	+2.75	+2.57
7	-2.48	+0.65 <sup>a</sup>	+2.56	+2.21	+2.37	+3.23	+1.92	+0.67	+1.46	+2.19	+2.82	+2.56
8	-2.52	+0.65 <sup>a</sup>	+2.59	+1.56	+2.58	+3.19	+1.92	+0.70	+1.56	+2.23	+2.86	+2.54
9	-2.53	+0.90 <sup>a</sup>	+2.62	+1.02	+2.72	+3.11	....	+0.72	+1.61	+2.28	+2.91	+2.52
10	-2.52	+1.21 <sup>a</sup>	+2.65	+0.57	+2.86	+3.03	....	+0.75	+1.60	+2.35	+3.16	+2.52
11	-2.47	+1.52	+2.69	+0.20	+2.97	+3.02	....	+0.72	+1.59	....	+3.60	+2.56
12	-2.50	+0.86	+2.75	-0.13	+3.07	+3.00	....	+0.69	+1.51	+2.33	+3.82	+2.57
13	-2.52	+0.16	+2.91	-0.47	+3.06	+2.93	....	+0.69	+1.46	+2.51	+3.68	+2.56
14	-2.49	-0.41	+3.02	-0.71	+3.08	+2.93	+2.04	+0.70	+1.46	+2.75	+3.46	+2.53
15	-2.40	-0.82	+3.04	-0.86	+3.14 <sup>a</sup>	+2.97	+1.97	+0.69	+1.64	+2.76	+3.24	+2.48
16	-2.39	-1.29	+3.08	-1.03	+3.20	+2.99	+1.91	+0.64	+1.61	+2.75	+3.08	+2.48
17	-2.38	-1.56	+3.13	-1.18	+3.26	+2.86 <sup>a</sup>	+1.85	+0.62	+1.61	+2.78	+3.01	+2.50
18	-2.24	-1.54	+3.12	-1.26	+3.33	+2.71 <sup>a</sup>	+1.80	+0.56	+1.58	+2.74	+3.00	+2.58
19	-1.24	-0.97	+3.13	-1.32	+3.38	+2.60 <sup>a</sup>	+1.74	+0.51	+1.60	+2.71	+3.02	+2.61
20	-0.21	-0.23	+3.16	-1.42	+3.41	+2.56 <sup>a</sup>	+1.55	+0.51	+1.64	+2.67	+2.99	+2.64
21	+0.51	+0.39	+3.32	-1.53	+3.40	+2.56	+1.38	+0.52	+1.64	+2.64	+2.93	+2.84
22	+1.01	+0.83	+3.44	-1.61	+3.44	+2.72	+1.28	+0.54	+1.64	+2.62	+2.90	+3.03
23	+1.45	+1.18	+3.49	-1.68	+3.48	+2.67	+1.25	+0.55	+1.63	+2.58	+2.86	+2.96
24	+1.66	+1.40	+3.50	-1.71	+3.53	+2.55	+1.26	+0.56	+1.63	+2.58	+2.82	+2.88
25	+1.93	+1.61	+3.55	-1.73	+3.54	+2.45	+1.23	+0.56	+1.65	+2.65	+2.79	+2.83
26	+2.15	+1.73	+3.59	-1.74	+3.50	+2.36	+1.12	+0.61	+1.69	+2.66	+2.77	+2.76
27	+2.32	+1.93	+3.71	-1.75	+3.49	+2.25	+1.02	+0.65	+1.76	+2.68	+2.74	+2.73
28	+2.57	+2.03	+3.74	-1.76	+3.48	+2.16	+0.96	+0.70	+1.79	+2.71	+2.74	+2.67
29	+2.69	....	+3.73	-1.76	+3.47	+2.06	+0.91	+0.75	+1.80	+2.73	+2.73	+2.65
30	+2.78	....	+3.72	-1.60 <sup>a</sup>	+3.39	+2.01	+0.88	+0.82	+1.81	+2.73	+2.67	+2.65
31	+2.98	....	+3.78	.... <sup>a</sup>	+3.33	....	+0.88	+0.90	....	+2.77	....	+2.65

Q 503. Measuring point lowered 0.07 foot Sept. 16, 1939. New measuring point, top of 8-inch flange, 1.1 feet above land surface and 14.08 feet above mean sea level. Water level Sept. 23, 1939, 2.84 feet below measuring point and 11.24 feet above mean sea level.

Lowest daily water level, in feet above mean sea level, 1939

(Record from January 1 through September 9 taken from recorder charts; record after September 9 based on tape measurements)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	11.62	11.62	11.98	12.33	12.56	12.37	12.15	11.80	11.53	....	....	....
2	11.62	11.64	11.97	12.37	12.54	12.37	12.12	11.78	11.51	....	....	10.69
3	11.58	11.74	12.00	12.37	12.55	12.36	12.12	11.78	11.50	....	....	....
4	11.54	11.72	12.02	12.39	12.57	12.38	12.13	11.79	11.50	....	10.80	....
5	11.55	11.72	12.08	12.39	12.56	12.38	12.10 <sup>a</sup>	11.76	11.47	....	....	....
6	11.62	11.80	12.08	12.40	12.55	12.34	12.09 <sup>a</sup>	11.75	11.45	....	....	....
7	11.65	11.75	12.00	12.46	12.56	12.34	12.09 <sup>a</sup>	11.74	11.45	11.09	....	....
8	11.70	11.74	11.99	12.47	12.55	12.36	12.09 <sup>a</sup>	11.73	11.43	....	....	....
9	11.69	11.74	12.07	12.50 <sup>a</sup>	12.54	12.38	12.08 <sup>a</sup>	11.73 <sup>a</sup>	11.43	....	....	10.57
10	11.74	11.74	12.03	12.50 <sup>a</sup>	12.48	12.35	12.05 <sup>a</sup>	11.68	....	....	....	....
11	11.70	11.79	12.03	12.57 <sup>a</sup>	12.44	12.35	12.04	11.67	....	....	10.85	....
12	11.66	11.79	12.14	12.51 <sup>a</sup>	12.46	12.31	12.03	11.67	....	....	....	....
13	11.66	11.86	12.12	12.49	12.45	12.29	12.01	11.68	....	....	....	....
14	11.69	11.88	12.07	12.49	12.48	12.32	12.02	11.67	....	10.99	....	....
15	11.66	11.85	12.08	12.54	12.49	12.31	11.99	11.65	....	....	....	....
16	11.68	11.73	12.22	12.51	12.49	12.32	11.97	11.64	....	....	....	10.52
17	11.67	11.73	12.22	12.52	12.50	12.28	11.96	11.64	....	....	....	....
18	11.71	11.86	12.24	12.58	12.45	12.27	11.95	11.63	....	....	10.80	....
19	11.68	11.86	12.21	12.60	12.45	12.26	11.93	11.63	....	....	....	....
20	11.67	11.86	12.26	12.54	12.48	12.28	11.91	11.66	....	....	....	....

<sup>a</sup> Estimated.

## Queens County--Continued

## Q 503.--Continued

Lowest daily water level, in feet above mean sea level, 1939  
(Record from January 1 through September 9 taken from recorder charts; record after September 9 based on tape measurements)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
21	11.67	11.85	12.26	12.52	12.47	12.25	11.89	11.67	.....	10.92	.....	.....
22	11.68	11.83	12.27	12.55	12.49	12.24	11.90	11.65	.....	.....	.....	.....
23	11.61	11.81	12.26	12.55	12.47	12.24	11.92	11.63	11.24	.....	.....	.....
24	11.65	11.82	12.31	12.57	12.40	12.23	11.90	11.61	.....	.....	.....	10.43
25	11.62	11.79	12.27	12.59	12.40	12.20	11.88	11.60	.....	.....	.....	.....
26	11.61	11.82	12.29	12.59	12.40	12.17	11.86	11.61	.....	.....	10.68	.....
27	11.60	11.88	12.28	12.57	12.41	12.16	11.85	11.61	.....	.....	.....	.....
28	11.58	11.88	12.27	12.56	12.47	12.17	11.86	11.60	.....	10.92	.....	.....
29	11.63	.....	12.24	12.59	12.43	12.16	11.85	11.59	.....	.....	.....	.....
30	11.66	.....	12.29	12.61	12.43	12.19	11.84	11.57	11.16	.....	.....	10.45
31	11.65	.....	12.34	.....	12.42	.....	11.82	11.54	.....	.....	.....	.....

Q 543. Measuring point raised 0.03 foot Mar. 3, 1939. New measuring point, same as described in Water-Supply Paper 840, 14.85 feet above mean sea level. Water level Mar. 4, 1939, 6.03 feet below measuring point and 8.82 feet above mean sea level.

Lowest daily water level, in feet above mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	8.72	9.52	9.66	8.75	7.69	7.02	a6.79	6.75	.....	.....
2	.....	8.66	8.82	9.44	9.18	8.62	7.80	a6.96	6.41	.....	.....	8.23
3	.....	8.66	8.83	9.24	9.23	8.58	7.77	.....	6.57	.....	.....	7.91
4	8.30	8.63	8.82	9.21	.....	8.68	7.81	.....	6.60	.....	7.40	.....
5	8.20	.....	9.03	9.41	.....	8.72	7.99	.....	.....	.....	8.18	.....
6	8.31	8.59	9.13	9.76	.....	8.90	7.97	.....	.....	.....	.....	.....
7	8.09	9.00	8.48	9.68	.....	8.79	7.96	.....	.....	.....	.....	.....
8	7.98	8.97	.....	9.80	.....	8.74	8.00	6.95	.....	.....	.....	.....
9	8.03	8.95	.....	10.07	9.78	8.93	8.00	7.05	.....	.....	.....	a7.23
10	8.76	9.67	.....	10.18	9.75	8.90	8.15	6.74	6.43	.....	.....	7.41
11	8.59	9.13	.....	10.22	9.66	8.87	7.97	6.53	.....	.....	7.28	.....
12	8.42	9.21	10.48	9.74	.....	8.60	7.85	6.35	.....	.....	7.23	.....
13	8.58	9.19	9.91	9.49	.....	8.38	7.76	6.35	.....	.....	.....	.....
14	8.89	9.50	10.12	9.78	9.10	8.23	7.70	6.23	.....	.....	.....	.....
15	8.48	9.35	10.08	10.07	9.28	8.10	7.62	a6.30	.....	.....	.....	.....
16	8.47	.....	9.58	9.92	9.36	8.06	7.41	6.28	5.81	.....	.....	.....
17	8.43	.....	9.49	9.80	9.29	8.10	7.19	a6.31	6.40	.....	.....	.....
18	8.58	9.24	9.19	10.08	.....	8.01	7.25	a6.40	.....	.....	8.36	.....
19	8.90	9.22	8.98	10.22	.....	7.94	7.29	6.45	.....	6.35	8.45	.....
20	a7.85	9.23	9.08	9.89	.....	8.10	7.31	6.75	.....	6.83	.....	.....
21	.....	9.23	9.06	9.35	.....	8.00	7.23	.....	.....	7.21	.....	.....
22	.....	8.97	9.16	9.35	.....	7.95	7.24	.....	.....	7.53	.....	.....
23	.....	.....	9.03	9.13	8.78	8.30	7.54	.....	.....	6.99	7.99	.....
24	.....	.....	9.26	9.17	8.79	8.27	7.47	.....	a5.82	6.81	.....	.....
25	.....	9.06	9.72	9.63	8.60	8.20	7.39	.....	.....	6.81	.....	.....
26	.....	9.47	9.87	9.97	8.47	8.19	7.40	a6.39	.....	7.30	8.38	.....
27	.....	9.05	9.67	10.07	8.60	8.10	7.35	6.55	.....	7.34	.....	.....
28	.....	9.41	10.01	10.10	8.74	8.01	7.27	a6.62	.....	7.15	.....	.....
29	.....	.....	9.58	9.91	8.64	8.03	7.24	a6.72	.....	6.74	.....	.....
30	.....	.....	9.78	9.99	8.84	8.04	7.29	a6.99	6.60	7.31	.....	5.87
31	.....	.....	9.62	.....	8.69	.....	7.24	a6.88	.....	.....	.....	6.60

Q 1089. Formerly test well A 33. Measurements discontinued May 6, 1939; well destroyed during construction of new parkway.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	2.50	Feb. 10	2.69	Mar. 17	3.05	Apr. 15	2.97
13	2.08	17	2.53	24	2.81	22	3.12
20	2.46	24	2.36	31	3.08	29	3.14
27	1.83	Mar. 3	2.71	Apr. 8	3.31	May 6	3.07
Feb. 3	2.67	10	2.53				

a Estimated.

## Queens County--Continued

Q 1090. Formerly test well A 43.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	5.38	Apr. 8	6.65	July 8	5.35	Oct. 7	4.11
13	5.35	15	6.77	15	5.20	14	4.07
20	5.26	22	6.80	22	5.03	21	4.02
27	5.22	29	6.78	29	4.89	28	3.95
Feb. 3	5.17	May 6	6.68	Aug. 5	4.75	Nov. 4	3.87
10	5.73	13	6.48	12	4.57	11	3.98
17	5.86	20	6.37	19	4.45	18	3.90
24	5.87	27	6.24	26	4.43	25	3.83
Mar. 3	5.96	June 3	6.09	Sept. 2	4.42	Dec. 2	3.81
10	6.05	10	5.94	9	4.36	9	3.74
17	6.21	17	5.78	16	4.31	16	3.66
24	6.36	24	5.61	23	4.22	23	3.59
31	6.49	July 1	5.47	30	4.13	30	3.51

Q 1092. New York City Department of Water Supply, Gas, and Electricity. On west side of Springfield Boulevard, about 100 feet north of Mills Lane, Springfield. Diameter 2 inches, depth 17.5 feet. Measuring point, top of pipe, 0.4 foot above land surface and 10.62 feet above mean sea level. Water level Apr. 8, 1939, 2.01 feet below measuring point and 8.61 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Apr. 8	8.61	June 17	8.06	Aug. 26	7.68	Nov. 4	7.87
15	8.57	24	8.01	Sept. 2	7.75	11	8.11
22	8.55	July 1	7.95	9	7.70	18	8.11
29	8.51	8	7.90	16	7.92	25	8.07
May 6	8.44	15	7.84	23	7.63	Dec. 2	7.99
13	8.38	22	7.77	30	7.64	9	7.89
20	8.46	29	7.71	Oct. 7	7.67	16	7.80
27	8.24	Aug. 5	7.65	14	7.76	23	7.74
June 3	8.16	12	7.67	21	7.74	30	7.63
10	8.08	19	7.55	28	7.77		

## Suffolk County

S 28.

Lowest daily water level, in feet above mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	95.61	95.44	95.63	96.14	97.08	97.30	97.53	97.10	96.68	96.26	95.77	95.48
2	95.62	95.45	95.51	96.14	97.27	97.21	97.50	97.09	96.65	96.24	95.76	95.48
3	95.61	95.36	95.63	96.15	97.32	97.17	97.50	97.08	96.64	96.23	95.74	95.47
4	95.60	95.33	95.67	96.20	97.36	97.32	97.50	97.08	96.64	96.21	95.74	95.45
5	95.60	95.25	95.72	96.23	97.20	97.29	97.49	97.05	96.62	96.20	95.75	95.43
6	95.62	95.24	95.73	96.40	97.21	97.53	97.47	97.04	96.60	96.19	95.74	95.41
7	95.62	95.27	95.76	96.48	97.42	97.57	97.47	97.02	96.60	96.17	95.73	95.41
8	95.42	95.38	95.76	96.51	97.46	97.35	97.47	97.02	96.59	96.16	95.73	95.40
9	95.39	95.30	95.79	96.40	97.50	97.28	97.46	97.01	96.57	96.15	95.71	95.38
10	95.44	95.29	95.81	96.40	97.54	97.48	97.30	96.87	96.55	96.14	95.72	95.37
11	95.40	95.21	95.82	96.45	97.56	97.50	97.39	96.78	96.53	96.11	95.71	95.34
12	95.38	95.18	95.86	96.49	97.56	97.35	97.39	96.92	96.51	96.10	95.70	95.33
13	95.42	95.19	95.88	96.54	97.58	97.45	97.38	96.93	96.49	96.08	95.69	95.32
14	95.40	95.38	95.87	96.55	97.60	97.44	97.38	96.90	96.49	96.06	95.68	95.30
15	95.52	95.45	95.88	96.72	97.63	97.43	97.36	96.89	96.48	96.04	95.67	95.29
16	95.54	95.45	95.91	96.76	97.65	97.45	97.35	96.88	96.48	96.04	95.67	95.28
17	95.55	95.36	95.91	96.80	97.68	97.48	97.34	96.87	96.44	96.01	95.65	95.27
18	95.56	95.36	95.92	96.86	97.69	97.57	97.20	96.85	96.42	95.99	95.64	95.25
19	95.57	95.35	95.94	96.92	97.71	97.58	97.17	96.83	96.42	95.99	95.62	95.24
20	95.56	95.34	95.97	96.96	97.71	97.45	97.15	96.82	96.41	95.97	95.61	95.24
21	95.56	95.34	96.00	96.87	97.41	97.57	97.13	96.71	96.40	95.96	95.60	95.22
22	95.37	95.37	96.03	96.80	97.46	97.57	97.22	96.78	96.38	95.95	95.59	95.20
23	95.32	95.50	96.05	96.80	97.54	97.59	97.09	96.66	96.38	95.92	95.57	95.18
24	95.41	95.36	95.99	96.83	97.46	97.58	97.10	96.75	96.36	95.89	95.56	95.17

## WATER LEVELS AND ARTESIAN PRESSURE, 1939

## Suffolk County--Continued

S 28.--Continued

Lowest daily water level, in feet above mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
25	95.38	95.36	95.96	97.04	97.48	97.47	97.02	96.74	96.35	95.87	95.54	95.16
26	95.36	95.53	96.11	97.10	97.48	97.53	97.03	96.73	96.33	95.87	95.53	95.14
27	95.24	95.58	96.04	97.15	97.48	97.53	97.13	96.74	96.33	95.87	95.52	95.13
28	95.23	95.59	96.03	97.19	97.32	97.54	97.15	96.73	96.30	95.82	95.51	95.12
29	95.41	.....	96.01	97.23	97.38	97.54	97.14	96.73	96.29	95.80	95.50	95.11
30	95.45	.....	96.20	97.09	97.26	97.56	97.14	96.71	96.28	95.80	95.49	95.12
31	95.46	.....	96.16	.....	97.21	.....	97.12	96.69	.....	95.80	.....	95.10

S 38. Measuring point raised 2.51 feet Sept. 27, 1939. New measuring point, top of 2 by 2-inch steel angle attached to steel recorder shelter, 1.5 feet above land surface and 34.19 feet above mean sea level. Water level Sept. 28, 1939, 13.67 feet below measuring point and 20.52 feet above mean sea level.

Lowest daily water level, in feet above mean sea level, 1939

(Record to September 28 based on tape measurements;  
record for rest of year taken from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	.....	.....	.....	.....	22.18	.....	.....	20.49	20.41	21.10
2	.....	.....	.....	.....	.....	.....	.....	.....	.....	20.49	20.48	21.10
3	.....	23.02	24.05	.....	.....	22.94	.....	.....	20.84	20.49	20.52	21.12
4	.....	.....	.....	.....	.....	.....	.....	.....	.....	20.55	20.55	21.11
5	.....	.....	.....	.....	.....	.....	.....	21.19	.....	20.56	20.58	21.09
6	.....	.....	.....	.....	23.75	.....	.....	.....	.....	20.57	20.64	21.07
7	22.80	.....	.....	.....	.....	.....	.....	.....	.....	20.55	20.73	21.06
8	.....	.....	.....	24.44	.....	.....	21.93	.....	.....	20.54	20.83	21.04
9	.....	.....	.....	.....	.....	.....	.....	.....	20.76	20.55	20.94	21.03
10	.....	23.74	23.94	.....	.....	22.75	.....	.....	.....	20.54	21.02	21.02
11	.....	.....	.....	.....	.....	.....	.....	.....	.....	20.52	21.09	20.99
12	.....	.....	.....	.....	.....	.....	.....	.....	.....	20.51	21.15	20.98
13	22.75	.....	.....	.....	23.54	.....	.....	.....	.....	20.49	21.19	20.98
14	.....	.....	.....	.....	.....	.....	.....	.....	.....	20.49	21.21	20.95
15	.....	.....	.....	24.30	.....	.....	21.78	.....	.....	20.48	21.23	20.94
16	.....	.....	.....	.....	.....	.....	.....	.....	19.78	20.48	21.24	20.94
17	.....	23.81	24.23	.....	.....	22.57	.....	.....	.....	20.46	21.26	20.94
18	.....	.....	.....	.....	.....	.....	.....	.....	.....	20.45	21.26	20.92
19	.....	.....	.....	.....	.....	.....	.....	.....	.....	20.45	21.27	20.91
20	22.69	.....	.....	.....	23.36	.....	.....	20.81	.....	20.43	21.26	20.91
21	.....	.....	.....	.....	.....	.....	.....	.....	.....	20.43	21.26	20.92
22	.....	.....	.....	24.06	.....	.....	.....	.....	.....	20.43	21.25	20.91
23	.....	.....	.....	.....	.....	.....	21.56	.....	.....	20.43	21.25	20.91
24	.....	23.61	24.20	.....	.....	22.36	.....	.....	20.58	20.42	21.24	20.90
25	.....	.....	.....	.....	.....	.....	.....	.....	.....	20.40	21.21	20.90
26	.....	.....	.....	.....	.....	.....	.....	.....	.....	20.40	21.19	20.89
27	22.57	.....	.....	.....	23.16	.....	.....	20.86	.....	20.39	21.19	20.88
28	.....	.....	.....	.....	.....	.....	.....	.....	.....	20.39	21.18	20.87
29	.....	.....	.....	23.94	.....	.....	.....	.....	20.52	20.38	21.16	20.86
30	.....	.....	.....	.....	.....	.....	21.37	.....	20.51	20.37	21.14	20.86
31	.....	.....	24.08	.....	.....	.....	.....	.....	20.50	20.37	21.12	20.86
									.....	20.37	.....	20.87

S 201. Measuring point raised 1.36 feet Sept. 16, 1939. New measuring point, top of 2 by 2-inch steel angle attached to steel recorder shelter, 1.36 feet above 8-inch coupling, 1.4 feet above land surface and 66.53 feet above mean sea level. Water level Sept. 17, 1939, 38.06 feet below measuring point and 28.47 feet above mean sea level.

Lowest daily water level, in feet above mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	29.92	28.70	29.37	.....	30.07	29.53	29.22	28.77	28.57	28.41	27.98	28.35
2	29.95	29.81	30.43	29.74	30.06	29.50	29.13	28.77	28.55	28.40	27.96	28.41
3	28.83	29.93	29.33	29.74	30.11	29.51	29.14	28.79	28.53	28.41	27.96	29.43
4	29.90	29.00	29.42	29.72	30.09	29.54	29.12	28.80	28.54	28.51	27.97	28.39
5	28.91	29.91	30.51	29.75	30.08	29.54	29.09	28.77	28.51	28.50	28.04	28.35
6	29.94	30.03	29.56	29.76	30.09	29.63	29.08	28.76	28.51	28.52	28.03	28.38

## Suffolk County--Continued

S 201.--Continued

Lowest daily water level, in feet above mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
7	28.94	29.06	.....	29.86	30.08	29.68	29.09	28.76	28.51	28.50	27.94	28.42
8	29.97	29.98	.....	29.92	30.08	29.66	29.09	28.75	28.48	28.46	27.90	28.35
9	28.92	29.12	.....	31.07	30.11	29.53	29.14	28.75	28.47	28.45	27.87	28.30
10	28.98	30.04	.....	29.96	30.04	29.50	29.04	28.68	28.47	28.48	27.92	29.38
11	29.06	29.15	.....	30.03	29.98	29.48	29.02	28.65	28.43	28.44	27.86	28.34
12	29.04	30.08	29.67	29.99	29.97	29.43	29.01	28.64	28.45	28.46	27.86	28.37
13	29.96	29.07	.....	30.02	29.96	29.41	29.00	28.64	.....	28.30	27.86	28.41
14	29.05	30.17	.....	30.10	29.97	29.34	29.00	28.62	.....	28.46	27.84	28.32
15	29.98	29.19	.....	30.07	30.02	29.35	28.84	28.61	.....	28.57	27.91	28.33
16	29.26	30.12	.....	31.22	30.02	29.35	28.82	28.60	28.54	28.58	27.87	28.33
17	28.90	29.22	.....	30.16	30.12	29.34	28.83	28.58	28.47	28.55	27.82	29.35
18	29.00	29.13	.....	30.25	30.07	29.37	28.83	28.56	28.46	28.52	27.86	28.33
19	28.78	30.24	30.73	.....	30.08	29.37	28.82	28.55	28.48	28.60	27.86	28.34
20	29.93	29.22	30.82	30.21	29.99	29.31	28.89	28.56	28.50	28.53	28.01	28.35
21	28.84	29.27	30.84	30.21	29.97	29.27	29.24	28.53	28.48	28.50	28.07	28.33
22	29.96	30.32	30.87	30.16	29.95	29.29	29.23	28.52	28.46	28.60	27.95	28.24
23	28.72	29.27	.....	31.35	29.92	29.32	29.22	28.52	28.46	28.52	29.16	28.25
24	28.65	30.34	.....	30.23	29.92	29.28	29.03	28.51	28.44	28.45	28.27	29.30
25	28.50	29.34	.....	30.29	29.82	29.28	29.00	28.50	28.52	28.25	28.31	29.36
26	28.53	30.42	30.95	30.26	29.80	29.28	28.94	28.46	28.45	28.18	29.31	28.30
27	28.47	29.33	29.78	30.14	29.80	29.28	28.93	28.44	28.46	28.17	28.32	29.29
28	28.43	30.40	29.79	30.13	29.79	29.26	28.88	28.44	28.43	28.09	28.45	28.29
29	28.54	.....	29.78	30.13	29.68	29.26	28.81	28.44	28.43	28.08	28.30	29.26
30	28.54	.....	29.77	30.12	29.67	29.28	28.81	28.46	28.43	28.10	28.32	28.27
31	29.76	.....	29.72	.....	29.61	.....	28.79	28.55	.....	28.07	.....	29.30

S 202.

Lowest daily water level, in feet above mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	41.00	36.93	37.82	38.65	38.98	39.33	39.74	39.89	40.08	40.19	40.47	40.22
2	41.12	37.00	37.77	38.62	38.97	39.38	39.66	39.83	40.09	40.17	40.38	40.27
3	40.93	37.19	37.83	38.54	39.05	39.36	39.67	39.89	40.11	40.20	40.38	40.41
4	40.81	37.03	38.04	38.57	39.10	39.45	39.74	39.94	40.14	40.27	40.36	40.26
5	40.81	37.10	38.14	38.60	39.12	39.48	39.74	39.86	40.25	40.24	40.39	40.19
6	40.94	37.21	38.13	38.77	39.11	39.44	39.70	39.86	40.03	40.25	40.48	40.16
7	41.00	37.18	37.95	38.77	39.12	39.38	39.71	39.88	40.08	40.19	40.32	40.19
8	41.02	37.16	37.98	38.72	39.12	39.49	39.79	39.90	40.17	40.17	40.36	40.16
9	41.01	37.14	38.08	38.67	39.24	39.50	39.77	39.94	40.15	40.20	40.16	40.16
10	41.03	37.25	38.14	38.69	39.15	39.46	39.77	39.88	40.23	40.25	40.17	40.26
11	41.05	37.39	38.20	38.75	39.12	39.53	39.69	39.81	40.08	40.19	40.20	40.12
12	40.98	37.40	38.46	38.65	39.02	39.47	39.75	39.85	40.01	40.22	40.16	40.10
13	40.98	37.39	.....	38.60	39.08	39.46	39.76	39.95	40.01	40.15	40.12	40.15
14	41.06	37.39	.....	38.67	39.18	39.63	39.87	39.89	40.05	40.19	40.08	40.12
15	41.01	37.46	.....	38.70	39.26	39.53	39.75	39.92	40.16	40.11	40.08	40.07
16	41.01	37.18	.....	38.73	39.24	39.54	39.75	39.95	40.19	40.15	40.11	40.08
17	41.01	37.29	.....	38.68	39.27	39.53	39.76	39.98	40.16	40.19	40.14	40.32
18	41.01	37.47	.....	38.75	39.20	39.50	39.78	39.94	40.01	40.06	40.15	40.14
19	41.09	37.53	38.42	38.90	39.23	39.54	39.76	39.98	40.04	40.13	40.11	40.18
20	41.03	37.47	38.51	38.77	39.27	39.61	39.76	40.10	40.14	40.22	40.10	40.26
21	41.03	37.50	38.41	38.73	39.29	39.60	39.73	40.05	40.18	40.28	40.12	40.26
22	41.05	37.70	38.44	38.79	39.38	39.60	39.78	40.00	40.18	40.39	40.15	40.15
23	40.97	37.50	38.43	38.83	39.32	39.68	39.85	40.01	40.17	40.22	40.17	40.10
24	40.97	37.57	38.49	38.87	39.36	39.64	39.85	39.99	40.15	40.11	40.16	40.13
25	41.07	37.54	38.46	38.97	39.26	39.62	39.83	40.05	40.18	40.13	40.10	40.23
26	40.93	37.68	.....	38.97	39.26	39.58	39.81	39.97	40.13	40.23	40.10	40.14
27	40.96	37.63	.....	38.98	39.37	39.62	39.85	40.02	40.15	40.28	40.22	40.15
28	39.97	37.68	.....	38.92	39.48	39.63	39.88	40.09	40.14	40.21	40.24	40.09
29	39.97	.....	.....	39.03	39.41	39.72	39.88	40.10	40.16	40.03	40.18	40.09
30	37.36	.....	.....	39.07	39.41	39.86	39.91	40.08	40.21	40.06	40.21	40.19
31	37.27	.....	.....	.....	39.38	.....	39.91	40.10	.....	40.32	.....	40.28

a Estimated.

## WATER LEVELS AND ARTESIAN PRESSURE, 1939

## Suffolk County--Continued

S 203.

Lowest daily water level, in feet above mean sea level, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	72.54	72.61	72.92	73.21	73.76	74.39a	75.11	75.83a	76.33	76.61	76.63	76.73
2	72.53	72.68	72.92	73.20	73.75	74.41	75.10	75.83a	76.36	76.59	76.62	76.77
3	72.48	72.89	72.95	73.21	73.79	74.45	75.10	75.87	76.37	76.62	76.59	76.80
4	72.46	72.68	72.98	73.26	73.86	74.50	75.20	75.92	76.38	76.64	76.61	76.73
5	72.49	72.68	73.07	73.26	73.86	74.54	75.27	75.91	76.37	76.65	76.66	76.69
6	72.55	72.85	73.03	73.31	73.89	74.50	75.27	75.91	76.36	76.67	76.75	76.66
7	72.56	72.70	72.87	73.30	73.89	74.50	75.31	75.95	76.41	76.63	76.70	76.86
8	72.60	72.69	72.86	73.30	73.89	74.62	75.36	75.98	76.45	76.62	76.73a	76.66
9	72.59	72.75	73.00	73.35	73.96	74.69	75.39	76.02	76.40	76.66	76.61a	76.66
10	72.68	72.75	72.99	73.35	73.95	74.68	75.40	75.99	76.44	76.67	76.62	76.78
11	72.64	72.79	72.97	73.50	73.93	74.71	75.36	75.97	76.38	76.64	76.67	76.57
12	72.58	72.79	73.17	73.38	73.90	74.70	75.43	76.00	76.37	76.64	76.67	76.57
13	72.58	72.92	73.04	73.37	73.93	74.70	75.45	76.06	76.40	76.60	76.71	76.64
14	72.64	72.93	72.93	73.33	74.01	74.76	75.53	76.08	76.43	76.61	76.67	.....
15	72.60	72.88	72.94	73.44	74.03	74.76	75.51	76.08	76.50	76.59	76.66	.....
16	72.65	72.67	73.04	73.41	74.06	74.85	75.51	76.10	76.52	76.60	76.71a	76.67
17	72.64	72.68	73.02	73.44	74.10	74.83	75.54	76.14	76.42	76.61	76.74	76.70
18	72.71	72.91	73.00	73.57	74.05	74.83	75.57	76.14	76.38	76.56	76.74	76.58
19	72.68	72.91	72.94	73.59	74.07	74.87	75.58	76.14	76.39	76.61	76.70	76.58
20	72.67	72.89	73.05	73.53	74.17	74.94	75.59	76.20	76.53	.....	76.70	76.66
21	72.69	72.89	73.08	73.52	74.19	74.94	75.59	76.20	76.59a	76.79	76.72	76.70
22	72.67	72.87	73.08	73.58	74.22	74.97	75.61	76.21	76.55	76.78	76.77	76.59
23	72.55	72.85	73.08	73.58	74.23	75.03	75.67	76.19	76.55	76.66	76.63	76.56
24	72.66	72.90	73.18	73.63	74.19	75.02	75.68	76.22	76.56	76.59a	76.66	76.60
25	72.64	72.85	73.14	73.70	74.20	75.03	75.69	76.25	76.58	76.59a	76.66	76.64
26	72.63	72.93	73.17	73.70	74.27	75.01	75.70	76.27	76.54	76.70	76.67	76.54
27	72.68	72.87	73.13	73.72	74.31	75.03	75.73	76.28	76.54	76.72	76.73	76.52
28	72.66	72.87	73.13	73.72	74.41	75.09	75.77	76.31	.....	76.63	76.73	.....
29	72.75	.....	73.08	73.78	74.38a	75.13	75.78	76.33	.....	76.58	76.69	.....
30	72.81	.....	73.16	73.82	74.38a	75.12	75.80a	76.37a	76.65	76.60	76.72a	76.68
31	72.66	.....	73.21	.....	74.41	.....	75.83a	76.33	.....	76.83	.....a	76.68

S 1803. Formerly test well SU 12.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	16.42	Apr. 8	17.64	July 8	15.51	Oct. 7	15.53
13	16.37	15	17.29	15	15.41	14	15.48
20	16.27	22	17.08	22	15.30	21	15.36
27	16.18	29	16.88	29	15.21	28	15.32
Feb. 3	16.81	May 6	16.66	Aug. 5	15.14	Nov. 4	15.65
10	17.14	13	16.46	12	15.04	11	16.17
17	17.18	20	16.30	19	14.99	18	16.04
24	16.91	27	16.15	26	15.36	25	15.88
Mar. 3	17.47	June 3	16.00	Sept. 2	15.45	Dec. 2	15.78
10	17.21	10	15.86	9	15.47	9	15.85
17	17.60	17	15.79	16	15.38	16	15.68
24	17.27	24	15.70	23	15.24	23	15.67
31	17.33	July 1	15.61	30	15.18	30	15.64

S 1804. Formerly test well SU 30.

Water level, in feet above mean sea level, 1939

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
6	11.01		8	11.28		8	10.54		7	10.42	
13	10.90		15	11.19		15	10.48		14	10.37	
20	10.95		22	11.14		22	10.43		21	10.37	
27	10.96		29	11.06		29	10.39		28	10.38	
Feb. 3	11.22		May 6	11.00		Aug. 5	10.35		Nov. 4	10.45	
10	11.20		13	10.93		12	10.31		11	10.59	
17	11.07		20	10.90		19	10.27		18	10.52	
24	11.02		27	10.83		26	10.39		25	10.47	
Mar. 3	11.21		June 3	10.77		Sept. 2	10.40		Dec. 2	10.43	
10	11.18		10	10.71		9	10.43		9	10.42	
17	11.24		17	10.69		16	10.33		16	10.40	
24	11.16		24	10.64		23	10.27		23	10.38	
31	11.19		July 1	10.61		30	10.30		30	10.34	

a Estimated.



## Suffolk County--Continued

S 1805. Formerly test well SU 37.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	44.50	Apr. 8	47.01	July 8	44.13	Oct. 7	42.01
13	44.42	15	46.86	15	43.95	14	41.86
20	44.33	22	46.60	22	43.72	21	41.69
27	44.18	29	46.43	29	43.50	28	41.56
Feb. 3	44.60	May 6	46.18	Aug. 5	43.27	Nov. 4	41.53
10	45.40	13	45.90	12	43.02	11	42.21
17	45.59	20	45.69	19	42.80	18	42.34
24	45.53	27	45.46	26	42.73	25	42.21
Mar. 3	46.12	June 3	45.21	Sept. 2	42.51	Dec. 2	42.08
10	46.06	10	45.01	9	42.33	9	41.95
17	46.32	17	44.82	16	42.13	16	41.79
24	46.46	24	44.62	23	41.94	23	41.66
31	46.33	July 1	44.40	30	41.77	30	41.54

S 1806. Formerly test well SU 47.

Water level, in feet above mean sea level, 1939

Jan. 6	58.16	Apr. 8	60.82	July 15	59.28	Oct. 14	56.95
13	58.07	15	61.42	22	59.03	21	56.86
20	57.95	22	61.69	29	58.94	28	56.78
27	57.84	29	61.63	Aug. 5	58.60	Nov. 4	56.64
Feb. 4	57.91	May 6	61.48	12	58.36	11	56.62
11	58.32	13	61.27	19	58.17	18	56.83
18	58.79	20	61.10	26	58.02	25	56.95
25	59.02	27	60.90	Sept. 2	57.85	Dec. 2	56.89
Mar. 4	59.22	June 3	60.77	9	57.68	9	56.91
11	59.58	10	60.44	16	57.49	16	57.00
18	59.95	24	59.98	23	57.33	23	56.85
25	60.40	July 1	59.74	30	57.20	30	56.79
Apr. 1	60.73	8	59.52	Oct. 7	57.07		

S 1807. Formerly test well SU 66.

Water level, in feet above mean sea level, 1939

Jan. 7	22.14	Apr. 8	23.15	July 8	21.74	Oct. 7	21.34
13	22.05	15	22.97	15	21.64	14	21.24
20	22.00	22	22.79	22	21.50	21	21.18
27	21.95	29	22.65	29	21.44	28	21.19
Feb. 3	22.77	May 6	22.47	Aug. 5	21.36	Nov. 4	21.37
10	22.79	13	22.36	12	21.27	11	21.64
17	22.73	20	22.27	19	21.20	18	21.58
24	22.55	27	22.17	26	21.41	25	21.47
Mar. 3	22.91	June 3	22.06	Sept. 2	21.44	Dec. 2	21.41
10	22.79	10	21.98	9	21.43	9	21.38
17	23.05	17	21.95	16	21.27	16	21.33
24	22.93	24	21.90	23	21.21	23	21.32
31	22.98	July 1	21.88	30	21.19	30	21.30

S 1808. Formerly test well SU 75.

Water level, in feet above mean sea level, 1939

Jan. 7	11.33	Apr. 8	12.03	July 8	10.04	Oct. 7	9.84
13	11.04	15	11.45	15	9.94	14	10.22
20	10.91	22	11.42	22	9.80	21	10.19
27	10.89	29	11.19	29	9.73	28	10.11
Feb. 3	12.13	May 6	11.02	Aug. 5	9.74	Nov. 4	10.85
10	11.75	13	10.89	12	9.59	11	11.11
17	11.57	20	10.79	19	9.48	18	10.78
24	11.26	27	10.70	26	10.09	25	10.62
Mar. 3	11.90	June 3	10.54	Sept. 2	10.49	Dec. 2	10.51
10	11.52	10	10.41	9	10.46	9	10.65
17	12.11	17	10.35	16	10.14	16	10.55
24	11.43	24	10.29	23	9.96	23	10.72
31	12.11	July 1	10.23	30	9.89	30	10.50

## Suffolk County--Continued

S 1809. Formerly test well SU 81.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	29.88	Apr. 8	32.40	July 8	29.57	Oct. 7	27.34
13	29.79	15	32.56	15	29.35	14	27.25
20	29.73	22	32.26	22	29.10	21	27.16
27	29.62	29	32.10	29	28.88	28	27.09
Feb. 3	29.96	May 6	31.86	Aug. 5	28.66	Nov. 4	27.02
10	30.80	13	31.58	12	28.42	11	27.35
17	30.90	20	31.32	19	28.21	18	27.57
24	30.92	27	31.04	26	28.08	25	27.62
Mar. 3	31.14	June 3	30.78	Sept. 2	27.93	Dec. 2	27.57
10	31.46	10	30.54	9	27.81	9	27.48
17	31.65	17	30.30	16	27.68	16	27.37
24	32.09	24	30.05	23	27.55	23	27.31
31	31.94	July 1	29.82	30	27.42	30	27.29

S 1810. Formerly test well SU 86.

Water level, in feet above mean sea level, 1939

Jan. 6	53.27	Apr. 8	55.40	July 8	55.08	Oct. 7	52.38
13	53.28	15	55.60	15	54.90	14	52.73
20	53.22	22	55.91	22	54.70	21	52.64
27	53.13	29	56.19	29	54.65	28	52.49
Feb. 4	53.07	May 6	56.14	Aug. 5	54.33	Nov. 4	52.28
11	53.16	13	56.08	12	54.13	11	52.19
18	53.42	20	56.05	19	53.99	18	52.12
25	53.72	27	55.92	26	53.82	25	52.00
Mar. 4	54.01	June 3	55.80	Sept. 2	53.67	Dec. 2	51.99
11	54.22	10	55.70	9	53.52	9	51.89
18	54.44	17	55.56	16	53.38	16	51.84
25	54.75	24	55.40	23	53.20	23	51.70
Apr. 1	55.13	July 1	55.23	30	53.02	30	51.65

S 1811. Formerly test well SU 101. Measuring point raised 5.94 feet Feb. 4, 1939 because of high level of the lake. New measuring point, top edge of bridge floor above old measuring point, 62.93 feet above mean sea level. Lake level, Feb. 4, 1939, 5.24 feet below measuring point and 57.69 feet above mean sea level.

Lake level, in feet above mean sea level, 1939

Jan. 7	57.19	Apr. 15	58.66	July 15	58.27	Oct. 14	58.45
21	57.23	22	58.73	22	58.23	21	58.41
28	57.28	29	58.74	29	58.11	28	58.45
Feb. 4	57.69	May 6	58.73	Aug. 5	58.17	Nov. 4	58.59
11	57.78	13	58.73	12	58.06	11	58.76
18	57.79	20	58.64	19	58.11	18	58.67
25	57.78	27	58.63	26	58.27	25	58.59
Mar. 4	57.99	June 3	58.58	Sept. 2	58.44	Dec. 2	58.60
11	58.06	10	58.54	9	58.61	9	58.70
18	58.28	17	58.52	16	58.45	16	58.64
25	58.36	24	58.48	23	58.46	23	58.67
Apr. 1	58.43	July 1	58.48	30	58.43	30	58.59
8	58.58	8	58.40	Oct. 7	58.53		

S 1812. Formerly test well SU 102.

Water level, in feet above mean sea level, 1939

Jan. 7	52.28	Apr. 8	54.12	July 8	54.41	Oct. 7	52.80
14	52.31	15	54.36	15	54.30	14	52.64
21	52.29	22	54.55	22	54.13	21	52.52
28	52.21	29	54.73	29	54.12	28	52.40
Feb. 4	52.43	May 6	54.86	Aug. 5	53.91	Nov. 4	52.29
11	52.57	13	54.86	12	53.75	11	52.28
18	52.67	20	54.84	19	53.61	18	52.20
25	52.77	27	54.87	26	53.55	25	52.08
Mar. 4	53.01	June 3	54.78	Sept. 2	53.44	Dec. 2	52.03
11	53.20	10	54.74	9	53.33	9	51.93
18	53.38	17	54.67	16	53.18	16	51.80
25	53.64	24	54.59	23	53.04	23	51.72
Apr. 1	53.86	July 1	54.51	30	52.91	30	51.63

# NORTH CAROLINA

## STATE-WIDE PROJECT

By E. D. Burchard

The program of water-level measurements in observation wells in North Carolina, as described in Water-Supply Papers 777, 817, 840, and 845, was continued in 1939. Water-level recorders were operated on five wells throughout the year; measurements were made daily to weekly in four other wells.

In 1939 there were net declines in water level in six of the eight wells on which satisfactory records were obtained. A net rise of about 0.2 foot occurred in the Freuler well at Roanoke Rapids, and a rise of about 0.3 foot occurred in the Brick Pit well near Goldsboro. Water levels in the Fishdam well near Northside and in the Kurfee well at Mocksville declined about 7.9 feet and 3.3 feet, respectively. Net declines in water level of about 0.7 foot to 2.7 feet were recorded in the Alston well near Nashville, in the Terrell well near Copeland, in the Baldwin well at Blantyre, and in the Governor Holt well at Haw River.

Records of water level in 1939 in the nine wells under observation are given on the following pages. The water level in each well is expressed in feet above an assumed datum.

### Freuler well.

Mean daily water level, in feet above datum, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	....	5.89	9.30	8.27	7.50	7.01	5.78	7.01	11.07	7.66	6.45	6.10
2	....	6.02	9.40	8.15	8.03	6.96	6.16	7.72	10.99	7.75	6.38	6.18
3	....	6.13	9.43	8.03	8.66	6.91	6.52	8.40	10.86	7.62	6.35	6.07
4	....	6.04	9.44	7.95	8.56	6.90	6.64	8.08	10.75	7.57	6.38	6.02
5	5.55	6.07	9.56	7.92	8.50	6.84	7.96	8.20	10.58	7.51	6.82	5.99
6	5.49	6.28	9.49	8.10	8.38	6.81	7.94	8.29	10.36	7.48	6.70	5.95
7	5.47	6.32	9.25	8.29	8.32	6.73	7.73	8.10	10.20	7.40	6.60	5.97
8	5.51	6.27	9.11	8.25	8.28	6.72	7.55	8.15	10.00	7.32	6.55	5.90
9	5.49	6.55	9.14	8.17	8.25	6.70	7.81	9.22	9.80	7.27	6.41	5.92
10	5.54	7.86	8.96	8.08	8.09	6.65	7.95	9.25	9.64	7.24	6.41	5.95
11	5.50	7.99	8.98	8.09	7.94	6.61	7.85	....	9.40	7.20	6.40	5.84
12	5.45	8.10	9.11	7.95	7.80	6.56	7.81	....	9.18	7.15	6.34	5.80
13	5.55	8.10	8.96	7.79	7.80	6.52	8.10	....	9.04	7.09	6.29	5.83
14	5.60	8.07	8.70	7.80	7.77	6.48	8.95	....	8.87	7.03	6.25	5.74
15	5.52	8.18	8.69	7.84	7.71	6.45	8.63	....	8.75	6.94	6.20	5.71
16	5.56	8.09	8.75	7.71	7.63	6.40	8.41	....	8.65	6.93	6.21	5.75
17	5.57	8.14	8.77	7.65	7.55	6.37	8.22	....	8.58	6.90	6.21	5.76
18	5.83	8.12	8.68	8.05	7.48	6.34	8.10	....	8.36	6.79	6.22	5.69
19	5.80	8.08	8.55	7.95	7.42	6.31	8.04	....	8.27	6.79	6.16	5.69
20	5.77	8.00	8.59	7.75	7.38	6.24	7.83	....	8.26	6.77	6.26	5.71
21	5.83	7.95	8.52	7.65	7.35	6.23	7.72	....	8.21	6.78	6.37	5.64

## Freuler well.--Continued

Mean daily water level, in feet above datum, 1939--Continued  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
22	5.85	7.85	8.47	7.57	7.31	6.22	7.61	....	8.07	6.79	6.35	5.58
23	5.73	7.66	8.29	7.52	7.27	6.19	7.52	....	7.98	6.67	6.31	5.58
24	5.96	7.66	8.31	7.51	7.17	6.14	7.40	....	7.94	6.60	6.27	5.59
25	5.95	7.60	8.26	7.50	7.10	6.10	7.31	....	7.89	6.58	6.20	5.58
26	5.97	8.33	8.17	7.48	7.15	6.05	7.24	....	7.83	6.57	6.17	5.57
27	5.92	8.33	8.11	7.50	7.45	6.02	7.17	....	7.86	6.57	6.20	5.84
28	5.88	8.64	8.01	7.65	7.35	5.97	7.14	....	7.77	6.52	6.15	5.75
29	5.98	....	7.89	7.74	7.21	5.85	7.11	....	7.72	6.44	6.12	5.79
30	6.15	....	8.24	7.65	7.14	5.80	7.06	11.27	7.68	6.50	6.10	5.77
31	5.99	....	8.35	....	7.06	....	7.07	11.19	....	6.59	....	5.76

## Kurfee well.

Mean daily water level, in feet above datum, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	7.24	7.97	13.04	12.38	....	10.33	9.02	8.01	7.22	5.99	5.10	4.29
2	7.30	7.95	13.38	12.33	....	10.26	8.96	7.97	7.19	5.95	5.07	4.28
3	7.33	8.41	13.42	12.26	....	10.21	8.92	7.95	7.14	5.93	5.04	4.26
4	7.34	8.46	13.36	12.22	....	10.16	8.90	7.92	7.11	5.91	5.01	4.23
5	7.36	8.29	13.26	12.20	....	10.12	8.88	7.87	7.08	5.88	4.99	4.21
6	7.38	8.56	13.20	12.21	....	10.09	8.85	7.82	7.03	5.86	4.96	4.18
7	7.38	8.75	12.98	12.18	....	10.04	8.81	7.77	6.99	5.83	4.93	4.15
8	7.40	8.61	12.85	12.14	....	10.00	8.78	7.75	6.96	5.80	4.90	4.13
9	7.41	9.71	12.82	12.11	....	9.98	8.76	7.71	6.93	5.77	4.87	4.11
10	7.45	10.32	12.77	12.06	....	9.93	8.72	7.67	6.90	5.74	4.83	4.10
11	7.46	10.26	12.74	12.04	....	9.88	8.68	7.63	6.84	5.72	4.81	4.08
12	7.46	10.16	12.74	11.98	....	9.82	8.64	7.58	6.79	5.69	4.78	4.05
13	7.77	10.20	12.65	11.94	....	9.79	8.63	7.55	6.74	5.65	4.75	4.03
14	7.80	10.40	12.55	11.92	....	9.74	8.62	7.53	6.70	5.61	4.72	4.00
15	7.60	11.05	12.60	11.93	....	9.68	8.57	7.49	6.65	5.58	4.69	3.97
16	7.56	11.27	12.76	11.93	....	9.62	8.52	7.46	6.57	5.56	4.66	3.95
17	7.53	11.23	12.72	11.88	....	9.59	8.49	7.42	6.50	5.54	4.64	3.94
18	7.61	11.25	12.71	11.87	....	9.57	8.46	7.57	6.43	5.50	4.62	3.92
19	7.60	11.25	12.65	11.87	....	9.52	8.42	7.51	6.38	5.48	4.60	3.90
20	7.56	11.21	12.64	11.79	....	9.47	8.37	7.47	6.35	5.46	4.58	3.88
21	7.56	11.14	12.64	11.74	....	9.42	8.34	7.46	6.33	5.43	4.55	3.87
22	7.56	11.07	12.63	11.67	....	9.40	8.29	7.46	6.29	5.40	4.52	3.84
23	7.55	10.99	12.57	....	....	9.38	8.26	7.46	6.24	5.37	4.50	3.82
24	7.95	10.99	12.56	....	....	9.33	8.23	7.46	6.21	5.34	4.47	3.80
25	7.81	11.00	12.55	....	....	9.26	8.21	7.46	6.18	5.30	4.44	3.78
26	7.69	12.10	12.52	....	10.51	9.21	8.19	7.43	6.15	5.27	4.41	3.78
27	7.66	11.90	12.50	....	10.51	9.16	8.17	7.41	6.12	5.25	4.39	4.38
28	7.62	12.79	12.46	....	10.50	9.12	8.15	7.39	6.08	5.22	4.37	4.11
29	7.62	....	12.38	....	10.46	9.11	8.11	7.34	6.04	5.18	4.34	3.96
30	8.50	....	12.42	....	10.41	9.08	8.08	7.31	6.02	5.15	4.31	3.92
31	8.10	....	12.42	....	10.37	....	8.03	7.27	....	5.13	....	3.91

## Brick Pit well.

Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	2.94	Apr. 22	5.42	July 15	3.57	Oct. 14	4.88
14	2.95	29	5.22	22	3.76	21	4.62
21	2.96	May 6	5.06	29	3.96	28	4.40
28	2.99	13	4.86	Aug. 5	4.14	Nov. 4	4.20
Feb. 4	3.51	20	4.62	12	4.06	11	4.02
25	6.60	27	4.48	19	4.18	18	3.84
Mar. 11	6.66	June 3	4.36	26	4.39	25	3.74
18	6.62	10	4.19	Sept. 9	5.28	Dec. 2	3.62
25	6.40	17	4.10	16	5.24	9	3.50
Apr. 1	6.12	24	3.94	23	5.06	16	3.36
8	5.88	July 1	3.80	30	4.86	23	3.24
15	5.60	8	3.64	Oct. 7	5.12		

## Fishdam well.

Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 8	9.62	May 10	10.83	July 19	3.76	Oct. 8	2.24
22	10.19	June 7	5.32	27	4.68	22	1.76
29	9.91	14	5.10	Aug. 2	4.42	29	1.35
Feb. 25	11.00	23	4.07	9	3.66	Nov. 12	.98
Mar. 18	11.27	28	3.23	Sept. 10	5.38	19	.98
Apr. 8	11.03	July 7	3.89	16	4.12	Dec. 3	1.54
15	10.48	11	4.04	27	3.12	10	1.14
24	9.82						

## Baldwin well.

Water level, in feet above datum, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.83	4.21	5.97	8.10	9.42	9.77	9.21	7.62	6.32	5.25	3.94	2.44
2	3.81	4.16	5.97	8.15	9.44	9.77	9.15	7.58	6.28	5.20	3.86	2.36
3	3.82	4.33	5.99	8.21	9.46	9.76	9.11	7.52	6.24	5.16	3.81	2.42
4	3.83	4.33	6.03	8.26	9.47	9.75	9.07	7.49	6.21	5.12	3.77	2.38
5	3.85	4.32	6.04	8.33	9.49	9.75	9.04	7.43	6.19	5.08	3.74	2.08
6	3.81	4.32	6.10	8.41	9.51	9.75	9.00	7.37	6.14	5.04	3.70	2.09
7	3.81	4.33	6.21	8.46	9.54	9.74	8.96	7.32	6.11	5.01	3.67	2.12
8	3.81	4.35	6.29	8.52	9.57	9.73	8.90	7.27	6.08	4.96	3.63	2.16
9	3.81	4.43	6.37	8.57	9.60	9.73	8.86	7.22	6.05	4.92	3.57	2.14
10	3.81	4.44	6.42	8.62	9.61	9.72	8.82	7.17	6.02	4.88	3.54	2.07
11	3.81	4.71	6.49	8.67	9.62	9.71	8.76	7.13	5.96	4.84	3.51	2.11
12	3.81	4.71	6.59	8.72	9.63	9.70	8.70	7.07	5.93	4.80	3.48	2.09
13	3.81	4.71	6.66	8.75	9.64	9.68	8.66	7.04	5.90	4.75	3.44	2.07
14	3.81	4.74	6.71	8.79	9.65	9.67	8.62	7.01	5.86	4.71	3.40	2.06
15	3.79	4.84	6.79	8.85	9.67	9.65	8.57	6.97	5.83	4.66	3.36	2.06
16	3.79	4.86	6.86	8.90	9.69	9.62	8.50	6.94	5.80	4.61	3.33	2.06
17	3.79	4.81	6.93	8.94	9.70	9.60	8.45	6.91	5.77	4.58	3.00	2.04
18	3.82	4.93	7.01	8.99	9.70	9.58	8.39	6.96	5.73	4.53	3.26	2.06
19	3.77	4.99	7.09	9.04	9.71	9.56	8.33	6.91	5.69	4.48	3.03	2.01
20	3.77	5.53	7.19	9.07	9.71	9.53	8.27	6.84	5.66	4.44	3.04	2.01
21	3.79	5.59	7.23	9.11	9.72	9.49	8.22	6.78	5.63	4.40	3.02	1.99
22	3.72	5.14	7.32	9.13	9.75	9.48	8.15	6.72	5.59	4.37	3.00	1.95
23	3.81	5.19	7.39	9.15	9.76	9.47	8.08	6.67	5.55	4.33	2.96	1.93
24	3.83	5.28	7.45	9.19	9.76	9.44	8.05	6.62	5.52	4.29	2.92	1.93
25	3.81	5.57	7.56	9.23	9.76	9.40	7.98	6.59	5.48	4.26	2.88	1.91
26	3.85	5.53	7.63	9.25	9.75	9.37	7.93	6.54	5.45	4.18	2.84	1.81
27	3.83	5.81	7.73	9.29	9.75	9.33	7.88	6.51	5.41	4.14	2.81	1.79
28	3.88	5.99	7.81	9.34	9.77	9.30	7.84	6.47	5.37	4.11	2.78	1.72
29	3.93	....	7.87	9.37	9.77	9.27	7.79	6.43	5.32	4.04	2.76	1.71
30	4.41	....	7.88	9.39	9.78	9.25	7.73	6.40	5.28	4.00	2.71	1.65
31	4.26	....	8.05	....	9.78	....	7.67	6.36	....	3.98	....	1.64

## Alston well.

Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	12.45	Mar. 1	20.21	Apr. 22	13.22	June 14	11.41
11	12.50	4	19.84	26	13.28	17	11.20
14	12.47	8	18.43	29	13.52	21	10.36
18	12.72	11	18.31	May 3	13.82	24	9.03
21	12.98	15	17.83	6	14.00	28	10.52
25	13.79	18	17.38	10	13.91	July 1	10.77
28	14.00	22	16.43	13	13.74	5	10.80
Feb. 1	14.54	25	15.65	17	13.23	8	10.53
4	14.96	29	14.63	20	12.96	12	12.92
8	16.12	Apr. 1	14.11	24	12.70	15	13.10
11	18.32	5	14.10	27	12.15	19	12.92
15	20.36	8	13.72	31	12.24	22	12.63
18	18.87	12	13.00	June 3	12.96	26	11.96
22	19.87	15	12.86	7	11.88	29	11.36
25	20.21	19	13.65	10	11.59	Aug. 2	10.90

## Alston well.--Continued

Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Aug. 5	10.71	Sept. 13	16.83	Oct. 21	11.23	Nov. 29	11.23
9	10.42	16	16.38	25	10.92	Dec. 2	11.10
12	10.16	20	14.72	28	11.00	5	11.00
16	10.34	23	13.63	Nov. 1	10.52	8	11.05
19	10.00	27	12.18	4	10.70	13	10.83
23	10.72	30	11.96	8	10.74	16	10.72
26	12.36	Oct. 4	12.26	11	10.69	20	11.10
30	18.72	7	12.21	15	10.61	23	11.23
Sept. 2	19.00	11	12.18	18	10.79	27	11.55
6	18.91	14	11.85	22	10.96	30	11.77
9	18.63	18	11.36	25	11.05		

## Governor Holt well.

Mean daily water level, in feet above datum, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	8.49	8.97	13.64	13.66	.....	9.97	7.97	8.63	9.54	6.50	5.41	5.10
2	8.40	8.97	13.95	13.65	.....	9.87	7.90	8.62	9.51	6.46	5.37	5.07
3	8.28	9.03	14.30	13.47	.....	9.79	7.84	8.59	9.39	6.42	5.34	5.06
4	8.14	9.47	14.32	13.39	.....	9.74	7.79	8.53	9.31	6.39	5.31	5.02
5	8.03	.....	14.21	13.28	.....	9.66	7.74	8.38	9.24	6.36	5.31	4.98
6	7.92	.....	14.12	13.17	.....	9.59	7.68	8.24	9.06	6.33	5.33	4.95
7	7.70	.....	14.31	13.28	12.72	9.50	7.64	8.18	8.89	6.29	5.33	4.90
8	7.51	.....	14.19	13.34	12.64	9.41	7.59	8.11	8.75	6.29	5.33	4.85
9	7.45	.....	14.05	13.37	12.57	9.37	7.54	8.04	8.60	6.24	5.31	4.78
10	7.42	.....	13.83	13.29	12.44	9.39	7.58	7.97	8.46	6.19	5.26	4.75
11	7.36	.....	13.61	13.22	12.28	9.42	7.60	7.85	8.32	6.15	5.19	4.71
12	7.27	12.49	13.55	13.09	12.09	9.41	7.60	7.74	8.16	6.10	5.17	4.65
13	7.33	12.18	13.49	12.87	11.94	9.35	7.59	7.67	8.04	6.06	5.14	4.62
14	7.62	12.02	13.30	12.74	11.83	9.29	7.55	7.59	7.93	6.02	5.10	4.59
15	7.87	12.36	13.17	12.68	11.73	9.21	7.49	7.51	7.84	5.97	5.07	4.53
16	7.96	12.97	13.18	12.59	11.62	9.12	7.45	7.45	7.75	5.93	5.04	4.50
17	7.97	12.98	13.22	12.46	11.49	9.03	7.35	7.39	7.62	5.92	5.04	4.48
18	8.07	12.88	13.21	12.41	11.37	8.92	7.28	7.43	7.49	5.88	5.03	4.48
19	8.37	12.68	13.09	12.37	11.24	8.87	7.22	7.84	7.38	5.84	5.04	4.48
20	8.42	12.45	13.05	12.24	11.13	8.81	7.16	7.99	7.30	5.82	5.03	4.48
21	8.42	12.16	12.98	12.11	11.04	8.74	7.23	8.05	7.26	5.78	5.17	4.48
22	8.41	11.95	12.90	11.99	10.97	8.68	7.41	8.05	7.17	5.72	5.14	4.48
23	8.31	11.67	12.74	11.85	10.90	8.62	7.56	8.02	7.05	5.68	5.19	4.48
24	8.28	11.49	12.64	11.78	10.78	8.52	7.63	7.95	6.96	5.63	5.20	4.51
25	8.54	11.34	12.50	11.72	10.64	8.43	7.66	7.87	6.90	5.58	5.21	4.61
26	8.68	12.07	12.43	11.67	10.52	8.33	7.67	7.79	6.83	5.55	5.20	4.87
27	8.73	12.44	12.33	11.60	10.42	8.21	7.80	7.68	6.77	5.52	5.18	5.19
28	8.64	12.75	12.22	11.54	10.35	8.12	8.05	7.78	6.69	5.50	5.16	5.49
29	8.58	.....	12.03	11.58	10.26	8.05	8.16	8.16	6.62	5.47	5.14	5.74
30	8.68	.....	12.55	.....	10.16	8.02	8.42	8.67	6.57	5.42	5.12	5.83
31	8.95	.....	13.43	.....	10.06	.....	8.58	9.30	.....	5.42	.....	5.84

## McCauley well.

Mean daily water level, in feet above datum, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	5.19	6.92	8.41	8.62	8.57	8.11	7.67	7.67	.....	6.59	5.94
2	.....	5.22	6.99	8.45	8.63	8.55	8.06	7.67	7.68	.....	6.59	5.95
3	.....	5.26	7.05	8.41	8.67	8.52	8.04	7.67	7.69	.....	6.50	5.93
4	.....	5.26	7.14	8.46	8.66	.....	8.03	7.67	7.70	7.32	6.49	5.89
5	.....	5.27	7.23	8.48	8.67	.....	8.02	7.64	7.72	7.28	.....	5.87
6	.....	5.33	7.28	8.51	8.68	8.53	8.01	7.61	7.70	7.26	6.46	5.85
7	.....	5.37	7.30	8.52	.....	8.50	8.00	7.59	7.71	7.24	6.41	5.82
8	.....	5.37	7.32	.....	8.73	8.49	7.99	7.57	7.72	.....	6.39	5.81
9	.....	5.41	7.41	.....	8.74	8.50	7.98	7.56	7.74	7.21	6.34	5.78
10	.....	5.65	7.46	8.45	8.73	8.49	7.99	7.54	.....	7.18	6.33	5.79
11	.....	5.76	7.52	8.47	8.70	8.47	7.97	7.51	7.73	7.17	6.32	5.78

## McCauley well.--Continued

Mean daily water level, in feet above datum, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
12	....	....	....	8.44	8.68	8.44	7.94	7.47	7.71	7.16	6.30	5.74
13	....	....	7.61	8.33	8.66	8.42	7.93	7.45	7.71	7.12	6.27	5.75
14	....	....	7.63	8.43	8.67	8.42	7.90	7.44	7.70	7.09	6.24	5.71
15	....	....	7.70	8.50	8.69	8.38	7.87	7.42	7.70	7.06	6.20	5.67
16	....	....	7.77	8.52	8.70	8.36	7.86	7.41	7.70	7.03	6.20	5.67
17	4.94	....	7.79	8.50	8.69	8.35	7.85	7.39	7.71	7.00	6.19	5.68
18	4.98	6.33	7.81	8.56	8.67	....	7.84	7.40	7.63	6.94	6.18	5.65
19	4.98	6.34	7.83	8.60	8.65	8.32	7.82	7.48	7.61	6.92	6.14	5.62
20	4.97	6.37	7.89	8.55	8.65	8.29	7.80	7.47	7.64	6.91	6.14	5.64
21	4.97	6.44	7.93	8.55	....	8.27	7.80	7.44	7.65	6.91	6.12	5.59
22	....	6.46	7.97	8.53	....	8.27	....	7.41	7.60	6.92	6.11	5.56
23	....	6.50	7.95	....	8.65	8.28	7.78	7.40	7.56	6.84	6.08	5.54
24	....	6.54	8.01	....	8.71	8.24	7.77	7.38	....	6.80	6.06	5.55
25	....	6.59	8.06	8.63	8.65	8.20	7.75	7.37	....	6.77	6.03	5.53
26	....	....	....	8.63	8.64	8.18	7.74	7.37	7.51	6.75	6.00	5.51
27	....	....	8.27	8.65	8.64	8.14	7.75	7.37	7.51	6.74	6.01	5.53
28	....	6.85	8.28	8.64	....	8.13	7.77	7.39	7.47	6.73	5.98	5.49
29	....	....	....	8.64	8.63	8.13	7.76	7.59	7.43	....	5.96	5.48
30	....	....	8.30	8.64	8.59	8.13	7.74	7.64	7.43	6.63	5.95	5.48
31	5.20	....	8.43	....	8.58	....	7.70	7.66	....	6.64	....	5.47

## Terrell well.

Mean daily water level, in feet above datum, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.32	4.10	3.80	3.37	3.23	3.33	3.62	3.98	4.14	4.03	3.81	3.46
2	4.30	4.10	3.77	3.31	3.22	3.35	3.63	3.98	4.13	4.03	3.79	3.45
3	4.31	4.09	3.73	3.31	3.21	3.35	3.65	3.98	4.13	4.02	3.77	3.44
4	4.32	4.07	3.70	3.31	3.20	3.35	3.66	3.99	4.13	4.01	3.75	3.40
5	4.32	4.03	3.70	3.31	3.20	3.35	3.68	3.98	4.13	4.00	3.75	3.35
6	4.32	4.02	3.70	3.31	3.19	3.35	3.70	3.97	4.12	3.99	3.74	3.35
7	4.32	4.02	3.67	3.30	3.18	3.35	3.70	3.98	4.11	3.98	3.73	3.35
8	4.30	3.98	3.64	3.29	3.19	3.35	3.72	3.99	4.11	3.97	3.72	3.34
9	4.29	4.03	3.61	3.28	3.20	3.36	3.82	4.00	4.11	3.96	3.70	3.34
10	4.28	4.11	3.60	3.27	3.20	3.37	3.89	4.00	4.11	3.96	3.69	3.33
11	4.27	4.35	3.59	3.26	3.20	3.37	3.87	4.00	4.11	3.95	3.69	3.32
12	4.26	4.25	3.58	3.25	3.19	3.38	3.85	4.00	4.10	3.95	3.68	3.30
13	4.25	4.20	3.56	3.24	3.19	3.39	3.85	4.00	4.10	3.94	3.66	3.29
14	4.25	4.15	3.53	3.23	3.20	3.41	3.85	4.01	4.09	3.94	3.65	3.27
15	4.23	4.15	3.50	3.24	3.20	3.41	3.85	4.03	4.09	3.92	3.64	3.25
16	4.22	4.10	3.50	3.25	3.20	3.42	3.85	4.03	4.07	3.91	3.63	3.25
17	4.22	4.00	3.50	3.25	3.20	3.44	3.85	4.06	4.06	3.91	3.62	3.25
18	4.22	3.98	3.49	3.25	3.20	3.45	3.85	4.54	4.05	3.90	3.61	3.24
19	4.22	3.94	3.45	3.25	3.21	3.46	3.85	4.50	4.05	3.90	3.60	3.23
20	4.24	3.88	3.44	3.25	3.21	3.47	3.87	4.43	4.05	3.90	3.57	3.26
21	4.22	3.82	3.44	3.24	3.21	3.49	3.89	4.38	4.05	3.89	3.55	3.24
22	4.20	3.75	3.44	3.23	3.22	3.50	3.89	4.33	4.05	3.89	3.55	3.22
23	4.17	3.75	3.42	3.21	3.23	3.51	3.89	4.29	4.04	3.88	3.55	3.16
24	4.16	3.75	3.41	3.20	3.24	3.52	3.90	4.25	4.04	3.87	3.55	3.15
25	4.15	3.75	3.40	3.20	3.24	3.53	3.92	4.21	4.04	3.86	3.55	3.14
26	4.14	3.82	3.37	3.24	3.25	3.54	3.94	4.20	4.04	3.85	3.53	3.13
27	4.12	3.83	3.36	3.24	3.25	3.57	3.95	4.19	4.04	3.85	3.50	3.15
28	4.09	3.84	3.36	3.24	3.26	3.60	3.95	4.18	4.04	3.84	3.46	3.15
29	4.09	....	3.37	3.24	3.26	3.61	3.97	4.17	4.03	3.83	3.45	3.14
30	4.13	....	3.38	3.23	3.27	3.62	3.98	4.16	4.02	3.83	3.45	3.12
31	4.10	....	3.38	....	3.28	....	3.98	4.15	....	3.82	....	3.10

## DEEP RIVER AREA OF SOIL CONSERVATION SERVICE

By V. C. Fishel and J. W. Gambrell

The observation-well program in the Deep River area <sup>1/</sup> in Guilford, Forsyth, and Randolph Counties, near High Point, N. C., was continued in 1939 by the Geological Survey. Water-level measurements were made about weekly in 21 wells at the beginning of the year. Well 24 was discontinued as an observation well in November. About 900 individual measurements of water level were made by M. Delk during 1939.

The average water levels on successive dates for 1939 were obtained by averaging water levels in 21 wells (1a, 2, 4, 5, 7-9, 9b, 10-12, 14, 15, 18-21, 23-25, and 27). The average of the water levels declined during the summer and fall of 1938 as a result of low precipitation, but it began to rise in November and had risen 2.8 feet by January 1, 1939. It rose 3.25 feet more until March 10, declined 4.49 feet until August 5, rose 2.46 feet until August 19, and then declined 3.75 feet until December 23. The water levels which had recovered an average of 0.61 foot by December 29, showed a net average decline of 1.57 feet for the year. They averaged 1.06 feet lower on January 1, 1940, than on January 1, 1935.

Average water levels, in feet above assumed datum planes,  
in observation wells, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 6	10.51	May 20	11.47	Sept. 22-23	9.99
20	10.63	26-27	11.30	Oct. 6-7	9.66
Feb. 17	13.37	July 1	10.29	13-14	9.46
24	12.89	8	9.93	20-22	9.21
Mar. 10	14.11	15	9.74	27-28	9.07
17	13.77	21-22	10.52	Nov. 3-4	8.98
24	13.15	28-29	9.90	10-11	8.82
31	13.18	Aug. 4-5	9.62	17-18	8.64
Apr. 6-7	12.93	11-12	9.85	24-25	8.65
15	12.42	18-19	12.08	Dec. 1-2	8.51
22	12.13	25-26	11.47	8-9	8.43
27-29	12.06	Sept. 1-2	11.35	15-16	8.35
May 6	12.15	8-9	10.84	22-23	8.33
13	11.79	15-16	10.29	29	8.94

## 1a. C. H. Mackay.

Water level, in feet above assumed datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	13.21	Apr. 15	13.64	July 29	9.64	Oct. 20	10.15
13	12.18	22	12.79	Aug. 5	9.49	27	9.79
20	13.40	29	12.47	12	9.92	Nov. 3	9.49
27	13.93	May 6	13.39	19	16.85	10	9.37
Feb. 3	16.76	13	12.45	26	17.54	17	8.97
10	22.35	20	11.76	Sept. 1	17.12	24	8.93
17	22.78	27	11.30	8	14.10	Dec. 1	8.69
24	17.96	July 1	10.08	15	12.79	8	8.45
Mar. 17	19.28	8	9.86	22	11.99	15	8.24
24	16.08	15	9.54	Oct. 6	10.98	22	8.61
31	15.23	22	10.07	13	10.52	29	12.95
Apr. 7	14.92						

<sup>1/</sup> See Water-Supply Papers 777, 817, 840, and 845.



2. Lindale Dairy Corporation. Measuring point since Nov. 14, 1939, 38.39 feet above datum.

Water level, in feet above assumed datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	8.48	Apr. 22	11.47	Aug. 5	10.41	Oct. 20	10.25
14	8.69	29	11.53	12	10.34	27	10.14
20	8.76	May 6	11.34	19	10.58	Nov. 3	9.97
Feb. 17	9.92	13	11.25	26	10.80	10	9.80
24	10.27	20	11.14	Sept. 1	10.97	17	9.73
Mar. 3	10.70	27	11.03	8	11.05	24	9.57
10	11.26	July 1	10.58	15	10.90	Dec. 1	9.50
17	11.42	8	10.50	22	10.81	8	9.31
24	11.63	15	10.46	29	10.68	15	9.12
31	11.66	22	10.34	Oct. 6	10.53	22	9.03
Apr. 7	11.65	29	10.48	13	12.33	29	8.98
15	11.65						

4. W. O. Atkins. Measuring point since Nov. 14, 1939, 42.83 feet above datum.

Water level, in feet above assumed datum, 1939

Jan. 6	11.28	Apr. 28	12.68	Aug. 18	14.18	Nov. 3	12.61
20	11.38	May 26	13.74	25	12.16	10	12.55
Feb. 17	10.83	July 1	12.55	Sept. 1	12.13	17	12.30
24	11.73	8	12.51	8	12.08	Dec. 1	11.43
Mar. 10	12.09	15	12.47	15	12.08	8	12.13
17	12.13	21	12.02	22	12.03	15	11.83
24	12.73	28	12.41	29	12.01	22	11.88
31	12.93	Aug. 4	12.38	Oct. 6	11.92	29	12.13
Apr. 7	13.77	11	12.24				

5. Isaac Tonkins. Measuring point since Nov. 10, 1939, 57.00 feet above datum.

Water level, in feet above assumed datum, 1939

Jan. 6	10.12	Apr. 22	10.83	Aug. 5	10.90	Oct. 21	10.78
20	10.19	28	10.91	12	10.92	28	10.78
Feb. 3	10.32	May 6	10.97	19	11.45	Nov. 4	9.72
17	10.44	13	10.92	26	10.90	11	10.80
24	10.37	20	10.91	Sept. 2	10.93	18	10.68
Mar. 10	10.62	26	10.91	9	10.90	24	10.60
17	10.62	July 1	10.92	16	10.89	Dec. 1	10.68
24	10.66	8	10.93	23	10.87	9	10.51
31	10.79	15	10.92	30	10.82	16	10.54
Apr. 7	10.79	22	10.94	Oct. 7	10.79	22	10.42
15	10.80	29	10.94	14	10.77	29	10.54

7. E. J. Welch.

Water level, in feet above assumed datum, 1939

Jan. 6	9.59	May 6	14.68	Aug. 19	10.60	Oct. 27	10.38
20	9.90	13	14.08	26	10.60	Nov. 3	8.75
Feb. 17	9.57	20	13.64	Sept. 1	10.61	10	8.60
24	11.47	26	13.31	8	10.60	17	8.44
Mar. 3	12.07	July 1	14.68	15	10.60	24	8.32
10	12.17	8	10.65	22	10.60	Dec. 1	8.20
17	12.11	15	10.63	29	10.60	8	8.08
24	12.07	22	10.59	Oct. 6	10.60	15	7.96
31	11.47	28	10.55	13	10.60	22	7.90
Apr. 7	11.37	Aug. 5	10.68	20	10.38	29	8.10
27	11.18	12	10.61				

8. Welch Place. Measuring point, since Nov. 13, 1939, 37.60 feet above datum.

Water level, in feet above assumed datum, 1939

Jan. 6	9.52	Apr. 22	14.66	Aug. 5	10.52	Oct. 20	10.24
20	10.10	28	14.44	12	10.49	27	10.21
Feb. 11	14.90	May 6	11.10	19	10.45	Nov. 3	10.19
24	13.98	13	11.04	22	10.45	10	10.16
Mar. 3	17.19	20	10.98	Sept. 1	10.42	17	10.13
10	16.79	26	10.92	8	10.43	24	10.10
17	16.35	July 1	12.79	15	10.38	Dec. 1	10.09
24	15.71	8	11.52	22	10.35	8	10.01
31	16.03	15	11.27	29	10.31	15	10.02
Apr. 7	16.11	22	11.03	Oct. 6	10.29	22	10.00
15	15.10	29	10.87	13	10.26	29	9.98

## 9. W. C. Warner.

Water level, in feet above assumed datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	10.60	Apr. 28	9.33	Aug. 12	6.36	Oct. 21	5.44
20	11.16	May 6	10.29	19	16.44	28	5.07
Feb. 17	18.63	13	8.89	26	13.44	Nov. 4	4.75
24	14.70	20	8.14	Sept. 2	13.14	11	4.46
Mar. 10	17.91	26	7.48	9	10.77	18	3.59
17	16.24	July 1	5.00	16	9.11	25	3.99
24	14.68	8	4.52	23	8.09	Dec. 1	3.79
31	13.88	15	4.21	30	7.16	16	3.33
Apr. 7	12.78	22	6.69	Oct. 7	6.50	22	3.15
15	11.18	28	5.10	14	5.85	29	5.33
22	10.04	Aug. 5	4.36				

## 9b. W. C. Warner.

Water level, in feet above assumed datum, 1939

Jan. 6	12.23	Apr. 15	15.18	July 28	9.93	Nov. 4	9.24
20	13.45	22	13.96	Aug. 5	8.93	11	8.61
Feb. 3	14.43	28	13.39	12	10.55	18	8.65
17	17.63	May 6	13.43	19	14.73	25	8.43
24	16.75	20	12.22	26	15.15	Dec. 1	8.33
Mar. 10	18.54	26	11.58	Sept. 2	15.18	9	8.26
17	18.21	July 1	9.14	9	14.07	16	7.88
24	16.83	8	8.81	16	13.07	23	7.79
31	16.43	15	8.59	Oct. 21	10.09	29	8.05
Apr. 7	15.66	22	8.80	28	9.33		

## 10. W. F. Beason. Measuring point since Nov. 8, 1939, 36.60 feet above datum.

Water level, in feet above assumed datum, 1939

Jan. 6	8.90	Apr. 15	13.80	July 22	9.99	Sept. 30	10.20
20	9.39	22	13.74	28	10.00	Oct. 7	9.81
Feb. 3	9.91	28	13.78	Aug. 5	9.89	14	9.70
17	11.11	May 6	13.70	12	9.91	21	9.39
24	11.59	13	13.53	19	10.35	28	9.16
Mar. 10	12.90	20	13.26	26	11.11	Nov. 4	9.06
17	13.21	26	12.90	Sept. 2	11.37	11	9.40
24	13.47	July 1	10.83	9	11.31	18	(a)
31	13.63	8	10.56	16	10.77	Dec. 16	(a)
Apr. 7	13.70	15	10.24	23	10.36	29	(a)

## 11. Emery Taylor.

Water level, in feet above assumed datum, 1939

Jan. 6	6.79	May 20	8.11	Aug. 26	9.88	Nov. 4	5.53
Feb. 3	9.44	26	7.30	Sept. 2	9.79	11	3.58
24	12.17	July 1	4.15	9	8.35	18	(a)
Mar. 10	14.07	8	3.79	16	5.74	25	(a)
24	10.32	15	3.47	23	4.90	Dec. 1	(a)
Apr. 7	10.85	22	3.98	30	4.56	9	(a)
15	9.11	28	3.70	Oct. 7	4.25	16	(a)
22	9.34	Aug. 5	3.51	14	4.08	22	(a)
May 6	10.79	12	3.48	21	3.52	29	(a)
13	9.23	19	10.87	28	3.44	31	(a)

## 12. John Blair Estate.

Water level, in feet above assumed datum, 1939

Jan. 6	8.39	Apr. 15	11.69	Aug. 5	9.83	Oct. 21	8.76
13	8.40	22	11.66	12	9.63	28	8.61
20	8.45	28	11.70	19	9.85	Nov. 4	8.44
Feb. 3	8.77	May 6	11.70	26	9.85	11	8.40
17	9.60	13	11.71	Sept. 2	9.88	18	7.93
24	9.91	20	11.66	9	9.86	25	7.98
Mar. 3	10.33	26	11.53	16	9.67	Dec. 1	7.87
10	10.74	July 1	10.53	23	9.37	9	7.71
17	11.02	8	10.33	30	9.22	16	7.62
24	11.29	15	10.15	Oct. 7	8.99	22	7.53
31	11.46	22	9.98	14	8.94	29	7.55
Apr. 7	11.59	28	9.98				

a Well dry.

## 14. Clodfelter Dairy.

Water level, in feet above assumed datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	11.65	Apr. 15	15.28	Aug. 5	12.28	Oct. 21	11.16
13	11.87	22	15.24	12	12.11	28	11.17
20	11.86	29	15.03	19	12.88	Nov. 4	11.05
27	11.95	May 6	14.83	26	12.15	11	10.95
Feb. 17	14.31	13	14.59	Sept. 2	11.95	18	10.71
24	14.40	20	14.37	9	11.85	25	10.63
Mar. 3	16.16	27	14.14	16	11.71	Dec. 2	10.62
10	16.73	July 1	13.11	23	11.61	9	10.52
17	16.73	8	12.93	30	11.48	16	10.46
24	16.45	15	12.76	Oct. 7	11.37	22	10.40
31	16.23	22	12.63	14	11.26	29	10.79
Apr. 7	15.88	29	12.44				

## 15. C. C. Robbins.

Water level, in feet above assumed datum, 1939

Jan. 6	11.58	Apr. 15	10.27	Aug. 5	7.10	Oct. 21	4.92
13	10.40	22	9.61	12	6.51	28	4.65
20	11.65	28	9.68	19	12.98	Nov. 4	4.45
Feb. 3	12.44	May 6	10.86	26	9.53	11	4.35
17	12.93	13	9.92	Sept. 2	8.64	18	4.05
24	11.97	20	9.07	9	7.48	25	4.15
Mar. 3	12.50	26	9.40	16	6.68	Dec. 1	3.90
10	12.53	July 1	7.27	23	6.00	9	3.70
17	12.41	8	6.94	30	5.59	16	3.51
24	11.32	15	6.66	Oct. 7	6.04	22	3.61
31	11.89	22	10.98	14	5.36	29	7.92
Apr. 7	11.46	28	8.25				

## 18. Federal Transient Camp.

Water level, in feet above assumed datum, 1939

Jan. 6	10.47	Apr. 28	11.85	Aug. 11	11.00	Oct. 27	10.65
20	10.54	May 6	11.85	18	11.91	Nov. 3	10.56
Feb. 17	11.02	13	11.83	26	11.19	10	10.50
24	11.06	20	11.80	Sept. 1	11.21	17	10.42
Mar. 10	11.43	26	11.75	8	11.19	24	10.35
17	11.58	July 1	11.38	15	11.10	Dec. 1	10.28
24	11.66	8	11.34	22	11.01	8	10.02
31	11.72	15	11.24	29	10.97	15	10.13
Apr. 7	11.75	21	11.18	Oct. 6	10.91	22	10.14
15	11.81	28	11.13	13	10.82	29	10.09
22	11.82	Aug. 4	11.05	20	10.73		

## 19. W. C. Michael.

Water level, in feet above assumed datum, 1939

Jan. 6	11.09	Apr. 27	11.23	July 28	11.64	Nov. 3	11.74
20	11.08	May 6	11.26	Aug. 4	11.64	10	11.75
Feb. 17	10.82	13	11.31	11	11.60	17	11.72
24	11.02	20	11.36	18	12.34	24	11.69
Mar. 10	10.92	26	11.39	25	11.64	Dec. 1	11.69
17	10.87	July 1	11.56	Sept. 1	11.64	8	11.62
24	11.14	8	11.59	8	11.60	15	11.57
31	11.24	15	11.60	Oct. 20	11.83	22	11.57
Apr. 7	11.21	21	11.06	27	11.83	29	11.54

## 20. Dr. Bush. Measuring point since Nov. 14, 1939, 34.43 feet above datum.

Water level, in feet above assumed datum, 1939

Jan. 6	10.61	Apr. 15	13.51	Aug. 5	11.79	Oct. 21	10.86
13	10.77	22	13.49	12	11.63	28	10.81
20	10.93	28	13.55	19	11.55	Nov. 4	10.69
27	11.09	May 6	13.51	26	11.50	11	10.58
Feb. 17	12.01	13	13.47	Sept. 2	11.56	18	10.27
24	12.24	20	13.42	9	11.51	25	10.16
Mar. 3	12.77	26	13.33	16	11.41	Dec. 1	10.10
10	13.05	July 1	11.36	23	11.30	9	10.00
17	13.15	8	12.41	30	11.19	16	9.94
24	13.28	15	12.23	Oct. 7	11.10	22	9.84
31	13.40	22	12.05	14	10.99	29	9.82
Apr. 6	12.49	28	11.95				

## 21. J. W. Young.

Water level, in feet above assumed datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	10.04	Apr. 22	13.95	Aug. 5	10.99	Oct. 21	9.56
20	10.52	28	14.04	12	11.98	28	9.27
Feb. 3	11.47	May 6	13.99	19	12.84	Nov. 4	9.21
17	12.86	13	13.92	26	11.71	11	9.25
24	12.33	20	13.76	Sept. 2	11.61	18	9.13
Mar. 10	13.29	26	13.56	9	11.25	25	9.24
17	13.18	July 1	12.32	16	10.80	Dec. 1	9.22
24	13.50	8	11.41	23	10.45	9	9.16
31	14.58	15	11.22	30	10.18	16	9.14
Apr. 7	13.91	22	13.27	Oct. 7	10.00	22	9.12
15	13.95	28	11.31	14	9.74	29	10.06

## 23. Mrs. Lonnie Pugh.

Water level, in feet above assumed datum, 1939

Jan. 6	11.89	Apr. 22	13.75	Aug. 5	13.90	Oct. 21	13.03
20	11.97	28	13.84	12	15.53	28	12.96
Feb. 3	12.95	May 6	13.90	19	10.47	Nov. 4	12.83
17	15.43	13	13.97	26	14.23	11	12.73
24	13.01	20	14.03	Sept. 2	14.10	18	12.62
Mar. 10	14.33	26	14.06	9	13.68	25	13.53
17	13.26	July 1	13.93	16	13.52	Dec. 1	12.46
24	13.46	8	13.83	23	13.43	9	12.28
31	15.24	15	13.77	30	13.37	16	12.25
Apr. 7	13.81	22	13.65	Oct. 7	13.29	22	12.20
15	13.67	28	14.73	14	10.42	29	12.32

## 24. H. L. Miller.

Water level, in feet above assumed datum, 1939

Jan. 6	9.33	Apr. 15	11.13	July 8	5.29	Oct. 28	3.45
Feb. 3	13.45	22	10.25	15	4.55	Nov. 4	2.93
24	14.13	May 6	8.89	28	4.58	11	2.81
Mar. 10	15.23	20	7.52	Aug. 12	4.13	18	2.85
24	12.53	26	7.03	26	5.05	25	2.94
Apr. 7	12.52	July 1	4.86	Oct. 21	3.39		(a)

## 25. J. S. White.

Water level, in feet above assumed datum, 1939

Jan. 6	8.45	July 1	9.63	Sept. 2	9.39	Nov. 4	8.20
Apr. 7	12.13	8	9.50	9	9.35	11	8.12
15	11.82	15	9.32	16	9.14	18	8.02
22	11.64	22	9.19	23	8.96	25	7.94
29	11.94	29	9.22	30	8.82	Dec. 2	7.89
May 6	11.22	Aug. 5	9.10	Oct. 7	8.75	9	7.76
13	11.03	12	8.92	14	8.60	16	7.64
20	10.83	19	9.06	21	8.46	22	7.59
27	10.62	26	9.28	28	8.33	29	7.65

## 27. Walter Lambeth.

Water level, in feet above assumed datum, 1939

Jan. 6	14.44	May 6	10.76	Aug. 12	8.86	Oct. 21	8.46
20	13.76	13	10.50	19	14.87	28	8.32
Feb. 3	16.16	20	10.28	26	12.57	Nov. 4	7.96
24	16.55	26	10.10	Sept. 2	11.79	11	8.37
Mar. 10	19.79	July 1	9.37	9	11.72	18	(b)
24	14.35	8	9.20	16	9.93	25	(b)
Apr. 7	13.13	13	9.18	23	9.82	Dec. 1	(b)
15	12.12	22	9.14	30	9.58	16	(b)
22	11.48	28	8.89	Oct. 7	9.08	22	(b)
28	11.12	Aug. 5	8.84	14	8.97	29	(b)

a Measurements discontinued.

b Well dry.

## ELIZABETH CITY AREA

By A. G. Fiedler

Observations of the fluctuations of ground-water level near Elizabeth City, N. C., were continued in 1939 through the cooperation of the Elizabeth City Public Utility Commission. The records reported herein are collected for obtaining reliable information on the fluctuations of ground-water level in the Elizabeth City well field and also in the same general region but sufficiently distant from the well field, where the water level is not especially affected by pumping from the field.

Records were obtained on two wells equipped with water-stage recorder. Well 31T is a shallow well about 2,500 feet northwest of the pumping plant in the city well field, and well 33T is a shallow well just west of the pumping plant and is within the well field proper. Detailed description and water-level records of the wells for previous years are given in Water-Supply Paper 817 (pp. 225-228), Water-Supply Paper 840 (pp. 316-318), and Water-Supply Paper 845 (pp. 343-345).

The water levels in well 31T are not appreciably affected by pumping in the well field, and accordingly they reflect the natural recharge and discharge from the underground reservoir. The records of water level taken from the recorder charts represent the lowest water level, in feet below the measuring point, for days for which records are available. The highest level during the year occurred on February 11 and was 1.82 feet below the measuring point. The lowest level recorded was 5.69 feet below the measuring point on December 26 and 27. Slightly higher or lower levels may have occurred on days for which records are not available. No new maximum or minimum stages were recorded in this well during 1939. The lowest water level on December 31, 1939, was 0.85 foot lower than the water level on the same date in 1938.

According to the U. S. Weather Bureau, the precipitation for 1939 at Elizabeth City, N. C., was 57.36 inches, which was 9.86 inches above normal. The precipitation was fairly well distributed throughout the year and was above normal in all months except May, June, September, and December. The highest monthly precipitation was 10.15 inches in August--4.65 inches above

normal. The water level in well 31T responds fairly promptly to changes in precipitation and generally rises following heavy rains, provided the soil has not dried out completely. The largest amount of recharge usually occurs from January through March, when vegetation is largely dormant and evaporation losses are low; however, recharge also takes place at other times during the year when infiltration is in excess of that required to satisfy the soil-moisture deficiency. Though the annual precipitation was above normal, the water level at the end of the year was 0.85 foot lower than at the beginning, largely because precipitation in December was only 1.48 inches--2.42 inches below normal.

The water level in well 33T, situated within the well field, reflects changes in recharge; but the strongest influence affecting the water level is that created by the pumping of surrounding wells. [Records of water levels for this well taken from the recorder charts, represent the minima on the days for which records are available. The highest water level recorded during the year, in well 33T, was 4.39 feet below the measuring point on March 18, and the lowest level was 13.50 feet below the measuring point on November 3 and December 31. The level on December 31, 1939, was 2.62 feet lower than the level on the corresponding date of 1938. The records for the year are not sufficiently complete, and the water levels in this well have not been recorded for a sufficiently long period to permit a definite statement of the significance of the net decline.

The pumpage for 1939 from the Elizabeth City well field is estimated on the basis of incomplete records to be about 160 million gallons, in contrast with about 195 million gallons for 1938. The precipitation in the Elizabeth City area was above normal and was essentially the same in amount in both 1938 and 1939. That the water level at the end of 1939 was lower than at the beginning of the year is not believed to be evidence of marked depletion, however, but rather may be caused by the existence of the well within the cone of influence of seven shallow, gravel-packed wells which were completed during the summer and which furnished, during the last half of 1939, almost 50 percent of the water supply for the city.

The following summary table gives the highest and lowest water levels recorded in wells 31T and 33T. The significant feature of the records for well 31T is that, during the 4½ years for which records are available, the lowest water level was recorded each year during the period from June to December, but it occurred in a different month each year. This fact is further evidence of the close relation between the ground-water level and

the precipitation in the Elizabeth City area. It is apparent from the record that the lowest level for the year and the time that it occurs are not dependent so much upon the aggregate precipitation during the year as they are upon the duration of the period of deficient precipitation preceding the time when the lowest level occurs. Even though the precipitation may be somewhat below normal, if it is well distributed during the year, the lowest level that is reached by the water table is likely to be definitely higher than in a year when, though the precipitation is above normal, there may be one or more extended periods of deficient precipitation during the later half of the year when normally the natural losses from the ground-water reservoir by transpiration and evaporation are large. These facts are especially significant with reference to the capacity of the Elizabeth City well field to meet the demand for water by the city, because the storage capacity of the underground reservoir is limited and the safe yield from the field is determined largely by the duration of extended periods of drought. It is equally significant that for several years during the period of record for well 31T the highest water levels were recorded during months which in other years produced the lowest water level of those years. This rather anomalous situation merely indicates that recharge takes place promptly in response to precipitation that is in excess of that needed to satisfy soil-moisture deficiency.

The summary of the records in the following table for well 33T is not especially significant because the records to date do not cover a sufficiently long period.

Summary, by calendar years, of ground-water levels  
for wells 31T and 33T, Elizabeth City area, N. C.

Well	First measured	Lowest observed water level (by calendar year)		Highest observed water level (by calendar year)	
		Water level (feet)	Date	Water level (feet)	Date
31T	June 27, 1935	7.50	Nov. 17, 1935	2.10	July 27, 1935
		6.64	June 1, 1936	1.87	Oct. 17, 1936
		7.14	July 7, 1937	2.03	Feb. 23, 1937
		7.15	Sept. 16, 1938	2.03	Dec. 7, 1938
		a 5.69	Dec. 26, 1939	a 1.82	Feb. 11, 1939
33T	Jan. 9, 1938	13.19	July 15, 1938	9.94	Dec. 27, 1938
		a 13.50	Nov. 3, 1939	a 4.39	Mar. 18, 1939
		13.50	Dec. 31, 1939		

a From recorder chart.

31T.

Lowest daily water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 1	2.33	Jan. 31	1.95	Mar. 28	3.38	Apr. 21	4.44
2	2.48	Feb. 1	2.02	29	3.34	22	4.42
3	2.67	2	2.05	30	3.41	May 20	4.36
4	2.81	3	2.05	31	3.41	21	4.50
5	2.92	4	2.06	Apr. 1	3.22	22	4.71
6	2.95	5	2.12	2	3.31	23	4.89
7	2.95	6	2.12	3	3.20	24	5.02
14	2.92	7	1.90	4	3.47	25	5.17
15	3.08	8	2.02	5	3.57	26	5.29
16	3.09	9	2.07	6	3.64	27	5.38
17	2.08	10	2.10	7	3.65	June 8	6.29
18	2.10	11	1.88	8	3.55	Dec. 22	5.55
19	2.07	Mar. 18	2.40	9	3.56	23	5.61
23	2.71	19	2.63	10	3.45	24	5.65
24	2.72	20	2.76	11	3.59	25	5.66
25	2.05	21	2.84	15	4.25	26	5.69
26	2.09	22	2.96	16	4.36	27	5.69
27	2.10	23	2.06	17	4.59	28	5.56
28	2.64	24	2.16	18	4.77	29	4.84
29	2.55	25	2.20	19	4.79	30	2.88
30	2.12	27	3.48	20	4.81	31	3.06

33T.

Lowest daily water level, in feet below measuring point, 1939

Jan. 1	10.90	Feb. 8	8.07	June 9	8.76	Sept. 15	10.51
2	10.98	9	7.83	10	8.83	16	10.53
3	11.02	10	7.61	11	8.90	17	10.56
4	11.18	11	6.53	12	9.00	18	10.65
5	11.19	Mar. 18	4.64	13	9.05	19	10.67
6	11.28	19	4.79	14	9.13	Oct. 28	13.07
14	11.43	20	4.78	15	9.20	29	13.20
15	11.44	21	5.08	Aug. 10	10.41	30	13.27
16	11.23	22	5.33	11	10.48	31	13.32
17	11.02	23	5.58	12	10.50	Nov. 1	13.36
18	10.83	24	5.58	13	10.51	2	13.42
19	10.68	25	5.60	14	10.54	3	13.43
20	10.64	27	6.11	15	10.58	24	12.86
21	10.48	28	6.50	16	10.59	25	12.84
22	10.39	29	6.73	17	10.65	26	12.78
23	10.34	30	6.69	18	10.68	27	12.72
24	10.26	31	6.38	19	10.71	28	12.66
25	10.13	Apr. 4	7.02	20	10.75	29	12.62
26	10.10	5	7.15	21	10.77	30	12.57
27	9.94	6	7.10	22	10.81	Dec. 1	12.53
28	9.91	7	7.28	23	10.84	22	12.59
29	9.79	8	7.29	24	10.98	23	12.62
30	9.67	9	7.36	25	11.02	24	12.67
31	9.30	10	7.41	26	11.05	25	12.71
Feb. 1	9.48	11	7.38	27	11.07	26	12.75
2	9.28	May 20	7.57	28	11.10	27	12.80
3	9.24	21	7.58	29	11.10	28	12.83
4	9.07	22	7.63	30	10.90	29	12.83
5	8.96	23	7.66	31	10.78	30	13.48
6	8.69	June 3	8.48	Sept. 14	10.49	31	13.50
7	8.07	8	8.68				



# NORTH DAKOTA

By L. K. Wenzel and F. W. Voedisch

The program of water-level measurements in wells in North Dakota <sup>1/</sup> was continued in 1939 by the Federal Geological Survey in cooperation with the North Dakota Geological Survey. Eight wells were dropped from the program and eight new wells were added. At the end of the year the water levels in 80 wells were under observation.

Water levels in most of the wells were measured weekly by local observers employed for the project; but in some they were measured at odd intervals, and in a few they were measured only once or twice in the year. Water levels in about 25 wells were measured through courtesy of the city, State, and Federal agencies. About 3,000 individual measurements of water level were made in 1939. Two automatic water-stage recorders were operated on wells during the year.

The following table gives average monthly water levels from September 1937 to December 1939 based on the records of 10 to 42 wells scattered over the State. In general, the average water levels in corresponding months during subsequent years show decreases in average water level from previous years. The average water level was 100.05 feet above datum in December 1937, 99.54 feet above datum in December 1938, and 99.31 feet above datum in December 1939. Records for 29 wells were used to compute average water levels for 1939. Water levels in 7 of these wells stood higher at the end of the year than at the beginning; whereas in 22 wells they stood lower. There was an average net decline of 0.65 foot in the 29 wells in the year. The precipitation in North Dakota in 1939 as reported by the United States Weather Bureau was only about 84 percent normal. The deficiency may account for the prevalence of net declines of water level in this year.

Average monthly water levels, in feet above assumed datum planes,  
in observation wells in North Dakota, 1937-39

Year	Jan.	Feb.	Mar.	Apr.	May	June
1937	•••••	•••••	•••••	•••••	•••••	•••••
1938	99.97	99.93	100.12	100.41	100.68	100.35
1939	99.49	99.38	99.38	99.95	99.98	100.07

Year	July	Aug.	Sept.	Oct.	Nov.	Dec.
1937	•••••	•••••	•••••	•••••	•••••	•••••
1938	99.99	99.61	99.59	99.44	99.51	99.54
1939	99.89	99.62	99.41	99.37	99.34	99.31

<sup>1/</sup> See Water-Supply Papers 840 and 845.

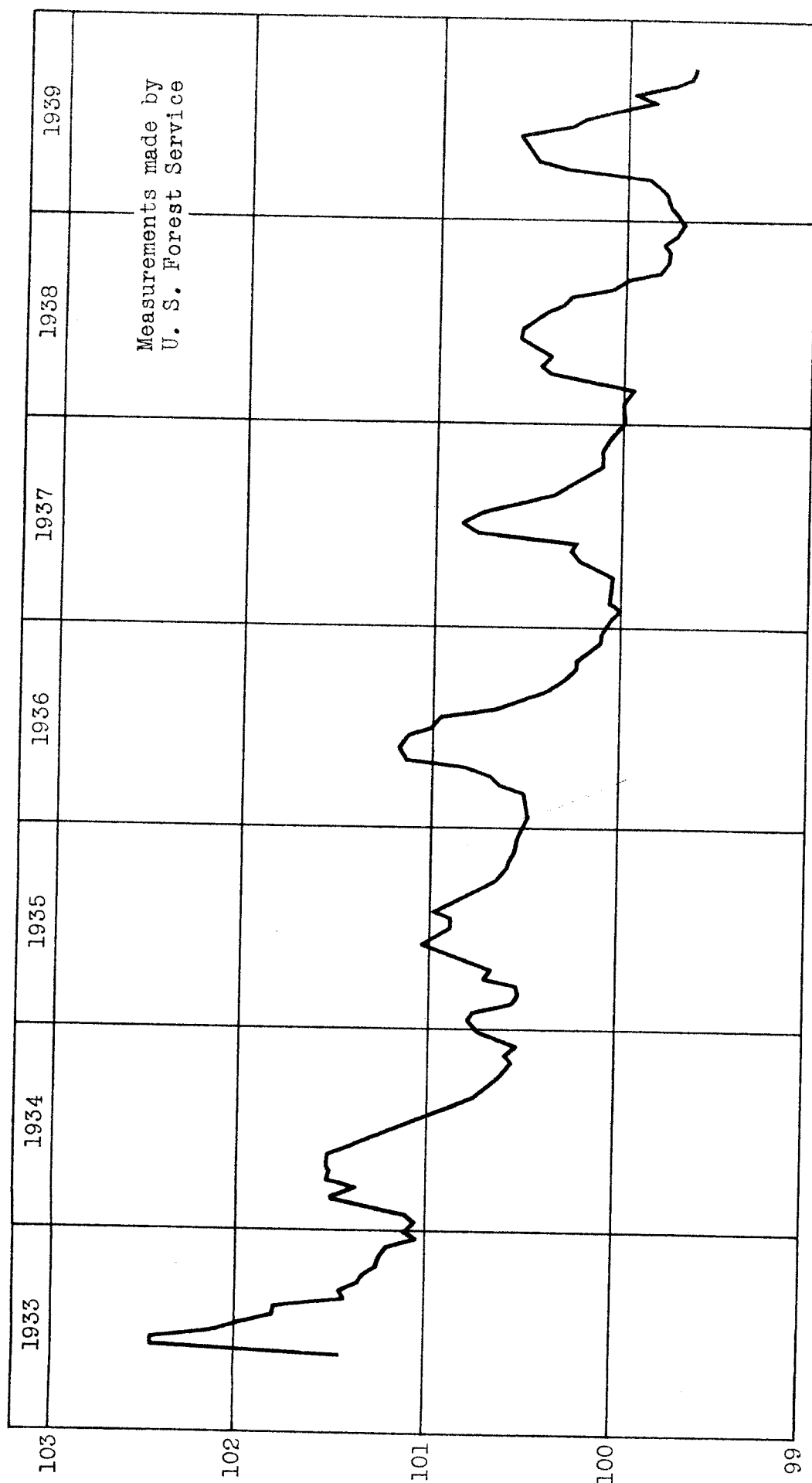


Figure 22.--Average water level, in feet above assumed datum planes, in six wells at Denbigh, North Dakota,

The water levels in six wells at the field station at Denbigh, N. Dak., have been measured about twice a month since August 15, 1932, by the United States Forest Service. During 1939 these wells (wells 101-106, McHenry County) were incorporated into the State program, but records of water levels in them are included in this report for the first time. Average water levels for the period of record are given in the following table, and these data are shown graphically in figure 22. These wells were not always measured on the first or fifteenth day of each month, but for ease of comparison they are given so in the table. The table indicates that the average of these water levels fluctuated in 1937, 1938, and 1939 in about the same manner as the average of water levels in wells scattered over the State, which are included in the foregoing table. The trend in water level has been generally downward; and average water levels on corresponding days of the same month of succeeding years, with the exception of the years 1935 and 1937, show a downward trend for the period of record. The largest annual variation in average water level in these six wells was 1.10 feet in 1933, and the least was 0.54 foot in 1935; an average net decline in water level of 0.74 foot occurred from October 1, 1933, to October 1, 1939. The soil in the vicinity of the wells is sandy, and the terrain is nearly level. As a consequence, much precipitation is absorbed by the soil and only a small part of it runs off. Fluctuations of water level in wells of this area are therefore not so large as in wells in drift-covered areas of the State, where the character of the soil is less favorable for recharge and the land surface is more hilly. The precipitation in the Denbigh area, except in 1935 and 1937, has been below normal since 1929.

Average water levels, in feet above assumed datum planes,  
in six wells at the U. S. Forest Service Experiment

Station at Denbigh, N. Dak., 1933-1939

Day	1933	1934	1935	1936	1937	1938	1939
Jan. 1	.....	101.11	100.74	100.51	100.07	100.00	99.70
15	.....	101.04	100.79	100.48	100.06	100.00	99.74
Feb. 1	.....	101.10	100.76	100.49	100.01	100.00	99.77
15	.....	101.34	100.56	100.50	100.07	99.98	99.79
Mar. 1	.....	101.51	100.51	100.51	100.05	99.95	99.83
15	.....	101.36	100.52	100.63	100.05	100.14	99.88
Apr. 1	.....	101.52	100.70	100.67	100.04	100.39	100.29
15	.....	101.51	100.67	100.81	100.15	100.43	100.48
May 1	.....	101.52	100.80	101.15	100.22	100.40	100.52
15	101.45	101.52	100.92	101.17	100.27	100.46	100.55

## WATER LEVELS AND ARTESIAN PRESSURE, 1933

Average water levels, in feet above assumed datum planes,  
in six wells at the U. S. Forest Service Experiment  
Station at Denbigh, N. Dak., 1933-1939--Continued

Day	1933	1934	1935	1936	1937	1938	1939
June 1	102.47	101.41	101.05	101.16	100.26	100.54	100.58
15	102.47	101.29	100.97	101.11	100.77	100.54	100.31
July 1	102.13	101.17	100.88	100.99	100.85	100.50	100.24
15	101.98	101.06	100.88	100.97	100.74	100.44	100.07
Aug. 1	101.80	100.94	100.97	100.64	100.60	100.34	99.84
15	101.80	100.83	100.90	100.51	100.45	100.29	99.95
Sept. 1	101.41	100.74	100.79	100.42	100.34	100.04	99.75
15	101.43	100.69	100.70	100.32	.....	99.99	99.66
Oct. 1	101.34	100.62	100.64	100.27	100.20	99.81	99.64
15	101.32	100.59	100.60	100.23	100.12	99.78	.....
Nov. 1	101.26	100.56	100.58	100.22	100.12	99.78	.....
15	101.24	100.59	100.55	100.17	100.11	99.80	.....
Dec. 1	101.20	100.52	100.54	100.11	100.09	99.74	.....
15	101.03	100.63	100.53	100.10	100.04	99.70	.....

Since October 1937, regular measurements of water level have been made in two artesian wells (wells 2A, La Moure County, and 72A, Dickey County), which derive their water supply from the Dakota sandstone formation of Cretaceous age. The measurements were made in connection with a study of the artesian water supply of the Dakota sandstone formation in the Ellendale-Jamestown area. At the conclusion of this study the wells were incorporated into the State program of observation wells, but the records of all measurements appear for the first time in this report. Water levels in both these wells are affected by changes in atmospheric pressure, and the water level in well 2A is also affected by the emission of gas.

Records for 80 observation wells are included in this report. The wells are listed alphabetically by county name and numerically within each county. Complete descriptions are given for only those wells whose descriptions are not included in Water-Supply Papers 840 and 845. Except where otherwise noted, all water levels are expressed in feet above an assumed datum 100 feet below the water level in that well on January 1, 1938, or nearest date of measurement. The height of the measuring point above the datum for wells that have been established since January 1, 1938, has been interpolated on a later date from the average water level in a group of selected wells. The depth to water level below the measuring point for any measurement may be computed by subtracting the height of the water level above the datum from the altitude of the measuring point. Water levels for any one well are directly comparable even though the measuring point may be changed, because the record is given in height above a datum that has been referred to one or more bench marks near the well.

## Barnes County

97. H. H. Wilkins. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 5, T. 138 N., R. 57 W. Bored well, diameter 24 inches, depth 51.0 feet. Measuring point, top of well platform, 1.2 feet above land surface and 142.83 feet above datum. Water level Oct. 5, 1939, 43.39 feet below measuring point. Observer, Paul Keller, Valley City. Used occasionally during threshing season.

Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Oct. 5	99.44	Oct. 28	99.43	Nov. 25	99.33	Dec. 16	99.43
7	99.39	Nov. 4	99.47	Dec. 2	99.37	23	99.33
14	99.34	11	99.37	9	99.39	30	99.37
21	99.48	18	99.37				

98. H. H. Wilkins. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 5, T. 138 N., R. 57 W. Bored well, diameter 21 inches, depth 67.2 feet. Measuring point, top of well platform, 1.1 feet above land surface and 146.73 feet above datum. Water level Oct. 5, 1939, 47.58 feet below measuring point. Observer, Paul Keller, Valley City. Used occasionally during threshing season.

Water level, in feet above datum, 1939

Oct. 5	99.15	Oct. 28	100.54	Nov. 25	100.97	Dec. 16	102.35
7	99.39	Nov. 4	100.72	Dec. 2	100.98	23	102.58
14	99.90	11	100.97	9	101.67	30	103.06
21	100.25	18	100.96				

## Billings County

88. Roosevelt National Park. SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 32, T. 140 N., R. 100 W.

Water level, in feet above datum, 1939

Jan. 7	100.09	Apr. 8	100.13	July 8	100.05	Oct. 7	99.82
14	100.08	15	100.13	15	100.02	14	99.79
21	100.07	22	100.13	22	100.00	21	99.77
28	100.06	29	100.13	29	99.98	28	99.75
Feb. 4	100.06	May 5	100.12	Aug. 5	99.96	Nov. 4	99.65
11	100.06	13	100.11	12	99.96	11	99.65
18	100.05	20	100.10	19	99.93	18	99.66
25	100.05	27	100.09	26	99.91	25	99.66
Mar. 4	100.03	June 3	100.07	Sept. 2	99.90	Dec. 2	99.67
11	100.03	10	100.07	9	99.88	9	99.67
18	100.03	17	100.09	16	99.86	16	99.67
25	100.10	24	100.09	23	99.84	23	99.67
Apr. 1	100.13	July 1	100.07	30	99.84	31	99.67

## Bottineau County

60. Federal Land Bank. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 23, T. 160 N., R. 76 W.

Water level, in feet above datum, 1939

Jan. 7	99.84	Apr. 8	99.87	July 8	99.83	Oct. 7	99.80
14	99.84	15	99.87	15	99.83	14	99.79
21	99.84	22	99.86	22	99.83	21	99.78
28	99.83	29	99.85	29	99.83	28	99.78
Feb. 4	99.82	May 6	99.85	Aug. 5	99.82	Nov. 4	99.78
11	99.82	13	99.84	12	99.82	11	99.77
18	99.81	20	99.83	19	99.82	18	99.77
25	99.80	27	99.82	26	99.81	25	99.77
Mar. 4	99.79	June 3	99.82	Sept. 2	99.81	Dec. 2	99.76
11	99.79	10	99.82	9	99.81	9	99.76
18	99.78	17	99.82	16	99.81	16	99.75
25	99.86	24	99.82	23	99.80	23	99.74
Apr. 1	99.87	July 1	99.83	30	99.77	30	99.74

## WATER LEVELS AND ARTESIAN PRESSURE, 1939

## Burke County

66. Mrs. P. M. Peterson. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 5, T. 162 N., R. 89 W.  
Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	100.28	Apr. 8	100.45	July 8	100.46	Oct. 7	100.28
14	100.32	15	100.40	15	100.38	14	100.15
21	100.28	22	100.42	22	100.34	21	100.15
28	100.28	29	100.42	29	100.32	28	100.13
Feb. 4	100.34	May 6	100.44	Aug. 5	100.28	Nov. 4	100.03
11	100.36	13	100.44	12	100.34	11	100.09
18	100.40	20	100.40	19	100.36	18	100.09
26	100.46	27	100.38	26	100.34	25	100.08
Mar. 4	100.42	June 3	100.39	Sept. 2	100.28	Dec. 2	100.07
11	100.46	10	100.36	9	100.28	9	100.09
18	100.48	17	100.44	16	100.25	16	100.09
25	100.48	24	100.51	23	100.23	23	100.09
Apr. 1	100.47	July 1	100.51	30	100.19	30	100.09

## Cass County

8. Arthur D. South. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 14, T. 140 N., R. 52 W.  
Water level, in feet above datum, 1939

Jan. 7	99.68	Apr. 8	99.61	July 15	98.98	Oct. 14	99.03
14	99.67	15	99.62	22	98.99	21	99.01
21	99.66	22	99.62	28	99.01	28	99.03
28	99.66	29	99.59	Aug. 5	99.01	Nov. 4	99.03
Feb. 4	99.66	May 13	98.92	12	99.01	11	99.02
11	99.67	20	98.90	19	99.01	18	99.02
18	99.66	27	98.92	26	99.01	25	99.00
25	99.62	June 3	98.92	Sept. 2	99.01	Dec. 2	98.99
Mar. 4	99.61	10	98.97	9	99.01	9	99.01
11	99.64	17	98.93	16	99.01	16	98.99
18	99.59	24	99.00	23	99.01	23	99.00
25	99.62	July 1	99.00	30	99.01	30	99.00
Apr. 1	99.61	8	99.00	Oct. 7	99.03		

10. Arthur D. South. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 14, T. 140 N., R. 52 W.  
Water level, in feet above datum, 1939

Jan. 7	99.33	Apr. 8	99.83	July 8	99.38	Oct. 7	98.49
14	99.31	15	99.72	15	99.28	14	98.56
21	99.33	22	99.76	22	99.19	21	98.59
28	99.31	29	99.71	28	99.09	28	98.63
Feb. 4	99.34	May 6	99.70	Aug. 5	98.97	Nov. 4	98.67
11	99.33	13	99.67	12	98.89	11	98.69
18	99.32	20	99.62	19	98.78	18	98.71
25	99.47	27	99.59	26	98.72	25	98.71
Mar. 4	99.56	June 3	99.58	Sept. 2	98.64	Dec. 2	98.72
11	99.49	10	99.79	9	98.56	9	98.72
18	99.64	17	99.65	16	98.47	16	98.72
25	99.66	24	99.57	23	98.40	23	98.72
Apr. 1	99.81	July 1	99.48	30	98.41	30	98.72

12. City of Fargo. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 1, T. 139 N., R. 49 W.  
Water level, in feet above datum, 1939

Jan. 7	92.74	Apr. 29	96.57	Aug. 12	66.05	Oct. 21	81.05
14	93.23	May 13	96.68	19	63.95	28	83.23
21	93.66	27	96.81	26	62.47	Nov. 4	84.77
28	94.03	June 10	96.90	Sept. 2	60.97	18	86.98
Feb. 4	94.37	24	96.97	11	60.81	25	87.75
18	94.99	July 8	96.88	16	58.84	Dec. 2	88.55
Mar. 4	95.44	15	86.87	23	57.65	16	89.75
18	95.81	22	77.15	30	57.19	23	90.15
Apr. 1	96.17	29	72.15	Oct. 7	72.34	30	90.59
15	96.40	Aug. 5	68.59	14	77.80		

## Cass County--Continued

14. City of Fargo. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 1, T. 139 N., R. 49 W. Water level, in feet below measuring point, 1939: Sept. 2, 65.17.

28. City of Fargo. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 1, T. 139 N., R. 49 W.  
Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	92.75	Apr. 29	96.56	Aug. 12	66.07	Oct. 21	81.05
14	93.25	May 13	96.70	19	63.86	28	83.22
21	93.69	27	96.83	26	62.44	Nov. 4	84.79
28	94.06	June 10	96.93	Sept. 2	60.91	18	86.97
Feb. 4	94.42	24	97.00	11	60.82	25	87.74
18	95.03	July 8	96.89	16	58.81	Dec. 2	88.54
Mar. 4	95.47	15	86.89	23	57.63	16	89.73
18	95.84	22	77.26	30	57.18	23	90.16
Apr. 1	96.18	29	72.23	Oct. 7	72.35	30	90.61
15	96.40	Aug. 5	68.57	14	77.80		

29. Arthur D. South. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 14, T. 140 N., R. 52 W.  
Water level, in feet above datum, 1939

Jan. 7	99.76	Apr. 8	101.21	July 15	99.61	Oct. 14	98.08
14	99.53	15	101.42	22	99.25	21	99.09
21	99.50	22	101.25	29	99.46	28	98.95
28	99.50	29	100.59	Aug. 5	95.30	Nov. 4	98.03
Feb. 4	99.54	May 13	99.92	12	97.92	11	99.52
11	99.50	20	99.90	19	99.21	18	99.48
18	99.52	27	99.75	26	99.07	25	100.21
25	99.50	June 3	99.40	Sept. 2	97.09	Dec. 2	99.46
Mar. 4	100.84	10	99.98	9	98.30	9	100.92
11	99.96	17	99.92	16	99.36	16	100.09
18	100.92	24	99.99	23	99.25	23	99.13
25	101.09	July 1	99.71	30	98.67	30	99.92
Apr. 1	101.25	8	98.52	Oct. 7	99.17		

56. Union Stockyards. SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 6, T. 139 N., R. 49 W. Water levels, in feet above datum, 1939: Jan. 14, 96.11; Feb. 4, 96.69; Feb. 18, 96.65.

57. Union Stockyards. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 6, T. 139 N., R. 49 W.  
Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 14	95.96	Feb. 18	96.17	Mar. 18	a 91.38
Feb. 4	96.75	Mar. 4	95.42		

58. Union Stockyards. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 6, T. 139 N., R. 49 W. Water levels, in feet above datum, 1939: Jan. 14, 96.21; Feb. 4, 96.50; Feb. 18, 96.34.

67. City of Fargo. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 18, T. 139 N., R. 48 W.  
Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	99.21	Apr. 1	100.01	July 29	98.56	Nov. 4	97.81
14	99.36	29	99.46	Sept. 1	97.91	Dec. 2	97.91
Feb. 4	99.46	June 3	99.31	30	97.51	30	98.01
Mar. 4	99.61	July 8	98.98				

a Pump operating.

## Cavalier County

43. City of Langdon. SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 14, T. 161 N., R. 60 W.  
Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	99.37	Apr. 8	99.23	July 8	102.92	Oct. 7	104.92
14	99.35	15	99.69	15	103.15	14	104.77
21	99.44	22	99.54	22	103.50	21	104.65
28	99.37	29	100.44	29	103.71	30	103.77
Feb. 4	99.39	May 6	100.98	Aug. 5	103.94	Nov. 4	104.06
11	99.10	13	101.48	12	104.10	11	104.39
18	98.94	20	101.89	19	104.23	18	104.50
25	99.08	27	102.25	26	104.35	25	104.62
Mar. 4	99.02	June 3	102.54	Sept. 2	104.50	Dec. 2	104.75
11	99.15	10	102.89	9	104.56	9	104.85
18	98.98	17	102.94	16	104.67	16	104.87
25	98.52	24	103.29	23	104.75	23	104.89
Apr. 1	99.56	July 1	102.15	30	104.85	30	104.96

44. City of Langdon. SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 14, T. 161 N., R. 60 W.  
Water level, in feet above datum, 1939

Jan. 7	99.00	Apr. 8	104.91	July 8	111.66	Oct. 7	112.50
14	99.04	15	105.93	15	112.35	14	111.33
21	99.08	22	108.20	22	111.68	21	110.68
28	99.25	29	112.79	29	112.81	30	107.75
Feb. 4	99.29	May 6	116.96	Aug. 5	113.00	Nov. 4	108.06
11	99.08	13	116.96	12	112.66	11	109.98
18	99.00	20	116.68	19	112.77	18	111.62
25	99.02	27	116.91	26	112.75	25	110.70
Mar. 4	99.00	June 3	117.20	Sept. 2	113.25	Dec. 2	111.00
11	98.91	10	116.70	9	112.79	9	112.83
18	99.00	17	115.85	16	112.70	16	112.96
25	99.54	24	119.91	23	112.48	23	111.75
Apr. 1	102.54	July 1	109.48	30	112.33	30	112.58

45. City of Langdon. SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 23, T. 161 N., R. 60 W.  
Water level, in feet above datum, 1939

Jan. 7	100.05	Apr. 8	133.88	July 8	131.34	Oct. 7	128.84
14	100.00	15	133.84	15	131.29	14	128.88
21	99.84	22	133.75	22	130.48	21	128.71
28	99.59	29	133.42	29	128.59	30	128.65
Feb. 4	99.46	May 6	133.71	Aug. 5	128.34	Nov. 4	128.38
11	99.36	13	133.13	12	130.40	11	128.32
18	99.34	20	133.13	19	130.29	18	128.17
25	99.34	27	133.00	26	129.25	25	128.02
Mar. 4	99.44	June 3	132.59	Sept. 2	129.92	Dec. 2	127.94
11	99.46	10	132.36	9	129.71	9	127.82
18	99.42	17	130.86	16	129.46	16	127.67
25	126.59	24	128.34	23	129.11	23	127.57
Apr. 1	133.05	July 1	131.25	30	128.98	30	127.44

46. Cavalier County Fair Association. NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 14, T. 161 N., R. 60 W.  
Water level, in feet above datum, 1939

Jan. 7	98.94	Apr. 8	98.10	July 8	100.16	Oct. 7	99.75
14	98.83	15	98.67	15	96.83	14	99.63
21	98.67	22	99.33	22	100.00	21	99.60
28	98.54	29	99.83	29	100.87	28	99.44
Feb. 4	98.37	May 6	100.19	Aug. 5	100.56	Nov. 4	99.25
11	98.25	13	100.13	12	100.19	11	99.15
18	98.10	20	100.29	19	100.79	18	98.90
25	98.02	27	100.46	26	100.35	25	98.71
Mar. 4	97.79	June 3	100.67	Sept. 2	100.44	Dec. 2	98.48
11	97.71	10	101.08	9	100.00	9	98.54
18	97.54	17	101.25	16	100.17	16	98.67
25	97.65	24	102.04	23	100.02	23	98.56
Apr. 1	97.67	July 1	102.04	30	99.90	30	98.52



## Dickey County

72A. State of North Dakota. NE $\frac{1}{4}$  sec. 36, T. 131 N., R. 64 W. Unused drilled artesian well, diameter 2 $\frac{1}{2}$  inches, depth 1,180 feet. Measuring point, top of casing, 1.0 foot above land surface and 110.40 feet above datum. Water level Sept. 24, 1937, 10.47 feet below measuring point. Observer, Gust R. Zinter, Monango.

Water level, in feet above datum, 1937-39

Date	Water level	Date	Water level	Date	Water level
Sept. 24, 1937	99.93	July 23, 1938	99.80	Apr. 22, 1939	100.11
Oct. 8	99.92	30	99.80	29	100.07
16	99.90	Aug. 6	99.76	May 6	100.08
23	99.94	13	99.86	13	100.02
30	99.93	20	99.98	20	100.00
Nov. 6	99.92	27	99.94	27	100.02
12	99.92	Sept. 3	99.86	June 3	100.04
20	99.92	10	100.03	10	100.19
27	99.96	17	99.98	17	100.28
Dec. 4	99.95	24	99.96	24	100.16
11	99.94	Oct. 1	99.93	July 1	100.28
18	99.98	8	99.93	8	100.17
25	100.00	15	99.92	15	100.07
Jan. 1, 1938	100.00	22	99.93	22	100.07
8	100.00	29	99.92	29	100.07
15	100.02	Nov. 5	99.93	Aug. 5	99.94
22	100.05	12	99.94	12	99.94
29	100.02	19	99.95	19	99.91
Feb. 5	100.04	26	99.94	26	99.88
12	100.01	Dec. 3	99.96	Sept. 2	99.90
19	100.05	10	99.98	9	99.88
26	100.06	17	100.00	16	99.86
Mar. 5	100.09	25	99.96	23	99.84
12	100.08	Jan. 7, 1939	99.94	30	99.84
19	100.09	14	99.99	Oct. 7	99.90
Apr. 2	100.09	21	99.98	14	99.90
9	100.05	28	99.99	21	99.90
16	100.05	Feb. 4	99.98	28	99.90
23	100.04	11	99.99	Nov. 4	99.88
30	100.02	18	100.05	11	99.90
May 7	100.00	25	100.02	18	99.87
14	99.95	Mar. 4	100.00	25	99.85
21	100.00	11	100.00	Dec. 2	99.88
28	100.02	18	100.00	9	99.88
June 4	99.95	25	100.00	16	99.88
11	99.92	Apr. 1	99.96	23	99.86
18	99.88	8	99.94	30	99.88
25	99.88	15	99.94		

92. S. A. Reko. NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 27, T. 131 N., R. 60 W.

Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	100.05	Apr. 8	100.22	July 8	100.12	Oct. 7	99.66
14	99.93	15	100.18	15	100.10	14	99.68
21	100.01	22	100.22	22	100.08	21	99.70
28	100.06	29	100.22	29	100.03	28	99.68
Feb. 4	100.10	May 6	100.20	Aug. 4	100.10	Nov. 4	99.66
11	99.99	13	100.22	12	99.95	11	99.67
18	100.12	20	100.18	19	99.99	18	99.67
25	100.03	27	100.12	26	99.72	25	99.68
Mar. 4	100.01	June 3	100.03	Sept. 2	99.79	Dec. 2	99.74
11	100.12	10	100.18	9	99.87	9	99.79
18	99.93	17	100.24	16	99.74	16	99.72
25	100.08	24	100.18	23	99.68	23	99.68
Apr. 1	100.09	July 1	100.20	30	99.61	30	99.70

## WATER LEVELS AND ARTESIAN PRESSURE, 1939

## Divide County

68. J. M. Johnson. SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 22, T. 163 N., R. 97 W.  
Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 1	100.21	May 14	101.17	Aug. 6	100.45	Oct. 22	99.96
8	100.19	21	101.08	13	100.41	29	99.90
15	100.17	28	101.02	20	100.38	Nov. 5	99.86
22	100.16	June 4	100.96	27	100.32	12	99.82
29	100.14	11	100.90	Sept. 3	100.31	19	99.76
Feb. 5	100.13	18	100.90	10	100.21	26	99.71
Apr. 2	102.28	25	100.81	17	100.14	Dec. 3	99.69
9	101.98	July 2	100.74	24	100.12	10	99.68
16	101.73	9	100.69	Oct. 1	100.09	17	99.64
23	101.55	16	100.63	8	100.05	24	99.63
30	101.41	23	100.56	15	99.99	31	99.62
May 7	101.28	30	100.52				

69. J. M. Johnson. SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 22, T. 163 N., R. 97 W.  
Water level, in feet above datum, 1939

Jan. 1	100.75	May 14	100.91	Aug. 6	100.29	Oct. 22	99.84
8	100.73	21	100.92	13	100.24	29	99.82
14	100.68	28	100.92	20	100.19	Nov. 5	99.81
22	100.67	June 4	100.85	27	100.12	12	99.79
29	100.66	11	100.79	Sept. 3	100.07	19	99.77
Feb. 5	100.65	18	100.79	10	100.02	26	99.74
Apr. 2	100.69	25	100.74	17	99.98	Dec. 3	99.74
9	100.71	July 2	100.71	24	99.93	10	99.73
16	100.73	9	100.61	Oct. 1	99.90	17	99.71
23	100.77	16	100.54	8	99.89	24	99.69
30	100.81	23	100.46	15	99.84	31	99.68
May 7	100.88	30	100.40				

70. J. M. Johnson. SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 22, T. 163 N., R. 97 W.  
Water level, in feet above datum, 1939

Jan. 1	98.28	May 14	103.34	Aug. 6	94.25	Oct. 22	97.66
8	98.86	21	102.19	13	94.50	29	97.17
15	98.00	28	101.00	20	95.98	Nov. 5	97.97
22	98.11	June 4	101.82	27	90.50	12	98.34
29	98.08	11	101.18	Sept. 3	91.42	19	98.67
Feb. 5	98.06	18	100.90	10	93.40	26	98.82
Apr. 2	105.27	25	100.73	17	93.60	Dec. 3	98.86
9	102.42	July 2	98.73	24	93.69	10	98.85
16	101.98	9	99.12	Oct. 1	96.98	17	98.89
23	102.72	16	96.95	8	97.53	24	98.87
30	102.62	23	97.26	15	97.63	31	98.85
May 7	104.21	30	97.13				

## Dunn County

89. Knute Haugen. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 18, T. 145 N., R. 91 W.  
Water level, in feet above datum, 1939

Jan. 7	99.64	Apr. 8	99.81	July 8	99.57	Oct. 7	98.96
14	99.68	15	99.64	15	99.62	14	98.87
21	99.63	22	99.82	22	99.61	21	99.71
28	99.83	29	99.57	29	99.64	28	99.57
Feb. 4	99.58	May 6	99.92	Aug. 5	99.58	Nov. 4	99.52
11	99.67	13	99.57	12	99.69	11	99.61
18	99.72	20	99.85	19	99.86	18	99.54
25	99.78	27	99.63	26	99.60	25	99.10
Mar. 4	99.71	June 3	99.57	Sept. 2	99.66	Dec. 2	99.68
11	99.58	10	99.15	9	99.02	9	99.67
18	99.58	17	99.75	17	98.76	17	99.51
25	99.85	23	99.64	24	99.96	23	98.70
Apr. 1	99.91	July 1	99.63	30	99.57	30	98.90

## Eddy County

17. L. S. Rude. SE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 9, T. 150 N., R. 66 W. Water level, in feet below measuring point, 1939: Aug. 3, 11.46.

18. Stockyards. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 9, T. 150 N., R. 66 W.  
Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 10	99.50	Mar. 25	99.65	May 14	99.60	Nov. 18	99.40
14	99.49	Apr. 1	99.78	29	99.57	25	99.39
28	99.42	8	99.70	June 10	99.57	Dec. 2	99.37
Feb. 4	99.44	15	99.71	24	99.61	9	99.31
18	99.30	22	99.64	Oct. 28	99.38	16	99.28
25	99.36	29	99.67	Nov. 4	99.46	23	99.27
Mar. 4	99.27	May 7	99.62	11	99.47	30	99.25
18	99.23						

19. Gilbert Olson. SE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 9, T. 150 N., R. 66 W. Water level, in feet below measuring point, 1939: Aug. 3, 15.62.

20. Knute Egger. SE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 9, T. 150 N., R. 66 W. Water level, in feet below measuring point, 1939: Aug. 3, 20.54.

21. Elmer Moe. NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 9, T. 150 N., R. 66 W. Water level, in feet below measuring point, 1939: Aug. 3, 22.73.

22. Carl Portz. SE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 9, T. 150 N., R. 66 W. Water level, in feet below measuring point, 1939: Aug. 3, 15.85.

## Grand Forks County

35. North Dakota State Historical Society (Grand Forks State Park). NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 36, T. 152 N., R. 54 W. Unused bored well, diameter 30 inches, depth 26.44 feet. Measuring point, top of well platform through hole marked with red arrow, 1.6 feet above land surface and 119.12 feet above datum. Observer, Albert Thoren, Arvilla. Well filled in after May 6, 1939; measurements discontinued.

Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level
Oct. 22, 1937	100.27	Sept. 24, 1938	99.19	Jan. 21, 1939	99.01
June 4, 1938	100.60	Oct. 1	99.11	28	98.94
11	100.58	8	99.02	Feb. 4	98.89
18	100.46	15	98.97	11	98.88
25	100.34	22	98.93	18	98.86
July 2	100.23	29	98.91	25	98.77
9	100.15	Nov. 5	98.95	Mar. 4	98.73
16	100.05	12	98.97	11	98.67
23	99.95	19	99.03	18	98.63
30	99.86	26	99.05	25	98.52
Aug. 6	99.78	Dec. 3	99.06	Apr. 1	98.41
13	99.68	10	99.06	8	98.29
20	99.60	17	99.06	15	98.16
27	99.57	24	99.10	22	98.06
Sept. 3	99.40	31	99.02	29	97.97
10	99.36	Jan. 7, 1939	99.00	May 6	97.90
17	99.29	14	99.01		

36. North Dakota State Historical Society (Grand Forks State Park). NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 36, T. 152 N., R. 54 W. Well filled in after May 6, 1939; measurements discontinued.

Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	99.96	Feb. 11	99.95	Mar. 18	99.92	Apr. 15	99.97
14	99.96	18	99.94	25	100.12	22	99.99
21	99.97	25	99.93	Apr. 1	99.92	29	99.99
28	99.96	Mar. 4	99.93	8	99.94	May 6	100.00
Feb. 4	99.95	11	99.92				

a Pumped just before measurement.

## WATER LEVELS AND ARTESIAN PRESSURE, 1939

## Hettinger County

82. L. F. Everhart. NW $\frac{1}{4}$  sec. 5, T. 133 N., R. 93 W.  
Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	100.53	Mar. 25	100.55	June 10	100.63	Aug. 19	100.68
14	100.53	Apr. 1	100.55	17	100.72	26	100.49
21	100.53	8	100.57	25	100.68	Sept. 2	100.49
28	100.53	15	100.57	July 1	100.80	9	100.49
Feb. 4	100.53	22	100.57	8	100.80	16	100.47
11	100.57	29	100.63	15	100.72	23	100.47
18	100.57	May 6	100.63	22	100.72	30	100.39
25	100.57	13	100.63	29	100.68	Oct. 7	100.39
Mar. 4	100.57	20	100.63	Aug. 5	100.68	14	100.41
11	100.55	28	100.63	12	100.68	21	100.39
18	100.51	June 3	100.63				

## Kidder County

50. Herman Peterson. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 9, T. 138 N., R. 73 W.  
Water level, in feet above datum, 1939

Jan. 7	100.00	Apr. 8	100.08	July 1	100.37	Sept. 30	99.75
14	100.03	15	100.11	8	100.33	Oct. 14	99.79
21	100.01	22	100.16	15	100.29	21	99.77
28	100.00	29	100.16	22	100.08	Nov. 4	99.75
Feb. 4	100.06	May 6	100.12	29	100.04	11	99.79
11	100.09	13	100.16	Aug. 19	100.00	25	99.74
18	100.02	21	100.20	26	99.96	Dec. 2	99.76
25	100.06	28	100.29	Sept. 2	99.91	9	99.83
Mar. 4	100.04	June 3	100.39	9	99.87	16	99.80
11	100.05	10	100.36	16	99.82	23	99.79
18	100.04	24	100.41	23	99.82	30	99.76
Apr. 1	100.09						

## La Moure County

2A. Mrs. Fidela Davis. SE $\frac{1}{4}$  sec. 24, T. 134 N., R. 64 W. Unused drilled artesian well, diameter at top 4 inches, diameter at bottom 1 $\frac{1}{4}$  inches, depth 1,265 feet. Measuring point, top of casing, 0.6 foot above land surface and 102.84 feet above datum. Taps artesian water in Dakota sandstone. Water level July 27, 1937, 2.95 feet below measuring point. Observer, Walter Davis, Edgeley.

Water level, in feet above datum, 1937-39

Date	Water level	Date	Water level	Date	Water level
July 27, 1937	99.89	Mar. 23, 1938	100.13	Sept. 19, 1938	100.02
28, a.m.	99.93	31	100.07	28	100.06
28, p.m.	99.87	Apr. 8	100.27	Oct. 7	100.07
Oct. 21	100.46	16	100.51	15	101.22
29	100.56	25	100.46	23	100.14
Nov. 5	100.05	May 3	100.62	Nov. 2	100.30
12	100.05	11	101.02	26	100.11
20	99.78	19	101.14	Dec. 1	100.40
28	99.71	28	101.22	18	100.70
Dec. 6	99.72	June 5	100.98	19	100.31
14	100.16	13	101.08	22	100.73
22	100.20	21	101.04	30	100.68
31	100.00	30	100.78	Jan. 7, 1939	100.63
Jan. 10, 1938	100.06	July 8	101.20	17	100.71
18	100.14	16	101.14	25	100.63
27	99.97	24	100.95	Feb. 2	100.66
Feb. 11	99.97	Aug. 1	100.94	11	100.68
18	99.58	10	100.47	18	100.68
25	99.98	18	100.30	25	100.77
Mar. 5	99.85	26	100.60	Mar. 4	100.57
7	99.85	Sept. 3	100.28	11	100.64
15	99.98	11	100.50	18	100.56

## La Moure County--Continued

2A. Mrs. Fidela Davis--Continued

Water level, in feet above datum, 1937-39

Date	Water level	Date	Water level	Date	Water level
Mar. 25, 1939	100.74	June 17, 1939	101.67	Sept. 24, 1939	101.02
Apr. 1	100.59	25	101.50	Oct. 1	101.24
8	100.83	July 1	101.43	7	100.92
15	100.92	8	101.45	14	101.22
22	100.80	15	101.65	25	101.22
29	100.92	24	101.08	30	101.12
May 6	101.14	30	101.50	Nov. 4	101.03
14	101.28	Aug. 6	101.59	11	100.94
21	101.28	13	101.42	19	101.29
28	101.46	20	100.75	25	101.09
June 4	101.68	Sept. 16	101.23	Dec. 2	101.01
11	101.41				

## McHenry County

101. Denbigh Forest Experiment Station well 1. United States Forest Service. SW cor. SW $\frac{1}{4}$  NW $\frac{1}{4}$  sec. 36, T. 156 N., R. 78 W. Unused dug well, 4 feet square, depth 12 feet. Measuring point, two brass hubs set in concrete on opposite sides of well, 0.5 foot above land surface and 108.15 feet above datum. Water level Aug. 15, 1932, 7.44 feet below measuring point. Measurements furnished by Lake States Forest Experiment Station, United States Forest Service, University Farm, St. Paul, Minnesota.

Water level, in feet above datum, 1932-39

Aug. 15, 1932	100.71	Jan. 1, 1935	a 100.69	Sept. 1, 1936	100.45
Sept. 15	100.65	17	a 100.76	16	100.35
May 15, 1933	100.39	30	a 100.74	30	100.29
June 1	102.61	Feb. 3	a 100.62	Oct. 16	100.24
15	102.51	17	a 100.48	30	100.25
July 1	102.13	Mar. 4	a 100.40	Nov. 16	100.19
17	101.95	18	a 100.37	Dec. 2	100.14
Aug. 1	101.75	Apr. 3	a 100.70	16	100.11
15	101.60	15	a 100.69	Jan. 2, 1937	100.09
Sept. 1	101.50	May 5	100.63	16	100.09
16	101.40	18	100.96	Feb. 1	100.17
Oct. 3	101.31	June 9	100.97	16	a 100.12
18	101.28	15	100.95	Mar. 2	a 100.10
Nov. 1	101.21	July 2	101.06	15	100.12
16	101.18	16	101.02	31	100.08
Dec. 2	101.17	Aug. 1	101.03	Apr. 17	100.17
18	100.40	15	100.91	30	100.25
Jan. 3, 1934	a 101.05	31	100.83	May 15	100.32
17	a 101.01	Sept. 16	100.69	June 1	100.32
Feb. 2	a 101.05	28	100.64	15	b 100.87
16	a 101.17	Oct. 16	100.60	30	100.91
Mar. 1	a 101.38	31	100.59	July 15	100.76
15	a 101.40	Nov. 14	100.55	31	100.56
Apr. 3	a 101.43	Dec. 2	100.55	Aug. 16	100.43
16	a 101.42	17	100.52	31	100.32
29	101.49	30	100.51	Sept. 30	100.19
May 20	101.49	Jan. 15, 1936	100.50	Oct. 15	100.15
31	101.32	30	100.50	Nov. 1	100.11
June 16	101.26	Feb. 15	100.51	15	100.10
July 2	101.13	Mar. 1	100.52	30	100.09
16	101.02	15	100.62	Dec. 15	100.04
Aug. 1	100.89	30	100.94	30	100.00
17	100.79	Apr. 15	101.21	Jan. 15, 1938	100.00
Sept. 1	100.70	May 2	101.27	Feb. 1	100.00
17	100.65	16	101.26	15	99.97
Oct. 1	100.60	June 1	101.23	Mar. 1	99.95
15	100.55	15	101.22	15	100.13
31	100.52	July 1	101.03	Apr. 1	100.42
Nov. 15	100.55	15	100.85	11	100.46
Dec. 1	100.47	29	100.69	20	100.54
16	100.63	Aug. 15	100.55	May 2	100.52

a Ice in well.

b 4.21 inches rainfall June 4, 5, and 6, 1937.

## McHenry County--Continued

101. Denbigh Forest Experiment Station well 1.--Continued  
Water level, in feet above datum, 1932-39

Date	Water level	Date	Water level	Date	Water level
May 18, 1938	100.57	Nov. 16, 1938	99.53	May 15, 1939	100.56
June 2	100.60	Dec. 1	99.71	31	100.62
16	100.57	16	99.69	June 19	100.35
July 5	100.51	30	99.69	July 1	100.26
18	100.46	Jan. 15, 1939	99.70	15	100.11
Aug. 1	100.36	31	99.75	Aug. 1	99.81
15	100.37	Feb. 15	99.80	16	99.92
31	100.06	Mar. 1	99.84	Sept. 1	99.73
Sept. 16	99.99	15	99.89	18	99.65
30	99.80	30	100.32	Oct. 1	99.61
Oct. 18	99.75	Apr. 20	100.49	17	99.57
Nov. 1	99.73	May 1	100.53		

102. Denbigh Forest Experiment Station well 2. United States Forest Service. NW cor. SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 36, T. 156 N., R. 78 W. Unused dug well, 4 feet square, depth 12 feet. Measuring point, two brass hubs set in concrete on opposite sides of well, 0.5 foot above land surface and 109.46 feet above datum. Water level Aug. 15, 1932, 8.80 feet below measuring point. Measurements furnished by Lake States Forest Experiment Station, United States Forest Service, University Farm, St. Paul, Minnesota.

Water level, in feet above datum, 1932-39

Aug. 15, 1932	100.66	Feb. 2, 1935	a 100.59	Dec. 2, 1936	100.12
Sept. 15	100.64	17	a 100.34	16	100.11
May 15, 1933	103.00	Mar. 4	a 100.46	Jan. 2, 1937	100.10
June 1	102.61	18	a 100.48	16	100.07
15	102.51	Apr. 3	a 100.77	Feb. 1	a 100.07
July 1	102.12	15	a 100.62	16	a 100.11
17	102.00	May 5	100.74	Mar. 2	a 100.09
Aug. 1	101.75	18	101.05	15	100.09
15	101.58	June 9	101.17	31	100.09
Sept. 1	101.47	15	101.23	Apr. 17	100.20
16	101.36	July 2	101.10	30	100.33
Oct. 3	101.27	16	101.12	May 15	100.39
18	101.24	Aug. 1	101.07	June 1	100.39
Nov. 1	101.19	15	100.97	15	100.92
16	101.18	31	100.88	30	100.96
Dec. 2	101.16	Sept. 16	100.77	July 15	100.78
18	101.11	28	100.71	31	100.57
Jan. 3, 1934	a 101.03	Oct. 16	100.67	Aug. 16	100.45
17	a 100.99	31	100.64	31	100.34
Feb. 2	a 101.01	Nov. 14	100.61	Sept. 30	100.21
16	a 101.15	Dec. 2	100.59	Oct. 15	100.15
Mar. 1	a 101.37	17	100.55	Nov. 1	100.12
15	a 100.81	30	100.56	15	100.11
Apr. 3	a 101.43	Jan. 15, 1936	100.54	30	100.09
16	a 101.46	30	100.55	Dec. 15	100.04
29	101.54	Feb. 15	100.56	30	100.00
May 20	101.54	Mar. 1	100.56	Jan. 15, 1938	100.02
31	101.43	15	100.74	Feb. 1	100.01
June 16	101.29	30	100.88	15	100.00
July 2	101.14	Apr. 15	100.99	Mar. 1	99.98
16	101.02	May 2	101.21	15	100.22
Aug. 1	100.88	16	101.25	Apr. 1	100.31
17	100.77	June 1	101.25	11	100.49
Sept. 1	100.68	15	101.19	20	100.54
17	100.64	July 1	101.07	May 2	100.51
Oct. 1	100.59	15	100.86	18	100.65
15	100.54	29	100.68	June 2	100.70
31	100.52	Aug. 15	100.57	16	100.64
Nov. 15	100.56	Sept. 1	100.45	July 5	100.61
Dec. 1	100.43	16	100.36	18	100.55
16	100.48	30	100.30	Aug. 1	100.45
Jan. 1, 1935	a 100.68	Oct. 16	100.26	15	100.39
17	a 100.75	30	100.24	31	100.11
30	a 100.63	Nov. 11	100.19	Sept. 16	100.04

a Ice in well.

## McHenry County--Continued

102. Denbigh Forest Experiment Station well 2.--Continued  
Water level, in feet above datum, 1932-39

Date	Water level	Date	Water level	Date	Water level
Sept. 30, 1938	99.83	Feb. 15, 1939	99.76	July 1, 1939	100.38
Oct. 18	99.76	Mar. 1	99.83	15	100.14
Nov. 1	99.75	15	99.92	Aug. 1	99.89
16	99.63	30	100.47	16	99.98
Dec. 1	99.74	Apr. 20	100.58	Sept. 1	99.79
16	99.71	May 1	100.62	18	99.72
30	99.69	15	100.66	Oct. 1	99.69
Jan. 15, 1939	99.72	31	100.68	17	99.64
31	99.74	June 19	100.44		

103. Denbigh Forest Experiment Station well 3. United States Forest Service. NE cor. SW  $\frac{1}{4}$  NW  $\frac{1}{4}$  sec. 36, T. 156 N., R. 78 W. Unused dug well, 4 feet square, depth 12 feet. Measuring point, two brass hubs set in concrete on opposite sides of well, 0.5 foot above land surface and 108.08 feet above datum. Water level Aug. 15, 1932, 7.43 feet below measuring point. Measurements furnished by Lake States Forest Experiment Station, United States Forest Service, University Farm, St. Paul, Minnesota.

Water level, in feet above datum, 1932-39

Aug. 15, 1932	100.65	Apr. 3, 1935	a 101.01	Mar. 15, 1937	100.11
Sept. 15	100.64	15	a 100.94	31	100.10
May 15, 1933	101.59	May 5	100.62	Apr. 17	100.18
June 1	102.36	18	100.94	30	100.26
15	102.48	June 9	101.08	May 15	100.34
July 1	102.13	15	101.06	June 1	100.34
17	101.98	July 2	100.90	15	100.80
Aug. 1	101.78	16	100.58	30	100.93
15	101.63	Aug. 1	101.00	July 15	100.80
Sept. 1	101.49	15	100.96	31	100.59
16	101.38	31	100.88	Aug. 16	100.46
Oct. 3	101.32	Sept. 16	100.75	31	100.34
18	101.29	28	100.70	Sept. 30	100.20
Nov. 1	101.24	Oct. 16	100.67	Oct. 15	100.16
16	101.22	31	100.65	Nov. 1	100.13
Dec. 2	101.13	Nov. 14	100.61	15	100.18
18	101.12	Dec. 2	100.58	30	100.17
Jan. 3, 1934	a 101.08	17	100.56	Dec. 15	100.05
17	a 100.83	30	100.56	30	100.00
Feb. 2	a 101.00	Jan. 15, 1936	100.54	Jan. 15, 1938	100.01
16	a 101.27	30	100.55	Feb. 1	100.02
Mar. 1	a 101.41	Feb. 15	100.55	15	99.99
15	a 101.36	Mar. 1	100.56	Mar. 1	99.95
Apr. 3	a 101.47	15	100.67	15	100.07
16	a 101.50	30	100.80	Apr. 1	100.38
29	101.51	Apr. 15	100.89	11	100.44
May 20	101.50	May 2	101.15	20	100.48
31	101.41	16	101.22	May 2	100.51
June 16	101.27	June 1	101.23	18	100.57
July 2	101.14	15	101.18	June 2	100.61
Aug. 1	100.94	July 1	101.08	16	100.60
17	100.81	15	100.88	July 5	100.56
Sept. 1	100.70	29	100.72	18	100.52
17	100.66	Aug. 15	100.57	Aug. 1	100.42
Oct. 1	100.61	Sept. 1	100.47	15	100.35
15	100.57	16	100.36	31	100.10
31	100.53	30	100.30	Sept. 16	100.00
Nov. 15	100.56	Oct. 16	100.26	30	99.83
Dec. 1	100.54	30	100.24	Oct. 18	99.78
16	100.69	Nov. 16	100.21	Nov. 1	99.78
Jan. 1, 1935	a 100.78	Dec. 2	100.15	16	99.90
17	a 100.84	16	100.14	Dec. 1	99.73
30	a 100.85	Jan. 2, 1937	100.11	16	99.72
Feb. 3	a 100.71	16	100.09	30	99.70
17	a 100.59	Feb. 1	100.09	Jan. 15, 1939	99.84
Mar. 4	a 100.58	16	100.08	31	99.81
18	a 100.71	Mar. 2	100.05	Feb. 15	99.83

a Ice in well.

## McHenry County--Continued

103. Denbigh Forest Experiment Station well 3.--Continued  
Water level, in feet above datum, 1932-39

Date	Water level	Date	Water level	Date	Water level
Mar. 1, 1939	99.88	May 31, 1939	100.63	Aug. 16, 1939	99.96
15	99.95	June 19	100.39	Sept. 1	99.76
30	100.35	July 1	100.31	18	99.64
Apr. 20	100.51	15	100.09	Oct. 1	99.65
May 1	100.56	Aug. 1	99.85	17	99.69
15	100.60				

104. Denbigh Forest Experiment Station well 4. United States Forest Service. SE cor. SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 36, T. 156 N., R. 78 W. Unused dug well, 4 feet square, depth 9 feet. Measuring point, two brass hubs set in concrete on opposite sides of well, 0.5 foot above land surface and 107.64 feet above datum. Water level Aug. 15, 1932, 6.97 feet below measuring point. Measurements furnished by Lake States Forest Experiment Station, United States Forest Service, University Farm, St. Paul, Minnesota.

Water level, in feet above datum, 1932-39

Aug. 15, 1932	100.67	June 9, 1935	101.02	Aug. 31, 1937	100.32
Sept. 15	100.63	15	101.00	Sept. 30	100.16
May 15, 1933	101.59	July 2	101.02	Oct. 15	100.15
June 1	102.41	16	101.00	Nov. 1	100.11
15	102.44	Aug. 1	101.01	15	100.07
July 1	102.12	15	100.96	30	100.05
17	101.94	31	100.74	Dec. 15	a 100.02
Aug. 1	101.79	Sept. 16	100.74	30	a 100.00
15	101.64	28	100.67	Jan. 15, 1938	a 100.01
Sept. 1	101.52	Oct. 16	100.63	Feb. 1	a 99.99
16	101.42	31	100.59	15	a 99.97
Oct. 3	101.34	Nov. 14	100.57	Mar. 1	a 99.95
18	101.33	Dec. 2	100.55	15	a 100.06
Nov. 1	101.26	17	100.52	Apr. 1	100.29
16	101.24	30	100.51	11	100.34
Dec. 2	101.22	Jan. 15, 1936	100.49	20	100.39
18	101.13	30	100.49	May 2	100.41
Jan. 3, 1934	a 101.10	Feb. 15	100.50	18	100.48
17	a 101.05	Mar. 1	100.51	June 2	100.53
Feb. 2	a 101.09	15	100.58	16	100.53
16	a 101.25	May 2	101.14	July 5	100.48
Mar. 1	a 101.41	16	101.18	18	100.46
15	a 101.43	June 1	101.18	Aug. 1	100.37
Apr. 3	a 101.43	15	101.14	15	100.35
16	a 101.45	July 1	101.05	31	99.95
29	101.46	15	100.86	Sept. 16	99.98
May 20	101.47	29	100.68	30	99.80
31	101.38	Aug. 15	100.54	Oct. 18	99.74
June 16	101.25	Sept. 1	100.45	Nov. 1	99.73
July 2	101.14	16	100.34	16	99.86
16	101.04	30	100.29	Dec. 1	99.70
Aug. 1	100.93	Oct. 16	100.26	16	99.64
17	100.80	30	100.24	30	a 99.63
Sept. 1	100.73	Nov. 16	100.20	Jan. 15, 1939	a 99.63
17	100.66	Dec. 2	100.14	31	a 99.65
Oct. 1	100.59	16	100.13	Feb. 15	a 99.68
15	100.53	Jan. 2, 1937	100.07	Mar. 3	a 99.75
31	100.52	16	100.03	15	a 99.75
Nov. 15	100.55	Feb. 1	99.83	30	100.23
Dec. 1	100.46	16	a 100.11	Apr. 20	100.37
16	100.54	Mar. 2	a 100.08	May 1	100.41
Jan. 1, 1935	a 100.62	15	a 100.08	15	100.43
17	a 100.64	31	100.07	31	100.45
30	a 100.62	Apr. 17	100.09	June 19	100.30
Feb. 3	a 100.49	30	100.16	July 1	100.23
17	a 100.44	May 15	100.23	15	100.00
Mar. 3	a 100.28	June 1	100.23	Aug. 1	99.78
18	a 100.24	15	100.80	16	99.89
Apr. 3	a 100.43	30	100.87	Sept. 1	99.68
15	a 100.38	July 15	100.76	18	99.59
May 5	100.61	31	100.59	Oct. 1	99.61
18	100.85	Aug. 16	100.44	17	(b)

a Ice in well.

b Dry.



## McHenry County--Continued

105. Denbigh Forest Experiment Station well 5. United States Forest Service. SE cor. of SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 36, T. 156 N., R. 78 W. Unused dug well, 4 feet square, depth 10 feet. Measuring point, two brass hubs set in concrete on opposite sides of well, 0.5 foot above land surface and 107.92 feet above datum. Water level Aug. 15, 1932, 7.22 feet below measuring point. Measurements furnished by Lake States Forest Experiment Station, United States Forest Service, University Farm, St. Paul, Minnesota.

Water level, in feet above datum, 1932-39

Date	Water level	Date	Water level	Date	Water level
Aug. 15, 1932	100.70	June 15, 1935	101.05	Sept. 30, 1937	100.22
Sept. 15	100.67	July 2	101.06	Oct. 15	100.16
May 15, 1933	101.61	16	101.01	Nov. 1	100.14
June 1	102.38	Aug. 1	100.97	15	100.09
15	102.40	15	100.94	30	100.09
July 1	102.16	31	100.87	Dec. 15	100.07
17	102.01	Sept. 16	100.77	30	100.00
Aug. 1	101.82	28	100.71	Jan. 15, 1938	a 99.99
15	101.67	Oct. 16	100.67	Feb. 1	a 100.01
Sept. 1	101.52	31	100.62	15	a 99.98
16	101.46	Nov. 14	100.61	Mar. 1	a 99.94
Oct. 3	101.39	Dec. 2	100.59	15	100.22
18	101.37	17	100.57	Apr. 1	100.44
Nov. 1	101.32	30	100.58	11	100.41
16	101.28	Jan. 15, 1936	100.53	20	100.44
Dec. 2	101.26	30	100.54	May 5	100.42
18	101.21	Feb. 15	100.53	18	100.44
Jan. 3, 1934	a 101.21	Mar. 1	100.55	June 2	100.43
17	a 101.26	15	100.68	16	100.41
Feb. 2	a 101.30	30	100.87	July 5	100.35
16	a 101.97	Apr. 15	100.99	18	100.27
Mar. 1	a 102.04	May 2	101.12	Aug. 1	100.18
15	a 101.57	16	101.14	15	100.15
Apr. 3	a 101.59	June 1	101.11	31	99.99
16	a 101.57	15	101.05	Sept. 16	99.96
29	101.59	July 1	100.95	30	99.76
May 20	101.54	15	100.80	Oct. 18	99.70
31	101.46	29	100.65	Nov. 1	99.72
June 16	101.32	Aug. 15	100.50	16	99.83
July 2	101.22	Sept. 1	100.46	Dec. 1	99.65
16	101.13	16	100.37	16	99.62
Aug. 1	101.01	30	100.34	30	a 99.62
17	100.91	Oct. 16	100.31	Jan. 15, 1939	a 99.77
Sept. 1	100.82	30	100.29	31	a 99.77
17	100.76	Nov. 16	100.23	Feb. 15	a 99.77
Oct. 1	100.72	Dec. 2	100.19	Mar. 1	a 99.78
15	100.67	16	100.19	15	a 99.86
31	100.63	Jan. 2, 1937	100.15	30	100.22
Nov. 15	100.66	16	100.12	Apr. 20	100.40
Dec. 1	100.61	Feb. 1	100.02	May 1	100.43
16	100.71	16	a 100.15	15	100.46
Jan. 1, 1935	a 100.72	Mar. 2	a 100.12	31	100.48
17	a 100.77	15	a 100.07	June 19	100.20
30	a 100.74	31	a 100.07	July 1	100.12
Feb. 3	a 100.72	Apr. 17	100.21	15	100.00
17	a 100.65	30	100.27	Aug. 1	99.76
Mar. 4	a 100.53	May 15	100.27	16	99.85
18	a 100.46	June 1	100.22	Sept. 1	99.67
Apr. 3	a 100.54	15	100.78	18	99.57
15	a 100.60	30	100.79	Oct. 1	99.54
May 5	100.70	July 15	100.72	17	99.49
18	100.30	31	100.66		
June 9	101.10	Aug. 16	100.46		
		31	100.34		

a Ice in well.

## McHenry County--Continued

106. Denbigh Forest Experiment Station well point 1. United States Forest Service. SW cor. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 36, T. 156 N., R. 78 W. Unused driven well, diameter 1 $\frac{1}{2}$  inches, depth 13 feet. Measuring point to July 15, 1937, top of casing, 2.1 feet above land surface and 109.74 feet above datum. Measuring point after July 15, 1937, top of casing, 3.1 feet above land surface and 110.70 feet above datum. Water level Aug. 1, 1933, 7.80 feet below measuring point in use at that time; 8.76 feet below present measuring point. Measurements furnished by Lake States Forest Experiment Station, United States Forest Service, University Farm, St. Paul, Minnesota.

Water level, in feet above datum, 1933-39

Date	Water level	Date	Water level	Date	Water level
Aug. 1, 1933	101.94	Sept. 16, 1935	100.48	Nov. 1, 1937	100.13
15	101.69	28	100.42	15	100.10
Sept. 1	100.98	Oct. 16	100.38	30	100.07
16	101.54	31	100.41	Dec. 15	100.04
Oct. 3	101.44	Nov. 14	100.37	30	100.00
18	101.42	Dec. 2	100.37	Jan. 15, 1938	100.00
Nov. 1	101.37	17	100.34	Feb. 1	99.98
16	101.34	30	100.35	15	99.95
Dec. 2	101.29	Jan. 15, 1936	100.31	Mar. 1	99.93
18	101.21	30	100.32	15	100.16
Jan. 3, 1934	a 101.18	Feb. 15	100.33	Apr. 1	100.45
17	a 101.12	Mar. 1	100.34	11	100.42
Feb. 2	a 101.15	15	100.47	20	100.24
16	a 101.24	30	100.72	May 2	100.02
Mar. 1	a 101.47	Apr. 15	100.81	18	100.06
15	a 101.60	May 2	100.99	June 2	100.40
Apr. 4	a 101.80	16	100.98	16	100.48
16	a 101.65	June 1	100.96	July 5	100.46
29	101.56	15	100.86	18	100.38
May 20	101.56	July 1	100.78	Aug. 1	100.27
31	101.48	15	100.57	15	100.21
June 16	101.35	29	100.44	31	100.00
July 2	101.23	Aug. 15	100.31	Sept. 16	99.95
16	101.13	Sept. 1	100.22	30	99.82
Aug. 1	101.01	16	100.14	Oct. 18	99.95
17	100.90	30	100.09	Nov. 1	100.00
Sept. 1	100.82	Oct. 16	100.03	16	99.97
17	100.75	30	100.03	Dec. 1	99.90
Oct. 1	100.64	Nov. 16	99.99	16	99.82
15	100.66	Dec. 2	99.94	30	99.86
31	100.65	16	99.94	Jan. 15, 1939	a 99.89
Nov. 1	100.65	Jan. 2, 1937	99.90	31	a 99.89
Dec. 1	100.63	16	99.86	Feb. 15	a 99.89
16	100.73	Feb. 2	99.89	Mar. 1	a 99.89
Jan. 1, 1935	a 100.93	16	99.86	15	a 99.93
17	a 100.96	Mar. 2	99.84	30	100.13
30	a 100.98	15	99.84	Apr. 20	100.54
Feb. 2	a 100.93	31	99.86	May 1	100.58
17	a 100.86	Apr. 17	100.04	15	100.59
Mar. 4	a 100.83	30	100.06	31	100.61
18	a 100.84	May 15	100.06	June 19	100.20
Apr. 4	a 100.78	June 1	100.06	July 1	100.13
15	a 100.79	15	100.45	15	100.10
May 5	101.50	30	100.64	Aug. 1	99.96
18	101.39	July 31	100.60	16	100.08
July 2	100.11	Aug. 16	100.48	Sept. 1	99.86
16	100.52	31	100.38	18	99.76
Aug. 1	100.73	Sept. 30	100.20	Oct. 1	99.75
15	100.64	Oct. 15	99.98	17	99.74
31	100.53				

a. Ice in well.

## McIntosh County

93. Freida Forrest. NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 7, T. 130 N., R. 69 W.  
Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	98.10	Apr. 15	102.91	July 15	102.15	Oct. 14	99.39
14	98.12	22	102.22	22	100.63	21	99.49
21	98.13	29	91.84	29	101.09	28	98.59
28	98.08	May 6	93.09	Aug. 5	100.92	Nov. 4	94.33
Feb. 4	98.15	13	92.17	12	101.09	11	94.86
11	98.13	20	91.94	19	100.67	18	96.28
18	98.04	27	92.92	26	100.66	25	96.92
25	98.84	June 3	105.17	Sept. 2	100.53	Dec. 2	97.53
Mar. 4	98.84	10	105.28	9	99.94	9	97.01
11	98.45	17	103.52	16	100.46	16	97.63
18	98.39	24	100.82	23	99.35	23	96.72
25	107.77	July 1	96.57	30	99.13	30	96.69
Apr. 1	105.72	8	102.09	Oct. 7	100.00		

94. Freida Forrest. NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 7, T. 130 N., R. 69 W.  
Water level, in feet above datum, 1939

Jan. 7	98.40	Apr. 22	88.84	July 22	99.34	Oct. 14	98.36
14	98.38	29	86.78	29	99.59	21	98.34
21	98.43	May 6	87.05	Aug. 5	99.66	28	98.46
28	98.44	13	86.53	12	99.45	Nov. 4	98.28
Feb. 4	98.44	20	89.30	19	100.44	11	98.24
11	98.43	27	92.22	26	100.45	18	98.27
18	98.34	June 3	93.53	Sept. 2	99.24	25	98.10
25	98.81	9	94.03	9	99.11	Dec. 2	98.32
Mar. 4	98.81	17	89.39	16	98.95	9	98.37
11	98.23	24	84.76	23	98.93	16	98.24
18	98.27	July 1	84.71	30	98.84	23	98.30
25	98.40	8	97.37	Oct. 7	98.38	30	98.29
Apr. 15	97.72	15	98.85				

## McKenzie County

81. Chas. E. Fleck. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 12, T. 150 N., R. 100 W.  
Water level, in feet above datum, 1939

Jan. 7	100.12	Apr. 8	100.31	July 8	100.08	Oct. 14	100.36
14	99.81	15	100.27	15	100.20	21	100.00
21	99.76	22	100.20	22	100.10	28	100.33
28	100.06	29	100.21	29	100.21	Nov. 4	99.97
Feb. 5	100.31	May 6	100.20	Aug. 5	100.20	11	100.08
12	100.28	13	100.25	19	99.93	18	100.15
19	99.73	20	100.22	26	100.10	25	100.06
26	100.08	27	100.13	Sept. 2	100.31	Dec. 2	100.16
Mar. 5	100.25	June 3	100.06	9	100.01	9	100.13
12	100.00	10	100.04	17	100.16	16	100.02
19	100.01	17	100.14	Oct. 1	100.18	23	99.94
25	99.92	24	100.05	7	100.09	30	100.05
Apr. 1	100.12	July 1	100.26				

91. Johanna Holen Estate. SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 7, T. 150 N., R. 99 W. Dry  
120 feet below measuring point Dec. 9, 1939. Observer, Walter M. Oberg,  
Arnegaard.

## WATER LEVELS AND ARTESIAN PRESSURE, 1939

## McLean County

27. State of North Dakota. SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 15, T. 149 N., R. 84 W.

Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	100.14	Apr. 8	100.04	July 8	100.13	Oct. 7	100.04
14	100.06	15	100.10	15	100.10	14	100.08
21	100.10	22	100.14	22	100.10	21	100.12
28	100.14	29	100.10	29	100.18	28	100.10
Feb. 4	100.10	May 6	100.23	Aug. 5	100.18	Nov. 4	100.06
11	100.06	13	100.18	12	100.14	11	99.98
18	100.10	20	100.23	19	100.06	18	100.02
27	99.98	27	100.21	26	100.10	25	100.06
Mar. 4	99.96	June 3	100.10	Sept. 2	100.21	Dec. 2	100.02
11	100.02	10	100.10	9	100.10	9	100.10
18	100.02	17	100.18	16	100.02	16	100.10
25	100.06	24	100.18	23	100.04	23	100.06
Apr. 1	100.02	July 1	100.18	30	100.10		

## Morton County

49. U. S. Department of Agriculture, Soil Conservation Service.  
NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 4, T. 138 N., R. 81 W.

Water level, in feet above datum, 1939

Jan. 7	98.15	Apr. 1	98.71	June 24	100.29	Oct. 14	98.04
14	98.04	8	99.44	July 1	100.15	21	97.90
21	98.10	22	100.53	8	99.92	28	97.90
28	97.92	29	100.84	15	99.79	Nov. 4	97.84
Feb. 6	97.81	May 6	100.96	Aug. 12	99.08	11	97.65
11	97.75	13	100.86	19	98.90	19	97.54
21	97.63	20	100.86	26	98.84	26	97.46
26	97.52	27	100.75	Sept. 9	98.50	Dec. 9	97.38
Mar. 5	97.54	June 3	100.58	23	98.23	16	97.29
11	97.47	10	100.44	Oct. 1	98.19	24	97.17
18	97.44	18	100.63	7	98.06	30	97.13
25	98.11						

## Mountrail County

90. Emil Molten. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 6, T. 152 N., R. 89 W.

Water level, in feet above datum, 1939

Jan. 7	100.28	Apr. 8	100.15	July 8	100.11	Oct. 7	100.06
14	100.28	15	100.13	15	100.09	14	100.04
21	100.26	22	100.13	22	100.09	21	100.05
28	100.26	29	100.13	29	100.09	28	100.07
Feb. 4	100.27	May 6	100.13	Aug. 5	100.09	Nov. 4	100.03
11	100.27	13	100.12	12	100.11	11	100.03
18	100.27	20	100.12	19	100.07	18	100.03
25	100.27	27	100.11	26	100.07	25	100.01
Mar. 4	100.22	June 3	100.12	Sept. 3	100.09	Dec. 2	100.10
11	100.21	10	100.11	9	100.05	9	100.04
18	100.20	17	100.12	16	100.05	16	100.04
25	100.19	24	100.12	23	100.05	23	100.03
Apr. 1	100.17	July 1	100.11	30	100.05	30	100.02

## Nelson County

47. State of North Dakota. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 4, T. 152 N., R. 59 W. Dug well, 36 inches square, depth 21.8 feet. Measuring point, top of curb, 1 foot above land surface. Water levels, in feet below measuring point: Nov. 2, 1937, 18.56; Oct. 24, 1939, 19.28.

## Pembina County

41. George Harris. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 27, T. 163 N., R. 51 W.  
Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 1	97.56	Apr. 2	99.11	July 1	100.90	Oct. 2	98.46
7	97.51	9	100.44	8	100.65	9	98.37
14	97.45	16	100.56	15	100.40	16	98.27
22	97.34	23	100.75	23	100.18	24	98.15
28	97.32	30	100.35	30	99.90	30	98.07
Feb. 5	97.24	May 7	100.67	Aug. 6	99.57	Nov. 6	97.98
12	97.19	14	100.50	13	99.44	13	97.90
19	97.14	21	100.44	21	99.23	20	97.76
26	97.06	29	100.44	27	99.16	28	97.65
Mar. 5	96.99	June 4	100.31	Sept. 3	99.04	Dec. 4	97.58
12	96.90	11	100.33	10	98.83	11	97.50
19	96.81	18	100.56	17	98.74	18	97.42
26	97.13	25	100.81	25	98.51	25	97.29

42. C. A. Thompson. SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 3, T. 163 N., R. 56 W. Measuring point after September 16, 1939, top of well platform, 0.5 foot above land surface and 110.90 feet above datum.

Water level, in feet above datum, 1939

Jan. 7	99.40	Apr. 22	99.05	July 15	99.15	Oct. 14	99.07
14	99.40	29	99.05	22	99.13	21	99.09
21	99.40	May 6	99.08	29	99.11	28	99.09
28	99.40	13	99.09	Aug. 5	99.07	Nov. 4	99.07
Feb. 4	99.36	20	99.09	12	99.09	11	99.07
25	99.35	27	99.09	19	99.09	18	99.07
Mar. 4	99.35	June 3	99.10	26	99.09	25	99.07
11	99.33	10	99.09	Sept. 2	99.09	Dec. 2	99.07
18	99.40	17	99.22	9	99.07	9	99.07
25	99.36	24	99.18	23	99.06	16	99.07
Apr. 1	99.19	July 1	99.18	30	99.07	23	99.08
8	99.14	8	99.18	Oct. 7	99.07	30	99.09
15	99.09						

## Ramsey County

48. Mrs. Bonnie Boland. NE $\frac{1}{4}$  sec. 14, T. 153 N., R. 65 W.  
Water level, in feet above datum, 1939

Jan. 7	99.51	Apr. 8	99.58	July 8	99.37	Oct. 7	99.13
14	99.53	15	99.57	15	99.34	14	99.05
21	99.56	22	99.61	22	99.33	21	99.15
28	99.56	29	99.58	29	99.32	28	99.10
Feb. 4	99.56	May 6	99.62	Aug. 5	99.30	Nov. 4	99.08
11	99.57	13	99.51	12	99.36	11	99.09
18	99.57	20	99.55	19	99.27	18	99.06
25	99.59	27	99.51	26	99.22	25	99.06
Mar. 4	99.59	June 3	99.58	Sept. 2	99.25	Dec. 2	99.09
11	99.56	10	99.45	9	99.06	9	99.14
18	99.55	17	99.51	16	99.13	16	99.15
25	99.60	24	99.51	23	99.10	23	99.16
Apr. 1	99.59	July 1	99.41	30	99.14	30	99.14

## Renville County

26. Minnesota Trust Company. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 20, T. 181 N., R. 88 W.

Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	90.64	Mar. 11	90.85	June 5	90.72	Nov. 11	90.40
14	90.66	18	90.84	18	90.79	18	90.38
21	90.67	25	90.89	Sept. 23	90.38	25	90.37
23	90.69	Apr. 1	90.91	30	90.38	Dec. 2	90.36
Feb. 4	90.66	13	90.64	Oct. 7	90.42	9	90.34
11	90.68	25	90.74	14	90.44	16	90.32
18	90.71	May 2	90.68	21	90.45	23	90.31
25	90.80	11	90.60	28	90.43	30	90.31
Mar. 4	90.82	15	90.70	Nov. 4	90.42		

75. Bureau of Biological Survey. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 31, T. 158 N., R. 84 W. Observer, Walter H. Granrud, Patrolman, Upper Souris Migratory Waterfowl Refuge, Foxholm.

Water level, in feet above datum, 1939

Jan. 7	100.83	Apr. 1	104.83	July 15	107.02	Sept. 30	106.42
14	100.83	8	107.13	22	107.00	Oct. 7	106.38
22	100.83	15	107.17	27	106.79	14	106.50
28	100.79	22	107.17	Aug. 5	106.71	21	106.33
Feb. 4	100.81	29	108.71	12	107.10	28	106.29
11	100.83	May 13	108.06	19	106.67	Nov. 18	106.08
18	100.79	20	108.21	26	106.44	Dec. 9	105.98
25	100.71	June 10	107.77	Sept. 2	106.31	16	105.92
Mar. 4	100.71	24	107.83	16	106.42	23	105.92
11	100.71	July 1	107.54	23	106.46	30	105.92
18	100.71	8	107.46				

## Richland County

2. Ira Madden. NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 12, T. 132 N., R. 49 W.

Water level, in feet above datum, 1939

Jan. 7	100.46	Apr. 8	100.67	July 8	100.83	Oct. 7	100.88
14	100.46	15	100.67	15	100.83	13	100.87
21	100.46	22	100.71	22	100.83	21	100.85
28	100.47	29	100.73	29	100.83	28	100.85
Feb. 4	100.47	May 6	100.73	Aug. 5	100.83	Nov. 4	100.85
11	100.46	13	100.73	12	100.94	11	100.84
20	100.46	20	100.72	19	100.94	18	100.84
25	100.46	27	100.73	28	100.90	25	100.84
Mar. 4	100.64	June 3	100.73	Sept. 3	100.88	Dec. 2	100.81
13	100.64	12	100.75	9	100.88	9	100.80
18	100.64	18	100.80	16	100.90	18	100.80
25	100.64	24	100.81	23	100.88	25	100.80
Apr. 1	100.67	July 1	100.82	30	100.88	30	100.80

5. John Liljemark. SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 23, T. 133 N., R. 52 W.

Water level, in feet above datum, 1939

Jan. 7	99.88	Apr. 8	102.15	July 8	104.83	Oct. 7	100.40
14	100.05	15	102.25	15	103.53	14	100.62
21	99.93	22	102.81	22	103.56	21	100.59
28	99.84	29	102.88	29	102.65	28	100.58
Feb. 4	99.79	May 6	102.96	Aug. 5	101.81	Nov. 4	100.62
11	99.73	13	102.25	12	101.54	11	100.60
18	99.66	20	101.85	19	101.02	18	100.59
25	99.58	27	102.09	26	100.81	25	100.59
Mar. 4	99.56	June 3	101.85	Sept. 3	100.69	Dec. 2	100.62
11	99.54	10	104.62	9	100.56	9	100.66
18	99.67	17	105.65	16	100.48	16	100.61
25	101.50	24	105.47	23	100.38	23	100.58
Apr. 1	101.92	July 1	106.00	30	100.31	30	100.42

## Sheridan County

95. Bank of North Dakota. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 28, T. 145 N., R. 75 W.  
Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	99.41	Apr. 8	99.53	July 15	100.16	Oct. 14	99.62
14	99.40	15	99.62	22	100.14	21	99.62
22	99.46	22	99.67	29	100.08	28	99.59
28	99.76	29	99.68	Aug. 5	100.01	Nov. 4	99.60
Feb. 4	99.44	May 6	99.80	12	100.01	11	99.55
11	99.44	13	99.74	19	99.91	18	99.57
18	99.45	20	99.80	26	99.84	25	99.53
25	99.45	27	99.81	Sept. 2	99.83	Dec. 2	99.59
Mar. 4	99.43	June 3	99.90	9	99.72	9	99.61
11	99.42	10	99.88	16	99.62	16	99.61
18	99.44	17	99.99	23	99.66	23	99.56
25	99.46	24	100.08	30	99.64	30	99.57
Apr. 1	99.45	July 8	100.23	Oct. 7	99.61		

## Stutsman County

51. Martin Rappley. SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 2, T. 139 N., R. 62 W. Well dry  
Feb. 25, 1939; measurements discontinued Sept. 30, 1939.  
Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 7	99.71	Jan. 21	99.79	Feb. 4	99.71
14	99.81	28	99.69	18	99.50

## Towner County

59. Bank of North Dakota. NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 28, T. 160 N., R. 66 W.  
Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	100.59	Apr. 8	101.01	July 8	100.88	Oct. 7	100.71
14	100.58	15	100.99	15	100.88	14	100.71
21	100.66	22	101.00	22	100.92	21	100.72
28	100.69	29	101.04	29	100.80	28	100.74
Feb. 4	100.78	May 6	101.07	Aug. 5	100.80	Nov. 4	100.74
11	100.80	13	101.01	12	100.92	11	100.75
18	100.86	20	101.00	19	100.80	18	100.76
25	100.89	27	101.05	26	100.80	25	100.76
Mar. 4	100.87	June 3	101.09	Sept. 4	100.68	Dec. 2	100.77
11	100.90	10	100.99	9	100.69	9	100.80
18	100.95	17	101.12	16	100.63	16	100.81
25	100.94	24	101.05	23	100.64	23	100.81
Apr. 1	100.99	July 1	100.97	30	100.69	30	100.81

## Traill County

15. A. C. Skyberg. SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 24, T. 146 N., R. 51 W.  
Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	99.68	Apr. 8	99.58	July 8	99.79	Oct. 7	99.66
14	99.68	15	99.60	15	99.80	14	99.64
21	99.68	22	99.62	22	99.81	21	99.62
28	99.67	29	99.64	29	99.81	28	99.60
Feb. 4	99.66	May 6	99.66	Aug. 5	99.81	Nov. 4	99.60
11	99.65	13	99.68	12	99.81	11	99.60
18	99.59	20	99.69	19	99.81	18	99.59
25	99.58	27	99.70	26	99.79	25	99.58
Mar. 4	99.61	June 3	99.72	Sept. 2	99.77	Dec. 2	99.58
11	99.60	10	99.75	9	99.75	9	99.58
18	99.59	17	99.76	16	99.72	16	99.58
25	99.58	24	99.77	23	99.75	23	99.58
Apr. 1	99.58	July 1	99.77	30	99.70	30	99.58

## Traill County--Continued

31. City of Hatton. SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 18, T. 148 N., R. 53 W.

Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 25	95.70	June 3	96.83	Aug. 12	92.93	Oct. 21	92.83
Apr. 1	96.63	10	98.09	19	92.06	28	93.20
8	96.97	17	97.71	26	92.02	Nov. 4	93.04
15	96.99	24	97.75	Sept. 2	90.62	11	92.81
22	97.41	July 1	97.75	9	90.63	18	92.16
29	97.37	8	97.28	16	90.88	25	94.25
May 6	98.02	15	97.25	23	91.14	Dec. 2	92.97
15	96.91	22	95.87	30	92.66	9	92.21
20	96.91	29	92.82	Oct. 7	93.05	17	92.20
28	97.14	Aug. 5	91.60	14	93.16		

32. City of Hatton. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 18, T. 148 N., R. 53 W.

Water level, in feet above datum, 1939

Apr. 1	97.73	June 10	98.25	Aug. 19	91.29	Oct. 21	91.17
8	98.48	17	98.39	26	90.82	28	91.84
15	98.34	24	98.67	Sept. 2	89.46	Nov. 4	91.76
22	98.75	July 1	98.46	9	89.94	11	91.94
29	98.86	8	97.94	16	90.24	18	91.98
May 6	98.86	15	97.52	23	89.89	25	92.43
15	98.87	22	96.54	30	90.65	Dec. 2	92.65
20	98.71	29	95.44	Oct. 7	90.87	9	92.67
28	98.69	Aug. 5	94.30	14	91.34	16	92.94
June 3	98.58	12	93.00				

33. City of Hatton. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 18, T. 148 N., R. 53 W.

Water level, in feet above datum, 1939

Jan. 7	98.45	June 3	100.19	Aug. 12	98.25	Oct. 21	97.71
Mar. 25	99.20	10	100.19	19	97.90	28	97.98
Apr. 1	99.79	17	100.52	26	97.77	Nov. 4	97.69
8	99.73	24	100.35	Sept. 2	97.48	11	97.86
15	99.88	July 1	99.12	9	98.04	18	97.70
22	99.84	8	98.44	16	97.98	25	97.95
29	99.79	15	98.57	23	97.84	Dec. 2	97.96
May 6	99.44	22	97.96	30	97.94	9	97.73
15	102.03	29	97.61	Oct. 7	97.92	16	98.01
20	99.81	Aug. 5	96.96	14	97.84	23	97.94
28	99.88						

34. City of Hatton. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 18, T. 148 N., R. 53 W.

Water level, in feet above datum, 1939

Mar. 25	97.45	June 3	100.51	Aug. 12	96.47	Oct. 21	95.80
Apr. 1	97.90	10	100.65	19	94.55	28	95.86
8	98.21	17	100.51	26	95.88	Nov. 4	95.80
15	98.67	24	100.28	Sept. 2	95.32	11	95.80
22	99.28	July 1	100.51	9	95.45	18	95.74
29	98.59	8	100.51	16	95.14	25	95.76
May 6	98.41	15	99.30	23	95.16	Dec. 2	95.93
15	100.38	22	99.52	30	95.41	9	95.97
20	100.44	29	97.48	Oct. 7	95.49	16	95.97
28	100.51	Aug. 5	96.76	14	95.53		

## Walsh County

37. C. D. Lewis. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 17, T. 157 N., R. 55 W. Measurements discontinued; replaced by well 96.



## Walsh County--Continued

38. Henry Dipple. SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 16, T. 157 N., R. 51 W.  
Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	99.52	Apr. 10	98.84	July 8	100.11	Oct. 7	99.82
14	99.47	15	100.44	15	99.86	14	99.78
22	99.46	22	100.44	22	99.89	21	100.70
28	99.38	29	100.59	29	100.03	28	100.69
Feb. 4	99.41	May 6	100.57	Aug. 5	99.74	Nov. 4	99.83
11	99.47	13	100.36	12	99.76	11	99.73
19	99.39	20	100.40	19	99.74	19	99.85
25	99.50	27	100.24	26	99.80	25	99.83
Mar. 4	99.53	June 3	100.07	Sept. 2	99.74	Dec. 2	99.61
11	99.80	10	100.25	11	99.80	9	99.80
18	99.82	17	100.26	17	99.73	16	99.87
25	99.61	24	100.10	23	99.59	23	99.82
Apr. 1	99.65	July 1	99.84	30	99.40	30	99.61

39. Henry Dipple. SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 16, T. 157 N., R. 51 W.  
Water level, in feet above datum, 1939

Jan. 7	97.89	Apr. 10	101.86	July 8	103.34	Oct. 7	101.12
14	98.25	15	101.75	15	103.87	14	101.06
22	98.18	22	101.77	22	102.11	21	100.54
28	98.17	29	101.63	29	101.86	28	100.50
Feb. 4	97.85	May 6	101.67	Aug. 5	100.95	Nov. 4	100.41
11	95.53	13	101.53	12	100.47	11	102.54
19	95.62	20	101.44	19	99.62	18	100.62
25	95.69	27	101.57	26	100.75	25	100.62
Mar. 4	95.51	June 3	100.95	Sept. 2	101.38	Dec. 2	100.17
11	95.43	10	102.69	11	101.72	9	100.02
18	95.60	17	102.90	17	101.66	16	100.50
25	95.76	24	103.12	23	101.10	23	100.37
Apr. 1	98.35	July 1	103.19	30	100.88	30	100.28

40. Henry Dipple. SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 16, T. 157 N., R. 51 W.  
Water level, in feet above datum, 1939

Jan. 7	99.78	Apr. 10	104.34	July 8	101.35	Oct. 7	102.37
14	98.52	15	101.60	15	100.68	14	102.33
22	99.02	22	100.49	22	99.65	21	101.26
28	98.92	29	97.21	29	100.40	28	101.49
Feb. 4	98.95	May 6	97.08	Aug. 5	100.45	Nov. 4	101.00
11	99.03	13	96.52	12	100.91	11	98.93
19	99.31	20	98.23	19	100.85	18	100.46
25	99.17	27	98.03	26	102.34	25	100.41
Mar. 4	99.34	June 3	97.91	Sept. 2	102.52	Dec. 2	100.36
11	99.67	10	103.15	11	102.87	9	101.34
18	99.50	17	102.95	17	102.87	16	101.43
25	104.42	24	101.48	23	101.49	23	101.48
Apr. 1	104.42	July 1	101.96	30	100.83	30	101.35

96. C. D. Lewis. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 17, T. 157 N., R. 55 W. Unused driven well, diameter 1 $\frac{1}{2}$  inches, depth 14.8 feet. Measuring point, top of pipe, 3.0 feet above land surface and 110.29 feet above datum. Water level Nov. 11, 1938, 13.47 feet below measuring point. Constructed Nov. 11, 1938 to replace well 37. Observer, C. D. Lewis, Park River.  
Water level, in feet above datum, 1938-39

Date	Water level	Date	Water level	Date	Water level
Nov. 11, 1938	96.82	Dec. 31, 1938	99.28	Feb. 25, 1939	99.45
12	97.63	Jan. 7, 1939	99.30	Mar. 4	99.45
19	98.61	14	99.33	11	99.46
26	98.98	21	99.35	18	99.47
Dec. 3	99.10	28	99.37	25	99.53
10	99.15	Feb. 4	99.39	Apr. 1	99.59
17	99.20	11	99.41	8	99.63
25	99.24	18	99.43	15	99.74

## Walsh County--Continued

96. C. D. Lewis--Continued

Water level, in feet above datum, 1938-39

Date	Water level	Date	Water level	Date	Water level
Apr. 22, 1939	99.78	July 15, 1939	99.62	Oct. 7, 1939	98.52
29	99.85	22	99.46	14	98.57
May 6	99.94	29	99.26	21	98.62
13	100.00	Aug. 5	99.05	28	98.67
20	100.06	12	98.96	Nov. 4	98.72
27	100.14	19	98.84	11	98.75
June 3	100.22	26	98.78	18	98.78
11	100.14	Sept. 2	98.71	25	98.81
17	100.14	9	98.63	Dec. 2	98.82
24	100.04	16	98.58	9	98.87
July 2	99.87	23	98.53	16	98.90
9	99.74	30	98.50	23	98.94

## Ward County

25. Rural Rehabilitation Corporation. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 2, T. 155 N., R. 84 W. Unused bored well, diameter 9 inches, depth 24.15 feet. Measuring point, top of casing on southeast side at arrow, 0.6 foot above land surface and 118.81 feet above datum. Water level Aug. 14, 1937, 18.94 feet below measuring point. Measurements in 1937 and 1938 furnished by Rural Rehabilitation Corporation, Milo Hoisveen, Engineer, Observer. Observer since Sept. 21, 1939, Robert Oliver, Burlington.

Water level, in feet above datum, 1937-39

Aug. 14, 1937	99.87	Jan. 28, 1938	100.10	June 4, 1938	100.39
Sept. 9	99.63	Feb. 4	100.10	11	100.33
23	99.74	11	100.11	19	100.27
Nov. 6	99.80	24	100.12	25	100.27
13	99.81	Mar. 2	100.43	July 2	100.26
20	99.83	9	100.46	9	100.23
27	99.83	26	100.65	17	100.14
Dec. 4	99.84	Apr. 10	100.66	23	100.05
18	99.84	May 3	100.52	Aug. 3	100.05
28	99.98	7	100.48	8	99.98
Jan. 1, 1938	100.00	14	100.48	10	99.93
14	100.09	21	100.50	Sept. 21, 1939	100.32
21	100.10	30	100.41	Oct. 8	100.52

53. Chas. O'Neill. SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 30, T. 160 N., R. 88 W. Bored well, diameter 24 inches, depth 29 feet. Measuring point, top of wood curb at carved arrow, 2.6 feet above land surface and 109.16 feet above datum. Water level Nov. 5, 1937, 8.35 feet below measuring point. Measurements prior to June 11, 1938, furnished by U. S. Biological Survey. Observer since Dec. 24, 1938, C. P. O'Neill, Kenmare. Used occasionally for stock.

Water level, in feet above datum, 1937-39

Nov. 5, 1937	100.81	June 1, 1938	101.90	Apr. 8, 1939	102.41
15	100.55	4	101.73	15	102.45
Dec. 3	100.39	11	101.30	22	102.33
12	100.21	Dec. 24	94.17	29	102.33
16	100.17	31	91.51	May 6	99.45
Jan. 4, 1938	100.00	Jan. 7, 1939	89.60	13	102.04
12	99.92	14	90.50	20	101.47
22	99.87	21	90.14	27	101.24
Feb. 27	99.66	28	88.41	June 3	99.72
Mar. 18	102.48	Feb. 4	88.91	10	100.54
26	102.81	11	90.45	17	99.66
Apr. 5	102.82	18	91.18	24	100.09
9	102.81	25	91.58	July 1	99.87
16	102.66	Mar. 4	91.57	8	98.41
23	102.42	11	88.77	15	99.37
30	102.52	18	89.45	22	98.50
May 7	102.46	25	100.83	29	96.67
21	102.36	Apr. 1	104.37	Aug. 4	93.18

## Ward County--Continued

## 53. Chas O'Neill.--Continued

Water level, in feet above datum, 1937-39

Date	Water level	Date	Water level	Date	Water level
Aug. 12, 1939	91.91	Sept. 30, 1939	96.45	Nov. 18, 1939	87.34
19	92.99	Oct. 7	96.41	25	89.41
26	91.59	14	96.47	Dec. 2	90.67
Sept. 2	91.58	21	96.51	8	91.54
9	91.62	28	95.70	16	92.34
16	93.99	Nov. 4	94.49	23	92.68
23	94.49	11	92.04	30	91.75

71. Bureau of Biological Survey. SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 5, T. 157 N., R. 84 W.  
Observer, Walter H. Granrud, Patrolman, Upper Souris Migratory Waterfowl  
Refuge, Foxholm.

Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	100.35	Apr. 1	100.77	July 15	101.33	Sept. 30	101.21
14	100.33	8	100.77	22	101.37	Oct. 7	101.26
22	100.35	15	100.79	29	101.27	14	101.21
28	100.37	22	100.77	Aug. 5	101.12	21	101.29
Feb. 4	100.33	29	100.83	12	101.23	28	101.29
11	100.21	May 13	101.00	19	101.21	Nov. 18	101.29
18	100.21	20	101.06	26	100.96	Dec. 9	101.29
25	100.25	June 10	101.19	Sept. 2	100.83	16	101.21
Mar. 4	100.23	24	101.12	16	101.16	23	101.26
11	100.23	July 1	101.33	23	101.12	30	101.21
18	100.23	8	101.29				

73. Bureau of Biological Survey. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 21, T. 157 N., R. 84 W.  
Observer, Walter H. Granrud, Patrolman, Upper Souris Migratory Waterfowl  
Refuge, Foxholm.

Water level, in feet above datum, 1939

Jan. 7	101.85	Apr. 29	102.71	July 29	101.29	Oct. 7	101.63
14	101.83	May 13	102.50	Aug. 5	101.00	14	101.67
22	101.87	20	102.35	12	101.33	21	101.67
28	101.87	June 10	102.19	19	101.67	28	101.71
Feb. 4	101.87	24	102.23	26	101.37	Nov. 18	102.13
Apr. 1	102.58	July 1	102.35	Sept. 2	101.52	Dec. 9	102.29
8	102.50	8	102.00	16	101.37	16	102.21
15	102.77	15	101.75	23	101.33	23	102.08
22	102.79	22	101.75	30	101.58	30	101.92

74. Bureau of Biological Survey. NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 21, T. 157 N., R. 84 W.  
Observer, Walter H. Granrud, Patrolman, Upper Souris Migratory Waterfowl  
Refuge, Foxholm.

Water level, in feet above datum, 1939

Jan. 7	101.29	Apr. 1	102.35	July 15	101.31	Sept. 30	100.85
14	101.29	8	102.42	22	101.27	Oct. 7	100.89
22	101.31	15	102.35	29	100.87	14	100.98
28	101.31	22	102.44	Aug. 5	100.81	21	100.89
Feb. 4	101.31	29	102.42	12	100.73	28	100.95
11	101.27	May 13	102.29	19	100.85	Nov. 18	101.19
18	101.35	20	102.19	26	100.92	Dec. 9	101.65
25	101.48	June 10	101.92	Sept. 2	100.29	16	101.69
Mar. 4	101.44	24	101.94	16	100.27	23	101.65
11	101.44	July 1	102.12	23	100.65	30	101.65
18	101.44	8	101.73				

## Wells County

23. City of Harvey. SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 21, T. 150 N., R. 72 W. Old measuring point destroyed. Measuring point from Apr. 8, 1939, top of 2-inch pipe set in well cover, 1.7 feet higher than old measuring point, 3.46 feet below land surface and 108.45 feet above datum.

Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 8	102.45	June 4	105.37	Aug. 20	102.53	Oct. 29	100.70
16	103.95	11	105.49	Sept. 10	102.62	Nov. 5	100.53
23	104.78	18	106.03	17	102.37	12	100.24
30	105.28	25	106.16	24	101.99	19	100.03
May 7	105.37	July 2	106.12	Oct. 1	101.78	26	99.83
14	105.12	9	105.49	8	101.37	Dec. 3	99.53
21	104.87	30	103.87	15	101.12	17	99.37
28	105.16	Aug. 6	103.37	22	101.95	24	99.12

24. City of Harvey. SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 21, T. 150 N., R. 72 W. Old measuring point destroyed. Measuring point from Apr. 8, 1939, end of 1 $\frac{1}{2}$ -inch pipe protruding diagonally through pumphouse floor at pump base, 2.0 feet lower than old measuring point, 1.33 feet above land surface and 115.23 feet vertically above datum. To convert measurements to depths to water level, subtract water level in feet above datum from 115.77 feet.

Water level, in feet above datum, 1939

Apr. 8	103.69	June 11	106.77	Sept. 10	103.89	Nov. 5	101.60
16	105.27	18	107.31	17	103.60	12	101.48
23	106.10	25	107.44	24	103.27	19	101.23
30	106.60	July 2	107.44	Oct. 1	103.15	26	100.89
May 7	106.69	9	106.89	8	102.69	Dec. 3	100.69
21	107.23	30	105.10	15	102.35	17	100.60
28	106.44	Aug. 6	104.85	22	102.19	24	100.35
June 4	106.69	20	104.69	29	101.94		

## Williams County

77. Hans O. Lottstad. NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 24, T. 159 N., R. 103 W. Dug well, diameter 18 inches, depth 43.25 feet. Measuring point, top of well platform, 0.9 foot above land surface and 122.80 feet above datum. Water level May 5, 1938, 22.76 feet below measuring point. Observer, Oscar Ledell, Grenora. Used for domestic supply.

Water level, in feet above datum, 1938-39

Date	Water level	Date	Water level	Date	Water level
May 5, 1938	100.04	Nov. 19, 1938	94.09	June 10, 1939	96.18
7	100.59	26	93.68	17	96.22
14	101.72	Dec. 3	93.99	24	99.80
21	102.61	10	93.86	July 1	95.00
28	102.36	17	93.38	15	93.70
June 4	102.74	24	92.03	22	93.86
11	102.92	31	93.05	29	93.68
18	101.51	Jan. 7, 1939	93.03	Aug. 5	93.80
25	100.63	14	93.18	12	93.53
July 2	99.97	21	92.72	19	93.49
9	99.82	28	91.86	26	91.88
16	98.88	Feb. 4	92.79	Sept. 2	89.20
23	98.45	11	92.79	9	91.27
30	98.01	18	92.28	16	90.73
Aug. 6	97.59	25	91.22	23	89.68
13	97.03	Mar. 4	91.51	30	91.80
20	96.76	11	91.56	Oct. 7	91.88
27	96.32	18	90.98	14	91.89
Sept. 3	95.70	25	93.02	21	90.57
10	95.63	Apr. 1	94.51	28	90.70
17	95.18	8	96.47	Nov. 4	91.22
24	94.65	15	97.34	11	91.04
Oct. 1	94.57	22	97.82	18	90.13
8	94.32	29	98.38	25	83.97
15	94.59	May 6	98.26	Dec. 2	87.35
22	94.80	13	97.55	9	88.26
29	93.38	20	97.74	16	89.15
Nov. 5	93.72	27	97.03	23	89.45
12	94.18	June 3	96.84	30	89.35

## Williams County--Continued

78. Hans O. Lottstad. NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 24, T. 159 N., R. 103 W.  
Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	85.86	Apr. 8	89.22	July 15	91.44	Oct. 14	85.84
14	85.70	15	89.07	22	91.17	21	85.29
21	86.44	22	89.85	29	90.46	28	85.28
28	85.89	29	89.69	Aug. 5	89.59	Nov. 4	84.90
Feb. 4	84.09	May 6	90.94	12	90.88	11	84.10
11	85.09	13	90.63	19	89.34	18	82.93
18	83.67	20	90.42	26	89.15	25	84.55
25	84.45	27	90.38	Sept. 2	88.89	Dec. 2	83.97
Mar. 4	84.42	June 3	90.42	9	87.71	9	83.76
11	83.88	10	92.55	16	87.07	16	84.73
18	83.55	17	93.00	23	86.76	23	83.33
25	86.84	24	92.38	30	86.80	30	83.76
Apr. 1	88.09	July 1	92.30	Oct. 7	86.97		

79. Mrs. Gus B. Swanson Estate. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 29, T. 157 N., R. 96 W.  
Water level, in feet above datum, 1939

Jan. 1	74.78	Apr. 8	86.26	July 8	92.01	Oct. 7	74.99
8	78.30	15	86.24	15	85.97	14	80.76
14	79.05	22	85.18	22	83.53	21	85.43
21	75.28	29	81.41	29	80.97	28	82.09
28	81.18	May 6	86.28	Aug. 5	77.64	Nov. 4	80.36
Feb. 4	76.39	13	80.95	12	91.22	11	76.64
11	69.62	20	90.93	19	90.14	18	60.45
18	79.09	27	92.28	26	89.43	25	60.89
25	71.99	June 3	92.28	Sept. 2	92.41	Dec. 2	73.59
Mar. 4	72.05	10	101.34	9	89.72	9	73.39
11	74.30	17	93.99	16	88.47	16	74.34
18	69.93	24	95.43	23	83.97	23	73.53
25	78.26	July 1	93.09	30	79.32	30	68.57
Apr. 1	82.59						

## OHIO

### BUTLER AND HAMILTON COUNTIES

By F. H. Klaer, Jr.

The investigation of ground-water conditions in Butler and Hamilton Counties, Ohio, begun in June 1938, was continued during 1939 by the Federal Geological Survey in financial cooperation with the Boards of County Commissioners of Butler and Hamilton Counties. The investigation is being conducted by D. G. Thompson and F. H. Klaer, Jr., of the Geological Survey, under the general supervision of O. E. Meinzer, geologist in charge of the Division of Ground Water. It is expected that most of the work will be completed by July 1, 1940, but measurements of water level in selected observation wells may be continued for a longer period. A description of the investigation and measurements of water levels made in observation wells in 1938 are given on pages 370-383, Water-Supply Paper 845.

At the end of 1939, the water levels in about 75 wells were being measured weekly as a part of the investigation. During the year about 7,500 individual measurements were made by H. F. Pittman, C. L. Elliott, and the writer.

During the year 15 automatic water-stage recorders were maintained on wells, most of which were in areas of heavy pumping where fluctuations of water level are of sufficient magnitude to make weekly measurements of little value. Throughout the year 8 recorders were maintained continuously on the same wells, and 7 recorders were installed on 10 different wells for shorter periods.

A study of water-level records obtained over a period of about 18 months shows a definite seasonal fluctuation of water level that is most prominent in shallow wells and least prominent in deep wells. In many shallow wells, the seasonal fluctuations have amounted to as much as 14 feet, the low levels generally having been reached in December 1938 or January 1939 and the high levels in April 1939.

The fluctuations of water level in wells that end in the deeper water-bearing beds depend largely on changes in the rate of pumping from industrial wells. As the rate of pumping from industrial wells depends largely on business conditions and on the seasonal activity of industries, these fluctuations sometimes coincide with the natural seasonal fluctuations. As a

result, it is difficult to determine whether some of the rises of water level in the deeper wells are caused by decreased pumping or by recharge from precipitation.

In the Norwood area there was a gradual rise in water level of about 4 feet from January through June 1939. From July to November, when pumpage for municipal supply was greater than from January through June, the water level declined about 5 feet. During November and December the municipal pumpage was decreased, and the water level rose about 0.5 foot. The water level in well 16-5, in the Norwood municipal well field, was 0.3 foot lower on December 31, 1939, than on the same date in 1938.

In the Ivorydale area the water level in well 17, in the Procter and Gamble Company well field, was relatively high at the end of 1938. A sharp decline of about 2 feet by the end of January was followed by a slow decline of about 0.5 foot from January to August. The rate of decline then became greater, and from August to November the water level dropped about 2 feet. The water level rose slowly about 0.5 foot during December. The lowest stage of 1939 was about 1.5 feet lower than the lowest stage of 1938.

Fluctuations of water level in the Lockland area are caused mostly by changes in the rates of pumping from wells nearby. When the pumping from wells was decreased in January, the water level rose about 3 feet. From February to August the water level fluctuated within a range of about 6 feet, depending on changes in rates of pumping; and from August to November it declined irregularly about 7 feet, due in part to increased industrial pumpage and to deficient rainfall. During December the water level rose slightly. The water level in well 14, at the Gardner-Richardson Company plant, showed a net decline of almost 8 feet for the year, which resulted mainly because the seasonal low level for 1938 was reached in August, whereas the seasonal low level for 1939 was not reached until December. The water level at the end of 1939 was only 0.1 foot lower than the low level of August 1938.

The water level in well 13, at the municipal water plant of the village of Wyoming, rose about 1 foot from December 1938 to December 1939. It rose about 3 feet from January to August and then declined about 2 feet from August to December.

In the Mill Creek Valley north of Lockland, water-level measurements made in wells 18 and 56 show that a general rise in water level of about 6 feet occurred from January to April. As a result of one storm, April 14 to 18, water levels in both wells rose 5 feet more within 10 days. From

April to December the water levels in the wells declined 9 to 13 feet, but nevertheless the water level in well 18 had a net rise of 0.4 foot in the year and the water level in well 56 had a net rise of 2 feet.

In the upper part of Mill Creek Valley, water levels on January 1 were generally low. They rose about 3.5 feet during January and February, fluctuated irregularly during March and April, and then declined 3 to 5 feet from April through May. After a rise of 2 to 3 feet in June, the water levels declined 6 to 7 feet from July to December and were about 3 feet lower on December 26, 1939, than on the same date in 1938.

In the divide area between Mill Creek Valley and Miami Valley, water levels in wells were low in January. They rose 5 to 9 feet during February, March, and April, declined about 2 feet in May and June, and then declined 7 to 12 feet more from July to December. Water levels in most wells in this area declined 2 to 7 feet in the year.

In the Miami Valley south of Hamilton, water levels in wells rose more or less continuously from January to June and then declined from June to December. The rises in the first part of the year and the declines in the last part were about the same--8 feet. Nearer the Miami River, the high level for the year was reached in April, and except for a small rise in June the water levels declined from April to December. Most wells showed net declines of water level of about 0.5 foot for the year.

Water levels in wells in Hamilton rose from the end of January to April but declined irregularly, except for an abrupt rise in June, from April to December. The rises in the early part of the year ranged from 10 to 12 feet; the ensuing declines were from 11 to 13 feet. The water levels declined about 1 foot in the year.

In Middletown, water levels in wells in the shallow water-bearing beds rose about 7.5 feet from January to March, declined 2.5 feet in March, and then rose 8 feet during April. From April to June the water levels declined about 10.5 feet, in June they rose 6 feet, and from June to December they declined 7 to 14 feet. There were net declines of water level in wells and gravel pits for the year of 2 to 8 feet.

Measurements of water level in the deeper water-bearing beds in Middletown have been made in two wells at the East End plant of the American Rolling Mill Company. The fluctuations of water level in this locality due to pumping nearby wells are so great that it is impossible to determine at the present time whether the water in the deeper beds is being replenished by recharge. The water level in well 23-13 declined irregularly about 6



feet from January 1 to April 7. During April and the first week in May, when pumpage from nearby wells of the company was decreased, the water level in the well rose about 6 feet. Pumpage was then increased, and the water level declined about 6 feet from May 8 to July 4. From July 4 to August 7, pumping from nearby wells was reduced to about 40 percent of the average, and the water level rose about 16 feet. From August 7 to December 9, when pumping was very heavy, the water level dropped 24.5 feet. A rise of 7 feet occurred in December, when pumpage was again decreased. The water level in well 23-13 was about 13 feet lower on December 31, 1939, than on the same date in 1938.

Precipitation recorded at the Abbe Observatory Station of the United States Weather Bureau in Cincinnati, for the period July 1, 1938, to July 1, 1939, was almost 13 inches above normal. The greatest excesses occurred during March and April, when conditions for recharge were unusually favorable. The ground was apparently unfrozen, and the growing season had not yet begun. Losses by transpiration were, therefore, small. A severe storm from April 14 to 18, during which 4.92 inches of rain was recorded at Cincinnati, 3.62 inches at Hamilton, and 3.30 inches at Middletown, caused rapid rises of water levels in most wells in the area. The water level in a test well rose 14 feet as a result of the storm. Heavy precipitation during the last 2 weeks in June caused additional rises in many shallow wells, although the rises were not so great or so widespread as those in April.

Precipitation for the last half of 1939 was below normal, the accumulated deficiency for the 6-month period being 7.74 inches. The greatest deficiencies occurred in September, when the precipitation was only 26.8 percent, and in November, when the precipitation was only 29.8 percent of normal. The precipitation for the year recorded at the Abbe Observatory was 2.54 inches above normal.

The period of deficient precipitation occurred in large part during the growing season, when much water is removed from the ground by plants. The decline in water levels was probably greater, therefore, than it would have been had the precipitation been equally deficient during the winter, when vegetation is dormant.

In July 1939 the water levels in most observation wells of the area were at about the same stages as in July 1938. From August to December, 1939, however, they declined almost without interruption as the result of low precipitation and increased pumpage for industrial purposes, and at

the end of the year the water levels were much lower in many of the wells than at the end of 1939. The usual low seasonal level had not been reached by the end of 1939, and the general decline in water levels was continuing.

In the following tables, water-level measurements are given in feet below measuring points. If water-level measurements for a well were given in pages 370-383 of Water-Supply Paper 845, the descriptions of the well and the measuring point, if unchanged, are omitted in this report. For wells on which automatic water-stage recorders have been installed, the lowest daily water level, as determined from the recorder charts, is given. Water-level measurements for pits are staff-gage measurements and represent the height of the water level above the zero of the gage.

The wells are grouped by townships so that the measurements for wells in the same locality may be given in the same table.

#### Butler County

##### Gravel Pits

D. Paul Benninghofen gravel pit (Symmes Lake), 2.1 miles west from Symmes, Fairfield Township. Staff gage moved to north side of pit and zero of gage raised 0.30 foot Oct. 10, 1939.

E. South Hamilton Sand and Gravel Company gravel pit, 1.4 miles north from Symmes and 0.4 mile east from U. S. Highway 127, Fairfield Township. Staff gage moved from pumphouse to north side of pit and zero of gage lowered 0.35 foot Nov. 4, 1939.

G. Abandoned gravel pit on property of -- Bantel, 1.3 miles west from Flockton, Fairfield Township.

J. Moorman Sand and Gravel Company gravel pit, Columbia Avenue, Middletown, Lemon Township.

L. Abandoned Smith gravel pit, 0.3 mile north from Middletown, NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 29, R. 4, T. 2, Lemon Township. Staff gage installed July 10, 1939 on east side of pit.

Water level, in feet above zero of staff gage, 1939

Date	D	E	G	J	L	Date	D	E	G	J	L
Jan. 3	2.16	10.48	8.83	1.19	....	Mar. 12	6.80	12.26	.....	.....	....
10	2.45	9.98	8.65	1.10	....	14	7.86	12.26	(a)	8.77	....
17	....	....	8.55	1.18	....	21	6.78	13.15	19.76	8.96	....
18	2.46	....	....	....	....	28	5.65	13.88	19.80	7.22	....
20	....	10.07	8.73	....	....	Apr. 4	5.67	14.30	19.50	6.60	....
24	2.74	9.99	8.65	1.32	....	11	5.86	14.70	20.30	6.40	....
31	4.10	9.97	10.44	2.54	....	16	....	15.28	....	....	....
Feb. 1	....	....	....	3.66	....	18	....	15.58	(a)	8.52	....
2	5.21	9.97	....	4.16	....	25	8.50	17.39	(a)	6.52	....
3	5.43	9.98	....	4.40	....	May 2	6.89	18.32	20.10	9.95	....
4	5.51	9.97	....	4.60	....	9	5.97	18.77	19.90	8.00	....
5	....	....	....	4.70	....	16	5.34	18.62	19.56	6.66	....
6	....	....	....	4.80	....	23	4.87	18.38	19.30	5.62	....
7	5.30	10.07	10.75	4.90	....	29	4.68	18.16	18.98	4.80	....
8	....	....	....	4.90	....	June 5	4.50	17.80	18.64	4.48	....
9	....	....	....	5.00	....	12	4.40	17.46	18.02	4.06	....
10	5.24	10.15	....	5.05	....	19	5.19	17.22	18.60	4.51	....
14	5.78	10.36	10.74	5.45	....	20	....	....	....	7.29	....
21	5.46	10.70	11.70	5.35	....	26	6.96	17.00	18.30	10.22	....
Mar. 7	7.07	11.62	19.16	8.08	....	29	6.31	17.00	18.22	9.74	....

a Gage completely submerged.

## Butler County--Continued

## Gravel Pits.--Continued

Water level, in feet above zero of staff gage, 1939

Date	D	E	G	J	L	Date	D	E	G	J	L
July 5	5.67	16.87	17.80	9.24	....	Oct. 3	2.26	13.48	12.88	0.40	1.72
10	5.41	16.76	18.20	8.39	6.72	10	cl.88	13.20	12.45	.25	1.44
17	4.42	16.57	17.74	6.66	6.31	17	1.99	12.84	11.98	.09	1.14
22	....	....	....	5.56	5.96	24	1.67	12.46	11.56	.05	.85
25	4.10	16.31	17.72	5.32	5.70	31	2.22	12.16	11.27	-.04	.67
Aug. 1	4.98	16.11	17.42	5.02	5.20	Nov. 4	....	cl.2.30	....	....	....
8	4.48	15.90	17.54	5.82	5.13	7	2.02	12.16	10.88	.30	.48
15	3.80	15.68	16.98	4.84	4.86	14	1.78	11.90	10.53	.05	.36
22	3.68	15.48	16.28	3.98	4.38	21	1.71	11.64	10.32	.04	.21
29	3.29	15.10	15.60	3.29	3.92	28	1.70	11.33	9.96	-.15	-.04
Sept. 1	....	....	....	2.60	....	Dec. 5	1.75	11.12	9.65	.01	-.15
5	2.95	14.84	....	....	3.45	12	1.67	10.91	9.45	-.08	-.32
12	2.66	14.48	14.34	1.84	2.98	19	1.56	10.64	9.12	-.25	-.42
19	2.48	14.13	12.84	1.20	2.49	26	1.47	10.44	8.83	-.60	-.50
26	2.31	13.83	12.30	.68	2.06						

## Union Township

19. Fox Paper Company, Crescentville.

37. Ben Kohls, SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 33, 1.1 miles northeast from Crescentville. At rear of house. Domestic drilled well, diameter 6 inches, depth 56 feet. Measuring point, top of board cover over well, 0.9 foot above land surface.

10A. Henry Baumann, 1.6 miles north from Crescentville. Measurements discontinued June 19, 1939.

25. J. W. Margonett, Rialto.

20. Margaret Bramble Estate, Rialto.

44. E. C. Shepherd, Princeton Pike, 0.7 mile north from Port Union.

47. O. S. Patchel, Princeton Pike, 1.3 miles north from Port Union. Measurements discontinued May 2, 1939.

Water level, in feet below measuring point, 1939

Date	19	37	10A	25	20	44	47
Jan. 3	12.38	....	9.50	9.86	5.31	14.06	4.00
10	11.20	....	8.03	9.23	4.76	13.98	3.15
17	11.10	21.38	6.52	8.87	4.90	14.30	2.70
24	10.26	....	4.57	7.22	3.79	14.30	3.25
31	9.27	....	2.58	5.89	2.27	13.73	2.34
Feb. 7	8.34	....	2.35	6.00	2.75	13.66	2.25
14	7.99	....	2.64	5.21	3.00	13.21	2.82
21	8.34	....	2.54	6.06	2.92	12.06	2.65
Mar. 7	8.28	....	2.77	5.99	2.85	5.82	2.95
14	7.22	....	2.47	5.85	2.62	5.10	2.67
21	8.41	....	4.15	6.69	3.28	6.05	3.80
28	9.15	....	2.86	6.43	3.03	6.72	2.85
Apr. 4	8.75	....	2.87	6.32	3.08	5.55	3.29
11	8.39	18.90	2.40	6.27	2.83	5.32	2.61
18	6.65	17.49	2.38	5.50	2.21	5.06	2.50
25	7.50	18.35	3.33	6.32	3.00	5.25	3.58
May 2	8.75	19.53	4.58	7.21	3.28	6.30	a4.52
9	9.83	19.97	5.77	8.10	3.83	6.95	....
16	11.15	20.70	10.98	9.10	4.17	7.83	....
23	11.32	21.20	13.60	9.87	4.63	8.40	....
29	11.85	21.19	17.60	9.15	5.13	8.88	....
June 5	10.80	21.35	18.69	10.00	4.96	9.21	....
12	11.97	21.47	23.24	10.58	5.55	9.68	....
19	10.14	20.54	e21.44	7.29	2.57	9.76	....
26	10.06	20.70	....	8.80	3.62	9.86	....

a Measurements discontinued May 2, 1939.

b Gage installed July 10, 1939.

c Zero of gage raised 0.30 foot.

d Zero of gage lowered 0.35 foot.

e Measurements discontinued June 19, 1939.

## Butler County--Continued

## Wells 19-47--Continued

Water level, in feet below measuring point, 1939

Date	19	37	10A	25	20	44	47
June 29	9.55	20.55	.....	7.72	2.33	9.66	.....
July 5	9.17	20.10	.....	7.59	2.08	10.03	.....
10	9.29	19.50	.....	7.44	2.12	10.11	.....
17	10.75	20.39	.....	8.70	3.38	10.47	.....
25	11.60	20.79	.....	8.51	3.50	10.66	.....
Aug. 1	11.73	20.82	.....	9.39	3.92	10.86	.....
8	11.53	20.80	.....	9.13	3.79	11.07	.....
15	12.15	21.28	.....	11.04	4.91	11.39	.....
22	12.68	21.60	.....	11.48	5.52	11.77	.....
29	13.06	21.86	.....	11.89	6.00	12.18	.....
Sept. 5	13.71	22.22	.....	11.96	6.33	12.67	.....
12	14.19	22.55	.....	12.31	6.74	13.20	.....
19	14.58	22.85	.....	12.43	7.10	13.46	.....
26	14.77	23.07	.....	12.52	8.32	14.11	.....
Oct. 3	15.15	23.13	.....	12.41	7.54	14.22	.....
10	15.23	23.57	.....	12.58	7.73	15.07	.....
17	15.67	23.68	.....	12.30	7.91	14.97	.....
24	15.70	23.65	.....	12.48	8.05	15.54	.....
31	15.80	24.32	.....	12.50	8.10	15.46	.....
Nov. 7	15.81	24.21	.....	12.62	8.20	15.42	.....
14	16.29	24.64	.....	12.57	8.32	15.55	.....
21	16.15	24.48	.....	12.47	8.42	16.05	.....
28	16.58	24.75	.....	12.86	8.55	16.22	.....
Dec. 5	16.39	24.66	.....	12.66	8.59	16.18	.....
12	16.70	24.80	.....	12.36	8.71	16.20	.....
19	16.59	24.88	.....	12.68	8.78	15.18	.....
26	16.89	25.00	.....	12.75	8.93	16.68	.....

## Union Township

48. Timothy Hoelle, 0.9 mile east from Flockton.

49. Orin James, 0.7 mile east from Flockton.

## Fairfield Township

53. Harry A. Morris, Flockton

66. Michael Diefel, 1 mile southeast from Schenck.

77. J. E. Ryan, NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 34, R. 2, T. 2., 0.7 mile south from Schenck. Domestic drilled well, diameter 6 inches, depth 63.3 feet. Measuring point, top of 6-inch casing, 0.4 foot above land surface.

71. Fairfield School, 1.4 miles south from Schenck.

153. George Shearer, SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 35, Schenck. Domestic drilled well, diameter 4 inches, depth 115 feet. Measuring point, top of 4-inch casing, 2.5 feet above land surface.

Water level, in feet below measuring point, 1939

Date	48	49	53	66	77	71	153
Jan. 3	12.36	5.81	10.49	6.65	.....	70.22	.....
7	.....	.....	.....	.....	36.70	.....	.....
10	12.03	4.43	10.02	5.45	34.80	70.26	.....
17	12.08	3.43	8.10	4.85	.....	70.48	.....
24	11.54	3.35	3.36	4.05	.....	70.74	.....
31	10.63	2.38	2.00	2.70	.....	70.94	.....
Feb. 4	.....	.....	.....	.....	.....	.....	49.92
7	9.82	2.25	2.22	2.09	.....	71.28	.....
14	.....	2.75	2.62	2.37	.....	71.50	.....
21	9.30	2.39	2.39	2.53	.....	71.65	.....
Mar. 7	9.40	2.59	2.47	2.25	.....	71.65	47.75

## Butler County--Continued

Wells 48-153.--Continued

Water level, in feet below measuring point, 1939							
Date	48	49	53	66	77	71	153
Mar. 14	8.30	2.50	2.07	1.87	.....	71.57	46.73
21	10.47	4.57	3.49	2.63	32.04	71.70	45.79
28	9.95	2.53	3.00	2.09	31.98	71.67	45.14
Apr. 4	9.51	2.85	3.08	2.20	31.05	71.35	44.68
11	9.75	2.30	2.73	1.92	30.32	70.98	44.20
18	6.85	2.00	2.10	1.75	27.80	71.00	42.93
25	9.44	2.95	3.31	2.30	25.17	70.53	40.82
May 2	10.39	3.80	4.24	3.00	24.98	70.13	40.23
9	10.73	4.45	4.86	3.28	25.00	69.80	39.93
16	11.23	5.36	5.25	3.55	25.59	69.40	40.23
23	11.53	5.22	5.70	3.82	26.00	69.20	40.49
29	11.83	5.79	6.26	4.12	26.50	.....	40.86
June 5	11.80	5.76	6.67	3.65	26.87	67.84	41.21
12	11.80	5.87	6.88	3.86	27.52	67.20	41.62
19	10.63	3.25	3.56	2.10	27.58	66.50	41.80
26	10.82	4.52	4.96	3.87	27.65	65.97	41.95
29	10.88	3.80	3.96	3.76	27.75	.....	41.90
July 5	11.60	4.15	4.86	4.02	27.95	.....	.....
10	10.28	3.65	4.10	3.38	28.79	.....	42.25
17	10.83	4.88	5.40	4.54	28.10	.....	42.36
25	10.72	4.32	5.24	4.36	28.49	.....	42.61
Aug. 1	10.75	4.19	5.58	3.92	28.95	.....	42.95
8	10.64	4.26	4.65	4.03	29.03	.....	43.05
15	11.31	5.07	5.88	4.85	29.47	63.72	43.28
22	11.93	5.78	6.45	6.25	29.82	.....	43.70
29	12.32	6.77	7.20	6.83	30.32	.....	44.07
Sept. 5	12.70	7.39	8.33	7.43	30.95	.....	44.48
12	13.10	8.09	9.12	8.00	31.35	.....	44.83
19	13.48	8.80	9.95	7.90	31.82	.....	45.22
26	13.62	9.35	10.39	8.19	32.15	.....	45.56
Oct. 3	14.00	9.91	10.83	8.10	32.65	.....	.....
10	14.12	10.53	11.42	8.31	33.11	.....	46.30
17	14.44	11.08	11.76	8.44	33.60	.....	46.70
24	14.55	11.59	11.94	8.93	33.85	68.69	47.00
31	14.71	12.05	12.21	8.10	34.14	.....	47.30
Nov. 7	14.86	12.53	12.32	8.36	34.43	69.12	47.60
14	15.15	12.93	12.44	8.76	35.30	.....	47.94
21	15.14	13.31	12.50	8.77	35.26	.....	48.22
28	15.48	13.67	12.60	8.83	35.59	.....	48.51
Dec. 5	15.40	13.94	12.72	8.32	35.82	.....	48.72
12	15.63	14.24	12.82	8.56	36.03	.....	49.01
19	15.65	14.47	13.06	8.55	36.40	.....	49.29
26	15.86	14.76	13.20	8.87	36.63	.....	49.53

## Fairfield Township

152. Carl Federle, SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 5, R. 2, T. 1, 1.5 miles north from Symmes, on U. S. Highway 127. Domestic drilled well, diameter 4 inches, depth 110 feet. Measuring point, top of 4-inch casing, 2.0 feet above land surface.

82. Miss Anna Magle, 0.7 mile northwest from Symmes.

151. George Groh, NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 9, R. 2, T. 1, 1.4 miles west from Symmes. Domestic drilled well, diameter 4 inches, depth 44 feet. Measuring point, top of 4-inch casing, 5.8 feet below land surface.

3. Joe Conrad, 2.2 miles west and 0.7 mile south from Symmes. New measuring point Mar. 28, 1939, top of concrete cover over well, 1.2 feet higher than previous measuring point.

T-50. Mary Gerber, NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 5, R. 2, T. 1, River Road, 0.5 mile south from Lindenwald. U.S.G.S. driven test well, diameter 1 $\frac{1}{2}$  inches, depth 21.3 feet. Measuring point, top of 1 $\frac{1}{2}$ -inch pipe, 0.7 foot above land surface.

## Butler County--Continued

T-51. Miami Conservancy District, NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 5, R. 2, T. 1. River Road, 0.2 mile south from Lindenwald. U.S.G.S. driven test well, diameter  $1\frac{1}{2}$  inches, depth 29.3 feet. Measuring point, top of  $1\frac{1}{2}$ -inch pipe, 0.3 foot above land surface.

Water level, in feet below measuring point, 1939.

Date	152	82	151	3	T-50	T-51
Jan. 3	.....	28.59	.....	19.08	.....	.....
10	.....	28.55	.....	18.92	.....	.....
18	.....	28.53	.....	19.00	.....	.....
24	.....	28.46	.....	18.75	.....	.....
31	.....	28.24	17.58	18.13	.....	.....
Feb. 2	.....	28.23	.....	.....	.....	.....
4	43.72	27.85	.....	.....	.....	.....
7	.....	27.65	16.68	16.16	.....	.....
10	.....	27.48	.....	.....	.....	.....
14	43.04	27.15	16.00	15.30	.....	.....
21	42.67	26.64	15.62	15.32	.....	.....
Mar. 7	41.88	25.67	13.23	13.68	.....	.....
12	.....	25.23	13.77	.....	.....	.....
14	41.11	25.06	13.23	13.00	.....	.....
21	40.23	24.45	13.32	13.23	.....	.....
28	40.00	24.26	13.77	a 15.47	.....	.....
Apr. 4	40.08	24.25	13.93	15.80	.....	.....
11	40.13	24.02	13.75	15.54	.....	.....
18	40.55	22.00	10.53	11.12	.....	.....
25	37.15	21.38	11.04	12.25	.....	.....
May 2	37.19	21.24	11.88	13.89	.....	.....
9	37.87	21.66	12.60	15.10	.....	.....
16	38.49	22.03	13.28	15.99	.....	.....
23	40.59	22.46	13.87	16.69	.....	.....
29	40.65	22.90	14.27	17.13	.....	.....
June 5	41.30	23.13	14.36	17.39	.....	.....
12	42.24	23.44	14.90	17.67	.....	.....
19	40.82	23.93	14.54	17.32	.....	.....
26	42.27	23.80	14.03	15.40	b 12.34	.....
29	40.38	23.67	14.10	15.75	12.46	.....
July 5	42.42	23.87	14.37	16.30	12.71	.....
10	41.64	23.93	14.58	16.55	12.88	.....
17	41.65	24.23	15.12	17.30	13.26	.....
25	41.24	24.55	15.50	17.82	13.59	.....
Aug. 1	41.31	24.85	15.15	17.69	13.65	.....
8	42.31	24.94	15.62	17.64	13.62	.....
15	42.88	25.18	16.01	18.23	13.92	.....
22	42.75	25.55	16.23	18.58	14.12	.....
29	39.99	25.87	16.56	18.84	14.30	.....
Sept. 5	42.98	26.15	16.90	19.18	14.56	.....
12	43.86	26.42	17.15	19.47	14.74	.....
19	42.58	26.73	17.37	19.71	14.95	.....
26	43.63	26.95	17.58	19.89	15.07	.....
Oct. 3	42.96	27.27	17.73	20.03	15.26	.....
10	43.22	27.49	17.90	20.14	15.39	.....
17	42.43	27.73	18.05	20.29	15.53	c 17.99
24	43.22	27.95	18.22	20.40	15.68	18.08
31	43.37	28.09	18.06	20.22	15.67	17.41
Nov. 7	d 43.36	28.10	18.21	20.25	15.74	17.80
14	.....	28.32	18.35	20.38	15.83	17.95
21	.....	28.53	18.46	20.46	15.95	17.98
28	.....	28.50	18.50	20.48	16.02	17.94
Dec. 5	.....	28.80	18.55	20.47	16.05	17.82
12	.....	28.81	18.64	20.54	16.13	17.98
19	.....	28.86	18.72	20.59	16.16	18.00
26	.....	28.90	18.80	20.68	16.26	18.10

a New measuring point 1.2 feet higher than previous measuring point.

b Measurements begun June 26, 1939.

c Measurements begun Oct. 17, 1939.

d Measurements discontinued Nov. 7, 1939.

## Butler County--Continued

## Fairfield Township

117. McGreevy Dairy Company, Dixie Highway and Laurel Avenue, Hamilton.

108-C. City of Hamilton old well field, SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 3, R. 3, T. 2, 0.2 mile north from Hamilton. Abandoned dug well, diameter 5 feet, depth 23 feet. Measuring point, top of steel plate over well, 0.8 foot above land surface.

## Madison Township

131. Village of Trenton, SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 31, T. 2 N., R. 4 E., 2.3 miles west from Excello. Drilled public supply well, diameter 8 inches, depth 51 feet. Measuring point, top of 8-inch casing, 21.1 feet below land surface.

## Lemon Township

156-1. Butler County Canning Factory, NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 7, R. 4, T. 2, Oakland, 1.5 miles northeast from Monroe on U. S. Highway 25. Drilled industrial well, diameter 10 inches, depth 29 feet. Measuring point, top of 10-inch casing, 1.8 feet above land surface.

156-2. Butler County Canning Factory, NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 7, R. 4, T. 2, Oakland, 1.5 miles northeast from Monroe on U. S. Highway 25. In boiler room. Drilled industrial well, diameter 6 inches, depth 32 feet. Measuring point, top of 6-inch casing, 0.1 foot above land surface.

157. Monroe Lumber Company, NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 7, R. 4, T. 2, Oakland, 1.5 miles northeast from Monroe on U. S. Highway 25. Drilled industrial well, diameter 4 inches, depth 27.3 feet. Measuring point, bottom edge of hole in side of casing, 0.7 foot below top of casing and 0.5 foot above land surface.

158. Young Men's Christian Association, Manchester Avenue and Broad Street, Middletown. Abandoned drilled well, diameter 6 inches, depth 34.7 feet. Measuring point, top of 4-inch flange, 15.08 feet below land surface.

117. Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	38.68	Feb. 14	37.42	Apr. 11	33.20	May 29	32.04
10	38.86	21	36.79	16	30.40	June 5	32.38
17	38.98	Mar. 7	35.15	18	28.10	12	32.83
24	38.90	12	34.28	25	28.18	19	32.99
31	38.65	14	33.56	May 2	29.60	26	33.04
Feb. 4	38.29	21	33.06	9	30.40	29	33.06
7	38.10	28	33.39	16	31.10	July 5	33.26
10	37.93	Apr. 4	33.58	23	31.59	10	33.32

108-C.

Water level, in feet below measuring point, 1939

Mar. 7	9.66	May 2	5.91	May 23	6.99	June 29	7.01
14	8.75	9	6.22	29	7.32	July 5	6.92
Apr. 4	8.37	16	6.64	June 5	7.72	10	6.47
25	5.57						

131.

Water level, in feet below measuring point, 1939

Feb. 21	13.12	Apr. 25	9.12	May 29	11.24	June 26	10.47
Mar. 14	11.75	May 9	a 11.03	June 5	11.47	29	10.61
Apr. 4	a 12.22	16	10.58	12	11.65	July 5	a 11.55
11	a 12.22	23	10.98	19	11.63	10	11.04

a Pumping.

## Butler County--Continued

Wells 117-158.--Continued

Water level, in feet below measuring point, 1939

Date	117	108-C	131	156-1	156-2	157	158
July 17	33.65	6.86	11.28	4.22	2.64	.....	.....
22	.....	7.14	.....	.....	.....	.....	.....
25	33.70	7.34	11.60	4.39	2.80	.....	.....
Aug. 1	33.94	7.38	11.61	3.80	2.20	.....	.....
8	34.05	7.64	.....	7.67	a 12.19	13.24	15.60
15	34.34	8.05	11.96	13.59	a 14.79	15.11	16.79
22	34.62	8.32	12.24	6.38	4.74	14.64	18.24
29	34.85	8.70	12.46	6.40	4.13	13.97	19.34
Sept. 5	35.20	9.02	12.75	5.87	4.26	14.16	19.68
12	35.45	9.42	13.01	6.97	4.46	14.28	21.08
19	35.76	9.80	13.24	.....	.....	.....	22.08
26	36.00	10.10	a 14.19	9.55	a 10.45	14.87	22.87
Oct. 3	36.29	10.38	a 14.33	.....	.....	.....	23.45
10	36.59	10.64	13.77	6.39	4.72	14.55	23.78
17	36.91	10.94	13.98	6.31	4.75	14.69	24.12
24	37.15	11.13	14.18	.....	.....	.....	24.64
31	37.28	11.28	14.10	5.87	4.28	14.23	25.04
Nov. 7	37.51	11.54	14.19	.....	.....	.....	25.28
14	37.80	11.80	a 15.14	6.15	4.54	14.44	25.25
21	38.03	12.04	a 15.27	.....	.....	.....	25.83
28	38.24	12.24	14.63	6.02	4.51	14.51	26.03
Dec. 5	38.40	12.40	14.73	.....	.....	.....	25.96
12	38.60	12.59	14.83	.....	.....	14.24	26.58
19	38.82	(b)	14.94	.....	.....	.....	26.81
26	39.02	.....	15.07	.....	.....	14.29	26.66

## Fairfield Township

22. General Machinery Company (Niles Tool Works), Hamilton. Automatic water-stage recorder in operation since July 25, 1938.

Water level, in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	41.92	35.76	.....	36.12	35.02	37.99	34.92	33.65	39.37	40.08	40.65	42.07
2	41.95	35.82	.....	36.31	35.20	38.13	34.92	34.32	39.38	40.23	40.76	42.09
3	42.00	35.84	.....	36.55	35.40	38.20	35.03	34.85	39.13	40.42	40.87	42.08
4	42.01	36.02	.....	36.74	35.58	38.20	35.12	35.30	39.02	40.42	40.97	42.10
5	41.99	36.45	34.80	36.90	35.75	38.00	35.04	35.51	39.27	40.49	41.06	42.16
6	41.95	37.10	35.08	36.97	35.85	38.09	35.00	35.70	39.42	40.52	41.20	42.08
7	41.90	37.23	35.31	36.00	35.80	38.29	35.30	36.18	39.52	40.51	41.28	42.05
8	41.75	37.50	35.60	35.57	35.95	38.37	35.50	36.53	39.61	40.32	41.22	42.08
9	41.65	37.82	36.10	35.60	36.18	38.42	35.35	36.87	39.63	40.42	41.26	42.10
10	41.60	37.91	36.52	36.00	36.35	38.49	34.92	37.13	39.50	40.67	41.36	42.13
11	41.55	36.81	36.67	36.23	36.65	.....	35.38	37.39	39.69	40.62	41.39	42.23
12	41.60	35.56	36.46	36.24	36.87	38.10	35.70	37.40	39.88	40.70	41.47	42.32
13	41.65	36.09	35.20	35.94	37.00	37.88	36.00	37.36	39.97	40.78	41.52	42.29
14	41.70	36.60	33.75	36.02	36.86	37.70	36.32	37.63	40.04	40.78	41.62	42.31
15	41.65	37.30	32.95	36.10	37.03	37.50	36.44	37.88	40.12	40.65	41.53	42.33
16	41.68	37.60	33.55	34.20	37.20	37.58	36.42	38.06	40.12	40.85	41.55	42.39
17	41.64	38.00	34.25	30.60	37.37	37.61	36.83	38.22	39.84	41.03	41.61	42.45
18	41.57	38.23	34.86	30.08	37.51	37.42	36.91	38.40	40.06	41.10	41.66	42.46
19	41.55	38.35	35.27	30.45	37.64	36.71	36.90	38.50	40.18	41.18	41.71	42.53
20	41.60	38.35	35.76	31.05	37.67	32.20	36.80	38.40	40.25	41.20	41.78	42.54
21	41.64	37.20	36.10	31.85	37.50	31.10	36.92	38.18	40.32	41.20	41.95	42.61
22	41.69	36.40	36.38	32.51	37.64	31.08	36.98	38.19	40.30	41.08	41.90	42.60
23	41.66	36.78	36.62	32.78	37.78	31.50	36.89	38.30	40.29	41.10	41.86	42.65
24	41.50	37.30	36.84	33.28	37.91	32.28	37.16	38.42	39.99	41.21	41.95	42.69
25	41.36	37.66	37.00	33.65	38.02	32.93	37.39	38.61	40.09	41.20	41.98	42.70
26	41.32	37.93	37.18	33.95	38.10	33.75	37.52	38.67	40.31	41.18	42.01	42.72
27	41.39	38.20	37.35	34.27	38.10	34.41	37.61	38.55	40.37	41.16	42.06	42.68
28	41.44	38.20	37.35	24.55	37.80	34.88	37.62	38.74	40.42	40.96	42.13	42.66
29	41.42	.....	37.10	34.64	37.59	34.89	37.60	38.97	40.49	40.75	42.08	42.68
30	41.18	.....	36.87	34.71	37.59	34.78	36.96	39.12	40.48	40.70	42.07	42.71
31	37.05	.....	36.50	.....	37.90	.....	35.80	39.27	.....	40.71	.....	42.77

a Pumping.

b Measurements discontinued Dec. 19, 1939.



## Butler County--Continued

108-7. City of Hamilton old well field, SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 3, R. 3, T. 2, 0.2 mile north from Hamilton. Second well from north end of field. Unused drilled well, diameter 12 inches, depth 113 feet. Measuring point, top of 1-inch board supporting recorder shelter over well, 3.25 feet above land surface. Automatic water-stage recorder installed May 20, 1939.

Lowest daily water level, in feet below measuring point, 1939  
(from recorder charts)

Day	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	.....	11.05	10.67	10.83	12.21	13.95	15.13	15.97
2	.....	.....	a 9.45	11.18	10.68	10.88	12.28	14.01	15.16	16.01
3	.....	.....	.....	11.25	10.67	10.96	12.26	14.05	15.18	16.03
4	.....	a12.05	.....	11.22	10.72	10.92	12.29	14.10	15.19	16.05
5	.....	.....	.....	11.25	10.49	10.94	12.36	14.15	15.20	16.06
6	.....	.....	.....	11.30	10.54	10.97	12.41	14.21	15.23	16.09
7	.....	.....	.....	11.38	10.57	11.01	12.47	14.22	15.25	16.14
8	.....	.....	.....	11.43	10.75	11.04	12.56	14.26	15.30	16.15
9	.....	.....	a 9.66	11.47	10.60	11.15	12.62	14.31	15.31	16.14
10	.....	.....	.....	11.58	10.02	11.20	12.68	14.39	15.31	16.21
11	.....	a11.91	.....	11.55	10.06	11.26	12.77	14.43	15.34	16.24
12	.....	.....	.....	11.60	10.07	11.30	12.85	14.49	15.39	16.27
13	.....	.....	.....	11.59	10.10	11.34	12.91	14.53	15.42	16.31
14	.....	.....	.....	11.60	10.19	11.38	12.99	14.57	15.46	16.35
15	.....	.....	.....	11.62	10.25	11.44	13.05	14.56	15.50	16.33
16	.....	a10.48	a10.15	11.66	10.29	11.48	13.10	14.60	15.53	16.34
17	.....	.....	.....	11.70	10.38	11.53	13.16	14.65	15.57	16.37
18	.....	a 9.53	.....	11.61	10.42	11.60	13.23	14.66	15.60	16.40
19	.....	.....	.....	11.47	10.49	11.66	13.30	14.71	15.63	16.42
20	.....	.....	10.41	11.24	10.55	11.69	13.37	14.75	15.68	16.46
21	a12.34	.....	10.45	11.03	10.61	11.69	13.44	14.76	15.72	16.51
22	.....	.....	10.48	10.77	10.63	11.72	13.51	14.81	15.74	16.52
23	.....	.....	10.56	10.62	10.66	11.78	13.55	14.85	15.76	16.52
24	.....	.....	10.64	10.56	10.74	11.84	13.58	14.92	15.81	16.55
25	.....	a 9.19	10.73	10.51	10.81	11.89	13.64	14.95	15.85	16.56
26	.....	.....	10.77	10.53	10.84	11.93	13.71	14.99	15.85	16.57
27	.....	.....	10.86	10.58	10.92	11.93	13.78	14.98	15.88	16.60
28	a12.27	.....	10.82	10.64	10.96	11.98	13.83	15.02	15.90	16.64
29	.....	.....	10.87	10.62	10.96	12.05	13.90	15.04	15.92	16.64
30	.....	.....	10.90	10.75	10.96	12.10	13.93	15.01	15.94	16.64
31	.....	.....	10.97	.....	10.85	12.15	.....	15.06	.....	16.67

109. City of Hamilton new well field, NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 28, R. 3, T. 2, 0.9 mile north from Hamilton on U. S. Highway 127. West well. Unused test well, diameter 3 inches, depth 110.5 feet. Measuring point, top of 3-inch casing, 1.5 feet above land surface. Automatic water-stage recorder installed July 7, 1939.

Lowest daily water level, in feet below measuring point, 1939  
(from recorder charts)

Day	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	.....	.....	.....	20.72	24.93	25.26	23.32	24.56
2	.....	.....	a19.41	.....	.....	20.83	24.90	24.24	23.97	23.74
3	.....	.....	.....	.....	.....	20.95	24.55	24.72	24.03	24.35
4	.....	a19.65	.....	.....	.....	22.33	23.60	24.83	23.99	24.65
5	.....	.....	.....	a23.49	a18.30	22.40	23.72	26.06	23.95	24.55
6	.....	.....	.....	.....	.....	22.75	21.34	26.01	23.79	24.18
7	a19.58	.....	.....	.....	22.95	21.50	25.04	25.72	23.54	24.23
8	.....	.....	.....	.....	23.05	21.93	25.00	24.58	23.50	24.00
9	.....	.....	a20.82	.....	22.15	23.04	24.26	23.46	23.28	24.78
10	.....	.....	.....	.....	20.83	23.39	25.37	23.21	24.18	24.78
11	.....	a19.36	.....	.....	20.95	23.20	25.43	24.47	24.37	25.20
12	.....	.....	.....	a22.68	22.40	22.16	25.50	24.52	24.37	25.31
13	.....	.....	.....	.....	22.90	23.50	25.27	23.02	24.24	25.03
14	a18.20	.....	.....	.....	22.85	23.60	.....	23.49	23.15	24.40
15	.....	.....	.....	.....	21.75	24.02	.....	22.48	23.23	24.77
16	.....	a15.96	a20.58	.....	23.16	23.67	.....	.....	23.65	24.80
17	.....	.....	.....	.....	23.01	22.61	.....	24.12	23.68	25.20
18	.....	a14.46	.....	.....	23.37	24.20	24.60	24.04	24.40	25.36
19	.....	.....	.....	a22.55	21.87	24.35	24.46	24.43	24.40	25.26
20	.....	.....	.....	.....	21.87	24.20	25.79	23.60	24.25	25.30
21	a19.36	.....	.....	.....	23.07	23.85	25.85	24.05	24.20	24.94

a Tape measurements.

## Butler County--Continued

## 109. City of Hamilton new well field.--Continued

Lowest daily water level, in feet below measuring point, 1939  
(from recorder charts)

Day	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
22	.....	.....	.....	.....	23.38	22.83	25.85	24.08	23.97	24.24
23	.....	.....	a21.12	.....	22.00	24.26	24.45	24.87	23.96	24.47
24	.....	.....	.....	.....	22.08	24.44	.....	24.47	23.37	24.51
25	.....	a17.79	.....	.....	22.05	24.06	.....	24.49	23.77	25.00
26	.....	.....	.....	a21.45	23.30	23.26	26.18	23.80	23.68	25.03
27	.....	.....	.....	.....	24.18	24.50	25.80	24.07	24.06	25.22
28	a20.14	.....	.....	.....	23.42	24.90	24.55	24.01	24.41	25.26
29	.....	.....	a21.85	a20.86	22.01	24.55	25.84	23.81	24.46	24.63
30	.....	.....	.....	.....	22.96	24.56	25.76	23.07	24.55	24.51
31	.....	.....	.....	.....	22.25	23.58	.....	23.21	.....	24.08

## Lemon Township

23-13. American Rolling Mill Company well 13, East end plant, Middletown. Automatic water-stage recorder in operation since July 28, 1938.

Lowest daily water level, in feet below measuring point, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June
1	96.78	98.98	.....	102.12	96.90	100.50
2	95.98	99.50	.....	101.40	97.42	100.75
3	96.53	99.73	.....	101.77	97.94	100.90
4	96.90	98.90	.....	102.26	98.40	100.00
5	97.00	98.15	.....	102.60	98.88	99.79
6	.....	98.75	.....	102.93	98.88	99.85
7	.....	99.25	99.80	103.02	97.70	100.10
8	.....	99.70	100.29	102.30	96.82	100.50
9	.....	100.00	100.75	101.30	97.26	100.85
10	97.52	100.50	100.97	101.48	97.74	100.90
11	98.00	100.22	101.12	101.59	98.20	100.01
12	98.32	99.08	100.30	101.82	98.50	100.33
13	98.40	99.60	99.80	101.97	98.58	100.75
14	97.40	100.08	100.12	101.35	98.00	101.08
15	96.62	100.78	100.62	101.08	98.40	101.42
16	.....	100.94	100.95	100.58	98.76	101.61
17	.....	101.30	101.30	99.65	98.82	101.76
18	98.00	100.40	101.50	99.72	99.11	100.90
19	98.52	99.50	100.70	100.00	99.52	101.30
20	98.40	100.12	101.05	100.30	99.60	101.51
21	97.00	100.82	101.58	100.70	98.98	101.30
22	96.60	101.20	102.00	100.70	99.06	101.70
23	96.97	101.40	102.33	99.50	99.38	102.12
24	97.70	101.73	102.54	98.18	99.41	102.30
25	98.10	100.84	102.10	98.76	99.77	102.41
26	98.64	100.12	101.20	99.14	100.00	101.49
27	98.86	100.58	100.40	99.51	100.19	101.82
28	97.88	101.18	100.67	99.42	99.69	102.18
29	96.95	.....	100.98	98.70	99.50	102.50
30	98.00	.....	101.40	97.73	99.72	102.91
31	98.52	.....	101.86	.....	100.21	.....

Lowest daily water level, in feet below measuring point, 1939  
(from recorder charts)

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	103.00	88.50	99.84	105.08	108.28	111.09
2	103.02	88.35	100.20	105.10	108.61	111.23
3	103.10	88.11	100.50	105.20	108.80	110.72
4	103.10	88.02	99.60	105.15	108.91	110.70
5	101.50	87.90	100.00	105.60	108.30	110.90
6	100.70	87.38	100.50	106.05	108.30	111.11
7	99.90	86.80	101.00	106.20	108.67	111.42
8	98.91	87.75	101.12	105.50	108.80	111.53
9	98.11	89.60	101.30	105.20	108.70	111.63
10	97.30	90.78	100.89	105.90	109.13	.....

a Tape measurements.

## Butler County--Continued

23-13. American Rolling Mill Company well 13.--Continued  
 Lowest daily water level, in feet below measuring point, 1939  
 (from recorder charts)

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.
11	96.70	91.40	100.55	106.22	109.20	.....
12	96.08	91.72	101.18	105.55	108.62	108.79
13	95.50	92.20	101.62	106.10	108.52	108.62
14	95.05	92.31	102.18	106.49	109.00	108.10
15	94.46	92.43	102.64	106.52	109.26	107.48
16	93.74	93.72	103.08	106.72	109.35	106.70
17	93.00	94.52	102.96	107.04	109.63	105.95
18	92.43	95.20	103.08	107.26	109.81	105.18
19	92.30	95.89	103.58	107.52	109.22	104.50
20	91.98	96.22	103.94	107.70	109.20	105.54
21	91.69	95.52	104.20	107.65	109.64	106.43
22	91.46	96.30	104.42	106.24	109.96	107.10
23	91.10	96.76	104.64	106.51	110.21	107.73
24	90.49	97.38	104.10	107.07	110.46	108.17
25	90.26	.....	104.40	107.65	110.60	107.50
26	90.08	.....	104.84	107.96	110.12	107.19
27	89.90	.....	105.22	108.30	110.00	108.06
28	89.70	.....	105.41	108.52	110.30	108.67
29	89.46	98.62	105.71	107.80	110.60	109.24
30	89.05	99.10	105.90	107.42	110.85	109.83
31	88.81	99.49	.....	107.70	.....	110.22

23-6. American Rolling Mill Company well 6, East end plant, Middletown. Abandoned drilled well, diameter 10 inches, depth 108 feet. Measuring point, top of casing, 1.4 feet above land surface.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
July 10	100.35	Aug. 1	92.01	Aug. 22	99.07	Sept. 12	104.04
17	94.83	8	90.84	29	101.50	19	(b)
22	93.63	15	95.66	Sept. 5	103.05		

132. Wardlow-Thomas Company, Vanderveer and Fifth Avenues, Middletown. Unused dug and drilled well, diameter 16 feet, depth 45.2 feet. Measuring point, top of concrete cover over well, 0.5 foot above land surface. Automatic water-stage recorder installed July 6, 1939.

Lowest daily water level, in feet below measuring point, 1939  
 (from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	.....	.....	.....	.....	.....	31.60	35.15	37.25	40.11	42.60
2	.....	.....	.....	.....	a28.63	.....	.....	31.97	35.18	37.40	40.27	42.63
3	a34.59	.....	.....	.....	.....	.....	.....	32.30	34.76	37.73	40.43	42.20
4	.....	.....	.....	a31.19	.....	.....	.....	32.57	34.51	37.90	40.46	42.25
5	.....	.....	.....	.....	.....	a30.59	a29.64	32.62	34.32	38.06	40.05	42.60
6	.....	.....	.....	.....	.....	.....	31.00	32.09	34.20	38.17	40.08	42.82
7	.....	a36.66	a33.08	.....	.....	.....	31.11	32.10	34.14	38.18	40.47	42.97
8	.....	.....	.....	.....	.....	.....	31.14	32.43	34.16	37.80	40.75	43.12
9	.....	.....	.....	.....	a28.67	.....	30.70	32.67	34.19	37.76	40.94	43.16
10	a34.61	.....	.....	.....	.....	.....	30.73	32.90	34.20	38.26	41.14	42.80
11	.....	.....	.....	a30.73	.....	.....	31.00	33.10	34.19	38.51	41.20	42.80
12	.....	.....	.....	.....	.....	a31.62	31.18	33.14	34.21	38.71	40.75	43.10
13	.....	.....	.....	.....	.....	.....	31.29	32.62	34.27	38.87	40.83	43.28
14	.....	a36.35	a32.87	.....	.....	.....	31.36	32.42	34.34	38.90	41.20	43.42
15	.....	.....	.....	.....	.....	.....	31.20	33.08	34.40	38.37	41.36	43.56
16	.....	.....	.....	.....	a28.64	.....	30.80	33.31	34.46	38.30	41.50	43.62
17	.....	.....	.....	.....	.....	.....	30.64	33.52	34.49	38.58	41.67	43.22
18	a36.70	.....	.....	a30.77	.....	.....	30.52	33.73	34.95	38.74	41.67	43.23
19	.....	.....	.....	.....	.....	a32.53	30.47	33.79	35.58	38.88	41.32	43.60
20	.....	.....	.....	.....	.....	.....	30.44	33.30	36.00	39.05	41.44	43.81
21	.....	a35.81	a32.35	.....	.....	.....	30.44	33.53	36.37	39.07	41.72	43.96
22	.....	.....	.....	.....	.....	.....	30.43	33.87	36.65	38.70	.....	44.15

a Tape measurements.

b Dry.

## Butler County--Continued

## 132. Wardlow-Thomas Company.--Continued

Lowest daily water level, in feet below measuring point, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
23	.....	.....	.....	.....	a28.88	.....	30.40	34.08	36.71	38.83	.....	44.17
24	a37.05	.....	.....	.....	.....	.....	30.41	34.31	36.22	39.08	.....	43.80
25	.....	.....	.....	a28.75	.....	.....	30.44	34.56	36.50	39.30	.....	43.40
26	.....	.....	.....	.....	.....	a31.90	30.45	34.61	36.92	39.55	.....	43.41
27	.....	.....	.....	.....	.....	.....	30.49	34.15	37.25	39.75	.....	43.64
28	.....	.....	a32.02	.....	.....	.....	30.54	34.31	37.50	39.83	42.22	43.82
29	.....	.....	.....	.....	a29.34	a32.05	30.58	34.76	37.70	39.45	42.37	43.95
30	.....	.....	.....	.....	.....	.....	30.59	34.96	37.75	39.62	42.48	44.00
31	a37.16	.....	.....	.....	.....	.....	30.98	34.07	.....	39.97	.....	43.65

## Hamilton County

## Gravel Pits

K. George L. Rack Sand and Gravel Company pit, Este and Township Avenues, Elmwood Place, Cincinnati, Mill Creek Township.

H. North Cincinnati Sand and Gravel Company pit, Fair Park Avenue and Vine Street, Carthage, Springfield Township.

I. Reading Sand and Gravel Company pit, Granite and Jefferson Streets, Reading, Sycamore Township.

F. Tennessee Corporation, Glendale-Milford Road and Pennsylvania R.R., Sycamore Township.

Water level, in feet above zero of staff gage, 1939

Date	K	H	I	F	Date	K	H	I	F
Jan. 2	bcl2.64	13.75	1.92	.....	Apr. 20	16.52	14.54	5.54	(d)
3	.....	.....	.....	-0.65	21	16.45	14.52	5.75	(d)
9	b12.66	13.66	1.80	-0.30	22	16.38	14.50	5.95	(d)
16	b12.72	13.80	bcl1.68	.....	23	16.30	14.46	6.16	(d)
17	.....	.....	.....	-.85	24	16.17	14.47	6.32	(d)
23	12.72	c13.85	c1.68	-.86	26	15.81	14.46	6.52	(d)
30	bcl3.18	bl4.10	2.05	-1.03	27	15.76	14.46	6.58	(d)
Feb. 1	13.18	14.16	1.94	-1.19	28	15.72	14.48	6.64	(d)
2	b13.21	bl4.18	1.98	-1.21	29	15.67	14.42	b6.66	(d)
3	13.26	14.22	2.04	.....	30	15.65	14.40	6.71	(d)
4	13.26	14.24	c2.08	.....	May 1	15.61	14.37	6.69	(d)
5	c13.26	c14.26	c2.12	.....	3	15.50	14.38	6.60	(d)
6	13.26	14.26	b2.05	-1.21	8	15.27	14.38	.....	(d)
7	.....	bl4.28	b2.06	.....	15	15.28	14.36	6.24	(d)
10	13.32	14.32	2.14	-1.10	22	15.38	14.42	6.06	(d)
13	13.47	14.40	2.30	-.86	29	15.22	14.36	5.66	(d)
20	13.71	14.58	b2.67	-.33	June 5	15.08	14.37	5.30	(d)
27	bcl3.78	bcl4.60	b2.94	+.28	12	14.85	bl4.32	b4.89	(d)
Mar. 6	14.26	14.66	2.28	.88	19	14.94	14.38	b4.79	(d)
11	14.74	14.60	3.50	1.42	26	14.78	bl4.30	b4.56	b9.90
12	14.86	14.88	3.62	.....	July 3	14.82	13.88	4.46	b9.61
13	14.92	14.97	3.64	1.57	10	14.52	13.80	4.36	b9.50
20	14.91	14.59	3.92	2.30	17	14.18	bl3.50	4.18	b9.26
27	15.00	14.52	4.22	3.12	24	14.60	13.70	4.11	b9.08
Apr. 3	14.97	14.68	4.30	3.60	31	13.86	12.70	3.98	b8.85
6	.....	.....	.....	3.86	Aug. 7	13.69	12.86	3.93	8.60
10	15.18	14.72	4.40	4.10	14	13.43	12.52	b3.72	8.30
14	.....	14.66	4.48	4.34	21	13.18	12.50	3.56	8.02
15	16.42	15.10	4.72	4.58	28	12.88	12.48	3.36	7.74
16	16.84	20.20	4.90	.....	Sept. 6	12.68	12.47	3.14	7.40
17	16.75	15.86	4.99	(d)	11	12.50	12.42	2.97	(e)
19	.....	.....	5.34	(d)	18	12.31	12.36	b2.80	.....

a Tape measurements.

b Pump in pit operating.

c Pit frozen over.

d Gage submerged (Top of gage 10.22 feet).

e Measurements discontinued and gage removed Sept. 6, 1939.

## Hamilton County--Continued

## Gravel Pits.--Continued

Water level, in feet above zero of staff gage, 1939

Date	K	H	I	F	Date	K	H	I	F
Sept. 25	12.10	12.36	2.73	.....	Nov. 20	11.65	12.48	2.06	.....
Oct. 2	11.98	12.32	2.54	.....	27	11.63	12.51	al.14	.....
9	11.87	12.38	2.28	.....	Dec. 4	11.61	12.53	1.38	.....
16	11.70	12.36	2.16	.....	11	11.55	12.48	1.26	.....
23	11.60	12.34	2.06	.....	18	11.53	(b)	1.28	.....
30	11.80	12.35	2.23	.....	22	11.50	.....	1.26	.....
Nov. 6	11.70	12.47	2.17	.....	29	11.55	.....	1.20	.....
13	11.67	12.48	2.12	.....					

## Columbia Township

16-5. Well 16 in Water-Supply Paper 845. City of Norwood, municipal water plant, Harris and Forest Avenues, Norwood.

Lowest daily water level, in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June
1	190.05	189.55	189.35	188.21	188.10	187.04
2	189.90	189.26	189.38	188.40	188.20	187.05
3	189.84	189.42	189.20	188.60	188.27	187.10
4	189.92	189.71	189.00	188.65	188.17	187.21
5	189.89	189.65	188.76	188.52	187.97	187.18
6	190.20	189.20	189.17	188.45	187.81	187.06
7	190.14	189.40	189.34	188.55	187.65	187.05
8	190.07	189.45	189.34	188.40	187.40	186.99
9	189.95	189.46	189.16	188.21	187.26	186.92
10	189.70	189.40	189.16	188.10	187.33	186.75
11	189.73	189.70	188.77	188.40	187.60	186.90
12	189.87	189.70	188.74	188.75	187.70	186.90
13	189.75	189.44	188.92	188.89	187.63	186.90
14	189.58	189.03	188.87	188.65	187.55	186.87
15	189.56	189.42	188.82	188.30	187.28	186.85
16	189.78	189.71	188.92	188.25	187.30	186.82
17	189.76	189.50	189.03	188.10	187.35	186.80
18	189.36	189.43	189.15	188.09	187.35	186.65
19	189.50	189.18	189.18	188.13	187.39	186.77
20	189.50	189.32	188.92	188.25	187.38	.....
21	189.51	189.32	188.94	188.36	187.25	.....
22	189.75	189.47	188.79	188.50	187.10	.....
23	189.75	189.47	188.79	188.47	187.09	186.64
24	189.42	189.30	188.63	188.22	187.21	186.65
25	189.73	189.31	188.47	188.06	187.33	186.61
26	189.52	189.12	188.31	187.88	187.36	186.72
27	189.67	189.25	188.50	187.95	187.30	186.70
28	189.60	189.02	188.75	188.07	187.06	186.65
29	189.33	.....	188.75	188.19	187.11	186.55
30	189.15	.....	188.28	188.11	187.12	186.49
31	189.55	.....	188.28	.....	187.11	.....

Lowest daily water level, in feet below measuring point, 1939  
(from recorder charts)

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	186.67	186.83	187.80	186.81	191.18	190.97
2	186.76	186.82	187.94	186.86	191.48	190.60
3	186.72	186.72	188.03	186.80	191.56	190.84
4	186.62	186.87	188.15	186.75	191.47	190.83
5	186.57	186.91	188.40	186.30	191.32	190.75
6	186.66	186.92	188.47	186.08	191.02	190.89
7	186.70	186.99	188.35	186.03	191.00	191.04
8	186.71	186.99	188.30	185.95	191.33	191.16
9	186.70	186.92	188.36	186.03	191.43	191.05
10	186.90	187.01	188.57	185.94	191.28	190.60
11	186.99	186.87	188.74	186.02	191.44	190.91

a Water being pumped from pit and returned to adjacent pit.

b Measurements discontinued.

## Hamilton County--Continued

16-5.--Continued

Lowest daily water level, in feet below measuring point, 1939  
(from recorder charts)

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.
12	186.95	186.93	a 186.95	186.03	191.40	190.90
13	186.72	186.85	186.85	186.04	191.50	190.99
14	186.75	.....	186.83	186.28	191.47	191.20
15	186.84	.....	186.82	186.28	191.51	191.20
16	186.84	.....	186.79	b 189.75	191.42	190.85
17	186.83	.....	186.90	190.15	191.29	190.77
18	186.71	.....	186.87	190.29	191.20	190.65
19	186.78	.....	186.90	190.40	191.08	190.65
20	186.78	.....	186.85	190.49	190.92	190.62
21	186.84	187.01	186.82	190.38	190.96	191.02
22	186.86	187.09	186.85	190.50	191.09	191.11
23	186.81	187.05	186.79	190.65	191.16	191.08
24	186.82	187.14	186.70	190.74	191.14	190.97
25	186.82	187.21	186.58	190.72	191.40	190.97
26	186.74	187.27	186.64	190.84	191.50	190.80
27	186.71	187.20	186.57	190.75	191.48	190.57
28	186.61	187.07	186.63	191.17	191.38	190.84
29	186.55	187.08	186.54	190.15	191.22	190.84
30	186.59	187.24	186.75	190.89	191.08	190.61
31	186.76	187.58	.....	190.89	.....	190.52

16-2. City of Norwood, municipal water plant well 2, Harris and Forest Avenues, Norwood. Abandoned drilled well, diameter 10 inches, depth 213 feet. Measuring point, top edge of concrete pumphouse floor, 0.5 foot above land surface. Screen was removed from well July 1939. Automatic water-stage recorder installed July 31, 1939.

Lowest daily water level, in feet below measuring point, 1939  
(from recorder charts)

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	188.67	189.65	190.24	191.75	191.83
2	.....	188.72	189.85	190.27	192.15	191.45
3	.....	188.70	189.92	190.27	192.25	191.52
4	.....	188.78	189.92	190.24	192.25	191.56
5	.....	188.94	190.22	190.15	192.15	191.56
6	.....	189.00	190.34	189.91	191.92	191.64
7	.....	189.03	190.26	189.84	191.80	191.67
8	.....	189.05	190.17	189.76	191.83	191.90
9	.....	189.10	190.27	189.73	192.00	191.90
10	.....	189.23	190.41	189.71	191.97	191.57
11	.....	189.25	190.55	189.72	192.01	191.67
12	.....	189.25	190.46	189.73	192.02	191.68
13	.....	189.23	190.27	189.77	192.12	191.60
14	.....	189.15	190.25	189.98	192.15	191.92
15	.....	189.16	190.23	190.01	192.20	191.96
16	.....	189.18	190.22	190.00	192.19	191.83
17	c 188.58	189.17	190.26	190.68	192.10	191.60
18	c 188.48	189.07	190.32	190.93	191.99	191.57
19	.....	189.07	190.32	191.05	191.85	191.53
20	.....	189.17	190.32	191.14	191.70	191.38
21	.....	189.25	190.27	191.14	191.65	191.64
22	.....	189.37	190.25	191.10	191.75	191.94
23	.....	189.35	190.25	191.25	191.83	191.94
24	.....	189.42	190.17	191.37	191.83	191.82
25	c 188.60	189.51	190.06	191.38	192.04	191.84
26	c 188.52	189.58	190.05	191.48	192.20	191.79
27	.....	189.57	190.04	191.49	192.22	191.52
28	c 188.24	189.44	190.07	191.72	192.20	191.67
29	.....	189.43	190.06	191.78	192.07	191.70
30	.....	189.42	190.14	191.63	191.93	191.67
31	188.48	189.53	.....	191.57	.....	191.37

a Nearby supply well 5 shut down for repairs and cleaning.

b Nearby supply well 5 put back into service.

c Tape measurement.

## Hamilton County--Continued

15. Globe-Wernicke Company, Norwood and Carthage Avenues, Norwood.  
Recorder removed July 30, 1939.

Lowest daily water level, in feet below measuring point, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July
1	179.75	180.38	.....	179.85	180.21	180.26	180.58
2	179.76	180.13	.....	180.00	180.41	180.41	180.57
3	179.72	180.12	.....	180.35	180.45	180.41	180.46
4	179.81	180.54	.....	180.45	180.46	180.43	180.48
5	179.97	180.35	.....	180.35	180.40	180.28	180.44
6	180.26	179.96	180.25	180.35	180.36	180.32	180.62
7	180.28	180.17	180.54	180.42	180.06	180.37	180.64
8	180.25	180.35	180.55	180.29	179.84	180.25	180.64
9	180.06	180.41	180.42	180.05	179.95	180.01	180.43
10	179.95	180.34	180.45	179.80	180.09	180.14	180.61
11	180.12	180.61	180.14	180.26	180.40	.....	180.81
12	180.20	180.55	179.45	180.77	180.53	180.32	180.80
13	180.11	180.25	180.00	180.95	180.55	180.40	180.65
14	180.12	179.88	180.12	180.84	180.37	180.45	180.71
15	180.05	180.40	180.18	180.34	180.12	180.49	180.74
16	180.26	180.67	180.13	180.17	180.18	180.48	180.62
17	180.26	180.51	180.45	180.00	180.22	180.46	180.46
18	179.86	180.45	180.50	179.94	180.36	180.25	180.61
19	180.08	180.02	180.50	179.97	180.42	180.33	180.69
20	180.18	180.12	180.22	180.15	180.43	180.67	180.73
21	180.35	180.24	180.22	180.40	180.20	180.67	180.79
22	.....	180.47	180.34	180.55	180.01	180.62	180.79
23	180.16	180.50	180.34	180.47	180.12	180.66	180.60
24	180.13	180.41	180.23	180.20	180.31	180.66	180.60
25	180.37	180.45	180.05	179.90	180.49	180.48	180.70
26	180.25	180.01	179.83	180.07	180.49	180.40	180.70
27	180.37	.....	180.02	180.15	180.47	180.57	180.81
28	180.30	.....	180.30	180.32	.....	180.57	180.71
29	180.02	.....	180.30	180.35	180.21	180.55	180.68
30	179.67	.....	179.95	180.20	180.21	180.58	180.50
31	180.38	.....	179.95	.....	180.21	.....	180.50

Water level, in feet below measuring point, 1939  
(tape measurements)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Aug. 7	180.44	Sept. 25	180.70	Oct. 30	180.69	Dec. 4	180.59
21	180.52	Oct. 2	181.01	Nov. 6	181.05	11	180.94
28	180.60	9	180.80	13	181.20	18	180.79
Sept. 6	180.94	16	180.98	20	180.54	22	181.48
11	180.83	23	180.97	27	181.28	29	181.15
18	181.00						

## Mill Creek Township

17. Procter and Gamble Company, Ross Run well field, Vine Street at Big Four Railroad, Ivorydale. Recorder removed Dec. 3, 1939 and measurements discontinued because an attempt was made to redevelop well for industrial supply. Replaced by well 17-2.

Lowest daily water level, in feet below measuring point, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	83.47	84.37	84.17	85.51	85.05	84.77	86.12	85.86	85.94	86.31	87.33	86.80
2	83.61	84.74	84.11	84.32	85.42	85.19	85.18	85.99	86.00	86.19	87.54	86.86
3	83.57	85.15	84.78	85.27	85.54	85.25	84.93	86.00	84.72	86.38	87.58	86.70
4	83.66	85.16	84.94	85.42	85.56	85.12	83.52	84.35	85.15	86.52	87.50	.....
5	83.94	83.70	83.20	85.40	85.64	85.24	84.33	84.74	85.09	86.60	86.85	.....
6	84.15	83.60	84.40	85.75	85.71	85.41	84.28	85.22	85.36	86.69	86.85	.....
7	83.97	84.05	84.94	85.83	84.46	85.52	84.32	85.57	85.65	86.74	87.20	.....
8	82.70	84.80	84.96	85.66	84.79	85.64	84.18	85.65	85.87	.....	87.75	.....
9	82.67	84.87	85.31	84.78	85.00	85.69	83.50	85.87	85.92	86.25	87.84	.....
10	83.42	85.42	85.32	84.96	85.34	85.75	84.76	85.96	.....	86.59	87.97	.....
11	83.57	85.57	85.18	85.52	85.71	85.33	85.09	85.98	.....	86.68	88.05	.....
12	83.70	.....	84.25	85.80	85.80	85.22	85.18	86.01	86.13	86.85	87.60	.....

## Hamilton County--Continued

## 17. Procter and Gamble Company.--Continued

Lowest daily water level, in feet below measuring point, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
13	83.60	83.83	84.90	85.92	85.75	85.54	85.35	85.59	86.23	86.95	87.30	.....
14	83.79	84.40	85.02	85.70	83.90	85.71	85.66	85.41	86.26	87.07	87.56	.....
15	83.15	85.30	85.47	85.67	84.50	85.80	85.75	85.63	86.31	86.59	87.54	.....
16	83.18	85.44	85.55	84.15	85.07	85.87	.....	85.70	86.33	86.59	87.61	.....
17	83.30	85.25	85.67	84.72	85.28	85.93	85.55	85.73	85.92	86.88	87.66	.....
18	83.52	84.42	85.70	85.18	85.45	85.40	85.75	85.84	85.95	86.92	87.69	.....
19	83.68	82.55	84.94	85.45	85.55	85.45	85.85	85.87	86.33	87.08	87.33	.....
20	83.73	83.82	85.32	85.60	85.59	85.85	85.95	85.04	86.51	87.20	86.91	.....
21	83.76	84.41	85.34	85.86	85.01	85.90	86.04	85.01	86.63	87.21	87.44	.....
22	83.76	84.50	85.50	85.95	85.25	85.88	.....	85.36	86.71	86.88	87.75	.....
23	83.05	84.50	85.52	85.00	85.50	85.98	85.51	85.61	86.75	87.12	87.82	.....
24	83.58	85.22	85.55	85.20	85.70	86.00	85.71	85.77	86.25	87.21	86.90	.....
25	83.75	85.24	85.55	85.32	85.78	85.64	85.87	85.90	85.92	87.28	86.14	.....
26	83.69	84.20	84.93	85.59	85.79	85.79	86.00	85.95	86.20	87.41	86.42	.....
27	83.75	84.16	85.35	85.74	85.65	85.90	86.05	84.71	86.50	87.50	86.37	.....
28	83.70	84.00	85.60	85.90	84.45	85.94	86.12	85.25	86.55	87.79	86.55	.....
29	83.20	.....	85.60	85.30	84.59	85.95	86.13	85.51	86.55	85.97	86.43	.....
30	84.25	.....	85.58	84.35	84.00	86.07	85.72	85.70	86.76	86.44	86.64	.....
31	84.55	.....	85.58	.....	84.55	.....	85.60	85.85	.....	86.80	.....	.....

17-2. Procter and Gamble Company well A-4, Ross run well field, south side of Ross Run, about 100 feet south from abandoned drilled well A-5, previously used as observation well, Vine Street at Big Four Railroad, Ivorydale. Abandoned drilled well, diameter 6 inches, depth 197 feet. Measuring point, top of 6-inch coupling, 0.8 foot above land surface. Automatic water-stage recorder installed Dec. 10, 1939.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Dec. 10	88.90	Dec. 16	89.10	Dec. 22	89.35	Dec. 27	88.43
11	89.10	17	88.33	23	89.25	28	89.11
12	89.08	18	88.24	24	88.35	29	89.19
13	89.48	19	88.59	25	87.95	30	89.05
14	89.52	20	88.87	26	88.12	31	88.07
15	89.39	21	89.23				

17-T. Procter and Gamble Company, Ross Run well field, Vine Street at Big Four Railroad, Ivorydale. Drilled test well, diameter 6 inches, depth 151 feet. Measuring point, top of 6-inch coupling, 2.1 feet above land surface.

Water level, in feet below measuring point, 1939

Aug. 7	a 112.67	Oct. 16	113.88	Nov. 17	114.24	Dec. 12	114.15
14	a 112.87	23	113.85	18	114.24	13	114.18
21	a 112.99	30	113.90	19	114.18	14	114.36
28	a 113.11	31	113.95	20	114.00	15	114.36
31	113.53	Nov. 1	114.28	21	114.16	16	114.05
Sept. 1	113.60	2	114.52	22	114.30	17	114.02
2	113.61	3	114.54	23	114.33	18	114.11
3	113.58	4	114.44	24	114.17	19	114.13
4	113.28	5	114.12	25	114.28	20	114.27
5	113.40	6	113.87	26	114.29	21	114.62
6	113.53	7	113.90	Dec. 2	113.99	22	114.71
7	113.49	8	114.26	3	114.11	23	114.66
8	113.46	9	114.34	4	114.16	24	114.16
9	113.48	10	114.22	5	114.13	25	114.16
10	113.43	11	114.40	6	114.42	26	113.86
11	113.47	12	114.36	7	114.40	27	113.90
18	113.65	13	114.17	8	114.50	28	114.25
25	113.46	14	114.19	9	114.34	29	114.27
Oct. 2	113.77	15	114.21	10	113.86	30	114.20
9	113.80	16	114.23	11	114.15	31	114.00

a Tape measurement.



## Hamilton County--Continued

104. Flintkote Company, Seventy-fifth Street and Longview Avenue, Carthage. Recorder removed June 30, 1939.

Lowest daily water level, in feet below measuring point, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	96.50	96.46	96.56	96.24	95.32	94.02	.....	.....	.....	.....	.....	.....
2	96.51	96.36	96.53	96.24	95.42	93.98	.....	.....	.....	a92.15	.....	.....
3	96.62	96.46	96.49	96.25	95.45	93.94	a92.45	.....	.....	.....	.....	.....
4	96.64	96.53	96.45	96.20	95.42	93.93	.....	.....	.....	.....	.....	a94.49
5	96.68	96.42	96.37	96.10	95.44	93.80	.....	.....	.....	.....	.....	.....
6	96.75	96.30	96.61	96.18	95.50	93.70	.....	.....	a92.59	.....	a93.02	.....
7	96.65	96.42	96.64	96.18	95.45	93.66	.....	a91.69	.....	.....	.....	.....
8	96.60	96.40	96.60	96.04	95.30	93.64	.....	.....	.....	.....	.....	.....
9	96.51	96.40	96.60	96.04	95.46	93.58	.....	.....	.....	a92.05	.....	.....
10	96.62	96.46	96.59	95.94	95.45	93.56	a92.29	.....	.....	.....	.....	.....
11	96.62	96.49	96.47	96.08	95.45	93.56	.....	.....	a92.52	.....	.....	a94.81
12	96.66	96.43	96.32	96.14	95.45	93.54	.....	.....	.....	.....	.....	.....
13	96.58	96.21	96.50	96.13	95.36	93.46	.....	.....	.....	.....	a93.49	.....
14	96.69	96.24	96.42	96.01	95.26	93.40	.....	a92.29	.....	.....	.....	.....
15	96.67	96.48	96.44	96.01	95.12	93.33	.....	.....	.....	.....	.....	.....
16	96.63	96.50	96.44	95.94	95.07	93.28	.....	.....	.....	a91.99	.....	.....
17	96.61	96.37	96.46	95.80	95.04	93.24	a92.07	.....	.....	.....	.....	.....
18	96.54	96.35	96.50	95.73	94.95	93.12	.....	.....	a92.35	.....	.....	a94.92
19	96.58	96.23	96.37	95.68	94.88	93.12	.....	.....	.....	.....	.....	.....
20	96.58	96.32	96.40	95.66	94.79	93.14	.....	.....	.....	.....	a93.98	.....
21	96.59	96.27	96.39	95.65	94.68	93.06	.....	a92.94	.....	.....	.....	.....
22	96.64	96.32	96.41	95.65	94.56	92.96	.....	.....	.....	.....	.....	a95.16
23	96.61	96.32	96.44	95.56	94.52	92.93	.....	.....	.....	a92.31	.....	.....
24	96.57	96.38	96.46	95.40	94.54	92.89	a91.88	.....	.....	.....	.....	.....
25	96.67	96.37	96.42	95.35	94.52	92.82	.....	.....	a92.17	.....	.....	.....
26	96.57	96.40	96.35	95.32	94.46	92.82	.....	.....	.....	.....	.....	.....
27	96.61	96.44	96.36	95.36	94.34	92.78	.....	.....	.....	.....	a94.37	.....
28	96.51	96.50	96.38	95.41	94.22	92.74	.....	a92.76	.....	.....	.....	.....
29	96.43	.....	96.35	95.48	94.23	92.64	.....	.....	.....	.....	.....	a95.40
30	96.47	.....	96.22	95.41	94.16	a92.63	.....	.....	.....	a92.71	.....	.....
31	96.52	.....	96.21	.....	94.10	.....	a91.76	.....	.....	.....	.....	.....

## Mill Creek Township

105. Cities Service Oil Company, Laidlaw Avenue and Norfolk and Western Railroad, SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 11, F.R. 2, T. 3, Cincinnati. Abandoned drilled well, diameter 12 inches, depth 218 feet. Measuring point, top of 6-inch drop pipe, 2.0 feet above land surface.

T-15. City of Elmwood Place, Township Avenue and Mill Creek, west side, Elmwood Place, SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 12, Cincinnati. U.S.G.S. bored and driven test well, diameter 1 $\frac{1}{2}$  inches, depth 18 feet. Measuring point, top of 1 $\frac{1}{2}$ -inch pipe, 1.3 feet above land surface.

143. Pollak Steel Company, Morton Road and Mill Creek, SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 12, F.R. 2, T. 3, Cincinnati. Unused drilled well, diameter 12 inches, depth 109 feet. Measuring point, top of 6-inch drop pipe, 5.5 feet above land surface.

## Springfield Township

T-63. Lunkenheimer Valve Company, North Bend Road and Baltimore and Ohio Railroad, Carthage, SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 7, R. 1, T. 3. U.S.G.S. bored and driven test well, diameter 1 $\frac{1}{2}$  inches, depth 28.6 feet. Measuring point, top of 1 $\frac{1}{2}$ -inch pipe, 0.6 foot above land surface.

T-16. Hamilton County Agricultural Society, Carthage Fair Grounds, Vine Street and Mill Creek, Carthage, NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 1, R. 1, T. 3. U.S.G.S. bored and driven test well, diameter 1 $\frac{1}{2}$  inches, depth 23 feet. Measuring point, top of 1 $\frac{1}{2}$ -inch pipe, 0.5 foot above land surface.

T-64. Mrs. Ann Frank, 8033 Woodbine Avenue, Hartwell, NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 1, R. 1, T. 3. U.S.G.S. bored and driven test well, diameter 1 $\frac{1}{2}$  inches, depth 19.7 feet. Measuring point, top of 1 $\frac{1}{2}$ -inch pipe, 2.5 feet above land surface.

a Tape measurement.

## Hamilton County--Continued

101. Mrs. Tieman, Cherry Hill Road, Hartwell, NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 1, R. 1, T. 2. Unused dug and driven well, diameter  $1\frac{1}{2}$  inches, depth 37.5 feet. Measuring point, top of  $1\frac{1}{2}$ -inch pipe, 2.3 feet above land surface.

105. Water level, in feet above measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
Nov. 15, 1938	117.85	Feb. 6, 1939	118.05	Apr. 24, 1939	119.04
28	117.79	13	118.37	May 1	119.30
Dec. 5	117.63	20	118.70	8	118.94
12	118.15	27	118.82	15	119.07
19	118.01	Mar. 6	118.75	22	119.17
26	117.55	13	119.02	29	119.31
Jan. 2, 1939	117.73	20	118.88	June 5	119.35
9	117.85	27	118.91	12	119.53
16	118.33	Apr. 3	119.35	19	119.47
23	118.35	10	118.87	26	119.51
30	117.65	17	118.84	July 3	119.46

143. Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 2	72.90	Feb. 13	72.99	Apr. 3	73.71	May 22	73.15
9	72.94	20	73.28	10	73.10	29	73.11
16	73.34	27	73.38	17	73.00	June 5	73.29
23	73.20	Mar. 6	73.32	24	73.17	12	73.36
30	72.62	13	73.52	May 1	73.16	19	73.24
Feb. 1	73.25	20	73.25	8	73.00	26	73.28
6	72.83	27	73.25	15	73.07	July 3	73.15

T-16. Water level, in feet above measuring point, 1939

Feb. 10	13.89	Apr. 3	13.47	Apr. 23	12.15	May 8	13.28
13	14.34	10	13.28	24	12.24	15	13.59
20	13.66	14	13.39	26	12.46	22	13.57
27	13.94	15	11.37	27	12.54	29	13.98
Mar. 6	13.45	16	9.88	28	12.60	June 5	14.02
11	12.86	17	10.90	29	12.39	12	14.36
12	12.75	20	11.81	30	12.75	19	13.71
13	12.89	21	11.95	May 1	12.82	26	14.30
20	13.77	22	12.09	3	13.00	July 3	14.18
27	13.85						

Water level, in feet above measuring point, 1939

Date	105	T-15	143	T-63	T-16	T-64	161
July 10	119.32	.....	73.25	.....	14.05	.....	.....
17	119.30	13.24	73.24	.....	14.61	.....	.....
24	119.47	13.13	73.41	.....	14.70	.....	.....
31	119.61	13.33	73.35	.....	14.81	.....	.....
Aug. 7	119.59	13.52	73.24	.....	14.80	.....	26.82
14	119.64	13.99	73.28	.....	15.08	.....	26.94
21	119.80	14.25	73.36	.....	15.16	.....	27.06
28	119.78	14.51	73.28	.....	15.34	.....	27.19
Sept. 6	120.02	14.72	73.52	.....	15.49	.....	27.35
11	120.17	14.79	73.55	.....	15.54	.....	27.44
18	120.20	14.93	73.59	.....	15.59	.....	27.57
25	120.01	14.98	73.34	.....	15.64	.....	27.67
Oct. 2	120.38	15.00	73.74	22.30	15.70	18.02	27.78
9	120.35	15.01	73.71	22.44	15.80	18.06	27.91
16	120.30	15.05	73.65	22.54	15.87	18.15	28.04
23	120.45	15.03	73.80	22.65	15.93	18.22	28.16
30	120.42	14.85	73.80	22.59	15.96	18.22	27.41
Nov. 6	120.30	14.80	73.73	22.72	15.99	18.24	28.18
13	120.75	14.83	74.10	22.82	16.03	18.28	28.20
20	120.46	14.88	73.90	22.93	16.07	18.34	28.40
27	120.82	14.81	74.23	23.02	16.11	18.38	28.48
Dec. 4	120.73	14.70	74.13	23.09	16.16	18.42	28.54
11	121.05	14.83	74.43	23.19	16.20	18.46	28.59
18	120.77	14.86	74.25	23.27	16.22	18.48	28.66
22	121.22	14.88	74.62	23.29	16.24	18.48	28.67
29	120.88	14.91	74.44	23.13	16.23	18.50	28.78

## Hamilton County--Continued

## Springfield Township

160. George Waldmann, 320 Elliott Avenue, Arlington Heights, SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 2, R. 1, T. 3. Unused driven well, diameter 1 $\frac{1}{2}$  inches, depth 29.1 feet. Measuring point, top of 1 $\frac{1}{4}$ -inch pipe, 3.0 feet above land surface.

T-57. Waldmann Estate, west end of property, rear of 406 Elliott Avenue, SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 2, R. 1, T. 3. U.S.G.S. bored and driven test well, diameter 1 $\frac{1}{2}$  inches, depth 51.3 feet. Measuring point, top of 1 $\frac{1}{2}$ -inch pipe, 1.0 foot above land surface.

T-55. Waldmann Estate, west side of West Fork of Mill Creek, Amity Road, Arlington Heights, SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 2, R. 1, T. 3. U.S.G.S. bored and driven test well, diameter 1 $\frac{1}{2}$  inches, depth 46.4 feet. Measuring point, top of 1 $\frac{1}{2}$ -inch pipe, 0.4 foot above land surface.

## Sycamore Township

T-54. W. S. Burkhardt property, 100 feet east of east fork of Mill Creek along Amity Road, Arlington Heights, SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 32. U.S.G.S. bored and driven test well, diameter 1 $\frac{1}{2}$  inches, depth 19.3 feet. Measuring point, top of 1 $\frac{1}{2}$ -inch pipe, 0.2 foot above land surface.

173. W. S. Burkhardt property, 500 feet north from Clark Road and 300 feet east from Mill Creek, Reading, NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 32. Unused drilled test well, diameter 6 inches, depth 70 feet. Measuring point, top of 6-inch casing, 0.4 foot above land surface.

175. Emery Theater, Benson Street, Reading, NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 32. Unused drilled well, diameter 8 inches, depth 147 feet. Measuring point, top of 8-inch casing, 1.4 feet above land surface.

123. Dr. William Bragg, Walnut Street, Reading, NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 32. Domestic dug well, diameter 24 inches, depth 22 feet. Measuring point, top of metal manhole rim, 0.6 foot above land surface.

123. Water level, in feet below measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
Nov. 25, 1938	11.25	Feb. 20, 1939	10.00	Apr. 23, 1939	9.38
Dec. 5	10.98	27	10.31	24	9.61
12	11.20	Mar. 6	9.98	27	9.92
19	11.42	11	9.99	29	10.34
26	11.54	13	9.35	30	10.44
Jan. 2, 1939	11.49	20	10.12	May 1	10.56
9	11.38	27	9.75	3	10.55
16	11.18	Apr. 3	10.14	15	11.39
23	10.69	10	9.82	23	11.56
30	10.73	17	8.10	29	11.62
Feb. 6	10.08	20	8.78	June 5	11.73
13	10.02				

Water level, in feet below measuring point, 1939

Date	160	T-57	T-55	T-54	173	175	123
June 6	.....	.....	.....	.....	54.72	.....	.....
12	.....	.....	.....	.....	.....	.....	11.89
14	.....	.....	.....	.....	54.60	.....	.....
19	.....	.....	.....	.....	54.97	.....	11.61
26	.....	.....	.....	.....	54.86	.....	11.03
July 3	.....	.....	.....	.....	.....	.....	11.02
10	.....	.....	.....	.....	54.65	.....	11.25
17	.....	.....	.....	.....	55.66	.....	11.56
24	.....	.....	.....	.....	54.77	.....	11.58
31	.....	.....	.....	.....	54.95	.....	11.64
Aug. 7	26.34	.....	35.73	.....	55.30	.....	11.45
14	26.75	.....	36.45	.....	55.37	.....	11.55
21	27.05	.....	37.31	14.22	55.73	.....	11.72
28	27.41	.....	38.28	14.31	55.99	.....	11.88
Sept. 6	27.83	.....	39.47	14.39	56.52	.....	12.05
11	27.80	.....	40.21	14.46	57.46	.....	12.12

## Hamilton County--Continued

## Wells 160-123.--Continued

Water level, in feet below measuring point, 1939

Date	160	T-57	T-55	T-54	173	175	123
Sept. 18	27.57	45.94	41.05	14.52	58.10	.....	12.25
25	28.10	46.74	41.87	14.58	58.34	.....	12.35
Oct. 2	28.22	47.56	42.69	14.71	59.13	.....	12.43
9	28.42	48.25	43.39	14.84	59.47	.....	12.54
16	28.59	49.13	44.25	14.98	60.02	.....	12.64
23	28.76	49.70	44.94	15.04	60.48	.....	12.73
30	28.87	50.09	45.23	15.14	60.83	.....	12.75
Nov. 6	28.92	50.67	45.90	15.23	61.29	.....	12.75
13	(a)	(a)	(a)	15.29	62.03	.....	12.80
20	(a)	(a)	(a)	15.36	62.21	77.64	12.87
27	(a)	(a)	(a)	15.41	63.01	78.30	12.98
Dec. 4	(a)	(a)	(a)	15.43	62.97	78.45	13.00
11	(a)	(a)	(a)	15.46	63.60	79.06	13.05
18	(a)	(a)	(a)	15.53	63.93	79.02	13.16
22	(a)	(a)	(a)	15.50	64.38	79.64	13.20
29	(a)	(a)	(a)	15.61	64.68	79.60	13.29

## Springfield Township

13. Village of Wyoming, municipal water plant, Vine and Water Streets, Wyoming.

Lowest daily water level, in feet below measuring point, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June
1	120.14	119.72	119.96	118.12	118.50	118.48
2	119.26	119.43	119.67	113.40	118.70	118.68
3	119.75	119.40	119.08	118.94	118.89	118.58
4	120.06	119.91	118.52	119.15	118.83	114.00
5	119.21	119.81	113.70	118.87	118.73	118.67
6	120.32	118.36	119.25	118.91	118.30	118.82
7	120.41	119.26	119.78	119.22	113.00	118.92
8	120.20	119.40	116.90	118.63	117.93	118.50
9	119.33	119.65	119.20	113.55	118.25	118.65
10	119.60	119.08	119.26	118.35	118.42	118.00
11	119.94	119.75	118.85	119.06	113.66	113.75
12	120.09	119.65	118.60	119.50	118.98	119.70
13	119.77	118.70	119.35	119.57	118.47	118.71
14	119.91	118.82	119.42	119.11	113.20	118.80
15	119.82	118.98	119.15	118.00	118.17	117.68
16	119.50	119.79	119.50	113.35	118.60	119.22
17	119.85	119.55	119.53	118.52	118.68	118.58
18	119.30	119.57	119.16	118.78	118.75	113.90
19	119.68	118.94	114.29	118.83	118.75	118.37
20	119.72	118.78	119.23	118.98	118.77	119.01
21	119.84	119.11	119.18	119.13	113.95	118.64
22	119.50	119.42	119.39	118.90	113.18	118.51
23	119.16	119.58	119.23	113.73	118.40	118.18
24	119.27	119.24	119.00	118.49	118.62	119.41
25	119.62	119.47	118.79	118.55	113.82	113.66
26	119.54	118.59	117.02	118.51	119.26	118.40
27	119.90	118.58	118.86	118.65	118.55	118.54
28	119.76	118.46	119.18	118.80	113.72	118.85
29	119.32	.....	118.97	118.97	118.37	118.60
30	118.34	.....	118.85	113.35	118.40	118.60
31	119.65	.....	118.60	.....	118.55	.....

Lowest daily water level, in feet below measuring point, 1939  
(from recorder charts)

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	118.64	118.35	118.86	118.76	119.12	119.42
2	113.95	118.23	118.99	118.92	119.58	119.09
3	118.35	118.20	118.86	118.86	119.85	119.44
4	113.13	118.31	118.36	118.80	119.75	119.52
5	118.30	118.24	118.89	118.90	119.66	119.42
6	118.46	113.50	118.76	119.50	119.19	119.58

a Dry.

## Hamilton County--Continued

## 13. Village of Wyoming.--Continued

Lowest daily water level, in feet below measuring point, 1939  
(from recorder charts)

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.
7	118.70	118.07	118.65	119.65	119.20	119.50
8	118.68	118.10	118.87	119.76	119.37	120.13
9	113.85	118.36	118.83	119.67	119.68	119.73
10	118.40	118.44	118.88	119.56	119.34	119.33
11	118.58	118.41	118.88	119.68	119.70	119.57
12	118.42	118.09	119.09	119.82	119.62	119.68
13	118.21	113.40	119.18	119.87	119.63	119.56
14	118.38	118.07	119.22	120.12	119.70	119.97
15	118.42	118.19	119.21	115.40	119.79	120.06
16	113.75	118.25	119.26	119.46	119.74	119.62
17	118.20	118.07	119.19	119.95	119.63	119.58
18	118.45	118.27	119.09	119.83	119.51	119.36
19	118.52	118.32	119.32	119.82	119.40	119.42
20	118.59	113.46	119.26	119.57	119.15	119.46
21	118.78	118.23	119.30	119.50	119.25	119.76
22	118.50	118.40	119.26	114.65	119.40	120.14
23	113.65	118.47	119.34	119.18	119.85	120.00
24	118.28	118.50	119.25	119.45	119.86	119.91
25	118.36	118.82	118.85	119.38	119.80	119.80
26	118.53	118.80	118.43	119.40	120.03	119.61
27	118.52	119.05	118.70	119.17	119.87	119.28
28	118.40	118.29	118.70	119.75	119.92	119.75
29	118.30	118.55	118.64	115.03	119.78	119.83
30	113.58	118.67	118.70	118.60	119.68	119.63
31	118.29	118.75	.....	118.98	.....	119.53

## 14. Gardner-Richardson Company, South Cooper Avenue, Lockland.

Lowest daily water level, in feet below measuring point, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June
1	111.29	109.30	113.12	115.30	110.07	114.28
2	110.96	109.25	112.75	115.49	110.15	115.06
3	111.35	109.47	112.04	114.11	110.13	115.64
4	111.10	109.68	111.86	113.10	110.00	115.95
5	110.98	109.46	112.13	112.00	109.89	114.40
6	111.20	108.90	113.70	113.65	109.84	114.10
7	110.96	109.15	113.08	114.42	109.20	115.00
8	.....	109.10	113.01	114.76	108.91	115.45
9	110.30	109.10	112.70	113.37	108.85	115.67
10	110.30	110.87	112.70	112.10	109.02	115.85
11	110.32	111.34	112.37	113.65	109.90	115.39
12	110.35	109.95	.....	115.03	111.20	115.25
13	110.10	109.15	112.80	114.75	111.62	115.35
14	110.04	109.20	112.50	113.25	110.35	116.14
15	110.00	111.66	112.42	114.16	109.59	116.59
16	110.05	112.58	112.42	112.95	111.14	117.00
17	109.95	112.17	112.33	114.08	111.19	116.75
18	109.83	111.62	112.29	114.93	111.36	115.29
19	110.40	110.48	111.50	115.22	111.88	114.29
20	110.00	112.20	110.92	114.55	112.10	115.64
21	109.74	112.80	110.47	113.21	110.95	116.25
22	109.82	112.68	109.90	112.71	111.05	116.65
23	109.75	112.12	109.80	112.05	111.77	117.05
24	109.42	111.78	109.50	111.39	112.00	117.24
25	109.63	111.50	109.22	111.26	113.14	116.50
26	109.31	111.05	109.00	111.56	113.76	115.32
27	109.40	110.81	110.80	110.76	113.81	116.20
28	109.20	112.20	112.50	110.93	113.36	116.87
29	108.95	.....	113.00	110.68	112.42	117.35
30	108.88	.....	113.07	110.16	112.21	117.83
31	109.29	.....	114.25	.....	113.42	.....

## Hamilton County--Continued

## 14. Gardner-Richardson Company.--Continued

Lowest daily water level, in feet below measuring point, 1939  
(from recorder charts)

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	118.52	116.05	117.90	120.90	121.54	123.12
2	118.69	116.17	118.06	120.45	121.64	122.81
3	117.08	116.51	118.45	120.70	122.12	122.11
4	115.67	116.86	115.20	120.91	122.66	121.46
5	114.45	115.97	115.63	120.83	121.41	121.43
6	113.92	115.57	115.96	120.92	122.05	121.46
7	113.65	114.75	116.55	120.86	122.80	122.08
8	113.18	115.30	116.75	120.72	123.30	122.16
9	112.65	116.05	117.51	120.50	123.47	122.08
10	114.00	116.31	117.73	120.53	123.70	121.17
11	114.60	116.46	117.56	120.57	123.93	121.40
12	115.07	116.43	117.78	120.90	123.90	121.65
13	115.34	116.45	118.21	121.06	123.40	121.87
14	115.73	116.15	118.37	121.49	123.91	122.20
15	116.20	116.38	118.68	120.61	124.07	122.27
16	116.32	116.49	119.12	121.45	124.12	122.21
17	116.01	116.51	119.45	121.83	124.06	122.28
18	116.65	116.70	119.55	121.65	124.00	121.61
19	117.03	117.10	119.70	121.38	123.97	122.14
20	117.47	115.75	119.75	121.29	122.76	122.30
21	117.59	116.33	119.93	121.00	123.00	122.65
22	117.55	116.64	120.12	121.34	123.10	123.03
23	116.08	116.85	119.16	121.37	123.14	123.03
24	115.95	117.10	119.15	121.25	123.04	123.18
25	116.25	117.32	120.00	121.32	123.23	122.15
26	116.50	117.50	120.33	121.47	123.41	120.65
27	116.56	117.55	120.28	121.32	122.63	119.26
28	116.53	116.97	120.31	121.64	122.90	119.04
29	115.85	117.19	120.39	121.60	123.08	118.65
30	114.90	117.62	120.81	121.03	123.29	117.73
31	115.60	117.78	.....	121.00	.....	117.31

26. City Ice and Fuel Company, Wayne and Cooper Avenues, Lockland.  
Lowest daily water level, in feet below measuring point, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June
1	131.83	130.95	131.50	131.15	129.80	133.93
2	131.56	130.53	131.35	131.24	129.86	134.00
3	131.54	130.95	131.05	131.27	130.70	134.49
4	131.63	131.22	130.75	130.98	130.83	134.22
5	131.62	131.05	130.60	130.70	130.62	133.90
6	131.95	130.45	131.27	131.10	129.61	134.25
7	131.82	130.69	131.20	131.31	130.25	134.36
8	131.43	130.75	131.19	131.20	129.10	134.42
9	131.47	130.76	130.82	130.80	129.93	134.41
10	131.24	131.12	130.82	130.22	130.20	134.46
11	131.30	131.35	130.45	131.15	130.39	134.41
12	131.45	131.02	130.65	131.66	a 130.94	134.62
13	131.21	130.50	131.00	131.55	131.01	134.58
14	131.25	130.26	130.81	131.05	131.15	134.72
15	131.20	131.47	130.77	131.00	131.79	134.42
16	131.24	131.87	130.85	130.72	132.05	134.34
17	131.21	131.35	130.91	130.72	131.70	134.49
18	130.80	131.20	130.95	131.06	132.36	134.01
19	131.00	130.75	130.96	131.15	132.55	133.95
20	130.98	131.05	130.51	130.95	132.50	134.34
21	131.00	131.25	130.52	130.85	132.10	134.32
22	131.20	131.20	130.32	130.95	132.12	134.56
23	131.20	131.20	130.30	130.80	132.27	134.88
24	130.80	130.93	130.12	130.38	133.06	134.90
25	131.12	130.93	129.90	130.10	133.53	134.71
26	130.90	130.59	129.72	129.97	133.64	134.52
27	131.05	130.64	130.28	130.01	133.55	134.54
28	130.90	131.05	130.90	130.10	133.05	134.75
29	130.57	.....	130.95	130.20	133.65	134.90
30	130.40	.....	130.75	130.02	133.75	135.04
31	130.95	.....	130.77	.....	133.85	.....

a Pumping for summer begun May 12, 1939.

## Hamilton County--Continued

28. City Ice and Fuel Company.--Continued  
 Lowest daily water level, in feet below measuring point, 1930  
 (from recorder charts)

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	135.46	134.48	135.83	136.99	134.38	134.63
2	135.52	134.42	135.68	136.95	134.75	134.24
3	135.05	134.46	135.47	136.90	134.82	134.23
4	134.68	134.70	134.75	136.61	134.81	134.25
5	134.53	134.60	135.15	136.68	134.69	134.20
6	134.51	134.18	135.30	136.75	134.26	134.24
7	134.55	.....	135.30	136.74	134.29	134.64
8	134.40	134.14	135.35	136.55	134.79	134.85
9	134.23	134.50	135.54	136.56	134.89	134.65
10	134.34	134.60	135.65	136.67	134.92	133.92
11	134.33	134.60	135.72	136.82	134.99	134.55
12	134.50	134.52	135.65	137.24	134.85	134.34
13	134.11	134.35	135.76	137.26	134.75	134.57
14	134.34	134.37	135.85	137.64	134.83	134.81
15	134.57	134.55	136.00	137.50	134.93	134.81
16	134.66	134.67	136.16	137.08	134.84	134.43
17	134.44	134.71	136.35	137.17	134.71	134.37
18	134.61	134.77	136.33	136.85	134.67	134.16
19	134.83	134.85	136.45	133.88	134.60	134.21
20	134.95	134.60	136.30	136.85	134.34	134.40
21	135.13	134.75	136.40	136.85	134.34	134.87
22	134.96	134.98	136.51	a 134.00	134.57	135.05
23	134.21	134.83	136.35	134.02	134.65	134.92
24	134.38	134.96	136.12	134.12	134.68	134.80
25	134.54	135.19	135.93	134.10	135.04	134.47
26	134.60	135.24	136.38	134.22	135.10	134.00
27	134.66	134.82	136.25	134.05	134.77	133.65
28	134.55	135.32	136.50	134.38	134.80	134.02
29	134.46	135.43	136.49	134.37	134.74	133.90
30	134.25	135.61	136.89	133.93	134.69	133.50
31	134.41	135.70	.....	133.93	.....	133.25

## Sycamore Township ✓

92-4. City of Reading, municipal water plant, Walnut Street, Reading, SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 33, R. 1, T. 4. Abandoned drilled well, diameter 12 inches, depth 208 feet. Measuring point, top of 4-inch air line flange, 1.8 feet above land surface.

T-66. B. Riesenbergs and Sons, Koenig Street, Reading, NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 33, R. 1, T. 1. U.S.G.S. bored and driven test well, diameter 1 $\frac{1}{2}$  inches, depth 23.3 feet. Measuring point, top of 1 $\frac{1}{2}$ -inch pipe, 2.9 feet above land surface.

91. Joslin-Schmidt Corporation, 0.4 mile north from Reading, SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 33, R. 1, T. 4. Unused drilled well, diameter 12 inches, depth 143 feet. Measuring point, top of board covering well, 4.4 feet below land surface.

T-20. Bliss Realty Company, Shepherd Road and Big Four Railroad, Lockland, NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 33. U.S.G.S. bored and driven test well, diameter 1 $\frac{1}{2}$  inches, depth 45.6 feet. Measuring point, top of 1 $\frac{1}{2}$ -inch pipe, 0.7 foot above land surface.

T-19. Mary I. Jackson Estate, 0.5 mile north from Lockland along Mill Creek, NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 33, R. 1, T. 4. U.S.G.S. bored and driven test well, diameter 1 $\frac{1}{2}$  inches, depth 12 feet. Measuring point, top of 1 $\frac{1}{2}$ -inch pipe, 0.6 foot above land surface.

T-59. Mary I. Jackson Estate, 0.6 mile north from Lockland, at Big Four Railroad, NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 33, R. 1, T. 4. U.S.G.S. bored and driven well, diameter 1 $\frac{1}{2}$  inches, depth 23.6 feet. Measuring point, top of 1 $\frac{1}{2}$ -inch pipe, 2.5 feet above land surface.

a Pumping stopped Oct. 22, 1939.

## Hamilton County--Continued

T-58. Mary I. Jackson Estate, 0.5 mile north from Lockland and 0.1 mile west from Big Four Railroad, NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 33, R. 1, T. 4. U.S.G.S. bored and driven test well, diameter 1 $\frac{1}{2}$  inches, depth 29.2 feet. Measuring point, top of 1 $\frac{1}{2}$ -inch pipe, 2.0 feet above land surface.

## T-19. Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 17	6.88	June 12	9.07	July 17	9.58	Aug. 21	10.28
18	7.20	19	8.43	24	9.77	28	10.47
22	7.89	26	9.25	31	9.87	Sept. 6	10.64
29	8.52	July 3	8.99	Aug. 7	9.94	11	10.75
June 5	8.81	10	8.86	14	10.18		

## T-20. Water level, in feet below measuring point, 1939

June 5	35.46	July 3	36.94	July 31	37.77	Aug. 28	38.68
12	35.86	10	36.94	Aug. 7	37.98	Sept. 6	39.04
19	36.24	17	37.18	14	38.19	11	39.29
26	36.59	24	37.46	21	38.39		

## Water level, in feet below measuring point, 1939

Date	92-4	T-66	91	T-20	T-19	T-59	T-58
Sept. 18	.....	.....	.....	39.63	10.98	21.97	20.98
25	79.30	.....	.....	39.88	11.05	22.17	21.22
Oct. 2	79.73	.....	.....	40.17	11.15	22.38	21.47
9	79.87	.....	.....	40.43	11.23	22.67	21.75
11	.....	.....	57.50	.....	.....	.....	.....
16	80.04	.....	.....	40.70	11.40	22.98	22.06
23	80.28	.....	.....	40.90	11.48	23.18	22.30
30	80.52	.....	.....	41.09	10.98	23.37	22.57
Nov. 6	80.60	.....	.....	41.27	11.00	23.54	22.83
13	81.27	19.08	.....	41.46	10.78	23.69	23.09
20	81.09	19.20	51.16	41.62	11.00	23.88	23.32
27	81.76	19.29	52.35	41.82	10.95	24.09	23.73
Dec. 4	81.80	19.36	52.81	41.91	10.93	24.25	24.04
11	82.38	19.44	a 53.27	42.05	11.00	25.48	24.35
18	82.30	19.51	a 53.45	42.16	11.00	25.96	24.66
22	82.97	19.49	a 54.42	42.22	10.96	26.00	24.83
29	82.90	19.55	a 53.91	42.30	11.03	26.13	25.20

## 93. Harry F. Pittman, Jackson Road.

Lowest daily water level, in feet below measuring point, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	29.32	29.82	29.10	26.17	17.75	18.43	.....	.....	.....	.....	.....	.....
2	29.33	29.76	29.05	26.10	17.79	.....	.....	.....	.....	b22.63	.....	.....
3	29.33	29.72	28.99	26.04	17.83	.....	b19.30	.....	.....	.....	.....	.....
4	29.34	29.71	28.93	26.00	17.86	.....	.....	.....	.....	.....	.....	b25.48
5	29.36	29.70	28.87	25.93	17.88	b18.58	.....	.....	.....	.....	.....	.....
6	29.38	29.70	28.80	25.84	17.90	.....	.....	.....	b21.49	.....	b24.24	.....
7	29.40	29.69	28.75	25.80	.....	.....	.....	b20.37	.....	.....	.....	.....
8	.....	29.68	28.69	25.71	17.89	.....	.....	.....	.....	.....	.....	.....
9	29.42	29.67	28.62	25.63	17.95	.....	.....	.....	.....	b22.94	.....	.....
10	29.45	29.66	28.56	25.52	17.97	.....	b19.50	.....	.....	.....	.....	.....
11	29.47	29.65	28.43	25.47	18.04	.....	.....	.....	b21.69	.....	.....	b25.79
12	29.50	29.64	28.40	25.43	18.07	b18.75	.....	.....	.....	.....	.....	.....
13	29.52	29.64	28.33	25.37	18.08	.....	.....	.....	.....	.....	b24.57	.....
14	29.55	29.63	28.23	25.28	18.09	.....	.....	b20.61	.....	.....	.....	.....
15	29.57	29.62	28.09	25.18	18.09	b18.84	.....	.....	.....	.....	.....	.....
16	29.58	29.60	27.98	25.10	18.11	.....	.....	.....	.....	b23.26	.....	.....
17	29.60	29.58	27.86	22.72	18.13	.....	b19.69	.....	.....	.....	.....	.....
18	29.62	29.55	27.74	18.32	18.16	.....	.....	.....	b22.01	.....	.....	b26.09
19	29.65	29.52	27.63	17.48	18.18	b18.93	.....	.....	.....	.....	.....	.....
20	29.67	29.50	27.43	17.32	18.20	.....	.....	.....	.....	.....	b24.88	.....

a Nearby well pumping.

b Tape measurement.



## Hamilton County--Continued

93. Harry F. Pittman.--Continued

Lowest daily water level, in feet below measuring point, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
21	29.69	29.48	27.35	17.28	18.20	.....	.....	a20.85	.....	.....	.....	.....
22	29.72	29.45	27.21	17.31	18.21	.....	.....	.....	.....	.....	.....	a26.28
23	29.75	29.42	27.09	17.34	18.24	.....	.....	.....	.....	a23.60	.....	.....
24	29.77	29.40	26.97	17.42	18.28	.....	a19.91	.....	.....	.....	.....	.....
25	29.79	29.35	26.85	17.45	18.31	.....	.....	.....	a22.30	.....	.....	.....
26	29.81	29.30	26.74	17.51	18.32	a19.14	.....	.....	.....	.....	.....	.....
27	29.83	29.21	26.64	17.57	18.33	.....	.....	.....	.....	.....	a25.19	.....
28	29.85	29.15	26.53	17.62	18.34	.....	.....	a21.12	.....	.....	.....	.....
29	29.85	.....	26.45	17.68	18.37	.....	.....	.....	.....	.....	.....	a26.57
30	29.85	.....	26.33	17.71	18.39	.....	.....	.....	.....	a23.91	.....	.....
31	29.85	.....	26.26	.....	18.41	.....	a20.15	.....	.....	.....	.....	.....

T-3. Harry F. Pittman, Jackson Road, 1.3 miles north from Lockland, SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 34, R. 1, T. 4. U.S.G.S. bored and driven test well, diameter 1 $\frac{1}{2}$  inches, depth 31.6 feet. Measuring point, top of 1 $\frac{1}{2}$ -inch pipe, 1.1 feet above land surface.

T-8. St. Rita School for Deaf Children, Glendale-Milford Road and Pennsylvania Railroad, SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 35, R. 1, T. 4. U.S.G.S. bored and driven test well, diameter 1 $\frac{1}{2}$  inches, depth 28.5 feet. Measuring point, top of 1 $\frac{1}{2}$ -inch pipe, 0.6 foot above land surface.

T-8A. Johns-Manville Corporation, Glendale-Milford Road, 0.1 mile east from Pennsylvania Railroad, SE cor. SE $\frac{1}{4}$  sec. 35, R. 1, T. 4. U.S.G.S. bored and driven test well, diameter 1 $\frac{1}{2}$  inches, depth 30.0 feet. Measuring point, top of 1 $\frac{1}{2}$ -inch pipe, 0.1 foot above land surface. Measuring point raised 2.7 feet Aug. 7, 1939; now 2.8 feet above land surface.

99. Tennessee Corporation, Glendale-Milford Road and Big Four Railroad, rear of old office, SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 29, R. 1, T. 4. Unused drilled well, diameter 4 inches, depth 38.6 feet. Measuring point, top of 4-inch coupling, 4.8 feet above land surface.

T-9. P. Froelich, Glendale-Milford Road, 500 feet west from Mill Creek, SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 29, R. 1, T. 4. U.S.G.S. bored and driven test well, diameter 1 $\frac{1}{2}$  inches, depth 28.8 feet. Measuring point, top of 1 $\frac{1}{2}$ -inch pipe, 3.4 feet above land surface.

T-10. H. Burwinkle, Glendale-Milford Road and Mill Creek, east bank, SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 29, R. 1, T. 4. U.S.G.S. bored and driven test well, diameter 1 $\frac{1}{2}$  inches, depth 22 feet. Measuring point, top of 1 $\frac{1}{2}$ -inch pipe, 3.00 feet above land surface.

T-14. Johns-Manville Corporation, 0.35 mile north from Glendale-Milford Road on south bank of Mill Creek, NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 35, R. 1, T. 4. U.S.G.S. bored and driven test well, diameter 1 $\frac{1}{2}$  inches, depth 23.2 feet. Measuring point, top of 1 $\frac{1}{2}$ -inch pipe, 0.35 foot above land surface.

## Water level, in feet below measuring point, 1938-39

Date	T-3	T-8	T-8A	99	T-9	T-10	T-14
Dec. 12, 1938	.....	.....	.....	27.63	.....	.....	.....
19	.....	19.06	.....	28.20	24.90	20.11	20.29
26	.....	19.12	.....	.....	25.06	20.40	20.51
27	.....	.....	.....	28.00	.....	.....	.....
Jan. 2, 1939	.....	19.18	.....	.....	24.32	20.40	20.74
3	.....	.....	.....	28.59	.....	.....	.....
9	.....	19.24	.....	28.77	25.49	20.35	20.88
16	.....	19.29	.....	28.38	25.69	20.57	21.10
23	.....	19.32	.....	28.99	25.54	19.37	19.96
29	.....	19.32	.....	.....	25.68	20.00	21.16
30	.....	19.35	.....	29.23	25.35	17.70	15.15
31	.....	19.35	.....	27.75	24.23	16.75	16.22
Feb. 1	.....	19.32	.....	28.55	24.14	16.65	17.00
2	28.34	19.29	.....	28.05	24.15	16.70	17.23
3	.....	19.28	.....	27.76	24.06	16.61	17.35

a Tape measurement.

## Hamilton County--Continued

Wells T-3--T-14--Continued

Water level, in feet below measuring point, 1938-39

Date	T-3	T-8	T-8A	99	T-9	T-10	T-14
Feb. 4, 1939	.....	19.25	.....	.....	24.07	16.45	17.51
5	.....	19.24	.....	28.06	24.02	16.74	17.56
6	.....	19.21	.....	27.95	23.99	16.87	17.66
7	.....	.....	.....	27.75	.....	.....	.....
10	.....	.....	.....	.....	23.75	16.52	16.92
11	.....	.....	22.50	.....	.....	.....	.....
13	.....	18.99	22.58	27.42	23.40	16.36	17.03
20	28.60	18.62	22.34	26.50	22.78	15.90	16.67
27	.....	18.19	21.74	25.98	22.22	15.31	14.64
Mar. 6	28.02	17.76	20.00	25.35	21.58	12.52	15.26
11	.....	17.48	19.67	24.90	21.01	11.62	13.95
12	.....	17.43	19.41	.....	19.72	10.46	10.73
13	27.50	17.33	19.29	24.46	19.58	10.72	11.30
20	26.88	16.79	18.21	23.40	19.39	11.39	12.89
27	25.88	16.12	17.40	22.63	19.02	10.32	13.18
Apr. 3	24.93	15.76	17.02	22.43	18.44	10.48	12.85
6	.....	15.64	16.86	22.12	18.15	8.93	10.49
10	24.18	15.42	16.53	21.84	17.76	9.90	11.40
14	.....	15.21	16.25	21.57	17.60	9.95	11.71
15	.....	11.80	16.12	21.35	14.34	6.70	a 4.95
16	23.65	3.68	.....	a 11.24	10.00	2.10	a 1.00
17	23.48	4.35	.81	10.72	9.27	4.60	3.12
18	.....	5.06	2.97	11.49	9.21	5.17	3.60
19	22.67	6.27	4.79	11.99	9.32	6.10	4.65
20	21.99	6.77	5.35	12.33	9.59	6.57	5.55
21	21.25	7.06	5.92	12.55	9.06	6.67	6.11
22	20.62	7.30	6.32	12.92	10.28	7.03	6.60
23	20.10	7.40	6.25	13.13	10.50	a 7.13	6.87
24	19.65	7.57	6.91	13.35	10.73	7.24	7.15
26	18.67	7.72	7.30	13.64	11.24	7.44	7.59
27	18.45	7.85	7.53	13.92	11.38	7.48	7.80
28	18.20	7.97	7.75	14.12	11.57	7.59	8.01
29	18.03	8.05	7.91	14.33	11.72	7.64	8.23
30	17.81	8.11	8.07	14.41	11.84	7.65	8.20
May 1	17.65	8.22	8.24	14.57	12.00	7.75	8.40
3	17.40	8.43	8.56	14.86	12.26	7.87	8.64
4	17.29	8.49	8.69	14.98	12.35	7.90	8.72
8	16.92	8.75	9.07	15.30	12.62	7.93	8.88
15	16.64	9.30	9.78	15.92	13.14	8.18	9.48
22	16.55	9.75	10.32	16.36	13.49	8.16	9.75
29	16.62	10.18	10.77	16.82	13.81	b 11.46	10.18
June 5	16.70	10.57	11.18	17.15	14.07	b 12.97	10.30
12	16.87	10.82	11.51	17.47	14.46	b 15.42	10.56
18	.....	.....	.....	.....	14.50	10.35	9.40
19	16.94	11.19	11.79	17.60	14.49	10.74	9.61
26	17.12	11.47	12.00	18.03	14.80	b 16.23	10.48
July 3	17.24	11.70	12.17	17.98	14.86	11.75	10.33
10	17.42	11.93	12.39	18.19	14.87	b 15.65	9.97
17	17.52	12.15	12.54	18.39	15.27	b 16.52	10.74
24	17.77	12.37	12.80	18.59	15.49	b 15.48	10.99
31	18.00	12.63	13.10	18.84	15.79	b 15.48	11.09
Aug. 7	18.16	12.79	c 15.96	19.09	16.09	b 15.57	11.19
14	18.37	13.06	16.24	19.35	16.40	b 15.84	11.42
21	18.60	13.33	16.50	19.55	16.67	b 15.47	11.57
28	18.82	13.57	16.60	19.90	17.08	b 15.45	11.77
Sept. 6	19.16	13.90	17.10	20.29	17.39	b 15.72	11.92
11	19.39	14.10	17.35	20.39	17.75	b 16.37	12.08
18	19.64	14.35	17.60	20.80	18.16	b 16.88	12.28
25	19.90	14.59	17.90	21.13	18.56	b 17.25	12.92
Oct. 2	20.24	14.90	18.34	21.58	18.95	17.00	13.16
9	20.59	15.22	18.66	21.93	19.31	17.88	13.98
16	20.96	15.56	19.07	22.35	19.73	18.39	14.49
23	21.32	15.89	19.46	22.74	20.10	18.84	14.90
30	21.67	16.19	19.81	23.10	20.33	18.57	14.75
Nov. 6	22.03	16.47	20.11	23.23	20.60	19.20	15.35

a Well surrounded by water.

b Water pumped from open ditch 5 feet from well.

c Measuring point raised 2.69 feet Aug. 7, 1939.

## Hamilton County--Continued

## Wells T-3--T-14---Continued

Water level, in feet below measuring point, 1938-39

Date	T-3	T-8	T-8A	99	T-9	T-10	T-14
Nov. 11, 1939	.....	.....	.....	23.59	.....	.....	.....
13	22.42	16.78	20.46	23.66	20.95	19.58	15.58
20	22.80	17.04	20.81	23.95	21.27	19.64	16.10
27	23.18	17.35	21.16	24.42	21.53	19.62	16.29
Dec. 4	23.50	17.63	21.44	24.57	21.66	19.33	16.56
11	23.84	17.84	21.67	24.57	21.83	.....	16.82
18	24.25	18.08	21.97	25.08	22.10	20.11	17.22
22	24.32	18.17	22.12	25.19	22.22	20.25	17.38
29	24.68	18.32	22.45	25.51	22.51	20.66	17.74

56. Johns-Manville Corporation, 0.1 mile north from Glendale-Milford Road.

Lowest daily water level, in feet below measuring point, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	37.61	37.15	35.60	32.63	26.36	27.20	.....	29.03	30.39	32.08	33.41	34.93
2	37.28	37.23	35.37	32.44	26.05	27.16	.....	29.06	30.85	32.32	33.94	34.59
3	37.88	36.90	35.57	32.67	26.13	26.86	.....	29.32	30.44	32.48	33.75	34.82
4	37.53	37.41	35.06	32.47	26.49	27.34	28.19	29.22	30.96	32.82	33.80	34.83
5	37.58	37.04	35.26	32.14	26.12	27.42	27.92	29.60	30.36	32.09	33.67	34.95
6	38.29	37.27	35.06	32.25	26.32	27.56	28.10	29.23	30.63	32.48	33.63	34.93
7	37.83	36.63	35.63	32.38	26.10	27.78	28.39	29.40	30.56	32.24	33.91	34.98
8	38.22	36.57	34.85	31.84	26.16	28.62	28.18	29.22	31.01	32.49	33.82	35.33
9	37.60	36.78	35.22	31.60	26.44	27.76	28.15	29.43	31.04	32.63	34.01	35.17
10	37.64	36.65	35.01	31.73	26.00	28.02	28.40	29.34	30.86	32.73	33.89	34.70
11	37.68	36.89	34.56	31.62	26.42	28.04	28.32	29.77	31.12	32.28	34.03	35.23
12	38.04	36.69	34.17	32.04	26.58	28.36	28.32	29.43	31.13	32.70	33.85	35.15
13	37.74	36.77	34.31	31.77	26.52	27.60	28.30	29.62	31.17	32.56	34.29	35.23
14	38.12	36.29	33.85	31.68	26.40	27.86	28.60	29.38	31.37	32.91	34.16	35.65
15	37.42	35.85	33.44	31.04	26.59	28.31	28.47	29.67	31.73	32.74	34.38	35.25
16	38.00	36.61	34.04	29.60	26.28	28.46	28.70	29.53	31.43	33.30	34.17	35.19
17	37.86	36.26	33.45	26.98	26.72	28.25	28.60	29.83	31.54	33.35	34.59	35.00
18	37.84	36.40	33.65	27.25	26.46	27.71	28.96	29.89	31.48	32.85	34.25	.....
19	37.75	36.01	33.99	26.83	26.87	27.97	28.59	29.85	31.47	33.40	33.92	35.23
20	37.82	36.52	33.40	26.75	26.52	28.12	29.12	29.67	31.34	33.16	34.24	35.07
21	37.68	35.84	33.46	26.65	26.42	28.26	28.75	29.69	31.71	33.32	34.16	35.54
22	38.47	35.98	33.60	26.40	26.90	28.27	29.40	.....	31.53	33.00	34.36	35.41
23	37.74	36.03	33.08	26.57	26.86	28.32	28.92	.....	31.79	33.38	34.46	35.53
24	37.88	35.82	33.37	26.32	27.01	28.26	29.26	.....	31.87	33.18	34.08	35.41
25	37.91	35.91	33.18	26.46	27.39	28.02	29.17	.....	31.86	33.27	34.53	35.62
26	37.77	35.47	33.25	26.16	27.21	28.00	28.80	.....	31.95	33.55	34.40	35.34
27	37.84	35.58	32.62	26.39	27.05	.....	28.88	.....	31.99	33.16	34.84	35.40
28	38.00	35.33	33.14	26.11	27.18	.....	28.96	30.03	31.90	33.57	34.97	35.53
29	37.50	.....	32.52	26.29	27.47	.....	28.97	.....	32.13	33.27	34.74	35.62
30	37.44	.....	32.86	25.96	26.67	.....	28.80	.....	32.33	33.87	34.91	35.63
31	37.70	.....	32.56	.....	26.84	.....	28.89	.....	.....	33.37	.....	35.47

T-47. Drackett Chemical Company, Sharon Avenue, 0.1 mile west from Mostellar Road, 2.7 miles north from Lockland, NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 35, R. 1, T. 4. U.S.G.S. bored and driven test well, diameter 1 $\frac{1}{2}$  inches, depth 17.5 feet. Measuring point, top of 1 $\frac{1}{2}$ -inch pipe, 2.7 feet above land surface.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
June 19	9.14	Aug. 7	11.13	Sept. 26	12.57	Nov. 14	13.82
26	10.29	14	11.37	Oct. 2	12.66	21	13.98
July 3	9.96	21	11.61	9	12.86	28	14.20
10	10.06	28	11.79	16	13.07	Dec. 5	14.33
17	10.59	Sept. 6	12.00	23	13.27	12	14.51
24	10.87	11	12.20	30	13.40	19	14.64
31	11.00	18	12.38	Nov. 6	13.56	26	14.82

a Tape measurement.

## Hamilton County--Continued

18. Village of Glendale, municipal water plant, Sharon Avenue, 0.2 mile east from Mostellar Road.

Lowest daily water level, in feet below measuring point, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	35.32	35.22	33.22	30.50	25.95	27.24	27.76	29.32	30.75	32.65	33.14	34.12
2	35.52	34.71	33.31	31.30	25.50	28.00	28.08	29.30	.....	32.18	33.00	34.03
3	35.39	35.18	32.43	30.80	26.00	27.50	28.10	29.50	.....	32.18	33.40	34.21
4	35.53	34.83	32.47	30.02	26.10	28.01	28.08	29.52	.....	31.92	33.50	34.13
5	35.48	.....	33.08	30.08	25.80	27.23	27.90	29.77	30.56	32.08	33.39	34.68
6	36.00	.....	32.96	30.31	26.40	27.85	28.37	30.05	30.29	32.11	33.40	34.41
7	35.81	34.25	33.17	29.79	26.10	27.90	28.31	29.28	31.30	32.30	33.30	34.41
8	36.59	34.03	32.78	29.92	26.03	28.10	28.47	29.52	31.28	32.50	33.50	34.39
9	35.80	34.58	32.60	29.62	25.85	28.27	28.91	29.39	31.40	32.35	33.41	35.19
10	35.49	33.74	32.70 <sup>a</sup>	29.29	26.17	28.16	28.48	29.31	31.06	32.28	33.81	34.60
11	35.53	34.46	32.18	30.42	26.60	28.58	28.40	29.95	31.34	32.09	33.70	34.46
12	35.80	34.19	31.87	30.35	26.21	28.00	28.17	29.52	31.34	32.30	34.45	34.66
13	35.21	34.20	32.08	30.60	26.60	27.46	28.26	29.09	31.59	32.46	33.94	34.80
14	35.31	34.13	30.90	30.18	27.42	28.17	28.60	29.60	31.80	32.58	33.68	34.21
15	35.42	33.55	31.40	30.10	26.77	28.10	28.75	29.62	31.82	33.51	33.21	34.80
16	35.15	34.40	31.23	28.32	26.42	29.80	28.78	29.65	31.78	32.90	33.50	34.59
17	35.57	33.80	31.40	26.95	26.38	28.78	28.43	29.92	32.38	32.82	33.79	34.66
18	35.02	34.16	31.22	27.57	26.71	28.30	28.67	29.92	31.95	32.47	33.80	34.49
19	35.98	34.70	32.10	26.75	26.72	28.18	28.80	.....	31.60	32.62	33.75	34.49
20	36.00	34.12	31.80	26.40	26.58	28.38	28.99	.....	31.66	33.18	33.76	34.64
21	35.18	33.50	31.00	25.83	26.70	28.04	29.08	.....	31.82	33.00	33.55	34.45
22	36.72	33.75	31.34	25.80	26.65	28.04	29.41	30.08	31.89	32.61	33.80	34.91
23	35.90	33.67	30.93	25.72	27.03	28.32	30.00	29.98	.....	33.12	33.62	.....
24	35.65	33.60	31.05	25.55	26.85	28.48	29.49	29.90	.....	32.98	33.83	.....
25	35.72	33.00	31.00	25.66	26.90	28.91	29.10	30.54	.....	32.91	33.96	.....
26	35.80	33.21	30.71	25.75	27.12	28.10	29.00	30.50	31.70	33.00	34.69	34.91
27	36.25	33.40	30.82	25.68	27.49	27.91	29.09	30.24	31.61	32.71	34.80	34.27
28	36.12	33.72	30.75	25.40	28.21	28.30	29.27	30.41	31.67	33.19	34.03	35.09
29	35.88	.....	30.37	25.80	28.00	28.04	29.33	30.30	31.55	34.07	34.40	35.05
30	35.40	.....	30.50	26.40	27.62	28.21	28.38	30.07	32.09	35.11	34.28	35.11
31	35.46	.....	30.50	.....	27.06	.....	29.00	30.17	.....	33.32	.....	34.93

18A. Village of Glendale, municipal water plant, Sharon Avenue, 0.2 mile east from Mostellar Road. Shallow well.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 2	18.15	Mar. 13	13.40	Apr. 30	8.27	Aug. 28	13.08
9	18.37	20	13.30	May 1	8.52	Sept. 6	13.36
16	18.32	27	13.45	3	7.92	11	12.48
23	18.40	Apr. 3	12.87	4	8.90	18	13.75
29	18.13	6	12.58	8	9.12	26	13.97
30	18.15	10	11.94	15	9.85	Oct. 2	14.18
31	18.14	14	12.04	22	10.33	9	14.40
Feb. 1	18.10	15	10.90	29	10.74	16	14.63
2	17.89	16	4.22	June 5	11.16	23	14.85
4	17.87	17	4.83	12	11.36	30	15.07
5	17.92	18	5.31	19	11.28	Nov. 6	15.31
6	17.14	19	5.86	26	11.55	14	15.58
7	16.95	20	6.39	July 3	11.52	21	15.70
10	16.77	21	6.78	10	11.67	28	16.01
13	16.32	22	7.10	17	11.86	Dec. 5	16.19
20	15.81	23	7.17	24	12.07	12	16.42
27	15.63	24	7.24	31	12.27	19	16.56
Mar. 6	15.08	26	7.61	Aug. 7	12.46	26	16.63
11	14.52	27	7.83	14	12.66		
12	13.90	28	8.09	21	12.87		

<sup>a</sup> Measuring point raised 0.96 foot Apr. 10, 1939.

## Hamilton County---Continued

T-46. L. Smizer, Sharon Avenue, 0.5 mile east from Mostellar Road, NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 29, R. 1, T. 4. U.S.G.S. bored and driven test well, diameter 1 $\frac{1}{2}$  inches, depth 27.6 feet. Measuring point, top of 1 $\frac{1}{2}$ -inch pipe, 1.8 feet above land surface.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
June 19	17.48	Aug. 7	18.69	Sept. 26	20.26	Nov. 14	21.88
26	17.69	14	18.90	Oct. 2	20.49	21	22.10
July 3	17.81	21	19.11	9	20.74	28	22.34
10	18.00	28	19.35	16	21.00	Dec. 5	22.51
17	18.14	Sept. 6	19.60	23	21.23	12	22.74
24	18.35	11	19.81	30	21.45	19	22.90
31	18.53	19	20.09	Nov. 6	21.65	26	23.00

30. Albert Sorter Estate, 0.2 mile north from Kemper Road, 100 feet east from Mill Creek, SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 31, R. 2, T. 3. Unused drilled well, diameter 6 inches, depth 132 feet. Measuring point, top of 6-inch coupling, 3.7 feet above land surface.

Water level, in feet below measuring point, 1939

Mar. 3	8.48	Apr. 26	7.80	June 19	8.85	Sept. 26	11.51
13	5.75	27	7.95	26	9.33	Oct. 3	11.66
20	8.60	28	8.09	July 3	8.37	10	11.80
27	8.75	29	8.22	10	7.97	17	11.95
Apr. 3	8.34	30	8.32	17	9.15	24	12.10
6	6.02	May 1	8.42	24	9.49	31	12.14
10	7.94	3	8.65	31	9.58	Nov. 7	12.26
14	8.40	4	8.68	Aug. 7	9.65	14	12.36
17	4.68	8	8.86	14	9.92	21	12.47
20	6.40	15	9.23	21	10.30	28	12.59
21	6.70	22	9.37	28	10.61	Dec. 5	12.63
22	7.03	29	9.65	Sept. 6	10.95	12	12.74
23	7.24	June 5	9.56	11	11.12	19	12.78
24	7.45	12	9.87	19	11.36	26	12.91

32. Michael Schwegmann, Hauck Road, 0.3 mile east from Mostellar Road. Measurements discontinued May 2, 1939.

Water level, in feet below measuring point, 1939

Jan. 3	9.89	Feb. 7	3.47	Mar. 14	3.58	Apr. 11	3.75
10	9.47	14	3.53	21	4.65	18	3.42
17	8.69	21	3.65	28	3.75	25	4.56
24	6.54	Mar. 7	3.95	Apr. 4	4.06	May 2	5.50
31	4.23						

## City of Canton

By A. N. Sayre

Canton lies in the northeastern part of Ohio near the edge of the glaciated area. The mean annual precipitation is about 39 inches. Three tributaries of Nimishillen Creek flow through the city. Except for water that is pumped from one of these tributaries for industrial use, the entire water supply for the city and its industries is pumped from wells. The outwash gravel that underlies parts of the city to a depth of 100 to 200 feet supplies most of the water. A sandstone of Mississippian age, known to the drillers as the "Big Injun Sand," supplies a small amount of water to wells. This formation, which is encountered in wells 200 to 400 feet deep, contains water that is, generally speaking, much softer than that in the gravel.

The average daily pumpage by the city and all its industries is about 40,000,000 gallons. About three-fourths of this is pumped by three organizations. The Timken Roller Bearing Co., in the southwestern part of the city, pumps about 11,000,000 gallons a day from a large well in the gravel deposits. The Republic Steel Corporation, in the northeastern section of the city, uses water from wells both in the gravel and in the sandstone and also from Nimishillen Creek. An average of 3,700,000 gallons a day is pumped from the wells that end in the gravel and 4,800,000 gallons a day from wells that end in the sandstone. Wells in the northeastern part of the city, which now supply water for the entire city, consist of nine wells drilled into the gravel near the northern limits of the city. During 1939 these wells furnished an average of 11,321,000 gallons a day.

The depth to the static water level in each of the city wells (wells 2-6, 8-11) on the first of each month, as supplied by H. A. Byers, is given on the following pages. Weekly water levels in a test well (well 20) drilled through the gravel by the Republic Steel Corporation at Lippert Street and Warner Road, N.E., are supplied by E. V. Beftoulides. This well is not pumped, and the nearest pumped well is about 500 feet to the east.

A water-stage recorder is maintained on well 21, owned by the Ohio Power Co. The recorder is serviced by C. R. Phillips. This is the westernmost well of a battery of 35 wells, staggered on two parallel lines on 8-foot centers. These wells extend about 40 feet below the bottom of a tunnel that is itself 25 feet below the land surface. All the wells were formerly pumped by suction, but now only the easternmost well is pumped, and that only for air conditioning during the daytime in summer. The wells end in gravel. About 400 feet east of the observation well is a well that ends in the Big Injun sand and is pumped for boiler water. The recorder chart shows sharp rises and declines of water level that appear to have more or less regular periodicity and are believed to result from compression of the aquifer by trains of the Wheeling and Lake Erie Railroad, which pass within a few feet of the well. They also show a downward trend of water level when the air-conditioning well is pumped but no apparent change in water level from the pumping of the deep well. There are no other wells within several blocks of well 21.

A total of 165 individual measurements of water level were made in the 11 observation wells in 1939.

2. City of Canton. Northeast well field, 900 feet from west line and 950 feet from south line of tract. Diameter 12 inches, depth 132 feet.  
Water level, in feet below land surface, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 1	42	Apr. 1	39	July 1	41	Oct. 1	49
Feb. 1	44	May 1	37	Aug. 1	45	Nov. 1	49
Mar. 1	42	June 1	39	Sept. 1	46	Dec. 1	50

3. City of Canton. Northeast well field, 463 feet east of well 2 and 950 feet from south line of tract. Diameter 12 inches, depth 149 feet.  
Water level, in feet below land surface, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 1	37	Apr. 1	33	July 1	35	Oct. 1	43
Feb. 1	37	May 1	30	Aug. 1	38	Nov. 1	42
Mar. 1	35	June 1	32	Sept. 1	40	Dec. 1	43

4. City of Canton. Northeast well field, 1,100 feet from west line and 600 feet from south line of tract. Diameter 12 inches, depth 147 feet.  
Water level, in feet below land surface, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 1	39	Apr. 1	35	July 1	39	Oct. 1	47
Feb. 1	40	May 1	35	Aug. 1	43	Nov. 1	44
Mar. 1	37	June 1	37	Sept. 1	44	Dec. 1	46

5. City of Canton. Northeast well field, 1,400 feet from west line and 600 feet from south line of tract. Diameter 12 inches, depth 209 feet.  
Water level, in feet below land surface, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 1	38	Apr. 1	33	July 1	36	Oct. 1	43
Feb. 1	39	May 1	31	Aug. 1	39	Nov. 1	44
Mar. 1	35	June 1	33	Sept. 1	41	Dec. 1	45

6. City of Canton. Northeast well field, 950 feet from west line and 200 feet from south line of tract. Diameter 12 inches, depth 128 feet.  
Water level, in feet below land surface, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 1	39	Apr. 1	35	July 1	36	Oct. 1	43
Feb. 1	39	May 1	32	Aug. 1	39	Nov. 1	44
Mar. 1	37	June 1	33	Sept. 1	41	Dec. 1	(a)

a Closed for repairs.

8. City of Canton. Northeast well field, 1,700 feet from west line and 200 feet from south line of tract. Diameter 12 inches, depth 109 feet. Water level, in feet below land surface, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 1	37	Apr. 1	33	July 1	35	Oct. 1	42
Feb. 1	38	May 1	31	Aug. 1	38	Nov. 1	42
Mar. 1	35	June 1	32	Sept. 1	40	Dec. 1	43

9. City of Canton. Northeast well field, 1,088 feet from west line and 600 feet from south line of tract. Diameter 28 inches, depth 180 feet. Water level, in feet below land surface, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 1	36	Apr. 1	32	July 1	33	Oct. 1	43
Feb. 1	37	May 1	30	Aug. 1	38	Nov. 1	43
Mar. 1	34	June 1	31	Sept. 1	40	Dec. 1	43

10. City of Canton. Northeast well field, 1,750 feet from west line and 430 feet from south line of tract. Diameter 30 inches, depth 157 feet. Water level, in feet below land surface, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 1	38	Apr. 1	33	July 1	36	Oct. 1	44
Feb. 1	38	May 1	31	Aug. 1	39	Nov. 1	44
Mar. 1	35	June 1	33	Sept. 1	39	Dec. 1	45

11. City of Canton. Northeast well field, 850 feet from west line of tract and 500 feet south of 30th Street. Diameter 30 inches, depth 198 feet. Water level, in feet below land surface, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 1	31	Apr. 1	27	July 1	30	Oct. 1	36
Feb. 1	32	May 1	24	Aug. 1	31	Nov. 1	37
Mar. 1	31	June 1	27	Sept. 1	34	Dec. 1	38

20. Republic Steel Co. test well. Lippert Street and Warner Road, N.E. Diameter 26 inches, depth 140 feet. Measuring point, top of 2-inch coupling, 0.9 foot above land surface.

Water level, in feet below measuring point, 1939

Jan. 16	27.54	Apr. 19	27.50	July 12	28.67	Oct. 4	32.42
23	27.81	25	27.33	18	29.00	11	32.92
29	27.92	May 2	27.12	25	29.33	18	33.17
Feb. 6	27.96	9	26.83	Aug. 2	29.67	26	33.46
13	28.17	16	26.79	9	29.96	Nov. 1	33.56
20	28.12	23	26.62	15	30.27	10	33.90
27	28.10	31	26.69	22	30.54	16	34.00
Mar. 6	28.17	June 6	26.92	29	30.87	22	34.17
13	27.58	13	27.10	Sept. 6	31.17	29	34.33
20	27.44	21	27.71	12	31.50	Dec. 11	34.53
28	27.62	28	28.04	19	31.75	19	34.79
Apr. 3	27.71	July 3	28.33	26	32.08	26	35.00
12	27.83						

21. Ohio Power Co. Second Street at Savannah, S.E. Well is westernmost well of a battery of 35 wells placed in a tunnel that trends westward. Floor of the tunnel is about 25 feet below land surface. Diameter 5½ inches, depth 40 feet. Measuring point, top of casing, about 0.5 foot above tunnel floor.

Water level, in feet below measuring point, 1939

Oct. 30	9.15	Nov. 20	9.52	Dec. 4	9.73	Dec. 18	10.00
Nov. 6	9.25	27	9.62	11	9.95	26	10.11
13	9.39						



## OKLAHOMA

### PANHANDLE COUNTIES

By S. L. Schoff

The observation-well program in the Oklahoma Panhandle, reported in Water-Supply Papers 840 and 845, was continued in 1939 as part of the investigation of ground-water resources of the area that was begun in 1937 by the Federal Geological Survey in cooperation with the Oklahoma Geological Survey. Measurements in 1939 were made in 119 wells, of which 42 are in Beaver County, 30 in Cimarron County, and 47 in Texas County.

The general plan has been to measure the observation wells bimonthly, in the last 10 days of January, March, May, July, September, and November. However, in 1939 it was not feasible to make measurements in January, and those scheduled for the last of March were delayed until the first 10 days of April. Thus, only 5 measurements were made in most of the wells. From 1 to 13 measurements of water level were made in 10 wells that were added to the program in 1939. To provide information on water-level fluctuations between the regular bimonthly measurements, from 12 to 16 measurements were made between July 8 and October 14 in each of 6 wells near Beaver. Of the 570 individual measurements of water level that were made in wells in the Panhandle in 1939, 252 were made in Beaver County, 132 in Cimarron County, and 186 in Texas County.

Bench marks described in this report were set at nearly all the observation wells in July.

Through the courtesy of the Oklahoma Electric & Water Co., an automatic water-stage recorder was installed in October on a well formerly used to supply part of the water for the town of Beaver. The well (Beaver County 528) taps water in the alluvium of the North Canadian (Beaver) River. The water level in it has fluctuated very little during the period of record; it declined 0.04 foot from October 12 to 28 and had risen by the end of December to a stage 0.28 foot above that of October 28. Because the fluctuations are very small and uniform, only tape measurements made by the well observer when servicing the recorder are given in this report.

In the spring of 1939, the Soil Conservation Service began to develop ground water for irrigation in the Paloduro Valley, in southeastern Texas County. Many test holes were drilled in the search for suitable well

locations, and eight 20-inch gravel-walled wells were put down in the alluvium. These were grouped in three pumping plants, one pumping plant with two wells, one with four wells, and a third with four wells, two of which were constructed privately. Water-level measurements were made in November in one well of each group (Texas County wells 125, 130, and 138), and it is expected that additional measurements will be made semiannually, before and after the pumping season.

In 1939, the investigation of the ground-water resources of Cimarron County, which was begun in 1938, was completed, and an inventory of wells in Beaver County was about one-half finished. A report entitled "Geology and ground-water resources of Texas County, Okla.," by the writer, was published in October by the Oklahoma Geological Survey as Bulletin 59.

#### Fluctuations of water level

Water levels in observation wells that tap water in the alluvium of stream valleys were mostly higher in April 1939 than in November 1938. They declined rather persistently throughout the summer, probably as a result of the general lack of rainfall; and, despite some recovery between September and November, they were generally lower in November 1939 than in the same month in 1938.

The water levels in wells 648 and 649, near Beaver, reached the highest stages of record on July 8 as a probable result of heavy precipitation, which in June was 1.24 inches above normal. A similar but less pronounced rise in water level occurred in well 401, which is deeper and which probably taps the Ogallala formation, but the water levels in wells 526, 527, and 635, all of which probably tap water in the Permian red beds, showed no effect of the heavy rains.

Water levels in wells tapping water in the Permian red beds and in the Ogallala (?) formation in eastern Beaver County declined irregularly in 1939, and in November they averaged 0.27 foot lower than in November 1938. On the other hand, water levels in wells in northwestern Beaver County rose appreciably in the first half of the year, and in November 1939 they averaged 0.33 foot higher than a year previous.

In wells on the uplands of Cimarron County the rise in water level that began late in 1938 continued through September 1939 and reached in that month an average stage 0.15 foot above the stage in November 1938 and 0.32 foot above the average stage in July 1938. From September to November 1939, water levels in the wells declined an average of 0.07 foot and in November were 0.08 foot higher than a year previous.

Water levels in wells on the uplands of Texas County fluctuated irregularly in 1939. In April they averaged 0.01 foot higher than in November 1938; in May they averaged 0.09 foot lower; in July they averaged the same as in the previous November; in September they reached the highest average stage of the 2-year record--0.10 foot above the stage in November 1938. But in November 1939 the water levels averaged 0.03 foot lower than a year previous and were at the same stage as at the beginning of record in January 1938.

The following tables present not only average water levels in several groups of wells in each county, but weighted averages for the Panhandle as a whole, in feet above assumed datum planes. Insofar as possible, the datum for each well was established 100 feet below the water level in that well in November 1938 because in this month measurements were made in more of the wells than in any other month. For wells not measured in November 1938 the datum is 100 feet below the water level of November 1937, and for those wells added to the program in 1939 it is 100 feet below the water level in November 1939. As no datum has been established for wells that have not been measured in one of the November months in the last 3 years, such wells are omitted from the averages.

In the following tables the average water level for any month represents the average of all measurements made in that month. No correction has been made for omitting wells in which no measurements were made in that month. In general, the fluctuations of water level are small, and the addition or omission of a given well has only a very small effect on the average.

Average water levels in groups of wells  
in the Oklahoma Panhandle, 1938-39

Date	Beaver County			Texas County			Cimarron County		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>1938</u>									
January	.....	.....	.....	99.97	.....	99.84	.....	.....	.....
March	.....	.....	.....	100.04	.....	99.97	.....	.....	.....
May	.....	.....	.....	100.02	.....	100.34	.....	.....	.....
July	100.18	100.13	100.48	100.05	.....	100.12	99.83	99.71	99.51
September	100.15	100.16	100.16	100.04	100.17	100.19	99.93	100.06	100.43
November	100.00	100.00	100.00	100.00	.....	100.00	100.00	100.00	100.00
<u>1939</u>									
April	100.23	100.09	100.31	100.01	99.97	100.37	100.00	99.73	100.32
May	100.75	99.94	100.31	99.91	100.07	100.57	100.13	99.83	100.20
July	100.34	99.94	100.52	100.00	100.04	99.90	100.14	100.12	99.33
September	100.38	99.93	99.83	100.10	100.03	99.25	100.15	100.29	98.96
November	100.33	99.73	99.68	99.97	100.00	99.43	100.08	100.05	99.05

## Explanation

(1) Northern and western Beaver County. Wells 577, 591, 593, 611, 613, 614, 616, 617, 618, 619, 631, 635, 636, 766, 767, 777. Nearly all wells in Ogallala formation. Maximum number of measurements in any month, 16; minimum in any month, 13.

(2) Southern and eastern Beaver County. Wells 62, 81, 401, 416, 418, 431, 432, 433, 434, 461, 462, 464, 525, 526, 527. Wells in Permian red shales or in Ogallala formation where readily drained because of dissected topography. Maximum number of measurements in any month, 15; minimum in any month, 12.

(3) Beaver County. Wells 258, 417, 446, 523, 573, 648, 649. Wells tap water in alluvium of Beaver River and tributaries between town of Beaver and east line of county.

(4) Texas County. Wells 40, 60, 72, 85, 120, 167, 172, 188, 235, 270, 284, 307, 308, 324, 325, 354, 369, 386, 399, 404, 436, 446, 461, 487, 497, 507, 530, 551, 552, 589, 618, 621, 626, 761, 765, 770, 795, 842. Wells on upland flats tapping water in Ogallala formation. Maximum number of measurements in any month, 30; minimum in any month, 24.

(5) Texas County. Well 294. Taps water in red beds (Permian and Triassic).

(6) Texas County. Wells 176, 187, 286, 295, 323, 332, 350, 459, 661. Wells in alluvium of North Canadian (Beaver) River and tributaries. Maximum number of measurements in any month, 9; minimum in any month, 7.

(7) Cimarron County. Wells 66, 129, 153, 240, 262, 263, 274, 275, 276, 282, 309, 313, 338, 384, 387, 398, 415, 418, 435. Wells on upland flats; tap water in Ogallala formation. Maximum number of measurements in any month, 19; minimum in any month, 15.

(8) Cimarron County. Wells 219, 223, 224, 237. Wells on upland flats probably tapping water in Dakota sandstone. Maximum number of measurements in any month, 4; minimum in any month, 1.

(9) Cimarron County. Wells 148 and 506, (506 only in September 1938). Wells tap water in alluvium of North Canadian and Cimarron Rivers.

Weighted average water levels in wells in Beaver, Cimarron,  
and Texas Counties, Oklahoma Panhandle, in feet  
above datum planes, 1938-39

Date	Beaver <sup>a/</sup>	Texas <sup>b/</sup>	Cimarron <sup>c/</sup>	Panhandle <sup>d/</sup>
<u>1938</u>				
January	.....	99.96	.....	.....
March	.....	100.04	.....	.....
May	.....	100.04	.....	.....
July	100.20	100.05	99.77	100.01
September	100.15	100.05	100.02	100.07
November	100.00	100.00	100.00	100.00
<u>1939</u>				
April	100.20	100.03	99.96	100.06
May	100.40	99.94	100.06	100.13
July	100.26	100.00	100.05	100.10
September	100.21	100.06	100.06	100.11
November	100.11	99.94	99.97	100.01

<sup>a/</sup> Weighted average in which wells in northwestern part of the county represent 65 percent of the total area; wells in eastern and southern part, 25 percent; and wells in alluvium, 10 percent.

<sup>b/</sup> Prior to April 1939, average weighted as follows: Ogallala formation, 95 percent; alluvium, 5 percent. For April 1939 and thereafter average weighted as follows: Ogallala formation, 93 percent; alluvium, 5 percent; red beds (Permian to Jurassic ?), 2 percent.

<sup>c/</sup> Average weighted as follows: Upland wells, 65 percent; Dakota sandstone wells, 25 percent; alluvium wells, 10 percent.

<sup>d/</sup> Average of figures in first three columns.

## Precipitation

Precipitation for the year ending November 30, 1939, at five Weather Bureau stations in the Panhandle averaged 13.79 inches--4.13 inches below normal. Precipitation, which ranged from 2.55 inches at Boise City to 5.75 inches at Beaver, was below normal at all stations. As all stations received more than the normal amount of rain in the months from December 1938 through February 1939, the deficiencies in the latter part of the year were especially large. In the 3 months from September through November 1939, departures from normal were negative at all five stations, as follows: Beaver, 3.64 inches; Hooker, 3.79 inches; Goodwell, 3.62 inches; Boise City, 3.65 inches; Kenton, 1.81 inches.

## Pumpage

The amount of water pumped from the larger municipal, industrial, and irrigation wells in the Oklahoma Panhandle in 1939 is estimated to be about 847 acre-feet, divided as follows: Beaver County, 170 acre-feet; Cimarron County, 64 acre-feet; Texas County, 613 acre-feet. These figures involve approximations because some of the town supplies are not metered. The quantities used by the railroads and withdrawn from farm windmills have not been estimated because of inadequate data. The estimate for Texas County is much larger than the estimates for Beaver and Cimarron Counties because that county has more and larger towns than the others and has the principal active irrigation wells.

## Beaver County

## East-west line of observation wells

461. Arthur E. Sharp, NE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 3, T. 3 N., R. 28 E. Water level, in feet below measuring point, 1939: Apr. 1, 83.19.

573. Federal Land Bank (Wichita), NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 34, T. 4 N., R. 28 E. Measuring point is 0.49 foot below bench mark, which is 60-penny spike in northeast corner post of windmill, filed flush, and circled with white paint.

## Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 1	16.06	July 19	16.55	Nov. 18	17.58
May 26	16.08	Sept. 23	17.42		

462. C. G. and W. A. Sawin, SW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 3, T. 3 N., R. 28 E. Pump removed in 1939. Measuring point is 1.60 feet above bench mark, which is spike in crotch of small hackberry tree 20 feet east of well.

## Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 1	40.31	July 19	40.40	Nov. 18	40.60
May 26	40.32	Sept. 23	40.50		

## Beaver County--Continued

434. N. W. Johnson, NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 9, T. 3 N., R. 26 E. Measuring point is 0.81 foot above bench mark, which is top of bolt protruding from ground 1 foot north of northeast corner post for windmill.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 1	113.18	July 19	113.48	Nov. 18	113.66
May 26	113.27	Sept. 23	113.55		

446. Hib Richard, NW $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 15, T. 3 N., R. 27 E. Measuring point changed to north edge of casing, 0.07 foot lower than original measuring point and 1.93 feet below bench mark, which is "X" chiseled in northwest corner of concrete tank immediately south of well.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 1	24.63	July 19	24.05	Nov. 18	25.07
May 26	24.82	Sept. 23	24.17		

433. Federal Land Bank, NE $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 12, T. 3 N., R. 26 E. Measuring point is 0.13 foot below bench mark, which is 60-penny spike driven in southeast corner post of windmill just above a knot and filed flush.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 1	41.25	July 19	41.31	Nov. 18	41.39
May 26	41.28	Sept. 23	41.36		

432. George H. Button, NW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 10, T. 3 N., R. 26 E. Measuring point changed to edge of casing, 0.57 foot below original measuring point and 1.09 feet below bench mark, which is 60-penny spike in northwest side of southeast corner post of windmill. Water level, in feet below measuring point, 1939: Nov. 18, 30.65.

434. J. W. Hibbs, et al, SW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 15, T. 3 N., R. 26 E. Measuring point is 0.95 foot below bench mark, which is top of head of lowest bolt in northeast corner post of windmill.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 1	116.91	July 19	116.92	Nov. 18	116.81
May 26	116.98	Sept. 23	116.83		

431. State of Oklahoma, SW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 8, T. 3 N., R. 26 E. Measuring point is 0.97 foot below bench mark, which is "X" chiseled in upper surface of northeast corner of concrete foundation for house.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 1	73.02	July 19	73.26	Nov. 18	73.49
May 26	73.16	Sept. 23	73.36		

416. Otto Barby (incorrectly "Basby" in Water-Supply Paper 845) et al, SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 1, T. 3 N., R. 25 E. Measuring point is 0.07 foot above bench mark, which is top of iron rod driven in ground 1.5 feet west of well.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 1	120.54	July 19	120.60	Nov. 19	120.84
May 26	120.63	Sept. 23	120.66		

418. Nile J. Mosburg, SE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 12, T. 3 N., R. 25 E. Measuring point is 1.74 feet above bench mark, which is "X" chiseled in top of northeast corner of highest concrete step leading to cellar for house, south of well.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 1	64.63	July 19	64.89	Nov. 18	65.08
May 26	64.82	Sept. 23	64.97		

## Beaver County--Continued

417. Ralph Ridgeway, SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 11, T. 3 N., R. 25 E. Measuring point was lowered about 1 foot prior to Apr. 1; now 2.45 feet below bench mark, which is 60-penny spike driven in southeast corner post of windmill and filed flush.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 1	12.41	July 19	12.08	Nov. 19	13.27
May 26	12.49	Sept. 23	12.97		

523. Frances M. Hancock, SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 24, T. 4 N., R. 24 E. Measuring point is 0.83 foot below bench mark, which is upper surface of end of lower bolt in southeast corner post of windmill.

Water level, in feet below measuring point, 1939

Apr. 1	23.71	July 19	23.68	Nov. 19	24.70
May 26	23.52	Sept. 23	24.47		

525. V. V. Cosner, NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 27, T. 4 N., R. 24 E. Water level, in feet below measuring point, 1939: Apr. 1, 31.05; May 26, caved in.

631. George W. Dubois, SE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 4, T. 5 N., R. 23 E. Measuring point is 1.35 feet above bench mark, which is "X" chiseled in south-central edge of concrete well curbing. Water levels, in feet below measuring point, 1939: Apr. 2, 112.52; May 26, 112.51; Sept. 25, 112.92; Nov. 19, 112.91.

636. Central Life Assurance Society, NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 18, T. 5 N., R. 23 E. Measuring point improved by nailing steel plate on top of west block of wooden clamp, 0.02 foot higher above measuring point, and 0.28 foot above bench mark, which is "X" chiseled in southwest corner of concrete well curbing.

Water level, in feet below measuring point, 1939

Apr. 2	112.00	July 20	112.64	Nov. 19	112.56
May 26	112.60	Sept. 25	112.72		

613. T. J. Trew, SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 13, T. 5 N., R. 22 E. Measuring point is 0.72 foot below bench mark, which is 60-penny spike in west post of gate, northeast of well house.

Water level, in feet below measuring point, 1939

Apr. 2	66.90	July 20	66.71	Nov. 19	66.55
May 26	66.86	Sept. 25	66.60		

619. Bank of Idana (Kansas), SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 23, T. 5 N., R. 22 E. Measuring point is level with bench mark, which is 60-penny spike driven in southwest corner post of windmill and filed flush.

Water level, in feet below measuring point, 1939

Apr. 2	82.14	July 20	81.46	Nov. 19	82.02
May 26	82.06	Sept. 25	81.97		

611. David Potter, SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 2, T. 5 N., R. 22 E. Measuring point is 0.52 foot below bench mark, which is "X" chiseled in northeast corner of concrete front step of house, west of well.

Water level, in feet below measuring point, 1939

Apr. 3	181.71	July 20	181.54	Nov. 20	181.69
May 26	181.55	Sept. 25	181.47		

614. Mrs. B. W. Lewis, SW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 14, T. 5 N., R. 22 E. Well repaired, in use; clamp shifted so that measuring point is upper inside edge of north block of wooden pipe clamp, on west side of pipe. Water levels, in feet below measuring point, 1939: Apr. 2, 92.02; May 26, 91.91; Sept. 25, 91.82.

## Beaver County--Continued

616. Walter C. Fincher, SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 16, T. 5 N., R. 22 E. Measuring point is 0.15 foot above bench mark, which is "X" chiseled in southwest corner of concrete well curbing.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 2	158.90	July 20	158.90	Nov. 20	158.32
May 25	158.91	Sept. 25	158.64		

618. Central Life Insurance Society, NW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 21, T. 5 N., R. 22 E. Measuring point is 0.42 foot above bench mark, which is "X" chiseled in northwest corner of concrete well curbing.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 2	156.31	July 20	156.28	Nov. 20	156.34
May 25	156.12	Sept. 25	156.15		

617. Minnie B. Dorman, et al, SW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 20, T. 5 N., R. 22 E. Measuring point improved by nailing iron plate to south block of wooden pipe clamp, 0.01 foot above original measuring point, and 0.89 foot above bench mark, which is 60-penny spike in east side of southeast corner post of windmill.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 2	170.03	July 20	169.87	Nov. 20	169.91
May 25	169.91	Sept. 25	169.74		

591. A. J. Isaac, SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 12, T. 5 N., R. 21 E. Measuring point is level with bench mark, which is "X" chiseled in southeast corner of concrete well curbing.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 3	193.09	July 20	193.05	Nov. 20	193.00
May 25	192.99	Sept. 25	192.87		

593. Ada Allred, SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 17, T. 5 N., R. 21 E. Measuring point improved by nailing steel plate to west block of wooden pipe clamp, 0.03 foot above original measuring point, and 2.23 feet below bench mark, which is 60-penny spike driven flush in top of larger post at southeast corner of windmill.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 3	172.45	July 20	172.40	Nov. 20	172.39
June 7	172.35	Sept. 25	172.31		

576. J. C. Peters, SE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 2, T. 5 N., R. 20 E. Affected by pumping of windmill 17 feet east. Measuring point is 0.13 foot above bench mark, which is "X" chiseled in southeast corner of concrete curb of windmill, about 20 feet east of observation well. Not measured in 1939.

578. J. M. Cleek, NW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 34, T. 5 N., R. 20 E. Measuring point is 0.92 foot below bench mark, which is "X" chiseled in northwest corner of concrete step at north door to well house, immediately south of well. Water levels, in feet below measuring point, 1939: July 22, 141.46; Sept. 25, 141.39; Nov. 20, 141.30.

577. W. A. Naylor, NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 19, T. 5 N., R. 20 E. Windmill and pump removed 1939. Measuring point is 0.01 foot above bench mark, which is "X" chiseled in southwest corner of concrete well curbing.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 3	141.45	July 20	141.36	Nov. 20	141.29
May 25	141.43	Sept. 25	141.30		



## Beaver County--Continued

## North-south line of observation wells

766. George W. Elliott, SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 14, T. 6 N., R. 23 E. Repaired. Not measured in 1939.

767. Robert F. LeCrone, SE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 24, T. 6 N., R. 23 E. Measuring point is 0.74 foot below bench mark, which is "X" chiseled in middle of concrete step on east side of foundation of house, northeast of well.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 3	77.87	July 20	77.41	Nov. 19	76.97
May 26	77.65	Sept. 25	77.06		

777. J. H. Neese, NW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 20, T. 6 N., R. 24 E. Measuring point improved by nailing steel plate to east block of wooden pipe clamp, 0.01 foot above original measuring point, and 2.32 feet below bench mark, which is 60-penny spike driven in top of northwest corner post of windmill and filed flush.

Water level, in feet below measuring point, 1939

Apr. 3	30.67	July 20	30.59	Nov. 19	30.41
May 26	30.66	Sept. 25	30.45		

647. Gilbert Hodges, SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 8, T. 5 N., R. 24 E. Measuring point improved by nailing steel plate to south block of wooden pipe clamp, 0.02 foot above original measuring point, and 1.17 feet below bench mark, which is 60-penny spike driven in south side of southwest corner post of windmill and filed flush. Water levels, in feet below measuring point, 1939: Apr. 3, 52.93; May 26, 52.97; July 21, 52.89; Sept. 25, 52.82.

648. John Angelton, SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 19, T. 5 N., R. 24 E. Measuring point is 1.99 feet above bench mark, which is 60-penny spike driven flush in top of cottonwood stump on east side of creek, opposite well.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 2	a 8.33	July 21	7.44	Sept. 9	8.23	Oct. 10	8.41
May 25	a 8.08	Aug. 19	7.58	23	8.42	14	b 8.40
July 8	6.84	26	7.91	Oct. 2	8.38	Nov. 19	8.33
15	7.21	Sept. 2	8.08	7	8.42		

635. A. E. Shillingburg, NW $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 25, T. 5 N., R. 23 E. Measuring point is 0.07 foot above bench mark, which is "X" chiseled in northwest corner of concrete well curbing.

Water level, in feet below measuring point, 1939

Apr. 2	62.80	July 21	62.66	Sept. 9	62.64	Oct. 7	62.64
May 26	62.76	Aug. 19	62.63	23	62.63	14	b 62.72
July 8	62.74	26	62.63	Oct. 2	62.63	Nov. 19	62.70
15	62.68	Sept. 2	62.61				

649. Arthur Williams, NW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 30, T. 5 N., R. 24 E. Measuring point is 2.04 feet above bench mark, which is "X" chiseled on top of south end of east headwall of concrete culvert for U. S. Highway 270, northwest of well.

Water level, in feet below measuring point, 1939

Apr. 2	10.08	July 21	10.14	Sept. 9	11.23	Oct. 10	11.18
May 26	10.10	Aug. 19	10.65	23	11.38	14	b 11.12
July 8	9.50	26	10.84	Oct. 2	11.30	Nov. 19	10.77
15	9.85	Sept. 2	11.04	7	11.34		

a Creek dry.

b 1 week after 1.06-inch rain.

## Beaver County--Continued

528. Oklahoma Electric and Water Co., NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 7, T. 4 N., R. 24 E. Unused dug well, diameter 16 feet to depth of 20 feet, and 2 feet from 20 to 34 feet; on flood plain of North Canadian (Beaver) River. Aquifer, alluvium. Measuring point, strap iron screwed to shelf of shelter for water-stage recorder, 4.9 feet above land surface and 3.42 feet above concrete well covering. Automatic water-stage recorder in operation beginning Oct. 12, 1939, showed only small, gradual changes. Water levels recorded below are tape measurements made by well observer about once a week when changing recorder charts, usually about 2:00 p.m.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Oct. 12	20.60	Nov. 4	20.55	Nov. 25	20.48	Dec. 15	20.40
14	20.61	11	20.53	Dec. 2	20.44	22	20.37
21	20.64	18	20.50	8	20.42	29	20.36
28	20.64						

521. B. H. Walton, SW $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 18, T. 4 N., R. 24 E. Dropped. Test showed lack of free circulation between well and ground water.

527. Mrs. Ellen F. Williams, SW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 30, T. 4 N., R. 25 E. Pump removed between Sept. and Nov. measurements, 1939. Measuring point is 0.37 foot above bench mark, which is nail driven flush in top of south-west wooden corner post of windmill and circled with white paint.

Water level, in feet below measuring point, 1939

Apr. 1	47.38	July 19	47.54	Sept. 2	47.76	Oct. 8	47.59
May 26	47.53	21	47.54	9	47.77	14 a	47.73
July 8	47.56	Aug. 19	48.00	23	47.70	Nov. 19	47.67
15	47.54	26	47.84	Oct. 2	47.65		

526. Elmer E. Thompson, SW $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 30, T. 4 N., R. 24 E. Well is uncased beginning many feet above water level, and probably draws from Permian red shale. Test shows water level recovers very slowly after 10 minutes pumping by hand. Measuring point is 0.25 foot above bench mark, which is "X" chiseled in northeast corner of concrete well curbing.

Water level, in feet below measuring point, 1939

Apr. 1	40.68	July 19	40.75	Sept. 2	40.75	Oct. 7	40.73
May 26	40.71	21	40.75	9	40.78	8 b	40.69
July 8	40.76	Aug. 19	40.76	23	40.77	14 a	40.83
15	40.75	26	40.83	Oct. 2	40.74	Nov. 19	40.77

518. Pete Sanders Estate, NE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 36, T. 4 N., R. 23 E. Well was pumped almost continuously through the summer. Well probably draws from Permian red shale. Test showed drawdown is about 29 feet at 1.5 gallons a minute. Measuring point is 0.63 foot below bench mark, which is top of head of lowest bolt in northeast corner post of windmill. Water levels, in feet below measuring point, 1939: Apr. 1, 39.52; May 26, 39.62; Nov. 28, 40.01.

401. T. T. Yarnold, NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 7, T. 3 N., R. 24 E. Measuring point is 0.25 foot below bench mark, which is 60-penny spike driven into sloping face of south side of southeast corner post of windmill, and filed flush.

Water level, in feet below measuring point, 1939

Apr. 1	94.00	July 21	93.79	Sept. 9	93.68	Oct. 7	93.60
May 26	93.99	Aug. 19	93.70	23	93.63	14 a	93.77
July 8	93.92	26	93.70	Oct. 2	93.57	Nov. 19	93.67
15	93.82	Sept. 2	93.62				

256. Dave and Minnie Hodson, SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 4, T. 2 N., R. 24 E. Not measured in 1939.

a 1 week after 1.06-inch rain.  
b At end of 1.06-inch rain.

## Seaver County--Continued

258. Frank S. Flynn, NW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 31, T. 2 N., R. 24 E. Measuring point changed to east edge of casing, 0.05 foot above original measuring point on west edge of casing, and 0.86 foot above bench mark, which is spike near base of leaning post 4 feet west of well.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 1	50.60	July 21	50.41	Nov. 19	50.52
May 26	50.72	Sept. 23	50.34		

61. J. R. Woodson, SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 1, T. 1 N., R. 23 E. Measuring point is 0.06 foot above bench mark, which is "X" chiseled in northwest corner of concrete slab southwest of well. Water levels, in feet below measuring point, 1939: Apr. 1, 61.18; Sept. 21, caved in (?).

81. L. T. Adelman, SW $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 7, T. 1 N., R. 24 E. Measuring point is 0.35 foot above bench mark, which is "X" chiseled in northeast corner of concrete well curbing. Water levels, in feet below measuring point, 1939: Apr. 1, 164.49; May 26, 164.66; July 21, 164.37; Sept. 23, 164.14 (pipe out; repairs in progress).

62. Ray D. Hall, SE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 14, T. 1 N., R. 23 E. Measuring point is 0.05 foot above bench mark, which is "X" chiseled in southeast corner of concrete slab immediately north of well.

Water level, in feet below measuring point, 1939

Apr. 1	161.99	July 21	162.22	Nov. 19	162.27
May 26	162.20	Sept. 23	162.19		

## Cimarron County

## East-west line of observation wells

338. Federal Land Bank, SW $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 14, T. 3 N., R. 9 E. Measuring point is 1.60 feet below bench mark, which is 60-penny spike driven flush in north side of northwest corner post of windmill, 1.7 feet above land surface.

Water level, in feet below measuring point, 1939

Apr. 8	183.45	July 26	183.54	Nov. 23	183.64
May 23	183.25	Sept. 28	183.15		

435. B. J. Wiggins, SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 26, T. 4 N., R. 8 E. Measuring point is 2.65 feet below bench mark, which is 60-penny spike driven flush in top of southwest corner post of windmill.

Water level, in feet below measuring point, 1939

Apr. 8	137.80	June 30	137.92	Sept. 28	138.28
May 23	137.71	July 26	a 138.08	Nov. 23	138.58

436. Mrs. S. C. Cantrell, NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 32, T. 4 N., R. 8 E. Drop pipe was removed between May and July, destroying the measuring point described in Water-Supply Paper 845. The probable position of the water level on July 26, below the original measuring point, was estimated on the basis of the past record, permitting adjustment of subsequent measurements to the original measuring point. On August 6 a steel drum was set over the open casing and measurements are being made from the south edge of the larger screw-cap opening in its top, estimated to be 1.56 feet above the original measuring point. It is 0.53 foot below the bench mark, set July 26, which is a 60-penny spike driven flush in top of southwest corner of post of windmill.

Water level, in feet below measuring point, 1939

Apr. 8	153.59	July 26	153.75	Sept. 28	153.02
May 22	153.68	Aug. 6	153.67	Nov. 23	153.30

a Estimated.

## Oimarron County--Continued

323. L. G. Miles, SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 7, T. 3 N., R. 6 E. Measuring point improved by nailing a piece of iron to the wooden clamp, 0.01 foot above the original measuring point and 1.12 feet below bench mark, which is "X" chiseled in northeast corner of concrete stoop of house. Water levels, in feet below measuring point, 1939: Apr. 8, 135.13; May 23, 134.80.

415. A. E. Buck, NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 23, T. 4 N., R. 7 E. Measuring point is 0.40 foot above bench mark, which is spike driven flush in southeast side of southernmost fence post (leaning) southwest of well, 1.2 feet above land surface.

Ground water level and Willowbar Lake level, in feet below measuring point, 1939

Date	Water level in well	Lake level	Date	Water level in well	Lake level
Apr. 8	75.43	6.6	July 26	75.42	7.8
May 2	75.50	6.8	Sept. 28	75.53	(a)
22	75.54	7.2	Nov. 25	75.64	(b)

309. Mrs. Wesley Burch, NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 3, T. 3 N., R. 7 E. Measuring point is 0.31 foot above bench mark, which is "X" chiseled in northeast corner of step at door of bath house to west of well.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 8	73.37	July 26	73.15	Nov. 25	72.74
May 22	73.27	Oct. 1	72.84		

313. E. J. Behrendt, NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 9, T. 3 N., R. 7 E. Measuring point is 0.12 foot below bench mark, which is "X" chiseled in top of step on west side of well house. The nearby pond was full on Apr. 8, but was dry beginning in July.

Water level, in feet below measuring point, 1939

Apr. 8	46.87	July 26	46.11	Nov. 25	46.73
May 22	46.26	Sept. 28	46.17		

418. T. F. Phillips, NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 29, T. 4 N., R. 7 E. Measuring point is 1.44 feet below bench mark, which is 60-penny spike driven flush in top of northeast corner post of windmill.

Water level, in feet below measuring point, 1939

Apr. 8	112.71	July 3	112.84	Sept. 28	112.58
May 22	112.85	26	112.28	Nov. 25	112.90

398. Central Life Assurance Society, SE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 24, T. 4 N., R. 6 E. Measuring point is 1.47 feet below bench mark, which is 60-penny spike driven flush in top of southeast corner post of windmill. Castor Lake,  $\frac{3}{4}$  mile northwest, was full on Apr. 8, but was dry beginning in May.

Water level, in feet below measuring point, 1939

Apr. 8	113.50	July 26	113.37	Nov. 25	113.25
May 22	113.47	Sept. 28	113.23		

275. O. A. Showalter, SW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 11, T. 3 N., R. 5 E. Unused drilled well, depth 154 feet, on upland flat. About 300 feet east of air-lift well that is pumped periodically in summer to fill swimming pool and is estimated to discharge 3 to 5 acre-feet annually; also about 80 feet southeast of windmill well in use. All measurements are referred to south edge of casing, 1.43 feet below bench mark, which is 60-penny spike in east side of northeast corner post of windmill, 2 feet above land surface. New measuring point, hole in top of tin can set over well and cemented in place, to be used in 1940; relation to bench mark not yet established.

Water level, in feet below measuring point, 1938-39

Oct. 19, 1938	146.46	May 22, 1939 c	146.09	Sept. 29, 1939 c	146.28
Apr. 11, 1939	146.51	July 27	d 146.29	Nov. 24	146.18

a Lake much lower.

b Lake shore receded  $\frac{1}{2}$  mile south.

c Time elapsed since air-lift well last operated, at least 12 hours.

d Time elapsed since air-lift well last operated, about 15 hours.

## Cimarron County--Continued

276. Atchison, Topeka, and Santa Fe Railroad, NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 14, T. 3 N., R. 5 E. Measuring point is 0.60 foot above bench mark, which is "X" chiseled near northwest corner of concrete foundation for northwest leg of windmill tower. In 1939 the lake  $\frac{3}{4}$  mile northeast of well contained water in April and May, but subsequently was dry.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 10	133.89	July 27	133.76	Nov. 25	133.80
May 22	133.79	Sept. 28	133.70		

274. C. Rollins (formerly T. J. Bader), NE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 8, T. 3 N., R. 5 E. Well was repaired and in use beginning in July. Measuring point is 1.97 feet below bench mark, which is 60-penny spike driven flush in top of southeast corner post of windmill. Small pond to northwest contained water in April, but subsequently was dry. Water levels, in feet below measuring point, 1939: Apr. 10, 171.44; May 22, 171.65.

262. H. W. and Z. B. Stone, SE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 12, T. 3 N., R. 4 E. After July 28, the well was repaired and put in use, and the measuring point was lowered 0.14 foot. Present measuring point is inside edge of northwest side of iron pipe clamp on northwest side of pipe, in angle between pipe, clamp, and clamp bolt; 0.94 foot below bench mark, which is 60-penny spike driven in southeast corner post of windmill and filed flush. Water levels, in feet below measuring point, 1939: Apr. 10, 182.26; May 22, 182.07; July 28, 182.24; Nov. 24, 182.16.

263. John Ohnick, Jr., SE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 15, T. 3 N., R. 4 E. Measuring point is 1.17 feet above bench mark, which is 60-penny spike driven flush in south side of fence post 11 feet northwest of well, and 2.0 feet above land surface.

Water level, in feet below measuring point, 1939

Apr. 10	128.95	July 28	128.92	Nov. 24	128.78
May 22	128.80	Sept. 28	128.76		

129. George Camilli, NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 2, T. 2 N., R. 2 E. Unused drilled well without pump, diameter  $4\frac{1}{2}$  inches, depth 179 feet, on low hill on upland. Measuring point, edge of hole near center of top of steel drum set over well, 2.2 feet above surface and 0.23 foot above bench mark, which is 30-penny nail driven in west side of west fork of 1-foot cottonwood tree 15 feet east of well, and left protruding about  $\frac{3}{4}$  inch. Water level, in feet below measuring point, 1939: Apr. 22, 170.00; Sept. 30, 169.92; Nov. 24, 169.93.

240. J. E. Benson, SE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 8, T. 3 N., R. 2 E. Well was put in service in May. Measuring point improved by screwing steel plate to the wooden clamp, 0.01 foot above the original measuring point and 1.10 feet below bench mark, which is 60-penny spike in west side of southwest corner post of windmill, 2.0 feet above land surface. Water level, in feet below measuring point, 1939: Apr. 11, 160.16.

237. Central Life Assurance Society, NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 36, T. 3 N., R. 1 E. Unused drilled well without pump, diameter 5 inches, depth 83 feet, in a shallow depression that sometimes contains a pond after rains. Measuring point, north edge of casing, 4.0 feet above land surface. Water levels, in feet below measuring point, 1939: Apr. 19, 67.26; Sept. 28, 66.81; Nov. 24, 67.00.

224. Walter R. Wood, NE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 15, T. 3 N., R. 1 E. The water level in this well responds to barometric fluctuations. Simultaneous water-level measurements and barometric readings made at 15-minute intervals over a period of  $5\frac{1}{2}$  hours showed the water level rose 0.06 foot while the barometric pressure declined 0.08 inch. Measuring point is 0.28 foot above bench mark, which is 60-penny spike driven flush in top of southeast corner post of windmill.

Water level, in feet below measuring point, 1939

Apr. 11	140.73	July 4	140.40	Sept. 28	140.17
May 22	140.38	27	140.50	Nov. 24	140.48

## Cimarron County--Continued

219. E. R. Morse, SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 9, T. 3 N., R. 1 E. Unused drilled well, diameter 5 inches, depth 185 feet, at north edge of upland flat overlooking South Carrizo Creek. Probable aquifer, Dakota sandstone. Measuring point, edge of horizontal flange of angle iron bolted to upper wooden clamp, 1.7 feet above land surface, 0.71 foot above top of stone well curbing, and 0.27 foot below bench mark, which is 30-penny nail driven flush in top of northern stump, 30 feet northeast of well. Water levels, in feet below measuring point, 1939: Apr. 26, 178.25; Sept. 28, 177.82; Nov. 24, 178.08.

223. E. C. Jones, SE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 19, T. 3 N., R. 1 E. Well was put in service after May, and measuring point, described in Water-Supply Paper 845 as north edge of casing, was shifted to east edge of casing. Measuring point is 1.28 feet below bench mark, which is "X" chiseled in top of southwest corner of concrete tank 17 feet north of well. Water levels, in feet below measuring point, 1939: Apr. 11, 141.90; May 22, 141.99.

## North-south line of observation wells

610. Mrs. L. K. Bangerter, SW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 21, T. 6 N., R. 5 E. Measuring point is 4.33 feet below bench mark, which is 60-penny spike in east side of corner post of fence 22 feet northwest of well, and 1.5 feet above land surface.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 10	34.80	July 27	34.24	Nov. 24	31.29
May 22	34.48	Sept. 29	31.24		

306. Bernard N. North, NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 4, T. 5 N., R. 5 E. Bench mark is 60-penny spike in southeast side of cottonwood tree 15 feet northwest of well, and 1 $\frac{1}{2}$  feet above land surface.

Water level, in feet below measuring point, 1939

Apr. 10	11.99	July 27	13.30	Nov. 24	13.65
May 22	12.30	Sept. 29	a 13.85		

516. State of Oklahoma, SE $\frac{1}{4}$  sec. 34, T. 5 N., R. 5 E. Unused, uncased well without pump, diameter about 9 inches, depth 103 feet, on a small flat about 100 feet east of spring in creek channel. Probable aquifer, Morrison formation. On Aug. 5 this well was protected by cementing a steel oil drum over it. Measuring point, edge of hole near center of top of drum, 1.6 feet above land surface, and 2.26 feet below bench mark, which is top of head of 30-penny nail in west side of 3 by 12-inch fence post 110 feet east of well and left protruding about 1 inch. Water levels, in feet below measuring point, 1939: Aug. 5, 8.02; Sept. 29, 30.29; Nov. 24, 30.20.

384. R. A. Godown (formerly Federal Land Bank), NW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 13, T. 4 N., R. 5 E. Measuring point improved by screwing steel plate to wooden clamp, 0.01 foot above original measuring point, and 1.40 feet below bench mark, which is 60-penny spike driven flush in north side of northwest corner post of windmill, 1.5 feet above land surface.

Water level, in feet below measuring point, 1939

Apr. 10	155.60	July 27	155.49	Nov. 24	155.52
May 22	155.46	Sept. 29	155.54		

387. F. M. Tudor, SE $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 28, T. 4 N., R. 5 E. Measuring point improved by screwing steel plate to wooden clamp, 0.04 foot above original measuring point, and 0.39 foot below bench mark, which is 60-penny spike driven flush in south side of southeast corner post of windmill, 1.2 feet above land surface.

Water level, in feet below measuring point, 1939

Apr. 10	170.20	July 27	170.07	Nov. 24	170.05
May 22	169.95	Sept. 29	170.30		

a Measuring point disturbed; approximate only.

## Cimarron County--Continued

282. Minnie Cook, NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 20, T. 3 N., R. 5 E. Measuring point is 1.88 feet below bench mark, which is 60-penny spike driven flush in north side of northeast corner post of windmill, 2.0 feet above land surface.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 10	160.03	July 28	160.61	Nov. 24	159.83
May 22	159.99	Sept. 29	160.05		

148. T. A. Peters, SE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 5, T. 2 N., R. 5 E. Measuring point improved by screwing steel plate to wooden clamp, 0.07 foot above original measuring point, and 0.39 foot above bench mark, which is 60-penny spike driven flush in south side of southwest corner post of windmill, 1.0 foot above land surface.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 10	24.13	June 29	24.54	Aug. 4 a	24.82	Nov. 24	25.01
May 22	24.05	July 28	24.80	Sept. 29	24.99		

153. Edmund B. Rogers, SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 32, T. 2 N., R. 5 E. Measuring point is 0.88 foot above bench mark, which is top of bolt, bent over to northwest, in top of concrete foundation post, 7.5 feet northeast of well.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 10	97.56	July 26	97.50	Nov. 24	97.44
May 22	97.52	Sept. 29	97.52		

66. C. K. Womack, NW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 34, T. 1 N., R. 5 E. Pump was removed between May and July and prior to setting of bench mark. As all previous measurements were close to 84.00 feet below the original measuring point, it was assumed that the water level on July 26 stood at this level and subsequent measurements have been adjusted accordingly. The casing was extended upward, capped, and cemented. Measuring point, hole near middle of casing cover, estimated as 5.8 feet below original measuring point and 0.37 foot above bench mark, which is 60-penny spike in north side of tree 35 feet southwest of well, and 1.5 feet above land surface.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 10	84.05	July 26 b	84.00	Aug. 5	83.99	Nov. 24	83.99
May 22	84.01	Aug. 4	83.99	Sept. 29	84.04		

## Northeastern Cimarron County

528. Alliance Insurance Co., NW $\frac{1}{4}$  sec. 4, T. 5 N., R. 7 E. Drilled irrigation well, diameter 18 inches, depth 330 feet, on flood plain of Cimarron River. Aquifer, alluvium and underlying Cretaceous (?) sandstones. Measuring point, edge of air-line hole in base of turbine pump, 1.0 foot above land surface. Water levels, in feet below measuring point, 1939: May 11, 20.17; Nov. 25, 20.28.

a 5 days after flood, North Canadian River.

b Assumed water level, based on previous performance.

## Texas County

## East-west line of observation wells

765. O. Jolliff (previously reported as "owner unknown"), SW $\frac{1}{4}$  sec. 26, T. 3 N., R. 19 E. Beginning with the July measurement, the measuring point was 0.07 foot lower, or 4.52 feet above bench mark, which is "X" chiseled in northeast corner of concrete stock tank.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 3	107.47	July 22	107.67	Nov. 20	108.45
May 25	107.57	Sept. 25	107.55		

770. A. C. DeHart, SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 15, T. 3 N., R. 19 E. Measuring point is 0.72 foot below bench mark, which is 60-penny spike in east side of southeast corner post of windmill, below lowest bolt.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 3	123.91	July 22	123.97	Nov. 20	123.89
May 25	123.98	Sept. 25	123.94		

497. R. M. VanHynning, NW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 21, T. 4 N., R. 19 E. The irrigation well 25 feet to the east was pumped very little in 1939. Measuring point is 0.87 foot above bench mark, which is "X" chiseled in west side of concrete curbing of irrigation well.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 3	104.56	July 22	104.52	Nov. 20	b 126
May 25	a 104.76	Sept. 25	104.42	27	104.43

761. Federal Life Insurance Co. (formerly Mrs. Cordia Humble), NW $\frac{1}{4}$  sec. 7, T. 3 N., R. 19 E. Measuring point is 1.06 feet below bench mark, which is "X" chiseled near northwest corner of top of upper step at back door of house, southwest of well.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 3	108.92	July 22	108.55	Oct. 1	107.27
May 25	108.98	Sept. 25	107.37	Nov. 20	107.18

487. J. E. Friesen, SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 34, T. 4 N., R. 18 E. Measuring point improved by nailing a steel plate to wooden clamp, 0.02 foot higher than original measuring point, and 0.44 foot above bench mark which is "X" chiseled in southwest corner of concrete well curbing. The adjacent pond was dry every time the well was visited in 1939.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 3	101.89	July 22	102.07	Nov. 20	102.02
May 25	102.06	Sept. 25	101.98		

60. J. E. Friesen, SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 3, T. 3 N., R. 18 E. Not measured in 1939.

795. Herman Zable, NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 30, T. 4 N., R. 18 E. Original measuring point was lowered 1.75 feet between July and Sept., or 1.00 foot above bench mark; but Sept. and Nov. measurements were made using north edge of casing as measuring point, about level with bench mark, which is "X" chiseled in concrete well curbing 1.0 foot northeast of drop pipe.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 3	116.55	July 22	116.84	Nov. 20	116.84
May 25	116.91	Sept. 25	116.85		

589. August Lorenz, NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 34, T. 4 N., R. 17 E. Measuring point is 0.77 foot below bench mark, which is 60-penny spike in west side of northwest corner post of windmill. Water levels, in feet below measuring point, 1939: May 25, 120.16; July 22, 120.12; Sept. 25, 120.12; Nov. 22, 120.15.

a Irrigation well last pumped May 13.

b Irrigation well pumping 325 gallons a minute.



## Texas County--Continued

40. August Lorenz, NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 6, T. 3 N., R. 17 E. Measuring point improved by nailing steel plate to wooden clamp, 0.01 foot higher than original measuring point, and 0.30 foot above bench mark, which is "X" chiseled in southeast corner of concrete well curbing.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 3	91.04	July 22	90.96	Nov. 22	91.09
May 25	91.04	Sept. 25	91.01		

323. Mrs. Bostwick, SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 1, T. 3 N., R. 16 E. Measuring point is 1.30 feet below bench mark, which is "X" chiseled in northeast corner of concrete roof of vegetable cellar southwest of the well, at northwest corner of house.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 3	22.00	July 22	21.93	Nov. 22	22.68
May 25	21.74	Sept. 26	22.53		

324. Anna Calvert, SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 2, T. 3 N., R. 16 E. Measuring point improved by nailing iron to east block of wooden pipe clamp, 0.19 foot above original measuring point, and 1.00 foot below bench mark, which is 60-penny spike in north side of southeast corner post of windmill.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 3	95.73	July 22	95.76	Nov. 22	95.81
May 25	95.78	Sept. 26	95.73		

325. ----- Ensten, NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 2, T. 3 N., R. 16 E. Measuring point is 0.03 foot above bench mark, which is "X" chiseled in southwest corner of concrete well curbing.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 3	105.07	July 22	105.13	Nov. 22	105.29
May 25	105.22	Sept. 26	105.12		

350. C. A. Nash, NW $\frac{1}{4}$  sec. 18, T. 3 N., R. 16 E.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 4	2.05	July 24	3.82	Nov. 22	3.27
May 24	2.97	Sept. 26	4.04		

187. John Gill, SE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 12, T. 3 N., R. 15 E. Measuring point is 0.36 foot above bench mark, which is 60-penny spike in east side of cottonwood tree 21 feet southwest of well, 1.0 foot above land surface.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 3	4.22	May 24	b 4.80	Sept. 26	5.98
May 23	a 4.81	July 22	5.05	Nov. 22	5.28

295. E. O. Hobson, SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 14, T. 3 N., R. 15 E. Well was used to furnish domestic and stock water. Water level recovers slowly after withdrawals. Measuring point is 3.11 feet above bench mark, which is 60-penny spike 1.0 foot above land surface in southeast side of southeastern (largest) cottonwood tree in barnyard west of well.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 6	10.72	July 22	11.30	Nov. 22	e 12.03
May 23	c 10.99	Sept. 26	d 12.50		

332. Owner unknown, SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 17, T. 3 N., R. 15 E. Measuring point is 1.21 feet above bench mark, which is top of iron pipe about 1.5 feet high and 46 feet south of well.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 4	68.60	July 24	68.54	Nov. 22	70.52
May 23	68.51	Sept. 26	69.57		

a At 4:30 p.m. b At 6:50 a.m.

c Time elapsed since last withdrawal, 5 hours.

d Time elapsed since last withdrawal, 1 hour.

e Time elapsed since last withdrawal, "not much or recently."

## Texas County--Continued

72. William L. Ziegler, SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 33, T. 4 N., R. 14 E. Water level, in feet below measuring point, 1939: Nov. 23, 74.42.

307. Henry Behne, NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 5, T. 3 N., R. 14 E. Not measured in 1939.

308. Charles Reust, SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 5, T. 3 N., R. 14 E. Unused drilled well without pump, diameter 5 inches, depth 92 feet, on gentle slope 0.5 mile south of Little Goff Creek. Aquifer, Ogallala formation. Measuring point, southeast edge of casing, level with land surface and 2.03 feet below bench mark, which is 60-penny spike driven flush in top of southeast corner post of windmill. Water levels, in feet below measuring point, 1939: July 24, 70.00; Sept. 27, 69.88; Nov. 23, 69.84.

294. Stonebraker-Zea ranch, NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 25, T. 3 N., R. 13 E. Measuring point is 0.41 foot above bench mark, which is "X" chiseled in northeast corner of concrete well curbing.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 6	43.28	July 24	43.21	Nov. 22	43.25
May 23	43.18	Sept. 28	43.22		

551. Owner unknown, SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 19, T. 4 N., R. 13 E. Measuring point is 2.53 feet below bench mark, which is 60-penny spike driven in top of northwest corner post of windmill and filed flush.

Water level, in feet below measuring point, 1939

Apr. 7	146.45	July 24	146.31	Nov. 23	146.43
May 23	146.22	Sept. 27	146.29		

552. B. G. Manwarren, NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 1, T. 3 N., R. 12 E. Measuring point is 3.89 feet above U. S. C. and G. S. bench mark L-72, north of U. S. Highway 64 and at first telephone pole west of crossroad. Elevation of bench mark, 3,367.36 feet above sea level; of measuring point, 3,371.25 feet. Water level, in feet below measuring point, 1939: Apr. 7, 178.14.

286. William Webb, SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 9, T. 3 N., R. 12 E. Measuring point is 3.36 feet below bench mark, which is 60-penny spike driven flush in top of northwest corner post of windmill.

Water level, in feet below measuring point, 1939

Apr. 7	(a)	July 24	23.28	Nov. 23	23.86
May 23	23.83	Sept. 27	23.83		

661. William Webb, SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 8, T. 3 N., R. 12 E. Measuring point is 1.95 feet above bench mark, which is "X" chiseled in northwest corner of concrete well curbing. Water level, in feet below measuring point, 1939: May 23, 10.65.

284. Paul Spradlin (formerly Liberty School), NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 5, T. 3 N., R. 12 E. Unused drilled well without pump, diameter 4 inches, depth 113 feet, on upland flat. Aquifer, Ogallala formation. Measuring point, edge of hole in tin cover bolted over casing, 0.5 foot above land surface, level with south edge of casing, and 1.37 feet above U. S. C. and G. S. bench mark N-72, 1.5 feet west of telephone pole north of U. S. Highway 64 and west of crossroad. Elevation of bench mark, 3,423.60 feet above sea level; elevation of measuring point, 3,424.97 feet.

Water level, in feet below measuring point, 1939

May 23	102.45	Sept. 27	102.39	Nov. 23	102.43
July 24	102.44	Oct. 1	102.40		

a Well flooded by surface water.

## Texas County--Continued

85. George Dean, SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 34, T. 4 N., R. 11 E. Measuring point is 1.06 feet below bench mark, which is "X" chiseled in southeast corner of concrete tank. The adjacent lake contained water in April, but there-after was dry when measurements were made.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 7	42.39	June 11	42.13	July 24	42.13	Nov. 23	42.29
May 23	42.18	July 5	42.18	Sept. 27	42.17		

270. Owner unknown, NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 7, T. 3 N., R. 11 E. Measuring point is 0.24 foot above bench mark, which is "X" chiseled near southwest corner of concrete well curbing.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 7	73.35	July 24	73.20	Nov. 23	73.14
May 23	73.30	Sept. 27	73.08		

621. Owner unknown, NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 2, T. 3 N., R. 10 E. Measuring point is 0.84 foot above bench mark, which is "X" chiseled in northwest corner of concrete well curbing.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 8	150.95	July 24	150.93	Nov. 23	151.11
May 23	150.70	Sept. 27	150.74		

618. Owner unknown, NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 11, T. 3 N., R. 10 E. Not measured in 1939.

626. John Copeland, SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 27, T. 4 N., R. 10 E. Measuring point changed beginning Nov. 23 to southwest upper edge of bearing housing that rests on gear wheel formerly used as measuring point. New measuring point 0.40 foot higher than the old, and 0.06 foot above bench mark, which is 60-penny spike driven in southeast side of southeast corner post of windmill and filed flush. Water levels, in feet below measuring point, 1939: July 24, 91.43; Nov. 23, 91.44.

## North-south line of observation wells

842. C. A. Rahm, NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 22, T. 6 N., R. 16 E. Measuring point is 1.28 feet below bench mark, which is "X" chiseled in west corner of concrete tank northeast of well.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 7	124.04	July 25	124.12	Nov. 23	124.40
May 23	123.91	Sept. 26	124.05		

369. Owner unknown, NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 15, T. 6 N., R. 15 E. Measurements discontinued in 1938.

354. A. M. Fankhauser, SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 27, T. 6 N., R. 15 E. Water level, in feet below measuring point, 1939: Nov. 23, 143.97.

120. Joe Gribble, NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 2, T. 5 N., R. 14 E. Measuring point is 0.70 foot above bench mark, which is "X" chiseled in northwest corner of concrete slab, 6.5 feet north of well. Water levels, in feet below measuring point, 1939: Apr. 7, a/196.18; Nov. 23, b/196.29.

530. Owner unknown, NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 26, T. 5 N., R. 14 E. Measuring point is 0.54 foot above bench mark, which is "X" chiseled in southeast corner of concrete well curbing.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 7	178.48	July 25	178.40	Nov. 23	178.55
May 23	178.40	Sept. 26	178.29		

a Not pumped for 2 weeks.

b Not pumped recently.

## Texas County--Continued

507. J. H. Wells, SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 1, T. 4 N., R. 14 E. Measuring point is 0.24 foot below bench mark, which is highest point on lowest bolt head in south side of southeast corner post of windmill. Water levels, in feet below measuring point, 1939: Apr. 7, a/165.55; Sept. 26, 165.72.

446. Owner unknown, NW $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 8, T. 4 N., R. 15 E. Measuring point is 2.87 feet below bench mark, which is 60-penny spike driven flush in top of southeast corner post of windmill. Adjacent pond was dry every time well was visited in 1939.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 7	149.41	July 25	149.36	Nov. 23	149.47
May 23	149.36	Sept. 26	149.30		

235. John E. Bauer, SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 18, T. 4 N., R. 15 E. Measurements discontinued in 1938.

436. Leo Holtgraver, NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 24, T. 4 N., R. 14 E. Measuring point is 0.39 foot above bench mark, which is "X" chiseled at southwest corner of concrete step at northern back door of house, south of well. Water levels, in feet below measuring point, 1939: Apr. 7, a/171.00; May 23, b/170.92; Sept. 26, b/170.86; Nov. 23, c/171.20.

176. W. N. Ballinger, SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 18, T. 3 N., R. 15 E. Measuring point is north edge of casing instead of southeast as described in Water-Supply Paper 840. It is 7.21 feet below bench mark, which is "X" chiseled in top of northwest corner of concrete stilling basin south of well. Water levels, in feet below measuring point, 1939: Apr. 4, d/1.54; July 24, 3.16; Sept. 26, 3.57; Nov. 22, 2.82.

188. Kuhn Bros., NW $\frac{1}{4}$  sec. 1, T. 2 N., R. 14 E. Unused drilled well, diameter 6-3/4 inches, depth 254 feet, on upland east of South Fork. Principal aquifer, Ogallala formation; some water may also come from underlying Permian or Triassic (?) red beds beginning at depth 205 feet. Measuring point, north edge of casing, 1.8 feet above land surface. Water levels, in feet below measuring point: Jan. 31, 1938, 124.92; Oct. 1, 1939, 124.71; Nov. 22, 1939, 124.89.

386. Frank Roten, SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 3, T. 2 N., R. 14 E. Measuring point is 0.54 foot below bench mark, which is 60-penny spike driven flush in south side of southwest corner post of windmill, 1.3 feet above land surface and 0.5 foot above a knot.

Water level, in feet below measuring point, 1939

Apr. 4	102.01	July 25	101.87	Nov. 22	101.97
May 24	102.04	Sept. 27	101.93		

399. Andrew Bender, NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 26, T. 2 N., R. 14 E. Measuring point is 2.01 feet below bench mark, which is 60-penny spike driven flush in top of northwest corner post of windmill. Water levels, in feet below measuring point, 1939: July 25, 127.59; Sept. 27, 127.54; Nov. 22, 127.57.

172. Owner unknown, SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 25, T. 2 N., R. 13 E. Measuring point is 1.93 feet below top of northwest rail of C. R. I. & P. railroad opposite center line of north-south road and opposite joint in southeast rail.

Water level, in feet below measuring point, 1939

Apr. 4	120.49	July 25	120.74	Nov. 21	120.88
May 24	120.74	Sept. 27	120.91		

a Not pumped for 4 days.

b Not pumped for 20 hours.

c Windmill shut off not more than 2 hours previous.

d Not pumped for 4 or 5 months.

## Texas County--Continued

132. Panhandle A. & M. College, NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 34, T. 2 N., R. 13 E. Well is 485 feet southeast of campus irrigation well (no. 179) which discharges 300 to 400 gallons a minute, 190 feet northwest of 120-gallon-a-minute town well (no. 180); and 345 feet northwest of 10-gallon-a-minute town well (no. 180-a). Measuring point is 0.03 foot below bench mark, which is "X" chiseled on top of curb for drive, 3 feet south of well.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 4	a 137.30	July 25	b 139.31	Nov. 21	c 138.79
May 24	b 138.78	Sept. 27	b 139.85		

404. Everett J. Ritter, NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 4, T. 1 N., R. 14 E. Measuring point is 0.93 foot below bench mark, which is highest point on square bolt head on east side of northeast corner post of windmill, 2.0 feet above surface. Water level, in feet below measuring point, 1939: Apr. 4, 167.03.

167. Owner unknown, SW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 34, T. 2 N., R. 12 E. Measuring point is 1.00 foot below bench mark, which is 60-penny spike driven flush in east side of northeast corner post of windmill, 1.2 feet above land surface.

Water level, in feet below measuring point, 1939

Apr. 4	190.60	July 25	190.62	Nov. 21	190.47
May 24	190.61	Sept. 27	190.46		

459. Owner unknown, NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 21, T. 1 N., R. 14 E. Measuring point is 0.12 foot above bench mark, which is 60-penny spike driven flush in southeast side of southeast corner post of windmill, 1.0 foot above land surface.

Water level, in feet below measuring point, 1939

Apr. 4	65.16	July 25	64.54	Nov. 22	64.91
May 24	64.93	Sept. 27	64.80		

461. Owner unknown, NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 31, T. 1 N., R. 14 E. (Incorrectly reported as sec. 21 in Water-Supply Paper 845.) On July 25 careful measurement showed that present depth is 193.5 feet in contrast with the 202.8 feet originally reported in Water-Supply Paper 840. Measuring point is 3.11 feet below bench mark, which is 60-penny spike driven flush in top of northwest corner post of former windmill. Water levels, in feet below measuring point, 1939: May 24, 191.90; Sept. 27, 191.80; Nov. 22, 191.86.

## Southeastern Texas County (Paloduro Valley)

125. J. Donald Hughes, SW $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 13, T. 1 N., R. 18 E. Battery of 2 drilled irrigation wells, diameter 20 inches, with 8-inch gravel wall, depth 26.6 feet, on flood plain of Paloduro Creek. Aquifer, alluvium. Measuring point, east edge of casing of eastern well, 5.9 feet below land surface. Water level, in feet below measuring point, 1939: Nov. 21, 2.90.

130. Robert Johnson, SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 7, T. 1 N., R. 19 E. Battery of 4 drilled irrigation wells, diameter 20 inches with 8-inch gravel wall, depths 29 to 35 feet, on flood plain of Paloduro Creek. Aquifer, alluvium. Measuring point, lowest edge of tee connecting suction and discharge pipes in northern well, 5.0 feet below land surface. Water level, in feet below measuring point, 1939: Nov. 21, 3.47.

138. Joe Sutton, SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 6, T. 1 N., R. 19 E. Battery of 4 drilled irrigation wells, diameter 20 inches, with 3-inch gravel wall, depth 26 feet, on flood plain of Paloduro Creek. Aquifer, alluvium. Measuring point, north edge of casing in second well from the east (with pump), 7.2 feet below land surface. Water level, in feet below measuring point, 1939: Nov. 21, 2.83.

- a Well 180-a pumping.
- b Wells 179, 180, 180-a pumping.
- c Wells 179, 180-a pumping.

STILLWATER CREEK AREA OF SOIL CONSERVATION SERVICE

By S. L. Schoff

The observation-well program in the Stillwater Creek area, <sup>1/</sup> near Stillwater, Payne County, Okla., was continued in 1939 by the Soil Conservation Service, R. N. Wall, technician in charge. During the year J. F. Relf, Associate Engineer of the Soil Conservation Service, measured water levels in 14 wells at intervals of about 4 weeks--an aggregate of 172 individual measurements.

The water levels in the following table are given in feet above assumed datum planes that were established 10 feet below the water level in each well on January 1, 1935. The average water levels are computed from measurements made in 12 wells (1-4, 7-9, 11-13, 15, and 17) except in September, when well 9 was omitted because it was in use; and in December, when well 11 was omitted because the water table declined below the bottom of the well and when well 12 was omitted because the casing was damaged.

On January 6, 1939, the average of the water levels was about 0.5 foot higher than a year previous. The average of the water levels, which rose 0.27 foot during January, reached a stage 1.14 feet higher than that of late January 1938. It declined through February and March, and then rose by May 24 to the highest stage of the year--0.47 foot above the stage on January 6. The average of the water levels declined through the summer and were consistently lower than on comparable dates in 1938. A new low average stage of 6.62 feet was reached on October 11 and was 1.23 feet below the stage of January 6. Water levels in the wells recovered somewhat thereafter, but at the end of the year they were about 0.9 foot lower than at the beginning of the year.

The precipitation at Stillwater in 1939, as reported by the U. S. Weather Bureau, was 26.62 inches, or 7.21 inches below normal. Precipitation was considerably above normal in January, and slightly above normal in June, July, and August, but in other months it was 0.15 inch to 3.31 inches below normal. In the last 4 months of the year the total deficiency was 6.16 inches.

The Soil Conservation Service maintained 13 rain gages in the Stillwater Creek area. The precipitation at these stations ranged from 21.25 inches to 29.89 inches and, including the precipitation recorded by the Weather Bureau at Stillwater, was 26.19 inches for the year.

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<sup>1/</sup> See Water-Supply Papers 777, 817, 840, and 845.

Water levels, in feet above datum planes, 1939

Date	1	2	3	4	5	7	8	9
Jan. 6	7.94	8.50	5.91	7.28	10.86	7.34	9.30	8.18
30-31	10.95	8.47	6.11	7.13	11.20	7.47	9.40	8.01
Feb. 28								
Mar. 1	8.33	8.57	5.39	7.04	10.99	7.40	9.05	7.17
27	8.47	8.63	5.57	6.86	10.86	7.34	9.21	6.77
Apr. 24	9.00	9.04	5.99	7.05	10.78	7.88	9.11	7.02
May 24	8.92	9.13	6.37	6.98	10.65	7.98	9.23	7.68
June 19	8.65	9.00	6.16	6.90	(a)	7.59	9.08	8.20
July 17	8.30	8.79	5.77	6.79	.....	7.09	8.97	9.07
Aug. 12	7.90	8.50	4.79	6.73	.....	6.77	8.66	9.17
Sept. 13	7.40	8.24	3.97	6.71	.....	6.21	8.38	(a)
Oct. 11	7.30	8.07	3.61	7.68	.....	5.97	8.40	.97
31	7.26	8.10	3.37	6.68	.....	5.83	8.08	6.47
Dec. 1-2	7.28	8.01	3.29	6.63	(b)	6.09	8.26	8.17

Water levels, in feet above datum planes, 1939

Date	11	12	13	15	16	17	Average
Jan. 6	5.84	7.77	7.93	8.97	9.92	9.32	7.85
30-31	5.81	7.74	7.94	9.03	9.95	9.40	8.12
Feb. 28							
Mar. 1	5.65	7.54	7.48	8.74	9.66	9.40	7.65
27	5.50	7.57	7.80	8.99	9.50	9.53	7.69
Apr. 24	6.46	8.17	7.71	9.04	9.55	10.72	8.10
May 24	7.48	8.68	7.72	8.92	9.71	10.80	8.32
June 19	6.73	8.79	7.69	8.84	9.45	10.19	8.15
July 17	6.32	8.96	7.76	9.09	10.23	d 9.74	8.04
Aug. 12	6.06	8.69	7.59	8.77	13.30	10.14	7.81
Sept. 13	5.92	8.31	7.52	8.64	9.63	8.17	7.22
Oct. 11	5.81	7.94	7.64	8.69	9.70	7.36	6.62
31	4.51	7.77	7.38	8.33	9.42	7.67	6.79
Dec. 1-2	(c)	(b)	7.54	8.62	9.33	8.92	7.28

## CLEVELAND COUNTY

By S. L. Schoff

The water level in a well in Cleveland County, central Oklahoma, has been measured by the writer at irregular intervals since March 31, 1939, in connection with ground-water studies that are being conducted by the Federal Geological Survey in cooperation with the Oklahoma Geological Survey. The well is in the Canadian River Valley, about 2½ miles north-east of the channel and on a terrace about 50 feet above the flood plain. The terrace is probably stream-cut and is underlain by the Hennessey shale, of Permian age.<sup>1/</sup> Locally there are patches of Pleistocene or Recent deposits on it. The well probably enters the Hennessey shale. Water for domestic and stock use is withdrawn, at least occasionally, by means of a rope and bucket. The erratic fluctuations in water level during the period of weekly measurements from October 16 to November 14 cannot be attributed

<sup>1/</sup> Dott, Robert H., Director, Oklahoma Geological Survey, Oral communication.

a In use.                      b Destroyed.                      c Dry.  
d Water level affected by nearby pumping.

to recharge from rainfall. In one well the water level was lower several days after a rain than it was before; hence it is probable that the water level recovers slowly after withdrawals, as might be expected in a shale, and little significance can be attached to fluctuations of magnitude shown in the following table. The record over a period of years may be of considerable value, however, as the owner reports that about 1927 the water level was less than 5 feet below the surface. In 1939 it was about 14 feet.

1. B. B. Leverich. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 28, T. 10 N., R. 3 W. Dug domestic well, diameter 18 inches, depth 24.5 feet, cased with rock. Measuring point, upper edge of steel plate nailed vertically to west side of wooden curb, 2.2 feet above land surface. Water level, in feet below measuring point, Nov. 14, 1939, 15.77 feet. Water level, in feet above datum, Nov. 14, 1939, 100.00 feet.

Water level, in feet above a datum, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 31	100.48	Sept. 21	100.49	Oct. 28	99.68
May 29	99.74	Oct. 16	99.62	Nov. 4	99.53
June 7	100.19	21	100.30	14	100.00
Sept. 12	100.72				



# OREGON

By A. M. Piper

The small observation-well program in Oregon (see Water-Supply Paper 845) was continued in 1939 by cooperation among the Geological Survey, the Oregon State Engineer, and the Oregon Agricultural Experiment Station. No observation wells were discontinued or established during the year. The distribution of observation wells and the number of measurements during the year are shown by the following table:

Scope of observation-well program in Oregon, 1939				
Area	Counties	Number of water-table wells	Number of wells tapping confined water (artesian and sub-artesian)	Number of measurements
Baker Valley.....	Baker.....	5	0	15
Fort Rock Valley...	Lake .....	1	6	24
Grande Ronde Valley	Union.....	4	0	13
Harney Valley.....	Harney.....	9	2	79
Walla Walla Basin..	Umatilla.....	a 19	0	510
Willamette Valley..	Benton, Clackamas, Lane, Linn, Marion, and Yamhill.....	12	4	61
Total, State.....		50	15	702

Of the six areas listed in the table, all but the Willamette Valley are in the semiarid part of Oregon that lies east of the Cascade Mountains. The Willamette Valley lies between the Cascade Mountains and the Coast Range. It has sufficient rainfall--about 40 inches a year on the average--to be classed as humid; nevertheless, in summer and early autumn its rainfall is usually no more than in the semiarid areas.

In all wells of the Baker, Fort Rock, Grande Ronde, Harney, and Willamette Valleys water levels were measured thrice during the year by G. A. La Rocque, Jr., of the Geological Survey. In the Harney Valley, additional measurements in two wells on the Experiment Station farm were made by Obil Shattuck and R. E. Hutchison, voluntary observers. In the Walla Walla Basin, measurements were made in each well once or twice a month by or under the direction of J. M. Spencer, district watermaster; also, float gages were maintained on two of the wells and were observed periodically by the owners, O. K. Goodman and Walter Hermann, who served without pay.

a Includes one well in Walla Walla County, Wash., near the inter-State boundary line.

In this report the observation wells in the Walla Walla Basin have been renumbered to show their location in the official rectangular system for subdivision of the public land; the scheme of the new numbers is that explained in Water-Supply Paper 845. Thus, all current observation wells in Oregon except those in the Willamette Valley are now so numbered. The wells in the Willamette Valley are numbered serially to agree with descriptions in a forthcoming report. <sup>1/</sup> Of the 11 observation wells in the Harney Valley, 3 are described under serial numbers in a report recently published <sup>2/</sup>; these serial numbers are given in this report.

The following table summarizes the net water-level changes during 1939 in the six areas covered by the observation-well program in Oregon. It shows a net decrease in ground-water storage and a net decline of the head in bodies of confined ground water in each of the six areas. In the Fort Rock Valley the rate of decline in head during the year was slightly greater than from 1936 to 1938, but it was only slightly more than half that from 1932 to 1936. In the five remaining areas, however, the recession of water levels in 1939 offset the general increase in ground-water storage during the preceding year.

Net rise (+) or recession (-) of water level, in feet, in observation wells in six areas in Oregon, 1939				
Area	Number of wells	Kind of well	Kind of change	Net rise (+) or recession (-)
Baker Valley	3	water-table	mean change	-1.69
Fort Rock Valley	1	water-table	.....	-.33
	5	artesian	mean change.....	-.30
Grande Ronde Valley	3	water-table	mean change.....	-1.00
Harney Valley	9	water-table	greatest rise....	+.11
			greatest recession	-1.39
	1	artesian	mean change.....	-.52
Walla Walla Basin			change	-.64
	16	water-table	greatest rise.....	+1.29
			greatest recession	-6.30
Willamette Valley			mean change	-.99
	11	water-table	least recession...	-2.11
			greatest recession	-15.20
	3	artesian	mean change.....	-4.62
			mean change.....	-2.92

<sup>1/</sup> Piper, A. M., Ground-water resources of the Willamette Valley, Oreg.: U. S. Geol. Survey Water-Supply Paper -----(in preparation).  
<sup>2/</sup> Piper, A. M., Robinson, T. W., and Park, C. F., Jr., Geology and ground-water resources of the Harney Basin, Oreg.: U. S. Geol. Survey Water-Supply Paper 841, 189 pp., 1939.

Baker County

Baker Valley

Water levels in Baker County are expressed in feet above sea-level datum of 1929.

7/39-20N1. Water levels in feet, 1939: Mar. 23, 3,371.86; June 22, 3,369.65; Sept. 29, a/ Dec. 8, a/.

8/39-22F1. Water levels, in feet, 1939: Mar. 23, 3,382.48; June 22, 3,380.96; Sept. 29, 3,375.91; Dec. 8, 3,377.93.

8/40-19D1. Water levels, in feet, 1939: Mar. 22, 3,339.16; June 22, 3,337.81; Sept. 29, 3,335.75; Dec. 8, 3,335.96.

8/40-23A1. Water levels, in feet, 1939: Mar. 23, 3,343.35; June 22, 3,342.53; Sept. 29, 3,341.65; Dec. 8, 3,341.34.

9/40-8N1. No measurements made in 1939.

Lake County

Fort Rock Valley

The water level in each well in Lake County is expressed in feet above an assumed datum, which is 10 feet below the water level in that well on Sept. 4, 1932. For wells established since 1932, the assumed datum is interpolated.

25/14-15E1. Harry Crampton. Water levels, in feet, 1939: Mar. 22, 7.81; June 21, 7.72; Sept. 28, 7.67; Dec. 7, 7.62.

26/15-22B1. H. W. Ostrom. Water levels, in feet, 1939: Mar. 22, 7.63; June 21, 7.89; Sept. 27, 7.61; Dec. 7, 7.48.

27/15-4G1. H. M. Parks. Water levels, in feet, 1939: Mar. 22, 7.85; June 21, 7.74; Sept. 26, 7.80; Dec. 7, 7.67.

27/15-4G2. H. M. Parks. Water levels, in feet, 1939: Mar. 22, 8.33; June 21, 7.68; Sept. 27, 7.73; Dec. 7, 7.67.

27/17-22R2. W. D. Collins. No measurements made in 1939.

27/18-6E1. W. D. Collins. Water levels, in feet, 1939: Mar. 22, 7.89; June 21, 7.79; Sept. 28, 7.78; Dec. 7, 7.75.

27/18-7N1. M. S. Buchanan. Water levels, in feet, 1939: Mar. 22, 7.69; June 21, 7.84; Sept. 28, 7.59; Dec. 7, 7.59.

Union County

Grande Ronde Valley

Water levels in Union County are expressed in feet above sea-level datum of 1929.

1/39-17K1. Water level, in feet, 1939: Dec. 16, a/.

2/39-26F1. Water levels, in feet, 1939: Mar. 23, 2,676.98; June 22, 2,677.44; Sept. 29, 2,676.97; Dec. 7, 2,676.07.

3/38-10B1. Water levels, in feet, 1939: Mar. 23, 2,722.01; June 22, 2,721.42; Sept. 28, 2,720.57; Dec. 8, 2,719.73.

3/38-25B1. Water levels, in feet, 1939: Mar. 23, 2,696.53; June 22, 2,697.50; Sept. 29, 2,696.84; Dec. 7, 2,695.76.

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a Dry.

## Harney County

## Harney Valley

Water levels in Harney County are expressed in feet above sea-level datum of 1929.

22/31-34N1. Well 5 in Water-Supply Paper 841. Frank Whiting. Artesian well. Water levels, in feet, 1939: Mar. 23, 4,150.15; June 21, 4,148.65; Sept. 28, 4,141.82; Dec. 7, 4,142.30.

22/31-3D2. Harney County. Water table well. Water levels, in feet, 1939: Mar. 23, 4,148.73; June 21, 4,148.21; Sept. 28, 4,145.80; Dec. 7, 4,144.90.

22/31-14A3. Harney County. Water table well. Water levels, in feet, 1939: Mar. 22, 4,131.67; June 21, 4,132.37; Sept. 28, 4,130.63; Dec. 7, 4,130.84.

23/31-16E1. Harney County. Water table well. Water levels, in feet, 1939: Mar. 22, 4,139.63; June 21, 4,141.06; Sept. 26, 4,138.26; Dec. 7, 4,138.20.

23/31-33E1. Harney County. Water table well. Water levels, in feet, 1939: Mar. 22, 4,127.49; June 21, 4,129.28; Sept. 28, 4,126.30; Dec. 7, 4,126.26.

23/32-7L1. Well 93 in Water-Supply Paper 841. Harney Branch Experiment Station. Water table well. Measurements on Mar. 22, June 21, Sept. 28, and Dec. 7, 1939, by U. S. Geological Survey; all others by Obil Shattuck and R. E. Hutchison, voluntary observers.

Water level, in feet above sea level datum, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 2	4,127.8	June 21	4,133.43	Oct. 5	4,129.5
Mar. 2	4,127.74	29	4,131.07	31	4,128.5
22	4,128.29	July 24	4,133.09	Dec. 1	4,127.99
Apr. 1	4,128.24	Aug. 29	4,133.33	7	4,127.99
May 1	4,128.11	Sept. 28	4,129.95	29	4,127.7
June 5	4,131.54				

23/32-7L2. Well 94 in Water-Supply Paper 841. Harney Branch Experiment Station. Artesian well. Measurements on Mar. 22, Sept. 28, and Dec. 7, 1939, by U. S. Geological Survey; all others by Obil Shattuck and R. E. Hutchison, voluntary observers. See accompanying table for record of monthly pumpage.

Water level, in feet above sea level datum, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 2	4,127.60	June 5	4,074.9	Oct. 5	4,124.03
Mar. 2	4,127.65	29	4,094.9	31	4,125.56
22	4,128.15	July 24	4,072.9	Dec. 1	4,126.35
Apr. 1	4,127.88	Aug. 29	4,069.9	7	4,126.88
May 1	4,128.21	Sept. 28	4,123.66	29	4,126.7

23/32-7Q3. Harney Branch Experiment Station. Water table well. Measurements on Mar. 22, June 21, Sept. 28, and Dec. 7, 1939, by U. S. Geological Survey; all others by Obil Shattuck and R. E. Hutchison, voluntary observers.

Water level, in feet above sea level, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 2	4,127.11	June 21	4,127.41	Oct. 5	4,127.1
Mar. 22	4,127.13	29	4,127.38	31	4,126.9
Apr. 1	4,127.06	July 24	4,127.43	Dec. 1	4,126.8
May 1	4,127.45	Aug. 29	4,127.34	7	4,126.81
June 5	4,127.21	Sept. 28	4,127.18	29	4,126.6

23/32-30R1. Harney County. Water table well. Water levels, in feet, 1939: Mar. 22, 4,117.47; June 21, 4,117.33; Sept. 28, 4,117.16; Dec. 4, 117.05.

## Harney County--Continued

24/31-28E1. Harney County. Water table well. Water levels, in feet, 1939: Mar. 22, 4,112.56; June 21, 4,112.70; Sept. 28, 4,112.17; Dec. 7, 4,112.12.

24/32-24R1. Harney County. Water table well. Water levels, in feet, 1939: Mar. 22, 4,064.13; June 21, 4,065.54; Sept. 28, 4,064.95; Dec. 7, 4,065.82.

Approximate monthly pumpage, in acre-feet,  
from two irrigation wells at the  
Harney Branch Experiment Station, 1939

Month	Well 23/32-7L2 a/	Well 23/32-7Q1 b/
April	.....	8.1
May	46.9	35.3
June	44.3	36.3
July	57.5	38.4
August	54.6	34.9
September	.8	12.9
October	....	2.9
November	....	.1
April - November	204.1	168.9

## Umatilla County

## Walla Walla Basin

5N/35-1C1. Formerly 10S-1C1. John Clark.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 12	976.94	Apr. 27	979.21	June 26	972.60	Sept. 12	971.20
Feb. 13	974.09	May 11	977.32	July 12 c	969.36	Oct. 13	970.12
Mar. 11	972.24	25	974.12	Aug. 11 c	967.40	Nov. 11	969.77
25	978.82	June 14	973.43	24	967.52	Dec. 13	972.80
Apr. 15	975.57						

5N/35-2C1. Formerly 10S-2C1. E. J. McSherry.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 11	957.28	Apr. 27	960.33	July 11	961.80	Sept. 12	960.96
Feb. 11	956.92	May 11	963.05	25	961.60	Oct. 12	958.79
Mar. 11	958.16	24	964.34	Aug. 11	961.33	Nov. 11	957.11
25	958.38	June 14	961.52	23 c	957.96	Dec. 12	956.92
Apr. 12	958.14	26	961.06				

5N/35-3H1. Formerly 10S-3H1. J. M. Morse estate.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 11	(d)	Apr. 27	939.57	July 11	941.31	Sept. 12	939.31
Feb. 11	922.25	May 11	940.90	25	940.15	Oct. 12	931.35
Mar. 11	922.38	24	941.70	Aug. 11	940.00	Nov. 11	924.30
25	922.85	June 14	941.42	23	939.76	Dec. 12	921.89
Apr. 12	923.32	26	941.19				

6N/34-13R1. Formerly 9R-13R1. M. O. Beauchamp.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 11	641.18	Apr. 27	641.39	July 12	642.27	Sept. 12	640.65
Feb. 11	640.40	May 11	641.15	25	642.03	Oct. 12	639.81
Mar. 11	640.77	25	641.92	Aug. 11	641.58	Nov. 11	639.24
25	640.83	June 14	642.57	23	641.34	Dec. 13	640.64
Apr. 12	641.13	26	642.34				

a Pump operated May 11-June 24 and June 29-Sept. 1.

b Pump operated Apr. 21-Aug. 30, Sept. 1-Oct. 7, and Nov. 9.

c Pumping.

d Dry.

## Umatilla County--Continued

6N/35-14L1. Formerly 9S-14L1. Conrad Miller.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 12	781.44	Apr. 27	781.86	July 12	782.91	Sept. 12	782.82
Feb. 13	782.34	May 11	782.58	25	783.06	Oct. 13	782.40
Mar. 11	782.15	25	783.17	Aug. 11	782.30	Nov. 11	782.72
25	782.31	June 14	783.61	23	782.18	Dec. 13 a	786.95
Apr. 15	781.87	26	783.09				

6N/35-20G1. Formerly 9S-20G1. Herman Markham.

Water level, in feet above mean sea level, 1939

Jan. 11	731.51	Apr. 27	b 726.14	July 11	734.31	Sept. 12	728.13
Feb. 11	731.37	May 11	733.61	25	733.06	Oct. 12	727.15
Mar. 11	731.91	24	734.75	Aug. 11	731.12	Nov. 11	729.04
25	732.38	June 14	(b)	23	729.86	Dec. 12	730.42
Apr. 12	732.16	26	c 735.11				

6N/35-20Q1. Formerly 9S-20Q1. ----- Jackson.

Water level, in feet above mean sea level, 1939

Jan. 11	729.38	May 11	735.00	July 11	736.77	Sept. 12	(d)
Feb. 11	729.62	24	737.38	25	734.74	Oct. 12	(d)
Mar. 11	729.85	June 14	739.32	Aug. 11	731.50	Nov. 11	730.33
25	730.68	26	738.29	23	729.66	Dec. 12	732.50
Apr. 12	732.03						

6N/35-21H1. Formerly 9S-21H1. ----- Behnke.

Water level, in feet above mean sea level, 1939

Jan. 11	767.32	Apr. 27	771.00	July 11	768.13	Sept. 12	761.10
Feb. 11	766.69	May 11	768.36	25	764.37	Oct. 12	763.22
Mar. 11	770.81	24	769.88	Aug. 11	759.80	Nov. 11	768.54
25	768.26	June 14	770.34	23	760.76	Dec. 12	765.60
Apr. 12	768.28	26	768.18				

6N/35-24C1. Formerly 9S-24C1. William Pomeroy.

Water level, in feet above mean sea level, 1939

Jan. 12	820.31	Apr. 27	820.92	July 12	820.80	Sept. 12	821.05
Feb. 13	820.27	May 11	819.31	26	820.27	Oct. 13	821.05
Mar. 11	820.10	25	820.95	Aug. 11	821.29	Nov. 11	820.25
25	821.00	June 14	822.12	24	821.20	Dec. 13	819.40
Apr. 15	821.09	26	821.96				

6N/35-24Q1. Formerly 9S-24Q1. C. B. Miller.

Water level, in feet above mean sea level, 1939

Jan. 12	851.60	Apr. 27	852.65	July 12	b 842.61	Sept. 12	b 833.92
Feb. 13	851.09	May 11	b 846.29	26	841.61	Oct. 13	845.07
Mar. 11	851.10	25	b 846.33	Aug. 11	b 837.56	Nov. 11	843.84
25	852.60	June 14	b 844.43	24	843.47	Dec. 13	841.63
Apr. 15	852.41	26	844.33				

6N/35-26C2. Formerly 9S-26C2. Boerstler estate.

Water level, in feet, above mean sea level, 1939

Jan. 12	844.32	Apr. 27	853.26	July 12	b 849.26	Sept. 12	847.74
Feb. 13	846.09	May 11	857.80	26	b 841.72	Oct. 13	849.32
Mar. 11	843.71	25	859.31	Aug. 11	b 840.02	Nov. 11	842.11
25	844.87	June 14	855.29	24	845.97	Dec. 13	840.17
Apr. 15	849.24	26	853.51				

a Adjacent land being irrigated.

b Pumping.

c Flowing.

d Dry.

## Umatilla County--Continued

6N/35-26Pl. Formerly 9S-26Pl. O. K. Goodman. Except as indicated by footnote, levels are from float-gage readings by owner.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 1-		May 23	892.20	July 12	b 872.80	Aug. 31	866.87
Apr. 1	(a)	25	890.87	13	872.74	Sept. 1	867.13
Apr. 3	864.12	25	b 890.77	15	871.45	3	868.82
5	864.46	27	890.37	17	870.85	5	867.87
7	864.99	29	890.11	19	870.19	7	868.27
9	856.45	31	890.97	21	869.24	9	868.47
11	866.22	June 1	891.11	23	869.83	11	868.31
13	869.77	3	888.89	25	868.31	12	b 868.42
15	871.59	5	887.23	26	b 868.21	13	868.24
15	b 871.63	7	884.73	27	867.82	15	868.52
17	871.07	9	883.37	29	867.57	17	869.94
19	872.77	11	881.11	31	866.47	19	869.42
21	874.91	13	879.22	Aug. 1	865.97	21	869.55
23	879.26	14	b 878.49	3	865.45	23	870.22
25	880.15	15	878.32	5	865.89	25	870.12
27	880.29	17	878.08	7	865.47	27	869.90
27	b 880.35	19	877.78	9	865.25	29	870.72
29	882.20	21	877.18	11	865.47	Oct. 1	871.29
May 1	883.61	23	876.37	11	b 865.45	3	871.80
3	885.27	25	876.51	13	866.02	5	871.84
5	887.42	26	b 875.51	15	865.22	7	871.57
7	888.17	27	875.10	17	865.27	9	870.41
9	888.87	29	874.98	19	866.12	11	867.92
11	890.85	July 1	874.94	21	866.07	13	868.17
11	b 890.91	3	873.27	23	865.76	13	b 867.23
13	892.22	5	874.05	24	b 865.91	15	866.32
15	891.32	7	874.94	25	866.55	17	864.07
17	891.77	9	875.12	27	867.37	19	864.07
19	892.57	11	873.95	29	866.61	21	(a)
21	893.70						

6N/35-28H1. Formerly 9S-28H1. W. J. Rand.

Water level, in feet above mean sea level, 1939

Jan. 11	816.91	Apr. 27	818.24	July 11	c 814.82	Sept. 12	816.50
Feb. 11	817.01	May 11	819.29	25	818.11	Oct. 12	817.73
Mar. 11	818.02	24	819.08	Aug. 11	817.08	Nov. 11	818.18
25	817.59	June 14	819.34	23	816.73	Dec. 12	817.12
Apr. 12	817.66	26	819.09				

6N/35-28N1. Formerly 9S-28N1. Lottie M. McKnight.

Water level, in feet above mean sea level, 1939

Jan. 11	795.35	Apr. 27	803.94	July 11	805.64	Sept. 12	796.54
Feb. 11	797.13	May 11	806.33	25	802.36	Oct. 12	798.36
Mar. 11	796.52	24	808.23	Aug. 11	798.65	Nov. 11	d 806.56
25	796.11	June 14	809.88	23	797.22	Dec. 12	800.78
Apr. 12	798.57	26	808.26				

6N/35-30M1. Formerly 9S-30M1. S. E. Givens. Measuring point (2) beginning October 12, 1939, top of concrete curb, 0.4 foot above land surface, and 687.62 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Jan. 11	663.22	Apr. 27	666.95	June 26	673.09	Aug. 23	663.72
Feb. 11	664.24	May 11	669.81	July 11	671.95	Sept. 12	661.26
Mar. 11	667.10	24	669.41	25	670.28	Oct. 12	660.62
25	672.64	June 14	673.52	Aug. 11	665.13	Nov. 11	665.68
Apr. 12	667.18						

a Well dry on alternate days from Oct. 21 to Dec. 31.

b Tape measurement by J. M. Spencer, watermaster, District 5.

c Pumping.

d Adjacent land being irrigated.

## Umatilla County--Continued

6N/35-34C1. Formerly 9S-34C1. Alpha Reese.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 11	834.39	Apr. 27	849.45	July 11	847.02	Sept. 12	837.70
Feb. 11	833.18	May 11	860.20	25	837.06	Oct. 12	850.76
Mar. 11	834.09	24	867.90	Aug. 11 a	832.69	Nov. 11	843.82
25	835.87	June 14	864.76	23 a	833.53	Dec. 12	833.78
Apr. 12	837.64	26	855.26				

6N/35-36C1. Formerly 9S-36C1. Redfern.

Water level, in feet above mean sea level, 1939

Jan. 12	901.27	Apr. 27	915.05	July 12	891.52	Sept. 12	885.50
Feb. 13	896.49	May 11	915.09	26	889.75	Oct. 13	886.25
Mar. 16	896.87	25	912.87	Aug. 11	887.27	Nov. 11	886.37
25	913.72	June 14	893.94	24	887.20	Dec. 13	(b)
Apr. 15	912.31	26	892.02				

6N/35-36H1. Formerly 9S-36H1. Walter Hermann. Except as indicated by footnote, levels are from float-gage readings by owner.

Water level, in feet above mean sea level, 1939

Jan. 12	c 896.85	Mar. 13	895.12	May 22	920.86	Aug. 25	898.61
18	897.75	16	895.69	25	c 920.10	31	898.84
22	898.43	23	898.82	28	919.50	Sept. 9	899.01
24	898.39	25	903.51	29	919.09	12 c	898.99
25	898.29	31	909.64	June 3	917.03	18	899.45
27	898.02	Apr. 7	912.68	14	c 913.36	Oct. 3	897.52
31	896.66	13	913.31	17	913.06	7	896.75
Feb. 2	896.04	15 c	913.91	19	912.75	12	897.00
6	894.87	17	914.81	22	912.31	13 c	897.10
7	894.62	20	817.03	24	911.56	20	896.64
9	894.21	21	818.11	26	c 910.35	24	895.36
12	893.76	23	818.84	July 7	919.04	29	894.63
13 c	893.63	24	819.29	10	908.40	Nov. 7	893.88
14	893.61	27	819.74	12	c 907.75	11 c	893.10
16	894.10	27 c	819.80	18	906.22	16	892.38
18	894.94	30	820.04	25	904.93	22	892.34
21	896.84	May 3	820.63	26 c	904.62	25	892.36
25	898.21	10	820.61	Aug. 5	901.84	Dec. 10	891.63
26	898.10	11 c	820.54	11 c	900.78	13 c	891.45
28	897.8	13	920.37	12	900.75	15	891.43
Mar. 6	896.52	15	920.66	17	900.05	17	892.23
9	895.8	16	920.88	21	899.05	22	895.09
11	895.42	18	921.30	24 c	898.65	31	901.95
11 c	895.40						

6N/35-16B1. Formerly 9S-16B1. Claude Winn.

Water level, in feet above mean sea level, 1939

Jan. 12	727.72	Apr. 27	727.67	July 12	726.36	Sept. 12	725.19
Feb. 13	728.90	May 11	728.04	25	725.96	Oct. 13	728.13
Mar. 11	728.87	25	729.04	Aug. 11	725.38	Nov. 11	727.21
25	729.00	June 14	727.38	23	725.21	Dec. 13	726.68
Apr. 15	729.23	26	726.43				

## Benton County

## Willamette Valley

596. W. E. Thomas. Water levels, in feet above 1929 sea-level datum, 1939: Mar. 20, 258.75; June 20, 254.07; Sept. 27, 252.02; Dec. 6, 251.68.

## Clackamas County

## Willamette Valley

100. Pietro Presutti. Water levels, in feet above 1929 sea-level datum, 1939: Mar. 20, 110.48; June 19, 109.50; Sept. 26, 108.78; Dec. 5, 108.06.

a Pumping

b Dry

c Tape measurement by J. M. Spencer, watermaster, District 5.



## Lane County

## Willamette Valley

636. Junction City. Water levels, in feet above 1929 sea-level datum, 1939: Mar. 21, 317.96; June 20, 315.66; Sept. 27, 312.86; Dec. 6, 312.30.

680. Leo Sidwell. Water levels, in feet above 1929 sea-level datum, 1939: Mar. 21, 379.80; June 20, 377.46; Sept. 27, 376.75; Dec. 6, 376.61.

## Linn County

## Willamette Valley

421. Henry Hofer. Water levels, in feet above preliminary sea-level datum, 1939: Mar. 20, 167.20; June 19, 165.21; Sept. 26, 162.54; Dec. 5, 162.12.

463. Oregon Agricultural Experiment Station. Water levels, in feet above 1929 sea-level datum, 1939: Mar. 20, 203.75; June 19, 197.21; Sept. 26, 194.91; Dec. 5, 194.47.

553. J. H. Swatzka. Water levels, in feet above preliminary sea-level datum, 1939: Mar. 21, 270.25; June 20, 264.27; Sept. 26, 256.64; Dec. 5 a.

568. Ray Fisher. Water levels, in feet above 1929 sea-level datum, 1939: Mar. 21, 341.38; June 20, 338.93; Sept. 26, 337.13; Dec. 6, 337.81.

590. Keeney School District 51. Water levels, in feet above 1929 sea-level datum, 1939: Mar. 21, 282.37; June 20, 279.30; Sept. 27, 275.93; Dec. 6, 275.57.

## Marion County

## Willamette Valley

158. W. J. Gering. Water levels, in feet above 1929 sea-level datum, 1939: Mar. 20, 111.22; June 19, 107.92; Sept. 26, 106.08; Dec. 5, 103.67.

171. Johnson School. Water levels, in feet above 1929 sea-level datum, 1939: Mar. 20, 170.01; June 19, 159.28; Sept. 26, 155.54; Dec. 5, 154.34.

172. D. A. Keil. Water levels, in feet above 1929 sea-level datum, 1939: Mar. 20, 165.08; June 19, 172.42; Sept. 26, 169.80; Dec. 5, 172.92.

245. Agricultural Research Corporation (S. H. Brown). Water levels, in feet above 1929 sea-level datum, 1939: Mar. 28, 165.58; June 19, 158.64; Sept. 26, 157.30; Dec. 5, 156.79.

297. Gideon E. Stolz. Water levels, in feet above 1929 sea-level datum, 1939: Mar. 20, 112.81; June 19, 108.33; Sept. 26, 105.32; Dec. 5, 105.14.

318. Fred Lucht. Water levels, in feet above 1929 sea-level datum, 1939: Mar. 20, 258.65; June 19, 251.01; Sept. 26, 243.28; Dec. 5, 242.88.

## Yamhill County

## Willamette Valley

196. George Fuller. Water levels, in feet above 1929 sea-level datum, 1939: Mar. 20, 140.09; June 19, 135.54.

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a Water level below bottom of dug part of well.

## PENNSYLVANIA

By R. C. Baker

The State-wide program of ground-water observations was continued in 1939 in cooperation with the Pennsylvania State Department of Internal Affairs, Topographic and Geologic Survey.

In 1939, measurements of water level were made weekly in 30 observation wells, and an automatic water-stage recorder and a rain gage were maintained at well 100. About 1,571 individual measurements of water level were made.

The average water levels in 1939, given in the accompanying table, are based on measurements made weekly in all the wells except well 115, which is 450 feet deep and is not considered comparable with the others. Another table gives average water levels in the wells for selected months in 1939 and for the same months in other years when the water table was unusually high or low. Subsequent tables give records of water levels in individual wells in 1939, expressed in feet above an assumed datum plane at each well. None of the wells are appreciably affected by pumping.

A comparison of average water levels in 1939 with the averages on corresponding dates in previous years shows that in 1939 the average of the water levels fluctuated through a range of 6.28 feet--the second largest annual fluctuation in the period of record. Only in 1936, when the range was 7.87 feet, did the average have a larger annual fluctuation. The large range in 1939 is apparent in figure 23 which shows graphs of the average weekly water levels in 1939, of the average of all weekly water levels throughout the years of record prior to 1939, and of the highest and lowest average weekly water levels recorded prior to 1939. The accumulated departure from normal precipitation for 1939 is shown also in the figure.

In 1939 the water level in 1 observation well reached a new high stage, whereas water levels in 12 other wells reached new low stages. One new low stage was recorded in August; four new low stages were recorded in September, three in October, and four in December. During the year 2 of the observation wells were dry on 1 or more days.

At the beginning of 1939, water levels in observation wells averaged 12.59 feet above the assumed datum planes. The average remained about the

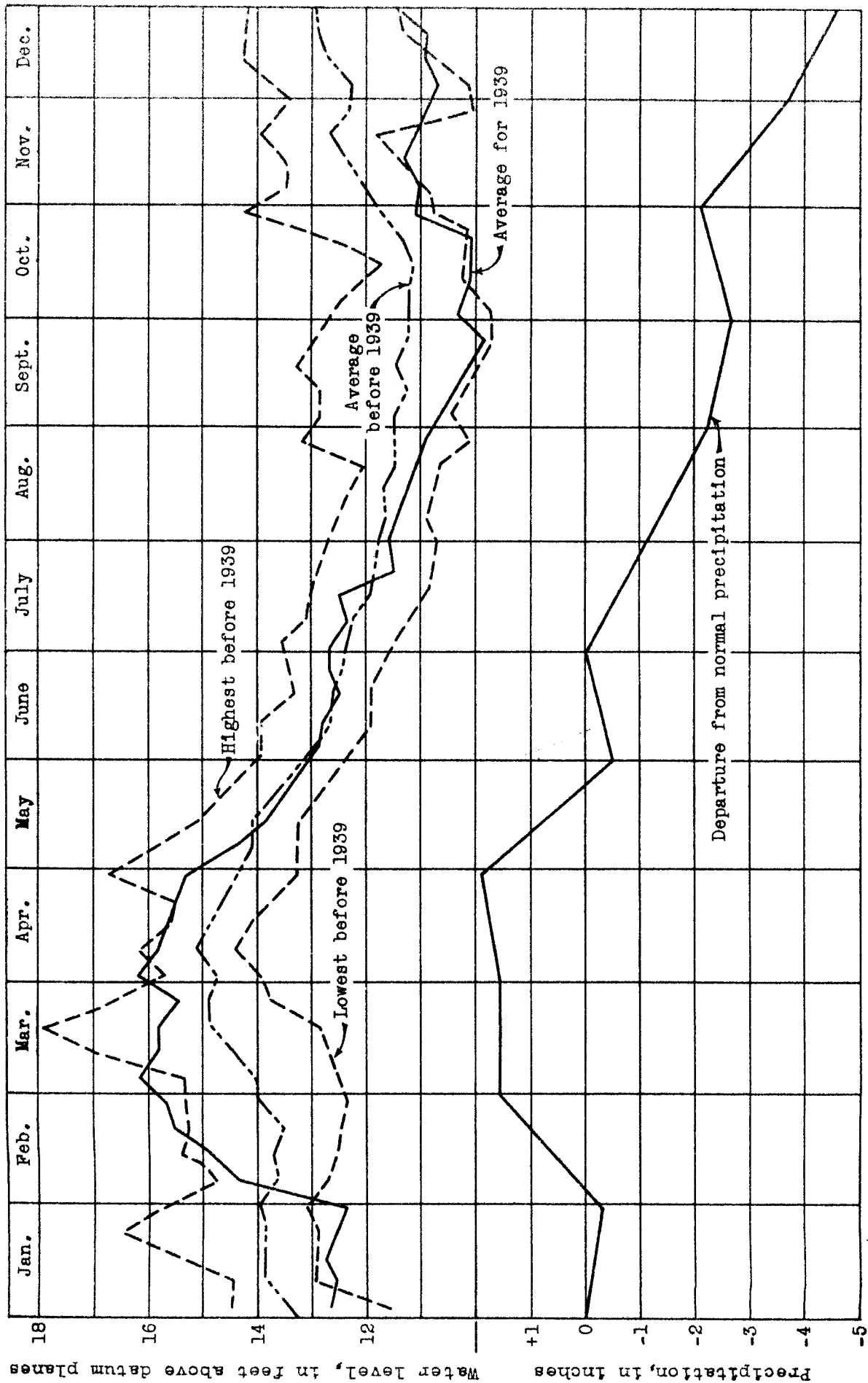


Figure 23.—Average water level in observation wells in Pennsylvania and departure from normal precipitation in 1939.

same throughout January and at the end of the month was the lowest on record for that time of year; the average level in January was also the lowest of record. In February, water levels in wells rose notably, and in the last 2 weeks of the month they stood at higher average stages than on any corresponding dates in the period of record. The average level in March was the second highest of record, and in April it was the highest of record.

As the precipitation in May was 2.25 inches below normal, water levels declined to about the average stage for that month in previous years. They declined seasonably from May to the first part of August. Subnormal precipitation during late summer caused them to decline more than seasonably, so that by the end of September they averaged about 1.5 feet below the normal stage for that time of year. The average rise of the water levels was irregular in October, November, and December, but it was less than seasonal for that period; and for the last week of 1939 the average was 11.21 feet above the datum planes--1.8 feet below the average for that week for the period of record and 1.4 feet below the average for the last week in 1938. The average in November was the lowest on record, and the averages in September, October, and December were next to the lowest on record.

The drought in the latter part of 1939 produced the longest period of extremely low ground-water levels during the 8 years of record. It is fortunate that water levels were high in the spring of 1939, because if they had been at or below the average stage, the drought probably would have caused them to decline to stages even lower than were recorded in 1939 and a more serious water shortage would have occurred.

The low water levels at the end of the year do not necessarily forecast low levels in 1940. In a period of only 3 weeks in February 1939, water levels rose from the lowest average stage to the highest average stage recorded for those weeks. A similar favorable period in 1940 would probably restore water levels to or above their average stage. On the other hand, if the low water levels should persist until the growing season of 1940, extremely low stages might occur in the summer or fall of the year.

Weekly average of water levels in observation wells in  
Pennsylvania, in feet above assumed datum planes, 1939

Date	Number of wells	Water level	Date	Number of wells	Water level
Jan. 7	29	12.59	July 8	29	12.39
14	29	12.74	15	29	12.49
21	29	12.56	22	28	11.49
28	29	12.40	29	28	11.60
Feb. 4	29	14.36	Aug. 5	28	11.50
11	29	14.83	12	28	11.28
18	29	15.49	19	26	11.10
25	29	15.61	26	26	10.99
Mar. 4	29	16.13	Sept. 2	26	10.62
11	29	15.85	9	26	10.44
18	29	15.81	16	27	10.11
25	29	15.46	23	27	9.87
Apr. 1	29	16.15	30	27	10.30
8	29	15.85	Oct. 7	27	10.18
15	29	15.66	14	27	10.12
22	29	15.55	21	27	10.05
29	29	15.31	28	27	11.16
May 6	29	14.52	Nov. 4	29	11.00
13	29	13.84	11	29	11.32
20	29	13.50	18	29	11.16
27	29	13.29	25	29	10.83
June 3	29	12.86	Dec. 2	28	10.71
10	29	12.74	9	28	10.92
17	29	12.37	16	28	10.93
24	29	12.68	23	29	11.39
July 1	29	12.66	30	29	11.21

Selected monthly average of water levels in 1939  
and in earlier years of record

Month	1931	1932	1935	1936	1938	1939
Jan.	.....	12.73	.....	.....	.....	a 12.57
Mar.	.....	.....	.....	b 16.67	15.46	15.81
Apr.	.....	.....	.....	15.47	.....	b 15.70
Sept.	.....	a 10.08	.....	10.42	.....	10.27
Oct.	.....	.....	a 10.37	10.56	.....	10.38
Nov.	.....	.....	11.44	.....	.....	a 11.08
Dec.	a 10.89	.....	.....	.....	.....	11.03

#### Armstrong County

26. Lowest observed water level 0.15 foot above datum, Oct. 14, 1939; highest observed water level 13.03 feet above datum, Jan. 13, 1935.

Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	8.92	Apr. 15	9.78	July 8	6.93	Oct. 7	.32
14	9.00	22	9.80	15	6.98	14	.15
21	8.85	29	9.84	22	4.57	21	.23
28	8.70	May 7	9.30	29	4.35	28	5.57
Feb. 4	9.93	13	9.09	Aug. 5	3.52	Nov. 4	4.23
11	10.45	17	9.00	12	3.41	11	4.93
18	9.97	20	8.48	19	2.35	18	5.10
25	9.35	27	9.19	26	.85	25	5.65
Mar. 4	9.48	June 3	9.03	Sept. 2	.65	Dec. 2	5.97
11	9.51	10	8.50	9	.59	9	7.50
18	9.47	17	7.65	16	.55	16	8.02
25	9.37	24	7.85	23	.35	23	8.20
Apr. 1	9.92	July 1	7.83	30	.41	30	8.22
8	10.00						

a Lowest of record.

b Highest of record.

## Bedford County

45. Lowest observed water level 9.44 feet above datum, Dec. 3, 1938; highest observed water level 40.08 feet above datum, Mar. 21, 1936.

Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	11.50	Apr. 15	14.67	July 22	14.30	Oct. 7	10.77
14	11.43	22	17.53	29	13.60	14	10.71
21	11.06	29	16.54	Aug. 5	12.92	21	10.62
28	10.97	May 6	15.44	12	12.39	28	10.51
Feb. 4	15.86	13	14.08	15	12.36	Nov. 4	10.94
11	15.70	20	16.45	19	12.07	11	11.34
18	17.22	28	17.33	26	11.76	18	11.72
25	15.83	June 3	17.03	Sept. 2	11.35	25	11.64
Mar. 4	19.86	10	15.42	9	10.99	Dec. 2	11.60
11	18.71	17	13.50	16	10.71	9	11.51
18	17.90	24	18.90	23	10.48	16	11.15
25	16.38	July 1	16.03	27	10.42	23	11.07
Apr. 1	14.73	8	15.77	30	10.36	30	11.34
8	14.06	15	15.43				

## Berks County

114. Lowest observed water level 9.09 feet above datum, Dec. 15, 1939; highest observed water level 16.13 feet above datum, Sept. 23, 1938.

Water level, in feet above datum, 1939

Jan. 6	11.63	Apr. 7	14.25	July 7	11.03	Oct. 6	9.63
13	11.76	14	14.46	14	10.85	13	9.56
20	11.55	21	14.59	21	10.75	20	9.44
27	11.09	28	14.03	28	10.51	27	9.43
Feb. 3	13.01	May 5	13.59	Aug. 4	10.46	Nov. 3	9.42
10	14.23	12	13.25	11	10.35	10	9.44
17	13.50	20	12.84	18	10.33	17	9.46
24	14.59	26	12.16	25	10.36	24	9.47
Mar. 3	14.92	June 2	11.84	Sept. 1	10.36	Dec. 1	9.23
10	15.26	9	11.56	8	10.16	8	9.20
17	14.25	16	11.15	15	9.95	15	9.09
24	13.73	23	11.25	22	9.75	22	9.45
31	13.44	30	11.03	29	9.64	29	9.64

## Bradford County

81. Highest observed water level 13.42 feet above datum, Dec. 30, 1933. Well dry Sept. 24 to Oct. 8, 1932, Oct. 3 to 17, 1936, and Aug. 20 to Oct. 29, 1939.

Water level, in feet above datum, 1939

Jan. 1	11.84	Mar. 19	12.19	June 4	11.15	Aug. 13	9.60
9	12.02	26	12.15	8	10.94	20	(a)
15	11.96	Apr. 2	12.58	11	10.74	Nov. 5	10.46
22	11.86	9	12.17	18	10.78	12	10.54
29	11.83	16	12.19	25	10.52	19	10.52
Feb. 2	12.15	23	12.15	July 2	10.52	22	10.91
5	12.13	26	12.04	9	10.48	26	10.54
12	12.32	30	11.92	16	10.36	Dec. 3	10.52
19	12.40	May 7	11.90	19	10.24	10	10.57
26	12.15	14	11.80	23	10.11	17	10.63
Mar. 5	12.28	21	11.78	30	9.86	24	11.84
12	12.05	28	11.70	Aug. 6	9.80	31	11.15
16	12.16						

a Dry until November 5.

## Bradford County--Continued

82. Lowest observed water level 6.88 feet above datum, Jan. 16, 1932;  
highest observed water level 37.82 feet above datum, Mar. 21, 1936.  
Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	25.10	Apr. 16	34.37	July 16	17.35	Oct. 8	11.15
14	27.00	22	33.18	22	16.80	11	10.91
21	25.68	26	32.05	30	16.22	15	10.65
28	24.11	29	30.61	Aug. 6	15.74	22	10.23
Feb. 2	24.09	May 7	27.10	13	15.26	29	9.80
4	25.20	14	25.10	20	14.81	Nov. 5	10.48
11	30.54	21	23.51	26	14.38	12	11.99
19	24.41	28	22.40	30	14.14	18	11.86
26	33.87	June 4	20.35	Sept. 3	13.85	25	11.36
Mar. 4	35.36	8	20.86	10	13.42	Dec. 2	10.51
11	33.65	11	20.50	17	12.76	9	9.85
18	33.83	18	19.71	23	12.41	16	9.23
25	33.67	24	19.11	26	12.07	23	9.39
Apr. 1	36.98	July 2	18.49	Oct. 1	11.67	30	9.96
8	35.50	8	18.00				

## Centre County

38. Lowest observed water level 9.34 feet above datum, Sept. 23, 1939. On March 21, 1936, well was covered with flood water.

Water level, in feet above datum, 1939

Jan. 7	11.10	Apr. 8	11.74	July 8	11.09	Oct. 7	10.06
14	11.12	15	11.38	15	11.10	14	10.44
21	11.16	22	11.64	22	10.88	21	10.96
28	11.10	29	11.36	29	10.52	28	10.94
Feb. 4	11.18	May 6	11.22	Aug. 5	10.24	Nov. 4	10.90
11	11.80	13	11.12	12	10.02	11	10.98
18	12.12	20	11.08	19	9.88	18	10.86
25	11.86	27	11.12	26	9.70	25	10.82
Mar. 4	12.05	June 3	11.28	Sept. 2	9.48	Dec. 2	10.84
11	12.12	10	11.12	9	9.62	9	10.80
18	11.88	17	11.00	16	9.58	16	10.80
25	11.48	24	11.02	23	9.34	23	10.78
Apr. 1	11.98	July 1	11.15	30	9.58	30	10.78

## Clarion County

103. Lowest observed water level 5.87 feet above datum, Oct. 21, 1939;  
highest observed water level 14.48 feet above datum, Apr. 9, 1938.

Water level, in feet above datum, 1939

Jan. 7	9.63	Apr. 8	13.38	July 8	7.36	Oct. 7	6.62
16	10.46	15	12.90	15	7.28	14	6.17
21	9.66	22	13.02	22	6.87	21	5.87
28	9.63	29	11.49	29	6.66	28	6.22
Feb. 4	13.80	May 6	10.25	Aug. 5	8.06	Nov. 4	8.34
11	13.87	13	9.39	12	8.07	11	7.82
18	13.20	20	8.75	19	7.65	18	7.17
25	12.81	27	8.49	26	7.29	25	6.39
Mar. 4	13.33	June 3	8.23	Sept. 2	6.65	Dec. 2	5.95
11	12.72	10	8.18	9	6.56	9	6.57
18	13.53	17	8.37	16	6.18	16	7.14
25	11.97	24	8.24	23	5.94	23	9.46
Apr. 1	13.90	July 1	7.75	30	5.96	30	9.32

## WATER LEVELS AND ARTESIAN PRESSURE, 1939

## Clearfield County

111. Lowest observed water level 9.31 feet above datum, Dec. 15, 1939; highest observed water level 15.73 feet above datum, Apr. 9, 1938.

Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	9.51	Apr. 8	15.01	July 8	13.53	Sept. 30	10.98
14	10.36	15	14.38	22	12.83	Oct. 7	10.67
21	10.29	22	14.66	31	12.35	14	10.41
30	10.42	May 1	13.98	Aug. 5	12.26	28	10.61
Feb. 4	10.55	13	12.83	8	12.06	31	10.01
11	11.63	20	12.53	12	11.85	Nov. 4	9.78
18	13.59	30	12.51	26	11.43	11	10.10
25	13.23	June 3	12.09	Sept. 2	11.48	18	10.07
Mar. 4	13.59	19	12.56	9	11.39	25	9.60
11	13.93	26	12.79	19	10.81	Dec. 15	9.31
18	14.43	July 1	13.71	23	10.95	23	10.16
Apr. 1	15.10						

## Columbia County

75. Lowest observed water level 10.00 feet above datum, Nov. 28 and Dec. 5, 1931; highest observed water level 19.63 feet above datum, Sept. 2, 1933.

Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	13.38	Apr. 15	14.54	July 15	11.58	Oct. 16	10.44
14	13.28	22	14.29	22	11.76	23	10.49
21	13.11	29	14.11	29	11.58	28	11.48
28	14.88	May 6	13.83	Aug. 5	11.83	Nov. 4	11.78
Feb. 4	14.68	13	13.61	12	11.68	11	11.90
11	14.80	20	13.50	19	11.33	18	11.68
18	14.70	27	13.17	Sept. 2	10.88	25	11.30
Mar. 4	14.63	June 3	12.46	9	10.31	Dec. 1	10.83
11	14.56	10	12.50	16	10.39	9	10.83
18	14.50	17	13.40	23	10.40	16	10.48
25	14.60	24	12.06	30	10.47	23	11.63
Apr. 1	14.69	July 1	12.08	Oct. 9	10.69	30	11.58
8	14.50	8	12.01				

## Erie County

1. Well dry Sept. 8 to Dec. 1, 1934. Highest observed water level 15.92 feet above datum Jan. 23, 1937.

Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 1	8.88	Mar. 12	14.24	May 20	9.05	Aug. 27	7.55
8	10.77	19	13.66	June 11	7.67	Sept. 3	7.83
15	9.83	26	13.01	17	7.65	16	7.68
21	11.27	Apr 8	13.13	July 1	7.81	24	7.57
29	10.24	16	14.65	9	7.77	Oct. 7	8.23
Feb. 3	10.32	23	14.09	14	8.30	22	8.87
11	12.35	30	12.57	16	8.53	Nov. 12	10.45
18	13.92	May 4	11.16	30	8.01	25	10.81
26	14.12	7	10.57	Aug. 6	8.07	Dec. 24	13.75
Mar. 5	14.65	13	9.92	20	7.65	31	12.70

## Forest County

30. Lowest observed water level 8.02 feet above datum, Sept. 23, 1939; highest observed water level 12.90 feet above datum Mar. 29, 1936.

Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 4	10.32	Feb. 4	9.99	Mar. 11	10.48	Apr. 15	10.92
7	10.76	11	10.75	18	10.44	22	10.37
14	9.82	18	10.85	25	9.97	29	9.87
21	9.36	25	10.66	Apr. 1	10.92	May 6	9.50
28	10.05	Mar. 4	10.68	8	10.59	13	9.25



## Forest County--Continued

30.--Continued

Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 20	9.04	July 22	8.52	Sept. 16	8.14	Nov. 11	9.52
27	9.31	29	8.69	23	8.02	18	9.35
June 3	8.98	Aug. 5	8.74	30	8.62	25	8.96
10	8.92	12	8.63	Oct. 7	8.32	Dec. 2	9.02
17	8.92	19	8.39	14	8.75	9	9.72
24	8.98	26	8.22	21	8.59	16	9.98
July 1	8.92	Sept. 2	8.13	28	9.90	23	10.62
8	9.07	9	8.26	Nov. 4	9.12	30	9.74
15	8.74						

## Huntingdon County

47. Lowest observed water level 9.91 feet above datum, Oct. 1, 1932;  
highest observed water level 29.23 feet above datum, Dec. 10, 1938.

Water level, in feet above datum, 1939

Jan. 7	13.33	Apr. 8	16.57	July 8	14.11	Oct. 7	13.01
14	13.28	15	14.56	15	22.25	14	12.26
21	12.98	22	20.38	22	14.39	21	11.95
28	12.51	29	16.00	29	16.46	28	24.86
Feb. 4	27.32	May 6	14.89	Aug. 5	14.39	Nov. 4	16.37
11	20.27	13	14.12	12	13.64	11	14.99
18	17.71	20	13.69	19	12.92	18	13.39
25	14.79	27	13.69	26	13.77	25	12.79
Mar. 4	18.18	June 3	13.24	Sept. 2	12.76	Dec. 2	12.30
11	16.77	10	13.19	9	13.98	9	12.21
18	18.00	17	12.24	16	12.63	16	11.69
25	15.00	24	16.42	23	12.11	23	13.58
Apr. 1	17.18	July 1	15.15	30	19.00	30	11.29

50. Lowest observed water level 9.14 feet above datum, Oct. 29, 1938;  
highest observed water level 14.79 feet above datum, Nov. 5, 1938.

Water level, in feet above datum, 1939

Jan. 7	10.90	Apr. 8	13.48	July 8	12.13	Oct. 7	9.85
14	11.21	15	13.26	15	11.84	14	9.69
21	11.09	22	13.72	22	11.56	21	9.62
28	11.94	29	13.21	31	11.25	Nov. 4	10.66
Feb. 4	13.97	May 6	12.87	Aug. 5	11.14	11	10.71
11	14.00	13	12.66	12	10.37	18	11.37
18	13.49	20	12.11	19	11.41	25	10.66
25	13.05	29	12.01	26	10.31	Dec. 2	10.85
Mar. 5	13.72	June 3	11.76	Sept. 2	9.85	9	10.51
11	13.48	14	11.39	9	9.75	16	10.33
18	13.56	17	11.23	16	9.65	23	10.29
25	13.27	24	11.61	23	9.31	31	10.24
Apr. 3	13.66	July 1	12.48	30	9.66		

## Lackawanna County

101. Lowest observed water level 8.29 feet above datum, Sept. 30, 1939. Well flooded March 17, 18, and 19, 1936.

Water level, in feet above datum, 1939

Jan. 7	13.39	Apr. 8	14.51	July 8	11.19	Oct. 7	8.98
14	13.11	15	14.29	15	10.38	14	9.18
21	13.03	22	14.44	22	9.81	21	9.31
28	13.28	29	14.62	29	9.54	28	9.44
Feb. 4	14.09	May 6	14.26	Aug. 5	9.25	Nov. 4	12.24
11	14.35	13	13.51	12	9.09	11	13.79
18	14.76	20	13.06	19	8.98	18	13.44
25	14.61	27	13.13	26	8.73	25	12.92
Mar. 4	14.64	June 3	13.09	Sept. 2	8.95	Dec. 2	12.94
11	14.31	10	12.39	9	9.03	9	12.85
18	14.83	17	12.05	16	8.81	16	12.60
25	14.75	24	11.81	23	8.31	23	12.51
Apr. 1	14.55	July 1	11.26	30	8.29	30	12.26

## Lackawanna County--Continued

102. Lowest observed water level 8.46 feet above datum, Oct. 1, 1932; highest observed water level 19.06 feet above datum, Mar. 21, 1936.  
Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	14.53	Apr. 9	16.85	July 9	10.33	Oct. 8	11.51
14	14.73	16	17.12	16	10.03	15	10.95
21	14.03	23	16.43	23	9.73	22	10.63
28	13.33	30	15.78	30	9.45	29	14.91
Feb. 4	14.13	May 7	14.63	Aug. 6	9.13	Nov. 5	14.78
11	14.13	14	14.13	13	9.03	12	14.73
19	16.06	21	13.08	20	9.18	19	13.78
26	16.07	28	13.10	27	9.95	26	12.78
Mar. 5	16.23	June 4	13.36	Sept. 3	9.80	Dec. 3	12.48
12	16.23	11	12.53	10	9.41	10	12.73
19	15.40	18	11.80	17	8.93	17	12.73
26	16.07	25	10.88	24	8.63	25	14.58
Apr. 2	18.01	July 2	10.78	Oct. 1	9.63	31	13.45

## Lancaster County

104. Lowest observed water level 9.22 feet above datum, Apr. 30, 1932; highest observed water level 21.39 feet above datum, Aug. 5, 1933.  
Water level, in feet above datum, 1939

Jan. 7	15.65	Apr. 8	16.55	July 8	19.18	Oct. 7	16.72
14	15.58	15	17.09	15	19.00	14	16.54
21	15.51	22	17.55	22	18.77	21	16.41
28	15.45	29	18.24	20	18.54	28	16.23
Feb. 4	15.45	May 6	18.74	Aug. 5	18.40	Nov. 4	16.02
11	15.44	13	19.04	12	18.16	11	15.83
18	15.45	20	19.44	20	17.94	18	15.72
25	15.47	27	19.57	26	17.83	25	15.56
Mar. 4	15.51	June 3	19.66	Sept. 2	17.57	Dec. 2	15.42
11	15.65	10	19.70	9	17.47	9	15.31
18	15.79	17	19.65	16	17.25	16	15.15
25	16.00	24	19.46	23	17.05	23	15.05
Apr. 1	16.23	July 1	19.39	30	16.84	30	14.92

## Luzerne County

76. Lowest observed water level 9.90 feet above datum, Nov. 7, 1931; highest observed water level 20.68 feet above datum, Dec. 6, 1938.  
Water level, in feet above datum, 1939

Jan. 2	14.58	Apr. 4	16.03	July 10	11.53	Oct. 3	13.35
9	14.83	10	15.48	17	11.13	8	13.88
16	14.73	17	15.73	27	10.18	16	13.78
24	14.68	24	15.73	Aug. 7	11.48	22	13.48
27	14.60	May 1	15.18	14	11.88	30	14.03
29	14.53	9	14.65	21	12.38	Nov. 13	14.68
Feb. 6	16.08	14	14.33	24	12.72	17	14.20
12	15.83	21	14.13	28	13.51	20	14.13
19	15.98	29	13.83	Sept. 4	13.98	27	13.78
26	15.68	June 4	13.06	10	13.78	Dec. 3	13.73
Mar. 7	15.60	11	12.93	17	13.38	11	13.68
13	15.43	18	12.88	25	13.18	18	13.58
19	16.18	26	12.38	Oct. 1	13.03	26	14.23
27	15.73	July 2	12.13				

## McKean County

108. No measurements made in 1939.

## Mercer County

5. Lowest observed water level 8.77 feet above datum, Oct. 3, 1932;  
highest observed water level 15.34 feet above datum, Mar. 28, 1936.  
Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	11.85	Apr. 8	14.01	July 8	11.24	Oct. 14	10.13
14	12.38	15	14.50	15	11.11	21	9.98
21	11.94	21	14.67	22	10.83	28	10.30
28	11.72	22	14.50	29	10.64	Nov. 4	10.58
Feb. 4	13.81	29	13.71	Aug. 5	11.38	11	10.55
11	14.11	May 6	13.00	12	11.14	18	10.40
18	13.90	13	12.16	19	10.94	25	10.24
25	14.21	20	12.01	26	10.59	Dec. 2	10.25
Mar. 4	14.48	27	11.38	Sept. 9	10.44	9	10.41
11	13.85	June 3	11.08	16	10.34	16	10.73
18	14.10	13	11.65	23	10.16	23	11.18
25	13.41	17	11.64	30	10.24	30	11.11
Apr. 1	14.03	24	11.31	Oct. 7	10.31		

## Northumberland County

57. Lowest observed water level 9.75 feet above datum, Dec. 24, 1939;  
highest observed water level 23.80 feet above datum, Mar. 28, 1936.  
Water level, in feet above datum, 1939

Jan. 4	10.92	Apr. 1	14.32	July 2	11.89	Oct. 7	9.91
4	10.93	9	13.68	9	11.52	15	9.89
7	10.90	16	13.96	15	11.31	22	9.98
14	11.01	17	13.96	22	11.11	29	10.14
21	11.10	22	13.96	29	10.89	Nov. 4	9.98
28	10.78	29	13.85	Aug. 6	10.86	11	9.96
Feb. 4	11.03	May 7	13.56	13	10.60	18	9.92
11	11.11	13	13.37	19	10.50	25	9.81
18	11.91	20	13.12	26	10.46	Dec. 3	9.79
25	13.31	27	12.80	Sept. 2	10.44	9	9.79
Mar. 5	13.37	June 4	12.64	10	10.23	16	9.76
11	13.38	10	12.45	16	10.12	24	9.75
18	13.26	18	12.21	23	9.97	31	9.79
25	13.54	24	11.96	30	9.92		

## Perry County

61. Lowest observed water level 9.72 feet above datum, Jan. 2, 1932;  
highest observed water level 18.59 feet above datum, Mar. 17, 1939.  
Water level, in feet above datum, 1939

Jan. 6	14.66	Apr. 7	18.15	July 14	14.99	Oct. 14	13.37
9	14.69	14	18.10	21	14.75	21	13.31
13	14.73	21	18.41	29	14.60	27	13.24
20	14.78	28	18.57	Aug. 4	14.50	30	13.21
27	14.74	May 5	17.97	7	14.39	Nov. 3	13.20
Feb. 3	15.10	12	17.29	11	14.31	10	13.20
10	15.71	19	16.91	18	14.20	17	13.21
17	16.40	26	16.50	26	14.06	25	13.16
24	17.07	June 2	16.12	Sept. 1	13.96	Dec. 1	13.12
Mar. 3	17.60	9	15.92	8	13.85	9	13.07
10	18.28	16	15.61	15	13.72	11	13.05
17	18.59	23	15.44	24	13.58	15	13.02
24	18.45	30	15.32	30	13.50	24	13.00
31	18.24	July 7	15.08	Oct. 6	13.42	30	12.90

## Perry County--Continued

110. Lowest observed water level 5.39 feet above datum, Dec. 11, 1939; highest observed water level 12.20 feet above datum, Nov. 13, 1937.  
Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	12.17	Mar. 25	12.12	June 17	12.10	Oct. 21	5.83
9	12.16	Apr. 1	11.94	24	12.06	28	7.90
14	12.13	8	11.67	26	12.12	Nov. 4	8.68
21	12.07	15	11.52	July 1	12.11	11	9.54
28	12.09	22	11.96	8	12.09	18	9.25
Feb. 4	12.11	29	12.13	15	12.13	25	7.62
11	12.09	May 6	12.12	Aug. 7	12.11	Dec. 2	5.43
18	12.12	13	12.09	Sept. 16	8.30	9	5.55
20	12.12	15	12.12	18	8.61	11	5.39
25	12.10	20	12.02	23	8.24	16	5.64
Mar. 4	12.12	27	12.08	30	7.37	23	9.95
11	12.09	June 3	12.12	Oct. 7	6.37	30	9.57
18	12.12	10	12.14	14	5.87		

## Potter County

107. Lowest observed water level 9.94 feet above datum, Aug. 26, 1939; highest observed water level 13.97 feet above datum, Mar. 14, 1936.  
Water level, in feet above datum, 1939

Jan. 7	11.69	Apr. 8	12.41	July 8	10.14	Oct. 7	11.45
14	11.67	15	12.03	15	10.13	14	11.43
21	11.64	22	12.01	22	10.12	21	11.46
28	11.78	29	11.76	29	10.04	28	11.47
Feb. 4	11.89	May 6	11.51	Aug. 5	10.02	Nov. 4	11.44
11	12.21	13	11.34	12	9.97	11	11.42
18	12.50	20	10.45	19	9.96	18	11.41
25	12.61	27	10.41	26	9.94	25	11.39
Mar. 4	12.71	June 3	10.39	Sept. 2	10.01	Dec. 2	11.37
11	12.69	10	10.36	9	10.03	9	11.35
18	12.63	17	10.34	16	10.69	16	11.36
25	12.59	24	10.31	23	10.41	23	11.37
Apr. 1	12.53	July 1	10.13	30	11.46	30	11.36

## Schuykill County

72. Lowest observed water level 9.72 feet above datum, Dec. 19, 1931; highest observed water level 24.79 feet above datum, Nov. 19, 1932.  
Water level, in feet above datum, 1939

Jan. 7	20.00	Apr. 15	21.20	July 18	12.84	Oct. 7	11.90
15	19.47	22	21.77	23	12.63	14	12.00
29	18.45	May 6	21.57	30	12.39	21	12.03
Feb. 4	22.44	13	18.62	Aug. 5	12.40	28	11.96
13	22.78	20	17.88	11	12.94	Nov. 7	12.63
18	22.81	27	17.09	19	12.40	18	14.00
25	21.05	June 3	16.07	26	12.49	28	13.94
Mar. 5	22.11	10	15.41	Sept. 2	12.44	Dec. 2	13.89
11	21.74	19	14.63	9	12.30	10	13.77
19	21.99	24	14.29	16	11.97	16	13.63
25	20.63	July 1	13.83	25	11.70	23	10.62
Apr. 1	21.15	8	13.42	30	11.54	30	11.41
8	22.64						

## Somerset County

16. Lowest observed water level 8.70 feet above datum, Nov. 12, 1938; highest observed water level 13.82 feet above datum, Mar. 28, 1936.

Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	9.50	Apr. 8	11.74	July 8	11.23	Oct. 7	9.13
14	9.60	15	12.25	15	10.96	14	8.97
21	10.36	22	12.01	22	10.82	21	8.86
28	9.77	29	11.65	29	10.61	28	9.04
Feb. 4	10.95	May 6	11.70	Aug. 5	10.48	Nov. 4	9.08
11	11.74	13	11.28	12	10.46	11	9.22
18	11.29	20	11.12	19	10.19	18	9.17
25	11.03	27	10.85	26	9.90	25	9.03
Mar. 4	10.55	June 3	10.80	Sept. 2	9.65	Dec. 2	9.02
11	11.45	10	10.85	9	9.50	9	9.20
18	11.47	17	10.60	16	9.30	16	9.39
25	11.13	24	11.14	23	9.14	23	9.43
Apr. 1	11.58	July 1	11.61	30	9.05	30	9.56

115. Lowest observed water level 9.35 feet above datum, Apr. 17, 1937; highest observed water level 16.22 feet above datum, May 21, 1938.

Water level, in feet above datum, 1939

Jan. 7	14.15	Apr. 8	15.80	July 8	15.42	Oct. 14	13.46
14	14.22	15	15.69	22	15.17	21	13.37
21	14.34	22	15.64	29	15.05	28	13.47
28	14.43	29	14.89	Aug. 5	14.82	Nov. 4	13.36
Feb. 4	15.29	May 6	15.33	12	14.60	11	13.44
11	15.20	13	14.91	19	14.51	18	13.36
18	15.12	20	15.00	26	14.28	25	13.36
25	14.52	27	15.57	Sept. 2	14.10	Dec. 2	13.42
Mar. 4	14.77	June 3	15.67	9	13.98	9	13.52
13	14.76	10	15.56	16	13.88	16	13.57
18	14.76	17	15.40	23	13.66	23	14.05
25	14.76	24	15.51	30	13.64	30	13.55
Apr. 1	15.57	July 1	15.54	Oct. 7	13.51		

## Sullivan County

105. Well dry Aug. 31 to Nov. 9, 1935; June 13 to Oct. 31, 1936; June 12 to 26, July 31, Sept. 18 to Oct. 16, 1937; Aug. 6 to Sept. 10, 1938; July 23, and Sept. 2 to Oct. 28, 1939. Highest observed water level 16.39 feet above datum, Mar. 16, 1936.

Water level, in feet above datum, 1939

Jan. 7	10.75	Apr. 1	13.44	June 17	9.35	Sept. 2	(c)
14	11.13	8	11.69	24	9.37	Oct. 28	(b)
21	10.86	15	11.76	July 1	9.49	Nov. 4	10.24
28	10.78	22	11.79	8	9.40	11	9.69
Feb. 4	12.46	29	13.83	15	9.30	18	9.48
11	13.49	May 6	11.91	23	(a)	25	9.29
18	14.40	13	10.80	29	9.25	Dec. 2	(b)
25	13.73	20	10.48	Aug. 5	9.34	9	(b)
Mar. 4	13.29	27	10.52	12	9.27	16	(b)
11	13.46	June 3	9.53	19	(b)	23	10.11
18	12.52	10	9.29	26	(b)	30	9.73
25	12.20						

a Dry.

b Insufficient water to permit measurement.

c Dry until October 28.

## WATER LEVELS AND ARTESIAN PRESSURE, 1939

## Susquehanna County

100. Lowest observed water level 9.79 feet above datum, Oct. 6 to 13, 1939; highest observed water level 18.39 feet above datum, Mar. 13, 1936.  
Water level, in feet above datum, at the end of each day, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	12.66	12.03	16.39	16.28	14.19	10.91	10.59	10.47	10.20	9.84	10.11	10.99
2	12.53	12.01	16.11	16.32	13.93	10.87	10.59	10.45	10.19	9.83	10.14	10.98
3	.....	12.00	15.83	16.23	13.78	10.84	10.59	10.44	10.18	9.82	10.17	11.01
4	.....	11.98	15.60	16.07	13.57	10.82	10.59	10.42	10.17	9.82	10.19	11.03
5	.....	11.95	15.55	15.92	13.35	10.79	10.60	10.41	10.16	9.80	10.23	11.04
6	12.26	11.94	15.54	15.78	13.13	10.77	10.61	10.38	10.14	9.79	10.27	11.06
7	12.75	11.93	15.43	16.00	12.98	10.75	10.62	10.36	10.13	9.79	10.33	11.08
8	12.92	11.89	15.25	15.93	12.80	10.72	10.64	10.33	10.12	9.79	10.38	11.10
9	12.99	11.85	15.11	15.77	12.66	10.70	10.65	10.30	10.12	9.79	10.43	11.11
10	13.05	11.81	14.98	15.60	12.51	10.70	10.66	10.28	10.12	9.79	10.48	11.11
11	13.06	11.78	14.83	15.43	12.35	10.69	10.67	10.25	10.11	9.79	10.52	11.14
12	13.06	11.78	14.73	15.30	12.15	10.67	10.67	10.22	10.10	9.79	10.56	11.14
13	13.06	11.78	14.57	15.16	12.03	10.66	10.68	10.21	10.09	9.79	10.59	11.16
14	13.06	11.84	14.34	15.07	11.93	10.66	10.68	10.23	10.07	9.81	10.63	11.16
15	13.04	14.96	14.17	15.19	11.84	10.64	10.62	10.23	10.06	9.81	10.66	11.17
16	13.00	15.47	14.05	15.23	11.75	10.63	10.67	10.22	10.05	9.81	10.70	11.19
17	12.93	15.37	13.90	15.23	11.70	10.60	10.67	10.22	10.03	9.82	10.74	11.21
18	12.89	15.25	13.77	15.21	11.65	10.59	10.67	10.21	10.03	9.82	10.77	11.23
19	12.81	15.72	13.68	15.19	11.59	10.58	10.66	10.22	10.01	9.83	10.79	11.25
20	12.76	17.53	13.60	15.12	11.56	10.57	10.65	10.24	9.98	9.83	10.83	11.61
21	12.63	17.15	13.48	15.01	11.48	10.56	10.64	10.25	9.96	9.83	10.85	12.14
22	12.58	16.88	13.41	14.99	11.41	10.54	10.63	10.25	9.93	9.84	10.88	12.29
23	12.50	16.54	13.43	14.97	11.33	10.53	10.62	10.26	9.93	9.84	10.90	12.48
24	12.44	16.18	14.77	14.97	11.28	10.53	10.61	10.28	9.92	9.85	10.94	12.54
25	12.29	15.78	15.12	14.90	11.21	10.53	10.59	10.27	9.91	9.85	10.94	12.54
26	12.20	16.18	15.30	14.82	11.15	10.52	10.57	10.26	9.90	9.88	10.95	12.55
27	12.13	16.19	15.40	14.74	11.08	10.51	10.55	10.25	9.89	9.92	10.95	12.55
28	11.95	16.37	15.54	14.58	11.05	10.50	10.54	10.25	9.88	9.96	10.97	12.72
29	11.95	.....	15.68	14.45	11.01	10.49	10.52	10.24	9.86	9.96	10.97	12.73
30	11.93	.....	15.76	14.31	10.98	10.59	10.51	10.22	9.84	9.98	10.98	12.72
31	12.04	.....	16.34	.....	10.95	.....	10.49	10.21	.....	10.02	.....	12.71

## Tioga County

106. Lowest observed water level 5.21 feet above datum, Sept. 16, 1939; highest observed water level 21.74 feet above datum, Mar. 21, 1936.  
Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	9.22	Apr. 8	18.24	July 8	10.31	Oct. 7	9.95
14	10.78	15	16.21	15	10.11	14	9.77
21	10.05	22	15.21	22	9.19	21	8.79
28	9.13	29	14.17	29	8.51	28	10.02
Feb. 4	9.14	May 6	12.79	Aug. 5	8.61	Nov. 4	10.47
11	9.68	13	11.53	12	8.23	11	11.96
18	21.11	20	10.61	19	7.68	18	11.43
25	19.64	27	12.00	26	6.84	25	10.31
Mar. 4	19.97	June 3	11.01	Sept. 2	6.32	Dec. 2	9.32
11	18.61	10	10.12	9	6.60	9	12.62
18	18.84	17	10.00	16	5.21	16	11.77
25	17.73	24	9.75	23	5.29	23	12.23
Apr. 1	18.92	July 1	10.22	30	9.61	30	11.97

## Washington County

112. Lowest observed water level 9.69 feet above datum, Oct. 1, 1938; highest observed water level 35.07 feet above datum, Mar. 19, 1938.  
Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	10.12	Apr. 8	32.11	July 8	29.12	Oct. 7	12.09
14	10.12	15	32.07	15	30.11	14	12.08
21	10.11	22	32.12	22	29.12	21	12.08
28	10.11	29	31.09	29	28.07	28	12.09
Feb. 4	23.08	May 6	28.12	Aug. 5	27.05	Nov. 4	12.07
11	28.04	13	26.70	12	26.05	11	12.09
18	30.07	20	26.08	19	22.17	18	12.09
25	29.04	27	24.08	26	22.21	25	11.11
Mar. 4	31.04	June 3	22.12	Sept. 2	17.12	Dec. 2	11.10
11	30.10	10	26.07	9	14.07	9	11.08
18	30.62	17	22.12	16	14.12	16	12.07
25	30.07	24	26.11	23	13.04	23	12.08
Apr. 1	31.07	July 1	30.06	30	12.11	30	12.08

## Wayne County

83. Lowest observed water level 9.81 feet above datum, Nov. 6, 1931; highest observed water level 23.25 feet above datum, Mar. 21, 1936.  
Water level, in feet above datum, 1939

Jan. 7	14.62	Apr. 8	19.72	July 8	13.71	Oct. 7	11.49
14	14.60	15	19.03	15	12.60	14	11.74
21	14.47	22	18.74	22	11.91	21	12.08
28	14.28	29	17.75	29	11.67	28	12.20
Feb. 4	14.70	May 6	17.49	Aug. 5	11.48	Nov. 4	12.31
11	15.00	13	17.00	12	11.31	11	12.51
18	18.03	20	16.64	19	11.40	18	12.35
25	20.28	27	16.23	26	12.17	25	12.28
Mar. 4	20.23	June 3	15.98	Sept. 2	11.93	Dec. 2	12.10
11	20.07	10	15.32	9	11.72	9	11.89
18	18.87	17	15.01	16	11.42	16	11.90
25	19.65	24	14.56	23	11.15	23	11.88
Apr. 1	21.97	July 1	14.11	30	11.34	30	11.87

## SOUTH CAROLINA

### TIGER RIVER AREA OF SOIL CONSERVATION SERVICE

By V. C. Fishel

The observation-well program in the Tiger River area <sup>1/</sup> in Spartanburg and Greenville Counties, S. C., was continued in 1939 by the Federal Geological Survey in cooperation with the Soil Conservation Service, S. L. Jeffords, project manager. Fourteen wells (3, 4, 7, 8, 9, 10, 17, 18, 19, 32, 34, 35, 36, and 39) were discontinued during the latter part of 1938, well 31 was discontinued January 3, 1939, and well 12 was discontinued July 17, 1939. Nine wells were being measured at the end of the year. During the year M. E. Franklin, of the Soil Conservation Service, made about 250 individual measurements of water level in the observation wells.

Average water levels from January 3 to July 17, 1939, were computed from the water levels in 10 wells (1, 2, 6, 12, 15, 16, 33, 37, 38, and 40). Well 12 was not included in the averages from July 17 to December 31. As observation on several of the wells was discontinued, the 1939 averages are not an exact continuation of the 1938 averages.

Precipitation was considerably above normal in 1936 so that water levels in the observation wells rose an average of about 3 feet in that year. Precipitation was also high in January and February 1937, when water levels rose about 2.5 additional feet, and reached in March the highest average level observed during the period of record, which extends from June 1934 to January 1940. Water levels then declined more or less persistently for 22 months and did not cease declining until February 1939. They declined an average of about 3 feet in 1937, 2.6 feet in 1938, and 0.5 foot in January and February 1939.

Recharge to underground reservoirs usually occurs during spring. In 1939 the water levels rose an average of 2.3 feet from February 13 to June 5, after which they declined the rest of the year. Their average declined 2.7 feet from June 5, 1939, to January 2, 1940, and on January 2, 1940, it was 0.73 foot below that at the beginning of 1939. Water levels on January 2, 1940, were at the lowest stage of record.

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<sup>1/</sup> See Water-Supply Papers 777, 817, 840, and 845 for records of ground-water levels, 1934-38.



Water levels in wells in the Tiger River area, in Spartanburg and Greenville Counties, S. C., in feet above datum, 1939

Date	1	2	6	12	15	16
Jan. 3	12.30	9.70	9.43	10.27	10.65	8.88
30	11.83	9.54	9.75	9.66	10.71	9.55
Feb. 13	13.04	9.61	9.35	9.81	10.05	7.90
27	12.90	10.78	9.43	10.01	10.23	7.77
Mar. 13	12.88	11.77	10.06	9.98	9.71	8.21
Apr. 3	12.83	13.52	10.58	11.12	9.55	8.24
24	12.34	14.32	.....	11.89	9.65	9.65
May 8	11.33	12.51	11.59	11.61	9.93	10.20
22	13.19	15.74	11.63	11.76	11.21	11.16
June 5	13.09	14.31	12.12	11.52	12.40	11.45
19	13.41	14.00	11.42	11.84	10.36	11.49
July 3	13.41	.....	11.50	10.44	10.64	11.50
17	13.21	13.34	11.61	11.42	10.67	11.46
31	13.20	12.99	10.44	.....	10.74	11.60
Aug. 14	13.10	12.65	11.29	.....	10.80	11.45
28	13.16	12.37	11.14	.....	10.82	10.21
Sept. 11	13.05	11.91	10.98	.....	10.70	10.91
25	13.01	11.52	10.83	.....	10.62	10.27
Oct. 9	13.10	11.13	10.67	.....	10.44	10.18
23	12.85	10.76	10.52	.....	10.34	9.85
Nov. 6	11.75	10.39	10.32	.....	10.11	9.44
20-21	12.71	10.12	9.93	.....	9.98	9.02
Dec. 18	11.51	9.61	9.72	.....	9.54	8.17
24	12.60	10.56	9.92	.....	9.79	8.58

Date	33	37	38	40	Average
Jan. 3	11.35	8.93	10.38	7.90	9.92
30	10.40	7.65	10.02	7.90	9.70
Feb. 13	11.01	7.14	9.86	7.49	9.53
27	10.72	7.97	10.44	7.52	9.78
Mar. 13	11.15	.....	9.88	7.24	10.10
Apr. 3	10.85	8.88	9.98	.....	10.62
24	10.67	9.65	11.02	7.82	10.78
May 8	11.26	9.77	10.54	8.29	10.70
22	10.85	10.24	11.05	8.51	11.53
June 5	10.87	10.11	12.36	10.29	11.85
19	11.28	10.15	11.40	9.39	11.47
July 3	11.53	.....	11.05	9.79	.....
17	.....	9.83	11.27	10.09	11.43
31	10.86	9.76	11.21	10.22	11.22
Aug. 14	10.84	9.61	11.03	10.28	11.23
28	10.73	9.47	11.04	11.25	11.13
Sept. 11	11.61	9.32	10.95	10.16	11.07
25	10.51	9.18	10.81	10.02	10.75
Oct. 9	10.39	8.00	10.62	9.84	10.49
23	10.35	8.79	10.45	9.72	10.40
Nov. 6	10.21	8.52	10.24	9.51	10.05
20-21	10.15	8.23	9.97	9.29	9.93
Dec. 18	9.88	7.75	9.56	8.92	9.41
24	9.80	8.05	9.76	8.80	9.76

# SOUTH DAKOTA

## CITY OF HURON

By A. N. Sayre

Water-level measurements in gage hole 1 and records of pumpage from the municipal wells 4 miles west of Huron were given in Water-Supply Papers 817, 840 and 845. The water levels and pumpage data for the Huron well field given in this report were obtained from a graph furnished by Mr. Dow I. Sears, city manager of Huron.

The wells in the well field supplied all water used by the city from January 1 to July 17 and from November 25 to December 31. The water supply for the period July 18 to November 24 was taken from reservoirs in the James River. The total pumpage from the wells during 1939, 153,590,000 gallons, was considerably less than the pumpage during 1938, 230,000,000 gallons. The water level in the gage hole was 9.2 feet higher on December 31, 1939, than it was on December 31, 1938.

Water level, in feet below measuring point, in an observation well near Huron, S. D., and pumpage from city wells, in millions of gallons a month, 1939

Date	Water level	Month	Pumpage	Date	Water level	Month	Pumpage
Jan. 7	25.4	.....	....	May 6	31.9	.....	....
14	25.0	.....	....	20	34.6	.....	....
21	24.2	.....	....	27	29.0	May	27.9
28	25.6	January	14.6	June 4	29.6	.....	....
Feb. 4	24.4	.....	....	10	32.6	.....	....
11	25.2	February	13.7	24	33.5	June	23.4
Mar. 4	26.4	.....	....	July 17	35.5	July	21.1
9	25.8	.....	....	Sept. 16	16.8	.....	....
18	26.3	.....	....	Nov. 25	16.4	.....	....
26	26.3	March	16.7	27	19.6	.....	....
Apr. 1	26.1	.....	....	30	21.0	November	3.4
9	26.0	.....	....	Dec. 22	16.8	.....	....
23	27.6	.....	....	31	16.6	December	16.4
30	32.7	April	17.4				

## SOUTHEASTERN SOUTH DAKOTA

By T. W. Robinson

A cooperative agreement for the measurement of water levels in southeastern South Dakota was entered into in the fall of 1939 by the Federal Geological Survey and the South Dakota Geological Survey. Work on the cooperative project was begun in December 1939 under the general supervision of O. E. Meinzer of the Federal Survey and E. P. Rothrock, State Geologist.

The purpose of the project is to obtain records of the fluctuations of water levels and artesian pressure in wells. The work is at present confined to wells that penetrate shallow water-bearing formations, largely glacial drift and alluvium. The project is essentially an expansion of a smaller program of water-level measurements in wells that has been carried on since 1936 by the State Geological Survey. In April 1935, water-level measurements were made in 4 wells south of Huron, Beadle County, by M. E. Kirby of the United States Army Engineers. In August 1936, V. C. Fishel and L. K. Wenzel of the Federal Survey remeasured the water levels in the wells and also measured the water levels in 17 additional wells in Beadle, Bon Homme, Kingsbury, Minnehaha, Moody, Turner, Union, and Yankton Counties. Beginning in 1937, the water levels in these 21 wells were measured at irregular intervals by E. P. Rothrock, State Geologist. In December 1939, shortly after the present cooperative agreement had been entered into, the writer measured the water levels in 19 other wells located in Bon Homme, Clay, Hutchinson, Lincoln, Minnehaha, Turner, Union, and Yankton Counties. In addition, many of the wells established by Fishel and Wenzel in 1936 were inspected. One of these early wells had to be abandoned, so that 39 wells were included in the water-level program at the end of 1939. Including the 19 measurements made in December, 49 individual measurements of water level were made during the year.

A report was published in 1938 by E. P. Rothrock<sup>1/</sup> summarizing to the fall of 1938 the water-level fluctuations in lakes and in 16 of the observation wells in eastern South Dakota.

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<sup>1/</sup> Rothrock, E. P., and Ullery, Dorothy, Ground-water fluctuations in eastern South Dakota: South Dakota Geol. Survey, Rept. of Investigations, No. 30, 29 pp., 1938.

The precipitation in southeastern South Dakota during 1939 was, in general, below normal. Beginning about mid-August, it was decidedly below normal and resulted in a rather severe drought in the fall. The lowest water levels in 1939 occurred during December.

A study was made of nine of the wells (wells 1, 3, 4, 5, 7, 19, 20, 21, and 22) that have the most nearly complete records. In December 1939 the water levels in seven of these wells were either about as low as the lowest levels recorded in previous years or were at lower stages.

On the following pages the observation wells are listed alphabetically by county name. All the water-level measurements are expressed in feet below the measuring point. Measurements of water levels in 1935 were made by M. E. Kirby of the United States Army Engineers; those in 1936, by V. C. Fishel and L. K. Wenzel of the Federal Geological Survey. All measurements from 1937 to December 1939 were made by E. P. Rothrock, State Geologist. Those in December 1939 were made by the writer.

#### Beadle County

11. ----- SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 36, T. 110 N., R. 62 W. Bored well, diameter 24 inches, depth 38 feet. Measuring point, bottom edge of pump base, 1.4 feet above land surface. Water levels, in feet below measuring point: Aug. 18, 1936, 28.87; Dec. 7, 1937, 27.4; Feb. 9, 1938, 27.88.

12. ----- SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 3, T. 109 N., R. 62 W. Bored well, diameter 18 inches. Measuring point, top of casing, 1.3 feet above land surface and 1,307.7 feet above mean sea level. Water levels, in feet below measuring point: Apr. 18, 1935, 30.64; Aug. 18, 1936, 29.81; Dec. 7, 1937, 28.89; Feb. 9, 1938, 29.46.

13. Mrs. Hildur Erickson. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 9, T. 109 N., R. 62 W. Bored well, diameter 18 inches, depth 75 feet. Measuring point, top of casing, 1.3 feet above land surface and 1,321.6 feet above mean sea level. Water levels, in feet below measuring point: Apr. 19, 1935, 26.58; Aug. 18, 1936, 26.36; Dec. 7, 1937, 27.00; Feb. 9, 1938, 28.39.

14. Mrs. Ella Johnson. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 7, T. 109 N., R. 62 W. Used well, diameter 18 inches, depth 74 feet. Measuring point, top edge of well platform at 1-inch hole, about level with land surface and 1,326.9 feet above mean sea level. Water levels, in feet below measuring point: Apr. 19, 1935, 35.83; Aug. 18, 1936, 39.16; Dec. 7, 1937, 30.85; Feb. 9, 1938, 30.75.

15. Nels Christensen. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 1, T. 109 N., R. 63 W. Unused bored well, diameter 18 inches, depth 74 feet. Measuring point, top of well platform, 1.0 foot above land surface and 1,325.4 feet above mean sea level. Water levels, in feet below measuring point: Apr. 19, 1935, 23.47; Aug. 18, 1936, 23.91; Dec. 7, 1937, 24.32.

#### Bon Homme County

7. T. C. Dugovic. SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 14, T. 94 N., R. 58 W. Unused dug well, depth 30.5 feet. Measuring point, top edge of wood casing at south side, 1.5 feet above land surface.

Water levels, in feet below measuring point, 1936-39

Date	Water level	Date	Water level	Date	Water level
Aug. 17, 1936	29.39	Nov. 26, 1937	32.5	Dec. 14, 1938	22.7
Apr. 17, 1937	31.87	Feb. 7, 1938	30.8	Jan. 19, 1939	21.2
June 8	30.53	Mar. 25	31.3	May 2	21.78
Sept. 26	32.55	Apr. 25	30.82	Dec. 16	23.37

## Bon Homme County--Continued

8. Jake Berndt. SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 8, T. 95 N., R. 60 W. Unused bored well, diameter 12 inches, depth 47 feet. Measuring point, top of inner tile casing, 0.7 foot above land surface. Water levels, in feet below measuring point: Aug. 17, 1936, 9.69; Dec. 7, 1937, 10.4; Dec. 16, 1939, 12.80.

9. ----- SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 31, T. 96 N., R. 60 W. Unused dug well, diameter 24 inches, depth 14.4 feet. Measuring point, top of well platform, 0.9 foot above land surface. Water levels, in feet below measuring point: Aug. 9, 1936, 10.40; Dec. 16, 1939, 11.00.

34. Joseph Krejci. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 6, T. 94 N., R. 59 W. Used domestic bored well, diameter 8 inches, depth 27 feet. Measuring point, top of tile casing, west side at blue mark, 1.0 foot above land surface. Equipped with pitcher pump, seldom used. Water level, in feet below measuring point, 1939: Dec. 16, 14.67.

## Brookings County

18a. ----- NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 12, T. 109 N., R. 53 W. Bored stock well, diameter 24 inches, depth 30 feet. Measuring point, top of stove casing, west side at cross, 2.0 feet above land surface. Water levels, in feet below measuring point: Feb. 9, 1938, 10.77; June 10, 1938, 5.89; Nov. 19, 1939, 10.53.

## Clay County

38. Yusten. SE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 35, T. 94 N., R. 52 W. Dug domestic well, diameter 42 inches, depth 15 feet. Measuring point, top of brick curb, northeast side at blue mark, 1.0 foot above land surface. Equipped with automatic pump, seldom used. Water level, in feet below measuring point, 1939: Dec. 17, 8.43.

## Hutchinson County

35. Herman Krause. NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 8, T. 97 N., R. 60 W. Dug domestic well, diameter 24 inches, depth 29 feet. Measuring point, top of vertical wood casing, north side, at copper nail with washer marked "USGS-WR," 1.4 feet above land surface. Equipped with rope and bucket, seldom used. Water level, in feet below measuring point, 1939: Dec. 16, 16.95.

36. ----- NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 10, T. 97 N., R. 58 W. Dug stock well, depth 8 feet. Measuring point, top of plank well cover, northeast corner at copper nail with washer marked "USGS-WR," 1.6 feet above land surface. Equipped with rope and bucket. Water level, in feet below measuring point, 1939: Dec. 16, 7.54.

37. Ed C. Mettler. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 10, T. 97 N., R. 57 W. Unused dug well, diameter 18 inches, depth 20 feet. Measuring point, top of tile casing, south side at blue mark, 0.4 foot above land surface. Water level, in feet below measuring point, 1939: Dec. 16, 16.01.

## Kingsbury County

17. ----- SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 1, T. 110 N., R. 53 W. Used bored well, diameter 24 inches. Measuring point, top of vertical board at south side of well, 1.5 feet above land surface.

Water level, in feet below measuring point, 1936, 1938-39

Date	Water level	Date	Water level	Date	Water level
Aug. 18, 1936	10.90	June 10, 1938	5.54	Nov. 19, 1939	7.98
Feb. 9, 1938	8.65	May 26, 1939	6.36		

## Lincoln County

26. ----- NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 21, T. 96 N., R. 50 W. Unused dug well, diameter 18 inches, depth 11 feet. Measuring point, top inside lip of tile casing, 1.0 foot above land surface. Water level, in feet below measuring point, 1939: Dec. 14, 9.54.

27. Andrew Lenna. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 5, T. 97 N., R. 50 W. Dug stock well, diameter 43 inches, depth 67 feet. Measuring point, top of well curb beneath platform, north side at copper nail with washer marked "USGS-WR," 1.0 foot above land surface. Equipped with lift pump, seldom used. Water level, in feet below measuring point, 1939: Dec. 14, 24.40.

28. H. J. Rolfe. SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 15, T. 98 N., R. 50 W. Unused bored well, diameter 8 inches, depth 63 feet. Measuring point, top inside lip of tile casing, 0.2 foot above land surface. Water level, in feet below measuring point, 1939: Dec. 15, 20.42.

29. Ed Devitt. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 26, T. 100 N., R. 50 W. Dug stock well, diameter 30 inches, depth 31 feet. Measuring point, top of tile casing beneath platform at south side, 1.2 feet above land surface. Equipped with lift pump, seldom used. Water level, in feet below measuring point, 1939: Dec. 15, 6.54.

## Minnehaha County

21. Killeaney. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 21, T. 101 N., R. 51 W. Dug domestic well, diameter 48 inches, depth 13.0 feet. Measuring point, top of well platform at 1-inch covered hole, 0.5 foot above land surface. Equipped with lift pump, seldom used.

Water level, in feet below measuring point, 1936-39

Date	Water level	Date	Water level	Date	Water level
Aug. 19, 1936	10.08	Oct. 8, 1937	11.19	Dec. 15, 1939	11.64
Mar. 30, 1937	11.45	June 12, 1938	9.2		

30. Renner Baseball Park. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 16, T. 102 N., R. 49 W. Driven domestic well, diameter 1 $\frac{1}{4}$  inches, depth 19 feet. Measuring point, top edge of lower valve seat of pump, 1.7 feet above land surface. Equipped with pitcher pump, used only during baseball games. Water level, in feet below measuring point, 1939: Dec. 15, 8.82.

31. ----- NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 6, T. 103 N., R. 49 W. Bored stock well, diameter 10 inches, depth 12.5 feet. Measuring point, top of tile casing, 0.2 foot above land surface. Equipped with lift pump, seldom used. Water level, in feet below measuring point, 1939: Dec. 15, 8.57.

## Moody County

19. Carl B. Jensen. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 16, T. 106 N., R. 50 W. Bored domestic and stock well, diameter 24 inches, depth 57 feet. Measuring point, top edge of vertical board at east side, 1.0 foot above land surface.

Water level, in feet below measuring point, 1936-39

Aug. 19, 1936	37.45	June 12, 1938	35.69	Aug. 12, 1939	38.72
May 8, 1937	36.22	Oct. 18	37.1	Nov. 19	38.32
Oct. 8	38.4				

20. ----- SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 33, T. 106 N., R. 49 W. Unused well, diameter 24 inches. Measuring point, bottom edge of pump base, 1.8 feet above land surface.

Water level, in feet below measuring point, 1936-39

Aug. 19, 1936	6.55	June 12, 1938	4.4	Nov. 19, 1939	6.28
May 8, 1937	2.18	Sept. 10, 1939	5.03		

## Turner County

4. J. H. Shaw. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 32, T. 96 N., R. 53 W. Unused dug well, diameter 72 inches. Measuring point, top edge of 4 by 4-inch timber well curb, 0.3 foot above land surface.

Water level, in feet below measuring point, 1936-39

Date	Water level	Date	Water level	Date	Water level
Aug. 16, 1936	10.99	Jan. 4, 1938	9.88	Jan. 7, 1939	10.22
Mar. 16, 1937	8.61	June 18	7.58	Mar. 24	11.25
June 8	6.8	Oct. 1	8.39	Dec. 17	12.61
Oct. 29	8.46	Nov. 13	9.09		

22. ----- NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 29, T. 99 N., R. 53 W. Unused dug well, diameter 42 inches, depth 12.5 feet. Measuring point, top of well platform at copper nail with washer marked "USGS-WR," 1.6 feet above land surface.

Water level, in feet below measuring point, 1936-39

Date	Water level	Date	Water level	Date	Water level
Aug. 19, 1936	9.36	Feb. 9, 1938	9.65	May 21, 1939	8.41
Mar. 30, 1937	6.35	June 10	7.15	Dec. 15	9.37
Dec. 6	9.67	Oct. 7	8.31		

32. Otto Kraemer. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 9, T. 100 N., R. 53 W. Unused drilled well, diameter 4 inches, depth 82 feet. Measuring point, top of casing, 0.8 foot above land surface. Water level, in feet below measuring point, 1939: Dec. 15, 40.10.

39. C. E. Johnson. Sec. 23, T. 96 N., R. 53 W., in Centerville, 0.35 mile east of Ford Garage. Unused drilled well, diameter 2 inches, depth 104 feet. Measuring point, top of casing, 2.5 feet above land surface. Water level, in feet below measuring point, 1939: Dec. 17, 5.74.

40. W. C. Olson. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 27, T. 96 N., R. 53 W. Dug stock well, diameter 18 inches, depth 31 feet. Measuring point, top of vertical wood casing, west side at blue mark, 1.0 foot above land surface. Equipped with lift pump and windmill. Water level, in feet below measuring point, 1939: Dec. 17, 25.83.

41. Jorgenson Studio. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 35, T. 97 N., R. 53 W. Unused dug well, diameter 24 inches, depth 40 feet. Measuring point, top of wood cover, south side at blue mark, 2.0 feet above land surface. Water level, in feet below measuring point, 1939: Dec. 17, 16.3.

42. ----- SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 26, T. 98 N., R. 53 W. Bored stock well, diameter 10 inches, depth 15.5 feet. Measuring point, top of casing, 0.2 foot above land surface. Equipped with lift pump operated by gasoline engine, seldom used. Water level, in feet below measuring point, 1939: Dec. 17, 11.61.

## Union County

5. J. J. Dolan. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 8, T. 95 N., R. 50 W. Unused dug well, diameter 24 inches, depth 42.5 feet. Measuring point, top of tile casing, 2.5 feet above land surface.

Water level, in feet below measuring point, 1936-39

Date	Water level	Date	Water level	Date	Water level
Aug. 15, 1936	10.81	Jan. 4, 1938	10.28	Jan. 7, 1939	9.22
Mar. 16, 1937	12.33	June 18	6.66	Mar. 24	10.35
June 8	6.73	Oct. 1	7.26	Dec. 14	14.33
Oct. 30	9.37	Nov. 13	8.14		

6. Mike Manning. NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 18, T. 93 N., R. 50 W. Unused dug well, 24 inches square, depth 17.7 feet. Measuring point, top edge of well platform, first board from north side, 1.0 foot above land surface.

Water level, in feet below measuring point, 1936-39

Date	Water level	Date	Water level	Date	Water level
Aug. 15, 1936	10.97	Oct. 30, 1937	5.63	Oct. 1, 1938	4.37
Mar. 16, 1937	2.71	Jan. 4, 1938	7.23	Nov. 13	4.82
June 8	3.0	June 18	4.48	Jan. 7, 1939	5.67

## WATER LEVELS AND ARTESIAN PRESSURE, 1939

## Union County--Continued

24. -----, SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 8, T. 93 N., R. 50 W. Unused dug well, diameter 24 inches, depth 24.5 feet. Measuring point, top of platform at 1-inch covered hole, 0.6 foot above land surface. Equipped with lift pump. Water level, in feet below measuring point, 1939: Dec. 14, 19.02.

25. A. G. McGuire. NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 6, T. 94 N., R. 50 W. Unused dug well, diameter 24 inches, depth 23 feet. Measuring point, top of 2-inch plank well cover, west side at copper nail with washer marked "USGS-WR," 2.3 feet above land surface. Equipped with lift pump. Water level, in feet below measuring point, 1939: Dec. 14, 22.46.

## Yankton County

1. Gayville Cemetery. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 11, T. 93 N., R. 54 W. Unused driven well, diameter 1 inch, depth 24 feet. Measuring point, top of platform, 3.2 feet above top of well casing in pit, and 0.2 foot above land surface.

Water level, in feet below measuring point, 1936-39

Date	Water level	Date	Water level	Date	Water level
Aug. 9, 1936	17.20	Nov. 26, 1937	16.79	Nov. 13, 1938	15.42
Mar. 16, 1937	17.16	Jan. 4, 1938	17.73	Jan. 7, 1939	15.28
Apr. 17	16.9	June 18	16.19	Mar. 24	15.17
Oct. 29	16.7	Oct. 1	15.77	Dec. 16	15.62

2B. Yankton Golf Club. SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 24, T. 94 N., R. 56 W. Unused dug well, diameter 36 inches, depth 10.4 feet. Measuring point, top of iron ring of manhole cover, 1.5 feet above land surface. Water levels, in feet below measuring point, 1939: Mar. 24, 7.22; Dec. 16, 9.83.

3. -----, NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 5, T. 95 N., R. 54 W. Unused dug well. Measuring point, top of 2 by 6-inch plank, west side of well at cross, 0.5 foot above land surface.

Water level, in feet below measuring point, 1936-39

Aug. 16, 1936	9.69	Jan. 4, 1938	9.64	Jan. 7, 1939	6.55
Mar. 16, 1937	6.34	June 18	5.6	Mar. 24	5.65
June 8	6.73	Oct. 1	5.98	Dec. 17	10.7
Oct. 29	8.47	Nov. 13	6.6		

33. Adolph Schoenfeldt. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 1, T. 93 N., R. 57 W. Bored stock well, diameter 18 inches, depth 32.5 feet. Measuring point, top of tile casing, north side at blue mark, 0.2 foot above land surface. Equipped with lift pump, seldom used. Water level, in feet below measuring point, 1939: Dec. 15, 23.77.



## TENNESSEE

### MEMPHIS

Measurements of water level in two wells in Memphis <sup>1/</sup>were continued during 1939 by F. T. Schaefer, under the direction of J. L. Saunders, district engineer of the Geological Survey in Fort Smith, Ark. These wells are known as the Central Avenue well, which is in Peabody Park, near the corner of Central Avenue and Tanglewood Street, and the Sycamore Avenue well, which is near the intersection of that avenue and Fifth Street. Description of the Central Avenue well is given in Water-Supply Paper 817; that of the Sycamore Avenue well in Water-Supply Paper 840.

The record for the Central Avenue well is fairly complete, but it has extended interruptions since 1928;<sup>2/</sup> that of the Sycamore Avenue well began on September 1, 1938. In each well the lowest water level in 1939 was lower than in any previous year of observation. In the Central Avenue well it was more than 7 feet below the lowest level observed in 1929, but as the record in that year was not complete the difference may not be so great. The lowest level in the Central Avenue well in 1939 was exactly 1 foot lower than the lowest level in 1938. The lowest level in the Sycamore Avenue well in 1939 was 2.07 feet lower than the lowest level during the period of observation in 1938, but in the latter year measurements did not begin until September 1. According to records furnished by the Water Division of the city of Memphis, the pumpage from wells of the public-supply system in 1939 was about the same as in 1930. Data furnished by the Memphis Department of Health show, however, that the pumpage from private wells in 1937 was about 20,000,000 gallons a day greater than in 1928.

In the following tables the water levels are reported in feet above an assumed datum. The datum for the Central Avenue well is 85.00 feet below the measuring point and 206.20 above mean Gulf datum. The datum for the Sycamore Avenue well is 187.76 feet above mean Gulf level and 42.00 feet below the measuring point.

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<sup>1/</sup> See Water-Supply Papers 817, 840, and 845.  
<sup>2/</sup> Record for the Central Avenue well since late November 1928, and for the Auction Avenue well, now abandoned, from May 1927, are given in graphic form on pl. 14, Geol. Survey Water-Supply Paper 656, "Ground-water resources of Western Tennessee, 1933."

## Central Avenue wells.

Lowest daily water level, in feet above an assumed datum, 1939 <sup>a/</sup>  
(from recorder charts)

Day	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	10.74	11.53	8.73	6.51	5.00	4.69	3.17	3.94	.....
2	.....	10.74	11.67	9.04	6.39	5.00	4.69	3.72	3.94	.....
3	.....	10.97	11.48	8.92	6.39	5.13	4.65	3.46	3.88	5.14
4	.....	10.86	11.33	8.47	6.59	5.34	4.77	3.25	3.86	5.33
5	.....	10.64	11.18	8.47	7.38	5.38	4.81	3.06	4.01	5.37
6	.....	10.31	11.17	8.16	7.20	5.00	4.89	2.92	4.34	5.14
7	.....	10.21	11.21	7.89	6.71	5.00	4.50	2.87	4.36	5.06
8	.....	10.21	11.36	7.74	6.49	5.00	4.17	2.87	4.07	5.00
9	.....	10.36	10.88	7.70	6.38	5.00	3.98	2.87	4.04	4.93
10	.....	11.01	10.76	7.70	6.47	4.64	4.08	2.93	4.01	4.93
11	.....	10.92	10.62	7.62	6.50	4.50	4.56	2.89	4.10	5.05
12	.....	10.63	10.22	7.44	6.10	4.56	4.24	2.86	4.32	5.00
13	.....	10.51	10.22	7.34	5.94	4.56	3.82	2.86	4.58	4.72
14	.....	10.44	10.21	7.02	5.79	5.13	3.48	2.85	4.73	4.52
15	.....	10.44	10.78	6.82	5.69	5.04	3.30	2.85	4.67	4.35
16	.....	10.67	10.28	6.73	5.72	4.75	3.30	3.07	4.72	4.20
17	9.73	11.48	9.85	6.62	5.76	4.56	3.30	3.27	4.56	4.20
18	9.71	11.61	9.46	6.69	5.64	4.34	3.42	3.36	4.57	4.46
19	9.89	11.45	9.41	7.13	5.50	4.32	3.34	3.46	4.68	4.78
20	10.67	11.43	8.54	6.83	5.51	4.29	.....	3.42	4.87	4.87
21	10.82	11.24	9.54	6.71	5.37	4.78	.....	3.42	5.13	4.77
22	10.69	11.09	9.53	6.73	5.32	4.75	.....	3.57	5.36	4.70
23	10.63	11.15	9.32	6.59	5.28	4.60	.....	3.76	5.52	4.77
24	10.63	11.69	8.86	6.62	5.27	4.52	.....	3.62	5.73	4.96
25	10.65	11.51	8.54	6.93	5.11	4.30	.....	3.44	5.85	4.96
26	10.82	11.21	8.63	6.98	4.92	4.33	.....	3.20	5.57	4.96
27	11.48	11.08	8.67	6.84	4.74	4.48	.....	3.12	5.39	4.96
28	11.29	11.06	8.68	6.63	4.78	4.96	.....	3.06	5.28	4.96
29	11.24	11.04	8.60	6.57	4.94	4.96	.....	3.13	5.24	4.96
30	11.03	11.05	8.47	6.58	5.00	4.96	.....	3.54	5.10	4.96
31	10.94	.....	8.47	.....	5.00	4.75	.....	3.69	.....	4.96

## Sycamore Avenue well.

Lowest daily water level, in feet above an assumed datum, 1939 <sup>b/</sup>

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	10.54	.....	13.73	17.11	8.81	5.74	5.58	2.25	1.85	.....	4.87
2	.....	10.61	.....	13.71	17.34	8.48	5.74	4.26	2.18	2.57	.....	5.19
3	.....	10.75	.....	13.94	17.09	8.19	6.44	3.90	2.18	2.77	.....	5.28
4	.....	10.66	.....	14.04	16.72	8.18	7.03	3.90	2.97	.....	.....	5.46
5	.....	10.77	.....	13.90	16.23	8.65	7.18	3.90	3.30	.....	4.20	5.62
6	.....	11.61	.....	13.83	15.68	8.69	7.21	3.89	2.81	.....	4.59	5.45
7	.....	11.72	.....	13.83	15.62	8.13	6.43	3.95	2.36	.....	4.87	5.27
8	.....	11.80	.....	13.96	15.63	7.70	5.81	3.89	1.92	.....	5.05	5.16
9	.....	11.89	.....	14.33	14.99	7.36	5.81	3.26	1.60	.....	5.31	5.16
10	.....	11.77	.....	15.03	14.07	7.17	6.15	2.89	2.05	.....	5.38	5.19
11	.....	11.77	.....	15.27	13.14	7.03	6.03	2.79	2.05	.....	5.48	5.47
12	.....	11.79	.....	15.04	12.47	7.26	5.47	2.43	1.77	.....	5.22	5.47
13	.....	12.45	.....	14.84	12.26	7.79	5.17	2.43	1.20	.....	5.07	5.35
14	.....	13.06	.....	14.63	12.26	7.60	4.87	3.11	.....	.....	4.97	5.11
15	.....	12.82	.....	14.57	12.75	7.14	4.67	3.21	.76	.....	4.80	5.02
16	.....	12.71	.....	14.57	12.39	6.79	4.65	2.89	.47	.....	4.51	5.13
17	.....	12.66	14.50	15.08	11.54	6.35	4.27	2.63	.35	.....	4.31	5.49
18	.....	12.66	14.50	15.36	10.97	6.07	4.33	2.49	.57	.....	4.28	5.31
19	.....	12.81	14.50	15.29	10.69	6.35	4.72	2.23	.66	.....	4.28	5.31
20	.....	13.51	15.05	15.29	10.47	6.66	4.27	2.23	.66	.....	4.43	5.37
21	.....	13.84	15.58	15.27	10.47	6.00	3.95	2.79	1.11	.....	4.49	5.47
22	.....	13.82	15.36	15.26	10.89	5.61	3.91	2.93	1.38	.....	4.33	.....
23	.....	.....	15.20	15.36	10.26	5.33	3.91	2.66	1.47	.....	4.16	.....
24	.....	.....	14.90	15.93	9.39	5.27	4.00	2.61	.83	.....	4.12	.....
25	9.73	.....	14.72	16.44	8.82	5.51	4.21	2.41	.45	.....	4.07	.....
26	9.65	.....	14.72	16.57	8.67	5.72	3.90	2.11	.42	.....	4.01	.....
27	9.58	.....	15.12	16.53	8.52	6.33	.....	2.11	.56	.....	4.30	.....
28	9.58	.....	15.50	16.53	8.52	6.11	3.69	2.56	.91	.....	4.67	.....
29	9.72	.....	15.41	16.54	8.88	6.03	3.77	2.82	1.07	.....	4.67	.....
30	10.49	.....	14.85	16.67	9.21	5.93	3.93	2.66	1.00	.....	4.65	.....
31	10.52	.....	14.28	.....	9.17	.....	4.40	2.51	1.10	.....	.....	.....

<sup>a/</sup> Recorder not operating or record indeterminable Dec. 18, 1938 to March 16, 1939.

<sup>b/</sup> Recorder not operating or record not determinable Dec. 13, 1938, to Jan. 24, 1939; Feb. 23 to March 16, 1939; Oct. 4 to Nov. 4, 1939; Dec. 22 to Dec. 31, 1939.

## TEXAS

### STATE-WIDE PROJECT

By R. W. Sundstrom

The measuring of water levels and artesian pressures at regular intervals in selected observation wells in Texas was continued during 1939 as a part of the cooperative ground-water investigation of the State, which is being carried on by the Federal Geological Survey and the Texas State Board of Water Engineers. Measurements of water level in a few wells began as early as 1928; observations on many others were begun in 1929 and 1930 in conjunction with the starting of intensive investigations in different parts of Texas, including the Winter Garden district, in Dimmit and Zavala Counties, and the Houston-Galveston area. Since 1930 the water-level program has grown so rapidly that at the end of 1939 it included wells in many parts of the State.

W. N. White, of the Federal Geological Survey, has supervised the water-level program since its beginning, as well as the other cooperative ground-water investigations in Texas. The entire staff engaged on ground-water studies in Texas, as well as Mr. A. C. Cook, assistant engineer with the State Board of Water Engineers, have contributed to this report.

Measurements of water level in about 1,300 selected observation wells in 78 counties distributed over a large part of the State are given on the following pages. Many single measurements of water level in wells, not included in this report, are given in mimeographed publications that were released in 1939 in connection with a water-well inventory project of the Federal Work Projects Administration. That project is sponsored by the State Board of Water Engineers and is carried out in cooperation with the Federal Geological Survey. Such publications were released during the year for Carson, Castro, Collingsworth, Crosby, Gonzales, Ochiltree, Edwards, San Patricio, and San Saba Counties.

Measurements of water level and artesian pressure before 1939 are given in Water-Supply Papers 777, 817, 840, and 845.

#### Character of water-level fluctuations

The observation-well program in Texas covers a large area over which the geology, precipitation, ground-water recharge, and ground-water discharge range considerably. As a result, many types of water-level fluctuations are observed in the observation wells. In some parts of the State the

fluctuations in nearby wells may differ considerably because the wells tap formations at different depths. In several areas the fluctuations in individual wells have been greatly influenced by changes in rate of withdrawal from nearby wells.

#### SOUTHEAST TEXAS

Jackson, Matagorda, and Wharton Counties.--The heaviest withdrawals of ground water in these counties are made for public water supply and for rice irrigation. In most of the observation wells outside the heavily pumped areas, water levels declined 1 foot or less from 1934 to 1939. Records obtained in the heavily pumped areas are as yet too meager to justify a conclusion regarding the trend of water levels.

Houston-Galveston area and adjacent region.--The fluctuations of ground-water levels in this territory have been discussed in much detail by Messrs. White, Livingston, and Turner in a mimeographed report on ground-water resources.<sup>1/</sup> Further discussion of water-level fluctuations will be published later in reports on investigations that are still in progress.

#### EAST-CENTRAL AND EAST TEXAS

Water-level fluctuations have been observed in wells extending from Austin northeast to the Texas-Louisiana boundary line, along and across outcrops of most of the important water-bearing sands of Tertiary age. As observations of these fluctuations have been made only since 1938 the records are too meager to permit interpretations of the significance of the fluctuations. The records indicate, however, that the water levels have declined slightly in most of the observation wells in Angelina, Bastrop, Cherokee, Gregg, Lee, Nacogdoches, Navarro, Panola, Robertson, and Shelby Counties.

#### HIGH PLAINS

About 600 observation wells are in the Texas High Plains. Some of these wells are in districts where heavy withdrawals of ground water are being made for irrigation; others are in areas adjacent to pumped districts; and still others are remote from areas of heavy withdrawals. The fluctuations of water level to the early part of 1939 have been discussed by White, Broadhurst, and Lang in two mimeographed reports.<sup>2/ 3/</sup> During

<sup>1/</sup> White, W. N., Livingston, Penn, and Turner, S. F., Ground-water resources of the Houston-Galveston area and adjacent region, Texas: Texas State Board of Water Engineers, 1939.

<sup>2/</sup> White, W. N., Broadhurst, W. L., and Lang, J. W., Ground water in the High Plains in Texas: Texas State Board of Water Engineers, July 26, 1938.

<sup>3/</sup> Memorandum for the press, Ground water in the High Plains in Texas: Texas State Board of Water Engineers, Apr. 12, 1939.

1939, water levels showed average net declines in the heavily pumped districts as follows: Plainview, comprising parts of Hale, Floyd, and Swisher Counties, about 1.5 feet; Hereford, comprising parts of Deaf Smith, Castro, and Parmer Counties, about 0.8 foot; Muleshoe, comprising parts of Bailey and Lamb Counties, about 0.7 foot; and Lubbock-Littlefield, comprising parts of Lubbock, Hockley, and Lamb Counties, 0.7 foot. In areas surrounding the heavily pumped districts there was a general but small decline. In areas remote from pumping, the water levels in some wells rose slightly whereas in other wells they declined slightly; but they showed a small average decline.

#### SOUTH TEXAS

Duval County.--In 1939 there were in this county 44 observation wells, of which 22 were less than 100 feet deep and 22 were from 100 to 340 feet deep. The records for most of these wells extend back to 1933; for the others, to 1931. Results of the observations from 1931 to 1936 have been discussed by Sayre.<sup>4/</sup>

Outstanding features of the rainfall record, as disclosed by records of the U. S. Weather Bureau at Alice, in Jim Wells County, and Falfurrias, in Brooks County, are as follows: July, August, and September, 1933, were exceptionally wet, as the precipitation during these 3 months amounted to 23.36 inches at Falfurrias and to 15.74 inches at Alice; the summer of 1935 was also exceptionally wet. The rainfall from 1937 to 1939 was much below average. Water levels in nearly all the wells show the effects of variations in rainfall, as can be seen in the pronounced rises that followed the heavy rains in 1933 and 1935.

Water levels in most of the shallow wells were slightly higher in 1939 than in 1933, but in a few of the wells they were somewhat lower. In most of the county the water levels in the deep observation wells were slightly higher in 1939 than in 1933. In the extreme southeastern part of the county, however, they were much lower in 1939, owing, it is believed, to withdrawals of ground water for irrigation in an adjacent area in the northern part of Brooks County near Falfurrias and in the southern part of Jim Wells County.

Brooks County.--Water levels in shallow wells in the northern part of the county, mostly in the vicinity of Falfurrias, declined from 1933 to 1939, when the average net decline amounted to about 9 feet. A part of the decline, however, was due to the fact that the water-level measurements

<sup>4/</sup> Sayre, A. N., Geology and ground-water resources of Duval County, Tex.: U. S. Geol. Survey Water-Supply Paper 776, 1937.

in most of the wells were started late in September 1933, when the stage of the water table was exceptionally high as a result of recharge from the heavy rains of July, August, and the early part of September. In the southern part of the county the water levels in the shallow wells were about the same stage in 1939 as in 1933. Water levels in the deep wells in the vicinity of Falfurrias are chiefly influenced by irrigation. Water-level measurements, usually made in January long after the end of the irrigation season, indicate a very small net change in water level from 1933 to 1936. From 1936 to 1938 there was, however, an average net decline of about 2.5 feet. Measurements made in October 1939 indicate that there may have been a further decline during 1939, but as no measurements were made in January 1939 a close comparison with previous measurements is not possible; therefore the further decline during 1939 cannot be ascertained.

Jim Wells County.--Periodic measurements of water level in 10 selected wells have been made since the summer of 1933 in south-central and southern parts of Jim Wells County. Of these wells, 7 are less than 100 feet deep, 1 is 125 feet, 1 is 475 feet, and 1 is 629 feet.

Records show that water levels in the shallow wells fluctuate with the rainfall, for the water levels rose sharply in all of them after the heavy rains of 1933 and 1935. The water levels in some of the wells were lower in October 1939 than in October 1933 and in others they were slightly higher. One of the deep wells showed a net decline in water level of 1.75 feet during the 7-year period and the other showed a net decline of about 7 feet. These wells presumably are affected by pumping for irrigation in the Falfurrias area in northern Brooks and southern Jim Wells Counties.

Kleberg County.--Well measurements in this county were started in the winter of 1932-33. Results of the measurements to 1935 have been reported by Livingston and Bridges.<sup>5/</sup> The report reveals a pronounced decline in water levels from the time irrigation began in 1904 to March 1935. Water levels continued to decline from March 1935 to April 1939, during which time the 16 observation wells for which good records are available displayed an average net decline of about 3.5 feet.

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<sup>5/</sup> Livingston, Penn, and Bridges, T. W., Ground-water resources of Kleberg County, Tex.: U. S. Geol. Survey Water-Supply Paper 773-D, 1936.

## BALCONES FAULT ZONE

Water-level observations in the Balcones fault zone, which comprises parts of Bexar, Comal, Guadalupe, Hays, Kinney, Travis, Uvalde, and Val Verde Counties, were started in 1929, when observations were first made on wells in Uvalde and Medina Counties. In 1932, observations were begun in Bexar County, and in 1937 they were extended to include Kinney, Comal, Hays, Travis, Guadalupe, and Val Verde Counties. Most of the observation wells in this area tap water in the Edwards limestone, which is the source of the water discharged by the large springs of the Balcones fault zone in Travis, Hays, Comal, Bexar, Uvalde, Kinney, and Val Verde Counties, of the public and industrial water supplies of San Antonio and several large towns, and of most of the water used for irrigation in Uvalde and Bexar Counties. The water enters the limestone in a zone of outcrop along the Balcones escarpment, which crosses the northern parts of Bexar, Medina, and Uvalde Counties and extends beyond to the east and the west of these counties. As the water in nearly all the observation wells is under artesian pressure the water levels in them usually respond quickly to heavy rains on the intake area.

Results of water-level measurements in Uvalde County from 1929 to October 1934 are given in Water-Supply Paper 678;<sup>6/</sup> those in Bexar County from 1932 to June 1935, in Water-Supply Paper 773-B.<sup>7/</sup>

Outstanding features of the 10-year record in Uvalde County are the rises of water level in the wells after the heavy rains in May and June 1930, April and May 1931, July and September 1932, and May to July 1935. Similar rises of water level occurred in wells in Bexar and Medina Counties after heavy rains in April and May 1935. Since 1936 the general trend of water levels in most of the wells has been downward; water levels in wells in Uvalde and Kinney Counties, however, showed moderate rises in the fall of 1939. In Uvalde County the highest stages recorded during the 10 years of observation were in 1932, 1933, and 1936. The lowest stages occurred in the winter and spring of 1929-30. Water levels in all the wells for which records are available were materially higher in 1939 than in 1929. In Bexar and Medina Counties the highest stages were reached in 1936, and the lowest in the winter of 1934-35. The average stage in the fall of 1939 was slightly above the average in the winter of 1934-35.

<sup>6/</sup> Sayre, A. N., Geology and ground-water resources of Uvalde and Medina Counties, Tex.: U. S. Geol. Survey Water-Supply Paper 678, pp. 86-96 and 128, 139, 1936.

<sup>7/</sup> Livingston, Penn, Sayre, A. N., and White, W. N., Water resources of the Edwards limestone in the San Antonio area, Texas: U. S. Geol. Survey Water-Supply Paper 773-B, pp. 92-100, 110-113, 1936.

Records of water-level fluctuations in the wells in Val Verde, Kinney, Guadalupe, Comal, Hays, and Travis Counties are too short to permit a critical analysis.

#### SOUTHWEST TEXAS

Dimmit and Zavala Counties; the Winter Garden district.--Pumping from wells for the irrigation of winter vegetables and fruits and summer feed crops has been made on a comparatively large scale in this area during the past 20 years. The Carrizo sand, from which nearly all the water is derived, crops out in a belt about 1 to 7 miles wide extending across the western part of Dimmit County, the western and northern parts of Zavala County, and parts of eastern Maverick and southern Uvalde Counties. The sand averages about 200 feet in thickness and dips generally to the east and southeast, and the belt in which it can be reached within a depth of 1,000 feet averages about 15 miles wide. The water supply in the sand comes from rainfall on the outcrop area and from the seepage from streams that cross the outcrop. Ground-water level measurements in this area were started in 1929 and 1930. The results to September 1933 are discussed in mimeographed reports<sup>8/9/</sup> prepared by the Federal Geological Survey in cooperation with the Texas State Board of Water Engineers.

The fluctuations of water level from 1929 to 1939 are fully discussed in a report on ground-water resources of the area, which is in preparation.

Outstanding features of the 10-year record are as follows: On the outcrop area in wells that are remote from heavy pumping the water levels show relatively little seasonal or yearly fluctuation and have changed only slightly during the decade. Where pumping has been fairly heavy on or near the outcrop, a decline amounting to several feet has been in progress. Down the dip, the lowest stages in water level during the 10-year period were recorded in the late winter and spring of 1929-30 and 1931-32, and the highest stages were recorded in the late summers of 1931, 1932, and 1933 after the exceptionally heavy rains in 1931 and 1932. The water levels gradually declined from the peak in the summers of 1931-33. In the winter and spring of 1938-39 and the summer of 1937, however, they were in general higher than during corresponding periods in 1929-30.

#### TABLES OF WATER LEVEL MEASUREMENTS

In the following tables measurements of water level not preceded by a plus sign indicate depths to water level below measuring point; measurements preceded by a plus sign indicate heights to which the water would rise above the measuring point in the casing if the casing were extended.

<sup>8/</sup> Survey of the underground waters of Texas: U. S. Dept. Interior press memo., Feb. 16, 1931, pp. 18-21.

<sup>9/</sup> White, W.N., Turner, S.F., and Lynch, W.A., Ground water in Dimmit and Zavala Counties, Tex.: U.S. Dept. Interior press memo., Apr. 11, 1934, pp. 3-4.



## Andrews County

Well numbers correspond to those in Water-Supply Paper 840, p. 378; Water-Supply Paper 845, p. 446; Andrews County, Texas, Records of Wells, etc., Works Progress Administration, Ground Water Survey Project 6999, State Board of Water Engineers, 1937 (Mimeographed).

122. Water levels, in feet, 1939: Jan. 26, 111.79; Aug. 14, 111.50  
 216. Water level, in feet, 1939: Jan. 26, a/; July 19, 75.80.  
 220. Water levels, in feet, 1939: Jan. 26, 78.86; July 19, 78.81.

## Angelina County

Well numbers correspond to those in the following reports: Water-Supply Paper 840, pp. 378-9; Geology and ground-water resources of the Lufkin area, Texas, by W. N. White, A. N. Sayre, and J. F. Heuser, 1937 (in manuscript); Water-Supply Paper 845, p. 446.

3. Water levels, in feet, 1939: Feb. 10, 3.50; May 8, 10.71;  
 July 21, 13.02; Dec. 13, 11.99.  
 5. Water levels, in feet, 1939: Feb. 10, 11.47; May 8, 8.77;  
 July 21, 11.02; Dec. 13, 15.18.  
 13. Water levels, in feet, 1939: Feb. 10, 8.52; May 10, 10.61;  
 July 21, 12.30; Dec. 13, 23.09.  
 19. Water level, in feet, 1939: Feb. 9, 6.38; May 8, measurements discontinued.  
 21. Water levels, in feet, 1939: Feb. 9, 4.78; May 8, 11.88;  
 July 20, 10.50; Dec. 13, 12.10.  
 43. Water levels, in feet, 1939: May 8, +30.2; July 20, +28;  
 Dec. 13, +10.2.  
 45.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 9	4.90	July 20	9.25	Dec. 13	10.98
May 8	7.04	Dec. 13	11.03		

47. Well flowing; no measurements made in 1939.  
 50. City of Lufkin. One and one-half miles north of Lufkin. Drilled domestic well, diameter 16 inches, depth 110 feet. Measuring point, lower edge square pump base, 2.5 feet above land surface. Water levels, in feet: Jan. 18, 1937, 12.0; Dec. 13, 1939, 14.59.  
 53. Water levels, in feet, 1939: Feb. 9, 9.00; July 20, 11.66;  
 Dec. 13, 13.23.  
 56. Water levels, in feet, 1939: Feb. 10, 18.98; May 8, 18.02;  
 July 21, 19.53; Dec. 13, 20.77.  
 167. W. F. Athey. About 6.6 miles north of Lufkin. Dug domestic well, diameter 30 inches. Measuring point, top of curb. Equipped with bucket and rope. Water level, in feet, 1939: Dec. 13, 13.82.

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a Pumping.

## Bailey County

Well numbers correspond to those in Water-Supply Paper 840, pp. 379-84; Water-Supply Paper 845, pp. 446-9; Bailey County, Texas, Records of Wells, etc., Works Progress Administration, Ground-Water Survey Project 2070, State Board of Water Engineers, 1937 (Mimeographed).

5A. Water levels, in feet, 1939: Mar. 9, 64.24; July 8, 64.22; Sept. 14, 64.22; Dec. 6, 64.18.

9. Water levels, in feet, 1939: Mar. 9, 39.09; July 8, a/; Sept. 14, 40.23; Dec. 7, 39.28.

11. Water levels, in feet, 1939: Mar. 9, 24.77; July 8, a/; Sept. 14, a/; Dec. 7, 25.93.

21A. Mrs. J. W. Gregory, Sr. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 6, blk. X, 8 miles west of Muleshoe. Drilled irrigation well, diameter 15 inches, depth 98 feet. Measuring point, top of casing, 0.8 foot above land surface.

Water level, in feet, 1936, 1938-39

Date	Water level	Date	Water level	Date	Water level
Oct. 20, 1936	23.69	Oct. 25, 1938	23.08	Sept. 14, 1939	(a)
June 10, 1938	28.18	Mar. 9, 1939	23.80	Dec. 7	24.06
Sept. 16	24.13	July 8	24.98		

25. Water levels, in feet, 1939: Mar. 9, 20.41; July 8, 21.03; Sept. 14, 26.38; Dec. 7, 21.96.

31. Water levels, in feet, 1939: Mar. 9, 13.82; July 8, 13.83; Sept. 14, 14.47; Dec. 7, 15.15.

33. Water levels, in feet, 1939: Mar. 9, 28.69; July 8, 30.93; Sept. 14, 32.35; Dec. 7, 30.94.

34A. Water levels, in feet, 1939: Mar. 9, 43.10; July 8, 43.12; Sept. 14, 43.10; Dec. 6, 43.15.

35. No measurements made in 1939.

35A. F. O. Boone. NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 24, blk. X, 4 $\frac{1}{2}$  miles northwest of Muleshoe. Unused drilled well, diameter 6 inches. Measuring point, top of tin barrel curb, 1.7 feet above land surface.

Water level, in feet, 1938-39

Mar. 31, 1938	25.97	Oct. 25, 1938	24.12	July 8, 1939	24.92
June 9	25.25	Dec. 1	24.23	Sept. 14	25.20
Sept. 16	23.91	Mar. 9, 1939	24.49	Dec. 7	25.43

36. Water levels, in feet, 1939: Mar. 9, 17.20; July 8, 17.90; Sept. 14, 19.40; Dec. 7, 19.00.

38. No measurements made in 1939.

45. Water levels, in feet, 1939: Mar. 9, 19.11; July 8, 20.33; Sept. 14, 21.14; Dec. 7, 20.58.

49. Water levels, in feet, 1939: Mar. 9, 23.12; July 8, 24.85; Sept. 14, a/; Dec. 7, 24.52.

53. Water levels, in feet, 1939: Mar. 9, 25.06; July 8, 25.33; Sept. 14, pit filled.

62. Water levels, in feet, 1939: Mar. 9, 22.94; July 8, 25.04; Sept. 14, a/; Dec. 7, 23.63.

63. Water levels, in feet, 1939: Mar. 9, 24.01; July 8, a/; Sept. 14, 29.73; Dec. 7, 25.18.

66. Water levels, in feet, 1939: Mar. 10, 20.42; July 8, 21.20; Sept. 14, 21.85; Dec. 7, 21.72.

67. Water levels, in feet, 1939: Mar. 10, 19.40; July 8, 19.97; Sept. 14, 20.38; Dec. 7, 20.36.

a Pumping.

## Bailey County--Continued

69. Water levels, in feet, 1939: Mar. 10, 15.49; July 8, 18.30;  
Sept. 14, a/; Dec. 7, 16.69.
70. No measurements made in 1939.
74. No measurements made in 1939.
79. Water levels, in feet, 1939: Mar. 10, 22.79; July 7, 23.36;  
Sept. 14, 23.86; Dec. 7, 24.31.
92. Water levels, in feet, 1939: Mar. 9, 21.09; July 8, 21.72;  
Sept. 15, 22.95; Dec. 7, 22.31.
95. Water levels, in feet, 1939: Mar. 9, 24.40; July 8, a/;  
Sept. 15, 25.38; Dec. 7, 25.12.
108. Water levels, in feet, 1939: Mar. 9, 36.72; Sept. 15, 37.90;  
Dec. 7, 36.82.
116. Water level, in feet, 1939: Dec. 7, 23.79.
117. Water levels, in feet, 1939: Mar. 9, 35.91; July 8, 36.84;  
Sept. 15, 36.94; Dec. 7, 36.65.
120. Water levels, in feet, 1939: Sept. 15, 28.9; Dec. 7, 28.0.
124. No measurements made in 1939.
129. No measurements made in 1939.
130. Water levels, in feet, 1939: Mar. 9, 2.38; July 7, 3.27;  
Sept. 15, 3.59; Dec. 7, 3.08.
131. Water levels, in feet, 1939: Mar. 9, 22.21; July 7, 22.31;  
Sept. 15, a/; Dec. 7, 21.92.
132. Water levels, in feet, 1939: Mar. 9, 22.42; July 7, 23.46;  
Sept. 15, 23.14; Dec. 7, 22.97.
135. Water levels, in feet, 1939: Mar. 10, 16.72; July 7, 17.38;  
Sept. 15, 17.54; Dec. 7, 17.54.
136. Water levels, in feet, 1939: Mar. 10, 15.51; July 7, 17.12;  
Sept. 15, a/; Dec. 7, 16.27.
137. Water levels, in feet, 1939: Mar. 10, 3.73; July 7, 4.41;  
Dec. 7, 4.57.
141. Water levels, in feet, 1939: Mar. 10, 2.60; July 7, 3.16;  
Sept. 15, 3.20; Dec. 7, 3.39.
143. Water levels, in feet, 1939: Mar. 10, 0.42; July 7, a/;  
Sept. 15, 0.88; Dec. 7, 1.09.
152. No measurements made in 1939.
153. No measurements made in 1939.
156. No measurements made in 1939.
205. Water levels, in feet, 1939: Jan. 27, 54.91; July 8, 55.02;  
Oct. 12, 55.72.
207. Water level, in feet, 1939: Jan. 27, 94.63.
212. No measurements made in 1939.
225. No measurements made in 1939.
228. No measurements made in 1939.
235. No measurements made in 1939.

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a Pumping.

## Bailey County--Continued

238. No measurements made in 1939.
240. No measurements made in 1939.
322. Water level, in feet, 1939: Jan. 27, 79.77.
- 324A. Water levels, in feet, 1939: Jan. 27, 101.28; July 8, 101.27;  
Oct. 12, 101.17.
333. No measurements made in 1939.
355. No measurements made in 1939.
423. No measurements made in 1939.
427. No measurements made in 1939.
430. Water levels, in feet, 1939: Jan. 27, 84.55; July 8, 84.60;  
Oct. 12, 84.49.
435. Water levels, in feet, 1939: Jan. 27, 28.63; July 8, 28.76;  
Oct. 12, 28.46.

## Bastrop County

Well numbers correspond to those in Water-Supply Paper 840, p. 385,  
and Water-Supply Paper 845, p. 449.

1. Water levels, in feet, 1939: Feb. 1, 12.40; Apr. 1, 13.21;  
July 14, 14.83; Dec. 5, 16.08.
2. Water levels, in feet, 1939: Feb. 1, 7.44; Apr. 1, 7.25;  
July 14, 11.61; Dec. 5, 16.53.
3. Water levels, in feet, 1939: Feb. 1, 27.41; Apr. 1, 29.84;  
July 14, 32.06; Dec. 5, 31.59.
4. Water levels, in feet, 1939: Feb. 1, 28.67; Apr. 1, 28.83;  
July 14, 29.01; Dec. 5, 29.30.
5. Water levels, in feet, 1939: Feb. 1, 124.75; Apr. 1, 122.42;  
July 14, 129.90.
7. Water levels, in feet, 1939: Feb. 1, 9.09; Apr. 1, 9.70; July 14,  
10.40; Dec. 5, 11.00.
8. Water levels, in feet, 1939: Feb. 1, 56.34; Apr. 1, 58.96;  
July 14, 61.23; Dec. 5, 63.39.
9. Water levels, in feet, 1939: Feb. 1, 118.99; Apr. 1, 119.60;  
July 14, 119.80; Dec. 5, 119.77.

## Bexar County

Well numbers correspond to those in Water-Supply Paper 777, pp. 179-  
181; Water-Supply Paper 817, p. 322; Water-Supply Paper 840, pp. 385-6;  
Water-Supply Paper 845, pp. 450-451.

15.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 27	118.62	May 4	124.26	July 6	127.85	Sept. 16	126.38
Mar. 2	119.85	June 9	124.22	Aug. 17	125.62	Oct. 26	127.80
Apr. 3	121.53						

## Bexar County--Continued

26.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 27	102.60	May 4	108.91	July 6	112.49	Sept. 16	111.04
Mar. 2	104.35	June 9	108.62	Aug. 17	110.39	Oct. 26	112.34
Apr. 3	106.08						

28.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 27	62.97	Apr. 3	65.80	Aug. 17	70.20
Mar. 2	64.03	July 6	68.15	Sept. 16	70.44

XB-1.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 27	117.87	May 4	123.57	July 6	127.00	Sept. 16	125.40
Mar. 2	119.04	June 9	123.11	Aug. 17	125.56	Oct. 26	126.81
Apr. 3	120.80						

XB-2.

## Water level, in feet, 1939

Jan. 27	70.40	May 4	76.05	July 6	79.62	Sept. 16	78.38
Mar. 2	71.72	June 9	76.00	Aug. 17	77.32	Oct. 26	78.42
Apr. 3	73.37						

XB-3.

## Water level, in feet, 1939

Jan. 24	51.88	Mar. 29	53.81	May 25	56.88	Oct. 5	60.00
Feb. 28	52.97	Apr. 22	56.58	July 3	59.55	Dec. 19	58.57

XB-4. Water levels, in feet, 1939: May 25, 44.94; July 4, 46.10; Oct. 5, 46.46; Dec. 19, 44.83.

## Brazos County

Well numbers correspond to those in Water-Supply Papers 840, p. 386, and 845, p. 451.

7. Water levels, in feet, 1939: Feb. 3, 28.03; May 3, 28.32; July 17, 30.16; Dec. 7, 31.36.

9. Water levels, in feet, 1939: Feb. 3, 23.27; May 3, 23.98; July 17, 25.20; Dec. 7, 29.50.

## Brooks County

Well numbers correspond to those in Water-Supply Paper 777, pp. 183-7; Water-Supply Paper 840, pp. 386-7; Water-Supply Paper 845, pp. 451-2.

202. No measurements made in 1939.

254. Water levels, in feet, 1939: Apr. 10, 13.48; Oct. 9, 15.90.

266. Water levels, in feet, 1939: Apr. 10, 16.00; Oct. 9, 18.26.

270. Water levels, in feet, 1939: Apr. 10, 23.41; Oct. 7, 21.90.

272. No measurements made in 1939.

## Brooks County--Continued

273. Water levels, in feet, 1939: Apr. 10, 17.55; Oct. 10, 17.20.
322. No measurements made in 1939.
323. Water levels, in feet, 1939: Apr. 10, 14.78; Oct. 9, 15.10.
324. Water levels, in feet, 1939: Apr. 10, 16.10; Oct. 9, 17.50.
333. Water levels, in feet, 1939: Apr. 10, 13.55; Oct. 9, 13.72.
334. Water levels, in feet, 1939: Apr. 10, 14.52; Oct. 10, 14.68.
336. Water level, in feet, 1939: Apr. 10, 12.93.
337. Water levels, in feet, 1939: Apr. 8, 12.00; Oct. 9, 13.40.
340. Water levels, in feet, 1939: Apr. 8, 6.60; Oct. 9, 8.02.
390. Water levels, in feet, 1939: Apr. 10, 14.85; Oct. 7, 15.37.
397. Water levels, in feet, 1939: Apr. 10, 20.33; Oct. 7, 23.21.
399. No measurements made in 1939.
405. Water levels, in feet, 1939: Apr. 10, 22.28; Oct. 7, reset pump, no opening for tape.
474. No measurements made in 1939.
504. Water level, in feet, 1939: Apr. 10, a/; Oct. 7, 25.55.
505. Water levels, in feet, 1939: Apr. 10, 23.80; Oct. 7, 23.77.
821. Water level, in feet, 1939: Apr. 8, 68.01.
822. Water level, in feet, 1939: Apr. 8, 63.98.
865. Water levels, in feet, 1939: Apr. 8, 76.95; Oct. 9, 77.88.
872. Water level, in feet, 1939: Apr. 7, 43.94; Oct. 9 a/.
874. Water levels, in feet, 1939: Apr. 8, 42.20; Oct. 9, 47.43.
882. Water levels, in feet, 1939: Apr. 8, 85.18; Oct. 9, 86.25.
885. Water levels, in feet, 1939: Apr. 8, 70.93; Oct. 9, 72.10.
918. Water levels, in feet, 1939: Apr. 8, 41.35; Oct. 9, 43.25.
919. Water levels, in feet, 1939: Apr. 8, 42.71; Oct. 9, filled, measurements discontinued.
920. Water level, in feet, 1939: Apr. 8, 40.17.
921. Water levels, in feet, 1939: Apr. 8, 40.75; Oct. 9, 42.35.

## Burleson County

Well numbers correspond to those in Water-Supply Paper 845, p. 453; Burleson County, Texas, Records of Wells, etc., Works Progress Administration, Ground-Water Survey Project 3763, State Board of Water Engineers, 1937 (Mimeographed).

42. Well flowing Feb. 2, Apr. 2, July 15, Dec. 6, and Dec. 15.
43. Well flowing Feb. 2, Apr. 2, July 15, Dec. 6, and Dec. 15.
48. Water levels, in feet, 1939: May 2, 33.14; July 15, 32.52; Dec. 6, 32.51.
71. Water levels, in feet, 1939: May 2, 56.00; July 15, 55.92; Dec. 6, 56.03.

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a Pumping.

## Burleson County--Continued

75. Water levels, in feet, 1939: May 2, 45.18; July 15, 45.20; Dec. 6, 45.52.
114. Water levels, in feet, 1939: May 2, 14.33; July 15, 14.56; Dec. 6, 16.24.
115. Water levels, in feet, 1939: May 2, 82.78; Dec. 6, 81.57; Dec. 15, 79.21.
147. Water levels, in feet, 1939: Feb. 2, 29.14; May 2, 30.20; July 15, 31.02; Dec. 6, dry at 32 feet.

## Carson County

165A. ----- Along U. S. Highway 60, 3 miles southwest from Gray-Carson County line and 0.7 mile south and 0.25 mile west on north side of county road. Drilled well, diameter  $4\frac{1}{2}$  inches, depth 408 feet. Measuring point, top of casing, 2.5 feet above land surface. Equipped with windmill; seldom used. Water levels, in feet, 1939: Mar. 11, 332.44; July 1, 331.88.

174. B. N. Craig. SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 38, blk. 7. About  $9\frac{1}{2}$  miles northeast of Panhandle. Unused drilled well, diameter  $4\frac{1}{2}$  inches, depth 314 feet. Measuring point, top of casing, 1.3 feet above land surface. Equipped with windmill. Water levels, in feet: Oct. 10, 1938, 266.7; July 1, 1939, 269.65.

## Castro County

Well numbers correspond to those in Water-Supply Paper 840, pp. 387-8; Water-Supply Paper 845, pp. 454-5; Castro County, Texas, Records of Wells, etc., Work Projects Administration, Ground-Water Survey Project 12205, State Board of Water Engineers, 1939 (Mimeographed).

4. Water levels, in feet, 1939: Mar. 30, 104.10; June 27, 104.21; Sept. 14, a/.

8.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 3	74.95	June 29	75.61	Dec. 5	75.23
Mar. 3	74.55	Sept. 12	<u>a</u> 93.60		

12. Water levels, in feet, 1939: June 29, 100.80; Sept. 12, 101.02; Dec. 5, 101.08.

18. Water level, in feet, 1939: June 29, 68.35; Sept. 12, a/.

20. Water levels, in feet, 1939: Mar. 3, 72.05; June 29, 73.20; Dec. 5, 73.99.

31. Water levels, in feet, 1939: Mar. 4, 62.25; June 29, 63.88; Sept. 12, a/; Dec. 5, 63.70.

32. Water levels, in feet, 1939: Mar. 3, 63.71; June 29, 64.73; Sept. 12, 75.60; Dec. 5, 64.90.

36. Water levels, in feet, 1939: Mar. 3, 83.18; June 29, 87.56; Sept. 12, a/; Dec. 5, a/.

40.

## Water level, in feet, 1939

Jan. 3	64.17	June 29	66.54	Dec. 5	66.35
Mar. 3	64.03	Sept. 12	<u>a</u> 86.5		

a Pumping.

## Castro County--Continued

46. Water levels, in feet, 1939: Mar. 3, 74.44; June 29, 76.33; Sept. 12, 76.88; Dec. 5, 75.47.

48. Water levels, in feet, 1939: Mar. 3, 61.31; June 29, 63.66; Sept. 12, 74.73; Dec. 5, 79.16.

52. Water levels, in feet, 1939: June 29, 71.72; Sept. 12, 71.58; Dec. 5, 71.59.

53. Water levels, in feet, 1939: Mar. 3, 58.59; June 29, 60.07; Sept. 12, a/; Dec. 5, a/.

57.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 26	78.86	June 29	78.81	Dec. 5	78.95
Mar. 3	78.80	Sept. 12	78.88		

58.

## Water level, in feet, 1939

Jan. 26	154.37	June 29	154.0	Dec. 5	154.05
Mar. 3	154.21	Sept. 12	154.05		

201. Water levels, in feet, 1939: Jan. 26, 153.18; Mar. 1, 153.19; June 29, 153.02; Sept. 12, 153.10.

202. Water levels, in feet, 1939: Jan. 26, 105.35; Mar. 1, 105.33; June 29, 105.10; Sept. 12, 105.12.

203. Water levels, in feet, 1939: Jan. 26, 99.99; Mar. 1, 99.94; June 29, 99.83; Sept. 12, 99.78.

## Cherokee County

Well numbers correspond to those in Water-Supply Paper 840, pp. 388-9; Water-Supply Paper 845, pp. 455-6; Cherokee County, Texas, Records of Wells, etc., Works Progress Administration, Ground-Water Survey Project 2074, State Board of Water Engineers, 1936 (Mimeographed).

22. Water levels, in feet, 1939: Feb. 6, 5.43; May 4, 8.30; July 18, 8.77; Dec. 9, 12.16.

27. Water levels, in feet, 1939: Feb. 6, 15.42; May 4, 30.50; July 18, 33.49; Dec. 9, 29.95.

158. Water levels, in feet, 1939: Feb. 6, 11.42; May 4, 12.00; July 18, 12.54; Dec. 9, 16.44.

159. Water levels, in feet, 1939: Feb. 6, 25.94; May 4, 26.00; July 18, 26.38; Dec. 9, 30.85.

179. Water levels, in feet, 1939: Feb. 6, 12.94; May 4, 13.90; July 18, 13.89; Dec. 9, 14.52.

186. Water levels, in feet, 1939: Feb. 6, 27.73; May 4, 25.54; July 18, 26.60; Dec. 9, 28.79.

236. Water level, in feet, 1939: Feb. 10, 24.91. Measurements discontinued.

365. Water levels, in feet, 1939: Feb. 10, 36.12; May 8, 35.90; July 21, 36.03; Dec. 14, 36.43.

418. Water levels, in feet, 1939: Feb. 10, 21.15; May 8, 22.10; July 21, 22.72; Dec. 14, 25.34.

a Pumping.



## Cherokee County--Continued

422. Water level, in feet, 1939: Feb. 10, 24.47. Measurements discontinued.

622. Water levels, in feet, 1939: Feb. 10, 13.28; May 8, 15.60; July 21, 17.22; Dec. 14, 19.08.

690. Water levels, in feet, 1939: Feb. 10, 7.78; May 8, 8.80; July 21, 10.21; Dec. 13, 9.59.

694. Water levels, in feet, 1939: Feb. 10, 20.58; May 8, 20.30; July 21, 20.60; Dec. 13, 21.77.

707. Water levels, in feet, 1939: Feb. 10, 32.22; May 8, 32.35; July 21, 32.40; Dec. 13, 32.75.

## Cochran County

Well numbers correspond to those in Water-Supply Paper 840, p. 390; Water-Supply Paper 845, p. 456.

1. Water levels, in feet, 1939: Feb. 6, 151.34; Mar. 14, 151.39; July 8, 151.32; Oct. 12, a/.

3. Water levels, in feet, 1939: Feb. 6, 154.60; July 8, 154.73; Oct. 12, 154.53.

4. Water levels, in feet, 1939: Feb. 6, 130.18; July 8, 130.33; Oct. 12, filled to 130 feet below measuring point.

5. Water levels, in feet, 1939: July 8, 126.88; Oct. 12, 126.76.

6. Water levels, in feet, 1939: July 8, 127.54; Oct. 12, 127.60.

7. Water levels, in feet, 1939: Jan. 27, 97.98; July 8, 98.38; Oct. 12, filled to 72 feet below measuring point.

8. Water levels, in feet, 1939: Jan. 27, 104.45; July 8, 104.81; Oct. 12, 104.81.

10. Water levels, in feet, 1939: Jan. 27, 95.06; Oct. 12, 95.02.

11. Water levels, in feet, 1939: Jan. 27, 83.39; Oct. 12, 83.01.

## Comal County

Well numbers correspond to those in Water-Supply Paper 840, pp. 391-2; Water-Supply Paper 845, pp. 457-8; Comal County, Texas, Records of Wells, etc., Works Progress Administration, Ground-Water Survey Project 2084, State Board of Water Engineers, 1937 (Mimeographed).

117. Alfred Beierle. About  $3\frac{1}{2}$  miles from Spring Branch, Elias Flint Survey. Used domestic and stock drilled well, diameter 6 inches, depth 157 feet. Measuring point, top of casing, at land surface and 1,006.57 feet above mean sea level. Water levels, in feet: Nov. 20, 1936, 119.1; Oct. 11, 1939, 124.98; Dec. 19, 132.68.

118. Henry Jonas Estate. About 3 miles northwest Smithson Valley, A. H. Jonas survey 78. Used domestic and stock drilled well, diameter 6 inches, depth 108 feet. Measuring point, top of steel casing, 0.55 foot above land surface and 1,016.65 feet above mean sea level. Water levels, in feet: Jan. 26, 1937, 93.5; Oct. 11, 1939, 93.50; Dec. 19, 93.52.

119. John Strieker. About 4 miles southeast of Spring Branch. Used domestic and stock drilled well, diameter 6 inches, depth 250 feet. Measuring point, top of concrete curbing, 1.24 feet above land surface and 1,031.88 feet above mean sea level. Water levels, in feet: Nov. 19, 1936, 166.9; Oct. 11, 1939, 172.67; Dec. 19, 173.33.

120. S. L. Gill. William Strawn survey 74, 2 miles south of Spring Branch. Used domestic and stock drilled well, diameter 6 inches, depth 280 feet. Measuring point, top of steel casing, 0.82 foot above land surface and 1,030.14 feet above mean sea level. Water levels, in feet: Nov. 16, 1936, 74.9; Oct. 12, 1939, 78.57; Dec. 19, 78.93.

a Pumping.

## Comal County--Continued

131. J. J. Arrechea. Theo. Hanz Survey 725,  $5\frac{1}{2}$  miles south of Spring Branch. Used domestic and stock drilled well, diameter 6 inches, depth 300 feet. Measuring point, top of steel casing, 1.02 feet above land surface and 1,205.97 feet above mean sea level. Water levels, in feet: Nov. 16, 1936, 117.8; Oct. 12, 1939, 119.26, Dec. 19, a/.
155. George Fronne. Aga. Hara Survey, 6 miles north of Bulverde. Used domestic and stock drilled well, diameter 6 inches, depth 145 feet. Measuring point, top of wooden block, 0.68 foot above land surface and 1,242.14 feet above mean sea level. Water levels, in feet: Dec. 10, 1936, 83.7; Oct. 12, 1939, 116.55; Dec. 9, 116.59.
171. Mrs Mattie Shelburne. About 3 miles northeast of Bulverde, C. George Survey 432. Used domestic drilled well, diameter 8 inches, depth 246 feet. Measuring point, top of casing, 0.5 foot above land surface and 1,157.44 feet above mean sea level. Water levels, in feet: Nov. 16, 1936, 228.9; Oct. 12, 1939, 238.66; Dec. 19, 238.94.
183. August Wehe. At town of Bulverde, G. Herrera Survey 192. Used domestic and stock drilled well, diameter 6 inches, depth 375 feet. Measuring point, top of hand-hewn 6 by 6-inch wood runners, 0.5 foot above land surface and 1,096.71 feet above mean sea level. Water levels, in feet: Nov. 12, 1936, 218.00; Oct. 11, 1939, 286.54; Dec. 19, a/.
184. Charles Willig. About  $1\frac{1}{2}$  miles east of Bulverde, A Gayton Survey 194. Used domestic and stock drilled well, diameter 6 inches, depth 300 feet. Measuring point, top of iron pipe clamp, 1.0 foot above land surface and 1,053.40 feet above mean sea level. Water levels, in feet: Nov. 12, 1936, 214.10; Oct. 11, 1939, 223.09; Dec. 19, 223.35.
193. W. B. Ethridge. About  $5\frac{1}{2}$  miles east of Bulverde, Anna Vecker Survey 678. Used domestic and stock drilled well, diameter 6 inches, depth 200 feet. Measuring point, top of casing, 0.2 foot above land surface and 956.14 feet above mean sea level. Water levels, in feet: Nov. 12, 1936, 153.9; Oct. 12, 1939, 226.75; Dec. 19, 224.95.
221. Albert Simon. About 4 miles north of New Braunfels, Juan M. de Veramendi Survey. Drilled well, diameter 6 inches, depth 186 feet. Measuring point, top of iron pipe clamp 1.0 foot above land surface and 793.99 feet above mean sea level. Water levels, in feet: Nov. 3, 1936, 171; Dec. 19, 1939, 170.46.
222. William Kraft. About 4 miles northwest of New Braunfels, Juan M. de Veramendi Survey. Used domestic and stock drilled well, diameter 6 inches, depth 190 feet. Measuring point, top of iron pipe clamp, 0.5 foot above land surface and 807.00 feet above mean sea level. Water levels, in feet: Oct. 28, 1936, 161.5; Dec. 19, 1939, 183.00.
223. Albert Kraft. About  $4\frac{1}{2}$  miles northwest of New Braunfels, I. Miller Survey 266. Used domestic and stock drilled well, diameter 6 inches, depth 320 feet. Measuring point, top of iron pipe clamp, 0.9 foot above land surface and 840.97 feet above mean sea level. Water levels, in feet: Dec. 21, 1936, 212; Dec. 19, 1939, 214.93.
225. W. H. Harborth Estate. About 4 miles northwest of New Braunfels, E. Hernandez Survey 454. Used domestic, stock, and irrigation drilled well, diameter 6 inches, depth 265 feet. Measuring point, top of iron pipe clamp, 1.1 feet above land surface and 810.15 feet above mean sea level. Water levels, in feet: Oct. 23, 1936, 188.1; Dec. 18, 1939, 183.71.
226. Henry Heise. About 5 miles north of New Braunfels, E. Hernandez Survey 454. Used domestic and stock drilled well, diameter 6 inches, depth 290 feet. Measuring point, top of steel pipe clamp 0.59 foot above land surface and 879.09 feet above mean sea level. Water levels, in feet: Dec. 21, 1936, 259.7; Oct. 9, 1939, 261.90; Dec. 18, 250.08.
232. A. J. Caldwell. About 8 miles northwest of New Braunfels, on H. Adams Survey 652. Used domestic and stock drilled well, diameter 6 inches, depth 250 feet. Measuring point, top of iron pipe clamp, 0.4 foot above land surface and 942.19 feet above mean sea level. Water levels, in feet: Jan. 1, 1937, 189.15; Oct. 10, 1939, 172.29; Dec. 19, a/.

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a Pumping.

## Comal County--Continued

263A. Alfred Kappelmacher. About 3-3/4 miles northwest of New Braunfels, at Junction Bulverde and Spring Branch Highways. Unused drilled well, diameter 8 1/4 inches, depth 300 feet. Measuring point, top of casing, 0.7 foot above land surface and 862.38 feet above mean sea level. Water levels, in feet, 1939: Oct. 10, 233.79; Dec. 18, 234.50.

271. Measuring point, 701.24 feet above mean sea level.  
Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 24	90.73	Mar. 28	90.82	May 26	91.55	Oct. 4	93.21
Feb. 28	90.80	Apr. 23	91.05	July 3	91.38	Dec. 18	92.42

274. Measuring point, 759.31 feet above mean sea level.

Water level, in feet, 1939

Jan. 24	152.83	Apr. 23	153.75	Oct. 4	154.73	Dec. 18	158.42
Feb. 28	155.21	May 26	153.86	Dec. 18	159.98	18	157.02
Mar. 28	153.91	July 3	153.50				

278. Measuring point, 753.31 feet above mean sea level.

Water level, in feet, 1939

Jan. 24	149.60	Mar. 28	150.02	May 26	150.60	Oct. 5	151.94
Feb. 28	149.60	Apr. 22	150.29	July 3	150.98	Dec. 18	169.00

281. Measurements discontinued Dec. 1, 1939.

Water level, in feet, 1939

Jan. 25	98.42	Mar. 28	155.20	May 26	79.59	Oct. 4	150.93
Feb. 28	55.27	Apr. 23	169.56	July 3	170.00		

291. Measuring point, 673.32 feet above mean sea level.

Water level, in feet, 1939

Jan. 24	54.17	Apr. 23	54.79	July 3	56.16	Dec. 18	55.96
Feb. 28	54.41	26	55.04	Oct. 5	55.80	18	55.93
Mar. 28	54.52						

320. Measurements discontinued Dec. 1, 1939.

Water level, in feet, 1939

Jan. 24	70.84	Mar. 28	74.18	May 25	167.5	July 3	229.45
Feb. 28	71.64	Apr. 23	205+	26	163.73	Oct. 5	164.50

326. Measuring point, 685.55 feet above mean sea level.

Water level, in feet, 1939

Jan. 24	34.55	Mar. 28	35.39	May 26	37.88	Oct. 5	39.67
Feb. 28	35.98	Apr. 23	36.77	July 3	39.75	Dec. 19	(a)

336. Measuring point, 728.87 feet above mean sea level.

Water level, in feet, 1939

Jan. 24	83.94	Mar. 28	84.00	May 26	85.68	Oct. 5	87.34
Feb. 28	83.40	Apr. 22	84.92	July 3	87.70	Dec. 19	86.79

373. Measuring point, 662.95 feet above mean sea level.

Water level, in feet, 1939

Jan. 25	23.37	Mar. 28	23.57	May 26	25.40	Oct. 5	26.63
Feb. 28	28.54	Apr. 23	24.91	July 3	26.15	Dec. 19	(a)

383. Measurements discontinued Aug. 1, 1939.

Water level, in feet, 1939

Jan. 25	162.05	Mar. 28	(a)	May 26	166.83	July 3	(a)
Feb. 28	(a)	Apr. 23	182.02				

a Pumping.

## Comal County--Continued

397.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 24	181.57	Mar. 28	182.20	May 25	184.55	Oct. 5	188.88
Feb. 28	181.98	Apr. 22	183.46	July 4	184.85	Dec. 19	186.60

399. Measuring point, 784.57 feet above mean sea level.

## Water level, in feet, 1939

Jan. 25	174.09	Mar. 29	(a)	May 26	175.06	Dec. 20	176.84
Mar. 1	170.00	Apr. 22	174.78	July 3	175.48		

## Crosby County

Well numbers correspond to those in Water-Supply Paper 840, pp. 392-3; Water-Supply Paper 845, p. 458; Crosby County, Texas, Records of Wells, etc., Work Projects Administration, Ground-Water Survey Project 10780, State Board of Water Engineers, 1939 (Mimeographed).

1. Water levels, in feet, 1939: Feb. 6, 114.34; Mar. 8, 114.16; Sept. 30, 114.29; Dec. 17, 114.12.

2. Water levels, in feet, 1939: Feb. 6, 107.00; Mar. 8, 107.10; Sept. 30, 107.20; Dec. 17, 107.00.

3. Water levels, in feet, 1939: Sept. 30, 136.26; Dec. 17, 135.73.

4.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 6	120.30	June 23	120.43	Dec. 17	120.10
Mar. 8	120.37	Sept. 30	120.42		

5. No measurements made in 1939.

6. Water levels, in feet, 1939: Sept. 30, 118.85; Dec. 17, 118.51.

7.

## Water level, in feet, 1939

Feb. 6	94.79	June 23	95.16	Dec. 17	95.20
Mar. 9	94.92	Sept. 30	95.50		

8. No measurements made in 1939.

9.

## Water level, in feet, 1939

Feb. 6	79.58	June 23	80.76	Dec. 17	80.33
Mar. 9	79.61	Sept. 30	80.46		

46. J. R. Noble. SW $\frac{1}{4}$ SW $\frac{1}{4}$  J. F. Littlefield survey, just north of Cone Public School, 13 miles northwest of Crosbyton. Unused drilled well, depth 137 feet. Measuring point, top of steel barrel cover plate, 0.2 foot above land surface. Equipped with windmill.

## Water level, in feet, 1938-39

June 14, 1938	110.78	Feb. 6, 1939	111.10	Sept. 30, 1939	111.19
Aug. 9	110.93	Mar. 8	111.08	Dec. 17	111.10
Oct. 18	110.97	June 23	111.10		

a Pumping.

## Crosby County--Continued

337. W. E. McLaughlin. NW cor. NE $\frac{1}{4}$  sec. 925, blk. C-3, 14 $\frac{1}{2}$  miles west of Crosbyton. Unused drilled well, diameter 5 inches, depth 100 feet. Measuring point, top of concrete curb, 0.1 foot above land surface.

Water level, in feet, 1938-39

Date	Water level	Date	Water level	Date	Water level
Sept. 30, 1938	88.82	Mar. 9, 1939	89.14	Dec. 17, 1939	88.92
Feb. 6, 1939	88.83	June 23	88.74		

338. W. E. McLaughlin. NW cor. NW $\frac{1}{4}$  sec. 925, blk. C-3, 15 miles west of Crosbyton. Unused drilled well, diameter 5 inches, depth 105 feet. Measuring point, top of wood water pipe clamp, 0.4 foot above land surface. Equipped with windmill.

Water level, in feet, 1938-39

June 14, 1938	90.16	Mar. 9, 1939	90.11	Sept. 30, 1939	89.99
Sept. 30	90.10	June 23	90.02	Dec. 17	89.97
Feb. 6, 1939	90.08				

## Dallam County

Well numbers correspond to those in Water-Supply Paper 840, pp. 393-5; Water-Supply Paper 845, pp. 459-60; Dallam County, Texas, Records of Wells, etc., Works Progress Administration, Ground-Water Survey Project 6007-5071, State Board of Water Engineers, 1937 (Mimeographed).

14.

Water level, in feet, 1939

Jan. 1	36.00	Mar. 9	35.80	May 8	35.71
Feb. 10	35.85	Apr. 8	35.78	June 19	35.80

16. M. E. Hay (Willis). SW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 71, M. E. Hay subdivision, 6 $\frac{1}{2}$  miles east of Texline. Drilled well, diameter 6 inches, depth 40 feet. Measuring point, top of concrete curb at west side, 1.0 foot above land surface. Equipped with windmill; seldom used.

Water level, in feet, 1937-39

Jan. 11, 1937	33.00	May 8, 1939	32.18	Sept. 6, 1939	32.26
Dec. 1, 1938	32.50	June 19	32.11	Oct. 29	32.70
Mar. 9, 1939	32.22	July 8	32.30	Nov. 17	32.34
Apr. 8	32.21	Aug. 5	32.40	Dec. 16	31.65

19. B. M. Hay. SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 60, M. E. Hay subdivision, 5 miles east of Texline. Drilled well, diameter 5 inches, depth 60 feet. Measuring point, top of casing at north side, 1.5 feet above land surface. Equipped with windmill.

Water level, in feet, 1937, 1939

Jan. 11, 1937	64.26	May 8, 1939	62.62	Oct. 29, 1939	62.78
Jan. 1, 1939	61.76	July 8	62.50	Nov. 17	61.07
Mar. 9	61.64	Aug. 5	63.16	Dec. 16	61.54
Apr. 8	61.49	Sept. 6	62.89		

20. J. C. Doss. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 69, M. E. Hay subdivision, 4-3/4 miles northeast of Texline. Drilled well, diameter 6 inches, depth 65 feet. Measuring point, top of 4 by 6-inch wood water pipe clamp at west side, 0.3 foot above land surface. Equipped with windmill.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 1	62.75	May 8	62.23	Aug. 5	62.00	Nov. 17	61.89
Mar. 9	62.21	June 19	61.93	Sept. 6	61.98	Dec. 16	62.00
Apr. 8	61.95	July 8	61.99	Oct. 29	62.12		

## Dallam County--Continued

21. Mrs. S. H. Madden. SW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 70, M. E. Hay subdivision, 5 miles east of Texline. Drilled well, diameter 5 inches, depth 82 feet. Measuring point, top of casing, 5 feet above land surface. Equipped with windmill.

## Water level, in feet, 1937, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 11, 1937	67.04	May 8, 1939	66.89	Sept. 6, 1939	72.11
Jan. 1, 1939	67.00	June 19	69.80	Oct. 29	68.02
Mar. 9	66.90	July 8	69.75	Nov. 17	66.58
Apr. 8	66.96	Aug. 5	70.70	Dec. 16	66.80

36A. Art Decker. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 1, blk. 2, 8 $\frac{1}{2}$  miles northeast of Texline. Drilled well. Measuring point, top of concrete slab, 0.5 foot above land surface. Equipped with hand pump.

## Water level, in feet, 1939

June 15	41.1	Sept. 6	41.5	Nov. 17	41.21
Aug. 5	41.4	Oct. 29	41.17	Dec. 16	41.20

41. No measurements made in 1939.

42. T. L. Thompson. SW $\frac{1}{4}$  sec. 5, blk. 3, 12 $\frac{1}{2}$  miles east of Texline, home well. Drilled well, diameter 4 inches, depth 40 feet. Measuring point, top of casing, 0.7 foot above land surface. Equipped with windmill.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 9	11.10	June 19	11.40	Sept. 6	13.60	Nov. 17	12.76
Apr. 8	10.73	July 10	11.85	Oct. 27	13.05	Dec. 16	12.35
May 8	11.06	Aug. 5	12.87				

49.

## Water level, in feet, 1939

Mar. 9	19.50	June 19	19.60	Sept. 6	20.11	Nov. 17	20.12
Apr. 8	19.40	July 8	19.63	Oct. 27	20.24	Dec. 16	20.00
May 8	19.33	Aug. 5	19.94				

52. Daniel Siedel. SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 5, blk. 2, 8 miles east of Texline. Drilled well, diameter 6 inches, depth 86 feet. Measuring point, top of 5 by 5-inch wood water pipe clamp, 1.5 feet above land surface.

## Water level, in feet, 1936, 1938-39

Date	Water level	Date	Water level	Date	Water level
Dec. 23, 1936	37.85	May 8, 1939	39.16	Sept. 6, 1939	39.50
Dec. 1, 1938	38.25	June 19	39.12	Oct. 29	39.42
Mar. 9, 1939	38.25	July 8	39.71	Nov. 17	39.27
Apr. 8	37.79	Aug. 5	40.48	Dec. 16	39.55

57.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 1	25.04	Apr. 8	25.79	July 8	25.16	Oct. 27	25.73
Feb. 10	25.01	May 8	24.72	Aug. 5	25.35	Nov. 17	26.08
Mar. 9	24.90	June 19	24.91	Sept. 6	25.60	Dec. 16	25.82

59. No measurements made in 1939.

60.

## Water level, in feet, 1939

Feb. 10	71.27	May 8	71.28	Aug. 5	71.33	Nov. 17	71.44
Mar. 9	71.29	June 19	71.29	Sept. 6	71.40	Dec. 16	71.50
Apr. 8	71.32	July 10	71.29	Oct. 27	71.47		

## Dallam County--Continued

61. Water levels, in feet, 1939: Feb. 10, 25.40; Mar. 9, 25.37; June 29, 25.32; Dec. 20, 25.75.

63. No measurements made in 1939.

64. No measurements made in 1939.

65. Water level, in feet, 1939: Feb. 10, 17.74.

67. A. A. R. Pope. NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 4, blk. 4, 13 miles east of Texline. Dug and drilled irrigation well. Measuring point, top of concrete curb at center of north side, level with land surface.  
Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 4	17.73	Apr. 8	17.00	July 10	17.42	Oct. 27	18.86
Feb. 10	17.36	May 8	16.77	Aug. 5	18.10	Nov. 17	18.65
Mar. 9	17.23	June 19	17.05	Sept. 6	18.85	Dec. 16	18.36

68. No measurements made in 1939.

70. Measurements discontinued Oct. 27, 1939.

Water level, in feet, 1939

Jan. 1	25.27	Apr. 8	24.64	June 19	24.85	Aug. 5	25.04
Feb. 10	24.90	May 8	24.62	July 8	25.00	Sept. 6	25.29
Mar. 9	24.74						

72.

Water level, in feet, 1939

Feb. 10	35.28	May 8	35.14	July 8	35.58	Oct. 27	36.50
Mar. 9	35.20	June 19	35.38	Aug. 5	35.92	Nov. 17	36.68
Apr. 8	35.15	29	(a)	Sept. 6	36.02	Dec. 16	36.48

73.

Water level, in feet, 1939

Feb. 10	38.50	May 8	38.45	Aug. 5	39.38	Nov. 17	40.10
Mar. 9	38.47	June 19	38.84	Sept. 6	39.43	Dec. 16	39.48
Apr. 8	38.44	July 8	38.96	Oct. 27	39.47		

95. Water level, in feet, 1939: Mar. 9, 107.80.

98. Water level, in feet, 1939: Mar. 9, 23.49; Dec. 20, 24.96.

106. No measurements made in 1939.

108. No measurements made in 1939.

122. Water levels, in feet, 1939: Feb. 10, 43.46; Mar. 9, 43.38; June 29, 43.51; Dec. 20, 43.62.

126. Water levels, in feet, 1939: Feb. 10, 18.26; Mar. 9, 18.26; June 29, 18.37; Dec. 20, 19.24.

130. Water levels, in feet, 1939: Feb. 10, 16.71; Mar. 9, 16.56; June 29, 17.12; Dec. 20, 17.54.

152. C. O. Hawk. NW cor. sec. 57, blk. 8, 16 $\frac{1}{2}$  miles southeast of Texline. Drilled well, diameter 4 $\frac{1}{2}$  inches, depth 250 feet. Measuring point, top of casing, 1.0 foot above land surface. Equipped with windmill; seldom used. Water levels, in feet: Mar. 9, 1937, 247.82; Mar. 8, 1939, 247.52; June 29, 1939, 247.44; Dec. 20, 1939, 247.01.

158. Water levels, in feet, 1939: Mar. 9, 72.82; June 29, 72.60; Dec. 20, a/.

159. Water levels, in feet, 1939: Mar. 8, 67.90; June 29, 68.37; Dec. 20, 68.24.

a Pumping.

## WATER LEVELS AND ARTESIAN PRESSURE, 1939

## Dallam County--Continued

234. Water levels, in feet, 1939: Mar. 8, 275.53; June 29, 275.62; Dec. 20, 275.17.
241. Water levels, in feet, 1939: Feb. 10, 51.53; Mar. 9, 51.51; June 29, 51.52; Dec. 20, 51.50.
243. A. P. Epp. SE cor. sec. 2, Blk. 18, 28 miles north of Dalhart. Unused drilled well, diameter  $4\frac{1}{2}$  inches, depth 64 feet. Measuring point, top of casing, 1.5 feet above land surface. Equipped with windmill. Water levels, in feet: Mar. 10, 1937, 35.20; Nov. 12, 1938, 34.85; June 29, 1939, 34.76; Dec. 20, 1939, 34.88.
248. Water levels, in feet, 1939: Feb. 10, 15.95; Mar. 9, 15.90; June 29, filled.
289. Water levels, in feet, 1939: Feb. 10, 157.03; Dec. 20, 156.40.
319. Water level, in feet, 1939: Dec. 21, 257.74.
367. Water levels, in feet, 1939: Feb. 10, 261.85; Mar. 9, 261.47; June 29, 261.56; Dec. 20, 261.83.
376. No measurements made in 1939.
377. E. Ashby. NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 3, blk. 2, 8 $\frac{1}{2}$  miles northwest of Dalhart. Drilled well, diameter 5 inches, depth 214 feet. Measuring point, top of casing, 2.0 foot above land surface. Equipped with windmill. Water levels, in feet: Feb. 24, 1937, 211.62; Mar. 8, 1939, 207.28; June 29, 1939, 207.41; Dec. 20, 1939, a/.
384. Water levels, in feet, 1939: Mar. 8, 200.10; June 29, 200.23; Dec. 20, 199.84.
386. Water levels, in feet, 1939: Mar. 8, 220.32; June 29, 221.66; Dec. 20, a/.

## Dawson County

Well numbers correspond to those in Water-Supply Paper 840, pp. 395-7; Water-Supply Paper 845, pp. 460-1.

601. Water level, in feet, 1939: Aug. 10, 106.50.
602. Water levels, in feet, 1939: Jan. 23, 90.13; Aug. 10, 89.88.
603. No measurements made in 1939.
606. Water level, in feet, 1939: Jan. 23, 104.5.
607. Water levels, in feet, 1939: Jan. 23, 87.32; Aug. 10, 87.91.
611. Water levels, in feet, 1939: Jan. 23, 50.79; Aug. 10, 48.14.
612. Water levels, in feet, 1939: Jan. 23, 79.08; Aug. 10, 78.81.
614. Water levels, in feet, 1939: Jan. 23, 47.12; Aug. 10, 47.50.
702. Water levels, in feet, 1939: Jan. 23, 99.70.
705. No measurements made in 1939.
707. Water levels, in feet, 1939: Jan. 23, 85.37; Aug. 10, 85.18.
708. Water levels, in feet, 1939: Jan. 23, 133.23; Aug. 10, 132.87.
709. Water level, in feet, 1939: Jan. 23, 66.84.
710. Water levels, in feet, 1939: Jan. 23, 53.34; Aug. 10, 52.11.
711. Water level, in feet, 1939: Jan. 23, 83.0.

a Pumping.



## Dawson County--Continued

713. No measurements made in 1939.
714. Water levels, in feet, 1939: Jan. 23, 72.48; Aug. 10, 72.20.
716. No measurements made in 1939.
718. Water levels, in feet, 1939: Jan. 23, 91.18; Aug. 10, 91.0.
719. No measurements made in 1939.
720. Water levels, in feet, 1939: Jan. 23, 102.50; Aug. 10, 101.24.

## Deaf Smith County

Well numbers correspond to those in Water-Supply Paper 840, pp. 398-403; Water-Supply Paper 845, pp. 461-8; Deaf Smith County, Texas, Records of Wells, etc., State Board of Water Engineers, in cooperation with United States Department of the Interior, Geological Survey, 1938 (Mimeographed).

51. Water levels, in feet, 1939: Mar. 20, 127.86; June 28, 127.89; Sept. 29, 127.45.
53. Water levels, in feet, 1939: Mar. 20, 143.58; June 28, 143.68; Sept. 29, 143.62.
54. Water levels, in feet, 1939: Mar. 20, 162.94; June 28, 162.26; Sept. 29, 160.12.
113. Water levels, in feet, 1939: Mar. 20, 98.78; Sept. 13, 98.67; Dec. 6, 98.65.
127. Water levels, in feet, 1939: Mar. 20, 73.84; June 28, 74.06; Sept. 29, 74.08; Dec. 6, 74.19.
128. Water levels, in feet, 1939: Mar. 20, 24.77; June 28, 24.43; Sept. 29, 25.18; Dec. 6, 25.34.
144. Water levels, in feet, 1939: Mar. 20, 158.46; June 28, 158.48; Sept. 29, filled.
148. Water level, in feet, 1939: Mar. 20, 123.91.
150. Water levels, in feet, 1939: Mar. 20, 96.47; June 28, 96.33; Sept. 13, 96.51; Dec. 5, 96.63.
201. No measurements made in 1939.
205. No measurements made in 1939.
207. Water levels, in feet, 1939: Mar. 20, 54.53; June 28, 55.27; Sept. 13, 57.15; Dec. 5, 55.13.
212. Water levels, in feet, 1939: Mar. 20, 71.68; June 28, 75.71; Sept. 13, a/; Dec. 6, 75.60.
216. Water levels, in feet, 1939: Sept. 13, 70.13; Dec. 6, 68.73.
217. Water levels, in feet, 1939: Mar. 20, 88.87; June 28, 92.10; Sept. 13, a/; Dec. 6, 93.65.
219. Water levels, in feet, 1939: Mar. 20, 75.54; Sept. 13, 83.52; Dec. 6, a/.
220. Water levels, in feet, 1939: Mar. 20, 84.58; June 28, a/; Sept. 13, a/; Dec. 6, 87.45.
224. Water levels, in feet, 1939: Mar. 20, 58.28; June 28, 61.07; Sept. 13, 58.28; Dec. 6, 57.68.
226. Water levels, in feet, 1939: June 28, 51.33; Sept. 13, a/; Dec. 6, a/.

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a Pumping.

## Deaf Smith County--Continued

230. Water levels, in feet, 1939: Mar. 21, 45.21; June 28, 47.92; Sept. 13, 49.61; Dec. 6, 48.49.
234. Water levels, in feet, 1939: Mar. 20, 51.23; June 29, 51.70; Sept. 13, 52.13; Dec. 6, a/.
235. Water levels, in feet, 1939: Mar. 21, 53.12; June 28, 53.85; Sept. 13, 56.00; Dec. 6, 53.96.
236. Water levels, in feet, 1939: Mar. 21, 47.58; June 28, 47.82; Sept. 13, 48.15; Dec. 5, 48.13.
237. Water levels, in feet, 1939: Mar. 21, 44.10; June 28, 45.71; Sept. 13, a/; Dec. 6, a/.
241. Water levels, in feet, 1939: Mar. 21, 47.20; Sept. 13, 47.50; Dec. 6, 47.51.
242. Water levels, in feet, 1939: June 28, 50.58; Sept. 13, 50.60; Dec. 5, 50.55.
245. Water levels, in feet, 1939: Mar. 21, 44.08; June 28, 44.41; Sept. 13, 44.54; Dec. 5, 44.76.
247. Water levels, in feet, 1939: Mar. 20, 22.57; June 28, 23.32; Sept. 13, a/; Dec. 5, 23.65.
248. Water levels, in feet, 1939: Mar. 20, 44.78, June 28, 45.06; Sept. 13, 45.23; Dec. 5, 45.41.
251. Water levels, in feet, 1939: Mar. 20, 48.31; June 28, 49.11; Sept. 13, 59.58; Dec. 5, 58.60.
258. Water levels, in feet, 1939: Mar. 21, 53.77; June 27, 54.51; Sept. 13, 59.59; Dec. 5, 55.40.
260. Water levels, in feet, 1939: Mar. 21, 56.03; June 27, 56.82; Sept. 13, b/; Dec. 5, b/.
261. Water levels, in feet, 1939: Mar. 21, 51.02; June 27, 53.78; Sept. 13, a/; Dec. 5, 53.14.
264. Water levels, in feet, 1939: Mar. 21, 48.97; June 27, 49.06; Sept. 13, 49.87; Dec. 5, c/.
265. Water levels, in feet, 1939: Mar. 21, 64.08; June 27, 64.71; Sept. 13, a/; Dec. 5, 66.68.
272. Water levels, in feet, 1939: Mar. 21, 68.11; June 28, 69.45; Sept. 13, 72.75; Dec. 6, 69.95.
276. Water levels, in feet, 1939: Mar. 20, 38.12; June 28, 38.67; Sept. 13, 39.41; Dec. 6, 39.75.
277. Water levels, in feet, 1939: Mar. 20, 22.03; June 28, 23.53; Sept. 13, 24.08; Dec. 6, 24.25.
278. Water levels, in feet, 1939: Mar. 20, 71.51; June 28, 71.27; Sept. 13, d/; Dec. 6, d/.
281. Water levels, in feet, 1939: Mar. 21, 65.48; June 27, 66.97; Sept. 13, 71.81.
283. Water level, in feet, 1939: Mar. 30, 63.38; Sept. 13, a/.
288. Water levels, in feet, 1939: Mar. 21, 61.92; June 27, 68.20; Sept. 13, a/; Dec. 5, a/.
291. Water levels, in feet, 1939: Mar. 21, 55.19; June 27, 55.92; Sept. 13, 56.60; Dec. 5, 56.10.

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- a Pumping.  
 b Dry, 57 feet below measuring point.  
 c Dry, 50 feet below measuring point.  
 d Dry, 71 feet below measuring point.

## Deaf Smith County--Continued

299. No measurements made in 1939.
300. Water levels, in feet, 1939: Mar. 20, 47.87; June 23, 47.73;  
Sept. 13, 48.45; Dec. 5, 48.71.
301. Water levels, in feet, 1939: Mar. 20, 47.28; June 23, a/  
Sept. 13, a/  
Dec. 5, 48.37.
302. Water levels, in feet, 1939: Mar. 21, 53.12; June 23, 54.86;  
Sept. 13, a/  
Dec. 5, 54.81.
308. Water levels, in feet, 1939: Mar. 20, 49.08; June 23, 49.28;  
Sept. 12, 49.75; Dec. 5, 50.03.
311. Water levels, in feet, 1939: Mar. 21, 50.46; June 29, a/  
Sept. 12, 59.43; Dec. 5, 52.38.
315. Water levels, in feet, 1939: Mar. 21, 55.51; June 29, 56.60;  
Sept. 12, 61.96; Dec. 5, 56.19.
317. Water levels, in feet, 1939: Mar. 21, 64.10; Dec. 5, 66.35.
319. Water levels, in feet, 1939: Mar. 21, 60.97; June 27, 61.17;  
Sept. 13, 61.43; Dec. 6, 61.59.
322. Water levels, in feet, 1939: Mar. 21, 72.62; June 29, 74.60;  
Sept. 12, 73.86; Dec. 5, 73.19.
326. Water levels, in feet, 1939: Mar. 21, 90.57; June 29, 90.86;  
Sept. 12, 91.02; Dec. 5, 91.31.
331. Water levels, in feet, 1939: Mar. 21, 80.47; June 29, 81.72;  
Sept. 12, 81.34; Dec. 5, 81.02.
336. Water levels, in feet, 1939: Mar. 21, 86.80; June 29, 86.86;  
Sept. 12, a/  
Dec. 5, 87.91.
340. Water levels, in feet, 1939: Mar. 21, 77.24; June 29, 78.96;  
Sept. 12, 83.45.
342. Water levels, in feet, 1939: Mar. 21, 75.67; Sept. 12, 78.79;  
Dec. 5, 76.53.
410. Water levels, in feet, 1939: Mar. 30, 62.96; Sept. 13, 64.02;  
Dec. 6, 64.44.
431. Water levels, in feet, 1939: Mar. 30, 69.32; June 27, 69.59;  
Sept. 13, 70.10; Dec. 6, 69.98.
433. Water levels, in feet, 1939: Mar. 30, 112.0; June 27, 111.93;  
Sept. 13, 111.86; Dec. 6, 112.07.
502. Water levels, in feet, 1939: Mar. 30, 96.30; June 27, 96.82;  
Sept. 13, 99.57; Dec. 6, 96.70.
506. Water levels, in feet, 1939: Mar. 30, 74.70; June 27, 74.70;  
Sept. 13, 74.88; Dec. 6, 75.10.
513. Water levels, in feet, 1939: Mar. 30, 79.51; June 27, 79.53;  
Sept. 13, 79.60; Dec. 6, 80.78.
514. Water levels, in feet, 1939: Mar. 30, 105.82; June 27, 106.12;  
Sept. 13, a/  
Dec. 6, a/.
519. Water levels, in feet, 1939: Mar. 30, 86.22; June 27, 86.23;  
Sept. 13, 86.25; Dec. 6, 86.35.

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a Pumping.

## Dimmit County

Well numbers correspond to those in Water-Supply Paper 777, pp. 187-98; Water-Supply Paper 840, pp. 403-5; Water-Supply Paper 845, pp. 469-70.

- M9-9. Water level, in feet, 1939: Apr. 6, 86.34; July 19, a/.
- N7-34. Water levels, in feet, 1939: Apr. 7, 70.02; July 15, 48.86.
- N7-48. Water levels, in feet, 1939: Apr. 7, 71.34; July 15, 52.40.
- N7-53. No measurements made in 1939.
- N7-78. Water levels, in feet, 1939: Apr. 5, 104.62; July 19, 104.61.
- N7-95. Water levels, in feet, 1939: Apr. 5, 75.49; July 14, 75.01.
- N7-125. Water levels, in feet, 1939: Apr. 5, 66.57; July 19, 66.68.
- N7-127. Water levels, in feet, 1939: Apr. 7, 73.00; July 15, 64.44;  
Dec. 10, 65.50.
- N7-135. Water levels, in feet, 1939: Apr. 5, 32.09; July 17, 31.82;  
Dec. 9, 32.03.
- N8-19. Water levels, in feet, 1939: Apr. 7, 91.39; July 19, 82.70.
- N8-26. Water levels, in feet, 1939: Apr. 9, 66.21; July 20, 56.15.
- N8-28. Water levels, in feet, 1939: Apr. 9, 67.91; July 20, 56.52.
- N8-29. Water levels, in feet, 1939: Apr. 7, 67.05; July 20, 56.65.
- N8-40. Water levels, in feet, 1939: Apr. 7, 47.88; July 15, 36.18.
- N8-47. Water levels, in feet, 1939: Apr. 7, 94.38; July 18, 85.38;  
Dec. 11, 90.18.
- N8-50. Water levels, in feet, 1939: Apr. 7, 70.90; July 18, 64.67;  
Dec. 11, 66.73.
- N8-58. Water levels, in feet, 1939: Apr. 8, 33.23; July 18, 40.98;  
Dec. 11, 42.18.
- N8-71. Water level, in feet, 1939: Apr. 9, 57.50; July 18, a/.
- N8-73. No measurements made in 1939.
- N8-103. Water levels, in feet, 1939: Apr. 7, 58.98; July 20, 29.25;  
Dec. 8, 27.73.
- N9-8. Water level, in feet, 1939: July 18, 56.20.
- N9-12. Water levels, in feet, 1939: Apr. 8, 32.03; July 18, 19.40;  
Dec. 11, 20.71.
- N9-16. No measurements made in 1939.
- N9-25. Water level, in feet, 1939: Dec. 11, 16.38.
- N9-32. Water level, in feet, 1939: July 18, 27.06.
- O7-3. Water level, in feet, 1939: Apr. 8, 98.89; July 14, a/.
- S1-15. Water levels, in feet, 1939: Apr. 5, 56.06; July 17, 56.25.
- S1-16. Water levels, in feet, 1939: Apr. 5, 58.38; July 17, 59.41;  
Dec. 9, 59.72.
- S1-18. Water levels, in feet, 1939: Apr. 5, 106.74; July 17, 106.74;  
Dec. 9, 107.06.
- S2-24. Water levels, in feet, 1939: Apr. 9, 128.50; July 16, 98.14;  
Dec. 9, 108.05.

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a Pumping.

## Dimmit County--Continued

- S2-27. Water levels, in feet, 1939: Apr. 12, 73.83; Dec. 8, 55.43.  
 S2-29. Water levels, in feet, 1939: Apr. 8, 79.59; July 16, 72.12;  
 Dec. 9, 82.12.  
 S2-77. No measurements made in 1939.  
 S2-78. Water levels, in feet, 1939: Apr. 8, 170.91; July 15, 157.20;  
 Dec. 10, 165.46.  
 S2-86. Water level, in feet, 1939: July 16, 126.54.  
 S2-91. Water levels, in feet, 1939: Apr. 8, 149.41; July 15, 139.34.  
 S2-94. No measurements made in 1939.  
 S2-102. Water levels, in feet, 1939: July 15, 111.31; Dec. 8, 111.07.  
 S3-10. Water levels, in feet, 1939: July 16, 76.86.  
 S5-3. No measurements made in 1939.  
 S5-10. Water levels, in feet, 1939: July 16, 84.21.  
 S6-4. Water levels, in feet, 1939: July 15, 10.84; Dec. 8, 10.39.  
 T1-5. Water levels, in feet, 1939: July 14, 6.93.

## Duval County

Well numbers correspond to those in Water-Supply Paper 776, pp. 60-62; Water-Supply Paper 777, pp. 199-203; Water-Supply Paper 840, p. 406; Water-Supply Paper 845, pp. 470-1.

55. Water levels, in feet, 1939: Apr. 6, 51.90; Oct. 5, 54.55.  
 59. Water levels, in feet, 1939: Apr. 6, 62.27; Oct. 5, 61.85.  
 61. Water levels, in feet, 1939: Apr. 6, 46.22; Oct. 5, 45.20.  
 68. Water levels, in feet, 1939: Apr. 6, 58.77; Oct. 5, 62.60.  
 69. Water levels, in feet, 1939: Apr. 6, 77.14; Oct. 5, 74.33.  
 70. Water levels, in feet, 1939: Apr. 6, 52.79; Oct. 5, 53.56.  
 71. Water levels, in feet, 1939: Apr. 6, 43.50; Oct. 5, 43.88.  
 72. Water levels, in feet, 1939: Apr. 6, 40.12; Oct. 5, 36.72.  
 73. Water levels, in feet, 1939: Apr. 6, 37.56; Oct. 5, 36.71.  
 143. Water levels, in feet, 1939: Apr. 6, 42.79; Oct. 6, 41.83.  
 144. Water levels, in feet, 1939: Apr. 6, a/; Oct. 6, 42.97.  
 145. Water levels, in feet, 1939: Apr. 6, 44.50; Oct. 6, 43.02.  
 157. Water levels, in feet, 1939: Apr. 7, 91.25; Oct. 6, 91.98.  
 158. Water levels, in feet, 1939: Apr. 6, 96.33; Oct. 6, 95.81.  
 173. Water levels, in feet, 1939: Apr. 6, 51.99; Oct. 6, 51.85.  
 175. Water levels, in feet, 1939: Apr. 7, 45.49; Oct. 6, 46.54.  
 183. Water levels, in feet, 1939: Apr. 6, 54.05; Oct. 6, 54.60.  
 184. Water levels, in feet, 1939: Apr. 6, 47.32; Oct. 6, 46.40.  
 185. Water levels, in feet, 1939: Apr. 6, 36.55; Oct. 6, 36.10.

a Pumping.

## Duval County--Continued

187. Water levels, in feet, 1939: Apr. 6, 45.58; Oct. 6, 44.18.  
 188. Water levels, in feet, 1939: Apr. 6, 75.89; Oct. 6, 75.94.  
 189. Water levels, in feet, 1939: Apr. 6, 62.55; Oct. 6, 62.28.  
 190. Water levels, in feet, 1939: Apr. 6, 46.37; Oct. 6, 48.02.  
 201. Water levels, in feet, 1939: Apr. 7, 75.56; Oct. 7, 76.50.  
 203. Water levels, in feet, 1939: Apr. 7, 52.60; Oct. 7, 51.28.  
 204. Water levels, in feet, 1939: Apr. 7, 64.60; Oct. 7, 70.70.  
 207. Water levels, in feet, 1939: Apr. 7, 58.03; Oct. 7, 55.00.  
 209. Water levels, in feet, 1939: Apr. 7, 42.98; Oct. 6, 32.50.  
 211. Water levels, in feet, 1939: Apr. 7, 40.60; Oct. 6, 41.00.  
 230. Water levels, in feet, 1939: Apr. 7, 60.23; Oct. 6, 64.60.  
 240. Water levels, in feet, 1939: Apr. 7, 94.52; Oct. 6, 96.02.  
 271. Water levels, in feet, 1939: Apr. 7, 76.02; Oct. 6, 76.35.  
 276. Water level, in feet, 1939: Apr. 7, a/; Oct. 6, 39.90.  
 287. Water levels, in feet, 1939: Apr. 7, 48.90; Oct. 6, 48.72.  
 289. Water levels, in feet, 1939: Apr. 7, 46.35; Oct. 6, 50.02.  
 290. No measurements made in 1939.  
 292. Water levels, in feet, 1939: Apr. 7, 31.99; Oct. 6, 32.34.  
 297. Water levels, in feet, 1939: Apr. 7, 55.07; Oct. 7, 54.98.  
 301. Water levels, in feet, 1939: Apr. 7, 53.65; Oct. 7, 53.06.  
 302. Water levels, in feet, 1939: Apr. 7, 36.40; Oct. 7, 31.90.  
 304. Water levels, in feet, 1939: Apr. 7, 53.42; Oct. 7, 53.25.  
 315. Water levels, in feet, 1939: Apr. 7, 49.77; Oct. 7, 50.30.  
 319. Water levels, in feet, 1939: Apr. 7, 27.05; Oct. 7, 27.84.  
 322. Water level, in feet, 1939: Apr. 7, a/; Oct. 7, 39.54.

## Ector County

Well numbers correspond to those in Water-Supply Paper 840, pp. 406-7; Water-Supply Paper 845, pp. 471-2; Ector County, Texas, Records of Wells, etc., Works Progress Administration, Ground-Water Survey Project 5316, State Board of Water Engineers, 1937 (Mimeographed).

68. Water levels, in feet, 1939: Jan. 26, 82.21; Aug. 12, 82.40.  
 68A. Water levels, in feet, 1939: Jan. 26, 72.60; Aug. 12, 72.65.  
 73A. Water levels, in feet, 1939: Jan. 26, 71.70; Aug. 12, 71.97.  
 161. Water levels, in feet, 1939: Jan. 26, 62.31; Aug. 12, 62.58.

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a Pumping.

## EL PASO COUNTY

By A. N. Sayre

The water levels in 37 selected wells in the El Paso area were measured once a month during 1939, and the water levels in 3 others--wells 41, 51, and 75b--were observed continuously by means of automatic water-stage recorders installed on them.

The average daily pumpage during 1939 was 16,900,000 gallons, as compared with 16,234,000 gallons during 1938. The smallest pumpage occurred during January, when it averaged 12,100,000 gallons a day; the largest occurred during June, when the daily average was 23,200,000 gallons. The daily pumpage during July--22,592,000 gallons--was nearly as large. In the El Paso area in 1939 the total pumpage was about 6,183,000,000 gallons,<sup>1</sup> of which the El Paso Water Department pumped 3,187,000,000 gallons from 12 wells--676,921,000 gallons from the Montana well field, 1,112,000,000 gallons from wells in the downtown area, and 1,398,141,000 gallons from wells in the Mesa well field.

The pumpage from two of these well fields showed great differences from that in 1938, and these differences are reflected in changes in water levels in and about the respective fields. The pumpage in the Montana well field in 1939 was about two-thirds of the pumpage in 1938, and the water levels in 10 wells in the area of influence averaged 3.6 feet higher at the end of 1939 than at the end of the preceding year. The pumpage in 1939 in the downtown area was about the same as in 1938, and water levels declined in 8 wells, whereas they rose in 3 wells. However, the average of the water levels in the 11 wells declined 0.34 foot during the year. In the Mesa field the pumpage was about one-third greater in 1939 than it was in 1938, and the water levels in 8 wells in the area affected by the pumping declined an average of 1.54 feet.

In the following tables the water levels are expressed in feet above mean sea level. Well numbers correspond to those in Water-Supply Paper 817 except for those added to the program since 1937. The highest and lowest water levels on record for each well, except as noted in this report, are given in Water-Supply Papers 840 and 845.

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<sup>1</sup>/ The pumpage data for C. Juarez were not available at the time this report was written, and it was assumed that the pumpage was the same as in 1938.

## El Paso County--Continued

6. El Paso Electric Co. Well 2, Santa Fe and 4th Streets.  
Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 24	3,698.55	Mar. 21	3,697.57	June 16	3,697.24	Oct. 11	3,699.28
Feb. 20	3,698.87	Apr. 18	3,696.86	July 15	3,698.45	Nov. 21	3,699.14
Mar. 14	a3,694.14	May 15	3,698.28	Aug. 16	3,698.92	Dec. 11	3,699.07

7. El Paso Electric Co well 1, Santa Fe and 4th Streets.  
Water level, in feet above mean sea level, 1939

Jan. 24	3,698.47	Mar. 21	3,697.27	June 16	3,696.81	Oct. 11	3,698.94
Feb. 20	3,698.79	Apr. 18	3,696.59	July 15	3,698.32	Nov. 21	3,698.77
Mar. 14	a3,694.78	May 15	3,698.35	Aug. 16	3,698.51	Dec. 11	3,698.75

8. El Paso Electric Co. well 4, Santa Fe and 4th Streets. Measuring point since Jan. 13, 1938 is top of flange coupling 6.20 feet above the land surface and 3,714.82 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Jan. 24	3,694.47	Mar. 21	3,693.96	June 16	3,691.85	Oct. 11	3,693.75
Feb. 20	3,694.74	Apr. 18	3,693.15	July 15	3,692.34	Nov. 21	3,694.37
Mar. 14	3,692.25	May 15	3,693.02	Aug. 16	3,693.46	Dec. 11	3,694.00

9. El Paso Electric Co. well 3, Santa Fe and 4th Streets.  
Water level, in feet above mean sea level, 1939

Jan. 24	3,697.26	Apr. 18	3,695.60	July 15	3,697.40	Nov. 21	3,698.26
Feb. 20	3,697.77	May 15	3,697.06	Aug. 16	3,697.37	Dec. 11	3,698.27
Mar. 21	3,696.07	June 16	3,695.59	Oct. 11	3,698.28		

10. City of El Paso, 4th and Oregon Streets. Highest recorded water level 3,698.51 feet May 20, 1938; lowest 3,695.50 July 17, 1938.

Water level, in feet above mean sea level, 1939

Jan. 24	3,682.91	June 16	3,695.59	Aug. 16	3,697.05	Nov. 20	3,697.90
Feb. 20	3,697.53	July 15	3,696.70	Oct. 11	3,697.83	Dec. 11	3,697.89
Mar. 21	3,696.16						

11. Measurements discontinued Dec. 11, 1938.

12. No measurements made in 1939.

13. No measurements made in 1939.

18. No measurements made in 1939.

19. El Paso Milling Co., Kansas and 11th Streets.

Water level, in feet above mean sea level, 1939

Jan. 24	3,695.66	Apr. 18	3,695.39	July 22	3,684.06	Nov. 20	3,692.97
Feb. 20	b3,695.72	May 16	3,685.84	Aug. 16	3,692.62	Dec. 11	3,692.94
Mar. 16	3,695.44	June 16	a3,683.38	Oct. 11	3,693.16		

21. City of El Paso well 10, Campbell and 6th Streets. Measuring point since June 14, 1937 is hole in pump base 1.6 feet above the land surface and 3,707.45 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Jan. 23	3,687.19	Jan. 31	3,686.98	Apr. 18	3,686.85	Oct. 11	3,684.44
27	3,686.84	Feb. 1	3,686.94	May 15	(c)	Nov. 20	3,685.95
28	3,686.94	20	3,687.09	June 16	(c)	Dec. 11	3,686.27
30	3,686.94	Mar. 13	3,686.81	Aug. 14	a3,678.53		

- a Lowest recorded water level.  
b Highest recorded water level.  
c Pumping.



## El Paso County--Continued

22. City of El Paso well 6, 2nd and Cotton Streets. Measuring point since Apr. 17, 1939 is floor of pump house, 3,704.20 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 23	3,687.32	Feb. 1	3,680.23	Apr. 17	3,688.62	Aug. 14	3,683.99
27	3,681.01	1	3,680.73	May 15	3,688.01	Oct. 11	3,685.32
28	3,680.42	2	3,683.89	June 16	3,687.39	Nov. 20	3,688.53
30	3,679.61	20	3,686.27	July 22	3,684.79	Dec. 11	3,687.47
31 a	3,679.04	Mar. 13	3,687.27	Aug. 14	3,683.80		

28. Acme Laundry, 905 E. Missouri Street.

Water level, in feet above mean sea level, 1939

Jan. 22	3,675.43	Apr. 23	3,675.23	Aug. 13	3,656.94	Oct. 15	3,672.08
Feb. 19	3,675.26	May 21	3,662.31	Sept. 17	3,667.99	Nov. 19	3,674.68
Mar. 12	3,675.36	July 16 a	3,646.13	Oct. 15	3,671.94		

30a. City of El Paso well 14, San Antonio and Walnut Streets. Measuring point from Dec. 7, 1939, top of pump base 0.43 foot above floor of pump house and 3,703.48 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Jan. 23	b3,646.72	Feb. 2	b3,641.23	May 16 a	3,666.50	Nov. 1	3,671.86
27	b3,643.44	20	b3,644.43	June 16	b3,636.07	20	c3,676.15
28	b3,641.41	Mar. 14	b3,647.82	July 17	b3,640.63	23	b3,645.70
30	b3,640.23	19	b3,647.10	Aug. 14	b3,639.77	25	b3,644.53
31	b3,639.75	Apr. 17	b3,643.36	Oct. 11	b3,641.77	Dec. 7	3,673.98
Feb. 1	b3,639.43						

31. City of El Paso well 7, Lee and Magoffin Streets. Diameter 22, 13, and 12 inches, depth 430 feet. Measuring point, top of  $\frac{1}{2}$ -inch pipe in pump base, 0.88 foot above floor of pump house and 3,705.29 feet above mean sea level. Water level Jan. 28, 1939, 11.84 feet below measuring point.

Water level, in feet above mean sea level, 1939

Jan. 28	3,692.57	Apr. 17	3,691.75	Aug. 22	b3,657.84	Aug. 25	3,692.21
30	3,692.33	May 15	3,692.71	22	b3,657.34	Sept. 12	3,691.90
Feb. 1	3,692.12	June 16	3,692.57	22	b3,657.02	Oct. 11	3,691.73
2	3,692.31	July 15	3,692.46	23	d3,689.70	Nov. 23	3,692.09
20	3,692.67	Aug. 14	3,692.43	24	3,691.90	Dec. 11	3,692.14
Mar. 14 c	3,692.72	22	3,692.53				

32a. City of El Paso well 17, San Antonio and Tornillo Streets. Diameter 24 and 12 $\frac{1}{2}$  inches, depth 851 feet. Measuring point, top of  $\frac{1}{2}$ -inch coupling, 0.36 foot above floor of pump house and 3,706.71 feet above mean sea level. Water level Nov. 18, 1939, 33.03 feet below measuring point.

Water level, in feet above mean sea level, 1939

Jan. 17	b3,616.21	Feb. 1	3,665.11	Aug. 14	b3,635.95	Nov. 20	3,676.63
30	b3,615.08	2	3,667.77	Oct. 11	b3,636.88	23	b3,640.05
31	b3,614.13	June 16	3,667.13	Nov. 1	b3,640.02	Dec. 6	b3,641.71
Feb. 1 a	3,659.76	July 15	b3,634.54	18	c3,673.68		

33. El Paso Foundry and Machine Co., Williams Street at International Boundary.

Water level, in feet above mean sea level, 1939

Jan. 24	3,692.56	Mar. 16	3,692.54	May 16	3,692.70	July 15	3,692.35
Feb. 20	3,692.35	Apr. 20	3,692.64	June 20	3,692.48	Nov. 20	3,692.42

36. Southern Pacific Ry., Piedras Street Shops.

Water level, in feet above mean sea level, 1939

Jan. 23	3,685.05	Apr. 18	3,683.87	June 16	3,681.68	Oct. 13	3,683.06
Feb. 20	3,684.48	May 16	3,682.64	July 15 a	3,681.18	Nov. 20	3,684.66
Mar. 14	3,685.26			Aug. 16	3,635.15	Dec. 30	3,686.40

a Lowest recorded water level.  
c Highest recorded water level.

b Pumping.  
d Recently pumped.

## El Paso County--Continued

## 39. Midwest Dairies Inc., Piedras and Oro Streets.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 23	3,669.56	Apr. 17	3,667.35	July 1	a3,660.30	Aug. 10	a3,659.66
Feb. 20	3,668.24	May 16	3,665.42	17	a3,659.58	Nov. 20	3,674.46
Mar. 14	3,670.52						

## 40. City of El Paso well, Piedras and Hamilton Streets. Water level, in feet above mean sea level, 1939: Feb: 20, 3,691.49.

## 41. City of El Paso well 5, Morenci and Grama Streets.

Water level, in feet above mean sea level, 1939

Jan. 25	3,669.35	Apr. 17	3,666.23	June 19	3,660.60	Sept. 30	3,663.59
Feb. 20	3,668.48	17	3,667.70	July 15	3,658.68	Nov. 20	3,672.06
Mar. 14	3,671.31	May 16	3,663.98	Aug. 10	3,661.32	Dec. 9	3,672.51

## 42. City of El Paso well 9, Luna and Pera Streets.

Water level, in feet above mean sea level, 1939

Jan. 24	3,670.04	Feb. 1	3,665.02	Apr. 18	b3,620.00+	Oct. 11	3,664.33
27	3,667.91	2	3,665.83	May 16	(b)	11	3,665.12
28	3,667.28	20	3,669.27	July 17	c3,661.68	Nov. 20	3,672.02
30	3,665.86	Mar. 14	3,671.82	Aug. 14	3,662.71	Dec. 30	3,674.34
31	3,665.43						

## 44. Harry Mitchel Brewing Co., Travis and Frutas Streets.

Water level, in feet above mean sea level, 1939

Jan. 25	3,672.55	Apr. 25	3,671.84	Aug. 13	3,666.21	Nov. 18	3,672.84
Feb. 19	3,675.46	May 25	3,669.21	Sept. 17	3,667.53	Dec. 30	3,676.17
Mar. 19	3,674.20	July 1	3,666.50	Oct. 15	3,669.33		

## 49. City of El Paso well 4, Montana well field.

Water level, in feet above mean sea level, 1939

Jan. 25	b3,615.74	Apr. 18	3,666.95	July 17	b3,604.38	Oct. 14	3,668.70
Feb. 20	b3,615.34	May 16	b3,616.58	Aug. 15	b3,605.95	Nov. 21	d3,674.33
Mar. 14	3,670.71	June 17	b3,605.16	Sept. 26	3,665.69	Dec. 15	3,668.37

## 50. City of El Paso well 1, Montana well field.

Water level, in feet above mean sea level, 1939

Jan. 25	3,664.80	July 17	3,654.05	Sept. 12	b3,584.98	Sept. 18	3,663.42
Feb. 20	3,664.15	Aug. 15	3,655.77	13	3,654.98	19	3,663.66
Mar. 14	3,669.41	20	3,663.41	14	3,655.22	Oct. 14	3,668.21
Apr. 18	3,666.43	20	b3,591.95	14	3,655.33	Nov. 21	3,673.19
May 16	3,658.10	29	b3,589.97	15	3,660.49	Dec. 4	d3,674.00
June 19	3,654.69	Sept. 11	b3,584.51	16	3,662.08	5	3,581.26

## 51. City of El Paso well 2, Montana well field. Lowest recorded water level, 3,651.57 feet July 10, 1936.

Water level, in feet above mean sea level, 1939

Jan. 25	3,667.11	May 1	3,664.96	Aug. 3	3,654.55	Oct. 14	3,669.65
Feb. 20	3,666.59	16	3,657.89	8	3,660.68	Nov. 13	3,672.95
Mar. 14	3,668.50	June 19	3,654.75	15	3,655.70	21	d3,674.13
Apr. 18	3,665.44	July 17	3,654.03	Sept. 26	3,663.79	Dec. 8	3,671.33

## 52. City of El Paso well 3, Montana well field. Measuring point since Oct. 23, 1937, top of brass coupling 0.33 foot above floor of pump house and 3,793.53 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Jan. 25	3,669.40	May 16	b3,632.33	Aug. 15	b3,630.94	Nov. 14	3,673.15
Feb. 20	3,668.91	June 19	b3,630.74	Sept. 26	b3,636.83	21	3,674.01
Mar. 14	b3,638.89	July 17	b3,630.15	Oct. 14	3,669.45	Dec. 8	3,672.41
Apr. 18	b3,637.48						

a Recently pumped.

c Lowest recorded water level.

b Pumped.

d Highest recorded water level.

## El Paso County--Continued

53. Loretto College, Clifton and Reynolds Streets.

Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 25	3,669.25	Apr. 18	3,667.23	July 17	a3,658.35	Nov. 21	b3,672.66
Feb. 20	3,668.51	May 16	3,662.37	Aug. 15	3,660.05	Dec. 30	3,670.83
Mar. 14	3,669.94	June 19	3,659.27	Oct. 14	3,668.44		

55. Texas Co., 0.6 mile northeast of Ascarate.

Water level, in feet above mean sea level, 1939

Jan. 25	3,670.15	May 16	c3,665.83	July 17	a3,666.10	Oct. 13	3,668.77
Feb. 20	3,671.26	18	c3,666.68	Aug. 16	3,666.19	Nov. 15	3,672.17
Mar. 14	3,672.00	June 13	c3,664.62	Sept. 30	3,667.67	Dec. 30	3,672.61
Apr. 20	3,668.98						

60. Measurements discontinued.

64. City of El Paso and Geological Survey test well 1, Carlsbad Highway.

Water level, in feet above mean sea level, 1939

Jan. 25	3,681.32	Apr. 21	3,681.43	July 21	3,681.18	Nov. 20	a3,681.06
Feb. 24	3,681.80	May 18	3,681.48	Aug. 17	3,681.16	Dec. 30	3,681.11
Mar. 16	3,681.54	June 21	3,681.41	Oct. 26	3,681.28		

67. Southern Pacific Ry., near south entrance to Fort Bliss. Water levels, in feet above mean sea level, 1939: Apr. 18, b/3,670.29; May 22, 3,665.72; July 21, 3,663.05.

67b. Southern Pacific Ry. well 3, near south entrance to Fort Bliss. Water levels, in feet below measuring point, 1939: Feb. 24, 221.48; Mar. 15, 219.44.

72. United States War Department, Fort Bliss well 2.

Water level, in feet above mean sea level, 1939

Jan. 24	3,669.33	Mar. 15	3,668.00	June 27	3,662.43	Nov. 23	3,666.69
Feb. 24	3,668.42	Apr. 18	3,663.94	July 15	3,662.79		

75a. United States War Department, Fort Bliss well 6. Water level, in feet above mean sea level, 1939: Jan. 24, a/3,672.87.

75b. City of El Paso test well 10, 0.6 mile south of Wilson Road and 0.6 mile west of Airport Road.

Water level, in feet above mean sea level, 1939

Feb. 13	3,674.31	May 22	3,669.31	July 18	3,669.34	Sept. 30	3,670.56
Mar. 17	3,670.95	June 21	a3,668.94	Aug. 10	3,670.03	Nov. 21	3,671.57
Apr. 27	3,669.36						

76. City of El Paso and Geological Survey test well 2, near southeast corner of Biggs field.

Water level, in feet above mean sea level, 1939

Jan. 24	3,684.53	Apr. 21	3,684.53	July 21	3,684.19	Nov. 20	3,683.99
Feb. 24	3,684.54	May 18	3,684.40	Aug. 17	3,684.12	Dec. 30	3,683.84
Mar. 16	3,684.56	June 21	3,684.33				

77. City of El Paso well 12, Mesa well field. Water levels, in feet above mean sea level, 1939: Jan. 24, 3,675.62; Dec. 8, d/3,633.67.

77b. City of El Paso well 15, Wilson Road and Airport Road. Measuring point since June 21, 1939, top of steel flange 0.15 foot above coupling and 3,894.74 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Jan. 24	d3,648.90	Apr. 20	d3,645.72	May 23	a3,673.55	Aug. 12	d3,643.34
Feb. 24	d3,646.52	May 18	d3,646.65	June 21	d3,643.25	Dec. 8	3,677.06
Mar. 15	d3,646.84	22	c3,672.15	July 19	d3,643.68		

a Lowest recorded water level.

b Highest recorded water level.

c Recently pumped.

d Pumping.

## El Paso County--Continued

78. City of El Paso well 11, Mesa well field. Diameter 20 inches to 12 $\frac{1}{2}$  inches, depth 758 feet. Measuring point, top of  $\frac{1}{2}$ -inch brass coupling, 0.55 foot above floor of pump house and 3,873.18 feet above mean sea level. Water level, in feet above mean sea level, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 1	3,666.60	June 21	a3,664.65	Aug. 8	3,666.12	Nov. 20	b3,669.18
18	3,664.67	July 19	3,665.21	Oct. 13	3,667.55		

78c. City of El Paso test well 4. One mile north of Mesa well field. Water level, in feet above mean sea level, 1939

Jan. 25	3,680.80	Apr. 20	3,680.51	July 21	3,680.00	Nov. 21	3,680.00
Feb. 24	3,681.11	May 18	3,680.30	Aug. 17	3,680.24	Dec. 30	a3,680.02
Mar. 18	3,680.44	June 20	3,680.25				

79. City of El Paso well 8, Mesa well field on Wilson Road. Measuring point since Apr. 3, 1939, top of brass pipe 0.56 foot above floor of pump house and 3,871.68 feet above mean sea level.

Water level, in feet above mean sea level, 1939

Jan. 24	b3,675.09	Apr. 20	c3,601.88	July 19	3,667.85	Oct. 13	3,670.60
Feb. 24	3,673.22	May 18	3,665.46	Aug. 12	3,668.58	Nov. 20	3,671.02
Apr. 3	c3,604.53	June 21	3,667.10				

112. City of El Paso, Old Mesa well field no. 32.

Water level, in feet above mean sea level, 1939

Jan. 24	3,674.98	Apr. 20	3,662.62	July 18	3,668.77	Nov. 20	3,671.67
Feb. 24	3,673.33	May 18	3,666.73	Aug. 12	3,669.17	Dec. 30	3,665.60
Mar. 15	3,670.55	June 21	3,668.11	Oct. 13	3,671.23		

114. No measurements made in 1939.

126. McKelroy Packing Co., 3.3 miles north of Wilson Road near Southern Pacific Railway.

Water level, in feet above mean sea level, 1939

Jan. 25	3,690.60	Apr. 14	3,690.95	July 21	3,690.48	Nov. 21	c3,689.98
Feb. 24	3,691.07	May 18	3,690.56	Aug. 17	c3,690.31	Dec. 30	a3,690.25
Mar. 16	3,690.75	June 20	3,690.69	Oct. 13	c3,690.33		

128c. City of El Paso test well 23, 2 $\frac{1}{2}$  miles north of Mesa well field. Diameter 6 inches, depth 385 feet. Measuring point, top of 4-inch pipe which is 3,882.28 feet above mean sea level. Water level June 20, 1939, 193.33 feet below measuring point. Water levels, in feet above mean sea level, 1939: June 20, 3,688.95; July 21, 3,688.73; Aug. 17, 3,688.85; Nov. 21, 3,688.69; Dec. 30, 3,688.68.

129. No measurements made in 1939.

129a. No measurements made in 1939.

130. G. T. Cook, Sunrise Acres, 2.9 miles north of Wilson Road. Highest recorded water level 3,691.22 feet Mar. 20, 1937.

Water level, in feet above mean sea level, 1939

Jan. 25	3,690.12	Apr. 21	3,689.99	July 21	3,689.56	Nov. 20	3,689.66
Feb. 24	3,690.33	May 18	3,689.86	Aug. 17	a3,689.63	Dec. 30	3,689.91
Mar. 16	3,690.23	June 20	3,689.81				

136. City of El Paso and Geological Survey test well 3, 6.9 miles north of Wilson Road.

Water level, in feet above mean sea level, 1939

Jan. 25	3,699.57	Apr. 21	3,699.54	July 21	3,699.36	Nov. 21	a3,699.33
Feb. 24	3,699.57	May 18	3,699.50	Aug. 17	3,699.43	Dec. 30	3,699.52
Mar. 16	3,699.61	June 14	3,699.54				

a Lowest recorded water level.

b Highest recorded water level.

c Pumping.

## Floyd County

Well numbers correspond to those in Water-Supply Paper 840, pp. 413-19; Water-Supply Paper 845, pp. 480-5; Floyd County, Texas, Records of Wells, etc., State Board of Water Engineers, in cooperation with United States Department of the Interior, Geological Survey, 1938 (Mimeographed).

5.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 3	52.05	June 21	53.49	Oct. 4	(a)
Feb. 27	51.93	Aug. 14	54.08	Dec. 8	53.34

14. No measurements made in 1939.

28.

## Water level, in feet, 1939

Jan. 3	97.78	July 24	97.97	Oct. 4	98.07
Feb. 27	97.81	Aug. 14	98.01	Dec. 8	98.14

32. Water levels, in feet, 1939: Jan. 3, 89.42; Oct. 4, 92.56.

44.

## Water level, in feet, 1939

Jan. 3	65.72	June 21	66.82	Oct. 4	(a)
Feb. 27	65.61	Aug. 14	67.46	Dec. 8	67.74

57. Water level, in feet, 1939: Dec. 8, 62.63.

71. Water levels, in feet, 1939: Jan. 3, 83.04; Feb. 27, 82.08; June 21, b/; Oct. 4, b/.

79. No measurements made in 1939.

106. Water levels, in feet, 1939: Jan. 5, 58.88; Feb. 27, 58.52; Oct. 4, 62.37; Dec. 8, 64.62.

108. Water levels, in feet, 1939: Jan. 5, 57.30; Oct. 4, 61.90.

111.

## Water level, in feet, 1939

Jan. 5	53.29	June 21	63.84	Dec. 8	61.31
Feb. 27	52.94	Oct. 4	57.65		

112. Water levels, in feet, 1939: Feb. 27, 52.18; June 21, 63.16; Oct. 4, 57.31; Dec. 8, 60.68.

120.

## Water level, in feet, 1939

Jan. 5	58.91	June 21	63.77	Dec. 8	62.29
Feb. 27	58.54	Oct. 4	63.72		

124. Water levels, in feet, 1939: Mar. 1, 42.50; June 21, 43.04; Oct. 4, 43.52; Dec. 8, a/.

140.

## Water level, in feet, 1939

Jan. 5	53.80	June 21	54.83	Dec. 8	55.31
Mar. 1	53.78	Oct. 4	55.37		

143.

## Water level, in feet, 1939

Jan. 5	61.46	June 26	65.+	Dec. 8	63.98
Mar. 1	61.00	Oct. 4	66.40		

a Pumping.

b Filled to 80 feet below measuring point.

## Floyd County--Continued

150.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 5	47.28	June 26	48.90	Oct. 5	49.83
Mar. 1	46.90	July 25	49.94	Dec. 14	49.53

153.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 5	53.68	June 26	54.98	Aug. 10	(a)	Dec. 14	55.88
Mar. 2	53.23	July 25	(a)	Oct. 5	(a)		

156. No measurements made in 1939.

157.

## Water level, in feet, 1939

Jan. 5	55.33	June 26	59.02	Oct. 4	58.73
Mar. 1	55.00	July 31	a 78.4	Dec. 14	57.48

161.

## Water level, in feet, 1939

Jan. 5	60.50	June 26	62.74	Dec. 8	62.13
Mar. 1	59.83	Oct. 4	63.41		

401.

## Water level, in feet, 1939

Jan. 5	56.85	Aug. 14	57.22	Dec. 14	57.45
Mar. 2	56.94	Oct. 5	57.32		

409.

## Water level, in feet, 1939

Jan. 5	52.63	June 23	54.54	Oct. 5	55.66
Mar. 2	52.25	Aug. 14	54.90	Dec. 14	55.02

410.

## Water level, in feet, 1939

Jan. 5	50.48	June 23	52.46	Dec. 14	53.46
Mar. 2	49.62	Oct. 5	54.44		

414.

## Water level, in feet, 1939

Jan. 5	61.62	June 26	(a)	Oct. 4	66.00
Mar. 2	60.90	July 5	64.11	Dec. 8	63.58

416.

## Water level, in feet, 1939

Jan. 5	63.66	June 26	(a)	Dec. 8	65.80
Mar. 2	63.02	Oct. 4	65.95		

421.

## Water level in feet, 1939

Jan. 5	60.22	June 26	61.90	Dec. 8	62.25
Mar. 2	60.08	Oct. 4	63.24		

422. No measurements made in 1939.

428.

## Water level, in feet, 1939

Jan. 5	51.14	June 26	52.48	Dec. 8	52.79
Mar. 2	50.96	Oct. 4	55.27		

a Pumping.

## Floyd County--Continued

435.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 5	58.60	June 21	59.71	Oct. 4	61.05
Mar. 2	58.36	July 25	59.95	Dec. 8	60.40

436. No measurements made in 1939.

437. Water levels, in feet, 1939: Oct. 4, 52.38; Dec. 8, 52.60.

439.

## Water level, in feet, 1939

Jan. 5	53.62	June 26	54.94	Dec. 8	55.98
Mar. 2	53.45	Oct. 4	58.39		

441.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	63.59	June 21	63.96	July 24	64.01	Oct. 4	64.17
Mar. 2	63.70	26	63.98	Aug. 14	64.05	Dec. 8	64.29

442.

## Water level, in feet, 1939

Jan. 3	37.47	June 21	38.51	July 24	38.18	Oct. 4	38.64
Mar. 2	37.92	26	38.54	Aug. 14	38.34	Dec. 8	38.83

446.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 3	43.71	June 21	43.92	Oct. 4	44.12
Mar. 2	43.70	Aug. 14	44.00	Dec. 8	44.14

459.

## Water level, in feet, 1939

Jan. 5	48.40	June 23	40.16	Oct. 4	50.58
Mar. 2	48.25	Aug. 14	50.54	Dec. 8	49.70

462. Water levels, in feet, 1939: Jan. 5, 52.63; Mar. 2, 52.30; June 23, a; Aug. 14, a.

465. Water levels, in feet, 1939: Jan. 5, 50.91; Mar. 2, 50.41; Dec. 14, 53.42.

467. Water levels, in feet, 1939: Jan. 5, 39.58; Mar. 2, 39.35.

468. Water levels, in feet, 1939: Jan. 5, 45.86; Mar. 2, 44.81; June 23, b; Dec. 8, b.

472.

## Water level, in feet, 1939

Jan. 5	48.25	June 23	49.96	Oct. 4	50.41
Mar. 2	48.09	Aug. 14	50.44	Dec. 8	49.57

486. Water levels, in feet, 1939: June 23, 35.35; Oct. 4, 35.51; Dec. 8, 35.64.

509.

## Water level, in feet, 1939

Jan. 3	40.54	June 23	41.47	Oct. 4	42.21
Mar. 2	40.69	Aug. 14	41.67	Dec. 8	42.30

<sup>a</sup> Dry, 50 feet below measuring point.<sup>b</sup> Dry, 45.5 feet below measuring point.

## Floyd County--Continued

510.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 3	43.57	June 23	47.43	Dec. 8	47.32
Mar. 2	43.07	Oct. 4	a 78.3		

519.

## Water level, in feet, 1939

Jan. 3	51.42	June 23	51.44	Oct. 4	52.19
Mar. 2	51.49	Aug. 14	51.87	Dec. 8	52.39

525.

## Water level, in feet, 1939

Jan. 3	40.84	June 23	41.38	Oct. 4	41.58
Mar. 2	40.93	Aug. 14	41.51	Dec. 8	41.57

528. Water level, in feet, 1939: Dec. 17, 51.79.

529. Water level, in feet, 1939: Dec. 17, 110.74.

533. Water levels, in feet, 1939: Jan. 26, 122.25; Dec. 17, 122.57.

534. Water level, in feet, 1939: Dec. 17, 111.02.

535. Water level, in feet, 1939: Sept. 30, b/.

562. Water levels, in feet, 1939: June 23, 137.12; Sept. 30, 137.73; Dec. 17, 137.01.

601. No measurements made in 1939.

602. No measurements made in 1939.

603. Water level, in feet, 1939: Jan. 26, 176.42.

604. No measurements made in 1939.

605. Water level, in feet, 1939: Jan. 26, 213.83.

607. Water level, in feet, 1939: Jan. 26, 240.60.

## Freestone County

Well numbers correspond to those in Water-Supply Paper 845, pp. 485-7; Freestone County, Texas, Records of Wells, etc., Works Progress Administration, Ground-Water Survey Project 2077, State Board of Water Engineers, 1937 (Mimeographed).

107. Water levels, in feet, 1939: Feb. 3, 61.72; May 3, 61.08; July 17, 62.10; Dec. 8, 60.93.

109. Water levels, in feet, 1939: Feb. 3, 33.71; May 3, 34.35; July 17, 34.55; Dec. 8, 35.62.

111.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 3	41.60	July 17	42.53	Dec. 8	43.50	Dec. 8	43.30
May 3	42.13	Dec. 8	43.33		43.35		43.25

112. Water levels, in feet, 1939: Feb. 3, 33.65; May 3, 33.75; July 17, 33.89; Dec. 8, 33.73.

a Pumping.

b Dry, 129 feet below measuring point.



## Freestone County--Continued

112-A.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 3	82.60	July 17	83.60	Dec. 8	84.45	Dec. 8	83.27
May 3	82.70	Dec. 8	86.54	8	83.43	8	83.19

113. Water levels, in feet, 1939: Feb. 3, 21.63; May 3, 21.34; July 17, 22.22; Dec. 8, 23.99.

200-A. Water levels, in feet, 1939: Feb. 4, 18.73; May 3, 18.60; July 17, 18.89; Dec. 8, 19.35.

216. Water levels, in feet, 1939: Feb. 4, 73.40; May 3, 73.21; July 17, 73.20; Dec. 8, 73.08.

249. Water levels, in feet, 1939: Feb. 4, 42.75; May 3, 42.75; July 1, measurements discontinued.

285. Water levels, in feet, 1939: Feb. 3, 30.80; May 3, 30.98; July 17, 30.95; Dec. 8, 31.09.

299. Water levels, in feet, 1939: Feb. 3, 12.64; May 3, 12.40; July 17, 13.20; Dec. 7, 17.80.

649. Water levels, in feet, 1939: Feb. 3, 19.64; May 3, 19.85; July 17, 20.45; Dec. 7, a/.

695-A. Water levels, in feet, 1939: Feb. 3, 60.37; May 3, 60.00; July 17, 61.22; Dec. 7, 61.88.

697-A. Water levels, in feet, 1939: Feb. 3, 31.44; May 3, 31.77; July 17, 31.82; Dec. 7, 32.42.

808. Water level, in feet, 1939: Feb. 3, 20.56; May 3, caved; measurements discontinued.

856-A. Water levels, in feet, 1939: Feb. 3, 27.96; May 3, 27.42; July 17, 27.20; Dec. 7, 27.67.

858-A. Water levels, in feet, 1939: Feb. 3, 40.98; May 3, 41.38; July 17, 42.08; Dec. 7, 41.65.

## Gaines County

Well numbers correspond to those in Water-Supply Paper 840, pp. 419-20; Water-Supply Paper 845, p. 487.

2. No measurements made in 1939.

6. No measurements made in 1939.

6-A. ----- NW $\frac{1}{4}$  sec. 160, blk. G, at abandoned oil test, 1.4 miles south of Seminole. Unused drilled well. Measuring point, top of steel casing, 0.5 foot above land surface. Water levels, in feet: Apr. 27, 1938, 41.17; July 21, 1938, 41.33; Jan. 26, 1939, 41.51; Aug. 12, 1939, 41.73.

7. Water levels, in feet, 1939: Jan. 26, 42.77; Aug. 12, 43.52.

8. No measurements made in 1939.

9. Water levels, in feet, 1939: Jan. 26, 67.47; Aug. 12, 67.48.

12. Water levels, in feet, 1939: Jan. 26, 74.24; Aug. 12, 74.17.

a Dry, 22 feet below measuring point.

## Galveston County

Well numbers correspond to those in Water-Supply Paper 777, pp. 204-6; Water-Supply Paper 840, pp. 420-1; Water-Supply Paper 845, 487-3.

3.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 24	a 37.69	May 9	a 37.98	Sept. 15	a 41.09
Apr. 7	a 37.66	July 19	a 38.99		

11. A. A. Davis. On Genoa Quadrangle G-1, in town of Friendswood. Unused drilled well, diameter 4 inches, depth 560 feet. Measuring point, top of 1½-inch valve, 2.8 feet above land surface.

## Water level, in feet, 1939

Feb. 15	54.50	May 9	54.94	Sept. 15	59.62
Apr. 7	54.52	July 19	57.13		

16. Cecil Brown. On Genoa Quadrangle, G-1, in town of Friendswood. Domestic public and industrial drilled well, diameter 6 inches, depth 450 feet. Measuring point, top of pump base 1.1 feet above land surface.

## Water level, in feet, 1939

Feb. 15	54.14	May 9	54.54	Sept. 15	59.28
Apr. 7	54.16	July 19	56.77		

28.

## Water level, in feet, 1939

Feb. 20	48.69	May 9	49.01	Sept. 15	52.17
Apr. 7	48.66	July 19	50.87		

30. J. P. Robinson. On Seabrook Quadrangle G-2, in town of Kemah. Formerly used for Kemah city water supply. Unused drilled well, diameter 2 inches, depth 584 feet. Measuring point, lowest point on 2-inch casing, 0.2 foot above land surface. Water levels, in feet, 1939: Apr. 7, 35.01; July 19, 36.57; Sept. 15, 38.20.

42. J. Freund. Seabrook Quadrangle G-2 in town of Kemah. Unused drilled well, diameter 2 inches, depth 500 feet. Measuring point, top of 2-inch tee, 2.1 feet above land surface.

## Water level, in feet, 1939

Mar. 22	33.67	May 9	34.70	Sept. 15	38.23
Apr. 7	34.28	July 19	36.32		

105.

## Water level, in feet, 1939

Jan. 27	7.65	May 9	8.29	Sept. 15	9.05
Apr. 7	7.78	July 19	8.22		

112.

## Water level, in feet, 1939

Jan. 27	56.07	May 9	57.00	Sept. 15	58.32
Apr. 7	55.58	July 19	58.67		

113.

## Water level, in feet, 1939

Jan. 27	35.44	May 9	31.94	Sept. 15	(b)
Apr. 5	33.32	July 19	33.34		

115.

## Water level, in feet, 1939

Jan. 27	62.42	May 9	46.55	Sept. 15	49.97
Apr. 7	48.25	July 19	52.14		

a Well leaking.

b Pumping.

## Galveston County--Continued

142. Maco Stewart. Dickinson Quadrangle, 2-3/4 miles west of League City. Industrial drilled well, diameter 4 inches, depth 686 feet. Measuring point, top of 4-inch casing, 2.7 feet above land surface. Water levels, in feet, 1939: Mar. 10, 43.60; June 20, 45.50; July 19, 47.35; Sept. 19, 48.08.

206. Water levels, in feet, 1939: Jan. 27, 41.51; May 9, 42.43; July 20, 45.00; Sept. 15, 42.25.

244. Stone Oil Company. Texas City Quadrangle, in town of Texas City. Unused drilled well, diameter 8 inches, depth 788 feet. Measuring point, top of 1 1/2-inch pipe in top, 3.1 feet above land surface.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 21	71.69	May 9	67.20	Sept. 15	73.42
Apr. 7	66.16	July 19	69.43		

272. Water levels, in feet, 1939: Apr. 7, 65.07; July 21, 50.55; Aug. 2, 63.64.

295. A. T. & S. F. R. R. Hitchcock Quadrangle, in town of Hitchcock. Public and industrial drilled well, diameter 8 to 6 inches, depth 689 feet. Measuring point, top of 8-inch casing, 2 feet above land surface.

Water level, in feet, 1939

Feb. 2	38.13	May 9	39.83	July 19	43.19
Apr. 7	39.30	June 20	40.66	Sept. 14	44.72

302. Water levels, in feet, 1939: Apr. 19, 30.92; May 9, a;/ July 19, 34.77; Sept. 15, a/.

381. Stewart Production Company. Virginia Point Quadrangle, 3 miles southeast from Hitchcock. Industrial drilled well, diameter 6 inches, depth 740 feet. Measuring point, top of 1-inch air line tee, 4.3 feet above land surface.

Water level, in feet, 1939

Apr. 29	26.34	June 20	27.10	Sept. 14	33.19
May 9	28.97	July 19	31.39		

619. Phenix Dairy. Dickinson Quadrangle, 4 miles northwest of Alta Loma. Domestic and stock drilled well, diameter 4 inches, depth 780 feet. Measuring point, hole drilled in pump base, 0.3 foot above land surface. Water level, in feet, 1939: May 9, 41.39; June 20, 42.58; July 19, 43.86; Sept. 14, 46.52.

## Gray County

1. ----- Along U. S. Highway 60, 6 1/4 miles southwest from Roberts-Gray County line and 0.6 mile west, on south side of road. Unused drilled well, diameter 4 1/2 inches, depth 438 feet. Measuring point, top of casing, 0.75 foot above land surface. Equipped with windmill. Water levels, in feet, 1939: July 1, 339.69; Dec. 22, 339.42.

## Gregg County.

Well numbers correspond to those in Water-Supply Paper 840, pp. 421-2; Water-Supply Paper 845, p. 489; Gregg County, Texas, Records of Wells, etc., Works Progress Administration, Ground-Water Survey Project 2073, State Board of Water Engineers, 1937 (Mimeographed).

159. Water levels, in feet, 1939: Feb. 7, 179.59; May 5, 180.85; July 19, a;/ Dec. 10, 183.28.

188. Water levels, in feet, 1939: Feb. 7, 15.77; May 5, 15.98; July 19, 16.21; Dec. 10, b/.

a Pumping.

b Dry.

## Gregg County--Continued

189. Water levels, in feet, 1939: Feb. 7, 47.00; May 5, 47.00;  
July 19, 47.50; Dec. 10, 48.44.

192. Water levels, in feet, 1939: Feb. 7, 15.70; May 5, 15.97;  
July 19, 16.07; Dec. 10, 16.73.

264. Water levels, in feet, 1939: Feb. 7, 168.23; May 5, a/  
July 19, a/  
Dec. 10, 169.59.

271. Water levels, in feet, 1939: Feb. 7, 46.13; May 5, 45.23;  
July 19, 46.80; Dec. 10, 47.64.

276. Water levels, in feet, 1939: Feb. 7, 21.72; May 5, 21.99;  
July 19, 22.52; Dec. 10, 23.27.

## Guadalupe County

Well numbers correspond to those in Water-Supply Paper 840, p. 422;  
Water-Supply Paper 845, p. 489; Guadalupe County, Texas, Records of Wells,  
etc., Works Progress Administration, Ground-Water Survey Project 2084,  
State Board of Water Engineers, 1937 (Mimeographed).

## 316. Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 24	108.96	Mar. 28	111.20	May 25	(a)	Oct. 5	117.63
Feb. 28	110.37	Apr. 23	112.19	July 3	(a)	Dec. 19	114.32

## 317. Water level, in feet, 1939

Jan. 24	76.13	Mar. 28	76.17	May 25	76.24	Oct. 5	77.08
Feb. 28	74.82	Apr. 23	76.58	July 4	76.97	Dec. 19	77.30

## Hale County

Well numbers correspond to those in Water-Supply Paper 840, pp. 422-35;  
Water-Supply Paper 845, pp. 490-500; Hale County, Texas, Records of Wells,  
etc., State Board of Water Engineers, in cooperation with the United States  
Department of the Interior, Geological Survey, 1938 (Mimeographed).

## 11. Water level, in feet, 1939

Jan. 4	38.42	Mar. 4	38.21	Aug. 15	38.55	Dec. 1	39.07
31	38.17	July 7	38.33	Oct. 2	38.80		

16. Cottle Co. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 8, blk. 31, 15 miles northwest from Hale  
Center. Unused drilled well, diameter 4 $\frac{1}{2}$  inches, depth 60 feet. Measuring  
point, top of concrete well curb, level with land surface. Equipped with  
windmill.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 4	48.83	July 7	48.93	Oct. 2	49.46
June 23	49.13	Aug. 15	49.27	Dec. 1	49.61

30. No measurements made in 1939.

36. No measurements made in 1939.

37.

## Water level, in feet, 1939

Jan. 4	66.90	June 23	67.03	Nov. 20	67.22
Mar. 3	67.11	Aug. 15	67.11	Dec. 1	67.23

a Pumping.

## Hale County--Continued

102.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 4	49.04	Aug. 15	49.25	Dec. 1	49.63
June 24	49.20	Oct. 2	49.32		

103.

## Water level, in feet, 1939

Mar. 4	47.27	Aug. 15	48.18	Dec. 1	47.80
June 24	47.47	Oct. 2	47.71		

105.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 4	50.99	Mar. 4	50.40	Aug. 15	(a)	Dec. 1	52.35
31	50.64	June 24	54.74	Oct. 2	(a)		

112.

## Water level, in feet, 1939

Jan. 4	54.21	Mar. 4	53.75	June 23	54.22	Oct. 2	54.43
16	53.92	Apr. 3	53.80	Aug. 15	54.20	Dec. 1	54.76
31	53.70						

115.

## Water level, in feet, 1939

Jan. 4	55.22	Mar. 4	54.86	Aug. 15	56.59	Dec. 1	56.82
31	55.01	June 23	56.05	Oct. 2	57.17		

120. No measurements made in 1939.

123.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 4	62.22	Aug. 15	64.46	Dec. 1	63.10
Mar. 3	62.08	Oct. 2	64.96		

124. No measurements made in 1939.

125.

## Water level, in feet, 1939

Jan. 4	80.74	June 23	81.94	Oct. 2	82.45
Mar. 3	80.53	Aug. 15	82.29	Dec. 1	81.86

201. No measurements made in 1939.

202.

## Water level, in feet, 1939

Feb. 28	66.06	Aug. 10	(a)	Dec. 1	67.02
June 16	69.80	Oct. 2	68.08		

203. No measurements made in 1939.

206. Water levels, in feet, 1939: Jan. 6, 68.21; Mar. 1, 68.05; Oct. 2, a/; Dec. 1, 70.35.

208.

## Water level, in feet, 1939

Jan. 6	65.43	Aug. 10	(a)	Dec. 1	66.81
Mar. 1	65.14	Oct. 3	67.85		

a Pumping.

## Hale County--Continued

209. No measurements made in 1939.

## 210. Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 6	65.05	June 16	65.37	Oct. 3	66.30
Mar. 1	64.81	Aug. 10	66.59	Dec. 1	66.08

## 212. Water level, in feet, 1939

Jan. 6	63.74	June 16	(a)	Oct. 3	73.63
Mar. 7	(a)	Aug. 10	(a)	Dec. 1	67.25

213. No measurements made in 1939.

## 220. Water level, in feet, 1939

Jan. 4	54.90	June 16	(a)	Oct. 2	(a)
Feb. 28	54.17	Aug. 10	(a)	Dec. 1	56.35

221. No measurements made in 1939.

## 223. Water level, in feet, 1939

Jan. 4	(a)	Aug. 10	(a)	Dec. 1	54.57
Feb. 28	52.33	Oct. 2	57.86		

## 231. Water level, in feet, 1939

Jan. 4	47.07	June 16	47.27	Oct. 2	47.91
Feb. 28	46.94	Aug. 16	47.61	Dec. 1	48.24

## 232. Water level, in feet, 1939

Jan. 4	50.45	Aug. 10	(a)	Dec. 1	55.23
June 16	(a)	Oct. 2	(a)		

## 238. Water level, in feet, 1939

Jan. 4	52.57	June 16	53.05	Oct. 2	53.47
Feb. 28	52.53	Aug. 14	53.12	Dec. 1	53.60

## 246. Water level, in feet, 1939

Jan. 4	47.97	June 16	48.24	Oct. 2	50.87
Feb. 28	47.78	Aug. 14	49.50	Dec. 1	50.47

248. No measurements made in 1939.

249. No measurements made in 1939.

252. No measurements made in 1939.

## 255. Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 16	18.32	Mar. 4	18.75	July 19	18.75	Dec. 1	20.21
31	18.44	Apr. 3	18.75	Oct. 2 a	42.5		

256. Water levels, in feet, 1939: June 23, 40.49; July 19, 40.37; Oct. 2, 40.90; Dec. 1, 41.19.

a Pumping.

## Hale County--Continued

259.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 16	18.52	Mar. 3	18.61	June 23	18.92	Oct. 2	19.72
31	18.46	26	18.78	July 19	21.54	Dec. 1	19.74

261.

## Water level, in feet, 1939

Jan. 4	15.93	Mar. 3	15.64	June 23	16.18	Oct. 2	16.41
16	15.84	26	15.94	Aug. 15	16.00	Dec. 1	16.66
31	15.63	Apr. 3	16.08				

263. Water-stage recorder operated on well since Oct. 20, 1939.

## Water level, in feet, 1939

Mar. 1	43.66	Oct. 2	44.66	Nov. 9	44.95	Dec. 4	45.02
June 16	43.99	20	44.87	16	44.98	11	45.03
21	44.05	26	44.91	23	45.00	18	45.04
Aug. 10	44.31	Nov. 2	44.93	29	45.01	30	45.06

304. No measurements made in 1939.

305.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 1	69.91	Oct. 3	73.18	Dec. 8	72.41
June 16	71.66	24	72.95		

307.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	64.27	June 16	(a)	Aug. 10	(a)	Dec. 8	66.15
Mar. 1	63.94	July 19	(a)	Oct. 3	(a)		

308. No measurements made in 1939.

314.

## Water level, in feet, 1939

Jan. 6	44.45	June 16	45.25	Aug. 14	45.64	Dec. 8	46.25
Feb. 28	44.28	July 24	45.38	Oct. 3	46.29		

316.

## Water level, in feet, 1939

Jan. 6	50.85	June 16	50.97	Aug. 14	51.06	Oct. 24	51.19
Feb. 28	50.89	July 20	51.02	Oct. 3	51.15	Dec. 8	51.27

317.

## Water level, in feet, 1939

Jan. 6	51.57	June 16	55.90	Oct. 3	(a)	Dec. 8	53.28
Feb. 28	51.53	July 18	52.82	24	52.86		

321. Water levels, in feet, 1939: Feb. 28, 64.20; June 24, 64.40; July 24, b/; Dec. 8, c/.

330.

## Water level, in feet, 1939

Jan. 6	45.32	June 16	(a)	Aug. 14	45.74	Dec. 8	47.24
Feb. 28	25.51	July 20	45.80	Oct. 3	(a)		

a Pumping.

b Dry, 64 feet below measuring point.

c Dry, 63.2 feet below measuring point.

## Hale County--Continued

338.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 3	45.93	June 24	46.82	Oct. 4	47.77
Feb. 27	45.92	Aug. 14	48.31	Dec. 8	47.23

346.

## Water level, in feet, 1939

Jan. 3	47.26	June 24	51.08	Dec. 8	51.99
Feb. 27	46.97	Oct. 4	(a)		

352. No measurements made in 1939.

355. Water levels, in feet, 1939: Jan. 3, 40.02; Feb. 27, 40.11; Oct. 4, 41.47; Dec. 14, 41.40.

356. Water levels, in feet, 1939: Jan. 3, 45.95; Feb. 27, b; Oct. 4, c.

357.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	36.98	June 21	37.59	July 25	37.59	Oct. 4	38.07
Feb. 27	37.01	26	37.59	Aug. 16	37.69	Dec. 14	38.23

370.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 6	42.97	June 16	43.48	Oct. 3	43.81
Feb. 28	42.94	July 20	43.47	Dec. 8	43.98

402.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 5	20.06	Mar. 26	20.08	June 23	19.98	July 19	20.23
16	19.30	Apr. 3	19.94	26	19.62	Aug. 14	20.34
31	19.55	June 19	20.55	July 3	19.54	Oct. 2	21.21
Mar. 1	19.91	21	20.50	7	19.76	Dec. 1	21.64

403. No measurements made in 1939.

405. No measurements made in 1939.

420. No measurements made in 1939.

422.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 5	41.21	June 23	41.46	Dec. 14	(d)
Mar. 1	40.95	Oct. 5	42.01		

427.

## Water level, in feet, 1939

Jan. 5	49.71	June 26	50.60	Oct. 5	51.65
Mar. 1	49.21	July 25	51.29	Dec. 14	51.27

428. Water levels, in feet, 1939: Jan. 5, 50.16; Oct. 5, 52.56; Dec. 14, 52.10.

- a Dry, 53 feet below measuring point.
- b Dry, 46 feet below measuring point.
- c Dry, 42 feet below measuring point.
- d Pumping.



## Hale County--Continued

433A.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 16	18.95	June 19	21.03	Oct. 5	21.60
Mar. 2	19.91	Aug. 16	19.52	Dec. 14	(a)

434. Water levels, in feet, 1939: Mar. 2, 45.08; Oct. 5, 46.49; Dec. 14, 46.59.

435. Water levels, in feet, 1939: Mar. 2, 49.57; Oct. 5, 51.23; Dec. 14, 51.23.

436.

## Water level, in feet, 1939

Mar. 2	52.23	Aug. 16	54.81	Dec. 14	54.29
June 19	(a)	Oct. 5	54.90		

445.

## Water level, in feet, 1939

Mar. 3	49.44	Aug. 16	51.05	Dec. 14	(b)
June 26	50.59	Oct. 16	(b)		

447. No measurements made in 1939.

449.

## Water level, in feet, 1939

Mar. 3	58.29	Aug. 16	59.11	Dec. 14	59.40
June 26	58.82	Oct. 6	59.08		

450. Water levels, in feet, 1939: Mar. 3, 33.48; June 26, 33.71; Aug. 16, 33.81; Oct. 5, 33.83.

454. Water levels, in feet, 1939: Jan. 5, 52.10; Aug. 16, 59.05; Oct. 5, 62.88; Dec. 14, 55.30.

459.

## Water level, in feet, 1939

Jan. 5	40.62	June 19	(a)	Oct. 5	43.73
Mar. 2	40.40	Aug. 16	43.30	Dec. 14	43.80

460. No measurements made in 1939.

462.

## Water level, in feet, 1939

Jan. 5	42.16	June 19	46.19	Oct. 5	45.79
Mar. 2	41.79	Aug. 16	44.96	Dec. 14	44.39

463.

## Water level, in feet, 1939

Jan. 5	37.50	June 19	(a)	Oct. 5	40.90
Mar. 2	37.13	Aug. 16	39.60	Dec. 14	39.79

467.

## Water level, in feet, 1939

Jan. 5	34.42	June 19	34.92	Oct. 5	37.11
Mar. 2	34.15	Aug. 16	37.27	Dec. 14	35.97

470.

## Water level, in feet, 1939

Jan. 5	33.06	June 19	33.22	Oct. 5	33.34
Mar. 3	33.06	Aug. 16	33.30	Dec. 14	33.35

472. No measurements made in 1939.

a Pumping.

b Well, 200 feet west, pumping.

## Hale County--Continued

477.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 5	38.77	June 19	39.17	Aug. 16	38.93	Dec. 14	38.73
Mar. 3	38.73	July 19	39.04	Oct. 5	38.95		

500. No measurements made in 1939.

504. No measurements made in 1939.

508.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 5	47.45	June 23	47.73	Oct. 6	48.15
Mar. 3	47.47	July 19	47.85	Dec. 1	48.31

510.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 4	36.04	Mar. 4	36.02	June 23	36.34	Oct. 2	36.58
16	36.05	Apr. 3	36.10	July 19	36.30	Dec. 1	36.86
31	36.00						

511.

## Water level, in feet, 1939

Jan. 5	20.67	Apr. 3	20.25	June 26	19.22	July 19	20.05
16	19.01	June 19	21.16	July 3	19.34	Aug. 14	20.79
31	19.58	21	21.09	7	19.56	Oct. 2	21.47
Mar. 4	20.29	23	19.87	11	19.76	Dec. 1	22.00
26	20.53						

518. No measurements made in 1939.

525. No measurements made in 1939.

526. Water levels, in feet, 1939: Mar. 3, 53.76; Oct. 6, 54.00; Dec. 4, 54.31.

533. Water level, in feet, 1939: Dec. 14, 59.27.

535. No measurements made in 1939.

539.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 3	57.58	July 19	58.89	Oct. 6	59.55
June 19	59.18	Aug. 16	58.64	Dec. 14	58.48

542. Water-stage recorder operated on well since Oct. 18, 1939.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 5	36.41	July 19	36.79	Oct. 26	37.02	Nov. 29	37.10
Mar. 3	36.54	Aug. 16	36.97	Nov. 2	37.03	Dec. 4	37.11
June 19	36.82	Oct. 6	37.02	9	37.04	11	37.13
21	36.83	17	36.97	16	37.06	14	37.14
26	36.83	18	36.98	23	37.09	18	37.14
July 3	36.79	21	37.00				

## Hale County--Continued

547.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 3	51.74	Aug. 16	52.27	Dec. 14	52.54
June 19	52.17	Oct. 6	52.53		

549.

## Water level, in feet, 1939

Mar. 3	56.60	Aug. 16	57.05	Dec. 14	57.40
June 26	56.90	Oct. 6	57.34		

552.

## Water level, in feet, 1939

Jan. 5	59.40	July 19	61.92	Oct. 6	61.13
Mar. 3	59.28	Aug. 16	60.69	Dec. 14	60.20

553.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 5	54.15	June 19	(a)	Aug. 16	55.44	Dec. 14	54.96
Mar. 3	54.05	July 19	56.76	Oct. 6	55.92		

564.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 3	56.55	July 19	56.81	Oct. 6	56.95
June 19	56.74	Aug. 16	56.86	Dec. 14	57.03

567.

## Water level, in feet, 1939

Mar. 3	52.84	July 19	53.30	Dec. 14	53.19
June 19	53.10	Oct. 6	53.25		

569.

## Water level, in feet, 1939

Mar. 3	(a)	July 19	54.50	Dec. 14	54.61
June 19	54.50	Oct. 6	54.53		

604. No measurements made in 1939.

605.

## Water level, in feet, 1939

Jan. 4	85.65	June 23	85.95	Oct. 2	86.85
Mar. 3	85.32	Aug. 15	86.47	Dec. 1	86.26

614. No measurements made in 1939.

621. Water level, in feet, 1939: Aug. 15, 62.51.

719A.

## Water level, in feet, 1939

Jan. 28	76.88	Apr. 3	77.06	Aug. 16	77.24
Mar. 4	76.90	June 16	77.13		

719B. W. Bogart. NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 22, Sabine County School land, 17 $\frac{1}{2}$  miles southwest of Hale Center. Drilled well, diameter 5 inches, depth 28 feet. Measuring point, top of steel casing, 0.5 foot above land surface. Equipped with windmill.

## Water level, in feet, 1938-39

Oct. 24, 1938	11.63	Mar. 4, 1939	11.72	June 16, 1939	12.21
Dec. 22	11.70	Apr. 3	11.78	Aug. 16	11.01
Jan. 28, 1939	11.21				

a Pumping.

## Hale County--Continued

720B.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 28	15.87	Apr. 3	16.42	Aug. 16	(a)
Mar. 4	16.27	June 16	16.70		

736A. Water levels, in feet, 1939: Jan. 28, 86.21; Mar. 4, 86.22; Apr. 3, 86.29.

736B.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 28	33.12	Apr. 3	33.86	June 22	34.20	Aug. 16	32.97
Mar. 4	33.57	June 16	34.18	July 11	32.71		

807. No measurements made in 1939.

816.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 3	56.50	Aug. 16	56.60	Dec. 14	56.73
June 26	56.80	Oct. 5	56.86		

819. No measurements made in 1939.

822. Water levels, in feet, 1939: Mar. 7, 51.80; June 23, 51.85; Oct. 6, 51.89; Dec. 17, 51.91.

824. Water levels, in feet, 1939: June 23, 64.38; Oct. 6, 64.42; Dec. 17, 64.43.

825. Water levels, in feet, 1939: Mar. 7, 65.82; June 23, 65.91; Oct. 6, a; Dec. 17, 66.07.

828. G. W. Bigler. NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 33, blk. A-4, 5 miles south of Hale Center. Drilled irrigation well, diameter 14 inches depth 218 feet. Measuring point, lower edge of large opening in pump base, 1.5 feet above land surface.

## Water level, in feet, 1938-39

June 15, 1938	75.49	Mar. 7, 1939	73.08	Oct. 16, 1939	83.44
Oct. 18	74.36	June 23	75.61	Dec. 17	74.33

833. Water levels, in feet, 1939: Mar. 7, 84.14; June 23, 84.15; Oct. 6, 84.07; Dec. 17, 84.01.

834. Water levels, in feet, 1939: Mar. 7, 77.31; June 23, 77.40; Oct. 6, 77.38; Dec. 17, 77.42.

835. Water levels, in feet, 1939: Mar. 7, 59.58; June 23, 59.68; Oct. 6, 59.73; Dec. 17, 59.78.

837. Water levels, in feet, 1939: Mar. 7, 64.88; June 23, 64.94; Oct. 6, 64.87; Dec. 17, 64.86.

840. Water levels, in feet, 1939: Mar. 7, 61.16; July 19, 61.28; Oct. 5, 61.41.

848. Mrs. J. E. Cheney. SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 75, blk. A-4, 12 $\frac{1}{2}$  miles south of Hale Center. Drilled well, diameter 4 $\frac{1}{2}$  inches, depth 105 feet. Measuring point, top of concrete curb at west side, 0.5 foot above land surface. Equipped with windmill.

## Water level, in feet, 1937-39

July 27, 1937	96.45	Mar. 7, 1939	96.31	Oct. 6, 1939	(a)
June 15, 1938	96.39	June 23	(a)	Dec. 17	96.17
Oct. 18	96.33				

a Pumping.

## Hale County--Continued

852. Water levels, in feet, 1939: Mar. 7, 117.89; June 23, 117.96; Oct. 6, 118.11; Dec. 17, 117.89.

859. L. Ragland. NW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 22, blk. C. L., 15 $\frac{1}{2}$  miles southeast of Hale Center. Drilled irrigation well, diameter 15 $\frac{1}{2}$  inches, depth 200 feet. Measuring point, top of air line hole in pump base, 1.0 foot above land surface.

## Water level, in feet, 1937-39

Date	Water level	Date	Water level	Date	Water level
Sept. 15, 1937	76.00	Mar. 7, 1939	76.80	Oct. 6, 1939	77.62
June 16, 1938	77.23	June 23	77.33		

906.

## Water level, in feet, 1939

Mar. 3	41.17	Aug. 2	45.46	Nov. 21	42.74
July 19	(a)	Oct. 5	42.90	Dec. 14	42.66

923.

## Water level, in feet, 1939

Mar. 3	55.44	July 19	55.72	Oct. 5	55.78
June 24	55.71	Aug. 16	55.70	Dec. 14	55.75

929. No measurements made in 1939.

936. Water levels, in feet, 1939: July 19, 47.60; Oct. 5, 48.41; Dec. 14, 47.83.

946. B. E. Porter. SE $\frac{1}{4}$ SE $\frac{1}{4}$  C. K. Andrews sec., 14 $\frac{1}{2}$  miles southeast of Hale Center. Unused drilled irrigation well, diameter 15 inches, depth 300 feet. Measuring point, top of concrete curb, 1.0 foot above land surface.

## Water level, in feet, 1937, 1939

Oct. 22, 1937	55.84	July 19, 1939	59.20	Dec. 14, 1939	59.61
Mar. 3, 1939	58.04	Oct. 5	60.02		

956. Water levels, in feet, 1939: Mar. 3, 65.97; July 19, 66.67; Oct. 5, 67.80; Dec. 14, 67.08.

958. Water levels, in feet, 1939: Mar. 3, 58.64; July 19, 58.96; Oct. 5, 59.05; Dec. 14, 58.90.

971. L. S. Claitor, NW cor. NW $\frac{1}{4}$  sec. 15, blk. C. L., 17 $\frac{1}{2}$  miles southeast of Hale Center. Unused drilled irrigation well, diameter 18 inches, depth 240 feet. Measuring point, top of concrete curb, 0.6 foot above land surface.

## Water level, in feet, 1938-39

June 16, 1938	63.41	Mar. 7, 1939	60.52	Oct. 6, 1939	61.86
Oct. 18	62.0	June 23	61.08		

974A. W. B. Mooney. SW $\frac{1}{4}$ NW $\frac{1}{4}$  J. A. Alexander Survey, 17 $\frac{1}{2}$  miles southeast of Hale Center. Unused drilled well, diameter 4 $\frac{1}{2}$  inches, depth 75 feet. Measuring point, top of casing, level with land surface. Equipped with windmill.

## Water level, in feet, 1938-39

June 16, 1938	62.28	Mar. 7, 1939	62.58	Oct. 6, 1939	62.98
Oct. 18	62.37	June 23	62.94		

a Pumping.

## Hansford County

Well numbers correspond to those in Water-Supply Paper 840, pp. 435-7; Water-Supply Paper 845, p. 501; Hansford County, Texas, Records of wells, etc., Works Progress Administration Ground-Water Survey Project 2069, State Board of Water Engineers, 1936 (Mimeographed).

124. Water levels, in feet, 1939: Feb. 13, 73.23; June 30, 73.51; Dec. 21, 73.74.

137. Water levels, in feet, 1939: Feb. 13, 67.93; June 30, 68.32; Dec. 21, 68.80.

141. Water level, in feet, 1939: Feb. 13, 71.70.

148. Water level, in feet, 1939: Feb. 13, 70.24.

153. No measurements made in 1939.

163. Water levels, in feet, 1939: Feb. 13, 79.95; June 30, 80.24; Dec. 21, 80.41.

166. No measurements made in 1939.

228. No measurements made in 1939.

236. Water levels, in feet, 1939: Mar. 10, 170.89; Dec. 21, 170.80.

239. Water levels, in feet, 1939: Mar. 10, 147.89; June 30, 147.95; Dec. 21, 147.92.

241. No measurements made in 1939.

243. Water level, in feet, 1939: Dec. 21, 163.70.

244. Water level, in feet, 1939: Mar. 10, 181.07.

246. Water level, in feet, 1939: Feb. 13, 174.58.

262. Water levels, in feet, 1939: Feb. 13, 45.50; Dec. 21, 46.01.

270. No measurements made in 1939.

277. Water levels, in feet, 1939: Feb. 13, 27.10; Dec. 21, 28.24.

289. J. J. Jones. NW $\frac{1}{4}$  sec. 7, J. W. Jones Survey, 6 $\frac{1}{2}$  miles south of Gruver. Drilled well, diameter 4 $\frac{1}{2}$  inches. Measuring point, top of casing, 0.5 foot above land surface. Equipped with pump jack. Water levels, in feet, 1939: Feb. 13, 25.52; Dec. 21, 26.79.

334. No measurements made in 1939.

## Harris County

Well numbers correspond to those in Water-Supply Paper 777, pp. 206-14; Water-Supply Paper 840, pp. 437-9; Water-Supply Paper 845, pp. 501-4; Harris County, Texas, Records of wells, etc., State Board of Water Engineers, in cooperation with the United States Department of the Interior, Geological Survey, 1939 (Mimeographed).

6a. Water level, in feet, 1939: Dec. 16, 17.81.

11.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 25	48.52	May 30	44.51	Sept. 25	44.56
Mar. 23	44.56	Aug. 2	44.55	Dec. 16	44.61

## Harris County--Continued

14. J. A. Hafner. One and three-quarters miles east of Waller. Domestic and stock drilled well, diameter 4 inches depth 122 feet. Measuring point, top of casing, 2.0 feet above land surface.

Water level, in feet, 1931-34, 1936-39

Date	Water level	Date	Water level	Date	Water level
Apr. 13, 1931	50.30	June 22, 1932	50.61	Oct. 24, 1938	51.54
May 28	50.30	Sept. 29	50.78	Nov. 22	51.55
June 19	50.54	Jan. 31, 1933	50.80	Dec. 22	51.56
July 23	50.45	Apr. 25, 1934	51.23	Jan. 25, 1939	51.42
Sept. 24	50.65	Feb. 25, 1936	51.05	Mar. 23	51.42
Jan. 13, 1932	50.36	May 13, 1937	50.91	May 30	51.37
Mar. 15	50.43	Nov. 9	(a)	Aug. 2	51.84
Apr. 19	50.67	Feb. 2, 1938	51.34	Sept. 25	52.21
24	50.72	May 10	51.10	Dec. 16	52.24

31.

Water level, in feet, 1939

Jan. 25	42.81	May 30	41.18	Sept. 25	43.27
Mar. 23	42.95	Aug. 2	42.46	Dec. 16	42.60

33. W. G. Neeley. Five miles east-southeast of Waller. Domestic and stock drilled well, diameter 10 inches, depth 61 feet. Measuring point, top of wood suction pipe clamp, 16 inches above land surface.

Water level, in feet, 1931-39

Apr. 13, 1931	32.11	Aug. 25, 1932	32.82	May 13, 1936	31.69
May 28	34.53	Sept. 27	32.91	Nov. 9, 1937	32.80
June 29	32.11	Oct. 28	32.95	Feb. 2, 1938	29.91
July 23	32.19	Nov. 28	33.09	May 10	24.67
Sept. 24	32.48	Dec. 28	33.06	Oct. 24	32.54
Nov. 14	32.62	Jan. 31, 1933	33.07	Nov. 22	32.64
Dec. 11	32.48	Mar. 13	33.09	Dec. 22	32.71
Jan. 13, 1932	32.45	May 10	33.36	Jan. 25, 1939	29.75
Feb. 10	32.30	June 26	33.38	Mar. 8	29.74
Mar. 15	32.04	Nov. 20	33.64	23	31.21
Apr. 19	32.30	Nov. 28, 1934	33.18	May 30	32.37
May 24	32.48	May 30, 1935	31.94	Aug. 2	32.72
June 24	32.58	Aug. 19	33.18	Sept. 25	33.24
July 22	32.75	Feb. 26, 1936	31.06	Dec. 16	33.45

35.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 25	25.83	Mar. 23	25.72	Aug. 2	25.10	Dec. 16	27.32
Mar. 8	25.79	May 30	24.52	Sept. 25	25.93		

36. Water levels, in feet, 1939: Jan. 25, b/; Mar. 8, b/; Mar. 23, b/; May 30, b/; Aug. 2, b/; Sept. 25, b/; Dec. 16, b/.

95. Water level, in feet, 1939: Dec. 2, 26.44.

97.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 26	12.32	Apr. 24	11.55	Aug. 3	13.14
Mar. 4	9.03	May 24	12.55	Dec. 2	(c)

102. C. P. Addison. About  $4\frac{1}{2}$  miles south of Spring. Domestic and stock dug well, diameter 4 inches, depth 20 feet. Measuring point, top of tin cover, 1.4 feet above land surface.

Water level, in feet, 1938-39

Feb. 6, 1938	17.62	Dec. 17, 1938	16.20	May 24, 1939	13.88
May 13	9.76	Jan. 26, 1939	14.90	Aug. 3	11.53
Oct. 26	15.77	Mar. 4	11.16	Sept. 25	15.03
Nov. 18	16.16	Apr. 24	12.35	Dec. 19	15.94

a Pumping. b Dry, 19 feet below measuring point.  
c Dry, 15 feet below measuring point.

## Harris County--Continued

103. G. P. Addison. About  $4\frac{1}{2}$  miles south of Spring. Domestic and stock drilled well, diameter 6 inches, depth 40 feet. Measuring point, top of casing, 2.0 feet above land surface.

Water level, in feet, 1931, 1938-39

Date	Water level	Date	Water level	Date	Water level
Nov. 9, 1931	18.37	Nov. 18, 1938	7.1	Mar. 4, 1939	6.93
Feb. 6, 1938	6.97	Dec. 17	(a)	May 24	(a)
Oct. 26	6.98	Jan. 26, 1939	(a)	Dec. 19	(a)

104. C. P. Addison. About  $4\frac{1}{2}$  miles south of Spring. Domestic and stock drilled well, diameter 6 inches, depth 45 feet. Measuring point, top of casing, 2.0 feet above land surface.

Water level, in feet, 1931, 1938-39

Nov. 9, 1931	28.27	Dec. 17, 1938	21.71	May 24, 1939	b 25.04
Feb. 6, 1938	17.63	Jan. 26, 1939	18.86	Aug. 3	16.17
May 13	15.16	Mar. 4	18.15	Sept. 25	19.20
Oct. 26	19.69	Apr. 24	17.70	Dec. 19	20.10
Nov. 18	19.28				

134. Ira Southard. About 9 miles southwest of Cypress. Drilled irrigation well, diameter 10 inches, depth 274 feet. Measuring point, top of casing at land surface.

Water level, in feet, 1931, 1939

Feb. , 1931	32.00	Mar. 10, 1939	45.98	Dec. 16, 1939	50.89
Jan. 5, 1939	47.09	Sept. 15	53.50		

134a. Ira Southard. About 9 miles southwest of Cypress. Drilled irrigation well. Measuring point, top of casing, at land surface. Water levels, in feet, 1939: Jan. 5, 45.61; Mar. 10, 44.38.

136. J. Freeman. About 9 miles southwest of Cypress. Drilled irrigation well, depth 138 feet. Measuring point, top of pump base, 0.5 foot above land surface and 160 feet above mean sea level.

Water level, in feet, 1931, 1933, 1939

Mar. 24, 1931	36.32	Mar. 17, 1933	38.37	Sept. 15, 1939	55.33
Apr. 28	36.21	Jan. 6, 1939	47.21	Dec. 16	51.78
Nov. 4	39.37	Mar. 10	45.53		

139a. E. W. Peak. About  $8\frac{1}{2}$  miles southwest of Cypress. Drilled irrigation well, depth 250 feet. Measuring point, top of casing, 2.0 feet above land surface. Water levels, in feet, 1939: Jan. 5, 44.93; Mar. 8, 43.19; Sept. 15, 54.69; Dec. 16, 49.84.

140. Oscar Kemp. About  $7\text{-}3/4$  miles southwest of Cypress. Drilled irrigation well, depth 359 feet. Measuring point, top of port in south side of pump base, 1.0 foot above land surface and 160 feet above mean sea level. Water levels, in feet, 1939: Jan. 5, 46.39; Mar. 8, 41.84; Sept. 18, 59.30; Dec. 21, 48.05.

166.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 25	4.32	Mar. 23	3.99	Aug. 2	7.81	Dec. 15	12.05
Mar. 8	2.82	May 30	7.73	Sept. 25	11.01		

167.

Water level, in feet, 1939

Jan. 25	14.32	Mar. 23	12.90	Aug. 2	21.52	Dec. 15	17.79
Mar. 8	13.06	May 30	20.37	Sept. 25	18.87		

a Dry, 7.1 feet below measuring point.

b Pumping.



## Harris County--Continued

169a. Ben Pewe. About 2.9 miles northwest of Cypress and 0.15 mile south of S. P. R. R. Drilled irrigation well, diameter 22 inches, depth 499 feet. Measuring point, top of 22-inch casing, 1.0 foot above land surface.

## Water level, in feet, 1938-39

Date	Water level	Date	Water level	Date	Water level
Nov. 3, 1938	15.60	Jan. 25, 1939	13.43	May 30, 1939	(a)
Dec. 22	15.26	Mar. 8	12.25	Sept. 25	b 19.91
22	14.78	23	12.16	Dec. 15	17.02

171.

## Water level, in feet, 1939

Jan. 25	15.56	Mar. 23	14.57	Sept. 25	20.56
Mar. 8	14.53	May 30	17.37	Dec. 15	20.30

178. Water level, in feet, 1939: Dec. 15, 14.34.

182. Joel Schmidt. About 4½ miles south of Cypress. Drilled irrigation well, diameter 24 inches, depth 239 feet. Measuring point, edge of 1-inch hole in pump base, flush with land surface and 142 feet above mean sea level. Water levels, in feet, 1939: Jan. 3, 28.50; Mar. 8, 27.40; Sept. 16, c/ 42.90.

183. J. J. Sweeny. About 5-3/4 miles south of Cypress. Drilled irrigation well, diameter 24 inches, depth 284 feet. Measuring point, top of pump base, flush with land surface and 136 feet above mean sea level.

## Water level, in feet, 1931-32, 1939

Mar. 12, 1931	23.98	Jan. 3, 1939	30.20	Sept. 16, 1939	41.52
Aug. 1, 1932	35.52	Mar. 8	29.11		

186. Tucker. Six miles southwest of Cypress. Irrigation well, diameter 18 inches. Measuring point, edge of 1-inch hole in inner pump base, flush with land surface and 148 feet above mean sea level.

## Water level, in feet, 1931, 1939

Mar. 12, 1931	21.57	Jan. 5, 1939	29.59	Sept. 16, 1939	37.70
24	21.13	Mar. 8	28.32		

205.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 25	32.96	Mar. 23	34.29	May 30	38.09	May 30	37.52
Mar. 8	(a)	May 30	39.50	30	37.77	Aug. 2	37.23

206.

## Water level, in feet, 1939

Jan. 25	27.36	Mar. 23	26.46	Aug. 2	32.38	Dec. 15	30.59
Mar. 8	26.65	May 30	30.02	Sept. 25	33.64		

210. Water level, in feet, 1939: Dec. 2, 23.78.

221. S. Terpstra. About 10-3/4 miles east of Cypress. Unused drilled well, diameter 4 inches, depth 208 feet. Measuring point, top of 4-inch casing, 0.4 foot above land surface.

## Water level, in feet, 1938-39

Date	Water level	Date	Water level	Date	Water level
Nov. 9, 1938	35.02	Apr. 24, 1939	34.49	Aug. 31, 1939	36.39
27	35.35	May 24	34.81	Sept. 25	36.96
Dec. 17	35.35	June 21	35.06	Nov. 1	37.40
Jan. 26, 1939	35.40	Aug. 3	35.68	Dec. 19	37.74
Feb. 17	35.02				

a Pumping. b Measuring point raised 0.1 foot to edge of 1-inch hole.  
c Measuring point raised 3.5 feet to bottom edge of inverted discharge pipe.

## WATER LEVELS AND ARTESIAN PRESSURE, 1939

## Harris County--Continued

225. Trinity and Brazos Valley, R. R. Co. Drilled well. Depth 616 feet. Measuring point, top of steel pipe clamp, at land surface. Water level, in feet, 1938-39

Date	Water level	Date	Water level	Date	Water level
Nov. 9, 1938	31.68	Apr. 24, 1939	31.69	Aug. 31, 1939	33.76
21	31.93	May 24	31.79	Sept. 25	34.32
Dec. 17	32.02	June 21	32.03	Nov. 1	35.00
Feb. 17, 1939	31.87	Aug. 3	32.94	Dec. 19	34.99

254.

Water level, in feet, 1939

Jan. 26	3.96	May 24	(a)	Dec. 19	(a)
Mar. 4	5.05	Sept. 25	(a)		

255. J. M. Blake. About 2½ miles west-northwest of Aldine. Domestic and stock well, diameter at top 5 feet, depth 41 feet. Measuring point, top of concrete curb, 2.0 feet above land surface.

Water level, in feet, 1937-39

Nov. 10, 1937	20.20	Dec. 17, 1938	21.79	Aug. 3, 1939	18.38
Feb. 6, 1938	13.75	Jan. 26, 1939	16.02	Sept. 25	20.83
May 12	12.22	Mar. 4	14.02	Dec. 19	22.60
Oct. 26	20.18	Apr. 25	15.24		
Nov. 18	24.35	May 24	17.11		

256.

Water level, in feet, 1939

Jan. 26	33.81	May 24	34.06	Sept. 25	(b)
Mar. 4	33.53	Aug. 3	34.50	Dec. 19	36.59
Apr. 24	33.70				

264.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 4	36.68	May 24	37.58	June 13	37.16	June 17	37.30
Apr. 24	37.05	June 3	37.13	14	37.18	Aug. 3	37.51
May 5	37.09	7	37.09	15	37.22	Dec. 18	39.58

264a. ----- About 0.15 mile south of No. 264 on Hardy Street road, opposite mile post 135 on M. P. R. R. Drilled domestic well, depth 102 feet. Measuring point, top of casing, 2.5 feet above land surface.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
June 7	10.32	Aug. 31	13.01	Dec. 18	15.46
Aug. 3	11.25	Sept. 25	38.47		

302. Rebel Oil Company. About 3½ miles southeast of Humble oil field supply. Drilled well, diameter 7 inches, depth 1,000 feet. Measuring point, top of casing, 2.0 feet above land surface.

Water level, in feet, 1939

Mar. 14	35.70	Aug. 3	36.85	Dec. 18	(b)
May 24	36.20	Sept. 1	37.89		

352. A. E. Thompson. About 5-3/4 miles north of Katy. Drilled irrigation well, diameter 24 inches, depth 470 feet. Measuring point, top of small port in pump base, 1.0 foot above land surface and 163 feet above mean sea level. Water levels, in feet, 1939: Jan. 5, 50.64; Mar. 10, 49.07; Sept. 15, 59.14; Dec. 16, 54.34.

a Dry.

b Pumping.

## Harris County--Continued

357. P. V. Cook. About  $4\frac{1}{2}$  miles northeast of Katy. Irrigation well, diameter 30 inches. Measuring point, top of casing, 1.5 feet above land surface and 154 feet above mean sea level.

Water level, in feet, 1931-33, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 24, 1931	35.57	Aug. 17, 1932	40.70	Mar. 10, 1939	41.39
Apr. 28	35.41	Mar. 17, 1933	37.55	Sept. 18	48.26
Nov. 4	38.95	Jan. 6, 1939	48.66	Dec. 21	52.85

362. E. G. Stockdick. Four miles northeast of Katy. Drilled irrigation well, diameter 24 inches, depth 500 feet. Measuring point, top of 24-inch casing, 1.0 foot above land surface.

Water level, in feet, 1931, 1933, 1938-39

Mar. 12, 1931	32.78	Jan. 5, 1939	42.17	Sept. 18, 1939	55.08
Mar. 17, 1933	35.67	Mar. 10	40.50	Dec. 21	45.94
Dec. 5, 1938	43.49				

367. W. C. Hickman. About  $3\frac{1}{4}$  miles east-northeast of Katy. Drilled irrigation well, diameter 16 inches, depth 535 feet. Measuring point, edge of 1-inch hole in east side of pump base, 1.5 feet above land surface.

Water level, in feet, 1930, 1938-39

May, 1930	36.00	Jan. 6, 1939	43.56	Sept. 18, 1939	(a)
Dec. 5, 1938	44.46	Mar. 10	42.29		

370. J. M. Johnson. Three miles east of Katy. Drilled irrigation well, diameter 18 inches, depth 625 feet. Measuring point, pump base, at land surface.

Water level, in feet, 1929-31, 1938-39

Jan., 1929	34.00	Aug. 6, 1931	53.05	Jan. 6, 1939	43.54
(b) 1930	41.00	Nov. 4	40.73	Mar. 10	42.29
Mar. 12, 1931	36.30	Dec. 5, 1938	45.04	Sept. 18	56.57

381. ----- About  $7\frac{1}{2}$  miles northeast of Katy. Unused drilled well, diameter 6 inches, depth 95 feet. Measuring point, top of casing, 2.5 feet above land surface and 147 feet above mean sea level.

Water level, in feet, 1931-33, 1939

Mar. 12, 1931	25.60	Mar. 17, 1933	28.14	Mar. 8, 1939	31.15
June 12	20.00	Jan. 3, 1939	31.55	Sept. 16	35.13
Aug. 10, 1932	31.00				

382. C. Stockdick. Six miles northeast of Katy. Unused drilled well, diameter 24 inches, depth 185 feet. Measuring point, top of casing, flush with land surface and 143 feet above mean sea level. Water levels, in feet, 1939: Jan. 5, 39.03; Mar. 10, 37.64; Sept. 18, 50.14.

383. C. Stockdick. Six miles northeast of Katy. Drilled irrigation well, diameter 24 inches. Measuring point, top of casing, 1.0 foot above land surface and 143 feet above mean sea level. Water levels, in feet, 1939: Jan. 5, 39.75; Mar. 10, 38.52.

384. A. J. Jordan. Six miles northeast of Katy. Unused drilled well, diameter 18 inches, depth 505 feet. Measuring point, top of casing, 1.0 foot above land surface and 138 feet above mean sea level.

Water level, in feet, 1932-33, 1939

Aug. 17, 1932	45.28	Jan. 5, 1939	41.28	Sept. 18, 1939	a 54.70
Mar. 17, 1933	34.72	Mar. 10	39.78		

385. A. J. Jordan. Six miles northeast of Katy. Drilled irrigation well, diameter 18 inches, depth 359 feet. Measuring point, top of steel casing, 1.5 feet above land surface and 139 feet above mean sea level. Water levels, in feet: Mar. 17, 1933, 37.20; Jan. 5, 1939, 40.90; Mar. 10, 1939, 39.95; Sept. 18, 1939, a/.

a Pumping.

b Fall season of year.

## Harris County--Continued

399. Gertie Rice Farm. About 9½ miles northeast of Katy. Drilled irrigation well, diameter 30 inches, depth 326 feet. Measuring point, top of 1½ by 6-inch port in pump base, flush with land surface and 129 feet above mean sea level. Water levels, in feet, 1939: Jan. 3, 28.94; Mar. 8, 28.28; Sept. 16, 35.01.

400. Schmidt Estate. Eleven miles northeast of Katy. Drilled irrigation well, diameter 12 inches, depth 258 feet. Measuring point, lower edge of discharge pipe, 3.5 feet above land surface and 129 feet above mean sea level. Water levels, in feet, 1939: Jan. 3, 27.87; Mar. 8, 27.10; Sept. 16, 35.20.

512.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 25	7.73	Mar. 23	6.35	Aug. 2	10.17
Mar. 8	5.44	May 30	10.00	Sept. 28	22+

519. Felix Meyers. About 6-3/4 miles west-northwest of Houston postoffice. Drilled domestic well, diameter 4 inches, depth 52 feet. Measuring point, top of casing, 1.0 foot above land surface.

## Water level, in feet, 1937-39

Nov. 9, 1937	13.14	Nov. 22, 1938	12.26	Mar. 23, 1939	a 8.54
Feb. 2, 1938	a 5.42	Dec. 22	13.62	May 30	10.74
May 11	a 9.22	Jan. 25, 1939	12.50	Aug. 2	11.04
Oct. 24	11.11	Mar. 8	6.57	Sept. 28	13.50

602.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 18	59.36	June 20	64.35	Aug. 25	b 69.03	Oct. 27	72.17
Apr. 20	(a)	July 25	66.67	Sept. 28	69.51	Dec. 9	67.03

604. West End Ice Company (now Horlocks Ice Ind.). In Houston, Heights Blvd. and R. R. Crossing. Drilled industrial well, diameter 8 inches, depth 250 feet. Measuring point, hole in 4-inch tee, 1.7 feet above land surface.

## Water level, in feet, 1937-39

Date	Water level	Date	Water level	Date	Water level
June 21, 1937	69.83	Apr. 22, 1938	66.67	Jan. 20, 1939	63.96
July 22	70.09	May 21	67.75	Feb. 20	62.97
Aug. 20	71.00	June 20	70.32	Mar. 18	63.64
Sept. 23	70.97	23	69.30	Apr. 20	66.19
Oct. 26	70.02	July 20	70.32	May 19	67.73
Nov. 18	69.90	Aug. 25	70.12	June 20	72.29
Dec. 17	67.24	Sept. 22	68.15	July 25	(a)
Jan. 20, 1938	64.22	Oct. 21	68.84	Aug. 25	(a)
Mar. 1	63.99	Nov. 21	67.18	Oct. 27	72.17
23	65.85	Dec. 20	66.70	Dec. 14	69.64

606. Henke and Pillot. Two miles west-northwest of Houston post office. Unused drilled well, diameter 6 inches, depth 575 feet. Measuring point, top of casing, 0.5 foot above land surface.

## Water level, in feet, 1937-39

June 21, 1937	69.41	Dec. 17, 1937	65.25	June 20, 1938	76.13
July 22	72.34	Jan. 20, 1938	67.40	July 20	79.90
Aug. 20	72.33	Mar. 1	66.98	Aug. 25	81.09
Sept. 23	75.05	23	67.42	Sept. 22	82.88
Oct. 26	69.90	Apr. 22	72.62	Oct. 21	84.13
Nov. 18	69.73	May 20	75.10	Nov. 21	78.61

a Pumping.

b Measuring point raised 0.6 foot to top of casing.

## Harris County--Continued

## 606. Henke and Pillot.--Continued

Water level, in feet, 1937-39

Date	Water level	Date	Water level	Date	Water level
Dec. 20, 1938	77.98	Feb. 20, 1939	74.65	May 19, 1939	81.85
Jan. 13, 1939	75.34	Mar. 18	77.93	June 20	80.82
13	75.99	Apr. 8	78.30	July 25	85.55
13	75.70	8	79.02	Aug. 25	86.83
13	75.69	15	79.02	Sept. 30	88.57
13	75.79	22	78.31	Oct. 27	86.22
14	75.73	May 2	80.28	Dec. 14	84.53

608. Fidelity Products Co. About 1-3/4 miles west-northwest from Houston post office, at 3029 Washington Avenue. Unused drilled well, diameter 6 inches, depth 350 feet. Measuring point, lower edge of discharge pipe, 3.0 feet above land surface.

Water level, in feet, 1931, 1938-39

Jan. 25, 1931	69.40	Jan. 13, 1939	72.46	June 20, 1939	80.85
Nov. 1, 1938	76.97	13	72.45	July 25	82.35
19	75.93	Feb. 20	71.10	Aug. 25	83.68
Dec. 20	73.08	Mar. 18	71.01	Sept. 30	83.67
Jan. 13, 1939	72.53	Apr. 20	73.05	Oct. 27	82.40
13	72.47	May 19	76.86	Dec. 14	78.87
13	72.47				

609. Fidelity Products Co. Houston, 3029 Washington Avenue. Unused drilled well, diameter 8 inches, depth 825 feet. Measuring point, top of lower 1/4-inch air-line union, 3.0 feet above land surface.

Water level, in feet, 1931, 1938-39

Jan. 23, 1931	80.08	Jan. 13, 1939	80.20	June 20, 1939	85.82
Nov. 1, 1938	86.24	13	80.33	July 25	90.08
19	83.52	Feb. 20	80.18	Aug. 25	91.50
Dec. 20	81.80	Mar. 18	82.40	Sept. 30	93.36
Jan. 13, 1939	79.83	Apr. 20	83.80	Oct. 27	90.56
13	79.93	May 19	86.03	Dec. 14	88.70
13	80.13				

610. Standard Rice Co., Inc. Butler Street and S. P. R. R., Houston. Drilled industrial well, diameter 6 inches, depth 853 feet. Measuring point, top of 1 1/4-inch air line, 1.0 foot above land surface. Water levels, in feet: Jan. 25, 1931, 54.00; Nov. 7, 1938, 86.17; May 22, 1938, 84.01.

## 619.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 20	72.86	Aug. 17	90.27	Nov. 27	86.64	June 20	84.86
Feb. 20	77.52	17	90.25	Dec. 4	88.11	July 25	88.25
Mar. 18	79.77	23	89.87	11	86.82	Sept. 30	92.45
Apr. 20	80.04	30	84.72	18	87.50	Oct. 27	88.19
May 18	84.67	Sept. 6	89.05	22	85.47		

620. Public Laundries. Houston, 1601 West Webster Street. Drilled industrial well, diameter 6 inches, depth 1,379 feet. Measuring point, top of flange on casing, 0.45 foot above concrete floor, at land surface.

Water level, in feet, 1938-39

Date	Water level	Date	Water level	Date	Water level
Nov. 6, 1938	105.97	May 21, 1939	111.12	Oct. 29, 1939	111.00
Feb. 5, 1939	101.05	July 23	118.90	Dec. 17	108.10
Apr. 23	108.28	Aug. 27	124.86		

## Harris County--Continued

651a. A. Wilke. Drilled well, depth 300 feet. Measuring point, edge of 1-inch air-line hole in cap, 0.8 foot above land surface.

Water level, in feet, 1938-39

Date	Water level	Date	Water level	Date	Water level
Nov. 9, 1938	54.06	Mar. 4, 1939	53.69	Aug. 31, 1939	57.66
27	54.32	Apr. 24	54.41	Oct. 31	58.42
Dec. 17	54.20	May 24	55.20	Dec. 19	58.62
Jan. 26, 1939	53.73	Aug. 3	56.40		

651b. A. Wilke. Drilled well, depth 65 feet. Measuring point, top of 2-inch casing, 1.2 feet above land surface.

Water level, in feet, 1938-39

Nov. 9, 1938	13.64	Mar. 4, 1939	(a)	Aug. 3, 1939	12.52
27	15.54	Apr. 24	(a)	31	14.90
Dec. 17	14.50	May 24	12.27	Dec. 19	15.27
Jan. 26, 1939	9.87				

651c. J. W. Follis. Gulf Bank Rd., 0.55 mile east of Highway 75. Domestic, stock and irrigation drilled well, diameter 4 inches, depth 301 feet. Measuring point, top of opening of 4-inch length of 2-inch pipe screwed in side of tee, 1.5 foot above land surface and 80 feet above mean sea level.

Water level, in feet, 1938-39

June , 1938	38.00	May 24, 1939	(a)	Sept. 25, 1939	50.19
Dec. 8	46.56	Aug. 3	48.64	Dec. 19	51.24
Apr. 24	(a)	31	(a)		

651d. Drilled irrigation well, depth 468 feet. Measuring point, top of 1-inch air line in cap, 1.8 feet above land surface.

Water level, in feet, 1938-39

Dec. 8, 1938	57.79	June 21, 1939	59.13	Sept. 25, 1939	61.76
Feb. 17, 1939	56.94	Aug. 3	60.30	Oct. 31	62.40
Apr. 23	58.06	31	61.29	Dec. 19	62.69
May 24	58.94				

654a. H. C. Meyers. About  $\frac{1}{2}$  mile north-northwest of Beaumann ranch house. Drilled well, diameter 6 inches, depth 1,800 feet. Measuring point, top of 6-inch casing, 3.0 feet below land surface.

Water level, in feet, 1938-39

Nov. 9, 1938	b 0.24	May 24, 1939	0.51	Aug. 26, 1939	b 2.35
Dec. 17	1.85	June 26	4.49	Oct. 31	1.67
Jan. 26, 1939	1.45+	Aug. 3	b .65	Dec. 19	5.50
Apr. 23	b 1.64				

656.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 14	80.47	Mar. 18	80.98	June 30	86.75	Sept. 29	90.40
20	80.65	Apr. 19	82.52	July 25	87.59	Oct. 31	90.10
Feb. 20	(a)	May 17	83.90	Aug. 25	89.52	Dec. 14	89.90
27	79.63	June 19	85.36				

a Pumping. b Bubbles of gas emitted by well.

## Harris County--Continued

662. South Texas Cotton Oil Co. H. E. & W. T. R. R. and I. & G. N. R. R. Junction, in Houston, 2½ miles north-northeast of Houston post office. Drilled industrial well, diameter 24 inches, depth 834 feet. Measuring point, top of pump base, at land surface.

Water level, in feet, 1937-39

Date	Water level	Date	Water level	Date	Water level
May 19, 1937	65.87	Apr. 22, 1938	75.50	Mar. 18, 1939	85.89
June 22	69.18	May 21	74.55	Apr. 19	(a)
July 20	70.62	June 23	79.45	May 17	85.41
Aug. 20	(a)	July 20	80.70	June 19	85.67
Sept. 23	75.10	Aug. 25	(a)	June 30	88.39
Oct. 26	74.86	Sept. 22	(a)	July 25	(a)
Nov. 18	74.60	Oct. 21	87.10	Aug. 25	90.80
Dec. 17	72.70	Nov. 21	87.76	Sept. 29	93.20
Mar. 1, 1938	72.53	Dec. 20	81.65	Oct. 31	95.02
23	(a)	Jan. 20, 1939	79.74	Dec. 14	96.30
30	74.44	Feb. 20	(a)		

663. South Texas Cotton Oil Co. About 2-3/4 miles north-northeast from Houston post office. Unused drilled well, diameter 24 inches, depth 740 feet. Measuring point, top of pump base, at land surface.

Water level, in feet, 1938-39

Nov. 21, 1938	67.44	Apr. 19, 1939	65.16	Aug. 25, 1939	72.49
Dec. 20	65.46	May 17	67.40	Sept. 29	73.15
Jan. 20, 1939	64.02	June 19	68.89	Oct. 31	73.73
Feb. 20	64.17	30	69.99	Dec. 14	72.98
Mar. 18	65.39	July 25	70.83		

665. National Lumber and Creosoting Co. About 2-3/4 miles north-northeast from Houston post office. Unused drilled well, diameter 552 feet. Measuring point, joint of top and bottom flanges of casing, 1.0 foot above land surface.

Water level, in feet, 1931, 1938-39

Jan. 14, 1931	56.18	Mar. 18, 1939	77.16	July 25, 1939	80.58
Nov. 7, 1938	79.30	Apr. 19	74.60	Aug. 25	81.30
26	76.75	May 17	77.40	Sept. 29	82.21
Dec. 20	74.80	June 19	77.65	Oct. 31	83.95
Jan. 20, 1939	72.69	30	79.47	Dec. 14	71.62
Feb. 20	74.39				

666a. Houston Foundry and Machine Co. Houston, 2005 White Street and Weber Street. Unused drilled well, diameter 6 inches, depth 900 feet. Measuring point, top of cap on 6-inch casing at 1-inch hole, 2.5 feet above land surface.

Water level, in feet, 1938-39

Nov. 7, 1938	80.32	Jan. 20, 1939	75.53	May 1, 1939	76.66
26	79.21	Feb. 20	74.15	19	78.58
Dec. 20	77.68	Mar. 18	74.52	June 19	81.48
Jan. 13, 1939	75.80	Apr. 10	75.58	Aug. 25	85.41
13	75.83	12	76.03	Sept. 30	86.10
13	75.98	15	76.08	Oct. 27	85.69
13	75.92	22	76.23	Dec. 14	82.70
13	75.90	22	76.23		

677. Houston Light and Power Co. Gable Street and Buffalo Bayou, Houston. Drilled industrial well, diameter 8 inches, depth 873 feet. Measuring point, top of discharge pipe.

Water level, in feet, 1931, 1938-39

Jan. 21, 1931	73.08	July 24, 1939	104.97	Oct. 31, 1939	103.89
Nov. 2, 1938	93.04	24	105.90	Dec. 12	113.70
Feb. 2, 1939	85.09	Aug. 25	106.30	12	113.77
July 24	104.05	Sept. 30	117.37	12	113.84

a Pumping.

Harris County--Continued

680.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 20	63.50	June 1	72.50	Sept. 13	84.73	Nov. 7	72.58
Feb. 20	60.31	3	70.90	20	82.00	13	72.04
Mar. 18	58.95	15	71.60	27	79.39	20	70.90
Apr. 20	63.93	18	73.09	Oct. 4	78.76	27	69.78
May 4	67.60	July 20	79.10	9	77.95	Dec. 4	68.49
11	67.96	Aug. 16	76.58	16	76.49	11	68.35
18	71.40	23	77.19	23	76.75	18	68.31
25	72.64	30	81.58	30	74.70	22	68.09
31	72.64	Sept. 6	84.25				

695. Harris County. Courthouse yard. Drilled public well, diameter 6 inches. Measuring point, top of air-line plug, 1.0 foot above land surface.

Water level, in feet, 1937-39

Date	Water level	Date	Water level	Date	Water level
June 21, 1937	54.08	Apr. 22, 1938	54.57	Feb. 20, 1939	55.90
July 20	54.96	May 20	49.82	Mar. 18	56.09
Aug. 19	55.47	June 23	51.90	Apr. 20	57.03
Sept. 22	55.80	July 21	52.47	May 18	58.47
Oct. 25	55.74	Aug. 25	52.76	June 19	57.51
Nov. 18	55.62	Sept. 22	53.49	July 20	58.19
Dec. 15	54.90	Oct. 20	55.54	Aug. 24	59.24
Jan. 19, 1938	53.73	Nov. 21	55.93	Sept. 30	60.04
Mar. 1	53.17	Dec. 20	56.09	Oct. 28	60.69
Mar. 24	54.23	Jan. 20, 1939	55.92	Dec. 12	60.07

738. Houston Packing Co. Houston, Navigation Boulevard,  $1\frac{1}{2}$  miles east of Houston post office. Unused drilled well, diameter 8 inches, depth 417 feet. Measuring point, top of casing at top of tee.

Water level, in feet, 1937-39

June 21, 1937	65.12	Apr. 22, 1938	67.30	Feb. 20, 1939	67.77
July 20	65.58	May 20	67.30	Mar. 18	67.77
Aug. 20	66.05	June 23	67.36	Apr. 20	67.70
Sept. 22	66.64	July 21	67.48	May 18	67.74
Oct. 25	67.05	Aug. 25	67.54	June 19	67.84
Nov. 18	67.29	Sept. 22	67.65	Aug. 24	68.41
Dec. 15	67.40	Oct. 20	67.76	Sept. 30	68.89
Jan. 19, 1938	67.39	Nov. 20	67.82	Oct. 28	69.22
Mar. 1	67.39	Dec. 20	67.79	Dec. 12	69.58
24	67.35	Jan. 20, 1939	67.82		

741.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 20	56.81	Mar. 18	56.78	May 18	56.77	Aug. 24	56.81
Feb. 20	56.78	Apr. 20	56.77	June 19	56.77	Oct. 28	56.82

751. Texas Pipe Line Co. Six miles east-northeast of Houston post office. Unused drilled well, diameter 6 inches, depth 540 feet. Measuring point, top of air line, 4.0 feet above land surface.

Water level, in feet, 1937-39

Date	Water level	Date	Water level	Date	Water level
June 21, 1937	64.27	Jan. 19, 1938	71.48	Aug. 25, 1939	77.52
July 20	67.52	Mar. 1	69.20	Sept. 22	81.82
Aug. 20	67.21	23	68.90	Oct. 21	80.10
Sept. 22	69.13	Apr. 22	69.65	Nov. 21	79.35
Oct. 26	70.00	May 21	70.18	Dec. 20	77.48
Nov. 18	69.65	June 23	71.25	Jan. 20, 1939	75.57
Dec. 17	69.83	July 20	73.60	Feb. 20	75.52



## Harris County--Continued

## 751. Texas Pipe Line Co.--Continued

Water level, in feet, 1937-39

Date	Water level	Date	Water level	Date	Water level
Mar. 17, 1939	77.48	July 2, 1939	79.48	Aug. 24, 1939	81.70
Apr. 19	77.12	7	79.68	Sept. 29	83.19
May 17	78.30	11	79.76	Oct. 31	84.77
June 19	78.54	15	79.55	Dec. 14	84.56
30	79.30				

## 757.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 20	80.83	May 17	84.60	July 8	86.04	Sept. 29	89.02
Feb. 20	(a)	June 19	85.16	15	85.38	Oct. 31	90.31
Mar. 17	82.36	July 2	85.28	Aug. 24	87.41	Dec. 14	89.85
Apr. 19	82.68	6	85.46				

## 759.

Water level, in feet, 1939

Jan. 20	86.32	May 17	88.87	July 5	91.02	Aug. 24	93.15
Feb. 20	85.68	June 19	(a)	10	92.47	Sept. 29	94.75
Mar. 17	86.88	July 2	95.05	15	90.68	Dec. 14	95.70
Apr. 19	(a)	4	90.72	24	91.09		

## 783.

Water level, in feet, 1939

Jan. 20	47.69	Apr. 20	47.88	July 20	b 75.00	Sept. 28	53.04
Feb. 20	47.25	May 19	48.95	25	51.07	Oct. 27	53.30
Mar. 18	47.32	June 19	49.88	Aug. 31	(a)	Dec. 9	52.36

787. American Service Co. About 2½ miles west-southwest from Houston post office. Unused drilled well, diameter 10 inches, depth 700 feet. Measuring point, top of flange on casing 5.0 feet above land surface.

Water level, in feet, 1938-39

Date	Water level	Date	Water level	Date	Water level
Nov. 8, 1938	70.32	Mar. 15, 1939	67.24	May 19, 1939	70.19
Dec. 21	68.52	23	67.60	June 20	71.96
Jan. 13, 1939	67.84	Apr. 5	68.07	July 25	73.87
Feb. 7	67.40	10	68.18	Aug. 25	75.50
14	67.33	12	68.29	Oct. 4	76.19
21	67.25	15	68.40	Nov. 2	75.00
28	67.06	22	68.76	Dec. 14	72.40
Mar. 8	67.08	May 1	69.56		

787a. American Service Co. Houston, 1623 Westheimer Street. Drilled industrial well, depth 584 feet. Measuring point, top of casing at notch in collar, 1.8 feet above land surface.

Water level, in feet, 1938-39

Nov. 8, 1938	73.40	Mar. 23, 1939	70.45	July 25, 1939	86.50
Dec. 21	71.54	Apr. 22	71.89	Aug. 25	(a)
Jan. 13, 1939	70.30	May 1	70.46	Oct. 4	(a)
13	70.34	19	73.89	Nov. 2	79.70
Feb. 7	69.85	June 20	(a)	Dec. 14	76.10
21	69.83				

a Pumping.

b Nearby well pumping.

## Harris County--Continued

787b. Hollyfield Laundry Co. Houston, 1733 Westheimer Street. Drilled industrial well, depth 732 feet. Measuring point, top of 1-inch air vent pipe in inner base, 2.5 feet above land surface.

Water level, in feet, 1936, 1938-39

Date	Water level	Date	Water level	Date	Water level
Aug. 19, 1936	69.50	Apr. 23, 1939	70.28	Oct. 29, 1939	77.42
Nov. 20, 1938	69.91	July 23	74.85	Dec. 17	73.97
May 21, 1939	71.43	Sept. 3	76.77		

788. Sheperd Laundries. Houston, 2400 Louisiana Street. Drilled industrial well, diameter 8 inches, depth 1,416 feet. Measuring point, top of special measuring pipe, 19½ inches above land surface.

Water level, in feet, 1938-39

Nov. 20, 1938	104.24	July 23, 1939	117.57	Oct. 29, 1939	110.14
Feb. 5, 1939	99.32	Sept. 3	125.38	Dec. 17	107.59
May 21	109.84				

790. Southern United Ice Co. Two miles south-southwest Houston post office. Drilled industrial well, diameter 16 inches, depth 606 feet. Measuring point, top of casing, 1.5 feet below land surface.

Water level, in feet, 1937-39

June 21, 1937	60.37	Apr. 23, 1938	64.22	Feb. 20, 1939	68.18
July 19	64.64	May 21	68.92	Mar. 18	68.13
Aug. 20	65.13	June 23	68.92	Apr. 18	70.00
Sept. 23	65.84	July 20	72.88	May 18	72.00
Oct. 26	62.40	Aug. 25	74.18	June 20	75.17
Nov. 19	61.70	Sept. 23	74.69	July 20	78.40
Dec. 17	58.77	Oct. 21	73.79	Aug. 25	80.25
Jan. 20, 1938	58.17	Nov. 22	72.07	Oct. 4	80.88
Mar. 1	57.84	Dec. 21	70.11	28	79.82
24	58.92	Jan. 20, 1939	69.18	Dec. 9	76.34

798. Rice Institute. About 3½ miles southwest from Houston post office. Unused drilled well, diameter 6 inches, depth 900 feet. Measuring point, top of 1½-inch tee in air line, 0.2 foot above land surface.

Water level, in feet, 1931, 1938-39

Jan. 24, 1931	68.50	Mar. 18, 1939	61.32	Aug. 25, 1939	69.95
Nov. 8, 1938	64.62	May 18	64.71	Oct. 4	69.78
Dec. 21	62.86	June 20	65.97	27	69.01
Jan. 20, 1939	62.35	July 20	69.75	Dec. 9	66.67
Feb. 20	61.64				

798a. H. C. Weiss. Houston, South Main and Sunset Streets. Drilled industrial well, depth 404 feet. Measuring point, edge of air-line hole 1.0 foot above land surface.

Water level, in feet, 1936, 1938-39

Apr. 24, 1936	66.00	Dec. 21, 1938	73.44	Mar. 18, 1939	71.84
Nov. 8, 1938	75.03	Jan. 20, 1939	73.14	Dec. 9	76.77

802. West University Place. About 5½ miles west-southwest from Houston post office. Drilled well, depth 900 feet.

Water level, in feet, 1938-39

Dec. 13, 1938	49.37	Apr. 19, 1939	48.97	Aug. 25, 1939	53.70
21	49.27	May 18	50.13	Sept. 28	54.25
Jan. 20, 1939	48.71	June 20	51.09	Oct. 27	54.43
Feb. 20	48.30	July 20	52.11	Dec. 9	53.40
Mar. 18	48.39				

## Harris County--Continued

804. West University Place. About  $5\frac{1}{2}$  miles west-southwest of Houston post office, at water plant. Drilled well, diameter 6 inches, depth 650 feet. Measuring point, top of tee, 2.6 feet above land surface.

Water level, in feet, 1937-39

Date	Water level	Date	Water level	Date	Water level
June 21, 1937	48.15	Mar. 1, 1938	(a)	May 18, 1939	58.36
July 19	48.08	Apr. 23	(a)	June 20	58.82
Aug. 20	48.88	Dec. 13	b 56.35	July 20	59.66
Sept. 24	51.52	21	c 56.17	Aug. 25	61.82
Oct. 26	50.10	Jan. 20, 1939	55.39	Sept. 28	62.55
Nov. 19	50.35	Feb. 20	55.23	Oct. 27	62.48
Dec. 17	49.26	Mar. 18	55.17	Nov. 9	61.23
Jan. 20, 1938	49.02	Apr. 19	56.93		

807a. City of Bellaire. Houston, Rice and Jessamine Streets at Water Tower. Drilled well, depth 827 feet. Measuring point, top of  $2\frac{1}{2}$ -inch special measuring pipe, 1.5 feet above land surface.

Water level, in feet, 1937-39

Feb. 1937	40.50	Mar. 18, 1939	46.48	July 20, 1939	49.37
Nov. 19, 1938	46.84	Apr. 19	47.49	Aug. 25	(c)
20	46.39	May 19	49.00	Sept. 28	52.42
Dec. 21	(c)	19	48.32	Oct. 27	53.69
Jan. 20, 1939	45.70	19	48.26	27	53.65
Feb. 15	45.53	June 20	(c)	Dec. 9	(c)

809. Gem Electric and Ice Co. In City of Bellaire. Drilled industrial well, diameter  $4\frac{1}{2}$  inches, depth 1,100 feet. Measuring point, top of casing, 4 feet above land surface.

Water level, in feet, 1937-39

June 21, 1937	47.43	Apr. 23, 1938	52.88	Feb. 20, 1939	56.09
July 19	49.95	May 21	52.78	Mar. 18	56.43
Aug. 20	51.78	June 24	54.02	Apr. 19	57.01
Sept. 24	51.17	July 20	55.64	May 19	58.15
Oct. 26	53.42	Aug. 25	56.65	June 20	59.43
Nov. 19	53.58	Sept. 23	61.79	July 20	60.94
Dec. 17	52.50	Oct. 20	58.40	Aug. 25	62.84
Jan. 20, 1938	52.21	Nov. 22	58.31	Sept. 28	63.79
Mar. 1	52.28	Dec. 21	57.88	Oct. 27	63.80
24	52.59	Jan. 20, 1939	57.05	Dec. 9	63.46

820. Institute Place. Alameda Road. Unused drilled well, diameter 8 inches, depth 310 feet. Measuring point, top of casing, 0.4 foot above land surface.

Water level, in feet, 1937-39

June 20, 1937	30.73	July 20, 1938	32.81	June 12, 1939	35.33
July 19	30.87	Aug. 25	33.24	July 20	35.77
Sept. 23	31.16	Sept. 23	33.74	Aug. 25	36.54
Oct. 26	30.12	Oct. 20	34.25	Sept. 28	37.00
Nov. 19	31.00	Nov. 22	34.67	Oct. 27	37.40
Jan. 20, 1938	30.91	Dec. 21	34.86	Dec. 9	37.28
Mar. 1	30.84	Mar. 18, 1939	34.73		
24	31.19	May 18	35.29		

853. Port City Ice Co. Houston, 2715 McKinney Avenue. Unused drilled well, diameter 6 inches, depth 650 feet. Measuring point, top of casing, 0.5 foot above land surface.

Water level, in feet, 1937-39

June 21, 1937	83.58	Dec. 15, 1937	78.41	June 23, 1938	89.11
July 20	85.44	Jan. 19, 1938	77.78	July 21	91.70
Aug. 19	86.81	Mar. 1	76.40	Aug. 25	94.38
Sept. 22	86.96	24	78.50	Sept. 22	93.16
Oct. 25	83.20	Apr. 22	79.84	Oct. 20	93.94
Nov. 18	81.96	May 20	84.43	Nov. 21	88.51

a Casing sealed.

b Measuring point raised to 3 feet above land surface.

c Pumping.

## Harris County--Continued

## 853. Port City Ice Co.--Continued

Water level, in feet, 1937-39

Date	Water level	Date	Water level	Date	Water level
Dec. 20, 1938	86.02	Apr. 20, 1939	86.77	Aug. 24, 1939	99.24
Jan. 20, 1939	84.53	May 18	90.83	Sept. 30	100.31
Feb. 20	83.41	June 19	94.98	Oct. 28	98.29
Mar. 18	85.22	July 20	97.45	Dec. 12	96.92

854. Port City Ice Co. One mile southeast of Houston post office. Drilled industrial well, diameter 16 inches, depth 919 feet. Measuring point, top of pump base.

Water level, in feet, 1937-39

July 20, 1937	85.00	Apr. 22, 1938	78.42	Jan. 20, 1939	81.27
Aug. 19	86.49	May 20	81.57	Feb. 20	80.60
Sept. 22	86.80	July 21	88.05	Apr. 20	90.36
Oct. 5	82.48	Aug. 25	89.54	May 18	93.63
Nov. 18	81.43	Sept. 22	89.23	June 19	(a)
Dec. 15	77.37	Oct. 20	89.34	July 20	(a)
Jan. 19, 1938	75.72	Nov. 21	85.91	Aug. 24	(a)
Mar. 1	74.60	Dec. 20	83.37	Sept. 30	(a)
24	76.78				

868. Hughes Tool Co. Three miles southeast of Houston post office. Drilled industrial well, diameter 16 inches, depth 697 feet. Measuring point, top of casing, 1.0 foot above land surface.

Water level, in feet, 1937-39

June 21, 1937	63.99	Apr. 22, 1938	59.26	Feb. 20, 1939	62.26
July 20	64.93	May 20	61.43	Mar. 18	63.91
Aug. 19	66.50	June 23	66.40	Apr. 20	65.14
Sept. 22	66.47	July 21	67.97	May 18	67.28
Oct. 25	63.00	Aug. 25	70.39	June 19	69.34
Nov. 18	62.20	Sept. 22	70.70	July 20	70.60
Dec. 15	59.54	Oct. 20	70.59	Aug. 24	72.02
Jan. 19, 1938	60.23	Nov. 21	67.34	Oct. 28	72.81
Mar. 1	58.08	Dec. 20	65.45	Dec. 12	70.97
24	58.90	Jan. 20, 1939	64.34		

876. Houston Country Club. About 3-3/4 miles southeast of Houston post office. Unused drilled well. Measuring point, pump base, 0.5 foot above land surface.

Water level, in feet, 1937-39

June 19, 1937	59.47	May 20, 1938	63.15	May 18, 1939	74.58
21	59.30	June 23	68.78	June 19	76.87
July 20	62.13	July 21	71.82	July 2	78.52
Aug. 20	64.84	Aug. 25	74.26	10	77.58
Sept. 22	66.22	Sept. 22	74.35	13	81.27
Oct. 25	64.38	Oct. 20	73.35	15	78.10
Nov. 18	62.89	Nov. 21	70.93	20	77.69
Dec. 15	61.37	Dec. 21	69.83	Aug. 24	82.05
Jan. 19, 1938	61.07	Jan. 20, 1939	67.90	Sept. 30	82.19
Mar. 1	65.50	Feb. 20	66.30	Oct. 28	78.94
24	60.73	Mar. 18	67.17	Dec. 12	76.55
Apr. 22	60.86	Apr. 20	70.13		

878. Houston Compress Co. Houston, Anderson-Clayton Turning Basin. Drilled industrial well, diameter 15½ inches, depth 905 feet. Measuring point, top of pump base, 0.5 foot above land surface.

Water level, in feet, 1937-39

June 21, 1937	(a)	July 20, 1938	(a)	May 18, 1939	76.24
July 19	(a)	Aug. 25	74.44	June 19	75.25
Aug. 20	68.51	Sept. 22	76.06	July 2	77.66
Sept. 22	70.03	Oct. 21	75.37	6	79.42
Oct. 25	(a)	Nov. 25	(a)	10	79.13
Dec. 15	68.56	Dec. 20	73.85	20	78.43
Mar. 1, 1938	(a)	Jan. 20, 1939	71.51	Aug. 24	82.62
Apr. 22	(a)	Feb. 20	70.48	Sept. 29	(a)
May 20	68.40	Mar. 18	74.34	Oct. 28	(a)
June 23	(a)	Apr. 20	72.94	Dec. 12	(a)

a Pumping.

## Harris County--Continued

881. Terminal Compress Co. Houston, 82nd and Harrisburg. Unused drilled well, diameter 6 inches, depth 650 feet. Measuring point, top of tee, 3.5 feet above land surface.

Water level, in feet, 1937-39

Date	Water level	Date	Water level	Date	Water level
June 21, 1937	64.64	May 20, 1938	69.30	Apr. 20, 1939	74.86
July 19	67.58	June 23	72.24	May 18	77.75
Aug. 20	71.07	July 20	75.00	June 19	78.74
Sept. 22	73.02	Aug. 25	76.64	July 2	80.76
Oct. 25	72.16	Sept. 22	77.40	9	81.43
Nov. 18	70.35	Oct. 20	79.48	20	80.71
Dec. 15	69.23	Nov. 21	78.74	Aug. 24	84.10
Jan. 19, 1938	68.95	Dec. 20	76.92	Sept. 29	85.69
Mar. 1	68.33	Jan. 20, 1939	75.17	Oct. 28	85.03
23	68.61	Feb. 20	74.83	Dec. 12	83.35
Apr. 22	67.73	Mar. 18	74.33		

883. Tennessee Coal and Iron R.R. Co. Near Morgan Line Docks on Bayou, 6-3/4 miles southeast of Houston post office. Drilled industrial well, diameter 6 inches, depth 841 feet. Measuring point, top of flange on discharge pipe, 15 feet above land surface.

Water level, in feet, 1938-39

Nov. 21, 1938	100.15	May 17, 1939	100.80	July 21, 1939	101.50
Dec. 20	99.53	June 19	99.93	Aug. 24	106.28
Jan. 19, 1939	97.50	July 2	101.55	Sept. 29	108.04
Feb. 20	97.07	5	101.50	Oct. 31	105.23
Mar. 17	96.59	9	100.87	Dec. 13	106.08
Apr. 19	97.26	13	100.75		

886. Phoenix Refinery. About 5 1/2 miles southeast of Houston post office, at Bowie and San Antonio Streets. Drilled well, diameter 10 inches, depth 540 feet. Measuring point, top of casing, 4.0 feet above land surface.

Water level, in feet, 1937-39

June 21, 1937	(a)	June 23, 1938	(a)	May 22, 1939	75.21
July 19	(a)	July 20	(a)	June 19	76.37
Aug. 19	73.21	Aug. 25	(a)	July 4	77.27
Oct. 25	74.33	Sept. 22	(a)	10	77.49
Nov. 18	73.34	Oct. 20	76.75	20	77.48
Mar. 1, 1938	71.64	Dec. 20	74.27	Aug. 24	78.84
23	(a)	Jan. 20, 1939	73.30	Sept. 29	79.80
30	71.64	Feb. 20	72.83	Oct. 28	79.34
Apr. 22	72.20	Mar. 16	72.88	Dec. 12	78.96
May 20	(a)				

890. Texas Chemical Co. Six miles southeast of Houston post office. Drilled industrial well, diameter 24 inches, depth 1,284 feet. Measuring point, top of pump base.

Water level, in feet, 1937-39

June 21, 1937	(a)	Apr. 22, 1938	85.82	Feb. 20, 1939	(a)
July 19	(a)	May 20	(a)	Mar. 18	(a)
Aug. 9	89.67	June 23	89.88	Apr. 20	(a)
19	91.20	July 20	(a)	May 18	(a)
Sept. 30	94.40	Aug. 25	(a)	June 19	(a)
Oct. 25	92.33	Sept. 22	94.57	July 2	98.23
Nov. 18	89.61	Oct. 20	(a)	9	98.53
Dec. 15	94.13	Nov. 25	(a)	15	97.88
Jan. 19, 1938	87.39	Dec. 20	(a)	Sept. 29	102.99
Mar. 1	86.80	Jan. 20, 1939	(a)	Dec. 12	(a)
23	87.42				

a Pumping.

## Harris County--Continued

898a. Allen Estate. Houston, Park Place Blvd. and Poplar St. Unused drilled well, diameter 10 inches, depth 900 feet. Measuring point, top of casing, 1.5 feet above land surface.

Water level, in feet, 1937-39

Date	Water level	Date	Water level	Date	Water level
May 27, 1937	64.32	July 20, 1938	73.69	May 23, 1939	77.64
June 21	64.24	Aug. 25	75.22	30	77.85
July 19	66.17	Sept. 22	81.17	June 1	77.86
Aug. 19	69.16	Oct. 20	77.50	8	77.86
Sept. 22	70.35	Nov. 21	72.29	15	77.82
Oct. 25	71.31	Dec. 20	76.44	30	78.82
Nov. 18	70.49	Jan. 20, 1939	75.38	July 1	78.99
Dec. 15	70.07	Feb. 20	75.06	8	79.63
Jan. 19, 1938	69.48	Mar. 18	74.96	20	79.54
Mar. 1	68.99	Apr. 19	75.62	Aug. 24	81.95
23	69.00	May 2	76.38	Sept. 29	83.28
Apr. 22	68.58	9	76.86	Oct. 30	83.29
May 20	69.52	16	77.52	Dec. 12	82.27
June 23	71.44				

1019. Captain Grotly. Houston, Morgans Point, bank of channel, north of U. S. Engineers Residence. Drilled well, diameter 2 inches, depth 450 feet. Measuring point, top of  $\frac{1}{2}$ -inch tee in air line, 1.1 feet above land surface.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 18	64.69	Apr. 19	62.62	July 21	62.63	Oct. 30	64.70
Feb. 17	62.01	May 17	60.09	Aug. 23	63.25	Dec. 12	62.93
Mar. 17	61.08	June 19	60.64	Sept. 27	64.17		

1020. U. S. Engineers Reservation. Morgans Point Quad., on U. S. Engineers Reservation. Unused drilled well, diameter 4 inches, depth 450 feet. Measuring point, top of  $\frac{3}{4}$ -inch air line, at land surface.

Water level, in feet, 1939

Jan. 18	62.85	Apr. 19	58.84	July 21	60.82	Oct. 30	61.77
Feb. 17	60.15	May 17	58.34	Aug. 23	60.37	Dec. 12	60.08
Mar. 17	59.09	June 19	58.88	Sept. 27	61.20		

1101a. M. M. Graves Estate. About  $8\frac{1}{2}$  miles east and northeast of South Houston. Unused drilled well, diameter 12 inches, depth 910 feet. Measuring point, lower edge of discharge pipe flange, 1.0 foot above land surface and 38 feet above mean sea level.

Water level, in feet, 1934, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 27, 1934	61.38	Aug. 23, 1939	(a)	Oct. 30, 1939	92.75
June 9, 1939	90.75	Sept. 27	92.54	Dec. 12	93.06
July 21	(a)				

1105. A. A. Womack. About 13 miles east of South Houston. Drilled well, diameter 6 inches. Measuring point, top of casing at top of tee, 1.6 feet above land surface.

Water level, in feet, 1937-39

June 21, 1937	55.77	Apr. 22, 1938	59.77	Feb. 16, 1939	60.47
July 20	59.54	May 23	59.68	Mar. 17	59.98
Aug. 19	60.16	June 23	58.90	Apr. 19	59.87
Sept. 22	61.39	July 20	61.72	May 17	59.65
Oct. 25	60.92	Aug. 25	62.20	June 19	60.12
Nov. 18	60.36	Sept. 22	62.75	July 21	60.65
Dec. 15	59.87	Oct. 21	62.19	Aug. 23	61.22
Jan. 19, 1938	59.29	Nov. 23	61.88	Sept. 27	61.10
Mar. 1	101.69	Dec. 19	61.37	Oct. 30	61.29
23	60.01	Jan. 18, 1939	61.07	Dec. 12	60.82

a Pumping.

## Harris County--Continued

1152a. City of Galena Park. Drilled well, diameter 13 inches, depth 680 feet. Measuring point, top of special measuring hole, 1.0 foot above land surface and 35 feet above mean sea level.

Water level, in feet, 1937, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 13, 1937	68.00	July 6, 1939	100.04	July 15, 1939	99.74
Feb. 15	68.00	7	99.02	21	100.10
June 30, 1939	100.36	9	99.30	Aug. 24	105.17
30	100.28	10	99.18	Sept. 29	108.60
July 1	99.85	11	99.32	Oct. 31	103.89
2	99.91	13	99.95	Dec. 13	105.77
4	99.75	14	99.64	20	103.84
5	99.78				

1154. Universal Water Co. About 4-3/4 miles north of South Houston. Unused drilled well, diameter 8 inches, depth 721 feet. Measuring point, top of 2 by 4-inch bushing.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
June 30	75.82	July 4	75.94	July 10	75.75	July 21	75.49
July 1	75.89	5	75.94	11	75.55	Aug. 24	76.56
2	75.90	6	75.95	13	75.33	Sept. 29	74.52
3	75.91	7	75.95	14	75.37	Oct. 31	74.83
3	75.90	8	75.89	15	75.42	Dec. 13	76.95
4	75.91	9	75.88				

1161. Sinclair Refining Co. Three miles north of Houston. Unused drilled industrial well, diameter 24 inches, depth 1,228 feet. Measuring point, top of concrete pit, 1.0 foot above land surface and 33 feet above mean sea level. Records from May 3 to Dec. 22, 1939, inclusive are from recorder charts.

Water level, in feet, 1938-39

Date	Water level	Date	Water level	Date	Water level
Nov. 7, 1938	104.40	May 10, 1939	103.75	June 20, 1939	102.45
14	104.70	11	104.00	21	102.45
21	101.00	12	104.45	22	102.75
28	99.70	13	104.75	23	103.30
Dec. 5	100.30	14	104.75	24	103.70
13	100.10	15	104.35	25	104.15
19	102.20	16	104.00	Aug. 1	105.39
26	99.30	17	103.60	5	106.81
Jan. 1, 1939	99.00	18	103.50	8	108.62
8	101.70	19	103.00	15	110.81
13	98.70	20	102.55	19	110.00
20	99.20	21	101.70	23	110.13
27	99.30	22	101.60	30	110.13
Feb. 3	98.60	23	102.25	Sept. 6	109.80
10	99.60	24	102.50	13	112.01
17	100.10	25	102.55	20	112.08
25	98.70	26	102.85	27	111.79
Mar. 2	99.30	27	103.25	Oct. 2	110.90
9	101.10	29	104.85	9	109.20
17	99.00	30	104.75	16	109.10
23	99.30	31	104.65	23	108.87
30	97.70	June 1	104.25	30	107.52
May 2	104.37	2	103.55	Nov. 7	109.21
6	102.84	3	103.00	13	107.39
3	103.50	4	103.80	20	108.67
4	103.75	12	101.90	27	108.49
5	104.00	13	102.55	Dec. 4	109.38
6	104.00	14	102.65	11	109.55
7	104.10	17	102.45	18	108.83
8	103.60	18	102.40	22	109.18
9	103.75	19	102.35		

## Harris County--Continued

1170. Houston Light and Power Co. Deepwater Plant,  $4\frac{1}{4}$  miles north of South Houston. Drilled industrial well, diameter 16 inches, depth 336 feet. Measuring point, pump base, 1.0 foot above land surface and 25 feet above mean sea level.

Water level, in feet, 1937-39

Date	Water level	Date	Water level	Date	Water level
June 19, 1937	95.80	Feb. 19, 1938	94.25	Oct. 28, 1938	99.50
26	97.20	26	88.83	Nov. 4	99.50
July 3	98.20	Mar. 4	90.83	18	95.50
10	97.20	11	90.08	25	95.00
17	98.30	13	94.42	Dec. 2	95.50
24	95.80	18	90.08	9	95.50
31	96.50	25	92.17	30	95.50
Aug. 7	99.70	Apr. 4	92.42	Jan. 6, 1939	95.50
14	101.10	11	96.50	13	96.50
21	96.00	22	90.00	30	97.50
28	99.70	29	93.83	Feb. 3	96.00
Sept. 4	97.70	May 5	97.00	10	95.50
11	97.00	23	95.58	24	95.00
18	101.60	June 1	96.00	Mar. 10	87.50
25	102.80	10	92.83	17	90.00
Oct. 2	103.80	17	96.40	27	88.50
9	101.50	24	96.25	31	88.50
16	98.10	July 1	92.58	Apr. 14	94.50
23	95.80	Aug. 26	95.50	20	90.50
30	95.00	Sept. 2	83.00	May 5	97.50
Nov. 8	91.17	9	96.50	12	99.50
27	97.00	16	96.50	19	96.00
Dec. 4	96.25	23	96.50	July 1	100.00
18	100.00	Oct. 3	97.50	5	98.00
29	99.00	7	99.50	7	97.50
Jan. 8, 1938	95.08	14	101.00	10	101.00
22	95.08	21	100.50	13	98.00
Feb. 5	96.25				

1174. Texas Co. Galena Park,  $4\frac{1}{2}$  miles north-northeast from South Houston. Drilled industrial well, diameter 24 inches, depth 802 feet. Measuring point, pump base, 0.5 foot above land surface.

Water level, in feet, 1937-39

Sept. 22, 1937	87.95	May 23, 1938	5.55	Jan. 20, 1939	6.04
Oct. 26	(a)	June 23	6.15	Feb. 20	5.51
Nov. 18	7.86	July 20	5.96	Mar. 17	5.86
Dec. 15	7.46	Aug. 23	6.60	Apr. 19	6.07
Jan. 19, 1938	6.40	Sept. 22	6.08	May 17	6.75
Mar. 1	6.09	Oct. 21	6.75	June 19	6.04
23	6.19	Nov. 21	6.85	July 21	6.36
Apr. 22	6.07	Dec. 20	6.90	Sept. 27	8.22

1176. Texas Co. Refinery. Galena Park,  $5\frac{1}{2}$  miles north-northeast of South Houston. Unused drilled well, diameter 8 inches, depth 800 feet. Measuring point, top of open casing, 1.2 feet above land surface.

Water level, in feet, 1937-39

June 21, 1937	69.98	Feb. 20, 1939	62.94	July 21, 1939	59.71
Aug. 4	72.35	Mar. 17	63.70	Aug. 16	65.84
19	73.42	Apr. 19	62.48	23	64.13
Sept. 22	77.00	May 1	63.30	30	64.59
Oct. 26	74.55	8	63.52	Sept. 6	62.89
Nov. 18	74.45	17	63.75	13	65.25
Dec. 15	74.42	June 19	62.04	Oct. 2	62.92
Jan. 19, 1938	74.17	July 1	62.10	9	62.25
Mar. 1	65.58	2	61.98	16	60.60
23	62.10	4	61.59	23	61.57
Apr. 22	63.82	5	61.20	30	60.30
May 23	59.36	6	59.53	Nov. 7	61.15
June 23	62.21	7	58.85	13	61.94
July 20	60.68	8	58.25	20	62.01
Aug. 25	60.93	9	58.19	27	61.00
Sept. 22	61.89	10	58.70	Dec. 4	61.33
Oct. 21	68.26	11	60.40	11	60.70
Nov. 21	64.33	12	60.64	18	62.34
Dec. 20	65.71	14	59.27	22	62.45
Jan. 20, 1939	62.26	15	59.99		

a Pumping.



## Harris County--Continued

1182. Port Terminal R.R. Co. Southeast corner of Crown Refinery. Unused drilled well, diameter 6 inches, depth 700 feet. Measuring point, top of casing, 2.0 feet above land surface.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
July 1	110.00	July 11	117.00	Aug. 23	118.23	Oct. 30	116.98
2	114.02	13	117.36	30	118.14	Nov. 7	122.54
3	115.04	14	119.48	Sept. 6	122.30	13	116.49
4	114.68	15	118.82	13	128.11	20	115.86
5	112.43	18	119.23	20	127.63	27	116.06
6	112.93	24	113.58	27	127.58	Dec. 4	126.86
7	110.30	Aug. 1	119.65	Oct. 2	128.48	11	120.64
8	112.13	8	124.80	9	119.02	18	117.43
9	117.54	15	125.11	16	122.54	22	117.37
10	116.69	19	122.04	23	120.64		

1187. City of Pasadena. About 3½ miles north-northeast of South Houston. Drilled municipal well. Measuring point, top of special tap, 2.5 feet above land surface.

Water level, in feet, 1937-39

Date	Water level	Date	Water level	Date	Water level
Sept. 22, 1937	114.22	Oct. 21, 1938	113.22	July 7, 1939	112.82
Oct. 25	114.22	Nov. 21	113.20	8	107.34
Nov. 12	106.60	Dec. 20	115.17	9	108.38
Dec. 15	110.32	Jan. 20, 1939	110.72	10	110.87
Jan. 19, 1938	109.29	Feb. 20	111.39	11	110.00
Mar. 1	101.69	Mar. 17	103.87	13	114.02
23	103.29	Apr. 19	106.23	14	117.14
Apr. 22	100.60	May 17	113.98	15	109.98
May 20	105.96	June 19	110.35	Aug. 24	115.36
June 23	109.81	July 1	106.70	Sept. 27	(a)
July 20	(a)	2	112.43	Oct. 30	116.90
Aug. 25	(a)	3	110.29	Dec. 13	(a)
Sept. 22	(a)	4	108.78		

1187a. City of Pasadena. About 3½ miles north-northeast of South Houston. Drilled municipal well. Measuring point, top of special tap, 2.5 feet above land surface.

Water level, in feet, 1937-39

Aug. 19, 1937	112.33	Sept. 22, 1938	118.15	June 19, 1939	106.05
Sept. 22	118.63	Oct. 21, 1938	112.80	July 10	110.87
Nov. 18	106.00	Nov. 21	(a)	11	110.00
Dec. 15	109.46	Dec. 20	(a)	13	114.02
Mar. 1, 1938	101.10	Jan. 18, 1939	114.87	14	117.14
23	104.56	20	(a)	15	109.98
Apr. 22	103.11	Feb. 20	(a)	Aug. 24	115.36
May 23	102.96	Mar. 17	103.91	Sept. 27	(a)
June 23	111.07	Apr. 19	99.63	Oct. 30	116.90
July 20	114.31	May 17	(a)	Dec. 13	(a)
Aug. 25	113.65				

1194. Deepwater Subdivision. Five miles northeast of South Houston. Unused drilled well, depth 811 feet. Measuring point, top of casing, 1.5 feet above land surface.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 19	91.51	July 2	93.23	July 10	92.48	July 24	92.69
Feb. 17	91.91	3	93.28	11	92.42	Aug. 1	93.56
Mar. 17	91.81	4	93.28	13	92.29	8	93.50
Apr. 19	91.54	5	93.19	14	92.39	15	93.81
May 17	91.98	6	93.03	15	92.51	23	94.37
June 9	b 92.22	7	92.85	18	92.69	Sept. 27	90.92
12	92.54	8	92.70	21	92.79	Oct. 30	93.76
19	92.15	9	92.55				

a Pumping.

b Measuring point raised 0.23 foot.

## Harris County--Continued

1194a. ----- Deepwater Quadrangle, 0.5 mile south of Deepwater Station. Unused drilled well, diameter 3 inches. Measuring point, top of 1-inch air line, 2.0 feet above land surface.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 17	94.19	June 19	94.00	July 7	94.68	July 15	93.37
Mar. 17	94.23	July 2	94.62	8	94.47	21	93.93
Apr. 19	94.21	3	94.67	9	94.16	Aug. 23	95.59
May 17	94.00	4	94.75	10	93.85	Sept. 27	90.80
June 9	94.37	5	94.78	13	93.17	Oct. 30	94.78
12	94.46	6	94.78	14	93.15	Dec. 13	96.84

1194b. ----- Deepwater Quadrangle, 0.5 mile south of Deepwater Station. Unused drilled well, diameter 2 inches, depth 50 feet. Measuring point, edge of hole in 1 by 2-inch bushing in side of tee, 2.75 feet above land surface.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 17	12.59	May 17	12.68	Oct. 30	16.08
Apr. 19	12.16	Sept. 27	14.75	Dec. 13	16.92

## Hartley County

250. ----- NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 138, blk. 48, 4 $\frac{1}{2}$  miles northwest of Hartley. Unused drilled well, diameter 4 $\frac{1}{2}$  inches. Measuring point, top of casing, 0.75 foot above land surface. Equipped with windmill. Water levels, in feet: May 11, 1938, 321.75; Mar. 8, 1939, 321.59; June 28, 1939, 321.66; Dec. 20, 1939, 321.60.

297A. ----- Along U. S. Highway 87, 1.85 miles west of Moore-Hartley County line, 0.3 mile south of highway. Drilled well, diameter 4 $\frac{1}{2}$  inches, depth 332 feet. Measuring point, top of 3 by 12-inch wood block around water pipe, 0.7 foot above land surface. Equipped with windmill. Water level, in feet, 1939: Dec. 20, 312.94.

## Hays County

Well numbers correspond to those in Water-Supply Paper 840, pp. 440-2; Water-Supply Paper 845, pp. 504-7; Hays County, Texas, Records of Wells, etc., State Board of Water Engineers in cooperation with United States Department of the Interior, Geological Survey, 1938 (Mimeographed).

502.

Water level, in feet, 1939

Jan. 26	104.60	May 26	118.60	Oct. 4	116.45
Apr. 28	105.40	July 1	119.52	Dec. 20	120.12

504.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	37.27	Mar. 29	37.22	May 24	37.20	Oct. 4	37.56
Mar. 1	37.12	Apr. 28	37.22	July 1	37.35	Dec. 20	37.48

505.

Water level, in feet, 1939

Jan. 26	72.98	Mar. 29	74.42	May 24	74.16	Oct. 4	75.76
Mar. 1	74.40	Apr. 28	73.94	July 1	75.03	Dec. 20	76.65

506.

Water level, in feet, 1939

Jan. 26	30.85	Mar. 29	32.60	May 24	32.60	Oct. 4	35.36
Mar. 1	32.58	Apr. 28	32.67	July 1	32.67	Dec. 20	36.42

## Hays County--Continued

507

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	65.81	Mar. 29	66.02	May 24	66.85	Oct. 4	68.05
Mar. 1	65.58	Apr. 28	66.58	July 1	70.09	Dec. 20	67.22

524.

## Water level, in feet, 1939

Jan. 24	33.98	Mar. 28	33.98	May 24	34.84	Oct. 3	35.25
Feb. 28	34.04	Apr. 25	34.38	July 3	34.66	Dec. 18	34.41

528.

## Water level, in feet, 1939

Jan. 24	98.09	Mar. 28	98.13	May 24	98.35	Oct. 3	99.50
Feb. 28	98.21	Apr. 25	98.64	July 3	98.91	Dec. 18	98.65

529.

## Water level, in feet, 1939

Jan. 24	138.06	Mar. 28	139.35	May 24	140.15	Oct. 3	149.10
Feb. 28	142.44	Apr. 24	139.45	July 3	(a)	Dec. 18	148.94

532.

## Water level, in feet, 1939

Jan. 24	190.24	Mar. 28	(a)	May 25	163.86	Oct. 3	194.86
Feb. 28	185.23	Apr. 27	171.90	July 3	151.02	Dec. 18	174.77

534.

## Water level, in feet, 1939

Jan. 24	131.75	Mar. 28	137.31	May 24	137.71	Oct. 3	142.17
Feb. 28	133.52	Apr. 27	137.95	July 3	137.88	Dec. 18	141.60

535.

## Water level, in feet, 1939

Jan. 24	26.32	Mar. 28	26.48	May 24	26.63	Oct. 3	30.62
Feb. 28	27.40	Apr. 27	26.70	July 3	27.67	Dec. 18	30.10

543.

## Water level, in feet, 1939

Jan. 24	(a)	Feb. 28	(a)	Apr. 22	135+	July 3	(a)
25	112.12	Mar. 28	(a)	May 26	78.30	Dec. 18	77.75

553.

## Water level, in feet, 1939

Jan. 24	121.25	Mar. 28	121.29	May 26	121.93	Oct. 5	122.80
Feb. 28	121.24	Apr. 22	121.87	July 3	122.24	Dec. 18	122.01

565.

## Water level, in feet, 1939

Jan. 25	152.44	Mar. 28	(a)	May 24	(a)	Oct. 3	(a)
Feb. 28	(a)	Apr. 27	154.9	July 3	(a)	Dec. 18	(a)

585.

## Water level, in feet, 1939

Jan. 25	65.30	Mar. 29	80.38	May 24	75.28	Dec. 20	66.27
Mar. 1	69.97	Apr. 23	69.19	Oct. 4	67.50		

586.

## Water level, in feet, 1939

Jan. 25	43.63	Mar. 29	45.13	May 26	49.91	Dec. 20	45.86
Mar. 1	43.95	Apr. 23	(a)	Oct. 4	(a)		

a Pumping.

## Hays County--Continued

590.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 25	65.36	Apr. 23	67.20	Oct. 4	68.46
Mar. 1	66.22	May 26	67.16	Dec. 20	68.92

591.

## Water level, in feet, 1939

Jan. 25	51.59	Apr. 23	52.24	Oct. 4	55.28
Mar. 1	51.56	May 26	53.16	Dec. 20	55.78

613.

## Water level, in feet, 1939

Jan. 26	174.06	Apr. 28	173.37	Oct. 4	174.38
Mar. 29	174.80	May 26	174.38	Dec. 20	174.01

614.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	71.80	Mar. 29	66.00	May 24	118.96	Oct. 4	124.56
Mar. 1	80.08	Apr. 28	105.36	July 1	130.19	Dec. 20	121.44

615.

## Water level, in feet, 1939

Jan. 26	86.05	Mar. 29	85.97	May 24	86.06	Oct. 4	86.08
Mar. 1	85.02	Apr. 28	86.31	July 1	86.23	Dec. 20	86.11

629.

## Water level, in feet, 1939

Jan. 25	226.41	Mar. 29	227.00	May 24	(a)	Dec. 20	(a)
Mar. 1	225.02	Apr. 22	229.00	Oct. 4	(a)		

677-A.

## Water level, in feet, 1939

Jan. 25	12.47	Apr. 23	11.30	May 24	9.58	Oct. 4	9.09
Mar. 1	35.25	28	10.70	July 1	9.31	Dec. 20	18.23
27	14.95						

677.

## Water level, in feet, 1939

Jan. 25	96.47	Mar. 29	(a)	May 24	99.38	Dec. 20	(a)
Mar. 1	(a)	Apr. 22	(a)	Oct. 4	99.43		

678.

## Water level, in feet, 1939

Jan. 25	275.+	Mar. 29	273.98	May 24	274.00	Dec. 20	275.15
Mar. 1	273.70	Apr. 22	275.+	Oct. 4	274.80		

699.

## Water level, in feet, 1939

Jan. 26	129.59	Mar. 29	130.15	May 24	131.37	Oct. 4	133.79
Mar. 1	129.80	Apr. 28	133.66	July 1	130.20	Dec. 20	133.91

706.

## Water level, in feet, 1939

Jan. 26	59.50	Mar. 29	58.46	May 24	59.37	Oct. 4	61.18
Mar. 1	59.70	Apr. 22	64.70	July 1	60.19	Dec. 20	60.81

a Pumping.

## Hemphill County

Well numbers correspond to those in Water-Supply Paper 840, p. 442; Water-Supply Paper 845, p. 508.

1. Water levels, in feet, 1939: Mar. 11, 136.67; July 1, 137.06; Dec. 22, 137.16.
2. No measurements made in 1939.
3. No measurements made in 1939.
4. Water levels, in feet, 1939: July 1, 51.09; Dec. 22, 51.64.
5. No measurements made in 1939.
6. Water levels, in feet, 1939: Mar. 11, 13.93; July 1, 13.51; Dec. 22, dry at 11 feet.
7. Water levels, in feet, 1939: Mar. 11, 5.69; July 1, 5.31; Dec. 22, 6.77.

## Henderson County

Well numbers correspond to those in Water-Supply Paper 840, pp. 443-4; Water-Supply Paper 845, pp. 508-9; Henderson County, Texas, Records of Wells, etc., Works Progress Administration, Ground-Water Survey Project 2076, State Board of Water Engineers, 1936 (Mimeographed).

270. No measurements made in 1939.
275. Water levels, in feet, 1939: Feb. 6, 22.80; May 4, 20.80; July 18, 23.12; Dec. 9, 23.97.
279. Water levels, in feet, 1939: Feb. 6, 14.84; May 4, 16.26; July 18, 17.35; Dec. 9, 17.28.
292. Water levels, in feet, 1939: Feb. 6, 76.31; May 4, 74.80; July 18, 76.78; Dec. 9, 74.76.
316. Water levels, in feet, 1939: Feb. 6, 40.30; May 4, 40.35; July 18, 40.42; Dec. 8, 40.70.
323. Water levels, in feet, 1939: Feb. 4, 46.20; May 4, 46.83; July 18, 46.72; Dec. 8, 45.60.
623. Water levels, in feet, 1939: Feb. 6, 39.19; May 4, 38.72; Dec. 9, 39.93.
628. Water levels, in feet, 1939: Feb. 6, 5.35; May 4, 5.45; Dec. 9, 6.28; Dec. 9, 7.53.
710. Water levels, in feet, 1939: Feb. 6, 15.55; May 4, 13.90; July 18, 15.30; Dec. 9, 17.51.
723. Water levels, in feet, 1939: Feb. 6, 26.55; May 4, 26.88; July 18, 26.62.
724. Water levels, in feet, 1939: Feb. 6, 35.34; May 4, 34.80; July 18, 35.12; Dec. 9, 35.63.
741. Water levels, in feet, 1939: Feb. 6, 55.30; May 4, a/; July 18, 54.45; Dec. 9, 54.53.
813. Water levels, in feet, 1939: Feb. 4, 26.05; May 4, 26.40; July 18, 26.32; Dec. 8, 28.07.
902. Water levels, in feet, 1939: Feb. 4, 88.25; May 4, 88.00; July 18, 88.56; Dec. 8, 88.30.
- 905-A. Water levels, in feet, 1939: Feb. 4, 94.12; May 4, 92.90; July 18, 101.79; Dec. 8, 101.04.

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a Pumping.

## Henderson County--Continued

919.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 4	88.30	Dec. 8	a 95.75	Dec. 8	69.64	Dec. 8	63.60
May 4	46.37	8	78.90	8	65.66	8	61.13
July 18	58.20						

920. Water levels, in feet, 1939: Feb. 4, 15.18; May 4, 14.70; July 18, 15.20; Dec. 8, 15.86.

921. Water levels, in feet, 1939: Feb. 4, a/93.50; May 4, a/93.44; July 18, a/92.50; Dec. 8, a/92.45.

925. Water levels, in feet, 1939: Feb. 4, 30.09; May 4, 31.20; July 18, 31.72; Dec. 8, 30.71.

## Hockley County

Well numbers correspond to those in Water-Supply Paper 840, pp. 444-6; Water-Supply Paper 845, pp. 509-11.

1. No measurements made in 1939.
2. No measurements made in 1939.
3. No measurements made in 1939.
4. No measurements made in 1939.
5. Water level, in feet, 1939: Oct. 12, 92.24.
6. Water level, in feet, 1939: Oct. 12, 115.54.
7. Water level, in feet, 1939: Oct. 12, 87.76.
8. No measurements made in 1939.
9. No measurements made in 1939.
12. No measurements made in 1939.
14. No measurements made in 1939.
17. No measurements made in 1939.
18. Water level, in feet, 1939: Oct. 12, 133.43.
19. Water level, in feet, 1939: Oct. 12, 143.99.
20. No measurements made in 1939.
- 21A. Water levels, in feet, 1939: Jan. 26, 69.52; Aug. 14, 69.58.
- 22A. Water levels, in feet, 1939: Jan. 26, 98.59; Aug. 14, 98.72.
24. Water levels, in feet, 1939: Jan. 16, 27.28; Mar. 10, 27.19; June 19, 27.41; Aug. 15, 26.62.

25.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 16	29.10	June 19	29.30	Oct. 13	29.08
Mar. 10	29.11	Aug. 15	28.98		

27.

## Water level, in feet, 1939

Jan. 16	30.12	June 19	31.33	Oct. 13	30.59
Mar. 10	30.10	Aug. 15	30.52		

a Pumping.

## Hockley County--Continued

28. Water levels, in feet, 1939: Jan. 16, 34.47; Mar. 10, 34.50; Oct. 13, 34.65.

29.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 16	29.78	June 19	30.24	Oct. 13	29.55
Mar. 10	30.00	Aug. 15	29.23		

125. Water levels, in feet, 1939: Jan. 16, 65.75; Mar. 10, 66.52; June 19, 65.90; Aug. 15, 65.70.

126.

## Water level, in feet, 1939

Jan. 16	28.09	June 19	28.51	Oct. 13	27.67
Mar. 10	28.20	Aug. 15	27.53		

127.

## Water level, in feet, 1939

Jan. 16	24.38	June 19	24.74	Oct. 13	23.24
Mar. 10	24.60	Aug. 15	23.70		

## Howard County

Well numbers correspond to those in Water-Supply Paper 817, pp. 324-9; Water-Supply Paper 840, pp. 447-61; Water-Supply Paper 845, pp. 512-4; Howard County, Texas, Records of Wells, etc., Works Progress Administration Ground-Water Survey Project 2091, State Board of Water Engineers, 1937 (Mimeographed).

51. Measurements furnished by E. V. Spence, City Manager, Big Spring.  
Water level, in feet, 1939

Day	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	122.83	125.25	125.92	.....	133.58	136.33	136.50	133.83	.....
2	123.33	125.92	127.83	128.58	134.50	.....	136.17	134.00	.....
3	123.25	126.00	128.25	129.42	135.08	.....	136.00	135.50	.....
4	123.17	126.83	128.67	131.33	135.50	.....	136.67	133.17	.....
5	123.50	125.00	127.17	131.75	134.42	.....	136.58	133.33	.....
6	122.08	124.67	127.00	135.33	133.50	.....	136.67	133.00	.....
7	121.92	124.25	128.25	153.67	132.92	.....	136.75	133.42	.....
8	121.67	124.00	128.08	154.00	134.00	.....	136.58	133.17	.....
9	121.50	124.08	128.58	135.17	133.33	.....	135.75	133.25	.....
10	121.67	124.58	129.17	133.75	132.58	.....	135.50	133.17	.....
11	122.58	125.75	128.83	135.00	132.25	136.42	135.33	133.25	.....
12	122.83	125.92	129.00	154.50	132.33	136.25	134.92	.....	134.42
13	122.08	125.58	129.75	134.83	131.75	136.50	134.75	132.33	134.42
14	122.25	125.00	130.00	132.50	131.67	136.42	135.00	132.33	134.08
15	122.92	124.50	130.42	131.42	132.83	136.58	135.00	132.75	133.83
16	123.25	125.00	130.67	131.50	133.08	136.58	134.67	132.58	133.58
17	122.50	126.42	131.17	132.17	133.25	137.00	134.75	132.67	.....
18	122.33	127.58	130.58	132.25	132.42	.....	134.83	132.17	.....
19	122.25	128.08	131.25	133.25	132.83	134.33	135.08	132.50	.....
20	122.58	128.33	130.83	133.92	133.25	135.50	135.00	132.08	.....
21	123.50	128.33	131.17	133.17	133.25	136.08	134.83	132.25	.....
22	123.67	128.50	133.75	133.92	133.17	136.58	134.75	132.17	.....
23	123.75	129.25	131.67	133.58	134.08	136.58	134.50	132.17	.....
24	123.67	129.67	132.08	133.00	134.17	137.00	.....	131.75	.....
25	124.42	.....	131.83	134.33	134.67	137.00	133.50	131.75	.....
26	125.25	126.33	131.67	134.58	134.83	137.67	133.33	.....	.....
27	125.75	126.83	132.17	134.83	134.50	137.83	134.00	131.00	.....
28	126.00	128.08	131.00	134.67	134.75	137.25	133.83	.....	.....
29	126.25	.....	.....	134.83	135.50	136.58	133.83	.....	.....
30	125.58	.....	130.17	134.33	135.83	136.58	133.42	.....	.....
31	.....	124.58	.....	133.17	136.00	.....	133.68	.....	.....

## Howard County--Continued

56. Measurements furnished by E. V. Spence, City Manager, Big Spring.  
Water level, in feet, 1939

Day	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	144.25	149.75	149.75	.....	162.75	169.42	164.00	.....	153.67
2	146.33	154.00	160.25	148.83	165.08	.....	161.00	159.58	153.83
3	146.00	154.17	162.25	155.33	165.83	.....	162.00	157.67	154.00
4	146.50	156.83	161.75	166.17	168.83	.....	166.50	157.50	154.83
5	146.67	147.75	153.33	166.58	163.17	.....	165.17	157.67	155.67
6	140.50	145.58	.....	171.67	158.83	.....	165.92	155.42	156.08
7	139.17	143.83	159.83	174.50	156.08	.....	165.92	158.17	157.00
8	139.33	143.67	158.00	174.92	163.92	.....	164.08	157.50	157.75
9	138.58	143.67	161.25	174.83	160.00	.....	159.50	158.50	158.33
10	139.58	148.67	163.17	168.75	155.25	.....	159.00	157.58	159.83
11	145.00	154.42	161.17	171.42	155.50	166.00	159.08	158.50	161.67
12	146.08	153.83	160.33	173.25	155.83	164.50	158.67	.....	162.08
13	140.75	150.67	164.50	170.00	155.83	167.83	158.33	153.17	161.75
14	141.75	148.25	165.50	158.25	155.17	166.50	160.00	154.17	161.75
15	147.50	145.67	166.00	154.33	160.67	166.92	160.50	156.67	159.58
16	148.08	149.17	166.67	157.75	161.42	166.83	158.00	157.25	159.33
17	142.50	155.50	167.75	159.92	160.25	167.92	159.50	157.58	.....
18	141.67	160.83	165.50	161.17	157.25	.....	.....	155.08	.....
19	143.00	161.00	166.67	166.25	158.83	156.00	161.25	156.33	.....
20	145.08	163.67	164.67	168.33	161.17	162.75	161.25	153.67	.....
21	149.00	161.67	165.33	164.17	160.83	166.33	161.00	155.42	.....
22	150.00	162.33	167.25	166.92	161.00	168.58	161.00	158.25	.....
23	150.33	164.58	167.25	165.42	165.92	166.67	159.75	158.08	.....
24	147.67	167.67	167.83	163.00	165.75	169.33	.....	156.50	.....
25	152.00	.....	165.17	166.83	167.50	169.17	153.92	157.33	.....
26	154.75	147.00	165.17	168.00	167.50	169.42	155.92	.....	.....
27	155.58	151.33	166.50	168.08	166.25	169.83	157.92	152.58	.....
28	155.25	159.92	160.67	167.33	165.42	167.50	158.08	.....	.....
29	156.92	.....	154.92	168.00	168.42	165.08	158.42	.....	.....
30	152.83	.....	155.42	164.67	169.33	164.33	156.17	150.58	.....
31	.....	141.50	.....	157.75	168.83	.....	158.17	.....	.....

65. No measurements made in 1939.

606. Water levels, in feet, 1939: Jan. 27, 110.29; Aug. 11, 111.39.

846. Water level, in feet, 1939: Jan. 27, 43.58.

853. Water level, in feet, 1939: Aug. 10, 98.87

859. Water level, in feet, 1939: Jan. 27, 111.78.

861. Water levels, in feet, 1939: Jan. 27, 44.60; Aug. 10, 45.02.

876A. Water level, in feet, 1939: Jan. 27, 16.72.

879. Water level, in feet, 1939: Jan. 27, 21.30.

893B. Water levels, in feet, 1939: Jan. 27, 70.32; Aug. 10, 70.30.

898. Water level, in feet, 1939: Jan. 27, 68.10.

899. Water level, in feet, 1939: Aug. 10, 22.38.

915. Water level, in feet, 1939: Aug. 11, 7.88.

942. Burton Lingo Lumber Co. About 0.1 mile south of U. S. Highway 80, at west edge of Big Spring. Unused drilled well, depth 63 feet. Measuring point, top of water pipe clamp, south side, level with land surface. Equipped with windmill.

Water level, in feet, 1937-39

Date	Water level	Date	Water level	Date	Water level
June 29, 1937	51.08	Jan. 24, 1938	53.24	Jan. 27, 1939	50.96
Aug. 5	51.66	Apr. 28	53.14	Aug. 11	52.27



## Jackson County

Well numbers correspond to those in Water-Supply Paper 840, pp. 461-4; Water-Supply Paper 845, pp. 514-5.

5. Water levels, in feet, 1939: Mar. 22, 35.00; June 21, 35.21; Sept. 23, 35.25; Dec. 15, 35.02.
6. Water levels, in feet, 1939: Mar. 22, 36.97; June 21, 36.99; Sept. 23, 37.00; Dec. 15, 37.70.
7. Water levels, in feet, 1939: Mar. 22, 45.40; June 21, 45.98; Sept. 23, 46.01; Dec. 15, 45.92.
- 11-A. Water levels, in feet, 1939: Mar. 22, a/; June 21, 36.98; Sept. 23, 39.95; Dec. 15, pipe changed.
12. Water levels, in feet, 1939: Mar. 22, 38.19; June 21, 38.38; Sept. 23, 38.42; Dec. 15, 38.52.
14. Water levels, in feet, 1939: Mar. 22, 35.50; June 21, 36.50; Sept. 23, a/; Dec. 15, 35.14.
56. Water levels, in feet, 1939: Mar. 22, 33.17; June 21, 33.44; Sept. 23, a/; Dec. 15, 32.82.
57. Water levels, in feet, 1939: Mar. 22, 38.07; June 21, 38.10; Sept. 23, 38.36; Dec. 15, 38.09.
64. Water levels, in feet, 1939: Mar. 23, 32.95; June 21, 32.85; Sept. 25, 32.90; Dec. 16, 32.88.
66. Water levels, in feet, 1939: Mar. 22, 38.27; June 21, 38.44; Sept. 23, 38.60; Dec. 15, 38.51.
69. Water levels, in feet, 1939: Mar. 22, 34.27; June 21, 35.87; Sept. 23, 36.09; Dec. 15, 36.21.
71. Water levels, in feet, 1939: Mar. 22, 26.09; June 21, 29.21; Sept. 25, 29.02; Dec. 16, 29.08.
76. Water levels, in feet, 1939: Mar. 22, 27.74; June 21, 28.41; Sept. 25, 28.63; Dec. 15, 29.14.
78. Water levels, in feet, 1939: Mar. 23, a/; June 21, 31.71; Sept. 25, 31.82; Dec. 15, 31.95.
86. No measurements made in 1939.
103. Water levels, in feet, 1939: Mar. 22, 37.65; June 21, 37.60; Sept. 23, 38.29; Dec. 15, 38.11.
106. Water levels, in feet, 1939: Mar. 22, 31.00; June 21, 33.60; Sept. 23, 34.01.
108. Filled; measurements discontinued.
- 108A. Water levels, in feet, 1939: Mar. 22, 26.75; June 28, 28.17; Sept. 25, 28.44; Dec. 16, 28.56.
115. Water levels, in feet, 1939: Mar. 22, a/; June 28, 26.21; Sept. 25, 26.86; Dec. 16, 26.94.
123. Water levels, in feet, 1939: Mar. 22, 26.90; June 28, 27.20; Sept. 25, 28.70; Dec. 16, 29.42.
154. Flowing in 1939.
155. Flowing in 1939.
156. Water levels, in feet, 1939: Mar. 23, +7.00; June 22, +6.50; Sept. 25, +2.00.
180. Water levels, in feet, 1939: Mar. 23, a/; June 22, a/; Sept. 25, 22.57; Dec. 18, 22.82.

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a Pumping.

## Jackson County--Continued

228. Water levels, in feet, 1939: Mar. 23, 8.33; June 21, 8.52; Sept. 25, 8.76; Dec. 16, 8.81.

229. Water levels, in feet, 1939: Mar. 23, 34.01; June 21, 34.34; Sept. 25, 34.98; Dec. 16, 34.89.

230. Water levels, in feet, 1939: Mar. 22, 36.74; June 21, 37.34; Sept. 25, 37.72; Dec. 16, 37.61.

## Jim Wells County

Well numbers correspond to those in Water-Supply Paper 777, pp. 215-6; Water-Supply Paper 840, p. 464; Water-Supply Paper 845, pp. 515-6.

193. Water levels, in feet, 1939: Apr. 11, 27.67; Oct. 10, 27.04.

201. Water levels, in feet, 1939: Apr. 11, 32.12; Oct. 10, 32.15.

206. Water levels, in feet, 1939: Apr. 11, 57.93; Oct. 10, 56.56.

207. Water levels, in feet, 1939: Apr. 11, 70.77; Oct. 10, 70.60.

221. Water levels, in feet, 1939: Apr. 11, 53.74; Oct. 10, 52.63.

222. Water levels, in feet, 1939: Apr. 11, 53.75; Oct. 10, 53.23.

252. Water level, in feet, 1939: Apr. 11, 52.65.

253. Water level, in feet, 1939: Apr. 11, 56.15.

374. Water levels, in feet, 1939: Apr. 10, 13.20; Oct. 9, 17.75.

391. Water levels, in feet, 1939: Apr. 11, 29.44; Oct. 9, 25.90.

## Kinney County

Well numbers correspond to those in Water-Supply Paper 840, pp. 464-6; Water-Supply Paper 845, pp. 516-7.

XK-1.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	60.87	Apr. 29	65.10	July 7	67.39	Sept. 12	68.80
Mar. 1	62.40	June 7	65.73	Aug. 15	65.52	Nov. 10	67.75
Apr. 1	63.61						

XK-3. Water levels, in feet, 1939: Jan. 26, 59.60; Apr. 1, 65.10; May 1, 85.30; July 7, 76.51. Measurements discontinued Aug. 1, 1939.

XK-5.

Water level, in feet, 1939

Jan. 26	24.51	May 1	28.71	July 7	29.02	Sept. 12	22.28
Mar. 1	25.92	June 7	27.00	Aug. 15	20.95	Oct. 24	23.17
Apr. 1	27.25						

XK-6.

Water level, in feet, 1939

Jan. 26	34.55	May 1	36.15	July 7	36.95	Sept. 12	33.48
Mar. 1	35.11	June 7	36.50	Aug. 15	32.92	Oct. 24	34.50

XK-7. Measurements discontinued Aug. 1, 1939.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 26	14.14	Apr. 1	14.40	June 7	14.82
Mar. 1	13.90	May 1	14.25	July 7	a 22.30

a Pumping.

## Kirney County--Continued

XK-8. Measurements discontinued Aug. 1, 1939.  
Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 26	77.36	Apr. 1	a 171.10	July 7	a 150+
Mar. 1	73.50	May 1	91.85		

XK-9.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	37.29	May 1	39.81	Aug. 14	42.16	Nov. 15	39.26
Mar. 1	38.22	June 9	40.86	Sept. 13	42.11	Dec. 5	38.74
Apr. 1	39.00	July 7	41.64				

XK-10. No measurements made in 1939.

XK-11.

Water level, in feet, 1939

Jan. 26	28.61	May 1	29.63	Aug. 14	29.74	Nov. 15	29.01
Mar. 1	29.15	June 7	29.97	Sept. 14	29.88	Dec. 5	28.71
Apr. 1	28.80	July 8	30.82				

XK-12.

Water level, in feet, 1939

Jan. 26	16.58	Apr. 29	(a)	Aug. 14	27.46	Nov. 10	24.75
Mar. 1	22.31	June 7	28.20	Sept. 14	27.15	Dec. 4	23.54
Apr. 1	25.91	July 8	28.92				

XK-13.

Water level, in feet, 1939

Jan. 26	56.91	Apr. 29	62.24	Aug. 14	58.15	Nov. 3	59.08
Mar. 1	58.72	June 7	57.05	Sept. 14	59.30	Dec. 4	60.27
Apr. 1	59.60	July 7	62.04				

XK-112. E. Webb. SW $\frac{1}{4}$  sec. 24, I. & G. N. R. R. Co., Blk. 6. Drilled stock well, diameter 6 $\frac{1}{4}$  inches. Measuring point, top of iron water pipe clamp, 1.0 foot above land surface.

Water level, in feet, 1938-39

Date	Water level	Date	Water level	Date	Water level
Apr. 13, 1938	188.08	July 8, 1939	202.50	Sept. 15, 1939	184.93
Jan. 23, 1939	191.70	15	195.72	Oct. 24	184.68
May 1	206.80	Aug. 12	181.98	Dec. 2	182.55
June 13	209.10				

XK-114. E. Webb. NE $\frac{1}{4}$  sec. 10, I. & G. N. R. R. Co., Blk. 6. Domestic and stock drilled well, diameter 5-3/16 inches. Measuring point, top of iron water pipe clamp, 1.3 feet above land surface.

Water level, in feet, 1938-39

Apr. 13, 1938	64.21	July 8, 1939	69.75	Sept. 14, 1939	66.10
Apr. 11, 1939	68.32	July 15	68.65	Oct. 24	66.15
May 1	68.76	Aug. 11	66.17	Dec. 12	65.63
June 13	69.34				

XK-116. J. D. Harwood. SE $\frac{1}{4}$  sec. 9, H. & H. R. R. Co., Blk. 1. Drilled stock well, diameter 5-3/16 inches. Measuring point, top of iron water pipe clamp, 0.3 foot below land surface.

Water level, in feet, 1938-39

Apr. 13, 1938	112.85	June 13, 1939	138.22	Sept. 14, 1939	130.79
Feb. 22, 1939	134.05	July 8	138.55	Oct. 24	125.75
Apr. 11	136.60	15	138.45	Nov. 28	133.18
May 1	137.00	Aug. 11	127.71	Dec. 2	133.44

a Pumping.

## Kinney County--Continued

XK-163. Edward Mey. SW $\frac{1}{4}$  sec. 29, I. & G. N. R. R. Co., Blk. 11. Domestic and stock drilled well, diameter 6 $\frac{1}{4}$  inches, depth 300 feet. Measuring point, top of iron water pipe clamp, 0.9 foot above land surface.

Water level, in feet, 1938-39

Date	Water level	Date	Water level	Date	Water level
Apr. 23, 1938	69.89	July 8, 1939	74.47	Sept. 14, 1939	72.95
Apr. 13, 1939	72.85	15	74.45	Nov. 8	72.75
May 1	73.31	Aug. 12	73.73	Dec. 4	72.26
June 13	73.99				

XK-172. Nolan and Postell. SW $\frac{1}{4}$  sec. 418, Karnes County School Land. Domestic and stock drilled well, diameter 6 inches, depth 360 feet. Measuring point, top of iron water pipe clamp, 1.6 feet below land surface. Measurements discontinued Oct. 24, 1939.

Water level, in feet, 1938-39

June 14, 1938	168.59	July 8, 1939	173.07	Aug. 12, 1939	(a)
Apr. 11, 1939	171.89	15	171.80	Sept. 14	(a)
June 13	172.30				

XK-180. N. P. Peterson. SE $\frac{1}{4}$  sec. 51, I. & G. N. R. R. Co., Blk. 6. Domestic and stock drilled well, diameter 6 inches, depth 475 feet. Measuring point, top of iron water pipe clamp, 0.4 foot above land surface.

Water level, in feet, 1938-39

June 15, 1938	178.13	June 13, 1939	180.20	Sept. 16, 1939	176.19
Apr. 11, 1939	178.20	July 8	177.34	Oct. 24	176.18
May 6	179.50	Aug. 12	178.50	Dec. 2	179.28

XK-196. Judge John Fritter. SW $\frac{1}{4}$  sec. 96, I. & G. N. R. R. Co., Blk. 6. Domestic and stock drilled well, diameter 6 inches, depth 500 feet. Measuring point, top of wood pipe clamp, 1.6 feet above land surface.

Water level, in feet, 1939

Feb. 20	115.20	Sept. 15	111.85	Dec. 2	109.75
Aug. 12	117.45	Oct. 24	a 144.11		

## Kleberg County

Well numbers correspond to those given in Water-Supply Paper 773-D, pp. 221-32; Water-Supply Paper 845, pp. 517-8.

13. Water levels, in feet, 1939: Apr. 11, 49.45; Oct. 10, 49.62.
15. Water levels, in feet, 1939: Apr. 11, 43.25; Oct. 10, 43.71.
23. Water levels, in feet, 1939: Apr. 14, 50.55; Oct. 12, 52.60.
31. Water levels, in feet, 1939: Apr. 14, 34.96; Oct. 12, 36.40.
35. Water levels, in feet, 1939: Apr. 14, 36.98; Oct. 12, 39.25.
64. Water levels, in feet, 1939: Apr. 12, a/ 5.85; Oct. 12, 3.25.
73. Water levels, in feet, 1939: Apr. 13, 37.34; Oct. 12, 38.82.
79. Water levels, in feet, 1939: Apr. 13, 51.01; Oct. 11, 51.72.
83. Water levels, in feet, 1939: Apr. 13, 48.41; Oct. 11, 49.57.
127. Water levels, in feet, 1939: Apr. 12, 29.37; Oct. 12, 30.70.
128. Water levels, in feet, 1939: Apr. 12, 24.31; Oct. 12, 24.92.
144. Water levels, in feet, 1939: Apr. 12, 28.46; Oct. 12, 28.54.

a Pumping.

## Kleberg County--Continued

- 150. Water levels, in feet, 1939: Apr. 12, 11.74; Oct. 12, 11.98.
- 179. Water levels, in feet, 1939: Apr. 12, 16.60; Oct. 12, 18.23.
- 188. Water levels, in feet, 1939: Apr. 12, 24.08; Oct. 12, 24.23.
- 190. Water levels, in feet, 1939: Apr. 12, 19.95; Oct. 12, 20.90.
- 217. Water levels, in feet, 1939: Apr. 12, 17.25; Oct. 12, 18.51.
- 219. Water levels, in feet, 1939: Apr. 12, 14.02; Oct. 12, 14.32.
- 257. Water levels, in feet, 1939: Apr. 12, 14.40; Oct. 12, 14.98.
- 282. Water level, in feet, 1939: Apr. 12, 4.40; Oct. 12, a/.
- 283. No measurements made in 1939.
- 375. No measurements made in 1939.
- 380. No measurements made in 1939.
- 381. No measurements made in 1939.
- 382. No measurements made in 1939.
- 383. No measurements made in 1939.
- 384. No measurements made in 1939.
- 385. No measurements made in 1939.
- 406. Water level, in feet, 1939: Apr. 13, 24.13.

## Lamb County

Well numbers correspond to those given in Water-Supply Paper 840, pp. 466-9; Water-Supply Paper 845, pp. 518-20; Lamb County, Texas, Records of Wells, etc., Works Progress Administration, Ground-Water Survey Project 2070, State Board of Water Engineers, 1937 (Mimeographed).

- 1. Water levels, in feet, 1939: Mar. 10, 70.42; July 7, 70.12; Sept. 15, 71.06; Dec. 7, 70.60.
- 3A. Water levels, in feet, 1939: Mar. 9, 29.93; July 7, 32.02; Sept. 15, 39.90; Dec. 7, 30.78.
- 6. Water levels, in feet, 1939: Mar. 10, 2.63; July 7, 3.26; Sept. 15, 3.20; Dec. 7, 3.02.
- 7. Water levels, in feet, 1939: Mar. 10, 15.38; July 7, 16.23; Dec. 7, 16.30.
- 8. Water levels, in feet, 1939: Mar. 10, 15.58; July 7, 16.74; Dec. 7, 16.62.
- 13. Water levels, in feet, 1939: Mar. 10, 19.50; July 7, 20.14; Sept. 15, 21.23; Dec. 7, 20.20.
- 16. Water levels, in feet, 1939: Sept. 15, 36.91; Dec. 7, 36.52.
- 19. Water levels, in feet, 1939: Mar. 10, 1.78; July 7, 2.14; Sept. 15, 2.27; Dec. 7, 2.16.
- 30. Water levels, in feet, 1939: Mar. 10, 23.34; July 7, 23.57; Sept. 15, 23.72; Dec. 7, 23.58.

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a Pumping.

## Lamb County--Continued

33A. Halsell Cattle Co. NW $\frac{1}{4}$  sec. 88 blk. 2, 1.3 miles south of U. S. Highway 70, on east side of Sudan road. Unused drilled well, diameter 4 inches. Measuring point, top of tin bucket curb, level with land surface.

Water level, in feet, 1938-39

Date	Water level	Date	Water level	Date	Water level
Sept. 23, 1938	25.06	Apr. 3, 1939	24.03	Aug. 15, 1939	24.14
Oct. 24	25.21	June 22	24.27	Sept. 15	23.87
Jan. 16, 1939	24.34	July 7	24.27	Oct. 13	23.88
Mar. 4	24.06	14	24.29	Dec. 18	23.90

34A. Halsell Cattle Co. SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 73, blk. 2, 0.3 mile south of U. S. Highway 70, on east side of Sudan road. Drilled seismograph test well, diameter 4 inches. Measuring point, top of tin bucket curb, 0.2 foot above land surface.

Water level, in feet, 1938-39

Oct. 24, 1938	12.21	June 22, 1939	11.80	Aug. 15, 1939	10.28
Jan. 16, 1939	11.34	July 7	11.46	Oct. 13	11.29
Mar. 4	11.44	14	11.65	Dec. 18	11.51
Apr. 3	11.41				

38. No measurements made in 1939.

42. Water levels, in feet, 1939: Jan. 27, 19.53; July 7, 20.32; Sept. 15, 18.80; Dec. 7, 19.08.

48. No measurements made in 1939.

60. Water levels, in feet, 1939: Jan. 27, 70.92; Sept. 15, 73.20.

76. Water level, in feet, 1939: Jan. 27, 79.73.

76A. Water level, in feet, 1939: Jan. 27, 84.27.

88.

Water level, in feet, 1939

Jan. 16	39.13	June 22	39.29	Oct. 13	37.90
Mar. 4	39.03	Aug. 15	38.41	Dec. 18	37.98
Apr. 3	39.08				

88A. Water levels, in feet, 1939: Jan. 16, 9.40; Aug. 15, 7.83; Oct. 13, 8.74.

89A. Halsell Cattle Co. SW $\frac{1}{4}$  lab. 21, lge. 237, 6 $\frac{1}{2}$  miles south of Earth. Drilled seismograph test hole, diameter 4 inches, depth 65 feet. Measuring point, top of tin bucket curb, 0.6 foot above land surface. Water levels, in feet, 1939: July 13, 30.63; Aug. 15, 29.28; Oct. 13, 29.57; Dec. 18, 29.80.

90A. ----- SE $\frac{1}{4}$  lab. 11, lge. 237, 5 miles south of Earth. Drilled seismograph test hole, diameter 4 inches. Measuring point, top of tile curb, 1.0 foot below land surface.

Water level, in feet, 1938-39

Aug. 23, 1938	35.10	Apr. 3, 1939	35.59	Aug. 15, 1939	35.27
Oct. 24	35.23	June 22	35.69	Oct. 13	35.09
Jan. 16, 1939	34.91	July 7	35.63	Dec. 18	35.25
Mar. 10	35.48	14	35.71		

91A. Halsell Cattle Co. East side lab. 1, lge. 237, 2 $\frac{1}{4}$  miles south of Earth. Drilled seismograph test hole, diameter 4 inches. Measuring point, top of tin bucket curb, 0.3 foot above land surface.

Water level, in feet, 1938-39

Oct. 24, 1938	12.03	June 22, 1939	12.02	Aug. 15, 1939	10.18
Jan. 16, 1939	10.98	27	11.83	Oct. 13	11.84
Mar. 4	12.05	July 7	11.72	Dec. 18	12.00
Apr. 3	12.18	14	11.93		

## Lamb County--Continued

98A. Halsell Cattle Co. SW $\frac{1}{4}$  lab. 10, lge. 221, 8 miles southwest of Earth. Drilled seismograph test hole, diameter 4 inches, depth 46 feet. Measuring point, top of tin bucket curb, level with land surface. Water levels, in feet, 1939: June 22, 37.7; Aug. 15, 37.66; Oct. 13, 37.85; Dec. 18, 37.98.

108.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 9	79.41	Aug. 15	72.46	Dec. 18	78.90
June 19	80.20	Oct. 12	78.90		

110. Water level, in feet, 1939: Jan. 27, 0.80.

216A. ----- SW $\frac{1}{4}$  lab. 20, lge. 223, 0.6 mile northeast of railroad depot in Sudan. Unused drilled well, diameter 4 $\frac{1}{2}$  inches. Measuring point, top of steel casing, 1.2 feet above land surface.

## Water level, in feet, 1939

Mar. 9	88.71	Aug. 15	88.60	Dec. 18	88.00
June 19	88.63	Oct. 13	87.96		

230. Water levels, in feet, 1939: Mar. 9, 86.57; June 19, 86.40; Aug. 15, 86.34; Oct. 13, 86.30.

231.

## Water level, in feet, 1939

Mar. 9	97.43	Aug. 15	97.74	Dec. 18	97.37
June 19	97.62	Oct. 12	97.41		

236. No measurements made in 1939.

238A.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 16	56.81	Apr. 3	56.50	July 13	56.58	Oct. 13	55.86
Mar. 4	56.49	June 22	56.91	Aug. 15	56.37	Dec. 18	55.68

243. Water levels, in feet, 1939: Mar. 10, 78.74; June 19, 78.75; Oct. 13, 78.67.

247. Water levels, in feet, 1939: Mar. 10, 67.46; June 19, 68.13; Aug. 15, well obstructed 61 feet below measuring point.

251A. G. Y. Oxford. NW $\frac{1}{4}$  lab. 17, lge. 644, 8 $\frac{1}{2}$  miles north of Littlefield. Unused drilled well, diameter 5 inches, depth 92 feet. Measuring point, top of casing, 2.0 feet above land surface. Equipped with windmill. Water levels, in feet, 1939: June 22, 69.88; Aug. 15, 69.50; Oct. 13, 69.58; Dec. 18, 69.60.

259A.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 16	28.29	Apr. 3	28.13	June 22	(a)
Mar. 4	28.01	June 16	28.30		

259B.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 16	76.64	Apr. 3	76.71	Aug. 15	77.06	Dec. 18	76.90
Mar. 4	76.62	June 22	77.03	Oct. 13	77.05		

a Casing obstructed.

## Lamb County--Continued

322. Water levels, in feet, 1939: Jan. 16, 41.83; Mar. 10, 41.88; June 19, 41.98; Aug. 15, 41.82.

341A.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 16	43.50	June 19	43.76	Oct. 13	43.74
Mar. 10	43.43	Aug. 15	43.53		

342A.

Water level, in feet, 1939

Jan. 16	40.00	June 19	40.23	Oct. 13	39.61
Mar. 10	40.07	Aug. 15	39.84		

## Lee County

Well numbers correspond to those in Water-Supply Paper 840, pp. 469-70; Water-Supply Paper 845, p. 520; Lee County, Texas, Records of Wells, etc., Works Progress Administration Ground-Water Survey Project 3763, State Board of Water Engineers, 1937 (Mimeographed).

101-A. Water levels, in feet, 1939: Feb. 1, 104.42; May 1, 105.62; July 14, 102.60; Dec. 5, a/.

113. Water levels, in feet, 1939: Feb. 1, 169.50; May 1, 168.20; July 14, 152.00.

113-A. Water levels, in feet, 1939: Feb. 1, 170.00; May 1, a/; July 14, 180.00.

113-B. Water levels, in feet, 1939: Feb. 1, 165.65; May 1, 167.75; July 14, 166.23; Dec. 5, 166.71.

122. Water levels, in feet, 1939: Feb. 2, 35.07; May 2, 35.57; July 15, 36.00; Dec. 5, 35.51.

124. Water levels, in feet, 1939: Feb. 2, 61.19; May 2, 78.80; July 14, 65.51; Dec. 5, 68.59.

153. Measurements discontinued; replaced by 153A.

153A. Doctor Baker. About  $3\frac{1}{2}$  miles west of New Dimebox, Thomas Bird Survey. Drilled stock well, diameter 8 inches, depth 121 feet. Measuring point, top of 8-inch tile casing, 2.9 feet above land surface. Water levels, in feet, 1939: May 2, 53.00; July 15, 53.21; Dec. 5, 51.40.

174. Water levels, in feet, 1939: Feb. 2, 33.08; May 2, 36.72; July 15, 38.85; Dec. 5, 39.55.

175. Water levels, in feet, 1939: Feb. 2, 15.11; May 2, 16.20; July 15, 16.87; Dec. 5, 19.63.

## Leon County

Well numbers correspond to those in Water-Supply Paper 845, p. 521; Leon County, Texas, Records of Wells, etc., Works Progress Administration, Ground-Water Survey Project 2077, State Board of Water Engineers, 1937 (Mimeographed).

72. Water levels, in feet, 1939: Feb. 3, 31.63; May 3, 32.00; July 17, 32.15; Dec. 7, 32.58.

79. Water levels, in feet, 1939: Feb. 3, 71.06; May 3, 69.82; July 17, 69.40; Dec. 7, 69.09.

a Pumping.



## Leon County--Continued

153. Water levels, in feet, 1939: Feb. 3, 39.46; May 3, 39.12; July 17, 39.20; Dec. 7, 39.30.
- 158-A. Water levels, in feet, 1939: Feb. 3, 24.69; May 3, 22.27; July 17, 24.50; Dec. 7, 26.73.
298. Water levels, in feet, 1939: Feb. 3, 39.20; May 3, 34.72; July 17, 35.52; Dec. 7, 31.46.
301. Water levels, in feet, 1939: Feb. 3, 2.15; May 3, 3.11; July 17, 3.22; Dec. 7, 3.12.
308. Water levels, in feet, 1939: Feb. 3, 45.11; May 3, 41.60; July 17, 44.91; Dec. 7, 46.11.
310. Water levels, in feet, 1939: Feb. 3, 9.31; May 3, 9.56; July 17, 9.62; Dec. 7, 16.38.
368. Water levels, in feet, 1939: Feb. 3, 52.09; May 3, 52.17; July 17, 52.62; Dec. 7, 52.75.
379. Water levels, in feet, 1939: Feb. 3, 53.86; May 3, 54.72; July 17, 55.71; Dec. 7, 55.76.

## Lubbock County

Well numbers correspond to those in Water-Supply Paper 840, pp. 470-3; Water-Supply Paper 840, pp. 522-6; Lubbock County, Texas, Records of Wells, etc., Works Progress Administration Ground-Water Survey Project 5072, State Board of Water Engineers, 1937 (Mimeographed).

- 3-A. Water level, in feet, 1939: Jan. 16, 28.98.
- 64-A. Water levels, in feet, 1939: Mar. 7, 86.72; June 23, 88.94; Oct. 10, 87.58; Dec. 17, 86.83.

67-A.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 28	78.22	Apr. 3	78.28	July 10	78.21	Oct. 10	78.06
Mar. 4	78.24	June 16	78.20	Aug. 16	78.17	Dec. 16	77.83

74-A.

## Water level, in feet, 1939

Jan. 28	35.23	June 22	34.87	July 10	33.52	Aug. 16	34.48
Mar. 4	35.42	30	33.32	20	33.98	Oct. 10	35.35
Apr. 3	35.50	July 5	32.97	Aug. 4	34.36	Dec. 16	35.53
June 16	35.04						

74-B. J. S. George. NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 37, blk. A., 7 $\frac{1}{2}$  miles north of Lubbock. Unused drilled well, diameter 5 inches, depth 52 feet. Measuring point, top of concrete curb, 1.0 foot above land surface. Equipped with windmill.

## Water level, in feet, 1939

June 30	36.06	July 10	35.88	Aug. 4	36.70	Oct. 10	37.04
July 5	35.41	20	36.06	16	36.36	Dec. 16	37.53

75-A.

## Water level, in feet, 1939

Jan. 28	45.00	June 22	45.12	July 10	44.87	Aug. 16	44.80
Mar. 4	45.08	30	44.90	20	44.76	Oct. 10	(a)
Apr. 3	45.18	July 5	44.88	Aug. 4	44.80	Dec. 16	(a)
June 16	45.07						

- 77-A. Water levels, in feet, 1939: Mar. 7, 70.67; June 23, 70.63; Oct. 10, 70.80; Dec. 16, 71.16.

a Dry, 44 feet below measuring point.

## Lubbock County--Continued

81. Water levels, in feet, 1939: Mar. 7, 45.48; Oct. 10, 47.98; Dec. 16, 47.40.

99. No measurements made in 1939.

101. Water levels, in feet, 1939: Mar. 11, 63.82; June 19, a;/ Aug. 15, 64.38; Oct. 13, 64.55.

107.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 16	50.80	June 19	51.01	Oct. 13	50.05
Mar. 11	50.87	Aug. 15	50.21		

118. Water level, in feet, 1939: Dec. 16, 81.27.

121. Water levels, in feet, 1939: Mar. 14, 75.36; June 26, 80.80; Oct. 12, 77.68; Dec. 16, 76.79.

123. Water levels, in feet, 1939: Oct. 12, 65.53; Dec. 16, 65.12.

128. Water levels, in feet, 1939: Oct. 11, 44.58; Dec. 16, 42.76.

138.

## Water level, in feet, 1939

Mar. 10	40.98	Aug. 15	41.20	Dec. 16	41.23
June 19	41.18	Oct. 13	41.26		

139.

## Water level, in feet, 1939

Jan. 16	26.82	June 19	25.04	Oct. 13	24.88
Mar. 10	26.86	Aug. 15	24.52	Dec. 16	25.41

150-A.

## Water level, in feet, 1939

Jan. 16	28.38	June 19	28.21	Oct. 13	28.24
Mar. 10	28.43	Aug. 15	28.23	Dec. 16	28.23

151.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 16	27.06	June 19	26.98	Aug. 15	27.00	Dec. 16	27.13
Mar. 10	27.14	July 12	27.00	Oct. 13	27.08		

154. J. S. Hamilton. NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 22, blk. A., 4 miles west of Lubbock. Unused drilled irrigation well, diameter 14 inches, depth 160 feet. Measuring point, top of concrete curb, level with land surface.

## Water level, in feet, 1937-39

Date	Water level	Date	Water level	Date	Water level
June 21, 1937	40.55	Dec. 23, 1938	38.18	Dec. 16, 1939	38.90
Dec. 18	38.71	Oct. 11, 1939	39.41		

156. Water levels, in feet, 1939: June 26, 40.58; Oct. 11, 41.77; Dec. 16, 41.23.

162-B. ----- NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 19, blk. A., 119 Temple Avenue, Lubbock. Unused drilled well, diameter 10 inches, depth 73 feet. Measuring point, top of 10-inch tile casing, 0.8 foot above land surface. Water levels, in feet, 1939: Oct. 13, 59.69; Dec. 16, 60.02.

a Pumping.

## Lubbock County--Continued

185

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 16	61.76	June 19	52.25	Oct. 10	62.50
Mar. 8	61.78	July 20	62.37	Dec. 17	62.48

188. Water levels, in feet, 1939: Jan. 12, 78.08; Mar. 7, 78.47; Dec. 17, 79.40.

197. Water level, in feet, 1939: Mar. 7, 47.26; June 23, well destroyed.

199-A. Owner unknown. SW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 2, blk. A., 2 $\frac{1}{2}$  miles north-east of Lubbock. Unused drilled well. Measuring point, top of wood water-pipe clamp, 1.0 foot above land surface. Water levels, in feet, 1939: June 26, 73.36; Oct. 10, 73.40; Dec. 17, 73.42.

200. Northeast Ward School. SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 41, blk. A., 3-3/4 miles northeast of Lubbock. Schoolhouse demolished. Unused drilled well, diameter 6 inches. Measuring point, top of tile casing, 0.3 foot above land surface. Water levels, in feet, 1939: June 26, 56.26; Sept. 30, 56.40; Dec. 17, 56.45.

202. Water levels, in feet, 1939: Mar. 7, 56.86; Sept. 30, a/.

219. Ed Harrison. NW cor. sec. 5, blk. RG., 9 $\frac{1}{2}$  miles east of Lubbock. Drilled irrigation well, diameter 16 inches, depth 193 feet. Measuring point, edge of air line hole in pump base, 1.4 feet above land surface.

## Water level, in feet, 1937-39

Feb. 5, 1937	44.40	Mar. 3, 1939	43.96	Oct. 10, 1939	46.14
Dec. 22	44.20	June 23	45.52	Dec. 17	45.22
June 14, 1938	45.13				

220. No measurements made in 1939.

221. Water levels, in feet, 1939: Mar. 7, 56.22; June 23, 56.27; Sept. 30, 56.28; Dec. 17, 56.23.

222. Water levels, in feet, 1939: Mar. 7, 53.08; June 23, 53.06; Oct. 10, 53.08; Dec. 17, 53.04.

223.

## Water level, in feet, 1939

Jan. 6	47.82	June 30	47.82	Dec. 16	47.80
Mar. 8	47.79	Oct. 10	48.05		

225. Acuff Public School. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 122, blk. C., 13 $\frac{1}{2}$  miles east of Lubbock. Schoolhouse demolished. Unused drilled well, diameter 6 inches, depth 100 feet. Measuring point, top of concrete curb, 0.2 foot above land surface.

## Water level, in feet, 1937, 1939

Feb. 3, 1937	53.56	Mar. 8, 1939	52.21	Oct. 10, 1939	52.90
Jan. 6, 1939	52.16	June 30	52.56	Dec. 16	52.90

228. Water levels, in feet, 1939: Mar. 7, 70.41; June 23, 70.37; Sept. 30, 70.34; Dec. 17, 70.30.

252B. A. T. & S. F. R. R. Co. NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 43, blk. S, 14 miles southeast of Lubbock. Unused drilled well, diameter 10 inches. Measuring point, top of steel casing, 0.5 foot above land surface. Water levels, in feet, 1939: Mar. 8, 99.58; June 30, 99.71; Oct. 11, 99.91; Dec. 16, 99.94.

272A.

## Water level, in feet, 1939

Jan. 16	46.42	June 19	45.96	Oct. 10	46.74
Mar. 8	45.63	July 20	46.43	Dec. 17	46.34

a Dry, 56 feet below measuring point.

## Lubbock County--Continued

278. Water levels, in feet, 1939: Mar. 2, 77.78; June 30, 77.84; Oct. 10, 78.31; Dec. 17, 78.33.

279. No measurements made in 1939.

284A. Water levels, in feet, 1939: Mar. 8, 44.66; June 30, 44.63; Oct. 11, 44.70; Dec. 16, 44.64.

301. New Hope Public School. SE cor. sec. 68, blk. S, 8 miles south of Lubbock. Drilled well, depth 70 feet. Measuring point, top of concrete curb, east side, 0.8 foot above land surface. Equipped with windmill.  
Water level, in feet, 1937, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 6, 1937	58.50	Mar. 8, 1939	57.32	Oct. 11, 1939	57.97
Jan. 6, 1939	57.36	June 30	57.61	Dec. 16	57.57

303B. ----- SE cor. sec. 18, blk. E, 8½ miles south of Lubbock. Drilled seismograph test hole, diameter 3 inches, depth 100+ feet. Measuring point, top of tin bucket, 0.1 foot below land surface.

Water level, in feet, 1938-39

May 4, 1938	70.75	Dec. 12, 1938	70.72	Oct. 11, 1939	71.60
July 22	70.71	Mar. 8, 1939	70.70	Dec. 16	71.18
Oct. 26	71.06	June 30	70.80		

314. Water levels, in feet, 1939: Jan. 26, 46.11; Mar. 10, 45.92; Aug. 9, 45.60; Oct. 11, 45.59.

316. Water level, in feet, 1939: Jan. 6, 63.89.

316A. Water levels, in feet, 1939: Jan. 26, 64.08; Mar. 10, 64.00; Aug. 9, 64.57; Oct. 11, 64.87.

332. Water levels, in feet, 1939: Jan. 26, 96.07; Oct. 11, 97.64.

336A. Water levels, in feet, 1939: Jan. 26, 79.77; Aug. 9, 79.85; Oct. 11, 79.88.

355. Water levels, in feet, 1939: Jan. 6, 84.62; Oct. 11, 86.02.

369. No measurements made in 1939.

372. No measurements made in 1939.

376. Union Public School. SE¼SW¼ sec. 4, blk. 20, 12½ miles south of Lubbock. Drilled well, depth 98 feet. Measuring point, top of concrete curb, west side, 1.0 foot above land surface. Equipped with windmill; seldom used.

Water level, in feet, 1937, 1939

Jan. 6, 1937	94.06	Mar. 8, 1939	93.78	Oct. 11, 1939	94.10
Jan. 6, 1939	93.81	June 30	94.32	Dec. 16	93.95

379-A. Clara Lynch. NE cor. sec. 27, blk. 24, 15½ miles southeast of Lubbock. Unused drilled well, diameter 5 inches, depth 75 feet. Measuring point, top of casing, 1.0 foot above land surface. Equipped with hand pump.

Water level, in feet, 1938-39

June 23, 1938	62.19	Mar. 8, 1939	61.87	Oct. 11, 1939	61.86
Sept. 9	61.90	June 30	61.82	Dec. 16	61.85
Oct. 26	61.93				

383. Water levels, in feet, 1939: Aug. 14, 73.68; Oct. 11, 73.72.

386. No measurements made in 1939.

387. Water levels, in feet, 1939: Jan. 26, 40.89; Aug. 14, 40.92; Oct. 11, 41.25.

## Lubbock County--Continued

388. Water levels, in feet, 1939: Jan. 26, 23.81; June 24, 24.72; Aug. 14, 24.96; Oct. 11, 25.67.

389. Water levels, in feet, 1939: Jan. 26, 24.30; Oct. 11, 26.76.

391. Water levels, in feet, 1939: Feb. 6, 78.58; Mar. 14, 78.64; June 26, 78.75; Oct. 12, 78.94.

392. Water levels, in feet, 1939: Feb. 6, 93.07; Mar. 14, 92.98; June 26, a/; Oct. 12, 92.96.

393. Water levels, in feet, 1939: Jan. 16, 56.74; July 20, 57.22; Oct. 10, 57.52.

394.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 16	46.96	June 19	47.41	Oct. 10	(b)
Mar. 10	46.94	July 20	47.00		

395. Water levels, in feet, 1939: Mar. 10, 44.95; June 19, 54.00; Aug. 15, 54.07; Oct. 11, a/.

397.

## Water level, in feet, 1939

Jan. 16	18.59	June 19	18.04	Oct. 13	18.43
Mar. 10	18.71	Aug. 15	18.56	Dec. 16	18.43

398.

## Water level, in feet, 1939

Jan. 16	16.98	June 19	16.12	Oct. 13	15.09
Mar. 10	17.10	Aug. 15	15.07	Dec. 16	15.33

399.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 28	42.46	June 16	42.52	July 20	42.13	Oct. 10	42.21
Mar. 4	42.53	30	42.40	Aug. 4	42.14	Dec. 16	42.14
Apr. 3	42.61	July 10	42.28	16	42.12		

401.

## Water level, in feet, 1939

Jan. 28	70.81	June 16	70.72	Aug. 16	70.80	Dec. 16	70.65
Mar. 4	70.68	July 10	70.74	Oct. 10	70.74		

402. Water levels, in feet, 1939: Mar. 7, 38.43; June 23, 38.62; Sept. 30, 39.23; Dec. 17, 39.64.

403. Water levels, in feet, 1939: Mar. 7, 39.37; June 23, 39.76; Sept. 30, 41.00; Dec. 17, 40.80.

## Lynn County

Well numbers correspond to those in Water-Supply Paper 840, pp. 473-5; Water-Supply Paper 845, pp. 526-7.

605. Water levels, in feet, 1939: Jan. 23, 64.11; Aug. 10, 64.08.

607. Water levels, in feet, 1939: Mar. 8, 109.31; Oct. 11, 109.36.

608. Water levels, in feet, 1939: Mar. 8, 100.07; June 30, 100.12; Oct. 11, 100.02.

a Pumping.

b Filled to 36 feet below measuring point.

## Lynn County--Continued

701. Water levels, in feet, 1939: Jan. 23, 66.40; Aug. 10, 66.08.  
703. Water levels, in feet, 1939: Jan. 23, 64.78; Aug. 10, 64.58.  
705. Water level, in feet, 1939: Jan. 23, 85.44.  
712. Water levels, in feet, 1939: Jan. 23, 54.50; Aug. 10, 54.87.  
803. Water levels, in feet, 1939: Jan. 23, 72.68; Aug. 10, 72.30.  
806. Water levels, in feet, 1939: Jan. 23, 39.02; Aug. 10, 36.13.

## Martin County

Well numbers correspond to those in Water-Supply Paper 840, pp. 476-8; Water-Supply Paper 845, pp. 528-9; Martin County, Texas, Records of Wells, etc., Works Progress Administration Ground-Water Survey Project 6999, State Board of Water Engineers, 1937 (Mimeographed).

241. Water level, in feet, 1939: Aug. 11, 81.93.  
292A. Water levels, in feet, 1939: Jan. 27, 31.41; Aug. 11, 31.53.  
336. Water level, in feet, 1939: Jan. 27, 42.71.  
361. Water levels, in feet, 1939: Jan. 27, 40.21; Aug. 11, 43.34.  
363. Water levels, in feet, 1939: Jan. 27, 64.40; Aug. 11, 65.07.  
369. Water levels, in feet, 1939: Jan. 27, 40.59.  
376. Water levels, in feet, 1939: Jan. 27, 1.31; Aug. 11, 2.54.  
384. No measurements made in 1939.  
389. Water levels, in feet, 1939: Jan. 27, 25.12; Aug. 11, 25.66.  
401. Water levels, in feet, 1939: Jan. 27, 77.78; Aug. 11, 77.80.  
452A. Water levels, in feet, 1939: Jan. 27, 27.83; Aug. 11, 28.91.  
455. Water levels, in feet, 1939: Jan. 27, 31.53; Aug. 11, 32.13.  
457. No measurements made in 1939.  
467. No measurements made in 1939.  
468. Water levels, in feet, 1939: Jan. 27, 62.57; Aug. 11, 62.79.  
471. Water level, in feet, 1939: Aug. 11, 73.48.  
494A. Water levels, in feet, 1939: Jan. 27, 46.31; Aug. 11, 47.10.  
610. Water levels, in feet, 1939: Jan. 27, 21.54; Aug. 11, 22.63.  
655. Water levels, in feet, 1939: Jan. 27, 27.70; Aug. 11, 28.12.  
665. Water levels, in feet, 1939: Jan. 27, 57.39; Aug. 11, 57.82.  
674. Water levels, in feet, 1939: Jan. 27, 22.48; Aug. 11, 23.04.  
687. Water level, in feet, 1939: Jan. 27, 22.61.  
690. Water levels, in feet, 1939: Jan. 27, 35.40; Aug. 11, 35.62.

## Matagorda County

Well numbers correspond to those in Water-Supply Paper 840, p. 479; Water-Supply Paper 845, p. 529.

3. Water levels, in feet, 1939: Mar. 23, 6.87; June 22, 9.96; Sept. 25, 13.00; Dec. 18, 10.74.

33. Water levels, in feet, 1939: Mar. 23, 1.65; June 22, 3.92; Sept. 25, 4.43.

40. Water levels, in feet, 1939: Mar. 23, 10.77; June 22, 11.82; Sept. 25, 14.00; Dec. 18, 14.81.

46. No measurements made in 1939; well flowing.

## Maverick County

Well number corresponds to that in Water-Supply Paper 777, p. 216; Water-Supply Paper 840, p. 479; Water-Supply Paper 845, p. 529.

M3-21. Water levels, in feet, 1939: Apr. 9, 46.65; July 21, 46.35.

## Medina County

Well numbers correspond to those in Water-Supply Paper 678, pp. 118-20; Water-Supply Paper 840, pp. 479-80; Water-Supply Paper 845, pp. 529-30.

I-2-1. Water levels, in feet, 1939: Apr. 10, 188.71; Aug. 1, 188.32; Sept. 18, 189.90; Oct. 25, 191.40.

I-2-6. Measurements discontinued.

I-2-7. Water levels, in feet, 1939: Apr. 10, 205.40; Aug. 1, 209.90; Sept. 18, 211.72; Oct. 25, 212.80.

I-3-3. Water levels, in feet, 1939: Apr. 10, 187.80; Aug. 1, 188.97; Sept. 18, 189.48; Oct. 26, 195.92.

I-3-4. No measurements made in 1939.

I-3-5. Water levels, in feet, 1939: Apr. 10, 152.08; Aug. 1, 154.62; Sept. 18, 157.91; Oct. 26, 159.34.

I-4-18. Water levels, in feet, 1939: Jan. 27, 215.09; Mar. 2, 216.82; Apr. 3, 217.00; Oct. 25, 225.00.

I-4-29. No measurements made in 1939.

XM-1.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 27	54.45	May 4	62.14	July 6	71.50	Sept. 16	66.16
Mar. 2	(a)	June 9	62.33	Aug. 17	64.28	Oct. 26	62.61
Apr. 3	57.97						

XM-2.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 27	144.35	May 4	149.89	July 6	153.52	Sept. 16	151.61
Mar. 2	140.25	June 9	150.20	Aug. 17	150.05	Oct. 26	153.15
Apr. 3	147.27						

XM-3.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 27	65.38	May 4	67.30	July 6	76.96	Sept. 16	70.62
Mar. 2	66.20	June 9	68.51	Aug. 17	68.00	Oct. 26	72.13
Apr. 3	66.16						

a Pumping.

## -Midland County

Well numbers correspond to those in Water-Supply Paper 840, p. 481; Water-Supply Paper 845, pp. 530-1; Midland County, Texas, Records of Wells, etc., Works Progress Administration Ground-Water Survey Project 5316, State Board of Water Engineers, 1938 (Mimeographed).

36. Water level, in feet, 1939: Aug. 11, 33.04.  
 37. Water level, in feet, 1939: Aug. 11, 45.61.  
 55. Water levels, in feet, 1939: Jan. 27, 30.71; Aug. 11, 31.43.  
 78. Water levels, in feet, 1939: Jan. 27, 51.20; Aug. 11, 51.31.  
 98. Water levels, in feet, 1939: Jan. 27, 39.57; Aug. 11, 39.72.  
 222. Water levels, in feet, 1939: Jan. 27, 27.07; Aug. 11, 26.13.

## Milam County

Well numbers correspond to those in Water-Supply Paper 845; Milam County, Texas, Records of Wells, etc., Works Progress Administration, Ground-Water Survey Project 3763, State Board of Water Engineers, 1937 (Mimeographed).

- 14-A. Water levels, in feet, 1939: Feb. 2, 88.50; May 2, 88.60; July 15, 88.90; Dec. 6, 88.83.  
 165. Water levels, in feet, 1939: Feb. 2, 16.08; May 2, 15.50; July 15, 16.50; Dec. 6, 16.11.  
 278. Water levels, in feet, 1939: Feb. 2, 36.28; May 2, 35.71; July 15, 36.60; Dec. 6, 36.21.  
 285. Water levels, in feet, 1939: Feb. 2, 25.72; May 2, 26.03; July 15, 26.21; Dec. 6, 24.16.  
 311. Water levels, in feet, 1939: Feb. 2, 55.68; May 2, 57.11; July 15, 56.25; Dec. 6, 55.86.  
 333. Water levels, in feet, 1939: Feb. 2, 94.05; May 2, 94.23; July 15, 94.24; Dec. 6, 94.54.  
 364. Water levels, in feet, 1939: Feb. 2, 57.82; May 2, 57.31; July 15, 61.00; Dec. 6, 57.41.

## Montgomery County

Well numbers correspond to those in Water-Supply Paper 840, pp. 481-2; Water-Supply Paper 845, p. 532.

## 16. Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 26	46.96	Aug. 3	47.70	Dec. 19	(a)
May 24	46.84	Sept. 25	(a)		

## 29. Water level, in feet, 1939

Jan. 26	24.98	May 24	25.85	Sept. 25	26.96
Mar. 4	24.11	Aug. 3	26.15	Dec. 19	27.80

## 30. Water level, in feet, 1939

Jan. 26	28.36	May 4	28.56	Sept. 25	29.56
Mar. 4	26.72	Aug. 3	28.98	Dec. 19	30.40

a Dry, 48 feet below measuring point.



## Montgomery County--Continued

45.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 26	24.27	May 24	24.56	Sept. 25	26.15
Mar. 4	24.01	Aug. 3	25.55	Dec. 19	25.80

46.

## Water level, in feet, 1939

Jan. 26	31.90	May 24	33.01	Sept. 25	33.55
Mar. 4	31.73	Aug. 3	32.92	Dec. 19	33.38

## Moore County

1. Water levels, in feet, 1939: Mar. 8, 256.88; June 28, 256.89; Dec. 20, casing removed, well filled above water level.

2. Texas Highway Department. Along U. S. Highway 87, 11.15 miles north from Moore-Potter County line, 6.2 miles north from junction of State Highway 5 with U. S. Highway 87, 20 feet east of pavement. Unused drilled well, diameter 8 inches, depth 51 feet. Measuring point, bottom edge of 2-inch hole in south side of casing, 2.0 feet above land surface. Water levels, in feet, 1939: Feb. 9, 50.40; Mar. 8, 50.64; June 28, 50.87; Dec. 20, 50.03.

3. ----- Along U. S. Highway 87, 6 miles west of railroad crossing in Dumas, 30 feet north of highway right-of-way. Drilled well, diameter 4½ inches, depth 286 feet. Measuring point, top of casing, 1.0 foot above land surface. Equipped with windmill. Water levels, in feet, 1939: Mar. 8, 268.67; June 28, 268.5; Dec. 20, 267.59.

## Nacogdoches County

Well numbers correspond to those in Water-Supply Paper 840, pp. 483-4; Water-Supply Paper 845, pp. 532-3; Nacogdoches County, Texas, Records of Wells, etc., Works Progress Administration, Ground-Water Survey Project 2074, State Board of Water Engineers, 1937 (Mimeographed).

66. Flowing 1.09 gallons a minute Dec. 12, 1939.

70. Water levels, in feet, 1939: Feb. 9, 23.05; May 6, 22.41; July 20, 23.52; Dec. 12, 24.59.

76. Water levels, in feet, 1939: Feb. 8, 8.15; May 6, 11.89; July 20, 14.72; Dec. 12, 15.06.

111. Measurements discontinued.

113. Water levels, in feet, 1939: Feb. 9, 8.73; May 6, 16.72; July 20, 16.74; Dec. 12, 24.13.

113-A. Water levels, in feet, 1939: Feb. 9, 74.40; May 6, 74.51; July 20, 74.95; Dec. 12, 75.68.

120. Water levels, in feet, 1939: Feb. 9, 4.10; May 6, a/; July 20, a/; Dec. 13, 9.13.

121. Water levels, in feet, 1939: Feb. 9, 41.35; May 6, 41.47; July 20, a/; Dec. 13, 35.01.

122. Water levels, in feet, 1939: Feb. 9, 20.16; May 6, a/; July 20, a/; Dec. 13, 31.18.

128. Water levels, in feet, 1939: Feb. 9, 15.18; May 6, 22.89; July 20, 25.23; Dec. 12, 27.54.

a Pumping.

## Nacogdoches County--Continued

132. Water levels, in feet, 1939: Feb. 9, 43.71; May 6, 42.62; Dec. 12, 44.32.

198. Water levels, in feet, 1939: Feb. 9, +7.2; May 8, +5.0; July 20, a/; Dec. 13, 5.13.

199. Water levels, in feet, 1939: Feb. 9, 22.85; May 8, 22.62; July 20, 25.34; Dec. 13, 27.82.

203. Water levels, in feet, 1939: Feb. 9, 7.58; May 6, 8.70; July 20, 9.20; Dec. 13, filled, measurements discontinued.

## Navarro County

Well numbers correspond to those in Water-Supply Paper 845, p. 533.

1. Water levels, in feet, 1939: Feb. 4, 21.81; May 3, 23.99; July 17, 24.87; Dec. 8, 24.96.

2. Water levels, in feet, 1939: Feb. 4, 21.94; May 3, 18.70; July 17, 20.50; Dec. 8, 26.35.

3. Water levels, in feet, 1939: Feb. 4, 25.25; May 4, 24.62; July 18, 26.11; Dec. 8, 27.36.

## 4. Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 4	21.20	July 18	21.36	Dec. 8	23.60
May 4	22.10	Dec. 8	22.31		

5. Water levels, in feet, 1939: Feb. 4, 34.85; May 4, 34.60; July 18, 34.98; Dec. 8, 35.54.

## Ochiltree County

Well numbers correspond to those in Water-Supply Paper 840, p. 484; Water-Supply Paper 845, p. 534.

1. No measurements made in 1939.

2. Water levels, in feet, 1939: Mar. 11, 261.5; July 1, 261.87; Dec. 22, 261.67.

3. Water levels, in feet, 1939: Mar. 11, 218.38; July 1, 218.98; Dec. 22, 218.86.

4. No measurements made in 1939.

## Panola County

Well numbers correspond to those in Water-Supply Paper 840, pp. 484-5; Water-Supply Paper 845, p. 534; Panola County, Texas Records of Wells, etc., Works Progress Administration, Ground-Water Survey Project 2075, State Board of Water Engineers, 1938 (Mimeographed).

148. Water levels, in feet, 1939: Feb. 8, 12.33; May 6, 16.28; July 20, 20.60; Dec. 12, 22.20.

150. Water levels, in feet, 1939: Feb. 8, 61.27; May 6, 61.75; July 20, 74.28; Dec. 12, 61.55.

151. No measurements made in 1939.

189. Water levels, in feet, 1939: Feb. 8, 15.30; May 6, 17.55; July 20, 18.44; Dec. 12, 20.80.

a Pumping.

## Panola County--Continued

202. Water levels, in feet, 1939: Feb. 8, 5.56; May 6, 11.60; July 20, 12.25; Dec. 12, 14.65.
277. Water levels, in feet, 1939: Feb. 8, 9.21; May 6, 11.30; July 20, 12.12; Dec. 12, 13.90.
279. Water levels, in feet, 1939: Feb. 8, 18.86; May 6, 18.46; July 20, 18.70; Dec. 12, 20.81.
293. Water levels, in feet, 1939: Feb. 8, 72.30; May 6, 72.15; July 20, 72.36; Dec. 12, 72.27.
302. Water levels, in feet, 1939: Feb. 8, 28.88; May 6, 28.80; July 20, 28.95; Dec. 12, 29.86.

## Parmer County

Well numbers correspond to those in Water-Supply Paper 840, pp. 485-6; Water-Supply Paper 845, pp. 534.5.

2. Water levels, in feet, 1939: July 8, 103.48; Sept. 14, 103.48; Dec. 6, 103.48.
5. No measurements made in 1939.
6. No measurements made in 1939.
8. No measurements made in 1939.
9. Water level, in feet, 1939: Sept. 14, 212.22.
10. No measurements made in 1939.
11. Water levels, in feet, 1939: Mar. 30, 147.72; Sept. 14, 147.66; Dec. 6, 147.55.
- 11A. Water levels, in feet, 1939: Mar. 30, 117.74; Sept. 14, 117.84.
12. No measurements made in 1939.
13. Water levels, in feet, 1939: Mar. 30, 127.10; Sept. 14, 127.37; Dec. 6, 127.36.
14. Water levels, in feet, 1939: Mar. 30, 126.71; Sept. 14, 127.06; Dec. 6, 126.92.
15. Water levels, in feet, 1939: Mar. 30, 139.72; Sept. 14, 139.81.

## Potter County

Well numbers correspond to those in Water-Supply Paper 840, pp. 486-7; Water-Supply Paper 845, p. 535; Potter County, Texas, Records of Wells, etc., Works Progress Administration, Ground-Water Survey Project 5674, State Board of Water Engineers, 1938 (Mimeographed).

22. No measurements made in 1939.
38. Water levels, in feet, 1939: Feb. 9, 95.17; Mar. 8, 95.56; June 28, 95.33; Dec. 20, 95.05.
- 38A. Water levels, in feet, 1939: Feb. 9, 48.74; Mar. 8, 49.21; June 28, 49.58; Dec. 20, 49.58.
- 84A. Water levels, in feet, 1939: Feb. 9, 1.43; Mar. 8, 1.50; June 28, 1.54; Dec. 20, 2.02.
123. Well dry 84 feet below measuring point Feb. 9, 1939.
161. No measurements made in 1939.

## Potter County--Continued

197. No measurements made in 1939.
210. Water levels, in feet, 1939: Feb. 9, 75.07; Mar. 8, 75.53; June 28, 75.50; Dec. 20, 75.18.
246. Water levels, in feet, 1939: July 1, 213.5; Dec. 23, 213.59.

## Randall County

Well numbers correspond to those in Water-Supply Paper 840, p. 487; Water-Supply Paper 845, pp. 535-6; Randall County, Texas, Records of Wells, etc., Works Progress Administration Ground-Water Survey Project 5674, State Board of Water Engineers, 1937 (Mimeographed).

- 5A. Well dry 140 feet below measuring point Mar. 7, 1939.
- 6A. Water levels, in feet, 1939: Mar. 7, 143.54; June 28, 143.73; Dec. 30, 143.95.
76. Water levels, in feet, 1939: Mar. 7, 107.78; June 28, 107.86; Dec. 30, 107.91.
- 83A. Water levels, in feet, 1939: Mar. 20, 79.11; June 28, 79.04; Sept. 29, 79.09.
91. Water levels, in feet, 1939: Mar. 20, 23.46; June 28, 23.08; Sept. 29, 23.85.
103. Water levels, in feet, 1939: Mar. 7, 10.41; Sept. 29, 11.86.
117. Water levels, in feet, 1939: Mar. 7, 41.22; June 28, 41.33; Sept. 29, 41.08; Dec. 30, 41.41.
- 145A. Water levels, in feet, 1939: Mar. 20, 111.96; June 28, 111.92; Sept. 29, 111.93.
- 160A. Water levels, in feet, 1939: Mar. 20, 103.30; June 28, 103.28; Sept. 29, 103.31.
- 167A. Water levels, in feet, 1939: Mar. 20, 105.89; June 28, 105.85; Sept. 29, 105.88.
- 172A. Water levels, in feet, 1939: Mar. 20, 109.27; June 28, 108.80; Sept. 29, 108.77.
- 189A. Water levels, in feet, 1939: Mar. 7, 96.60; June 28, 96.70; Dec. 30, 96.82.

## Roberts County

Well numbers correspond to those in Water-Supply Paper 840, p. 488; Water-Supply Paper 845, p. 537.

1. Water levels, in feet, 1939: Mar. 11, 7.03; July 1, 3.94; Dec. 22, 7.66.
2. Water level, in feet, 1939: Mar. 11, 73.68.
3. Water level, in feet, 1939: Mar. 11, 41.61.

## Robertson County

Well numbers correspond to those in Water-Supply Paper 845, p. 537.

1. Water levels, in feet, 1939: Feb. 2, +53.5; May 2, +55.0; July 15, +56.50; Dec. 6, +56.0.
2. Water levels, in feet, 1939: Feb. 2, +8.5; May 2, +8.5; July 15, +9.0; Dec. 6, +8.5.

## Robertson County--Continued

3. Water levels, in feet, 1939: Feb. 2, 4.33; May 2, 4.70; July 15, 2.74; Dec. 6, 5.69.

5. Water levels, in feet, 1939: Feb. 3, 54.27; May 3, 54.27; July 15, 54.03; Dec. 7, 53.99.

6. Water levels, in feet, 1939: Feb. 3, +7.12; May 3, +7.05; July 17, a/; Dec. 7, a/.

8. Water levels, in feet, 1939: Feb. 3, 22.15; May 3, 22.76; July 17, 24.35; Dec. 7, 24.36.

21. No measurements made in 1939.

## Rusk County

Well numbers correspond to those in Water-Supply Paper 840, p. 488; Water-Supply Paper 845, p. 538; Rusk County, Texas, Records of Wells, etc., Works Progress Administration, Ground-Water Survey Project 2075, State Board of Water Engineers, 1937 (Mimeographed).

16. Water levels, in feet, 1939: Feb. 7, 149.27; May 5, 149.50; July 19, 155.02; Dec. 11, 149.96.

31. Water levels, in feet, 1939: Feb. 7, 14.67; May 5, 13.40; July 19, 16.40; Dec. 11, 17.46.

31-A. Water levels, in feet, 1939: Feb. 7, 62.16; May 5, 63.50; July 19, 63.50; Dec. 11, 62.38.

165. Water levels, in feet, 1939: Feb. 8, 41.92; May 6, 42.30; July 19, 42.70; Dec. 12, 42.33.

177. Water levels, in feet, 1939: Feb. 8, 4.84; May 6, 11.28; July 19, 21.98; Dec. 12, 25.15.

179. Water levels, in feet, 1939: Feb. 8, 5.56; May 6, 6.60; July 19, 10.20; Dec. 12, 14.01.

248. Water levels, in feet, 1939: Feb. 8, 17.80; May 5, 19.05; July 19, 19.23; Dec. 11, 19.07.

255. Water levels, in feet, 1939: Feb. 8, 25.89; May 5, 25.10; July 19, 26.21; Dec. 11, 27.31.

434. Water levels, in feet, 1939: Feb. 8, 8.67; May 6, 26.45; July 19, 25.55; Dec. 12, 28.48.

## Shelby County

Well numbers correspond to those in Water-Supply Paper 840, p. 489; Shelby County, Texas, Records of Wells, etc., Works Progress Administration, Ground-Water Survey Project 2075, State Board of Water Engineers, 1937 (Mimeographed).

11. Water levels, in feet, 1939: Feb. 8, 6.53; May 6, 10.62; July 20, 12.42; Dec. 12, 14.63.

26. Water levels, in feet, 1939: Feb. 8, 18.93; May 6, 17.41; July 20, 18.10; Dec. 12, 20.08.

28. Water levels, in feet, 1939: Feb. 8, 17.18; May 6, 17.03; July 20, 17.03; Dec. 12, 17.61.

35. Water levels, in feet, 1939: Feb. 8, 8.20; May 6, 10.98; July 20, 11.02; Dec. 12, 17.25.

---

a Flowing.

## Sherman County

Well numbers correspond to numbers given in Water-Supply Paper 840, p. 489; Water-Supply Paper 845, p. 538.

1. Water level, in feet, 1939: Mar. 10, 203.76; June 30, a/.
2. No measurements made in 1939.
3. Water levels, in feet, 1939: Mar. 10, 175.94; June 30, 176.11.
4. Water levels, in feet, 1939: Mar. 10, b/; June 30, 190.68; Dec. 21, 190.76.

## Smith County

Well numbers correspond to those in Water-Supply Paper 840, pp. 489-91; Water-Supply Paper 845, p. 539; Smith County, Texas, Records of Wells, etc., Works Progress Administration, Ground-Water Survey Project 2073, State Board of Water Engineers, 1937 (Mimeographed).

68. Well flowing July 18 and Dec 9, 1939.
69. Water levels, in feet, 1939: Feb. 6, b/; May 5, b/; July 18, 120.80; Dec. 10, 120.69.
- 70-A. Water levels, in feet, 1939: Feb. 6, 34.50; May 5, 32.40; July 18, 32.98; Dec. 10, 35.21.
86. Water levels, in feet, 1939: Feb. 7, 23.01; May 5, 22.62; July 19, 23.53; Dec. 10, 23.34.
93. Water levels, in feet, 1939: Feb. 7, 16.14; May 5, 15.50; July 19, 17.40; Dec. 10, 17.45.
102. Water levels, in feet, 1939: Feb. 7, 26.09; May 5, 25.10; July 19, 26.00; Dec. 10, 27.06.
196. Water levels, in feet, 1939: Feb. 6, 3.30; May 4, 4.18; July 18, 5.02; Dec. 9, 4.31.
205. Water levels, in feet, 1939: Feb. 6, 17.72; May 4, 17.39; July 18, 18.11; Dec. 9, 20.55.
217. Water levels, in feet, 1939: Feb. 6, 54.60; July 18, 55.00; Dec. 9, 54.30.
343. Water levels, in feet, 1939: Feb. 6, 1.92; May 4, 1.80; July 18, 3.75; Dec. 9, 1.87.
353. Water levels, in feet, 1939: Feb. 6, 6.20; May 4, 4.13; July 18, 7.80; Dec. 9, 16.26.
462. Water levels, in feet, 1939: Feb. 8, rains; May 5, 101.58; July 19, 100.02; Dec. 11, 101.13.
466. Water levels, in feet, 1939: Feb. 8, 29.02; May 5, 28.72; July 19, 29.71; Dec. 11, 30.34.
477. No measurements made in 1939.
- 477-A. Emma Adams. About 400 feet south of well 477. Domestic dug well, diameter 48 inches. Measuring point, top of 1 by 4-inch flat top of curb, 3.3 feet above land surface. Water level, in feet, 1939: Dec. 11, 19.15.

a Filled to 104 feet below measuring point.

b Pumping.

## Swisher County

Well numbers correspond to those in Water-Supply Paper 840, pp. 491-5; Water-Supply Paper 845, pp. 539-42; Swisher County, Texas, Records of Wells, etc., State Board of Water Engineers in cooperation with United States Department of the Interior, Geological Survey, 1938 (Mimeographed).

2. Water levels, in feet, 1939: Mar. 7, 78.32; June 28, 78.40; Dec. 30, 78.37.

3. No measurements made in 1939.

3A. Water levels, in feet, 1939: Mar. 7, 99.87; June 28, 99.90; Dec. 30, 99.91.

4. No measurements made in 1939.

5. Water levels, in feet, 1939: Mar. 20, 72.79; June 28, 72.65; Dec. 30, dry at 72 feet.

13. Water levels, in feet, 1939: Mar. 7, 75.96; June 28, 75.36; Dec. 30, 75.37.

14. No measurements made in 1939.

16. Water levels, in feet, 1939: Mar. 7, 61.73; June 28, 61.84; Dec. 30, 61.96.

18. Water levels, in feet, 1939: Mar. 7, 77.60; June 28, 77.57; Dec. 30, 77.33.

38. Water level, in feet, 1939: Mar. 7, 55.95.

49. Water levels, in feet, 1939: Mar. 20, 50.22; July 1, 50.18; Dec. 30, 50.61.

50. Water levels, in feet, 1939: Mar. 7, 61.28; July 1, 61.57; Dec. 30, 61.82.

226. Water levels, in feet, 1939: Jan. 6, 45.99; June 24, 46.28; Oct. 3, 46.47; Dec. 8, 46.58.

245. No measurements made in 1939.

254.

## Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 6	38.29	June 24	38.60	Dec. 8	39.21
Feb. 28	38.34	Oct. 3	39.02		

255. No measurements made in 1939.

256. No measurements made in 1939.

258. Water levels, in feet, 1939: Jan. 6, 52.50; Feb. 28, 52.48; Oct. 3, 54.02; Dec. 8, a.

261. No measurements made in 1939.

301. Water levels, in feet, 1939: Mar. 7, 32.40; June 28, 32.20; Oct. 3, 32.60; Dec. 30, 32.89.

302. Water levels, in feet, 1939: Mar. 7, 68.66; June 28, 68.89; Oct. 3, 68.56; Dec. 30, 69.40.

304. No measurements made in 1939.

305. Water level, in feet, 1939: Dec. 30, 38.18.

315. No measurements made in 1939.

a Pumping.

## Swisher County--Continued

323. Water levels, in feet, 1939: Mar. 7, 65.27; June 24, 65.53; Aug. 16, 65.68; Oct. 3, a/.

## 332. Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 6	63.34	June 24	70.78	Oct. 3	72.70
Mar. 1	63.16	Aug. 16	81.58	Dec. 30	65.28

## 337. Water level, in feet, 1939

Jan. 6	(a)	June 24	63.82	Dec. 30	65.96
Mar. 1	63.30	Oct. 3	(a)		

339. Water levels, in feet, 1939: Jan. 6, 50.98; Mar. 1, 50.82; Aug. 17, b/.

## 352. Water level, in feet, 1939

Jan. 6	60.68	June 24	60.88	Oct. 2	61.16
Mar. 1	60.63	Aug. 16	60.98	Dec. 30	61.45

## 354. Water level, in feet, 1939

Jan. 6	62.32	June 24	62.38	Oct. 2	62.47
Mar. 1	62.35	Aug. 16	62.40	Dec. 30	62.57

359. E. E. Formway. NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 57, M-13, 2-3/4 miles west of Kress. Drilled irrigation well, diameter 14 inches, depth 220 feet. Measuring point, top of concrete curb, 2.0 feet above land surface.

## Water level, in feet, 1937-39

Dec. 1, 1937	75.68	Dec. 8, 1938	77.01	Oct. 2, 1939	(a)
Apr. 9, 1938	76.71	Feb. 28, 1939	77.05	Dec. 1	77.67
Oct. 19	78.11	June 24	77.40		

362. Water levels, in feet, 1939: Oct. 2, 71.04; Dec. 1, 71.15.

364. No measurements made in 1939.

## 368. Water level, in feet, 1939

Jan. 6	74.67	Aug. 10	76.05	Dec. 1	76.44
Mar. 1	74.61	Oct. 2	76.64		

369. No measurements made in 1939.

## 370. Water level, in feet, 1939

Jan. 6	73.32	Aug. 10	73.87	Dec. 1	74.24
Mar. 1	73.40	Oct. 2	74.10		

371. No measurements made in 1939.

380. Water levels, in feet, 1939: Jan. 10, 54.65; Feb. 28, 54.75; Dec. 8, 55.10.

383. Water levels, in feet, 1939: Jan. 6, 73.51; Feb. 28, 73.27; Oct. 3, 79.15; Dec. 8, 75.25.

## 427. Water level, in feet, 1939

Jan. 4	86.53	June 24	86.52	Dec. 1	86.84
Feb. 28	86.37	Oct. 2	(a)		

a Pumping.

b Dry 49 feet below measuring point.



## Swisher County--Continued

429. Clifton Reed. NW cor. strip sec. 66, J. A. Ward survey,  $5\frac{1}{2}$  miles west of Kress. Drilled irrigation well, diameter 15 inches, depth 198 feet. Measuring point, bottom of pump base, level with land surface. Water levels, in feet: Sept. 23, 1937, 93.17; Oct. 2, 1939, 96.04; Dec. 1, 1939, 96.75.

430. No measurements made in 1939.

## Terry County

Well numbers correspond to those in Water-Supply Paper 840, pp. 495-6; Water-Supply Paper 845, pp. 542-3.

2. Water levels, in feet, 1939: Jan. 25, 104.62; Aug. 12, 104.33.
5. Water level, in feet, 1939: Jan. 26, 118.09.
8. Water levels, in feet, 1939: Jan. 26, 98.0; Aug. 12, 97.70.
9. Water levels, in feet, 1939: Jan. 26, 90.72; Aug. 14, 90.47.
12. Water levels, in feet, 1939: Jan. 26, 83.41; Aug. 14, a/.
14. Water levels, in feet, 1939: Jan. 26, 86.22; Aug. 14, 85.93.
15. Water level, in feet, 1939: Aug. 14, 91.22.
16. Water levels, in feet, 1939: Jan. 26, 97.28; Aug. 14, 97.12.
- 17A. Water levels, in feet, 1939: Jan. 26, 80.61; Aug. 14, 80.67.
19. Water levels, in feet, 1939: Jan. 26, 68.84; Aug. 14, a/.

## Travis County

Well numbers correspond to those in Water-Supply Paper 840, pp. 496-7; Water-Supply Paper 845, pp. 543-5.

501. Measurements discontinued July 3, 1939.  
Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 24	16.65	Mar. 28	16.93	May 24	15.72
Feb. 28	16.92	Apr. 29	17.32		

502. Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 24	14.30	Mar. 28	16.06	May 24	17.49	Oct. 3	17.49
Feb. 28	14.50	Apr. 29	17.88	July 3	17.95	Dec. 21	18.36

504. Water level, in feet, 1939

Jan. 24	31.86	Mar. 28	31.73	May 24	33.05	Oct. 3	30.97
Feb. 28	31.77	Apr. 27	33.35	July 3	32.54	Dec. 21	30.21

508. Water level, in feet, 1939

Jan. 26	231.19	Mar. 29	231.23	May 26	231.54	Oct. 4	232.12
Mar. 1	230.88	Apr. 28	231.58	July 1	231.94	Dec. 20	232.31

509. Water level, in feet, 1939

Jan. 26	41.28	Mar. 29	42.98	May 24	42.16	Oct. 4	40.44
Mar. 1	42.94	Apr. 28	45.43	July 1	42.29	Dec. 20	42.82

a Well sealed at top.

## Travis County--Continued

516. Water levels, in feet, 1939: Feb. 1, 33.85; Apr. 1, 34.01; July 14, 34.50; Dec. 5, 34.72.

519. Water levels, in feet, 1939: Feb. 1, 36.21; Apr. 1, 37.75; July 14, 38.80; Dec. 5, 39.99.

527. Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	25.89	Mar. 29	25.86	May 24	26.70	Oct. 4	26.84
Mar. 1	25.81	Apr. 28	26.16	July 1	26.77	Dec. 20	27.09

532. Measurements discontinued Oct. 1, 1939.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 26	16.02	Mar. 29	14.20	May 26	15.22
Mar. 1	14.26	Apr. 28	14.71	July 1	15.49

581.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 24	188.25	Apr. 29	191.64	Oct. 3	213.49	Dec. 21	211.57
Feb. 23	(a)	May 24	202.67	Dec. 21	227.00	21	204.19
Mar. 23	(a)	July 3	208.35				

616.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 26	146.11	Apr. 28	146.90	Dec. 20	149.88
Mar. 1	140.4	Oct. 6	160.11		

617. Measurements discontinued Aug. 1, 1939.

Water level, in feet, 1939

Jan. 26	13.79	Mar. 29	13.30	May 26	14.08
Mar. 1	13.48	Apr. 28	13.50	July 1	14.37

618.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 24	23.26	Mar. 28	25.13	May 24	27.25	Oct. 3	27.99
Feb. 28	24.34	Apr. 27	26.71	July 3	27.30	Dec. 21	27.73

621. Water level, in feet, 1939: Jan. 26, a/; Oct. 4, 229.80; Dec. 20, a/.

640.

Water level, in feet, 1939

Jan. 14	21.01	Feb. 11	21.12	Mar. 18	21.17	Apr. 22	21.31
20	20.96	18	21.09	25	21.23	29	21.50
21	20.96	25	21.10	Apr. 1	21.23	May 7	21.42
28	20.99	Mar. 4	21.10	12	21.29	13	21.51
Feb. 4	21.04	11	21.15				

a Pumping.

## Uvalde County

Well numbers correspond to those in Water-Supply Paper 840, pp. 498-501; Water-Supply Paper 845, pp. 545-7.

H-2-4. Water levels, in feet, 1939: Apr. 8, 147.98; Aug. 1, 150.70; Oct. 25, 148.87.

H-2-5. Water levels, in feet, 1939: Apr. 8, 72.90; Aug. 1, 53.99; Oct. 25, 67.25.

H-2-8. Water level, in feet, 1939: Oct. 25, 166.85.

H-3-4. No measurements made in 1939.

H-3-9. No measurements made in 1939.

H-4-6. Water levels, in feet, 1939: Apr. 8, 68.80; Aug. 1, 69.35.

H-4-8. No measurements made in 1939.

H-4-18. No measurements made in 1939.

H-4-28.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	21.33	May 29	22.37	July 8	23.37	Sept. 14	19.22
Mar. 2	21.73	June 7	22.88	Aug. 15	18.50	Oct. 24	14.87
Apr. 1	22.07						

H-5-1.

Water level, in feet, 1939

Jan. 28	31.50	May 4	33.50	Aug. 16	33.88	Oct. 24	33.13
Mar. 3	32.12	June 10	34.62	Sept. 12	33.40	Nov. 4	32.96
Apr. 3	33.08	July 8	35.27				

H-5-22. Water level, in feet, 1939: Nov. 4, 60.79.

H-5-26. No measurements made in 1939.

H-5-39.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 27	78.25	June 7	81.60	Sept. 18	82.40
Mar. 2	79.34	July 7	82.57	Nov. 4	80.30

H-5-42. Measurements discontinued.

H-5-51. Water levels, in feet, 1939: Apr. 8, 40.60; Aug. 1, 42.22; Sept. 15, 41.37; Oct. 24, 41.08.

H-5-53. Measurements discontinued.

H-6-1.

Water level, in feet, 1939

Apr. 8	97.22	Aug. 17	95.10	Nov. 4	92.86
Aug. 1	98.62	Sept. 18	94.24		

H-6-8.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 27	72.21	May 4	72.50	July 7	72.82	Sept. 16	73.90
Mar. 2	72.38	June 9	72.64	Aug. 17	72.78	Oct. 25	73.05
Apr. 3	72.60						

## Uvalde County--Continued

H-6-9. Measurements discontinued.

H-6-10.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 27	67.59	May 4	68.14	July 6	68.40	Sept. 16	68.23
Mar. 2	67.99	June 9	68.46	Aug. 17	68.65	Oct. 25	68.43
Apr. 3	68.30						

H-6-16. No measurements made in 1939.

I-1-3. Measurements discontinued.

XU-6.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 2	127.50	Apr. 29	140.98	Sept. 14	117.10
Apr. 1	121.17	July 7	129.95		

XU-7. Water levels, in feet, 1939: Apr. 1, 163.77; July 7, 190.00.

XU-8. Water levels, in feet, 1939: Jan. 26, 157.30; Mar. 2, 183.46; Apr. 1, 130.63; Apr. 29, 180.32.

XU-9.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	49.30	Apr. 29	52.55	July 7	54.80	Sept. 12	55.85
Mar. 2	50.08	June 7	53.70	Aug. 15	55.30	Oct. 24	54.90
Apr. 1	51.04						

XU-10.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	35.06	Apr. 29	39.07	July 7	41.32	Sept. 12	42.60
Mar. 1	36.50	June 7	39.44	Aug. 15	42.22	Oct. 24	42.12
Apr. 1	37.68						

## Val Verde County

Well numbers correspond to those in Water-Supply Paper 840, p. 501; Water-Supply Paper 845, p. 547.

XV-1.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	38.94	Apr. 29	39.00	Aug. 14	39.24	Nov. 10	39.51
Mar. 1	38.79	June 7	39.19	Sept. 13	39.23	Dec. 5	39.31
Apr. 1	38.73	July 7	39.52				

XV-2.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	72.04	Apr. 29	77.90	Aug. 14	75.31	Nov. 3	86.05
Mar. 1	73.37	June 7	76.86	Sept. 13	76.09	Dec. 5	74.25
Apr. 1	80.90	July 7	78.40				

XV-3.

Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	37.73	Apr. 29	38.82	Aug. 14	38.52	Nov. 3	38.68
Mar. 1	37.87	June 7	38.10	Sept. 13	38.51	Dec. 5	38.59
Apr. 1	38.35	July 7	39.21				

## Waller County

Well numbers correspond to those in Water-Supply Paper 840, p. 502; Water-Supply Paper 845, pp. 547-8.

117. Water level, in feet, 1939: Jan. 25, a/; Mar. 23, 16.35; Dec. 16, b/.

151. No measurements made in 1939.

152. Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 25	(c)	May 30	9.24	Dec. 16	(c)
Mar. 23	3.61	Aug. 2	8.64		

154. Water level, in feet, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 25	d 14.69	Mar. 23	e 13.39	Aug. 2	d 14.75	Sept. 25	e 15.34
25	e 14.15	May 30	d 14.61	2	e 14.30	Dec. 16	d 16.12
Mar. 23	d 13.98	30	e 14.07	Sept. 25	d 15.87		

## Wharton County

Well numbers correspond to those in Water-Supply Paper 840, pp. 503-4; Water-Supply Paper 845, pp. 548-9.

4. Water levels, in feet, 1939: Mar. 21, 36.74; June 20, f/; Sept. 23, 45.98; Dec. 15, 39.20.

8. Water levels, in feet, 1939: Mar. 20, 36.46; June 20, f/; Sept. 23, 37.00; Dec. 15, 37.06.

31. Water levels, in feet, 1939: Mar. 20, 27.00; June 20, f/; Sept. 23, f/; Dec. 15, 29.25.

32. Water levels, in feet, 1939: Mar. 20, 31.35; June 20, 31.25; Sept. 23, 31.64; Dec. 15, 31.75.

33. Water level, in feet, 1939: Sept. 23, 40.98.

70-A. Water levels, in feet, 1939: Mar. 21, 15.75; June 22, 15.11; Sept. 26, 15.60; Dec. 18, 15.88.

70-B. Water levels, in feet, 1939: Mar. 21, 16.56; June 22, 16.65; Sept. 26, 16.51; Dec. 18, 16.77.

96. Water levels, in feet, 1939: Mar. 21, 24.36; June 22, 24.65; Sept. 26, 24.83; Dec. 18, 24.85.

108. Water levels, in feet, 1939: Mar. 21, 24.08; June 22, 23.89; Sept. 26, 24.75; Dec. 18, 24.85.

109. Water levels, in feet, 1939: Mar. 21, June 22, Sept. 25, f/; Dec. 18, 31.31.

140. Water levels, in feet, 1939: Mar. 21, 21.28; June 22, f/; Sept. 25, 22.50; Dec. 19, 22.62.

165. Water levels, in feet, 1939: Mar. 21, 23.49; June 20, 30.71; Sept. 23, 29.10; Dec. 15, 24.91.

173. Water levels, in feet, 1939: Mar. 22, 16.71; June 28, f/; Sept. 25, 17.96; Dec. 16, 17.98.

- 
- a Dry 17 feet below measuring point.
  - b Dry 18.5 feet below measuring point.
  - c Dry.
  - d Inside steel casing.
  - e Inside tile casing.
  - f Pumping.

## Wharton County--Continued

178. Water levels, in feet, 1939: Mar. 22, 17.65; June 28, 19.50; Sept. 25, 19.17; Dec. 16, 18.44.
181. Water levels, in feet, 1939: Mar. 22, 29.80; June 28, 33.50; Sept. 25, 35.28; Dec. 16, 34.89.
186. Water levels, in feet, 1939: Mar. 23, 17.76; June 22, 21.12; Sept. 25, 20.11; Dec. 19, 18.38.
209. Water levels, in feet, 1939: Mar. 21, 15.45; June 22, a/; Sept. 25, 17.55; Dec. 19, 16.08.
239. Water levels, in feet, 1939: Mar. 21, 21.50; June 22, 22.68; Sept. 26, 23.39; Dec. 18, 25.39.
241. Water levels, in feet, 1939: Mar. 21, 32.49; June 22, 32.99; Sept. 26, 32.49; Dec. 18, 42.42.

## Zavala County

Well numbers correspond to those in Water-Supply Paper 777, pp. 217-23; Water-Supply Paper 840, pp. 504-5; Water-Supply Paper 845, pp. 549-50.

- H7-13. No measurements made in 1939.
- H7-20. Water level, in feet, 1939: Apr. 9, 75.69.
- M3-28. No measurements made in 1939.
- M3-29. No measurements made in 1939.
- M6-9. Water level, in feet, 1939: Apr. 6, 52.64.
- M6-10. Water level, in feet, 1939: Apr. 6, 78.40.
- M6-16. Water level, in feet, 1939: Apr. 6, 41.55.
- M6-18. Water level, in feet, 1939: Apr. 6, 44.70.
- M6-19. Water level, in feet, 1939: Apr. 6, 59.80.
- M9-1. Water level, in feet, 1939: Apr. 6, 78.66.
- N1-17. Water level, in feet, 1939: July 21, 132.47.
- N1-24. Water levels, in feet, 1939: Apr. 9, 126.36; July 21, 125.62.
- N1-40. No measurements made in 1939.
- N5-31. Water levels, in feet, 1939: Apr. 7, 69.08; July 20, 57.86.
- N5-39. Water levels, in feet, 1939: Apr. 7, 77.80; July 20, 64.94.
- N5-40. Water levels, in feet, 1939: Apr. 7, 76.10; July 20, 62.57.
- N5-47. No measurements made in 1939.
- N5-55. Water levels, in feet, 1939: Apr. 7, 82.59; July 18, 63.98.
- N5-60. Water levels, in feet, 1939: July 18, 62.43; Dec. 12, 67.00.
- N7-2. Water levels, in feet, 1939: Apr. 6, 44.12; July 19, 40.53.
- N8-7. Water levels, in feet, 1939: Apr. 7, 76.34; July 18, 61.74.

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a Pumping.

## ELM CREEK AND DEER CREEK AREAS OF SOIL CONSERVATION SERVICE

The observation-well program in the Elm Creek and Deer Creek areas<sup>1/</sup> near Temple, Tex., was continued in 1939 by the Federal Geological Survey in cooperation with the Soil Conservation Service. Measurements of water level by the wetted-tape method were made weekly in 15 wells; continuous records for all or part of 1939 were obtained for 6 other wells by means of automatic water-stage recorders.

The average of the water levels in the wells was 11.52 feet above the assumed datum planes on December 30, 1938, and 9.17 feet on December 28, 1939--a decline of 2.35 feet in the year. In 1938 there was an average net decline of 3.91 feet. The average stage of the water levels at the end of 1939 was the lowest on record for that time of year. It was more than 8 feet below the average stage at the end of 1936 and about 0.8 foot below that at the end of 1934.

Water levels, in feet above arbitrary datum, in wells in Elm Creek and Deer Creek areas, near Temple, Texas, 1939

Date	7	8	9	11	12	20	22	24
Jan. 6	13.27	12.37	(a)	7.60	8.60	11.19	14.87	12.70
13	13.27	15.42	(a)	8.20	8.90	11.34	.....	.....
20	13.32	12.92	(a)	8.55	9.00	11.64	16.02	12.70
27	13.42	12.42	(a)	8.75	9.20	11.69	15.82	12.60
Feb. 3	13.52	12.32	(a)	8.75	9.10	11.84	15.72	12.50
10	13.52	12.32	(a)	8.75	9.10	11.84	15.47	12.25
17	13.37	12.12	(a)	8.45	8.90	11.64	.....	.....
24	13.37	11.92	(a)	8.35	9.10	12.14	15.72	12.50
Mar. 3	13.52	12.22	10.70	9.25	10.20	12.64	.....	.....
9	13.42	12.07	10.35	9.45	10.20	12.74	16.22	12.40
16	13.37	12.02	10.20	9.55	10.10	12.74	b15.32	12.40
23	13.37	11.92	10.30	9.55	10.10	12.74	15.22	12.30
30	13.57	11.92	10.30	9.95	10.30	12.99	15.67	12.30
Apr. 6	13.52	11.92	10.15	10.10	10.20	13.29	15.72	12.30
13	13.32	11.22	10.10	10.10	10.05	13.24	15.72	12.30
20	13.37	11.87	10.25	10.10	10.15	13.39	15.77	12.30
27	13.37	11.87	10.15	10.10	9.85	13.39	15.62	12.30
May 4	13.32	11.22	10.00	9.65	9.50	13.34	15.62	12.30
11	13.22	11.82	9.90	9.55	9.00	13.24	15.32	12.30
18	.....	.....	.....	10.15	10.20	13.54	15.82	12.40
25	13.72	11.82	12.80	9.75	10.20	13.74	15.92	12.60
June 1	13.92	12.52	13.50	9.65	10.70	14.14	15.92	12.60
8	14.22	12.92	14.60	9.95	10.90	14.54	16.52	12.60
15	14.42	13.12	13.10	9.65	10.40	14.44	16.52	12.60
22	14.22	13.12	12.50	9.55	10.30	14.24	15.92	12.10
29	14.22	13.12	11.60	9.25	9.60	13.84	15.62	12.30
July 7	14.22	13.12	11.00	8.85	8.90	13.74	15.42	12.20
22	13.72	12.92	10.00	7.65	8.00	13.24	15.02	12.10
27	13.42	12.92	9.70	7.25	7.60	12.94	14.82	12.10
Aug. 3	13.32	12.82	9.40	6.85	7.70	12.84	14.42	12.00
10	13.12	12.62	9.10	6.35	7.40	12.54	14.62	12.00
17	12.92	12.82	(a)	6.05	7.10	12.34	13.92	11.80
24	12.82	12.62	(a)	5.75	6.60	12.34	13.82	11.80
31	12.72	12.62	(a)	5.55	6.20	11.94	13.72	11.80
Sept. 7	12.12	12.62	(a)	5.15	5.80	11.64	13.42	11.70
14	12.02	12.52	(a)	4.75	5.50	11.54	13.12	11.60
21	11.92	12.42	(a)	4.45	5.10	11.24	12.82	11.60
29	11.82	12.32	(a)	4.15	4.70	11.04	10.62	11.50

a Dry.

b Well curbing rebuilt; new measuring point 25.62 feet above datum.

<sup>1/</sup> See Water-Supply Papers 777, 817, 840, and 845.

Water levels, in feet above arbitrary datum, in wells in Elm Creek and Deer Creek areas, near Temple, Texas, 1939--Continued

Date	7	8	9	11	12	20	22	24
Oct. 5	11.62	14.32	(a)	3.95	4.40	10.74	12.22	11.50
12	11.52	12.12	(a)	3.75	4.30	10.64	12.12	11.40
19	11.42	12.02	(a)	3.35	4.00	10.34	12.02	11.30
26	11.32	12.02	(a)	3.25	4.10	10.34	11.82	11.20
Nov. 2	11.02	11.92	(a)	3.05	3.80	10.14	11.72	11.10
9	11.12	11.82	(a)	2.95	3.80	10.04	10.22	11.10
16	11.12	11.82	(a)	2.85	4.40	10.04	11.62	11.00
24	11.12	11.72	(a)	2.85	4.10	10.04	11.62	10.90
Dec. 4	11.12	11.92	(a)	2.75	4.50	9.84	11.62	10.80
8	11.12	11.72	(a)	2.65	4.30	9.84	11.22	10.80
15	11.22	11.72	(a)	2.55	4.40	9.74	10.22	10.80
21	11.12	11.62	(a)	2.45	4.40	9.64	10.92	10.70
28	11.12	11.62	(a)	2.35	4.70	9.64	10.92	10.70

Water levels, in feet above arbitrary datum, in wells in Elm Creek and Deer Creek areas, near Temple, Texas, 1939

Date	25	26	27	29	30	31	32	Average
Jan. 6	13.79	13.90	9.90	12.31	9.93	10.00	8.33	11.34
13	.....	.....	.....	.....	10.58	10.50	8.78	10.87
20	13.69	13.75	10.20	12.86	12.08	10.15	8.68	11.83
27	13.69	13.75	10.05	12.86	12.53	10.15	8.58	11.82
Feb. 3	13.49	13.65	9.95	12.81	12.38	10.10	8.58	11.77
10	13.34	13.65	9.80	12.81	12.33	10.00	8.38	11.68
17	.....	.....	.....	.....	.....	9.90	8.33	10.39
24	13.49	13.45	9.90	13.31	12.93	10.10	8.48	11.77
Mar. 3	.....	.....	9.95	13.66	14.33	10.30	8.88	11.42
9	13.29	13.45	10.00	13.51	14.23	10.30	9.03	12.04
16	13.19	13.15	9.90	13.31	13.93	10.20	9.08	11.90
23	13.19	13.35	9.70	13.31	13.63	10.00	9.18	11.86
30	13.19	13.50	10.60	13.91	15.73	10.15	9.88	12.26
Apr. 6	13.19	13.45	10.35	13.51	14.38	10.10	9.93	12.14
13	13.19	13.45	10.00	13.21	13.93	10.00	10.08	11.99
20	13.19	13.45	10.55	13.31	14.23	10.00	10.18	12.14
27	13.19	13.45	10.20	13.06	13.48	10.10	9.93	12.00
May 4	13.09	13.35	10.50	12.51	13.33	10.00	9.78	11.83
11	13.09	13.35	10.40	10.91	13.13	9.90	9.58	11.65
18	13.09	13.35	10.50	10.91	17.93	10.50	10.28	12.39
25	13.19	13.25	10.50	10.31	14.23	10.10	9.88	12.13
June 1	13.19	13.45	10.60	10.51	16.63	10.10	10.18	12.51
8	13.29	13.55	10.90	10.91	17.63	10.30	10.88	12.91
15	13.49	13.85	10.80	10.01	14.93	10.10	10.68	12.54
22	13.49	13.75	10.90	9.81	.....	10.10	10.58	12.18
29	13.49	13.75	10.90	9.71	(b)	9.90	10.08	11.96
July 7	13.49	13.65	10.80	9.01	.....	9.80	9.38	11.68
22	13.09	13.25	10.40	8.51	.....	9.40	8.38	11.12
27	13.09	13.25	10.70	8.31	.....	9.00	(a)	11.16
Aug. 3	12.99	13.25	10.70	8.51	.....	8.90	(a)	11.05
10	12.99	13.15	10.70	8.41	.....	8.50	(a)	10.88
17	12.79	13.05	10.60	8.21	.....	8.20	(a)	10.82
24	12.69	12.85	10.70	8.51	.....	7.90	(a)	12.37
31	12.49	12.65	10.50	.....	.....	7.70	(a)	10.72
Sept. 7	12.39	12.55	10.30	7.91	.....	7.40	(a)	10.25
14	12.39	12.55	10.20	7.91	.....	7.30	(a)	10.12
21	12.29	12.45	10.10	7.81	.....	7.10	(a)	9.94
29	12.19	12.35	10.00	7.81	.....	7.10	(a)	9.63
Oct. 5	10.59	12.35	9.90	7.71	.....	7.00	(a)	9.69
12	10.49	12.20	9.90	7.71	.....	7.70	(a)	9.49
19	10.39	12.15	9.60	7.61	.....	7.00	(a)	9.27
26	10.19	12.05	9.80	7.81	.....	7.60	(a)	9.29
Nov. 2	10.19	11.95	9.80	7.81	.....	6.70	(a)	9.10
9	10.09	11.85	9.90	8.01	.....	6.70	(a)	8.97
16	10.19	11.75	9.90	8.41	.....	8.70	(a)	9.32
24	10.09	11.65	9.70	8.71	.....	8.30	(a)	9.23
Dec. 4	9.99	11.35	9.50	8.71	.....	9.30	(a)	9.28
8	10.09	11.55	9.80	8.91	.....	8.30	(a)	9.19
15	10.09	11.45	9.60	9.11	.....	7.90	(a)	9.07
21	9.99	11.30	9.50	9.01	.....	7.90	(a)	9.04
28	9.99	11.25	9.40	9.11	.....	9.20	(a)	9.17

a Dry.

b Well caved.



4.

Daily noon water level, in feet above datum, 1939  
(from recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 1	12.09	Jan. 18	12.29	Feb. 4	12.28	Feb. 20	12.09
2	12.06	19	12.32	5	12.29	21	11.96
3	12.04	20	12.33	6	12.32	22	11.94
4	12.03	21	12.38	7	12.29	23	11.91
5	11.98	22	12.36	8	12.28	24	11.91
6	11.96	23	12.38	9	12.34	25	11.94
7	11.94	24	12.32	10	12.27	26	12.07
8	11.94	25	12.33	11	12.21	27	12.29
9	11.90	26	12.34	12	12.21	28	12.34
10	11.89	27	12.34	13	12.28	Mar. 1	12.44
11	11.87	28	12.42	14	12.32	2	12.46
12	11.92	29	12.44	15	12.22	3	12.54
13	12.02	30	12.34	16	12.20	4	12.65
14	12.10	31	12.36	17	12.12	5	12.74
15	12.16	Feb. 1	12.38	18	12.09	6	12.72
16	12.24	2	12.38	19	12.13	7	12.84
17	12.34	3	12.29				

6.

Daily noon water level, in feet above datum, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July
1	12.57	13.54	14.45	14.30	14.48	15.00	14.42
2	12.59	13.55	14.45	14.30	14.45	14.95	14.34
3	12.60	13.45	14.57	14.24	14.45	14.86	14.36
4	12.64	13.43	14.64	14.26	14.45	14.90	14.30
5	12.55	13.46	14.53	14.35	14.46	15.45	14.25
6	12.52	13.54	14.42	14.18	14.50	15.60	14.16
7	12.50	13.50	14.42	14.12	14.55	15.56	14.10
8	12.50	13.50	14.49	14.25	14.56	15.50	14.06
9	12.52	13.60	14.53	14.32	14.48	15.51	14.01
10	12.52	13.48	14.60	14.34	14.46	15.46	13.94
11	12.50	13.38	14.68	14.40	14.46	15.34	13.93
12	12.66	13.37	14.54	14.50	14.38	15.30	13.91
13	12.85	13.49	14.55	14.44	14.34	15.24	13.94
14	12.95	13.55	14.65	14.32	14.41	15.18	13.82
15	13.03	13.50	14.50	14.25	14.43	15.11	13.82
16	13.10	13.50	14.47	14.23	14.53	15.05	13.76
17	13.25	13.40	14.54	14.41	14.94	15.00	13.74
18	13.25	13.40	14.53	14.46	15.63	14.94	13.68
19	13.27	13.60	14.53	14.37	15.85	14.87	13.62
20	13.30	13.64	14.57	14.30	15.90	14.91	13.56
21	13.35	13.50	14.57	14.50	15.95	14.88	13.52
22	13.35	13.45	14.57	14.50	15.78	14.83	13.47
23	13.37	13.55	14.59	14.47	15.15	14.82	13.44
24	13.35	13.61	14.64	.....	15.08	14.77	13.40
25	13.30	13.95	14.72	.....	15.02	14.70	13.36
26	13.35	14.30	14.75	.....	14.99	14.62	13.30
27	13.40	14.54	14.71	.....	14.92	14.54	.....
28	13.48	14.41	14.30	14.50	14.90	14.48	.....
29	13.58	.....	14.26	14.46	14.90	14.42	.....
30	13.45	.....	14.22	14.45	14.93	14.38	.....
31	13.47	.....	14.30	.....	15.01	.....	.....

13.

Daily noon water level, in feet above datum, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	10.34	12.94	11.98	10.35	12.20	10.33	8.73	8.38	7.95	7.58	7.43
2	.....	10.27	13.23	12.02	10.25	12.08	10.25	8.71	8.37	7.94	7.58	7.43
3	.....	10.17	13.35	12.02	10.19	11.84	10.18	8.71	8.37	7.93	7.57	7.42
4	7.92	10.08	13.44	12.04	10.14	.....	10.10	8.71	8.36	7.92	7.56	7.41
5	7.92	10.03	13.47	12.02	10.09	11.74	9.99	8.68	8.35	7.92	7.54	7.40
6	7.92	9.98	13.41	11.98	10.04	12.25	9.94	8.67	8.14	7.92	7.53	7.40
7	7.92	9.91	13.32	11.91	10.01	12.74	9.87	8.65	8.14	7.91	7.53	7.40

## 13.--Continued

Daily noon water level, in feet above datum, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
8	7.92	9.84	13.30	11.91	9.98	13.02	9.81	8.64	8.14	7.90	7.52	7.39
9	7.91	9.80	13.29	11.91	10.14	13.19	9.73	8.62	8.13	7.90	7.52	7.38
10	7.91	9.75	13.30	11.88	10.08	13.30	....	8.61	8.12	7.88	7.52	7.38
11	7.91	9.70	13.27	11.72	10.01	13.33	....	8.61	8.11	7.74	7.52	7.37
12	8.01	....	13.12	11.72	9.95	13.34	9.44	8.60	8.10	7.74	7.51	7.37
13	8.71	....	13.04	11.56	9.91	13.36	9.40	8.59	8.10	7.74	7.51	7.36
14	9.48	....	13.04	....	9.86	13.30	9.35	8.57	8.09	7.74	7.50	7.36
15	10.08	9.34	12.98	....	9.82	13.16	9.30	8.56	8.09	7.74	7.49	7.36
16	10.75	9.34	12.92	....	9.78	12.90	9.26	8.53	8.09	7.73	7.49	7.36
17	11.54	9.34	12.86	....	9.78	12.57	9.20	8.52	8.07	7.72	7.49	7.36
18	12.12	9.34	12.75	11.84	10.07	12.15	9.15	8.52	8.06	7.70	7.49	7.35
19	12.23	9.34	12.61	11.74	10.66	....	9.10	8.51	8.05	7.70	7.48	7.34
20	12.19	9.36	12.52	11.67	11.03	11.44	9.06	8.50	8.04	7.70	7.48	7.34
21	12.05	9.54	12.42	11.37	11.15	11.25	9.02	8.49	8.03	7.69	7.47	7.34
22	11.87	9.54	12.30	11.16	11.19	11.10	9.00	8.48	8.02	7.67	7.47	7.34
23	....	9.53	12.17	11.01	11.25	10.97	8.96	8.47	8.01	7.66	7.47	7.34
24	....	9.51	12.03	11.01	11.33	10.89	8.92	8.44	8.01	7.65	7.47	7.33
25	11.04	9.49	11.96	10.99	11.41	10.81	8.89	8.44	8.00	7.64	7.47	7.33
26	10.90	10.16	12.22	10.88	11.47	....	8.85	8.42	7.99	7.64	7.47	7.32
27	10.74	11.29	12.92	10.77	11.51	10.64	8.82	8.41	7.98	7.64	7.44	7.31
28	10.68	12.18	11.44	10.63	11.53	10.56	8.80	8.40	7.97	7.62	7.43	7.31
29	10.64	....	12.88	10.53	11.57	10.49	8.79	8.39	7.96	7.62	7.43	7.31
30	10.51	....	14.06	10.42	12.20	10.41	8.77	8.38	7.95	7.60	7.43	7.31
31	10.40	....	11.90	....	12.24	....	8.75	8.38	....	7.59	....	....

## 14.

Daily noon water level, in feet above datum, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	....	10.61	12.47	13.70	....	....	....	....	....	10.75	10.17	9.42
2	....	10.61	....	13.67	12.67	....	....	14.17	....	10.75	10.17	9.42
3	....	10.60	....	13.62	12.67	....	....	14.14	....	10.75	10.17	9.42
4	9.40	10.60	....	....	12.65	....	....	14.05	....	10.75	10.17	9.42
5	9.39	10.59	....	....	12.62	....	16.92	13.98	....	10.72	10.12	9.42
6	9.39	10.59	....	....	12.61	....	16.87	13.92	....	10.71	10.10	9.42
7	9.37	10.58	12.82	....	12.58	....	16.75	....	11.92	10.67	10.10	9.42
8	9.37	10.58	13.02	....	12.57	....	16.64	....	11.91	10.67	9.97	9.40
9	10.73	10.58	13.22	....	12.52	....	16.57	13.67	11.86	10.67	9.97	9.39
10	10.67	10.57	13.40	....	12.52	....	16.46	13.66	11.82	10.54	9.90	9.38
11	10.62	10.56	13.57	....	12.52	....	16.34	13.60	11.76	10.54	9.90	9.37
12	10.64	10.53	13.67	....	12.51	....	16.24	13.45	11.72	10.53	9.90	9.36
13	10.64	10.53	13.77	....	12.51	....	....	13.40	11.67	10.53	9.90	9.32
14	10.64	10.52	13.87	....	12.48	....	....	....	11.67	10.52	9.90	9.31
15	10.63	10.52	13.89	....	12.46	....	....	....	11.67	10.52	9.79	9.31
16	10.63	10.52	13.89	....	12.37	....	....	13.22	11.59	10.52	9.79	9.27
17	10.63	10.52	13.89	....	12.42	....	....	13.18	11.57	10.50	9.78	9.27
18	10.62	10.52	13.89	13.72	12.42	....	....	13.15	....	10.46	9.78	9.25
19	10.62	10.54	13.89	13.72	12.50	....	....	13.18	....	10.46	9.78	9.24
20	10.62	10.54	13.89	13.71	12.62	17.52	....	....	....	10.46	9.78	9.22
21	10.62	10.66	13.89	13.68	12.77	17.54	....	....	....	10.46	9.77	9.21
22	10.62	10.66	13.89	13.63	12.89	17.56	....	....	11.37	10.46	9.59	9.21
23	10.61	10.68	13.89	13.60	13.03	17.57	....	12.72	11.35	10.46	9.59	9.21
24	10.61	10.73	13.88	13.57	13.12	17.57	....	....	11.35	10.40	9.59	9.19
25	10.61	10.92	13.87	13.55	13.24	17.55	....	....	11.35	10.32	9.54	9.18
26	10.61	11.00	13.87	....	13.38	17.47	14.72	....	11.35	10.32	9.54	9.17
27	10.61	11.11	13.87	....	13.48	17.46	14.59	....	10.87	10.30	9.52	9.17
28	10.61	11.16	13.85	....	13.66	17.39	14.57	....	10.84	10.29	9.50	9.17
29	10.61	....	13.78	....	13.87	17.29	14.49	....	10.82	10.27	9.47	9.17
30	10.61	....	13.76	....	....	17.24	....	....	10.75	10.26	9.42	9.10
31	10.61	....	13.72	....	....	17.20	....	....	....	10.25	....	9.10

23.

Daily noon water level, in feet above datum, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	7.96	7.95	9.43	8.91	9.74	8.84	.....	7.50	7.10	7.09	6.95
2	.....	7.94	8.90	9.42	8.88	9.66	8.81	8.00	7.47	.....	7.09	6.93
3	.....	7.90	8.90	9.40	8.84	9.56	8.77	7.99	7.46	.....	7.06	6.92
4	8.29	7.87	8.90	9.40	8.83	9.53	.....	7.97	7.43	.....	7.06	6.90
5	8.26	7.85	8.85	9.52	8.82	9.60	8.66	7.96	7.42	.....	7.06	6.89
6	8.23	7.84	8.74	9.46	8.80	9.85	8.78	7.94	7.40	.....	7.06	6.88
7	8.21	7.81	8.69	9.34	8.80	9.91	8.73	7.92	7.39	.....	7.06	6.87
8	8.21	7.80	8.68	9.34	8.81	9.91	8.70	7.90	7.37	.....	7.06	6.86
9	8.18	7.79	8.66	9.35	8.75	9.90	8.65	7.89	7.35	.....	7.06	6.85
10	8.17	7.81	8.63	9.36	8.69	9.87	8.60	7.87	7.34	.....	7.06	6.85
11	8.17	7.76	8.63	9.27	8.67	9.78	8.58	7.84	7.34	.....	7.11	6.83
12	8.23	7.73	8.55	9.20	8.64	9.74	8.55	7.82	7.34	7.10	7.09	6.83
13	8.25	7.72	8.50	9.17	8.61	9.65	8.55	7.79	7.30	7.10	7.07	6.79
14	8.22	7.73	8.49	9.15	8.58	9.59	8.53	7.77	7.29	7.10	7.06	6.77
15	8.28	7.70	8.42	9.15	8.57	9.53	8.48	.....	7.27	7.10	7.05	6.77
16	8.32	7.70	8.36	9.16	8.59	9.47	8.44	7.73	7.25	7.10	7.05	6.76
17	8.32	7.68	8.32	9.51	8.63	9.42	8.42	7.73	7.23	7.10	7.05	6.76
18	8.26	7.66	8.28	9.32	9.50	9.35	8.39	7.72	7.22	7.10	7.05	6.75
19	8.22	7.73	8.25	9.31	10.43	9.31	8.35	7.71	7.21	7.10	7.05	6.73
20	8.18	8.06	8.24	9.30	10.48	9.25	.....	7.67	7.21	7.11	7.03	6.70
21	8.16	8.10	8.20	9.27	10.45	9.21	.....	7.71	7.20	7.11	7.02	6.69
22	8.13	8.08	8.19	9.17	10.40	9.16	.....	7.69	7.19	7.11	7.02	6.72
23	8.12	8.07	8.16	9.13	10.30	9.13	.....	7.67	7.18	7.11	7.01	6.73
24	8.08	8.07	8.15	9.11	10.25	9.10	.....	7.65	7.17	7.11	6.99	6.69
25	8.04	8.23	8.26	9.12	10.18	9.06	.....	7.63	7.16	7.14	6.97	6.68
26	8.02	8.83	8.64	9.11	10.10	9.01	.....	7.61	7.15	7.14	6.95	6.69
27	8.02	9.04	8.76	9.07	10.03	8.97	.....	7.60	7.13	7.14	6.94	6.67
28	8.02	8.98	8.81	9.01	9.95	8.95	.....	7.60	7.12	7.12	6.93	6.65
29	8.00	.....	9.41	8.96	9.85	8.91	.....	.....	7.11	7.11	6.93	6.64
30	7.97	.....	9.45	8.92	9.80	8.86	.....	7.53	7.11	7.09	6.95	6.63
31	7.96	.....	9.41	.....	9.80	.....	.....	7.52	.....	7.09	.....	.....

28.

Daily noon water level, in feet above datum, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	12.17	12.53	12.77	13.16	13.27	13.30	13.51	12.78	12.08	11.44	11.06	10.84
2	12.18	12.53	12.78	13.18	13.24	13.30	13.49	12.76	12.05	11.45	11.05	10.81
3	12.20	12.49	12.84	13.20	13.24	13.30	13.46	12.74	12.02	11.41	11.03	10.81
4	12.20	12.48	12.88	13.22	13.23	13.32	13.44	12.72	11.99	11.40	11.03	10.80
5	12.15	12.51	12.88	13.25	13.23	13.34	13.42	12.69	11.96	11.38	11.02	10.80
6	12.14	12.52	12.86	13.24	13.24	13.44	13.40	12.66	11.94	11.36	11.02	10.79
7	12.14	12.51	12.88	13.19	13.26	13.46	13.37	12.62	11.94	11.34	11.01	10.78
8	12.16	12.51	12.90	13.23	13.23	13.40	13.35	12.60	11.91	11.33	11.00	10.78
9	12.16	12.54	12.92	13.27	13.19	13.56	13.32	12.58	11.89	11.30	10.99	10.78
10	12.14	12.48	12.94	13.30	13.20	13.61	13.28	12.56	11.87	11.28	10.98	10.78
11	12.14	12.44	12.98	13.30	13.19	13.63	13.26	12.52	11.85	11.28	10.96	10.77
12	12.36	12.44	12.94	13.24	13.16	13.69	13.27	12.48	11.83	11.28	10.97	10.77
13	12.28	12.48	12.97	13.26	13.13	13.70	13.26	12.45	11.79	11.26	10.94	10.75
14	12.28	12.51	13.02	13.30	13.13	13.72	13.22	12.42	11.79	11.24	10.94	10.75
15	12.30	12.46	12.97	13.32	13.13	13.73	13.20	12.40	11.78	11.24	10.92	10.74
16	12.33	12.47	12.96	13.33	13.14	13.74	13.18	12.38	11.75	11.23	10.92	10.74
17	12.36	12.43	12.98	13.26	13.14	13.75	13.15	12.38	11.73	11.22	10.92	10.74
18	12.36	12.43	12.97	13.27	13.14	13.74	13.12	12.35	11.71	11.21	10.91	10.73
19	12.37	12.56	12.98	13.29	13.17	13.72	13.10	12.32	11.68	11.21	10.90	10.72
20	12.39	12.52	12.99	13.32	13.20	13.70	13.07	12.28	11.66	11.20	10.89	10.72
21	12.42	12.42	12.99	13.30	13.22	13.68	13.04	12.31	11.65	11.19	10.89	10.74
22	12.42	12.41	12.99	13.28	12.25	13.67	13.02	12.28	11.63	11.16	10.88	10.72
23	12.45	12.43	12.99	13.29	12.27	13.67	13.00	12.27	11.60	11.15	10.88	10.74
24	12.42	12.48	13.01	13.30	12.28	13.66	12.98	12.26	11.58	11.14	10.87	10.72
25	12.42	12.78	13.03	13.34	12.28	13.65	12.95	12.24	11.56	11.14	10.86	10.72
26	12.44	12.64	13.04	13.32	12.28	13.62	12.93	12.21	11.54	11.13	10.85	10.71
27	12.44	12.65	13.04	13.32	12.26	13.59	12.90	12.21	11.52	11.11	10.84	10.69
28	12.50	12.61	13.07	13.28	12.26	13.57	12.87	12.18	11.51	11.09	10.84	10.68
29	12.52	.....	13.10	13.26	12.25	13.55	12.88	12.14	11.49	11.10	10.82	10.68
30	12.48	.....	13.12	13.27	12.27	13.53	12.84	12.12	11.46	11.06	10.85	10.67
31	12.52	.....	13.14	.....	12.29	.....	12.80	12.10	.....	11.06	.....	.....

## UTAH

By G. H. Taylor, H. E. Thomas, and W. K. Bach

The ground-water investigation in Utah was continued during 1939 in financial cooperation with the State Engineer. Fifty percent of the cost of the project was supplied by the State of Utah through the State Engineer's office, and the State Engineer made available to the writers the data collected by his office on ground water in the State, particularly the number, location, and altitude of wells. Detailed investigations of the geology and ground-water resources of Cedar City Valley, Parowan Valley, and the Beryl district in Escalante Valley--all in Iron County--were continued, and a preliminary report on the projects was begun. The State-wide program of observations of ground-water level was expanded to include 935 wells. Periodic measurements were made of the water levels or artesian pressure in 830 of the wells during the year, and 160 miscellaneous measurements were made in the other 105 wells. A total of 6,012 individual measurements of water level or artesian pressure was made in 1939. The following tabulation shows the distribution, by counties, of the observation wells in Utah and the number of measurements made in them in 1939.

The State Engineer, in connection with his administration of ground water in Utah, continued to collect data in 1939 on wells, drains, and tunnels. He reports that, as of January 1, 1940, information had been obtained on 25,040 wells in the 24 counties for which water levels are given in this report. Measurements were made in 1939 in an average of about one of each 28 wells in the 24 counties. Records for an average of about one of each 43 wells were available for a comparison of ground-water levels in 1939 with those in previous years. Records were obtained for a part or all of the year from 30 wells equipped with automatic recording gages.

Distribution, by counties, of observation wells in Utah  
and number of measurements made in them in 1939

County	Number of observation wells	Number of measure- ments	County	Number of observation wells	Number of measure- ments
Beaver	49	457	Piute	6	29
Box Elder	46	172	Rich	24	121
Cache	28	159	Salt Lake	40	598
Davis	57	195	Sanpete	40	277
Duchesne	32	32	Sevier	19	102
Garfield	11	53	Summit	20	93
Iron (Cedar City Valley)	131	1,274	Tooele	34	383
Iron (Escalante Valley)	117	349	Uintah	13	13
Iron (Parowan Valley)	44	462	Utah	90	704
Juab	20	69	Wasatch	5	21
Kane	2	6	Washington	4	13
Millard	42	165	Wayne	5	13
Morgan	13	66	Weber	43	186
Total				935	6,012

In addition to the measurements of water level or artesian pressure made in connection with the cooperative investigation with the State Engineer, Mr. T. F. Wentz, Provo River Water Commissioner, and the United States Bureau of Reclamation made observations of water levels in wells in Wasatch and Summit Counties; and Mr. Henry R. Watson, working under the direction of Mr. S. T. Harding, consulting engineer for the Board of (Utah Lake) Canal Presidents, made observations of water levels in wells in Wasatch County. Records of these observations are not included in this report.

A summary of the net changes in water level in observation wells in Utah in 1939, a comparison with net changes in 1936, 1937, and 1938, and the approximate number of wells in each county are given in the following table. The summary does not include all the wells that are being measured periodically, because a yearly comparison of the changes of water level in some of them could not be made, and the location or individual characteristics of other wells did not justify their inclusion. Net changes in water level are based on measurements made during the fall and winter of each year, chiefly on those made in December. In most valleys, particularly in the more intensively developed parts of the valleys, the observation wells have been selected to give a more or less uniform areal distribution regardless of the number of wells in the valley. Thus, the tabulated net rise or decline of water level during each year is the mathematical average of changes of water level in the observation wells in each valley, and may be considerably different from the changes of water level in wells in any

particular part of the valley. For example, the average net decline of water level in 1939 in 68 wells in Cedar City Valley, Iron County, was 0.7 foot, whereas the average net decline in 33 wells in the main pumping district was 1.3 feet, and in 35 wells outside the pumping district it was only 0.1 foot; the average net rise of water level in 31 wells in Parowan Valley during 1939 was 0.6 foot, whereas in 11 wells in the main pumping district the rise was 0.9 foot, and in 20 wells outside the pumping district it was only 0.5 foot. A more detailed analysis of the average net rise or fall of water level in each area indicates that the net change of water level in individual wells may range considerably from the average net change over the entire area. For example, there was an average net decline in water level of 0.8 foot in 11 wells in 1939 in the East Shore area, Box Elder County, although the net change of water level in individual wells ranged from a decline of 2.9 feet in one well to a rise of 3.4 feet in another well. The foregoing explanation has been made in an effort to prevent the drawing of erroneous conclusions from the following summary table.

Summary of net change in water level, in feet, in  
observation wells in Utah, 1936-39

Ground-water area	Approximate total number of wells in county a/	Number of observa- tion wells used in computations				Average net rise or decline in water level, in feet			
		1936	1937	1938	1939	1936	1937	1938	1939
Beaver County:	310								
Beaver Valley.....		5	4	5	7	+2.0	-0.2	-0.4	-1.1
Milford district.....		12	12	14	20	+.7	+4.4	+3.1	+.1
Box Elder County:	b/1,800								
East Shore area.....		7	7	10	11	+3.4	+3.0	0	-.8
Lower Bear River Valley		..	8	9	8	...	+1.6	+.1	-.6
Cache County:	1,200								
Cache Valley.....		7	19	27	27	+4.3	+.4	+.2	-2.6
Davis County:	b/2,150								
East Shore area.....		12	17	27	29	+4.6	+.4	-.4	-2.0
Farmington and north..		..	..	..	14	...	...	...	-.2
South of Farmington...		..	..	..	15	...	...	...	-3.7
Duchesne and Uintah Counties:	270								
Uinta Basin.....		10	17	16	20	+3.0	+.2	+.9	-2.0
Garfield and Piute Counties:	125								
Upper Sevier Valley...		6	7	9	11	+.4	+2.7	-.9	-.1
Iron County:	1,100								
Beryl district.....		12	12	35	35	-.1	0	-.1	0
Cedar City Valley.....		9	14	44	68	-1.8	+1.8	+1.8	-.7
Parowan Valley.....		5	6	12	31	0	+2.9	+3.3	+.6

a From records of State Engineer.

b Includes all shallow, domestic-use, and hand-pumped wells. Number of wells 40 feet and less in depth: Box Elder County, 1,127; Davis County, 310; Salt Lake County, 667; Utah County, 364. Surveys of other counties incomplete.

Summary of net change in water level, in feet, in  
observation wells in Utah, 1936-39--Continued

Ground-water area	Approximate total number of wells in county a/	Number of observa- tion wells used in computations				Average net rise or decline in water level, in feet			
		1936	1937	1938	1939	1936	1937	1938	1939
Juab County:	150								
Chicken Creek Valley...		2	3	3	4	+0.1	+0.3	+0.2	-1.0
Juab Valley.....		5	5	5	5	+4.4	+3.4	+2.3	-3.9
Millard County:	1,600								
Pavant Valley.....		6	8	6	9	+3.0	+.2	+1.6	-1.0
Sevier Desert.....		12	13	14	19	+.1	+.1	0	+.2
Snake Valley.....		..	9	9	18	...	-.4	-.2	-.8
Morgan County:	50								
Morgan Valley.....		..	10	11	12	...	-.4	-.4	-.7
Rich County:	50								
Bear Lake Valley.....		..	11	14	12	...	+1.7	-.9	0
Upper Bear River Valley		..	6	7	8	...	-.7	+1.6	-2.1
Salt Lake County:	b/6,500								
Jordan River Valley...		31	37	39	38	+2.0	+2.1	+1.1	-1.0
East of Jordan River		19	20	21	20	+1.9	+1.4	+1.5	-1.0
Sanpete County:	1,700								
Sanpete Valley.....		27	19	24	30	+3.9	+1.4	-.3	-1.9
Sanpete and Sevier Counties:	...								
Central Sevier Valley.		17	17	18	18	+.8	+2.9	+1.1	-.9
Sevier County:	710								
Grass Valley.....		2	3	5	6	+1.0	-.1	+.1	-.7
Summit County:	130								
Rhodes Valley.....		..	..	..	12	...	...	...	-2.5
Tooele County:	1,100								
Rush Valley.....		6	6	5	5	+.7	+.5	+.4	+.3
Tooele Valley.....		11	13	21	21	-.6	+.2	+.8	-.2
Erda district.....		4	5	6	6	-1.8	+.6	0	-.3
Grantsville district		3	4	8	9	-.1	+.3	+2.0	-.1
Utah County:	b/3,780								
Goshen Valley.....		..	2	2	4	...	+.8	+.5	-.8
Utah Lake Valley.....		20	16	22	50	+5.0	+3.5	+1.3	-1.9
Provo and north.....		..	..	..	34	...	...	...	-2.3
Springville and south		..	..	..	16	...	...	...	-1.1
Wasatch County:	80								
Heber Valley.....		..	4	4	5	...	0	-.1	-1.8
Wayne County:	15								
Fremont Valley.....		..	2	2	2	...	+1.1	-.6	-1.4
Weber County:	2,200								
East Shore area.....		5	11	26	26	+1.0	+1.1	-.3	0
Ogden Valley.....		4	3	2	2	+4.6	+7.3	+.7	-1.5
Artesian wells.....		14	14	12	12	+1.8	+.5	+.2	-.7
Shallow wells.....									
Total.....	25,040	247	335	459	585				
Average number of wells represented									
by each observation well.....		101	75	55	43				

a From records of State Engineer.

b Includes all shallow, domestic-use, and hand-pumped wells. Number of wells 40 feet and less in depth: Box Elder County, 1,127; Davis County, 310; Salt Lake County, 667; Utah County, 364. Surveys of other counties incomplete.

The trend of the ground-water levels in Utah, as shown by the changes of water level in observation wells, was downward in 1939. The average water level in the State declined in 25 of the 32 areas for which comparative figures are available. The average water level was essentially unchanged in three areas, of which Weber County is the most developed, and it rose in four areas. In the Milford district, Beaver County, the average water level rose 0.1 foot, and in Parowan Valley, Iron County, it rose 0.6 foot. Both are areas in which there is considerable pumping from wells. The other two areas showing average net rises in water level are relatively unimportant as to ground-water development.

During 1939 the greatest average net decline--3.9 feet--occurred in Juab Valley, Juab County. The average net decline in the part of Davis County south of Farmington--an intensively developed ground-water area--was 3.7 feet. In Utah Lake Valley, Utah County, and in Jordan River Valley, Salt Lake County, which contain the greatest number of wells per county of all counties in the State, the water levels in the observation wells declined an average of 1.9 feet and 1.0 foot, respectively.

The lack of precipitation during the last part of 1939 probably caused to a considerable extent the wide-spread decline in ground-water levels. The program relating to the control of flowing wells to prevent waste was actively prosecuted by the State Engineer during 1939, and as a result large quantities of ground water were conserved for future use. Had not this waste been prevented the decline in water levels in many areas would have been greater.

Of the 27 ground-water areas in Utah for which comparative data are available, only three had an average net decline in water level for the period 1936 to 1939, inclusive: Erda district, Tooele County, 1.5 feet; Chicken Creek Valley, Juab County, 0.4 foot; and Beryl district, Iron County, 0.2 foot. The net rise of ground-water level from 1936 to 1939 inclusive in the other 24 areas was considerable. The largest net rise was 11.1 feet, in the artesian wells in Ogden Valley, Weber County, where the head was raised as a result of the construction of the reservoir. The next was 8.3 feet, in the Milford pumping district, Beaver County. The ground-water levels in the State during 1935 were probably as low as, or lower than, at any other time on record. This was the result of a succession of years with deficient precipitation culminating in the drought of 1934, and increased ground-water development. The records of water levels



show that during the last 4 years the average ground-water level in only one relatively important area, the Erda district, declined below its average stage in 1934 and 1935. The decline in this district may have resulted at least in part from subnormal precipitation during the 4 years 1936 to 1939. Based on records of the United States Weather Bureau, the cumulative departure from normal precipitation (48 years of record) over the entire State during this 4-year period was +6.6 inches, whereas the cumulative departure from normal precipitation (42 years of record) at Tooele, a few miles from the Erda district, was -5.7 inches.

The following measurements of water level and of artesian pressure were made by the Geological Survey, except as noted. The tabulation includes all measurements made in 1939 by the Geological Survey in observation wells in Utah. Flowing wells were closed 10 minutes before the pressure head was measured. All altitudes given were determined by instrumental leveling by the State Engineer. Observation wells are arranged alphabetically by county and numerically within each county.<sup>1/</sup> Errors discovered in Water-Supply Papers 777, 817, 840, and 845 have been corrected in the following tabulation. Descriptive data are given only for those wells which have not been described in the prior publications, unless there are corrections or additions.

Hydrographs for more or less typical wells in ground-water areas are shown on the following pages for the purpose of illustrating the trend of the ground-water levels in the areas.

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<sup>1/</sup> See Water-Supply Paper 817, pp. 350-351, for description of well-numbering system.

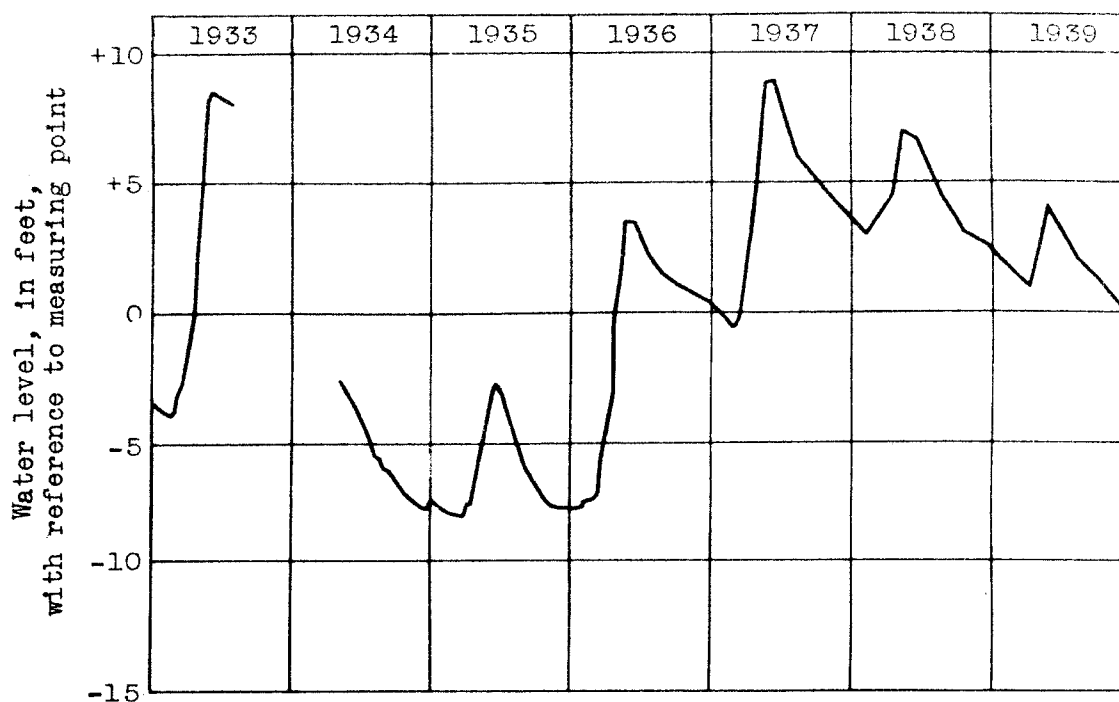


Figure 24.--Hydrograph of well (B-7-2)2abal, near Willard, Box Elder County, Utah.

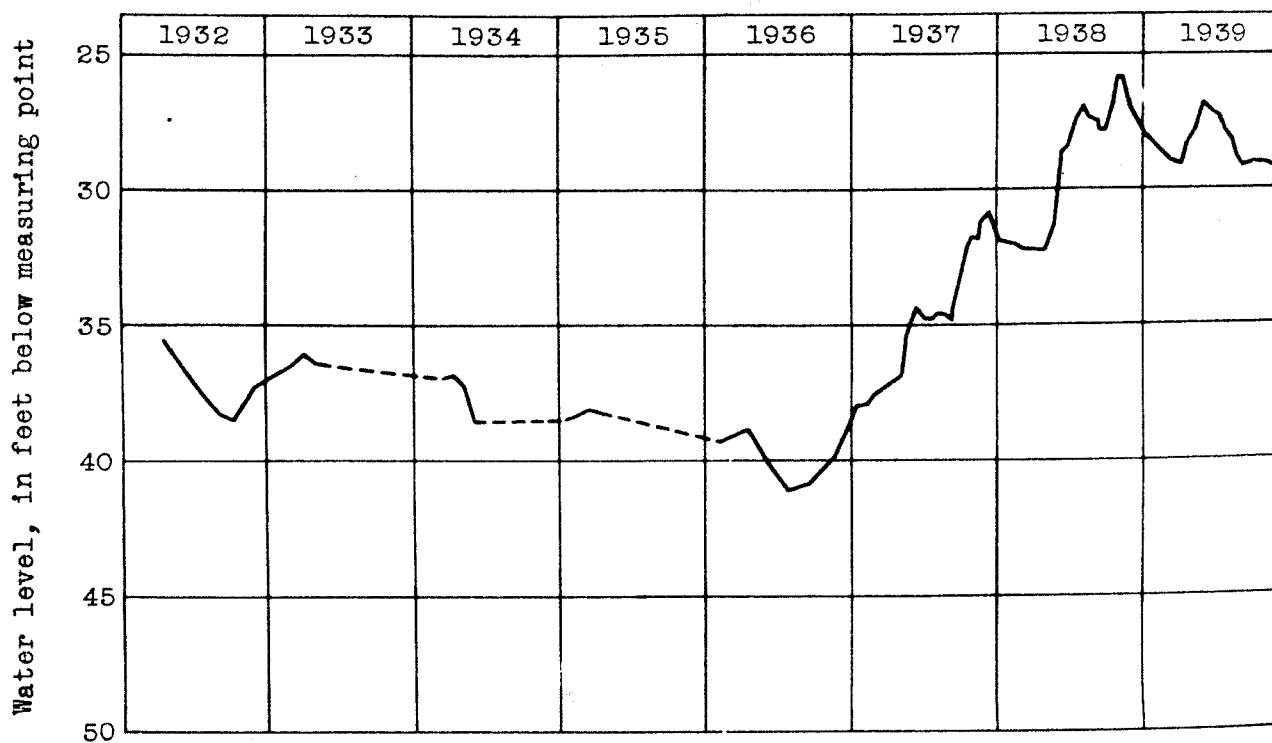


Figure 25.--Hydrograph of well (C-29-10)6ddcl, Milford District, Beaver County, Utah. Record after April 6, 1937, obtained by a water-stage recorder.

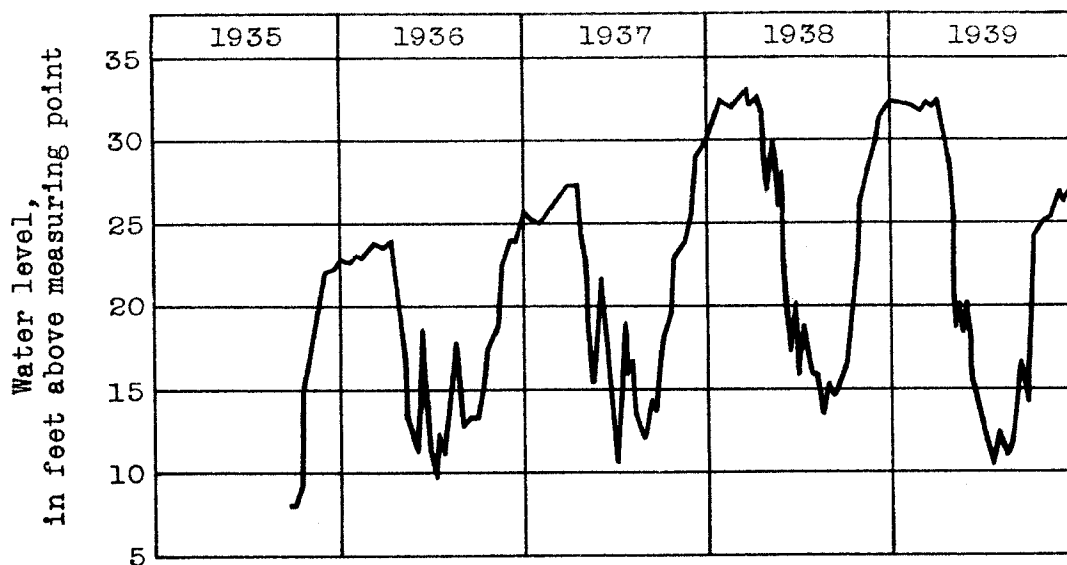


Figure 26.—Hydrograph of well (D-5-1)20aba2, near Lehi, Utah County, Utah. Record obtained by a recording-pressure gage.

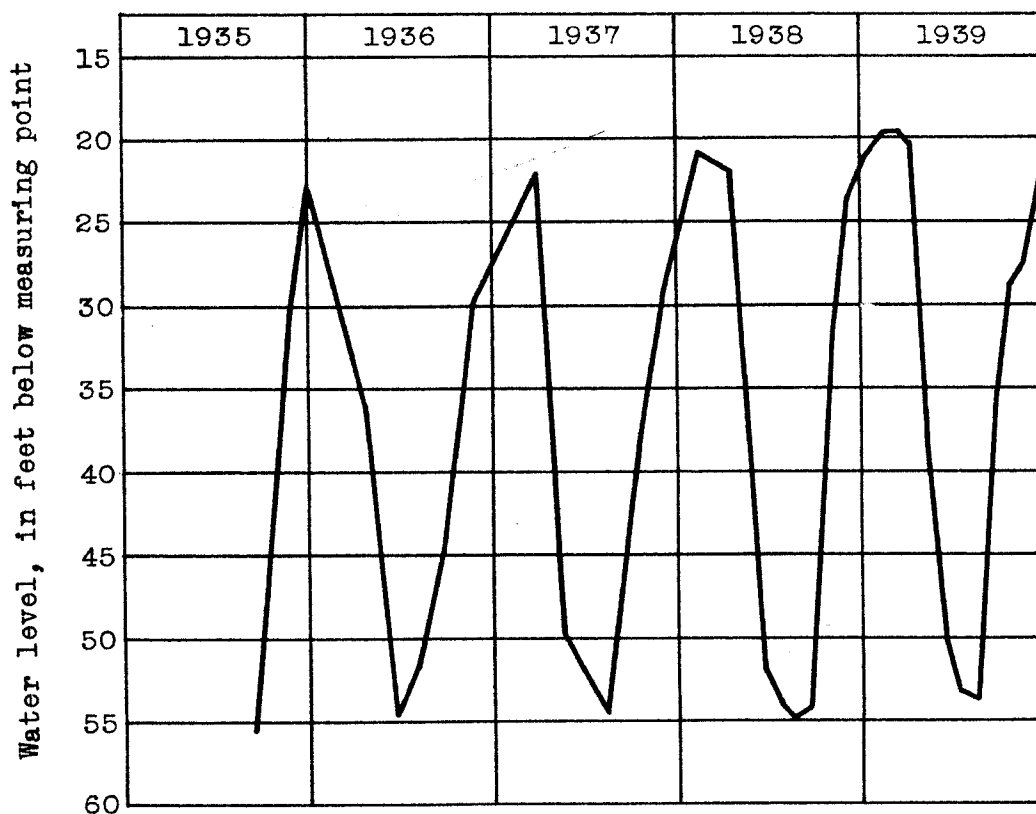


Figure 27.—Hydrograph of well (C-33-9)34cbd2, Parowan Valley, Iron County, Utah. Water level shows draw-down effect from adjacent well during the pumping season.

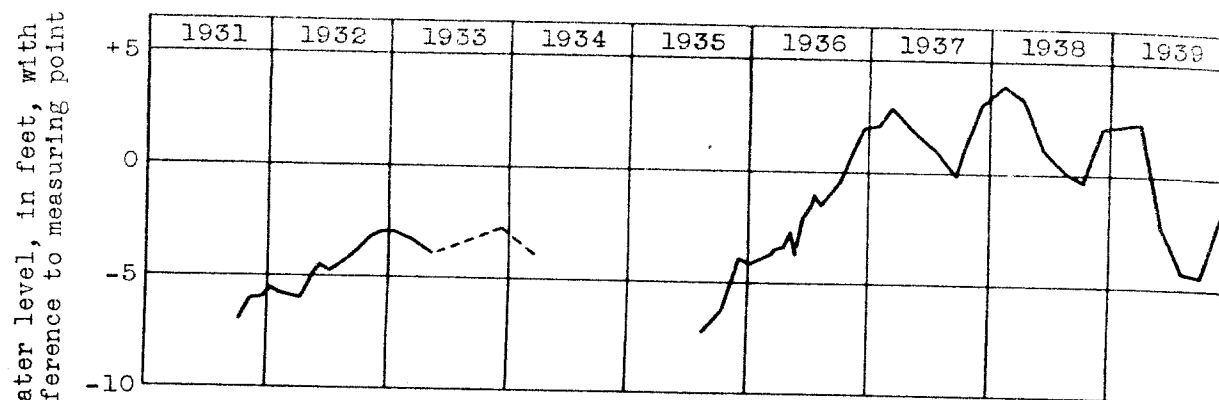


Figure 28.—Hydrograph of well (B-2-1)36ccb1, near Woods Cross, Davis County, Utah.

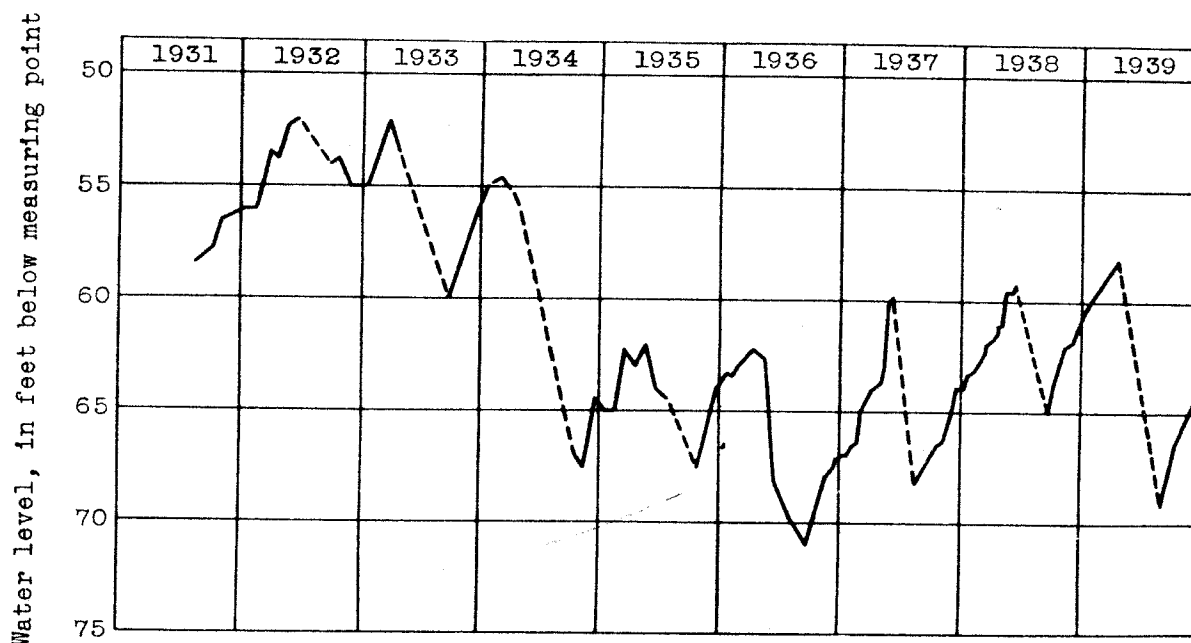


Figure 29.—Hydrograph of well (C-35-11)33aac1, Cedar City Valley, Iron County, Utah. Water level not shown when pump is operating in well.

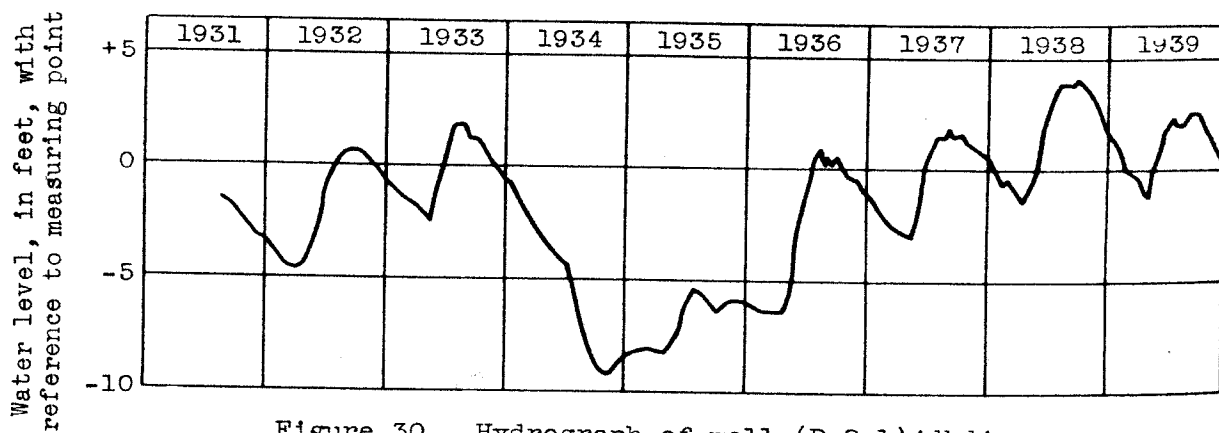


Figure 30. Hydrograph of well (D-2-1)4dbd4, near Holliday, Salt Lake County, Utah.

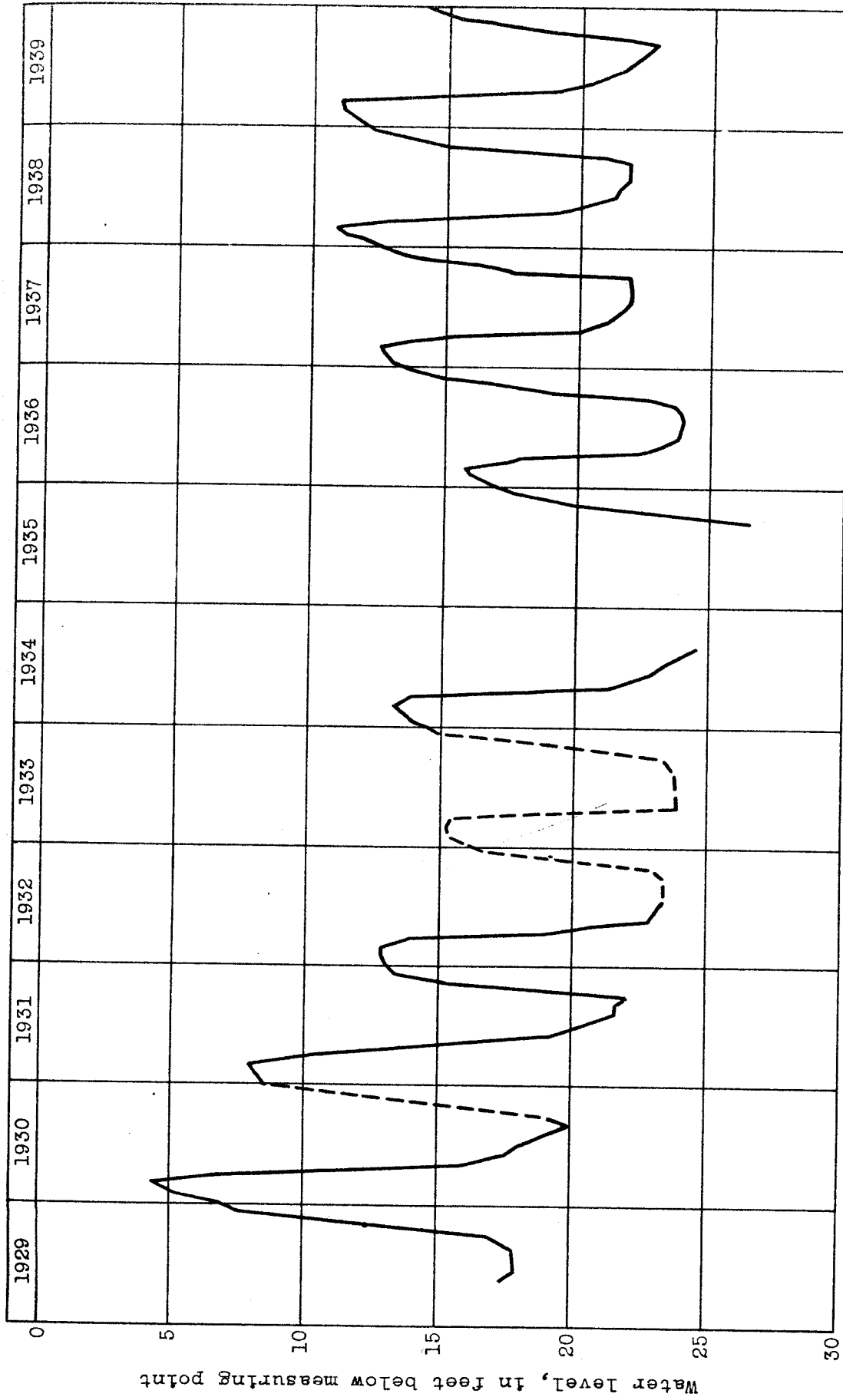


Figure 31.--Hydrograph of well (C-21-5)21abal, Flowell District, Millard County, Utah. Water-stage recorder installed September 26, 1935.

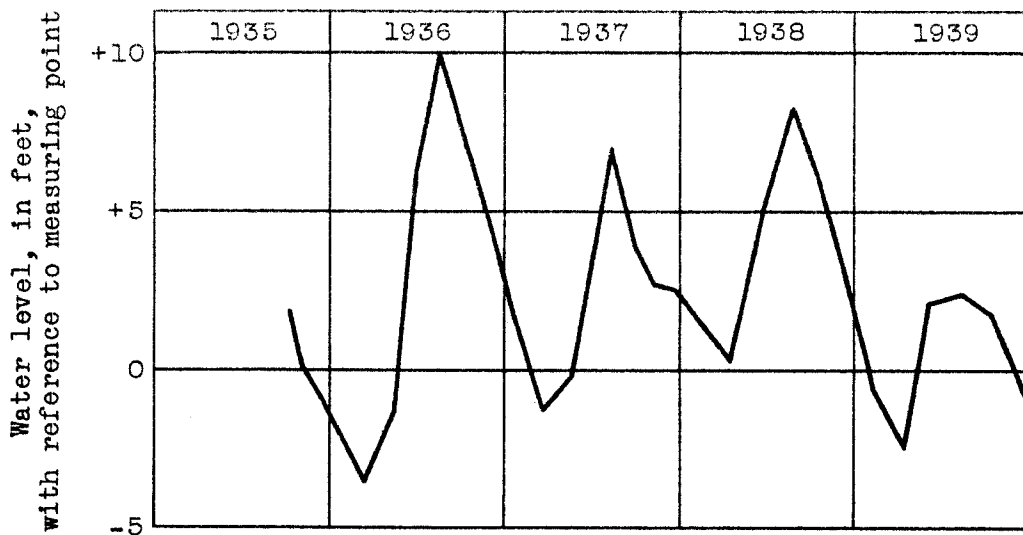


Figure 32.--Hydrograph of well (A-13-1)29bdb1, near Smithfield, Cache County, Utah.

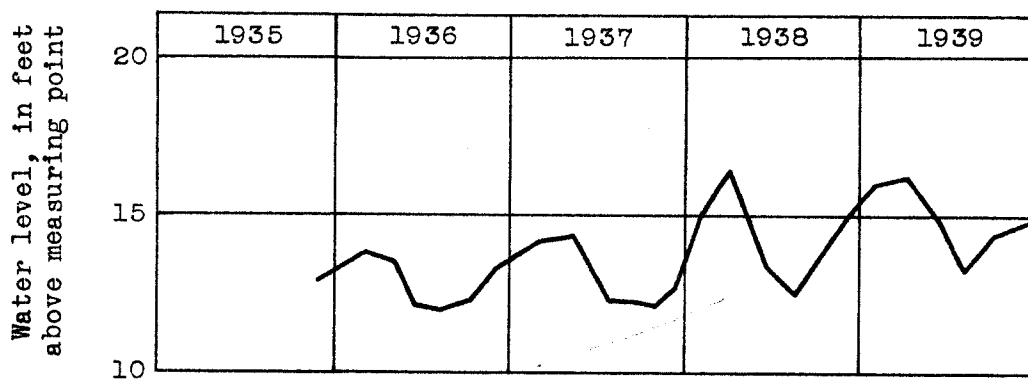


Figure 33.--Hydrograph of well (B-6-2)17acd1, near West Weber, Weber County, Utah.

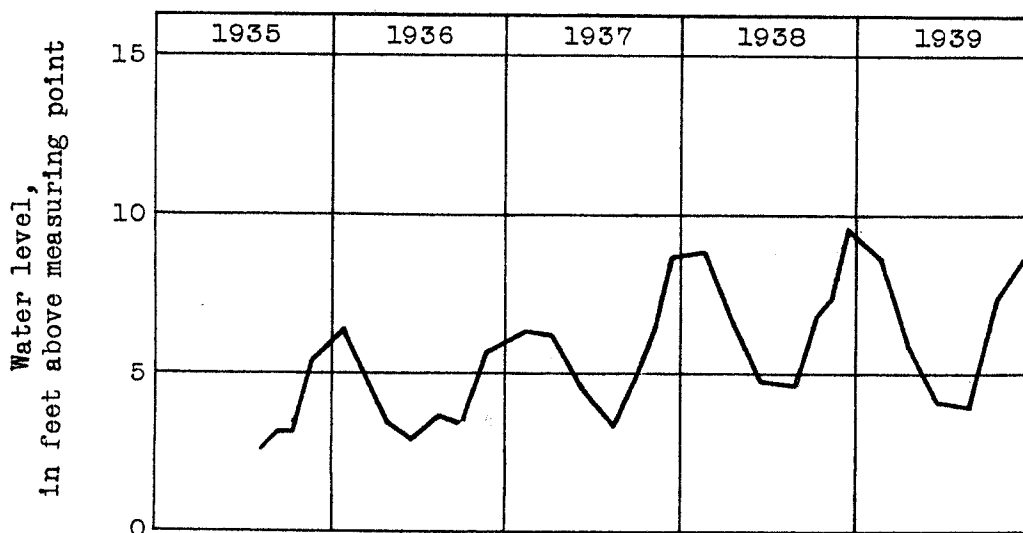


Figure 34.--Hydrograph of well (C-23-2)15dcb4, Venice District, Sevier County, Utah.

## Beaver County

(C-26-10)32cad1. Burton Smithson.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 24	13.02	June 15	14.42	Dec. 18	16.95
May 5	12.84	Oct. 24	17.55		

(C-26-10)32cdal. Burton Smithson.

Water level, in feet above measuring point, 1939

Feb. 24	3.57	June 15	3.50	Dec. 18	3.02
May 5	3.68	Aug. 14	3.05		

(C-27-10)21ab. John Armstrong and Sons.

Water level, in feet below measuring point, 1939

Feb. 24	54.75	June 15	54.68	Oct. 24	55.02
May 5	54.60	Aug. 14	54.97	Dec. 18	55.12

(C-28-7)21add1. Earl F. Baldwin, Manderfield. State claim no. 8118. Diameter 6-5/8 inches, depth 178 feet. Measuring point, bottom of  $\frac{1}{4}$  inch opening in pump base, 0.1 foot above top of concrete platform, 1.5 feet above land surface. Used for domestic purposes. Water levels, in feet below measuring point, 1939: July 18, 40.20; Aug. 12, 41.08; Oct. 25, 42.04; Dec. 18, 40.10.

(C-28-7)21daal. Earl F. Baldwin. Formerly C. T. Baldwin.

Water level, in feet below measuring point, 1939

Jan. 25	25.65	Apr. 27	27.97	Aug. 12	26.63
Feb. 23	26.15	June 15	26.75	Oct. 25	26.61
Apr. 1	26.22	July 18	26.48	Dec. 18	25.65

(C-28-10)5add. No measurements made in 1939.

(C-28-10)6abb2. Oversewing Machine Co.

Water level, in feet below measuring point, 1939

Jan. 25	72.62	May 5	72.62	Oct. 24	72.85
Feb. 24	72.54	June 15	72.80	Dec. 18	72.71

(C-28-10)18acal. Geo. C. Goodwin, Milford. State claim no. 1089. Diameter 14 inches, depth 75 feet. Measuring point, chisel mark, north side of check valve pipe. 3.0 feet below land surface and 4,960.27 feet above sea level.

Water level, in feet below measuring point, 1938-39

May 14, 1938	a 1.55	May 6, 1939	1.90	Sept. 2, 1939	4.25
June 22	a 2.60	June 3	2.80	Oct. 7	4.30
Aug. 8	a 3.72	15	2.42	24	3.23
Feb. 24, 1939	1.97	July 1	3.43	Nov. 4	3.12
Apr. 1	1.58	Aug. 5	3.95	Dec. 2	2.82
May 5	1.90	14	4.06	18	2.60

(C-28-10)19abcl. Ezra Walker. Flowing prior to all measurements.

Water level, in feet above measuring point and flow, in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Jan. 25	3.67	11.0	June 15	2.68	8.6
Feb. 24	4.05	12.0	Aug. 14	1.68	5.7
May 5	3.45	10.2	Dec. 18	3.58	10.0

a Measurement made by Utah State Engineer in cooperation with Works Progress Administration.

## Beaver County--Continued

(C-28-10)19add1. Peter Weidner. Reported depth, 65 feet. Altitude of measuring point, 4,964.82 feet above sea level.

Water level, in feet, with reference to measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	+3.05	Apr. 1	+3.38	Aug. 5	a-14.50	Oct. 24	+1.47
21	+2.20	May 6	a-12.50	14	a-14.65	Nov. 4	+1.57
Feb. 4	+2.55	June 3	-4.00	Sept. 2	-0.75	Dec. 2	+2.10
18	+2.74	15 a	-9.27	Oct. 7	-0.85	18	+2.35
Mar. 4	+2.93	July 1	a-14.10				

(C-28-10)29cdcl. J.H. Hanlon.

Water level, in feet below measuring point, 1939

Feb. 24	7.77	June 3	11.28	Aug. 12	10.80	Nov. 4	8.76
Apr. 1	7.67	15	11.80	Sept. 2	13.20	Dec. 2	9.05
May 5	8.26	July 1	11.48	Oct. 7	9.66	18	8.24
6	8.32	Aug. 5	12.51	24	8.95		

(C-28-10)30acd1. State of Utah.

Daily noon water level, in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	Sept.	Oct.	Nov.	Dec.
1	8.06	7.50	7.10	6.57	10.46	9.39	8.40	7.58
2	8.01	7.49	6.95	6.57	10.50	9.38	8.36	7.56
3	7.99	7.41	6.91	6.55	10.53	9.34	8.32	7.53
4	8.02	7.42	6.97	6.57	10.55	9.35	8.32	7.50
5	7.90	7.44	7.05	6.56	10.52	9.28	8.27	7.45
6	7.93	7.36	6.96	6.61	10.44	9.21	8.26	7.42
7	7.99	7.38	6.90	6.53	10.38	9.21	8.24	7.40
8	7.85	7.26	6.92	6.50	10.41	9.18	8.19	7.37
9	7.91	7.40	6.89	6.53	10.32	9.23	8.17	7.37
10	7.89	7.39	6.85	6.55	10.30	9.17	8.20	7.31
11	7.84	7.44	6.95	6.50	10.21	9.13	8.15	7.31
12	7.79	7.32	6.88	6.47	10.13	9.08	8.11	7.35
13	7.78	7.32	6.84	6.46	9.99	9.05	8.07	7.27
14	7.79	7.31	6.94	6.52	9.98	8.95	8.03	7.27
15	7.70	7.22	6.91	6.53	9.96	8.92	8.05	7.25
16	7.76	7.29	6.88	6.57	9.90	8.90	8.00	7.23
17	7.75	7.28	6.84	6.59	9.84	8.87	7.96	7.20
18	7.72	7.19	6.83	6.53	9.81	8.84	7.93	7.26
19	7.64	7.10	6.82	6.48	9.77	8.90	7.92	7.21
20	7.58	7.17	6.80	6.50	9.74	8.86	7.88	7.16
21	7.67	7.18	6.77	6.47	9.67	8.80	7.84	7.14
22	7.61	7.14	6.74	6.47	9.61	8.74	7.82	7.09
23	7.70	7.04	6.72	6.46	9.60	8.67	7.78	7.08
24	7.71	7.08	6.71	6.49	9.56	8.61	7.74	7.09
25	7.62	7.02	6.67	6.45	9.54	8.60	7.72	7.11
26	7.57	7.03	6.62	6.58	9.54	8.65	7.68	7.06
27	7.50	7.07	6.63	6.52	9.50	8.67	7.67	7.04
28	7.56	7.02	6.63	6.51	9.48	8.60	7.65	7.10
29	7.57	....	6.68	6.55	9.47	8.56	7.62	7.16
30	7.46	....	6.65	6.58	9.46	8.52	7.61	7.07
31	7.46	....	6.62	....	....	8.44	....	7.01

Daily high and low water levels, in feet below measuring point, 1939

Date	May		June		July		August	
	High	Low	High	Low	High	Low	High	Low
1	b6.60	....	8.08	8.91	b10.30	....	10.04	10.93
2	b6.66	....	8.26	8.75	b10.49	....	10.20	11.09
3	....	....	8.76	9.17	10.15	10.72	10.28	11.23
4	....	....	8.45	9.43	9.75	10.70	10.08	10.39
5	b8.61	....	9.43	10.00	9.90	10.70	b10.00	....

a Pumping.

b Depth to water level at noon; daily fluctuation less than 0.2 foot.



## Beaver County--Continued

(C-28-10)30acdl. State of Utah.--Continued

Daily high and low water levels, in feet below measuring point, 1939

	May		June		July		August	
	High	Low	High	Low	High	Low	High	Low
6	a9.03	....	a10.10	.....	9.49	10.60	a9.98	.....
7	7.94	9.20	9.54	10.00	9.81	10.76	a9.88	.....
8	7.68	8.27	9.02	9.72	10.59	11.06	a9.85	.....
9	7.47	8.14	8.55	9.39	10.06	11.16	a9.83	.....
10	7.46	8.44	8.42	9.36	a9.84	.....	a9.88	.....
11	7.67	8.26	8.52	9.14	9.72	10.06	a9.92	.....
12	7.65	....	8.45	9.25	a9.53	.....	a9.83	.....
13	....	....	8.51	8.85	9.43	10.45	a9.84	.....
14	a7.40	....	8.44	9.58	10.45	11.06	a9.85	.....
15	a7.26	....	8.76	9.72	10.86	11.19	a9.93	.....
16	a7.20	....	a8.60	....	11.21	11.58	a9.97	.....
17	a7.17	....	a8.55	....	a11.70	.....	a10.01	.....
18	a7.11	....	a8.47	....	11.39	11.82	a10.05	.....
19	a7.13	....	a8.41	....	11.38	11.63	a10.11	.....
20	a7.10	....	a8.40	....	a11.71	.....	a10.15	.....
21	7.06	7.61	a8.45	....	11.05	12.06	a10.15	.....
22	7.19	7.40	a8.41	....	10.52	11.07	a10.17	.....
23	a7.18	....	a8.37	....	10.26	10.52	a10.19	.....
24	7.19	7.46	8.36	9.45	10.14	11.35	10.21	11.52
25	a7.19	....	8.75	9.90	10.40	11.43	10.65	11.87
26	7.18	7.81	8.82	9.23	10.15	11.02	10.88	12.07
27	7.50	8.42	a8.76	....	a9.95	.....	11.01	12.34
28	7.74	8.59	8.71	9.26	9.75	10.58	10.79	11.46
29	8.03	8.78	8.81	9.95	9.80	10.20	a10.70	.....
30	8.17	9.06	9.64	10.18	9.73	10.87	a10.64	.....
31	8.17	8.80	....	.....	9.90	10.98	a10.58	.....

(C-28-10)31addl. Frank W. Gaspill.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
May 5	b 15.78	Aug. 12	b 17.65	Dec. 18	10.36
June 15	b 16.56	Oct. 24	10.51		

(C-28-10)31ddcl. Frances Investment Co. Walter E. Weber, tenant.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	16.18	Apr. 1	16.90	July 1	15.24	Oct. 24	16.76
21	16.28	May 5	15.86	Aug. 5	15.92	Nov. 4	16.14
Feb. 4	16.50	6	15.82	12	17.06	Dec. 2	16.80
18	16.26	June 3	14.52	Sept. 2	15.30	18	16.77
Mar. 4	16.15	15	14.39	Oct. 7	17.95		

(C-28-10)33abal. Duluth Land Co.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 4	13.92	May 5	14.52	Aug. 5	11.90	Oct. 24	12.06
18	14.77	6	14.50	12	12.30	Nov. 4	11.18
23	14.80	June 3	12.30	Sept. 2	12.55	Dec. 2	12.02
Mar. 4	13.88	15	11.62	Oct. 7	12.28	18	13.85
Apr. 1	16.18	July 1	11.72				

(C-28-11)24accl. Ira E. Leck, Milford. Diameter  $4\frac{1}{2}$  to 3 inches. Measuring point, top of 3-inch ell at land surface. Old smelter well now used for stock. Water level, in feet above measuring point: (4 $\frac{1}{2}$ -inch casing) Dec. 17, 1938, 0.77, found flowing; May 12, 1939, 0.45, found flowing. Water level in feet below measuring point, 1938: (3-inch casing) Dec. 17, 0.58.

a Depth to water level at noon; daily fluctuation less than 0.2 foot.

b Pumping.

## Beaver County--Continued

(C-28-11)24bdcl. Ira E. Leck, Milford. Diameter 6 to 2 inches. Measuring point, top of 4½ inch casing, 1.0 foot above land surface. The closing of an adjacent flowing well for 10 minutes raised the water level in the 4½-inch casing 0.27 foot on Dec. 17, 1938 and 0.08 foot on May 12, 1939. Water level, in feet below measuring point: (2-inch casing) Dec. 17, 1938, 0.46; (4½-inch casing) Dec. 17, 1938, 0.30; May 12, 1939, 0.44.

(C-28-11)24daal. John D. Johnson, Milford. State claim nos. 1317 and 11221. Diameter 14 inches, depth 58 feet. Measuring point, nail in north wall of pit, 3.6 feet below land surface and 2.85 feet above top of highest part of casing. Well used for irrigation.

## Water level, in feet below measuring point, 1938

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb 24	4.55	June 3 a	19.25	Aug. 14 a	22.8	Nov. 4	5.83
Apr. 1	3.83	15 a	21.34	Sept. 2 a	22.47	Dec. 2	5.29
May 5 a	19.0	July 1 a	21.3	Oct. 7	6.10	18	5.09
6 a	10.43	Aug. 5	10.24	24	5.87		

(C-28-11)35dddl. State of Utah (formerly J.L. Griffiths), Milford. State claim no. 3619. Diameter 14 inches, depth 74 feet. Measuring point and bench mark, nail in north wall of pit, 0.5 foot below top of 8 by 8 inch timber and land surface, 4,998.37 feet above sea level. Used for stock and irrigation.

## Water level, in feet below measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
May 31, 1938 b	23.14	June 3, 1939	11.65	Oct. 7, 1939	11.52
July 22 b	23.40	15 a	19.65	24	11.23
Aug. 10 b	23.60	July 1 a	19.35	Nov. 4	11.10
Feb. 24, 1939	10.50	Aug. 5 a	19.50	Dec. 2	10.68
Apr. 1	9.70	14 a	21.65	18	10.50
May 6 a	19.20	Sept. 2 a	20.87		

(C-28-11)36addl. State of Utah (Geo. Malouf), Milford. Diameter 14 inches. Measuring point, nail in south wall of pit. 1.0 foot below land surface.

## Water level in feet, below measuring point 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 24	7.10	June 3	6.65	Aug. 14	8.78	Nov. 4	8.02
Apr. 1	7.02	15	6.68	Sept. 2	8.75	Dec. 2	7.30
May 5	7.24	July 1	7.30	Oct. 7	8.46	18	7.10
6	6.76	Aug. 5	7.78	24	8.00		

(C-28-11)36bbal. D. Walter Muir. Reported depth 18 feet.

## Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	5.79	May 5	4.52	Aug. 5	6.28	Oct. 24	5.85
21	5.60	6	4.56	14	6.36	Nov. 4	5.93
Feb. 4	5.35	June 3	4.48	Sept. 2	6.66	Dec. 2	5.17
18	5.15	15	5.16	Oct. 7	6.13	18	5.00
Apr. 1	4.44	July 1	5.51				

(C-29-7)3cbb1. Harry Hodges. Measuring point changed to top of new platform, 0.3 foot above previous measuring point. Reported depth 20 feet, measured depth, 25 feet. Diameter, 36 inches.

a Pumping  
b Measurement by Utah State Engineer in cooperation with Works Progress Administration.

## Beaver County--Continued

(C-29-7)3cbb1.--Continued

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 25	20.30	Mar. 31	18.24	June 15	17.90	Oct. 25	21.64
Feb. 23	20.73	Apr. 27	16.28	July 18	19.85	Dec. 18	21.85

(C-29-7)17odd1. (C-29-7) 21baal in Water Supply Paper 845. Drought Relief Administration.

Water level, in feet below measuring point, 1939

Jan. 25	23.85	May 4	13.80	July 18	13.87	Oct. 24	19.54
Feb. 23	24.58	June 15	9.16	Aug. 12	16.17	Dec. 18	23.50
Mar. 31	22.82						

(C-29-7)28db. J. A. Nower.

Water level, in feet below measuring point, 1939

Jan. 25	16.34	May 12	11.58	July 18	12.74	Oct. 24	18.80
Feb. 23	17.08	June 15	10.90	Aug. 12	13.59	Dec. 18	16.16
Mar. 31	16.92						

(C-29-8)25oac1. Board of Education, Beaver School District. Found flowing prior to all measurements.

Water level, in feet above measuring point and flow, in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Jan. 25	9.9	7.8	June 15	9.4	7.4
Feb. 23	9.95	7.9	Aug. 12	9.1	7.4
May 4	9.65	7.5	Dec. 18	9.4	7.5

(C-29-8)28ocb1. Drought Relief Administration. Depth to water level outside of casing, in feet, 1939: May 4, 2.95; June 15, 3.26; Aug. 12, 4.18; Oct. 24, 3.05; Dec. 18, 2.95.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
May 4	2.11	Aug. 12	2.34	Dec. 18	2.38
June 15	2.12	Oct. 24	2.38		

(C-29-8)30aac1. Drought Relief Administration. Measuring point top of casing, 5,538.17 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 25	21.10	Mar. 31	21.17	June 15	20.87	Oct. 24	21.70
Feb. 23	21.37	May 4	20.62	Aug. 12	22.61	Dec. 18	21.65

(C-29-10)6aad1. Laura L. Gates. Altitude of measuring point, 5,019.63 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
May 5	19.67	Aug. 12	a 22.42	Dec. 18	20.04
June 15	17.92	Oct. 24	19.92		

a Pumping.

## Beaver County--Continued

(C-29-10)6ddcl. Duluth Land Co.

Daily noon water level, in feet below measuring point, 1939

Date	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	27.81	28.38	28.80	29.11	28.26	.....	27.16	27.79	28.93	29.12	29.08	29.19
2	27.81	28.43	28.76	29.13	.....	.....	27.15	27.82	28.95	29.11	29.08	29.19
3	27.82	28.42	28.73	29.14	.....	.....	27.17	27.85	28.98	29.12	29.08	29.20
4	27.89	28.43	28.77	29.15	.....	26.84	27.17	27.86	29.02	29.17	29.08	29.20
5	27.87	28.45	28.84	29.15	28.25	26.87	27.19	27.87	29.04	29.17	29.09	29.21
6	27.89	28.48	28.85	29.19	28.24	26.90	27.22	27.88	29.07	29.16	29.10	29.20
7	27.96	28.47	28.81	29.16	28.25	26.96	27.25	27.92	29.12	29.16	29.11	29.22
8	27.94	28.44	28.86	29.14	28.25	26.94	27.25	27.96	29.12	29.15	29.09	29.22
9	27.99	28.51	28.86	.....	28.22	26.90	27.26	27.99	29.10	29.20	29.06	29.23
10	28.02	28.56	28.84	.....	28.18	26.86	27.27	28.04	29.12	29.21	29.12	29.23
11	28.04	28.62	28.90	.....	28.14	26.90	27.29	28.09	29.13	29.19	29.09	29.22
12	28.04	28.61	28.89	.....	28.14	26.95	27.30	28.12	29.14	29.16	29.09	29.28
13	28.08	28.58	28.87	.....	28.12	26.98	27.29	28.15	29.15	29.14	29.08	29.27
14	28.10	28.64	28.94	29.20	28.08	27.00	27.30	28.18	29.18	29.13	29.06	29.27
15	28.10	28.61	28.95	29.20	28.00	27.02	27.33	28.21	29.21	29.11	29.08	29.30
16	28.12	28.65	28.97	29.22	27.94	27.01	27.33	28.25	29.23	29.11	29.09	29.30
17	28.16	28.69	28.97	29.24	27.88	27.06	27.34	28.28	29.23	29.11	29.09	29.29
18	28.18	28.64	28.97	29.20	27.80	27.08	27.35	28.32	29.23	29.10	29.06	29.32
19	28.19	28.63	28.99	29.11	27.75	27.09	27.36	28.41	29.23	29.10	29.12	29.34
20	28.17	28.70	29.00	29.06	27.73	27.11	27.37	28.44	29.22	29.13	29.12	29.29
21	28.21	28.73	29.01	28.96	27.71	27.14	27.39	28.47	29.22	29.12	29.12	29.29
22	28.20	28.74	29.01	28.86	27.68	27.15	27.40	28.50	29.20	29.12	29.12	29.28
23	28.24	28.70	29.03	28.78	27.64	27.16	27.42	28.53	29.21	29.09	29.13	29.28
24	28.31	28.71	29.05	28.74	27.57	27.17	27.44	28.58	29.20	29.06	29.12	29.28
25	28.32	28.70	29.03	28.59	27.20	27.18	27.45	28.62	29.19	29.06	29.15	29.30
26	28.33	28.71	29.01	28.50	.....	27.19	27.50	28.73	29.19	29.11	29.15	29.30
27	28.29	28.75	29.02	28.34	27.17	27.20	27.53	28.76	29.19	29.15	29.14	29.30
28	28.28	28.74	29.05	28.33	.....	27.21	27.55	28.79	29.18	29.16	29.15	29.34
29	28.35	.....	29.08	28.34	.....	27.21	27.68	28.84	29.18	29.15	29.14	29.35
30	28.34	.....	29.10	28.32	.....	27.21	27.72	28.87	29.17	29.15	29.17	29.35
31	28.31	.....	29.11	.....	.....	.....	27.75	28.90	.....	29.12	.....	29.34

(C-29-10)7cddl. Duluth Land Company. Owner given as Frances Investment Co. in Water-Supply Paper 845. State claim no. 10284.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	35.12	Apr. 1	35.50	July 1	34.35	Oct. 24	35.12
21	35.24	May 5	35.40	Aug. 5	34.84	Nov. 4	35.31
25	35.28	6	35.40	14	35.04	Dec. 2	35.50
Feb. 4	35.22	June 3	35.37	Sept. 2	35.35	18	35.59
18	35.45	15	34.65	Oct. 7	35.19		

(C-29-10)8ba. Frances Investment Co. See Water-Supply Paper 817, page 421. Water level, in feet below measuring point, 1938: April 20, 33.85.

(C-29-10)16cccl. Daniel Hartman.

Water level, in feet below measuring point, 1939

Jan. 25	48.41	Apr. 1	49.18	June 15	48.88	Oct. 24	48.19
Feb. 24	48.67	May 4	49.34	Aug. 12	48.31	Dec. 18	48.33

(C-29-11)1addl. Frances Investment Co. Measuring point, top of casing, 4,997.63 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 7	1.11	Apr. 1	1.20	July 1	1.32	Oct. 24	2.26
21	1.13	May 5	1.48	Aug. 5	1.50	Nov. 4	2.17
Feb. 4	1.04	6	1.53	14	2.07	Dec. 2	1.66
18	1.18	June 3	1.49	Sept. 2	2.52	18	1.54
Mar. 4	1.10	15	1.30	Oct. 7	2.78		

## Beaver County--Continued

(C-29-11)2ddd1. Beaver County (Formerly J. H. Rollins, Milford. Diameter 15 to 10 inches. Measuring point, top of 15-inch casing at east side, 14.45 feet below top of curb, 14 feet below land surface and 4,995.76 feet above sea level. Used for irrigation.

Water level, in feet below measuring point 1938-39

Date	Water level	Date	Water level	Date	Water level
Feb. 3, 1938	a 2.85	May 6, 1939	9.70	Sept. 2, 1939	4.27
June 13	ab 14.75	June 3	b 13.43	Oct. 7	2.79
July 20	ab 15.58	15	4.43	24	2.45
Aug. 9	a 4.99	July 1	b 13.38	Nov. 4	2.32
Feb. 24, 1939	1.77	Aug. 5	b 13.55	Dec. 2	1.93
Apr. 1	1.39	14	b 14.32	18	1.80
May 5	9.77				

(C-29-11)10cad1. Howard W. Gaspill.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 25	10.37	July 1	10.95	Sept. 2	11.57	Nov. 4	10.85
Feb. 24	10.01	Aug. 5	11.02	Oct. 7	11.63	Dec. 2	11.10
May 5	10.14	14	11.50	24	10.95	17	10.45
June 15	10.79						

(C-29-11)11cdd1. Preston H. Davis. Measuring point, bottom of 6 by 8-inch beam spanning well, 5,017.66 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 7	19.17	Apr. 1	18.60	Aug. 5	20.17	Oct. 24	19.12
21	19.09	May 5	19.19	14	20.30	Nov. 4	19.05
25	19.04	June 3	19.65	Sept. 2	20.17	Dec. 2	18.86
Feb. 4	18.93	15	19.76	Oct. 7	20.35	17	18.70
18	19.01	July 1	19.87				

(C-29-11)15abd1. Milford State Bank.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 25	11.9	June 15	12.47	Oct. 24	12.19
May 5	11.97	Aug. 14	12.82	Dec. 17	11.90

(C-29-11)20bbb1. Laho. In 5 by 8 by 14 foot pit. Abandoned well, diameter 18 inches, measured depth, 45 feet. Measuring point, top of wooden curb at east side, 13.7 feet above top of casing, level with land surface and 5,017.56 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 25	14.85	May 6	14.83	June 14	15.24	Oct. 24	15.20
Apr. 1	14.83	12	14.74	Aug. 14	15.85	Dec. 17	14.90

(C-29-11)20dcd1. U.S. Geol. Survey test well. Bored well, diameter 2 inches, depth 5 feet. Measuring point, top of corrugated galvanized-iron casing, 0.5 foot above land surface and 5,007.20 feet above sea level. Water level in feet below measuring point, 1939: Oct. 24, 3.83.

a Measurement by Utah State Engineer in cooperation with Works Progress Administration.  
b Pumping.

## Beaver County--Continued

(C-29-11)21ddd1. Asa D. Thompson. Altitude of measuring point, 5,028.32 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 25	20.85	May 6	20.62	Aug. 5	21.13	Oct. 24	20.87
Feb. 24	20.69	June 3	20.75	14	21.16	Nov. 4	20.95
Apr. 1	20.57	14	20.80	Sept. 2	21.74	Dec. 2	20.70
May 5	20.57	July 1	20.15	Oct. 7	20.99	17	20.64

(C-29-11)22ddd1. P.V.Haworth. State claim no. 10667. Altitude of measuring point, 5,035.23 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 7	27.54	May 5	27.36	Aug. 5	27.60	Oct. 24	27.09
21	27.45	6	27.35	14	27.58	Nov. 4	27.20
Feb. 4	27.41	June 3	28.05	Sept. 2	28.18	Dec. 2	27.00
18	27.40	14	27.54	Oct. 7	27.23	17	26.89
Apr. 1	27.19	July 1	27.55				

(C-29-11)29adal. Public Land. Measuring point, bottom of 12 by 12-inch timber, 5,020.53 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 25	15.44	May 6	15.01	Aug. 5	16.20	Oct. 24	15.74
Feb. 24	15.35	June 3	15.15	14	16.23	Nov. 4	15.82
Apr. 1	15.07	14	15.63	Sept. 2	16.85	Dec. 2	15.26
May 5	15.16	July 1	14.97	Oct. 7	15.84	17	15.45

(C-30-10)12cda. T. L. Gray.

Water level, in feet below measuring point, 1939

Jan. 25	31.03	Mar. 31	31.46	June 15	29.35	Oct. 24	30.00
Feb. 23	31.10	May 4	29.89	Aug. 12	29.64	Dec. 18	30.90

(C-30-11)4dcc. Public Domain. Altitude of measuring point, 5,040.97 feet above sea level. Water level, in feet below measuring point, 1939: June 14, 28.04; Aug. 14, 28.21; Oct. 24, 28.12; Dec. 17, 28.02.

(C-30-11)8dccl. U. S. Geol. Survey test well. Bored well, diameter 2 inches, depth 13 feet. Measuring point, top of wooden casing, level with land surface and 5,018.83 feet above sea level. Water level, in feet below measuring point, 1939: Oct. 23, 9.02; Oct. 24, 8.96.

(C-30-12)11bbbl. David L. Barnes. Measuring point, top of timber over well, 5,048.64 feet above sea level. Water levels, in feet below measuring point, 1939: May 12, 31.12; June 14, 31.81; Oct. 23, 31.93; Dec. 17, 31.85.

(C-30-12)12bbb. Ernest E. Gray. Measuring point, top of wooden casing, 5,028.84 feet above sea level. Water levels, in feet below measuring point, 1939: May 12, 16.67; June 14, 16.95; Oct. 23, 17.23; Dec. 17, 17.00.

(C-30-12)13bcbl. Beaver County. Abandoned well, diameter 2 inches, depth 43 feet. Measuring point, top of 2-inch casing, 1.0 foot above land surface and 5,023.73 feet above sea level. Water levels, in feet below measuring point, 1939: Oct. 23, 10.13; Dec. 17, 9.73.

## Beaver County--Continued

(C-30-12)22aad1. U. S. Geol. Survey test well. Bored well, diameter 2 inches, depth 9.8 feet. Measuring point, top of galvanized iron casing, 0.7 foot above land surface and 5,024.92 feet above sea level. Water levels, in feet below measuring point, 1939: Oct. 23, 7.50; Nov. 10, a/7.33.

(C-30-12)28bacl. U. S. Geol. Survey test well. Bored well, diameter 2 inches, depth 4.2 feet. Measuring point, top of galvanized iron casing, 0.7 foot above land surface and 5,034.94 feet above sea level. Water level, in feet below measuring point, 1939: Oct. 20, 4.68.

(C-30-12)28dabl. U. S. Geol. Survey test well. Bored well, diameter 2 inches, depth 9.5 feet. Measuring point, top of wooden casing, level with land surface and 5,033.22 feet above sea level. Water levels, in feet below measuring point, 1939: Oct. 23, 5.33; Nov. 9, a/5.10

(C-30-12)29ddal. U. S. Geol. Survey test well. Bored well, diameter 2 inches, depth 9.5 feet. Measuring point, top of galvanized iron casing, 1.0 foot above land surface and 5,039.60 feet above sea level. Water levels, in feet below measuring point, 1939: Oct. 23, 9.04; Nov. 9, a/8.96.

(C-30-12)31bdcl. Ludwig Culmsee. Altitude of measuring point, 5,054.24 feet above sea level. Water levels, in feet below measuring point, 1939: June 14, 17.03; Oct. 20, 17.54; Oct. 23, 17.52; Dec. 17, 17.36.

(C-30-12)33bbdl. ----- Dug well, diameter about 36 inches, depth 17 feet. Two inch hole drilled in pit to obtain water level. Measuring point, bottom of east side of well curb, level with land surface and 5,050.23 feet above sea level. Water level, in feet below measuring point, 1939: Oct. 20, 18.39.

## Box Elder County

(B-7-2)2abal. Earl Lemon.

Water level, in feet, with reference to measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 6	+1.81	May 31	+4.07	Oct. 3	+1.32
Apr. 4	+1.11	Aug. 5	+2.24	Dec. 28	-0.13

(B-7-2)2cba3. Delbert Cook.

Water level, in feet above measuring point, 1939

Feb. 6	46.8	May 31	37.85	Oct. 3	37.0
Apr. 4	46.4	Aug. 5	37.15	Dec. 28	44.8

(B-7-2)11cdal. First Savings Bank of Ogden. (B-7-2)11cd, Parley Deen in Water-Supply Paper 817.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 6	21.03	Apr. 4	21.30	Aug. 5	21.30	Dec. 28	21.08
Mar. 25	21.27	May 31	21.74	Oct. 3	21.38		

(B-8-2)11bdcl. J. A. Ward.

Water level, in feet below measuring point, 1939

Feb. 6	52.34	Apr. 6	53.15	Aug. 5	50.61	Dec. 28	52.72
Mar. 25	53.24	May 31	50.79	Oct. 3	49.50		

a Measurement supplied by State engineer.

## Box Elder County--Continued

(B-8-2)23cdb1. Willard Water Co. (B-8-2)23cd, Drought Relief Administration in Water-Supply Paper 817.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 6	42.00	May 31	36.82	Oct. 3	42.97
Apr. 6	41.05	Aug. 5	41.77	Dec. 28	43.50

(B-8-2)26cacl. George L. Braegger.

Water level, in feet above measuring point, 1939

Feb. 6	28.85	May 31	26.5	Oct. 3	22.0
Apr. 6	29.6	Aug. 5	23.4	Dec. 28	27.5

(B-9-1)22ccc. Raymond Jeppesen.

Water level, in feet below measuring point, 1939

Feb. 6	28.24	June 2	24.41	Oct. 3	26.30
Apr. 4	20.64	Aug. 5	25.56	Dec. 26	26.83

(B-9-1)27bbb. Charles Jeppesen.

Water level, in feet below measuring point, 1939

Feb. 6	22.82	June 2	20.76	Oct. 3	21.55
Apr. 4	18.93	Aug. 5	21.24	Dec. 26	21.65

(B-9-2)12cccl. Geo. D. Reeder. Altitude of measuring point. 4,298.12 feet above sea level.

Water level, in feet below measuring point, 1939

Apr. 6	9.05	Aug. 8	8.24	Dec. 26	7.20
May 31	7.03	Oct. 3	5.98		

(B-9-2)12ccd1. Geo. D. Reeder.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 6	16.28	Apr. 6	15.88	Aug. 8	15.50	Dec. 26	15.14
Mar. 25	15.86	May 31	14.54	Oct. 3	15.37		

(B-9-2)14dacl. W. W. and J. F. Knudsen.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 6	19.53	May 31	a 28.44	Oct. 3	18.60
Apr. 6	20.14	Aug. 8	a 29.08	Dec. 26	19.41

(B-9-2)25bdal. First National Bank of Brigham City.

Water level, in feet below measuring point, 1939

Feb. 6	23.25	May 31	21.75	Oct. 3	21.72
Apr. 6	25.55	Aug. 5	21.31	Dec. 28	23.6 <sup>±</sup>

(B-9-2)35dcd1. H. F. Hansen. (B-9-2)35dc in Water-Supply Paper 817.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 6	42.27	Apr. 6	42.76	Aug. 5	41.73	Dec. 28	41.42
Mar. 25	42.72	May 31	41.94	Oct. 3	38.29		

a Pumping.



## Box Elder County--Continued

(B-9-3)1bbb1. Federal Land Bank.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 9	8.69	May 31	5.87	Sept. 30	6.28
Apr. 6	5.53	Aug. 8	6.28	Dec. 26	5.80

(B-10-3)8dcl. S. N. Cole. Water levels, in feet below measuring point, 1939: Apr. 6, 5.95; Aug. 8, 8.98; Sept. 30, 9.27; Dec. 26, 8.74.

(B-10-3)9aaa. Henry Berchtold.

Water level, in feet below measuring point, 1939

Feb. 9	5.74	May 31	4.58	Sept. 30	3.46
Apr. 6	4.20	Aug. 8	6.17	Dec. 26	6.82

(B-10-3)32aaa. B. E. Stallings.

Water level, in feet below measuring point, 1939

Apr. 6	4.04	Aug. 8	2.42	Dec. 26	5.44
May 31	3.97	Sept. 30	3.08		

(B-10-5)26. Grazing Service. Used stock well, diameter 8 to 6 inches, depth 333 feet. Measuring point, top of casing, level with land surface. Water level, in feet below measuring point, 1939: Sept. 29, 94.48.

(B-10-18)28dca. Grazing Service. Used stock well, diameter 6½ inches, depth 252 feet. Measuring point, bottom of hole in casing under discharge pipe, 1.3 feet above land surface. Water level, in feet below measuring point, 1939: Sept. 29, 119.90.

(B-11-3)21bbb1. J. A. House.

Water level, in feet below measuring point, 1939

Feb. 9	4.83	May 31	4.76	Sept. 30	5.00
Apr. 6	4.90	Aug. 8	5.01	Dec. 26	5.22

(B-11-3)21bb2. J. A. House.

Water level, in feet below measuring point, 1939

Feb. 9	3.95	May 31	3.19	Sept. 30	4.27
Apr. 6	4.34	Aug. 8	4.18	Dec. 26	4.29

(B-11-3)21bbb1. J.A.House

Water level, in feet above measuring point, 1939

Feb. 9	5.45	May 31	6.75	Sept. 30	5.2
Apr. 6	6.5	Aug. 8	5.85	Dec. 26	5.4

(B-11-4)11aaal. Fred Deininger. Measuring point, 2.03 feet above top of casing.

Water level, in feet below measuring point, 1939

Feb. 9	9.87	May 31	9.68	Sept. 30	8.83
Apr. 6	10.28	Aug. 8	9.02	Dec. 26	9.40

## Box Elder County--Continued

(B-11-4)14ba. I. D. Newman.

Water level, in feet above measuring point, and flow, in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow	Date	Water level	Flow
Feb. 9	0.78	2.5	May 31	0.73	2.2	Sept. 30	0.85	2.2
Apr. 6	0.20	1.7	Aug. 8	0.89	2.5	Dec. 26	0.97	2.3

(B-11-18)2cdbl. Drought Relief Administration. Water level, in feet above measuring point, 1939: Sept. 28, a/2.14.

(B-11-18)3aadl. No measurements made in 1939.

(B-11-18)22aa. Annie L. Paskett. Water level, in feet below measuring point, 1939: Sept. 28, 20.13.

(B-11-18)23bb. Central Pacific Railroad. Water level, in feet below measuring point, 1939: Sept. 28, 20.20.

(B-12-3)11db1. (B-12-3)11db in Water-Supply paper 845. R. D. McFarlane. About 20 feet south of gasoline service station. Water level, in feet below measuring point, 1939: Feb. 8, 10.69; Apr. 6, 5.57; May 31, 6.14. Well destroyed.

(B-12-3)11db2. R. D. McFarlane, Riverside. Diameter 1 $\frac{1}{4}$ -inches, depth shallow. About 200 feet west of (B-12-3)11db1, at a concrete trough. Measuring point, lip of pitcher pump, 3.2 feet above land surface, and level with top of concrete curb. Water level, in feet below measuring point, 1939: Aug. 8, 7.13; Sept. 28, 7.32; Dec. 26, 11.9 $\pm$ .

(B-12-3)26acd1. Thomas Rampton. Pressure system connected to well; measurements discontinued.

(B-12-4)11cb. Adolph Harris.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 6	117.67	Aug. 8	116.86	Dec. 26	116.72
May 31	117.1	Sept. 28	116.82		

(B-12-11)22. Drought Relief Administration. Water level, in feet below measuring point, 1939: Sept. 29, 9.84.

(B-12-11)28ba. Albert Crandall. Water level, in feet above measuring point, 1939: Sept. 29, 0.20, found flowing 0.9 gallon per minute.

(B-12-14)2ab. F. J. Hirschie. Water level, in feet below measuring point, 1939: Sept. 29, 12.55.

(B-12-18)13a. Tanner. Water level, in feet below measuring point, 1939: Sept. 28, 17.57.

(B-12-18)25ba. Elmer Kimber. Well dry 19 feet below measuring point, Sept. 28, 1939.

(B-12-18)35aa. Geo. Blanthorne. Wind mill and pump re-installed. Water levels, in feet below measuring point, 1939: Sept. 28, b/ 28.18, c/ 26.58, d/ 25.28.

a Found flowing.

b Pumping.

c Measurement made 5 minutes after pumping stopped.

d Measurement made 10 minutes after pumping stopped.

## Box Elder County--Continued

(B-13-5)17bb. Ross A. Miller. Water levels, in feet below measuring point, 1939: Apr. 6, a/ 97.77; Aug. 8, 63.20; Sept. 28, 63.22; Dec. 26, 63.23.

(B-13-5)28cb. Joseph Aebischuer. Water levels, in feet below measuring point, 1939: Apr. 6, 62.14; Aug. 8, 62.39; Sept. 28, 62.39; Dec. 26, 62.60.

(B-13-6)1d. Radcliffe Henrie. Well measurements discontinued. Water level in well not true ground-water level; well partly plugged with silt. Measurements discontinued.

(B-13-13)28dd. L. G. Carter. Formerly Arnold R. Goodliffe, Water level, in feet below measuring point, 1939: Sept. 29, 12.22.

(B-13-13)32aa. John Vance. Water level, in feet below measuring point, 1939: Sept. 29, 33.34.

(B-13-14)25cb. J. H. Kunzler. Water level, in feet below measuring point, 1939: Sept. 29, 15.73.

(B-13-14)26bd. W. A. Newman. Water level, in feet below measuring point, 1939: Sept. 29, 19.45.

(B-14-8)11ab. Brady S. Cutler. Water levels, in feet below measuring point, 1939: Aug. 8, 48.70; Sept. 28, 47.92; Dec. 26, 47.47.

(B-14-9)10ad. Abe Rose. Water levels, in feet below measuring point, 1939: Apr. 6, 101.60; Aug. 8, 97.77; Sept. 28, 98.43; Dec. 26, 97.02.

(B-14-5)3dd. M. A. Smith. Water level, in feet below measuring point, 1939: Sept. 28, 51.00.

(B-14-5)11cc. Mrs. C. B. Tracy. Water level, in feet below measuring point, 1939: Sept. 28, 23.97.

(B-15-14)36. H. Alberts. Water level, in feet below measuring point, 1939: Sept. 28, 8.67.

## Cache County

(A-9-1)10add. Drought Relief Administration.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 7	27.06	June 1	25.52	Oct. 3	28.23
Apr. 4	26.06	Aug. 5	27.90	Dec. 28	27.42

(A-10-1)4ab. O. H. Anderson.

Water level, in feet below measuring point, 1939

		Inside of casing			
Feb. 7	11.28	June 2	11.70	Oct. 3	10.42
Apr. 4	11.60	Aug. 5	10.49	Dec. 28	11.03
		Outside of casing			
Feb. 7	(b)	June 2	5.97	Oct. 3	5.84
Apr. 4	5.92	Aug. 5	6.04	Dec. 28	(b)

a Pumping.

b Water frozen.

## Cache County--Continued

(A-11-1)3bda. Drought Relief Administration.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 7	33.89	June 1	34.91	Oct. 3	36.05
Apr. 5	35.53	Aug. 7	35.20	Dec. 27	36.17

(A-11-1)5abl. W. H. Baxter.

Daily noon pressure head, in feet above measuring point, 1939

Date	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13.3	13.2	12.8	13.0	12.3	12.6	12.4	12.3	12.0
2	13.3	13.2	....	12.9	12.5	12.7	12.4	12.3	12.2
3	13.3	13.2	12.9	12.7	12.6	12.8	12.6	12.4	12.0
4	13.3	13.3	13.0	12.7	12.4	12.9	12.6	12.5	a 12.0
5	13.3	13.2	....	12.7	12.5	13.0	12.6	12.2	....
6	13.3	13.2	....	12.5	12.4	12.7	12.4	12.1	....
7	13.3	13.2	....	12.5	12.5	12.6	12.5	12.1	....
8	13.2	13.2	....	12.6	12.5	12.5	12.3	12.2	....
9	13.2	12.9	....	12.5	12.4	12.4	12.4	12.4	....
10	13.3	12.7	....	12.5	12.6	12.8	12.6	12.4	....
11	13.5	12.8	....	12.5	12.4	12.6	12.7	12.2	....
12	13.5	....	....	12.6	12.3	12.7	12.7	12.4	....
13	13.3	....	....	12.6	12.5	12.5	12.7	12.4	....
14	13.4	....	....	12.6	12.5	12.6	12.3	12.5	....
15	13.3	....	....	12.5	12.4	12.7	12.4	12.5	....
16	13.3	12.7	12.5	12.5	12.6	12.7	12.2	12.6	....
17	13.3	....	12.8	12.6	12.7	12.8	12.2	12.7	....
18	13.4	....	....	12.6	12.5	13.2	12.2	12.3	....
19	13.3	....	....	12.6	12.5	13.1	12.2	12.2	....
20	13.3	....	....	12.5	12.7	12.8	12.3	12.0	....
21	13.4	....	13.0	12.6	12.6	12.4	12.4	12.0	....
22	13.2	....	13.0	12.7	12.6	....	12.2	12.1	....
23	13.1	....	12.9	12.6	12.6	....	12.2	12.1	....
24	13.0	....	....	12.5	12.5	12.5	12.3	12.4	....
25	13.2	....	13.0	12.6	12.5	12.5	12.4	12.3	....
26	13.2	....	12.7	12.6	12.5	12.6	12.3	12.2	....
27	13.3	....	12.5	12.6	....	12.6	12.3	12.4	....
28	13.5	12.9	12.6	12.7	....	13.0	12.4	12.0	....
29	13.3	....	12.8	12.7	....	12.4	12.3	12.2	....
30	13.3	....	12.8	12.5	....	12.4	12.3	12.0	....
31	13.3	....	12.8	....	....	....	12.4	12.0	....

(A-11-1)8dda3. Amalgamated Sugar Company.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 7	b 11.8	June 1	b 10.8	Oct. 2	10.6
Apr. 5	b 10.9	Aug. 7	b 10.2	Dec. 27	10.2

(A-11-1)8ddb2. Amalgamated Sugar Company.

Water level, in feet above measuring point, 1939

Feb. 7	13.7	June 1	12.2	Oct. 2	12.8
Apr. 5	12.8	Aug. 7	11.8	Dec. 27	12.1

(A-11-1)18ddd1. Loverus Olsen. Found flowing prior to all measurements. Measuring point changed to top of ell, 1.1 feet above former measuring point, altitude 4,480.1 feet above sea level.

- a Recording pressure gage removed.  
b Found flowing.

## Cache County--Continued

(A-11-1)18ddd1.--Continued

Water level, in feet above measuring point and flow,  
in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Feb. 7	5.2	18.2	Aug. 7	3.18	16.0
Apr. 5	3.7	16.2	Oct. 3	3.25	15.0
June 1	3.25	15.0	Dec. 27	2.90	15.0

(A-11-1)30bbd2. Leroy S. Hill.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 7	3.79	June 2	6.00	Oct. 3	6.03
Apr. 5	5.24	Aug. 7	6.10	Dec. 27	6.15

(A-12-1)3bbb1. Smithfield Irrigation Company. Water levels, in feet below measuring point, 1939: Apr. 5, 13.63; June 1, 9.82; Oct. 2, 7.45; Dec. 27, 11.50.

(A-12-1)3bbb2. Nora Johnson.

Water level, in feet below measuring point, 1939

Feb. 8	13.00	June 1	11.56	Oct. 2	9.72
Apr. 5	15+	Aug. 7	10.17	Dec. 27	13.63

(A-12-1)16bcd1. Logan City and Cache County. Found flowing prior to all measurements.

Water level, in feet above measuring point, 1939

Feb. 8	16.9	Aug. 7	8.2	Dec. 27	17.1
Apr. 5	15.9	Oct. 2	10.7		

(A-12-1)16ccal. Benson Irrigation Company.

Water level, in feet above measuring point, 1939

Feb. 8	45.6	Aug. 7	a 44.1	Dec. 27	41.85
Apr. 5	43.3	Oct. 2	42.1		

(A-12-1)28cdcl. Homa Andrew. Found flowing prior to all measurements.

Water level, in feet above measuring point and flow  
in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Feb. 7	2.45	5.3	Aug. 7	0.80	5.4
Apr. 5	1.09	5.9	Oct. 2	0.60	5.0
June 1	1.18	6.2	Dec. 27	0.58	5.0

(A-12-1)31dabl. R. S. Painter.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 7	35.4	May 31	31.7	Sept. 30	32.7
Apr. 5	34.1	Aug. 8	30.65	Dec. 28	34.0

a Found flowing.

## Cache County--Continued

(A-13-1)16ccb1. A. A. Miles.

Water level, in feet above measuring point and flow  
in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Apr. 5	3.95	...	Aug. 7	a 8.0	40.
June 1	a 6.4	40.	Oct. 2	a 7.0	37.5

(A-13-1)20acb1. James Hind.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 5	22.2	Aug. 7	27.2	Dec. 27	23.4
June 1	a 25.7	Oct. 2	25.3		

(A-13-1)29bdb1. J. C. Cannell. Flow, in gallons per minute, 1939:  
June 1, 10; Aug. 7, 12.5; Oct. 2, 8.8.

Water level, in feet, with reference to measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 8	-0.60	June 1	a +2.07	Oct. 2	a +2.23
Apr. 5	-2.49	Aug. 7	a +2.86	Dec. 27	-0.91

(A-13-1)13ccc1. W. G. Reese. Flow, in gallons per minute, 1939:  
Feb. 8, 2.2; Apr. 5, 2.2. Water levels, in feet above measuring point,  
1939: Feb. 8, 9.05; Apr. 5, 11.0; May 31, 7.25. Well undesirable as  
observation well because of gas discharged with water; measurements dis-  
continued.(A-14-1)22bad1. C. B. Stoddard. Flow, in gallons per minute, 1939:  
Aug. 7, 20.0; Oct. 3, 8.9.

Water level, in feet above measuring point, 1939

Apr. 5	4.2	Aug. 7	a 4.6	Dec. 27	0.88
June 1	10.2	Oct. 3	a 2.26		

(A-14-1)22bbd2. H. H. Merrill. Water level, in feet above measuring  
point, 1939: Aug. 7, 19.4; Oct. 3, 16.8; Dec. 27, 14.7.

(A-14-1)34adb1. Crockett Well Co.

Water level, in feet below measuring point, 1939

Feb. 8	18.05	Aug. 7	12.42	Dec. 27	19.79
Apr. 5	13.82	Oct. 3	16.39		

(A-14-1)34cac1. (A-14-1)34bdc3 in Water-Supply Papers 840 and 845;  
(A-14-1)34ca in Water-Supply Paper 817. Victor Johnson.

Water level, in feet above measuring point, 1939

Apr. 5	14.9	Aug. 7	a 8.7	Dec. 27	11.9
June 1	a 12.7	Oct. 3	a 8.2		

(A-14-1)34dca1. Drought Relief Administration (Richmond Irrigation  
Co.). Water level, outside of casing, in feet below measuring point, 1939:  
June 1, 2.52.

Water level, in feet below measuring point, 1939

Apr. 5	2.89	Aug. 7	3.05	Dec. 27	5.83
June 1	0.18	Oct. 3	5.45		

a Found flowing.

## Cache County--Continued

(B-11-1)3bcd1. (B-11-1)3ca in Water-Supply Papers 817, 840 and 845 Utah Power and Light Co. State claim no. 15,787. Found flowing prior to all measurements. Flow, in gallons per minute, 1939: Feb. 7, 0.5; Apr. 5, 0.8; Aug. 7, 0.7.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 7	3.77	June 1	4.8	Oct. 2	4.25
Apr. 5	5.0	Aug. 7	4.5	Dec. 27	4.45

(B-11-1)13bbcl. Alma Olson.

Water level, in feet above measuring point, 1939

Feb. 7	39.3	June 1	37.8	Oct. 2	35.8
Apr. 5	38.9	Aug. 7	35.65	Dec. 27	38.35

(B-11-1)35caal. James Lieshman. State claim no. 1475.

Water level, in feet above measuring point, 1939

Feb. 7	15.6	June 2	12.5	Oct. 3	a 13.2
Apr. 5	11.4	Aug. 5	a 12.2	Dec. 27	11.4

(B-11-1)35dad1. Andrew Hutcheson.

Water level, in feet above measuring point and flow, in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Feb. 7	6.4	7.0	Aug. 5	3.95	4.5
Apr. 5	4.9	6.0	Oct. 3	3.68	3.6
June 2	4.5	5.0	Dec. 27	3.63	3.8

(B-12-1)8cdb2. Edward Edwards. State claim no. 16851. Measuring point, 2.0 feet above land surface instead of 0.8 foot above land surface as given for the same well, (B-12-1)8cd1, in Water-Supply Paper 817. Found flowing from  $\frac{1}{2}$ -inch pipe prior to all measurements.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 5	7.0	Aug. 8	6.7	Dec. 28	6.95
May 31	7.25	Sept. 30	7.15		

(B-12-1)26cdb1. Utah Power and Light Company.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 7	23.7	May 31	14.9	Sept. 30	19.2
Apr. 5	19.2	Aug. 8	13.8	Dec. 28	23.2

(B-13-1)30accl. E. R. Ballard.

Water level, in feet above measuring point and flow in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Apr. 5	14.9	...	Sept. 30	17.0	1.7
May 31	16.2	1.9	Dec. 28	16.05	1.6
Aug. 8	16.5	1.8			

a Found flowing.

## Davis County

(A-2-1)6acc3. R. G. Ford. Centerville. State claim no. 4508. Used irrigation well, diameter 3 inches, depth 59 feet. Measuring point, top of 3-inch ell, 1.2 feet above land surface and 4,241.64 feet above sea level. Nov. 20, 1939: Flow, 7.9 gallons per minute; temperature of water, 55°F.; water level, in feet above measuring point, 1.58.

(A-2-1)6cddl. Lund Home, Zion's Aid Society, Centerville. State claim no. 193. Used irrigation well, diameter 3 inches, depth 60 feet. Measuring point, top of 3-inch tee, 1.0 foot above land surface. Nov. 20, 1939: Flow, 33.3 gallons per minute; temperature of water, 66°F.; water level, in feet above measuring point, 31.5.

(A-2-1)6dcd1. Lund Home, Zion's Aid Society, Centerville. State claim no. 187. Diameter  $1\frac{1}{2}$  inches, depth 60 feet. Measuring point, top of casing, 0.35 foot below top of ell, level with land surface and 4,302.33 feet above sea level. Water level, in feet below measuring point, 1939: Nov. 20, 0.90.

(A-2-1)7aabl. Ben Brown, Centerville. State claim no. 214. Diameter 3 inches, depth 150 feet. Measuring point, top of ell, 0.35 foot above top of casing, 0.8 foot above land surface and 4,302.59 feet above sea level. Nov. 20, 1939: Flow, 0.36 gallon per minute; water level, in feet above measuring point, 0.10.

(A-2-1)7aad. Ozewalla, Centerville. Used domestic well, diameter, 36 inches. Measuring point, top of brick, 0.25 foot below cross on concrete curb, level with land surface. Water level, in feet below measuring point, 1939: Nov. 20, 60.74.

(A-2-1)7acd4. C. A. Parrish. Centerville. State claim no. 179. Domestic and irrigation well, diameter 2 inches, depth 62 feet. Measuring point, top of horizontal tee, 1.0 foot above land surface. Nov. 20, 1939: Flow, 30 gallons per minute; temperature of water, 53°F.; water level, in feet above measuring point, 9.75.

(A-2-1)7dac2. Wesley E. Tingey. Centerville. State claim no. 14,682. Unused well, diameter 60 to 3 inches, depth 61 feet. Measuring point, top of concrete curb at south side, level with land surface. Water level, in feet below measuring point, 1939: Nov. 20, 7.47.

(A-2-1)7dball. Henry Cleveland. Centerville. State claim no. 12,910. Diameter 3 inches, depth 52 feet. Measuring point, top of 3-inch ell, 0.5 foot above land surface and 4,286.74 feet above sea level. Nov. 21, 1939: Flow 42.8 gallons per minute; temperature of water, 55°F.; water level, in feet above measuring point, 15.6.

(A-2-1)7dbb1. Henry Cleveland. Centerville. State claim no. 12,911. Diameter 3 inches, depth 300 feet. Measuring point, top of 3-inch ell, 0.5 foot above land surface and 4,279.10 feet above sea level. Nov. 21, 1939: Flow, 30 gallons per minute; temperature, 62°F.; water level, in feet above measuring point, 25.2.

(A-2-1)7ddcl. Centerville City Corp. Centerville. State claim nos, 4989 and 8155. Diameter  $12\frac{1}{2}$  inches, depth 370 feet. Measuring point, edge of hole in pump base, 1.0 foot above land surface. Water level, in feet below measuring point, 1939: Nov. 20, 17.28.

(A-2-1)17cba2. E. E. Randall. Centerville. Diameter 72 inches, reported depth 47 feet, measured depth 43 feet. Measuring point, top of base of instrument shelter, 0.8 foot above top of concrete curb, 1.0 foot above land surface and 4,358.88 feet above sea level. Water level, in feet below measuring point, 1939: Nov. 20, 42.12.



## Davis County--Continued

(A-2-1)17ccbl. Will Holbrook.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 2	31.08	June 5	27.37	Oct. 6	29.45
Apr. 1	32.95	Aug. 3	27.37	Nov. 20	31.51

(A-2-1)18aabl. E. O. Reading. Centerville. State claim no. 9,314. Diameter 3 inches, depth 80 feet. Measuring point, top of 3-inch ell, 0.4 foot above land surface. Water level, in feet below measuring point, 1939: Nov. 21, 1.78.

(A-2-1)18aab2. Frank Earl. Centerville. State claim no. 9,315. Diameter  $2\frac{3}{8}$  inches, depth 60 feet. Measuring point, top of ell, 0.6 foot above land surface and 4,308.40 feet above sea level. Nov. 21, 1939: Flow, 1.6 gallons per minute; temperature of water, 53°F.; water level, in feet above measuring point, 1.35.

(A-2-1)18aab. Frank Earl. Centerville. Diameter  $1\frac{1}{2}$  inches. Measuring point, top of  $1\frac{1}{2}$ -inch casing, level with land surface. Water level, in feet below measuring point, 1939: Nov. 21, 1.84.

(A-2-1)18abd. T. Q. Williams.

Daily noon pressure head, in feet above measuring point, 1939

Date	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	18.0	18.1	17.9	18.3	20.3	21.3	15.9	13.3	12.6	14.2	15.5	14.8
2	18.1	17.9	18.0	18.5	20.5	21.9	14.8	13.4	10.9	14.3	15.5	14.8
3	18.1	18.0	18.0	18.4	20.5	21.9	15.2	12.5	12.7	14.3	15.5	14.8
4	18.0	18.1	18.0	18.7	20.6	21.2	15.2	12.6	13.2	14.5	15.4	14.4
5	18.1	18.1	17.9	18.8	17.8	21.4	16.7	11.8	12.7	14.5	15.3	14.6
6	18.0	17.9	17.9	17.6	19.5	21.6	16.7	11.4	10.4	14.4	15.3	14.6
7	18.0	18.1	18.0	18.8	19.3	22.0	17.0	11.1	11.0	14.4	15.3	14.6
8	18.0	18.1	18.0	19.2	19.8	21.8	13.3	13.5	13.6	14.4	14.2	14.6
9	17.9	18.1	18.0	18.5	20.4	21.5	13.2	14.3	14.2	14.5	14.1	14.6
10	18.2	17.9	18.0	19.1	19.8	22.0	13.7	12.5	14.4	14.8	13.9	14.7
11	18.2	17.9	18.0	19.2	19.3	21.4	13.8	14.0	14.7	14.8	14.9	14.4
12	18.1	17.9	18.0	19.2	19.7	21.0	13.9	12.2	14.6	15.0	15.1	14.8
13	18.1	17.9	18.0	17.9	20.3	21.4	13.1	11.2	14.8	15.0	15.2	14.8
14	18.1	17.9	18.0	18.7	20.3	17.8	13.4	11.1	14.6	14.7	15.2	14.8
15	18.1	17.9	18.0	19.0	20.0	20.3	15.3	10.9	14.6	14.7	15.2	14.8
16	18.1	17.9	18.0	19.5	20.5	20.5	15.7	10.4	14.6	14.8	15.2	14.5
17	18.1	17.8	18.0	19.6	17.9	20.4	13.5	10.1	14.7	14.8	15.5	14.4
18	18.3	17.9	18.0	19.8	19.7	21.3	12.7	10.3	14.5	14.8	15.5	....
19	18.2	17.9	18.0	19.5	20.0	21.8	14.9	12.6	13.9	14.7	15.5	....
20	18.2	17.8	18.0	19.4	20.1	22.0	15.2	11.1	13.5	14.7	15.3	14.2
21	18.2	17.8	18.0	19.7	20.3	22.1	15.4	13.0	13.3	14.7	15.3	....
22	18.1	17.8	18.1	19.5	19.4	21.4	13.9	13.0	13.2	14.7	15.2	....
23	18.1	18.0	18.0	17.2	19.7	21.0	12.9	12.6	13.8	15.0	15.2	....
24	18.0	18.0	18.0	19.0	19.7	21.0	12.7	12.8	14.2	15.4	14.8	....
25	18.1	18.0	18.1	19.6	20.6	20.8	12.6	12.9	14.2	15.3	15.0	....
26	18.0	18.0	17.7	19.9	20.8	18.8	14.4	12.7	14.3	15.2	15.0	....
27	18.1	17.9	17.7	20.1	20.6	20.2	13.9	12.9	14.3	15.2	15.0	....
28	18.2	17.9	17.8	20.3	18.9	20.1	14.5	12.7	14.0	15.2	15.0	....
29	18.1	....	18.2	20.2	17.7	18.8	15.3	13.0	14.1	15.3	15.2	....
30	18.1	....	18.2	19.9	19.1	17.4	15.5	12.5	14.1	15.4	15.1	15.4
31	18.1	....	18.4	....	19.9	....	15.4	12.2	....	15.5	....	15.3

(A-2-1)18abd14. Jos. E. Williams. Centerville. State claim no. 17,215. Diameter 3 inches. Measuring point, top of 3-inch ell, 1.5 feet above land surface. Nov. 20, 1939: Flow, 14.3 gallons per minute; water level, in feet above measuring point, 2.80.

(A-2-1)18adal. Perry G. Tingey. Centerville. State claim no. 941. Diameter 3 inches, depth 60 feet. Measuring point, top of  $1\frac{1}{2}$ -inch coupling, 0.6 foot above land surface. Water level, in feet below measuring point, 1939: Nov. 21, 0.52.

## Davis County--Continued

(A-2-1)18ada2. Perry G. Tingey. Centerville. State claim no. 942. Diameter 3 inches, depth 60 feet. Measuring point, top of 2-inch ell, 1.35 feet above top of 3-inch casing, 2.0 feet above land surface and 4,311.01 feet above sea level. Water level, in feet below measuring point, 1939: Nov. 21, 0.87.

(A-2-1)18ada3. Perry G. Tingey. Centerville. State claim no. 943. Diameter 3 inches, depth 60 feet. Measuring point, top of 3-inch casing, 2.0 feet below top of 2-inch ell, 0.5 foot above land surface. Nov. 21, 1939: Flow, 14.3 gallons per minute; temperature of water, 55°F.; water level, in feet above measuring point, 2.08.

(A-2-1)18baa1. (A-2-1)18ba in Water-Supply Paper 817. F. W. Cottrell.

## Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 2	34.25	June 6	38.7	Oct. 5	31.7
Apr. 1	35.0	Aug. 3	26.85		

(A-2-1)18bab. ----- Centerville. Located 30 feet north of red brick house on north side of Porters Lane, about 200 feet east of north-south lane. Diameter 60 inches, depth 10.5 feet. Measuring point, top of 2-inch by 4-inch sill on cover, 2.0 feet above land surface. Water level, in feet below measuring point, 1939: Nov. 21, 7.38.

(A-2-1)18cab8. T. C. and E. Waddoups. Woods Cross. State claim no. 15,211. Diameter 2 inches, depth 125 feet. Measuring point, top of 3-inch ell, 2.0 feet above land surface and 4,273.61 feet above sea level. Nov. 21, 1939: Flow, 33.3 gallons per minute; temperature of water, 58°F.; water level, in feet above measuring point, 12.5.

(A-2-1)18dba. Pat Rice. Centerville. Dug well. Measuring point, top of concrete curb, 1.9 feet above land surface. Water level, in feet below measuring point, 1939: Nov. 20, 30.45.

(A-2-1)18dba3. Anna E. M. Bangerter.

## Water level, in feet above measuring point, 1939

Feb. 2	10.4	June 5	12.9	Oct. 5	7.1
Apr. 1	11.5	Aug. 3	a 4.5	Nov. 20	b 7.3

(A-2-1)18dbb. Earl L. Burnham. Centerville. Diameter 72 inches, depth 18 feet. Measuring point, top of concrete curb at north side, level with land surface. Water level, in feet below measuring point, 1939: Nov. 20, 8.15.

(A-2-1)18ddcl. Smith, Black and Duncan. Centerville. State claim no. 12,569. Diameter 48 inches, depth 50 feet. Measuring point, top of rock curb at cross, level with land surface. Water level, in feet below measuring point, 1939: Nov. 20, 27.02.

(A-2-1)19aad1. Moses Holbrook.

## Water level, in feet below measuring point, 1939

Feb. 2	61.33	June 5	50.59	Oct. 6	58.31
Apr. 1	63.26	Aug. 3	56.53		

(A-2-1)19dbcl. Bountiful City Corporation. Water level, in feet below measuring point, 1939: Feb. 2, 69.21; Apr. 1, 67.98; June 5, 66.02; Oct. 6, 72.78.

a Found flowing.

b Flow, 30 gallons per minute; temperature of water 55°F.

## Davis County--Continued

(A-3-1)31bdd1. Roy White. Centerville. At old pump house in trees, 60 feet west of highway, 100 feet north of east-west lane and 300 feet south of deserted stone house. Dug well. Measuring point, top of 2-inch well cover, 1.0 foot below land surface. Water level, in feet below measuring point, 1939: Nov. 20, 14.32.

(A-3-1)31cb. Robert Moss. Found flowing prior to all measurements.

Water level, in feet, above measuring point,  
and flow in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Feb. 2	10.9	1.8	Aug. 3	10.25	1.7
Apr. 1	10.8	1.7	Oct. 5	10.7	1.7
June 6	10.8	1.7			

(B-2-1)13acc2. Lewis Reed. Woods Cross. Diameter 2 inches. Measuring point, top of tee, 1.5 feet above land surface and 4,231.64 feet above sea level. Nov. 21, 1939: Flow, 28.3 gallons per minute; temperature of water, 54°F.; water level, in feet above measuring point, 35.8.

(B-2-1)24aab7. Mable Barlow. Centerville. State claim no. 12,518. Diameter 2 inches, depth 140 feet. Measuring point, top of 2-inch ell, 3.4 feet above land surface. Nov. 21, 1939: Flow, 30 gallons per minute; temperature of water, 52°F.; water level, in feet above measuring point, 14.8.

(B-2-1)25bad2. Myrtle Hatch.

Water level, in feet, with reference to measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 2	+4.35	June 6	a +3.1	Oct. 6	-0.90
Apr. 1	+4.9	Aug. 3	-1.36		

(B-2-1)26aad1. Clyde Hatch.

Water level, in feet above measuring point, 1939

Feb. 2	45.9	June 6	41.95	Oct. 6	38.9
Apr. 1	46.35	Aug. 3	37.15		

(B-2-1)27cdd4. Albert Thalman

Water level, in feet above measuring point, 1939

Feb. 2	+31.5	June 6	19.4	Oct. 6	21.6
Apr. 1	30.9	Aug. 3	18.25		

(B-2-1)34ada3. Marlow H. Dearden.

Water level, in feet above measuring point, 1939

Feb. 2	20.4	June 6	11.3	Oct. 6	10.9
Apr. 1	20.0	Aug. 3	10.6		

(B-2-1)35ada6. Anna I. Lemon. Measurements made by W. S. Lemon.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 2	15.15	Mar. 20	14.19	Apr. 26	13.36	May 29	10.79
6	15.10	22	14.33	29	13.34	31	9.75
9	15.04	28	14.42	May 5	13.27	June 2	9.72
11	15.03	31	14.50	14	11.73	9	10.16
16	15.11	Apr. 7	14.60	20	11.12	22	10.12
20	15.02	12	14.53	23	11.20	27	9.78
Mar. 9	14.58	18	14.45	26	11.20	30	8.75
15	14.20	23	14.04				

a Found flowing.

## Davis County--Continued

(B-2-1)35ada6--Continued

Water level, in feet above measuring point, 1939							
Date	Water level	Date	Water level	Date	Water level	Date	Water level
July 9	9.03	Aug. 5	8.47	Sept. 11	7.97	Oct. 29	9.18
12	8.84	7	8.33	14	7.93	31	9.31
13	8.69	12	7.95	16	7.97	Nov. 2	9.37
14	8.68	13	8.19	19	7.87	6	9.39
16	8.70	16	7.97	25	7.83	9	9.45
17	8.79	18	7.62	28	7.87	13	9.90
18	8.79	20	7.43	Oct. 4	8.08	21	10.43
20	8.43	21	7.19	8	8.45	30	10.79
22	7.97	24	7.45	11	8.91	Dec. 7	11.17
23	8.37	27	7.60	12	8.97	17	11.31
27	8.20	30	7.69	15	9.06	20	11.24
29	8.02	Sept. 3	7.78	19	9.20	24	11.26
31	7.99	6	7.83	22	9.22	28	11.26
Aug. 2	7.95	9	7.79	28	9.39	31	11.24
4	7.78						

(B-2-1)36bad2. Millicent Parkin.

Water level, in feet below measuring point, 1939									
Date		Water level		Date		Water level			
Feb.	2	16.95		June	6	19.75			
Apr.	1	16.99		Aug.	3	19.63			
						Oct.	6	19.82	

(B-2-1)35bbdl. Anna I. Lemon.

Daily noon pressure head, in feet above measuring point, 1939												
Date	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	8.1	7.7	7.0	7.5	6.3	4.1	3.9	a 0.8	a 0.7	1.3	1.8	2.9
2	8.1	7.6	7.1	7.6	6.4	4.3	3.5	a 0.9	a 0.8	1.0	1.8	3.0
3	8.2	7.7	7.2	7.4	6.5	4.5	3.3	a 0.9	a 1.0	1.3	2.0	3.0
4	8.1	7.6	7.4	7.5	6.6	4.5	3.2	a 0.9	a 1.1	1.2	1.6	2.9
5	8.1	7.6	7.3	7.5	6.6	4.4	3.1	a 0.7	a 1.0	1.5	1.7	3.1
6	8.1	7.7	7.3	7.5	6.3	4.2	2.9	a 0.2	a 1.0	0.8	1.6	3.1
7	8.0	7.7	7.4	7.7	6.1	4.3	3.3	a 0.4	a 0.2	0.5	1.7	3.1
8	8.0	7.8	7.3	7.8	5.6	4.4	3.4	a 0.4	a 0.4	0.4	2.0	3.3
9	7.9	7.6	7.4	7.5	5.7	4.5	3.2	a 0.6	a 0.5	0.6	1.8	3.4
10	8.0	7.6	7.4	7.4	5.7	4.7	a 1.4	a 0.6	a 0.7	0.9	1.8	3.2
11	8.0	7.6	7.3	7.5	5.4	4.5	a 1.5	a 0.5	a 0.9	1.4	2.0	3.1
12	8.0	7.6	7.2	7.5	5.1	4.6	a 1.4	a 0.5	a 0.8	1.6	2.1	2.8
13	8.0	7.1	7.2	7.4	5.2	4.8	a 1.5	a 0.7	a 0.9	1.6	2.4	3.0
14	8.1	7.1	7.0	7.4	5.2	4.7	a 1.5	a 0.8	a 0.4	1.7	2.4	3.0
15	8.1	7.2	7.1	7.4	5.1	4.4	a 1.4	a 0.8	a 0.5	1.6	2.4	3.2
16	7.9	7.1	7.1	7.4	5.0	4.1	a 1.1	a 0.8	a 0.7	1.6	2.4	3.2
17	7.9	7.1	7.1	7.4	4.9	3.9	a 1.0	a 0.8	a 0.8	1.7	2.5	3.3
18	7.9	7.2	7.2	7.5	5.1	3.5	a 1.4	a 0.7	a 1.1	1.7	2.5	2.9
19	7.8	7.1	7.1	7.4	4.7	3.9	a 1.2	a 0.5	a 1.1	1.6	2.5	3.0
20	8.0	7.0	7.1	7.4	4.7	4.2	a 1.1	a 0.6	a 1.2	1.6	2.5	3.2
21	7.9	7.0	7.2	7.5	4.9	4.2	a 1.1	a 0.6	a 1.1	1.7	2.6	3.2
22	7.8	7.0	7.2	7.4	4.6	4.3	a 1.0	a 0.7	a 1.1	1.7	2.7	...
23	7.6	7.1	7.2	7.1	4.7	4.5	a 1.0	a 0.8	a 1.1	1.7	2.7	...
24	7.6	7.2	7.2	6.6	4.5	4.3	a 1.0	a 0.6	a 1.2	2.2	2.8	3.2
25	7.2	7.2	7.3	6.5	4.8	4.3	a 1.0	a 0.7	a 0.8	1.6	2.7	...
26	7.2	7.1	7.2	6.4	4.8	4.3	a 1.0	a 0.7	a 1.0	1.4	3.0	...
27	7.8	7.0	7.2	6.4	4.8	4.1	a 1.0	a 0.6	a 1.0	1.4	2.7	...
28	7.8	7.1	7.3	6.3	4.9	3.9	a 0.7	a 0.5	a 0.9	1.5	2.7	...
29	7.6	...	7.4	6.6	4.8	4.0	a 0.9	a 0.6	a 0.7	1.6	2.7	...
30	7.8	...	7.4	6.3	4.7	4.0	a 0.7	a 0.7	1.1	1.6	2.7	...
31	7.8	...	7.5	...	4.2	...	a 0.8	a 0.8	...	1.7	...	3.0

a Well open and flowing.

## Davis County--Continued

(B-2-1)36ccb1. Farmers State Bank. State claim no. 17,108. Water level, in feet, with reference to measuring point, 1939: Apr. 1, +2.38; June 6, -2.25; Aug. 3, -4.23; Oct. 6, -4.38.

(B-3-1)15aab1. (B-3-1)15aa in Water-Supply Paper 817. Drought Relief Administration.

## Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 2	16.13	June 6	15.75	Oct. 5	16.41
Apr. 1	16.22	Aug. 3	16.39		

(B-3-1)24aaa4. Lagoon Resort.

## Water level, in feet above measuring point, 1939

Feb. 2	8.0	June 6	9.2	Oct. 5	+7.6
Apr. 1	7.7	Aug. 3	3.73		

(B-3-1)24aad1. Lagoon Resort.

## Water level, in feet above measuring point, 1939

Feb. 2	7.95	June 6	8.5	Oct. 5	6.3
Apr. 1	8.0	Aug. 3	6.45		

(B-3-1)24aad3. Lagoon Resort. Water level, in feet above measuring point, 1939: Feb. 2, 9.5; Apr. 1, 9.8 (flow, 6.0 gallons per minute); Oct. 5, 8.65. Found flowing prior to all measurements.

(B-4-1)19cd. Charles Layton.

## Water level, in feet, with reference to measuring point, 1939

Feb. 3	a +0.95	June 5	-0.14	Oct. 5	-0.17
Apr. 3	-0.10 <sup>a</sup>	Aug. 3	-0.23		

(B-4-1)29cac1. No measurement made in 1939.

(B-4-1)30ba. W. W. Evans.

## Water level, in feet below measuring point, 1939

Feb. 3	4.32	June 5	3.49	Oct. 5	3.16
Apr. 3	4.43	Aug. 3	3.49		

(B-4-1)33bbb1. J. E. Flint. Measuring point changed to top of 2-inch ell, 0.3 foot above previous measuring point. Found flowing prior to all measurements.

## Water level, in feet above measuring point and flow in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Feb. 3	5.1	....	Aug. 3	3.50	5.7
Apr. 3	4.3	6.6	Oct. 5	3.75	5.8
June 5	6.0				

(B-4-1)34cbc3. Kaysville Canning Corporation.

## Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 2	4.52	June 5	5.09	Oct. 5	5.45
Apr. 3	4.69	Aug. 3	8.31		

a Found flowing, 0.22 gallon per minute.

## Davis County--Continued

(B-4-2)ldcc. (B-4-2)ldc. in Water-Supply Paper 817. Drought Relief Administration.

## Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 4	175.57	June 5	175.88	Oct. 5	176.42
Apr. 3	175.73	Aug. 3	176.35		

(B-4-2)9caal. A. D. Miller. Water level, in feet above measuring point, 1939: Apr. 3, 23.65; June 5, 21.3 (found flowing); Aug. 3, 18.2 (found flowing); Oct. 5, 19.2 (found flowing).

(B-4-2)10daal. Drought Relief Administration.

## Water level, in feet below measuring point, 1939

Jan. 4	38.35	Apr. 6	36.22	Aug. 3	39.94
Feb. 3	36.93	June 5	41.40	Oct. 5	37.38

(B-4-2)16ada2. Clarence W. Smedley. Water level, in feet above measuring point, 1939: Apr. 3, 22.3; June 5, 20.2; Aug. 3, 16.8; Oct. 5, 17.6.

(B-4-2)20bbbl. George Sandoz.

## Water level, in feet above measuring point, 1939

Feb. 3	27.3	June 5	22.6	Oct. 5	24.0
Apr. 3	27.85	Aug. 3	a 19.35		

(B-5-1)29bdb1. Mountain Fuel Supply Company. Unused well, diameter 6 inches, depth 544 feet. Measuring point. top of casing, 10.97 feet below top of wall of concrete pit and 9.0 feet below land surface. Water level, in feet below measuring point, 1939: Nov. 15, 407.8.

(B-5-2)25bbcl. Drought Relief Administration. State application no. 11,938. Driller reports depth to water level was 238 feet when well was drilled and that he believes sand has entered well between overlap in well casings at point of reduction in casing size, about 250 feet below land surface, and that the water level does not now represent the true water level of the lower aquifer.

## Water level, in feet below measuring point, 1939

Feb. 3	184.02	June 5	184.56	Oct. 5	185.86
Apr. 13	184.20	Aug. 3	185.84		

(B-5-2)26aa. J. J. Sepal. Water level, in feet below measuring point, 1939: Feb. 3, 4.73; Apr. 3, 4.60; June 5, 2.53. Well capped; measurements discontinued.

(B-5-3)36adal. (B-5-3)36adl in Water-Supply Paper 817. Mary Stoddard.

## Water level, in feet above measuring point, 1939

Feb. 3	30.3	June 5	28.2	Oct. 5	25.5
Apr. 3	30.0	Aug. 4	24.55		

## Duchesne County

U(B-1-1)31ddb. Morris Woodward. Water level, in feet below measuring point, 1939; Sept. 7, 6.65.

a Found flowing.

## Duchesne County--Continued

U(B-4-3)2bad1. Duchesne City. Duchesne. State application no. 12,553. Unused well, diameter 96 inches, depth 20 feet. Measuring point, top of concrete curb at northeast side, 1.0 foot below land surface. Water level probably fluctuates with river stage. Water level, in feet below measuring point, 1939: Sept. 5, 3.37.

U(C-1-2)4adcl. Drought Relief Administration. Water level, in feet below measuring point, 1939: Sept. 7, a/ 20.41; Sept. 7, b/ 20.22.

U(C-1-2)15bbcl. R. M. Clark. Water level, in feet above measuring point, 1939: Sept. 7, 11.8 (found flowing 4.1 gallons per minute).

U(C-1-2)27aaa. Drought Relief Administration. Water level, in feet above measuring point, 1939: Sept. 7, 13.0 (found flowing 6.5 gallons per minute).

U(C-1-3)28dcd1. D. H. Allred. Bluebell. Stock well, diameter 5 inches, depth 30 feet. Measuring point, top of casing, 1.3 feet above land surface. Water level, in feet below measuring point, 1939: Sept. 6, 9.39.

U(C-1-3)31cca5. R. A. Lister. Mt. Emmons. Used domestic well, diameter 54 inches, depth 13 feet. Measuring point, bottom of 2-inch curb sill at east side of curb, 1.0 foot above land surface. Water level, in feet below measuring point, 1939: Sept. 6, 3.16.

U(C-1-4)14aad1. U. S. Forest Service. Altonah. State application no. 12,748. Used domestic well, diameter 32 inches, depth 17 feet. Measuring point, top of galvanized iron casing, level with land surface. Water level, in feet below measuring point, 1939: Sept. 6, 2.73.

U(C-1-4)28dcd1. Drought Relief Administration. Boneta. State claim no. 8,170. Used domestic and stock well, diameter 10 to 6½ inches, depth 600 feet. Measuring point, top of casing, 6.0 feet below land surface. Water level, in feet below measuring point, 1939: Sept. 5, 2.44.

U(C-1-5)13ada2. U(C-1-5)13ad2 in Water-Supply Paper 817. Brigham Stephenson. Water level, in feet below measuring point, 1939: Sept. 6, 7.37.

U(C-1-5)13ada3. U(C-1-5)13ad1 in Water-Supply Paper 817; U(C-1-5)13adal in Water-Supply Papers 840 and 845. Drought Relief Administration. Water level, in feet below measuring point, 1939: Sept. 5, 2.39.

U(C-2-1)15ddal. R. Q. Warnock. State application no. 12,977. Diameter 8 inches, depth 557 feet. Measuring point, top of casing, 2.65 feet below top of ell and 0.5 foot above land surface. Sept. 7, 1939: Flow, 5.0 gallons per minute; temperature of water, 57°F.; water level, in feet above measuring point, 47.95.

U(C-2-1)20dcd1. Brigham Stevenson. Measuring point, top of 1½-inch plug. Water level, in feet above measuring point, 1939: Sept. 1, 19.3, (found flowing 0.18 gallon per minute).

U(C-2-1)22bb. E. H. Peterson. Water level, in feet above measuring point, 1939: Sept. 7, 27.2.

U(C-2-1)22bcb1. Stephen Wogac. Water level, in feet above measuring point, 1939: Sept. 7, 22.9.

a Pumping.

b Pumping stopped 10 minutes prior to measurement.

## Duchesne County--Continued

U(C-2-2)13ccc. J. O. Griffin. Roosevelt. State claim no. 1,861. Diameter  $1\frac{1}{4}$ -inches, depth 110 feet. Measuring point, top of ell on casing, 2.0 feet above land surface. Domestic and stock use. Water level, in feet above measuring point, 1939: Sept. 7, 1.68.

U(C-2-2)23bacl. City of Roosevelt. Water level, in feet above measuring point, 1939: Sept. 7, 11.55, (found flowing; leaking slightly while measurement was made).

U(C-2-3)10dad. George Vangundy. Upalco. Used domestic and stock well, diameter 5 inches, depth 40 feet. Measuring point, top of casing, 1.2 feet above land surface. Water level, in feet below measuring point, 1939: Sept. 6, 17.16.

U(C-2-3)28da. Town of Upalco. Water level, in feet below measuring point, 1939: Sept. 6, 1.88.

U(C-2-3)33ccd1. Eldon B. Thompson. Used domestic and stock well, diameter 2 inches, depth 200 feet. Measuring point, top of ell on casing, 1.5 feet above land surface. Sept. 6, 1939: Flow, 0.27 gallon per minute; water level, in feet above measuring point, 4.85.

U(C-2-5)2bbcl. U(C-2-5)2bb in Water-Supply Paper 817. Drought Relief Administration. Water level, in feet below measuring point, 1939: Sept. 5, 4.24.

U(C-2-5)2bc. Talmage School. Water level, in feet below measuring point, 1939: Sept. 5, 7.11.

U(C-3-3)8cd. Henry Richins. Water level, in feet above measuring point, 1939: Sept. 6, 10.9 (found flowing).

U(C-3-3)17da. Frank Horricks. Water level, in feet below measuring point, 1939: Sept. 6, 9.11.

U(C-3-4)7cal. U(C-3-4)7ca in Water-Supply Paper 817. Knight Investment Co. East well of two wells. Water level, in feet below measuring point, 1939: Sept. 5, 104.73.

U(C-3-4)7ca2. U(C-3-4)7ca in Water-Supply Paper 845. Knight Investment Co. West well of two wells. Water level, in feet below measuring point, 1939: Sept. 5, 101.51.

U(C-3-4)21aa. Knight Investment Co. Water level, in feet below measuring point, 1939: Sept. 5, 97.22.

U(C-3-4)22ba. Knight Investment Co. Water level, in feet below measuring point, 1939: Sept. 5, 149.07.

U(C-3-5)36dc. Jesse A. Clement. Water level, in feet below measuring point, 1939: Sept. 5, 7.34.

U(C-4-2)5bb. Drought Relief Administration. Water level, in feet below measuring point, 1939: Sept. 8, 4.95.

U(C-4-3)3cb. Roy Taylor. Water level, in feet below measuring point, 1939: Sept. 6, 9.04.



## Duchesne County--Continued

U(C-4-3)4bdcl. U. S. Bureau of Reclamation. Bridgeland CCC Camp. State application no. 12,568. Domestic well, diameter 4 inches, depth 47 feet. Measuring point, top of casing, 4.0 feet below land surface. Water level, in feet below measuring point, 1939: Sept. 6, 5.54.

## Garfield County

(C-31-2)10cb. Gus Lambson. Water level, in feet below measuring point, 1939: Apr. 21, 10.90; August 21, 15.06; Oct. 18, 15.83; Dec. 7, 16.05.

(C-32-2)2. T. W. Roberts. Water level, in feet below measuring point, 1939: Apr. 21, 14.69; Aug. 21, 13.61; Oct. 18, 14.77; Dec. 7, 15.12.

(C-33-5)16cd. W. C. Tebbs.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 2	15.20	Aug. 21	12.23	Dec. 7	14.32
Apr. 21	15.38	Oct. 18	14.32		

(C-33-5)28bdcl. Annie Wilcox.

Water level, in feet below measuring point, 1939

Mar. 2	45.05	Aug. 21	40.27	Dec. 7	44.50
Apr. 21	46.55	Oct. 18	42.63		

(C-34-5)8adb. D. Woodward.

Water level, in feet below measuring point, 1939

Mar. 2	14.76	Aug. 21	6.04	Dec. 7	11.98
Apr. 21	14.38	Oct. 18	8.72		

(C-34-5)28db. Reed Hayward. Measuring point changed to top of concrete curb, level with land surface and 4.0 feet below previous measuring point.

Water level, in feet below measuring point, 1939

Mar. 2	15.63	Aug. 21	4.32	Dec. 7	10.70
Apr. 21	16.29	Oct. 18	6.57		

(C-35-4)34dcal. Chas. and Will Proctor. Water levels, in feet below measuring point, 1939: Apr. 21, 6.24; Aug. 19, 7.84; Oct. 18, 6.80; Dec. 7, 6.85.

(C-36-3)7. J. Austin Cope. Measuring point, 1.2 feet above land surface. Water levels, in feet below measuring point, 1939: Apr. 21, 5.10; Aug. 19, 8.22; Oct. 18, 5.82; Dec. 7, 5.98.

(C-36-3)18bdcl. R. G. Syrett. State claim no. 9,492 instead of application number as given in Water-Supply Paper 845. Water levels in feet below measuring point, 1939: Apr. 21, 3.62; Aug. 19, a/ 5.92; Oct. 18, 3.87; Dec. 7, 4.00.

(C-36-3)18bddl. R. G. Syrett. Water level inside of casing, in feet below measuring point, 1939: Apr. 21, 85.11; Aug. 19, 81.84; Oct. 18, 83.30; Dec. 7, 82.52. Water level, in feet below measuring point outside of casing; Apr. 21, 13.85; Aug. 19, 13.42; Oct. 18, 13.15; Dec. 7, 13.35.

a Pumping.

## Garfield County--Continued

(C-36-5)29da. John A. Yardley.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 2	33.75	Aug. 19	27.87	Dec. 7	26.68
Apr. 21	33.92	Oct. 18	26.58		

(D-35-3) No measurements made in 1939.

## Iron County, Cedar City Valley

(C-33-10)3ladbl. C. A. Hatch. Measuring point, top of casing, 5,447.62 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 4	54.01	May 9	53.90	July 12	54.03	Sept. 15	54.19
Feb. 2	53.97	31	53.93	Aug. 17	54.08	Dec. 12	54.11
Apr. 4	53.93	June 13	54.00				

(C-33-11)29ccb1. J. S. Green. Measuring point, top of tee of discharge pipe, 5,357.45 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 4	34.51	Mar. 2	34.22	May 9	34.20
Feb. 2	34.41	Apr. 4	34.13	June 12	(a)

(C-33-11)30odd1. G. P. Stapley. Measuring point, top of casing, 5,353.28 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 2	35.34	May 9	34.97	July 12	35.24	Sept. 14	35.50
Mar. 2	35.23	June 12	35.02	Aug. 17	35.53	Dec. 11	35.50
Apr. 4	35.10						

(C-33-11)31aad1. Geo. W. Perry. Rush Lake. Used stock well, diameter 6 to 3 inches. Measuring point, top of reducer in casing, 1.0 foot above land surface and 5,354.09 feet above sea level. Equipped with windmill. Water level, in feet below measuring point, 1939: May 16, 33.17.

(C-33-11)33dbb1. T. R. Adams and Bros. Measuring point, top of concrete curb, 5,371.30 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 4	11.00	Mar. 28	10.73	June 15	c 16.00	Sept. 14	11.51
Feb. 2	10.90	May 9	10.78	July 12	11.35	Dec. 12	11.08
Mar. 2	10.84	June 13	b 12.11	Aug. 17			

(C-33-12)11aaal. Mortenson and Holyoak. State claim no. 2,239. Used stock well, diameter 4 inches, depth 60 feet. Measuring point, top of casing, 3.0 feet below land surface and 5,284.55 feet above sea level. Equipped with windmill.

- a Windmill repaired and casing opening closed.
- b Probably pumped recently.
- c Pump stopped just prior to measurement.

Iron County, Cedar City Valley--Continued  
(C-33-12)11aaal.--Continued

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 11	a 36.65	July 12	36.87	Aug. 17	c 36.85
May 9	36.70	Aug. 17	b 37.12	Sept. 14	a 36.91
June 12	a 36.76	17	a 36.87	Dec. 11	d 36.82

(C-33-12)14dca1. Mortenson and Holyoak. State claim no. 2,240. Abandoned stock well, diameter 48 inches, depth 65 feet. Measuring point, top of 3 by 12-inch timber at east side, 2.0 feet above land surface and 5,298.63 feet above sea level.

Water level, in feet below measuring point, 1938-39

Aug. 5, 1938	46.05	Mar. 2, 1939	46.14	July 12, 1939	46.15
Nov. 27	46.16	Apr. 4	46.16	Aug. 17	46.15
Jan. 4, 1939	46.12	May 9	46.13	Sept. 14	46.18
Feb. 2	46.10	June 12	46.13	Dec. 11	46.20

(C-34-10)6cccl. Benson and Orton. Measuring point, valve seat in pump cylinder, 5,400.63 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 4	12.65	May 9	11.90	July 12	13.18	Sept. 15	13.60
Apr. 4	11.95	June 13	12.63	Aug. 17	13.53	Dec. 12	12.68

(C-34-10)31cbcl. Myron S. Jones. Measuring point, top of casing, 5,469.26 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 4	0.35	Apr. 10	0.05	July 13	0.45	Oct. 20	0.52
Feb. 3	.20	May 9	.46	Aug. 18	.68	Dec. 12	.24
Apr. 5	.06	June 13	.11	Sept. 15	.44		

(C-34-11)2ddal. U. S. Geol. Survey test well. On Webster Bettridge's property. Diameter 2 inches, depth 7 feet. Measuring point, top of casing, 0.6 foot above land surface and 5,387.66 feet above sea level.

Water level, in feet below measuring surface, 1939

Apr. 8	2.13	June 3	3.57	July 12	4.55	Sept. 14	4.96
13	2.27	12	3.88	Aug. 17	5.60	Dec. 11	3.50
May 9	2.80						

(C-34-11)3ccbl. H. L. Adams. Rush Lake. State claim no. 11,587. Used stock well, diameter 4 1/2 inches, depth 519 feet. Measuring point, top of shoulder on reducer 1.0 foot above land surface and 5,384.6 feet above sea level. Flow, April 6, 1939, 0.17 gallon per minute.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 6	0.40	Aug. 17	0.09	Dec. 11	0.11
July 12	.20	Sept. 14	.14		

- a Windmill stopped 10 minutes prior to measurement.
- b Windmill stopped 4 minutes prior to measurement.
- c Windmill stopped 35 minutes prior to measurement.
- d Windmill stopped 29 minutes prior to measurement.

## Iron County, Cedar City Valley--Continued

(C-34-11)3ccb2. U. S. Geol. Survey test well. On H. L. Adam's property. Diameter 2 inches, depth 6 feet. Measuring point, top of casing, 2.9 feet below land surface and 5,381.35 feet above sea level.

## Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 6	1.82	May 10	2.01	July 12	3.01	Sept. 14	2.82
8	1.78	June 12	2.62	Aug. 17	3.90	Dec. 11	2.33

(C-34-11)4bdd1. U. S. Geol. Survey test well. H. L. Adam's property. Diameter 2 inches, depth 19.5 feet. Measuring point, top of casing, 8.8 feet above land surface and 5,376.60 feet above sea level.

## Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
May 10	18.20	July 11	19.60	Sept. 14	19.94
June 12	19.32	Aug. 17	20.15	Dec. 11	19.21

(C-34-11)5cdal. Public land. Measuring point, top of casing, 5,382.46 feet above sea level.

## Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 4	28.20	May 9	27.99	July 12	28.46	Sept. 14	28.61
Feb. 2	28.16	June 12	28.20	Aug. 17	28.58	Dec. 11	28.37
Apr. 4	28.02						

(C-34-11)9ccd1. J. W. and J. H. Melling. Cedar City. State claim no. 5,226. Used stock well, diameter 4 inches, depth 194 feet. Measuring point, top of concrete curb, level with land surface and 5,404.15 feet above sea level. Equipped with windmill. Water level, in feet below measuring point, 1939: July 12, 29.24.

(C-34-11)9cdcl. Don Carlos Evans. Measuring point, top of casing 5,403.12 feet above sea level.

## Water level, in feet below measuring point, 1939

Jan. 4	22.76	May 9	22.33	July 12	22.95	Sept. 14	23.36
Feb. 2	22.63	June 12	22.47	Aug. 17	23.30	Dec. 11	22.91
Apr. 4	22.42						

(C-34-11)10cbd1. U. S. Geol. Survey test well. On Sarah Evans' property. Diameter 2 inches, depth 19 feet. Measuring point, top of casing, 0.4 foot above land surface and 5,392.99 feet above sea level.

## Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
May 10	18.20	Aug. 17	19.52	Dec. 11	18.95
June 12	18.68	Sept. 14	19.18		

(C-34-11)10ddd. Public land. Rush Lake. Diameter 2 inches, measured depth, 51 feet. Measuring point, top of casing, 3.5 feet above land surface. Water level, in feet below measuring point, 1939: Dec. 12, 18.28.

(C-34-11)11ccb1. U. S. Geol. Survey test well. On Webster Bettridge's property. Diameter 2 inches, depth 14 feet. Measuring point, top of casing, 0.3 foot above land surface and 5,393.04 feet above sea level.

## Iron County, Cedar City Valley--Continued

(C-34-11)11ccbl.--Continued

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 8	10.38	June 3	10.38	July 12	10.85	Sept. 14	11.08
13	10.33	12	10.46	Aug. 17	11.02	Dec. 11	10.88
May 9	10.29						

(C-34-11)13bab1. Dr. J. W. Bergstrom (formerly Matilda Bettridge). Measuring point, top of casing, 5,391.77 feet above sea level. Found flowing prior to all measurements.

Water level, in feet above measuring point, 1939

Jan. 4	1.57	May 9	1.77	July 12	1.53	Sept. 15	1.35
Mar. 3	1.53	June 13	1.63	Aug. 17	1.49	Dec. 12	1.48
Apr. 4	1.77						

(C-34-11)13bab2. U. S. Geol. Survey test well. On Dr. J. W. Bergstroms property. Diameter 2 inches, depth 9.0 feet. Measuring point, top of pipe, 0.2 foot above land surface and 5,393.11 feet above sea level.

Water level, in feet, below measuring point, 1939

Mar. 28	6.90	May 9	6.55	June 13	7.35	Sept. 15	8.42
Apr. 4	6.65	June 3	7.0	Aug. 17	8.66	Dec. 12	8.01

(C-34-11)15bab. E. L. Childs. Rush Lake. Diameter 4 inches, measured depth 55 feet. Measuring point, top of casing, 1.0 foot above land surface. Water levels, in feet below measuring point, 1939: Aug. 17, 18.40; Sept. 14, 18.42; Dec. 11, 18.11.

(C-34-11)20dddl. E. E. Williams. Measuring point, nail in center of cross, 5,429.43 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 4	22.16	May 8	21.66	July 12	22.65	Sept. 14	23.15
Feb. 2	22.05	June 12	21.94	Aug. 17	23.24	Dec. 11	23.03
Apr. 4	21.72	12	22.01				

(C-34-11)22bdal. Iron County. Measuring point, top of 3-inch casing, 5,415.97 feet above sea level.

Water level, in feet, below measuring point, 1939

Jan. 4	16.37	May 8	15.90	July 12	16.82	Sept. 14	17.10
Feb. 2	16.19	June 12	16.29	Aug. 17	17.13	Dec. 11	16.62
Apr. 4	15.98						

(C-34-11)22cccl. E. L. Crooks. Measuring point, top of coupling on casing, 5,425.29 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 4	16.97	May 8	16.45	July 12	17.41	Sept. 14	17.81
Feb. 2	16.82	June 12	16.82	Aug. 17	17.78	Dec. 11	17.22
Apr. 4	16.53						

(C-34-11)29bad1. E. E. Williams. Measuring point, top of casing, 5,443.68 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 4	24.70	May 8	24.64	July 12	24.71	Sept. 14	24.87
Feb. 2	24.70	June 12	24.67	Aug. 17	24.82	Dec. 11	24.96
Apr. 4	24.67						

## Iron County, Cedar City Valley--Continued

(C-34-11)33accl. Perry Mackelprong. Measuring point, top of casing, 5,450.47 feet above sea level.

## Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 4	14.90	Apr. 5	14.30	July 11	16.09	Oct. 20	15.83
Feb. 2	14.68	May 9	14.46	Aug. 18	16.56	Dec. 12	15.39
Mar. 6	14.50	June 13	15.36	Sept. 15	16.63		

(C-34-11)34aaal. U. S. Geol. Survey test well. On Wm. H. Wood's property. Diameter 2 inches, depth 22.5 feet. Measuring point, top of casing, 0.7 foot above land surface and 5,437.17 feet above sea level. Water level first encountered 21 feet below surface; rose  $1\frac{1}{2}$  feet.

## Water level, in feet below measuring point, 1939

Apr. 10	20.18	June 13	20.76	Aug. 18	22.02	Oct. 20	21.03
13	20.05	July 11	21.05	Sept. 15	21.53	Dec. 12	20.72
May 9	19.94						

(C-34-11)36adcl. S. M. Clark. Measuring point, top of casing, 5,464.07 feet above sea level. Found flowing prior to all measurements.

## Water level, in feet above measuring point, 1939

Apr. 10	7.1	June 13	6.9	Aug. 18	6.55	Oct. 20	6.35
May 9	7.15	July 13	6.6	Sept. 15	6.45	Dec. 12	6.75

(C-34-11)36cbc2. George Grimshaw. Measuring point, top of casing and flange, 5,448.56 feet above sea level.

## Water level, in feet below measuring point, 1939

Jan. 4	17.83	May 10	17.13	July 13	17.57	Oct. 20	17.92
Feb. 3	17.73	Apr. 5	17.33	Aug. 18	17.89	Dec. 12	18.13
Mar. 3	17.57	June 13	17.32	Sept. 15	17.93		

(C-35-10)7cadl. J. M. Jones. Measuring point, top of coupling, 5,575.34 feet above sea level.

## Water level, in feet below measuring point, 1939

Jan. 4	34.60	Apr. 5	33.43	Aug. 18	a 50.9 $\frac{1}{2}$	Oct. 20	a 48.5 $\frac{1}{2}$
Feb. 3	34.08	May 11	a 44.88	Sept. 16	39.4	Dec. 13	35.30
Mar. 2	33.73	June 13	a 48.35				

(C-35-10)7cddl. Claude Crosby. Measuring point, top of concrete curb, 5,617.28 feet above sea level.

## Water level, in feet below measuring point, 1939

Jan. 4	30.09	Mar. 2	29.85	May 20	29.77	Oct. 20	30.78
Feb. 3	29.96	Apr. 5	29.75	June 13	29.99	Dec. 12	30.74

(C-35-10)18cbbl. (C-35-10)18cbd1 in Water-Supply Paper 840. Parson Webster. Measuring point, top of casing, 5,551.12.

## Water level, in feet below measuring point, 1939

Jan. 7	46.89	Mar. 11	45.03	Apr. 29	43.94	July 2	52.57
14	46.31	18	44.77	May 11	48.74	8	53.01
21	46.20	25	44.67	20	50.02	14	53.18
28	46.28	Apr 1	44.57	27	50.62	22	53.49
Feb. 4	45.65	5	44.46	June 3	51.17	Aug. 18	54.47
18	45.39	8	44.33	13	51.70	Sept. 16	53.18
25	45.62	15	44.11	17	51.86	Oct. 20	50.34
Mar. 4	45.11	22	44.00	24	52.00	Dec. 12	47.21

a Pumping.

## Iron County, Cedar City Valley--Continued

(C-35-11)1accl. J. N. Smith and Douglas Clark. Enoch. State claim no. 8,964. Used stock well, diameter 3 inches, measured depth 179 feet. Measuring point, top of casing, 0.7 foot above land surface and 5,461.57 feet above sea level. Found flowing prior to all measurements.

## Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 10	12.8	June 13	10.8	Aug. 18	7.05	Oct. 20	7.5
May 4	12.2	July 13	9.7	Sept. 15	7.3	Dec. 12	8.8
May 9	11.9						

(C-35-11)1cdcl. Ray Grimshaw. Measuring point, top of coupling, 5,469.50 feet above sea level.

## Water level, in feet below measuring point, 1939

Jan. 4	4.14	Apr. 5	3.32	June 13	4.42	Sept. 15	4.88
Feb. 3	3.84	May 22	3.28	July 13	4.32	Oct. 20	4.60
Mar. 3	3.63	May 9	3.66	Aug. 18	4.85	Dec. 12	3.87

(C-35-11)2ddd1. Frank Grimshaw. Measuring point changed to top of pipe under pitcher pump, 2.15 feet above top of casing and, 5,469.56 feet above sea level.

## Water level, in feet below measuring point, 1939

Jan. 4	15.45	Apr. 22	15.03	June 13	15.70	Sept. 15	16.53
Feb. 3	15.23	May 9	15.26	July 13	16.26	Oct. 20	16.08
Mar. 3	15.05	May 12	15.28	Aug. 18	16.86	Dec. 12	15.59
Apr. 4	14.87						

(C-35-11)4bbd1. Wm. H. Wood. Cedar City. State claim no. 14,009. Used stock well, diameter 2 inches, depth 210 feet. Measuring point, top of coupling, 0.3 foot above land surface and 5,461.19 feet above sea level.

## Water level, in feet below measuring point, 1939

Mar. 14	1.63	May 27	2.47	Aug. 18	3.79	Oct. 20	4.43
Apr. 5	1.82	June 13	2.70	Sept. 15	4.09	Dec. 12	4.97
May 9	2.22	July 11	3.18				

(C-35-11)4bbd2. Wm. H. Wood. Cedar City. Abandoned well, diameter 3 inches. Measuring point, top of coupling, 1.7 feet above land surface and 5,462.54 feet above sea level.

## Water level, in feet below measuring point, 1939

Mar. 14	11.30	May 27	12.92	Aug. 18	14.92	Oct. 20	13.42
Apr. 5	10.99	June 13	13.58	Sept. 15	14.54	Dec. 12	12.52
May 9	9.86	July 11	14.47				

(C-35-11)4ddal. Federal Land Bank. Measuring point, top of casing, 5,473.65 feet above sea level.

## Water level, in feet below measuring point, 1939

Jan. 4	1.80	Apr. 5	1.12	June 13	6.18	Sept. 15	7.11
Feb. 2	1.48	May 9	2.08	July 11	7.28	Oct. 20	4.26
Mar. 6	1.22	May 27	5.13	Aug. 18	7.00	Dec. 12	3.20

(C-35-11)4dda2. Federal Land Bank. Cedar City. Abandoned well, diameter 2 inches. Measuring point, top of casing, 1.1 feet above land surface and 5,474.30 feet above sea level.

## Water level, in feet below measuring point, 1939

Apr. 6	9.20	June 13	12.48	Aug. 18	13.06	Oct. 20	10.74
May 9	8.92	July 11	13.16	Sept. 15	13.14	Dec. 12	9.64
May 27	11.02						

## Iron County, Cedar City Valley--Continued

(C-35-11)5bcd1. Trehorne Leigh. Measuring point, top of coupling on 6-inch casing, 5,470.31 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 4	24.61	Apr. 4	24.34	June 12	24.38	Sept. 14	24.93
Feb. 2	24.56	May 22	24.29	July 12	24.59	Oct. 20	24.94
Mar. 2	24.43	May 8	24.28	Aug. 16	24.88	Dec. 11	25.03

(C-35-11)8cddl. Charles Corry.

Daily noon water level, in feet below measuring point, 1939

Date	Jan.	Feb.	Mar.	Apr.	Sept.	Oct.	Nov.	Dec.
1	11.39	11.00	10.67	10.23	.....	15.15	13.72	13.15
2	11.38	11.10	10.62	10.22	.....	15.12	13.67	13.12
3	11.36	11.00	10.58	10.22	.....	15.05	13.78	13.22
4	11.37	11.08	10.64	10.20	.....	14.98	13.68	13.12
5	11.45	10.98	10.63	10.21	.....	.....	13.65	13.09
6	11.43	10.95	10.58	10.35	.....	.....	13.64	13.05
7	11.39	10.98	10.55	10.32	.....	.....	13.57	13.22
8	11.30	10.81	10.56	10.28	.....	.....	13.52	13.06
9	11.31	11.03	10.59	10.18	.....	14.54	13.45	13.05
10	11.30	10.92	10.53	10.29	.....	14.60	13.48	13.04
11	11.34	10.93	10.50	10.24	.....	14.44	13.49	13.05
12	11.27	.....	10.47	10.28	.....	14.38	13.43	13.05
13	11.27	.....	10.45	10.26	.....	14.33	13.62	13.01
14	11.25	.....	10.48	10.26	.....	14.23	13.42	12.98
15	11.23	.....	10.47	10.24	.....	14.19	13.40	12.96
16	11.29	.....	10.46	.....	.....	14.14	13.46	12.94
17	11.37	.....	10.47	.....	.....	14.00	13.36	12.88
18	11.27	10.84	10.48	.....	.....	14.13	13.36	12.93
19	11.19	10.80	10.44	.....	16.28	14.03	13.55	12.87
20	11.15	10.81	10.45	.....	16.10	14.00	13.36	12.86
21	11.17	10.80	10.47	.....	15.94	14.01	13.31	12.81
22	11.11	10.78	10.42	.....	15.80	13.93	13.33	12.75
23	11.11	10.72	10.40	.....	15.75	13.93	13.28	12.77
24	11.19	10.70	10.41	.....	15.62	13.87	13.33	12.84
25	11.15	10.66	10.39	.....	15.57	14.00	13.28	12.76
26	11.13	10.65	10.37	.....	15.49	13.94	13.28	12.77
27	11.06	10.67	10.39	.....	15.34	13.92	13.22	12.76
28	11.15	10.61	10.30	.....	15.38	13.93	13.22	12.81
29	11.07	.....	10.29	.....	15.30	13.85	13.17	12.74
30	11.09	.....	10.25	.....	15.36	13.90	13.21	12.72
31	11.09	.....	10.27	.....	.....	13.76	.....	12.70

(C-35-11)8cddl. Charles Corry.

Daily high and low water levels, in feet below measuring point, 1939

Day	April		May		June	
	High	Low	High	Low	High	Low
1	.....	.....	a 14.40	.....	a 19.32	.....
2	.....	.....	.....	.....	18.18	19.06
3	.....	.....	.....	.....	a 19.13	.....
4	.....	.....	.....	.....	17.71	18.90
5	.....	.....	.....	.....	17.39	17.90
6	.....	.....	.....	.....	17.32	17.85
7	.....	.....	a 15.98	.....	17.07	18.20
8	.....	.....	a 16.12	.....	a 18.70	.....
9	.....	.....	a 16.23	.....	a 19.17	.....
10	.....	.....	a 16.59	.....	a 19.26	.....
11	.....	.....	a 16.80	.....	19.08	19.64
12	.....	.....	a 16.98	.....	a 19.65	.....
13	.....	.....	a 17.23	.....	a 19.90	.....
14	.....	.....	a 17.42	.....	a 20.06	.....
15	.....	.....	a 17.59	.....	a 20.18	.....
16	10.22	10.42	a 17.75	.....	19.23	20.22
17	a 10.29	.....	a 17.88	.....	a 20.04	.....
18	10.27	10.65	16.70	17.85	a 20.21	.....
19	a 10.58	.....	a 17.95	.....	a 20.26	.....

a Water level at noon; daily fluctuation less than 0.2 foot.



## Iron County, Cedar City Valley--Continued

(C-35-11)8cddl.--Continued

Daily high and low water levels, in feet below measuring point, 1939

Day	April		May		June	
	High	Low	High	Low	High	Low
20	a 10.70	.....	17.51	18.00	a 20.27	.....
21	a 10.77	.....	a 18.05	.....	a 20.30	.....
22	10.60	10.80	17.43	18.34	20.06	20.33
23	10.52	11.38	16.94	17.91	a 20.26	.....
24	10.67	10.98	17.55	18.09	a 20.40	.....
25	10.57	12.70	17.31	17.93	19.64	20.47
26	a 13.55	.....	17.42	18.05	18.78	19.85
27	a 14.50	.....	18.07	18.58	a 20.14	.....
28	a 14.70	.....	17.87	18.58	a 20.35	.....
29	12.90	15.00	17.54	18.60	19.75	20.49
30	12.13	13.95	a 18.87	.....	a 20.33	.....
31	.....	.....	a 19.13	.....	.....	.....

Daily high and low water levels, in feet below measuring point, 1939

	July		Aug.		Sept.	
	High	Low	High	Low	High	Low
1	a 20.52	.....	18.85	19.90	20.68	21.50
2	a 20.58	.....	19.60	20.45	19.90	21.20
3	19.83	20.63	19.36	20.60	19.40	21.55
4	18.57	19.90	20.50	20.69	19.78	20.42
5	a 20.07	.....	18.91	20.69	a 18.96	.....
6	19.98	20.56	18.37	19.32	a 18.46	.....
7	20.27	20.59	18.40	19.70	a 18.07	.....
8	a 20.65	.....	19.70	20.53	a 17.95	.....
9	a 20.80	.....	19.96	20.68	.....	.....
10	a 20.97	.....	20.35	20.90	.....	.....
11	a 21.09	.....	20.70	21.20	.....	.....
12	20.01	21.16	19.81	20.75	.....	.....
13	20.46	20.88	.....	.....	a 17.52	.....
14	a 21.07	.....	.....	.....	a 17.09	.....
15	a 21.25	.....	.....	.....	a 16.99	.....
16	21.34	.....	.....	.....	16.57	18.00
17	a 21.34	.....	.....	.....	16.65	18.00
18	19.90	21.30	.....	.....	16.40	16.72
19	18.82	20.15	.....	.....	.....	.....
20	19.39	20.66	19.19	20.60	.....	.....
21	19.48	20.38	20.60	21.24	.....	.....
22	a 20.55	.....	20.22	21.33	.....	.....
23	19.15	20.55	20.23	20.75	.....	.....
24	19.65	20.58	20.75	21.14	.....	.....
25	19.79	20.78	19.86	21.24	.....	.....
26	20.25	20.60	19.72	20.58	.....	.....
27	20.29	20.68	20.08	20.73	.....	.....
28	19.69	20.73	19.96	20.90	.....	.....
29	19.11	20.29	20.90	21.45	.....	.....
30	19.02	19.62	20.42	21.43	.....	.....
31	.....	.....	19.95	21.20	.....	.....

(C-35-11)9addl. Federal Land Bank. Cedar City. Used stock well, diameter 2 inches, depth 130 feet. Measuring point, top of ell, 0.4 foot above land surface and 5,485.05 feet above sea level. Found flowing prior to all pressure measurements.

Water level, in feet, with reference to measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 14	+5.3	May 11	+1.70	June 13	-3.38	Sept. 15	-1.53
Apr. 5	+6.05	20	-1.02	July 11	-4.42	Oct. 20	+2.05
22	+5.75	27	-2.17	Aug. 18	-3.32	Dec. 12	+3.44

(C-35-11)10dbd3. Owen Matheson. Measuring point, top of tee, 5,487.91 feet above sea level. Found flowing prior to all pressure measurements.

a Water level at noon; daily fluctuation less than 0.2 foot.

## Iron County, Cedar City Valley--Continued

(C-35-11)10dbd3.--Continued

Water level, in feet, with reference to measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 4	+3.45	Apr. 5	+3.75	June 13	-0.77	Sept. 15	-1.58
Feb. 1	+3.59	22	+3.65	July 14	-2.48	Oct. 20	+0.88
Mar. 6	+3.81	May 11	+2.70	Aug. 18	-3.12	Dec. 13	+1.99

(C-35-11)11accl. Walker Davis. State claim no. 15,815. Measuring point, top of casing, 5,478.30 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 4	15.05	Apr. 22	14.03	July 13	15.33	Oct. 20	14.92
Feb. 3	14.75	May 9	14.14	Aug. 18	15.82	Dec. 12	14.53
Apr. 4	14.19	June 13	14.62	Sept. 15	15.45		

(C-35-11)11dccl. Clifton P. Halterman. Cedar City. State claim no. 5,093. Used domestic and stock well, diameter 2 inches, depth 292 feet. Measuring point, top of coupling on casing, 7.65 feet below top of concrete curb, 7.65 feet below land surface and 5,483.73 feet above sea level. Equipped with automatic pressure pump.

Water level, in feet below measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
May 11, 1938	a 2.11	July 7, 1938	a 2.30	Sept. 6, 1938	a 2.07
June 7	a 1.78	Aug. 12	ab 17.68	July 16, 1939	3.92

(C-35-11)12ddd1. West Enoch Irrigation Association. Measuring point, bottom of hole in casing, 5,513.68 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 4	19.74	Apr. 5	17.69	Aug. 18	b 65.5±	Oct. 20	b 61.7±
Feb. 3	18.90	May 11	b 59.6±	Sept. 16	b 65.5±	Dec. 12	20.68
Mar. 2	18.27	July 14	c 40.57				

(C-35-11)13ddb2. Drought Relief Administration. Depth, 166 feet, not 760 feet as given in Water-Supply Paper 845. Measuring point, bottom of hole in casing, 5,541.20 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 7	36.37	Apr. 5	34.76	July 14	b 58.25	Oct. 20	39.98
Feb. 3	35.36	May 11	b 54.04	Aug. 18	b 59.08	Dec. 13	36.90
Mar. 3	34.55	June 13	b 56.75	Sept. 16	43.83		

(C-35-11)14bdb1. Roice Nelson. Enoch. State claim no. 5,054. Used stock well, diameter 4 to 2 inches, depth 230 feet. Measuring point, top of coupling, 4.0 feet above land surface and 5,503.58 feet above sea level. Equipped with windmill.

Water level, in feet below measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
May 13, 1938	a 6.38	Sept. 6, 1938	a 9.73	Aug. 18, 1939	13.84
June 7	a 9.10	May 12, 1939	8.08	Sept. 15	11.12
July 7	a 9.51	June 13	10.82	Oct. 20	12.26
Aug. 12	a 9.52	July 14	12.80	Dec. 13	9.45

a Measurement made by Utah State Engineer in cooperation with Works Progress Administration.

b Pumping.

c Pump stopped 3 minutes prior to measurement.

## Iron County, Cedar City Valley--Continued

(C-35-11)14dabl. David Murie. Measuring point, top of casing, 5,504.34 feet above sea level.

## Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 4	1.38	Apr. 4	1.09	June 13	15.58	Sept. 15	3.08
Feb. 3	1.23	22	1.03	July 14	17.85	Oct. 20	17.88
Mar. 2	1.20	May 11	1.08	Aug. 17	21.54	Dec. 13	2.53

(C-35-11)14ddd3. Geo. and David Murie. Measuring point, top of casing, 5,530.51 feet above sea level.

## Water level, in feet below measuring point, 1939

Jan. 4	21.35	Mar. 2	20.98	May 11	20.68	Oct. 20	23.17
Feb. 3	21.19	Apr. 4	20.92	Sept. 27	23.16	Dec. 13	22.03

(C-35-11)15aaci. H. D. Haight. Measuring point, top of well cover, 5,499.79 feet above sea level.

## Water level, in feet below measuring point, 1939

Jan. 3	9.29	Apr. 5	8.82	June 13	7.45	Sept. 15	7.36
Feb. 1	9.35	22	8.04	July 14	7.82	Oct. 21	7.31
Mar. 3	9.43	May 11	7.26	Aug. 18	7.96	Dec. 15	7.94

(C-35-11)15abal. Sherman Haight. Measuring point, edge of hole in pump base, 5,497.23 feet above sea level. Pressure system installed; measurements discontinued June 13, 1939.

## Water level, in feet below measuring point, 1939

Jan. 7	a 3.85	Feb. 18	2.74	Apr. 1	2.72	Apr. 29	2.20
14	2.16	25	2.32	5	2.61	May 11	4.30
21	a 3.42	Mar. 4	2.48	8	2.39	20	4.70
28	a 3.42	11	2.37	15	2.26	June 13	a 8.73
Feb. 4	2.38	25	2.63	22	2.14		

(C-35-11)16dbal. Maillin Bros. Cedar City. Used stock well, diameter 3 inches. Measuring point, top of casing, 0.2 foot above land surface and 5,502.97 feet above sea level. Equipped with pitcher pump.

## Water level, in feet below measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
May 16, 1938	b 4.19	Apr. 22, 1939	2.16	Aug. 16, 1939	c 24.02
June 9	b 3.27	May 11	c 18.14	Sept. 8	5.98
July 16	bc 18.72	27	c 21.18	13	4.83
Aug. 13	bc 19.34	June 13	c 22.43	Oct. 20	6.68
Sept. 8	bc 22.46	July 13	c 24.18	Dec. 13	5.91
Apr. 5, 1939	2.13				

(C-35-11)17dcdl. H. B. Liston. Measuring point, top of casing, 5,507.96 feet above sea level.

## Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	16.60	Apr. 22	15.84	July 11	18.60	Sept. 13	19.20
Feb. 2	16.30	May 8	16.28	Aug. 16	19.31	Oct. 21	18.05
Mar. 2	16.24	June 12	17.83	Sept. 8	19.25	Dec. 11	17.67
Apr. 4	16.09						

(C-35-11)19bdal. John Sherratt. State claim no. 4,882, not 4,887 as given in Water-Supply Paper 840. Measuring point, top of casing, 5,507.00 feet above sea level.

- a Probably pumped recently.  
 b Measurement made by Utah State Engineer in cooperation with Works Progress Administration.  
 c Adjacent well pumping.

## Iron County, Cedar City Valley--Continued

(C-35-11)19bda1.--Continued

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	21.25	Apr. 5	20.82	July 11	c 24.49	Oct. 21	22.43
Feb. 2	20.81	May 20	22.50	Aug. 16	24.58	Dec. 11	b 28.89
Mar. 2	20.90	June 12	a 23.55	Sept. 13	24.30	11	d 25.07
6	20.88	July 11	b 31.83				

(C-35-11)21bacl. Henry H. McConnell. Measuring point, top of casing, 5,520.42 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 7	14.28	Apr. 12	12.63	June 3	21.96	July 22	24.04
14	14.20	15	12.63	13	22.70	Aug. 16	25.92
21	13.98	22	12.58	17	22.87	Sept. 8	25.44
28	13.98	29	12.59	24	23.04	13	22.92
Feb. 4	13.69	May 11	17.92	July 2	23.70	Oct. 20	18.82
Mar. 20	12.98	20	19.78	8	24.30	Dec. 13	17.38
Apr. 5	12.72	27	20.89	13	24.78		

(C-35-11)21dbdl. Don C. Urie. Cedar City. State claim no. 1,222. Irrigation well, diameter, 12 to 10 inches, depth 228 feet. Measuring point, top of 10-inch casing level with land surface and 5,533.25 feet above sea level. Insufficient supply; no permanent pump installation made.

Daily noon water level, in feet below measuring point, 1939

	Sept.	Oct.	Nov.	Dec.
1	.....	28.21	27.55	26.98
2	.....	28.20	27.54	26.95
3	.....	28.18	27.52	26.93
4	.....	28.19	27.49	26.92
5	.....	28.15	27.47	26.89
6	.....	28.11	27.50	26.87
7	.....	28.10	27.43	26.86
8	.....	.....	27.39	26.84
9	.....	28.11	27.36	26.82
10	.....	28.09	27.39	26.68
11	.....	28.06	27.35	26.76
12	.....	28.03	27.33	26.79
13	.....	28.01	27.30	26.73
14	.....	27.99	27.28	26.72
15	.....	27.96	27.28	26.71
16	.....	27.95	27.26	26.68
17	e 28.62	27.93	27.23	26.50
18	28.58	27.92	27.21	26.67
19	28.55	27.91	27.19	26.60
20	28.53	27.91	27.18	26.61
21	28.48	27.88	27.14	26.59
22	28.54	27.80	27.14	26.55
23	28.52	27.75	27.12	26.56
24	28.51	27.72	27.09	26.55
25	28.49	27.71	27.08	26.56
26	28.56	27.73	27.05	26.53
27	28.42	27.78	27.02	26.51
28	28.34	27.68	27.01	26.54
29	28.31	27.64	27.00	26.50
30	28.27	27.62	27.00	26.48
31	.....	27.57	.....	26.45

a Pumped recently.

b Pumping.

c Windmill stopped 25 minutes prior to measurement.

d Windmill stopped 12 minutes prior to measurement.

e Water-stage recorder installed.

Iron County, Cedar City Valley--Continued

(C-35-11)21dcd1. (C-35-11)21dc in Water-Supply Paper 817 and  
-11)21dcd1 in Water-Supply Papers 840 and 845. Wilford Pipe.  
measuring point, top of casing, 5,538.56 feet above sea level.

Water level, in feet below measuring point, 1939				Water level	Date	Water level
Water level	Date	Water level	Date	Water level	Date	Water level
4 27.55	May 11	a 44.08	July 13	32.69	Sept. 13	33.65
1 26.91	20	a 44.8	Aug. 16	a 49.08	Oct. 20	31.77
3 26.38	June 13	a 45.81	Sept. 8	34.96	Dec. 13	30.32
5 26.07						

(C-35-11)22aab1. Grant Hunter. Cedar City. Abandoned well, diameter 2 inches, reported depth, 115 feet; measured depth, 93 feet. Measuring point, top of coupling, level with land surface. Water level reported 3-inches above top of casing when drilled. Reported to have ceased flowing about 1921. Water level, in feet below measuring point, 1939: Sept. 5, 1.42.

(C-35-11)22acb1. Federal Land Bank. Measuring point, top of casing, 7.5 feet below land surface and 5,518.8 feet above sea level.

Water level, in feet below measuring point, 1939				Water level	Date	Water level
Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3 8.46	Apr. 28	8.25	July 14	11.30	Oct. 21	11.13
Feb. 3 7.46	May 11	10.80	Aug. 18	11.74	Dec. 13	b 14.47
Mar. 3 7.60	June 13	10.97	Sept. 15	12.00		

(C-35-11)22adc1. Myron Higbee. Cedar City. Abandoned well, diameter 3 inches, reported depth, 68 feet; measured depth, 44 feet. Measuring point, top of casing, 0.8 foot above land surface. Reported drilled to 327 feet and casing pulled back to 68½ feet. Reported never flowed. Water level, in feet below measuring point, 1939: Sept. 15, 17.08.

(C-35-11)23cbal. Roice Nelson. Cedar City. State claim no. 5,053. Used stock well, diameter 6 inches, depth 125 feet. Measuring point, top of casing, 0.5 foot above land surface and 5,540.51 feet above sea level. Equipped with lift pump.

Water level, in feet below measuring point, 1939				Water level	Date	Water level
Water level	Date	Water level	Date	Water level	Date	Water level
May 12 30.63	July 14	33.59	Sept. 15	34.02	Dec. 9	34.15
June 13 32.95	Aug. 17	34.27	Oct. 20	34.51		

(C-35-11)27acal. Walker and Halterman. Measuring point, top of casing, 5,545.93 feet above sea level.

Water level, in feet below measuring point, 1939				Water level	Date	Water level
Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3 29.98	Apr. 5	28.88	May 11	a 35.92	July 14	a 41.91
Feb. 1 29.61	22	28.62	June 13	a 40.14	Sept. 15	39.90
Mar. 2 29.25						

(C-35-11)27acc1. Fernleigh Gardner. Measuring point, top of iron pump base at hole, 5,553.10 feet above sea level.

Water level, in feet, below measuring point, 1939				Water level	Date	Water level
Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3 37.12	June 13	a 50.67	Sept. 2	57.09	Nov. 11	42.20
14 37.00	July 2	a 52.46	8	56.58	18	41.96
Feb. 1 36.73	8	a 53.30	14	47.25	25	41.74
Mar. 2 36.27	July 13	a 53.65	23	45.55	Dec. 2	41.64
Apr. 5 35.89	29	a 54.00	30	44.79	9	41.45
22 35.68	Aug. 5	55.36	Oct. 9	43.98	13	41.33
May 11 37.46	12	55.67	15	43.54	16	41.23
15 38.08	18	56.04	21	43.42	23	41.07
15 c 46.7	19	56.07	28	43.00	30	40.95
20 47.1	26	56.53	Nov. 4	42.52		

a Pumping.  
b Pump stopped 5 minutes prior to measurement.  
c Pumping for 30 minutes.

## Iron County, Cedar City Valley--Continued

(C-35-11)27bab2. Carlyle Esplin. Measuring point, top of casing, 5,543.54 feet above sea level.

Daily noon water level, in feet below measuring point, 1939

Date	Jan.	Feb.	Mar.	Apr.	May
1	29.33	28.95	28.66	28.07	28.05
2	29.30	28.95	28.52	28.08	28.02
3	29.30	28.86	28.51	28.06	27.94
4	29.30	28.89	28.58	28.05	27.99
5	29.21	28.90	28.55	28.03	28.03
6	29.26	28.83	28.43	28.07	28.10
7	29.26	28.87	28.40	28.01	28.25
8	29.24	28.75	28.41	27.96	28.37
9	29.33	28.91	28.38	.....	28.47
10	29.29	28.88	28.33	.....	28.57
11	29.25	28.92	28.46	.....	28.56
12	29.22	28.78	28.36	.....	28.66
13	29.22	28.81	28.32	.....	28.75
14	29.23	28.79	28.40	.....	28.83
15	29.14	28.69	28.36	27.90	a 28.93
16	29.22	28.78	28.32	27.90	.....
17	29.20	28.73	28.30	27.87	.....
18	29.18	28.67	28.28	27.82	.....
19	29.12	28.68	28.28	27.78	.....
20	29.10	28.74	28.27	27.79	.....
21	29.10	28.73	28.23	27.77	.....
22	29.08	28.69	28.21	27.90	.....
23	29.15	28.59	28.21	27.97	.....
24	29.14	28.67	28.20	28.05	.....
25	29.07	28.58	28.16	28.07	.....
26	29.04	28.57	28.13	28.15	.....
27	28.97	28.62	28.14	28.00	.....
28	29.05	28.60	28.14	28.07	.....
29	29.02	.....	28.17	28.13	.....
30	28.91	.....	28.13	28.12	.....
31	28.94	.....	28.10	.....	.....

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 20	29.75	June 3	b 43.6	Aug. 18	b 46.65	Oct. 20	35.00
27	30.70	July 14	45.25	Sept. 15	37.95	Dec. 13	33.20

(C-35-11)27cddl. Drought Relief Administration. Measuring point, top of casing, 5,571.15 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 3	53.15	Apr. 5	51.71	Sept. 8	63.70	Oct. 21	59.14
Feb. 1	52.63	22	51.16	14	62.40	Dec. 13	57.49
Mar. 2	52.19	May 11	b 62.10				

(C-35-11)27dbb1. (C-35-11)27db in Water-Supply Paper 817. Lorenzo F. Luke and others. State claim no. 5,223. Measuring point, top of casing, level with land surface and 5,556.18 feet above sea level.

Water level, in feet below measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
May 19, 1938	c 41.09	July 15, 1938	c 51.16	Sept. 12, 1938	c 56.19
June 13	c 47.84	Aug. 17	c 54.70	14, 1939	49.28

(C-35-11)28aac1. (C-35-11)28aa in Water-Supply Paper 817. Ether Perry and Bros. State claim no. 14,222. Measuring point, bottom edge of  $\frac{1}{2}$ -inch hole in northeast side of casing, 0.4 foot below top of coupling, 1.5 feet above land surface and 5,547.57 feet above sea level. Water level, in feet below measuring point, 1939: Sept. 14, 41.32.

a Water-stage recorder removed.

b Pumping.

c Pumping. Measurement made by Utah State Engineer in cooperation with Works Progress Administration.

## Iron County, Cedar City Valley--Continued

(C-35-11)28dbcl. Lawrence Bracken. Measuring point, top of casing, 5,561.84 feet above sea level.

## Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 4	47.53	Apr. 5	45.60	June 13	48.00	Sept. 8	54.15
Feb. 1	46.84	May 11	45.91	July 13	50.44	13	54.18
Mar. 6	46.15	20	46.30	Aug. 16	52.75	Dec. 13	51.15

(C-35-11)29abd2. Kumen Jones. Measuring point, top of casing, 5,537.70 feet above sea level.

## Water level, in feet below measuring point, 1939

Jan. 3	29.77	Apr. 22 a	29.33	June 12	31.19	Sept. 8	33.54
Feb. 2	29.47	May 8	29.75	July 11	32.25	14	33.41
Mar. 6	29.17	20	30.17	16	33.50	Oct. 21	32.63
Apr. 7	28.84	31	30.65	Aug. 17	34.17	Dec. 12	31.88

(C-35-11)29add1. (C-35-11)29ad in Water-Supply Paper 817. Kumen Jones. State claim no. 11,606. Measuring point, top of casing, 1.5 feet above land surface and 5,545.66 feet above sea level.

## Water level, in feet, below measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
May 23, 1938 b	33.93	July 28, 1938 ab	50.91	Sept. 12, 1938 b	34.76
June 14	b 33.24	Aug. 15	ab 51.25	13, 1939	38.95

(C-35-11)29dbdl. Wm. Whitney. (C-35-11)29db in Water-Supply Paper 817. State claim no. 1,230. Measuring point, bottom of inspection opening at air line entrance, 0.8 foot below centerline of air gage, 0.43 foot above concrete base, 2.5 feet above land surface and 5,551.48 feet above sea level. Water level, in feet below measuring point, 1939: Sept. 13, c/ 65.90.

(C-35-11)29dcd1. (C-35-11)29dc in Water-Supply Paper 817. Thurman Higbee. State claim no. 490. Measuring point, bottom of hole in casing, at surface and 5,551.90 feet above sea level.

## Water level, in feet below measuring point, 1938-39

May 23, 1938 ab	59.08	Aug. 15, 1938 ab	57.86	Sept. 13, 1939	43.25
June 14	ab 57.53	Sept. 12	b 43.88		

(C-35-11)30caal. John Sherratt. State claim 17,823. North well of two wells. Measuring point, top of 16-inch casing, 5,522.99 feet above sea level.

## Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	18.77	Apr. 4	18.93	June 12	19.68	Sept. 13	21.12
Feb. 2	18.79	May 8	19.09	July 11	20.12	Oct. 21	20.77
Mar. 2	18.54	20	19.46	Aug. 16	20.97	Dec. 11	20.60

(C-35-11)30caa2. John Sherratt. State claim 34. Measuring point, top of 12-inch casing, 5,523.35 feet above sea level.

## Water level, in feet below measuring point, 1939

Jan. 3	20.36	Apr. 4	20.20	June 12	19.25	Sept. 13	20.65
Feb. 2	20.82	May 8	19.66	July 11	19.77	Oct. 21	20.08
Mar. 2	20.54	20	19.80	Aug. 16	20.55	Dec. 11	19.61

a Pumping.

b Measurement made by Utah State Engineer in cooperation with Works Progress Administration.

c Pumping; air gage reading, 10.5 feet.

## Iron County, Cedar City Valley--Continued

(C-35-11)31acd1. Heber Jensen. Measuring point, bottom of hole in casing, 5,535.36 feet above sea level.

## Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	23.83	Apr. 4	21.52	July 11 a	63.06	Oct. 21	29.22
Feb. 2	22.96	May 8 a	60.90	Aug. 16 a	62.90	Dec. 11	26.69
Mar. 3	21.97	June 12 a	61.77	Sept. 13	32.42		

(C-35-11)32acal. Donald Whitney. Measuring point, top of casing, 5,555.16 feet above sea level.

## Water level, in feet below measuring point, 1939

Jan. 7	41.91	Apr. 8	39.26	Aug. 5 a	55.92	Oct. 28	47.69
14	41.77	15	39.14	12 a	56.25	Nov. 4	46.63
21	41.44	22	38.95	16 a	56.78	11	46.80
28	41.36	29	38.90	19 a	56.68	18	45.87
Feb. 4	40.94	May 8 a	48.84	26 a	56.72	25	45.70
18	40.62	June 12 a	52.93	Sept. 2 a	56.98	Dec. 2	45.40
25	40.87	17 a	52.93	13 a	57.49	9	45.13
Mar. 4	40.18	24 a	53.03	23 a	56.76	11	46.51
11	40.01	July 2 a	53.89	30 a	56.74	16	44.97
18	39.76	8 a	54.51	Oct. 9	47.95	23	44.57
25	39.55	11 a	55.25	15	47.52	30	44.54
Apr. 1	39.38	29 a	55.47	21	48.33		

(C-35-11)32add1. Aurelius Haslam. Measuring point, top of casing, level with land surface. Well cleaned and casing changed since previous measurements. Water level, in feet below measuring point, 1939: Sept. 13, a/ 66.75.

(C-35-11)32ccd1. (C-35-11)32cc in Water-Supply Paper 817. E. M. Corry and J. M. Palmer. State claim no. 5,098. Measuring point, top of casing, 1.0 foot above land surface and 5,549.75 feet above sea level.

## Water level, in feet below measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
May 23, 1938 b	50.30	July 19, 1938 b	53.26	Sept. 10, 1938	ab 54.62
June 14 ab	50.50	Aug. 19 ab	55.00	13, 1939	a 56.60

(C-35-11)32cdd1. C. R. Matheson. Measuring point changed to top of casing, 1.26 feet above previous measuring point and 5,555.65 feet above sea level.

## Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	44.26	Apr. 7	41.40	July 11	44.77	Sept. 13	48.59
Feb. 2	43.44	May 20	41.29	16	45.18	Oct. 21	48.37
Mar. 2	42.52	June 12	42.42	Aug. 16	47.27	Dec. 12	46.84

(C-35-11)33aac1. Cottonwood Pump and Irrigation Co. Measuring point, top of casing, 5,576.65 feet above sea level.

## Water level, in feet below measuring point, 1939

Jan. 4	60.64	Apr. 22	58.06	July 13 a	85.30	Sept. 13	68.33
Feb. 1	59.85	May 11 a	73.00	Aug. 16 a	85.85	Oct. 20	66.42
Mar. 6	59.10	20 a	74.50	Sept. 8	69.08	Dec. 13	64.67
Apr. 5	58.50	June 13 a	80.17				

(C-35-11)33abd1. (C-35-11)33ab in Water-Supply Paper 817. Gronway Parry. State claim no. 11,590. Measuring point, top of pump base at air line opening, 0.1 foot above top of concrete floor, 0.5 foot below center-line of air gage, 1.5 feet above land surface and 5,576.20 feet above sea level. Water level, in feet below measuring point, 1939: Sept. 14, c/68.03.

a Pumping.

b Measurement made by Utah State Engineer in cooperation with Works Progress Administration.

c Air gage reading, 5.0 feet.



## Iron County, Cedar City Valley--Continued

(C-35-11)33cddl. Alex and Ezra Rollo. Measuring point, top of casing, 5,585.6 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 4	70.19	May 11 a	74.2	July 13 a	85.1	Sept. 14	77.90
Feb. 1	68.66	20 a	74.3	Aug. 16 a	93.54	Oct. 20	76.12
Mar. 6	67.07	June 13	71.53	Sept. 7 a	93.41	Dec. 13	73.90
Apr. 5	66.76						

(C-35-11)33dbcl. (C-35-11)33db in Water-Supply Paper 817. Wm. H. Wood. State claim no. 14,012. Measuring point, bottom edge of hole in casing, 0.50 foot below top of casing, 0.5 foot below land surface and 5,583.33 feet above sea level. Water level, in feet below measuring point, 1939: Sept. 14, 74.70.

(C-35-12)13dadl. C. and C. Wooster. Measuring point, top of casing, 5,524.47 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 3	51.36	Apr. 5	51.52	July 11 b	52.77	Oct. 21 b	52.63
Feb. 2	51.49	June 12	51.60	Sept. 13	51.91	Dec. 11	51.72

(C-35-12)25dddl. State of Utah. Measuring point, top of casing, 5,515.16 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 3	19.65	Apr. 4	19.49	July 11	19.55	Oct. 21	19.73
Feb. 2	19.67	May 8	19.50	Aug. 16	19.69	Dec. 11	19.78
Mar. 2	19.55	June 12	19.52	Sept. 13	19.78		

(C-35-12)34aacl. Federal Land Bank. Measuring point, top of tee, 5,471.28 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 3	7.29	Apr. 3	6.65	July 10	7.91	Oct. 21	7.84
Feb. 1	7.12	May 8	6.74	Aug. 16	8.25	Dec. 11	7.56
Mar. 14	6.66	June 12	7.30	Sept. 14	8.16		

(C-35-12)34cdcl. R. J. and W. M. Shay. Measuring point, top of casing, 5,485.38 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 3	16.42	Apr. 3	15.81	July 10	17.03	Oct. 21	17.02
Feb. 1	16.30	May 8	15.87	Aug. 16	17.28	Dec. 11	16.74
Mar. 1	16.10	June 12	16.54	Sept. 14	17.27		

(C-36-10)21caal. Drought Relief Administration. Measuring point, top of galvanized iron sheeting, 6,449.6 feet above sea level. Water-stage recorder installed July 15, 1939 and removed Sept. 15, 1939; water levels for this period given in table are stages at noon.

Water level, in feet below measuring point, 1939

Jan. 4	31.65	July 17	32.36	July 29	33.00	Aug. 10	33.85
31	29.53	18	32.44	30	33.01	11	34.00
Mar. 6	27.68	19	32.50	31	32.99	12	34.16
24	24.47	20	32.55	Aug. 1	32.98	13	34.30
Apr. 4	22.67	21	32.66	2	33.01	14	34.42
22	24.58	22	32.72	3	33.06	15	34.54
May 7	26.39	23	32.79	4	33.11	16	34.66
June 13	29.36	24	32.86	5	33.12	17	34.78
30	34.46	25	32.93	6	33.22	18	34.84
July 7	31.68	26	32.98	7	33.42	19	35.00
15	32.23	27	33.00	8	33.55	20	35.08
16	32.29	28	33.00	9	33.70	21	35.19

a Pumping.

b Windmill pumping intermittently.

## Iron County, Cedar City Valley--Continued

(C-36-10)21caal.--Continued

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Aug. 22	35.28	Aug. 29	35.92	Sept. 5	36.66	Sept. 11	36.92
23	35.38	30	36.01	6	36.79	12	36.97
24	35.47	31	36.12	7	36.71	13	36.85
25	35.56	Sept. 1	36.24	8	36.73	14	36.85
26	35.65	2	36.35	9	36.78	15	36.91
27	35.73	3	36.47	10	36.85	Dec. 9	33.14
28	35.82	4	36.57				

(C-36-11)6aad1. (C-36-11)6aa in Water-Supply Paper 817. Leonard Hargrave. State claim no. 17,943. Measuring point, top of casing, 5,542.55 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 3	29.58	July 11	35.20	Sept. 2	37.58	Nov. 11	33.50
23	29.14	17	35.87	13	36.45	18	33.00
Feb. 2	28.80	22	35.39	23	37.22	25	32.74
Mar. 3	28.05	29	36.29	30	36.50	Dec. 2	32.24
Apr. 6	27.38	Aug. 5	36.98	Oct. 9	36.14	9	32.00
May 8	29.72	12	37.26	15	35.92	16	31.84
20	31.37	16	37.14	21	35.16	17	31.80
29	32.02	19	37.02	28	34.24	23	31.34
June 12	34.15	26	37.26	Nov. 4	33.92	30	31.12

(C-36-11)7baal. Alfred Stuki. Measuring point, top of horizontal outlet of tee, 5,526.70 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 3	19.46	Apr. 6	17.27	June 12	27.45	Aug. 16	31.42
Feb. 2	18.54	May 20	24.32	July 11	29.23	Oct. 21	25.60
Mar. 15	17.44						

(C-36-11)8aabl. Leonard Hargrave. Measuring point, top of opening in pump base, 5,562.97 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 3	51.76	July 29	60.60	Sept. 23	61.27	Nov. 18	55.85
Feb. 2	50.72	Aug. 5	60.91	30	59.93	25	55.68
Mar. 3	49.58	12	61.16	Oct. 9	58.94	Dec. 2	55.60
Apr. 4	48.58	16	61.51	15	58.00	9	54.96
May 8	50.86	19	61.96	21	57.91	11	54.76
20	53.25	26	61.93	28	57.34	16	54.76
June 12	57.03	Sept. 2	62.13	Nov. 4	57.76	23	54.35
July 11	59.23	13	61.29	11	56.26	30	54.10

(C-36-11)8bbal. Alfred Stuki. Cedar City. State application no. 11,977. Irrigation well, diameter 12 inches, depth 158 feet. Measuring point, bottom edge of hole in pump base, 5,541.79 feet above sea level.

Water level, in feet, below measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
May 24, 1938	a 31.10	July 30, 1938	ab 53.12	Sept. 20, 1938	a 37.60
June 6	a 32.17	Aug. 20	ab 53.55	Sept. 13, 1939	42.01

(C-36-11)8bbd1. (C-36-11)8bb in Water-Supply Paper 817. Lawrence Bess. State claim no. 13,983. Measuring point, bottom edge of hole in pump, 5,545.46 feet above sea level.

Water level, in feet below measuring point, 1938-39

May 24, 1938	a 33.36	Aug. 20, 1938	ab 56.82	Sept. 13, 1939	b 53.60
June 15	a 33.46	Sept. 20	a 38.16		

a Measurement made by Utah State Engineer in cooperation with Works Progress Administration.  
b Pumping.

## Iron County, Cedar City Valley--Continued

(C-36-11)8cbb1. Lehi Jones. Measuring point, top of casing, 5,536.87 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	25.50	Apr. 3	24.58	July 11 a	36.55	Oct. 21 a	36.61
Feb. 1	25.22	May 8 a	35.20	Aug. 16 a	36.96	Dec. 11	28.10
Mar. 1	25.00	June 12 a	35.95	Sept. 13 a	37.01		

(C-36-11)8dabl. Los Angeles and Salt Lake Railroad. Cedar City. Used industrial well, diameter 10 inches, depth 192 feet. Measuring point, top of 6 by 6-inch pump support, 0.5 foot above concrete floor, 0.9 foot above land surface and 5,565.49 feet above sea level. Water level, in feet below measuring point, 1939: Oct. 25, 63.57.

(C-36-11)8cab1. Drought Relief Administration. Cedar City. State claim no. 8,180. Irrigation well, diameter 12 $\frac{1}{2}$  inches, depth 200 feet. Measuring point, bottom edge of  $\frac{1}{2}$ -inch hole in south side of casing 0.5 foot above land surface and 5,544.63 feet above sea level. Water level, in feet below measuring point, 1939: Sept. 14, 43.60.

(C-36-11)18aba2. Jacob Smith.

Daily noon water level, in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	21.07	20.60	20.35	20.57	22.51	24.63	25.90	26.80	27.53	26.20	23.99	23.25
2	21.05	20.59	20.32	20.57	22.57	24.70	25.91	26.83	27.57	26.23	23.95	23.23
3	21.04	20.58	20.29	20.56	22.63	24.75	25.96	26.88	27.62	26.24	23.92	23.22
4	21.02	20.57	20.26	20.55	22.68	24.79	26.01	26.92	27.64	26.25	23.89	23.19
5	21.00	20.56	20.26	20.55	22.71	24.81	26.06	26.95	27.65	25.99	23.86	23.16
6	20.99	20.55	20.28	20.56	22.80	24.87	26.11	26.95	27.66	25.64	23.83	23.14
7	20.98	20.54	20.32	20.56	22.90	24.93	26.16	26.96	27.61	25.41	23.80	23.11
8	20.97	20.52	20.44	20.54	22.98	24.99	.....	26.98	27.60	.....	23.76	23.09
9	20.96	20.51	20.59	20.51	23.04	25.05	.....	27.02	.....	25.16	23.72	23.07
10	20.94	20.50	20.84	20.52	23.11	25.10	.....	27.05	.....	25.06	23.70	23.05
11	20.93	.....	20.89	20.50	23.19	25.16	.....	27.09	.....	24.96	23.69	23.02
12	20.91	.....	20.89	20.48	23.25	25.21	.....	27.12	.....	24.91	23.66	23.01
13	20.86	.....	20.88	20.46	23.35	25.24	.....	27.12	26.83	24.81	23.64	23.00
14	20.81	.....	20.88	20.43	23.46	25.30	.....	27.15	26.58	24.73	23.60	22.99
15	20.80	.....	20.88	20.41	23.57	25.36	26.48	27.17	26.40	24.68	23.58	22.98
16	20.79	.....	20.89	20.40	23.67	25.41	26.52	27.21	26.25	24.63	23.56	22.96
17	20.78	.....	20.86	20.40	23.75	25.43	26.56	27.23	26.16	24.58	23.53	22.95
18	20.77	20.42	20.85	20.37	23.82	25.46	.....	27.17	26.07	24.74	23.51	22.94
19	20.76	20.42	20.84	20.34	23.88	25.52	.....	27.17	26.00	24.81	23.49	22.93
20	20.74	20.42	20.83	20.54	23.94	25.56	.....	26.95	25.96	24.68	23.48	22.91
21	20.73	20.41	20.81	20.95	23.97	25.62	26.57	26.92	26.16	24.59	23.45	22.90
22	20.72	20.41	20.79	21.23	24.04	25.69	26.62	27.06	26.37	24.50	23.43	22.88
23	20.71	20.40	20.76	21.43	24.13	25.71	26.65	27.13	26.50	24.40	23.41	22.86
24	20.70	20.39	20.75	21.62	24.20	25.74	26.63	27.21	26.57	24.33	23.38	22.85
25	20.69	20.38	20.66	21.76	24.27	25.74	26.68	27.29	26.61	24.27	23.36	22.83
26	20.68	20.38	20.61	21.90	24.33	25.77	26.72	27.35	26.62	24.24	23.34	22.82
27	20.67	20.38	20.58	22.07	24.40	25.80	26.75	27.36	26.30	24.21	23.32	22.81
28	20.65	20.37	20.57	22.17	24.45	25.80	26.74	27.39	25.97	24.18	23.30	22.80
29	20.64	.....	20.56	22.33	24.50	25.81	26.74	27.44	26.01	24.13	23.27	22.80
30	20.62	.....	20.56	22.41	24.54	25.87	26.76	27.45	26.14	24.09	23.26	22.79
31	20.61	.....	20.57	.....	24.58	.....	26.76	27.49	.....	24.04	.....	22.78

(C-36-11)18adal. (C-36-11)18ac in Water Supply Paper 817. Henry C. Esplin. Measuring point, bottom edge of hole in casing, 2.4 feet below center line of air gage, 1.5 feet below land surface and 5,528.94 feet above sea level. Water level, in feet below measuring point, 1939: Sept. 13, b/ 41.11.

(C-36-11)18cdcl. Wayne Montgomery. Measuring point, bottom of hole in casing, 5,514.81 feet above sea level.

a Pumping.

b Air gage reading, 11 feet.

## Iron County, Cedar City Valley--Continued

(C-36-11)18cdcl.--Continued

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	26.56	May 6	26.18	July 9	26.88	Sept. 11	27.58
Feb. 1	26.46	June 10	26.31	Aug. 15	27.34	Dec. 9	27.18
Apr. 6	26.30						

(C-36-11)18daal. David Thorley. Cedar City. State claim no. 17,277. Used stock well, diameter 4½ inches, depth 90 feet. Measuring point, bottom of old pump frame, 2.3 feet above land surface and 5,575.6 feet above sea level. Equipped with lift pump. Water level, in feet below measuring point, 1939: Apr. 6, 80.6.

(C-36-12)1aaa2. (C-36-12)1aa in Water-Supply Paper 817. M. J. MacFarlane. Measuring point, top of casing, 5,517.36 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 3	9.83	Mar. 2	9.00	May 8	10.14	Oct. 21	15.17
Feb. 4	9.33	Apr. 4	7.57	Sept. 13	18.53	Dec. 11	12.88

(C-36-12)1adal Fred Barnson. Cedar. Unused well, diameter 5 inches. Measuring point, top of casing, level with land surface.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 11	10.04	Sept. 13	13.88	Dec. 11	12.63
Aug. 16	12.45	Oct. 21	14.31		

(C-36-12)2adb1. Lawrence Hanchett. (C-36-12)2adb2. W. W. Armstrong in Water-Supply Paper 845. Measuring point, top of casing, 5,495.53 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	13.24	Apr. 3	11.72	July 10	14.05	Oct. 21	13.80
Feb. 1	12.59	May 8	12.17	Aug. 16	14.61	Dec. 11	12.90
Mar. 14	11.98	June 12	13.39	Sept. 14	14.69		

(C-36-12)3bbal. Wm. R. Palmer. Measuring point, top of 2 by 12-inch upright of curb, 5,470.55 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 3	5.40	Apr. 3	4.91	July 10	6.10	Oct. 21	5.91
Feb. 1	5.25	May 8	5.03	Aug. 16	6.33	Dec. 9	5.62
Mar. 16	4.96	June 10	5.56	Sept. 14	6.01		

(C-36-12)3cbal. Wm. R. Palmer. Measuring point, top of casing, 5,471.65 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 3	1.25	Apr. 3	0.77	July 10	2.24	Oct. 21	2.14
Feb. 1	1.10	May 8	.98	Aug. 16	2.60	Dec. 9	2.19
Mar. 16	.95	June 10	1.54				

(C-36-12)9aaal. Erastus L. Jones. Cedar City. State application no. 12,955. Diameter 6 inches, depth 257 feet. Measuring point, top of nail in west side of post, level with trough, 1.0 foot above land surface. Found flowing prior to all measurements.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 10	2.49	Sept. 14	2.40	Dec. 9	2.8
Aug. 16	2.34	Oct. 21	2.53		

## Iron County, Cedar City Valley--Continued

(C-36-12)9dcbl. E. B. Robinson. Queatchupah. State claim no. 5,234. Diameter 2 inches. Measuring point, top of casing, level with land surface and 5,458.32 feet above sea level. Found flowing prior to all measurements.

## Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 3	7.55	June 10	8.1	Aug. 16	7.4	Dec. 9	7.3
May 8	7.6	July 10	7.9	Sept. 14	7.4		

(C-36-12)12dacl. Webster Leigh. Diameter, 4 to 2 inches. Measuring point, top of casing, 5,510.15 feet above sea level.

## Water level, in feet below measuring point, 1939

Jan. 3	10.95	May 8	9.63	July 10	15.2 <sup>a</sup>	Sept. 14	17.39
Feb. 1	9.98	June 12	14.55	Aug. 16	17.23	Dec. 11	12.94
Mar. 1	9.12						

(C-36-12)12dbal. Branch Agricultural College. Measuring point, top of casing, 5,511.75 feet above sea level.

## Water level, in feet below measuring point, 1939

Jan. 3	15.79	May 8	a 46.04	July 10	ab 29.70	Sept. 27	20.05
Feb. 1	15.20	June 12	a 47.90	Aug. 16	a 48.2 <sup>a</sup>	Oct. 21	19.19
Mar. 1	14.72	July 10	a 48.10	Sept. 14	21.74	Dec. 11	17.64
Apr. 3	14.09						

(C-36-12)13bdal. Federal Land Bank. Measuring point, top of plank, 5,502.03 feet above sea level.

## Water level, in feet below measuring point, 1939

Jan. 3	23.12	Mar. 14	22.90	May 8	22.80	July 10	23.05
Feb. 1	23.02	Apr. 3	22.86	June 12	22.85		

(C-36-12)14bbdl. G. H. Pratt. Measuring point, top of casing, 5,479.35 feet above sea level.

## Water level, in feet below measuring point, 1939

Jan. 3	9.92	Apr. 3	9.35	July 10	10.05	Oct. 21	10.41
Feb. 1	9.69	May 8	9.33	Aug. 16	10.37	Dec. 11	10.04
Mar. 1	9.55	June 12	9.68	Sept. 14	10.53		

(C-36-12)16bccl. (C-36-12)16bcdl in Water-Supply Paper 845. H. D., E. L., and L. M. Jones. Found flowing prior to all measurements.

## Water level, in feet above measuring point, 1939

Jan. 3	1.49	Apr. 3	2.84	July 10	0.90	Sept. 11	0.17
Feb. 1	1.87	May 8	c 2.46	Aug. 16	0.21	Dec. 9	1.46
Mar. 1	2.31	June 10	1.84				

(C-36-12)21ccbl. (C-36-12)21cc in Water-Supply Paper 817. D. C. Bullock and others. Measuring point, top of coupling, 5,460.55 feet above sea level. Found flowing prior to all measurements.

## Water level, in feet above measuring point, 1939

Jan. 3	d 11.25	Apr. 4	9.9	July 10	9.6	Sept. 11	9.7
Feb. 1	11.45	June 10	9.8	Aug. 15	9.8	Dec. 9	9.4
Mar. 1	11.3						

(C-36-12)23dddl. David Thorley. Measuring point, rim of hole in cap, 5,495.55 feet above sea level.

## Water level, in feet below measuring point, 1939

Jan. 4	23.75	June 10	a 28.55	July 16	24.40	Dec. 9	a 38.46
Apr. 7	23.53	July 9	a 40.55	Aug. 15	24.09	12	24.80

a Pumping.

b Pump stopped 65 minutes prior to measurement.

c Flow, 3.0 gallons a minute.

d Flow, 37 gallons a minute.

## Iron County, Cedar City Valley--Continued

(C-36-12)26cbb1. Cox and Thorley. Measuring point, top of ell, 5,467.12 feet above sea level. Found flowing prior to all measurements.

Water level, in feet above measuring point, and flow in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Jan. 3	3.98	2.3	Aug. 15	3.95	2.4
Apr. 4	4.1	2.4	Sept. 11	4.0	2.1
May 6	4.2	2.4	Oct. 21	3.85	2.1
June 10	4.1	2.4	Dec. 9	3.94	2.2
July 9	4.15	...			

(C-36-12)27dac1. No measurements made in 1939. Measuring point, top of ell 5,461.90 feet above sea level. The elevation of measuring point is included because it refers to measurements given in prior Water Supply Papers.

(C-36-12)28ccc1. A. P. Spillsbury. Measuring point, top of ell, 5,466.53 feet above sea level. Found flowing prior to all measurements.

Water level, in feet above measuring point, and flow in gallons per minute, 1939

Jan. 3	5.5	3.4	June 10	5.4	3.3
Feb. 1	5.7	...	July 10	5.3	...
Mar. 1	5.5	3.4	Aug. 15	5.2	2.9
Apr. 4	5.6	3.6	Sept. 11	5.2	2.9
May 6	5.45	3.4	Dec. 9	5.0	3.0

(C-36-12)29dab2. H. H. Lunt. Queatchupah. Abandoned drilled well. In pit at site of former reservoir, about 300 feet southwest of house. Measuring point, top of flange of discharge pipe, 1.0 foot above land surface and 1.02 feet above center line of lower flange. Water levels, in feet below measuring point, 1939: July 11, 11.63; Aug. 15, 11.73; Sept. 11, 11.82; Dec. 9, 12.00.

(C-36-12)33dbcl. A. P. Spillsbury. Queatchupah. Diameter 2 inches. Measuring point, top of coupling, 1.3 feet above land surface and 5,448.77 feet above sea level. Found flowing prior to all measurements.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 5	a 19.6	June 10	19.9	Aug. 15	20.2	Dec. 9	19.5
May 6	19.8	July 9	20.2	Sept. 11	19.75		

(C-37-12)3ccc1. Frank A. Thorley. (Federal Land Bank). Queatchupah. State claim nos. 12,826 and 16,359. Diameter 1 $\frac{1}{4}$ -inches. Measuring point, top of casing, level with land surface and 5,458.81 feet above sea level. Found flowing about one gallon a minute prior to all measurements. Water levels, in feet above measuring point: July 17, 7.0; Aug. 15, 6.2; Sept. 11, 7.2; Dec. 9, 6.2.

(C-37-12)3ddd1. M. M. Vandenberghe. Measuring point, top of horizontal outlet of tee, 5,468.20 feet above sea level. Found flowing prior to all measurements except measurement on Dec. 9.

Water level, in feet above measuring point, 1939

Jan. 3	4.5	May 6	4.75	July 9	4.55	Sept. 11	4.3
Mar. 1	4.5	June 10	4.55	Aug. 15	4.3	Dec. 9	5.85
Apr. 4	b 4.75						

(C-37-12)5aad3. Federal Land Bank. Measuring point, top of ell, 0.5 foot below land surface and 5,474.87 feet above sea level.

- a Flow, 2.0 gallons a minute.  
b Flow, 7.0 gallons a minute.

## Iron County, Cedar City Valley--Continued

(C-37-12)5aad3.--Continued

Water level, in feet above measuring point and flow in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Jan. 3	4.6	....	July 9	3.11	a ....
Feb. 1	4.55	....	Aug. 15	2.90	a 19.4
Apr. 4	4.3	30.0	Sept. 11	2.82	a 15.0
May 6	3.37	a 20.7	Dec. 9	2.80	a 15.0
June 10	3.28	a 21.0			

(C-37-12)9aad1. Geo. W. Foster. Queatchupah. State claim no. 13,989. Diameter  $1\frac{1}{2}$  inches. Measuring point, top of ell, 1.0 foot above land surface and 5,464.63 feet above sea level. Found flowing prior to all measurements.

Water level, in feet above measuring point and flow, in gallons per minute, 1938-39

Aug. 10, 1938 b	4.6	...	Sept. 11, 1939	4.8	2.5
July 17, 1939	4.8	3.0	Dec. 9	4.8	2.5
Aug. 15	4.75	3.0			

(C-37-12)9add1. Geo. W. Foster. Queatchupah. State claim no. 13,991. Diameter 30 to 9 inches, depth 135 feet. Measuring point, top of 2 by 4-inch platform, level with land surface and 5,477.00 feet above sea level. Water levels, in feet below measuring point, 1939: July 17, 5.00; Aug. 15, 5.08; Sept. 11, 5.05; Dec. 9, 5.17.

(C-37-12)9baal. Platt Watson. Measuring point, top of reducing tee, 5,472.98 feet above sea level. Found flowing prior to all measurements.

Water level, in feet above measuring point and flow, in gallons per minute, 1939

Jan. 3	2.52	0.47	July 9	2.49	....
Feb. 1	2.55	....	Aug. 15	2.32	0.43
Apr. 4	2.64	.49	Sept. 11	2.33	.37
May 6	2.59	.48	Dec. 9	2.02	.38
June 10	2.54	.39			

(C-37-12)10acal. R. S. Tiernan. Queatchupah. State claim no. 16,629, diameter  $1\frac{1}{2}$  inches. Measuring point, top of ell at land surface. Found flowing prior to all measurements.

Water level, in feet above measuring point and flow, in gallons per minute, 1939

July 17	8.05	3.0	Sept. 11	8.0	3.0
Aug. 15	8.15	3.4	Dec. 9	8.2	3.0

(C-37-12)11dbcl. Oliver Berkhelden. Measuring point, top of casing, 5,481.52 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	9.82	Apr. 4	8.92	June 10	9.40	Sept. 11	10.98
Feb. 3	9.61	17	8.90	July 9	10.12	Oct. 21	10.60
Mar. 1	9.50	May 6	8.88	Aug. 15	10.77	Dec. 9	10.27
17	9.03						

(C-37-12)14abd1. John G. Pace. Unused well, diameter 48 to 36 inches. Measuring point, top of 2 by 6-inch pump support, 2.5 feet above land surface. Equipped with wind mill.

a Found flowing.

b Measurement made by Utah State Engineer in cooperation with Works Progress Administration.

## Iron County, Cedar City Valley--Continued

(C-37-12)14abd1.--Continued

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
July 17	16.00	Sept. 11	16.33	Dec. 9	16.04
Aug. 15	16.13	Oct. 21	16.09		

(C-37-12)14dccl. John W. Platt. Kanarraville. State claim no. 13,753. Unused well, diameter 12 inches, depth 285 feet. Measuring point, top of casing 0.5 foot above land surface and 5,498.49 feet above sea level.

Water level, in feet below measuring point, 1938-39

June 18, 1938	a 32.5	Aug. 5, 1939	34.81	Oct. 21, 1939	34.51
Apr. 4, 1939	31.92	Sept. 27	34.94	Dec. 9	34.14

(C-37-12)14ddd1. (C-37-12)14dd in Water-Supply Papers 817 and 840. Federal Land Bank. Measuring point, top of casing, 5,532.42 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	61.49	Mar. 1	61.95	May 6	61.92	July 9	(b)
Feb. 3	61.68	Apr. 4	61.95	June 10	62.63		

(C-37-12)22cbcl. W. J. Williams. Kanarraville. State application no. 12,071. Unused irrigation well, diameter 16 inches, depth 340 feet. Measuring point, top of casing 1.2 feet above land surface and 5,555.82 feet above sea level.

Water level, in feet below measuring point, 1938-39

Date	Water level	Date	Water level	Date	Water level
June 8, 1938	a 88.26	June 10, 1939	87.99	Sept. 11, 1939	88.35
Apr. 20, 1939	87.84	July 9	88.17	Dec. 9	88.42
May 6	87.82	Aug. 15	88.35		

(C-37-12)23acb1. (C-37-12)23ac in Water-Supply Paper 817. Federal Land Bank. Measuring point, top of concrete pump base, 5,513.93 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	49.14	Apr. 4	49.14	July 9 c	91.6	Oct. 21	52.28
Feb. 3	49.13	May 6 c	60.5±	Aug. 15	52.78	Dec. 9	51.77
Mar. 1	49.22	June 10 c	73.58	Sept. 27	52.42		

(C-37-12)34abb1. (C-37-12)34ab in Water-Supply Paper 817. Kanarra Field and Reservoir Co. Measuring Point, bottom of inspection opening, 5,508.54 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 3	41.12	May 6 c	60.2	July 9 c	62.05	Sept. 11	45.95
Mar. 1	41.07	June 10 c	61.48	Aug. 15 c	63.70	Dec. 9	43.09
Apr. 4	41.17						

(C-38-12)3bcal. Ford and Williams. Measuring point, top of casing, 5,482.65 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 3	68.98	Apr. 4	68.96	July 9	68.96	Sept. 11	69.18
Feb. 3	68.97	May 6	68.88	Aug. 15	69.11	Dec. 9	69.37
Mar. 1	69.00	June 10	68.87				

a Measurement made by Utah State Engineer in cooperation with Works Progress Administration.

b Plugged with debris at 61 feet.

c Pumping.



## Iron County, Escalante Valley

(C-31-12)9abbl. Used domestic and stock well, diameter 48 inches. Measuring point, top of tie curbing, 2.0 feet above land surface. Equipped with windmill. Water level, in feet below measuring point, 1939: Nov. 8, 78.15.

(C-31-12)9cbcl. Used domestic and stock well, diameter 60 inches. Measuring point, top of tie at hole for discharge pipe, 1.5 feet above land surface. Equipped with windmill. Water level, in feet below measuring point, 1939: Nov. 8, 61.93.

(C-31-12)19ccd1. Dug stock well. At windlass frame near south end of Blue Butte. Measuring point, iron pump base, or top of platform, 1.0 foot above land surface. Water levels, in feet below measuring point, 1939: Nov. 8, 52.15; Dec. 17, 50.87.

(C-31-13)1al. Oscar Stephenson. Water levels, in feet below measuring point, 1939: Jan. 14, a/27.71; June 14, 27.64; Oct. 23, 27.72; Dec. 17, 27.70.

(C-31-13)1a2. Oscar Stephenson.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 14	a 27.63	June 14	27.48	Dec. 17	27.70
May 12	27.58	Oct. 23	27.75		

(C-31-13)4cddl. Pearl Boeck.

Water level, in feet below measuring point, 1939

Jan. 14	a 24.68	June 14	24.74	Dec. 17	24.71
May 12	24.56	Oct. 23	24.82		

(C-31-13)8dbcl. H. L. Adams.

Water level, in feet below measuring point, 1939

Jan. 14	a 36.50	June 14	36.58	Dec. 13	b 37.40
May 12	36.43	Oct. 23	36.74		

(C-31-13)21abbl. (C-31-13)21ab in Water-Supply Paper 817. Public land. Measuring point, top of 6 by 6-inch curbing, 5,074.22 feet above sea level. Water levels, in feet below measuring point, 1939: Oct. 20, 22.14; Dec. 17, 22.04.

(C-31-13)33cccl. LeMont Lowe.

Water level, in feet below measuring point, 1939

Jan. 14	a 34.13	June 14	34.18	Dec. 17	b 35.25
May 12	34.18	Oct. 23	34.29		

(C-32-12)34ddal. W. L. Adams. Mud Springs. State claim no. 6,004. Used stock well, diameter 12 by 16 feet, depth 16 feet. Measuring point, center of cross cut in 2 by 8-inch beam on south side of well opening, level with land surface. Equipped with gas engine and horizontal centrifugal pump.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 14	10.05	June 12	10.61	Aug. 17	11.38	Dec. 11	12.74
May 10	10.52	July 12	11.11	Sept. 14	11.85		

(C-32-13)9bdd1. Alma Frahske. Measurements given in Water-Supply Paper 845 were interchanged with the measurements for (C-32-13)9bdd2. Water levels, in feet below measuring point, 1939: Jan. 14, 37.78; June 14, 37.39; Oct. 23, 37.58; Dec. 17, 37.81.

a Measurement made by Utah Agricultural Experiment Station in co-operation with Utah State Engineer.

b Pumping.

## Iron County, Escalante Valley--Continued

(C-32-13)9bdd2. Alma Frahske. Measurements given in Water-Supply Paper 845 were interchanged with the measurements for (C-32-13)9bdd1. Measuring point, base of hand pump, 5,106.14 feet above sea level, not 5,104.92 as given in Water-Supply Paper 845.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 14	a 40.59	June 14	b 45.28	Dec. 17	40.40
May 12	b 44.07	Oct. 23	40.40		

(C-32-14)10dccl. U. S. Geol. Survey test well. About 50 feet east of railroad tracks and 12 feet southeast from lead-in pole to semaphore. Diameter 2 inches, depth 11 feet. Measuring point, top of galvanized iron casing, 0.8 foot above land surface and 5,077.35 feet above sea level. Water levels, in feet below measuring point, 1939: Oct. 20, 10.85; Dec. 17, 10.80.

(C-32-14)12ccdl. At deserted homestead. Abandoned dug well, diameter 36 $\frac{1}{2}$  inches. Measuring point, top of railroad tie well cover, 1.0 foot above land surface. Water level, in feet below measuring point, 1939: Oct. 20, 23.10.

(C-32-14)28bbbl. Joseph Dyson. State claim no. 17,227. Measured depth, 23 feet. Water levels, in feet below measuring point, 1939: Apr. 26, 2.37; Sept. 18, 2.97; Oct. 19, 2.83; Dec. 14, 2.67.

(C-32-14)32addl. U. S. Geol. Survey test well. Diameter 2 inches, depth 13 feet. Measuring point, top of quarter-section marker, 1.4 feet above land surface and 5,090.73 feet above sea level. Water levels, in feet below measuring point, 1939: May 5, 14.10; Sept. 18, 14.22; Oct. 19, 14.15; Dec. 14, 14.11.

(C-33-14)8cccl. U. S. Geol. Survey test well. Three feet northeast of southwest corner of section 8. Diameter 2 inches, depth 10 feet. Measuring point, top of casing, 0.7 foot above land surface and 5,094.14 feet above sea level. Water levels, in feet below measuring point, 1939: Oct. 18, 9.30; Dec. 14, 9.24.

(C-33-14)15dbdl. Grazing Service (no. 46 $\frac{1}{2}$ ). Lund. Stock well, diameter 6 $\frac{1}{4}$  inches, depth 140 feet. Measuring point, top of casing, 0.7 foot above land surface and 5,118.97 feet above sea level. Equipped with lift pump and gas engine. Water levels, in feet below measuring point, 1939: May 5, 30.70; Sept. 18, 31.18; Dec. 14, 31.30.

(C-33-14)19adbl. U. S. Geol. Survey test well. Lund. South of graded road and at angle in telephone line. Diameter 2 inches, depth 7.3 feet. Measuring point, top of galvanized-iron casing, level with nail in south side of telephone pole, 0.5 foot above land surface. Water levels, in feet below measuring point, 1939: Oct. 19, 6.67; Dec. 14, 6.57.

(C-33-14)36dd. Bank of Southern Utah. Water levels, in feet below measuring point, 1939: Sept. 18, 69.81; Dec. 14, 69.79.

(C-33-15)11bbcl. Charles Jobert. Water levels, in feet below measuring point, 1939: Apr. 26, 61.53; Oct. 2, 61.6.

(C-33-15)12aaal. Public Land. Ford. Unused well, 12 inches square, measured depth, 18 feet. Measuring point, top of 1 $\frac{1}{2}$ -inch pipe, 2.65 feet above top of railroad tie, 3.2 feet above wooden curb, 3.0 feet above land surface and 5,113.70 feet above sea level. Water levels, in feet below measuring point, 1939: May 5, 20.10; Oct. 2, 19.85; Oct. 18, 19.88; Dec. 14, 19.98.

(C-33-15)13cbb1. Iron County. Ford. State claim no. 17,615. Twelve inches square, depth 16 feet. Measuring point, top of wood curbing, 2.8 feet above land surface and 5,108.82 feet above sea level. Water levels, in feet below measuring point, 1939: Apr. 26, 15.54; Sept. 18, 16.38; Dec. 14, 16.04.

a Measurement made by Utah State Agricultural College in cooperation with Utah State Engineer.  
b Pumping.

## Iron County, Escalante Valley--Continued

(C-33-15)19bcc1. Robins and Maguire. Water levels, in feet below measuring point, 1939: Jan. 14, a/ 78.71; Apr. 26, 78.70; Sept. 19, 78.70; Dec. 14, 78.70.

(C-33-15)25bbb1. Public Land. Table Buttes. Diameter 2 inches, measured depth 18 feet. Measuring point, top of casing, 4.0 feet below land surface and 5,095.92 feet above sea level. Water levels, in feet below measuring point, 1939: Apr. 26, 2.26; Sept. 18, 2.74; Dec. 14, 2.64.

(C-33-15)27cdal. Public Land. Zane. Diameter 12 inches, depth 100 feet. Measuring point, top of 1 by 2-inch wooden stake, 0.2 foot above land surface and 5,116.43 feet above sea level. Water levels, in feet below measuring point, 1939: Apr. 26, 17.18; Sept. 18, 17.96; Dec. 14, 18.06.

(C-33-15)31bbcl. (C-33-15)31bbc in Water-Supply Paper 840. Clayton Phillips. Water levels, in feet below measuring point, 1939: May 13, 23.25; Sept. 19, 23.31; Dec. 14, 23.38.

(C-33-15)31cbb1. Jesse Carlson. Water levels, in feet below measuring point, 1939: Jan. 14, a/27.93; Apr. 26, 27.92; Sept. 19, 28.18; Dec. 14, 28.09.

(C-33-15)33dcb1. Arlie Fourman. Measuring point changed to valve seat in base of pitcher pump, 8.50 feet above top of casing and 5,111.75 feet above sea level. Water levels, in feet below measuring point, 1939: Jan. 14, a/ 10.76; Apr. 26, 10.68; Sept. 18, 10.94; Dec. 14, 10.90.

(C-33-15)34ddd1. U. S. Geol. Survey test well. Table Buttes. Diameter 2 inches, depth 10 feet. Measuring point, top of township corner marker, 1.2 feet above land surface and 5,106.53 feet above sea level. Water levels, in feet below measuring point, 1939: May 5, 9.20; Sept. 18, 9.52; Dec. 14, 9.54.

(C-33-15)36cccl. U. S. Geol. Survey test well. Table Buttes. Diameter 2 inches, depth 9 feet. Measuring point, top of section corner marker, 1.0 foot above land surface and 5,104.92 feet above sea level. Water levels, in feet below measuring point, 1939: May 13, 7.55; Sept. 18, 7.58; Dec. 14, 7.91.

(C-33-16)13ddd1. Mrs. Ann Phillips. Measuring point changed to top of railroad tie well cover, about 0.6 foot above previous measuring point. Water level, in feet below measuring point, 1939: Sept. 19, 88.07.

(C-33-16)19ddd1. Clarence Lynd. Water levels, in feet below measuring point, 1939: Jan. 7, a/ 66.77; Apr. 24, 66.81; Sept. 21, 66.87; Dec. 16, 66.85.

(C-33-16)25bbal. Anson H. Emerine. Depth, 82 feet. Water levels, in feet below measuring point, 1939: Apr. 26, 54.80; Sept. 19, 54.87; Dec. 14, 54.93.

(C-33-16)29cdb1. Donji Ikeda. Water levels, in feet below measuring point, 1939: Apr. 24, 28.55; Sept. 21, 28.72; Dec. 16, 28.63.

(C-33-16)32abal. Union Pacific Railroad. Water levels, in feet below measuring point, 1939: Jan. 7, a/ 19.20; Apr. 25, 19.01; Sept. 21, 19.36; Dec. 14, 19.20.

a Measurement made by Utah State Agricultural College in cooperation with Utah State Engineer.

## Iron County, Escalante Valley--Continued

(C-33-17)25add1. Nunzio Eucarino. Water level, in feet below measuring point, 1939: Oct. 2, a/ 63.58; Oct. 2, b/ 63.10.

(C-33-17)29dcbl. Frank Webster. Water levels, in feet below measuring point, 1939: Sept. 21, 108.29; Dec. 15, 108.24.

(C-34-14)31cccl. U. S. Geol. Survey test well. Three feet north-east from southwest corner of section 31. Diameter 2 inches, depth 18 feet. Measuring point, top of galvanized iron casing, 0.5 foot above land surface and 5,127.90 feet above sea level. Water level, in feet above measuring point, 1939: Oct. 21, 14.90.

(C-34-15)1aad1. Bank of Southern Utah. Measuring point changed to cross on concrete about 6 feet west of well outlet, 0.6 foot below previous measuring point and 5,102.23 feet above sea level.

Water level, in feet above measuring point, and flow in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Apr. 26	2.68	3.2	Dec. 14	2.43	3.7
Sept. 18	2.33	3.2			

(C-34-15)1aad2. U. S. Geol. Survey test well. Table Buttes. Diameter 2 inches, depth 6 feet. Measuring point, top of concrete at cross, 0.4 foot above land surface and 5,102.23 feet above sea level. Water levels, in feet below measuring point, 1939: May 5, 2.40; Sept. 18, 5.23; Dec. 14, 2.80.

(C-34-15)6cbb2. (C-34-15)6cbb in Water-Supply Paper 840. Rollo F. Bromman. Water levels in feet below measuring point, 1939: Apr. 26, 8.97; May 13, 9.50; Dec. 14, 9.96.

(C-34-15)10odd1. D. C. Rood. Table Buttes. Diameter 42 inches, depth 11 feet. Measuring point, top of rock curb at south side, 0.8 foot above land surface and 5,113.81 feet above sea level. Water levels, in feet below measuring point, 1939: Apr. 26, 11.45; Sept. 18 c/ Dec. 14 c/.

(C-34-15)16cccl. Table Buttes. Diameter 12½ to 8 inches. Measuring point, top of 12½-inch casing, 0.3 foot above land surface and 5,117.5± feet above sea level. Water levels between 12½ and 8-inch casings; in feet below measuring point, 1939: May 13, 5.03; Sept. 19, 6.00; Oct. 2, 5.84; Dec. 14, 5.52. Water levels in 8-inch casing in feet below measuring point, 1939: Oct. 2, 5.86; Dec. 14, 5.56.

(C-34-15)16ccc2. U. S. Geol. Survey test well. About 3 feet north-east from the southwest corner of section 16. Diameter 2 inches, depth 15.5 feet. Measuring point, top of galvanized iron casing, 0.7 foot above land surface and 5,117.56 feet above sea level. Water levels, in feet below measuring point, 1939: Oct. 19, d/ 9.40; Oct. 21, 8.84; Oct. 21, e/ 8.62; Dec. 14, 8.60.

(C-34-15)17bbb1. Public domain. Zane. Abandoned well, 48 by 36 inches, depth 8 feet. Measuring point, top of 2 by 4-inch curbing at north side, 2.1 feet above land surface and 5,118.57 feet above sea level. Water levels, in feet below measuring point, 1939: Apr. 26, 9.83; Sept. 19, 10.40; Dec. 14, 10.05.

a Pumping.

b Pump stopped 10 minutes prior to measurement.

c Dry 12 feet below measuring point.

d Depth of well, 11 feet.

e Well deepened to 15.5 feet.

## Iron County, Escalante Valley--Continued

(C-34-15)27daa2. U. S. Geol. Survey test well. On property of K. L. McGarry, 0.5 foot south of an 8-inch well that is plugged 3.5 feet below land surface. Diameter 2 inches, depth 11.5 feet. Measuring point, top of galvanized iron casing, 1.3 feet above land surface and 5,125.14 feet above sea level. Water levels, in feet below measuring point, 1939: Apr. 26, 11.13; Sept. 19, 11.69; Dec. 16, 12.76.

(C-34-15)31bbb1. U. S. Geol. Survey test well. Diameter 2 inches, depth 8 feet. Measuring point, nail in post at section corner, 0.2 foot above land surface and 5,128.21 feet above sea level. Water levels, in feet below measuring point, 1939: Apr. 26, 7.2; Sept. 19, 8.05; Dec. 14, dry at 8.0.

(C-34-16)7aab2. (C-34-16)7aab in Water-Supply Paper 840. Jos. M. Robinson. Water levels in feet below measuring point, 1939: Apr. 24, 17.02; Sept. 21, 17.80; Dec. 16, 17.32.

(C-34-16)7ccd1. (C-34-16)7ccd in Water-Supply Paper 840. Joe Hughes. Water levels, in feet below measuring point, 1939: Apr. 24, 11.35; Sept. 21, a/; Dec. 16, a/

(C-34-16)9bcc1. Fred Pinafrock. Water levels, in feet below measuring point, 1939: Jan. 7, b/ 11.60; Apr. 24, 10.29; Sept. 10, 9.32; Dec. 16, 10.94.

(C-34-16)9cbcl. Augustus Lott. Water levels, in feet below measuring point, 1939: Jan. 7, b/ 9.83; Apr. 24, 9.17; Sept. 20, 9.12; Dec. 16, 9.35.

(C-34-16)10bab2. (C-34-16)10bab in Water-Supply Paper 840. A. E. McGarry. Water levels, in feet below measuring point, 1939: Apr. 24, 10.34; Sept. 21, 10.39; Dec. 16, 10.41

(C-34-16)15ccc2. Inland Investment Co. Beryl. Unused well, diameter 8 inches, depth 16 feet. Measuring point, top of casing, 3.2 feet below land surface and 5,124.53 feet above sea level. Water levels, in feet below measuring point, 1939: Apr. 25, 2.72; Sept. 20, 3.65; Dec. 16, 3.57.

(C-34-16)17dcc2. Public land.

Water level, in feet below measuring point, 1939

Date	Water level		Date	Water level	
	(inside casing)	(outside casing)		(inside casing)	(outside casing)
Jan. 7	1.57	1.82	Sept. 20	1.78	2.07
Apr. 24	1.27	1.44	Dec. 16	1.60	1.87

(C-34-16)18aac1. (C-34-16)18aac in Water-Supply Paper 840. Charles E. Aye. Water levels, in feet below measuring point, 1939: Apr. 24, 13.75; Sept. 21, 13.98.

(C-34-16)21dcc2. Public land. Water levels, in feet below measuring point, 1939: Apr. 25, 11.47; Sept. 20, 12.00; Dec. 16, 11.83.

(C-34-16)26ccc2. Public land. Beryl. Diameter 12 inches, measured depth 69 feet. Measuring point, top of casing, 1.7 feet above land surface and about 5,136.6 feet above sea level. Water levels, in feet below measuring point, 1939: Apr. 25, 11.37; Sept. 25, 12.16; Dec. 16, 11.86.

a Dry 11.5 feet below measuring point.

b Measurement made by Utah State Agricultural College in cooperation with Utah State Engineer.

## Iron County, Escalante Valley--Continued

(C-34-16)27ccc2. George F. White estate. Water levels, in feet below measuring point, 1939: Jan. 7, a/ 5.32; Apr. 25, 4.97; Sept. 20, 5.69; Dec. 16, 5.40.

(C-34-16)28acc3. George and Alma Owen. Water level, in feet below measuring point, 1939: Jan. 7, a/ 9.30; observations discontinued.

(C-34-16)28bcc2. Fred Fisher.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 7	a 1.97	Sept. 20	2.42	Dec. 16	2.13
Apr. 25	1.75	Oct. 2	2.37		

(C-34-16)28ccc2. J. H. Davis. Water levels, in feet below measuring point, 1939: Apr. 25, 3.53; Sept. 20, 4.18; Dec. 16, 3.97.

(C-34-16)30aad1. (C-34-16)30aad in Water-Supply Paper 840. Dudley F. Shelley. Well plugged and dirt damp 9.5 feet below measuring point on Apr. 24 and Sept. 20, 1939

(C-34-16)30adb1. Dudley F. Shelley. Water levels, in feet below measuring point, 1939: Oct. 2, 4.33; Dec. 16, 4.23.

(C-34-16)30ddc2. Dudley F. Shelley. Water levels, in feet below measuring point, 1939: Apr. 24, 1.40; Sept. 20, 2.17; Dec. 16, 1.94.

(C-34-16)31bcc3. Sarah B. Endicott.

Water level, in feet below measuring point, 1939

Jan. 7	a 2.50	Sept. 20	Pumping	Dec. 16	2.57
Apr. 25	2.45	Oct. 2	2.61		

(C-34-16)33cdc2. Utah Land Security. Beryl. Unused well, diameter 6 inches, measured depth 37 feet. Measuring point, top of casing, 5.3 feet above land surface and 5,146.80 feet above sea level. Water levels, in feet below measuring point, 1939: Apr. 25, 16.30; Sept. 21, 16.73; Dec. 15, 16.83.

(C-34-16)33cdd1. (C-34-16)33cdc2 in Water-Supply Paper 840. Utah Land Security Co. Water levels, in feet below measuring point, 1939: Apr. 25, 12.88; Sept. 20, 13.76; Dec. 15, 13.40.

(C-34-17)1dabl. Freda Spooner. Water levels, in feet below measuring point, 1939: Jan. 7, a/ 22.67; Apr. 24, 21.68; Sept. 21, 22.32; Dec. 16, 21.87.

(C-34-17)9ddd1. William Haigh. Water levels, in feet below measuring point, 1939: Jan. 7, a/ 31.54; Apr. 24, 31.79; Sept. 21, 31.89; Dec. 15, 31.87.

(C-34-17)10bbcl. Ada F. Randall. Yale. Unused well, diameter 42 inches, depth 35.5 feet. Measuring point, top of concrete curb, 1.0 foot above land surface and 5,173.04 feet above sea level. Water levels, in feet below measuring point, 1939: Apr. 24, 33.74; Sept. 21, 33.83; Dec. 15, 33.84.

(C-34-17)18add1. (C-34-17)18add in Water-Supply Paper 840. Ole Martinsen estate. Measuring point, top of 8 by 8-inch beam, level with land surface and 5,198.8 feet above sea level. Water levels, in feet below measuring point, 1939: Sept. 21, 55.61; Dec. 15, 55.64.

(C-34-17)24bcc2. William Maston. Water level, in feet below measuring point, 1939: Oct. 2, 15.82.

a Measurement made by Utah State Agricultural College in cooperation with Utah State Engineer.

## Iron County, Escalante Valley--Continued

(C-34-17)24cbb1. Marvin Hughes. Water levels, in feet below measuring point, 1939: Jan. 7, a/ 15.76; Apr. 24, 15.60; Sept. 21, 16.07; Dec. 16, 15.74.

(C-34-17)27abab. (C-34-17)27aba in Water-Supply Paper 840. Lena Murphy. Water levels, in feet below measuring point, 1939: Apr. 24, 28.49; Sept. 21, 28.60; Dec. 15, 28.58.

(C-34-17)28abb1. (C-34-17)28abb in Water-Supply Paper 840. Public land. Water levels, in feet below measuring point, 1939: Apr. 24, 41.82; Sept. 21, 42.20; Dec. 15, 41.95.

(C-35-12)18ddd2. Columbia Steel Co. Measuring point, top of casing, 5,376.18 feet above sea level.

## Water level, in feet, below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	3.24	Apr. 3	2.56	June 12	2.72	Sept. 14	4.17
Feb. 1	3.01	May 8	1.57	July 10	3.32	Oct. 21	3.62
Mar. 1	2.88	May 20	2.48	Aug. 16	3.94	Dec. 11	3.03

(C-35-15)3accl. R. D. Clarke estate.

## Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 14	a 15.48	Sept. 19	15.91	Dec. 16	15.56
Apr. 25	15.08	Oct. 21	15.77		

(C-35-15)3dec1. R. D. Clarke estate.

## Water level, in feet below measuring point, 1939

Jan. 14	a 15.68	Sept. 19	16.14	Dec. 16	15.65
Apr. 25	15.30	Oct. 21	15.94		

(C-35-15)3dcc2. R. D. Clarke estate. Water levels, in feet below measuring point, 1939: Jan. 14, a/ 15.02; Apr. 25, 14.81; Sept. 19, 15.59; Dec. 16, 15.13.

(C-35-15)4dcc2. (C-35-15)4dcc in Water-Supply Paper 840. Anna E. Lloyd. Water levels in feet below measuring point, 1939: Apr. 25, 9.25; Sept. 19, 10.29; Dec. 16, 9.82.

(C-35-15)6cddl. Frank Bridel. Water levels, in feet below measuring point, 1939: Jan. 14, a/ 15.06; Apr. 25, 14.51; Sept. 19, 16.01; Dec. 16, 15.27.

(C-35-15)10adcl. Erroneously numbered (C-35-15)19adcl in Water-Supply Paper 845. R. D. Clarke estate. Water level, in feet below measuring point, 1939: Jan. 14, a/ 17.06; observations discontinued.

(C-35-15)10bacl. Walter Martin. Water level, in feet below measuring point, 1939: Jan. 14, a/ 10.90; observations discontinued.

(C-35-15)10bdc2. Walter Martin.

## Water level, in feet below measuring point, 1939

Jan. 14	a 17.18	May 13	18.43	Dec. 16	17.35
Apr. 25	b 43.85	Sept. 19	18.49		

a Measurement made by Utah State Agricultural College in cooperation with Utah State Engineer.

b Pumping.

## Iron County, Escalante Valley-Continued

(C-35-15)11bbb1. (C-35-15)11bbb in Water-Supply Paper 840. Marvel Del Vecchio. Water levels, in feet below measuring point, 1939: Apr. 25, 18.05; Sept. 19, 19.07; Dec. 16, 18.55.

(C-35-15)20bcd1. (C-35-15)20bcd in Water-Supply Paper 840. Public land. Water levels, in feet below measuring point, 1939: Apr. 25, 23.10; Sept. 19, 23.78; Dec. 16, 23.40.

(C-35-15)30acc2. Hugh Ash. Water levels, in feet below measuring point, 1939: Jan. 14, a/ 29.53; Apr. 25, 29.34; Sept. 19, 29.76; Dec. 16, 29.60.

(C-35-16)3bcd1. R. D. Clarke estate. Water levels, in feet below measuring point, 1939: Jan. 7, a/ 15.93; Apr. 25, 15.68; Sept. 20, 16.52; Dec. 16, 16.12.

(C-35-16)6bbcl. Fortunatus Thompson.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 7	a 17.97	Sept. 20	18.43	Dec. 16	18.13
Apr. 24	17.78	Oct. 21	18.30		

(C-35-16)6ccc2. Emily Jones. Water level, in feet below measuring point, 1939: Jan. 7, a/ 18.52; observations discontinued.

(C-35-16)7bbb1. H. L. Austin. Water levels, in feet below measuring point, 1939: Jan. 7, a/ 19.10; Apr. 24, 18.89; Sept. 20, 19.67.

(C-35-16)7bdb1. Maud Moyle. Water level, in feet below measuring point, 1939: Jan. 7, a/ 2.43; observations discontinued.

(C-35-16)7ccb2. Ole Martinsen estate. Water levels, in feet below measuring point, 1939: Jan. 7, a/ 19.95; Apr. 24, 20.00; Sept. 20, 20.80; Dec. 15, 20.30.

(C-35-16)9cdcl. W. and U. Hasegawa. Water levels, in feet below measuring point, 1939: Jan. 7, a/ 15.54; Apr. 25, 15.13; Sept. 20, 15.97; Dec. 15, 15.55.

(C-35-16)10bdal. Robt. D. Clarke. Water levels, in feet below measuring point, 1939: Apr. 25, 1.94; Sept. 20, 2.72; Dec. 15, 2.40.

(C-35-16)15abcl. J. E. Harris. Water levels, in feet below measuring point, 1939: Jan. 7, a/ 17.75; Apr. 25, 17.47; Sept. 20, 18.22; Dec. 15, 17.95.

(C-35-16)17bad1. S. and K. Kase. Water levels, in feet below measuring point, 1939: Jan. 7, a/ 3.54; Apr. 25, 3.27; Sept. 20, 4.07; Dec. 15, 3.78.

(C-35-16)17cda2. Ira Caldwell. Water levels, in feet below measuring point, 1939: Jan. 7, a/ 2.23; Apr. 25, 2.08; Sept. 20, 2.74; Dec. 15, 2.52.

(C-35-16)18cdc4. Napoleon Boutin. Water levels, in feet below measuring point, 1939: Apr. 24, 20.40; Sept. 20, 21.22; Dec. 15, 20.89.

a Measurement made by Utah State Agricultural College in cooperation with Utah State Engineer.



## Iron County, Escalante Valley--Continued

(C-35-16)20dcd1. Eva Hard. Water level, in feet below measuring point, 1939: Jan. 7, a/ 21.48; Apr. 25, 21.33; Sept. 20, 21.82; Dec. 15, 21.71.

(C-35-16)22add1. R. C. Inatomi. Water level, in feet below measuring point, 1939: Jan. 7, a/0.67; Apr. 25, b/ 1.12; Sept. 20, 1.69; Dec. 15, 1.42.

(C-35-16)22bbal. (C-35-16)22bba in Water-Supply Paper 840. Chas. Erickson. Water levels, in feet below measuring point, 1939: Apr. 24, 20.99; Sept. 20, 21.49; Dec. 15, 21.38.

(C-35-16)22ccd1. (C-35-16)22ccd in Water-Supply Paper 840. Lyman and Heber Sevy. Water levels, in feet below measuring point, 1939: Apr. 25, 18.50; Sept. 20, 19.17; Dec. 15, 18.96.

(C-35-17)1bcc1. (C-35-17)1bcc in Water-Supply Paper 840. Geo. Pershall estate. Water levels, in feet below measuring point, 1939: Apr. 24, 7.57; Sept. 21, 7.73; Dec. 15, 7.74.

(C-35-17)3bbb1. John L. Sevy. Water levels, in feet below measuring point, 1939: Jan. 7, a/ 46.20; Apr. 24, 46.22; Sept. 21, 46.27; Dec. 15, 46.31.

(C-35-17)13bcd1. Austin D. Moyle. Water levels, in feet below measuring point, 1939: Jan. 7, a/ 25.70; Oct. 2, 26.52.

(C-35-17)13cbcl. Gordon Moyle. Measuring point changed to top of casing, 2.5 feet below land surface and about 5,166.6 feet above sea level. Water levels, in feet below measuring point, 1939: Sept. 20, c/ 49.43; Oct. 2, 27.37; Dec. 15, 26.70.

(C-35-17)21add1. (C-35-17)21add in Water-Supply Paper 840. Ernest A. Pickering. Water levels, in feet below measuring point, 1939: Apr. 24, 38.61; Sept. 21, 39.45; Dec. 15 d/

(C-35-17)25cdd1. Henry Brenn. Water levels, in feet below measuring point, 1939: Jan. 7, a/ 35.32; Apr. 24, 35.26; Sept. 20, 35.46; Dec. 15, 35.47.

(C-35-17)25dcal. Gustave Sievert. Water level, in feet below measuring point, 1939: Jan. 7, a/ 37.33; observations discontinued.

(C-36-16)8dbdl. Charles Hart. Newcastle. Domestic and stock well, diameter 7 inches, depth 125 feet. Measuring point, base of hand pump, 3.45 feet above top of casing, at land surface and 5,265.31 feet above sea level. Equipped with hand pump. Water levels, in feet below measuring point, 1939: May 13, 118.03; Sept. 19, 118.29; Dec. 16, 118.40.

(C-36-16)4bl. John L. Sevy and Sons. Water levels, in feet below measuring point, 1939: Jan. 7, a/ 43.36; Apr. 24, 43.37.

(C-36-16)5al. John L. Sevy and Sons. Reference to Water-Supply Paper 840 given in Water-Supply Paper 845 in error. (C-36-16)5al, H. M. and L. E. Sevy, in Water-Supply Paper 840. Water levels, in feet below measuring point, 1939: Sept. 19, 44.32; Dec. 15, 44.85.

a Measurement made by Utah State Agricultural College in cooperation with Utah State Engineer.

b Pumped recently.

c Pumping.

d Dry 40 feet below measuring point.

## Iron County, Escalante Valley--Continued

(C-36-16)16ddal. Chas. Erickson. Water levels, in feet below measuring point, 1939: Jan. 7, a/ 57.31; Sept. 19, 57.40; Dec. 15, 57.45.

(C-36-17)1ccc1. (C-36-17)12b, Public land, in Water-Supply Paper 817. John C. Benson. Measuring point, bottom of railroad tie over pit, 1.0 foot above land surface and 5,220.15 feet above sea level. Water levels, in feet below measuring point, 1939: Apr. 24, 69.03; Sept. 19, 70.28; Dec. 15, 70.85.

## Iron County, Parowan Valley

(C-32-8)1adal. Used stock well, diameter 6 inches. Measuring point, bottom edge of  $\frac{1}{2}$ -inch hole in casing, 0.47 foot below top of coupling, 1.5 feet above land surface and 5,748.08 feet above sea level. Equipped with lift pump. Water levels, in feet below measuring point, 1939: Sept. 29, 50.50; Oct. 12, 50.43; Dec. 9, 50.45.

(C-32-8)13dbcl. Paragonah. Unused well, diameter 48 $\frac{1}{2}$  inches. Measuring point, top of 4 by 4-inch beam spanning well, level with land surface. Water level, in feet below measuring point, 1939: Oct. 13, 17.85.

(C-32-8)14dad1. R. F. Starley. Measuring point, top of tee on casing, 5,775.90 feet above sea level. Found flowing prior to all measurements except as noted.

Water level, in feet above measuring point, and flow, in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Jan. 7	9.1	8.8	July 10	9.1	7.0
Jan. 11	9.2	...	Aug. 2	9.1	7.1
Feb. 14	9.4	b 2.5	Aug. 24	8.8	6.7
Mar. 12	9.5	b 1.5	Sept. 11	8.8	7.0
Apr. 6	9.3	7.3	Oct. 5	8.9	7.0
May 8	9.3	7.3	Nov. 30	10.2	(c)
June 6	9.3	7.1	Dec. 9	10.7	(c)

(C-32-8)32ccc1. Rex Ward. Measuring point, top of outlet pipe, 5,721.66 feet above sea level. Found flowing prior to all measurements except as noted.

Water level, in feet above measuring point, and flow, in gallons per minute, 1939

Jan. 7	6.0	(c)	Aug. 2	4.7	16.2
Jan. 13	6.0	(c)	Aug. 23	4.6	....
Mar. 12	6.4	(c)	Sept. 12	4.6	17
Apr. 6	5.3	22	Oct. 5	4.6	17
May 8	4.9	20	Nov. 20	4.8	18
June 7	5.0	17	Dec. 9	5.9	(c)
July 10	4.8	17.5			

(C-32-8)35bcb1. H. N. Edwards. Measuring point, top of ell, 5,768.11 feet above sea level. Found flowing prior to all measurements except March 12, 1939.

Water level, in feet above measuring point, and flow, in gallons per minute, 1939

Jan. 7	8.3	4.0	July 10	6.4	3.1
Jan. 11	8.5	...	Aug. 2	5.6	3.0
Feb. 14	8.7	4.3	Aug. 24	5.3	2.7
Mar. 12	10.5	...	Sept. 11	5.2	2.6
Apr. 6	8.3	4.0	Oct. 5	6.4	3.3
May 8	8.25	3.9	Nov. 20	8.3	4.0
June 6	8.0	3.8	Dec. 9	8.5	4.0

a Measurement made by Utah State Agricultural College in cooperation with Utah State Engineer.  
b Found partially closed.  
c Found closed.

## Iron County, Parowan Valley--Continued

(C-33-8)4cdd3. Harold Mitchell. Measuring point, top of ell, 5,739.36 feet above sea level. Found flowing prior to all measurements except as noted.

Water level, in feet above measuring point, and flow, in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Jan. 7	25.1	(a)	Aug. 7	7.5	4.6
Feb. 14	25.1	(a)	25	7.7	5.0
Mar. 12	25.2	(a)	Sept. 11	7.6	4.6
Apr. 6	11.7	7.5	Oct. 5	7.6	4.6
May 8	7.2	4.8	Nov. 20	20.4	(a)
June 8	7.6	4.5	Dec. 9	18.9	(a)
July 10	7.0	4.6			

(C-33-8)8dcd3. Wm. Talbot. Leaking around casing; measurements discontinued.

(C-33-8)15cbd1. Albert R. McBride. Paragonah. Diameter 48± inches, depth 47 feet. Water level, in feet below land surface, 1939: Oct. 4, 18.5.

(C-33-8)18abcl. Eva Talbot and others. Measuring point, top of casing, 5,715.57 feet above sea level.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	16.25	Apr. 6	22.2	July 10	b 19.2	Oct. 5	b 13.6
13	16.9	May 8	bc 19.9	Aug. 2	bd 14.6	Nov. 20	b 14.8
Mar. 9	19.5	June 9	b 19.6	Sept. 11	be 13.7	Dec. 11	20.7

(C-33-8)19ddd1. State of Utah. Measuring point, top of ell, 5,735.41 feet above sea level. Found flowing prior to all measurements except as noted.

Water level, in feet above measuring point, and flow, in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Jan. 7	15.0	30	July 10	13.5	24
14	14.9	...	Aug. 2	13.5	24.5
Feb. 14	17.9	(a)	Sept. 12	13.7	24.5
Mar. 12	18.3	(a)	Oct. 5	14.1	25
Apr. 6	18.5	(a)	Nov. 30	15.0	23
May 8	14.55	26.5	Dec. 11	15.2	23.1
June 9	13.6	24.5			

(C-33-8)20aad1. T. R. Robinson. Measuring point, top of ell, 5,764.01 feet above sea level. Found flowing prior to all measurements except as noted.

Water level, in feet above measuring point, and flow in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Feb. 2	13.1	(a)	July 10	9.7	1.7
25	13.0	(a)	Aug. 7	9.7	1.9
Mar. 12	13.1	(a)	Sept. 12	9.8	1.8
Apr. 6	13.3	(a)	Oct. 5	9.8	1.8
May 8	9.65	(a)	Nov. 20	13.9	...
June 11	9.2	1.7	Dec. 9	14.4	(a)

a Found closed.

b Found leaking.

c Flow, 1 gallon per minute.

d Flow, 5.4 gallons per minute through  $\frac{1}{8}$ -inch opening.

e Flow, 3.2 gallons per minute.

## Iron County, Parowan Valley--Continued

(C-33-8)30ddd1. W. T. Davenport. Measuring point, top of ell, 5,759.26 feet above sea level.

## Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 16	a 0.60	Apr. 6	1.37	July 10	1.80	Oct. 14	1.95
Feb. 11	a 1.25	May 8	1.44	Aug. 2	1.46	Nov. 20	2.07
Mar. 12	a 1.23	June 11	1.65	Sept. 11	1.92	Dec. 11	2.16

(C-33-9)ldad1. Henry Mitchell estate. Measuring point, top of casing, 5,720.66 feet above sea level.

## Water level, in feet above measuring point, and flow, in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Jan. 7	8.7	....	Aug. 2	4.2	b 17.1
19	9.1	....	23	7.8	....
Mar. 9	10.1	....	Sept. 11	8.2	....
Apr. 6	5.1	b 22.5	Oct. 16	8.1	....
May 8	8.8	....	Nov. 20	5.6	b 18.5
June 5	5.0	b 21.0	Dec. 9	4.2	b 17.6
July 7	4.4	b 19.5			

(C-33-9)ldad2. Henry Mitchell estate. Measuring point, top of casing, 5,720.82 feet above sea level.

## Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	14.4	May 8	15.4	Aug. 2	13.7	Oct. 16	14.2
19	14.7	June 5	14.6	23	13.7	Nov. 20	14.2
Mar. 9	15.8	July 7	13.9	Sept. 11	14.1	Dec. 9	13.8
Apr. 6	15.4						

(C-33-9)lddal. Henry Mitchell estate. Measuring point, top of casing, 5,720.91 feet above sea level. Found flowing prior to all measurements except as noted.

## Water level, in feet above measuring point, and flow, in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Jan. 7	6.9	(c)	Aug. 2	2.4	2.1
19	7.4	(c)	23	3.9	(c)
Mar. 9	8.5	(c)	Sept. 11	4.2	4.3
Apr. 6	3.0	3.0	Oct. 16	4.3	4.0
May 8	4.6	4.6	Nov. 20	2.45	2.7
June 5	2.8	2.1	Dec. 9	2.7	2.5
July 7	1.6	2.0			

(C-33-9)llacbl. Emil Witte. Measuring point, top of casing, 5,718.96 feet above sea level. Found flowing through 1-inch opening prior to all measurements except those on Jan. 9 and Jan. 19, 1939.

## Water level in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 9	11.7	May 8	10.85	Aug. 2	9.1	Oct. 16	8.8
19	11.8	June 5	d 10.3	22	8.9	Nov. 20	8.3
Mar. 9	10.6	July 7	9.1	Sept. 12	8.9	Dec. 9	11.5
Apr. 6	10.8						

a Water frozen.

b Found flowing.

c Found closed.

d Flow, 23.5 gallons per minute.

## Iron County, Parowan Valley--Continued

(C-33-9)14ccc1. W. M. Eyre estate. Measuring point, top of ell, 5,710.54 feet above sea level. Found flowing prior to all measurements except as noted.

Water level, in feet above measuring point, and flow, in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Jan. 9	18.3	(a)	Aug. 2	7.1	42
20	18.9	(a)	22	7.0	..
Mar. 17	19.4	(a)	Sept. 12	7.0	42
Apr. 6	19.5	(a)	Oct. 16	7.8	47
May 8	10.0	60	Nov. 30	15.3	(a)
June 5	9.1	47	Dec. 9	16.4	(a)
July 7	8.1	43			

(C-33-9)24abal. Annie J. Decker. Measuring point, top of bushing, 5,721.80 feet above sea level. Flow, in gallons per minute, 1939: Jan. 9, 5.5; Mar. 17, 8.0; May 8, 6.3; Aug. 13, 4.0. Recording pressure gage installed Sept. 20, 1939.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 9	8.1	Apr. 6	19.7	June 14	14.0	Aug. 13	5.5
19	16.1	May 8	10.3	July 10	14.2	Sept. 20	5.6
Mar. 17	9.0						

Daily noon water level, in feet above measuring point, 1939

Sept. 20	b 5.6	Oct. 13	14.0	Nov. 5	15.1	Nov. 28	16.4
21	9.95	14	14.1	6	15.3	29	16.4
22	10.8	15	14.1	7	15.4	30	16.4
23	11.25	16	14.2	8	15.5	Dec. 1	16.6
24	11.5	17	14.35	9	15.6	2	16.5
25	11.5	18	14.35	10	15.5	3	16.5
26	11.5	19	14.35	11	15.6	4	16.7
27	11.9	20	14.45	12	15.6	5	16.8
28	12.1	21	14.45	13	15.7	6	17.0
29	12.4	22	14.50	14	15.7	7	17.0
30	12.7	23	14.7	15	15.8	8	17.0
Oct. 1	12.8	24	14.7	16	15.8	9	16.7
2	12.5	25	14.75	17	15.9	10	17.3
3	12.7	26	14.35	18	15.8	11	17.0
4	12.8	27	14.7	19	15.9	12	16.9
5	12.95	28	14.8	20	16.0	13	17.1
6	13.1	29	14.9	21	16.0	14	17.2
7	13.2	30	14.8	22	16.0	17	17.3
8	12.9	31	14.9	23	16.1	18	17.4
9	13.1	Nov. 1	15.1	24	16.3	19	17.7
10	13.3	2	15.2	25	16.3	20	17.7
11	13.7	3	15.3	26	16.2	21	17.6
12	13.85	4	15.3	27	16.2	22	17.6

(C-33-9)24cddl. W. L. Adams. Measuring point, cross on outlet pipe, 5,716.98 feet above sea level.

Water level, in feet above measuring point, 1939

Jan. 9	30.8	Apr. 6	33.1	Aug. 3	19.4	Oct. 16	26.3
20	31.0	May 8	c 25.3	Sept. 6	21.3	Nov. 20	28.0
Feb. 14	31.9	June 14	c 19.0	20	24.1	Dec. 9	29.6
Mar. 17	33.3	July 10	c 16.2				

(C-33-9)25cdd3. State Land Board. State claim no. 17,710. Irrigation well, diameter 4 $\frac{1}{2}$  to 3 inches. Measuring point, top of casing, 1.6 feet above land surface and 5,747.89 feet above sea level. Water level, in feet below measuring point, 1939: Sept. 21, 2.02.

a Found closed.

b Measurement made 10 minutes after flow was stopped.

c Found leaking 18 to 21 gallons per minute.

## Iron County, Parowan Valley--Continued

(C-33-9)26bbb1. Federal Land Bank. Measuring point, top of vertical tee, 5,718.05 feet above sea level. Found flowing prior to all measurements except as noted.

Water level, in feet above measuring point, and flow in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Jan. 9	18.5	(a)	Aug. 2	3.1	25
Feb. 17	21.2	(a)	22	3.1	..
Mar. 17	22.3	(a)	Sept. 11	4.3	33
Apr. 7	20.65	(a)	Oct. 14	8.7	60
May 9	8.35	58	Nov. 20	13.3	(a)
June 5	5.55	42	Dec. 6	17.9	(a)
July 7	3.8	31			

(C-33-9)28abd1. John Dolorinske. Measuring point, top of casing, 5,713.3 feet above sea level and 0.1 foot below land surface (not 0.6 foot above land surface as given in Water-Supply Paper 845). Flow in gallons per minute, 1939: June 15, 5.8; June 30, 0.9; Sept. 25, 0.4; Oct. 27, 5.0.

Water level, in feet with reference to measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 9	+11.8	Apr. 29	+14.7	July 20	-0.35	Oct. 27 b	+3.50
Feb. 17	+12.2	June 15	b +3.4	Aug. 14	-1.80	Nov. 20 b	+2.50
Mar. 14	b +6.8	30	b +1.1	Sept. 25 b	+0.75	Dec. 6	+14.9
Apr. 7	+14.75						

(C-33-9)32ccd1. Alfred Wilcox. State claim no. 11,601. (C-33-9)32ccd2. State claim no. 17,335 in Water-Supply Paper 845. Measuring point, top of flange on casing, 5,702.87 feet above sea level. Water level in this well evidently does not reflect true fluctuations in either the shallow or artesian water bodies. Measurements discontinued at end of 1939.

Water level, in feet below measuring point, 1939

Jan. 8	7.43	Apr. 7	7.50	July 10	7.90	Oct. 27	8.17
23	7.48	May 9	7.58	Aug. 13	8.07	Nov. 20	8.25
Feb. 21	7.51	June 11	7.67	Sept. 25	8.06	Dec. 6	8.37
Mar. 13	7.57						

(C-33-9)32ccd2. Alfred Wilcox. State claim no. 17,335. (C-33-9)32ccd1. State claim no. 11,601 in Water-Supply Paper 845. Measuring point, top of ell, 0.6 foot above top of casing and 5,698.65 feet above sea level.

Water level, in feet, with reference to measuring point, 1939

Jan. 8	+9.5	Apr. 7 b	+7.0	July 10	-11.34	Oct. 27 b	+0.75
Feb. 21	+10.3	May 9	-0.12	Aug. 13	-12.50	Nov. 20 b	+1.85
Mar. 13	+10.6	June 11	-7.50	Sept. 25	-6.38	Dec. 6	+7.5

(C-33-9)32ddd1. State of Utah. Measuring point, top of casing, 5,707.97 feet above sea level.

Water level, in feet below measuring point, 1939

May 9	10.03	Aug. 13	23.19	Oct. 25	10.91	Nov. 20	8.63
June 11	18.65	Sept. 25	14.15	27	9.90	Dec. 6	1.27
July 10	21.95	Oct. 15	7.78				

(C-33-9)34cbd1. Mary Marsden. No measurements made in 1939.

(C-33-9)34cbd2. Mary Marsden. Measuring point, top of 4 $\frac{1}{2}$ -inch casing, 5,737.61 feet above sea level.

a Found closed.  
b Found flowing.

## Iron County, Parowan Valley--Continued

(C-33-9)34cbd2.--Continued

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water	Date	Water
Jan. 8	21.05	Mar. 14	19.64	June 15 a	50.02	Sept. 25	35.86
23	20.63	Apr. 7	20.35	July 10 a	53.15	Oct. 27	28.98
Feb. 6	20.04	May 9 a	38.43	Aug. 13 a	53.80	Nov. 20	27.67
23	19.68						

(C-33-9)34dbd2. Oscar Lyman. Measuring point changed to top of tee, 0.61 foot above top of casing and 5,755.27 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 8	0.52	Apr. 7	(b)	July 10 c	33.30	Oct. 14	7.77
Feb. 6	(b)	May 9 c	29.34	Aug. 13 c	36.16	Nov. 14	4.38
Mar. 12	(b)	June 11 c	35.30	Sept. 25 c	24.97	Dec. 6	1.67

(C-33-9)34dcd1. Federal Land Bank. Measuring point, top of concrete curb, 5,762.60 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 8	4.78	Apr. 7	3.00	Sept. 25	10.59	Nov. 14	6.99
Feb. 6	3.87	Aug. 13 d	52.04	Oct. 14	9.13	Dec. 6	5.70
Mar. 12	3.16						

(C-33-9)35bbc3. Clark Orton.

Water level, in feet, with reference to measuring point, 1939

Feb. 17	+7.8	Apr. 7	b +4.7	July 10	-10.85	Oct. 27	e +1.54
25	+7.4	May 9	-3.05	Aug. 13	-11.60	Nov. 14	f +2.10
Mar. 12	+7.4	June 11	-8.10	Sept. 25	-2.63	Dec. 6	+4.80

(C-33-9)35ddd1. State of Utah (Wilford Day). Measuring point, top of concrete curb, 5,792.75 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 9	35.45	Apr. 7	33.20	Aug. 13 g	82.55	Oct. 14	37.90
Feb. 2	34.46	May 8	46.24	Sept. 25	39.15	Nov. 14	37.10
11	34.35	July 10 g	82.25	28	39.03	Dec. 6	36.05
Mar. 12	33.38						

(C-33-9)36aaal. Emerson Adams. Measuring point, top of casing, 5,745.29 feet above sea level.

Water level, in feet, with reference to measuring point, and flow in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Jan. 9	+6.2	g 9	July 7	+3.10	b 4.5
17	+6.0	g ..	19	-0.07	...
Feb. 14	+6.4	g 10	Aug. 14	+1.70	b 4.6
Mar. 17	+7.2	g 10	Sept. 25	+4.0	b 9.2
Apr. 7	+7.5	b 15	Oct. 27	+4.8	b 11.5
May 8	+5.6	b 13	Nov. 14	+5.4	b 11.6
June 15	+0.68	b 1.8	Dec. 6	+6.2	b 13.6

(C-33-9)36bbcl. R. W. Hulet. Measuring point, top of 4½-inch casing, 5,754.54 feet above sea level.

- a Nearby well pumping
- b Found flowing.
- c Pumped from this or adjacent well.
- d Pumping.
- e Found flowing 1.8 gallons per minute.
- f Found flowing 3.0 gallons per minute.
- g Partly closed.

## Iron County, Parowan Valley--Continued

(C-33-9)36bbcl.--Continued

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 9	6.39	Apr. 7	4.71	July 10 a	28.78	Oct. 14	7.82
Feb. 11	5.35	May 8	13.45	Aug. 13 a	28.73	Nov. 14	7.18
Mar. 12	4.70	June 11 a	36.75	Sept. 25	10.30	Dec. 6	5.87

(C-33-9)36dcd1. H. L. Adams. Measuring point, top of concrete curb, 5,796.76 feet above sea level.

Water level, in feet below measuring point, 1939

Jan. 9	37.97	Apr. 7	39.97	Aug. 14 b	71.50	Oct. 14	39.79
17	37.95	May 8 b	71.55	Sept. 21	42.40	Nov. 14	38.95
Feb. 11	36.64	June 11 b	72.50	25	43.40	Dec. 6	38.36
Mar. 12	35.80						

(C-33-10)25dcd1. Edgar Benson. Parowan. State claim no. 10,612. Diameter 2 inches, depth 15 feet. Measuring point, top of casing 0.5 foot below land surface. Water levels, in feet above measuring point, 1939: July 19, 0.20; Dec. 6, 0.29.

(C-34-8)5bb. Drought Relief Administration.

Water level, in feet below measuring point, 1939

Jan. 10	25.17	Apr. 6	23.67	July 10	23.51	Oct. 27	23.87
Feb. 11	24.72	May 8	23.07	Aug. 13	23.83	Nov. 30	24.90
Mar. 12	24.28	June 11	23.10	Sept. 25	24.15	Dec. 6	23.78

(C-34-9)3cba2. Federal Land Bank.

Daily high and low water levels, in feet below measuring point, 1939  
(Water level on days for which no low stage  
is given is water level at noon)

Day	January		February		March	
	High	Low	High	Low	High	Low
1	6.60	....	5.20	....	4.80	....
2	6.50	....	5.25	....	4.72	....
3	6.45	....	5.17	....	4.62	....
4	6.50	....	5.22	....	4.57	....
5	6.35	....	5.18	....	4.65	....
6	6.23	....	5.27	5.60	4.63	....
7	6.37	6.53	5.21	....	4.51	....
8	6.17	....	5.16	....	4.51	....
9	6.20	....	5.16	....	4.46	....
10	6.11	6.43	5.16	....	4.37	....
11	6.22	....	5.20	....	4.46	....
12	6.18	....	5.18	6.23	4.41	....
13	6.10	....	5.46	6.47	4.39	....
14	5.92	6.48	5.25	....	4.42	....
15	6.05	....	5.15	....	4.42	....
16	6.0	....	5.0	....	4.38	....
17	6.0	....	5.0	....	4.32	....
18	5.97	....	4.90	....	4.30	....
19	5.97	....	4.86	....	4.26	....
20	5.65	....	4.90	....	4.28	....
21	5.63	....	4.97	....	4.28	....
22	5.60	....	4.93	....	4.22	....
23	5.64	....	4.81	....	4.18	4.43
24	5.71	....	4.78	....	4.19	....
25	5.66	....	4.80	....	4.15	4.38
26	5.60	....	4.75	....	4.09	....
27	5.44	....	4.78	....	4.08	....
28	5.48	....	4.72	....	4.08	....
29	5.64	....	....	....	4.09	....
30	5.40	....	....	....	4.11	....
31	5.15	....	....	....	4.11	....

a Pumping.

b Pumping; pump breaks suction near this level.



## Iron County, Parowan Valley--Continued

(C-34-9)Scba2.--Continued

Daily high and low water levels, in feet below measuring point, 1939  
 (Water level on days for which no low stage  
 is given is water level at noon)

Day	April		May		June	
	High	Low	High	Low	High	Low
1	4.12	.....	12.68	.....	15.50	.....
2	4.12	.....	12.38	12.74	15.80	.....
3	4.10	.....	12.72	.....	15.97	.....
4	4.10	.....	13.50	.....	15.69	16.02
5	4.16	.....	14.06	.....	16.04	.....
6	4.19	.....	14.35	.....	16.18	.....
7	4.14	.....	14.47	.....	16.29	.....
8	4.18	.....	14.71	.....	16.37	.....
9	4.19	.....	14.83	.....	16.43	.....
10	4.20	.....	14.91	.....	16.54	.....
11	4.16	.....	13.48	14.72	16.60	.....
12	4.13	.....	14.48	.....	16.68	.....
13	4.06	4.27	14.82	.....	16.73	.....
14	4.12	.....	14.98	.....	16.76	.....
15	4.29	.....	15.13	.....	16.42	16.78
16	4.52	.....	14.40	15.18	16.40	16.63
17	5.30	.....	15.14	.....	16.79	.....
18	6.95	.....	15.19	.....	16.92	.....
19	8.43	9.28	15.24	.....	16.96	.....
20	.....	.....	15.32	.....	17.01	.....
21	.....	.....	15.34	.....	16.79	17.05
22	.....	.....	15.48	.....	17.00	.....
23	10.78	.....	15.59	.....	16.99	.....
24	11.12	.....	15.74	.....	17.02	.....
25	11.68	.....	15.86	.....	16.58	17.03
26	12.06	.....	15.91	.....	16.94	.....
27	12.20	.....	15.85	.....	17.05	.....
28	12.30	.....	.....	.....	16.84	17.12
29	12.50	.....	15.97	.....	17.10	.....
30	12.60	.....	15.95	.....	17.25	.....
31	.....	.....	15.92	.....	.....	.....

Daily high and low water levels, in feet below measuring point, 1939  
 (Water level on days for which no low stage  
 is given is water level at noon)

Day	July		August		September	
	High	Low	High	Low	High	Low
1	16.64	17.28	18.03	18.27	19.00	.....
2	16.13	17.13	18.15	18.35	19.17	.....
3	17.12	.....	18.27	.....	19.27	.....
4	17.28	.....	18.44	.....	19.00	.....
5	17.38	.....	18.17	18.52	18.26	.....
6	16.60	17.50	18.12	18.45	18.00	.....
7	17.23	.....	17.37	18.12	15.53	16.33
8	17.53	.....	17.78	18.28	15.78	16.26
9	17.53	.....	17.72	18.43	15.77	.....
10	17.67	.....	17.54	18.32	14.70	.....
11	17.75	.....	17.95	18.44	12.57	.....
12	17.76	.....	.....	.....	11.81	.....
13	17.74	.....	.....	.....	.....	.....
14	17.77	.....	18.60	.....	.....	.....
15	17.83	.....	18.77	.....	.....	.....
16	17.85	.....	18.85	.....	.....	.....
17	16.76	17.85	18.65	.....	10.43	.....
18	17.85	18.15	18.87	.....	10.41	.....
19	.....	.....	18.00	18.96	10.42	.....
20	.....	.....	17.60	18.65	10.45	.....
21	.....	.....	18.69	.....	10.35	10.90
22	17.75	.....	18.77	.....	10.30	.....
23	17.54	17.90	.....	.....	10.03	10.46
24	17.35	17.90	.....	.....	9.93	.....
25	17.47	17.92	.....	.....	9.65	.....
26	18.00	.....	.....	.....	9.59	.....
27	.....	.....	.....	.....	9.39	9.82
28	.....	.....	18.85	.....	9.31	.....
29	.....	.....	19.08	.....	9.20	.....
30	18.61	.....	19.10	.....	9.13	9.70
31	17.96	18.21	18.50	.....	.....	.....

## Iron County, Parowan Valley--Continued

(C-34-9)3cba2.--Continued

Daily high and low water levels, in feet below measuring point, 1939  
(Water level on days for which no low stage  
is given is water level at noon)

Day	October		November		December	
	High	Low	High	Low	High	Low
1	9.15	.....	8.06	.....	7.35	7.85
2	8.95	.....	8.02	.....	7.40	.....
3	8.85	9.07	8.01	.....	7.29	.....
4	8.92	9.75	8.00	9.17	7.25	.....
5	9.13	10.01	8.16	.....	7.20	7.63
6	8.93	9.25	8.02	.....	7.19	8.00
7	8.88	.....	.....	.....	7.20	7.50
8	8.70	.....	.....	.....	7.13	.....
9	8.36	8.66	.....	.....	7.09	.....
10	8.40	8.93	.....	.....	7.02	.....
11	8.47	9.43	.....	.....	6.96	.....
12	8.54	10.18	8.02	.....	7.24	.....
13	.....	.....	.....	.....	6.98	.....
14	.....	.....	.....	.....	7.15	.....
15	8.08	.....	.....	.....	6.99	.....
16	7.83	8.23	.....	.....	6.96	.....
17	7.82	.....	.....	.....	6.87	.....
18	.....	.....	.....	.....	6.86	.....
19	.....	.....	7.79	.....	6.99	.....
20	.....	.....	7.80	8.60	6.80	.....
21	.....	.....	7.86	.....	7.00	.....
22	.....	.....	7.68	.....	6.76	.....
23	8.61	9.05	7.60	.....	6.73	.....
24	8.72	9.21	7.46	.....	6.72	.....
25	8.47	.....	7.38	.....	.....	.....
26	8.40	.....	7.40	.....	.....	.....
27	8.40	9.50	7.37	.....	.....	.....
28	8.46	.....	7.34	.....	.....	.....
29	8.32	.....	7.28	7.58	.....	.....
30	8.21	.....	7.33	.....	.....	.....
31	8.13	.....	.....	.....	.....	.....

(C-34-9)6bcd1. G. D. Hyatt. Measuring point, top of 2-inch ell, 5,698.32 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 8	3.41	Apr. 7	3.00	July 10	a 4.05	Oct. 27	a 4.18
Feb. 7	3.18	May 22	a 3.62	Aug. 13	a 4.37	Nov. 21	a 4.00
Mar. 13	2.82	June 2	a 3.60	Sept. 25	a 4.45	Dec. 6	3.88

(C-34-9)9bacl. Horace Evans. Measuring point, top of casing, 5,750.36 feet above sea level. No measurements made in 1939.

(C-34-9)9bbd3. Horace Evans. Measuring point, top of casing, 1.1 feet above surface.

Water level, in feet, with reference to measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 8	+4.0	Apr. 7	bc +1.48	July 10	b -12.80	Oct. 27	e +1.30
Feb. 6	+5.3	May 9	b -8.85	Aug. 14	b -13.37	Nov. 21	+2.45
25	+5.4	June 15	b -12.45	Sept. 25	d +0.66	Dec. 6	+3.60
Mar. 13	+6.4						

(C-34-9)9bbd7. Horace Evans. Measuring point, top of casing, 5,751.90 feet above sea level. No measurements made in 1939

- a Found flowing from  $\frac{1}{4}$ -inch outlet, 5.0 feet below measuring point.
- b Nearby well pumping.
- c Found flowing 4.2 gallons per minute.
- d Found flowing 1.25 gallons per minute.
- e Found flowing 3.5 gallons per minute.

## Iron County, Parowan Valley--Continued

(C-34-9)10bdd1. Albert R. Barnes. Measuring point, top of concrete casing, 5,817.12 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 8	52.52	Apr. 7	50.05	July 10	57.90	Oct. 14	55.18
Feb. 6	51.47	May 9	52.23	Aug. 14	57.67	Nov. 21	54.30
Mar. 12	50.34	June 15	55.10	Sept. 25	55.97	Dec. 6	53.76

(C-34-9)16cdd1. Federal Land Bank. Measuring point, top of coupling, 5,807.60 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 8	29.94	Apr. 7	26.93	July 11	28.35	Oct. 27	29.24
Feb. 6	28.83	May 9	27.23	Aug. 14	29.20	Nov. 21	29.40
Mar. 12	27.71	June 3	27.45	Sept. 25	29.38	Dec. 6	29.50

(C-34-9)22acd1. Federal Land Bank. Measuring point, top of casing, 5,885.46 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	121.04	Mar. 14	118.85	May 22	118.50	Oct. 25	122.75
23	120.30	Apr. 7	118.52	June 15	119.38	Dec. 6	121.97
Feb. 2	119.90	12	117.85	July 10	120.40	10	122.12
25	118.95	May 11	118.27	11	121.70		

(C-34-10)11dcd1. Rulon Lyman.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 8	69.15	Apr. 7	69.01	July 11	68.83	Oct. 14	69.08
Feb. 7	69.10	May 9	68.91	Aug. 13	68.93	Nov. 21	69.03
Mar. 13	69.05	June 3	69.35	Sept. 25	69.00	Dec. 6	68.05

(C-34-10)24abc1. R. J. Green. Summit. State application no. 12,115. Diameter 8 inches, depth 104 feet. Measuring point, top of casing 0.8 foot above land surface. Water levels, in feet below measuring point: June 14, 1938, a/ 56.57; July 16, 1938, a/ 56.51; Oct. 21, 1938, a/ 56.23; Mar. 14, 1939, a/ 55.87.

(C-34-10)24abd1. R. J. Green. Measuring point, top of casing, 5,768.17 feet above sea level.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 8	50.98	May 9	50.52	Aug. 13	50.74	Oct. 25	50.77
Feb. 6	50.77	June 3	50.60	Sept. 25	50.78	Nov. 21	50.78
Mar. 14	50.70	July 11	50.67	Oct. 14	50.73	Dec. 6	50.95
Apr. 7	50.55						

(C-34-10)24cdal. Lyle Farron. Summit. State application no. 12,241. Diameter 12 inches, depth 150 feet. Measuring point, top of casing, 0.5 foot above land surface and 5,808.61 feet above sea level. Water level, in feet below measuring point: June 14, 1938, a/ 92.73; July 16, 1938, a/ 101.70; Oct. 25, 1939, 92.35.

(C-34-10)24ddel. Summit. Abandoned well, diameter 6 inches, measured depth 139 feet. Measuring point, top of 6 to 3-inch bushing, 0.3 foot above land surface and 5,852.22 feet above sea level. Water levels in feet below measuring point, 1939: Oct. 25, 132.18; Dec. 8, 132.40.

a Measurements made by Utah State Engineer in cooperation with Works Progress Administration.

## Juab County--Continued

(C-15-1)14dd. C. H. Johnson. West well of two wells.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 14	0.40	Aug. 24	0.90	Dec. 1	0.92
June 18	0.52	Oct. 13	0.87		

(C-15-1)11bab1. Mrs. Nicholine Powell.

Water level, in feet below measuring point, 1939

Feb. 28	2.45	June 18	2.78	Oct. 13	4.24
Apr. 15	2.58	Aug. 24	3.94	Dec. 1	4.63

(C-15-1)12abab1. R. C. Mangelson.

Water level, in feet below measuring point, 1939

Feb. 28	59.45	June 18	59.43	Oct. 13	59.72
Apr. 15	59.65	Aug. 24	59.57	Dec. 1	59.85

(C-11-1)9bbb4. J. L. and H. J. Fowkes. Flow, in gallons per minute, 1939: June 19, 60.

Water level, in feet above measuring point, 1939

Mar. 4	11.2	June 19	a 8.4	Oct. 13	8.05
Apr. 14	10.8	Aug. 24	a 7.8	Dec. 1	7.6

(D-11-1)31abc. Loren Keyte.

Water level, in feet below measuring point, 1939

Apr. 14	1.63	Aug. 24	2.88	Dec. 1	2.97
June 19	1.95	Oct. 13	2.96		

(D-12-1)19cdcl. P. P. Christison. Found flowing prior to all measurements.

Water level, in feet above measuring point, 1939

Apr. 14	16.9	Aug. 24	14.55	Dec. 1	12.55
June 19	15.8	Oct. 13	13.3		

(D-13-1)6ccbl. Drought Relief Administration.

Water level, in feet below measuring point, 1939

Feb. 28	21.31	June 19	23.25	Oct. 13	26.73
Apr. 14	21.43	Aug. 24	25.48	Dec. 2	27.02

(D-14-1)6baal. C. H. Garrett.

Water level, in feet below measuring point, 1939

Feb. 28	197.17	June 18	197.58	Oct. 13	197.52
Apr. 15	197.65	Aug. 24	197.65	Dec. 1	198.82

## Kane County

(C-43-5)24dbd1. Lester Little. Water levels, in feet below measuring point; 1939: Apr. 21, 39.04; Aug. 19, b/ 43.29; Dec. 7, 40.40.

(C-44-5)6cbb1. Drought Relief Administration. Water levels, in feet below measuring point, 1939: Apr. 21, b/ 58.56; Aug. 19, b/ 57.81; Dec. 7, b/ 59.02.

a Found flowing.

b Windmill shut down 10 minutes prior to measurement.

## Juab County

(C-11-15)30c. Grazing Service well 54. Grazing Service. Used stock well, diameter  $6\frac{1}{4}$  inches, depth 112 feet. Measuring point, top of outlet tee 1.0 foot above land surface. Eight miles southwest of Fish Springs and about  $\frac{1}{4}$ -mile south of Callao-Fish Springs road. Water level, in feet below measuring point, 1939: Nov. 2, 31.91.

(C-11-16)6cc. J. H. Giulmette, Callao. Water level, in feet below measuring point, 1939: Nov. 2, 24.37.

(C-11-17)1bdcl. Drought Relief Administration. Water level, in feet below measuring point, 1939: Nov. 2, 5.34.

(C-12-1)36dcal. Orson Cazier. Water levels, in feet below measuring point, 1939: June 19, 39.78; Aug. 24, 41.43; Oct. 13, 41.12; Dec. 2, 34.67.

(C-12-4)23d. Division of Grazing. No measurements made in 1939.

(C-13-18)13d. David Howells. Water level, in feet above measuring point, 1939: Nov. 2, 1.32.

(C-13-18)14dcc. Will Parker. Water level, in feet below measuring point, 1939: Nov. 2, 17.21.

(C-13-18)23aab1. Chas. Nielson. In yard of Nielson's house, about 50 feet east of Post Office and 50 feet south of deep well with windmill. Filled in; measurements discontinued at end of 1938.

(C-13-18)23aab2. Chas. Nielson. Trout Creek, in yard of Nielson's house, about 50 feet east of Post Office and 100 feet south of deep well with windmill. Used domestic and stock well, diameter 10 inches, depth 44 feet. Measuring point, top of casing 0.8 foot above land surface. Water level, in feet below measuring point, 1939: Nov. 2, 6.92.

(C-14-1)27ccd1. Federal Land Bank. Water levels, in feet below measuring point, 1939: Feb. 28, 70.88; Apr. 15, 70.90; June 18, 70.90; Aug. 24, 71.03; Oct. 13 and Dec. 1, plugged and dry at 74 feet.

(C-14-5)36cccl. Federal Land Bank. Water levels, in feet below measuring point, 1939: Apr. 20, 93.59; Dec. 20, 93.70.

(C-14-18)3. Public Domain. Northernmost of 3 wells. Measuring point changed to top of coupling, 0.7 foot below top of ell (old measuring point). Water level, in feet above measuring point, 1939: Nov. 2, 3.79.

(C-14-18)3 Public Domain. Southernmost of 3 wells. Flow, in gallons per minute, 1939: Nov. 2, 3.5. Water level, in feet above measuring point, 1939: Nov. 2, 3.60.

(C-15-1)4dd. C. H. Johnson. East well of two wells.  
Water level, in feet, with reference to measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 28	+0.68	June 18	+0.67	Oct. 13	+0.35
Apr. 14	+0.78	Aug. 24	-0.05	Dec. 1	+0.32

## Millard County

(C-15-4)9dc. C. F. Olsen. Water levels in feet, below measuring point, 1939: Apr. 20, 32.82; Aug. 10, 31.67; Dec. 20, 34.30.

(C-15-4)20dc. Spencer Nielson. Water levels, in feet below measuring point, 1939: Apr. 20, 125.59; Aug. 10, 125.11; Dec. 20, 125.50.

(C-15-5)1aa. I. Parnell Hinckley.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 20	101.64	June 9	100.80	Dec. 20	101.76
Apr. 27	101.51	Aug. 10	100.04		

(C-15-7)17da. Isaac H. Losee. Water levels, in feet above measuring point, 1939: Apr. 20, 2.68; Aug. 11, 2.47; Dec. 20, 2.35. Found flowing prior to all measurements.

(C-15-8)23bba1. C. D. Ashby. Measuring point changed to top of outlet pipe, 0.2 foot above previous measuring point. Concrete basin removed. Water levels, in feet above measuring point, 1939: Apr. 20, 2.25 (found flowing 3.2 gallons per minute); Aug. 11, 2.20 (found flowing 3.5 gallons per minute); Dec. 20 (found flowing 3.4 gallons per minute).

(C-16-7)1dc. H. W. Steiner. Found partly closed on Dec. 18, 1939; found flowing prior to all other measurements.

Water level, in feet above measuring point, and flow in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Feb. 23	4.3	16.5	Aug. 11	3.95	15.
Apr. 20	4.25	15.	Dec. 18	6.9	...

(C-16-7)4abb1. L. N. Hinckley. Flowing prior to all measurements.

Water level, in feet above measuring point, and flow in gallons per minute, 1939

Feb. 23	3.46	3.7	Aug. 11	3.10	3.3
Apr. 20	3.50	3.8	Dec. 20	3.20	3.4

(C-16-7)7ccbl. Millard County. Water levels, in feet below measuring point, 1939: Feb. 23, 5.56; Apr. 20, 5.42; Aug. 11, 4.96; Dec. 20, 5.15.

(C-16-7)21acd1. Martin Tanner. Water levels, in feet below measuring point, 1939: Feb. 23, 16.85; Apr. 20, 17.00; Aug. 11, 16.75; Dec. 19, 16.82.

(C-16-7)34cdal. Utah-Idaho Sugar Co. Water levels, in feet below measuring point, 1939: Feb. 23, 16.32; Apr. 20, 16.80; Aug. 11, 16.23; Dec. 19, 16.41.

(C-16-8)15ddd3. Frank Foot. Water levels, in feet below measuring point, 1939: Feb. 23, 1.95; Apr. 20, 1.96; Aug. 11, 1.76; Dec. 20, 1.83.

(C-16-19)4add1. J. H. Singleton. Gandy. State claim no. 6,827. Unused well, diameter 36 inches, depth 34 feet. Measuring point, top of boards over well, 0.3 foot above land surface. Water level, in feet below measuring point, 1939: Nov. 2, 31.85.

(C-17-6)6bdcl. Utah-Idaho Sugar Co. Water levels, in feet below measuring point, 1939: Feb. 22, 48.22; Apr. 20, 48.35. Aug. 10, 1939, found filled or plugged with debris about 46 feet below measuring point--unable to obtain measurements thereafter.

## Millard County--Continued

(C-17-6)7acc2. Henry Forester. Formerly J. U. Rencher. Found flowing prior to all measurements. Pressure pump found installed Dec. 19, 1939.

## Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 23	5.25	June 9	5.4	Dec. 19	5.5
Apr. 20	5.4	Aug. 10	5.3		

(C-17-6)7dbb2. H. H. Sherwood.

## Water level, in feet below measuring point, 1939

Feb. 23	3.39	June 9	3.25	Dec. 19	3.49
Apr. 20	3.55	Aug. 10	3.38		

(C-17-6)33dcl. Duluth Land Co.

## Water level, in feet above measuring point, 1939

Feb. 22	5.45	June 9	5.5	Dec. 19	5.35
Apr. 20	5.35	Aug. 11	5.05		

(C-17-7)20cbb1. Wm. J. Webb. Water levels, in feet above measuring point, 1939: Apr. 20, 5.35; Aug. 11, a/ 4.8; Dec. 19, a/ 5.2.

(C-17-7)25daal. Investors Finance Co.

## Water level, in feet above measuring point, 1939

Feb. 23	3.85	June 9	4.5	Dec. 19	3.92
Apr. 19	3.95	Aug. 11	4.2		

(C-17-7)30aaa. John G. Parry. Water levels, in feet above measuring point, 1939: Apr. 20, 2.37; Aug. 11, b/ 1.75; Dec. 19, a/ 1.88.

(C-18-5)5bbal. Union Pacific Railroad.

## Water level, in feet above measuring point, 1939

Feb. 23	28.4	June 9	<u>a</u> 18.3	Oct. 17	27.8
Apr. 20	28.8	Aug. 11	26.5	Dec. 19	28.3

(C-18-5)28accl. Lawrence Clark. Water levels, in feet below measuring point, 1939: Apr. 19, 15.14; June 9, 14.97; Aug. 11, c/ 16.10; Dec. 19, 14.42.

(C-18-7)5aaa2. Sarah A. Webb. Found flowing prior to all measurements. Water levels, in feet above measuring point, 1939: Feb. 23, 4.95; Apr. 20, 5.15; Aug. 11, 4.40; Dec. 19, 5.7.

(C-18-19)20dadl. Mrs. Ward Robinson. Water level, in feet below measuring point, 1939: Nov. 1, 31.31.

(C-18-19)20dddl. Louise Robinson. Water level, in feet below measuring point, 1939: Nov. 1, 31.20.

(C-19-4)32becl. Union Pacific Railroad.

## Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 22	18.03	Apr. 27	18.16	Aug. 11	17.27	Dec. 19	17.37
Apr. 20	18.10	June 9	17.25	Oct. 17	17.18		

(C-19-5)4ddal. Lawrence Clark.

## Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 22	34.18	June 9	34.11	Oct. 17	34.29
Apr. 19	34.13	Aug. 11	34.38	Dec. 19	34.28

(C-19-5)22acb. (C-19-5)22da in Water-Supply Papers 817, 840 and 845. Utah State Road Commission.

a Found flowing.

b Found flowing 0.77 gallon per minute.

c Pumping a few hours previously.

## Millard County--Continued

(C-19-5)22acb.--Continued

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 22	16.15	Apr. 27	15.86	Aug. 11	17.80	Dec. 19	17.80
Apr. 19	16.25	June 9	15.80	Oct. 17	17.83		

(C-20-5)9adal. Edgar Turner.

Water level, in feet, above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 22	a 12.5	June 9	a 7.2	Oct. 17	a 7.8
Apr. 19	a 8.6	Aug. 11	a 7.9	Dec. 19	26.2

(C-20-5)13dad. C. H. Day.

Water level, in feet below measuring point, 1939

Feb. 23	48.32	June 9	46.50	Oct. 17	47.57
Apr. 20	48.68	Aug. 11	46.75	Dec. 19	47.96

(C-20-5)22bcc1. Mary E. Rowley(formerly George Rowley). Found flowing prior to all measurements.

Water level, in feet above measuring point, 1939

Feb. 22	5.95	June 9	6.25	Oct. 17	6.1
Apr. 19	6.0	Aug. 12	6.45	Dec. 19	6.3

(C-20-19)6bcc. Glen A Bellander. Water level, in feet above measuring point, 1939; Nov. 1, b/6.9.

(C-20-19)7aab. G. S. Quayte. No measurements made in 1938. Water level in feet above measuring point, 1939: Nov. 1, a/ 6.67.

(C-20-19)7bbd. Marcus Sorenson. Water level, in feet above measuring point, 1939: Nov. 1, a/ 2.60.

(C-20-19)16bdcl. Fred G. Schumaker. Water level, in feet below measuring point, 1939: Nov. 1, 3.10.

(C-21-4)9bbdl. John Carling. Fillmore. Unused well, diameter 6 inches, reported depth 160 feet, measured depth July 6, 1939, 120 feet. Measuring point, top of coupling on casing, 1.0 foot above land surface. Reported cased to 100 feet. Reported water level when drilled, 130 feet below land surface.

Water level, in feet below measuring point, 1939

July 6	20.03	Sept. 6	21.02	Oct. 17	21.51
18	20.22	29	21.30	Dec. 19	22.50
Aug. 12	20.64				

(C-21-5)3bbbl. Dal Huntsman. (Formerly Alfred Huntsman)

Water level, in feet below measuring point, 1939

Feb. 22	25.98	June 9	25.91	Oct. 17	25.85
Apr. 19	25.99	Aug. 12	25.92	Dec. 19	25.60

(C-21-5)17ccd1. Harry Johnson.

Water level, in feet above measuring point, 1939

Feb. 22	c 31.0	June 9	a 8.4	Oct. 17	c 22.5
Apr. 19	a 8.9	Aug. 12	a 8.4	Dec. 19	c 26.0

a Found flowing.

b Found flowing 33 gallons per minute.

c Found partially closed but leaking badly; full pressure could not be obtained.



## Millard County--Continued

(C-21-5)Blabal, State of Utah.

Daily noon water level, in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	Sept.	Oct.	Nov.	Dec.
1	12.10	11.39	11.17	15.17	19.80	22.79	21.69	18.11	15.31
2	12.01	11.39	10.96	16.10	19.84	22.82	21.48	18.11	.....
3	12.00	11.29	.....	16.30	19.90	22.84	21.25	18.08	15.30
4	12.07	11.35	.....	16.60	19.92	22.73	21.03	17.95	15.29
5	11.90	.....	11.05	16.79	19.93	22.82	20.70	17.76	15.14
6	11.98	11.28	11.00	17.00	20.06	22.83	20.51	17.76	15.10
7	12.02	11.29	10.93	17.02	20.11	22.85	20.30	17.61	15.09
8	11.90	11.17	10.98	17.23	20.07	22.86	20.02	16.92	14.99
9	11.93	11.31	10.97	17.37	20.00	.....	19.69	16.88	15.16
10	11.91	11.32	10.93	17.54	20.10	.....	19.57	16.85	15.04
11	11.85	11.45	11.04	17.69	20.22	.....	.....	16.79	14.99
12	11.81	11.35	10.98	17.71	20.25	.....	19.28	16.74	14.98
13	11.78	11.30	.....	18.16	20.25	22.79	19.22	16.51	14.83
14	.....	11.31	10.91	18.52	20.38	22.77	19.07	16.36	14.82
15	11.69	11.19	11.05	18.72	20.32	22.83	18.95	16.27	14.74
16	11.71	11.30	11.04	18.83	20.40	22.51	18.89	16.17	14.68
17	11.76	11.30	11.03	18.94	20.58	22.41	18.82	16.05	14.59
18	11.73	.....	11.02	18.93	20.59	22.39	18.80	15.93	14.62
19	11.66	11.20	11.07	19.06	20.70	22.37	18.75	15.83	14.50
20	11.55	11.23	11.92	.....	20.69	22.32	18.66	15.77	14.35
21	11.58	11.25	12.42	.....	20.68	22.27	18.58	15.69	14.25
22	11.51	11.22	12.58	.....	20.75	22.28	18.54	15.64	14.10
23	11.55	11.07	13.41	.....	20.76	22.14	18.47	15.58	14.08
24	11.60	11.00	13.65	19.40	20.75	22.18	18.38	15.52	14.07
25	11.51	11.09	13.90	19.42	20.78	22.38	18.39	15.54	14.02
26	11.48	11.10	14.18	19.53	20.82	22.33	18.47	15.48	13.98
27	.....	11.10	14.34	19.57	20.94	22.31	18.43	15.42	14.06
28	.....	11.05	14.45	19.63	20.95	22.32	18.30	15.37	14.02
29	11.50	.....	14.57	19.66	20.82	22.12	18.27	15.33	13.96
30	11.40	.....	14.65	19.73	21.51	21.92	18.22	15.33	.....
31	11.32	.....	14.73	.....	21.59	.....	.....	.....	.....

Daily high and low water level, in feet below measuring point, 1939

Day	June		July		August	
	High	Low	High	Low	High	Low
1	20.96	21.76	21.87	22.57	21.94	22.55
2	21.10	21.76	a 21.75	.....	a 22.39	.....
3	21.00	21.90	a 21.73	.....	a 22.40	.....
4	21.00	21.24	21.69	21.96	22.36	22.70
5	21.10	22.00	a 21.75	.....	22.40	.....
6	21.26	21.50	a 21.89	.....	a 22.42	.....
7	.....	.....	21.90	22.59	22.33	23.16
8	21.26	21.50	a 21.96	.....	a 22.44	.....
9	21.20	21.74	a 21.94	.....	22.41	23.26
10	a 21.27	.....	a 21.92	.....	22.55	22.76
11	a 21.31	.....	21.88	22.13	a 22.58	.....
12	21.22	22.11	a 21.89	.....	a 22.57	.....
13	21.40	22.17	21.94	22.43	a 22.50	.....
14	21.28	21.45	a 22.04	.....	22.37	23.20
15	a 21.47	.....	a 22.05	.....	22.50	23.16
16	a 21.46	.....	a 22.08	.....	a 22.37	.....
17	a 21.51	.....	22.02	22.41	a 22.42	.....
18	a 21.42	.....	22.09	.....	22.46	23.07
19	a 21.35	.....	a 22.12	.....	a 22.50	.....
20	a 21.47	.....	22.10	22.88	22.49	22.86
21	.....	.....	22.24	22.97	a 22.46	.....
22	21.65	22.35	22.20	22.58	a 22.62	.....
23	a 21.59	.....	a 22.21	.....	22.67	23.50
24	a 21.62	.....	a 22.15	.....	a 22.79	.....
25	a 21.65	.....	22.16	22.51	a 22.77	.....
26	21.65	22.48	22.22	23.00	a 23.06	.....
27	21.96	22.57	22.32	23.02	a 22.82	.....
28	a 21.80	.....	22.06	22.70	a 22.74	.....
29	a 21.79	.....	a 22.34	.....	a 22.83	.....
30	21.74	22.50	a 22.33	.....	a 22.91	.....
31	.....	.....	22.21	22.79	.....	.....

a Water level at noon; daily fluctuation less than 0.2 foot.

## Millard County--Continued

(C-21-5)33dcdl. Andrew Dahlquist. Measuring point, 0.9 foot below land surface, not 2.0 feet as reported in Water-Supply Paper 840. Water levels, in feet, with reference to measuring point, 1939: Feb. 22, +0.30; Apr. 19, -4.85; Oct. 17, -5.68; Dec. 19, -2.60.

(C-21-5)34bddl. R. E. Sweeting.

## Daily noon water level, in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	42.79	41.96	41.59	42.62	46.20	47.76	48.71	49.63	50.20	49.27	47.10	45.27
2	42.70	41.96	41.42	43.25	46.34	47.98	48.59	49.61	50.19	49.16	46.95	45.23
3	42.67	41.89	41.37	43.45	46.59	48.08	48.62	49.65	50.08	49.06	46.89	45.29
4	42.73	41.86	41.39	43.65	46.58	47.75	48.52	49.61	50.05	49.05	46.81	45.29
5	42.61	41.91	41.50	43.81	46.58	47.76	48.52	49.63	50.04	48.93	46.74	45.27
6	42.61	41.84	41.45	44.04	46.78	47.80	48.84	49.67	50.03	48.77	46.66	45.21
7	42.68	41.83	41.38	44.10	46.83	47.96	48.95	49.76	50.02	48.68	46.66	45.20
8	42.50	41.69	41.40	44.20	46.86	47.84	48.82	49.78	50.04	48.55	46.61	45.18
9	42.54	41.84	41.40	44.30	46.79	47.85	48.78	49.83	50.04	48.54	46.49	45.12
10	42.53	41.86	41.35	44.40	46.96	48.09	48.93	49.73	50.03	48.45	46.49	.....
11	42.50	41.96	41.42	44.50	46.98	.....	48.92	49.88	50.02	48.33	46.32	.....
12	42.46	41.84	41.39	44.60	46.89	.....	49.07	49.90	50.03	48.21	46.24	.....
13	42.46	41.81	41.33	44.68	47.18	48.18	49.06	49.84	50.03	48.12	46.15	.....
14	42.48	41.84	41.43	44.87	47.18	48.29	49.13	49.73	50.06	48.03	46.10	.....
15	42.38	41.70	41.43	45.01	47.06	48.35	49.12	49.70	50.12	47.91	46.07	.....
16	42.47	41.77	41.43	45.14	47.27	48.14	49.15	49.93	50.12	47.86	46.00	.....
17	42.50	41.82	41.45	45.26	47.40	48.12	49.15	49.84	49.83	47.82	45.94	44.81
18	42.49	41.71	41.47	45.31	47.42	48.13	49.16	49.81	49.78	47.78	45.91	44.83
19	42.49	41.66	41.66	45.33	47.52	48.12	49.12	49.90	49.73	47.73	45.84	44.80
20	42.35	41.74	41.69	45.42	47.53	48.16	49.27	49.92	49.76	47.69	45.76	44.71
21	42.36	41.74	41.70	45.49	47.54	48.25	49.20	50.13	49.70	47.57	45.69	44.70
22	42.33	41.73	41.70	45.48	47.67	48.24	49.32	50.11	49.81	47.50	45.63	44.60
23	42.32	41.59	41.75	45.51	47.74	48.34	49.19	50.18	49.72	47.44	45.59	44.58
24	42.34	41.58	41.77	45.62	47.75	48.26	49.20	50.22	49.66	.....	45.49	44.65
25	42.27	41.55	41.77	45.68	47.59	48.25	49.18	50.24	49.67	.....	45.44	44.69
26	42.26	41.52	41.77	45.91	47.74	48.32	49.19	50.02	49.71	47.35	45.42	44.70
27	42.05	41.53	41.84	45.97	47.88	48.42	49.20	50.10	49.71	47.36	45.36	44.67
28	42.08	41.46	41.89	46.02	47.73	48.54	49.23	50.13	49.66	47.34	45.32	44.73
29	42.11	.....	42.00	46.03	47.93	48.68	49.27	50.19	49.61	47.25	45.28	44.72
30	42.02	.....	42.08	46.06	47.86	48.67	49.27	50.21	49.52	47.24	45.27	44.64
31	41.93	.....	42.41	.....	47.92	.....	49.51	50.21	.....	47.16	.....	.....

(C-22-5)17acd. Wm. Blake.

## Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 22	25.9	June 9	15.2	Oct. 17	18.2
Apr. 19	20.7	Aug. 12	14.0	Dec. 19	23.0

(C-22-5)32dad. Frank Paxton.

## Water level, in feet below measuring point, 1939

Feb. 22	35.30	June 9	a 43.08	Oct. 17	37.18
Apr. 19	35.38	Aug. 12	36.81	Dec. 19	36.85

(C-22-19)6bc. Dennis Smith. Water level, in feet below measuring point, 1939: Nov. 1, 61.72.

(C-23-19)9cb. Thomas Dearden. Water level, in feet below measuring point, 1939: Nov. 1, 17.08.

(C-23-19)9cc. Fred Loper. Water level, in feet below measuring point, 1939: Nov. 1, 13.30.

a Nearby well pumping.

## Morgan County

(A-3-2)14dc. Earl Walker.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 14	55.83	June 22	51.54	Oct. 30	54.32
May 1	54.84	Aug. 29	53.37		

(A-3-2)24ob. Hyrum Adams.

Water level in feet below measuring point, 1939

Mar. 14	17.40	June 22	11.27	Oct. 30	13.20
May 1	16.15	Aug. 29	15.99		

(A-4-2)6cda. Axel Olsen.

Water level, in feet below measuring point, 1939

Jan. 4	25.90	May 1	25.23	Aug. 29	25.66
Mar. 14	25.74	June 22	22.94	Oct. 30	25.17

(A-4-2)15cc. Jake Pentz.

Water level, in feet below measuring point, 1939

Mar. 14	21.38	June 22	21.61	Oct. 30	22.23
May 1	22.37	Aug. 29	22.12		

(A-4-2)17da. Heber Anderson Estate.

Water level, in feet below measuring point, 1939

Mar. 14	15.14	June 22	12.76	Oct. 30	15.51
May 1	14.75	Aug. 29	15.92		

(A-4-2)26cc. Jesse C. Little.

Water level, in feet below measuring point, 1939

Mar. 14	13.01	June 22	9.89	Oct. 30	13.13
May 1	14.75	Aug. 29	10.16		

(A-4-2)27dd. Jesse C. Little. Measuring point changed to top of concrete floor, 4.4 feet above top of casing (previous measuring point).

Water level, in feet below measuring point, 1939

Jan. 4	11.95	May 1	12.34	Oct. 30	10.43
Mar. 14	15.52	Aug. 29	7.90		

(A-4-2)28baal. Morgan County School District.

Water level, in feet below measuring point, 1939

Mar. 14	25.64	June 22	24.28	Oct. 30	25.45
May 1	25.28	Aug. 29	24.96		

(A-4-2)35od. Albert Wiggins.

Water level, in feet below measuring point, 1939

Mar. 14	Dry at 28	June 22	18.57	Oct. 30	22.71
May 1	27.24	Aug. 29	18.36		

(A-4-2)36obdl. Morgan County. Water levels, in feet below measuring point, 1939: Jan. 4, 38.75; Mar. 14, 39.55; May 1, 37.50; Oct. 30, 32.53.

(A-4-3)31bcc. Morgan County. Measuring point changed to edge of hole in pump base, 0.9 foot above top of casing, previous measuring point.

Water level, in feet below measuring point, 1939

Mar. 14	24.31	June 22	a 30.45	Aug. 29	c 20.92
May 1	a 31.17	Aug. 29	b 21.64	Oct. 30	23.22

a Pumping.

b Pump operating for 30 minutes prior to measurement.

c Pump stopped 5 minutes prior to measurement.

## Morgan County--Continued

(A-4-3)31bdc. Como Springs Resort Company.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 14	4.48	June 22	4.29	Oct. 30	4.94
May 1	4.77	Aug. 29	4.16		

(A-5-1)27db. Emma R. France.

Water level, in feet below measuring point, 1939

Date	Water level inside of casing	Water level outside of casing	Date	Water level inside of casing	Water level outside of casing
Mar. 14	0.44	1.08	Aug. 29	1.05	1.95
May 1	1.11	1.29	Oct. 30	1.58	2.10
June 22	0.83	1.45			

## Piute County

(C-27-1)15cbb1. Talmage Bagley. Voyle Bagley in Water-Supply Paper 845.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 1	10.81	Aug. 21	10.21	Dec. 6	10.47
Apr. 18	10.67	Oct. 18	10.24		

(C-27-1)27abc2. H. B. Crandall.

Water level, in feet above measuring point, 1939

Mar. 1	2.61	Aug. 21	a 1.87	Dec. 6	a 1.84
Apr. 18	2.35	Oct. 18	a 2.03		

(C-28-3)6ad. J. R. Pearson. No measurements in 1938 and 1939. Caved; measurements discontinued.

(C-30-2)32a. Antimony. Water level, in feet below measuring point, 1939: Apr. 21, 14.44; Aug. 21, 16.07; Oct. 18, 17.31; Dec. 7, 17.58.

(C-30-3)15bba. O. P. Jessen.

Water level, in feet below measuring point, 1939

Mar. 2	23.69	Aug. 21	9.06	Dec. 7	22.35
Apr. 21	24.71	Oct. 18	17.39		

(C-30-4)14dc. Earl Whitaker. Found flowing prior to all measurements.

Water level, in feet below measuring point, and flow in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Mar. 2	4.75	0.9	Oct. 18	4.85	0.7
Apr. 21	4.45	.7	Dec. 7	4.9	.8
Aug. 21	4.5	.7			

(C-30-4)25bcc1. Drought Relief Administration.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 2	20.38	Aug. 21	19.20	Dec. 7	19.89
Apr. 21	23.72	Oct. 18	19.23		

a Found flowing, 1.9 gallons per minute.

## Rich County

(A-9-7)16ba. Drought Relief Administration.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 3	29.18	June 10	26.29	Sept. 21	40.05	Nov. 18	41.19
June 6	25.99	Aug. 1	34.73	27	40.42		

(A-9-7)16bd. Drought Relief Administration.

Water level, in feet below measuring point, 1939

May 3	26.39	June 10	28.56	Sept. 21	(a)	Nov. 18	(a)
June 6	27.79	Aug. 1	(a)	27	(a)		

(A-9-7)25. Woodruff. Fifty feet northwest of house, 50 feet west of windmill, 2.7 miles east and southeast from Woodruff, 1.4 miles south-east and 0.3 mile west from lane. Diameter, 5 to 3 inches. Measuring point, top of 3-inch casing, 1.1 feet above land surface. Water level, in feet below measuring point, 1939: Sept. 27, 17.10.

(A-9-8)17ac. S. Francis and Sons Co.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
May 3	5.57	Aug. 1	4.77	Sept. 27	9.27
June 6	3.23	Sept. 21	6.82	Nov. 18	7.78

(A-10-7)20aaal. Joseph Hatch.

Water level, in feet below measuring point, 1939

May 3	12.76	Aug. 1	8.80	Sept. 27	10.84
June 6	2.03	Sept. 21	11.74	Nov. 18	12.08

(A-11-7)9cd1. F. H. Jackson.

Water level, in feet below measuring point, 1939

May 3	12.33	Sept. 21	13.50	Nov. 18	12.64
Aug. 1	12.78	27	12.91		

(A-11-7)9cd2. F. H. Jackson. Water level, in feet below measuring point, 1939: Sept. 27, 16.85.

(A-11-7)21bc. Loren Jackson.

Water level, in feet below measuring point, 1939

May 3	6.66	Aug. 1	8.41	Sept. 27	10.72
June 6	5.27	Sept. 21	10.53	Nov. 18	9.47

(A-12-7)26bb1. William Hoffman.

Water level, in feet below measuring point, 1939

June 6	3.43	Sept. 21	8.59	Nov. 18	7.87
Aug. 1	7.18	27	9.74		

a Dry, 36 feet below measuring point.

## Rich County--Continued

(A-12-7)26bb2. William Hoffman.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
May 3	4.31	Aug. 1	6.99	Sept. 27	9.47
June 6	3.65	Sept. 21	9.33	Nov. 18	8.61

(A-13-5)10bbb1. Thomas Hodges.

Water level, in feet below measuring point, 1939

May 3	15.79	July 31	11.70	Sept. 27	13.25
June 8	12.27	Sept. 20	12.89	Nov. 17	14.61

(A-13-5)10bbb2. Thomas Hodges.

Water level, in feet below measuring point, 1939

May 3	17.84	July 31	14.42	Sept. 27	15.56
June 8	16.01	Sept. 20	16.19	Nov. 17	16.88

(A-13-5)21ad. Drought Relief Administration. Water levels, in feet below measuring point, 1939: May 3, 1.40; June 8, 2.61; Sept. 27, 7.28.

(A-13-5)22bd. Willis Brothers.

Water level, in feet below measuring point, 1939

May 3	19.49	July 31	19.77	Sept. 27	19.62
June 6	19.55	Sept. 20	19.79	Nov. 17	20.29

(A-13-5)22da. Max Green.

Water level, in feet below measuring point, 1939

June 6	14.79	Sept. 20	16.00	Nov. 17	16.43
July 31	15.22	27	16.02		

(A-13-5)25db. Willis Brothers.

Water level, in feet below measuring point, 1939

May 3	9.20	Aug. 2	5.10	Sept. 27	5.20
June 8	3.91	Sept. 20	5.66	Nov. 17	5.25

(A-13-6)30bb. Rich County. Found flowing prior to all measurements.

Water level, in feet above measuring point, 1939

June 8	4.9	Sept. 20	4.58	Nov. 17	4.35
Aug. 1	5.22	27	3.4		

(A-13-6)31bb. J. A. Cheney. Water level, in feet below measuring point, 1939: May 3, 17.64. Caved; measurements discontinued.

(A-14-5)16cd. Mrs. David Cook.

Water level, in feet below measuring point, 1939

Date	Water level inside of casing	Water level outside of casing	Date	Water level inside of casing	Water level outside of casing
May 3	26.58	26.58	Sept. 20	14.35	15.85
June 8	13.02	.....	27	15.91	17.95
July 31	10.85	12.23	Nov. 17	20.59	21.36

(A-14-5)21bd. Alex Johnson.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
May 3	32.33	July 31	7.07	Sept. 27	11.77
June 8	9.62	Sept. 20	10.48	Nov. 17	16.60

## Rich County--Continued

(A-14-5)21bd. J. W. Gibbons.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
May 3	(a)	July 31	9.14	Sept. 30	12.48
June 8	11.82	Sept. 27	13.69	Nov. 17	(b)

(A-14-5)21bd. Thomas Hodges.

Water level, in feet below measuring point, 1939

May 3	20.17	July 31	6.11	Sept. 27	10.01
June 8	8.99	Sept. 20	8.94	Nov. 17	14.30

(A-14-5)21cd. C. W. Pope.

Water level, in feet below measuring point, 1939

May 3	7.81	July 31	6.74	Sept. 27	6.91
June 8	6.49	Sept. 20	6.83	Nov. 17	7.09

(A-14-5)34cc. Drought Relief Administration. Water level, in feet below measuring point, 1939: June 8, 16.0.

(A-15-5)32cd. LaMont E. Scofield.

Water level, in feet below measuring point, 1939

May 3	24.49	July 31	5.76	Sept. 27	12.75
June 8	7.68	Sept. 20	13.71	Nov. 17	20.97

## Salt Lake County

(B-1-1)6ccal. Rudy Gun Club. Water levels, in feet above measuring point, 1939; Apr. 10, 15.6; Aug. 1, 15.7; Oct. 6, 16.1; Dec. 22, 15.9. Found flowing prior to all measurements.

(B-1-1)26ddc2. L. T. Farnsworth. Found flowing prior to all measurements.

Water level, in feet above measuring point, and flow in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Feb. 24	4.85	0.71	Aug. 1	3.84	0.55
Apr. 10	5.1	0.69	Oct. 7	3.75	0.41
June 7	4.55	0.64	Dec. 22	4.30	0.59

(B-1-1)33cdal. Salt Lake City Corporation. Measurements made by Salt Lake City Corporation.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 10	15.1	May 10	14.9	July 28	14.25	Oct. 16	14.6
Feb. 17	15.1	June 8	14.6	Aug. 12	14.35	27	13.4
Mar. 8	15.3	16	14.76	21	14.4	Nov. 21	14.75
22	14.6	July 7	14.3	Sept. 11	14.3	Dec. 8	14.8
Apr. 6	15.0	19	14.35	26	13.9		

(B-1-1)36abcl. Utah Oil Co. Measurements made by Salt Lake City Corporation except as noted.

Water level, in feet below measuring point, 1939

Jan. 10	4.75	Mar. 14	5.20	Apr. 11	5.38	June 2	6.30
31	4.68	21	5.25	28	4.75	7	c 6.43
Feb. 24	c 4.67	31	5.45	May 9	5.03	14	6.95
27	4.78	Apr. 10	c 5.42	22	5.58	26	7.51

a Dry.

b Dry, 10.7 feet below measuring point.

c Measurement made by Geological Survey.

## Salt Lake County--Continued

(B-1-1)35abcl.--Continued

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
July 7	7.93	Aug. 4	9.55	Sept. 22	10.58	Oct. 17	10.16
13	8.18	9	9.76	Oct. 3	10.60	Nov. 13	7.70
19	8.60	22	10.35	7 a	10.43	21	7.78
28	9.02	Sept. 5	10.59	10	10.47	Dec. 6	7.00
Aug. 1	a 9.36	15	10.49				

(C-1-1)2cdal. J. D. Brown. Flow, in gallons per minute, 1939: Feb. 24, 0.39; Apr. 10, 0.39. Found flowing prior to all measurements. Measurements made by Salt Lake City Corporation except as noted.

Water level, in feet above measuring point, 1939

Jan. 10	3.50	Apr. 10	a 3.42	July 7	2.20	Sept. 26	1.10
Feb. 24	a 2.92	May 10	1.70	19	1.92	Oct. 6	a 0.78
Mar. 8	2.80	June 7	a 2.42	Aug. 1	a 1.57	27	2.56
22	3.60	8	2.15	12	2.06	Nov. 21	3.00
Apr. 6	3.47	16	1.72	Sept. 11	1.17	Dec. 8	3.17

(C-1-1)15abb2. Eva May Davis. Measurements made by Salt Lake City Corporation except as noted.

Water level, in feet above measuring point, 1939

Jan. 10	4.40	Apr. 10	a 4.35	July 28	3.25	Oct. 6	a 3.69
Feb. 17	4.00	May 10	a 3.55	Aug. 1	a 3.10	16	3.75
25	a 4.15	June 8	a 3.42	12	3.04	27	3.80
Mar. 8	4.25	16	3.10	21	3.10	Nov. 21	4.20
22	4.29	July 7	3.00	Sept. 11	3.50	Dec. 8	4.30
Apr. 6	4.20	19	2.92	26	3.35		

(C-1-1)22bdal. Wm. Gedge. Measuring point changed to top of ell, 0.1 foot lower than previous measuring point.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 10	9.25	Aug. 1	8.5	Dec. 22	9.6
June 8	8.6	Oct. 6	10.3		

(C-1-1)28cddl. Edna May Hill.

Water level, in feet above measuring point, 1939

Feb. 24	17.0	June 7	13.85	Oct. 6	22.8
Apr. 11	17.55	Aug. 1	16.65	Dec. 22	20.1

(C-1-1)33abbl. W. D. Hill. Partly open prior to all measurements.

Water level, in feet above measuring point, 1939

Feb. 25	16.85	June 7	13.5	Oct. 6	19.9
Apr. 11	14.0	Aug. 1	13.4	Dec. 22	18.5

(C-1-2)5bbb1. Morton Salt Co. Valve open to plant prior to all measurements.

Water level, in feet above measuring point, 1939

Feb. 17	18.55	June 7	17.95	Oct. 6	18.25
Apr. 11	18.15	Aug. 1	18.0	Dec. 22	18.25

(C-1-2)19bddd1. Utah Copper Company.

Water level, in feet below measuring point, 1939

Feb. 25	2.78	June 7	3.01	Oct. 6	1.64
Apr. 4	3.01	Aug. 1	2.62	Dec. 22	2.21

a Measurement made by Geological Survey.



## Salt Lake County--Continued

(C-1-2)19dad1. Utah Copper Company.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 11	a 7.25	Aug. 1	a 9.5	Dec. 22	9.8
June 7	a 8.15	Oct. 6	11.9		

(C-1-2)21add1. Esther Beagley.

Water level, in feet above measuring point, 1939

Feb. 24	11.45	June 7	11.6	Oct. 6	13.4
Apr. 11	10.55	Aug. 1	12.2	Dec. 22	11.9

(C-1-2)22cbb1. Franklin E. Fowler.

Water level, in feet above measuring point, 1939

Feb. 24	11.45	June 7	11.85	Oct. 6	14.0
Apr. 11	11.0	Aug. 1	12.85	Dec. 22	12.2

(C-1-2)25dccl. Hannah Nielson. Found flowing prior to all measurements.

Water level, in feet above measuring point, 1939

Feb. 25	30.6	June 7	29.20	Oct. 6	32.8
Apr. 11	31.0	Aug. 1	30.55	Dec. 22	31.4

(C-1-3)15bdcl. Utah Copper Company. Water levels, in feet below measuring point, 1939: Feb. 25, 2.82; Apr. 11, 2.55; June 7, 1.97; Oct. 6, 3.47.

(C-2-1)1bab2. C. S. Walters. Measurements made by Salt Lake City Corporation except as noted.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	18.9	Apr. 12	18.8	July 7	13.8	Sept. 26	15.2
Feb. 11	18.6	24	16.3	26	13.1	Oct. 6	16.9
24	b 18.4	May 8	15.9	Aug. 2	b 13.8	7	b 17.0
Mar. 9	18.5	25	15.6	8	13.7	16	17.5
16	19.1	June 6	15.5	25	13.65	27	17.7
23	19.1	7	b 15.6	Sept. 12	15.35	Nov. 20	18.35
Apr. 10	b 18.9	20	16.0	22	15.27	Dec. 16	17.8

(C-2-1)10bad1. Emma B. Lindsay.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 24	12.36	June 7	14.71	Oct. 7	3.41
Apr. 10	14.71	Aug. 1	9.20	Dec. 22	7.27

(C-2-1)22bd. Walter A. Diamond. Measurements made by Salt Lake City Corporation except as noted.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 25	75.23	Apr. 14	77.77	June 30	74.23	Oct. 4	70.24
Feb. 25	b 76.26	May 17	75.55	Aug. 1	b 72.52	7	b 70.12
28	76.36	June 7	b 76.01	22	71.52	27	70.78
Apr. 10	b 77.68	12	75.55	Sept. 18	70.68	Nov. 29	72.13
Mar. 28	77.22						

(C-2-1)24adcl. J. D. Blain. State claim no. 16,012.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 24	23.69	June 7	22.66	Oct. 7	20.77
Apr. 10	24.05	Aug. 2	21.60	Dec. 22	22.86

a Found flowing.

b Measurement made by Geological Survey.

## Salt Lake County--Continued

(C-2-1)24ccc2. J. R. Smith.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 24	2.64	June 7	2.07	Oct. 7	1.33
Apr. 10	2.86	Aug. 1	1.62	Dec. 22	2.31

(C-2-1)36abal. Agnes B. Jenkins.

Water level, in feet below measuring point, 1939

Feb. 24	67.23	June 7	66.88	Oct. 7	65.06
Apr. 10	67.61	Aug. 1	65.77	Dec. 22	66.60

(C-3-1)14bdcl. B. H. Beckstead.

Water level, in feet below measuring point, 1939

Feb. 24	12.55	June 7	12.03	Oct. 7	9.01
Apr. 10	13.26	Aug. 1	10.28	Dec. 22	10.55

(C-3-1)15bddl. Catherine Holt. No measurements made in 1939.

(C-3-1)15cadl. Lillian Dodd. Riverton. Used domestic well, diameter 3 inches, depth 248 feet. Measuring point, top of casing, 0.3 foot above land surface. Water levels, in feet below measuring point, 1939: Aug. 1, 51.34; Oct. 7, 49.54; Dec. 22, 50.60

(C-3-1)25aa. Sproul Bros.

Water level, in feet below measuring point, 1939

Feb. 24	35.21	Aug. 1	33.94	Oct. 7	33.05
Apr. 10	35.66	26	33.68	Dec. 22	33.82
June 7	35.03				

(C-3-1)26cadl. Frank Bagley.

Water level, in feet above measuring point, 1939

Feb. 24	17.2	June 7	18.25	Oct. 7	19.55
Apr. 10	16.85	Aug. 1	19.40	Dec. 22	18.25

(C-3-1)27cddl. J. R. Dansie and others.

Water level, in feet below measuring point, 1939

Feb. 24	31.01	June 7	29.09	Oct. 7	23.62
Apr. 10	32.77	Aug. 1	25.01	Dec. 22	27.30

(D-1-1)5aadl. Salt Lake City Corporation.

Daily noon water level, in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May
1	99.69	99.96	100.35	100.50	100.80
2	99.60	100.02	100.20	100.48	100.78
3	99.64	99.94	100.12	100.51	100.78
4	.....	99.95	100.16	100.54	100.73
5	99.59	100.02	100.33	100.53	100.64
6	99.70	99.92	100.28	.....	100.74
7	99.82	99.99	100.20	.....	100.76
8	99.71	99.84	100.28	.....	100.78
9	99.81	.....	100.26	.....	100.70
10	99.84	100.04	100.22	.....	100.65
11	.....	100.10	100.38	.....	100.68
12	99.79	100.23	100.31	.....	100.76
13	99.85	100.10	100.23	100.48	100.76
14	99.89	100.14	100.43	100.56	100.70
15	99.76	100.18	100.44	100.62	100.67
16	99.86	100.08	100.43	100.69	100.67
17	99.91	100.24	100.40	100.73	100.69
18	99.93	100.08	100.40	100.71	100.62
19	99.91	100.09	100.41	100.60	100.69
20	99.81	100.23	100.44	100.64	100.65
21	99.89	100.29	100.40	100.60	100.54
22	99.87	100.29	100.38	100.57	100.61
23	99.98	100.14	100.39	100.55	100.54
24	100.07	100.18	100.41	100.65	100.64
25	100.03	100.14	100.37	100.67	100.65
26	99.96	100.16	100.31	100.73	100.61
27	99.80	100.24	100.35	100.76	100.70
28	99.84	100.22	100.41	100.75	100.64
29	99.69	.....	100.47	100.70	100.54
30	99.86	.....	100.55	100.75	100.47
31	99.83	.....	100.53	.....	100.47

## Salt Lake County--Continued

(D-1-1)5aadt.---Continued

Daily noon water level, in feet below measuring point, 1939

Day	June	July	Sept.	Oct.	Nov.	Dec.
1	100.50	99.96	.....	103.58	101.83	101.15
2	100.50	99.93	.....	103.49	101.82	101.13
3	100.41	99.95	.....	103.45	101.77	101.13
4	100.33	99.93	.....	103.46	101.80	101.13
5	100.31	99.94	.....	103.34	101.72	101.07
6	100.39	100.01	.....	103.17	101.75	101.08
7	100.41	100.01	.....	103.15	101.72	101.08
8	100.35	99.99	110.17	103.03	101.59	100.99
9	.....	99.95	109.39	103.11	101.65	100.99
10	.....	99.96	108.73	103.03	101.72	100.98
11	.....	99.95	108.16	102.93	101.64	101.07
12	.....	99.95	107.71	102.81	101.58	101.18
13	.....	99.87	107.30	102.74	101.50	101.06
14	.....	99.86	107.00	102.65	101.49	101.08
15	100.11	99.84	106.64	102.57	101.53	101.08
16	100.10	99.85	106.34	102.53	101.52	101.03
17	100.19	99.89	106.03	102.46	101.50	100.97
18	100.21	99.84	105.79	102.40	101.51	101.11
19	100.15	99.87	105.57	102.33	101.48	101.08
20	100.15	a 101.60	105.36	102.35	101.38	101.03
21	100.21	a 102.36	105.14	102.27	101.31	100.98
22	100.15	.....	104.95	102.17	101.29	100.88
23	100.04	.....	104.77	102.05	101.26	100.91
24	100.06	.....	104.57	101.95	101.19	100.95
25	100.03	.....	104.42	102.00	101.23	101.00
26	100.03	.....	104.28	102.07	101.22	100.96
27	100.07	a 104.65	104.13	102.16	.....	100.90
28	100.06	a 104.89	104.02	101.97	101.12	101.05
29	100.04	.....	103.97	101.99	101.09	101.03
30	100.00	.....	103.80	102.06	101.15	100.95
31	.....	.....	.....	101.87	.....	100.90

Daily high and low water level, in feet below measuring point, 1939

Date	Water level		Date	Water level	
	High	Low		High	Low
Aug. 3	b 107.42	.....	Aug. 21	110.05	110.81
4	107.29	108.10	22	110.20	110.94
5	107.54	108.34	23	110.32	111.06
6	107.76	108.55	24	110.43	111.14
7	107.97	108.75	25	110.51	111.24
8	108.16	108.81	26	110.62	111.34
9	108.20	109.00	27	110.70	111.43
10	108.40	109.19	28	110.80	111.55
11	108.58	109.36	29	110.94	111.67
12	108.76	109.53	30	111.28	111.82
13	108.90	109.67	31	111.23	111.90
14	109.04	109.82	Sept. 1	111.28	111.96
15	109.18	109.94	2	111.36	112.06
16	109.32	110.09	3	111.44	112.11
17	109.47	110.23	4	111.50	112.18
18	109.60	110.39	5	111.57	112.27
19	109.81	110.57	6	111.43	112.00
20	109.95	110.69	7	110.48	111.43

(D-1-1)6cadt. Royal Laundry. Measurements made by Salt Lake City Corporation.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 10	10.56	Apr. 28	10.93	Aug. 9	13.56	Oct. 10	15.18
31	10.48	May 22	11.04	Sept. 5	14.72	Nov. 13	14.48
Mar. 14	10.74	June 14	11.45	22	15.05	Dec. 6	14.05
Apr. 3	10.85	July 7	12.15				

a Nearby well pumping.

b Water level at 12:00 noon.

## Salt Lake County--Continued

(D-1-1)7abd6. Salt Lake City Corporation. Measurements made by Salt Lake City Corporation except as noted.

## Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 10	7.0	Apr. 11	6.6	July 7	4.1	Sept. 26	3.35
18	7.2	28	5.5	22	3.85	Oct. 2	5.5
31	7.0	May 9	4.85	28	4.1	7	a 5.4
Feb. 24	a 6.95	22	5.05	Aug. 2	a 4.5	9	5.5
27	7.15	June 2	5.7	9	4.4	17	5.3
Mar. 10	a 7.4	7	a 5.45	22	4.05	Nov. 13	6.2
21	7.0	14	5.75	Sept. 5	4.6	21	6.4
Apr. 3	6.75	28	4.2	15	5.0	Dec. 6	6.2
10	a 7.05						

(D-1-1)9acal. Salt Lake City Corporation well 1064. Salt Lake City Corporation. State claim no. 4,836. Near Sunnyside Avenue and Red Butte Creek. Diameter 20 inches, depth 502 feet. Measuring point, top of casing, 1.8 feet above land surface and 4,660.69 feet above sea level. Water levels prior to July 1, 1935 will be published in a Water-Supply Paper on the Geology and ground-water resources of the Jordan River Valley, Utah by R. M. Leggette and G. H. Taylor. Following records were obtained with a water-stage recorder, except as noted, maintained by Salt Lake City Corporation.

## Daily noon water level, in feet below measuring point, 1935

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	.....	156.51	156.71	156.89
2	.....	b 156.38	.....	156.51	156.66	156.90
3	156.52	.....	b 156.50	156.50	156.77	156.91
4	156.55	.....	.....	156.54	156.82	156.89
5	156.50	.....	.....	156.55	156.76	156.92
6	156.48	.....	.....	156.55	156.76	156.95
7	156.50	b 156.33	.....	156.57	156.78	156.97
8	156.48	.....	.....	156.56	156.69	156.95
9	156.49	.....	.....	156.59	156.64	157.00
10	156.50	.....	b 156.34	156.58	156.85	156.97
11	156.51	.....	.....	156.56	156.78	156.93
12	156.50	.....	.....	156.63	156.69	156.88
13	156.47	.....	.....	156.62	156.77	157.03
14	156.47	b 156.34	.....	156.55	156.80	157.03
15	156.46	.....	.....	156.69	156.79	156.98
16	156.45	.....	.....	156.71	156.77	157.00
17	156.44	.....	.....	156.70	156.76	156.96
18	156.40	.....	b 156.46	156.60	156.90	156.98
19	156.44	b 156.34	.....	156.55	156.89	157.00
20	156.45	.....	156.47	156.65	156.86	156.97
21	156.44	.....	156.46	156.71	156.84	156.98
22	156.43	.....	156.44	156.72	156.83	156.97
23	156.44	.....	156.46	156.69	156.86	157.02
24	156.44	.....	156.47	156.65	156.87	157.05
25	156.38	.....	156.49	156.68	156.90	157.01
26	156.46	.....	156.46	156.70	156.91	156.97
27	156.43	b 156.30	156.52	156.69	156.93	157.01
28	156.43	.....	156.52	156.60	156.94	157.11
29	156.43	.....	156.52	156.75	156.84	157.00
30	156.41	.....	156.53	156.73	156.88	157.11
31	156.38	.....	.....	156.77	.....	157.11

## Daily noon water level, in feet below measuring point, 1936

Day	Jan.	Feb.	Mar.	Apr.	May	June
1	157.16	.....	.....	.....	155.32	153.98
2	157.04	.....	.....	b 157.24	155.18	154.02
3	157.16	.....	.....	.....	155.10	153.96
4	157.04	.....	b 157.42	.....	155.06	153.90
5	157.16	.....	.....	.....	154.86	153.89
6	157.14	b 157.27	.....	.....	154.93	153.80
7	157.14	.....	.....	.....	154.87	153.76
8	157.18	.....	.....	.....	154.80	153.76
9	157.09	.....	.....	157.09	154.76	153.75
10	157.17	.....	.....	157.08	154.71	153.70

a Measurement made by Geological Survey.

b Tape measurement.

## Salt Lake County--Continued

(D-1-1)9acal.--Continued

Daily noon water level, in feet below measuring point, 1936

Day	Jan.	Feb.	Mar.	Apr.	May	June
11	157.13	.....	.....	157.00	154.63	153.65
12	157.20	.....	a 157.35	156.89	154.61	153.60
13	157.14	.....	.....	156.88	154.57	153.60
14	157.17	a 157.32	.....	156.85	154.49	153.55
15	157.25	.....	.....	156.79	154.51	153.50
16	157.17	.....	.....	156.77	154.53	153.50
17	157.20	.....	.....	156.49	154.48	153.40
18	157.23	.....	.....	156.42	154.41	153.40
19	157.22	a 157.35	a 157.45	156.38	154.33	153.37
20	157.19	.....	.....	156.29	154.35	153.35
21	157.25	.....	.....	156.34	154.41	153.31
22	157.22	.....	.....	156.31	154.28	153.27
23	157.19	.....	.....	.....	154.25	153.22
24	157.18	.....	.....	156.03	154.20	153.20
25	157.19	.....	.....	155.98	154.16	153.16
26	157.23	a 157.30	.....	.....	154.10	153.13
27	157.19	.....	.....	155.65	154.13	153.08
28	157.19	.....	.....	155.52	154.04	153.00
29	157.26	.....	.....	155.47	154.09	153.00
30	.....	.....	.....	155.42	154.06	152.98
31	.....	.....	.....	.....	153.91	.....

Daily noon water level, in feet below measuring point, 1936

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	152.96	151.48	150.32	149.60	148.72	147.84
2	152.82	151.46	150.22	149.65	148.91	147.67
3	152.82	151.41	150.28	149.59	148.99	147.70
4	152.80	151.36	150.34	149.59	148.73	147.69
5	152.73	151.33	150.33	149.57	148.57	147.79
6	152.71	151.29	150.32	149.65	148.55	147.82
7	152.63	151.24	150.24	149.58	148.65	147.73
8	152.56	151.22	150.19	149.48	148.50	147.73
9	152.56	151.18	150.11	149.52	148.41	147.80
10	152.50	151.11	150.12	149.52	148.35	147.82
11	152.50	151.11	150.06	149.44	148.33	147.70
12	152.48	151.10	149.95	149.39	148.32	147.73
13	152.43	151.07	150.01	149.45	148.32	147.71
14	152.34	151.01	150.10	149.37	148.21	147.60
15	152.35	150.95	150.08	149.29	148.19	147.60
16	152.25	150.96	150.00	149.39	148.19	147.55
17	152.17	150.90	149.94	149.35	148.20	147.76
18	152.11	150.83	149.92	149.23	148.22	142.66
19	152.06	150.81	149.91	149.12	148.17	147.59
20	152.02	150.77	149.87	149.28	.....	147.54
21	151.94	150.76	149.84	149.15	.....	147.46
22	151.88	150.75	149.82	.....	.....	147.47
23	151.86	150.70	149.85	149.16	.....	147.48
24	151.80	150.64	149.78	149.03	147.98	147.39
25	151.75	150.59	149.64	149.06	147.98	147.22
26	151.70	150.57	149.77	149.06	.....	147.36
27	151.68	150.62	.....	148.95	147.84	147.29
28	151.65	150.52	.....	148.98	147.88	147.22
29	151.62	150.47	.....	148.87	147.84	147.27
30	151.58	150.46	.....	148.72	147.82	147.29
31	151.51	150.43	.....	148.73	.....	147.16

Daily noon water level, in feet below measuring point, 1937

Day	Jan.	Feb.	Mar.	Apr.	May	June
1	147.18	147.26	146.99	146.33	144.75	143.68
2	147.41	147.21	146.97	146.41	144.66	143.63
3	147.38	147.30	147.09	146.29	144.64	143.54
4	147.14	147.09	147.04	146.40	144.55	143.57
5	147.06	147.07	146.93	146.19	144.45	143.55
6	147.22	146.89	146.90	146.07	144.47	143.53
7	147.19	147.09	146.91	146.28	144.50	143.44
8	147.38	147.16	146.93	146.03	144.46	143.36
9	147.38	147.36	146.89	145.91	144.29	143.47
10	147.27	147.25	146.85	145.90	144.25	143.45

a Tape measurement.

## Salt Lake County--Continued

(D-1-1)9acal.--Continued

Daily noon water level, in feet below measuring point, 1937

Day	Jan.	Feb.	Mar.	Apr.	May	June
11	147.26	147.02	146.84	145.98	144.06	143.40
12	147.07	147.06	146.71	145.89	144.09	143.53
13	147.10	147.07	146.76	145.81	143.98	143.45
14	147.36	146.95	146.91	145.76	143.87	143.37
15	147.28	147.22	146.77	145.50	143.97	.....
16	147.13	146.95	146.72	145.65	143.74	.....
17	147.13	147.04	146.84	145.70	143.76	143.42
18	147.07	147.07	146.62	145.48	143.58	143.42
19	147.04	146.96	146.87	145.50	143.71	143.39
20	147.22	147.21	146.73	145.53	143.72	143.42
21	147.24	147.05	146.68	145.20	143.72	143.34
22	147.22	146.98	146.49	145.30	143.57	143.30
23	147.08	146.98	146.72	145.27	143.69	143.37
24	147.10	146.91	146.64	145.18	143.66	143.30
25	147.28	146.82	146.63	144.96	143.48	143.37
26	147.07	146.96	146.66	144.77	143.62	143.35
27	147.18	147.11	146.60	144.85	143.62	143.31
28	147.09	147.06	146.50	145.04	143.49	143.28
29	147.11	.....	146.60	145.07	143.50	143.28
30	147.20	.....	146.51	145.11	143.54	143.30
31	147.39	.....	146.48	.....	143.67	.....

Daily noon water level, in feet below measuring point, 1937

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	143.28	143.19	143.12	143.18	143.46	143.01
2	143.24	143.23	143.12	143.09	143.44	142.98
3	143.23	143.22	143.12	143.08	143.36	143.06
4	143.16	143.12	143.08	143.23	143.43	143.16
5	143.19	143.11	143.09	143.22	143.33	143.05
6	143.27	143.20	143.11	143.34	143.21	142.80
7	143.23	143.15	143.11	143.24	143.32	142.75
8	143.22	143.13	143.09	143.30	143.38	142.70
9	143.21	143.14	143.20	143.23	143.38	142.83
10	143.21	143.19	143.15	143.25	143.39	142.85
11	143.16	143.18	143.14	143.25	143.13	142.78
12	143.18	143.14	143.10	143.25	143.46	142.74
13	143.16	143.06	143.14	143.21	143.32	142.86
14	143.17	143.12	143.13	143.20	143.27	142.86
15	143.20	143.15	143.10	143.24	143.33	142.76
16	143.17	143.17	143.10	143.32	143.28	142.85
17	143.20	143.14	143.07	143.31	143.16	142.83
18	143.20	143.10	143.06	143.46	143.37	142.83
19	143.23	143.15	143.01	143.47	143.31	142.78
20	143.19	143.15	143.07	143.41	143.23	142.80
21	143.16	143.11	143.18	143.45	143.35	142.59
22	143.23	143.06	143.08	143.41	143.31	142.33
23	143.21	143.05	143.29	143.35	143.14	142.46
24	143.22	143.14	143.26	143.34	143.19	142.54
25	143.20	143.19	143.23	143.42	143.16	142.62
26	143.20	143.14	143.18	143.33	143.11	142.52
27	143.20	143.07	143.10	143.35	143.14	142.57
28	143.17	143.03	143.06	143.39	143.11	142.58
29	143.16	143.10	143.11	143.36	143.12	142.47
30	143.11	143.02	143.20	143.31	143.20	142.39
31	143.08	143.07	.....	143.37	.....	142.43

Daily noon water level, in feet below measuring point, 1938

Day	Jan.	Feb.	Mar.	Apr.	May	June
1	142.33	a 141.48	.....	a 140.66	.....	.....
2	142.11	.....	.....	.....	.....	.....
3	142.23	.....	.....	.....	.....	.....
4	142.29	.....	.....	.....	.....	.....
5	142.20	.....	.....	.....	a 140.40	.....

a Tape measurement.

## Salt Lake County--Continued

(D-1-1)9acal.--Continued

Daily noon water level, in feet below measuring point, 1938

Day	Jan.	Feb.	Mar.	Apr.	May	June
6	142.15	.....	.....	.....	.....	.....
7	142.08	a 141.51	.....	.....	.....	.....
8	142.25	.....	a 141.29	.....	.....	.....
9	142.25	.....	a 141.52	.....	.....	.....
10	142.13	.....	.....	.....	.....	.....
11	142.03	.....	.....	a 140.69	.....	.....
12	142.06	.....	.....	.....	a 140.53	.....
13	142.08	.....	.....	.....	.....	.....
14	142.01	a 141.41	.....	.....	.....	.....
15	141.95	.....	a 141.20	.....	.....	.....
16	141.95	.....	.....	.....	a 140.44	.....
17	141.71	.....	.....	.....	.....	.....
18	141.79	.....	.....	a 140.42	.....	.....
19	141.74	.....	.....	.....	a 140.74	.....
20	141.79	.....	.....	.....	.....	.....
21	141.78	a 141.88	a 140.98	.....	.....	141.05
22	a 141.78	.....	.....	.....	.....	141.05
23	.....	.....	.....	.....	.....	141.09
24	.....	.....	.....	.....	.....	141.12
25	a 141.83	.....	.....	.....	.....	141.15
26	.....	.....	.....	a 140.31	a 140.74	141.10
27	a 141.77	.....	.....	.....	.....	141.07
28	.....	a 141.62	.....	a 140.29	.....	141.16
29	.....	.....	a 140.43	.....	.....	141.14
30	.....	.....	.....	.....	.....	141.17
31	.....	.....	a 139.77	.....	.....	.....

Daily noon water level in feet below measuring point, 1938

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	141.57	.....	142.47	142.77	143.53
2	141.19	141.55	141.97	142.45	143.00	143.70
3	141.26	141.63	141.98	142.50	143.04	143.59
4	141.32	141.63	142.00	142.44	142.87	143.82
5	141.27	.....	141.97	142.45	143.11	143.79
6	141.32	.....	141.96	142.50	143.25	143.80
7	141.31	.....	142.02	142.52	143.19	143.82
8	.....	141.68	142.03	142.55	142.98	143.79
9	.....	141.76	142.08	142.61	142.97	143.53
10	.....	141.77	142.18	142.60	143.14	143.63
11	.....	141.70	142.09	142.58	143.11	143.75
12	.....	141.68	142.11	142.71	143.32	143.73
13	.....	141.60	142.19	142.63	143.29	143.78
14	141.40	141.73	.....	142.57	143.30	143.66
15	141.39	141.76	.....	142.51	143.30	143.61
16	141.41	141.78	142.14	142.61	143.24	143.72
17	141.46	141.69	142.19	142.79	143.83	143.77
18	141.49	141.71	142.21	142.82	143.40	143.69
19	141.48	141.82	142.27	142.84	143.30	143.71
20	141.47	141.88	142.29	142.78	143.18	143.71
21	141.52	141.82	142.26	142.75	143.37	143.66
22	141.51	141.82	142.31	142.82	143.41	143.89
23	141.44	141.91	142.31	142.83	143.59	143.86
24	141.43	141.89	142.34	142.89	143.34	143.83
25	141.48	141.88	142.40	142.91	143.46	143.61
26	141.54	141.92	142.45	142.90	143.48	143.83
27	141.54	141.92	142.38	142.90	143.51	143.72
28	141.58	141.94	142.38	142.88	143.46	143.79
29	141.57	141.94	142.42	142.85	143.38	143.84
30	141.55	141.94	142.45	142.82	143.48	143.92
31	141.57	141.96	.....	142.83	.....	143.85

a Tape measurement.

## Salt Lake County--Continued

(D-1-1)9acal.--Continued

Daily noon water level, in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June
1	143.83	143.79	142.83		140.59	140.80
2	143.74	143.71	142.68	.....	140.54	140.83
3	143.78	143.67	142.44	.....	140.52	140.70
4	143.90	143.74	142.52	.....	140.46	140.68
5	143.70	143.79	142.76	.....	140.39	140.70
6	143.91	143.60	142.53	140.91	140.58	140.85
7	143.99	143.74	142.38	140.71	140.59	140.90
8	143.76	143.51	142.30	140.59	140.63	140.84
9	143.93	143.81	.....	140.62	140.53	140.90
10	143.97	143.77	141.73	140.66	140.50	140.83
11	143.92	143.95	.....	140.50	140.53	140.90
12	143.88	143.66	.....	140.40	140.57	140.90
13	143.92	143.77	141.30	140.42	140.65	140.79
14	143.99	143.73	141.59	140.56	140.56	140.79
15	143.78	143.59	141.43	140.56	140.56	140.82
16	143.96	143.79	141.38	140.64	140.64	140.81
17	143.97	143.72	.....	140.65	140.62	140.97
18	143.98	143.51	.....	140.57	140.50	140.98
19	143.92	143.54	140.98	140.58	140.75	140.93
20	143.81	143.64	140.84	140.60	140.61	140.97
21	143.91	143.65	140.80	140.61	140.52	141.10
22	143.82	143.58	.....	140.62	140.74	140.99
23	144.03	143.83	141.12	140.63	140.60	140.90
24	144.02	143.35	.....	140.62	140.76	140.95
25	143.95	143.21	140.88	140.61	140.76	140.95
26	143.85	143.28	140.80	140.60	140.72	140.97
27	143.64	143.05	140.88	140.59	140.73	141.09
28	143.76	142.80	140.88	140.57	140.74	141.08
29	143.83	.....	140.96	140.55	140.68	141.07
30	143.67	.....	140.98	140.56	140.64	141.04
31	143.67	.....	.....	.....	140.73	.....

Daily noon water level in feet below measuring point, 1939

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	140.99	141.68	142.52	143.25	144.20	144.81
2	141.02	141.72	142.58	143.34	.....	144.83
3	141.05	141.73	142.63	143.46	.....	144.85
4	141.08	141.73	142.68	143.55	144.34	144.85
5	141.11	141.72	142.66	143.56	144.27	144.85
6	141.23	141.75	142.69	143.53	144.37	144.86
7	141.22	141.84	142.86	143.60	144.38	144.85
8	141.21	141.82	142.83	143.59	144.27	144.84
9	141.20	141.82	142.83	143.79	144.42	144.84
10	141.25	141.91	142.82	143.78	144.49	144.84
11	141.26	141.96	142.77	143.78	144.48	145.00
12	141.23	141.97	142.88	143.77	144.47	145.03
13	141.20	141.98	142.89	143.79	144.43	144.93
14	141.24	141.97	143.03	143.79	144.50	.....
15	141.24	142.06	143.09	143.81	144.57	.....
16	141.23	142.10	143.09	143.83	144.52	.....
17	141.34	142.10	143.11	143.81	144.52	.....
18	141.31	142.14	143.14	143.93	144.56	.....
19	141.36	142.20	143.18	143.94	144.57	.....
20	141.46	142.22	143.18	144.01	144.56	.....
21	141.43	142.22	143.18	144.00	144.57	.....
22	141.43	142.23	143.14	143.97	144.67	.....
23	141.41	142.24	143.17	143.92	144.66	.....
24	141.44	142.35	143.16	143.83	144.64	.....
25	141.50	142.36	143.24	144.07	144.70	.....
26	141.53	142.37	143.26	144.16	144.70	.....
27	141.56	142.40	143.28	144.29	144.74	.....
28	141.61	142.41	143.34	.....	144.75	.....
29	141.57	142.50	143.43	.....	144.77	.....
30	141.58	142.51	143.39	.....	144.85	.....
31	141.63	142.50	.....	.....	.....	.....



## Salt Lake County--Continued

(D-1-1)19bba. Salt Lake County Hospital. Measurements made by Salt Lake City Corporation except as noted.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 5	17.7	Mar. 31	18.3	June 20	11.8	Sept. 22	9.6
13	17.65	Apr. 4	16.5	30	8.0	26	10.3
20	17.75	10	a 17.0	July 15	7.0	Oct. 7	a 13.7
Feb. 17	17.2	24	14.8	29	8.15	16	14.0
24	a 17.35	May 10	9.5	Aug. 2	a 7.95	26	15.2
Mar. 6	17.6	June 5	9.25	15	7.4	Nov. 10	15.2
16	18.4	7	a 11.9	21	6.9	21	16.0
22	18.2	15	7.9	Sept. 12	14.3	Dec. 16	16.2

(D-1-1)20cdc4. Louis Lund. Measurements made by Salt Lake City Corporation except as noted.

Water level, in feet above measuring point, 1939

Jan. 6	4.44	May 9	2.18	July 29	2.00	Oct. 2	2.28
17	4.48	19	2.01	Aug. 2	a 1.50	7	a 2.80
30	4.50	31	2.62	4	1.00	9	2.86
Feb. 24	a 4.1	June 7	a 2.80	9	1.47	16	2.76
Mar. 10	4.38	14	1.88	16	1.20	Nov. 13	3.19
17	4.56	26	2.03	28	1.60	20	3.50
31	4.48	July 7	1.60	Sept. 11	2.12	Dec. 6	3.61
Apr. 10	a 3.85	12	1.30	22	1.77	22	1.40
25	3.26	22	1.20				

(D-1-1)21acc1. Utah State Prison. Measurements made by Salt Lake City Corporation.

Water level, in feet below measuring point, 1939

Jan. 5	72.70	Mar. 31	75.05	July 21	74.27	Oct. 16	74.49
16	73.27	Apr. 10	74.79	Aug. 5	74.15	Nov. 8	74.59
27	73.68	25	73.07	28	74.93	20	74.92
Feb. 24	74.53	May 3	71.64	Sept. 22	73.07	Dec. 6	75.48
Mar. 10	74.90	24	73.35	Oct. 2	74.73	22	76.03
17	75.00	June 26	72.06	9	74.51		

(D-1-1)30bbc9. L. W. Aamodt. Measurements made by Salt Lake City Corporation except as noted.

Water level, in feet above measuring point, 1939

Jan. 6	14.7	Mar. 31	15.9	July 7	3.60	Sept. 12	8.7
13	14.75	Apr. 4	15.2	15	2.75	22	6.5
20	14.9	10	a 14.9	Aug. 2	a 3.98	26	9.55
Feb. 18	14.3	24	12.2	4	4.00	Oct. 7	a 12.1
24	a 14.6	May 12	10.0	15	3.75	16	12.1
Mar. 6	14.65	June 5	6.35	21	3.20	26	13.0
16	15.9	7	a 9.8	Sept. 2	5.6	Nov. 10	13.8
22	15.8	20	8.9	8	8.95		

(D-1-1)31caa2. William Sorenson. Measurements made by Salt Lake City Corporation except as noted.

Water level, in feet above measuring point, 1939

Jan. 5	12.65	Apr. 10	a 13.95	July 26	7.25	Sept. 26	9.75
Feb. 18	12.25	June 6	10.6	Aug. 2	a 7.6	Oct. 7	a 12.3
24	a 13.6	7	a 10.95	8	6.7	27	12.7
Mar. 8	13.7	20	10.6	25	7.0	Nov. 20	13.0
23	14.45	July 11	7.35				

(D-1-1)31cad4. William Sorenson. Measurements made by Salt Lake City Corporation except as noted.

a Measurement made by Geological Survey.

## Salt Lake County--Continued

(D-1-1)3lead4.--Continued

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 5	14.4	Apr. 10	a 12.7	July 26	6.35	Oct. 21	11.35
Feb. 18	13.3	June 6	9.2	Aug. 2	a 6.3	27	11.5
24	a 12.1	7	a 8.65	Sept. 26	9.0	Nov. 20	12.1
Mar. 8	12.6	20	9.4	Oct. 7	a 11.2	Dec. 8	12.6
23	13.3	July 11	6.7				

(D-2-1)4dbd4. Eugene Templeman. Measurements made by Salt Lake City Corporation except as noted.

Water level, in feet, with reference to measuring point, 1939

Jan. 11	+1.68	Apr. 10	a -0.58	July 10	+1.95	Sept. 26	+2.28
24	+1.31	14	-0.67	18	+2.08	Oct. 4	+2.55
Feb. 8	+0.97	28	-1.00	28	+2.40	7	a +2.53
24	a +0.27	May 12	-1.16	Aug. 2	a +2.10	11	+2.44
28	+0.20	23	-0.20	15	+2.10	27	+2.02
Mar. 13	-0.12	June 7	a +0.75	22	+2.13	Nov. 16	+1.60
28	-0.25	21	+1.40	Sept. 6	+2.35	29	+1.05
Apr. 7	-0.56	30	+1.66	18		Dec. 14	+0.75

(D-2-1)5aaa1. May L. Davis. Measurements made by Salt Lake City Corporation except as noted.

Water level, in feet, with reference to measuring point, 1939

Jan. 6	+2.33	Apr. 12	+1.75	June 30	-0.17	Sept. 14	+0.38
17	+2.20	20	+1.25	July 14	-0.70	29	+0.40
Feb. 24	ab +1.85	29	+0.90	18	-0.83	Oct. 7	a +1.25
25	+2.50	May 11	+0.30	25	-0.75	14	+1.25
Mar. 8	+1.77	18	+0.18	Aug. 2	a -0.48	26	+1.30
16	+1.80	25	+0.45	10	-0.43	Nov. 9	+1.54
23	+1.75	June 1	+0.58	18	-0.60	20	+1.70
31	+1.95	7	ac +0.65	26	-0.76	Dec. 8	+1.75
Apr. 10	a +1.74	13	+0.50	Sept. 8	+0.20		

(D-2-1)7bcd1. American Smelting and Refining Company.

Daily noon water level, in feet above measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	....	....	21.0	21.5	20.1	19.3	17.1	17.0	17.1	18.0	20.2	....
2	....	....	21.0	21.4	19.7	19.7	16.7	17.2	17.0	18.0	20.2	....
3	....	21.4	21.1	21.4	19.5	19.8	16.7	16.2	16.5	18.4	20.3	....
4	....	21.4	21.1	21.5	19.1	19.0	16.7	16.9	16.5	18.4	20.0	....
5	....	21.4	21.0	21.5	18.8	18.9	17.0	16.8	17.4	19.1	20.0	....
6	....	21.4	21.1	21.2	19.1	18.4	16.6	16.0	17.0	19.6	20.0	....
7	....	21.4	21.1	21.4	18.9	18.8	16.8	16.7	16.7	19.6	20.1	....
8	....	21.4	21.1	21.4	19.0	19.0	16.8	16.9	17.8	19.7	20.1	....
9	....	21.5	21.0	21.2	18.9	18.9	16.7	16.8	18.2	19.9	20.0	....
10	....	21.2	21.1	21.2	18.9	19.0	16.8	16.1	17.7	20.0	19.8	....
11	....	21.3	21.2	21.1	18.5	18.7	16.2	17.1	18.5	19.9	....	....
12	....	....	21.2	21.1	18.6	18.7	16.6	16.9	18.5	19.9	....	....
13	....	....	21.4	20.9	19.0	17.8	16.4	17.1	18.2	20.0	....	....
14	....	....	21.2	20.6	18.7	17.8	16.5	17.1	17.3	20.0	....	....
15	....	....	21.3	20.6	18.9	17.7	16.2	16.9	....	19.6	....	....
16	....	21.3	21.3	20.6	18.9	17.8	16.3	16.7	....	19.6	20.3	....
17	....	21.4	21.5	....	18.5	17.7	16.7	16.8	....	20.1	20.4	....
18	....	21.5	21.6	....	19.0	18.4	16.8	16.8	....	20.1	....	....
19	....	21.4	21.6	....	18.4	18.6	16.5	16.6	....	19.8	....	....
20	....	21.5	21.6	....	18.8	18.8	16.6	16.4	....	19.8	....	....
21	....	21.5	21.6	20.7	....	19.0	16.5	16.2	18.1	19.6	....	....
22	....	....	21.7	20.3	18.7	19.0	16.0	16.6	18.1	20.0	20.7	....
23	....	21.5	21.4	19.6	18.6	18.3	16.1	16.0	18.2	20.1	20.7	....
24	....	21.5	21.5	19.5	18.7	18.2	15.9	16.3	17.9	20.3	20.9	....
25	....	21.1	21.6	19.7	19.2	18.3	16.3	16.6	17.6	19.5	21.0	....
26	....	21.1	21.5	19.8	19.6	18.2	16.3	16.8	18.2	19.6	20.8	....
27	21.6	21.1	21.5	20.1	19.2	17.6	16.4	16.7	18.2	19.8	20.6	....
28	21.7	21.0	21.5	20.0	19.0	17.5	16.5	16.9	18.2	19.6	20.7	....
29	21.6	....	21.5	20.2	19.0	17.1	16.8	17.1	18.1	19.8	....	....
30	21.6	....	21.6	20.0	18.7	17.0	16.5	17.4	18.1	19.9	....	20.9
31	21.5	....	21.6	....	18.5	....	17.0	17.3	....	20.0	....	20.7

a Measurement made by Geological Survey.

b Flow, 7.5 gallons per minute.

c Flow, 2.6 gallons per minute.

## Salt Lake County--Continued

(D-2-1)Sada3. Chester Cahoon.

Daily noon water level in feet above measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	Oct.	Nov.	Dec.
1	11.5	11.3	11.2	11.5	10.4	11.2	10.7	10.9	11.2
2	11.7	11.4	11.1	11.5	10.3	11.4	10.3	11.0	11.2
3	11.5	11.7	11.3	11.6	a 7.6	11.7	10.4	11.0	11.2
4	11.4	11.8	11.1	11.5	10.8	11.7	10.5	10.8	11.1
5	11.7	11.7	11.0	11.5	11.0	....	10.8	10.8	11.1
6	11.5	11.8	11.2	11.1	10.9	11.0	11.1	10.7	11.1
7	11.4	11.5	11.2	11.4	11.0	11.3	10.7	10.8	11.2
8	11.4	11.7	11.3	11.6	11.0	11.6	10.4	11.1	11.5
9	11.4	11.4	11.2	11.2	11.1	11.3	10.6	10.9	11.4
10	11.5	....	11.2	11.2	11.2	....	10.9	10.9	11.4
11	....	....	11.3	11.3	11.0	11.6	11.0	11.3	11.0
12	11.6	....	11.2	11.5	11.0	....	11.0	11.3	11.0
13	11.5	....	11.4	10.6	11.0	....	11.1	11.4	11.0
14	11.4	....	11.1	10.0	11.2	....	11.2	11.5	11.1
15	11.5	....	11.2	10.4	11.1	11.4	10.9	11.1	11.1
16	11.5	....	11.2	10.3	11.2	11.1	11.0	11.3	11.1
17	11.4	11.3	11.6	10.2	11.0	10.4	11.1	11.3	11.1
18	11.5	11.4	11.6	10.2	11.3	11.3	11.1	11.3	11.2
19	11.6	11.3	11.6	10.4	10.8	11.4	11.1	11.1	11.2
20	11.7	11.3	11.6	10.4	10.7	11.5	11.1	11.1	11.3
21	11.7	11.3	11.6	10.5	11.1	11.6	11.1	11.1	....
22	11.6	11.3	11.6	10.5	10.8	11.5	11.0	11.3	....
23	11.5	11.3	11.4	10.4	11.0	11.6	11.0	11.3	....
24	11.5	....	....	10.2	11.6	....	11.3	11.4	....
25	11.6	....	11.5	10.5	11.2	11.6	10.7	11.4	....
26	11.6	....	11.5	10.2	11.3	....	9.9	11.4	....
27	11.7	11.0	11.5	10.2	11.4	....	10.1	11.3	....
28	11.7	11.0	11.5	10.6	11.5	....	10.5	11.1	....
29	11.7	....	11.1	10.6	11.5	....	10.8	11.0	....
30	11.7	....	11.5	10.6	11.5	....	10.7	11.3	....
31	11.5	....	11.5	....	11.1	....	10.8	....	9.8

Daily high and low water level, in feet above measuring point, 1939

	June		July		August		September	
	High	Low	High	Low	High	Low	High	Low
1	....	...	10.9	3.6	9.3	3.0	9.3	3.2
2	....	...	b 11.2	...	9.2	3.0	b 10.2	...
3	....	...	10.6	3.6	9.3	3.1	10.3	4.8
4	....	...	b 11.0	...	...	...	9.7	3.2
5	11.4	3.7	10.2	3.4	...	...	9.6	3.2
6	....	...	10.3	3.4	...	...	9.4	3.2
7	....	...	10.4	3.4	...	...	9.4	3.4
8	....	...	9.8	3.1	...	...	b 10.4	...
9	....	...	b 10.8	...	...	...	....	...
10	12.0	4.6	10.4	3.2	...	...	....	...
11	....	...	9.7	3.1	9.0	3.2	....	...
12	11.7	3.9	9.7	3.3	8.9	3.4	....	...
13	11.7	4.0	9.8	3.3	9.7	3.3	....	...
14	11.7	4.0	9.5	3.1	9.0	3.2	....	...
15	....	...	9.5	3.1	8.9	3.1	b 10.5	...
16	....	...	10.4	3.5	8.9	3.2	9.6	3.2
17	....	...	9.6	3.1	8.9	3.2	b 10.7	...
18	....	...	9.2	2.8	9.0	3.2	9.8	3.4
19	....	...	9.0	3.0	9.0	3.2	9.4	3.3
20	....	...	9.2	3.0	9.5	3.2	9.3	3.3
21	....	...	8.8	3.0	9.2	3.2	9.3	3.5
22	....	...	8.7	3.0	9.0	3.1	9.7	3.6
23	....	...	10.0	3.2	8.8	3.2	9.7	3.5
24	11.8	4.9	9.5	3.1	9.1	3.2	9.7	3.5
25	....	...	9.3	3.0	8.8	3.2	b 10.2	...
26	10.7	3.4	9.5	3.0	9.0	3.1	10.8	3.7
27	10.5	3.5	9.4	3.0	b 10.1	...	9.8	3.5
28	10.8	3.6	9.7	3.0	10.1	3.4	10.8	3.4
29	10.4	3.5	9.6	3.1	10.4	3.6	10.6	3.8
30	....	...	10.2	3.1	9.5	3.3	9.7	3.5
31	....	...	9.9	3.0	9.2	3.3	....	...

a Nearby wells pumping.

b Water level at noon.

## Salt Lake County--Continued

(D-2-1)8bbb1. A. R. and T. E. Hogge. Measurements made by Salt Lake City Corporation except as noted.

Water level, in feet, with reference to measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 17	-0.25	May 11	-1.32	July 18	-4.30	Sept. 27	-1.58
Feb. 27	-.02	24	-.90	25	-4.02	Oct. 3	-.95
Mar. 8	-.08	31	-.68	Aug. 2	a -3.50	7	a -.55
16	.00	June 7	a -0.65	18	-4.02	9	-.49
23	+.05	12	-1.00	24	-3.88	26	-.31
31	+.06	19	-.66	Sept. 1	-3.47	Nov. 9	-.23
Apr. 10	a +.15	30	-3.20	5	-2.40	Dec. 2	-.05
12	+.16	July 6	-3.00	15	-1.50	22	a -.20
May 4	-1.33	14	-4.25	18	-2.55		

(D-2-1)15acc. Malcom A. Keyser. Measurements made by Salt Lake City Corporation except as noted.

Water level, in feet below measuring point, 1939

Jan. 12	66.80	Apr. 14	70.65	July 18	61.20	Oct. 4	64.45
24	67.59	28	69.27	28	61.60	7	a 64.73
Feb. 8	68.29	May 12	67.88	Aug. 2	a 61.80	11	64.94
28	70.00	23	65.87	15	62.55	27	66.17
Mar. 13	70.53	June 7	a 63.46	22	62.84	Nov. 16	67.10
28	71.20	21	61.63	Sept. 8	63.67	29	68.12
Apr. 7	70.97	30	61.03	18	63.92	Dec. 14	69.47
10	a 70.93	July 11	61.00	26	64.18		

(D-3-1)5cdcl. Sam Jones.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 24	9.95	June 7	8.13	Oct. 7	10.62
Apr. 10	10.32	Aug. 1	7.68	Dec. 22	11.94

## Sanpete County

(C-18-1)13cc2. Arch Mellor. Found flowing prior to all measurements.

Water level, in feet above measuring point, 1939

Feb. 28	6.9	June 16	6.2	Oct. 15	6.5
Apr. 17	7.55	Aug. 23	6.25	Dec. 5	6.65

(C-19-1)23bccl. C. H. Beal.

Water level, in feet below measuring point, 1939

Feb. 28	34.46	June 16	34.77	Oct. 15	33.77
Apr. 17	34.82	Aug. 23	b 38.02	Dec. 5	33.64

(C-19-1)25cd2. Wintch and Dyreng. Found flowing prior to all measurements.

Water level, in feet above measuring point, 1939

Feb. 28	2.78	June 14	2.20	Oct. 15	2.68
Apr. 17	2.25	Aug. 23	2.44	Dec. 5	2.50

(D-13-4)23dd. Thomas E. Rigby. No measurements made in 1939.

(D-14-2)13aa. Ernest Hansen. Found flowing prior to all measurements.

Water level, in feet above measuring point, 1939

Mar. 3	15.1	June 18	15.45	Oct. 14	13.5
Apr. 15	16.0	Aug. 24	14.4	Dec. 2	13.85

a Measurement made by Geological Survey.

b Pumping.

Sanpete County--Continued

(D-14-3)33bcc1. Joseph Cloward. Found flowing prior to all measurements.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 3	5.7	June 18	4.6	Oct. 14	4.4
Apr. 15	5.1	Aug. 24	3.75	Dec. 2	4.6

(D-15-3)8cda3. William Prestwick. Found flowing prior to all measurements.

Water level, in feet above measuring point, 1939

Mar. 3	2.05	June 18	0.93	Oct. 14	0.65
Apr. 15	1.98	Aug. 24	1.32	Dec. 2	1.30

(D-15-3)26ccc. James C. Christensen. Chester, northeast corner of crossroad, about 3.0 feet south of Post Office. Unused well, diameter 2 inches, measured depth, 23 feet. Measuring point, valve seat of pitcher pump, 3.0 feet above land surface. Water levels, in feet below measuring point, 1939: June 18, 10.35; Aug. 24, 13.15; Oct. 14, 12.29; Dec. 2, 11.27.

(D-15-3)26ccd1. Chester Waterworks Co. Water level, in feet below measuring point, 1939: Mar. 3, 3.07. Well casing capped with concrete; measurements discontinued.

(D-15-3)28aba1. Isaac Reynolds. Measuring point, top of street ell, 1.25 feet below old measuring point. Found flowing prior to all measurements.

Water level, in feet above measuring point, and flow, in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Mar. 3	3.20	3.0	Aug. 24	0.93	...
Apr. 15	3.33	3.2	Oct. 14	0.73	a 1.9
June 18	1.23	1.9	Dec. 2	1.95	a 3.6

(D-15-3)35bbb. Christian Larsen. Chester. Diameter 2 inches, depth 150 feet. Measuring point, top of ell, 1.65 feet above top of 2-inch casing and 0.80 foot above land surface. Cased to 140 feet. Dec. 1, 1939, found flowing 1.6 gallons per minute from 1-inch opening; water level, 4.8 feet above measuring point.

(D-15-4)4dda1. (D-15-4)4dd in Water-Supply Paper 817. Twin Creek Irrigation Co.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 3	24.06	June 18	15.68	Oct. 14	20.87
Apr. 14	24.71	Aug. 24	20.38	Dec. 2	22.44

(D-15-4)6ada1. W. H. Brinton.

Water level, in feet below measuring point, 1939

Mar. 3	5.16	June 18	4.69	Oct. 14	5.52
Apr. 15	5.05	Aug. 24	6.61	Dec. 2	5.63

(D-15-4)29bacl. Drought Relief Administration. Water levels, in feet below measuring point, 1939: June 18, 3.80; Aug. 24, 9.33; Oct. 14 and Dec. 2, plugged with rubbish and dry at 8.0 feet.

a Flowing from point 1.25 feet lower than previous measurement.

## Sanpete County--Continued

(D-16-3)4aaal. Joseph Bagnall. Found flowing prior to all measurements.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 3	5.5	June 18	3.35	Oct. 14	4.2
Apr. 15	5.45	Aug. 24	2.58	Dec. 2	5.3

(D-16-3)14dcal. Chris. Larsen and Sons.

Water level, in feet below measuring point, 1939

Mar. 3	14.94	June 17	14.49	Oct. 14	14.51
Apr. 15	14.49	Aug. 24	14.50	Dec. 2	14.49

(D-16-3)15acal. Federal Land Bank.

Water level, in feet below measuring point, 1939

Apr. 14	36.39	Aug. 24	36.67	Dec. 2	36.92
June 18	36.12	Oct. 14	36.88		

(D-16-3)15adcl. E. L. Davidson. Measuring point changed to edge of hole in pump base, 0.75 foot above top of casing.

Water level, in feet below measuring point, 1939

Mar. 3	59.65	June 18	59.57	Oct. 14	60.48
Apr. 15	60.00	Aug. 24	60.29	Dec. 2	60.50

(D-16-3)32adal. David N. Beal. Found flowing prior to all measurements.

Water level, in feet above measuring point, 1939

Apr. 15	6.9	Aug. 23	5.6	Dec. 4	5.5
June 17	6.0	Oct. 14	5.4		

(D-16-3)32ddc2. George Beal.

Daily noon water level in feet above measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	8.0	7.6	6.9	6.5	5.8	2.1	a0.3	0.5	4.4	5.5	5.7	6.0
2	8.1	7.1	6.6	6.4	5.7	2.1	0.0	0.3	4.3	5.5	5.7	5.7
3	8.1	7.6	6.5	6.4	5.7	2.2	a0.1	0.2	4.5	5.5	5.7	5.8
4	7.9	...	6.5	6.4	5.8	2.7	0.1	0.3	4.7	5.4	5.8	5.8
5	8.2	7.1	7.0	6.3	5.9	3.7	0.0	0.3	4.3	5.4	5.8	5.5
6	8.0	7.1	6.8	6.5	5.8	3.1	a0.2	...	4.9	5.5	5.7	5.5
7	8.4	7.3	6.8	6.4	5.7	2.1	a0.4	0.7	5.0	5.5	5.7	5.6
8	8.5	7.1	6.8	6.3	4.7	1.7	a0.9	1.5	5.1	5.4	5.7	5.7
9	8.7	6.7	6.8	6.5	3.5	1.5	a0.9	2.5	5.1	5.3	5.6	5.3
10	8.5	7.2	6.8	6.4	3.2	1.4	a1.1	2.1	5.1	5.3	6.0	5.4
11	8.7	7.3	6.5	6.3	3.8	1.5	a1.2	1.1	5.2	5.3	5.8	5.3
12	8.4	7.1	6.8	6.4	4.0	1.4	0.3	0.9	5.2	5.5	5.7	5.3
13	8.7	6.8	6.8	6.4	3.0	1.2	0.8	0.9	5.2	5.4	5.7	5.5
14	7.9	7.0	6.5	6.3	2.8	1.5	0.9	0.1	5.3	5.4	5.7	5.6
15	8.4	6.9	6.9	6.1	3.2	1.1	1.4	0.9	5.3	5.7	5.8	5.6
16	8.2	7.3	6.5	5.9	4.0	0.6	...	1.8	5.3	5.7	5.8	5.5
17	8.4	6.9	6.5	6.0	4.4	0.1	0.7	2.8	5.3	5.6	6.1	5.7
18	8.3	7.0	6.4	5.9	3.9	a0.2	0.3	3.0	5.4	5.5	6.0	5.6
19	8.6	7.0	6.5	5.9	3.7	a0.4	0.1	2.9	5.4	5.6	5.8	5.5
20	8.3	7.2	6.5	5.9	3.2	a0.5	a0.1	3.2	5.3	5.6	6.0	5.5
21	7.7	7.0	6.5	5.7	2.8	a0.2	a0.2	2.7	5.4	5.6	5.9	5.5
22	7.5	6.7	6.5	5.6	...	a0.1	a0.4	1.7	5.5	5.7	5.8	5.5
23	7.8	7.1	6.6	5.7	...	0.3	a0.4	1.5	5.4	5.7	5.9	5.5
24	7.9	7.0	6.6	5.7	...	0.5	a0.2	1.5	5.5	5.6	6.0	5.5
25	7.7	6.7	6.5	5.6	...	0.6	0.1	2.5	5.4	5.7	5.5	5.5
26	7.9	6.8	6.5	5.6	...	1.8	0.3	3.2	5.3	5.7	5.6	5.4
27	7.5	7.0	6.5	5.8	...	1.4	1.7	3.7	5.3	5.7	5.7	5.5
28	7.7	6.7	6.5	5.6	...	0.9	1.2	4.0	5.5	5.8	5.6	5.3
29	7.9	...	6.4	5.6	2.3	0.3	1.3	4.3	5.4	5.7	6.2	5.7
30	7.5	...	6.5	5.6	2.2	a0.1	1.1	3.5	5.4	5.7	5.7	5.3
31	7.4	...	6.5	...	2.0	...	0.7	4.0	...	5.7	...	5.1

a Water level, in feet below measuring point.

## Sanpete County--Continued

(D-16-3)33bab1. P. S. Justeson. Measuring point changed to top of  $\frac{1}{2}$ -inch ell, 0.67 foot above top of casing and 5,459.64 feet above sea level.

Water level, in feet with reference to measuring point, and flow, in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Apr. 15	+2.28	a 4.3	Oct. 14	+0.89	a 1.3
June 18	+1.80	a 2.9	Dec. 4	+1.05	a 1.5
Aug. 24	-1.01				

(D-16-3)33bac2. P. S. Justeson.

Water level, in feet with reference to measuring point, and flow, in gallons per minute, 1939

Apr. 15	+1.84	a 1.5	Oct. 14	+0.43	a 0.31
June 17	+1.23	a 0.62	Dec. 4	+0.62	a 0.46
Aug. 24	-1.02				

(D-16-3)33ccb1. Chris Olsen. Measuring point, 5,465.53 feet above sea level. (Incorrectly given 5,465.33 in Water-Supply Paper 817).

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	5.77	Apr. 15	5.32	Aug. 6	6.40	Oct. 14	7.58
21	5.90	21	5.70	13	6.40	22	6.90
Feb. 4	6.01	May 11	7.60	20	6.10	29	6.11
19	6.60	June 9	7.30	23	6.97	Nov. 5	6.70
25	6.10	17	4.78	27	7.80	12	6.60
Mar. 3	6.02	26	4.20	Sept. 3	7.20	Dec. 4	7.57
11	6.70	July 2	5.10	10	7.10	9	7.60
19	6.70	9	4.70	18	7.10	16	7.10
26	6.20	16	5.20	24	6.40	23	7.70
Apr. 2	4.80	23	6.35	Oct. 1	7.60	30	7.60
9	5.60	30	6.30	8	7.10		

(D-17-2)1bca2. G. Anton Anderson. Found flowing prior to all measurements.

Water level, in feet above measuring point, and flow, in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Mar. 3	4.00	0.7	Aug. 23	3.36	0.36
Apr. 17	3.85	.7	Oct. 14	3.28	.51
June 17	3.42	.58	Dec. 4	3.39	.53

(D-17-2)36cbd1. Geo. B. Cox.

Water level, in feet, with reference to measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 17	-2.11	Aug. 23	+0.45	Dec. 5	-1.80
June 17	+0.34	Oct. 15	-0.76		

(D-17-3)4bcc1. R. A. Olsen and others.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	8.85	Apr. 2	11.40	Sept. 3	12.10	Oct. 29	11.70
21	8.10	9	11.10	10	12.40	Nov. 5	11.00
28	7.70	14	10.63	18	12.00	12	11.10
Feb. 4	7.00	21	11.80	24	11.10	Dec. 4	11.92
19	9.70	May 11	14.80	Oct. 1	11.50	9	10.90
25	10.20	June 17	b 54.02	8	11.90	16	11.20
Mar. 3	10.07	26	13.70	14	11.40	23	11.10
11	10.50	27	11.10	22	12.00	30	12.00
26	10.60						

a Found flowing.

b Pumping from well.

## Sanpete County--Continued

(D-17-3)5bdal. Alden Beal. Found flowing prior to all measurements. Flow, in gallons per minute, 1939: Aug. 23, 0.28; Dec. 4, 0.55.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 17	7.6	Aug. 23	3.76	Dec. 4	6.55
June 17	2.89	Oct. 14	6.40		

(D-17-3)5ccd1. James Rasmussen. Flow, in gallons per minute, 1939: Mar. 3, 10; Apr. 17, 8.6; Dec. 4, 5.5. Found flowing prior to all measurements.

Water level, in feet above measuring point, 1939

Mar. 3	14.7	June 17	11.5	Oct. 14	12.5
Apr. 17	13.05	Aug. 23	11.9	Dec. 4	12.3

(D-17-3)5cda. Orson Paulson.

Water level, in feet below measuring point, 1939

Apr. 17	0.10	Aug. 23	0.27	Dec. 4	0.30
June 17	0.26	Oct. 14	1.25		

(D-17-3)6aad1. Federal Land Bank of Berkeley. Found flowing prior to all measurements.

Water level, in feet above measuring point, 1939

Apr. 17	17.0	Aug. 23	16.45	Dec. 4	16.7
June 17	15.8	Oct. 14	16.7		

(D-17-3)6bcc. Nels Thompson.

Water level, in feet above measuring point, 1939

Apr. 17	5.7	Aug. 23	5.5	Dec. 4	5.7
June 17	6.25	Oct. 14	5.05		

(D-17-3)6dbal. (D-17-3)6db in Water-Supply Paper 817. Niels Christensen. Found flowing prior to all measurements.

Water level, in feet above measuring point, 1939

Mar. 3	5.8	June 17	2.40	Oct. 14	3.32
Apr. 17	4.35	Aug. 23	3.55	Dec. 4	3.80

(D-17-3)7bbbl. Jacob Thompson. Found flowing prior to all measurements.

Water level, in feet above measuring point, 1939

Mar. 3	13.6	Aug. 23	10.85	Dec. 4	10.3
Apr. 17	11.9	Oct. 14	9.95		

(D-17-3)8bab1. J. O. Anderson. Found flowing prior to all measurements.

Water level, in feet above measuring point, 1939

Apr. 17	4.8	Aug. 23	3.77	Dec. 4	4.26
June 17	4.02	Oct. 14	4.35		

(D-17-3)8cddl. Stanley Nielsen.

Water level, in feet below measuring point, 1939

Apr. 17	7.97	Aug. 23	8.39	Dec. 4	8.81
June 17	9.36	Oct. 14	8.30		

(D-17-3)9cbd1. (D-17-3)9cb in Water-Supply Paper 817. S. E. Christensen. Measuring point, top of casing, 1.0 foot above land surface and 5,519.8 feet above sea level.

Water level, in feet below measuring point, 1939

Mar. 3	42.21	June 17	43.40	Oct. 14	43.60
Apr. 17	43.62	Aug. 23	a 62.73	Dec. 4	44.23

a Pumping.



Sanpete County--Continued  
(D-17-3)17adbl. Drought Relief Administration.

Water level, in feet below measuring point, 1939					
Date	Water level	Date	Water level	Date	Water level
Mar. 3	51.10	Aug. 23	52.14	Dec. 4	53.32
June 17	a 74.05	Oct. 15	52.64		

(D-17-3)30dbdl. Ernest Munk. Found flowing prior to all measurements.

Water level, in feet above measuring point, and flow, in gallons per minute, 1939					
Date	Water level	Flow	Date	Water level	Flow
Apr. 17	8.5	...	Oct. 15	8.5	4.0
June 17	9.95	5.7	Dec. 5	8.2	4.6
Aug. 23	8.8	5.0			

(D-18-2)1da. L. H. Hougaard.

Daily noon water level, in feet below measuring point, 1939												
Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	75.89	77.72	79.34	80.21	80.13	74.82	.....	71.06	73.75	75.54	77.01	78.46
2	75.90	77.83	79.30	80.18	80.14	74.36	69.46	71.15	73.82	75.61	77.07	78.48
3	75.98	77.83	79.36	80.17	80.07	73.85	69.50	71.21	73.96	75.69	77.12	.....
4	76.11	77.90	79.46	80.13	79.99	73.50	69.47	71.26	74.05	75.82	77.18	.....
5	76.05	78.00	79.48	80.08	79.90	73.21	69.48	71.32	74.10	75.87	77.20	78.65
6	76.18	77.98	79.55	80.10	79.88	73.10	69.56	71.45	74.20	75.86	77.26	78.65
7	76.27	78.09	79.62	80.01	79.82	72.90	69.60	71.53	74.32	75.96	77.30	78.69
8	76.31	78.03	79.69	79.96	79.74	72.67	69.55	71.59	74.47	76.00	77.36	78.72
9	76.36	78.25	79.72	79.94	79.75	72.48	69.57	71.66	74.52	.....	77.41	78.76
10	76.45	78.33	79.74	79.98	79.63	72.27	69.57	71.69	74.57	.....	77.45	78.78
11	76.48	78.49	79.87	79.96	79.54	72.08	69.61	71.83	74.57	.....	77.48	78.82
12	76.51	78.51	79.89	79.92	79.47	71.85	69.58	71.92	74.77	.....	77.52	78.90
13	76.58	78.52	79.92	79.89	79.35	.....	69.56	71.94	74.85	.....	77.55	78.94
14	76.66	78.59	79.96	79.93	79.20	.....	69.60	72.04	74.91	.....	77.57	78.94
15	76.73	78.56	80.03	79.95	79.06	.....	69.70	72.14	74.95	.....	77.62	78.97
16	76.80	78.72	80.06	.....	78.93	.....	69.79	72.25	74.99	76.37	77.68	78.99
17	76.87	78.78	80.10	79.97	78.73	70.46	69.89	72.29	75.07	76.41	77.72	78.99
18	76.95	78.75	80.13	79.93	78.53	70.38	69.96	72.37	75.13	76.45	77.77	78.97
19	76.98	78.66	80.15	79.86	78.33	70.23	70.06	72.46	75.16	76.51	77.83	79.06
20	76.98	78.80	80.17	79.91	78.04	70.16	70.13	.....	75.20	76.62	77.86	79.07
21	77.08	78.91	80.18	79.92	77.76	70.16	70.24	.....	75.21	76.65	77.91	79.10
22	77.12	78.96	80.20	79.92	77.56	70.09	70.30	72.84	75.23	76.66	77.95	79.13
23	77.28	78.92	80.23	79.92	77.44	69.90	70.39	72.97	75.28	76.67	78.00	79.19
24	77.36	79.03	80.25	80.00	77.22	69.83	70.43	73.05	75.29	76.68	78.06	79.25
25	77.39	79.07	80.26	80.03	76.97	69.70	70.52	73.13	75.34	76.71	78.12	79.28
26	77.37	79.09	80.26	80.08	76.65	69.65	70.56	73.24	75.39	76.77	78.18	79.31
27	77.31	79.15	80.26	80.12	76.32	69.63	70.60	73.24	75.45	76.81b	78.23	79.32
28	77.45	79.21	80.28	80.10	76.03	69.56	70.69	73.33	75.48	76.86b	78.29	79.44
29	77.55	.....	80.28	80.09	75.73	69.49	70.71	73.48	75.49	76.91b	78.35	79.44
30	77.56	.....	80.30	80.12	75.51	.....	70.85	73.57	75.52	76.94	78.40	79.46
31	77.60	.....	80.26	.....	75.23	.....	70.97	73.68	.....	76.99	.....	79.45

(D-18-2)12babl. Manti City.

Water level, in feet below measuring point, 1939					
Date	Water level	Date	Water level	Date	Water level
Mar. 3	81.50	June 17	71.46	Dec. 5	79.42
Apr. 17	81.04	Oct. 15	76.89		

(D-19-2)17aadl. W. G. Frischknecht.

Water level, in feet below measuring point, 1939					
Date	Water level	Date	Water level	Date	Water level
Mar. 2	6.49	June 16	5.07	Oct. 15	6.42
Apr. 17	6.87	Aug. 23	6.08	Dec. 5	6.78
a Pumping.					
b Estimated.					

## Sanpete County--Continued

(D-19-3)32aacl. Mayfield Irrigation Co.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 2	35.66	June 16	24.05	Oct. 15	31.82
Apr. 17	37.51	Aug. 23	29.28	Dec. 5	35.28

(D-20-1)5bd. Federal Land Bank. Used domestic well, diameter 4 inches, depth 40 feet. Measuring point, top of casing, 2.0 feet below land surface. Water levels, in feet below measuring point, 1939: June 16, 17.92; Aug. 23, 17.32; Oct. 15, 19.17; Dec. 5, 20.85.

(D-20-1)5dc. W. M. Nielson. Equipment on well prevents making of measurements.

(D-20-1)20aaal. Federal Land Bank.

Water level, in feet below measuring point, 1939

Apr. 17	42.09	Aug. 23	41.08	Dec. 5	41.98
June 16	41.62	Oct. 15	41.38		

## Sevier County

(C-21-1)13bdal. Federal Land Bank. Measuring point changed to top of concrete basin adjacent to outlet, about 40 feet north of well and 0.27 foot below old measuring point. Found flowing prior to all measurements.

Water level, in feet above measuring point, 1939

Feb. 28	3.40	June 16	3.90	Oct. 16	4.02
Apr. 17	3.35	Aug. 23	3.89	Dec. 5	4.18

(C-21-1)27aadl. E. A. Thorsen.

Water level, in feet below measuring point, 1939

Feb. 28	4.05	June 16	4.42	Oct. 16	3.62
Apr. 17	4.57	Aug. 23	4.29	Dec. 5	3.62

(C-22-1)8bb. A. L. Anderson.

Water level, in feet below measuring point, 1939

Feb. 28	30.77	June 16	31.32	Oct. 16	30.16
Apr. 17	31.47	Aug. 23	31.27	Dec. 5	30.20

(C-23-2)1aacl. U. S. Gypsum Co. Measuring point changed to top of casing, 0.25 foot below old measuring point and 0.8 foot below land surface; change made Feb. 23, 1938; all measurements given in Water-Supply Paper 845 should be changed accordingly. Found flowing prior to all measurements.

Water level, in feet above measuring point, 1939

Feb. 28	3.15	June 16	3.95	Oct. 16	3.67
Apr. 17	3.48	Aug. 22	3.25	Dec. 5	3.30

(C-23-2)15bdd3. Sevier School District. Measuring point changed to top of tee, 0.45 foot above old measuring point and 5,234.50 feet above sea level. Change made Feb. 23, 1938; all measurements given in Water-Supply Paper 845 should be changed accordingly.

Water level, in feet above measuring point, 1939

Feb. 28	7.5	June 16	6.9	Oct. 16	7.3
Apr. 19	7.0	Aug. 22	6.9	Dec. 5	7.4

## Sevier County--Continued

(C-23-2)15ccc. Martha Avery.

Daily noon water level, in feet above measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	7.0	7.0	6.7	6.7	2.0	2.7	1.9	...	1.7	2.1	4.7	5.7
2	6.9	6.9	6.7	...	2.2	2.9	1.5	...	1.6	2.1	4.7	...
3	6.8	7.0	6.7	...	2.2	3.2	1.5	...	1.4	2.5	4.7	...
4	...	7.0	6.7	...	2.3	3.2	1.5	...	1.5	2.5	4.7	5.5
5	...	7.0	6.6	...	2.1	3.2	1.6	...	1.4	3.3	4.3	5.7
6	...	7.0	6.5	...	2.0	3.1	1.5	...	1.6	3.5	4.5	6.2
7	...	7.0	6.6	...	2.0	3.1	1.3	1.8	2.0	3.9	5.1	6.4
8	6.9	7.0	6.8	...	2.0	3.0	1.3	1.9	2.1	3.9	5.1	6.5
9	6.7	7.0	6.8	5.8	2.0	2.8	1.3	2.2	2.1	4.0	5.3	6.4
10	6.8	6.9	6.8	5.8	2.0	2.9	1.2	2.3	2.1	4.3	5.0	6.0
11	6.8	6.9	6.8	5.9	2.0	2.7	1.2	2.1	2.1	4.6	5.0	6.0
12	6.8	7.0	6.6	5.8	2.0	2.5	1.4	2.1	2.2	4.8	5.0	5.9
13	6.9	6.9	6.9	5.3	1.9	2.5	1.6	1.3	2.2	4.9	4.8	6.1
14	6.8	6.8	6.9	5.1	1.9	2.3	1.6	1.1	2.4	4.9	4.8	5.8
15	6.9	7.0	7.0	4.8	2.1	2.5	1.6	1.0	2.2	4.9	4.9	6.0
16	6.7	6.9	7.1	4.6	2.3	2.0	1.6	1.1	2.3	4.7	5.1	5.7
17	6.7	6.8	7.0	3.8	2.4	2.4	1.5	1.2	2.2	4.8	5.1	5.4
18	6.9	7.0	7.0	3.3	2.4	2.6	1.6	1.1	2.3	5.0	4.9	5.2
19	6.9	7.0	6.9	2.9	2.3	2.4	1.6	1.0	3.7	5.4	4.8	5.6
20	6.9	6.9	6.9	...	2.0	2.1	1.7	0.9	3.8	5.2	5.1	5.8
21	6.9	6.9	7.0	...	1.9	2.0	1.5	0.9	3.8	5.2	5.1	5.3
22	6.9	6.9	7.1	...	2.0	2.3	1.4	1.1	3.7	4.9	5.2	5.8
23	6.7	7.0	7.0	2.7	2.5	2.4	1.1	1.2	3.6	4.7	5.2	...
24	6.9	7.0	7.0	2.7	2.5	1.9	1.2	1.4	3.9	4.9	5.3	5.8
25	6.9	7.0	6.8	2.5	2.3	1.9	1.2	1.4	3.3	4.9	5.3	5.2
26	6.9	6.7	6.8	2.5	2.4	1.8	1.1	1.3	2.4	4.6	5.4	5.8
27	6.9	6.7	6.8	2.4	2.4	1.8	1.4	1.3	2.4	4.5	5.1	5.4
28	6.9	6.7	6.8	2.4	2.3	1.6	1.6	1.4	2.4	4.5	5.5	5.3
29	7.0	...	6.9	2.0	2.3	1.7	1.9	1.5	2.3	4.4	5.4	5.5
30	7.0	...	6.8	2.2	2.2	1.7	...	1.5	2.2	4.3	5.5	5.5
31	7.0	...	6.8	...	2.5	...	...	1.6	...	4.3	...	5.2

(C-23-2)15dcb4. F. M. Jackson. Found flowing prior to all measurements.

Water level, in feet above measuring point, and flow, in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Feb. 28	8.6	...	Aug. 22	3.91	9.9
Apr. 19	5.8	13.3	Oct. 16	7.3	17.1
June 18	4.05	10.8	Dec. 5	8.6	21.4

(C-23-2)19da. Wm. Hallows. Found flowing prior to all measurements.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 2	20.0	June 16	17.5	Oct. 17	20.45
Apr. 18	19.8	Aug. 22	20.1	Dec. 5	20.0

(C-23-2)26cdb1. Nettie C. Johnson.

Water level, in feet above measuring point, 1939

Mar. 1	6.45	June 16	a 4.25	Oct. 16	5.0
Apr. 18	5.25	Aug. 22	a 3.50	Dec. 6	6.6

(C-23-2)27bdal. Archie L. Buchanan. Found flowing prior to all measurements.

Water level, in feet above measuring point, and flow in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Mar. 1	5.1	...	Aug. 22	2.68	1.9
Apr. 19	3.68	2.9	Oct. 16	3.92	2.4
June 16	2.87	2.1	Dec. 6	4.8	2.8

a Found flowing.

## Sevier County--Continued

(C-23-2)31ccbl. Pacific National Life Insurance Co. Found flowing prior to all measurements except that on Apr. 19, 1939.

Water level, in feet above measuring point, and flow, in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Mar. 2	6.95	15	Aug. 22	6.95	14.3
Apr. 19	6.6	....	Oct. 17	6.9	14.3
June 16	6.75	14.3	Dec. 7	6.9	13.3

(C-24-2)7bac2. R. and J. A. Hooper.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 2	4.3	June 16	4.15	Oct. 17	4.2
Apr. 19	3.82	Aug. 22	4.31	Dec. 7	4.25

(C-24-3)33dcbl. Peter E. Willardson.

Water level, in feet below measuring point, 1939

Mar. 2	16.77	June 16	15.87	Oct. 17	16.24
Apr. 19	18.31	Aug. 22	15.74	Dec. 7	16.84

(C-25-3)3bbdl. Luther Winget.

Water level, in feet below measuring point, 1939

Mar. 2	12.57	June 16	12.33	Oct. 17	13.15
Apr. 19	14.25	Aug. 22	12.34	Dec. 7	13.78

(C-25-4)2db. R. W. Pinney. Joseph. Unused well, diameter 3 inches, depth 89 feet. Measuring point, top of coupling on casing, 1.5 feet above land surface. Water levels, in feet below measuring point, 1939: June 15, 51.69; Aug. 22, 50.00; Oct. 17, 50.47; Dec. 7, 50.90.

(C-25-4)11cd. Geo. Bradbury. Water level, in feet below measuring point, 1939: Mar. 2, 18.82; Apr. 19, 19.95. Found plugged with rocks 9 feet below the top of casing June 16, 1939; measurements discontinued.

(C-26-1)23ddbl. A. E. DeLange. Found flowing prior to all measurements.

Water level, in feet above measuring point, and flow, in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Mar. 1	12.3	...	Oct. 18	10.95	2.9
Apr. 18	12.5	3.5	Dec. 6	11.4	3.0
Aug. 21	11.8	3.3			

(C-26-1)25accl. Arnel R. Brown. Found flowing prior to all measurements. Water levels, in feet above measuring point, 1939: Apr. 18, 17.3; Aug. 21, 16.65; Oct. 18, 16.4; Dec. 6, 16.5. Flow, in gallons per minute, 1939: Apr. 18, 1.3; Aug. 21, 1.3; Oct. 18, 1.3; Dec. 6, 1.4.

(C-26-1)35acd1. Otto Erickson. Found flowing prior to all measurements.

Water level, in feet above measuring point, and flow, in gallons per minute, 1939

Mar. 1	4.7	1.3	Oct. 18	4.3	1.0
Apr. 18	4.3	0.9	Dec. 6	4.4	1.0
Aug. 21	4.7	1.1			

(D-25-1)31cb. Charles Burr. Found flowing prior to all measurements. Water levels, in feet above measuring point, 1939: Apr. 18, 2.44; Aug. 21, 0.70; Oct. 18, 1.43; Dec. 6, 1.54.

## Summit County

(A-2-5)9cd. Coalville City. No measurements in 1939.

(A-3-4)4. Thomas Overd. Measuring point changed to top of new well cover, 0.5 foot above previous measuring point.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 14	3.51	June 22	2.25	Oct. 30	2.69
May 1	3.95	Aug. 29	1.98		

(D-1-4)18cc. Otto Stevens. Formerly Paul Poredda. Water levels, in feet below measuring point, 1939: Mar. 21, 84.21; May 1, 83.85; June 22, 85.05; Oct. 30, 86.11.

(D-1-4)31aa. Wilford Snyder. Water levels, in feet below measuring point, 1939: Mar. 21, 12.51; May 1, 4.71; June 22, 4.69; Aug. 29, 15.72.

(D-1-4)31bdb1. Theodore Johnson. Measuring point changed to top of 2 by 6-inch well cover, altitude unchanged.

Water level, in feet below measuring point, 1939

Mar. 21	8.84	June 22	5.87	Oct. 30	11.87
May 1	5.26	Aug. 29	11.05		

(D-1-5)3ccb. Martin Larsen.

Water level, in feet below measuring point, 1939

Mar. 21	25.18	June 22	24.19	Oct. 30	24.95
May 1	24.05	Aug. 29	20.98		

(D-1-5)4cd. Joe Bean. Depth of well, 12.5 feet.

Water level, in feet below measuring point, 1939

Mar. 21	7.56	June 22	4.39	Oct. 30	7.01
May 1	8.40	Aug. 29	5.86		

(D-1-5)26aaa. Gordon Stembridge. Measuring point changed to top of rock curb under large rock, 0.3 foot below previous measuring point.

Water level, in feet below measuring point, 1939

Mar. 21	a 29.55	June 22	13.12	Oct. 30	26.18
May 1	25.47	Aug. 29	20.23		

(D-1-6)19dad. Arthur W. Frazier. Measuring point is 5.5 feet above top of casing.

Water level, in feet below measuring point, 1939

Mar. 21	13.25	June 22	2.17	Oct. 30	10.04
May 1	11.20	Aug. 29	3.98		

(D-1-6)28bdc. Sylvester Wilde.

Water level, in feet with reference to measuring point, 1939

Mar. 21	-24.33	June 22	+4.21	Oct. 30	-7.75
May 1	+4.45	Aug. 29	-9.54		

(D-1-6)29daa. Cyrus C. Mitchell.

Water level, in feet below measuring point, 1939

Mar. 21	27.75	June 22	4.95	Oct. 30	15.04
May 1	3.50	Aug. 29	18.61		

a Water turned out of river for two days, a few days prior to measurement and well went dry (report by owner).

## Summit County--Continued

(D-2-6)3c. Martin Larson. No measurements made in 1939.

(D-2-6)4bcc. Victor Barberry. Water levels, in feet below measuring point, 1939: Mar. 21, 48.20; May 1, 41.90; June 22, 12.17; Oct. 30, 40.93.

(D-2-6)5dcb. Burton Peterson.

## Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 21	7.88	June 22	5.00	Oct. 30	7.66
May 1	7.95	Aug. 29	6.70		

(D-2-6)8aaa. Ed. Rockhill.

## Water level, in feet below measuring point, 1939

Mar. 21	12.42	June 22	4.78	Oct. 30	9.18
May 1	11.81	Aug. 29	9.18		

(D-2-6)16bcc. Dean Mitchel. Diameter 30-inches.

## Water level, in feet below measuring point, 1939

Mar. 21	15.07	June 22	6.21	Oct. 30	15.52
May 1	7.02	Aug. 29	13.85		

(D-2-6)17dac. Jack Wilsonholme. Diameter 48 inches, depth 18 feet.

## Water level, in feet below measuring point, 1939

Mar. 21	10.78	June 22	4.14	Oct. 30	11.11
May 1	4.84	Aug. 29	10.93		

(D-2-6)20ccc. Julia A Padfield Estate.

## Water level, in feet below measuring point, 1939

Mar. 21	3.02	June 22	3.90	Oct. 30	6.36
May 1	3.49	Aug. 29	6.81		

(D-2-6)21bba. Dell Jones. Diameter, 48 inches.

## Water level, in feet below measuring point, 1939

Mar. 21	20.95	June 22	7.35	Oct. 30	17.74
May 1	12.50	Aug. 29	17.37		

(D-2-6)28ccc. Lillian McNeil.

## Water level, in feet below measuring point, 1939

Mar. 21	29.58	June 22	9.93	Oct. 30	25.99
May 1	24.06	Aug. 29	25.67		

(D-2-6)28ddc. A. D. Prescott.

## Water level, in feet below measuring point, 1939

Mar. 21	16.36	June 22	0.57	Oct. 30	9.31
May 1	9.33	Aug. 29	6.85		

(D-2-6)33dad. Amos Prescott. Depth, 65 feet. Measuring point changed to top of well cover at pump base, 0.18 foot above previous measuring point.

## Water level, in feet below measuring point, 1939

Mar. 21	59.33	June 22	8.81	Oct. 30	44.64
May 1	29.30	Aug. 29	40.35		

## Tooele County

(C-1-4)36bcb1. A. J. Williams.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 17	a 10.65	June 8	a 9.75	Oct. 11	a 9.65
Mar. 31	10.7	Aug. 9	a 9.7	Dec. 21	a 9.65
Apr. 28	10.55				

(C-2-4)2ab1. (C-2-4)2ab1.in Water-Supply Paper 817. Byron N. Griffith.

Water level, in feet above measuring point, 1939

Feb. 17	6.2	June 8	1.36	Oct. 11	6.7
Mar. 31	6.95	Aug. 9	1.79	Dec. 21	6.9
Apr. 28	6.6				

(C-2-4)2aba2. B. Dewey Davis. Found flowing prior to all measurements.

Water level, in feet above measuring point, and flow, in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Feb. 17	4.35	2.1	Aug. 9	4.25	2.1
Mar. 31	4.2	2.2	Oct. 11	4.00	1.9
Apr. 28	4.45	2.2	Dec. 21	3.82	1.9
June 8	4.6	2.2			

(C-2-4)17da. E. J. Jeremy. Found flowing prior to all measurements.

Water level, in feet above measuring point, and flow, in gallons per minute, 1939

Feb. 17	21.35	5.5	Aug. 9	20.85	...
Mar. 31	21.05	6.1	Oct. 11	20.35	7.3
Apr. 28	21.1	6.6	Dec. 21	20.65	7.5
June 8	21.0	6.8			

(C-2-4)21ccc2. Romulus De La Mare. No measurements made in 1939.

(C-2-4)28cdb1. Batesville Ward. Measuring point changed to top of bushing, 0.8 foot above prior measuring point, 1.0 foot above present top of casing and 1.2 feet above land surface.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 18	12.1	Apr. 27	12.1	Aug. 10	a 5.2	Dec. 21	a 11.2
Mar. 31	12.45	June 8	a 5.2	Oct. 11	a 5.3		

(C-2-4)32bcc1. (C-2-4)32bc in Water-Supply Paper 817. Robert Fenton.

Water level, in feet above measuring point, 1939

Feb. 18	13.4	Apr. 27	a 10.1	Aug. 10	a 8.75	Dec. 21	13.2
Mar. 31	12.7	June 8	9.2	Oct. 11	a 8.8		

(C-2-4)33aac2. Ida L. Clegg.

Water level, in feet below measuring point, 1939

Feb. 18	12.60	Apr. 27	12.13	Aug. 10	16.07	Dec. 21	13.08
Mar. 31	12.18	June 8	15.75	Oct. 11	16.21		

(C-2-4)33aac8. Ida L. Clegg.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 18	9.51	Apr. 27	9.02	Oct. 11	(b)
Mar. 31	9.03	June 8	(b)	Dec. 21	9.99

a Found flowing.

b Obstruction about 11 feet below measuring point; dry.

## Tooele County--Continued

(C-2-4)33abab. L. T. Liddell. No measurements made in 1939.

(C-2-4)33abb2. L. T. Liddell. Southeast of residence and just north of small reservoir.

Water level, in feet with reference to measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 1	+1.33	Mar. 29	+1.62	June 28	-2.52	Sept. 28	-2.86
4	+1.36	Apr. 1	+1.71	30	-2.58	30	-2.84
7	+1.38	5	+1.72	July 5	-2.56	Oct. 4	-2.82
11	+1.42	9	+1.78	8	-2.51	7	-2.80
14	+1.42	12	+1.81	15	-2.52	12	-2.81
18	+1.42	15	+1.76	19	-2.59	14	-2.79
21	+1.46	19	+1.78	22	-2.66	18	-2.82
25	+1.45	22	+1.79	27	-2.73	21	-2.89
28	+1.50	29	+1.78	29	-2.67	26	-2.63
Feb. 1	+1.51	May 3	-0.79	Aug. 2	-2.74	Nov. 1	-2.48
4	+1.44	7	-1.04	5	-2.71	4	-2.50
8	+1.49	10	-1.50	12	-2.79	9	-2.95
11	+1.35	13	-1.73	16	-2.75	11	-2.94
15	+1.17	17	-2.25	17	-2.72	16	-2.52
18	+1.17	20	-1.94	19	-2.98	18	-2.52
22	+1.17	25	-2.10	23	-2.80	22	-2.55
26	+1.25	27	-2.12	26	-2.80	25	-2.52
Mar. 1	+1.21	31	-2.23	31	-2.81	29	-2.53
4	+1.25	June 3	-2.25	Sept. 3	-2.81	Dec. 2	-0.52
8	+1.42	7	-2.31	7	-2.82	10	+0.50
9	+1.58	10	-2.31	9	-2.82	16	+0.78
11	+1.48	14	-2.42	13	-2.82	20	+0.84
15	+1.50	17	-2.48	16	-2.89	23	+0.91
18	+1.48	21	-2.92	20	-2.82	30	+0.92
25	+1.57	24	-2.83	23	-2.83		

(C-2-4)33abb4. L. T. Liddell.

Water level, in feet above measuring point, 1939

Jan. 1	5.32	Mar. 29	5.62	June 24	1.99	Sept. 23	1.54
4	5.38	31	5.69	28	2.09	28	1.73
7	5.36	Apr. 1	5.64	30	2.04	30	1.62
11	5.45	5	5.74	July 5	1.63	Oct. 4	1.54
14	5.44	9	5.81	8	1.92	7	1.60
18	5.37	12	5.84	15	1.92	12	1.76
21	5.42	15	5.75	19	1.80	18	1.58
25	5.44	19	5.44	22	1.82	21	1.52
28	5.52	22	5.29	27	1.56	26	1.83
Feb. 1	5.54	29	5.40	29	1.92	Nov. 1	1.93
4	5.45	May 3	3.54	Aug. 2	1.71	4	1.93
8	5.54	7	3.26	5	1.67	9	1.50
11	5.40	10	2.81	12	1.73	11	1.73
15	5.33	13	2.37	16	1.67	16	1.95
18	5.25	17	2.29	19	1.13	18	1.98
22	5.25	20	2.33	23	1.69	22	2.00
26	5.33	25	2.31	26	1.52	25	2.04
Mar. 1	5.31	27	2.10	31	1.77	29	2.04
4	5.40	31	2.18	Sept. 3	1.79	Dec. 2	3.69
8	5.38	June 3	2.05	7	1.65	10	4.56
9	5.59	7	1.98	9	1.75	16	4.98
11	5.54	10	2.00	13	1.67	20	5.06
15	5.53	14	2.10	16	1.65	23	5.04
18	5.54	17	2.09	20	1.53	30	5.06
25	5.57	21	1.71				



## Tooele County--Continued

(C-2-4)33add1. Ida L. Clegg.

Daily noon water level, in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	43.78	43.54	43.58	43.31	43.45	45.03	45.38	45.63	45.73	45.78	45.76	45.72
2	43.73	43.54	43.50	43.31	43.76	45.05	45.38	45.63	45.76	45.79	45.76	45.33
3	43.72	43.51	43.48	43.32	43.87	45.03	45.40	45.65	45.74	45.82	45.75	45.23
4	43.75	43.51	43.50	43.32	43.96	45.03	45.41	45.63	45.74	45.85	45.78	45.11
5	43.65	43.53	43.57	43.32	44.05	45.07	45.42	45.63	45.74	45.83	45.77	45.01
6	43.68	43.48	43.52	43.36	44.13	45.09	45.46	45.63	45.76	45.81	45.77	45.01
7	43.72	43.50	43.49	43.32	44.19	45.13	45.48	45.66	45.80	45.85	45.82	44.92
8	43.66	43.43	43.52	43.29	44.23	45.13	45.49	45.65	45.80	45.84	45.80	44.85
9	43.71	43.52	43.43	43.28	44.27	45.13	45.48	45.66	45.79	45.90	45.84	44.80
10	43.70	43.51	43.42	43.29	44.31	45.13	45.51	45.62	45.77	45.89	45.86	44.80
11	43.67	43.51	43.47	43.25	44.39	45.15	45.51	45.68	45.75	45.87	45.85	44.78
12	43.64	43.48	43.39	43.24	44.46	45.16	45.52	45.68	45.79	45.86	45.82	44.68
13	43.66	43.51	43.38	43.25	44.51	45.15	45.51	45.68	45.79	45.87	45.80	44.64
14	43.65	43.51	43.47	43.27	44.52	45.15	45.52	45.68	45.82	45.85	45.80	44.64
15	43.61	43.54	43.43	43.29	44.58	45.16	45.52	45.69	45.82	45.82	45.80	44.61
16	43.66	43.64	43.41	43.31	44.64	45.19	45.52	45.69	45.81	45.84	45.79	44.58
17	43.65	43.62	43.40	43.32	44.68	45.23	45.54	45.69	45.80	45.83	45.78	44.54
18	43.63	43.56	43.39	43.29	44.70	45.23	45.53	45.70	45.81	45.84	45.78	44.55
19	43.61	43.62	43.40	43.25	44.79	45.23	45.54	45.71	45.82	45.84	45.77	44.51
20	43.56	43.62	43.40	43.27	44.74	45.25	45.58	45.72	45.82	45.86	45.77	44.50
21	43.58	43.62	43.37	43.25	44.73	45.29	45.56	45.72	45.81	45.84	45.76	44.45
22	43.58	43.61	43.36	43.24	44.81	45.28	45.54	45.72	45.80	45.80	45.76	44.39
23	43.66	43.54	43.36	43.22	44.79	45.28	45.54	45.73	45.81	45.78	45.76	44.39
24	43.66	43.54	43.36	43.26	44.83	45.30	45.55	45.74	45.78	45.76	45.74	44.39
25	43.61	43.54	43.34	43.26	44.86	45.32	45.57	45.75	45.80	45.82	45.75	44.39
26	43.59	43.53	43.32	43.29	44.88	45.33	45.58	45.72	45.81	45.84	45.74	44.36
27	43.51	43.55	43.34	43.29	44.90	45.36	45.59	45.73	45.82	45.86	45.74	44.33
28	43.50	43.53	43.35	43.28	44.91	45.35	45.60	45.72	45.84	45.80	45.74	44.38
29	43.56	.....	43.35	43.25	44.91	45.37	45.59	45.75	45.84	45.81	45.73	44.34
30	43.51	.....	43.36	43.25	44.97	45.39	45.60	45.75	45.83	45.80	45.76	44.29
31	43.49	.....	43.33	.....	45.00	.....	45.62	45.74	.....	45.76	.....	44.28

(C-2-5)7acb4. (C-2-5)7ac2 in Water-Supply Paper 817. Western Pacific Railroad. Found flowing through small hole in plug before all measurements. Water levels, in feet above measuring point, 1939: Apr. 27, 6.7; June 8, 5.0; Aug. 9, 4.8; Oct. 11, 5.55. Found plugged with concrete, Dec. 21, 1939; measurements discontinued.

(C-2-5)7acb6. (C-2-5)7acbb in Water-Supply Paper 845. Western Pacific Railroad. Water levels, in feet above measuring point, 1939: Mar. 31, 8.45; Apr. 28, 9.05. Well plugged with concrete; measurements discontinued.

(C-2-5)19dccl. (C-2-5)19ccd in Water-Supply Paper 840 and (C-2-5)19accl in Water-Supply Paper 845. Geo. L. Sutton. Found flowing prior to all measurements. Water level, in feet above measuring point, and flow, in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Feb. 18	3.50	2.8	Aug. 9	2.32	1.7
Mar. 31	3.40	2.2	Oct. 11	2.04	1.3
Apr. 28	3.28	2.5	Dec. 21	2.94	1.7
June 8	2.93	2.2			

(C-2-5)25aac1. Numbered (C-2-5)25aa in Water-Supply Paper 845. State of Utah. Found flowing prior to all measurements.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 17	9.9	June 8	9.6	Oct. 11	9.35
Mar. 31	9.9	Aug. 9	9.35	Dec. 21	9.5
Apr. 28	9.7				

Tooele County--Continued

(C-2-5)29dcd1. J. Reuben Clark.

Water level, in feet above measuring point, 1939							
Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 17	27.0	Apr. 28	26.0	Aug. 9	24.35	Dec. 21	25.1
Mar. 31	27.3	June 8	24.8	Oct. 11	24.3		

(C-2-5)29dcc5. J. Reuben Clark.

Water level, in feet above measuring point, 1939							
Feb. 17	19.9	Apr. 28	19.0	Aug. 9	a 13.25	Dec. 21	a 14.6
Mar. 31	20.2	June 8	a 14.25	Oct. 11	a 13.35		

(C-2-5)29dcd. J. Reuben Clark. Grantsville. Northwestern well of group of 4 wells. State application no. 12,227-4. Diameter 3 inches, depth 340 feet. Measuring point, top of discharge pipe, 1.0 foot above land surface. Water level, in feet above measuring point, 1939: Oct. 11, 29.1.

(C-2-5)29dcd. J. Reuben Clark. Grantsville. Southwesterly well of group of 4 wells. State application no. 12,227-5. Diameter 3 inches, depth 340 feet. Measuring point, top of ell at valve, 1.0 foot above land surface. Water level, in feet above measuring point, 1939: Oct. 11, 28.7.

(C-2-5)31bbd3. Tony Castagno. Measuring point, top of tee, 4,281.75 feet above sea level.

Water level, in feet above measuring point, 1939							
Feb. 18	15.25	Apr. 28	15.3	Aug. 9	13.3	Dec. 21	14.6
Mar. 31	15.5	June 8	13.15	Oct. 11	13.9		

(C-2-5)32daal. Allan J. Fraser.

Water level, in feet above measuring point, 1939							
Date	Water level	Date	Water level	Date	Water level		Water level
Mar. 31	11.25	June 8	a 8.7	Oct. 11	8.0		
Apr. 28	a 8.55	Aug. 9	a 8.2	Dec. 21	10.65		

(C-2-5)34aacl. (C-2-5)34aa in Water-Supply Paper 817. Phoebe Nation.

Water level, in feet below measuring point, 1939							
Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 17	0.84	Mar. 31	1.22	June 8	0.97	Oct. 11	1.93
18	0.70	Apr. 28	1.45	Aug. 9	1.72	Dec. 21	2.44

(C-2-5)36caal. J. A. and S. W. Smith.

Water level, in feet below measuring point, 1939							
Feb. 18	32.70	Apr. 27	32.71	Aug. 10	33.49	Dec. 21	33.14
Mar. 31	32.68	June 8	32.89	Oct. 11	33.42		

(C-2-6)25cdc2. (C-2-6)25cd2 in Water-Supply Paper 817; (C-2-6)25cdcl, State Claim no. 15, in Water-Supply Papers 840 and 845. J. Reuben Clark. State application no. 11,855; State claim no. 16.

Water level, in feet above measuring point, 1939							
Feb. 18	12.15	Apr. 28	a 10.25	Aug. 9	a 9.1	Dec. 21	11.45
Mar. 31	12.2	June 8	a 9.65	Oct. 11	10.9		

(C-2-6)36baa8. (C-2-6)36ba in Water-Supply Paper 817. J. Reuben Clark. State claim no. 16,575. Measuring point, top of ell, 4,288.05 feet above sea level. Found flowing prior to all measurements.

a Found flowing.

## Tooele County--Continued

(C-2-6)36baa8.--Continued

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 18	3.30	Apr. 28	2.95	Aug. 9	1.45	Dec. 21	2.75
Mar. 31	3.48	June 8	2.30	Oct. 11	2.20		

(C-2-6)36bdd1. Grantsville City Corporation.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 31	34.68	June 8	34.76	Oct. 11	a 50+
Apr. 28	34.58	Aug. 9	35.40	Dec. 21	35.78

(C-3-5)5bab1. Leland S. Tate.

Water level, in feet below measuring point, 1939

Mar. 31	1.72	June 8	1.78	Oct. 11	2.80
Apr. 28	1.93	Aug. 9	2.20	Dec. 21	2.30

(C-5-5)2bc. Alma Young.

Water level, in feet below measuring point, 1939

Feb. 18	25.19	Apr. 27	25.27	Aug. 10	25.67
Mar. 31	25.20	June 9	b 29.30	Dec. 20	25.23

(C-5-5)30bcb1. Willard Sager.

Water level, in feet below measuring point, 1939

Feb. 18	5.02	Apr. 27	3.95	Aug. 10	5.53
Mar. 31	4.23	June 9	4.17	Dec. 20	4.63

(C-5-5)30cbb1. (C-5-5)30cb in Water Supply Paper 817. Willard Sager. Water levels, in feet below measuring point, 1939: Feb. 18, 9.84; Mar. 31, 10.74; Apr. 27, 10.47; June 9, 10.85. Pressure system for school installed and casing closed tightly; measurements discontinued.

(C-5-6)25aaa1. (C-5-6)25aa in Water-Supply Paper 817. Willard Sager.

Water level, in feet below measuring point, 1939

Feb. 18	20.05	Apr. 27	15.52	Aug. 10	20.32
Mar. 31	15.78	June 9	16.72	Dec. 20	20.20

(C-8-5)31abc3. (C-8-5)31ab in Water-Supply Paper 817. Peter Hansen. Found flowing prior to all measurements.

Water level, in feet above measuring point, and flow, in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Feb. 18	25.3	21.4	June 9	23.0	20.8
Mar. 31	25.5	20.9	Aug. 10	23.4	20.0
Apr. 27	25.5	20.8	Dec. 20	23.75	20.0

(C-8-6)26aaa1. J. Ernest Olson. Found flowing prior to all measurements.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 31	13.0	June 9	11.8	Dec. 20	15.9
Apr. 27	21.7	Aug. 10	14.1		

a Pumping.

b Well pumped recently.

## Tooele County--Continued

(C-9-5)6bcal. (C-9-5)6bc in Water-Supply Paper 817. Drought Relief Administration.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 18	15.66	Apr. 27	17.45	Aug. 10	18.84
Mar. 31	17.52	June 9	17.92	Dec. 20	18.43

(C-7-10)25cc Grazing Service well 50. Grazing Service. About 18 miles southwest of Orr's Ranch, along road to Fish Springs, diameter  $6\frac{1}{4}$  to 8 inches, depth 317 feet. Measuring point, top of casing, south side, 0.5 foot above land surface. Water level, in feet below measuring point, 1939: Nov. 2, 3.99.

## Utah County

(C-5-2)26bbb1. State Land Board. Well plugged; no measurements made in 1939; measurements discontinued.

(C-6-2)29dcl. Henry Armstrong. Found flowing prior to all measurements. Flow, in gallons per minute, 1939: Apr. 11, 1.6; July 25, 1.8. Water levels, in feet above measuring point, 1939: Apr. 11, 4.9; July 25, 5.15.

(C-6-2)32baal. E. L. Carson. Measuring point, 4,877.05 feet above sea level. Water levels, in feet above measuring point, 1939: Apr. 11, 2.11; July 25, 0.58. Found flowing prior to all measurements.

(C-6-2)32baa2. William C. Thomas. Measuring point, 4,876.27 feet above sea level. Water levels, in feet above measuring point, 1939: Apr. 11 2.80; July 25, 2.95. Found flowing prior to all measurements.

(C-9-1)26dcb1. R. C. Lewis.

Water level, in feet above measuring point, 1939

Mar. 4	3.4	June 19	3.25	Oct. 13	2.98
Apr. 14	3.25	Aug. 24	2.85		

(C-10-1)2aad1. Albert Morgan.

Water level, in feet below measuring point, 1939

Mar. 4	15.42	June 19	15.34	Oct. 13	14.80
Apr. 14	15.70	Aug. 24	15.50		

(D-5-1)9ccc3. E. N. Webb.

Water level, in feet with reference to measuring point, 1939

Feb. 20	+9.25	June 20	+1.25	Oct. 12	+3.58
Apr. 12	+6.9	July 25	-2.19		

(D-5-1)9cdc2. (D-5-1)9cdcl in Water-Supply Paper 845. Lehi Irrigation Co. and Lehi City.

Water level in feet above measuring point, 1939

Jan. 13	a 42.6	Apr. 12	40.3	July 25	37.6
Feb. 20	40.95	May 17	a 37.3	Oct. 12	37.7

(D-5-1)9dbb1. City of Lehi.

Water level in feet below measuring point, 1939

Jan. 6	b 4.10	Apr. 12	8.35	July 25	14.48
Feb. 20	b 4.76	June 20	16.49	Oct. 12	11.77

a Measurement made by Board of Canal Presidents.

b Water from creek flowing into well.

## Utah County--Continued

(D-5-1)14adbl. Drought Relief Administration.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 20	57.35	June 20	58.94	Aug. 26	60.67
Apr. 12	57.86	July 25	59.80	Oct. 12	60.80

(D-5-1)15bcal. Eugene Briggs. Measuring point changed to top of all on casing, 2.0 feet above land surface, 1.0 foot above top of casing and 4,549.98 feet above sea level.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 13	a 33.2	Apr. 12	32.4	June 20	29.2	Aug. 16	a 26.35
Feb. 20	33.2	May 17	a 29.5	July 25	27.0		28.95

(D-5-1)17abd9. Mary Ann Southwick.

Water level, in feet with reference to measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 20	+10.2	June 20	+0.35	Aug. 26	-3.07
Apr. 12	+8.8	July 25	-2.93	Oct. 12	+4.20

(D-5-1)17adc5. H. C. Comer.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 13	a 34.4	May 11	a 28.0	July 25	22.45	Aug. 26	22.0
Feb. 20	34.6	June 20	25.8	Aug. 16	a 23.0	Oct. 12	28.8
Apr. 12	33.45						

(D-5-1)17add5. M. S. Lott. Water levels, in feet above measuring point, 1939: June 20, 12.4; July 25, 9.45; Oct. 12, 17.25.

(D-5-1)17cdb1. Odell Peterson. Water levels, in feet above measuring point, 1939: Apr. 12, 18.65; June 20, 4.2; July 25, 1.44; Oct. 12, 9.0. Well began leaking around outside of casing; measurements discontinued.

(D-5-1)17cdal. Christie E. Petersen. Lehi. State claim no. 1,453. Used irrigation well, diameter 2 inches, depth 125 feet. Measuring point, top of casing, at land surface and 4,527.10 feet above sea level. Water levels, in feet above measuring point, 1939: Feb. 20, 17.95; Oct. 12, 8.4.

(D-5-1)18bcc1. Aaron Evans.

Water level, in feet above measuring point, 1939

Jan. 13	a 22.5	Apr. 11	23.1	July 25	12.7	Oct. 12	16.15
Feb. 20	23.0	June 20	14.2	Aug. 16	a 11.5		

(D-5-1)20abal. Jacob G. Cox. Elevation of measuring point, 4,523.14 feet above sea level.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 20	54.45	July 25	40.7	Oct. 12	48.5
June 20	46.5	Aug. 25	39.2	Nov. 8	49.5

a Measurement made by Board of Canal Presidents.

## Utah County--Continued

(D-5-1)20aba2. Jacob Cox.

Daily noon water level, in feet above measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	32.1	....	31.7	32.4	26.2	20.7	12.7	12.5	12.5	18.2	25.1	26.8
2	32.3	....	32.1	32.3	23.1	20.9	13.2	12.8	12.8	18.8	25.2	27.0
3	32.4	....	32.3	32.3	21.8	20.7	13.0	12.2	12.5	19.3	25.6	26.9
4	32.2	....	32.3	32.3	20.8	20.5	12.4	....	12.7	19.0	25.8	26.7
5	32.2	....	32.1	32.1	20.9	19.9	12.7	12.0	13.1	19.3	25.6	26.3
6	32.4	....	32.1	32.1	20.9	19.0	12.0	12.2	13.3	21.7	25.6	26.1
7	32.1	....	32.2	32.2	21.3	18.9	12.1	12.7	13.3	22.4	25.6	26.4
8	....	....	32.1	32.2	20.6	18.1	12.2	13.8	14.1	23.4	25.7	26.3
9	....	....	32.1	32.0	20.7	16.9	12.0	13.8	14.3	23.6	25.3	26.3
10	....	....	32.2	31.5	18.5	16.5	11.6	13.6	14.2	23.9	25.3	26.2
11	....	....	32.1	31.7	18.7	15.4	11.8	12.6	14.4	23.9	25.3	26.1
12	....	....	32.0	31.5	19.7	15.0	10.9	12.2	14.7	23.9	25.5	26.5
13	....	....	32.1	31.4	20.2	14.9	10.4	11.5	15.2	24.5	25.5	26.4
14	....	....	32.1	31.5	18.9	14.6	10.5	11.3	16.6	24.7	25.5	26.6
15	....	....	32.0	31.7	17.9	14.6	10.7	10.8	16.7	24.7	25.4	26.7
16	....	....	32.1	31.1	16.9	14.2	11.0	10.7	16.2	24.8	26.0	26.7
17	....	....	32.2	30.9	17.1	14.4	11.6	10.8	15.9	25.0	26.2	26.8
18	....	....	32.2	30.9	17.1	14.4	11.2	10.9	16.5	24.9	26.3	26.8
19	....	....	31.9	30.1	18.2	15.4	11.2	10.8	16.8	25.0	26.5	26.9
20	....	31.8	32.0	29.4	18.4	15.1	10.6	12.0	15.9	25.0	26.4	27.0
21	....	32.0	32.1	29.3	18.8	15.3	11.0	12.2	15.3	25.0	26.5	26.6
22	....	31.8	32.1	28.6	18.1	14.8	11.0	11.7	15.5	25.0	26.5	26.8
23	....	31.9	32.0	28.0	18.1	14.5	10.6	11.6	14.3	24.7	26.5	27.0
24	....	32.1	32.2	28.4	18.1	12.3	11.0	11.4	14.7	24.7	26.6	27.2
25	....	32.1	32.2	29.0	20.0	12.0	11.0	11.4	14.7	24.9	26.3	26.7
26	....	31.9	32.1	29.6	20.6	12.1	10.8	11.3	15.0	24.8	26.8	26.5
27	....	31.8	32.0	28.7	20.6	11.7	11.0	11.6	14.8	24.7	27.0	26.2
28	....	32.0	32.3	27.3	21.1	12.3	11.0	11.9	14.8	24.7	27.1	26.0
29	....	....	32.1	26.3	20.1	12.6	11.2	12.2	16.9	24.6	27.0	26.2
30	....	....	32.1	26.3	20.1	13.0	11.7	12.2	17.9	24.6	26.9	26.2
31	....	....	32.3	....	20.5	....	12.5	12.5	....	25.0	....	26.5

(D-5-1)25dab1. Geo. Addy and others.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 12	33.3	June 20	b 27.55	Oct. 12	29.8
May 17	a 32.4	July 25	b 29.1		

(D-5-2)29dba3. Mark Richins and others. No measurements made in 1939.

(D-5-2)29dba4. Mark Richins and others. Found flowing prior to all measurements.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 13	a 17.4	Mar. 10	16.7	June 20	12.85	Sept. 19	9.2
Feb. 14	a 16.8	Apr. 12	16.2	July 25	11.1	Oct. 12	11.5
20	16.8	May 17	a 12.8				

(D-6-2)3bdd1. Pioneer Pumping Company.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 7	a 15.45	Mar. 29	a 17.58	May 13	a 12.9
21	16.27	Apr. 12	17.57	June 7	a 5.4

a Measurement made by Board of Canal Presidents.

b Found flowing.

## Utah County--Continued

(D-6-2)4adc. W. P. Kirk. About 30 feet east of red brick house.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 7	a 35.07	May 13	a 39.25	Aug. 8	a 30.92	Oct. 3	a 31.61
21	36.09	June 7	a 36.02	Sept. 9	a 31.92	Nov. 15	a 31.24
Mar. 29	a 38.46	July 11	a 30.43	19	a 31.85	Dec. 6	a 26.75
Apr. 12	39.20						

(D-6-2)5dbbl. Earl Toone. Measuring point changed to top of trough in milkhouse, 0.75 foot above old measuring point and 1.5 feet above land surface. Water levels, in feet above measuring point, 1939: Feb. 14, 3.4; Feb. 20, 2.37; Mar. 10, 2.50; Apr. 12, 2.70. All measurements, except that on Feb. 14, 1939, made by Board of Canal Presidents.

(D-6-2)6dcbl. Utah Power and Light Company.

Water level, in feet above measuring point, 1939

Jan. 10	a 35.0	May 17	a 29.3	Aug. 1	a 29.0	Sept. 26	a 29.6
Feb. 7	a 35.6	26	a 31.9	15	a 28.2	Oct. 6	a 30.7
20	35.75	June 7	a 32.0	29	a 27.7	16	a 31.0
Mar. 22	a 35.6	26	a 29.2	Sept. 9	a 29.3	Nov. 15	a 31.6
Apr. 12	35.2	July 11	a 28.9	19	a 30.1	Dec. 20	a 32.8
May 6	a 30.9						

(D-6-2)7dbcl. Jay Gillies.

Water level, in feet above measuring point, 1939

Jan. 10	a 25.6	May 10	a 19.4	Aug. 22	a 18.2	Nov. 15	a 22.5
Feb. 20	26.45	June 7	a 22.95	Sept. 26	a 21.0		
Apr. 12	25.8						

(D-6-2)9acd1. R. Lee Johnson. Measurements discontinued at request of owner.

(D-6-2)9bdd1. (D-6-2)9bdcl in Water-Supply Paper 845. Provo Community Brooding Association.

Water level, in feet below measuring point, 1939

Jan. 13	a 9.91	Apr. 19	a 11.20	June 20	11.06	Sept. 19	a 11.27
Feb. 21	10.50	May 17	a 11.42	Aug. 15	a 10.98	Oct. 9	a 10.90
Mar. 10	10.69	June 14	a 11.16				

(D-6-2)9ccc. E. McKullip. No measurements made in 1939.

(D-6-2)9cdd. Frank Sorenson. Water levels, in feet below measuring point, 1939: Jan. 13, 12.84; Mar. 10, 13.30; June 14, 13.10. Measurements made by Board of Canal Presidents.

(D-6-2)9dda. C. Sumner.

Water level, in feet below measuring point, 1939

Mar. 22	a 36.35	June 7	a 27.35	Aug. 8	a 23.87	Nov. 13	a 25.08
Apr. 12	37.55	20	25.28	Sept. 9	a 24.73	Dec. 6	a 23.09
May 13	a 35.77	July 11	a 22.80	Oct. 9	a 24.19		

(D-6-2)16adc. Geo. Gregory.

Water level, in feet below measuring point, 1939

Jan. 10	a 4.90	Apr. 12	a 6.41	June 20	6.25	Oct. 6	a 4.30
Feb. 7	a 5.30	May 10	a 6.60	July 11	a 5.75	Nov. 15	a 4.82
21	5.58	26	a 6.80	Aug. 22	a 4.92	Dec. 6	a 4.66
Mar. 10	5.74	June 7	a 6.70	Sept. 19	a 4.98		

(D-6-2)16bc. Geo. F. Wells.

Water level, in feet below measuring point, 1939

Jan. 10	a 13.37	Apr. 12	a 13.74	June 7	a 15.95	Aug. 22	(ab)
Feb. 21	13.34	May 10	a 16.80	20	17.27	Dec. 6	a 16.25
Mar. 10	13.37	26	a 15.50	July 11	a 16.80		

a Measurements made by Board of Canal Presidents.

b Dry at 18.2 feet below measuring point.

## Utah County--Continued

(D-6-2)16bcb1. Board of Education, Alpine School District. Measurements inaccurate when well is flowing.

Water level, in feet with reference to measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 10	a +0.2	June 14	a -2.91	Aug. 29	a -6.34	Oct. 6	a -2.15
Mar. 10	+0.3	July 11	a -4.30	Sept. 26	a -3.90	Nov. 15	a -2.83
May 10	a -4.03						

(D-6-2)17aba2. J. J. Madsen, Jr.

Water level, in feet with reference to measuring point, 1939

Jan. 10	a +2.2	May 10	a -3.30	Aug. 8	a -4.70	Oct. 6	a -2.05
Feb. 20	+2.35	26	a -0.94	22	a -5.11	Nov. 15	a -1.46
21	a +2.4	June 7	a -0.65	Sept. 19	a -2.60	Dec. 6	a -0.45
Apr. 12	a +1.87	July 11	a -3.57	26	a -2.70	20	a -0.31

(D-6-2)25bbb. Maud Olsen.

Water level, in feet below measuring point, 1939

Jan. 17	a 21.03	Apr. 13	21.05	July 11	a 19.46	Oct. 9	a 19.65
Feb. 7	21.5	May 13	a 19.13	Aug. 8	a 19.33	Nov. 13	a 19.08
Mar. 10	21.73	June 7	a 18.32	Sept. 9	a 19.12	Dec. 6	a 20.05
22	a 21.11						

(D-6-2)26ac. Lexia Harris. Water levels, in feet below measuring point, 1939: Jan. 17, a/ 48.20; Feb. 21, 49.53. Well filled Mar. 29, 1939, measurements discontinued.

(D-6-2)27abb. Jessie Adams. About 40 feet south of brick house on south side of road. Well filled Oct. 9, 1939; measurements discontinued.

Water level, in feet below measuring point, 1939

Jan. 17	a 23.23	Apr. 13	25.77	June 1	a 22.54	Aug. 17	a 21.20
Feb. 21	24.13	May 13	a 22.14	July 11	a 21.50	Sept. 9	a 20.97
Mar. 29	a 25.1						

(D-6-2)27bcb1. Peter Zobell.

Water level, in feet below measuring point, 1939

Jan. 13	a 12.34	May 10	a 12.30	Aug. 17	a 12.97	Oct. 9	a 12.78
Mar. 10	12.04	29	a 12.33	Sept. 15	a 13.10	Nov. 25	a 12.96
Apr. 12	12.56	July 10	a 13.08				

(D-6-2)27cd. Haldor Nelson.

Water level, in feet below measuring point, 1939

Jan. 13	a 8.82	May 10	a 9.78	Aug. 17	a 9.03	Oct. 9	a 9.24
Mar. 10	8.79	29	a 8.47	Sept. 15	a 9.14	Nov. 25	a 9.57
Apr. 12	9.18	July 10	a 8.67				

(D-6-2)28bad1. (D-6-2)28ba in Water-Supply Paper 817. Henry Williamson.

Water level, in feet above measuring point, 1939

Jan. 10	a 12.75	Mar. 30	a 12.7	July 10	a 8.3	Oct. 6	a 9.7
Feb. 7	a 13.1	Apr. 12	12.6	Aug. 8	a 8.0	Nov. 15	a 10.1
21	13.1	May 10	a 8.8	Sept. 5	a 7.0	Dec. 20	a 10.85
Mar. 10	12.8	June 1	a 11.0	15	a 9.0		

(D-6-2)34aca. M. B. Jonnson. No measurements made in 1939.

(D-6-2)34bca1. (D-6-2)34bca10 in Water-Supply Paper 845. Fred Startin. Flow, in gallons per minute, through 1½-inch pipe, Feb. 21, 1939, 12.0.

Water level, in feet with reference to measuring point, 1939

Jan. 13	a +4.1	Apr. 12	+3.15	May 29	a +2.00	Aug. 15	a -2.12
Feb. 21	+3.51	May 10	ab -0.48	July 10	ac -2.24	Sept. 15	a -0.21
Mar. 10	+3.4						

(D-6-2)34bdb2. Thomas Johnson. No measurements made in 1939.

(D-6-2)35bcc. N. A. Nielsen.

Water level, in feet below measuring point, 1939

Mar. 10	30.20	May 13	a 30.22	Aug. 15	a 21.86	Oct. 9	a 22.31
24	31.24	June 1	a 26.65	Sept. 15	a 22.33	Nov. 25	a 24.72
Apr. 12	31.85	July 11	a 22.47				

a Measurement made by Board of Canal Presidents.

b Well flowing May 1.

c Well stopped flowing June 24.



## Utah County--Continued

(D-6-2)17cab4. C. N. Gammon.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 10	a 28.5	Apr. 12	26.8	June 20	25.1	Oct. 12	23.3
Feb. 7	a 28.4	May 13	a 25.2	Aug. 25	21.9	Nov. 7	23.5
Mar. 10	27.4						

(D-6-2)17cac3. Harry Gammon Estate.

Water level, in feet above measuring point, 1939

Feb. 7	a 23.4	Apr. 12	21.0	June 20	18.7	Oct. 12	16.1
Mar. 10	22.0	May 13	a 18.5	Aug. 25	13.4	Nov. 7	16.1

(D-6-2)17cba1. Harry Gammon Estate. No measurements made in 1939.

(D-6-2)17ddd1. Lawrence Kirk.

Water level, in feet with reference to measuring point, 1939

Jan. 10	a +5.0	May 10	a +2.3	July 11	a -0.24	Sept. 26	a +0.84
Feb. 21	a +5.2	26	a +2.1	Aug. 8	a -0.98	Oct. 6	a +0.92
Mar. 10	+5.0	June 14	a +1.3	29	a -1.62	Nov. 15	a +1.35
Apr. 12	a +4.7						

(D-6-2)17ddd2. Lawrence Kirk.

Water level, in feet above measuring point, 1939

Jan. 10	a 17.7	May 13	a 11.2	July 11	a 9.8	Oct. 6	a 14.8
Feb. 6	a 18.3	June 7	a 13.7	Aug. 1	a 11.5	Nov. 15	a 15.3
Mar. 10	18.4	20	12.55	Sept. 19	a 14.1	Dec. 20	a 16.3
Apr. 12	18.25						

(D-6-2)18add2. J. L. Larson. No measurements made in 1939.

(D-6-2)20dba1. Lewis Clegg. No measurements made in 1939.

(D-6-2)21cad1. S. H. Blake. Measuring point changed to top of tee, 0.15 foot above old measuring point.

Water level, in feet above measuring point, 1939

Jan. 10	a 24.35	Mar. 10	23.75	May 10	a 20.8	Aug. 8	a 20.2
Feb. 7	a 24.25	30	23.5	June 1	a 21.2	Sept. 15	a 21.6
21	24.05	Apr. 12	23.65	July 10	a 20.2		

(D-6-2)23bab. Elias Nielson. Twenty feet east of old brick house, 1/4-mile north of Lincoln High School.

Water level, in feet below measuring point, 1939

Jan. 17	a 38.00	Apr. 13	41.08	July 11	a 33.94	Oct. 9	a 33.24
Feb. 7	a 38.83	May 13	a 38.45	Aug. 8	a 34.48	Nov. 13	a 34.70
21	39.37	June 7	a 35.75	Sept. 9	a 35.50	Dec. 6	a 34.18
Mar. 10	40.01	20	34.11				

(D-6-2)24bacl. Chas. A. Keeler.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 10	14.84	June 7	a 9.63	Aug. 25	12.35
Apr. 13	14.74	20	10.11	Oct. 12	12.85

(D-6-2)24dac. Isaac Boyce.

Water level, in feet below measuring point, 1939

Mar. 10	125.60	June 20	126.21	Oct. 12	129.72
Apr. 13	125.50	Aug. 25	130.35	Nov. 7	129.40

a Measurement made by Board of Canal Presidents.

Utah County--Continued

(D-7-2)2ccbl. D. L. Vincent.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 14	a 19.5	May 10	a 13.2	Aug. 7	a 11.4	Oct. 27	a 17.3
Mar. 10	19.8	June 14	a 12.9	Sept. 22	a 14.1	Dec. 27	a 18.0
Apr. 12	18.3	July 10	a 8.4				

(D-7-2)2cccl. D. L. Vincent. No measurements made in 1939.

(D-7-2)3ada2. Joseph Shaw. No measurements made in 1939.

(D-7-2)3bdb1. Chas. Madsen.

Water level, in feet above measuring point, 1939

Jan. 31	a 23.9	May 10	a 16.3	Aug. 1	a 15.2	Oct. 6	a 21.2
Feb. 14	a 23.6	29	a 19.9	Sept. 15	a 18.8	Nov. 15	a 21.5
Mar. 10	23.8	June 14	a 18.0	26	a 19.9	Dec. 20	a 22.7
Apr. 12	23.4	July 10	a 13.6				

(D-7-2)3bdb2. R. G. Jolley Estate. No measurements made in 1939.

(D-7-2)3daal. David Kinhear.

Water level, in feet above measuring point, 1939

Jan. 31	a 16.2	May 10	a 9.3	July 10	a 4.9	Nov. 15	a 13.3
Mar. 10	15.9	29	ab 11.7	Aug. 1	a 6.7	Dec. 20	a 14.2
Apr. 12	15.2	June 14	ab 9.3	Sept. 15	a 11.05		

a Measurement made

(D-7-2)3dcal. (D-7-2)3dd in Water-Supply Paper 845. Viri R. Fisher.

Water level, in feet above measuring point, 1939

Jan. 31	a 25.1	May 29	a 20.4	Aug. 7	a 16.7	Oct. 5	a 22.0
Feb. 14	a 24.5	June 14	a 17.9	24	a 14.3	27	a 22.3
Mar. 10	24.8	19	a 20.3	Sept. 11	a 18.6	Nov. 15	a 22.3
Apr. 12	24.3	July 10	a 14.1	15	a 20.0	Dec. 20	a 23.2
May 10	a 18.1	31	a 15.4	22	a 19.3		

(D-7-2)4cbb2. Arthur N. Taylor Estate. No measurements made in 1939.

(D-7-2)4cbcl. H. A. Knudsen.

Water level, in feet above measuring point, 1939

Jan. 31	a 26.8	Apr. 12	a 25.25	July 10	ab 12.3	Nov. 15	a 25.3
Feb. 21	26.6	May 15	a 21.5	31	a 17.4	Dec. 27	a 26.7
Mar. 20	a 26.8	29	a 23.5	Sept. 15	a 23.8		

(D-7-2)4cbd1. Reed Knudsen.

Water level, in feet above measuring point, 1939

Jan. 31	a 27.4	Apr. 12	a 25.65	June 19	a 19.9	Sept. 15	a 24.2
Feb. 21	27.4	May 15	a 21.8	July 10	ab 12.5	Dec. 27	a 26.9
Mar. 20	a 27.4	29	a 23.8				

(D-7-2)9bdd1. Geo. and Will Peay. No measurements made in 1939.

(D-7-2)9caa2. C. E. Loose Corporation. Water levels, in feet above measuring point, 1939: May 8, a/ 12.6; June 19, a/ 11.5; July 31, a/ 8.7; Sept. 15, a/ 11.2.

a Measurement made by Board of Canal Presidents.  
b Found flowing.

Utah County--Continued

(D-7-2)11bbc3. Wm. K. Farrer.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 14	a 25.8	May 10	a 19.7	July 10	ab 14.4	Oct. 27	a 23.7
Mar. 10	26.1	June 14	a 19.3	Sept. 22	a 20.6	Dec. 27	a 24.2
Apr. 12	25.6						

(D-7-2)11cac2. Joseph Earl Stubbs.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 10	a 28.2	Feb. 21	30.5	Apr. 15	28.0
Feb. 14	a 28.1	Mar. 10	28.5	June 7	a 23.9

(D-7-2)11cdb1. D. A. Johnson.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 10	a 30.6	May 22	a 23.0	Aug. 7	a 22.6	Oct. 5	a 28.6
Feb. 21	28.2(?)	June 7	a 27.1	Sept. 5	a 20.9	9	a 28.8
Mar. 10	30.8	19	a 26.5	11	a 22.9	27	a 29.1
Apr. 13	30.4	July 6	a 23.1	26	a 26.8	Nov. 14	a 28.2
May 15	a 19.5	31	a 20.9				

(D-7-2)12bcb1. Provo City Corporation.

Daily noon water level, in feet above measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	25.3	24.7	24.2	24.6	22.1	22.8	19.9	19.5	18.5	21.0	22.8	22.8
2	25.3	24.5	24.3	24.6	22.2	23.7	20.1	19.6	18.5	21.8	22.7	22.9
3	25.3	24.7	24.4	24.6	22.0	23.8	20.2	20.6	18.5	21.9	22.7	22.8
4	25.2	24.9	24.5	24.8	21.5	23.4	20.5	20.6	19.2	21.9	22.9	22.7
5	25.0	24.7	24.3	24.6	22.0	23.6	20.1	20.4	18.6	22.1	22.7	23.2
6	25.0	24.8	24.4	24.5	21.9	23.3	19.7	20.5	19.2	22.2	22.6	23.3
7	25.0	24.8	24.5	24.6	21.7	23.4	20.5	20.0	20.0	22.1	22.5	23.3
8	25.1	24.7	24.3	24.5	21.7	22.4	20.0	20.9	19.8	22.1	22.6	23.4
9	25.0	24.3	24.2	24.3	21.9	22.4	20.0	20.0	19.7	22.0	22.5	23.2
10	25.1	24.4	24.4	24.5	20.8	22.4	19.1	19.1	20.6	22.0	22.5	22.9
11	24.9	24.3	24.4	24.5	20.8	21.7	19.7	18.5	21.2	22.2	22.4	23.0
12	24.8	24.1	24.6	24.5	21.4	21.4	19.5	19.1	20.1	22.0	22.5	23.0
13	25.0	24.3	24.7	24.3	21.6	20.7	19.5	18.9	20.3	22.5	22.5	23.1
14	25.0	24.5	24.5	24.0	21.7	20.6	19.0	17.8	20.6	22.5	22.5	23.1
15	25.0	24.5	24.5	24.3	22.0	20.2	17.9	17.6	21.2	22.3	22.0	23.3
16	24.9	24.3	24.4	24.4	21.6	20.4	17.5	17.5	21.3	22.8	22.1	23.3
17	24.9	24.2	24.5	24.4	21.3	21.6	18.0	18.5	21.3	22.9	22.3	23.3
18	24.8	24.3	24.6	24.4	21.4	22.7	18.4	17.5	21.3	22.8	22.4	23.2
19	24.7	24.2	24.4	24.2	....	23.2	18.3	19.3	19.9	22.7	....	23.3
20	25.0	24.2	24.4	23.9	....	23.4	19.2	20.0	20.2	22.9	....	23.4
21	24.9	24.3	24.5	23.8	....	23.3	19.4	18.5	19.4	22.9	....	23.4
22	25.0	24.3	24.5	23.5	20.3	23.0	19.2	17.5	19.6	22.9	....	23.5
23	24.9	24.3	24.3	23.9	20.3	22.0	18.5	17.5	19.9	22.9	....	23.4
24	25.0	24.4	24.5	23.2	22.5	20.9	19.1	18.4	20.0	23.0	....	23.5
25	24.8	24.5	24.6	23.2	23.3	21.0	19.4	18.5	19.8	22.9	....	23.4
26	24.7	24.5	24.3	22.7	23.4	21.0	18.9	18.5	19.7	22.8	22.6	23.4
27	25.0	24.3	24.5	23.3	23.5	21.0	18.5	19.0	20.3	22.9	21.9	23.4
28	25.1	24.4	24.6	23.1	23.3	20.9	18.0	17.5	20.2	22.9	22.5	23.2
29	24.8	....	24.6	22.5	23.4	20.6	17.5	17.4	20.6	22.9	22.7	23.3
30	24.9	....	24.5	22.1	22.4	20.4	18.0	17.2	20.9	22.9	22.7	23.4
31	25.1	....	24.7	....	22.3	....	18.0	17.6	....	23.0	....	23.5

a Measurement made by Board of Canal Presidents.

b Found flowing.

## Utah County--Continued

(D-7-2)13bad2. J. O. Webb. Measuring point changed to top of ell, 0.4 foot above old measuring point and 1.4 feet above land surface.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 10	a 40.0	Mar. 10	40.1	May 15	a 38.0
Feb. 21	40.2	Apr. 13	40.4	June 7	a 39.9

(D-7-2)13bdal. R. I. and E. J. Jacobsen.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 10	a 41.4	Apr. 13	41.8	June 19	a 40.1	Sept. 22	a 37.2
Feb. 14	a 41.2	May 15	a 39.7	July 6	a 37.2	Oct. 9	a 39.8
Mar. 10	41.7	June 7	a 41.0	Aug. 7	a 37.4		

(D-7-2)33ddd1. Hyrum Christopherson. No measurements made in 1939.

(D-7-2)35ccd. Angus Hales. Found flowing prior to all measurements. Flow, in gallons per minute, Mar. 24, 1939, 29. Water levels, in feet above measuring point, 1939: Feb. 27, 4.25; Mar. 24, 4.30; Apr. 13, 3.7; June 13, a/5.0.

(D-7-2)36dcc2. H. H. Spatford.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 30	a 12.4	Apr. 13	13.5	Aug. 3	a 10.1
Mar. 17	13.2	June 13	a 13.2	Oct. 17	a 10.5

(D-7-3)6cdb1. Lillie Curtis. Water levels, in feet above measuring point, 1939: Apr. 13, 11.7; June 19, a/ 11.3; Aug. 25, 7.1.

(D-7-3)18dbcl. K. E. and Ralph Bullock. No measurements made in 1939.

(D-7-3)28bac2. C. O. Claudin.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 30	a 14.6	Apr. 13	14.6	June 13	a 16.7	Sept. 21	a 16.0
Mar. 24	13.6	May 9	ab 16.0	Aug. 3	a 16.2	Oct. 27	a 15.8

(D-7-3)28cad1. Ray E. Jones.

Water level, in feet above measuring point, 1939

Jan. 30	a 3.9	Mar. 24	3.1	May 9	a 3.50	Aug. 3	a 3.40
Feb. 13	a 3.6	Apr. 13	3.15	June 13	a 3.60	Oct. 27	a 3.30

(D-7-3)28cdb1. Wm. M. Mower.

Water level, in feet above measuring point, 1939

Jan. 30	a 7.1	Apr. 13	b 5.2	June 13	a 7.8	Sept. 21	a 6.9
Mar. 24	6.5	May 9	a 7.6	Aug. 2	a 7.1	Oct. 27	a 6.7

(D-7-3)30cba. Pratt Thomas. No measurements made in 1939.

(D-7-3)30dc. Arthur Condie.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 30	a 14.8	June 13	a 14.6	Aug. 25	14.25
Mar. 18	a 15.4	Aug. 2	a 14.2		

(D-7-3)30ddd1. Jacob A. Packard. Water levels, in feet above measuring point, 1939; Jan. 30, a/ 12.6; Mar. 18, a/ 12.4. Measurements discontinued because of broken well casing.

a Measurement made by Board of Canal Presidents.

b Found flowing.

## Utah County--Continued

(D-7-3)32bacl. Drought Relief Administration.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 30	a 48.9	Mar. 14	48.9	May 4	a 48.9	Aug. 2	a 30.8
Feb. 27	49.1	Apr. 13	48.9	June 23	a 32.4	Sept. 21	a 30.5

(D-7-3)33abb2. Measurements discontinued. Previous measurements incorrect because of an opening from well which was not closed.

(D-7-3)33baa6. (D-7-3)33baal in Water-Supply Paper 845. A. W. Finley. Found flowing prior to all measurements. Flow, in gallons per minute, 1939: Feb. 21, 12; Mar. 24, 9.6; Apr. 13, 10.

Water level, in feet above measuring point, 1939

Jan. 30	a 7.7	Apr. 13	7.1	June 13	a 8.0	Sept. 21	a 7.1
Feb. 21	7.35	May 9	a 7.7	Aug. 2	a 7.5	Oct. 22	a 6.8
Mar. 24	7.0						

(D-7-3)33ccc5. H. L. Vane.

Water level, in feet above measuring point, 1939

Jan. 30	a 7.4	Mar. 24	6.65	May 9	a 7.3	Aug. 8	a 7.0
Feb. 21	7.15	Apr. 13	6.4	June 13	a 7.3	Sept. 21	a 6.7

(D-8-1)13aaal. R. G. Francis.

Water level, in feet above measuring point, 1939

Jan. 30	a 15.7	Apr. 13	14.9	June 19	14.0	Oct. 7	a 14.0
Feb. 27	15.6	May 4	a 14.6	Aug. 3	a 12.3	Nov. 14	a 12.5
Mar. 24	15.7	June 13	a 13.6	Sept. 21	a 13.8	Dec. 19	a 14.5

(D-8-1)25ccb1. F. S. Hiatt.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 17	13.2	June 19	11.85	Oct. 13	12.0
Apr. 12	13.3	Aug. 25	11.4		

(D-8-2)4cba2. (D-8-2)4cba1 in Water-Supply Paper 845. Mary Barney.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 30	a 26.8	Apr. 13	25.95	Aug. 2	a 22.3	Oct. 17	a 25.1
Feb. 27	26.9	May 23	a 22.0	Sept. 21	a 24.95	Dec. 19	a 25.2
Mar. 24	27.75	June 13	a 23.3				

(D-8-2)5aaal. Leo J. Artken. Flow, in gallons per minute, 1939: Mar. 17, 1.25.

Water level, in feet above measuring point, 1939

Jan. 30	a 8.1	Apr. 13	8.5	July 12	a 6.2	Sept. 21	a 6.8
Mar. 17	8.6	May 23	a 8.3	Aug. 29	a 5.4		

(D-8-2)7ddd1. A. H. Beers.

Water level, in feet above measuring point, 1939

Jan. 30	a 18.3	Apr. 13	18.2	June 19	18.4	Oct. 7	a 17.9
Feb. 13	a 18.8	May 9	a 15.9	Aug. 3	a 16.1	Nov. 14	a 18.0
Feb. 27	18.7	June 13	a 17.3	Sept. 21	a 16.5	Dec. 19	a 18.6
Mar. 24	18.85						

a Measurement made by Board of Canal Presidents.

## Utah County--Continued

(D-8-2)13acd1. Federal Land Bank. Previous measurements inaccurate because an outlet from well was open in a house west of well. Water level, in feet above measuring point, 1939: June 19, 22.8.

(D-8-2)16caa. W. G. Foster.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 27	36.7	Apr. 13	36.7	Aug. 25	32.65
Mar. 24	37.0	June 19	34.1	Oct. 13	33.5

(D-8-2)23dbd1. Utah-Idaho Sugar Co.

Water level, in feet above measuring point, 1939

Feb. 27	19.20	Apr. 14	18.9	Aug. 25	14.8
Mar. 24	19.20	June 19	16.45		

(D-8-3)4cad1. Eddington Canning Co.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 13	a 19.1	Mar. 24	18.4	May 11	a 19.1	Aug. 8	a 18.9
Feb. 21	19.1	Apr. 13	18.3	June 13	a 19.2		

(D-8-3)4ddc. M. Messenger.

Water level, in feet below measuring point, 1939

Jan. 30	a 7.8	Apr. 13	8.00	Aug. 8	a 5.20	Nov. 14	a 7.21
Mar. 17	6.62	May 9	a 3.98	Sept. 21	a 8.69		

(D-8-3)10ddc. John Holley.

Water level, in feet below measuring point, 1939

Jan. 30	a 19.95	Apr. 13	20.70	June 13	a 17.13	Sept. 21	a 17.43
Mar. 17	20.67	May 9	a 20.43	Aug. 8	a 16.33	Oct. 17	a 18.43

(D-8-3)15ccb. E. Whitcomb. Measuring point is 1.0 foot above land surface (incorrectly given 0.5 foot in Water-Supply Paper 845.)

Water level, in feet below measuring point, 1939

Jan. 30	a 10.13	May 9	a 10.57	Sept. 21	a 9.51	Nov. 14	a 10.51
Mar. 17	10.15	June 13	a 9.55	Oct. 17	a 9.87	Dec. 26	a 11.42
Apr. 13	10.82	Aug. 8	a 8.70				

(D-8-3)18dc. M. P. Mortison. Flow, in gallons per minute, 1939: Mar. 24, 1.6; Aug. 25, 1.6. Found flowing prior to all measurements.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 27	6.7	Apr. 13	6.4	Aug. 25	6.6
Mar. 24	5.75	June 19	6.6		

(D-9-1)2ddd. Clay Ashworth. Payson. Unused well, diameter 2 inches, depth 105 feet. Measuring point, top of 2-inch casing, 2.3 feet above land surface. Water level in feet below measuring point, 1939: Aug. 25, 7.58; Oct. 13, 7.21.

(D-9-1)11aaal. John L. Done. Water levels, in feet below measuring point, 1939: Mar. 17, 6.81; Apr. 14, 7.01; June 19, 6.46; Aug. 25, 8.72. New pressure system installed; measurements discontinued.

(D-2-1)25adal. Drought Relief Administration.

Water level, in feet above measuring point, 1939

Mar. 17	13.4	June 19	10.5	Oct. 13	10.7
Apr. 14	12.8	Aug. 25	10.5		

a Measurement made by Board of Canal Presidents.

## Utah County--Continued

(D-9-1)25add1. Federal Land Bank.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 17	2.35	June 19	a 0.75	Oct. 13	a 0.58
Apr. 14	a 1.85	Aug. 25	a 0.53		

(D-9-1)29cdd. Genola. About 0.5 mile west of Genola school, 20 feet north of house at northwest corner of road intersection. Dug well, diameter about 36 inches, depth 34 feet.

Water level, in feet below measuring point, 1939

Mar. 4	27.46	June 19	25.62	Oct. 13	26.52
Apr. 14	27.81	Aug. 24	26.27		

(D-9-1)33bbb1. Drought Relief Administration. Water levels, in feet below measuring point, 1939: Apr. 14, 74.85; June 19, 64.20; Aug. 24, 70.82; Oct. 13, 72.51.

(D-9-2)5ddc2. Payson City Corporation.

Daily noon water level, in feet above measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	14.1	14.1	13.9	14.4	13.0	11.7	12.0	12.4	....	12.5	13.2	13.5
2	14.2	14.0	14.0	14.4	12.8	11.7	12.0	12.4	....	12.4	13.2	13.4
3	14.2	14.1	14.0	14.5	12.7	11.8	12.0	12.5	....	12.7	13.2	13.5
4	14.2	14.1	14.0	14.5	12.0	11.9	12.0	12.5	12.3	12.9	13.0	13.6
5	14.2	14.0	13.9	14.5	11.9	12.2	12.0	12.5	12.3	12.9	13.0	13.5
6	14.2	14.2	14.0	14.4	11.9	12.0	12.0	12.5	12.3	13.4	13.1	13.5
7	14.1	14.1	14.0	14.3	11.8	11.9	12.0	12.5	12.3	13.4	13.1	13.5
8	14.1	14.2	14.0	14.5	11.6	12.0	12.0	12.5	12.2	13.3	13.1	13.4
9	14.2	14.2	14.0	14.5	11.7	12.0	12.0	12.5	12.3	13.4	13.2	13.3
10	14.1	14.0	14.0	14.5	11.8	12.0	12.0	12.5	12.3	13.4	13.7	13.3
11	14.1	13.9	14.1	14.5	11.8	12.0	12.0	12.5	12.3	13.5	14.1	13.4
12	14.0	14.0	14.1	14.5	11.5	12.0	12.0	12.5	12.3	13.5	14.1	13.3
13	14.1	14.1	14.1	14.5	11.5	12.1	12.0	12.5	12.3	13.6	14.0	13.3
14	14.0	14.0	14.2	14.0	11.5	12.2	12.1	12.7	12.3	13.6	14.0	13.5
15	14.1	14.1	14.1	13.9	11.7	12.0	12.3	12.7	12.2	13.5	14.0	13.5
16	14.1	14.0	14.2	13.8	11.9	12.0	12.2	12.7	12.2	13.5	14.1	13.4
17	14.0	13.9	14.2	14.0	11.8	11.7	12.4	12.7	12.3	13.6	13.9	13.4
18	14.0	14.1	14.3	13.8	11.9	11.7	12.4	12.6	12.3	13.6	14.0	13.5
19	14.0	14.0	14.2	13.4	11.7	11.9	12.4	12.6	12.3	13.6	13.8	13.3
20	14.1	14.1	14.3	13.3	11.6	11.9	12.4	12.6	12.4	13.5	13.9	13.5
21	....	13.9	14.3	13.2	11.7	11.9	12.3	12.4	12.4	13.5	13.9	13.6
22	....	14.0	14.4	13.3	11.7	11.9	12.3	12.5	12.6	13.5	13.9	13.8
23	14.0	14.0	14.4	13.3	11.7	11.9	12.3	12.6	12.5	13.5	13.9	14.2
24	13.9	13.9	14.3	13.0	11.3	11.9	12.4	12.6	12.6	13.8	13.7	13.1
25	14.0	14.0	14.4	13.0	11.6	11.9	12.4	12.6	12.6	13.5	13.6	13.7
26	14.0	14.0	14.3	13.1	11.6	12.0	12.4	12.6	12.6	13.0	13.6	13.4
27	14.2	14.0	14.4	13.1	11.6	12.0	12.4	12.5	12.6	13.2	13.7	13.3
28	14.1	14.0	14.3	13.1	11.7	12.0	12.4	12.5	12.5	13.0	13.4	13.6
29	13.9	....	14.4	13.2	11.9	12.0	12.4	12.4	12.5	13.0	13.5	....
30	14.2	....	14.4	13.2	11.8	12.0	12.4	....	12.4	13.0	13.4	13.3
31	14.2	....	14.4	....	11.7	....	12.5	....	....	13.2	....	13.3

(D-9-2)11aaal. Salt Lake and Utah Railroad.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 17	32.7	June 19	30.6	Oct. 13	29.8
Apr. 14	30.95	Aug. 25	29.8		

## Uintah County

U(B-1-1)2ca2. Jay Larsen. Water level, in feet below measuring point, 1939: Sept. 7, 25.29.

a Found flowing.

## Uintah County--Continued

U(C-2-1)23aaal. Drought Relief Administration. Water level, in feet below measuring point, 1939: Sept. 8, a/54.40.

U(D-1-1)14bbel. George Hackford. Measuring point changed to top of pump platform, 2.4 feet above top of casing, previous measuring point. Water level, in feet below measuring point, 1939: Sept. 7, 12.78.

U(D-1-1)19cc. Bennett School. Water level, in feet below measuring point, 1939: Sept. 7, 11.45.

U(D-1-1)23ab. Albert Daniels. Water level, in feet below measuring point, 1939: Sept. 12, 15.58.

(D-3-21)17cda. Martha M. Bingham. Water level, in feet above measuring point, 1939: Sept. 16, 7.3, found flowing 10.6 gallons per minute through  $\frac{1}{2}$ -inch opening.

(D-3-21)30dc. Ralph G. Alexander. Water level, in feet above measuring point, 1939: Sept. 8, 12.5, (well found closed).

(D-4-21)2bcdl. Gibson Ranch Co. Vernal. Unused well, diameter 42 inches, depth 12.5 feet. Measuring point, top of rock curb 1.0 foot above land surface. Water level, in feet below measuring point, 1939: Sept. 8, 6.83.

(D-4-21)12acc. Lonzo McCarl. Vernal. Used stock well, diameter 54 inches, depth 16 feet. Measuring point, top of rock in rock curbing, 1.0 foot below land surface. Water level, in feet below measuring point, 1939: Sept. 8, 11.79.

(D-4-21)15dcc. R. T. Freestone. Vernal. Used domestic well, diameter 2 inches, depth 24 feet. Measuring point, lip of pitcher pump, 4.0 feet above land surface. Water level, in feet below measuring point, 1939: Sept. 8, 11.91.

(D-4-21)15ddd. Bill Hall. Vernal. Used domestic well, diameter  $1\frac{1}{2}$  inches, depth 14 feet. Measuring point, lip of pitcher pump, 4.0 feet above land surface. Water level, in feet below measuring point, 1939: Sept. 8, 6.57.

(D-4-21)24dbb. Peter Erickson. Vernal. State claim no. 6,931. Used domestic well, diameter 48 inches, depth 10 feet. Measuring point, top of platform at base of bucket pump, 0.5 foot above land surface. Water level, in feet below measuring point, 1939: Sept. 8, 8.82.

(D-4-21)28daa. Drought Relief Administration. Water level, in feet below measuring point, 1939: Sept. 8, 28.41.

## Wasatch County

(D-2-5)20cc. Lee Brothers.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 21	27.55	June 22	28.95	Oct. 30	29.13
May 1	28.34	Aug. 29	29.28		

(D-2-5)3laadl. W. H. Davis. Hailstone, 20 feet east of residence. State claim no. 13,770. Diameter 36 inches, depth 27 feet. Measuring point, top of platform, 1.0 foot above land surface. Water level, in feet below measuring point, 1939: Aug. 29, 8.85.

a Probably pumped recently.



## Wasatch County--Continued

(D-2-5)3lada. Harry Morris.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Mar. 21	7.58	June 22	4.77	Oct. 30	10.03
May 1	(a)	Aug. 29	5.41		

(D-3-4)35bbcl. Drought Relief Administration.

Water level, in feet below measuring point, 1939

Mar. 21	2.17	June 22	2.78	Oct. 30	3.82
May 1	2.41	Aug. 29	3.61		

(D-3-5)29cac. Miles Clyde. Measuring point raised 0.1 foot above previous measuring point.

Water level, in feet below measuring point, 1939

Mar. 21	8.12	June 22	2.25	Oct. 30	5.85
May 1	3.06	Aug. 29	4.95		

(D-4-4)14abb. Brown.

Daily noon water level, in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	17.56	.....	18.86	16.77	15.32	4.88	10.87	14.67	16.21	16.14	.....	17.00
2	17.56	.....	18.87	16.86	14.73	5.77	11.28	14.86	16.27	16.60	.....	17.07
3	17.58	18.51	18.89	16.94	14.57	5.50	11.45	15.01	16.34	16.78	15.72	17.12
4	17.61	18.53	18.90	17.09	14.00	6.00	11.76	15.13	16.35	16.89	15.46	17.18
5	17.63	18.55	18.90	17.24	13.73	6.16	12.07	15.15	16.16	16.92	.....	17.23
6	17.66	18.57	18.92	17.38	13.43	6.02	12.34	14.86	16.26	16.93	15.30	17.27
7	17.70	18.59	18.93	17.30	13.28	5.69	12.03	15.01	16.36	16.88	15.15	17.32
8	17.74	18.60	18.94	17.27	13.15	5.77	12.35	14.94	16.45	16.84	15.05	17.33
9	17.77	18.62	18.95	17.25	12.67	5.92	12.51	15.11	16.52	16.80	15.08	17.36
10	17.78	18.62	18.93	17.42	12.33	6.02	12.75	15.26	16.40	16.77	15.19	17.39
11	17.82	18.63	18.94	17.41	11.84	5.50	12.85	15.18	16.39	16.74	15.30	17.42
12	17.84	18.65	18.93	17.38	11.49	5.90	12.42	15.33	16.46	16.70	15.45	17.45
13	17.87	18.66	18.92	17.43	10.74	5.42	12.90	15.48	16.53	16.64	15.50	17.44
14	.....	18.70	18.91	17.50	10.43	5.81	13.25	15.59	16.57	.....	15.47	17.45
15	.....	18.70	18.89	17.59	10.01	6.55	13.52	15.62	16.08	.....	15.25	17.46
16	.....	18.71	18.87	17.64	8.98	6.94	13.64	15.37	16.08	.....	15.15	17.49
17	.....	18.71	18.80	17.65	8.73	7.26	13.50	15.52	16.23	.....	.....	17.52
18	.....	18.72	18.69	17.50	8.67	7.76	13.72	15.58	16.34	.....	15.15	17.54
19	.....	18.74	18.56	17.44	9.04	8.17	13.84	15.75	16.50	.....	15.20	17.58
20	18.08	18.75	18.39	17.40	9.01	7.01	14.00	15.81	16.47	.....	15.28	17.63
21	.....	18.76	18.10	17.23	8.81	7.69	14.06	15.72	16.54	16.42	15.36	17.68
22	.....	18.77	17.62	17.20	7.47	8.08	14.04	15.84	16.60	16.44	15.56	17.72
23	.....	18.78	17.18	17.20	7.10	8.01	14.22	15.94	16.66	16.42	15.82	17.76
24	.....	18.79	17.01	17.18	6.92	8.72	14.37	16.01	16.69	16.41	16.05	17.75
25	.....	18.80	16.84	17.03	7.11	9.27	14.50	16.05	16.02	16.45	16.27	17.77
26	.....	18.81	16.58	16.68	7.04	9.70	14.52	15.77	16.00	16.49	16.48	17.85
27	18.34	18.86	16.48	16.45	6.92	9.55	14.35	15.90	15.99	16.50	16.64	17.88
28	.....	18.85	16.47	15.70	6.59	9.58	14.54	16.00	16.40	.....	16.77	17.89
29	.....	.....	16.51	14.50	6.08	10.03	14.62	16.13	16.62	.....	16.87	17.90
30	.....	.....	16.62	15.01	6.18	10.44	14.78	16.20	15.86	16.61	16.96	17.91
31	.....	.....	16.71	.....	6.21	.....	14.82	16.10	.....	.....	.....	17.92

(D-4-4)14cccl. Town of Charleston.

Daily noon water level, in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	12.65	13.37	13.86	12.78	11.36	6.55	7.89	9.92	11.10	11.48	11.38	12.08
2	12.63	13.40	13.79	12.81	11.00	6.43	8.02	9.99	11.13	11.54	11.40	12.13
3	12.67	13.38	13.76	12.83	10.76	6.29	8.12	10.03	11.21	11.58	11.47	12.19
4	12.75	13.41	13.82	12.86	10.56	6.19	8.17	10.07	11.25	11.60	11.47	12.24
5	12.71	13.44	13.91	12.85	10.17	5.85	8.24	10.09	11.27	11.51	11.44	12.28
6	12.78	13.41	13.89	12.92	9.98	5.80	8.33	10.14	11.24	11.38	11.46	12.33
7	12.85	13.43	13.84	12.88	9.81	5.69	8.40	10.06	11.24	11.39	11.44	12.39
8	12.78	13.37	13.88	12.87	9.67	5.63	8.34	10.10	11.31	11.33	11.36	12.42
9	12.88	13.48	13.86	12.87	9.60	5.58	8.44	10.15	11.34	11.31	11.37	12.45

a Dry at 11 feet below measuring point.

## Wasatch County--Continued

(D-4-4)14cccl.--Continued

Daily noon water level, in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
10	12.92	13.53	13.85	12.84	9.43	5.75	8.55	10.22	11.37	11.22	11.44	12.43
11	12.92	13.60	13.94	12.83	9.28	5.82	8.65	10.30	11.37	11.15	11.41	12.55
12	12.93	13.52	13.88	12.78	9.27	5.90	8.74	10.38	11.41	11.03	11.44	12.63
13	12.99	13.55	13.85	12.77	9.21	5.95	8.78	10.43	11.40	11.03	11.47	12.59
14	13.02	13.60	13.94	12.80	9.09	6.10	8.82	10.48	11.42	11.01	11.53	12.63
15	13.00	13.54	13.92	12.80	8.75	6.24	8.93	10.50	11.43	11.02	11.60	12.67
16	13.07	13.66	13.90	12.82	8.60	6.40	9.03	10.51	11.33	11.06	11.63	12.69
17	13.12	13.66	13.82	12.82	8.42	6.57	9.11	10.48	11.26	11.08	11.61	12.68
18	13.14	13.62	13.74	12.76	8.14	6.56	9.08	10.53	11.29	11.10	11.56	12.78
19	13.16	13.64	13.67	12.68	8.14	6.55	9.17	10.59	11.33	11.14	11.61	12.80
20	13.12	13.73	13.57	12.62	8.07	6.72	9.26	10.63	11.34	11.20	11.62	12.80
21	13.18	13.75	13.44	12.50	7.99	6.86	9.31	10.67	11.34	11.22	11.61	12.84
22	13.18	13.76	13.33	12.40	7.90	6.95	9.35	10.72	11.35	11.23	11.65	12.84
23	13.26	13.70	13.21	12.30	7.75	7.06	9.38	10.76	11.33	11.23	11.69	12.93
24	13.31	13.73	13.09	12.23	7.67	7.15	9.41	10.83	11.32	11.24	11.72	12.95
25	13.29	13.72	12.97	12.14	7.55	7.27	9.49	10.87	11.36	11.30	11.77	13.01
26	13.28	13.75	12.86	12.10	7.38	7.37	9.56	10.90	11.38	11.37	11.81	13.04
27	13.19	13.79	12.80	12.02	7.21	7.41	9.68	10.91	11.39	11.45	11.85	13.03
28	13.24	13.79	12.97	11.88	7.09	7.40	9.67	10.95	11.43	11.45	11.89	13.15
29	13.32	.....	12.97	11.59	6.82	7.58	9.72	11.02	11.50	11.47	11.94	13.15
30	13.28	.....	12.80	11.53	6.61	7.73	9.80	11.06	11.51	11.44	12.01	13.15
31	13.25	.....	12.79	.....	6.67	.....	9.86	11.08	.....	11.37	.....	13.16

## Washington County

(C-37-17)12cddl. Drought Relief Administration. Water levels, in feet below measuring point, 1939: Jan. 7, 40.27; Apr. 24, 41.13; Sept. 19, 41.70; Dec. 15, 41.85.

(C-37-17)14acbl. Enterprise Town. Water levels, in feet below measuring point, 1939: Jan. 7, 26.55; Apr. 24, 28.28; Sept. 19, 30.95; Dec. 15, 31.90.

(C-42-10)33bb. Oscar DeMill. Water levels, in feet below measuring point, 1939: Apr. 21, 123.73; Aug. 19, 121.50; Dec. 8, 119.00.

(C-42-11)3ac. Drought Relief Administration. Water levels, in feet below measuring point, 1939: Apr. 21, 18.82; Aug. 19, 17.74; Dec. 8, 19.02.

## Wayne County

(D-27-2)25bd. Silas Tanner. Dec. 6, 1939: found flowing 7.0 gallons per minute from tee 3.0 feet above measuring point; water level, in feet above measuring point, 8.5.

(D-27-2)34ccc. Ren Taylor. On property originally owned by D. H. Allred, now owned by Caryle Baker. Claimed by Ren Taylor. Water levels, in feet above measuring point, 1939: Aug. 21, 49.6 (found flowing 6.6 gallons per minute); Dec. 6, 43.5 (found flowing 6.7 gallons per minute; pressure was several feet higher but decreased slowly during 10 minutes well was closed).

(D-27-3)17cd. Charles Ellett. Found flowing prior to all measurements.

Water level, in feet above measuring point, and flow, in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Mar. 1	7.0	1.5	Aug. 21	8.6	2.3
Apr. 18	7.4	1.6	Dec. 6	7.5	2.2

## Wayne County--Continued

(D-28-4)36cd. Vernon A. Lee. Water levels, in feet below measuring point, 1939: Apr. 18, 10.62; Aug. 21, 12.93; Dec. 6, 12.35.

(D-29-4)15ca. W. P. Coleman. Water levels, in feet below measuring point, 1939: Apr. 18, 7.54; Aug. 21, 9.76; Dec. 6, 7.10

## Weber County

(A-6-1)1dc. Measuring point changed to top of tile casing, altitude unchanged. Water level, in feet below measuring point, 1939: Oct. 28, 15.02.

(A-6-1)2db. H. B. Stallings. Water level, in feet below measuring point, 1939: Oct. 28, 15.11.

(A-6-1)1ldc. U. S. Bureau of Reclamation.

Daily noon water level, in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	21.09	23.73	26.15	.....	10.60	13.06	15.07	18.89	21.68	22.65	22.97	23.45
2	21.15	23.84	26.22	.....	10.42	13.09	15.24	18.93	21.75	22.68	22.98	23.46
3	21.22	23.94	26.30	.....	10.28	13.14	15.41	19.00	21.82	22.65	22.99	23.46
4	21.29	24.04	26.37	.....	10.16	13.18	15.58	19.09	21.90	22.67	23.00	23.47
5	21.37	24.14	26.44	.....	10.25	13.22	15.76	19.19	21.98	22.70	23.01	23.47
6	21.45	24.24	26.51	.....	10.27	13.26	15.92	19.32	22.06	22.71	23.03	23.49
7	21.56	24.33	26.58	.....	10.28	13.30	16.00	19.45	22.14	22.71	23.05	23.49
8	21.63	24.42	26.65	.....	10.29	13.34	16.05	19.57	22.16	22.72	23.09	23.49
9	21.70	24.50	26.72	20.26	10.57	13.39	16.10	19.66	22.18	22.73	23.13	23.49
10	21.78	24.60	26.79	.....	11.09	13.43	16.15	19.76	22.19	22.74	23.17	23.49
11	21.86	24.69	26.85	.....	11.54	13.48	16.26	19.84	22.22	22.75	23.21	23.49
12	21.93	24.78	26.91	.....	11.91	13.54	16.41	19.91	22.19	22.76	23.25	23.49
13	22.01	24.87	26.98	.....	12.37	13.58	16.56	19.99	22.19	22.77	23.29	23.50
14	22.08	24.95	27.04	16.70	12.68	13.64	16.76	20.05	22.22	22.77	23.33	23.51
15	22.15	25.05	27.11	.....	12.97	13.79	16.88	20.11	22.25	22.78	23.36	23.52
16	22.23	25.13	27.17	14.30	13.22	13.93	17.08	20.17	22.26	22.78	23.37	23.53
17	22.30	25.22	27.24	13.93	13.24	14.07	17.28	20.23	22.26	22.79	23.38	23.54
18	22.37	25.29	27.30	13.53	13.24	14.04	17.48	20.29	22.27	22.80	23.38	23.55
19	22.44	25.37	27.36	.....	13.23	14.04	17.69	20.38	22.29	22.81	23.39	23.55
20	22.52	25.46	27.41	.....	13.23	14.04	17.88	20.49	22.30	22.86	23.40	23.56
21	22.61	25.54	27.47	.....	13.22	14.03	18.05	20.62	22.31	22.86	23.40	23.56
22	22.71	25.62	27.52	13.15	13.21	14.03	18.19	20.75	22.33	22.87	23.41	23.57
23	22.80	25.70	27.56	12.76	13.20	14.02	18.30	20.88	22.35	22.87	23.42	23.57
24	22.90	25.78	27.60	12.17	13.15	14.05	18.39	21.01	22.37	22.88	23.42	23.57
25	23.11	25.85	.....	11.67	13.14	14.12	18.48	21.16	22.41	22.89	23.42	23.57
26	23.11	25.93	.....	11.44	13.13	14.20	18.56	21.26	22.45	22.90	23.43	23.57
27	23.22	26.00	.....	11.25	13.13	14.34	18.65	21.35	22.49	22.91	23.43	23.57
28	23.33	26.08	.....	11.19	13.13	14.51	18.75	21.44	22.54	22.92	23.44	23.57
29	23.43	.....	.....	11.02	13.12	14.71	18.82	21.51	22.58	22.93	23.44	23.57
30	23.52	.....	.....	10.83	13.12	14.90	18.86	21.57	22.61	22.94	23.45	23.57
31	23.63	.....	.....	.....	13.09	.....	18.88	21.62	.....	22.95	.....	23.57

(A-6-1)1ldd. Herman Larson. Measuring point, 0.25 foot above top of brick curb. Water level, in feet below measuring point, 1939: Oct. 23, 12.93.

(A-6-1)12aal. City of Ogden.

Daily noon water level, in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	17.93	.....	.....	18.35	8.25	8.08	9.97	13.21	16.59	17.55	15.80	16.22
2	17.94	.....	.....	18.16	8.06	8.20	10.17	13.41	16.75	17.47	15.79	16.26
3	17.95	20.08	21.28	17.88	7.93	8.25	10.43	13.74	16.99	17.43	15.79	16.30
4	18.10	20.13	21.30	17.51	7.80	8.26	10.63	14.01	17.18	17.41	15.79	16.34
5	18.18	20.17	21.36	16.89	7.73	8.29	10.82	14.25	17.30	17.33	15.78	16.37
6	18.23	20.24	21.43	16.40	7.71	8.36	10.99	14.44	17.39	17.13	15.78	16.38
7	18.48	20.38	21.42	15.80	7.64	8.36	10.94	14.61	17.50	17.04	15.94	16.43
8	18.47	20.43	21.44	.....	7.60	8.36	10.82	14.72	17.32	16.96	16.11	16.45
9	18.47	20.52	21.45	14.76	7.69	8.35	10.76	14.72	17.19	16.89	16.20	16.47

## Weber County--Continued

(A-6-1)12aal.--Continued

Daily noon water level, in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
10	18.47	20.63	21.45	14.44	7.93	8.37	10.77	14.73	17.08	16.83	16.35	16.50
11	18.60	.....	21.48	14.09	8.11	8.38	11.05	14.79	17.02	16.76	16.44	16.51
12	18.65	.....	21.52	13.65	8.23	8.45	11.39	14.86	17.00	16.70	16.47	16.62
13	18.73	.....	21.50	13.36	8.30	8.49	11.62	14.89	16.98	16.61	16.49	16.68
14	18.86	.....	21.53	13.29	8.33	8.52	11.79	14.88	17.00	16.54	16.49	16.71
15	18.90	.....	21.58	13.05	8.34	8.64	12.00	14.90	17.07	16.43	16.42	16.77
16	18.91	.....	21.58	12.78	8.35	8.80	12.29	14.97	17.11	16.32	16.23	16.81
17	19.02	21.02	21.54	12.54	8.12	8.94	12.58	15.04	17.11	16.24	16.13	16.81
18	19.05	.....	21.47	11.23	7.88	8.83	12.80	15.11	17.10	16.15	16.08	16.83
19	19.10	.....	21.34	10.82	7.78	8.59	12.97	15.32	17.09	16.10	16.06	16.87
20	19.12	.....	21.21	10.50	7.78	8.53	13.12	15.68	17.05	15.98	16.05	.....
21	19.22	.....	21.02	10.16	7.72	8.54	13.22	15.92	17.00	15.95	16.04	.....
22	19.37	.....	20.81	10.67	7.68	8.56	13.22	16.05	16.98	15.87	16.03	.....
23	19.38	.....	20.56	10.48	7.71	8.53	13.14	16.19	16.97	15.81	16.04	.....
24	.....	21.18	20.29	10.02	7.72	8.67	13.04	16.33	17.05	15.73	16.04	.....
25	.....	.....	19.88	9.53	7.75	8.87	13.04	16.47	17.21	15.68	16.04	.....
26	.....	.....	19.47	9.21	7.79	9.03	13.09	16.55	17.36	15.72	16.06	.....
27	19.78	.....	19.19	8.95	7.81	9.23	13.25	16.56	17.47	15.81	16.07	.....
28	.....	.....	19.00	8.72	7.83	9.44	13.46	16.57	17.52	15.88	16.10	.....
29	.....	.....	18.79	8.54	7.84	9.64	13.62	16.56	17.60	15.87	16.13	.....
30	.....	.....	18.68	8.36	7.88	9.84	13.46	16.54	17.62	15.88	16.17	17.03
31	.....	.....	18.50	.....	7.97	.....	13.26	16.55	.....	15.85	.....	17.03

(A-6-1)13ab. Water level, in feet below measuring point, 1939: Oct. 28, 13.92.

(A-6-2)6aa. Water level, in feet below measuring point, 1939: Oct. 28, 3.62.

(A-6-2)6dd. No measurements made in 1939.

(A-6-2)16badl. Golden Bingham. Measuring point, top of tile casing, 0.7 foot below top of platform; effective Oct. 14, 1937, Oct. 26, 1938 for measurements published in Water-Supply Papers 840 and 845. Water level, in feet below measuring point, 1939: Oct. 28, 27.27.

(A-6-2)18acc. Charles Felt. Water level, in feet below measuring point, 1939: Oct. 28, 16.02.

(A-6-2)21cc. C. D. Shupe. Water level, in feet below measuring point, 1939: Oct. 28, 14.85.

(A-7-1)20ac. John Ward. Well dry at about 60 feet below measuring point on Oct. 28, 1939.

(A-7-1)29baal. Elmer Gardner. Water level, in feet below measuring point, 1939: Oct. 28, 18.18.

(A-7-1)35cb. Water level, in feet below measuring point, 1939: Oct. 28, 16.21.

(A-7-1)35cd. Water level, in feet below measuring point, 1939: Oct. 28, 16.05.

(A-7-1)36cb. Water level, in feet below measuring point, 1939: Oct. 28, 9.38.

## Weber County--Continued

(B-5-2)4cddl. Samuel Peterson.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 4	35.0	June 6	34.0	Oct. 5	33.3
Apr. 3	36.2	Aug. 4	32.3	Dec. 29	34.5

(B-5-2)12dc. A. P. Bigelow. Measurements discontinued.

(B-5-2)14cdcl. Lorenzo Stoker Estate.

Water level, in feet below measuring point, 1939

Feb. 3	2.54	June 5	2.67	Oct. 5	2.35
Apr. 3	2.47	Aug. 4	2.25	Dec. 29	2.61

(B-5-2)16cdd2. Charles A Rundquist. Found flowing prior to all measurements.

Water level, in feet above measuring point, and flow, in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Feb. 3	5.9	2.0	Aug. 4	3.85	1.5
Apr. 3	4.7	1.3	Oct. 5	3.9	1.6
June 5	4.4	1.7	Dec. 29	4.1	1.5

(B-5-3)12add1. F. V. Simpson. Found flowing prior to all measurements.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 3	21.5	June 5	21.3	Oct. 5	19.15
Apr. 3	22.4	Aug. 4	19.0	Dec. 29	21.2

(B-5-3)13ddcl. J. D. Hooper.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 4	36.2	Apr. 3	37.3	Aug. 4	33.2	Dec. 29	36.1
Feb. 3	36.9	June 5	35.5	Oct. 5	34.0		

(B-5-3)15ddal. T. W. Read.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 3	46.6	June 5	47.1	Oct. 5	44.95
Apr. 3	46.95	Aug. 4	45.7	Dec. 29	45.7

(B-6-1)6dbal. Ogden Pressed Brick Company. (B-6-1)6db in Water-Supply Paper 817.

Water level, in feet above measuring point, 1939

Feb. 6	52.1	June 3	52.3	Oct. 3	52.85
Apr. 3	53.8	Aug. 4	50.75	Dec. 29	56.5

(B-6-1)8acbl. L. W. Winkler and Carl Nielson.

Water level, in feet below measuring point, 1939

Feb. 6	5.47	June 2	5.14	Oct. 3	5.23
Apr. 4	5.27	Aug. 5	5.74	Dec. 30	5.62

a Found flowing.

Weber County--Continued

(B-6-1)8badd16. J. T. Bybee.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Apr. 4	6.8	Aug. 5	a 6.6	Dec. 30	a 6.7
June 2	7.2	Oct. 4	a 7.0		

(B-6-1)2labbl. (B-6-1)2lab in Water-Supply Paper 817. Western Irrigation Company.

Water level, in feet below measuring point, 1939

Feb. 6	30.79	June 2	30.47	Oct. 3	30.91
Apr. 4	30.72	Aug. 5	30.78	Dec. 30	31.35

(B-6-1)2ladd1. Drought Relief Administration.

Daily noon water level, in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	43.68	43.51	43.71	.....	.....	43.22	43.44	43.56	43.68	43.69	.....	44.22
2	43.61	43.56	43.62	.....	43.39	43.26	43.44	43.56	43.67	43.63	.....	.....
3	43.58	43.51	43.53	.....	43.40	43.22	43.46	43.59	43.72	43.66	43.92	.....
4	43.66	43.51	43.53	43.45	43.39	43.19	43.43	43.58	43.69	43.68	43.93	.....
5	43.57	43.56	43.61	43.48	43.31	43.17	43.43	43.55	43.68	43.72	43.93	.....
6	43.58	43.52	43.62	43.58	43.35	43.26	43.51	43.54	43.65	43.70	43.96	.....
7	43.68	43.54	43.55	43.51	43.36	43.34	43.51	43.55	43.67	43.72	44.01	.....
8	43.57	43.43	43.60	43.47	43.38	43.38	43.54	43.56	43.72	43.71	43.96	.....
9	43.65	43.52	43.57	43.44	43.35	43.35	43.58	43.49	43.70	43.83	43.96	.....
10	43.67	43.58	43.54	43.49	43.28	43.33	43.58	43.53	43.65	43.89	44.08	.....
11	43.66	43.72	43.64	43.48	43.27	43.30	43.60	43.58	43.62	43.90	44.10	.....
12	43.62	43.65	43.63	43.41	43.30	43.33	43.61	43.65	43.58	43.86	44.13	.....
13	43.65	43.64	43.53	43.40	43.35	43.32	43.56	43.63	43.63	43.85	44.12	.....
14	43.67	43.68	43.68	43.44	43.33	43.35	43.53	43.62	43.73	43.85	44.12	.....
15	43.58	43.58	43.69	43.48	43.30	43.30	43.56	43.60	43.80	43.85	44.14	44.29
16	43.60	43.71	43.67	43.56	43.32	43.32	43.55	43.64	43.80	43.87	44.17	.....
17	43.67	43.73	43.65	43.62	43.33	43.36	43.57	43.64	43.80	43.88	44.14	.....
18	43.68	43.61	43.63	43.60	43.28	43.35	43.55	43.65	43.81	43.87	44.16	.....
19	43.67	43.59	43.63	43.51	43.32	43.33	43.56	43.66	43.85	43.89	44.18	.....
20	43.59	43.68	43.63	53.52	43.31	43.33	43.59	43.70	43.86	43.94	44.18	.....
21	43.61	43.74	43.60	43.45	43.23	43.38	43.63	43.70	43.85	43.94	44.17	.....
22	43.57	43.76	43.57	43.46	43.24	43.41	43.62	43.68	43.83	43.90	44.18	.....
23	43.65	43.63	43.56	43.41	43.18	43.32	43.65	43.66	43.83	43.82	44.14	44.07
24	43.74	43.63	43.56	43.32	43.25	43.35	43.66	43.71	43.79	43.74	44.14	.....
25	43.72	43.59	43.52	43.31	43.28	43.42	43.63	43.72	43.75	43.77	44.16	.....
26	43.68	43.57	43.44	43.37	43.29	43.52	43.64	43.70	43.76	43.86	.....	.....
27	43.52	43.62	43.40	43.41	43.29	43.53	43.62	43.71	43.77	43.94	.....	.....
28	43.46	43.60	43.43	43.41	43.30	43.53	43.63	43.66	43.78	.....	.....	.....
29	43.56	.....	43.46	43.37	43.26	43.51	43.59	43.69	43.85	.....	.....	.....
30	43.49	.....	43.51	.....	43.22	43.48	43.56	43.71	43.83	.....	.....	.....
31	43.40	.....	43.50	.....	43.24	.....	43.54	43.70	.....	.....	.....	.....

(B-6-1)30bcb1. American Packing and Provision Co. Measuring point changed to top of ell on 2-inch pipe about 6 feet west of well, 0.5 foot above previous measuring point. Found flowing prior to all measurements. Water levels, in feet above measuring point, 1939: June 3, 30.8; Aug. 4, 30.6; Oct. 5, 27.5.

(B-6-1)30bcb2. American Packing and Provision Co.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 4	6.1	June 3	5.75	Dec. 29	7.8
Apr. 3	5.6	Oct. 5	5.7		

a Found flowing.

Weber County--Continued

(B-6-2)1acd2. George B. Taylor.

Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 6	a 10.1	June 2	c 15.15	Oct. 4	c 15.7
Apr. 4	b 8.2	Aug. 5	c 14.5	Dec. 30	c 7.85

(B-6-2)1acd3. George B. Taylor.

Water level, in feet above measuring point, 1939

Feb. 6	16.3	June 2	16.9	Oct. 4	16.7
Apr. 4	16.0	Aug. 5	15.0	Dec. 30	15.05

(B-6-2)8abdl. West Weber L.D.S. Cemetery.

Water level, in feet, above measuring point, and flow in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Feb. 4	12.8	12.0	Aug. 4	11.6	10.0
Apr. 4	12.9	12.0	Oct. 4	11.4	8.2
June 3	12.7	11.9	Dec. 29	13.4	(d)

(B-6-2)11dadl. Jerome Wheeler. Found flowing prior to all measurements.

Water level, in feet above measuring point, and flow, in gallons per minute, 1939

Feb. 4	18.8	0.20	Aug. 5	19.0	0.26
Apr. 4	18.8	0.29	Oct. 4	18.5	0.23
June 2	19.2	0.28	Dec. 30	18.6	0.21

(B-6-2)17acd1. H. C. Gibson. Found flowing prior to all measurements, valve partly open.

Water level, in feet, above measuring point, and flow, in gallons per minute, 1939

Feb. 4	16.0	9.3	Aug. 4	13.3	5.5
Apr. 4	16.25	10.0	Oct. 4	14.4	5.4
June 3	15.1	6.6	Dec. 29	14.75	6.0

(B-6-2)22dcd. Frances M. Petterson.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 4	1.60	June 3	0.67	Oct. 4	1.65
Apr. 4	0.88	Aug. 4	1.54	Dec. 29	1.25

(B-6-2)25cccl. Geo. E. Stratford.

Water level, in feet above measuring point, 1939

Feb. 4	9.5	June 6	7.8	Oct. 5	7.5
Apr. 3	9.55	Aug. 4	7.1	Dec. 29	7.3

(B-6-2)26adal. (B-6-2)26ad in Water-Supply Paper 817. Amalgamated Sugar Co.

Water level, in feet above measuring point, 1939

Feb. 4	13.35	June 3	10.9	Oct. 4	e 10.0
Apr. 3	9.8	Aug. 4	10.6	Dec. 29	e 11.3

- a Found flowing 5.0 gallons per minute.
- b Well cleaned, found flowing 5.0 gallons per minute.
- c Flow nearly stopped.
- d Found closed.
- e Found partly open and flowing.

## Weber County--Continued

(B-6-2)29ccal. Antonio Favero. Measuring point changed to top of 2-inch valve, 2.94 feet below previous measuring point. Water levels, in feet above measuring point, 1939: Feb. 4, 14.55; Apr. 4, 12.15; Aug. 4, 11.2; Oct. 2, 13.8.

(B-6-2)34dbbl. Heber Swarner. Found flowing prior to all measurements.

## Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 4	27.4	June 6	26.1	Oct. 5	23.3
Apr. 3	26.8	Aug. 4	24.0	Dec. 29	25.4

(B-6-3)26bbbl. Mrs. F. G. Kelley.

## Water level, in feet above measuring point, 1939

Feb. 4	a 30.1	June 3	29.4	Oct. 4	26.2
Apr. 4	30.5	Aug. 4	26.85	Dec. 29	27.8

(B-7-1)32aac1. (B-7-1)32aa in Water-Supply Paper 817. C. M. Barker. Measurements by 100-foot altitude gage.

## Water level, in feet above measuring point, 1939

Feb. 6	71	June 2	66.5	Oct. 3	66.5
Apr. 4	71	Aug. 5	62.0	Dec. 30	b 57.7

(B-7-1)32adal. Joseph Folkman.

## Water level, in feet above measuring point, 1939

Feb. 6	8.9	June 2	7.25	Oct. 3	9.3
Apr. 4	10.4	Aug. 5	7.7	Dec. 30	10.8

(B-7-2)21dc. Annie Maw. Found flowing prior to all measurements.

## Water level, in feet above measuring point, 1939

Feb. 4	c 2.30	June 2	2.10	Oct. 4	2.27
Apr. 4	2.21	Aug. 4	2.45	Dec. 29	2.17

(B-7-2)26ddbl. W. J. Randall. State claim no. 17,509. Found flowing prior to all measurements.

## Water level, in feet, above measuring point, and flow, in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Feb. 4	8.6	1.9	Aug. 5	8.1	1.7
Apr. 4	8.9	1.8	Oct. 4	8.6	1.5
June 2	8.7	1.7	Dec. 30	8.7	1.6

(B-7-2)32dab. Roy Richardson.

## Water level, in feet above measuring point, 1939

Date	Water level	Date	Water level	Date	Water level
Feb. 4	29.0	June 2	33.4	Oct. 4	32.8
Apr. 4	33.0	Aug. 4	31.15	Dec. 29	31.2

(B-7-2)33dca. J. M. Skeen. State claim no. 14,386. Found flowing prior to all measurements.

## Water level, in feet above measuring point, 1939

Feb. 4	7.1	Aug. 4	6.7	Dec. 29	6.9
June 3	7.1	Oct. 4	6.6		

a Flow, 40 gallons per minute.

b Leaking slightly during measurement.

c Flow, 0.8 gallon per minute.



## Weber County--Continued

(B-7-3)35daal. Herman Van Braak. State claim no. 5,489. Reported as state claim no. 5,849 in Water-Supply Paper 840. Found flowing prior to all measurements. Measuring point changed to top of vertical tee, 0.25 foot above previous measuring point and 4,217.10 feet above sea level.

Water level, in feet above measuring point and flow, in gallons per minute, 1939

Date	Water level	Flow	Date	Water level	Flow
Feb. 4	9.2	2.0	Aug. 4	9.0	2.8
Apr. 4	9.1	3.0	Oct. 4	8.9	2.8
June 3	9.2	2.9	Dec. 29	8.8	2.6

## VIRGINIA

### NORTHERN VIRGINIA

By V. C. Fishel

The observation-well program in Virginia<sup>1/</sup> was continued in 1939. Water-stage recorders were maintained on the Bacon, Ross, Swart Stream, Swart 5, and Swart 162 wells, and measurements were made about weekly in the other wells. About 700 individual measurements of water level were made during 1939.

The precipitation in northern Virginia, as indicated by records of the United States Weather Bureau at Washington, D. C., was 1.95 inches above normal for the first 4 months of 1939. In May, however, it was only 0.41 inch--3.29 inches below normal--and in July and August it was also considerably below normal. The accumulated departure from normal precipitation to the end of August was 4.41 inches. In September and October the precipitation was sufficiently above normal to cause water levels to rise in some of the shallow wells; but the water levels in deeper wells were not affected. The precipitation for the year was 1.62 inches below normal.

The water level in the Bacon well was 18.89 feet below the measuring point on January 1, 1939. The high precipitation in January and February caused the water level to rise 3.90 feet by March 6. The water level changed very little during March and April and was 0.05 foot lower on May 1 than on March 6. In May it declined 1.06 feet; in June, 1.18 feet; in July, 0.98 foot; in August, 0.62 foot; and in September, 0.47 foot. The water level, which had risen 1.46 feet by November 22, was down to 0.71 foot by December 31. At the end of the year it was 0.12 foot higher than at the beginning of the year.

The water level in the Bell well was 5.84 feet below the measuring point on January 1. It rose about 3 feet during January and February but declined about 7.5 feet during the summer. It rose to the highest observed stage of the year on October 2 but then declined during October, November, and December. It had a net decline of 1.13 feet in the year.

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<sup>1/</sup> See Water-Supply papers 777, 817, 840, and 845.

The water level in the Glendale farm well was 15.26 feet below the measuring point on January 1. By February 5 it had risen to 6.80 feet--the highest stage on record--but it had declined 0.07 foot by February 12 and 4.33 feet more by February 19. It continued the downward trend until about October 8, at which time it reached the lowest stage on record; it was then 1.65 feet lower than on January 1 and 8.45 feet lower than on February 5. The precipitation in the fall resulted in a rise in water level of 1.77 feet by December 31. The water level was 0.12 foot higher at the end of the year than at the beginning.

The water level in the Halls Hill School well was 27.25 feet below the measuring point on January 1. It had declined 0.28 foot by January 23 but had risen 5.45 feet by May 1. It then continued to decline, with the exception of minor rises in October and December, for the remainder of the year. There was a net rise of 0.16 foot in water level in the year.

The water level in the Ross well followed the trend of that in the Halls Hill School well, but it reached its highest stage of the year about the middle of March, which was about  $1\frac{1}{2}$  months prior to the time the water level in the Halls Hill School well reached its highest stage. The water level in the well was 26.04 feet below the measuring point on January 1. It had risen 3.84 feet by the middle of March but then declined 4.33 feet by December 31 to the lowest stage since December 1931. It had a net decline of 0.49 foot in the year.

Water levels in the Bacon, Glendale farm, and Halls Hill School wells had an average net rise of 0.13 foot in 1939, whereas the water level in the Ross well declined 0.49 foot.

New shelters were built for the Swart wells during June 1939. An accompanying table gives the altitude of the new measuring points with respect to bench mark 2 of the Bacon well. This bench mark was arbitrarily assigned an altitude of 500 feet.

Altitude, in feet above datum, of land surface and measuring points since June 15, 1939, at the Swart wells, Fairfax County, Va.

Well	Altitude of land surface	Altitude of measuring point	Well	Altitude of land surface	Altitude of measuring point
Stream well	445.3	448.34	85	444.3	445.45
5	445.7	448.37	110	444.4	445.56
10	445.3	446.63	135	444.6	445.84
35	445.0	446.02	162	446.2	448.79
60	445.5	445.73			

Precipitation and departure from normal precipitation, in inches,  
at Washington, D. C., in 1939.

Month	Recorded precipitation	Normal precipitation	Departure from normal	Accumulated de- parture from normal
January	3.41	3.55	-0.14	-0.14
February	5.71	3.27	+2.44	2.30
March	2.89	3.75	-.86	1.44
April	3.78	3.27	+.51	1.95
May	0.41	3.70	-3.29	-1.34
June	4.55	4.13	+.42	-.92
July	2.01	4.71	-2.70	-3.62
August	3.22	4.01	-.79	-4.41
September	6.90	3.24	+3.66	-.75
October	4.06	2.84	+1.22	.47
November	1.40	2.37	-.97	-.50
December	2.20	3.32	-1.12	-1.62
Year	40.54	42.16	-1.62	-1.62

#### Arlington County

Halls Hill School well.

Water levels, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	27.25	Mar. 27	22.79	June 26	23.18	Oct. 9	25.95
9	27.39	Apr. 3	22.64	July 10	23.48	16	26.13
16	27.36	10	22.52	17	23.79	24	26.26
23	27.53	17	22.62	24	23.98	31	26.10
30	25.84	24	22.28	31	24.23	Nov. 6	26.35
Feb. 6	25.72	May 1	22.08	Aug. 7	25.00	13	26.44
13	25.31	15	22.08	14	24.79	27	26.58
20	24.88	22	22.08	21	25.00	Dec. 4	26.24
27	24.77	29	22.27	28	25.21	11	26.76
Mar. 6	23.98	June 5	22.60	Sept. 4	25.46	18	27.00
13	23.60	13	22.81	Oct. 2	25.70	25	27.09
20	23.22	19	22.96				

Ross well.

Daily water level at 2:00 a.m., in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	26.04	25.92	23.25	22.40	22.58	23.35	24.06	24.82	25.47	25.84	26.08	26.26
2	26.04	25.78	23.14	22.35	22.64	23.40	24.14	24.84	25.48	25.87	26.10	26.25
3	26.05	25.61	22.98	22.50	22.62	23.48	24.19	24.85	25.51	25.87	26.12	26.24
4	26.06	25.44	22.87	22.56	22.65	23.44	24.21	24.85	25.53	25.81	26.13	26.28
5	26.07	25.21	22.69	22.61	22.67	23.50	24.22	24.90	25.52	25.79	26.12	26.29
6	26.09	25.87	22.66	22.54	22.68	23.46	24.24	24.93	25.55	25.76	26.10	26.30
7	26.10	24.61	22.84	22.53	22.65	23.59	24.26	24.95	25.53	25.75	26.10	26.32
8	26.09	24.69	22.91	22.68	22.66	23.57	24.27	24.98	25.51	25.77	26.07	26.30
9	26.11	24.59	22.65	22.52	22.63	23.52	24.29	24.99	25.56	25.78	26.08	26.33
10	26.09	24.55	22.73	22.67	22.66	23.58	24.30	25.02	25.55	25.78	26.10	26.36
11	26.09	24.45	22.74	22.57	22.76	23.62	24.34	25.07	25.60	25.77	26.06	26.38
12	26.12	24.39	22.51	22.66	22.90	23.67	24.36	25.10	25.62	25.81	26.08	26.40
13	26.15	24.15	22.45	22.84	22.96	23.74	24.37	25.10	25.63	25.84	26.09	26.38
14	26.11	23.98	22.72	22.86	22.93	23.69	24.30	25.11	25.65	25.84	26.10	26.41
15	26.17	23.86	22.71	22.62	22.90	23.78	24.41	25.13	25.65	25.89	26.11	26.43
16	26.17	24.02	22.49	22.81	22.94	23.74	24.47	25.15	25.66	...	26.12	26.43
17	26.20	23.99	22.51	22.86	22.96	23.77	24.50	25.17	25.64	25.88	26.10	26.42
18	26.19	23.72	22.47	22.68	22.97	23.83	24.49	25.19	25.71	25.93	26.10	26.45
19	26.17	23.68	22.52	22.53	23.05	23.86	24.51	25.18	25.72	25.93	26.11	26.46
20	26.22	23.56	22.33	22.62	23.03	23.85	24.56	25.22	25.71	25.93	26.13	26.45
21	26.22	23.68	22.38	22.69	23.05	23.92	24.60	25.24	25.70	23.94	26.14	26.46
22	26.20	23.53	22.22	22.66	23.02	23.89	24.61	25.27	25.73	23.92	26.15	26.48
23	26.22	23.74	22.41	22.75	23.05	23.85	24.62	25.31	25.75	23.96	26.16	26.49

## Arlington County--Continued

Ross well--Continued

Daily water level at 2:00 a. m., in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
24	26.20	23.61	22.25	22.62	23.10	23.94	24.63	25.32	25.76	26.99	26.17	26.49
25	26.14	23.71	22.20	22.54	23.25	23.95	24.66	25.34	25.77	26.02	26.19	26.49
26	26.19	23.60	22.25	22.56	23.27	24.01	24.68	25.36	25.77	26.02	26.20	26.49
27	26.14	23.61	22.27	22.51	23.26	24.05	24.69	25.38	25.79	26.02	26.21	26.50
28	26.15	23.59	22.31	22.51	23.16	24.05	24.71	25.39	25.80	26.01	26.23	26.50
29	26.13	.....	22.43	22.57	23.21	24.03	24.73	25.40	25.83	26.07	26.25	26.51
30	26.08	.....	22.43	22.54	23.29	23.99	24.75	25.42	25.83	26.07	26.25	26.52
31	25.98	.....	22.28	.....	23.32	.....	25.78	25.45	.....	26.06	.....	26.53

## Fairfax County

Bacon well.

Daily water level at 2:00 a.m., in feet below measuring point, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	18.89	17.72	15.42	15.04	15.04	16.16	17.38	18.38	19.04	19.52	19.11	18.40
2	18.87	17.62	15.18	15.03	15.07	16.23	17.45	18.41	19.07	19.52	19.13	18.39
3	18.86	17.52	15.08	15.09	15.08	16.27	17.51	18.44	19.08	19.26	19.16	18.37
4	18.86	16.85	15.06	15.12	15.08	16.29	17.59	18.46	19.11	19.12	19.17	18.41
5	18.87	16.24	15.01	15.14	15.10	16.34	17.62	18.49	19.08	19.11	19.17	18.42
6	18.85	16.27	14.99	15.14	15.12	16.36	17.64	18.54	19.03	19.10	18.77	18.43
7	18.86	16.26	15.05	15.12	15.14	16.43	17.67	18.57	19.07	19.09	18.63	18.47
8	18.85	16.47	15.13	15.18	15.16	16.48	17.69	18.54	19.09	19.11	18.57	18.45
9	18.85	16.51	15.08	15.13	15.17	16.50	17.70	18.60	19.12	19.12	18.54	18.50
10	18.83	16.56	15.07	15.19	15.19	16.55	17.73	18.63	19.15	19.13	18.52	18.49
11	18.81	16.51	15.11	15.16	15.26	16.60	17.78	18.68	19.17	19.13	18.46	18.49
12	18.83	16.29	15.04	15.20	15.34	16.66	17.83	18.71	19.20	19.14	18.46	18.54
13	18.84	16.08	14.98	15.28	15.40	16.74	17.86	18.74	19.21	19.15	18.44	18.55
14	18.81	16.00	15.04	15.33	15.41	16.75	17.88	18.76	19.22	19.15	18.43	18.55
15	18.84	15.97	15.04	15.25	15.41	16.80	17.94	18.81	19.23	19.17	18.43	18.61
16	18.84	16.00	14.94	15.32	15.43	16.83	17.99	18.83	19.24	19.18	18.40	18.63
17	18.85	16.01	14.96	15.31	15.46	16.98	18.02	18.85	19.25	19.14	18.37	18.62
18	18.85	15.85	14.97	15.22	15.49	16.94	18.04	18.88	19.30	19.10	18.36	18.64
19	18.82	15.81	15.01	15.08	15.56	16.97	18.06	18.89	19.34	19.06	18.35	18.67
20	18.85	15.77	14.96	15.08	15.60	16.98	18.10	18.83	19.34	19.03	18.35	18.67
21	18.86	15.82	14.97	15.11	15.64	17.03	18.14	18.82	19.35	19.00	18.07	18.64
22	18.85	15.78	14.96	15.11	15.66	17.07	18.16	18.83	19.36	18.97	18.06	18.64
23	18.86	15.89	15.02	15.16	15.70	17.10	18.18	18.85	19.39	18.94	18.06	18.68
24	18.86	15.88	14.99	15.13	15.75	17.14	18.20	18.87	19.41	18.95	18.06	18.69
25	18.82	15.92	14.97	15.10	15.86	17.19	18.24	18.90	19.44	18.98	18.07	18.71
26	18.83	15.91	14.98	15.12	15.90	17.25	18.28	18.92	19.45	18.98	18.09	18.71
27	18.81	15.85	15.00	15.09	15.93	17.30	18.31	18.94	19.47	19.02	18.09	18.73
28	18.83	15.86	15.00	15.06	15.94	17.33	18.33	18.96	19.49	19.08	18.37	18.75
29	18.82	.....	15.09	15.09	16.00	17.34	18.33	18.97	19.51	19.12	18.38	18.78
30	18.71	.....	15.08	15.06	16.05	17.34	18.34	18.98	19.51	19.14	18.39	18.77
31	17.97	.....	14.99	.....	16.10	.....	18.36	19.00	.....	19.14	.....	18.77

Bell well.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	5.84	Mar. 20	3.25	May 22	4.70	Aug. 14	10.60
9	6.19	27	3.38	29	5.20	21	8.09
23	5.13	Apr. 3	3.28	June 13	5.82	28	8.57
30	2.54	10	3.30	19	5.97	Sept. 4	9.37
Feb. 6	3.23	17	2.97	26	6.59	Oct. 2	2.53
13	3.22	24	3.35	July 17	8.28	9	5.89
20	3.34	May 1	3.17	24	8.83	31	7.12
27	3.09	8	3.67	31	9.06	Nov. 27	6.36
Mar. 6	2.89	15	3.69	Aug. 7	9.79	Dec. 18	6.97

## Fairfax County--Continued

## Jefferson School well.

Water level, in feet below measuring point, 1939							
Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	25.00	Mar. 13	21.22	June 5	23.33	Aug. 21	26.84
9	24.97	20	21.00	19	24.06	28	26.04
16	24.96	27	21.16	26	24.46	Oct. 2	27.24
23	24.95	Apr. 3	21.31	July 10	25.02	9	26.35
30	24.60	10	21.48	17	25.45	31	26.59
Feb. 6	23.40	17	21.64	24	25.74	Nov. 27	25.99
13	22.59	24	21.56	31	26.04	Dec. 9	26.12
20	22.03	May 15	22.08	Aug. 7	26.36	18	26.26
27	21.93	22	22.39	14	26.77	25	26.12
Mar. 6	21.31	29	22.86				

## Swart stream well.

## Daily water level at 2 a.m., in feet above assumed datum, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.97	2.07	2.20	1.98	2.02	1.84	1.79	1.74	1.68	1.88	2.03	1.77
2	1.98	2.04	2.07	2.04	1.99	1.87	1.77	1.73	1.67	1.89	1.73	1.77
3	1.97	2.30	2.03	2.00	1.98	1.87	1.76	1.72	1.66	1.88	1.76	1.77
4	1.96	2.23	2.03	2.00	1.97	1.86	1.76	1.71	1.66	1.87	1.76	1.78
5	1.96	2.06	2.03	1.98	1.96	1.85	1.77	1.71	1.92	1.85	1.77	1.78
6	1.98	2.04	2.05	1.99	1.96	1.83	1.80	1.72	1.79	1.82	2.01	1.78
7	1.96	2.12	2.09	2.06	1.95	1.81	1.78	1.72	1.78	1.79	1.86	1.76
8	1.96	2.03	2.05	2.00	1.95	1.79	1.78	1.72	1.77	1.77	1.84	1.80
9	1.96	2.02	2.04	2.00	1.94	1.89	1.77	1.73	1.75	1.77	1.81	1.83
10	1.95	2.13	2.04	2.00	1.93	1.84	1.77	1.72	1.79	1.76	1.80	1.97
11	1.95	2.52	2.03	1.98	1.93	1.82	1.75	1.70	1.77	1.75	1.81	1.97
12	1.95	2.09	2.08	2.01	1.92	1.80	1.74	1.69	1.75	1.75	1.80	1.98
13	1.95	2.05	2.16	1.98	1.91	....	1.74	1.68	1.74	1.75	1.80	1.99
14	1.96	2.04	2.03	1.96	1.93	1.92	1.75	1.68	1.71	1.77	1.77	1.79
15	1.95	2.03	2.01	1.97	1.92	1.86	1.74	1.69	1.72	1.77	1.77	1.79
16	1.95	2.17	2.15	2.29	1.93	1.86	1.72	....	1.70	1.78	1.77	1.77
17	1.97	2.05	2.02	2.11	1.92	1.79	1.72	....	1.69	1.69	1.77	1.77
18	1.97	2.05	2.00	2.23	1.92	1.79	1.71	....	1.67	1.69	1.77	1.77
19	1.97	2.04	1.99	2.08	1.91	1.82	1.74	....	1.65	1.70	1.77	1.76
20	1.96	2.05	2.00	2.03	1.91	1.82	1.72	....	1.65	1.70	1.77	1.76
21	1.96	2.03	2.00	2.01	1.91	1.81	1.78	2.35	1.64	1.70	1.75	1.87
22	1.99	2.04	2.00	2.03	1.90	1.79	1.75	1.71	1.63	1.69	1.75	1.81
23	2.00	2.01	1.99	2.00	1.90	1.87	1.75	1.72	1.62	1.74	1.75	1.81
24	1.99	2.01	1.99	1.99	1.89	1.79	1.74	1.72	1.61	1.75	1.74	1.80
25	2.04	2.00	2.00	1.99	1.87	1.78	1.73	1.72	1.61	1.77	1.75	1.79
26	1.97	2.10	2.00	2.02	1.86	1.76	1.73	1.72	1.61	1.78	1.74	1.80
27	1.96	2.08	2.00	2.15	1.86	1.76	1.72	1.71	1.61	1.82	1.74	1.80
28	1.94	2.03	1.98	2.03	1.86	1.76	1.77	1.70	1.60	1.89	1.76	1.80
29	1.95	....	1.97	2.01	1.85	1.79	1.79	1.70	1.60	2.03	1.76	1.79
30	4.10	....	1.98	2.05	1.85	1.83	1.77	1.69	2.08	2.04	1.75	1.79
31	2.30	....	2.02	....	1.85	....	1.71	1.68	....	2.09	....	1.79

## Swart well 5.

## Daily water level at 2 a.m., in feet above assumed datum, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.35	3.05	3.19	2.66	2.83	1.44	1.87	2.31	1.56	....	2.79	2.08
2	3.40	2.94	2.94	2.82	2.65	1.45	1.77	2.13	1.52	....	2.62	2.09
3	3.40	3.32	2.79	2.75	2.54	1.51	1.65	1.98	1.49	2.94	2.46	2.27
4	2.39	3.32	2.72	2.60	2.46	1.51	1.53	1.86	1.44	2.66	2.34	2.29
5	2.36	2.92	2.70	2.50	2.38	1.47	1.52	1.76	2.06	2.51	2.35	2.26
6	2.40	2.84	2.79	2.45	2.34	1.44	1.78	1.65	1.94	2.37	1.96	2.25
7	2.43	2.92	2.97	2.82	2.27	1.39	1.86	1.58	1.92	2.24	2.82	2.22
8	2.41	2.82	2.76	2.70	2.23	1.37	1.78	1.58	1.84	2.11	2.66	2.21
9	2.35	2.72	2.68	2.60	2.17	1.45	1.67	1.52	1.68	2.05	2.50	2.19
10	2.35	2.79	2.57	2.54	2.13	1.41	1.58	1.50	1.62	1.99	2.41	2.22
11	2.33	3.68	2.53	2.45	2.08	1.42	1.52	1.44	1.86	1.94	2.37	2.23

## Fairfax County--Continued

Swart well 5--Continued

Daily water level at 2 a.m., in feet above assumed datum, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
12	2.30	3.01	2.86	2.42	2.03	1.37	1.44	1.41	1.73	1.89	2.29	....
13	2.27	2.86	3.20	2.41	1.99	1.33	1.37	1.37	1.74	1.88	2.25	....
14	2.32	2.79	2.86	2.34	2.01	1.48	1.35	1.34	1.74	1.84	2.22	....
15	2.33	2.73	2.73	2.32	2.02	1.46	1.32	1.23	1.69	1.80	2.18	2.45
16	2.37	3.23	2.88	2.42	1.99	1.46	1.29	1.23	1.62	1.79	2.17	2.43
17	2.35	2.88	2.81	3.10	1.96	1.40	1.25	1.20	1.57	1.80	2.16	2.39
18	2.41	2.82	2.68	3.31	1.94	1.36	1.24	1.17	1.49	1.78	2.14	2.32
19	2.45	2.75	2.58	2.96	1.89	1.46	1.33	1.87	1.47	1.77	2.13	....
20	2.46	2.68	2.55	2.76	1.85	1.50	1.27	2.04	1.48	1.79	2.12	....
21	2.46	2.62	2.47	2.63	1.81	1.48	1.36	2.33	1.48	1.79	2.12	2.98
22	2.51	2.60	2.45	2.54	1.78	1.41	1.42	2.26	1.46	1.79	2.12	2.72
23	1.92	2.58	2.39	2.53	1.77	1.57	1.48	2.05	1.43	1.77	2.11	2.57
24	2.70	2.53	2.38	2.45	1.74	1.75	1.48	1.94	1.39	1.75	2.11	2.50
25	3.07	2.48	2.36	2.39	1.70	1.66	1.45	1.86	1.35	1.75	2.10	2.44
26	2.77	2.49	2.33	2.32	1.67	1.58	1.43	1.84	....	1.80	2.07	2.33
27	2.56	3.04	2.31	3.10	1.64	1.51	1.39	1.78	....	1.83	2.07	2.32
28	2.41	2.85	2.37	2.84	1.62	1.47	1.79	1.73	....	1.89	2.09	2.33
29	2.36	....	2.34	2.71	1.58	1.55	2.30	1.68	....	1.89	2.08	2.40
30	1.30	....	2.33	3.04	1.52	1.75	2.43	1.65	....	1.94	2.08	2.44
31	3.34	....	2.72	....	1.48	....	2.45	1.60	....	2.01	....	2.41

Water levels, in feet above assumed datum, in Swart wells 10, 35, 60, 85, 110 and 135, and weekly precipitation, in inches, recorded at the station of the United States Weather Bureau in Washington, D. C., 1939

Date	10	35	60	85	110	135	Precipitation
Jan. 3	2.55	2.87	2.94	3.79	4.66	4.81	.00
9	2.47	2.79	2.84	3.51	4.60	4.79	T
23	3.04	3.66	3.64	4.03	4.70	4.80	1.31
30	4.14	4.55	4.35	4.26	....	....	1.99
Feb. 6	3.08	3.63	3.76	4.10	....	....	1.66
13	3.01	3.63	3.82	4.08	4.74	4.78	1.24
20	2.83	3.31	3.45	4.00	4.71	4.78	.66
27	3.24	3.97	4.20	4.60	4.82	4.80	1.07
Mar. 6	3.49	3.98	4.20	4.15	4.94	....	1.65
27	2.34	2.67	2.75	3.30	4.72	4.75	1.70
Apr. 3	2.83	3.44	3.60	3.99	4.84	4.80	.88
10	2.66	3.09	2.22	3.81	4.87	4.78	.63
17	3.32	4.02	3.92	4.14	4.89	4.80	1.55
May 1	2.93	3.63	3.72	4.05	4.97	4.80	1.35
15	2.06	2.34	2.23	3.18	4.45	4.74	.23
22	1.75	2.00	1.88	2.59	4.21	4.58	.18
29	1.49	1.76	1.61	2.31	4.20	4.51	T
June 5	1.41	1.65	1.54	2.56	4.31	4.65	.44
13	1.17	1.45	1.33	2.26	4.08	4.86	2.69
19	1.48	1.60	1.56	2.97	4.49	4.74	.25
26	1.73	2.02	1.98	2.74	4.46	4.90	.41
July 10	1.74	2.21	2.23	2.71	4.40	4.92	1.11
17	1.23	1.62	1.63	1.78	4.02	4.57	.06
24	1.64	1.60	1.82	2.97	4.50	4.64	.85
31	3.06	2.87	2.90	4.23	4.79	4.88	.75
Aug. 14	1.18	1.64	1.62	1.65	4.02	4.59	.08
21	2.89	2.43	2.45	4.22	4.77	4.74	3.13
28	1.83	2.22	2.24	2.88	4.49	4.79	T
Oct. 2	2.93	2.56	2.60	3.47	4.91	4.71	9.36
9	2.26	2.78	2.81	3.31	4.66	4.88	.06
16	.93	3.25	2.06	3.02	4.42	4.86	T
23	1.83	1.91	2.04	2.99	4.39	4.82	.10
30	2.10	2.10	2.12	3.64	4.56	4.71	.44
Nov. 6	3.34	3.44	3.36	4.30	4.16	4.97	2.23
13	2.41	2.74	2.97	3.66	4.86	5.07	T
20	2.30	2.47	2.61	3.58	4.78	5.06	.07
27	2.28	2.37	2.49	3.51	4.73	5.06	.11
Dec. 4	2.50	2.54	2.61	4.00	4.86	5.08	.51
11	2.34	2.51	2.63	3.51	4.74	5.06	.08
25	2.60	2.96	3.00	3.78	4.86	5.03	1.18

## Fairfax County--Continued

Swart well 162

Daily water level at 2 a.m., in feet above assumed datum, 1939

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.48	5.46	5.64	4.87	5.11	3.98	4.40	4.55	....	4.34	5.13	4.49
2	4.52	5.31	5.48	5.17	4.94	4.09	4.22	4.39	....	4.62	4.76	4.52
3	4.51	5.52	5.36	4.88	4.84	4.21	4.12	4.27	....	5.34	4.64	4.78
4	4.50	5.68	5.28	4.74	4.73	4.21	3.98	4.17	3.80	4.97	4.60	4.63
5	4.47	5.50	5.24	4.67	4.64	4.16	4.05	4.11	4.65	4.81	4.73	4.57
6	4.56	5.40	5.21	4.61	4.57	4.04	4.41	4.02	4.43	4.69	5.60	4.54
7	4.54	5.47	5.24	5.99	4.48	3.95	4.36	3.95	4.14	4.58	5.21	4.53
8	4.48	5.22	5.12	4.87	4.42	3.90	4.24	3.86	4.06	4.50	5.05	4.51
9	4.44	5.14	5.09	4.79	4.40	4.20	4.11	3.78	3.95	4.47	4.89	4.47
10	4.42	5.29	4.98	4.72	4.38	4.21	4.01	....	3.91	4.43	4.78	4.46
11	4.41	5.61	4.92	4.61	4.34	4.17	3.89	....	4.08	4.41	4.71	4.46
12	4.39	5.47	5.22	4.78	4.33	4.04	3.81	....	4.02	4.40	4.65	4.44
13	4.36	5.35	5.41	4.63	4.30	....	3.75	....	4.03	4.41	4.62	4.44
14	4.44	5.26	....	4.56	4.50	4.32	3.71	3.62	3.97	4.38	4.59	4.39
15	4.48	5.20	....	4.55	4.44	4.27	3.85	3.57	3.91	4.34	4.58	....
16	4.48	5.45	....	5.06	4.36	4.16	3.72	3.54	3.86	4.34	4.57	....
17	4.50	5.29	....	5.26	4.32	4.03	3.66	3.52	3.78	4.33	4.56	....
18	4.61	5.26	....	5.46	4.29	3.96	3.59	3.48	....	4.33	4.55	....
19	4.62	5.17	....	5.26	4.25	4.20	3.73	4.45	3.72	4.33	4.55	4.49
20	4.58	5.10	....	5.10	4.22	4.26	3.68	4.58	3.71	4.32	4.56	4.49
21	4.54	5.02	4.86	4.96	4.21	4.20	3.80	4.98	3.70	4.29	4.56	5.05
22	4.25	4.99	4.81	5.02	4.19	4.09	4.10	4.59	3.68	4.27	4.55	4.82
23	4.93	4.94	4.76	4.83	4.27	4.34	4.24	4.38	3.65	4.26	4.55	4.70
24	4.77	4.89	4.73	4.68	4.20	4.34	4.16	4.29	3.61	4.16	4.55	4.65
25	4.94	4.86	4.68	4.58	4.14	4.19	4.08	4.24	3.58	4.16	4.54	4.59
26	4.74	4.85	4.64	4.52	4.12	4.07	4.10	4.27	3.59	4.23	4.53	4.57
27	4.59	4.25	4.58	4.38	4.09	3.97	4.00	4.20	3.53	4.23	4.51	4.57
28	4.54	5.14	4.60	5.08	4.09	3.91	4.58	4.16	3.64	4.28	4.52	4.57
29	4.49	....	4.63	5.01	4.07	4.10	4.87	4.11	3.67	4.24	4.50	4.57
30	4.59	....	4.58	5.22	4.05	4.44	4.73	4.06	3.84	4.23	4.49	4.63
31	5.68	....	5.03	....	4.02	....	4.83	4.00	....	4.48	....	4.64

## Fauquier County

Glendale Farm well. Measurements made by J. E. Johnson

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 1	15.26	Mar. 26	13.26	July 16	14.65	Oct. 8	16.91
8	15.24	Apr. 2	13.47	22	14.66	15	15.97
15	15.36	9	13.78	30	12.95	22	16.36
22	14.80	16	14.08	Aug. 6	14.08	29	16.67
29	14.92	23	13.61	13	14.96	Nov. 5	15.83
Feb. 5	8.46	30	13.26	20	14.76	12	15.59
12	8.53	May 28	14.58	27	15.06	19	15.50
19	12.86	June 11	13.13	Sept. 3	15.56	26	15.57
26	12.15	18	14.21	10	15.71	Dec. 10	15.65
Mar. 5	12.66	25	14.09	17	16.00	17	15.79
12	12.59	July 2	14.01	24	16.03	24	15.70
19	13.38	9	14.13	Oct. 1	16.40	31	15.14



## SOUTHEASTERN VIRGINIA

By D. J. Cederstrom

Periodic measurements of water levels in selected wells in southeastern Virginia were begun in 1938 in connection with a cooperative ground-water investigation by the Federal Geological Survey and the Virginia Geological Survey, Arthur Bevan, State Geologist. The area under investigation consists of that part of the Coastal Plain of Virginia lying south of the James River, and it includes eastern Chesterfield and Dinwiddie Counties and all of Prince George, Surry, Sussex, Southampton, Isle of Wight, Nansemond, Norfolk, and Princess Anne Counties.

The most productive wells tap water in Cretaceous sands, which underlie a Miocene marl in most places but which crop out along the Fall Zone. The Cretaceous sands and clays feather out at the Fall Zone but thicken eastward to about 1,600 feet at Norfolk. They lie at successively greater depths toward the east and at Norfolk are encountered in wells about 600 feet below the land surface.

Many domestic and industrial wells and some public supplies are developed from the Cretaceous sands. At Hopewell, heavy pumping for industrial purposes is taking place. In the vicinities of Franklin and Courtland, in Southampton County, and in the area bordering the James River in Sussex, Isle of Wight, and Nansemond Counties much water is being discharged from the formation through flowing wells. The daily discharge of flowing wells in the area bordering the James River is estimated to be at least 4,000,000 gallons.

In the vicinity of Norfolk some water for industrial use and for irrigation is obtained by wells, generally less than 70 feet deep, from the Miocene sand and shell formations. Throughout the State many shallow farm wells are developed in terrace formations.

Five wells were being measured periodically at the end of 1939, four of them at weekly intervals and the fifth at monthly intervals. Two of the wells are equipped with automatic water-stage recorders. A total of 90 individual measurements of water level were made in 1939.

There are many publications that deal with the ground-water resources of the area.<sup>1/</sup>

Water-level measurements are available for only a part of the year, and hence only a cursory interpretation of them can be made.

Well 36, in Chesterfield County, showed a net decline in water level of 0.62 foot from October 10 to December 31, 1939. The well is at the Fall Zone, and the water in it, which is under water-table conditions, probably fluctuates mainly in response to precipitation.

Well 56, in Prince George County, taps water under artesian pressure in Cretaceous sands. The fluctuations of water level in it are apparently caused mostly by pumping for industrial use nearby. The first measurement of water level was made May 29, near the beginning of the season of heavy pumping. The water level declined more or less steadily from that date to October 16, when the lowest stage of the year was reached--5.57 feet below the level of May 29. The water level then fluctuated irregularly until about November 6, when a rise began that lasted through the rest of the year: on December 25 it was 9.15 feet higher than on October 16 and 3.58 higher than when measurements were begun. It is believed that the water level at the end of the year was still considerably depressed by the pumping of wells nearby. Throughout the period of record it was subject to violent fluctuations that were caused apparently by short cessations of pumping from wells nearby.

The fluctuations of water level in well 51, in Prince George County, are similar to those of well 56 but are not so large.

From June 14 to November 9, the fluctuations of water level in well 42, in Prince George County, appear to reflect the rate of withdrawal at Hopewell. The progressive lowering of water level that began December 5, however, may represent the enlargement of the cone of depression about Hopewell that resulted from heavy summer pumping, or it may be the result of subnormal rainfall along the Fall Zone.

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<sup>1/</sup> See Darton, N. H., Artesian well prospects in the Atlantic Coastal Plain region: U. S. Geol. Survey Bull. 138, pp. 182-190, 1896. Darton, N. H., Norfolk Folio, Va.-N.C., Folio 80 of the U. S. Geol. Survey, 1902. Sanford, S., The underground water resources of the Coastal Plain province of Virginia: Va. Geol. Survey, Bull. V, 1913. Cederstrom, D. J., Artesian-water resources of Southampton, Sussex, and Isle of Wight Counties, Va.: Mimeographed Memo., U. S. Dept. Interior, P. N. 23837, May 14, 1938.

The precipitation in the first part of 1939 was below normal. On August 15 the maximum accumulated departure for the year was reached--2.9 inches below normal. On October 10, the first day on which well 36, in Chesterfield County, was measured, the accumulated departure was 0.1 inch above normal. Weekly rainfall was subnormal for the remainder of the year with the exception of the week ending November 7, when it was 1.9 inches above normal, and at the end of the year (December 26) an accumulated departure of -2.5 inches existed. It is believed that the effects of precipitation are reflected in the fluctuations of water level in well 36; but in the other wells, situated at considerable distances from the outcrop area of the water-bearing strata, the effects of precipitation, if present, are masked by variations in water level that are caused by pumping.

#### Chesterfield County

36. Fred Pilcher. Three miles north of Petersburg, one-half mile south of Swift Creek on United States Highway 1. Abandoned drilled well, diameter 6 inches, depth 139 feet. Measuring point, notch in base of recorder platform, 60± feet above sea level. Taps water in granitic basement rock.

Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Oct. 10	18.12	Nov. 5	18.50	Nov. 26	18.17	Dec. 17	18.63
17	18.35	12	18.17	Dec. 3	18.34	24	18.77
22	18.38	19	18.08	10	18.50	31	18.74
29	18.62						

#### Nansemond County

97. State Highway Department. One mile north from Suffolk. Jetted domestic well, diameter 2 inches, depth 560 feet. Measuring point, tee joint in stand-pipe, about 2 feet above land surface, about 5.5 feet above high tide level and about 8.5 feet above sea level. Well flows. Observations made by Virginia State Highway Department. Pressure head, in feet above measuring point, 1939: Aug. 15, 20.0; Sept. 1, 20.0; Oct. 2, 20.0; Nov. 1, 20.0.

#### Prince George County

42. Department of Justice Federal Reformatory. Lower well house, southeast of main buildings, 3 miles west of Hopewell, 5.5 miles north-east of Petersburg. Abandoned drilled well, diameter 8 inches, depth 350+ ft. Measuring point, top of casing, 0.25 foot above concrete floor which is level with land surface, and 80± feet above sea level. Measurements made by Department of Justice.

Water level, in feet below measuring point, 1939

June 14	18.15	Aug. 24	18.78	Oct. 10	18.15	Nov. 21	18.37
July 14	18.79	29	18.35	17	18.07	28	18.33
18	18.85	Sept. 6	17.50	24	18.19	Dec. 5	18.19
25	18.99	12	17.69	31	18.43	12	18.56
Aug. 1	18.47	19	18.20	Nov. 7	18.36	19	18.99
8	18.56	26	18.53	14	18.16	27	19.21
15	18.91	Oct. 3	18.56				

## Prince George County--Continued

51. Tubize-Chatillon Co. well 2. Two thousand feet south from intersection of Main St. with City Point Road, 2900 ft. southwest from main pumping station of old Dominion Water Works, Hopewell. Abandoned drilled well, diameter 8 inches, depth 263 feet. Measuring point, rim of casing about 0.25 feet above concrete floor which is about level with land surface, and 40± feet above sea level. Water level is greatly affected by nearby pumping.

## Water level, in feet below measuring point, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 27	36.99	Aug. 15	40.83	Oct. 25	40.48	Nov. 27	36.23
July 14	39.90	21	40.66	Nov. 2	40.33	Dec. 8	35.17
24	39.84	28	40.32	9	39.92	23	34.87
31	40.21	Sept. 12	40.80	16	39.79	29	34.51
Aug. 7	40.49	25	40.67				

56. Old Dominion Water Co., Hopewell. At main pumping station, 1,600 feet southeast from Hopewell and Stuart Sts. Abandoned drilled well, diameter 6 inches. Measuring point, V-shaped opening on recorder base, 2.2 feet above top of casing which is flush with land surface and 40± feet above sea level. Fluctuations of water level due to nearby pumping for industrial purposes.

## Water level, in feet below measuring point, 1939

May 29	43.84	Aug. 7	48.60	Sept. 25	49.33	Nov. 13	47.62
June 24	47.16	14	49.16	Oct. 2	47.63	20	46.39
28	47.58	21	48.86	9	49.28	27	43.10
July 3	47.62	28	45.12	16	49.41	Dec. 4	41.35
10	47.58	Sept. 4	48.79	23	49.23	11	40.75
17	47.97	11	49.14	30	49.32	18	40.39
24	47.88	18	49.32	Nov. 6	47.50	25	40.26
31	48.12						

## WASHINGTON

By A. M. Piper

During 1939, continuing records of water level at observation wells in the State of Washington were collected by the Geological Survey in connection with four cooperative projects. The purpose and status of these four projects are described in the following paragraphs.

At Tacoma, in Pierce County, the investigation to determine the feasibility of more extensive use of ground water for municipal purposes was carried far toward completion in cooperation with the Department of Public Utilities of the city. Some records of water level in wells have been given in two preliminary reports; 1/ current records will be incorporated in a forthcoming general report.

A State-wide canvass of public water supplies from wells and springs was completed in cooperation with the Department of Conservation and Development of the State of Washington. In conjunction with this canvass, a small beginning was made on a State-wide net of permanent observation wells; other wells will be added to this net as facilities permit. Records of water level from this project will be given in a separate report. 2/

In Spokane County the investigation to determine means for most effectively using the large underflow in the Spokane River Valley was continued through 1939. For this area, another report 3/ describes general features of geography, geology, and ground-water hydrology; it also describes the observation wells and gives data on water levels in observation wells through 1938. These data are unique for the Pacific Northwest in that they afford continuous records covering a term of 10 years or more for many wells. Records of water level for 1939 in 22 wells in the State of Washington are given in the following pages. These current records were collected in cooperation with the State Department of Conservation and Development and in collaboration with the Water Division of the city of Spokane and with the Washington Water Power Co.

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1/ Piper, A. M., and La Rocque, G. A., Jr., Ground water in the Tacoma area, Washington: Progress report No. 1: U. S. Geol. Survey typewritten report, 104 pp., released June 6, 1938.

La Rocque, G. A., Jr., and Piper, A. M., Ground water in the Tacoma area, Washington: Progress report No. 2: U. S. Geol. Survey typewritten report, 70 pp., released Aug. 30, 1938.

2/ La Rocque, G. A., Jr., Public water supplies from wells and springs in the State of Washington: U. S. Geol. Survey (report in preparation).

3/ Piper, A. M., and La Rocque, G. A., Jr., Water-table fluctuations in the Spokane Valley and contiguous area, Washington-Idaho: U. S. Geol. Survey, Water-Supply Paper 849 (in preparation).

The measurements were made by G. A. La Rocque, Jr., of the Geological Survey, A. H. Schafer of the Water Division of the city; and by C. E. Mells and W. E. Johnson of the power company.

In this area, water-level recorders were operated throughout 1939 on 3 wells and during a third of the year on a fourth well. In addition, float gages were maintained at 3 wells and water-level observations made weekly. In the remaining 15 observation wells, the water level was measured once in 3 weeks on the average. In all, 804 measurements of water level were made during the year, in addition to the check measurements at wells equipped with water-level recorders. At the end of the year, 21 observation wells were being maintained in the area.

Throughout 1939 the water level was somewhat lower than the average in all observation wells of the Spokane Valley; on an average, the highest water level observed in 1939 was 4.72 feet below the maximum yet recorded and the lowest water level observed was only 2.46 feet above the minimum. The following table summarizes water-level fluctuations in 1939:

Fluctuations, in feet, of water levels in 20 wells  
in the Spokane Valley, 1939

Rise of water level from autumn of 1938 to spring of 1939	
Maximum.....	12.87
Minimum.....	.15
Average.....	8.38
Decline of water level from spring to autumn of 1939	
Maximum.....	12.99
Minimum.....	1.64
Average.....	9.55
Net decline from autumn of 1938 to autumn of 1939	
Maximum.....	2.52
Minimum.....	.08
Average.....	1.16

In the basin of the South Fork of the Palouse River, in Whitman County, Wash., and Latah County, Idaho, the observation-well program initiated by the Soil Conservation Service in 1934 was continued in 1939 through cooperation between the Geological Survey, the Soil Conservation Service, and the Flood Control Coordinating Committee. Water-level measurements were continued throughout 1939 at all 37 water-table wells that had been under observation in the basin on December 31, 1938. Of these, 27 wells are in Whitman. Water-level records for these 27 wells are given on the following pages. A total of 1,022 water-level measurements were made during the year by or under the direction of E. Z. Gray of the Geological Survey. A water-level recorder was operated throughout the year on well 23 A. In addition, water-level measurements were made weekly in 8

wells, monthly in 6 wells, and weekly or monthly in the 12 wells on the Soil Erosion Experiment Station farm. Water-level measurements were continued also in the 3 observation wells in Whitman County that tap confined (artesian) water. At these wells, in which water levels were measured twice a month throughout the year, 65 measurements were made.

The range in water level during 1939 in all 27 water-table wells of the area was greater than the average. In 7 wells the water level rose higher and in 6 wells fell lower than any stage heretofore observed in those particular wells; in 2 wells both new maximum and new minimum water levels occurred during the year. The following table summarizes these fluctuations:

Summary of observed water-level changes, in feet, in water-table observation wells in Whitman County, 1939				
Well	Highest level, spring of 1939		Lowest level, autumn of 1939	
	Rise since autumn of 1938	Net rise (+) or decline (-) from high level of 1938	Decline since spring of 1939	Net rise (+) or decline (-) from low level of 1938
1	4.82	a +0.69	4.97	b -0.15
6	....	-1.49	....	....
11	4.45	a +.32	5.37	b -.92
17	7.36	a +.22	7.43	-.07
18	7.95	-1.31	7.92	+.03
19	6.47	(a)	6.51	-.04
21	4.30	.00	4.30	.00
23	6.31	+.16	6.19	+.12
23A	6.02	-.16	6.00	+.02
35	5.46	-2.63	5.46	.00
37	3.98	-.17	3.24	+.74
38	12.80	-.30	12.55	+.25
47	5.84	a +.53	5.68	+.16
51	3.03	-.63	2.26	+.77
54	3.81	-1.37	4.11	b -.30
Average	5.90	-0.41	5.86	+0.04
3N	1.72	-2.28	2.35	-0.63
2N	5.60	a +.63	5.02	+.58
1N	9.19	a +.46	9.14	+.05
1E	5.11	+2.01	5.13	-.02
3E	11.91	+.69	12.09	-.18
4E	3.35	-.32	4.18	-.83
5E	11.63	-1.75	12.66	b -1.03
1S	4.63	+1.69	4.50	+.13
2S	4.69	+2.11	4.62	+.07
3S	9.02	-.74	9.28	-.26
4S	1.89	-.12	3.12	-1.23
5S	2.77	-3.51	4.11	b -1.34
Average	5.96	-0.09	6.35	-0.39

In the three artesian observation wells, on the other hand, the water level fluctuated less widely and continued its downward trend. The following table summarizes the three records:

- a Rose to highest level on record.  
b Declined to lowest level on record.

Summary of observed water-level changes, in feet,  
in artesian observation wells in Whitman County, 1939

Well	Highest level, spring of 1939		Lowest level, autumn of 1939	
	Rise since autumn of 1938	Net decline (-) from high level of 1938	Decline since spring of 1939	Net rise (+) or decline (-) from low level of 1938
14/45-4N1	1.37	-0.85	1.83	-0.46
14/45-5B1	.62	-.87	2.08	-1.46
14/45-6D2	1.03	-.82	2.02	a -.99
Average	1.01	-0.85	1.98	-0.97

## Spokane County

## Spokane Valley

25/42-13B1. Washington Water Power Co. Well 90. Empire Ice and Shingle Co. Local datum, 1,700 feet above preliminary sea-level datum.

## Water level, in feet above a local datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 21	39.53	Apr. 27 b	45.65	July 3	b 42.10	Oct. 9	b 38.85
Feb. 17	40.63	May 25	b 47.34	25	b 39.75	Nov. 21	39.00
Mar. 2	40.15	June 8	b 44.72	Sept. 18	b 39.08	Dec. 11	b 37.41
Apr. 5 b	42.97						

25/43-11G1. Owner's well 1. City of Spokane, Water Division. Local datum, 1,800 feet above city datum and 1,783.44 feet above sea-level datum of 1929. Except as indicated by foot note, water levels are from float-gage readings by city Water Division, ordinarily at 8:00 a.m. Water level depressed somewhat by continuous withdrawal from adjacent well.

## Water level, in feet above a local datum, 1939

Jan. 2	89.76	Apr. 3	99.10	July 3	91.73	Oct. 3	90.87
9	90.10	10	99.18	10	90.40	9	90.04
16	91.00	17	99.30	17	89.60	16	90.60
21 c	91.10	24	100.70	24	89.60	23	89.72
23	91.30	27 c	101.12	25	c 89.55	30	89.60
30	91.10	May 1	101.43	31	89.05	Nov. 6	89.38
Feb. 6	91.40	8	102.18	Aug. 7	90.09	13	89.75
13	92.72	15	100.53	14	90.14	20	89.38
20	91.83	22	99.40	21	90.35	27	89.45
27	91.00	29	95.22	28	90.14	Dec. 4	89.65
Mar. 3 c	91.23	June 5	93.70	Sept. 4	90.09	11	89.84
6	90.93	9 c	92.77	11	90.51	11 c	89.56
13	91.53	12	93.30	17 c	90.04	18	89.41
20	92.13	19	92.90	18	89.91	26	89.73
27	97.26	26	91.60	25	89.98		

25/43-11G2. Owner's well 2. City of Spokane, Water Division. Local datum, 1,800 feet above city datum and 1,783.44 feet above sea-level datum of 1929. Except as indicated by foot note, water levels are from float-gage readings by city Water Division, ordinarily at 8:00 a.m. Water level depressed somewhat by continuous withdrawal from adjacent well.

## Water level, in feet above a local datum, 1939

Jan. 2	89.85	Apr. 3	99.17	July 3	91.82	Oct. 3	90.95
9	90.20	10	99.95	10	90.30	9	90.13
16	91.12	17	99.43	17	90.00	16	90.27
21 c	91.21	24	100.83	24	89.58	23	89.85
23	91.40	27 c	101.28	25	bc 89.73	30	89.70
30	91.30	May 1	101.63	31	90.18	Nov. 6	89.50
Feb. 6	91.48	8	102.36	Aug. 7	90.25	13	89.88
13	92.78	15	100.69	14	90.30	20	89.40
20	91.93	22	99.60	21	90.52	27	89.60
27	91.10	29	95.36	28	90.29	Dec. 4	89.85
Mar. 2 c	91.33	June 5	93.72	Sept. 4	90.30	11	90.00
6	91.30	9 c	92.87	11	90.67	11 bc	88.67
13	91.72	12	93.45	17 c	90.21	18	90.12
20	92.27	19	93.00	18	90.09	26	89.84
27	97.36	26	91.74	25	90.11		

a Declined to lowest level on record.

b Pump operating in well.

c Measurement by Geological Survey.



## Spokane County--Continued

25/43-11G3. Owner's well 3. City of Spokane, Water Division. Local datum, 1,800 feet above city datum and 1,783.44 feet above sea-level datum of 1929. Except as indicated by footnote, levels are from float-gage readings by city Water Division, ordinarily at 8:00 a.m. Water level depressed somewhat by continuous withdrawal from adjacent well.

Water level, in feet above a local datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 2	89.48	Apr. 3	99.39	July 2	91.95	Oct. 3	91.11
9	90.33	10	100.10	10	90.31	9	90.29
16	91.25	17	99.58	17	90.17	16	90.40
21 a	91.35	24	100.94	24	89.82	23	89.93
23	91.53	27 a	101.42	25 ab	89.77	30	89.85
30	91.40	May 1	101.80	31	90.30	Nov. 6	90.63
Feb. 6	91.62	8	102.48	Aug. 7	90.37	13	90.00
13	92.94	15	100.84	14	90.43	20	89.60
20	92.08	22	99.70	21	90.64	27	89.70
27	91.23	29	95.48	28	90.40	Dec. 4	89.96
Mar. 3 a	91.46	June 5	93.44	Sept. 4	90.39	11	90.13
6	91.18	9 a	93.01	11	90.79	11 a	89.75
13	91.61	12	93.58	17 a	90.34	18	90.25
20	92.38	19	93.15	18	90.18	26	89.98
27	97.50	26	91.86	25	90.25		

25/43-11G4. Owner's well 4. City of Spokane, Water Division. Local datum, 1,800 feet above city datum and 1,783.44 feet above sea-level datum of 1929. Water level depressed moderately by continuous withdrawal from this well or adjacent wells, or both.

Water level, in feet above a local datum, 1939

Date	Water level	Date	Water level	Date	Water level
Jan. 21	90.82	June 9	91.63	Sept. 17	89.49
Mar. 3	90.27	July 25	87.83	Dec. 11	90.14
Apr. 27	100.18				

25/43-11G5. Owner's well 5. City of Spokane, Water Division. Local datum, 1,800 feet above city datum and 1,783.44 feet above sea-level datum of 1929. Water level depressed moderately by continuous withdrawal from this well or adjacent wells, or both.

Water level, in feet above a local datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 21	91.76	Apr. 27	99.25	July 25	87.33	Dec. 11	90.41
Mar. 3	91.02	June 9	92.80	Sept. 17	88.87		

25/43-11G6. Owner's "gage well" 1. City of Spokane, Water Division. Local datum, 1,800 feet above city datum and 1,783.44 feet above sea-level datum of 1929. Water level usually depressed somewhat by continuous withdrawal from adjacent wells.

Daily noon water level, in feet above a local datum, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	91.57	92.79	92.80	99.79	102.78	96.90	93.03	91.85	92.09	92.24	91.28	91.06
2	91.37	92.67	92.57	99.91	103.05	96.32	93.00	91.84	92.08	91.87	91.45	91.56
3	91.84	92.72	92.70	100.36	103.24	95.04	93.47	91.77	92.33	92.12	91.10	91.32
4	91.28	92.68	92.56	100.57	103.74	95.64	93.50	91.81	92.23	91.92	91.15	91.40
5	91.50	92.62	92.41	100.98	103.88	95.57	93.24	91.82	92.20	91.95	91.13	91.69
6	91.51	92.67	92.38	101.05	103.76	96.64	93.13	91.88	92.30	91.85	91.16	91.47
7	91.80	92.80	92.48	101.03	103.74	96.35	92.66	91.81	92.33	92.11	91.08	91.72
8	91.76	92.59	92.74	101.01	103.39	95.24	92.30	91.82	92.11	91.99	91.18	91.48
9	91.74	92.99	92.60	101.06	103.19	94.79	92.03	91.79	92.03	92.00	91.05	91.60
10	.....	93.16	92.38	100.89	103.02	94.84	91.70	91.84	92.03	91.99	91.12	91.80
11	.....	93.57	92.52	100.81	102.69	95.14	91.78	91.82	92.60	91.95	91.01	91.62
12	.....	93.44	92.68	101.09	102.41	95.19	92.01	91.75	92.33	91.92	91.08	91.76
13	.....	93.95	92.97	100.79	102.37	94.69	91.93	91.82	92.28	91.78	91.23	91.46
14	.....	93.96	93.33	100.97	102.31	94.22	91.89	91.88	92.28	91.58	91.12	91.62

a Measured by Geological Survey.

b Pump operated well.

## Spokane County--Continued

25/43-1106.--Continued

Daily noon water level, in feet above a local datum, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
15	.....	94.04	93.22	100.89	101.86	94.12	91.35	91.90	92.63	92.11	90.98	91.70
16	.....	93.81	93.13	100.77	101.94	94.43	91.73	91.94	92.11	92.06	91.06	91.73
17	92.64	93.84	93.30	100.61	101.95	94.93	91.68	91.90	92.03	91.74	90.91	91.69
18	92.64	93.39	93.18	100.37	102.09	94.98	91.81	91.92	91.93	91.66	91.03	91.58
19	92.64	93.53	93.21	100.74	101.66	94.78	91.68	91.92	91.78	91.85	90.97	91.57
20	92.64	93.36	93.49	100.83	101.15	94.58	91.74	92.09	91.73	91.90	90.89	91.54
21	92.70	93.09	94.04	100.89	101.47	94.22	91.74	91.98	91.70	91.99	90.99	91.66
22	92.49	92.66	94.46	101.21	101.26	93.72	91.73	91.95	91.62	91.90	90.95	91.56
23	92.66	92.77	94.98	101.71	101.10	94.08	91.69	92.00	91.71	91.79	91.00	91.56
24	92.64	92.50	95.97	.....	100.50	93.83	91.78	91.98	91.62	91.86	90.97	91.42
25	92.45	92.50	96.66	.....	100.20	93.87	91.82	91.95	91.64	91.92	91.07	91.36
26	92.75	92.55	97.48	102.17	99.94	93.50	91.78	91.96	91.69	91.83	91.31	91.50
27	92.71	92.59	98.18	102.37	99.68	93.08	91.75	92.05	91.74	91.42	90.99	91.45
28	92.83	92.42	98.74	102.06	99.70	92.84	91.84	91.99	91.91	91.30	91.12	91.69
29	92.74	.....	98.88	102.52	97.27	92.58	91.88	92.02	91.85	91.35	91.18	91.66
30	92.70	.....	99.33	102.72	97.61	92.66	91.85	91.98	91.84	91.59	91.05	91.38
31	92.73	.....	99.44	.....	97.47	.....	91.80	91.98	.....	91.49	.....	91.40

25/43-11K. Owner's "gage well" 2. City of Spokane, Water Division.  
Local datum, 1,800 feet above city datum and 1,783.44 feet above sea-level datum of 1929. Water level usually depressed slightly by continuous withdrawal from adjacent wells.

Daily noon water level, in feet above a local datum, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	92.79	93.87	93.87	100.12	103.40	98.48	94.77	93.60	93.73	93.31	92.59	92.37
2	92.76	93.85	93.81	100.31	103.65	97.95	94.65	93.59	93.75	93.36	92.66	92.74
3	92.81	93.86	93.81	100.68	103.82	96.77	94.84	93.56	93.89	93.28	92.56	92.64
4	92.75	93.81	93.82	100.96	104.10	97.06	94.80	93.57	93.86	93.36	92.49	92.70
5	92.77	93.81	93.70	101.24	104.23	97.05	94.74	93.59	93.79	93.28	92.55	92.87
6	92.90	93.84	93.67	101.42	104.30	97.53	94.68	93.58	93.84	93.32	92.52	92.73
7	92.98	93.88	93.79	101.53	104.25	97.48	94.53	93.56	93.81	93.31	92.50	92.85
8	92.96	93.83	93.82	101.55	104.08	96.76	94.21	93.57	93.74	93.25	92.52	92.74
9	93.02	94.08	93.84	101.54	103.88	96.23	93.97	93.57	93.68	93.22	92.48	92.84
10	93.16	94.15	93.74	101.48	103.71	96.22	93.76	93.57	93.67	93.22	92.48	92.84
11	93.22	94.48	93.77	101.44	103.48	96.50	93.79	93.55	93.87	93.19	92.44	92.82
12	93.15	94.48	93.89	101.51	103.32	96.50	93.93	93.53	93.76	93.08	92.38	92.75
13	93.22	94.84	94.04	101.43	103.17	96.22	93.87	93.52	93.68	93.12	92.60	92.83
14	93.56	94.88	94.32	101.44	103.05	95.91	93.79	93.60	93.76	93.13	92.43	92.78
15	93.40	94.87	94.34	101.39	102.82	95.66	93.49	93.61	93.83	93.16	92.35	92.88
16	.....	94.86	94.32	101.31	102.75	95.80	93.55	93.63	93.63	93.17	92.41	92.90
17	93.73	94.75	94.21	101.27	102.66	96.15	93.55	93.61	93.54	93.10	92.36	92.84
18	93.76	94.52	94.32	101.21	102.62	96.19	93.63	93.64	93.45	93.08	92.31	92.84
19	93.77	94.52	94.32	101.29	102.43	96.10	93.56	93.65	93.38	93.08	92.34	92.79
20	93.78	94.47	94.55	101.41	102.18	95.83	93.60	93.71	93.32	93.18	92.31	92.77
21	93.82	94.19	94.94	101.55	102.10	95.66	93.57	93.69	93.30	93.18	92.34	92.79
22	93.66	93.92	95.27	101.84	101.93	95.47	93.58	93.66	93.24	93.10	92.24	92.79
23	93.80	93.90	95.82	102.18	101.72	95.49	93.53	93.69	93.31	93.00	92.33	92.71
24	93.80	93.82	96.55	102.44	101.43	95.45	93.61	93.70	93.23	93.14	92.31	92.68
25	93.79	93.82	97.23	102.70	101.19	95.42	93.59	93.68	93.21	93.10	92.33	92.60
26	93.86	93.80	97.90	102.88	100.95	95.20	93.57	93.68	93.23	93.02	92.44	92.68
27	93.84	93.81	98.55	102.93	100.74	94.94	93.55	93.71	93.27	92.79	92.37	92.70
28	93.87	93.75	99.08	102.90	100.57	94.83	93.58	93.69	93.39	92.73	92.41	92.78
29	93.85	.....	99.38	103.00	98.81	94.61	93.63	93.72	93.26	92.72	92.45	92.82
30	93.86	.....	99.69	103.19	98.97	94.58	93.65	93.69	93.45	92.73	92.41	92.67
31	93.84	.....	99.90	.....	98.84	.....	93.59	93.75	.....	92.78	.....	92.63

25/43-14K1. Washington Water Power Co. well 3. Ohio Match Co. Local datum, 1,800 feet above preliminary sea-level datum.

Water level, in feet above local datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 21	83.23	Apr. 27	91.17	July 3	84.98	Oct. 9	83.26
Feb. 17	84.13	May 25	90.84	25	83.70	Nov. 21	82.14
Mar. 3	83.35	June 8	87.17	Sept. 18	83.49	Dec. 11	81.92
Apr. 5	88.89						

## Spokane County--Continued

25/43-17D1. Washington Water Power Co. well 88. New Method Laundry. Local datum, 1,900 feet above preliminary sea-level datum.

Water level, in feet above local datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 21	63.50	Apr. 27	69.52	July 3	65.36	Oct. 9	63.89
Feb. 17	63.84	May 25	a 68.56	25	64.83	Nov. 21	62.59
Mar. 3	63.60	June 8	66.59	Sept. 18	64.71	Dec. 11	62.34
Apr. 5	66.63						

25/44-2B1. Washington Water Power Co. well 49. Trentwood Irrigation District. Local datum, 1,900 feet above preliminary sea-level datum.

Water level, in feet above a local datum, 1939

Jan. 20	36.75	Apr. 27	a 42.77	July 3	a 40.48	Oct. 9	a 36.58
Feb. 17	37.41	May 25	a 45.29	25	a 38.67	Nov. 21	a 36.01
Mar. 2	a 36.41	June 8	a 43.10	Sept. 16	a 38.22	Dec. 11	a 35.81
Apr. 6	41.21						

25/44-10Q1. Washington Water Power Co. well 19. Jerry Mossell. Local datum, 1,900 feet above preliminary sea-level datum.

Water level, in feet above a local datum, 1939

Jan. 20	28.27	Apr. 5	32.85	June 8	33.27	Sept. 18	29.09
Feb. 17	29.19	27	35.17	July 3	30.97	Oct. 9	(b)
Mar. 2	28.53	May 25	36.17	25	29.43		

25/44-15E1. Washington Water Power Co. well 15. Modern Electric Water Co. well 5. Local datum, 1,900 feet above preliminary sea-level datum. One or more of three pumps operating in well at time of each water-level measurement.

Water level, in feet above a local datum, 1939

Jan. 20	21.32	Apr. 27	27.05	July 3	21.45	Oct. 9	21.98
Feb. 17	21.99	May 25	26.60	25	19.34	Nov. 21	20.28
Mar. 2	21.51	June 8	27.37	Sept. 15	22.12	Dec. 11	20.10
Apr. 5	24.79						

25/44-19D1. Washington Water Power Co. well 5. Edgecliff Sanitarium. Local datum, 1,800 feet above preliminary sea-level datum.

Daily noon water level, in feet above a local datum, 1939  
(from recorder charts)

Jan. 17	82.27	Feb. 14	82.96	Mar. 13	82.66	Apr. 9	87.57
18	82.31	15	83.02	14	82.69	10	87.72
19	82.35	16	83.08	15	82.74	11	87.86
20	82.38	17	83.12	16	82.79	12	87.97
21	82.41	18	83.14	17	82.81	13	88.06
22	82.43	19	83.14	18	82.85	14	88.15
23	82.44	20	83.13	19	83.87	15	88.22
24	82.46	21	83.11	20	82.90	16	88.27
25	82.47	22	83.08	21	82.95	17	88.32
26	82.50	23	83.02	22	83.04	18	88.37
27	82.52	24	82.97	23	83.15	19	88.40
28	82.54	25	82.93	24	83.31	20	88.45
29	82.55	26	82.89	25	83.52	21	88.51
30	82.56	27	82.86	26	83.77	22	88.58
31	82.57	28	82.84	27	84.06	23	88.69
Feb. 1	82.59	Mar. 1	82.81	28	84.38	24	88.82
2	82.60	2	82.79	29	84.72	25	88.98
3	82.60	3	82.76	30	85.03	26	89.14
4	82.61	4	82.74	31	85.34	27	c 89.30
5	82.61	5	82.73	Apr. 1	85.62	May 25	a 90.13
6	82.62	6	82.71	2	85.87	June 8	87.54
7	82.63	7	82.69	3	86.15	July 3	84.93
8	82.63	8	82.68	4	86.40	25	a 83.53
9	82.64	9	82.67	5	86.66	Sept. 15	83.55
10	82.65	10	82.65	6	86.91	Oct. 9	82.73
11	82.71	11	82.63	7	87.16	Nov. 21	80.94
12	82.79	12	82.64	8	87.39	Dec. 11	81.94
13	82.87						

a Pump operating in well.

b Measurements discontinued.

c Water-level recorder removed.

## Spokane County--Continued

25/44-21J1. Washington Water Power Co. well 17. Modern Electric Water Co. well 3. Local datum, 1,900 feet above preliminary sea-level datum and 1,895.86 feet above sea-level datum of 1929.

Water level, in feet above a local datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 20	22.52	Apr. 27	28.29	July 3	a 21.71	Oct. 9	23.40
Feb. 17	23.15	May 25	a 26.23	25	a 20.92	Nov. 21	21.92
Mar. 2	23.68	June 8	28.77	Sept. 16	23.99	Dec. 11	21.67
Apr. 5	25.42						

25/44-23D1. Lewis A Lewis. Local datum 1,900 feet above sea-level datum of 1929.

Water level, in feet above a local datum, 1939

Jan. 20	24.74	Apr. 27	31.13	July 3	28.20	Oct. 9	25.40
Feb. 17	25.70	May 26	32.81	25	a 26.02	Nov. 21	23.92
Mar. 2	25.65	June 8	30.72	Sept. 16	26.05	Dec. 11	23.76
Apr. 5	28.45						

25/45-10C1. Washington Water Power Co. well 41. W. C. Lielman. Local datum, 1,900 feet above preliminary sea-level datum.

Water level, in feet above a local datum, 1939

Jan. 20	59.14	Apr. 26	66.22	July 3	64.01	Oct. 9	59.39
Feb. 17	59.86	May 26	68.09	25	62.18	Nov. 21	56.71
Mar. 2	58.29	June 7	66.42	Sept. 15	60.89	Dec. 11	56.39
Apr. 5	64.47						

25/45-16C1. Washington Water Power Co. well 38. Inland Empire Paper Co. Local datum, 1,900 feet above preliminary sea-level datum.

Daily noon water level, in feet above local datum, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	52.10	.....	.....	54.33	59.00	61.02	57.68	55.61	55.01	53.60	51.91	50.58
2	52.05	.....	52.31	54.54	59.21	60.88	57.59	55.57	55.01	53.53	51.83	50.56
3	52.01	.....	52.29	54.75	59.38	60.73	57.50	55.54	55.01	53.45	51.78	50.54
4	51.99	.....	52.28	54.97	59.59	60.55	57.43	55.51	55.02	53.40	51.73	50.53
5	51.96	.....	52.25	55.20	59.79	60.40	57.38	55.48	55.03	53.34	51.68	50.51
6	51.93	.....	52.22	55.41	60.00	60.27	57.33	55.45	55.02	53.28	51.62	50.50
7	51.91	.....	52.19	55.62	60.18	60.18	57.26	55.41	55.01	53.23	51.56	50.48
8	51.90	.....	52.17	55.82	60.35	60.09	57.19	55.38	54.99	53.17	51.52	50.48
9	51.88	.....	52.14	56.01	60.49	59.95	57.10	55.35	54.98	53.10	51.48	.....
10	51.86	.....	52.11	56.16	60.62	59.81	57.00	55.31	54.96	53.04	51.43	.....
11	51.87	.....	52.09	56.31	60.72	59.68	56.90	55.28	54.93	52.98	51.37	50.43
12	51.88	.....	52.05	56.44	60.82	59.58	56.81	55.25	54.91	52.91	51.33	.....
13	51.89	.....	52.06	56.56	60.92	59.49	56.73	55.22	54.88	52.86	51.29	.....
14	51.93	.....	52.09	56.69	61.00	59.36	56.64	55.19	54.86	52.80	51.24	.....
15	51.96	.....	52.12	56.80	61.08	59.24	56.56	55.17	54.84	52.75	51.18	.....
16	.....	.....	52.14	56.90	61.14	59.11	56.46	55.15	54.82	52.69	51.14	.....
17	.....	.....	52.16	57.00	61.20	59.01	56.38	55.13	54.79	52.64	51.09	.....
18	.....	.....	52.17	57.10	61.27	58.92	56.30	55.11	54.73	52.59	51.06	.....
19	.....	.....	52.18	57.19	61.32	58.85	56.23	55.10	54.64	52.53	51.01	.....
20	.....	.....	52.21	57.29	61.37	58.77	56.16	55.08	54.54	52.48	50.97	.....
21	.....	.....	52.26	57.41	61.42	58.68	56.09	55.07	54.45	52.43	50.92	.....
22	.....	.....	52.33	57.51	61.44	58.60	56.03	55.07	54.34	52.38	50.88	.....
23	.....	.....	52.42	57.66	61.46	58.52	55.98	55.07	54.25	52.34	50.85	.....
24	.....	.....	52.58	57.83	61.47	58.42	55.92	55.06	54.15	52.29	50.82	.....
25	.....	.....	52.75	58.00	61.48	58.33	55.87	55.05	54.07	52.26	50.78	.....
26	.....	.....	52.94	58.18	61.48	58.22	55.83	55.05	53.99	52.22	50.74	.....
27	.....	.....	53.19	58.34	61.47	58.13	55.79	55.04	53.91	52.17	50.70	.....
28	.....	.....	53.42	58.51	61.45	58.03	55.75	55.04	53.82	52.09	50.67	.....
29	.....	.....	53.67	58.67	61.36	57.93	55.71	55.03	53.76	52.04	50.64	.....
30	.....	.....	53.90	58.83	61.24	57.80	55.68	55.03	53.68	52.00	50.61	.....
31	.....	.....	54.12	.....	61.13	.....	55.65	55.02	.....	51.96	.....	.....

a Pump operating in well.

## Spokane County--Continued

25/45-18A1. Washington Water Power Co. well 40. C. B. Nilson.  
Local datum, 1,900 feet above preliminary sea-level datum.

Water level, in feet above a local datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 20	a 46.33	Apr. 27	53.03	July 5	51.70	Oct. 9	47.38
Feb. 17	47.50	May 26	55.88	25	50.17	Nov. 21	45.38
Mar. 2	a 47.18	June 8	54.30	Sept. 18	49.02	Dec. 11	45.21
Apr. 5	50.10						

26/43-19A1. Country Homes Estates. Local datum, 1,750 feet above sea-level datum of 1929.

Water level, in feet above a local datum, 1939

Jan. 21	48.64	Apr. 27	a 48.55	July 5	a 48.71	Oct. 9	a 48.93
Feb. 17	48.33	May 25	a 48.01	25	a 48.78	Nov. 21	a 48.61
Mar. 3	a 48.40	June 8	a 48.61	Sept. 18	a 47.14	Dec. 11	a 48.46
Apr. 5	a 48.51						

26/43-34P1. Washington Water Power Co. well 80. Great Northern Railway Co. Local datum, 1,800 feet above preliminary sea-level datum. Measurements made by owner with chain gage.

Water level, in feet above a local datum, 1939

Jan. 3	56.62	Mar. 15	57.37	June 14	59.37	Sept. 20	55.87
11	56.62	27	56.87	30	58.37	Oct. 7	54.62
20	56.87	Apr. 3	58.87	July 8	57.62	24	55.37
26	56.87	14	60.20	15	57.37	Nov. 2	54.87
Feb. 2	56.87	22	61.37	22	56.87	14	54.87
13	56.87	May 6	60.62	Aug. 5	57.04	25	54.87
20	56.12	13	61.37	21	55.87	Dec. 8	54.87
25	56.87	20	61.37	26	55.87	22	54.87
Mar. 4	57.37	June 5	60.37	Sept. 9	55.87		

26/44-32R1. Washington Water Power Co. well 46. Hutton Settlement. Local datum, 1,850 feet above preliminary sea-level datum.

Water level, in feet above a local datum, 1939

Jan. 21	51.80	Apr. 27	57.28	July 5	57.71	Oct. 9	53.49
Feb. 17	52.22	May 25	a 58.62	25	56.09	Nov. 21	51.60
Mar. 3	51.93	June 8	59.84	Sept. 18	54.78	Dec. 11	51.39
Apr. 5	51.87						

## Whitman County

## Palouse River area

## Water levels in water-table wells

## 1. T. Griffin.

Water level, in feet above an assumed datum, 1939

Jan. 4	8.90	Mar. 22	12.69	June 7	9.93	Oct. 28	8.36
12	8.90	29	12.07	26	9.77	Nov. 4	8.32
17	8.91	Apr. 5	11.56	July 13	9.59	11	8.34
23	9.12	12	11.28	24	9.36	18	8.29
Feb. 2	8.92	19	11.06	31	9.15	25	8.31
10	8.82	May 26	10.78	Aug. 7	8.92	Dec. 2	8.31
16	11.08	3	10.55	14	8.70	11	8.49
23	10.87	10	10.29	21	8.52	16	8.78
Mar. 2	10.79	17	10.11	Sept. 24	8.30	21	8.61
9	10.75	24	10.06	Oct. 22	8.27	29	8.48
17	13.24	31	9.97				

## 2. A. Luck. No measurements made in 1939.

a Pump operating in well.

## Whitman County--Continued

## 6. Mr. O'Donnel.

Water level, in feet above an assumed datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	(a)	Mar. 23	10.33	June 6	5.18	Oct. 28	(a)
10	(a)	30	10.30	27	4.28	Nov. 4	(a)
16	(a)	Apr. 4	10.46	July 14	3.60	11	(a)
23	(a)	11	10.85	22	3.25	18	(a)
30	(a)	18	11.07	28	3.08	25	(a)
Feb. 6	(a)	25	10.08	Aug. 4	2.82	Dec. 4	(a)
17	4.34	May 2	8.97	11	2.77	11	(a)
23	5.15	9	7.61	18	(a)	16	(a)
Mar. 3	5.22	16	6.65	Sept. 3	(a)	22	(a)
9	6.77	23	6.02	Oct. 15	(a)	29	(a)
16	8.60	30	5.53				

## 11. Federal Geological Survey.

Water level, in feet above an assumed datum, 1939

Jan. 4	7.72	Mar. 28	10.44	June 6	8.90	Oct. 28	6.32
12	7.75	Apr. 4	10.10	26	8.51	Nov. 4	6.43
24	7.98	11	9.95	July 13	8.05	11	6.64
31	8.05	18	9.94	22	7.64	18	6.65
Feb. 7	8.17	25	9.72	28	7.30	25	6.79
14	8.50	May 2	9.53	Aug. 4	7.05	Dec. 4	6.88
21	9.92	9	9.34	11	6.79	11	6.91
28	9.77	16	9.19	18	6.51	16	7.16
Mar. 7	9.77	23	9.08	Sept. 3	6.23	22	7.20
14	10.37	30	8.97	Oct. 15	6.00	29	7.17
21	11.37						

## 17. Northern Pacific Railway.

Water level, in feet above an assumed datum, 1939

Jan. 4	9.05	Mar. 29	14.98	June 7	10.06	Oct. 28	8.73
11	9.08	Apr. 5	13.06	26	9.82	Nov. 4	8.73
25	9.12	12	11.58	July 13	9.52	11	8.77
Feb. 1	9.14	19	11.07	24	9.34	18	8.72
8	9.17	26	10.80	31	9.24	25	8.72
15	9.70	May 3	10.59	Aug. 7	9.17	Dec. 2	8.69
22	12.07	10	10.46	14	9.09	11	8.78
Mar. 1	12.36	17	10.32	21	9.00	16	8.84
8	11.93	24	10.25	Sept. 10	8.83	21	8.87
15	15.88	31	10.14	Oct. 22	8.71	30	8.88
22	16.12						

## 18. F. Druffel.

Water level, in feet above an assumed datum, 1939

Jan. 25	8.90	Apr. 28	12.54	July 13	8.40	Oct. 15	5.77
Feb. 22	11.46	May 24	11.18	Aug. 14	6.57	Dec. 16	7.08
Mar. 29	13.59	June 26	9.83	Sept. 10	5.67		

## 19. A. Shriver. Correction: Water level Dec. 11, 1935, 8.33 feet.

Water level, in feet above an assumed datum, 1939

Jan. 24	10.33	Apr. 24	13.58	July 15	10.15	Oct. 22	8.25
Feb. 22	14.34	May 24	12.26	Aug. 14	8.91	Dec. 18	8.51
Mar. 27	14.76	June 26	11.13	Sept. 10	8.44		

## 20A. W. Benedict. Correction: Water level May 23, 1938, 10.63 feet.

a Well dry.

## Whitman County--Continued

21. J. E. Wood.

Water level, in feet above an assumed datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	8.12	Mar. 24	10.99	June 6	8.37	Oct. 28	7.82
13	8.09	29	10.81	26	8.19	Nov. 4	7.85
20	8.12	Apr. 5	10.54	July 15	8.02	11	7.86
27	8.09	14	10.27	24	7.96	18	7.88
Feb. 1	8.10	19	10.15	31	7.87	25	7.91
11	8.15	26	9.98	Aug. 7	7.83	Dec. 2	7.92
17	8.89	May 3	9.75	14	7.80	11	7.95
22	8.78	10	9.47	21	7.75	16	8.00
Mar. 3	8.74	17	9.12	Sept. 3	7.73	21	8.03
10	8.73	24	8.85	Oct. 22	7.75	30	8.00
17	10.37	31	8.58				

23. Federal Geological Survey.

Water level, in feet above an assumed datum, 1939

Jan. 4	8.70	Mar. 22	13.23	June 7	10.05	Nov. 5	7.92
11	8.78	29	12.76	28	9.47	12	7.99
18	8.87	Apr. 5	12.35	July 15	9.09	19	8.09
25	8.96	12	12.10	22	8.91	26	8.17
Feb. 1	9.05	19	11.94	28	8.68	Dec. 4	8.25
8	9.12	26	11.68	Aug. 4	8.39	9	8.25
14	9.45	May 3	11.39	11	8.10	16	8.38
22	9.89	10	11.09	18	7.75	22	8.45
Mar. 1	10.00	17	10.76	Sept. 24	7.04	30	8.53
8	10.27	24	10.55	Oct. 22	7.65		
15	12.95	31	10.28				

23A. Federal Geological Survey. Correction: Highest water level Mar. 19, 1938, 14.16 feet.

Daily noon water level, in feet above an assumed datum, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	9.41	9.79	10.73	13.36	12.28	11.05	10.14	9.31	8.27	8.00	8.46	8.92
2	9.42	9.80	10.74	13.31	12.24	11.01	10.13	9.27	8.26	8.00	8.47	8.93
3	9.43	9.81	10.76	13.25	12.18	10.97	10.11	9.23	8.25	8.00	8.49	8.94
4	9.44	9.82	10.77	13.16	12.15	10.92	10.10	9.19	8.24	8.01	8.51	8.96
5	9.46	9.82	10.79	13.10	12.10	10.88	10.08	9.15	8.22	8.02	8.53	8.97
6	9.47	9.84	10.83	13.07	12.07	10.85	10.06	9.10	8.20	8.03	8.54	8.98
7	9.48	9.84	10.86	13.05	12.02	10.82	10.03	9.06	8.19	8.04	8.56	8.99
8	9.49	9.85	10.90	13.02	11.98	10.81	10.01	9.02	8.18	8.05	8.58	9.00
9	9.50	9.86	10.92	12.97	11.93	10.79	9.99	8.99	8.16	8.06	8.60	9.02
10	9.51	9.86	10.97	12.92	11.89	10.78	9.98	8.95	8.15	8.07	8.62	9.02
11	9.52	9.86	11.05	12.91	11.84	10.76	9.95	8.91	8.14	8.08	8.63	9.04
12	9.53	9.88	11.30	12.88	11.79	10.73	9.92	8.87	8.13	8.10	8.65	9.04
13	9.54	9.92	13.20	12.94	11.75	10.71	9.91	8.83	8.12	8.11	8.67	9.05
14	9.55	9.98	13.60	12.93	11.71	10.66	9.88	8.79	8.12	8.12	8.68	9.06
15	9.56	10.09	13.71	12.89	11.66	10.64	9.87	8.75	8.12	8.14	8.70	9.07
16	9.57	10.22	13.74	12.84	11.61	10.60	9.85	8.72	8.11	8.14	8.72	9.09
17	9.58	10.35	13.77	12.80	11.57	10.57	9.83	8.69	8.11	8.16	8.74	9.11
18	9.60	10.46	13.76	12.78	11.55	10.55	9.81	8.65	8.11	8.18	8.75	9.11
19	9.61	10.53	13.71	12.73	11.52	10.53	....	8.62	8.10	8.20	8.77	9.12
20	9.62	10.59	13.77	12.71	11.48	10.52	....	8.59	8.09	8.22	8.78	9.13
21	9.64	10.63	13.93	12.68	11.45	10.46	....	8.56	8.08	8.23	8.79	9.14
22	9.65	10.66	14.00	12.63	11.42	10.45	9.69	8.52	8.07	8.25	8.81	9.15
23	9.67	10.67	13.95	12.59	11.38	10.42	9.66	8.50	8.06	8.28	8.82	9.15
24	9.68	10.68	13.86	12.55	11.34	10.38	9.63	8.47	8.05	8.30	8.84	9.16
25	9.71	10.70	13.80	12.51	11.32	10.34	9.59	8.44	8.05	8.32	8.85	9.17
26	9.72	10.70	13.75	12.48	11.28	10.30	9.56	8.41	8.04	8.34	8.87	9.18
27	9.74	10.71	13.63	12.44	11.24	10.27	9.51	8.37	8.03	8.36	8.87	9.19
28	9.76	10.72	13.58	12.41	11.20	10.26	9.47	8.35	8.03	8.38	8.89	9.20
29	9.76	.....	13.50	12.36	11.16	10.22	9.43	8.33	8.02	8.40	8.90	9.21
30	9.78	.....	13.45	12.32	11.12	10.17	9.38	8.31	8.01	8.42	8.91	9.24
31	9.79	.....	13.40	.....	11.08	.....	9.35	8.29	....	8.44	....	9.24

## Whitman County--Continued

## 35. R. Barr.

Water level, in feet above an assumed datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 23	9.21	Apr. 27	12.47	July 13	8.14	Sept. 17	7.01
Feb. 24	11.08	May 23	11.73	21	7.77	Oct. 29	7.42
Mar. 31	12.41	June 26	9.72	Aug. 15	7.22	Dec. 19	8.08

## 37. Federal Geological Survey.

Water level, in feet above an assumed datum, 1939

Jan. 26	14.58	Apr. 27	16.67	July 21	14.88	Oct. 22	14.09
Feb. 23	15.80	May 22	16.20	Aug. 16	14.33	Dec. 16	14.31
Mar. 30	17.33	June 26	15.54	Sept. 3	14.31		

## 38. W. Boyd.

Water level, in feet above an assumed datum, 1939

Jan. 4	6.55	Mar. 21	12.22	June 6	9.02	Oct. 28	3.01
12	6.69	28	15.07	26	5.97	Nov. 4	3.09
19	6.69	Apr. 4	15.44	July 13	3.16	11	3.03
24	6.96	11	14.99	22	3.83	18	3.14
31	7.00	18	14.60	28	3.96	25	3.03
Feb. 7	7.09	25	13.99	Aug. 4	4.23	Dec. 4	2.91
14	6.63	May 2	12.71	11	4.25	11	3.00
21	6.38	9	12.00	18	4.08	16	2.89
28	6.64	16	10.74	Sept. 3	3.92	22	3.08
Mar. 7	7.02	23	10.27	Oct. 15	2.95	29	2.89
14	7.96	30	9.70				

## 46. C. and M. Stirewalt. Measurements discontinued Mar. 24, 1937.

## 47. Whelan School District. Water level June 8, 1936, 11.43 feet.

Water level, in feet above an assumed datum, 1939

Jan. 3	10.11	Mar. 20	15.66	June 6	12.39	Oct. 28	10.21
10	10.14	27	15.36	27	11.67	Nov. 4	10.17
16	10.17	Apr. 4	14.69	July 14	10.92	11	10.15
23	10.26	11	14.33	22	10.61	18	10.11
30	10.35	18	14.27	28	10.53	25	10.06
Feb. 7	10.41	25	13.92	Aug. 4	10.47	Dec. 4	10.04
13	10.80	May 2	13.62	11	10.44	11	10.06
20	12.29	9	13.29	18	10.39	16	10.08
27	12.23	16	13.01	Sept. 3	10.35	22	10.01
Mar. 6	12.17	23	12.84	Oct. 15	10.20	29	9.98
13	13.84	30	12.64				

## 51. G. Anderson.

Water level, in feet above an assumed datum, 1939

Jan. 25	8.11	Apr. 24	9.49	July 15	10.68	Oct. 22	10.58
Feb. 20	10.66	May 24	8.46	Aug. 14	8.88	Dec. 18	10.22
Mar. 28	10.04	June 26	11.14	Sept. 10	10.74		

## 54. W. Boyd.

Water level, in feet above an assumed datum, 1939

Jan. 23	6.25	Apr. 24	9.25	July 14	7.26	Oct. 15	5.90
Feb. 24	6.99	May 22	8.29	Aug. 18	6.23	Dec. 16	6.14
Mar. 27	10.01	June 26	7.53	Sept. 3	6.18		



## Whitman County--Continued

Wells on the Soil Erosion Experiment Station Farm  
at Pullman, Wash.

Corrected water levels, 1935-38: 3N, 499.05 feet, Jan. 15, 1935; 2N, 506.42 feet, Aug. 6, 1936; 1N, 517.73 feet, Apr. 16, 1937; 3E, 529.68 feet, May 4, 1938; 4E, 529.48 feet, Nov. 17, 1938; 5E, 529.82 feet, Oct. 7, 1937; 529.73 feet, Oct. 21, 1937; 2S, 509.43 feet, Sept. 10, 1938.

## Water level, in feet above sea level, minus 2,000, 1939

Date	3N	2N	1N	1E	3E	4E	5E
Jan. 5	498.93	504.08	511.68	512.74	527.50	529.61	528.60
12	498.83	503.89	511.48	512.66	527.95	529.24	528.39
19	498.82	504.20	511.55	512.83	530.12	529.39	528.40
26	498.80	504.25	511.48	512.98	531.75	529.45	528.45
Feb. 2	498.78	504.34	511.70	513.07	530.75	529.66	528.47
9	498.70	504.20	511.56	512.92	529.55	529.43	528.34
16	498.68	505.34	513.11	513.12	537.17	529.17	530.09
23	498.86	507.71	513.37	514.33	536.66	530.13	529.07
Mar. 2	498.93	507.65	513.55	515.05	535.14	530.70	529.48
9	498.91	507.58	513.42	515.16	533.17	530.72	529.14
16	499.00	509.47	514.12	515.63	537.27	530.70	532.11
23	499.66	508.71	517.45	517.17	538.66	532.20	540.02
30	500.06	508.10	520.60	517.77	537.12	532.68	539.89
Apr. 6	500.20	507.51	517.08	517.66	535.20	532.33	533.90
13	500.36	507.38	515.97	517.72	532.76	532.45	531.15
20	500.40	507.11	515.68	517.57	530.97	532.18	530.69
27	500.34	506.54	515.22	517.10	529.91	531.86	530.41
May 4	500.29	506.12	515.00	516.86	529.26	531.68	530.27
11	500.16	505.71	514.55	516.35	528.73	531.34	530.02
18	500.13	505.69	514.51	516.31	528.40	531.34	529.94
25	499.96	505.40	514.06	515.79	527.99	530.90	529.67
June 1	499.85	505.28	513.81	515.56	527.94	530.66	529.49
8	499.74	505.13	513.69	515.38	527.83	530.52	529.34
26	499.47	504.70	513.18	514.80	526.85	530.05	528.91
July 14	499.20	504.48	512.82	514.49	526.51	529.97	528.77
24	499.09	504.41	512.78	514.31	526.43	529.95	528.67
31	498.99	504.58	512.61	514.12	526.32	529.78	528.52
Aug. 7	498.90	504.62	512.47	514.00	526.16	529.57	528.37
14	498.85	504.72	512.47	513.95	526.17	529.57	528.32
21	498.77	504.67	512.40	513.88	526.09	529.47	528.22
Sept. 17	498.56	504.62	512.13	513.67	525.78	529.11	527.74
Oct. 21	498.32	504.54	511.80	514.15	525.47	528.75	527.65
28	498.28	504.46	511.74	514.06	525.38	528.65	527.61
Nov. 4	498.25	504.45	511.64	513.96	525.31	528.61	527.55
11	498.21	504.48	511.63	513.95	525.31	528.60	527.52
18	498.41	504.47	511.61	513.88	525.27	528.58	527.48
25	498.17	504.64	511.68	512.80	525.39	528.71	527.50
Dec. 4	498.13	504.49	511.56	512.87	525.18	528.50	527.39
11	498.11	504.59	511.46	512.64	525.24	528.57	527.41
16	498.09	504.68	511.46	512.81	525.24	528.59	527.41
23	498.05	504.79	511.46	512.75	525.18	528.56	527.36

## Water level, in feet above sea level, minus 2,000, 1939

Date	1S	2S	3S	4S	5S
Jan. 5	511.08	509.32	503.99	499.10	501.08
12	510.88	509.01	503.95	499.12	501.10
19	510.97	511.18	504.43	498.97	501.18
26	511.09	509.26	505.67	498.49	501.09
Feb. 2	511.13	509.29	505.54	498.41	501.01
9	511.00	509.12	505.42	498.05	500.85
16	511.78	511.01	511.08	499.15	501.00
23	512.63	510.71	511.98	499.13	501.28
Mar. 2	512.96	511.03	509.03	498.99	501.38
9	512.84	510.95	506.42	498.90	501.32
16	513.36	513.63	512.64	499.16	501.63
23	512.87	512.99	511.46	498.88	503.62
30	515.45	513.14	508.00	498.64	503.62
Apr. 6	515.27	512.85	505.59	498.81	503.24
13	515.19	513.00	504.88	498.73	503.21
20	514.96	512.69	504.48	498.19	503.25
27	514.54	512.35	504.25	498.17	503.02

## Whitman County--Continued

Wells on the Soil Erosion Experiment Station Farm  
at Pullman, Wash.--Continued

Water level, in feet above sea level, minus 2,000, 1939					
Date	1S	2S	3S	4S	5S
May 4	514.33	512.16	504.12	498.09	502.85
11	513.88	511.81	503.98	498.10	502.58
18	513.86	511.74	504.02	497.97	502.52
25	513.43	511.30	503.87	497.99	502.30
June 1	513.19	511.13	503.85	497.59	502.18
8	513.02	511.00	503.73	497.55	502.07
26	512.57	510.59	503.74	496.82	501.78
July 14	512.24	510.29	503.67	496.03	501.55
24	512.19	510.26	503.68	496.12	501.48
31	512.03	510.10	503.64	496.13	501.42
Aug. 7	511.88	509.97	503.57	496.19	501.36
14	511.87	509.93	503.61	496.30	501.33
21	511.80	509.86	503.59	496.37	501.27
Sept. 17	511.56	509.57	503.54	496.66	500.73
Oct. 21	511.18	509.21	503.42	496.84	499.92
28	511.13	509.14	503.38	496.83	499.89
Nov. 4	511.04	509.10	503.36	496.84	499.81
11	511.03	509.10	503.40	496.86	499.75
18	511.01	509.09	503.37	496.86	499.67
25	511.10	509.20	503.47	496.87	499.63
Dec. 4	510.95	509.01	503.36	496.86	499.54
11	510.90	509.07	503.45	496.88	499.58
16	511.00	509.10	503.47	497.01	499.58
23	510.96	509.08	503.41	497.15	499.51

Water levels in wells that tap confined (artesian) water

14/45-4N1. J. T. Graham, Pullman, Washington.

Water level, in feet above mean sea level, minus 2,000, 1939							
Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 13	341.14	Mar. 24	340.38	May 31 a	340.05	Sept. 24	339.80
27 a	339.31	Apr. 3	341.52	June 26	340.62	Oct. 15	339.73
Feb. 10	341.36	21	341.50	July 19	340.26	Nov. 11 a	339.47
24	341.27	May 5 a	340.09	Aug. 4 a	337.51	Dec. 11	339.83
Mar. 10	341.56	19 a	339.93	17	339.77	21 a	339.86

14/45-5B1. Washington State College well 1, Pullman, Washington.

Water level, in feet above mean sea level, minus 2,000, 1939							
Jan. 13	339.52	Mar. 24	339.68	June 6 b	339.16	Sept. 23	337.96
14	339.55	Apr. 3	339.95	26	339.05	Oct. 21	338.05
27	339.97	21	339.74	July 17	338.58	Nov. 11	337.89
Feb. 10	339.79	May 5	339.44	Aug. 4	338.23	Dec. 11	338.09
24	339.69	19	339.24	17 a	335.83	21	338.37
Mar. 10	339.97	31	339.20	Sept. 14 b	337.97		

14/45-5D2. Standard Lumber Co., Pullman, Washington.

Water level, in feet above mean sea level, minus 2,000, 1939							
Jan. 13	a 339.46	Apr. 3	a 339.87	June 28	a 339.06	Sept. 23	a 338.03
14	339.24	21	a 339.70	July 17	338.86	Oct. 21	a 337.97
27	340.05	May 5	a 339.42	Aug. 4	338.17	Nov. 18	338.07
Feb. 24	a 339.62	19	a 339.28	17 a	337.98	Dec. 2	a 338.08
Mar. 20	a 339.88	31	a 339.15	Sept. 14	338.03	21	338.25
24 a	339.64	June 6	a 339.17				

a Pump operating in well.

b Pump operating in nearby well.

# WISCONSIN

## COON CREEK AREA OF SOIL CONSERVATION SERVICE

By V. C. Fishel and C. C. Yonkers

The observation-well program in the Coon Creek area <sup>1/</sup> in Vernon, Monroe, and La Crosse Counties, Wis., was continued through part of 1939 by the Federal Geological Survey in cooperation with the Soil Conservation Service, L. B. Cummings, project manager. Water-level measurements were made about weekly in 14 wells until the latter part of September, when they were temporarily discontinued. Automatic water-stage recorders were maintained on wells 8 and 9. About 550 individual measurements of water level were made in the observation wells by E. Couch, Victor Kilmer, H. S. Peterson, and F. L. Robbins, of the Soil Conservation Service.

The measurements of 10 wells (2-4,8-14) were used for computing average water levels for 1939. Water levels in the wells were generally higher during 1938 than during the preceding 4 years, and on January 1, 1939, they averaged about 11.0 feet above the assumed datum planes. Water levels had only minor fluctuations in January and February, but in March they rose an average of about 0.9 foot; they declined an average of 0.3 foot until April 13 and then rose 0.4 foot until April 22, on which date they reached the highest average stage of the year; and then they declined an average of 1.3 feet until September 29, when measurements were discontinued. From January 1 to September 29, 1939, they had an average net decline of 0.4 foot.

Weekly average water levels in feet above datum, in  
10 observation wells, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 5	11.10	Mar. 16	11.59	May 25	11.27	Aug. 3	10.80
12	11.26	23-24	11.83	June 1-2	11.33	10	10.74
19	11.14	30	11.88	8-9	11.21	17	10.75
26	11.03	Apr. 6	11.71	15	11.20	24	10.88
Feb. 2	11.04	13	11.54	22	11.13	31	10.79
9	10.94	21-22	11.99	29	11.10	Sept. 7	10.77
16	10.94	27	11.86	July 5-6	11.04	14	10.72
23-24	11.07	May 5	11.68	13	10.97	21	10.64
Mar. 2	11.05	11	11.47	20	10.88	28-29	10.70
9	10.99	18	11.35	27	10.84	(a)	

<sup>1/</sup> See Water-Supply Papers 777, 817, 840, and 845.

a Measurements discontinued temporarily.

## 1. Ed Clements.

Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 5	9.36	Mar. 16	9.60	May 25	9.22	Aug. 3	(a)
12	9.86	23	9.97	June 1	9.33	10	(a)
19	9.62	30	10.36	9	9.23	17	(a)
26	9.43	Apr. 6	10.21	15	9.32	24	9.07
Feb. 2	9.34	13	9.85	22	9.22	31	(a)
9	9.22	22	11.80	29	9.17	Sept. 7	(a)
16	9.30	27	10.47	July 6	(a)	14	(a)
23	9.36	May 5	9.90	13	(a)	21	(a)
Mar. 2	9.25	11	9.46	20	(a)	28	(a)
9	9.19	18	9.39	27	(a)		

## 2. Joe Anderson.

Water level, in feet above datum, 1939

Jan. 5	14.09	Mar. 16	15.58	May 25	16.55	Aug. 3	14.22
12	14.83	24	15.79	June 1	16.10	10	14.00
19	14.70	30	18.04	9	15.77	17	13.93
26	14.38	Apr. 6	17.70	15	15.33	24	13.86
Feb. 2	14.20	13	17.33	22	15.33	31	13.73
9	14.18	22	17.93	29	15.23	Sept. 7	13.62
10	13.90	27	17.80	July 5	15.02	14	13.49
23	14.53	May 5	17.38	13	14.76	21	13.30
Mar. 2	14.28	11	16.92	20	14.60	28	13.26
9	14.00	18	16.63	27	14.35		

## 3. Anton Bekkum.

Water level, in feet above datum, 1939

Jan. 5	10.16	Mar. 16	10.67	May 25	10.20	Aug. 3	10.15
12	10.28	24	11.05	June 1	10.28	10	10.13
19	10.19	30	10.46	9	10.26	17	10.16
26	10.14	Apr. 6	10.36	15	10.24	24	10.21
Feb. 2	10.13	13	10.34	23	10.24	31	10.15
10	10.14	22	10.46	29	10.26	Sept. 7	10.13
10	10.08	27	10.38	July 6	10.22	14	10.12
24	10.11	May 5	10.36	13	10.18	21	10.10
Mar. 3	10.11	11	10.34	20	10.08	28	10.09
9	10.08	18	10.23	27	10.21		

## 4. Albert Starbakken.

Water level, in feet above datum, 1939

Jan. 5	12.13	Mar. 16	13.26	May 25	12.48	Aug. 3	11.90
12	12.77	24	14.11	June 1	12.76	10	11.94
19	12.32	30	13.78	8	12.43	17	11.98
26	12.24	Apr. 6	13.18	15	12.80	24	12.55
Feb. 2	12.34	13	12.91	23	12.15	31	12.23
9	12.27	22	13.35	29	12.10	Sept. 7	12.10
16	12.33	27	12.95	July 6	12.11	14	12.08
24	12.01	May 5	12.82	13	12.17	23	11.95
Mar. 2	12.43	11	12.81	20	11.98	28	12.09
9	12.40	18	12.59	27	11.95		

## 5. John Bakkestuen.

Water level, in feet above datum, 1939

Jan. 5	9.25	Mar. 16	8.81	May 25	9.04	Aug. 3	9.15
12	8.99	23	8.85	June 1	9.05	10	9.15
19	9.13	30	9.11	8	9.06	17	9.25
26	9.05	Apr. 6	8.91	15	9.03	24	9.05
Feb. 2	8.98	13	8.89	22	9.02	31	8.92
9	9.31	20	9.15	29	9.01	Sept. 7	9.28
16	8.91	27	8.99	July 6	9.00	14	8.83
23	9.43	May 4	9.05	13	9.10	23	8.78
Mar. 2	9.15	11	9.14	20	9.00	28	9.23
9	8.83	18	9.03	27	9.22		

a Well dry.

## 6. Ole Olson.

Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 5	11.19	Mar. 16	10.65	May 25	15.90	Aug. 3	10.89
12	11.35	24	10.71	June 2	12.31	10	10.82
19	11.17	30	10.75	9	12.08	17	10.67
26	10.99	Apr. 6	10.93	15	11.82	24	10.98
Feb. 2	10.89	13	10.77	23	11.67	31	10.90
10	10.84	22	18.83	29	11.54	Sept. 7	10.83
16	10.74	27	18.67	July 6	11.27	14	10.74
23	10.69	May 5	18.35	13	11.19	23	10.77
Mar. 3	10.82	11	16.87	20	11.33	28	10.71
9	10.62	18	16.42	27	10.99		

## 7. August Mitchel.

Water level, in feet above datum, 1939

Jan. 5	10.48	Mar. 16	10.34	May 25	10.33	Aug. 3	10.36
12	10.44	23	10.85	June 1	10.61	10	10.39
19	10.38	30	10.42	8	10.30	17	10.41
26	10.32	Apr. 6	10.34	15	10.62	24	10.40
Feb. 2	10.33	13	10.32	22	10.16	31	10.42
9	10.54	20	10.37	29	10.32	Sept. 7	10.52
16	10.26	27	10.35	July 6	10.61	14	10.46
23	10.29	May 4	10.33	13	10.46	21	10.43
Mar. 2	10.25	11	10.32	20	10.62	29	10.43
9	10.26	18	10.32	27	10.36		

## 8. C. Stylen.

Daily noon water level, in feet above datum, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	.....	11.01	11.24	11.59	11.19	11.23	11.03	10.87	10.84
2	.....	11.20	11.00	11.44	11.10	11.19	10.99	10.89	11.05
3	11.14	11.17	11.13	11.17	11.08	11.05	10.96	10.86	11.03
4	11.07	.....	11.27	11.02	11.16	10.89	11.02	10.81	10.95
5	11.27	.....	11.29	11.18	11.26	10.94	11.05	10.81	10.91
6	11.05	.....	11.31	11.19	11.33	11.05	11.01	10.81	10.78
7	10.91	.....	11.06	11.19	11.44	11.21	10.97	10.81	10.90
8	10.79	.....	10.93	11.31	11.44	11.11	10.93	10.82	10.81
9	10.90	10.79	11.06	11.34	11.40	11.09	10.87	10.86	10.71
10	11.17	11.19	11.00	11.35	11.33	11.13	10.87	10.71	10.70
11	11.05	10.92	11.18	11.27	11.08	11.30	10.81	10.71	10.72
12	10.94	10.81	11.32	11.06	10.89	11.10	10.80	10.71	10.78
13	10.92	11.00	11.31	10.92	10.85	11.06	11.03	10.74	10.77
14	11.05	11.10	11.35	11.11	10.98	11.06	11.01	10.74	10.75
15	11.03	11.01	11.52	11.25	11.17	11.08	10.92	10.74	10.75
16	10.94	10.82	11.31	11.32	11.18	11.09	10.87	10.79	10.75
17	10.87	10.82	11.14	11.43	11.17	11.17	10.90	10.76	10.67
18	11.03	10.95	11.07	11.55	11.02	11.09	10.94	10.79	10.57
19	11.07	11.21	11.10	11.45	11.06	11.12	10.90	10.81	10.51
20	11.09	10.95	11.21	11.41	11.11	11.07	10.83	10.82	10.56
21	11.09	10.95	11.19	11.38	11.14	10.92	10.83	10.92	10.61
22	10.98	10.89	11.29	11.21	11.14	11.05	10.85	10.91	10.68
23	10.84	11.01	11.35	11.18	11.16	11.03	10.88	10.93	10.79
24	11.10	11.14	11.41	11.28	11.08	11.01	10.88	10.84	10.81
25	10.91	11.01	11.50	11.36	11.02	10.98	10.88	10.72	10.81
26	10.89	11.05	11.61	11.39	11.01	10.99	10.87	.....	10.72
27	10.87	11.11	11.33	11.32	11.06	10.98	10.86	.....	10.79
28	11.11	11.23	11.14	11.16	11.20	10.95	10.83	.....	10.89
29	11.13	.....	11.10	11.04	11.13	10.98	10.80	.....	10.86
30	11.00	.....	11.29	11.10	11.12	11.02	10.81	.....	10.74
31	10.97	.....	11.47	.....	11.15	.....	10.85	10.83	.....

## 9. F. Lenser.

Daily noon water level, in feet above datum, 1939  
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12.06	12.14	12.45	13.23	.....	12.58	12.48	12.34	12.21
2	12.10	12.13	12.40	13.19	.....	12.58	12.48	12.34	12.21
3	12.09	12.10	12.42	13.12	.....	12.55	12.48	12.30	12.23
4	12.08	12.10	12.42	13.12	.....	12.55	12.48	12.30	12.23
5	12.14	12.11	12.41	.....	.....	12.55	12.48	12.30	12.21
6	12.04	12.11	12.40	13.06	.....	12.57	12.45	12.30	12.21
7	12.03	12.10	12.33	13.06	.....	12.57	12.45	12.30	12.23
8	12.03	12.07	12.33	13.06	.....	12.52	12.45	12.30	12.19
9	12.08	12.07	12.27	13.06	.....	12.52	12.44	12.30	12.19
10	12.07	12.12	12.28	13.05	.....	12.56	12.44	12.27	12.19
11	12.04	12.05	12.39	12.99	12.65	12.56	12.44	12.27	12.19
12	12.02	12.05	12.30	12.94	12.65	12.51	12.45	12.27	12.19
13	12.05	12.08	12.35	12.90	12.65	12.51	12.42	12.27	12.17
14	12.08	12.08	.....	12.95	12.69	12.51	12.40	12.27	12.16
15	12.08	12.05	.....	12.94	12.68	12.53	12.39	12.27	12.16
16	12.08	11.99	13.37	12.94	12.68	12.54	12.39	12.27	12.15
17	12.08	12.00	13.37	12.95	12.65	12.53	12.39	12.24	12.15
18	12.09	12.04	13.29	12.93	12.62	12.53	12.39	12.24	12.14
19	12.12	12.12	13.29	12.90	12.64	12.53	12.38	12.24	12.13
20	12.12	12.11	13.13	12.90	12.64	12.50	12.35	12.24	12.13
21	12.14	12.43	13.12	12.88	12.64	12.50	12.35	12.25	12.12
22	12.14	12.53	13.13	12.84	12.64	12.51	12.35	12.25	12.12
23	12.14	12.63	13.31	12.84	12.63	12.50	12.35	12.24	12.13
24	12.14	12.62	13.34	12.84	12.61	12.50	12.35	12.21	12.13
25	12.10	12.59	13.38	12.84	12.59	12.50	12.35	12.21	12.14
26	12.10	12.58	13.38	12.84	12.59	12.50	12.35	12.20	12.15
27	12.10	12.55	13.36	12.79	12.61	12.48	12.34	12.20	12.16
28	12.14	12.53	.....	.....	12.61	12.48	12.34	12.20	12.17
29	12.13	.....	.....	.....	12.61	12.48	12.34	12.20	.....
30	12.12	.....	13.27	.....	12.61	12.48	12.34	12.20	.....
31	12.12	.....	13.27	.....	12.61	.....	12.34	12.21	.....

## 10. Dennis Shea.

Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 5	10.68	Mar. 16	10.68	May 25	10.61	Aug. 3	10.05
12	10.78	24	10.84	June 2	10.65	10	9.98
19	10.79	30	10.83	9	10.57	17	9.97
26	10.68	Apr. 6	10.81	15	10.58	24	10.14
Feb. 2	10.67	13	10.76	22	10.55	31	10.10
9	10.55	22	12.25	29	10.50	Sept. 7	10.13
16	10.51	27	11.45	July 5	10.40	14	10.06
23	10.60	May 5	10.99	13	10.29	21	9.98
Mar. 2	10.51	11	10.84	20	10.17	28	10.00
9	10.53	18	10.73	27	10.12		

## 11. John Sullivan.

Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 5	10.23	Mar. 16	10.32	May 25	10.04	Aug. 3	9.62
12	10.60	24	10.45	June 2	10.24	10	9.57
19	10.31	30	10.49	9	10.03	17	9.62
26	10.11	Apr. 6	10.39	15	10.03	24	9.75
Feb. 2	10.05	13	10.27	22	10.01	31	9.68
9	9.96	21	10.85	29	9.93	Sept. 7	9.64
16	10.04	27	10.68	July 6	9.86	14	9.59
23	10.08	May 5	10.35	13	9.74	21	9.53
Mar. 2	10.00	11	10.23	20	9.67	28	9.58
9	9.99	18	10.11	27	9.59		

## 12. Melvin Olson.

Water level, in feet above datum, 1939

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 5	10.79	Mar. 16	10.70	May 25	10.58	Aug. 3	10.54
12	10.61	23	10.54	June 2	10.59	10	10.57
19	10.62	30	10.71	9	10.62	17	10.58
26	10.59	Apr. 6	10.64	15	10.62	24	10.60
Feb. 2	10.59	13	10.58	22	10.64	31	10.61
9	10.58	21	10.67	29	10.64	Sept. 7	10.57
16	10.57	27	10.63	July 6	10.62	14	10.56
23	10.68	May 5	10.61	13	10.61	21	10.58
Mar. 2	10.64	11	10.61	20	10.59	28	10.59
9	10.67	18	10.60	27	10.60		

## 13. Walter Parks.

Water level, in feet above datum, 1939

Jan. 5	9.71	Mar. 16	10.06	May 25	9.45	Aug. 3	9.19
12	9.99	24	10.70	June 2	9.44	10	9.06
19	9.67	30	10.09	9	9.40	17	8.99
26	9.60	Apr. 6	9.99	15	9.41	24	9.29
Feb. 2	9.56	13	9.81	22	9.49	31	9.11
9	9.50	21	10.05	29	9.38	Sept. 7	9.12
16	9.55	27	10.84	July 6	9.33	14	9.10
23	9.61	May 5	10.69	13	9.23	21	9.03
Mar. 2	9.47	11	9.77	20	9.27	28	9.05
9	9.44	18	9.52	27	9.17		

## 14. Chris Benrud.

Water level, in feet above datum, 1939

Jan. 5	9.81	Mar. 16	9.92	May 25	9.17	Aug. 3	9.18
12	9.82	24	10.08	June 1	9.41	10	9.16
19	9.61	30	9.79	9	9.36	17	9.24
26	9.53	Apr. 6	9.74	15	9.37	24	9.34
Feb. 2	9.51	13	9.59	23	9.36	31	9.26
10	9.36	22	10.04	29	9.52	Sept. 7	9.26
16	9.63	27	9.79	July 6	9.31	14	9.24
24	9.46	May 5	9.60	13	9.26	21	9.19
Mar. 2	9.61	11	9.49	20	9.26	28	9.27
9	9.44	18	9.44	27	9.21		

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