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U. S. Geological Survey

GROUND-WATER RESOURCES

of the

HOUSTON-GALVESTON AREA

And Adjacent Region, Texas

Prepared by the Texas Board of Water Engineers, in cooperation with the Geological Survey, U. S. Department of the Interior

1939

GROUND-WATER RESOURCES OF THE HOUSTON-GALVESTON AREA

and adjacent region, Texas, with tables of well records, well logs, water level fluctuations, and water analyses for Harris, Galveston, Waller, Grimes, and Montgomery Counties and Fort Bend and Brazoria Counties east of the Brazos river

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GROUND-WATER RESOURCES OF THE HOUSTON-GALVESTON AREA, TEXAS.

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Report prepared through cooperation between the Texas State Board of Water Engineers and the United States Geological Survey.

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By W. N. White, Penn Livingston, and S. F. Turner

The supply of underground water in an area in eastern Texas comprising Harris County, in which Houston is located, and parts of adjoining counties is the subject of an investigation started in December, 1930, as part of a survey of the underground-water resources of Texas by the United States Geological Survey in cooperation with the State Board of Water Engineers. The investigation is being made by W. N. White, Penn Livingston, and S. F. Turner, under the direction of O. E. Meinzer, geologist in charge of the division of ground water in the Geological Survey. Though the study is continuing, it has progressed sufficiently to warrant the release of some of the facts that have been disclosed and some general conclusions regarding the available supply of water. Further conclusions will be released later, especially as to the recharge in the outcrop areas and as to the water supplies of the Baytown and Alta Loma districts and the rice-growing areas.

Location and topography

The area is a part of the Gulf Coastal Plain, which in this region extends from Oklahoma to the Gulf of Mexico. It is a plain of low relief that lies not far above sea level. Low escarpments, probably representing ancient shore lines, break the level of the plain, and in some localities the streams have cut trench-like courses 30 to 50 feet deep. The Hockley escarpment, which is the most prominent, can be traced across the southern part of Montgomery County, the northwestern part of Harris County, and the central part of Waller County. From the foot of the escarpment, about six miles southeast of Hockley, to the Gulf, a distance of 80 miles, there is a fall of only about 165 feet. To the north and west of the escarpment the land rises more rapidly and the country is somewhat hilly. The area is bounded on the east by the Trinity River and on the west by the Brazos River and is crossed by the San Jacinto River, Spring Creek, and a few other perennial creeks. The smaller streams generally carry water only during and immediately after heavy rains. The tides reach inland from the Gulf to Houston through Galveston Bay and the Houston ship channel.

Previous investigations

The ground-water conditions in this area were briefly described in 1907 by T. U. Taylor, in U. S. Geological Survey Water-Supply Paper 190, "Underground water of the Coastal Plain of Texas," and more fully in 1914 by Alexander Deussen, in Water-Supply Paper 335, "Geology and underground waters of the southeastern part of the Texas Coastal Plain."

Importance of ground water in the area

The area is one of great industrial development. Houston, the county seat of Harris County and one of the largest cities in the South, is a leading seaport and manufacturing and railroad center. The city had a population of 292,000 in 1930. Galveston, with a population of 53,000 in 1930, also ranks high as a seaport. There are about 12 producing oil fields and 11 oil refineries in the area. Farming is also important, and the chief crops are rice, cotton, sugar cane, and garden truck.

Large quantities of water are required for public water supplies, oil refining, ice manufacturing, cooling and other industrial uses, and the irrigation of rice. The industrial plants and a large part of the rice-producing districts are remote from adequate supplies of stream water suitable for these varied requirements. On the other hand, almost everywhere abundant supplies of water of satisfactory quality can be obtained from wells. Without doubt the availability of water from this convenient source has contributed in no small measure to the rapid industrial development and concentration of population in the area.

Purpose of investigation and field operations

The importance of the available supply of ground water in this area has become increasingly apparent. As industry has developed and the population has increased, the demands for water have grown and have been met by larger and larger withdrawals of ground water. In practically all parts of the area where the withdrawals have been heavy the head in flowing wells has declined and the water levels in non-flowing wells have fallen. In some localities the decline in head has amounted to 100 feet or more, and it has become a matter of public concern lest the decline continue until it is no longer feasible to pump the wells or the wells become contaminated by salt water. The present investigation was undertaken in response to public request. It covers various phases of the ground-water problem, such as the quantity and quality of the water in different localities at different depths, its suitability for municipal, industrial, and farm uses and for irrigation, and the possibility of contamination of deep wells by salt water. The chief purpose of the investigation is to obtain information to serve as a basis for estimating the safe yield of the underground reservoir in different parts of the area--that is, the practicable rate at which water may be withdrawn perennially.

In any locality the average amount of water that can be safely withdrawn from the underground reservoir each year depends on the average annual recharge to the reservoir in that locality. This is determined by the amount of water that penetrates to the water table from rains and by seepage from the streams on the outcrops of the water-bearing formations, the capacity of the formations to transmit water from the outcrops to the wells, and the amount of this underflow that can be withdrawn through wells. In practice all these quantities are difficult to determine.

If an underground reservoir is heavily pumped a study of the relations of the water levels in wells to the amount of pumpage is likely to give more reliable information as to the safe yield than can be obtained by any other method. The water levels or artesian pressures in the wells that tap a heavily pumped reservoir will inevitably decline. The decline may be comparatively rapid for periods

of considerable length when the rate of withdrawal is constantly increasing, but this is not in itself an indication of overdevelopment if the decline is not so great as to indicate the approach of the time when the required lifts will be beyond the economic limit. If the rate of pumping is kept constant and does not exceed the rate of recoverable recharge, the decline will proceed at a diminishing rate and will eventually stop. To determine the limit of drawdown under a constant rate of pumping requires the lapse of sufficient time to permit the development of a curve in which the water levels in a group of key wells are plotted against time and which can with some confidence be projected into the future. In most areas the problem is further complicated by fluctuations in the rate of pumping. The area under discussion embraces several localities in which heavy withdrawals of ground water have been made for years, and in these localities an effort is being made to obtain accurate records of fluctuations in the rate of pumping and fluctuations in the water levels in wells and to correlate the two.

The work that is in progress or has already been completed is as follows: The depths to the water levels in about 90 selected wells are being measured monthly, and automatic water-stage recorders are being maintained on eight of these wells; available data on pumpage are being collected, special attention being given to seasonal changes on the rate of pumping; the outcrops of the chief water-bearing formations are being mapped, and the penetration of rainfall on these outcrops is being studied; descriptive details relating to 900 water wells and the logs of about 500 water wells and oil test wells have been gathered and tabulated; irrigated lands in the Katy rice-growing district have been mapped; 20 samples of loose sand and fine gravel from well cuttings and 46 samples of sand and of sand and silt selected from 200 feet of drill cores obtained from deep wells at Houston have been tested in the hydrologic laboratory of the Geological Survey, at Washington, to determine the permeability of the water-bearing sand and gravel--that is, their capacity to transmit water under head; numerous samples of water from wells have been analyzed in the water-resources laboratory of the Geological Survey; about 300 samples have been analyzed by field methods; and copies of many analyses have been collected from local sources.

Rainfall

The climate of the area is humid. Heavy rains are of frequent occurrence, and the precipitation is well distributed throughout the year. According to records of the United States Weather Bureau, the average annual rainfall at Houston during 47 years was 47.05 inches; at Conroe, about 40 miles north of Houston, during 14 years, 48.28 inches; at Hempstead, about 50 miles northwest of Houston, during 30 years, 41.04 inches; at Liberty, about 40 miles northeast of Houston, during 28 years, 49.74 inches; and at Galveston during 61 years, 44.77 inches. In 1930 the rainfall was materially below the average at all these stations. In 1931 it was below the average at Houston, Conroe, Liberty, and Galveston and a fraction of an inch above the average at Hempstead. During the period from January to May, 1932, the rainfall was materially below the average at Houston, slightly below the average at Conroe and Liberty, and slightly above the average at Hempstead and Galveston. In the period from January, 1930, to May, 1932, the accumulated deficiency below the average amounted to 26.36 inches at Houston, 9.37 inches at Conroe, 4.39 inches at Hempstead, 9.38 inches at Liberty, and 11.35 inches at Galveston.

Geology and its effect on the recharge and movement of the ground water

Supplies of ground water in this area that are available at depths to which it is practicable to drill water wells occur in beds of sand, sandstone, and gravel that crops out in the area or immediately to the north. The sediments range in age from Miocene (?) to Recent and have a total thickness of 2,500 to 4,000 feet. They were deposited for the most part under water during successive advances and retreats of the sea. The sand and gravel were deposited close to the shore; the mud and clay were laid down in deeper water. As the sea moved inland the zones of deposition moved with it, and hence practically continuous deposits of sand, partly overlain by clay, reach to the present outcrops from localities far seaward. As the sea retreated the process was reversed, and deposits of sand were spread over the clay. During times when the land was above water the beds were subjected to reworking by the streams and were thereby materially modified.

The beds consist, therefore, of relatively impermeable clay, gumbo, and shale interbedded with layers of permeable sand. In or close to the outcrop areas of the formations the beds are in general dominantly sandy and the clays more or less lenticular, but toward the Gulf the beds of clay thicken and persist over wide areas and the sands tend to pinch out.

The beds dip generally to the south or southeast, which is also the general direction in which the land slopes. However, the dip is nearly everywhere steeper than the surface slope, and the beds are beveled by the surface. Successively younger formations are therefore encountered in crossing the area from north to south or from northwest to southeast. Each of the formations has an outcrop area, from which it extends toward the south or southeast, below the younger formations, to progressively greater depths below the surface. Thus the Lagarto clay, which crops out in the northern parts of Waller and Montgomery Counties, is encountered at a depth of approximately 1,800 feet at Houston.

The streams in their gulfward courses cross one outcrop after another and may lose a part of their water by seepage into the permeable sands, except where these sands are sealed by dense deposits of clay or silt. The underground reservoirs formed by the permeable sands are chiefly replenished, however, by the penetration to the water table of rain that falls on the outcrop areas of these sands.

In outcrop areas of the water-bearing formations the water generally is unconfined and there is a water table. Down the dip, however, where the beds disappear under cover, artesian conditions are commonly present. The underground reservoirs formed by the permeable sands have been filled almost completely with water received at their outcrops. As the sands are interbedded with relatively impermeable clays and shales, the water in the sands is confined under artesian pressure, and in areas where the clays are widespread it rises in wells sunk into the sands through the overlying clay or shale. As the land slopes gently from the outcrops toward the Gulf the artesian water is in some places under sufficient head to rise to the surface and produce flowing wells.

Geologic formations and their water-bearing properties

A generalized section of the geologic formations that crop out in this area is given in the following table:

Generalized section of the geologic formations of the Houston-Galveston area

System	Series	Formation	Thickness (feet)
	Recent	Stream and beach deposited sand, gravel, clay, and shells	0-25
Quaternary	Pleistocene	Beaumont clay	1,300
	- - - - - - - -	Lissie formation ? ?	600-750
Tertiary	Pliocene (?) - - - - - - - -	Reynosa formation	600-800
	Pliocene - - - - - - - - Miocene (?)	Lagarto clay	1,000-1,400

The structure of the rocks and the order in which they occur is shown in Figure 5, which gives a generalized cross section from a point about 17 miles north of Conroe, the county seat of Montgomery County, southward through Houston to Galveston. A map showing the boundaries of the outcrop area will be published in a later and more complete report.

The Lagarto clay is the oldest formation exposed in the area. It appears in the northeastern and northern parts of the area, in Waller, Montgomery, Grimes, and San Jacinto Counties. The formation consists chiefly of pink, green, and brown calcareous clay and shale but includes two persistent beds of coarse gray sand, one about 60 feet and the other about 100 feet thick, which occur respectively at 500 to 600 feet and 750 to 900 feet below the top of the formation. With the clay and shale are thin layers of hard lime-cemented sandstone and many lime nodules.

The thick sand members of the formation usually yield large quantities of good water in Montgomery County, the southern part of Grimes County, and the northern part of Waller and Liberty Counties. Wells in these sands at low altitudes in the valleys usually flow. The thin layers of lime-cemented sandstone usually yield a moderate amount of fair water to shallow wells in the outcrop area. Shallow wells in the clays of the formation are reported to yield only small supplies of mineralized water.

The Reynosa formation crops out in the area above the Hockley scarp in Waller, Montgomery, and San Jacinto Counties and the northern parts of Harris and Liberty Counties. It consists of alternating beds of gray sand and gray, brown, blue, or variegated sandy clay, silt, and gumbo. The upper part of the formation is chiefly clay but contains a few thin sand layers. The lower half of the formation is mainly sand, and the basal sand is the coarsest.

The sands in the Reynosa formation yield abundant supplies of water to shallow wells in the outcrop area and to deep wells wherever they are within economic reach of the drill. The City of Houston draws heavily upon the water supply in these sands. The five deep wells recently completed by the City and many of the deeper privately owned wells that are used to obtain water for industrial purposes at Houston, Pasadena, and Deepwater, the deeper wells used for rice irrigation in the Katy area, the deep wells at Sugarland, and the railroad wells at Spring, Cypress, North Houston, and Tomball all draw from the formation. The water from either deep or shallow wells in the Reynosa formation is usually soft and relatively low in mineral content.

The Lissie formation crops out in the southern parts of Waller and Montgomery Counties and the northern parts of Fort Bend, Harris, and Liberty Counties in a belt averaging about 20 miles wide extending southward and southeastward from the foot of the Hockley escarpment.

There is some difference of opinion among geologists as to the exact stratigraphic position at which the contact should be drawn between the Reynosa and the overlying Lissie formations. For the purposes of this preliminary report the line of outcrop of this contact is arbitrarily taken as the base of the Hockley escarpment. In Figure 5, the line of the Reynosa-Lissie contact is represented as coming to the surface at the base of this escarpment, but the uncertainty as to correct position of the contact is indicated by question marks.

The Lissie formation is composed of beds of gray sand containing some fine pebbles and beds of gray, brown, blue, or red sandy silt, clay, and gumbo. The upper part of the formation is dominantly clay except in areas on or near the outcrop, where the beds are more sandy. The lower part of the formation is mainly sand. Southeastward from Houston the sands have a tendency to pinch out or become finer and the silts and clays increase in thickness.

The sands in this formation yield large supplies of water to comparatively shallow wells in the Katy district that are used for rice irrigation and to many fairly deep industrial wells at Houston. Water from the deeper wells in the formation is good. That from the shallow wells is nearly always relatively hard but otherwise is satisfactory for most uses.

The outcrop area of the Beaumont clay occupies the southern parts of Harris, Fort Bend, and Liberty Counties and nearly all of Brazoria, Galveston, and Chambers Counties. The basal 200 feet of the formation consists largely of sand, but the middle and upper parts are largely clay. The basal sandy member furnishes large quantities of water to wells in the southern parts of Harris, Fort Bend, and Liberty Counties and in Brazoria and Galveston Counties. The largest wells are at Houston, Baytown, Texas City, Alta Loma, and Galveston and in the industrial area along the ship channel east of Houston.

Ground-water recharge

In the outcrop area of the Reynosa formation fine sandy loam soils predominate, and in parts of the area the soils are too sandy for cultivation. In northern Harris County and in Montgomery County many of the more sandy lands are heavily forested, but in northwestern Harris County and in Waller County most of them support a luxuriant growth of grass and are used for grazing. Sandy loam soils predominate also in the outcrop area of the middle and lower parts of the Lissie formation, but clay loams commonly occur on the outcrop of the upper parts of that formation. In general the sandy lands on the outcrop areas of both formations have fewer drainage channels than the adjoining country and numerous small drainage basins with no outlet. These surface features indicate that the rain sinks more readily into the sandy soils than into the clay or clay loam soils of adjoining lands.

Studies of the penetration of rainfall on these outcrop areas are in progress. In four localities pits have been sunk and lysimeters installed in tunnels driven laterally from them. Measurements of depths to water in about 70 shallow wells, many of which were put down for purposes of observation, are made monthly, and during the winter of 1931-32 and the spring and early part of the summer of 1932 the measurements were made weekly in 40 of the wells. The wells are spaced at regular intervals in two lines across the outcrops--one along the highway between Houston and Hempstead and the other along the highway between Houston and Willis. Automatic water-stage recorders are maintained on six of the wells.

It is found that for most of the time on the greater part of the outcrop area of the two formations there is both a true water table and a perched water table. The permeable sandy soils and sandy loam soils are underlain by silty sand or sand mixed with some clay, which usually are somewhat less permeable than the soils themselves. The soils readily absorb the rain, and the water moves downward in them at a comparatively rapid rate. When it reaches the underlying silty or clayey sands its movement becomes slower, and as a result these materials become saturated. During the summer practically all the moisture that penetrates the soils is dissipated by evaporation or by transpiration of grasses, shrubs, and trees. During the late fall, winter, and early spring, however, the evaporation and transpiration losses are comparatively small, and a temporary perched water table is built up. This water table rises abruptly after each rain, but at other times it slowly but continuously moves downward toward the true water table. During the winter of 1931-32 there was a substantial rise in the water levels in all the observation wells on the outcrop areas, both those that penetrated to the true water table and those that penetrated only to perched water, the average net rise amounting to about eight feet.

These figures indicate that the ground-water recharge on the outcrops of the water-bearing formations is relatively heavy. In order to evaluate the results in terms of water it is necessary to apply a factor generally known as the specific yield. This factor represents the interstitial space that is filled as the water table rises, expressed as a percentage of the total volume of material saturated. The observations are to be continued during the coming winter.

The experiments with the lysimeters have been only partly successful, but they indicate that water in the perched zone moves downward in considerable quantities to depths exceeding ten feet below the surface. At such depths the water is below the zone of evaporation and out of the reach of the grass roots, and if it is not intercepted by deeply seated tree roots it must move downward to the water table. It is estimated that the penetration of one inch of water to the true water table over the entire outcrop area of the Reynosa and Lissie formations in Harris, Waller, and Montgomery Counties would provide ground-water recharge amounting to a quantity several times greater than the total quantity withdrawn from wells in both formations in Harris County. The streams on the outcrop areas doubtless contribute some recharge to the true water table. However, seepage from the zone of perched ground water is entering the streams nearly all the time, and this makes it difficult if not impossible to determine the true recharge from the streams.

Pumpage

Discharge of ground water occurs in the area through the flow of springs, evaporation from the soil and transpiration from plants on the outcrops of the water-bearing formations, movement down the dip of the beds to unknown outlets, possibly located beneath the Gulf, and withdrawals from wells. Some of the artificial discharge takes place through flowing wells in widely scattered parts of the area, but most of it is accomplished by pumping from wells in the Houston, Baytown, and Alta Loma districts and in the Katy rice-growing area. A summary of the pumpage in these areas is given below.

Houston district. - The Houston district, as the term is used in this report, covers about 150 square miles and comprises the area within the city limits and adjacent territory, including several incorporated and unincorporated towns and the strip along the ship channel between Houston and Pasadena. The water supply of this district is obtained entirely from wells. The heaviest demands for water are for domestic use and for office buildings, most of which are supplied from the city wells. According to the records of the City Water Department, the average quantities of water delivered by the City between 1906 and 1931, in millions of gallons a day, were as follows: 1906 to 1910, 9.3; 1911 to 1920, 7.0; 1921 to 1925, 13.5; 1926, 16.9; 1927, 20.5; 1928, 21.9; 1929, 23.0; 1930, 25.8; 1931, 25.4.

The following table was compiled from city records:

Average quantities of water delivered by the City of Houston, 1928-1932, in millions of gallons a day

	1928	1929	1930	1931	1932
January	20.5	20.0	24.5	23.8	22.5
February	18.3	20.6	24.6	23.2	22.8
March	18.8	21.2	24.0	22.5	22.1
April	20.0	22.2	25.9	22.7	24.9
May	23.3	22.7	25.0	24.3	25.1
June	24.0	22.7	27.9	28.4	26.8
July	25.5	23.6	28.5	28.3	26.9
August	26.0	26.0	28.2	27.3	
September	22.8	26.1	27.7	28.7	
October	22.5	25.8	26.0	27.4	
November	20.9	22.0	24.5	24.6	
December	20.5	22.9	23.7	23.1	
Average	21.9	23.0	25.8	25.4	

It is estimated that altogether there are about 400 wells in the Houston district, of which about 230 are in use and 170 have been abandoned. Industrial requirements for water are supplied largely from privately owned wells. The heaviest consumers are oil refineries, ice plants, and laundries, but large quantities are also used for cooling machinery for air conditioning office buildings and theaters. During 1931 the production of each well or group of wells was either measured or estimated. In May, 1932, the results of this survey were revised and checked and all available information as to the volume of pumpage in 1930 as compared with that in 1931 was collected and studied. The figures that were reached as the average pumpage from all public and private wells in the district were 52,000,000 gallons a day in 1930 and 50,000,000 gallons a day in 1931. It was computed that the average daily pumpage amounted to about 56,000,000 gallons from May to October, 1930, about 47,000,000 gallons from November, 1930, to April, 1931, and about 54,000,000 or 55,000,000 gallons from May to October, 1931. During the same periods the city water system made average daily deliveries of 27,200,000, 23,300,000, and 27,400,000 gallons, respectively.

A pronounced decline in the demands for water for industrial purposes began about the first of January, 1932, and the industrial pumpage during the late spring and summer may have been 20 to 25 per cent less than it was during the same period in 1931. There has, however, been little reduction in the pumpage by the city. Thus the total pumpage from public and private wells may have been ten or 12 per cent below that of 1931.

Rice-growing areas. - In recent years rice has been irrigated on a comparatively large scale from wells in several widely separated localities in the area. In 1931, however, only five rice farms outside of the Katy district were thus supplied. Three of the farms were near Webster and had an aggregate irrigated area of 875 acres. The other two were near Bonney. The Katy rice-irrigation district centers around the town of Katy, which is about 30 miles west of Houston. The irrigation of rice in this district was begun in 1902, and by 1905 the area devoted to this crop amounted to about 400 acres. There was a gradual increase in production between 1906 and 1929. The area amounted to about 9,400 acres in 1930 and to about 8,300 acres in 1931. All these lands are irrigated with water pumped from wells.

The records of the Houston Lighting & Power Company show that the average irrigation season in the Katy rice district is about 100 days. During this time the pumps are never allowed to stop unless a heavy rain occurs, and then they are stopped only for a few hours. It is estimated that during the season of 1931 an average of 58,000,000 gallons a day was delivered to the rice fields. On this basis the pumpage during the season amounted to about 18,000 acre-feet, or about 2.2 acre-feet per acre.

Baytown district. - According to information obtained from the Humbel Oil Company, the average pumpage from the nine wells at Baytown amounted to about 11,000,000 gallons a day in 1931 and for several previous years. The wells furnish water to the refinery, which is one of the largest on the Gulf coast, and also to the town of Goose Creek.

Alta Loma district. - The wells that supply Galveston are at Alta Loma, and it is reported that on the average 4,000,000 to 5,000,000 gallons a day is pumped from them. Thus far, only work of a reconnaissance character has been done in this part of the area, but it is planned to extend the investigation into this area during the coming fall and winter.

Fluctuations in artesian pressure

Houston district. - In the early days of Houston flowing wells could be obtained practically anywhere within the present city limits, and the artesian head in some localities was sufficient to raise the water in wells from 15 to 30 feet above the surface. The artesian head, as shown by water levels in unused wells, is now about 80 feet below the surface in the downtown part of Houston. Between 1920 and 1931 the decline in artesian head averaged about four feet a year. The fluctuations in artesian head that are now in progress, together with those that have occurred during the last three or four years, have particular significance in connection with the prblem of the safe yield of the underground reservoir, because they can be correlated with figures on pumpage that are reasonably accurate. The current program of well measurements shows the fluctuations in artesian head that have taken place during the last 18 months, and a survey has been made to obtain as much information as possible regarding the

decline in head between 1928 and 1931. Figure 1 is a map of the Houston district showing the positions above or below sea level to which water in artesian wells in the district would rise in 1928. Figure 2 is a similar map showing the position to which the water would rise in 1931. These maps are comparable with a topographic map, but instead of indicating the form of the land surface they indicate the form of the water levels in wells as if there were an infinite number of wells. The water levels in the wells are determined by the artesian pressure, and the maps therefore are artesian-pressure maps. The wells for which the water-level data were obtained are from 100 to 1,900 feet deep, and the deeper wells penetrate water-bearing sands at many different horizons. It is the practice in constructing many of the wells to place screens opposite all the most favorable sands. However, more than half of the water pumped in Houston comes from beds that lie between 700 and 1,300 feet below the surface, and as a result in parts of the area the static level is lower in the deep wells than in moderately shallow wells. Figures 1 and 2 are compiled from levels in wells that are more than 150 feet deep but represent most nearly the head in wells more than 700 feet deep. Local differences in head have been set up in parts of the area as a result of unequal draft by the pumps, and in compiling the maps it has been found necessary to neglect the water levels in a few of the wells that were obviously erratic and not indicative of the prevailing pressures. A depression in the artesian head has been created by the withdrawals of water in the areas of greatest pumping development. Figure 1 shows that in 1928 the prevailing artesian head had been depressed below sea level in an area of about 50 square miles extending from Glenwood Cemetery southeastward to Pasadena. Figure 2 shows that in 1931 the area in which the prevailing pressures had been depressed below sea level had increased to about 150 square miles. Both maps indicate that the pumping has lowered the artesian head much more in the area to the south and east of Houston than it has in the area to the north and west.

In general in the heavily pumped area of Houston the water levels in all the wells except the shallow ones appear to rise and fall together, regardless of their depths. The water levels in all the observation wells in the district respond to seasonal changes in the rate of pumping. In some of them the effect is obscured by fluctuations due to short-time changes in the rate of pumping from the observation wells themselves or from nearby wells, but usually a seasonal trend is unmistakable. The mean water level begins to decline in April and continues to decline slowly until October or November. From November to April there is a corresponding rise in the water level. The average decline between April and October, 1931, in the 40 wells in the Houston district where monthly observations were made amounted to 6.0 feet. The average rise between November, 1931, and March, 1932, amounted to 7.1 feet. In most of the wells the water levels were as high during January, 1932, as they were during January, 1931, slightly higher in May and June, 1932, than in May and June, 1931, and from one to two feet higher in August and early September, 1932, than during the corresponding period in 1931. In three of the wells the levels were slightly lower in 1932 than during corresponding periods in 1931. The most significant fact brought out by the record is that there was no decline in head during 1931, although the pumpage in 1931 was only slightly below that of 1930.

The hydrograph in Figure 3 shows fluctuations of the water levels in four widely spaced wells in the Houston district from January, 1931, to April or May, 1932. The location of the wells is shown on Figures 1 and 2. Well 1 is owned by the River Oaks Country Club and was drilled about a quarter of a mile north of the club house. It is ten inches in diameter and 1,038 feet deep and is used to supply the club house and to water the grounds. There are no large wells within 1½ miles from this well. It is not used much during the winter, but during the summer probably an average of 250,000 gallons a day is pumped from it. The water level in this well rose 1.5 feet between January 19 and April 4, 1931, and declined 5.2 feet between April 4 and September 10. It rose about nine feet during the fall of 1931 and winter of 1931-32. On April 18, 1932, it stood 4.9 feet higher than on April 7, 1931, and in August, 1932, it stood about 3½ feet higher than in August, 1931. The well was being pumped when the May and June measurements were made.

Well 2 is a 6-inch well of unknown depth belonging to the Texas Pipe Line Company, at the tank farm on the Wallisville road. The well is no longer in use, and very little water is pumped within a distance of 1½ miles from it. The water level in this well on March 19, 1931, was 54.1 feet below the reference point (top of air line). The level gradually declined during the spring, summer, and early fall, the total decline amounting to about five feet. It rose steadily during the winter of 1931-32 and spring of 1932, and on June 6, 1932, it stood at 53.82 feet, or about one foot higher than on May 25, 1931. It stood two to 2½ feet higher in August and the early part of September, 1932, than during the corresponding period in 1931.

Well 3 is an abandoned 6-inch well of unknown depth belonging to the City of Houston at the site of the old Lincoln swimming pool, on Sabine Street, just south of Buffalo Bayou. It is in a heavily pumped area where there are pronounced daily as well as seasonal fluctuations in the rate of pumping. The water level was 55.5 feet below the reference point (1.5 feet above level of street) on January 31, 1931. The water rose slightly during the spring and declined during the summer. On September 10 it was 4.5 feet below the level recorded on January 31. It rose about nine feet during the succeeding six months and declined again during April and May, 1932. The water level was about 1-3/4 feet higher on January 25, 1932, than on January 30, 1931, but in May and June, 1932, it was about the same as for the corresponding months in 1931.

Well 4 is a 6-inch well belonging to the City which was drilled to supply water for Park Place but is no longer in use. The nearest heavy pumping is done at the City east-end plant, which delivers about 1,000,000 gallons a day throughout the year. This plant is about one mile northeast of the well. The water level in this well was 58.5 feet below the reference point (1.6 feet above level of ground) on January 8, 1931. It rose somewhat during the spring, declined during the summer and fall, and rose again during the winter of 1931-32. On April 7, 1932, it was about three feet higher than on April 6, 1931. In August and September 1932, it was 1½ to two feet higher than during the corresponding period in 1931.

Hourly measurements made at well 3 on January 17, 18, and 25, 1932, and at well 4 on January 26, 1932, showed that there is a fluctuation during the day in the water levels of these wells amounting to about a tenth of a foot. These changes apparently are due to fluctuations in barometric pressure.

Rice-growing areas. - The hydrograph obtained with an automatic water-stage recorder from Mr. Lamb's unused well one mile east of Katy is shown in Figure 4. This well is practically in the center of the irrigated areas but is a mile from the nearest well that was pumped for irrigation during the time the record was obtained. The hydrograph shows that the water level gradually fell from May 1 to 19, 1931, and then dropped very rapidly until June 11. Unfortunately the float struck an obstruction, and the record between that date and September 2 was lost except for a brief period in late July when a rise in the water level lifted the float above the obstruction. The water rose gradually during the fall and winter, and on March 24, 1932, it had reached a level slightly below the level of the corresponding date in 1931. The record of fluctuations in the water level in this well and in other observation wells in the Katy district is not very long, and no attempt will be made at this time to draw any conclusion as to the trend of water levels in the district. Observations are still being made and should be continued for several years. According to a statement by Mr. John Cope, one of the leading rice growers, the water level in the district has declined about five feet since 1903.

Baytown district. - In the district supplying water for the refinery of the Humble Oil & Refining Company the static level has fallen at the average rate of five feet a year since 1920. The drop in water level during some of the years was as much as ten feet and during others as little as three feet. It has been reported that prior to 1915 wells at La Porte, four miles south of Baytown, flowed 20 feet above the surface. Soon after the Goose Creek and Baytown development began the water level dropped suddenly. In 1931 the depth to the water levels in wells at La Porte was between 50 and 55 feet.

Alta Loma district. - The wells at Alta Loma that furnish the water supply for the City of Galveston when drilled in 1893-94 would flow about 28 feet above the surface. In 1931 the static level was 33 feet below the surface.

Movement of ground water

Most of the water withdrawn from the underground reservoirs in Harris County is supplied by percolation from the outcrop to the pumped districts, which usually are many miles apart. In the greater part of the area the water is moving from northwest to southeast, which is the direction of both the hydraulic gradient and the slope of the land. A depression in the artesian head has been created by the withdrawals of water in the areas of greatest pumping development. The location and shape of the depression in the Houston district in 1928 and 1931 are shown in Figures 1 and 2. The water moves at right angles to the contours shown on these maps, along the strike and up the dip of the water-bearing formations as well as down the dip from the northwest. In the long run, however, the supply from the outcrop must provide most of the water withdrawn by the pumps. The amount of the inflow of water to any part of the area depends on the permeability and thickness of the water-bearing formations and on the hydraulic gradient. The coefficient of permeability can be expressed as the number of gallons of water that will flow daily through a cross section of the water-bearing bed one foot high and one mile wide for each foot of head per mile. The total flow across a segment of the formation one mile wide is obtained by multiplying the coefficient of permeability by the thickness of the formation and this product by the hydraulic gradient. Twenty samples of loose sand from drill cuttings and 46 samples of sand

and of sand and silt selected from drill cores obtained from deep wells at Houston have been tested in the hydrologic laboratory of the United States Geological Survey, at Washington, to determine the permeability of the water-bearing materials. The results show that the permeability varies considerably but averages about 150.

In order to reach a tentative figure as to the amount of the annual replenishment from the outcrop to the Houston district, it has been assumed that the inflow passes through a vertical section of the sands 50 miles long along the 20-foot contour shown on Figure 2. It is estimated that along this contour the average thickness of the formation is 600 feet, the average coefficient of permeability 150, and the average hydraulic gradient ten feet to the mile. On this basis the estimated flow from the outcrop to the pumped districts is 45,000,000 gallons a day.

Conclusions, with special reference to the safe pumping yield in the Houston district

The water-bearing beds of sand tapped by the wells in the Houston district have an extensive outcrop area, and there is evidence that the ground-water recharge by penetration of the rain that falls on this area is heavy. The permeability of the sands is only moderately high, but the water-bearing beds have a great total thickness and therefore a large aggregate capacity to transmit water.

In 1931, with an average daily pumpage only a few per cent less than that during the peak years 1929 and 1930, the prevailing artesian pressures held their own. During the first eight months of 1932, with a decline in pumpage which is estimated to have amounted to ten or 12 per cent, the pressures generally have risen. Apparently, therefore, a state of essential equilibrium has been reached, and there will be no further decline in head if the average daily pumpage does not exceed 45,000,000 to 50,000,000 gallons. This conclusion is strengthened by the fact that the rainfall has been below the average and the rise in head can thus not be attributed to especially heavy recharge.

With the increased demands which may be expected to accompany the normal growth of the City, the artesian head would decline further if all water were pumped from existing pumping plants, but as this would take place the cone of pressure depression would be expanded and deepened, and greater quantities of water would thereby be brought into the district. Further material lowering in head can be prevented and additional supplies can be obtained if in the future the City locates its new wells at greater distances from the centers of the existing cones of depression (shown in figs. 1 and 2), preferably toward the west and southwest. The conclusion is reached, therefore, that the underground reservoir is capable of supplying more water for the City of Houston than has heretofore been withdrawn from it.

(P. N. 66553)

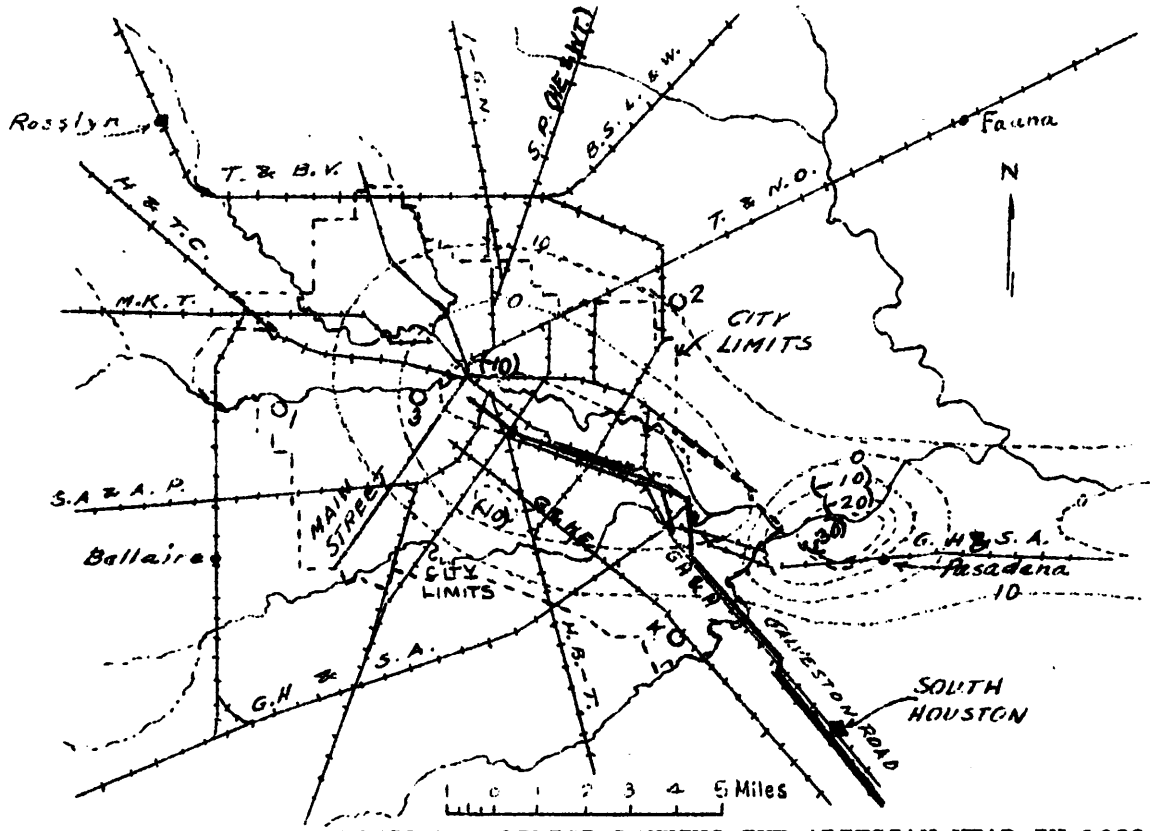

FIG. 1. -MAP OF THE HOUSTON DISTRICT SHOWING THE ARTESIAN HEAD IN 1928, IN FEET ABOVE OR BELOW SEA LEVEL, AND FOUR OBSERVATION WELLS MENTIONED IN THE TEXT.

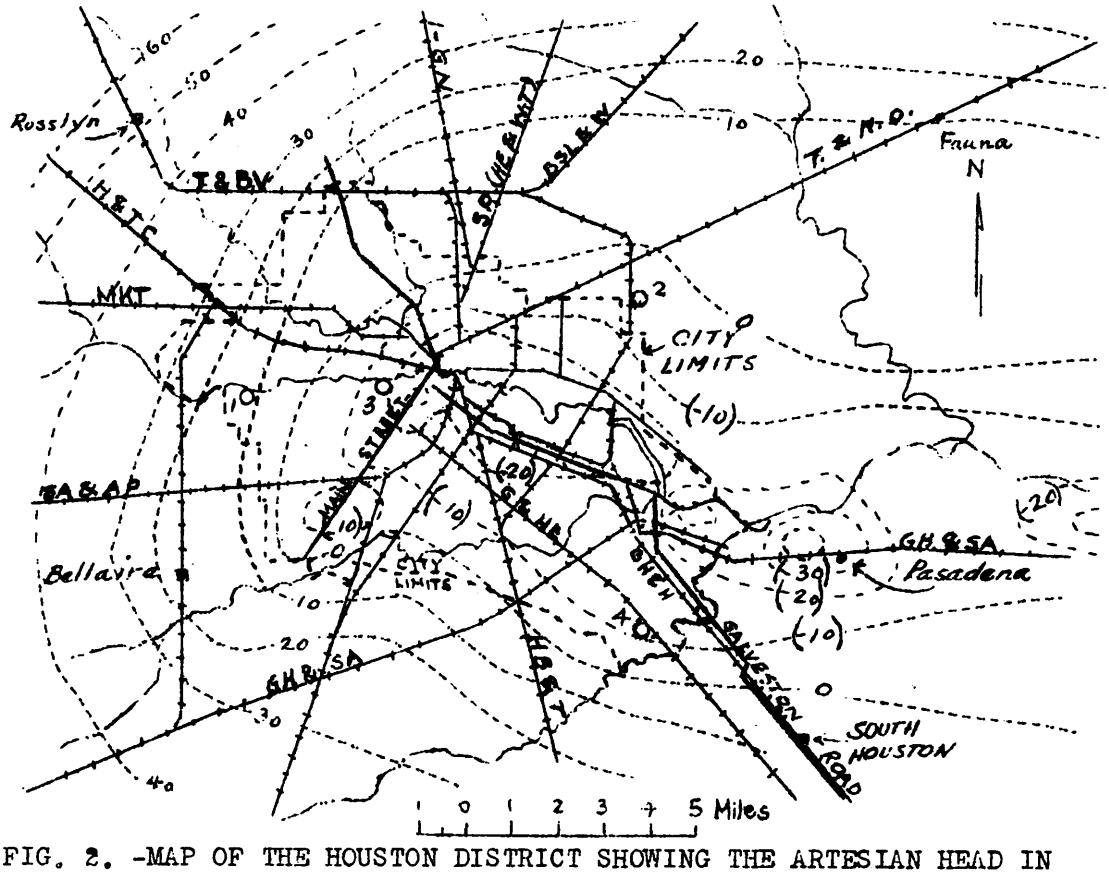

FIG. 2. -MAP OF THE HOUSTON DISTRICT SHOWING THE ARTESIAN HEAD IN 1931, IN FEET ABOVE OR BELOW SEA LEVEL, AND THE FOUR OBSERVATION WELLS SHOWN IN FIGURE 1.

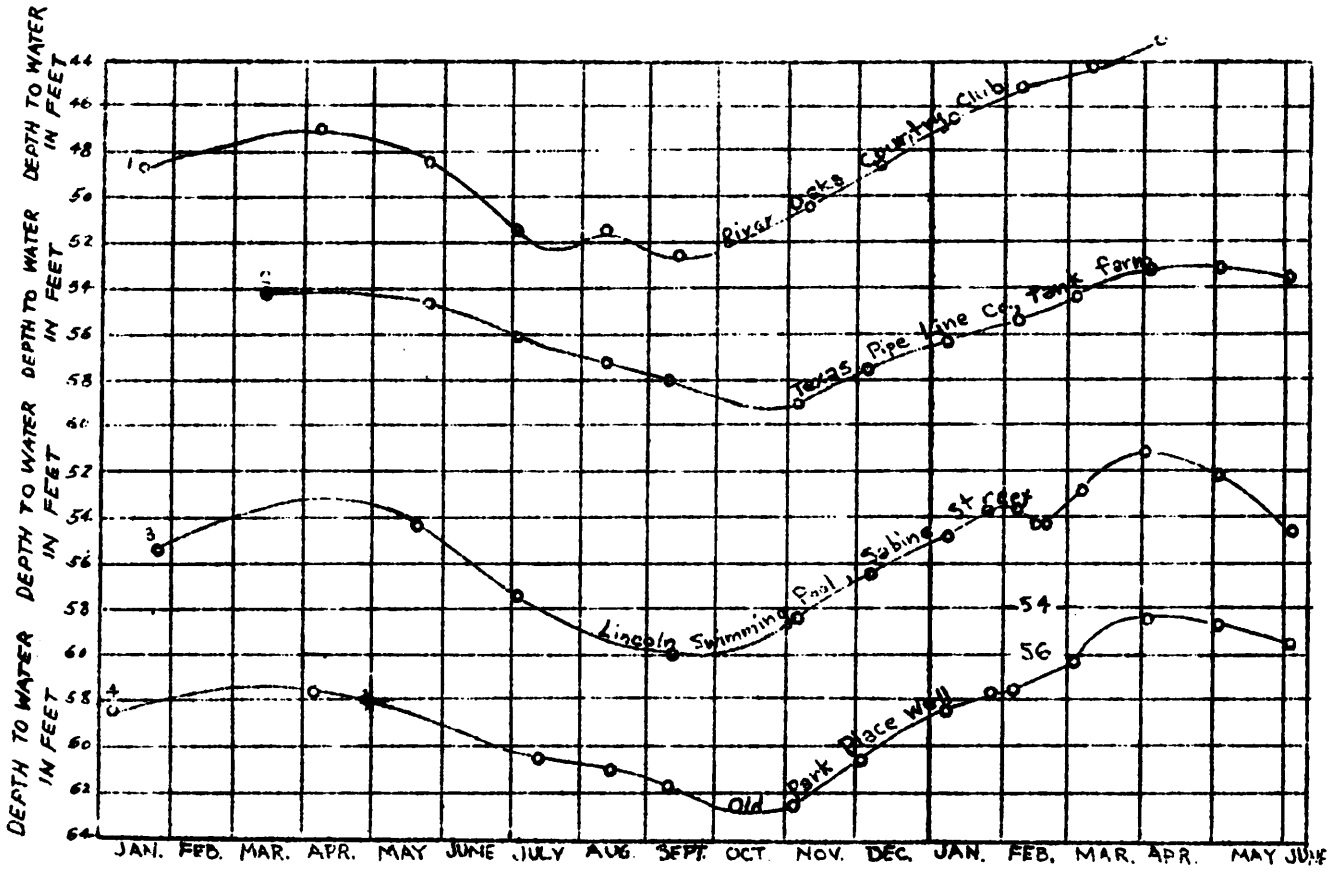

FIG. 3.-GRAPHS SHOWING FLUCTUATIONS OF WATER LEVELS IN THE FOUR OBSERVATION WELLS WHOSE LOCATIONS ARE GIVEN IN FIGURES 1 AND 2.

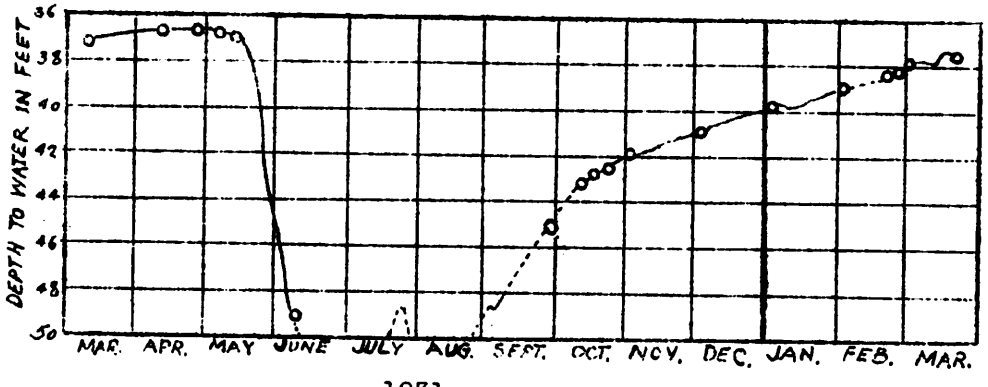

FIG. 4.- GRAPH SHOWING FLUCTUATIONS OF THE WATER LEVEL AS RECORDED BY AN AUTOMATIC WATER-STAGE RECORDER ON AN UNUSED WELL 1 MILE EAST OF KATY.

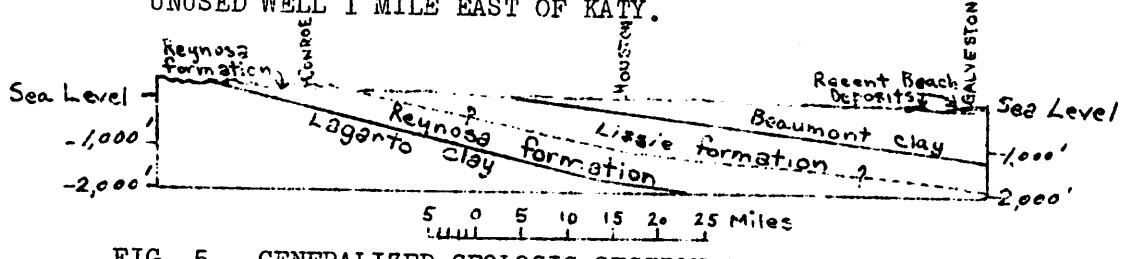

FIG. 5.- GENERALIZED GEOLOGIC SECTION ACROSS MONTGOMERY, HARRIS, AND GALVESTON COUNTIES, FROM A POINT 17 MILES NORTH OF CONROE, SOUTHWARD THROUGH HOUSTON TO GALVESTON.

DEPARTMENT OF THE INTERIOR

Memorandum for The Press

RELEASE FOR DECEMBER 29, 1933.

GROUND-WATER RESOURCES IN THE HOUSTON DISTRICT, TEXAS.

Report prepared through cooperation between the Texas State Board of Water Engineers and the United States Geological Survey.

By W. N. White and Penn P. Livingston

An investigation of the underground-water supply available for Houston and vicinity has been in progress during the last three years, as part of a survey of the ground-water resources of Texas by the United States Geological Survey in cooperation with the State Board of Water Engineers. This investigation is under the direction of O. E. Meinzer, geologist in charge of the division of ground-water in the Geological Survey. The most important results of the investigation to August 1932 were set forth in a mimeographed memorandum which was released October 17, 1932, and in large part was published in the daily newspapers of Houston. In this memorandum it was shown that the water-bearing beds of sand tapped by the wells in the Houston district have an extensive outcrop area, that there is good evidence that the ground-water recharge by penetration of the rain that falls on this area is heavy, that the sands have a large aggregate capacity to transmit water, and that a state of equilibrium in artesian pressures had been reached in the Houston district. The conclusion was reached that the underground reservoir was capable of supplying more water to the city of Houston than had theretofore been withdrawn from it. Since the memorandum was issued an estimate has been made of the total pumpage in the district in 1932, and the program of monthly measurements of depths to water in 43 selected wells in the district, which was begun in December 1930, had been continued.

Pumpage

As explained in the memorandum of October 17, 1932, the Houston district covers about 150 square miles and comprises the area within the city limits and adjacent territory, including several incorporated towns and the strip along the ship channel between Houston and Pasadena. The water supply of this district is obtained entirely from wells. It is estimated that altogether there are about 400 wells in the district, of which about 230 are in use and 170 have been abandoned. The heaviest demands for water are for domestic use, oil refining, ice manufacture, laundry operation, and air conditioning office buildings and theaters. About half the supply is furnished by the city from 30 wells at nine pumping stations in widely separated parts of the city. According to the records of the City Water Department the average quantities of water delivered by the city between 1906 and 1931, in millions of gallons a day, were as follows: 1906-10, 9.3; 1911-20, 7.0; 1921-25, 13.5; 1926, 16.9; 1927, 20.5; 1928, 21.9; 1929, 23.0; 1930, 25.8; 1931, 25.4; 1932, 23.9.

The following table was compiled from city records:

Average quantities of water delivered by the city of Houston, 1928-33, in millions of gallons a day

	1928	1929	1930	1931	1932	1933
January	20.5	20.0	24.5	23.8	22.5	20.2
February	18.3	20.6	24.6	23.2	22.8	22.3
March	18.8	21.2	24.0	22.5	22.1	21.0
April	20.0	22.2	25.9	22.7	24.9	23.4
May	23.3	22.7	25.0	24.3	25.1	25.7
June	24.0	22.7	27.9	28.4	26.8	27.9
July	25.5	23.6	28.5	28.3	26.9	25.4
August	26.0	26.0	28.2	27.3	25.6	23.8
September	22.5	26.1	27.7	28.7	24.2	24.7
October	22.5	25.8	26.0	27.4	23.4	23.5
November	20.9	22.0	24.5	24.6	21.8	
December	20.5	22.9	23.7	23.1	20.9	
Average	21.9	23.0	25.8	25.4	23.7	

During 1931 the production of each privately owned well or group of wells was either measured or estimated, and on the basis of data thus obtained and all other available information as to fluctuations in industrial use of water, the following estimates have been made of the pumpage in 1930 and 1932:

Estimated average quantities of water pumped from all wells in the Houston district, 1930 to 1932, in millions of gallons a day

	1930	1931	1932
January	45.8	45.2	42.6
February	46.2	45.0	43.6
March	45.9	44.4	43.4
April	50.2	46.3	47.5
May	51.7	49.1	49.2
June	55.3	54.1	51.6
July	56.1	53.9	51.5
August	54.8	52.9	49.9
September	55.2	54.6	48.5
October	52.1	51.3	45.9
November	47.8	47.9	43.1
December	45.9	45.4	41.3
Average	50.7	49.2	46.5

The average quantities delivered by the city during the first 10 months of 1933 were somewhat less than those for the corresponding period in 1932. No figures are available for private pumpage during this period in 1933, but the general information available indicates that it may have been considerably more than it was for the corresponding months in 1932.

Fluctuations in artesian pressure

At one time flowing wells could be obtained practically anywhere within the present city limits, and the artesian head in some localities was sufficient to raise the water in wells from 15 to 30 feet above the surface. The present artesian head, as shown by water levels in unused wells, is 70 to 80 feet below the surface in the downtown part of Houston. Between 1920 and 1931 the decline in head, according to the best information that can be obtained, averaged about four feet a year. This decline in itself represents no particularly unfavorable condition, for a certain amount of decline in water levels is an inherent and unavoidable consequence of any ground-water development, and progressive decline is to be expected if the rate of withdrawal is continually increasing, as it was in Houston from 1920 to 1930. However, if the rate of withdrawal is kept constant and does not exceed the rate of recoverable discharge, the decline should proceed at a diminishing rate and should eventually stop.

One of the chief purposes of the investigation was to obtain records of fluctuations in artesian pressure that are now in progress, as shown by fluctuations in the water levels in wells, and to correlate them with the pumpage. The well measurement record, which now contains the results of more than 1,000 measurements obtained monthly from January 1931 to October 1933, has recently been released for public inspection by filing copies in the office of the State Board of Water Engineers at Austin and in the offices of the United States Geological Survey at Washington and at 308 Federal Building, Houston.

The records show that in most of the wells the water levels either held their own or were higher in 1933 than they were during corresponding months in 1931. During the winter many wells are idle or are not pumped heavily, and local inequalities in artesian pressure produced by heavy pumping during the summer are gradually smoothed out. Therefore, spring measurements of water levels in a group of observation wells are a more accurate index of pressures that exist generally in the underground reservoir than measurements at any other time. In about three-quarters of the Houston observation wells the water levels were higher in the spring of 1932 than they were in the spring of 1931. In all except three wells the water levels were higher in the spring of 1933 than they were in the spring of 1932, and in all except one well the water levels were higher in the spring of 1933 than they were in the spring of 1931, the average gain being about 3-3/4 feet. In about half of the wells the water levels were lower in September and October 1933 than they were in the fall of 1932. This is believed to be due in part to a shift in the centers of pumping operations by the city and in part to an increase in pumpage by industrial plants. However, in all except six wells the water levels were higher in the fall of 1933 than they were in the fall of 1931. The most significant fact brought out by this record is that there was a rise in head during 1931 and 1932, although the pumpage in those years was not very much below that of 1930. These facts support the conclusion indicated in the memorandum of October 17, 1932, that the supply of underground water available for Houston is adequate.

Chemical character of the public water supply

The analyses in the following table were made in connection with the preparation of a report on the industrial utility of public water supplies in the United States, which will be published as a water-supply paper of the United States Geological Survey.

Analyses of water from public supply of Houston, Texas, May 9, 1932

Analyses by E. W. Lohr, U. S. Geological Survey - Parts per million.

	Central plant	South End plant	Magnolia Park plant	West End plant	East End plant
Silica (S_iO_2)	20	22	23	-	-
Iron (Fe)	.17	.39	.16	-	-
Calcium (Ca)	22	27	34	[a] 45	[a] 2
Magnesium (Mg).....	5.8	7.2	7.5	-	-
Sodium (Na)	108	76	59	([b] 53	[b] 175
Potassium (K)	1.9	1.9	2.1		

Analyses of water from public supply of Houston, Tex., May 9, 1932-Continued

Analyzed by E. W. Lohr, U. S. Geological Survey - Parts per million.

	Central plant	South End plant	Magnolia Park plant	West End plant	East End plant
Bicarbonate (HCO_3).....	301	256	239	260	402
Sulphate (SO_4).....	7.8	14	16	12 a/	1 a/
Chloride (Cl).....	48	32	26	50	38
Nitrate (NO_3).....	.0	.10	.20	.20	.0
Total dissolved solids...	362	303	281	314 b/	397 b/
Total hardness as $CaCO_3$.. (calculated)	79	97	116	182 c/	4.5 c/

a/ By turbidity. b/ Calculated. c/ Determined.

The analyses show some differences in composition between the waters from different sources. For use in calculating State and national averages the weighted average hardness of the water used in Houston was calculated to be 85 parts per million. The weighted average for 20 places in Texas which have 27.3 percent of the total population of the State was 135. The average for 670 places in the United States which have 46.2 percent of the total population was 102.

The supply at Houston in 1932 was not far from the average for the United States in mineral content.

The analyses made by the United States Geological Survey do not show the sanitary condition of a water, and any statements based on such analyses are made without reference to possible pollution of the water.

P. N. 79241

PROGRESS REPORT ON THE GROUND-WATER RESOURCES OF THE HOUSTON DISTRICT, TEXAS

By

Walter N. White, Samuel F. Turner, and Penn Livingston

* * *

Prepared in cooperation between the Texas Board of Water Engineers and the United States Geological Survey

March 1, 1937

Postscript, June 10, 1937

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ILLUSTRATIONS

PROGRESS REPORT ON THE GROUND-WATER RESOURCES OF THE HOUSTON DISTRICT, TEXAS.

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Prepared in cooperation between the Texas Board of Water Engineers and the United States Geological Survey

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By Walter N. White, Samuel F. Turner and Penn Livingston

March 1, 1937, with postscript, June 10, 1937.

* * * * * *

Abstract

An investigation of the ground water, or underground water supply of Houston and the region surrounding it has been in progress for several years as part of a survey of the ground-water resources of Texas by the United States Geological Survey in cooperation with the State Board of Water Engineers. The investigation has covered Harris, Galveston and Waller Counties and a part of Montgomery, Fort Bend, Brazoria, Liberty and Grimes Counties. In the summer of 1933 the investigation was interrupted because of a reduction in the State appropriation, periodic observations of water level fluctuations in certain key wells, however, being continued--mostly by the Water Department of Houston. In the spring of 1936 the cooperative investigation was resumed following the appropriation of $1500 by the City of Houston and the matching of this amount with an approximately equal sum by the Geological Survey.

Results of the investigation were set forth in mimeographed memoranda which were released October 17, 1932, and December 29, 1933. In these reports the conclusion was reached that the available supply of ground water was adequate and it was pointed out that further material lowering in the artesian head which had already amounted to about 80 feet in parts of the Houston-Pasadena area, could be prevented and additional supplies could be obtained if in the future the city located its new wells at greater distances from the centers of the existing cones of depression, preferably toward the west and southwest. New industrial requirements for water in large quantities have recently developed in the vicinity of Pasadena, amounting, it is said, to a total of 20,000,000 to 40,000,000 gallons a day, representing from about 40 percent to about 80 percent of the total average daily supply pumped from all the wells of the Houston-Pasadena area up to this time. This proposed great increase in the use of water and the possibility that it may be followed by other large industrial demands has altered to a degree the aspects of the water supply situation.

The present report is based on data obtained from observations during 5 to 6 years. It comprises about 60 pages of manuscript and 138 pages of tables and is illustrated by hydrographs of water level fluctuations in wells and by a hydrologic map covering Houston and several thousand square miles of the adjacent region. (Copies of the report with all the tables are on file and available for public reference at the offices of U. S. Geological Survey at Washington, Texas Board of Water Engineers at Austin, and City Water Department at Houston.

About 1930 the total pumpage from all wells in the Houston-Pasadena area reached the maximum obtained up to that time, slightly under an average of 50,000,000 gallons a day. As the financial depression spread in 1931-32 the rate of pumping both from city and privately owned wells gradually declined and reached a minimum for the 1931-36 period in 1933, but the decline amounted to only 10 or 12 percent of the pumpage in 1930-31. Since 1933 there has been a gradual increase in the pumping and the total in the latter half of 1935 and the first half of 1936 was not greatly different from the total during corresponding periods in 1930-31.

For reasons explained in the report the artesian pressures in a group of observation wells in the spring are a more accurate index of pressures that exist generally in the underground reservoirs than those recorded at any other time. The trends in artesian pressure in the region between the spring of 1931 and the spring of 1936 (indicated by the records of water level fluctuations in wells) were as follows: In the Houston-Pasadena area there was a loss in head amounting on the average to less than 2 feet. North and northwest of Houston there are no deep wells that can be measured within several miles of the city limits, but farther out in the vicinities of Spring, Humble and Fairbanks apparently there was no material decline. West of Houston in the Katy rice-growming district there was a decline of $2\frac{1}{2}$ to 3 feet in several wells. Southwest of Houston at Bellaire the net decline amounted to about $2\frac{1}{3}$ feet. South and southeast of Houston in the localities of South Houston, Genoa, Friendswood, Webster and League City, there was an average net decline of six or seven feet and farther south in the localities of Dickinson, Texas City, La Marque, and Hitchcock, the average net decline was still greater.

The outstanding facts disclosed by the 5-year record of water level fluctuations are as follows: In the heavily pumped districts of the Houston-Pasadena area the artesian pressures declined, but the average decline was small; down the dip to the southeast of Houston the average decline was relatively large and the area in which the artesian pressures are depressed to or below sea level was materially expanded.

The chemical analyses and tests do not indicate that any important changes occurred from 1931 to 1936 in the chemical character of the water in the Houston-Pasadena area or in the territory between Houston and the Gulf.

The following conclusions are reached:

Considerable water is wasted in the Houston-Pasadena area and the elimination of this waste and of prodigal use of the water would go far toward solving the water supply problems of the area.

No large increase in pumping over the volume of water pumped in 1931 should be made within the city limits or along the ship channel between the city limits and Baytown.

In developing additional supplies of ground water, it would be advisable to go out from the city a sufficient distance to avoid undue interception of water that is moving toward the heavily pumped areas at Houston, Pasadena and Baytown, and replenishing the supply in those areas.

When additional pumping at the rate of 20,000,000 gallons a day is started at Pasadena, it appears probable that, locally, the present cone of artesian depression will be deepened to considerably more than 100 feet below sea level. This new cone of depression will expand to adjacent areas. The amount of lowering in any given direction from the new wells will decrease with distance from them and as the area affected expands the rate of expansion will decrease and the progress of the regional drawdown can be watched. A pronounced drop in head is to be expected during the spring of 1937 in all wells in the vicinity of Pasadena and probably also in the wells of southeastern Houston. Before the end of the summer a material decline in artesian head may occur in central and west central Houston 8 to 10 miles from the new project and necessitate the lowering of pumps in wells in which the present minimum water level during pumping is close to the suction limit of the pumps. With an adequate program of observations of water levels in wells, however, it should be possible to anticipate pronounced regional drawdown at these distances.

The possibility that a further large decline in the artesian pressures may result in the encroachment of water containing objectionable quantities of salt from the direction of the Gulf is to be feared. Such encroachment, if it does occur, fortunately is likely to be slow and the movement of the salt water can be watched.

The people of Houston need have no immediate serious apprehension regarding the effect of an increase of 20,000,000 gallons in the pumpage at Pasadena as ample time will be available in which to develop an additional water supply outside the Houston-Pasadena area. Plans toward that end, however, should be made at once.

The effect of pumping an additional 40,000,000 gallons a day at Pasadena is not discussed. If carried out, the pumpage from that vicinity, it is believed, would be greater than from almost any other area of equal size on earth. It would invite eventual disaster to the ground-water supply of the entire Houston-Pasadena area.

Important ground-water supplies are to be found in the territory west and southwest of the city in Harris County and a part of Fort Bend and Wharton Counties, north of the city in Harris and Montgomery Counties, and northeast of the city in Harris, Montgomery and Liberty Counties. Detailed information is given in the report regarding the yield of the wells and quality of the ground water in different parts of this territory, together with information indicating some of the advantages or disadvantages to be expected in the development of additional water supplies in the different sections.

The present water level observation program in the city and surrounding territory should be continued and materially expanded. Additional observation wells should be added and several of them equipped with continuous water stage recorders. This is especially necessary in the neighborhood of the new development. In certain critical areas where the observations are likely to have especial significance, existing unused wells, not now available should be cleaned out, deepened if necessary, and used for observation wells, or new wells should be put down for that purpose. The observation program should include frequent sampling and determination of the chloride content in the water from numerous carefully selected wells. The pumping inventory should be continued.

June 10, 1937. A pronounced decline in water levels has occurred in the observation wells of the Houston-Pasadena area since March First, 1937, following a large increase in the total pumpage. The average net decline for the year ending May, 1937, was as follows: 30 feet + near Pasadena, 11 feet in Southeast Houston, 7 feet in Northeast and Central Houston, 1 foot in North Houston and 1 foot in Southwest Houston.

INTRODUCTION

History of investigation, location and extent of area and previous reports

An investigation of the ground-water, or underground water, supply available for Houston and the region surrounding it has been in progress for several years, as part of a survey of the ground-water resources of Texas by the United States Geological Survey in cooperation with the State Board of Water Engineers, under the general direction of O. E. Meinzer, geologist in charge of the Division of Ground Water in the Geological Survey. The investigation has covered Harris, Galveston and Waller Counties, a large part of Montgomery, Fort Bend and and Brazoria Counties, and a small part of Liberty and Grimes Counties. Results of the investigation were set forth in mimeographed memoranda which were released October 17, 1932, and December 29, 1933. In the first memorandum it was shown that the water-bearing beds of sand tapped by the wells in the Houston district have an extensive outcrop area, that there is good evidence that the ground-water recharge by penetration of the rain that falls on this area is heavy, that the sands have a large aggregate capacity to transmit water, and that a state of essential equilibrium in artesian pressures had been reached in the Houston district.

The most significant fact brought out in the second memorandum is that there was a rise in the artesian head from the spring of 1931 to the spring of 1933 as a result of a moderate decrease in the rate of withdrawal from wells. In the summer of 1933 the investigation was interrupted because of a reduction in the State appropriation. In the spring of 1936 the sum of $1,500 was allotted by the City of Houston for further investigation, and this sum was matched by an equal sum by the U. S. Geological Survey. Between the summer of 1933 and the spring of 1936 monthly measurements of water levels in observation wells in the city were made by the Water Department of the City of Houston, and some measurements were made on the observation wells outside of the city by the Geological Survey in cooperation with the Board of Water Engineers.

In connection with earlier investigations, a study was made of the geochemical relations of the ground waters of an area about 25 miles wide and 90 miles long extending from Galveston northwestward through Houston, including a study of salt-water encroachment. A brief report on this subject relating to a part of the area, entitled "A study of salt-water encroachment in the Galveston area, Texas," by Samuel F. Turner and Margaret D. Foster, was published in the Transactions of the American Geophysical Union of the National Research Council for 1934, part 2, pp. 432-435.

In March, 1936, field work was resumed in making regular measurements on observation wells and in obtaining the rate of pumpage from the different producing wells, and studies of the chemical character of the well waters were continued with the special purpose of determining whether or not any material change had occurred in the character of the water during the preceeding three to five years. Samples were obtained from about 50 deep wells that had been previously sampled and these were tested for their contents of chloride, bicarbonate, and sulphate, and for their hardness. Samples were also analyzed from 27 deep wells, in the city and in areas northeast, southeast, south and west of the city, in Harris, Liberty, Montgomery and Fort Bend Counties, to supplement analyses of waters from 30 deep wells made in 1931 or 1932 or to give a comparison with later analyses.

The field work in March and April, 1936, was done by T. W. Bridges, whose untimely death occurred on April 30. Most of the later field work was done by J. F. Heuser.

Tables of well records, water level fluctuations in wells, drillers' logs and analyses of well waters. Hydrological map of the region.

Copies of a manuscript report from which this mimeographed release is taken are on file at the offices of the United States Geological Survey at Washington, the Texas Board of Water Engineers at Austin and the City Water Department at Houston. In the manuscript report are given the records of all the wells investigated in Harris, Galveston, Fort Bend, Brazoria, and Waller Counties, including the results of field tests of the water for chloride, sulphate, and hardness (table 1); the records of the water levels in observation wells in Harris, Galveston and Waller Counties (table 2); the highest water levels recorded in most of the observation wells in Houston in the spring of each year from 1931 to 1935 and the net rise or decline to 1936 (table 3); average quantities of water pumped by the City of Houston, 1928-36, in millions of gallons a day (table 4); total quantities of water pumped by the City of Houston, 1930-36, at each of the 9 pumping plants (table 4a); total quantities of water pumped from Houston wells not owned by the City (table 5); analyses or partial analyses of well waters in Harris, Galveston, Fort Bend, Brazoria, Waller and Liberty Counties (tables 6, 7, 8, 9, 10, 10a, 10b and 10c); and logs of selected deep wells (table 11). The fluctuations of the water levels in 21 of the observation wells are shown by graphs.

The map that accompanies the manuscript report shows the location of most of the wells in the region studied outside of Houston, the wells being given a number that corresponds to the number assigned to them in the tables. On this map, wells used for stock and domestic purposes and unused wells are indicated by a black circle, wells with pumping plants by a solid black dot, flowing wells by a blue circle, principal observation wells by a black half-arrowhead, wells for which water analyses or partial analyses are available by a green arrowhead, and wells that were tested for chloride, sulphate and hardness by a short green line. The approximate elevations above sea level to which the static water levels in deep wells would rise in 1936 is indicated by dashed red lines. These elevations are an index of the artesian pressures. The map, therefore, is an artesian pressure map besides a well map and shows approximately the amount and direction of the hydraulic gradient. This in turn indicates the direction of the underflow.

The tables and illustrations listed below accompany this mimeographed release.

Table 1. Water level fluctuations in observation wells (part of table 2 of manuscript report).

Table 2. Analyses of water from wells (part of table 6 of manuscript report).

Map 1. Map of Houston-Galveston area and adjacent region, Texas, showing location of observation wells, etc.

Map 2. Sketch map of Houston-Pasadena area, Texas, showing location of selected record wells.

Graphs of water level fluctuations in 21 observation wells.

GEOLOGY AND GROUND-WATER RECHARGE AND MOVEMENT

Discussions of the geology of the region and the conditions that affect ground-water recharge and movement are given in the report of October 17, 1932,1/ and will not be repeated in detail here. The most essential facts are as follows: Supplies of ground water in this region that are available at depths to which it is practicable to drill water wells occur in permeable beds of sand and fine gravel belonging, in ascending order, to the Lagarto clay, the unit consisting of the Goliad (?) sand, Willis (?) sand and Lissie formation, and the Beaumont clay. The sands are interbedded with relatively impermeable clay gumbo and shale and the beds dip generally to the south and southeast. Each of the formations except the Goliad has an outcrop area from which it extends toward the south or southeast beneath younger formations in general to progressively greater depths below the surface. Successively younger formations are therefore encountered in crossing the region from north to south or from northwest to southeast.

The Lagarto clay appears at the surface in the southern part of Grimes County, the northwestern part of Montgomery County and northern part of San Jacinto County, and is encountered at considerable depth at Houston. The thick sand members of the formation yield large quantities of water, usually somewhat hard but otherwise of good quality to deep wells in the central and southern parts of Waller and Montgomery Counties and in the northern part of Harris and Liberty Counties.

The Goliad sand does not crop out in the Houston district, its nearest appearance at the surface, known to the writers, being about 65 miles to the west near Eagle Lake in Colorado County; apparently it has been completely overlapped by younger formations for there is good evidence of its presence in subsurface in different parts of the district.

The Willis sand, and the Lissie formation crop out in broad zones covering the northern part of Harris County, the southern part of San Jacinto County, the northwestern part of Liberty County, and most of Waller and Montgomery Counties. Sands in the Lissie formation, and in the Willis (?) and Goliad (?) yield water to the wells of the Katy rice-growing districts and to most of the deep wells of the Houston and Pasadena areas.

The outcrop area of the Beaumont clay occupies the southern part of Harris County, the southern and eastern parts of Liberty County, and nearly all of Fort Bend, Brazoria, Galveston and Chambers Counties. The basal 200 feet of the formation consists largely of sand, but the upper and middle parts are largely clay. This member furnishes water to most of the large producing wells at Baytown, Texas City and Alta Loma and to shallow wells at Houston. The base of the formation which crops out immediately to the north of Houston is more than 1000 feet below the surface at Galveston.

The underground reservoirs formed by the permeable sands are replenished by rainfall on the outcrop areas of the sands and in a large part of these areas are filled to overflowing and spilling into the streams. In the 1932 report, 1/ it was concluded that the replenishment or recharge is comparatively heavy. This conclusion has been confirmed by subsequent observations of water level fluctuations in shallow wells on the outcrops. However, in most of the region the heavily pumped areas are remote from the outcrops of the sands that furnish water to the wells and the available supply is largely determined by the capacity of the sands to transmit water from the outcrops to the wells.

1/ Op. cit., p. 4.

The water moves slowly down dip and if not intercepted by wells eventually escapes through natural outlets, perhaps located in the Gulf of Mexico, or it may escape by slow movement into overlying beds. Such outlets must exist. The formations for the most part were deposited in the sea and were therefore once full of salt water. They now contain fresh water to relatively great depths, far down the dip, indicating movement has taken place, which would have been impossible if there were no deep-seated outlets.

The water-bearing sands are at higher elevations at their outcrop than they are at any place down the dip. On this account, and because the sands are interbedded with relatively impermeable clay, the water in them is under artesian pressure practically everywhere down the dip, even in areas close to the outcrop.

Map showing artesian pressures in underground reservoirs in 1936 and amount and direction of hydraulic gradients.

On the accompanying map of the Houston-Galveston area and adjacent region, lines are drawn showing the position above or below sea level to which water in wells 400 feet to 1800 feet or more in depth would rise in 1936. The lines are comparable with the contours on a topographic map, but instead of indicating the form of the land surface, they indicate the form of a surface represented by the water levels in wells. In most of the moderately deep to deep wells the water level is determined by the artesian pressure and the map therefore is essentially an artesian pressure map.

When wells were first put down in the region the artesian pressures practically everywhere were higher in the deeper wells than they were in the shallow wells. In the Houston, Pasadena, Baytown, Texas City, and Alta Loma areas this has been reversed as the result of heavy pumping from deep wells, and now the water level stands lower in the deep wells. North and west of Houston the deep well pressures still are greater and the water levels in wells from 800 or 1000 feet to 1500 feet or more in depth in the Lagarto clay and lower part of the Goliad (?) sand range from 25 to 40 feet higher than the water levels in wells 300 to 800 feet in depth in the upper part of the Goliad (?), the Willis (?) sand and the Lissie formation. For convenience, the difference, arbitrarily, has been assumed to be 35 feet, and on the map the contours north and west of Houston are indicated as 50 to 85 feet, 100 to 135 feet, and 150 to 185 feet, the larger number in each case representing the altitude of the water level in the deeper wells. At Houston and in the vicinity of Pasadena the lines represent most nearly the levels in wells 700 to 1300 feet deep in the Lissie, Willis (?), and Goliad (?) formations. South of Houston the lines at sea level and 20 feet above sea level are based on wells 475 to 900 feet deep in the Lissie formation, none of the wells studied in that area being of sufficient depth to penetrate to the deeper sands. Around La Porte and Baytown the lines represent the levels in wells from about 400 to about 1000 feet deep in the Lissie formation and Beaumont clay.

In the early days of well development the artesian head everywhere was above sea level, even, perhaps, in areas well out in the Gulf, and the lines of equal pressure probably were roughly parallel to the Coast, the 50 to 85 foot line passing through the southern part of Houston. The prevailing pressures now have been depressed below sea level in an area of several hundred square miles at Houston and east and southeast of Houston, and, as mentioned later in this report, the area of depression is still deepening and widening.

Water confined underground is not unlike water confined in a system of pipes; it will move in the direction of the hydraulic gradient. The gradients here have directions roughly at right angles to the lines shown on the map and the water everywhere is moving approximately in those directions. Originally the direction of movement throughout the region was from northwest to southeast approximately in the direction of the dip of the water-bearing formations and the first few wells put down at Houston intercepted water from only a small segment along the line of flow. Now, however, in some parts of the Houston, Pasadena and Baytown areas, the water is moving along the strike and up the dip of the water-bearing formations as well as down the dip.

FLUCTUATIONS IN WATER LEVELS IN OBSERVATION WELLS IN RELATION TO PUMPAGE

Fluctuations of the artesian pressures and water levels in wells when correlated with changes in the rate of ground-water withdrawals through wells provide the most accurate information available regarding changes in underground storage and the safe limits of ground-water use. The program of water-level measurements in wells undertaken in connection with the investigation in the Houston district and contiguous territory has been described in the mimeographed reports of October 17, 1932, and December 29, 1933. The record on many of the wells was started in the winter of 1930-31, and now covers almost six years. The measurements in the city wells and in a few wells in closely adjoining territory have been made monthly ever since the program was started. In most of the surrounding area, however, the monthly measurements were discontinued in the summer of 1933, and since then the measurements have been made at irregular intervals. The measurements in some of the wells have been discontinued because the wells have been sealed at the top or obstructed so that it is no longer possible to introduce a measuring tape.

Following is a discussion of the fluctuations in water levels in 63 observation wells of which 25 are located in Houston, 3 near Pasadena, 8 near Baytown (observations made by Humble Oil & Refining Co.), 1 at La Porte, 2 at South Houston, 2 at or near Genoa, 1 at Webster, 2 near Friendswood, 3 at or near Webster, 1 at La Marque, 3 near Hitchcock, 1 near Alta Loma, 1 at Texas City, 1 near Aldine, 1 at Spring, 1 at Humble, 3 on the Houston-Hempstead road and 4 in the rice-growing district near Katy. The water level measurements in these wells are given in the accompanying table and the fluctuations in 21 of the Houston and Pasadena wells are shown by the attached hydrographs.

The most consistent results can be obtained by comparing the maximum spring water levels. During the winter many wells are idle or are not pumped heavily, and local inequalities in artesian pressure produced by heavy pumping during the summer are gradually smoothed out. Therefore spring measurements of water levels in a group of observation wells are a more accurate index of pressures that exist generally in the underground reservoir than measurements at any other time. The discussion that follows is devoted chiefly to a comparison of the water levels in the spring of 1936 with those in the spring of 1931. Consideration is also given to changes in the rate of pumping from the well itself and from nearby wells that may have had an effect on the trend in pressures.

Fluctuations in Northwestern Houston

Well 590. City of Houston, Heights pumping station, 4⅔ miles northwest of Post Office. Depth, 1,362 feet.

The water level recorded in this well on February 20, 1936, was 9.55 feet lower than the level recorded on January 25, 1931, and on the average the levels recorded in February, March, April and May, 1936, were about 4 feet lower than those recorded in the corresponding months in 1932 (graph 1).

The observation well is an unused one and has not been in operation during the last six years. It is about 100 feet from one pumped well (Heights No. 3) and 600 to 800 feet from the other (Heights No. 5). The average quantities of water pumped at the station in million gallons a day from 1931 to 1936, inclusive, were approximately as follows: 1931, 2.9; 1932, 4.6; 1933, 4.1; 1934, 4.9; 1935, 5.1; 1936, 4.4.

Fluctuations in Central and South-Central Houston

Well 619. City of Houston, Lincoln Pool, Sabine Street, and Buffalo Drive, about 1 mile west of Post Office. Depth, 900 feet (?).

The water levels in this well were between 2 and 3 feet lower in the early spring of 1936 than they were in the early spring of 1931 (graph 6).

The well has not been used during the observation period of more than 5 years. So far as is known there are no pumped wells in its immediate vicinity, but it is less than one-half mile from the central pumping plant of the city, where the total pumpage in millions of gallons during 1930-1935 was as follows: 1930, 2653; 1931, 2789; 1932, 1784; 1933, 1692; 1934, 1782; 1935, 1870; 1936, 2369. It is on the western border of down-town Houston, an area in which there has been a material increase in pumpage during the last two years.

Well 673. M. K. & T. Railway Company. At railroad yards on North Main Street, 1 mile north of Post Office. Depth, 1,630 feet.

This well has not been used during the last six years, the water in it having become salty. The fluctuation in water levels disclosed by the record are erratic and probably do not reflect the true fluctuation of the artesian pressures in the fresh water-bearing sands.

Well 679. Houston Gas and Fuel Company, Commerce and La Branch Streets, one-half mile northeast of Post Office. Depth, 1,392 feet.

The water levels in this well were 3 to 4 feet higher in the spring of 1936 than they were in the spring of 1931. The well has not been used during the last six years. It is located on the west bank of Buffalo Bayou and is subject to flooding during high water. The fluctuations of water levels in it, therefore, may not reflect the true fluctuations in artesian pressure in the vicinity.

Well 680. Houston Electric Company, La Branch Street, one-half mile northeast of Houston Post Office. Depth, 1,350 feet +.

This is an unused well near Buffalo Bayou. The water level in it is very sensitive to the effects of pumping in neighboring wells and may be affected to some extent by the stage of the bayou. The record of water level fluctuations in the well, therefore, is believed to have little or no significance.

Well 790. Southern United Ice Company, Alameda and Cleburne Streets, 2 miles south-southwest of Post Office. Depth, 606 feet.

The water levels recorded in this well were about the same in the spring of 1936 as they were in the spring of 1931 (graph 9). The well was pumped in 1931, the average reported daily delivery amounting to about 140,000 gallons. The pumping plant was idle during 1932, 1933, and 1935, and was used for only a few days in 1934. It was shut down entirely in 1935, but was operated again a part of the time in the summer of 1936. The well is located in a district in which the total pumpage is not very heavy. It is, however, only about 1 mile northeast of the South End pumping plant, and about 1⅝ miles northwest of the Scott Street plant, the two most heavily pumped of the six plants now operated by the City. The total pumpage from these two plants in million gallons from 1931 to 1936 was as follows: 1931, 3321; 1932, 3654; 1933, 4091; 1934, 4493; 1935, 4553; 1936, 4377.

Well 853. Port City Ice Company, 2715 McKinney Street, one mile east-southeast of Houston Post Office. Depth, 650 feet.

The water level in this well was about one foot lower in February, 1936, than it was in February, 1931 (graph 7). The well has not been used during the last six years. It is, however, about 180 feet from a well belonging to the same company, which is reported to have been pumped at a rate averaging 50,000 gallons a day in 1931, but has not been operated since 1933. The well is close to the east border of down-town Houston, where there has been a considerable increase in pumpage during the last two years.

Well 738. Houston Packing Company, Navigation Boulevard, 1½ miles west of Houston Post Office. Depth, 417 feet.

The water levels in this well were about the same in the spring of 1936 as they were in the spring of 1931, and the fluctuations during the intervening period were comparatively small. The well has not been used during the last six years. It is located near another well, belonging to the Houston Packing Company, that is pumped almost continuously, the reported average daily pumpage in thousand gallons a day being as follows: 1931, 770; 1933 and 1934, 900; 1935 and 1936, 948. The water level in the observation well fluctuates only slightly with changes in the rate of pumping.

Well 741. Houston Electric Company, at car barns on Navigation Boulevard, 1¾ miles east of Post Office. Depth, 540 feet.

This well has not been used during the last six years. The record shows that the water level in it has declined persistently since the first measurement was made on January 8, 1931, the total decline to September 26, 1936, amounting to 8.21 feet (graph 8). This record is unlike that obtained at any other well in the Houston area. It is fairly clear that the well is shut off from the water-bearing sands that are tapped by the pumped wells in the vicinity, including the pumped well at the car bars, as otherwise it would be subject not only to seasonal rises and declines in water level but also to daily fluctuations.

Well 598. Brooks estate, near Eureka Junction, 4½ miles west-northwest of Houston Post Office. This is an unused well located about 4½ miles west-northwest of the Houston Post Office, at the western border of the city near Eureka Junction.

The water surface in the well reached the highest observed level in the spring of 1933 and was at about the same elevation in the spring of 1934 as it was in the spring of 1931 (graph 2), when measurements were begun. The well is an old one and its exact depth is not known but is reported to be several hundred feet. It is remote from any heavily pumped wells. The last measurement was made in June, 1934, when the well became obstructed.

Well 602. River Oaks Country Club, 4 miles west of Houston Post Office. Depth, 1,038 feet. The water levels recorded in this observation well were about the same in the spring of 1936 as they were in the spring of 1931 (graph 3), but lower than in 1932 and 1933.

The well is equipped with a 30 h. p. motor and turbine pump, and from 1931 to 1935 furnished all the water used for the club house, golf course and swimming pool, amounting to an average of about 240,000 gallons a day from May to October and about 20,000 gallons a day from November to April. During the summer of 1936 the supply for the swimming pool, amounting to about 40,000 gallons a day during the summer, was pumped from a new well about one-fourth mile distant. Most of the measurements were made on days when the pump was idle. None was taken while it was running.

No other wells are pumped in the vicinity, but the municipal West End pumping plant, the only large plant in this part of the city, is located about 1½ miles to the northeast. The total yearly pumpage from the West End plant in 1931, 1932, 1933 and 1934, amounted to 401, 389, 167, and 40 million gallons respectively. In 1935 the plant was not used.

Well 604. West End Ice Company, Heights Boulevard, about 2⅓ miles west-northwest of the Houston Post Office. Depth unknown, but reported to be around 400 feet.

The water level recorded in this well was about 2½ feet higher in April, 1936, than it was in April, 1931 (graph 4), but the average in the spring of 1936 was lower than the average in the springs of 1934 and 1935.

The well was pumped more or less regularaly during the summer of 1931 and 1932, the average reported daily pumpage amounting to 30,000 gallons. The pumping plant was shut down in the fall of 1932, and has not been operated since except for about two months in the summer of 1934. The West End pumping plant of the City of Houston is located about seven-eighths of a mile west of the well. As stated in the paragraph above relating to the River Oaks well (No. 602), the pumpage at the West End plant declined from a total of 401,000,000 gallons in 1931, to 40,000,000 gallons in 1934, and the plant was not operated in 1935 and 1936. On the other hand, pumpage by industrial plants within a mile of the Ice Company's well has increased materially since 1933, the largest increase, about 80,000 gallons a day, being at the plant of the Fidelity Products Company, located about three-fourths of a mile to the southwest.

Well 606. Henke and Pillot, Washington and Brown Streets, 2 miles west-northwest of Houston Post Office. Depth, 575 feet.

The record of water levels in this well show there was a net decline of about 3⅓ feet from the spring of 1931 to the spring of 1936 (graph 5). The well is unused but is within a few hundred feet of another well belonging to the Henke and Pillot Company that is regularly pumped, the reported average daily pumpage being 15,000 gallons in 1936. It is less than one-fourth mile from the plant of the Dickson Car Company, which in 1931 was supplied with water from a well belonging to the company, but is now supplied by the City. It lies between the West End and Central pumping plants of the City, being about 1¼ miles from the former and about 1⅔ miles from the latter.

Fluctuations in Southwestern Houston

Well 783. Houston Riding and Polo Club, Westheimer Road, 6 miles west of Houston Post Office. Depth, 350 feet.

Measurements of water levels in this well were started in July, 1932. The record shows that although the seasonal and yearly fluctuations have been rather small, the water levels in March, April and May, 1936, were about 2¾ feet lower than they were in the corresponding months in 1933 (graph 13).

The well is unused but is only about 8 feet from a well of about the same depth that is pumped occasionally to provide drinking water for club members and for horses. It is remote from any other pumped well.

Well 801. South Side Place, West University and Virginia Avenues, 5¼ miles southwest of Post Office. Depth, 600 feet.

The water level observations in this well were begun in January, 1931, and stopped at the close of 1935, when the well was sealed at the top so that it could no longer be measured. The water level fluctuations during the period were comparatively small. The recorded level in January, 1935, was about 1⅓ feet higher than that in January, 1931, and was about the same in November and December, 1935, as it was in the corresponding months in 1931. The well is used for public water supply in South Side Place, the reported average pumpage being 35,000 gallons a day from 1931 to 1935, and 55,000 gallons a day in 1936. It is comparatively remote from any other heavily pumped well.

Well 804. West University Place, 5⅓ miles west-southwest of the Houston Post Office. Depth, 650 feet.

The water levels recorded in this well averaged 2 feet lower in February, March and April, 1936, than they were in the corresponding months in 1932 (graph 12). The well has not been used during the last six years. It is located near two other wells that are pumped to supply water to West University Place, the average combined yield of which, in gallons a day, is reported to have been as follows: 1931, 90,000; 1933, 105,000; 1934 and 1935, 120,000; 1936, 140,000. No record was obtained of the pumpage in 1932. There are no other heavily pumped wells in the vicinity.

Well 809. Gem Electric and Ice Company, Bellaire, 7 miles southwest of Houston Post Office. Depth, 1,100 feet.

The water levels reported in this well were slightly lower in the spring of 1936 than they were in the spring of 1931 (graph 11). The well has not been used during the last six years. It is about 50 feet from a well 340 feet deep that is used for public water supply of Bellaire. The water level in the observation well shows no immediate effect from this pumping and is about the same when the pump is operated as it is when it is not operated.

Fluctuations in extreme Southern Houston

Well 820. Institute Place, 5⅞ miles south-southwest of Houston Post Office. Depth, 310 feet.

The water levels recorded in this well show a small but rather persistent decline (graph 10). The well is located on the open prairie south of the present city development. The nearest heavily pumped wells are at the South End plant of the City about two miles to the north.

Fluctuations in Eastern and Southeastern Houston

Well 759. Port City Compress Company, foot of Buchanan Street, 4¾ miles east of Post Office. Depth, 396 feet when drilled, deepened to 569 feet in November, 1932.

The water levels recorded in this well averaged about 5 feet lower in 1936 than they did in 1931 (graph 19) before the well was deepened, and the loss in head was due chiefly to the drop that occurred abruptly when the well was deepened. An average of only a few thousand gallons a day are pumped and apparently this draft has not changed materially during the last five years. No other heavily pumped wells are located within two miles of the well. As explained elsewhere the water level in well 861, 650 feet deep located about one mile to the southwest, was higher in the spring of 1936 than it was in the spring of 1931.

Well 868. Hughes Tool Company, Hughes and North Capitol Streets, 3 miles southeast of Post Office. Depth, 697 feet.

The water levels recorded in this well were about 3 feet lower in the spring of 1936 than they were in the spring of 1931. The well has been idle most of the time during the 5¾ years covered by the record. Two other nearby wells, owned by the Hughes Tool Company, supply water to the Company's plant and to the Gulf brewery, a few hundred feet distant. The well that supplies the brewery is only about 125 feet from the observation well and is about 1,100 feet deep. It has been pumped almost continuously since operations were started at the brewery (about January 1, 1934), at the reported rate of about 1,300,000 gallons a day. The other well, used to supply the tool plant, is about 300 feet from the observation well. Its reported production in gallons a day is as follows: 1931, 750,000; 1932, small; 1933 to 1935, 480,000; 1936, 1,440,000. The total reported pumpage at this plant in the spring of 1936 therefore was nearly 2,000,000 gallons a day greater than it was in the spring of 1931.

Well 878. Houston Compress Company, Anderson Clayton Turning Basin, 4¾ miles southeast of Post Office. Depth, 905 feet.

The water levels recorded in this well were 2 to 3 feet higher in the spring of 1936 than they were in the spring of 1931. The well supplies water to the cotton compress works and to ships, but no records are available as to the amount used from 1931 to 1936. In 1928, the water supply was furnished by the City and according to meter readings, averaged about 140,000 gallons a day. So far as is known there has been no material change since 1931 in the pumpage from other wells that are within a mile of this well.

Well 881. Terminal Compress Company, 82d Street and Harrisburg Boulevard, 5½ miles southeast of Post Office. Depth, 650 feet.

The water levels recorded in this well in the spring of 1936 were slightly higher than they were in the spring of 1931 (graph 18). The well has not been used during the last six years. So far as can be learnedthere has been no material change in the pumpage in this locality since 1931.

Well 886. Bennett Oil Company (formerly Texas Alkali Works), San Antonio and Bowie Streets, 5½ miles southeast of Post Office.

The water levels recorded in this well in February and May, 1936, were about 6 feet lower than they were in the corresponding months in 1931 (graph 20). The pumpage from the well is reported to have averaged 10,000 gallons a day in 1931, and 23,000 gallons a day in 1935 and 1936. So far as known, there has been no material change in the rate of pumping from other wells in this locality since 1931.

Well 890. Texas Chemical Company, Magnolia Street, six miles southeast of Post Office.

This well has been in use most of the time since the early part of 1931. The water level fluctuation record therefore is a rather poor one. The water level was about the same on May 8, 1936, as it was on January 13 and April 6, 1931. The reported average yield of the well, in gallons a day, is as follows: 1931, 300,000; 1932, 230,000; 1933 and 1934, 300,000; 1935 and 1936, 400,000. The production of water from the well of the Deepwater Oil Refinery, less than one-fourth mile from this well, is also said to be greater in 1936 than it was in 1931, being reported as follows: 1931, 370,000; 1932, no record; 1933 and 1934, 400,000; 1935 and 1936, 420,000. Production from the well of the Bennett Oil Company, the only other pumped well within a mile, has also increased considerably (see discussion of well 886 above).

Well 898. City of Houston, Park Place, 6¾ miles east-southeast of Post Office.

This well was partly destroyed in the summer of 1935 and is no longer measurable. The last record was obtained June 18, 1935. The water levels recorded in January and April, 1935, were about a foot higher than those recorded in the corresponding months in 1931.

Well 900. Golf Crest Country Club, Telephone Road, 5½ miles east-southeast of Houston Post Office. Oil test well, depth, 2,560 feet, filled with mud to a level within 360 feet of the surface.

The water levels recorded in this well in the spring of 1931 were made while an adjoining well that supplies the golf course was being pumped, and apparently were abnormally low. Records obtained while the pump was idle indicate that the water levels were about 2 feet lower in the spring of 1936 than they were in the spring of 1932.

Fluctuations near Pasadena

Well 1170. Houston Light and Power Co., Deepwater plant, 8½ miles east-southeast of Houston Post Office, 1 mile northeast of Pasadena. Depth, 836 feet.

The observation well is one of three closely-spaced wells that supply water to the power station. The water level record is badly broken because the pump usually was running when it was visited by the observer. The few measurements that were made, however, indicate that the water level in the early part of 1936 was about as high as it was during the corresponding period in 1931 (graph 15). It is reported that on the average about 75,000 gallons a day was pumped at the plant in 1935 and that this rate of pumping has not varied materially since 1931. The well is less than a mile from the heavily pumped wells of the Sinclair Refining Company. The reported pumpage at the Sinclair plant from 1932 to 1935 in million gallons a day is as follows: 1932, 4.31; 1933 to 1935, 5.04; 1936 (first half), 5.1.

Well 1176. Texas Company Oil Refinery, Galena Park, 8½ miles east-southeast of Houston Post Office, about 2 miles north-northwest of Pasadena. Depth, 800 feet.

The water levels recorded in this well in the spring of 1936 were about the same as those recorded in 1931 (graph 21). The well has not been used during the last six years. It is located about one-half mile north of two wells that supply water to the oil refinery of the Texas Company. The reported average quantities pumped from the refinery wells in gallons a day from 1932 to 1935 were as follows: 1932, 345,000; 1933, 352,000; 1934, 390,000; 1935, 407,000.

Well 1196. Talford Jones, 13 miles southeast of Houston Post Office and 3 miles east of Pasadena. Depth, 550 feet.

Water level observations in this well were started in December, 1932. The water levels recorded in the spring of 1936 were about the same as those recorded in the spring of 1933. The well is practically unused, and there is no heavy pumpage near it. At the refinery of the Shell Petroleum Company, about 2½ miles to the northeast, the use of the following average quantities of ground water in million gallons a day is reported: 1933, 2.55; 1934, 2.64; 1935, 3.52; 1936, 3.50.

Fluctuations at La Porte

Well 1105. (Harris County). A. A. Womack, La Porte, about 23 miles east-southeast of Houston Post Office. Reported several hundred feet deep.

Water level observations were started in this well in December, 1932. The levels recorded in the spring of 1936 averaged about 3½ feet lower than those recorded in the spring of 1933. The average spring levels recorded during the four years are as follows: 1933, 53.0; 1934, 52.1; 1935, 53.54; 1936, 56.5.

According to report, this well formerly had a flow and when it was drilled, about 40 years ago, the artesian pressure was sufficient to raise the water 20 feet above the ground. The well is unused but is only a few hundred feet from a well that furnishes the public water supply for La Porte, amounting to the following average quantities in gallons a day, according to the municipal records: 1931, 311,000; 1932, 304,000; 1933, 319,000; 1934, 374,000; 1935, 500,000.

The well is across the bay and about four miles from the heavily pumped wells of the Humble Oil Refinery at Baytown.

Fluctuations at Baytown

Wells of Humble Oil Refinery at Baytown, 1051 to 1067 (Harris County). According to records kindly furnished by the Humble Oil and Refining Company, the water levels in the wells at the Baytown Refinery had declined in the spring of 1929 on the average to a depth of about 68 feet below sea level. The water levels became higher each spring during the succeeding 3 years and reached an average of 46 feet below sea level in the spring of 1932. They declined to about 56 feet below sea level in the spring of 1933, rose to about 47 feet in the spring of 1935, and declined to about 68 feet in the early spring of 1936. The water levels at the end of the 7-year period, therefore, were in about the same position as they were at the start.

During this period the average daily pumpage from the refinery wells reached a maximum of about 17 million gallons a day in 1929 and declined to a minimum of about 10,000,000 gallons in 1931. The average daily pumpage during the fall, winter and spring in 1935-36 was about 13,800,000 gallons, which, however, was about 2,900,000 gallons a day less than the average during the corresponding period in 1928-29.

The water levels in the spring of 1936, therefore, were correlated with considerably less pumpage than the levels in the spring of 1929.

Fluctuations at South Houston

Well 1203. (Harris County). Highway Department well at South Houston, about 11 miles southeast of Houston Post Office. Depth, 600 feet.

According to the comparatively few records of water levels in this well the levels in spring have become progressively lower since 1931, the net decline from 1931 to 1936 amounting to about 5 feet. The well is about 1,000 feet from a well that furnishes the public supply for South Houston, a small community with a population of about 600.

Well 1209. (Harris County). Firework Co., South Houston, about 11 miles southeast of Houston Post Office. Depth, 650 feet +.

The record in this well was started in October, 1932. The water level in the spring of 1936 was about three feet lower than it was in the spring of 1932.

Fluctuations at Genoa

Well 1302. (Harris County). City of Genoa, at Genoa, about 14 miles southeast of Houston Post Office. Depth, 832 feet.

The spring measurements of water levels in this well show a progressive decline from 48.06 feet in 1931 to 53.91 feet in 1936 below the reference point. The well is not used but is near another well that supplies water to Genoa, a community with about 600 inhabitants. No heavy pumping is known within several miles.

Well 1312. (Harris County). T. C. Dunn. Depth, 885 feet. Unused rice irrigation well 2½ miles southwest of Genoa. The water level in this well was about 6 feet lower in the spring of 1936 than it was in the spring of 1931.

Fluctuations at Webster

Well 1360. Mrs. Fain. One-fourth mile east of Webster and about 22 miles southeast of Houston Post Office. Depth, 659 feet. The water levels in this well show a progressive decline below the reference point from 31.47 feet in April, 1931, to 38.70 feet in February, 1936. A well about 2 miles northwest of this well is pumped during the summer to irrigate rice.

Fluctuations at Friendswood

Well 1. (Galveston County). Garretson Estate, 8 miles west-northwest of League City. Depth, 600 feet. The water level in this well was 4.36 feet lower on February 28, 1936, than it was on May 9, 1933. On January 1, 1937, the level was at least 2 feet lower than it was on February 28, 1936, but its position was not exactly determined, the tape being stopped by an obstruction before water was reached.

Fluctuations at League City

Well 3. (Galveston County). Mrs. A. Voss, 5½ miles west of League City. Depth, 763 feet.

The water level in this well was about 1½ feet lower on January 1, 1937, than it was on May 9, 1933.

Fluctuations at Dickinson

Well 112. (Galveston County). G. H. & H. Ry. Depth, 750 feet. Not used. The water level in this well was about 18 feet lower in the spring of 1936 than it was in the spring of 1931.

Well 113. (Galveston County). E. Monotti. Depth, 504 feet. Pumped with 2 h.p. engine for domestic use and stock. The water level in this well was about 4½ feet lower in the spring of 1936 than it was in the spring of 1933.

Well 115. (Galveston County). J. W. Palmer. Depth, 526 feet. The water level in this well dropped nearly 9 feet in the 3 years from the spring of 1933 to the spring of 1936.

Fluctuations at La Marque

Well 206. (Galveston County). A. J. Biron. Depth, 926 feet. The water level in this well was about 23 feet lower in the spring of 1936 than it was in the spring of 1931.

Fluctuations at Texas City

Well 228. (Galveston County). "Depot" well. Not used. Depth, 740 feet.

The water level in this well was about 7 feet below the surface in the spring of 1932. On January 28, 1937, it was more than 27 feet below. (On the latter date the well was obstructed and the tape could not be lowered below a depth of 27.2 feet.) The lowering of the water level in this well and in well 206 above probably was due in large part to heavy pumping at Texas City amounting in 1936 to an average of about 10,000,000 gallons a day. This is more than twice the amount pumped in 1931 and 1932. Most of the water is used by oil refineries.

Fluctuations at Hitchcock

Well 286. (Galveston County). A. Cook. Depth, 720 feet.

The water level in this well was about 8 feet lower in the spring of 1936 than it was in the spring of 1933.

Well 297. (Galveston County). Chas. Schiro. Depth, 720 feet. Equipped with 3 h.p. gas engine and pumped for domestic use and stock.

The water level in this well was about 8½ feet lower in the spring of 1936 than it was in the spring of 1933.

Well 300. (Galveston County). Chris Jonson. Depth, 500 feet. Not used.

The water level in this well was about 3 feet lower in the spring of 1936 than it was in the spring of 1933.

Fluctuations at Alta Loma

Well 272. (Galveston County). City of Galveston. Depth, 609 feet. Unused.

The water level in this well was about 3½ feet lower in the spring of 1936 than it was in the spring of 1933.

Fluctuations north of Houston, (near Aldine)

Well 264. (Harris County). Weary Farm, 3 miles north of Aldine and about 16 miles north of Houston Post Office. Depth, 1610 feet. The water levels recorded in this well show a continuous decline from 3 feet below the top of the casing in May, 1931, to 21.22 feet below in May, 1936. From May to September, 1936, the level rose about one-fourth foot, the only rise indicated in five years. The well is reported to have had a flow until 1930, the water coming from sand about 900 feet below the surface.

The well is located in a depression and is subject to flooding during exceptionally heavy rain. It is possible that silt has entered the casing at such times and partly sealed the sands thereby causing a decline in the artesian head. On the other hand the decline may have been due to heavy pumping from the deep sands at Houston and Pasadena. The well furnished water for stock when it flowed but has not been used since the flow ceased.

Fluctuations at Humble

Well 281a. (Harris County). City of Humble. Depth, 1140 feet. When this well was put down in 1934 it had a flow of 40 gallons a minute at a height of 21 feet above the ground. The well, and another one near it, 740 feet in depth, are heavily pumped for the public water supply of Humble. In December, 1936, it was flowing into a tank about 10 feet above the ground during periods when the pump was idle.

Fluctuations at Spring

Well 93. (Harris County). International and Great Northern R. R., at Spring, about 22 miles north of Houston, Depth, 984 feet.

When measured in the summer of 1936, this well had a flow of about 35 gallongs a minute and the artesian pressure was sufficient to raise the water about 25 feet above the ground. This is about the pressure recorded in the well when it was drilled, about 10 years ago.

Fluctuations northwest of Houston, along Houston-Hempstead Road

Well 206. (Harris County). R. B. Tucker. 20 miles northwest of Houston Post Office and 6½ miles southeast of Cypress. Depth, 450 feet.

The record for this well shows that the changes in water level during the last 5 years have been comparatively small.

Well 431. (Harris County). G. E. Wilkins, about 13 miles northwest of Houston and 2 miles west of Fairbanks.

This is a flowing well. Its depth is unknown but is said to be only a few hundred feet. However the high temperature of the water, 87° F., indicates that it may be 1500 feet or more in depth.

The discharge of the well was estimated at about 75 gallons a minute in 1931, when it was visited in connection with the ground water survey, and in 1936, when it was again visited, the discharge apparently was about the same. The well flows continuously and the water is unused except by stock.

Well 205. (Harris County). Humble Pipe Line Co., near Satsuma, about 20 miles northwest of Houston Post Office and about 6¼ miles southeast of Cypress. Depth, 700 feet.

The water levels recorded in this well in the spring of 1936 were about the same as those recorded in the springs of 1933 and 1934, but averaged about 3 feet lower than those recorded in the spring of 1931.

The well supplies the domestic needs and other moderate requirements at the pipe line station at Satsuma. It is pumped only occasionally.

Fluctuations in Katy rice-growing district

Well 362. (Harris County). E. G. Stockdick, about 4 miles northeast of Katy. Depth, 500 feet.

This well is used for rice irrigation and is reported to have a yield of about 1200 gallons a minute. The water level was about 3 feet lower in the spring of 1936 than it was in the spring of 1931.

Well 367. (Harris County). W. C. Hickman. 3¼ miles east-northeast of Katy. Depth, 535 feet. Used for rice irrigation, and is reported to have a yield of about 1100 gallons a minute. The water level was about 2½ feet lower in April, 1936, than it was in May, 1931.

Well 370. (Harris County). J. M. Johnson, about 3 miles east of Katy. Depth, 625 feet. Used for irrigation and reported to yield about 1600 gallons a minute. Water level was 2½ feet lower in April, 1936, than it was in March, 1931.

Well 384. (Harris County). A. J. Jordan, 6 miles northeast of Katy. Depth, 505 feet. Well does not yield much water, and is unused. Water level was about the same in the spring of 1936 as it was in the spring of 1931.

Summary of results of water level observations in wells

The results of the water level fluctuation measurements in the region are briefly summarized below.

In general the water levels in the Houston observation wells stood higher in the spring of 1932 than in the spring of 1931, and reached a maximum elevation for the 1931-36 period in the spring of 1933. Since 1933 there has been a general decline in the maximum levels and in most wells the maximum in the spring of 1936 was somewhat lower than the maximum in the spring of 1931, but on the average the difference amounted to less than 2 feet.

East of Houston, in the vicinity of Pasadena, the water levels in two observation wells were about the same in the spring of 1936 as they were in the spring of 1931.

East of Pasadena, at La Porte, there was a decline of about $3\frac{1}{2}$ feet from the spring of 1933 to the spring of 1936. Across the Bay from La Porte, at Baytown, the water levels showed practically no net decline from 1929 to 1936.

Northeast, north and northwest of Houston there are no deep wells within several miles of the city limits that can be measured. In this territory, therefore, no information is available as to whether or not there have been important changes in the artesian pressure. Farther out in these directions, 3 wells are flowing with no apparent decline in pressure, one at Humble, another at Spring and the third near Fairbanks. In one well near Aldine (No. 264) which had a flow until 1930, the water level has persistently declined but the decline may have been due to the entrance of muddy storm water into the well. Northwest of Houston on the Houston-Hempstead road near Satsuma the water level in a 700 foot well displayed a net decline of about 3 feet between 1931 and 1936, due, perhaps, to the effects of pumping from wells for rice irrigation a few miles to the south.

West of Houston, in the Katy rice-growing district in several wells, there was a decline of $2\frac{1}{2}$ to 3 feet from 1931 to 1936.

Southwest of Houston, at Bellaire, there was a net decline of about $2\frac{1}{2}$ feet from 1931 to 1936.

South and southeast of Houston, in the localities of South Houston, Genoa, Friendswood, Webster and League City, there was a net decline during the 5 years, amounting to 6 or 7 feet in several wells. Still farther south, in the localities of Dickinson, Texas City, La Marque and Hitchcock, a net decline was recorded that was the largest in the region, reaching a maximum of more than 20 feet. At Texas City and La Marque the decline probably was due in large part to the increased use of ground water by oil refineries at Texas City.

Of the 30 observation wells at Houston and Pasadena that have yielded the most satisfactory data, 5 are unused and are located a half mile or more from any heavily pumped well; 13 are unused but are only a short distance (in some instances less than 100 feet) from a well that is pumped a part of the time; 2 are pumped regularly during the summer but are not used very much during the winter and 10 are pumped more or less regularly, the most of them, however, being subjected to a heavier draft in summer than in winter. None of the wells was measured while the well itself was being pumped.

The water level fluctuation record in most of the wells of the Houston-Pasadena area must have been affected to a degree by pumping from the well itself, if it was pumped, or by pumping from nearby wells, as well as by regional changes in the artesian pressure. When the records are studied, however, the trend in the fluctuations is found to have a remarkable similarity. The seasonal fluctuations vary in amplitude but the yearly trends are about the same in most of the wells and the net gains or losses during the 5 year period are not greatly different. This can be most clearly seen by reference to the hydrographs. The conclusion is reached that the records reflect fairly well the changes in pressure for the entire Houston-Pasadena area.

The outstanding facts disclosed by the water level measurements are as follows: (1) The depression in the prevailing artesian head that existed in the most heavily pumped districts of Houston, Pasadena and Baytown, prior to 1931, was deepened scarcely at all between 1931 and 1936. (2) The depression in the prevailing artesian head that existed in the region south and southeast of Houston, prior to 1931, was materially deepened and widened between 1931 and 1936.

(See attached maps for location of observation wells.)

HOUSTON PUMPAGE, 1930-36

According to the records of the City Water Department, the average quantities of water delivered by the City between 1928 and 1936, in million gallons a day were as follows: 1928, 21.9; 1929, 23.0; 1930, 25.8; 1931, 25.4; 1932, 23.7; 1933, 23.5; 1934, 24.2; 1935, 24.4; 1936, 25.4.

A part of the results of studies that were made for the purpose of computing the production of water from wells in the Houston and Pasadena areas, other than those belonging to the City from 1930 to 1936, are given in table 5 of the manuscript report. In making the inventory of this independent pumpage, the yield of the well was measured if possible and the best available information was obtained regarding the operation of the pump over a period of years. Systematic pumping records, it was found, are seldom kept. Many of the pumps are electrically operated, but ordinarily, the pump is on the same electric meter as other machinery and no accurate information is to be had as to how the load is distributed. Often it is necessary to depend entirely upon the memory of the pump engineer or the plant manager for the pumping record, and sometimes when the statements of both are obtained they are found to differ materially. It is found that the general tendency of company officials, however, is to overestimate the yield of the pump and the length of the pumping periods. The figures on total pumpage given in the preliminary report of October 17, 1932, are believed to be somewhat too high, largely as a result of this tendency.

The figures in the table have been rated from A to E according to their probable accuracy, those designated "A" being the most accurate and those designated "E" the least accurate. All the figures except those rated "A" and "B", should be classed as estimates. While the data are not as accurate as could be desired, they nevertheless appear to justify the following conclusions: About 1930 the total pumpage from all wells in the area reached the maximum obtained up to that time. As the financial depression grew in 1931-33, the rate of pumping both from city and privately owned wells gradually declined and reached a minimum in 1933, but the decline amounted to only 10 or 12 percent of the pumpage in 1930-31. Since 1933 there has been a gradual increase in the pumping and the total in the latter half of 1935 and the first half of 1936 was not greatly different from the total during corresponding periods in 1930-31.

The upward trend in water levels in the Houston-Pasadena area between 1930 and 1933 was due to the reduced rate of pumping in most of the producing wells, and the decline in water levels since 1933 was chiefly the result of increased pumping. It is significant that the increase in pumping to a rate comparable with that at the start of the investigation has been accomplished with comparatively little average net loss in artesian head.

CHEMICAL CHARACTER OF GROUND WATER; FLUCTUATION IN CHARACTER

The following records of analyses of water from wells in the Houston region accompany the manuscript report:

Analyses of water from wells in Harris, Galveston, Waller and Fort Bend Counties, Texas, 1931-35 (Table 6); partial analyses of water from wells in the Houston district, Texas, 1936 (Table 7); partial analyses of water from selected deep wells in Houston, Texas, and in areas southeast, south and west of the city, 1936 (Table 8); results of a series of tests of chloride in well water at Houston (Table 9); results of a series of tests of chloride in well waters of Houston region (Table 9a); analyses of water from wells in the Humble-Crosby district in Harris County (Table 10); analyses of water from wells along the Humble-New Caney road in Montgomery County and at Cleveland and Hightower in Liberty County (Table 10a); analyses of water from wells at Stilson, Dayton and Liberty in Liberty County (Table 10b). The analyses given in tables 6 to 9a were made in the Water Resources laboratory of the U. S. Geological Survey at Washington by Margaret D. Foster. Those in tables 10 to 10b were made for the City of Houston in the laboratory of Rice Institute by A. J. Hartsook.

Analyses from representative wells in different parts of the region are given in the table of analyses herewith.

These records show that ground water of good quality is to be found in a large region surrounding Houston, as well as in Houston itself. In general, the water is hardest in the outcrop areas of the water-bearing sands and becomes progressively softer while the chloride in the water tends to increase with distance down the dip. For example: the water in the middle and lower parts of the Lagarto is of good quality in the northern part of Harris and Liberty Counties and in Montgomery County, but is salty in the vicinity of Houston; the water in the Goliad (?) sand and Willis (?) sand is of exceptionally good quality at Houston but is salty in the vicinity of Baytown.

The subject of the increase in the chloride content of the water with distance down the dip to the southeast of Houston is discussed at some length in the paper by Turner and Foster mentioned on page 4 entitled "Encroachment of salt water in the Galveston area, Texas". The information in that paper and other data obtained in the course of the investigation tends to show that at no great distance down the dip to the southeast of Houston the fresh water in the deep sands from which the city water supplies are largely obtained gives way to water that is too salty for municipal or industrial use.

As explained in the Turner-Foster paper, samples from 12 wells located in an irregular line from Houston southeastward to Texas City are being analyzed from time to time to determine whether or not the wells show any evidence of the encroachment of salt water, the last analysis being made in the summer of 1936. The series of tests of water from about 50 wells in the region referred to on page 4 were made for the same purpose. Comparison of the most recent analyses of samples from the 12 wells in the Houston-Texas City line with earlier analyses and the results of the chloride tests in 1936 with those made in 1931 and 1935 does not indicate any important change in the composition of the water. However, as stated later in this report, it must be recognized that a heavy increase in the rate of pumpage in the eastern part of Houston or in the vicinity of Pasadena, where the artesian head already has been depressed to 20 feet or more below the level of the sea may further lower the pressure to such an extent that water containing objectionable quantities of salt eventually will be drawn into the area from down the dip.

PROBABLE EFFECT OF ADDITIONAL HEAVY PUMPING IN THE VICINITY OF PASADENA

Industrial requirements have developed in recent months in the vicinity of Pasadena which, it is said, will necessitate an additional water supply of from 20,000,000 to 40,000,000 gallons a day. New wells have been put down which, it is said, have a combined capacity of 20,000,000 gallons a day. The pumping of these wells is to be started this month (March, 1937). What will be the effect of this great increase in the pumping draft on other wells in the area and on the underground reservoir as a whole ?

When additional pumping at the rate of 20,000,000 gallons a day is started, a deep cone of depression will quickly be developed in the immediate vicinity of the wells, all of which are located within an area of not more than 1 square mile. In one area of similar size in this region, the increase in the average daily pumping from about 10,300,000 gallons a day to about 14,200,000 gallons a day caused the average static water level to decline from about 46 feet below sea level in the spring of 1932 to about 68 feet below sea level in the spring of 1936, or a net decline of about 5.6 feet for each million gallons a day increase. In the Pasadena area the fresh water sands are materially thicker than in the area cited and, if the permeability of the sands is about the same, the rate of decline is likely to be materially less. Nevertheless, with an increase in pumpage of 20,000,000 gallons a day at Pasadena, it appears probable that locally the present cone of artesian depression will be deepened to considerably more than 100 feet below sea level. This new cone of depression will expand to adjacent areas. The amount of lowering in any given direction from the new wells will decrease with the distance from them, but as the area affected expands the rate of expansion will decrease and the progress of the regional drawdown can be watched. A pronounced drop in head is to be expected during the spring of 1937 in all wells in the vicinity of Pasadena and probably, also, in the wells of southeastern Houston. Before the end of the summer of 1937 a material decline in artesian head may occur in central and west central Houston 8 to 10 miles from the new project and necessitate the lowering of pumps in wells in which the water level during pumping is close to the suction limit of the pumps. With proper observations, however, it should be possible to anticipate pronounced regional drawdown at these distances.

The possibility that a further large decline in the artesian pressures may result in the encroachment of salt water is to be feared. Salty water occurs below the Houston-Pasadena area at depths of 3,000 to 3,500 feet, but this water is rather effectively confined by the thick clays of the Lagarto formation, and is not likely to rise into the wells. But chlorides in objectionable quantities probably occur only a few miles down dip in the deep horizons from which the largest supplies in the Houston-Pasadena area are now being pumped, and this water may move up the dip to this area. The recent extension of the cone of depression down the dip to the southeast of Houston adds to the apprehension on this score.

If, following over-pumping, salt water does move into the locality of greatest artesian depression, its movement, fortunately, is likely to be slow, and the movement can be watched. The contact, down the dip, between the fresh water and salt water, in all probability, is not abrupt, but is in the form of a zone of brackish water with a gradual gradation from fresh water to salt water. Moreover, further pronounced deepening of the cone of depression at first, is likely to increase the movement of water toward the depression from localities up the dip to the northwest of Houston faster than from localities down the dip, to the southeast, due to the fact that the water-bearing sands are more permeable up the dip and the hydraulic gradient is greater. The first result, therefore, of a heavy increase in pumping may be to decrease the chloride content of the water, and increase its hardness. This has already occurred in one of the most heavily pumped areas of this region. If salt water does enter the localities of over pumping, its spread to other parts of the area also is likely to be slow, and the movement can be watched. The people of Houston need have no immediate apprehension, as ample time will be available in which to develop an additional water supply outside the Houston-Pasadena area. Plans toward that end should, however, be made at once.

The effect of pumping an additional 40,000,000 gallons a day will not be discussed. If carried out, the pumpage in this vicinity, it is believed, would be greater than that from almost any other area of equal size on earth. It would invite eventual disaster to the water supply of the entire Houston-Pasadena area.

POSSIBILITIES OF DEVELOPING ADDITIONAL SUPPLIES OF GROUND WATER FOR THE HOUSTON-PASADENA AREA IN LOCALITIES OUTSIDE THE AREA

(See map 1 and tables)

In the 1932 report the following statement was made: "Further material lowering in head can be prevented and additional supplies can be obtained if, in the future, the city locates its new wells at greater distances from the existing cones of depression, preferably toward the west and southwest."

It is believed that the data now available from observations covering 5 to 6 years justify the following conclusions: No large increase in pumping over the volume of water pumped in 1936 should be made within the city limits or along the ship channel between the city limits and Baytown. Any large increase in ground-water withdrawals in or near the existing deep depressions in artesian pressure in down-town Houston and in the East Houston-Pasadena district would be especially undesirable. New wells involving heavy withdrawals of ground water should be located at distances of several miles from these depressions.

Large additional supplies are now needed by at least one industry, and a decision must be reached as to where these supplies can be obtained most economically and with least interference with present ground-water development. In considering the possibilities of obtaining additional supplies, it is necessary to keep the following facts in mind. Essentially there are three ground-water reservoirs in the region. The reservoir in the Beaumont sands occupies only the southern part of the area, the upper limit of the formation being along a northeast-southwest line that passes a few miles northwest of Houston. Below this line all four formations are present, the Beaumont slowly thickening down dip.

The reservoir formed by the Goliad (?) sand, the Willis (?) sand, and the Lissie formation is more or less effectively separated from the reservoir in the underlying Lagarto by thick, persistent clays belonging to the upper part of the Lagarto. In places thick, persistent clays in the Goliad (?), Willis (?), and Lissie separate to a degree the water supplies in the sands at different horizons. At Houston and from there southeastward the water is salty in the middle and lower sands of the Lagarto and contains objectionable amounts of chloride even in the uppermost sand. In the vicinities of Texas City and Alta Loma the water in the Goliad (?) sand, Willis (?) sand and Lissie formation is salty and the wells obtain their supplies from sands in the Beaumont clay. At Baytown the water in the Goliad (?), and Willis (?) is salty and the wells are supplied from the Lissie and the Beaumont.

Reserves of ground water of fair quality that are practically untouched occur in sands of the Lagarto clay west, north and northeast of Houston but relatively little is known regarding the extent of these supplies. Reserves are also available in the Goliad (?) sand, Willis (?) sand, and Lissie formation but in planning to develop them it would be advisable to go considerable distances from Houston in order to avoid the interception of water that is moving toward the heavily pumped areas and replenishing the supply in these areas. As mentioned on page 8 and indicated by the lines of equal artesian pressure shown on map 1, water is moving into parts of these areas along the strike and up the dip as well as down the dip.

In the paragraphs that follow, some of the advantages and disadvantages are cited of making new development in different directions from the city.

Northwest and north from Houston
(See map 1 and table of water analyses)

No additional ground-water supplies should be developed to the northwest or north of Houston, unless deep wells are put down and water is pumped only from the Lagarto sands or the wells are located far enough out to prevent serious interference with the wells of Houston and Pasadena, perhaps at least 20 miles from down-town Houston.

Some of the available data regarding deep wells northwest and north of Houston are summarized below.

Well 431, located about 2 miles west of Fairbanks, has a natural flow of water amounting to about 75 gallons a minute, having a temperature of 87 degrees Fahrenheit. The water is moderately high in dissolved mineral matter but is very soft. The depth of the well is reported as only about 800 feet but the high temperature of the water indicates that its depth may be 1500 feet or more. In such case the well may be drawing from a sand in the Lagarto clay.

According to field tests made near Satsuma, about half way between Fairbanks and Cypress, the water from a well 700 feet deep (No. 205) has a hardness of 220 parts per million while that from a nearby well about 400 feet deep (No. 206) has a hardness of about 400 parts per million.

Well 174, located 1½ miles southeast of Cypress, supplies water to the Houston hot well bathing and health resort. The well has a flow of about 50 gallons a minute of water that has a temperature of 104 degrees Fahrenheit and is very highly mineralized being particularly high in chloride. The well is reported to have a depth of 2,830 feet.

About 1¼ miles northwest of Cypress, a 400-foot well (No. 169) yields water that is relatively low in dissolved solids and is comparatively soft and fresh.

About 1 mile northeast of Cypress, an oil test well (No. 165), 1717 feet deep, has a flow of about 1 gallon a minute of water that is excessively high in chloride and contains some gas.

At Spring, about 25 miles north of Houston, water is obtained for locomotives and public use from well 93 belonging to the International and Great Northern Railway Company. This well has a flow of about 35 gallons a minute 4 feet above the ground and the artesian pressure is sufficient to raise the water about 25 feet above the ground. It is reported that during a pumping test in 1931 a yield of about 960,000 gallons a day was developed. The water contains a moderate quantity of dissolved minerals. According to the log, the sands penetrated by the well have a total thickness of about 300 feet.

Well 264, used as an observation well, is located along the International and Great Northern Railroad about 16 miles north of Houston. Until 1930 this well had a flow from a horizon reported as located about 950 feet below the surface and the water is said to have been of good quality.

Well 54, Montgomery County, is located near the north bank of Spring Creek about 26 miles north of Houston. The well belongs to Mr. C. L. Fitch and is reported to have a depth of 2285 feet. According to a field test made in 1931 the chloride and hardness in the water amounted to 60 and 150 parts per million, respectively.

Well 35, Montgomery County, is located close to the Houston-Conroe highway about 4¾ miles south of Conroe. The well belongs to Mr. W. T. Peoples, has a reported depth of about 350 feet, and on June 3, 1931, had a flow of about 9 gallons a minute. A field test on that date indicated that the chloride and hardness amounted to 35 and 110 parts per million, respectively.

Well 23, Montgomery County, belongs to the City of Conroe and is located at Conroe. The well has a total depth of 1221 feet and is equipped with screens at depths 1099 to 1163 feet and 1185 to 1221 feet. The chloride and hardness, according to a field test in 1931, amounted to 60 and 110 parts per million, respectively.

Well 28, Montgomery County, is located about ¾ mile southwest of Conroe. It belongs to the Delta Land and Timber Company, has a total depth of 1172 feet and is equipped with a screen from a depth of 1023 to 1146 feet.

Northeast from Houston

In this direction the nearest wells should be located at least 15 miles from down-town Houston and even at that distance should not tap the water in the upper sands which might eventually reach the wells in the vicinity of Baytown. In this direction from Houston there are comparatively few deep wells and considerable exploratory drilling may be needed before a conclusion can be reached as to whether or not adequate supplies of water of suitable quality can be obtained. Available data regarding the deep wells in the areas north and northeast from Houston and the character of the deep waters are briefly summarized below. The map shows the location of the wells and the results of analyses of the well waters are given in the table of water analyses. The distances given are estimated distances from the Houston Post Office.

Wells 281a and 281b are located at Humble, about 18 miles north of Houston. They belong to the City of Humble and are 1140 and 740 feet deep respectively. The deeper well is reported to have had a flow of 40 gallons a minute 21 feet above the ground and a pumping yield of 250 gallons a minute in 1934, when it was drilled. In December, 1936, when not pumped, it was discharging by natural pressure into a reservoir about 10 feet above the ground. The static water level in the shallower well remains at about 26 feet below the surface. This well is reported to have had an initial yield of 304 gallons a minute. The analyses indicate that the mineral content in the water from both of the wells is rather high and is similar in amount and character.

Wells 56 and 56a, Montgomery County, have a flow of water amounting to 3 or 4 gallons a minute, about one foot above the level of the ground in the first mentioned, and to about 20 gallons a minute, 6 feet above the ground in the other. These wells are located along the Humble-New Caney road about 5 miles north of Humble and about 23 miles northeast of Houston. The depth of one of these wells is reported as 992 feet. The temperature of the water in both wells is about normal for wells around 1000 feet deep in this region. According to the analyses the dissolved solids are relatively high but the water is comparatively soft.

At Cleveland, in Liberty County, about 45 miles northeast of Houston, the water supply for locomotives of the Gulf, Colorado and Santa Fe Railroad is obtained from a flowing well 1300 feet in depth. The well was first drilled to a depth of about 900 feet and developed a small flow at about the level of the ground. When it was deepened to 1300 feet, the artesian pressure increased materially and the well now has a flow thirty feet above the level of the ground. According to the analysis the water contains a moderate amount of dissolved solids and is relatively soft.

The public water supply of Cleveland is obtained from a well 386 feet deep belonging to the Gulf States Utilities Company. This water is considerably harder than that from the railroad well, but the total dissolved solids is less.

Along the north side of the Gulf, Colorado and Santa Fe Railroad, about 6 miles east of Cleveland and 1 mile west of Hightower station in Liberty County, there is an oil test that has a flow of water amounting to about 50 gallons a minute 5 to 6 feet above the ground. The well is located on land belonging to the B. E. Quinn estate, but nothing has yet been learned regarding its depth. The temperature of the water is relatively high and the well may be materially deeper than the railroad well at Cleveland, described above. The total quantity of dissolved solids in the water is moderately high but the water is quite soft.

About 8 miles east of Humble near the east bank of the San Jacinto River there is an abandoned oil test that has a barely perceptible flow about 1 foot above the ground. The well is located on the Frederick Rankin Survey and is known locally as the Black Cat oil test. The well may or may not be well No. 1 of the Humble Gulf Coast Oil Company which is on the same survey and has a total depth of 3557 feet. According to the log of that well, artesian water was struck in a bed of sand 32 feet thick between 2468 and 2500 feet. According to the analyses the water contains a moderate quantity of dissolved mineral matter. Further inquiry should be made to clear up the doubt as to the identity of the Black Cat well.

At Dayton in Liberty County about 33 miles northeast of Houston, the public water supply is obtained from a well 400 feet in depth. The water is somewhat highly mineralized.

At Liberty, county seat of Liberty County, about 40 miles northeast of Houston, the public water supply is obtained from 3 wells 650 to 685 feet in depth, all of which have a flow. The water is somewhat highly mineralized.

The swimming pool at Liberty is supplied from the natural flow of a well only 233 feet deep belonging to Mr. Fisher, manager of the cotton gin. The dissolved minerals in this water according to the results of the analyses are materially less than those in the waters of the deeper flowing wells at Liberty referred to above.

At the Stilson pumping station of the American Pipe Line Company, in Liberty County about 28 miles northeast of Houston, water is obtained from a well that is reported to have a depth of about 300 feet. The water is quite soft.

West and southwest from Houston

The territory west and southwest from Houston offers certain advantages as a field for obtaining additional ground-water supplies for the city. It is believed that new wells could be put down and pumped at moderate distances from the city in these directions with less effect on present wells at Houston, Pasadena and Baytown than would be produced by new developments at similar distances in other directions. Even in that territory, however, any new development should be located several miles west of the western limits of the city. The artesian head at Bellaire is about 60 feet below its original level and the area of depressed head undoubtedly is still progressing westward and southward, the rate of decline being rather slow, however, as it amounted only to $2\frac{1}{2}$ feet at Bellaire between 1931 and 1936. From the initial well a line of wells could be extended westward or southwestward, if necessary all the way to the Brazos River, or even beyond the Brazos, into the northern part of Fort Bend County and eastern part of Wharton County, although to do this would involve the heavy expense of constructing a pipe line across the river.

It is believed that wells almost anywhere in this territory will yield fairly large supplies. Wells of fair to large yield have been brought in in western and southwestern Houston. Some of the wells in the Katy rice district are reported to yield upwards of 1500 gallons a minute. Three wells at Sugarland have a reported combined yield of 2,000,000 gallons a day. Wells put down for rice irrigation west of the Brazos in Wharton County yield very large supplies of water.

The territory west and southwest of Houston includes the Katy rice-growing district, most of the rice wells being located within 6 or 8 miles of Katy. The total pumpage in the district was estimated as about 20,500 acre-feet in 1930 and 18,000 acre-feet in 1931--the equivalent of a continuous draft of about 18,000,000 gallons a day and 16,000,000 gallons a day respectively (1932 report, page 10). No figures are available as to the amount of water used in the district in 1936, but reports indicate that the total pumpage in that year was not greatly different from the pumpage in 1931. According to a statement by Mr. John Cope, one of the leading rice growers, the water level in the Katy district declined about 5 feet between 1903 and 1931 (1932 report, p. 13), and as mentioned in the present report in the section on water-level fluctuations a small decline occurred in a few wells in the district between 1931 and 1936. A further material decline in water levels undoubtedly will occur if heavy additional pumping is undertaken within several miles of the district.

The water in the deep well at Bellaire is relatively soft but in most of the territory west and southwest of Houston the water probably averages considerably harder than it does at Houston. The rice wells in the Katy district and the well along the railroad at Simonton yield rather hard water. The municipal wells at Richmond and Rosenberg yield water that is materially harder than the Houston water. (Records of wells, drillers logs and water analyses, Fort Bend County, west of Brazos River, a mimeographed report compiled by the Texas Board of Water Engineers under an allocation of funds from the Works Progress Administration.) The rice wells in Wharton County yield water that is relatively hard. (Unpublished data on water wells in Wharton County available for public reference in the open files of the State Board of Water Engineers at Austin and the U. S. Geological Survey at Washington.)

The Katy rice wells admit water from shallow as well as deep horizons. This is illustrated by the logs of wells 353 and 370, Harris County, in table 11, pages 6 and 7 of the manuscript report. At Sugarland the water from a well 1606 feet deep (well 54, Fort Bend County) in which the top of the principal water-bearing sand is reported to be 1505 feet below the surface, is quite soft, whereas the water from a well 733 feet deep (well 53, Fort Bend County) is quite hard. It is believed that much softer water could be obtained in the rice-growing areas and contiguous territory if the shallow ground water were cased off.

Presumably in all this area the water becomes softer toward the south and, on the whole, the strip of territory between the San Antonio and Aransas Pass Railroad and the Richmond road may offer the most favorable opportunities for development. The drilling should not proceed south of the Richmond road because of the possibilities that the chloride in the water is too high, or may become so with heavy pumping.

It should be pointed out that the development of additional supplies of well water for Houston in the territory to the northeast of the city would have this advantage: The conduit constructed to carry the well water to the city might later be used to convey water from the San Jacinto River or the Trinity River if it is decided to resort to one or both of these streams for a supplementary water supply.

Similarly, if new supplies of ground water were developed to the west-southwest of the city, the conduit constructed to convey the water to Houston might later be used to convey water from the Brazos River if it is decided eventually to make use of that stream.

IMPORTANCE OF CONTINUING AND EXPANDING THE PRESENT OBSERVATION PROGRAM

It was pointed out in a preceding section of this report that both the widening of the deep cone of artesian depression which additional heavy pumping is likely to produce, and the movement of salt water into the depression, if such movement does occur, can be watched and to a degree anticipated if proper observations are carried out. With this in mind the following recommendations are submitted:

The present water level observation program in the city and surrounding territory should be continued and materially expanded. Additional observation wells should be added and the wells should be measured weekly, at least for a time, after the new pumping starts. This is especially necessary in the neighborhood of the new development. Dependable information regarding artesian pressure fluctuations is being obtained from only 2 deep observation wells in the vicinity of Pasadena: well 1170, 836 feet deep, at the Deepwater plant of the Houston Lighting and Power Company; and well 1176, 800 feet deep belonging to the Texas Company. Well 1181, 691 feet deep, belonging to the Phillips Petroleum Company, Well 1183, of unknown depth, belonging to the Crown Oil Refinery, and one or more of the wells of the Sinclair Refinery Company (Nos. 1161-1167, 800 to 1301 feet deep), probably could be measured if a determined effort were made. Well 898 at the old East End plant of the City at Park Place should be cleaned out, deepened to not less than 1300 feet, and equipped with an automatic water-stage recorder. This is very important. The well is near the present East End plant and is in a direct line between Pasadena and the heavily pumped Scott Street and South End plants. If possible, an observation well 800 to 1,000 feet deep should be put down and equipped with a water-stage recorder a mile or so to the southeast of the Northeast plant from which an average of about a million gallons a day was pumped in 1936, in order that any further decline in pressure in that part of the area can be observed. The unused well at the North End plant should be equipped with a water-stage recorder. Several privately owned unused wells in central and east-central Houston should be equipped with water-stage recorders, if this can be arranged. The wells must be 3 inches in diameter or larger in order to admit a float of adequate size and, of course, the pumping equipment must be removed. The following wells are suggested (see table 1 in manuscript report): Well 677, depth 873 feet, screens set at 741-996 and 818-873 feet; well 605, 900 feet deep +, position of screens unknown; well 687, 1222 feet deep, screens set at 1279-1328 feet; well 854, 919 feet deep, screens set at 224-266, 366-382, 421-442, 542-564, 704-764 and 831-853 feet.

The observation program should include the frequent collection of samples of water and determination of their chloride content from numerous carefully selected deep wells in eastern Houston and Pasadena and in the areas south and southeast of Pasadena.

The pumping inventory should be continued without interruption, with a view to obtaining accurate information as to the current pumpage in each section and in the entire area. Without such information it is not possible to understand the significance of the fluctuations in artesian pressures and to reach a conclusion as to whether or not the available ground-water supplies are being materially depleted. For this purpose the cooperation of the owners or managers and engineers of the plants must be obtained. Such cooperation should not be difficult to obtain, once it is understood that the continuation of the pumpage inventory and other observations are of vital importance both to the owner of the plant and the whole community.

WASTE OF WATER; PROPOSED GROUND-WATER LAW

The availability of a large and convenient supply of ground water of good quality has been one of the major incentives for the location of industries in the vicinity of Houston and it is of the greatest importance that this resource should not be impaired. Most of the industrial firms make reasonable use of the water but others do not. For example, water employed for cooling machinery and air conditioning in some instances is used only once and then emptied into the sewer or nearest stream. The universal use of properly constructed cooling towers would greatly decrease the consumption of water. Considerable waste results also from the employment of methods of manufacture that involve unnecessarily large quantities of water. The elimination of this waste and prodigal use should go far toward solving the water-supply problems of the area.

The Texas State Planning Board is preparing a bill to submit to the current Legislature that is designed to stop the waste of underground water and henceforth to control the development of the available supplies so as to prevent them from being seriously depleted, while permitting the fullest use of the water that can be made with safety. One of the chief purposes of the proposed law is to protect the rights of the owners of wells that are now in use. This bill deserves the support of the people of Houston.

POSTSCRIPT
June 10, 1937

Since the above was written, records of water level measurements in wells have been accumulated for several additional months in the Houston-Pasadena area, the last measurement being made in well 1170 on June 5, 1937. These additional records have been incorporated in the table of water level measurements and graphs of water level fluctuations herewith.

About March 1 a battery of new wells was brought into operation near Pasadena and since then has been pumped almost continuously at the reported rate of about 19 million gallons a day. This represents an increase of around 40 per cent over the total maximum previous pumpage in the Houston-Pasadena area. Moreover, due to lack of rain, the pumpage by the City of Houston in May and the latter part of April, 1937, was materially heavier than it was during the corresponding period in 1936. The water levels in most of the observation wells in the area have responded to this increased draft and are materially lower than they were a year ago, the levels in wells 1170 and 1176 near Pasadena, for example, being more than 30 feet lower. In other parts of the area the average decline between May, 1936, and May, 1937, was approximately as follows in the deeper observation wells: 11 feet in Southeast Houston; 7 feet in Northeast Houston; 7 feet in Central, South Central and West Central Houston; 1 foot in Southwest Houston, 1 foot in North Houston.

TABLE 1

Water level fluctuations in observation wells in Houston-Pasadena area, Texas

Date	Depth to water (feet)
Well 590	
City of Houston, at Heights pumping station, 4⅔ miles northwest of Houston post office. Depth 1362 feet. Measuring point, top of pump base.	
1931 - Jan. 23 -	55.67
July 2 -	63.70
Aug. 12 -	69.21 b/
Sept. 9 -	67.83 b/
Nov. 3 -	65.54
Dec. 5 -	60.94 b/
1932 - Jan. 7 -	58.62 b/
Feb. 6 -	58.70 b/
Mar. 4 -	61.38
Apr. 8 -	60.06 b/
May 7 -	62.20
June 7 -	64.00
July 7 -	63.84
Aug. 8 -	66.28
Sept. 7 -	65.12
Oct. 8 -	62.90
Nov. 4 -	63.35
Nov. 29 -	60.87
Dec. 31 -	60.25 b/
1933 - Jan. 26 -	60.64 b/
Mar. 9 -	59.32 b/
Apr. 15 -	58.80 b/
May 12 -	59.45 b/
June 23 -	64.38 b/
Aug. 18 -	65.47 b/
Sept. 20 -	65.95 b/
Oct. 22 -	63.91 b/
Nov. 22 -	63.38 b/
Dec. 23 -	62.07 b/
1934 - Jan. 23 -	60.57 b/
Feb. 21 -	59.87 b/
Mar. 21 -	58.38 b/
Mar. 30 -	59.76
Apr. 20 -	59.24
May 22 -	59.38
June 26 -	66.79 b/
July 24 -	65.01
Aug. 16 -	65.51 b/
Sept. 22 -	66.30 b/
Oct. 23 -	65.75 b/
Nov. 21 -	62.52
Dec. 21 -	60.71
1935 - Jan. 31 -	64.11 b/
Mar. 1 -	62.20 b/
Mar. 22 -	62.25 b/
Well 590 -- Continued	
1935 - Apr. 24 -	63.05 b/
May 21 -	63.10 b/
June 19 -	65.14 b/
July 26 -	68.55 b/
Aug. 17 -	69.74 b/
Sept. 21 -	69.27 b/
Oct. 26 -	67.20 b/
Nov. 23 -	64.56 b/
1936 - Feb. 20 -	65.02 b/
Mar. 14 -	63.95 b/
Mar. 14 -	64.04 b/
Mar. 14 -	64.11 b/
Apr. 25 -	64.35 b/
May 9 -	64.77 b/
May 22 -	63.69 b/
July 24 -	64.79 b/
Aug. 26 -	63.90 b/
Well 598	
Brooks, 4½ miles west northwest of Houston post office, near Eureka Junction. Measuring point, top of casing at level of ground. Abandoned well.	
1931 - Mar. 20 -	43.80
May 26 -	43.38
July 2 -	44.00
Aug. 12 -	46.25
Sept. 9 -	47.41
Nov. 3 -	48.26
Dec. 5 -	47.87
1932 - Jan. 7 -	47.10
Feb. 6 -	45.42
Mar. 4 -	45.30
Apr. 8 -	44.82
May 7 -	44.63
June 8 -	45.48
July 7 -	45.94
Aug. 8 -	46.25
Sept. 7 -	47.43
Oct. 8 -	46.54
Nov. 28 -	45.15
Dec. 29 -	44.55
1933 - Jan. 31 -	42.51
Mar. 11 -	41.55
May 12 -	41.58
Aug. 18 -	47.26
Well 598 -- Continued	
1933 - Oct. 31 -	44.68
Nov. 22 -	44.50
Dec. 23 -	44.06
1934 - Jan. 23 -	43.06
Feb. 21 -	42.73
Mar. 21 -	42.42
Mar. 30 -	43.09
Apr. 20 -	43.64
May 22 -	43.91
June 26 -	45.90
July 24 -	Obstructed
Aug. 16 -	"
Sept. 22 -	"
Well 602	
River Oaks Country Club, 4 miles west of Houston post office. Depth 1038 feet. Measuring point, ⅛ inch hole in pump bowl, 2 feet above ground.	
1931 - Jan. 19 -	48.54
Apr. 7 -	47.10
May 21 -	48.05
July 2 -	51.56
Aug. 12 -	51.65
Sept. 10 -	52.29
Nov. 3 -	49.97
Dec. 5 -	48.48
1932 - Jan. 7 -	46.38
Feb. 6 -	45.14
Mar. 4 -	44.18
Apr. 8 -	43.22
June 7 -	a/
July 8 -	a/
July 9 -	48.09
Aug. 8 -	a/
Sept. 7 -	45.86
Oct. 5 -	a/
Nov. 7 -	44.00
Nov. 28 -	43.05
1933 - Jan. 2 -	42.16
Mar. 10 -	41.18
Apr. 15 -	41.00
Nov. 22 -	
Dec. 23 -	
1934 - Jan. 23 -	
Feb. 23 -	44.74

a/ Pump running. b/ Pump running in nearby well.

Date	Depth to water (feet)
Well 602 -- Continued	
1934 - Mar. 21 -	
Mar. 30 -	
Apr. 20 -	44.45
May 22 -	a/
June 26 -	a/
July 24 -	a/
Aug. 16 -	a/
Sept. 22 -	a/
Oct. 23 -	a/
Nov. 21 -	49.32
Dec. 21 -	47.11
1935 - Jan. 31 -	45.49
Mar. 1 -	
Mar. 22 -	a/
Apr. 24 -	a/
Apr. 29 -	47.34
May 21 -	46.84
June 19 -	a/
July 26 -	a/
Aug. 17 -	49.22
Sept. 21 -	a/
Oct. 26 -	a/
Nov. 23 -	48.62
1936 - Feb. 20 -	a/
Mar. 14 -	45.77
Mar. 14 -	46.70
Mar. 14 -	46.35
Mar. 16 -	45.82
Apr. 25 -	46.92
May 9 -	49.19
May 22 -	
July 24 -	49.34
Aug. 26 -	50.35
Sept. 26 -	a/
Nov. 23 -	49.47
Dec. 23 -	48.81
1937 - Feb. 1 -	46.17
Mar. 26 -	45.61
Apr. 27 -	a/
May 20 -	51.00

Well 604

West End Ice Co., Heights Boulevard, near H. & T. C. railroad crossing, 2⅔ miles west-northwest of post office. Measuring point, hole in 4-inch tee, 1.7 feet above ground.

Date	Depth to water (feet)
Well 604 -- Continued	
1931 - Jan. 23 -	71.34
Apr. 6 -	63.38
Nov. 3 -	64.80
Dec. 5 -	63.42
1932 - Jan. 7 -	62.00
Feb. 6 -	61.36
Mar. 4 -	60.60
Apr. 8 -	59.48
May 7 -	a/
June 7 -	a/
July 7 -	a/
Aug. 8 -	a/
Sept. 7 -	a/
Oct. 8 -	64.01
Nov. 4 -	61.07
Nov. 29 -	60.00
Dec. 31 -	59.51
1933 - Jan. 28 -	59.08
Mar. 9 -	58.23
Apr. 15 -	58.70
May 13 -	59.45
June 23 -	62.65
Aug. 18 -	61.09
Sept. 20 -	60.88
Oct. 31 -	58.46
Nov. 22 -	57.04
1934 - Oct. 23 -	60.47
Nov. 21 -	58.97
Dec. 21 -	57.27
1935 - Jan. 31 -	56.00
Mar. 1 -	55.48
Mar. 22 -	55.65
Apr. 24 -	56.55
May 21 -	58.75
June 19 -	61.13
July 26 -	62.54
Aug. 17 -	63.20
Sept. 21 -	62.70
Oct. 26 -	62.61
Nov. 23 -	57.37
1936 - Feb. 20 -	58.15
Mar. 14 -	58.90
Mar. 14 -	58.93
Mar. 14 -	58.93
Mar. 16 -	58.07
Apr. 25 -	61.10
May 9 -	61.94
May 22 -	61.86
July 24 -	65.34
Aug. 26 -	67.21
Sept. 26 -	68.54

Date	Depth to water (feet)
Well 604 -- Continued	
1936 - Nov. 23 -	65.98
Dec. 22 -	64.53
1937 - Feb. 1 -	63.42
Mar. 26 -	64.24
Apr. 27 -	65.29
May 19 -	67.57

Well 606

Henke and Pillot, Washington and Brown Streets, 2 miles west northwest of post office. Depth 575 feet. Measuring point, top of casing 6 inches above ground.

Date	Depth to water (feet)
1931 - Jan. 22 -	58.50
Apr. 6 -	55.96
May 25 -	57.63
July 2 -	59.86
Aug. 12 -	61.98
Nov. 3 -	65.69
Dec. 5 -	61.52
1932 - Jan. 7 -	60.10
Feb. 6 -	58.69
Mar. 4 -	57.92
Apr. 8 -	56.90
May 7 -	(60.72 b/
	(60.24
June 7 -	59.49 b/
July 7 -	60.18
Aug. 8 -	60.52
Sept. 7 -	60.74
Oct. 5 -	60.64
Nov. 4 -	59.55
Nov. 23 -	57.36
Dec. 31 -	56.53
1933 - Jan. 30 -	54.62
Mar. 9 -	56.25 b/
Apr. 15 -	53.46
May 13 -	54.33
June 23 -	58.12
Aug. 18 -	58.84
Sept. 20 -	59.08
Oct. 31 -	60.43
Nov. 22 -	59.75
Dec. 23 -	58.84
1934 - Jan. 23 -	57.80
Feb. 21 -	57.13

a/ Pump running. b/ Pump running in nearby well.

Water level fluctuations, Houston-Pasadena area -- Continued

Date	Depth to water (feet)
Well 606 -- Continued	
1934 - Mar. 21	57.09 b/
Mar. 30	58.35 b/
Apr. 20	58.45 b/
May 22	58.63
June 26	51.75
July 24	64.40
Aug. 16	63.59
Sept.22	63.73
Oct. 23	63.71
Nov. 21	63.63
Dec. 21	61.30
1935 - Jan. 31	59.96
Mar. 1	59.64
Mar. 22	60.39 b/
Apr. 24	59.39 b/
May 21	60.03
June 19	60.04
July 26	61.63
Aug. 17	62.67
Sept.21	64.05
Oct. 26	63.67
Nov. 23	62.16
1936 - Feb. 20	59.96
Mar. 19	59.42
Apr. 25	60.46
May 9	61.25
May 22	61.27 b/
July 24	66.72
Aug. 26	69.95 b/
Sept.26	72.01 b/
Oct. 27	70.99
Nov. 23	67.72
Dec. 22	65.23
1937 - Feb. 1	62.42
Mar. 26	63.80
Apr. 27	65.73
May 19	68.61 b/

Well 619

City of Houston. (Lincoln Swimming Pool.) Sabine Street and Buffalo Drive, 1 mile west of post office. Depth, 900 feet. Measuring point, top of casing. Abandoned well.

Date	Depth to water (feet)
1931 - Jan. 30	55.50
May 21	54.46
Well 619 -- Continued	
1931 - July 1	57.29
Sept.10	60.00
Nov. 3	58.46
Dec. 5	56.45
1932 - Jan. 7	54.76
Feb. 6	53.65
Mar. 4	52.92
Apr. 8	51.25
May 7	52.10
June 7	54.73
July 9	55.86
Aug. 8	56.64
Sept. 7	57.23
Oct. 8	56.02
Nov. 4	54.68
Nov. 29	52.65
Dec. 31	51.72
1933 - Jan. 28	49.78
Mar. 10	48.95
Apr. 15	48.86
May 13	50.92
June 23	55.24
Aug. 18	57.12
Sept.19	57.13
Oct. 31	56.72
Nov. 22	57.45
Dec. 23	56.70
1934 - Jan. 23	55.13
Feb. 21	54.83
Mar. 21	54.11
Mar. 30	54.65
Apr. 20	55.67
May 22	56.17
June 26	59.57
July 24	61.40
Aug. 16	61.81
Sept.22	61.80
Oct. 23	61.29
Nov. 21	59.89
Dec. 21	58.13
1935 - Jan. 31	56.68
Mar. 1	56.57
Mar. 22	56.56
Apr. 24	55.84
May 21	56.77
June 19	57.33
July 26	58.64
Aug. 17	61.44
Sept.21	61.63
Oct. 26	60.82
Nov. 23	59.40
Well 619 -- Continued	
1936 - Feb. 20	57.15
Mar. 16	56.90
Apr. 25	58.03
May 9	58.94
May 22	59.44
July 24	67.05
Aug. 26	73.25 b/
Sept.26	75.10 b/
Oct. 27	74.72
Nov. 23	68.98
Dec. 22	64.87
1937 - Feb. 1	61.97
Mar. 26	63.38
Apr. 13	65.75
Apr. 27	66.52
May 19	68.80

Well 656

Texas Creosoting Co., Hardy St. and H. B. & T. railroad crossing, 4½ miles north of post office. Depth, 665 feet. Measuring point, top of pipe, 5 feet above ground.

Date	Depth to water (feet)
1931 - Jan. 9	62.68
Apr. 6	62.46
July 28	65.98
Nov. 3	67.00
Dec. 3	64.33
1932 - Jan. 8	a/
Feb. 6	62.86
Mar. 3	61.74
Apr. 8	62.51
May 7	a/
June 7	63.82
July 9	a/
Aug. 8	a/
Sept. 6	a/
Oct. 11	a/
Nov. 29	61.85
Dec. 31	a/
1933 - Jan. 27	59.95
Mar. 9	a/
Apr. 15	a/
May 12	59.45
June 22	a/
Aug. 19	64.42
Sept.20	a/

a/ Pump running. b/ Pump running in nearby well.

Date	Depth to water (feet)
Well 656 -- Continued	
1933 - Nov. 22	62.20
Dec. 23	63.31
1934 - Jan. 23	62.61
Feb. 21	62.78
Mar. 21	62.47
Mar. 30	62.49
Apr. 20	a/
May 22	64.99
June 23	a/
July 24	67.97
Aug. 16	a/
Sept. 21	68.58
Oct. 22	68.23
Nov. 20	a/
Dec. 20	a/
1935 - Jan. 30	65.88
Feb. 28	65.46
Mar. 21	66.01
Apr. 23	a/
May 20	65.27
June 18	66.22
July 25	a/
Aug. 16	68.34
Sept. 20	68.38
Oct. 25	68.21
Nov. 22	a/
1936 - Feb. 19	a/
Mar. 19	63.58
Apr. 24	a/
May 9	65.89
May 22	a/
July 24	66.59
Aug. 26	67.99
Sept. 26	68.05
Oct. 26	67.25
Nov. 23	65.19
Dec. 22	64.89
1937 - Feb. 1	62.71
Mar. 26	a/
Apr. 27	66.93
May 19	68.09

Well 662

South Texas Cotton Oil Co., near junction of H. E. & W. T. and I. & G. N. railroads, 2¾ miles northeast of post office. Depth, 834 feet. Measuring point, top of pump base.

Date	Depth to water (feet)
Well 662 -- Continued	
1931 - Jan. 14	62.91
Apr. 6	61.52
July 3	65.87
Nov. 3	a/
Dec. 3	a/
1932 - Jan. 8	62.63
Feb. 6	60.68
Mar. 3	60.96
Apr. 8	a/
May 7	59.97
June 7	60.93
July 6	62.07
Aug. 8	63.05
Sept. 6	a/
Oct. 11	a/
Nov. 4	60.42
Nov. 29	59.06
1933 - Jan. 27	57.75
Mar. 9	a/
May 12	a/
June 22	a/
Aug. 19	a/
Sept. 20	63.61
Oct. 31	a/
Nov. 22	a/
Dec. 23	62.19
1934 - Jan. 23	61.91
Feb. 21	62.04
Mar. 21	61.31
Mar. 30	61.32
Apr. 20	a/
May 22	63.11
June 26	67.76
July 24	69.48
Aug. 16	a/
Sept. 21	68.00
Oct. 22	66.94
Nov. 20	66.35
Dec. 20	64.42
1935 - Jan. 30	63.61
Feb. 28	62.66
Mar. 21	62.58
Apr. 23	61.99
May 20	62.93
June 18	65.39
July 23	65.31
Aug. 16	a/
Sept. 20	66.47
Oct. 25	a/
Nov. 22	a/
1936 - Feb. 19	61.64
Mar. 19	60.52

Date	Depth to water (feet)
Well 662 -- Continued	
1936 - Apr. 24	61.82
May 9	62.25
May 21	67.53
June 22	63.91
July 24	65.09
Aug. 26	67.25
Sept. 26	a/
Oct. 26	a/
Nov. 23	65.52
Dec. 22	65.35
1937 - Jan. 1	60.33
Apr. 27	60.85
May 19	65.37

Well 663

South Texas Cotton Oil Co. Near junction of H. E. & W. T. and I. & G. N. railroads. 2½ miles northeast of post office. Depth, 740 feet. Measuring point, top of pump base ½ foot above ground.

Date	Depth to water (feet)
1931 - Jan. 14	56.27
Apr. 6	54.91
Sept. 9	61.20
Nov. 3	a/
Dec. 3	a/
1932 - Jan. 8	a/
Feb. 6	56.10
Mar. 3	55.87
Apr. 8	55.82
May 7	54.83
June 7	56.03
July 9	58.83
Aug. 8	57.72
Sept. 6	59.65
Oct. 11	
Nov. 29	56.25
1933 - Jan. 27	53.96
Mar. 9	52.60
May 12	53.90
June 22	55.32
Aug. 19	56.28
Sept. 20	56.56
Oct. 31	56.25
Nov. 22	55.56
Dec. 23	54.10
1934 - Jan. 23	53.33

a/ Pump running. b/ Pump running in nearby well.

Date	Depth to water (feet)
Well 663 -- Continued	
1934 - Feb. 21	52.96
Mar. 21	52.94
Mar. 30	53.18
Apr. 20	53.49
May 22	53.52
June 26	56.01
July 24	57.44
Aug. 16	58.30
Sept.21	Sealed

Well 673

M. K. & T. Railway Co. yards, on North Main St., 1 mile north of post office. Depth, 1,638 feet. Not used. Measuring point, top of air line.

Date	Depth to water (feet)
1931 - Jan. 29	52.33
Apr. 7	44.43
May 20	52.75
July 16	56.84
Aug. 11	49.10
Sept.10	49.38
Nov. 3	46.95
1932 - Jan. 7	42.31
May 7	47.76
June 16	50.04
July 9	50.90
Aug. 8	54.12
Sept. 7	53.38
Oct. 8	52.24
Nov. 4	49.75
Dec. 27	45.37
1933 - Jan. 30	44.92
Mar. 11	44.15
Apr. 15	44.65
May 15	45.12
June 21	48.98
Aug. 18	50.80
Sept.19	50.87
Oct. 31	49.00
Nov. 21	47.42
Dec. 23	46.70
1934 - Jan. 23	44.82
Feb. 21	44.35
Mar. 21	44.98
Mar. 30	44.70
Well 673 -- Continued	
1934 - Apr. 20	45.64
May 22	45.53
June 26	49.66
July 24	51.29
Aug. 16	52.33
Sept.22	52.77
Oct. 22	50.24
Nov. 21	
Dec. 21	45.80
1935 - Jan. 31	44.27
Feb. 28	44.03
Mar. 22	43.78
Apr. 24	45.47
May 21	45.37
June 19	46.47
July 26	47.66
Aug. 17	48.16
Sept.21	47.93
Oct. 26	46.13
Nov. 23	42.68
1936 - Feb. 20	45.75
Mar. 19	45.60
Apr. 25	47.27
May 9	48.71
May 22	48.51
July 24	51.53
Aug. 26	55.57
Oct. 27	56.76
Nov. 24	53.43
Dec. 22	53.21
1937 - Feb. 1	50.39
Apr. 27	51.05
May 19	53.53

Well 676

Houston Gas & Fuel Co., Commerce and LaBranch Sts., $\frac{1}{4}$ mile northeast of post office. Depth, 1392 feet. Measuring point, top of casing. Abandoned well.

Date	Depth to water (feet)
1931 - Jan. 7	27.74
Feb. 18	28.44
May 20	25.50
June 30	27.50
Aug. 11	27.91
Sept. 8	26.22
Well 678 -- Continued	
1931 - Nov. 2	26.07
Dec. 1	24.36
1932 - Jan. 7	23.25
Feb. 5	22.04
Mar. 3	21.00
Apr. 7	22.48
May 6	23.07
June 6	23.38
July 8	21.87
Aug. 5	21.66
Sept. 6	20.87
Oct. 10	21.55
Nov. 3	21.80
Nov. 28	22.19
Dec. 27	20.66
1933 - Jan. 27	20.84
Mar. 9	20.57
Apr. 15	21.60
May 11	22.06
June 22	22.03
Aug. 18	21.73
Sept.19	20.40
Oct. 30	20.90
Nov. 21	20.53
Dec. 21	21.57
1934 - Jan. 22	18.85
Feb. 20	18.51
Mar. 20	19.29
Mar. 30	20.60
Apr. 19	19.23
May 21	20.05
June 25	24.80
July 23	24.96
Aug. 15	23.05
Sept.21	23.64
Oct. 22	22.81
Nov. 20	23.18
Dec. 20	20.30
1935 - Jan. 30	21.91
Feb. 28	19.75
Mar. 21	19.58
Apr. 23	18.64
May 20	18.18
June 18	18.73
July 25	19.08
Aug. 16	19.23
Sept.20	19.93
Oct. 25	19.29
Nov. 22	18.77
1936 - Feb. 19	26.46

a/ Pump running. b/ Pump running in nearby well.

Date	Depth to water (feet)
Well 678 -- Continued	
1936 - Mar. 18 -	25.90
Apr. 24 -	23.11
May 7 -	21.89
May 21 -	24.50
June 22 -	27.95
July 24 -	27.44
Aug. 25 -	28.51
Sept.25 -	27.79
Oct. 26 -	31.42

Well 680

Houston Electric Co., La-Branch St. station, ½ mile northeast of post office, on Bayou. Depth, 1350 feet +. Measuring point, top of casing. Abandoned well.

1931 - Jan. 8 -	33.25
Feb. 18 -	27.35
May 20 -	40.33
May 30 -	44.74
June 30 -	47.24
Aug. 11 -	47.37
Sept. 8 -	46.50
Nov. 2 -	42.15
Dec. 1 -	40.05
1932 - Jan. 7 -	36.20
Feb. 5 -	40.53
Mar. 3 -	41.83
Apr. 7 -	42.93
May 6 -	36.91
June 6 -	37.80
July 8 -	41.85
Aug. 5 -	46.58
Sept. 6 -	37.46
Oct. 10 -	35.95
Nov. 3 -	38.00
Nov. 28 -	31.37
Dec. 27 -	29.67
1933 - Jan. 27 -	32.03
Mar. 9 -	29.92
Apr. 15 -	33.07
May 11 -	40.30
June 22 -	45.52
Aug. 18 -	45.84
Sept.19 -	43.95
Oct. 30 -	37.70

Date	Depth to water (feet)
Well 680 -- Continued	
1933 - Nov. 21 -	36.90
Dec. 21 -	35.40
1934 - Jan. 22 -	32.60
Feb. 20 -	34.82
Mar. 20 -	39.72
Mar. 30 -	36.96
Apr. 19 -	39.59
May 21 -	38.60
June 25 -	53.18
July 23 -	49.94
Aug. 15 -	50.21
Sept.21 -	48.82
Oct. 22 -	45.36
Nov. 20 -	43.77
Dec. 20 -	41.79
1935 - Jan. 30 -	46.10
Feb. 28 -	42.21
Mar. 21 -	45.05
Apr. 25 -	43.96
May 20 -	43.28
June 18 -	51.05
July 25 -	59.66
Aug. 16 -	60.01
Sept.20 -	57.34
Oct. 25 -	51.49
Nov. 22 -	47.50
1936 - Feb. 19 -	51.63
Mar. 18 -	49.72
Apr. 24 -	49.76
May 7 -	49.63
May 21 -	46.51
June 22 -	58.65
July 24 -	55.80
Aug. 25 -	58.00
Sept.25 -	52.24
Oct. 26 -	54.88
Nov. 24 -	56.11
Dec. 22 -	52.51
1937 - Jan. 27 -	50.74
Mar. 22 -	48.32
Apr. 26 -	57.08
May 19 -	63.56

Well 695

Harris County, Court House yard, 3 blocks north of post office. (6-inch casing.) Measuring point, top of air line. Abandoned well.

Date	Depth to water (feet)
Well 695 -- Continued	
1931 - Feb. 4 -	79.13
Apr. 7 -	78.91
May 20 -	80.97
June 24 -	85.95
Aug. 11 -	87.25
Sept. 8 -	86.99
Nov. 2 -	85.34
Dec. 1 -	81.40
1932 - Jan. 7 -	76.05
Feb. 5 -	72.28
Mar. 3 -	69.18
Apr. 7 -	78.80
May 5 -	78.32
June 6 -	79.90
July 8 -	83.11
Aug. 8 -	82.60
Aug. 28 -	73.87
Sept. 6 -	50.20
Oct. 10 -	77.23
Nov. 3 -	72.38
Nov. 28 -	71.92
Dec. 27 -	72.25
1933 - Jan. 27 -	75.16
Mar. 9 -	67.83
Apr. 15 -	75.10
May 11 -	77.12
June 22 -	81.73
Aug. 18 -	60.10
Sept.19 -	64.30
Oct. 28 -	70.36
Nov. 21 -	78.61
Dec. 21 -	49.62
1934 - Jan. 22 -	48.68
Feb. 20 -	47.66
Mar. 20 -	47.71
Mar. 30 -	47.77
Apr. 19 -	47.06
May 21 -	48.23
June 25 -	49.53
July 23 -	49.91
Aug. 15 -	50.47
Sept.21 -	51.85
Oct. 22 -	51.81
Nov. 20 -	51.50
Dec. 20 -	50.76
1935 - Jan. 30 -	49.79
Feb. 28 -	49.13
Mar. 21 -	48.97
Apr. 23 -	48.82
May 20 -	48.67
June 18 -	49.09

a/ Pump running. b/ Pump running in nearby well.

Well 695 -- Continued

Date	Depth to water (feet)
1935 - July 25	49.85
Aug. 16	50.27
Sept.20	50.86
Oct. 25	50.76
Nov. 22	50.13
1936 - Feb. 19	48.10
Mar. 19	48.15
Apr. 24	48.78
May 7	49.00
May 21	49.26
June 22	49.63
July 24	50.59
Aug. 25	52.20
Sept.25	53.15
Oct. 26	53.61
Nov. 24	53.57
Dec. 22	53.50
1937 - Jan. 27	50.21
Mar. 22	52.04
Apr. 26	52.38
May 19	53.12

Well 733

Houston Packing Co., Navigation Boulevard, 1½ miles west of post office. Depth, 417 feet. Measuring point, top of casing--top of tee. Abandoned well.

Date	Depth to water (feet)
1931 - Jan. 8	62.37
Apr. 6	62.83
May 6 - to Oct. 12	
Nov. 2	64.00
Dec. 1	63.86
1932 - Jan. 7	63.63
Feb. 5	63.46
Mar. 3	63.10
Apr. 7	62.89
May 6	62.65
June 6	62.43
July 8	62.47
Aug. 5	62.52
Sept. 6	62.60
Nov. 3	62.59
Nov. 23	62.52
Dec. 28	62.45
1933 - Jan. 27	62.00

Well 738 -- Continued

Date	Depth to water (feet)
1933 - Mar. 9	62.34
Apr. 14	61.44
May 11	61.29
June 22	61.34
Aug. 18	61.46
Sept.19	61.45
Oct. 30	61.53
Nov. 21	61.52
Dec. 21	61.56 b/
1934 - Jan. 22	61.48 b/
Feb. 20	61.00 b/
Mar. 20	60.81 b/
Mar. 29	60.76 b/
Apr. 19	60.68 b/
May 21	60.74 b/
June 25	60.97 b/
July 25	61.25 b/
Aug. 15	61.50 b/
Sept.21	61.68 b/
Oct. 22	62.15 b/
Nov. 20	62.33 b/
Dec. 20	62.31 b/
1935 - Jan. 30	62.32 b/
Feb. 28	62.30 b/
Mar. 21	62.28 b/
Apr. 25	62.32 b/
May 20	62.38 b/
June 18	62.46 b/
July 25	62.52 b/
Aug. 16	62.63 b/
Sept.20	62.86 b/
Oct. 25	63.07 b/
Nov. 22	63.15 b/
1936 - Feb. 19	62.95 b/
Mar. 18	62.90 b/
Apr. 24	63.02 b/
May 7	63.04 b/
May 21	63.06 b/
June 22	63.11 b/
July 23	63.25 b/
Aug. 25	63.52 b/
Sept.25	63.79 b/
Oct. 26	64.00 b/
Nov. 24	64.09 b/
Dec. 22	64.13 b/
1937 - Jan. 27	64.27 b/
Mar. 22	64.52 b/
Apr. 26	64.63 b/
May 19	64.78 b/

Well 741

Houston Electric Co., car barns on Navigation Blvd., 1½ miles east of post office. Depth, 540 feet. Measuring point, top of air line. Abandoned well.

Date	Depth to water (feet)
1931 - Jan. 8	47.95
Mar. 25	48.54
July 2	49.22
Aug. 12	49.61
Sept. 6	49.84
Nov. 2	50.24
Dec. 1	50.43
1932 - Jan. 7	50.65
Feb. 5	50.80
Mar. 3	50.92
Apr. 7	51.06
May 6	51.20
June 6	51.37
July 8	51.45
Aug. 5	51.70
Sept. 6	51.84
Oct. 10	52.00
Nov. 3	52.10
Nov. 28	52.26
Dec. 28	52.30
1933 - Jan. 27	52.12
Mar. 9	52.51
Apr. 14	52.62
May 11	52.54
June 22	52.86
Aug. 18	52.78
Sept.19	53.30
Oct. 30	53.45
Nov. 21	53.52
Dec. 21	53.62
1934 - Jan. 22	53.72
Feb. 20	53.75 b/
Mar. 20	53.81
Mar. 29	53.84
Apr. 19	53.88 b/
May 21	54.00 b/
June 25	54.10
July 23	54.23 b/
Aug. 15	54.34 b/
Sept.21	54.50 b/
Oct. 22	54.64 b/
Nov. 20	54.77 b/
Dec. 20	54.34 b/
1935 - Jan. 30	54.96 b/

a/ Pump running. b/ Pump running in nearby well.

Date	Depth to water (feet)
Well 741 -- Continued	
1935 - Feb. 28	55.00 b/
Mar. 21	55.05 b/
Apr. 23	55.12 b/
May 20	55.18 b/
June 18	55.26 b/
July 25	55.35 b/
Aug. 16	55.43 b/
Sept. 20	55.50 b/
Oct. 25	55.67
Nov. 22	55.72
1936 - Feb. 19	55.80
Mar. 18	55.76
Apr. 24	55.85
May 7	55.87 b/
May 21	55.89
June 22	55.92
July 23	55.93
Aug. 25	56.06
Sept. 26	56.16
Oct. 26	56.20
Nov. 24	56.23
Dec. 22	56.17
1937 - Jan. 27	56.24
Mar. 22	56.29
Apr. 26	56.30
May 19	56.32

Well 746

Texas and New Orleans Railway Co. creosoting plant on Liberty Road, 5¼ miles northeast of post office. Depth, 658 feet. Measuring point, end of 6-inch discharge pipe 4 feet above ground.

Date	Depth to water (feet)
1931 - Jan. 12	63.17
July 3	64.74
Aug. 11	66.28
Sept. 9	67.05
Nov. 3	67.57 b/
Dec. 3	65.98
1932 - Jan. 8	64.62
Feb. 6	63.48
Mar. 3	62.35
Apr. 8	61.30
May 7	61.22 b/
June 7	62.13 b/
July 9	63.29 b/
Aug. 5	63.68 b/
Sept. 6	64.32 b/
Oct. 11	64.02 b/
Nov. 3	63.34
Nov. 28	62.42 b/
Dec. 28	61.45 b/
1933 - Jan. 27	61.27 b/
Mar. 9	59.31
Apr. 15	59.08 b/
May 15	Sealed

Well 751

Texas Pipe Line Co., Wallesville Road, 5¼ miles northeast of post office. Depth, 540 feet. Measuring point, top of air line 4.5 feet above ground. Abandoned well.

Date	Depth to water (feet)
1931 - Mar. 19	54.11
May 25	54.37
July 3	56.11
Aug. 11	57.23
Sept. 9	58.13
Nov. 3	59.13
Dec. 3	57.71
1932 - Jan. 8	56.45
Feb. 6	55.49
Mar. 3	54.40
Apr. 7	53.28
May 6	53.26
June 7	53.82
July 9	54.72
Aug. 5	55.33
Sept. 6	55.58
Oct. 11	55.44
Nov. 3	55.00
Nov. 28	54.52
Dec. 28	53.76
1933 - Jan. 27	53.00
Mar. 9	52.34
Apr. 15	52.28
May 12	52.08
June 22	54.32
Aug. 19	55.96
Sept. 20	57.15
Oct. 31	58.18
Nov. 22	58.17
Dec. 23	57.99
1934 - Jan. 23	57.23
Feb. 21	56.85
Mar. 21	56.17
Mar. 29	56.23
Apr. 20	56.34
May 22	56.98
June 25	58.64
July 24	59.91
Aug. 16	60.56
Sept. 21	61.07
Oct. 22	60.89
Nov. 20	60.64
Dec. 20	59.49
1935 - Jan. 30	58.14
Feb. 28	57.38
Mar. 21	56.93
Apr. 23	56.56
May 20	56.29
June 18	56.56
July 25	57.29
Aug. 16	58.00
Sept. 20	59.35
Oct. 25	58.83
Nov. 22	58.08
1936 - Feb. 19	56.20
Mar. 16	55.68
Mar. 17	55.78
Mar. 17	55.75
Mar. 17	55.74
Apr. 24	56.07
May 9	55.99
May 21	55.99
June 22	56.93
July 24	57.87
Aug. 25	59.04
Sept. 26	59.86
Oct. 26	60.39
Nov. 23	59.43
Dec. 22	58.16
1937 - Jan. 27	56.34
Mar. 26	57.67
Apr. 27	60.18
May 19	62.77

Well 757

Layne-Texas Co., Market St. 4½ miles east northeast of

a/ Pump running. b/ Pump running in nearby well.

Date	Depth to water (feet)
Well 757 -- Continued	
post office. Depth, 676 feet. Measuring point, pump base at level of ground.	
1931 - Feb. 25 -	57.61
Mar. 19 -	57.33
May 27 -	58.26
Sept. 9 -	62.00
Nov. 3 -	a/
Dec. 3 -	61.18
1932 - Jan. 8 -	59.40
Feb. 6 -	58.44
Mar. 3 -	56.90
Apr. 7 -	55.69
May 6 -	55.53
June 7 -	a/
July 9 -	a/
Aug. 5 -	a/
Sept. 6 -	a/
Oct. 11 -	57.92
Nov. 3 -	57.35
Nov. 28 -	a/
Dec. 28 -	56.12
1933 - Jan. 27 -	a/
Mar. 9 -	53.98
Apr. 15 -	53.72
May 12 -	a/
June 22 -	57.30
Aug. 19 -	59.81
Sept.20 -	60.73
Oct. 31 -	61.90
Nov. 22 -	61.80
Dec. 23 -	61.61
1934 - Jan. 23 -	60.81
Feb. 21 -	60.12
Mar. 21 -	59.03
Mar. 29 -	59.21
Apr. 20 -	a/
May 21 -	60.20
June 25 -	
July 24 -	63.47
Aug. 15 -	64.08
Sept.21 -	a/
Oct. 22 -	64.23
Nov. 20 -	63.82
Dec. 20 -	62.32
1935 - Jan. 30 -	60.91
Feb. 28 -	60.11
Mar. 21 -	59.74
Apr. 23 -	59.10

Date	Depth to water (feet)
Well 757 -- Continued	
1935 - May 20 -	58.78
June 18 -	59.20
July 25 -	60.34
Aug. 16 -	60.89
Sept.20 -	a/
Oct. 25 -	61.67
Nov. 22 -	60.84
1936 - Feb. 19 -	59.03
Mar. 16 -	58.10
Mar. 17 -	58.25
Mar. 17 -	58.30
Mar. 17 -	a/
Apr. 24 -	58.32
May 9 -	58.33
May 21 -	58.41
June 22 -	59.51
July 24 -	60.55
Aug. 26 -	61.87
Sept.26 -	62.65
Nov. 23 -	61.82
Dec. 22 -	Obstructed
1937 - Jan. 27 -	a/
Mar. 26 -	a/
Apr. 26 -	65.76
May 19 -	66.02
Well 759	
Port City Compress. Foot of Buchanan St., 4 5/8 miles east of post office. Depth, 396 feet. Measuring point, top of casing, 1 1/4 feet above ground.	
1931 - Feb. 26 -	56.85
July 3 -	59.28
Aug. 13 -	60.41
Sept. 9 -	60.98
Nov. 3 -	60.51
Dec. 3 -	59.63
1932 - Jan. 8 -	57.76
Feb. 6 -	a/
Mar. 3 -	a/
Apr. 7 -	56.13
May 6 -	55.95
June 7 -	a/
July 9 -	57.25
Aug. 5 -	a/
Sept. 6 -	56.83

Date	Depth to water (feet)
Well 759 -- Continued	
1932 - Oct. 11 -	a/
Nov. 3 -	61.00
Nov. 28 -	60.70
Dec. 28 -	59.82
1933 - Jan. 27 -	59.26
Mar. 9 -	57.60
Apr. 15 -	57.67
May 12 -	58.17
June 22 -	a/
Aug. 19 -	64.36
Sept.20 -	a/
Oct. 31 -	66.08
Nov. 22 -	a/
Dec. 23 -	a/
1934 - Jan. 23 -	64.52
Feb. 20 -	63.91
Mar. 20 -	62.26
Mar. 29 -	62.91
Apr. 19 -	63.05
May 21 -	63.99
June 25 -	66.23
July 23 -	67.56
Aug. 15 -	68.11
Sept.21 -	68.37
Oct. 22 -	67.99
Nov. 20 -	67.43
Dec. 20 -	64.77
1935 - Jan. 30 -	64.39
Feb. 28 -	63.55
Mar. 21 -	63.26
Apr. 23 -	a/
May 20 -	62.38
June 18 -	63.10
July 25 -	64.14
Aug. 16 -	a/
Sept.20 -	66.19
Oct. 25 -	a/
Nov. 22 -	64.50
1936 - Feb. 19 -	62.58
Mar. 16 -	61.80
Mar. 17 -	61.87
Mar. 17 -	61.88
Mar. 17 -	61.88
Apr. 24 -	61.80
May 9 -	a/
May 21 -	62.08
June 22 -	63.50
July 24 -	64.52
Aug. 26 -	65.67
Sept.26 -	a/
Oct. 26 -	66.74

a/ Pump running. b/ Pump running in nearby well.

Water level fluctuations, Houston-Pasadena area -- Continued

Date	Depth to water (feet)
Well 759 -- Continued	
1936 - Nov. 23 -	65.42
Dec. 22 -	63.79
1937 - Jan. 27 -	63.20
Mar. 26 -	64.98
Apr. 26 -	68.39
May 20 -	71.66

Well 783

Houston Riding & Polo Club. Westheimer Road, 6 miles west of post office. Depth, 350 feet +. Measuring point, top of casing, $\frac{1}{3}$ foot above ground.

1932 - July 8 -	38.10
Aug. 8 -	38.57
Sept. 7 -	38.47
Oct. 5 -	38.54
Nov. 7 -	38.45
Nov. 28 -	38.25
1933 - Jan. 2 -	37.52
Jan. 30 -	36.98
Mar. 10 -	36.37
Apr. 15 -	36.27
May 13 -	36.44
June 23 -	37.36
Aug. 23 -	a/
Sept.18 -	38.16
Oct. 31 -	38.36
Nov. 22 -	38.40
Dec. 23 -	38.29
1934 - Jan. 23 -	37.87
Feb. 21 -	37.46
Mar. 21 -	37.37
Mar. 30 -	37.36
Apr. 20 -	37.10
May 22 -	37.17
June 26 -	38.77
July 24 -	39.75
Aug. 16 -	40.18
Sept.22 -	40.65
Oct. 23 -	40.59
Nov. 21 -	40.94 b/
Dec. 21 -	39.72
1935 - Jan. 31 -	38.96
Mar. 1 -	39.00
Mar. 22 -	38.86
Apr. 24 -	38.55
May 21 -	38.50
June 19 -	38.60
July 26 -	38.97
Aug. 17 -	39.30
Sept.21 -	40.16
Oct. 26 -	40.30
Nov. 23 -	39.94
1936 - Feb. 20 -	38.83
Mar. 14 -	39.07
Apr. 25 -	39.00
May 8 -	39.20 b/
May 22 -	39.57
July 24 -	40.32
Aug. 26 -	41.25
Sept.26 -	41.62
Oct. 27 -	41.77
Nov. 23 -	41.39
Dec. 23 -	40.80
1937 - Feb. 1 -	39.64
Mar. 26 -	39.41
Apr. 27 -	39.57
May 19 -	40.30

Well 790

Southern United Ice Co., Almeda & Cleburne Sts., 2 miles south-southwest of post office. Depth, 606 feet. Measuring point, top of casing, 1.5 feet below level of ground.

1931 - Jan. 17 -	57.04
Apr. 6 -	55.70
Sept.24 -	60.33
Nov. 3 -	59.28
Dec. 5 -	54.62
1932 - Jan. 7 -	
Apr. 8 -	51.03
May 7 -	51.10
June 16 -	52.46
July 9 -	53.19
Aug. 8 -	53.97
Sept. 7 -	54.61
Oct. 10 -	53.20
Nov. 28 -	51.42
1933 - Jan. 30 -	49.20
Mar. 8 -	48.95
Apr. 15 -	48.88
May 13 -	49.51
June 23 -	52.16
Aug. 23 -	a/
Sept.18 -	54.32
Oct. 31 -	53.90
Nov. 22 -	53.00
Dec. 23 -	52.66
1934 - Jan. 23 -	51.61
Feb. 21 -	51.03
Mar. 21 -	51.02
Mar. 30 -	50.78
Apr. 29 -	50.00
May 22 -	50.73
June 26 -	a/
July 24 -	a/
Aug. 16 -	a/
Sept.22 -	a/
Oct. 23 -	a/
Nov. 21 -	55.53
Dec. 21 -	52.75
1935 - Jan. 31 -	51.20
Mar. 1 -	
Mar. 22 -	53.12
Apr. 24 -	50.99
May 21 -	53.61
June 19 -	53.91
July 26 -	55.85
Aug. 17 -	57.90
Sept.21 -	58.76
Oct. 26 -	
Nov. 23 -	
1936 - Feb. 20 -	
Mar. 16 -	55.80
Apr. 25 -	
May 8 -	57.43
May 22 -	57.71
July 24 -	a/
Aug. 23 -	a/
Sept.26 -	a/
Nov. 23 -	61.35
1937 - Feb. 1 -	58.96
Mar. 26 -	60.05
Apr. 27 -	60.47
May 19 -	61.23

Well 801

South Side Place, University & Va. Sts., $5\frac{1}{4}$ miles southwest of post office. Depth, 600 feet +. Measuring

a/ Pump running. b/ Pump running in nearby well.

Date	Depth to water (feet)
Well 801 -- Continued	
point, top of cap, ⅓ foot above ground.	
1931 - Jan. 24 -	39.44
Nov. 3 -	39.53
Dec. 5 -	38.64
1932 - Jan. 7 -	a/
Feb. 6 -	37.59
Mar. 4 -	a/
Apr. 8 -	36.16
May 7 -	36.82
May 7 -	36.55
May 7 -	36.40
May 7 -	36.25
June 7 -	a/
July 8 -	37.15
Sept. 7 -	a/
Oct. 5 -	36.97
Nov. 7 -	36.48
Nov. 28 -	a/
1933 - Jan. 2 -	35.78
Jan. 30 -	34.96
Mar. 10 -	a/
Apr. 15 -	34.58
May 13 -	a/
June 23 -	36.92
Oct. 31 -	37.20
Nov. 22 -	a/
Dec. 23 -	37.25
1934 - Jan. 23 -	37.60
Feb. 21 -	a/
Mar. 21 -	37.65
Mar. 30 -	a/
Apr. 20 -	a/
May 22 -	a/
June 26 -	a/
July 24 -	a/
Aug. 16 -	a/
Sept. 22 -	a/
Oct. 23 -	39.91
Nov. 21 -	39.20
Dec. 21 -	38.78
1935 - Jan. 31 -	37.90
Mar. 1 -	a/
Mar. 22 -	a/
Apr. 24 -	a/
May 21 -	37.49
June 19 -	a/
July 26 -	a/
Aug. 17 -	a/
Sept. 21 -	a/

Date	Depth to water (feet)
Well 801 -- Continued	
1935 - Oct. 26 -	39.02
Nov. 23 -	39.00
1936 - Feb. 20 -	Sealed

Well 804

West University Place, West University St., 5½ miles west-southwest of post office. Depth, 650 feet +. Measuring point, top of tee, 2½ feet above ground. Abandoned well.

1931 - Nov. 3 -	45.41
Dec. 5 -	43.98
1932 - Jan. 7 -	43.05
Feb. 6 -	42.70
Mar. 4 -	42.18
Apr. 8 -	41.05
May 7 -	41.15
June 7 -	41.90
July 8 -	41.85
Aug. 8 -	42.12 b/
Sept. 7 -	41.98
Oct. 5 -	42.02
Nov. 7 -	41.39
Nov. 23 -	41.10 b/
1933 - Jan. 2 -	40.41 b/
Jan. 30 -	39.70
Mar. 10 -	39.38
Apr. 15 -	39.35
May 13 -	39.80
June 23 -	40.67
Aug. 23 -	41.73
Sept. 18 -	42.00
Oct. 31 -	43.07
Nov. 22 -	43.12
Dec. 23 -	42.95
1934 - Jan. 23 -	42.74 b/
Feb. 21 -	42.68
Mar. 21 -	42.50
Mar. 30 -	42.29
Apr. 20 -	42.05
May 22 -	42.00
June 26 -	43.91 b/
July 24 -	
Aug. 11 -	
Sept. 22 -	46.47

Date	Depth to water (feet)
Well 804 -- Continued	
1934 - Oct. 23 -	46.43
Nov. 21 -	46.46
Dec. 21 -	45.33
1935 - Jan. 31 -	44.54
Mar. 1 -	44.12 b/
Mar. 22 -	44.07
Apr. 24 -	43.74
May 21 -	44.01 b/
June 19 -	44.33 b/
July 26 -	43.73 b/
Aug. 17 -	44.66 b/
Sept. 21 -	47.31
Oct. 26 -	46.29 b/
Nov. 23 -	45.63
1936 - Feb. 20 -	43.94 b/
Mar. 16 -	43.97
Apr. 25 -	44.39 b/
May 8 -	44.70 b/
May 22 -	44.97 b/
July 24 -	45.49 b/
Aug. 25 -	46.55
Sept. 26 -	47.05 b/
Oct. 26 -	47.53
Nov. 23 -	46.58 b/
Dec. 23 -	46.16 b/
1937 - Mar. 26 -	42.32
Apr. 27 -	44.38
May 19 -	45.71

Well 809

Gem Electric and Ice Co., Bellaire, 7 miles southwest of Houston post office. Depth, 1100 feet +. Measuring point, top of casing, 4 feet above ground.

1931 - Feb. 16 -	43.60
Apr. 7 -	42.90
May 21 -	42.52 b/
July 2 -	43.60 b/
Aug. 12 -	44.52 b/
Sept. 10 -	45.00 b/
Oct. 20 -	45.84
Nov. 3 -	45.82
Dec. 5 -	45.18
1932 - Jan. 7 -	43.94
Feb. 6 -	43.23
Mar. 4 -	42.70

a/ Pump running. b/ Pump running in nearby well.

Water level fluctuations, Houston-Pasadena area -- Continued

Date	Depth to water (feet)
Well 809 -- Continued	
1932 - Apr. 8	41.83
May 7	42.63 b/
June 7	42.92 b/
July 8	43.30 b/
Aug. 8	43.86 b/
Sept. 7	43.25 b/
Oct. 5	42.98 b/
Nov. 7	42.40 b/
Nov. 28	42.11
1933 - Jan. 2	41.37 b/
Jan. 30	40.86 b/
Mar. 10	40.52 b/
Apr. 15	40.36 b/
May 13	40.83 b/
June 23	41.82 b/
Aug. 23	42.76 b/
Sept. 18	43.12 b/
Oct. 31	43.60
Nov. 22	43.55
Dec. 23	43.22
1934 - Jan. 23	42.83
Feb. 21	42.67
Mar. 21	42.91
Mar. 30	42.91
Apr. 20	42.64
May 22	43.02
June 26	44.71
July 24	45.84 b/
Aug. 16	46.44 b/
Sept. 22	46.92 b/
Oct. 23	47.07
Nov. 21	46.75 b/
Dec. 21	46.09
1935 - Jan. 31	45.11
Mar. 1	44.69
Mar. 22	44.70 b/
Apr. 24	44.62
May 21	44.73
July 26	45.68 b/
Aug. 17	46.35
Sept. 21	47.47
Oct. 26	47.32
Nov. 23	46.96 b/
1936 - Feb. 20	45.26
Mar. 16	45.00
Apr. 25	45.38
May 8	45.56
May 22	45.87 b/
July 29	46.35
Aug. 26	48.46 b/
Sept. 26	48.70 b/
Oct. 27	48.92
Nov. 23	48.55
Dec. 23	47.94
1937 - Feb. 1	46.63
Mar. 26	45.84 b/
Apr. 27	46.09
May 19	47.36

Well 820

Institute Place, Almeda Road, 5½ miles south-southwest of Houston post office. Depth, 310 feet. Measuring point, top of casing, 0.4 foot above level of ground. Abandoned well.

Date	Depth to water (feet)
1931 - Sept. 24	28.98
Nov. 4	29.44
Dec. 5	29.11
1932 - Jan. 7	27.24
Feb. 6	26.18
Apr. 8	28.20
June 10	28.95
July 9	28.73
Aug. 8	28.64
Sept. 7	28.30
Nov. 7	28.69
Nov. 28	28.77
1933 - Jan. 30	28.40
Apr. 15	27.50
May 13	28.23
Aug. 23	27.86
Sept. 18	28.00
Oct. 31	28.10
Nov. 22	28.11
Dec. 23	28.25
1934 - Jan. 23	27.99
Feb. 21	27.59
Mar. 21	27.56
Mar. 30	27.54
Apr. 20	27.53
May 22	27.76
June 26	28.52
July 24	28.73
Aug. 16	
Sept. 22	29.42
Oct. 23	29.64
Nov. 21	29.63
Dec. 21	29.59
1935 - Jan. 31	29.37
Mar. 1	29.11
Mar. 22	28.99
Apr. 24	29.28
May 21	29.17
June 19	29.80
July 26	30.66
Aug. 17	31.13
Sept. 21	31.63
Oct. 26	31.28
Nov. 23	30.60
1936 - Feb. 20	29.88
Mar. 16	29.30
Apr. 25	30.51
May 8	30.45
May 22	30.24
July 24	30.34
Aug. 26	31.33
Sept. 26	31.14
Oct. 27	31.08
Nov. 23	31.07
Dec. 23	30.39
1937 - Feb. 1	
Mar. 26	
Apr. 27	30.24
May 19	30.69

Well 853

Port City Ice Co., 2715 McKinney St., 1 mile east-southeast of post office. Depth, 650 feet. Measuring point, top of casing, 0.5 foot above ground.

Date	Depth to water (feet)
1931 - Jan. 8	71.25
Feb. 18	70.74
Apr. 6	69.89
June 30	76.12
Aug. 11	77.33
Sept. 10	77.44
Oct. 13	75.35
Nov. 3	73.43
Dec. 3	70.26
1932 - Jan. 7	67.54
Feb. 6	65.72

a/ Pump running. b/ Pump running in nearby well.

Water level fluctuations, Houston-Pasadena area -- Continued

Date	Depth to water (feet)
Well 853 -- Continued	
1932 - Mar. 4	64.94
Apr. 8	63.83
May 7	65.13
June 16	69.54
July 9	69.73
Aug. 8	71.62
Sept. 7	72.18
Oct. 10	69.25
Nov. 4	67.38
Nov. 29	65.80
1933 - Jan. 2	64.67
Jan. 28	62.90
Mar. 8	63.10
Apr. 14	63.65
May 11	64.24
June 21	67.12
Aug. 18	70.08
Sept. 18	72.18
Oct. 31	74.23
Nov. 22	72.45
Dec. 21	71.77
1934 - Jan. 22	70.74
Feb. 20	69.77
Mar. 20	69.49
Mar. 30	68.57
Apr. 19	69.41
May 21	71.81
June 25	75.66
July 23	77.23
Aug. 15	78.06
Sept. 21	77.96
Oct. 22	76.83
Nov. 20	75.64
Dec. 20	72.58
1935 - Jan. 30	70.19
Feb. 28	71.03
Mar. 21	70.69
Apr. 23	71.70
May 20	72.09
June 18	72.58
July 25	73.86
Aug. 16	76.26
Sept. 20	76.86
Oct. 25	76.05
Nov. 22	73.94
1936 - Feb. 19	71.75
Mar. 16	71.02
Mar. 17	71.13
Mar. 17	71.33
Apr. 24	72.62
May 7	74.10
May 21	74.64
June 22	78.23
July 23	80.60
Aug. 25	83.25
Sept. 25	84.25
Oct. 26	80.54
Nov. 24	75.79
Dec. 22	73.28
1937 - Jan. 27	71.98
Mar. 22	74.89
Apr. 26	78.32
May 19	81.86

Well 868

Hughes Tool Co., Hughes and North Capitol Sts., 3 miles southeast of post office. Depth, 697 feet. Measuring point, top of steel plate, 1 foot above ground.

Date	Depth to water (feet)
1931 - Jan. 8	50.25
Jan. 10	50.25
May 25	49.54
July 2	52.98
Aug. 12	54.40
Sept. 8	54.56
Nov. 2	52.07
1932 - Jan. 3	48.26
Feb. 5	47.18
Mar. 3	45.75
Apr. 7	44.57
May 6	45.79
June 6	47.24
July 8	48.50
Aug. 5	48.98
Sept. 6	49.20
Oct. 10	47.18
Nov. 3	45.80
Nov. 28	44.85
Dec. 28	43.71
1933 - Jan. 27	42.72
Mar. 9	42.26
Apr. 14	42.35
May 11	44.03
June 22	47.00
Aug. 18	
Sept. 19	56.64
Oct. 30	57.11
Nov. 21	55.56
Dec. 21	55.02

Date	Depth to water (feet)
Well 868 -- Continued	
1934 - Jan. 22	53.08 b/
Feb. 20	52.41 b/
Mar. 20	51.48 b/
Mar. 29	51.44 b/
Apr. 19	53.75 b/
May 21	57.50 b/
June 25	60.54 b/
July 23	62.29 b/
Aug. 15	63.06 b/
Sept. 21	62.68 b/
Oct. 22	60.28 b/
Nov. 20	58.40 b/
Dec. 20	55.57 b/
1935 - Jan. 30	
Feb. 28	53.85 b/
Mar. 21	53.48
Apr. 23	56.24
May 20	56.67 b/
June 18	60.15 b/
July 25	
Aug. 16	
Sept. 20	60.79
Oct. 25	
Nov. 22	
1936 - Feb. 19	
Mar. 16	52.75
Apr. 24	52.67
May 7	56.26
May 21	57.54
June 22	60.37 b/
July 23	62.29
Aug. 25	62.52 b/
Sept. 25	64.24 b/
Oct. 26	60.31
Nov. 24	Obstructed
Dec. 22	65.82 b/
1937 - Jan. 27	57.47 b/
Mar. 22	57.44 b/
Apr. 26	59.81 b/
May 19	62.42 b/

Well 881

Terminal Compress Co., 82nd St. and Harrisburg Blvd., 5½ miles southeast of post office. Depth, 650 feet ±. Measuring point, top of tee, 3.5 feet above ground.

a/ Pump running. b/ Pump running in nearby well.

Date	Depth to water (feet)
Well 881 -- Continued	
1931 - Jan. 21 -	54.35
July 2 -	57.57
Aug. 12 -	58.67
Sept. 8 -	59.29
Nov. 2 -	60.10
Dec. 1 -	56.97
1932 - Jan. 8 -	54.12
Feb. 5 -	53.46
Mar. 3 -	50.36
Apr. 7 -	48.44
May 6 -	48.67
June 6 -	49.84
July 8 -	51.38
Aug. 5 -	53.30
Sept. 6 -	51.28
Oct. 10 -	50.33
Nov. 3 -	50.00
Nov. 23 -	49.36
Dec. 28 -	49.21
1933 - Jan. 27 -	47.54
Mar. 9 -	46.68
Apr. 14 -	46.54
May 11 -	48.08
June 22 -	52.87
Aug. 18 -	55.93
Sept. 20 -	57.88
Oct. 30 -	58.10
Nov. 21 -	57.87
Dec. 21 -	58.46
1934 - Jan. 22 -	56.44
Feb. 20 -	55.77
Mar. 20 -	53.47
Mar. 29 -	54.77
Apr. 19 -	54.95
May 21 -	55.56
June 25 -	58.15
July 23 -	59.73
Aug. 15 -	60.29
Sept. 21 -	60.19
Oct. 22 -	58.60
Nov. 20 -	58.02
Dec. 20 -	55.66
1935 - Jan. 30 -	53.78
Feb. 28 -	52.60
Mar. 21 -	52.31
Apr. 23 -	51.12
May 20 -	50.33
June 18 -	51.40
July 25 -	52.54
Aug. 16 -	54.64
Sept. 20 -	55.85

Date	Depth to water (feet)
Well 881 -- Continued	
1935 - Oct. 25 -	53.61
Nov. 22 -	
1936 - Feb. 19 -	51.65
Mar. 16 -	50.33
Mar. 17 -	50.48
Mar. 17 -	50.50
Mar. 17 -	50.50
Mar. 18 -	50.54
Apr. 24 -	49.86
May 7 -	49.36
May 21 -	50.16
June 22 -	51.36
July 24 -	52.53
Aug. 25 -	
Sept. 25 -	
Yard locked	
Oct. 26 -	"
Nov. 24 -	"
Dec. 22 -	"
1937 - Jan. -	
Mar. 22 -	52.43
Apr. 26 -	58.60
May 19 -	61.93

Well 876

Houston Country Club, Harrisburg Blvd., $3\frac{5}{4}$ miles southeast of Houston post office. Measuring point, pump base, 0.2 foot above ground.

1931 - Jan. 16 -	51.36
Apr. 6 -	50.92
July 15 -	57.61
Nov. 2 -	57.14
Dec. 1 -	54.15
1932 - Jan. 8 -	51.29
Feb. 5 -	50.75
Mar. 3 -	47.00
Apr. 7 -	44.40
May 6 -	a/
June 6 -	47.52
July 8 -	a/
Aug. 5 -	a/
Sept. 6 -	48.37
Oct. 10 -	46.71
Nov. 3 -	44.42
Nov. 28 -	45.44
Dec. 28 -	42.66

Date	Depth to water (feet)
Well 876 -- Continued	
1933 - Jan. 27 -	41.85
Mar. 9 -	41.16
Apr. 14 -	
May 11 -	44.25
June 22 -	a/
Aug. 18 -	a/
Sept. 19 -	56.33
Oct. 30 -	55.93
Nov. 21 -	55.39
Dec. 21 -	55.76
1934 - Jan. 22 -	52.28
Feb. 20 -	53.50
Mar. 20 -	53.00
Mar. 29 -	53.37
Apr. 19 -	Sealed
1937 - June 9 -	59.47

Well 878

Houston Compress Co., Anderson Clayton Turning Basin, $4\frac{3}{5}$ miles southeast of post office. Depth, 905 feet. Measuring point, top of pump base, 0.5 foot above ground.

1931 - Jan. 21 -	47.78
Apr. 6 -	46.97
May 25 -	49.42
Sept. 8 -	53.71
Nov. 2 -	53.78
Dec. 1 -	52.18
1932 - Jan. 7 -	47.73
Feb. 5 -	a/
Apr. 7 -	42.05
May 6 -	a/
June 6 -	43.68
July 8 -	46.09
July 8 -	45.93
July 8 -	45.80
Aug. 5 -	a/
Sept. 6 -	a/
Oct. 10 -	43.92
Nov. 3 -	44.54
Nov. 3 -	44.28
Nov. 3 -	44.04
Nov. 3 -	43.87
Nov. 28 -	a/
1933 - Jan. 27 -	a/

a/ Pump running. b/ Pump running in nearby well.

Water level fluctuations, Houston-Pasadena area -- Continued

Date	Depth to water (feet)
Well 878 -- Continued	
1933 - Mar. 9 -	a/
May 11 -	a/
Aug. 18 -	a/
Sept.19 -	52.68
Oct. 30 -	a/
Nov. 21 -	52.65
Dec. 21 -	a/
1934 - Jan. 22 -	50.85
Feb. 20 -	51.47
Mar. 20 -	46.20
Mar. 29 -	a/
Apr. 19 -	49.05
May 21 -	a/
June 25 -	
July 23 -	54.71
Aug. 15 -	55.63
Sept.21 -	55.60
Oct. 22 -	56.74
Nov. 20 -	a/
Dec. 20 -	a/
1935 - Jan. 30 -	47.28
Feb. 28 -	a/
Mar. 21 -	46.12
Apr. 23 -	46.51
May 20 -	a/
June 18 -	47.28
July 25 -	49.33
Aug. 16 -	a/
Sept.20 -	49.89
Oct. 25 -	a/
Nov. 22 -	a/
1936 - Feb. 19 -	45.22
Mar. 18 -	43.78
Apr. 24 -	a/
May 7 -	47.84
May 21 -	45.16
June 22 -	47.94 ?
July 23 -	49.89
Aug. 25 -	49.34
Sept.25 -	52.01
Oct. 26 -	50.55
Nov. 24 -	46.97
Dec. 22 -	45.27
1937 - Jan. 27 -	45.76
Mar. 22 -	48.43
Apr. 26 -	55.07
May 20 -	58.24

Date	Depth to water (feet)
Well 886	
Bennett Oil Co., San Antonio and Bowie Sts., 5½ miles southeast of post office. Depth, 540 feet. Measuring point, top of casing.	
1931 - Feb. 5 -	54.70
Apr. 6 -	54.47
May 25 -	55.52
July 15 -	57.09
Aug. 12 -	58.04
Sept. 8 -	58.51
Nov. 2 -	58.00
Dec. 1 -	56.90
1932 - Jan. 8 -	55.61
Feb. 5 -	54.88
Mar. 3 -	54.21
Apr. 7 -	53.78
May 6 -	53.62
June 6 -	54.65
July 8 -	55.75
Aug. 5 -	55.81
Sept. 6 -	55.84
Oct. 10 -	55.54
Nov. 3 -	54.85
Nov. 28 -	54.25
Dec. 28 -	53.14
1933 - Jan. 27 -	52.38
Mar. 9 -	51.79
Apr. 14 -	51.75
May 11 -	52.70
June 22 -	55.80
Aug. 18 -	56.75
Sept.30 -	58.62
Oct. 30 -	a/
Nov. 21 -	a/
Dec. 21 -	58.68
1934 - Jan. 22 -	57.67
Feb. 20 -	57.47
Mar. 30 -	57.64
Mar. 29 -	57.29
Apr. 19 -	57.34
May 21 -	60.48
June 25 -	65.47
July 23 -	65.78
Aug. 15 -	70.62
Sept.21 -	67.60
Oct. 22 -	66.29
Nov. 20 -	63.18
Dec. 20 -	a/

Date	Depth to water (feet)
Well 886 -- Continued	
1935 - Jan. 30 -	a/
Feb. 28 -	61.35
Mar. 21 -	60.81
Apr. 23 -	a/
May 20 -	62.92
June 18 -	63.10
July 25 -	65.80
Aug. 16 -	67.47
Sept.20 -	68.62
Oct. 25 -	67.55
Nov. 22 -	a/
1936 - Feb. 19 -	61.39
Mar. 18 -	a/
Apr. 24 -	a/
May 8 -	61.55
May 21 -	61.41
June 22 -	64.31
July 23 -	65.66
Aug. 25 -	67.20
Sept.25 -	67.30
Oct. 26 -	67.51
Nov. 25 -	68.70
Dec. 25 -	a/
1937 - Jan. 27 -	a/
Mar. 22 -	65.06
Apr. 26 -	67.73
May 19 -	a/

Well 890

Texas Chemical Co., Magnolia St., 6 miles southeast of post office. Depth, 1,284 feet. Measuring point, base of pump, 1.5 feet above ground.

1931 - Jan. 13 -	68.90
Apr. 6 -	68.08
July 13 -	73.41
Nov. 2 -	76.68
Dec. 1 -	72.12
1932 - Jan. 8 -	69.05
Feb. 5 -	66.85
Mar. 3 -	a/
Apr. 7 -	63.23
May 6 -	a/
June 6 -	64.74
July 8 -	a/
Aug. 5 -	a/

a/ Pump running. b/ Pump running in nearby well.

Date	Depth to water (feet)
Well 890 -- Continued	
1932 - Sept. 6	65.70
Oct. 10	a/
Nov. 3	a/
Nov. 28	64.32
Dec. 28	65.45
1933 - Jan. 27	a/
Mar. 9	a/
Apr. 14	61.75
May 11	a/
June 22	a/
Aug. 18	67.23
Sept.20	a/
Oct. 30	a/
Nov. 21	a/
Dec. 21	a/
1934 - Jan. 22	a/
Feb. 20	70.77
Mar. 20	70.63
Mar. 29	a/
Apr. 19	a/
May 21	a/
June 25	74.61
July 23	75.92
Aug. 15	a/
Sept.21	a/
Oct. 22	a/
Nov. 20	a/
Dec. 20	a/
1935 - Jan. 30	a/
Feb. 28	a/
Mar. 21	a/
Apr. 23	a/
May 20	a/
June 18	a/
July 25	a/
Aug. 16	a/
Sept.20	a/
Oct. 25	70.16
Nov. 22	a/
1936 - Feb. 10	a/
Mar. 19	a/
Apr. 24	a/
May 8	69.15
May 21	a/
July 24	a/
Aug. 25	a/
Sept.25	a/
Oct. 26	a/
Nov. 24	a/
Dec. 22	Obstructed
1937 - Jan. 27	63.70
	Motor cold

Date	Depth to water (feet)
Well 890 -- Continued	
1937 - Mar. 22	72.90
	Motor warm
Apr. 26	77.68
May 19	80.95
	Motor cold

Well 898

City of Houston. Park Place, 6⅝ miles east-southeast of post office. Measuring point, top of bushing in air line. Abandoned well.

1931 - Jan. 3	58.50
Apr. 6	57.52
July 13	60.61
Aug. 13	61.08
Sept. 8	61.79
Nov. 2	62.71
Dec. 1	60.63
1932 - Jan. 8	58.40
Feb. 5	57.60
Mar. 3	56.17
Apr. 7	54.35
May 6	54.55
June 6	55.54
July 8	56.78
Aug. 5	57.42
Sept. 6	57.18
Oct. 10	56.80
Nov. 3	56.30
Nov. 28	56.16
Dec. 28	55.27
1933 - Jan. 27	54.17
Mar. 9	53.42
Apr. 14	53.28
May 11	54.30
June 22	57.30
Aug. 18	58.91
Sept.20	59.77
Oct. 30	61.06
Nov. 21	61.17
Dec. 21	61.45
1934 - Jan. 22	60.71
Feb. 20	60.31
Mar. 20	59.01
Mar. 29	59.24
Apr. 19	59.13
May 21	59.75
June 25	62.08

Date	Depth to water (feet)
Well 898 -- Continued	
1934 - July 23	63.19
Aug. 15	63.36
Sept.21	63.22
Oct. 22	62.62
Nov. 20	62.10
Dec. 20	59.76
1935 - Jan. 30	57.55
Feb. 28	56.58
Mar. 21	56.36
Apr. 23	55.92
May 20	55.51
June 18	55.63
July 25	
Aug. 16	
Sept.20	
	Obstructed

Well 900

Golf Crest Country Club, 5½ miles east-southeast of Houston post office. Depth, 360 feet (?). Measuring point, top of casing at level of ground.

1931 - Feb. 19	48.71 b/
Apr. 6	48.29 b/
July 13	41.26
Aug. 13	41.32
Sept. 8	41.37
Nov. 2	a/
Dec. 1	37.51
1932 - Jan. 8	36.38
Feb. 5	35.64
Mar. 3	33.82 ?
Apr. 7	36.22
May 6	36.13
June 6	36.40
July 8	36.75
Aug. 5	37.05
Sept. 6	36.82
Oct. 10	37.03 b/
Nov. 3	37.07
Nov. 28	37.00
Dec. 28	36.46
1933 - Jan. 27	35.98
Mar. 9	35.22
Apr. 14	35.48 b/
May 11	35.54
June 22	36.18

a/ Pump running. b/ Pump running in nearby well.

Date	Depth to water (feet)
Well 900 -- Continued	
1933 - Aug. 18	37.42 b/
Sept.20	36.88 b/
Oct. 30	37.24
Nov. 21	37.27
Dec. 21	37.34
1934 - Jan. 22	37.91
Feb. 20	36.57
Mar. 20	36.49
Mar. 29	36.48
Apr. 19	36.37
May 21	36.63 b/
June 25	37.44
July 23	37.99 b/
Aug. 15	38.34
Sept.21	38.89
Oct. 22	39.13
Nov. 20	39.16
Dec. 20	38.79
1935 - Jan. 30	38.43
Feb. 28	38.18
Mar. 21	38.05 b/
Apr. 23	38.11
May 20	38.17 b/
June 18	38.58
July 25	39.13
Aug. 16	39.43
Sept.20	39.81
Oct. 25	39.71
Nov. 22	39.66
1936 - Feb. 19	38.67
Mar. 18	38.56
Apr. 24	38.79
May 8	38.90
May 21	38.80
June 22	39.25
July 23	39.74
Aug. 25	40.44
Sept.25	40.87
Oct. 26	42.21
Nov. 24	41.33
Dec. 22	40.93
1937 - Jan. 27	40.49
Mar. 22	40.34
Apr. 26	40.53
May 19	40.92

Well 900A

Golf Crest Country Club, 5½ miles east-southeast of Houston post office. Depth, ?. Measuring point, top of casing.

Date	Depth to water (feet)
Well 900A -- Continued	
1936 - Oct. 26	57.00
Nov. 24	55.26
Dec. 22	53.22
1937 - Jan. 27	51.23
Mar. 22	51.50
Apr. 26	53.93
May 19	55.75

Well 908

J. W. Maddon, 9 miles south-southeast of Houston post office near Pykawa. Depth, 900 foot +. Measuring point, top of casing, 0.7 foot above ground.

Date	Depth to water (feet)
1932 - June 6	23.30
July 8	23.32
Aug. 5	23.45
Sept. 6	23.34
Oct. 10	23.28
Nov. 3	24.76
Nov. 28	24.03
Dec. 28	23.37
1933 - Jan. 27	23.16
Mar. 9	22.93
Apr. 14	22.96
May 11	24.06
June 22	25.14
Oct. 30	25.91
Nov. 22	26.73
Dec. 21	27.22
1934 - Jan. 22	
Feb. 20	22.86
Mar. 20	21.08
Mar. 29	21.50
Apr. 19	21.56
May 21	
June 25	
July 23	22.49
Aug. 15	
Sept.21	
Inaccessible	

Well 1105

A. A. Womack, La Porte, about 23 miles east-southeast of Houston post office. Measuring point, top of tee, 1.6 feet above level of ground. Abandoned well.

Date	Depth to water (feet)
1932 - Dec. 28	53.73
1933 - Jan. 27	55.15
Mar. 9	52.84
Apr. 14	52.67
May 12	53.48
June 22	54.50
Aug. 19	54.91
Sept.20	54.72
Oct. 30	54.74
Nov. 22	54.43
Dec. 21	54.42
1934 - Jan. 22	53.64
Feb. 20	53.10
Mar. 20	52.93
Mar. 29	52.75
Apr. 19	52.54
May 21	52.95
June 25	54.07
July 23	54.58
Aug. 15	54.90
Sept.21	55.37
Oct. 22	55.31
Nov. 20	54.56
Dec. 20	54.16
1935 - Jan. 30	54.40
Feb. 28	53.83
Mar. 21	53.67
Apr. 23	53.67
May 20	53.21
June 18	54.53
July 25	56.00
Aug. 18	57.10
Sept.20	57.16
Oct. 25	57.19
Nov. 22	56.80
1936 - Feb. 19	56.05
Mar. 18	56.46
Apr. 24	59.93
May 8	56.97
May 21	57.18
June 22	58.28
July 24	58.20
Aug. 25	58.95

a/ Pump running. b/ Pump running in nearby well.

Date	Depth to water (feet)
Well 1105 -- Continued	
1936 - Sept. 25	59.46
Oct. 26	59.04
Nov. 24	58.57
Dec. 22	57.92
1937 - Jan. 27	57.54
Mar. 22	57.29
Apr. 26	57.48
May 19	57.45

Well 1170

Deepwater Plant of Houston Lighting & Power Co. 8½ miles east-southeast of Houston post office and about 1½ miles northwest of Pasadena. Depth, 836 feet. Measuring point, top of pump base, 2 feet above ground.

1931 - Feb. 25	56.81
July 13	62.74
Aug. 13	64.74
Sept. 8	67.42
Nov. 2	65.30
Dec. 1	a/
1932 - Jan. 8	59.28
Feb. 5	54.71
Mar. 3	56.25
Apr. 7	58.91
May 6	a/
June 6	a/
July 8	a/
Aug. 5	a/
Sept. 6	a/
Oct. 10	62.46
Nov. 3	63.56
Nov. 3	63.10
Nov. 3	62.72
Nov. 3	62.48
Nov. 28	62.43
Dec. 28	63.80
1933 - Jan. 27	a/
Mar. 9	54.93
Apr. 14	a/
May 12	59.80
June 22	a/
Aug. 19	a/
Sept. 20	a/

Date	Depth to water (feet)
Well 1170 -- Continued	
1933 - Oct. 30	67.10
Nov. 22	a/
Dec. 21	64.44
1934 - Jan. 22	a/
Feb. 20	63.20
Mar. 20	64.11
Mar. 29	a/
Apr. 19	a/
May 21	65.42
June 25	67.38
July 23	a/
Aug. 15	a/
Sept. 21	68.16
Oct. 22	65.27
Nov. 20	63.87
Dec. 20	a/
1935 - Jan. 30	60.62
Feb. 28	a/
Mar. 21	a/
Apr. 23	56.75
May 20	52.60
June 18	57.46
July 25	a/
Aug. 16	a/
Sept. 20	62.66
Oct. 25	56.67
Nov. 22	58.50
1936 - Feb. 19	57.73
Mar. 18	a/
Mar. 19	58.14
Apr. 24	53.47
May 8	57.69
May 21	57.65
June 22	a/
July 28	58.34
Aug. 25	a/
Sept. 25	60.83
Oct. 26	a/
Nov. 24	58.35
1937 - Mar. 22	80.52 ?
Apr. 26	Sealed
May 14	90.5
May 22	92.3
May 29	92.8
June 5	93.6

Well 1176

Texas Co. Refinery, Galena Park, 8½ miles east-south-east of Houston post office and about 2 miles north-northwest of Pasadena. Depth, 800 feet +. Measuring point, top of casing, 1.2 feet above ground. Abandoned well.

1931 - Mar. 25	28.02
May 25	29.29
July 13	31.35
Aug. 13	31.05
Sept. 8	32.84
Nov. 2	34.80
Dec. 1	32.35
1932 - Jan. 8	31.92
Feb. 5	29.17
Mar. 3	28.82
Apr. 7	28.41
May 6	28.34
June 6	29.68
July 8	29.92
Aug. 5	31.95
Sept. 6	31.74
Oct. 11	31.21
Nov. 3	30.82
Nov. 28	31.28
Dec. 28	29.77
1933 - Jan. 27	29.70
Mar. 9	27.12
Apr. 15	27.46
May 12	28.15
June 22	31.78
Aug. 19	30.12
Sept. 20	32.78
Oct. 30	32.66
Nov. 22	33.25
Dec. 23	32.42
1934 - Jan. 23	32.33
Feb. 20	33.02
Mar. 20	33.24
Mar. 29	32.99
Apr. 19	33.13
May 21	33.43
June 25	34.75
July 23	36.29
Aug. 15	35.32
Sept. 21	34.37
Oct. 22	33.79
Nov. 20	33.06
Dec. 20	28.26

a/ Pump running. b/ Pump running in nearby well.

Date	Depth to water (feet)
Well 1176 -- Continued	
1935 - Jan. 30	25.83
Feb. 26	25.26
Mar. 21	25.88
Apr. 23	
May 20	25.15
June 18	26.14
July 25	26.21
Aug. 16	27.25
Sept. 20	28.37
Oct. 25	28.75
Nov. 22	28.30
1936 - Feb. 19	29.40
Mar. 10	27.38
Apr. 24	28.13
May 9	29.40
May 21	30.28
June 22	32.50
Aug. 25	33.12
Obstructed	
Oct. 26	31.23
Nov. 24	32.42
Dec. 22	31.14
1937 - Jan. 27	30.37
Mar. 26	51.31
Apr. 26	58.16
May 19	34.27

Well 1153

Kirby Lumber Co., Clinton, about 8 miles east-southeast of Houston post office and 2 miles northwest of Pasadena. Depth, 549 feet. Measuring point, top of casing, 4.5 feet above ground. Abandoned well.

1931 - Mar. 27	52.05 b/
May 27	46.89
July 13	49.16
Aug. 13	50.75
Sept. 8	48.50
Nov. 2	48.50
Dec. 1	54.18 b/
1932 - Jan. 8	47.30
Feb. 5	47.50
Mar. 3	46.30
Apr. 7	47.23
May 6	51.50 b/
June 6	53.88 b/
July 8	47.75
Aug. 5	48.53
Sept. 6	47.25
Oct. 11	51.65 b/
Nov. 3	48.22
Nov. 28	47.43
Dec. 28	46.86
1933 - Jan. 27	46.30
Mar. 9	46.18
Apr. 15	46.42
May 12	46.56
June 22	52.43 b/
Aug. 19	49.72 b/
Sept. 20	49.84 b/
1936 - Apr. 9	48.40 ?
Obstructed	

Well 1186

American Service Co., Pasadena, 10 miles southeast of Houston post office. Depth, 220 feet. Measuring point, top of casing, 0.5 foot above ground. Abandoned well.

1932 - July 8	42.19
Aug. 5	42.67
Sept. 6	42.60
Oct. 10	43.02
Nov. 3	43.20
Nov. 28	43.43
Dec. 28	43.10
1933 - Jan. 27	42.95
Mar. 9	42.84
Apr. 14	42.71
May 12	43.05
June 22	43.42
Aug. 19	43.63
Sept. 20	44.25
Oct. 30	44.44
Nov. 22	44.60
Dec. 21	44.49
1934 - Jan. 22	44.27
Feb. 20	44.12
Mar. 20	44.16
Mar. 29	44.11
Apr. 19	Filled in

Well 1196

Talford Jones, 13 miles southeast of Houston post office and 3 miles southeast of Pasadena. Depth, 550 feet +. Measuring point, top of casing, 1.3 feet above ground.

1932 - Dec. 28	62.05
1933 - Jan. 27	62.03
Apr. 14	61.92
May 12	62.56
June 22	62.30
Aug. 19	62.26
Sept. 20	61.47
Oct. 30	61.22
Nov. 22	61.22
Dec. 21	61.22
1934 - Jan. 22	61.18
Feb. 20	61.12
Mar. 20	61.05
Mar. 29	61.00
Apr. 19	60.89
May 21	60.85
June 25	60.83
July 23	60.85
Aug. 15	
Sept. 21	
1936 - Mar. 18	62.38
Apr. 24	62.65
May 8	62.74
May 21	62.83
June 22	63.03
July 24	63.29
Aug. 25	63.63
Sept. 25	
Oct. 26	64.20
Nov. 24	64.44
Dec. 22	64.62
1937 - Jan. 27	64.82
Mar. 22	65.16
Apr. 26	65.31
May 19	65.37

a/ Pump running. b/ Pump running in nearby well.

Water level fluctuations in observation wells in Houston-Galveston area, Texas

Well 1203 (Harris County)

Harris County highway well, 11 miles southeast of Houston post office at South Houston. Depth, 600 feet +. Not used. Measuring point, top of casing, 0.5 foot above ground.

Date	Depth to water (feet)
1931 - Apr. 3	34.73
Sept.16	36.91
1932 - Oct. 7	38.25
Nov. 8	38.70
Nov. 26	38.97
Dec. 30	39.04
1933 - Feb. 1	39.15
Mar. 14	38.62
May 9	38.90
Oct. 26	39.85
1935 - Aug. 22	45.81
1936 - Feb. 28	39.36
Mar. 18	39.81
May 11 - Aug. 28	Obstructed

Well 1209 (Harris County)

Fireworks Co., 11 miles southeast of Houston post office and ½ mile southeast of South Houston. Depth, 650 feet +. Not used. Measuring point, top of air line, 4 feet above ground.

Date	Depth to water (feet)
1932 - Oct. 7	39.66
Nov. 8	39.95
Nov. 26	40.03
Dec. 30	39.75
1933 - Feb. 1	39.83
Mar. 14	39.41
May 9	39.83
Oct. 26	40.72
1935 - Aug. 22	43.77
1936 - May 11	42.97
Aug. 11	43.61
Aug. 28	45.03
Sept.17	45.32
Dec. 24	45.62
1937 - May 17	44.53

Well 1302 (Harris County)

City of Genoa, at Genoa. Depth, 332 feet. Measuring point, hole in 8-inch casing, 1 foot above ground.

Date	Depth to water (feet)
1931 - Apr. 3	48.06
Sept. 4	51.18
1932 - May 10	50.19
Oct. 7	52.12
Nov. 8	51.92
Nov. 26	51.92
Dec. 30	51.43
1933 - Feb. 1	51.19
Mar. 14	a/
May 9	a/
Oct. 26	52.18
1935 - Aug. 22	55.02
1936 - May 11	a/
May 12	53.91
Aug. 11	a/
Aug. 12	55.60
Dec. 24	Locked

Well 1360 (Harris County)

Mrs. Fain, ½ mile east of Webster. Depth, 659 feet. Measuring point, top of casing, 2 feet above ground.

Date	Depth to water (feet)
1931 - Apr. 3	31.47
Aug. 7	37.29
Sept. 4	36.00
1932 - May 10	32.25
July 9	37.26
Oct. 7	a/
Nov. 8	35.96
Nov. 26	35.36
Dec. 30	34.45
1933 - Feb. 1	33.76
Mar. 14	33.43
May 9	34.30
1935 - Aug. 22	
1936 - Feb. 28	38.70
May 12	40.15 a/
Aug. 11	Obstructed
Aug. 29	"
Sept.17	"
Dec. 31	42.45
1937 - May 17	45.18

Well 26 (Galveston County)

Galveston, Houston and Henderson Railway, at League City. Depth, 1,020 feet. Measuring point, top of casing, 3 feet above ground. Abandoned well.

Date	Depth to water (feet)
1931 - Apr. 15	14.86
Sept. 4	17.53
1932 - May 10	15.82
Sept.20	17.19
Oct. 7	16.98
Nov. 8	17.22
Nov. 26	17.43
Dec. 30	18.71
1933 - Feb. 1	16.30
Mar. 14	15.85
May 9	16.18
Oct. 26	16.73
1935 - Aug. 23	15.80
1936 - Feb. 28	14.45
May 12	14.92
Aug. 11	16.04
Aug. 29	16.19
Sept.17	16.21
Dec. 30	18.07
1937 - Jan. 28	15.75
May 17	16.37

Well 112 (Galveston County)

Galveston, Houston and Henderson Railway, 6½ miles northeast of Alta Loma. Depth, 750 feet. Measuring point, top of casing, 1 foot above ground.

Date	Depth to water (feet)
1931 - Apr. 15	18.89
Sept.16	23.12
1932 - Oct. 7	24.10
Nov. 8	24.37
Nov. 26	23.33
Dec. 30	21.41
1933 - Feb. 1	20.82
Mar. 14	20.57
May 9	22.86
Oct. 26	25.10
1935 - Aug. 23	35.68
1936 - Feb. 28	37.48

a/ Pump running. b/ Pump running in nearby well.

Date	Depth to water (feet)
Well 112 -- Continued	
1936 - May 12	40.20
Aug. 11	42.30
Aug. 28	43.00
Sept.17	43.68
1937 - Jan. 2	40.15
Jan. 28	39.33
May 17	46.93

Well 113 (Galveston County)

E. Menotti, 7 miles northeast of Alta Loma. Depth, 504 feet. Measuring point, top of pipe clamp, 6 inches above ground.

1932 - Sept.20	14.92
Oct. 7	14.98
Nov. 8	15.17
Nov. 26	15.20
Dec. 30	15.40
1933 - Feb. 1	14.94
Mar. 14	14.86
Apr. 9	16.12
Oct. 26	15.70
1935 - Aug. 23	13.25
1936 - Feb. 28	19.45
May 11	19.04
Aug. 11	21.73
Aug. 29	20.63
Sept.17	20.32
1937 - Jan. 28	21.47
May 17	a/

Well 115 (Galveston County)

J. W. Palmer, 6 miles northeast of Alta Loma. Depth, 526 feet. Measuring point, top of air line, 4¼ feet above ground.

1932 - Sept.20	19.38
Oct. 7	19.36
Nov. 8	19.56
Nov. 26	19.55
Dec. 30	19.16
1933 - Feb. 1	18.93
Mar. 14	18.80
May 9	19.15
Oct. 26	20.14
1935 - Aug. 23	23.95
1936 - Feb. 28	27.25
May 11	27.84
Aug. 11	31.66
Aug. 29	24.69
Sept.17	32.78
1937 - Jan. 2	31.49
Jan. 28	29.95
May 17	43.91

Well 206 (Galveston County)

A. J. Biran, 3½ miles west of Texas City. Depth, 926 feet. Measuring point, hole under 1-inch pipe, 11 inches above top of casing.

1931 - Apr. 15	7.23
1932 - Oct. 7	9.64
Nov. 8	9.13
Nov. 26	8.96
Dec. 30	9.13
1933 - Feb. 1	9.28
Mar. 14	9.07
May 9	9.43
Oct. 26	12.10
1935 - Aug. 23	30.30
1936 - Feb. 28	33.00
May 11	35.54
Aug. 11	Obstructed
1937 - Jan. 2	34.00
Jan. 28	35.90
May 24	40.42

Well 272 (Galveston County)

City of Galveston, at Alta Loma. Depth, 809 feet. No pump. Measuring point, top of 12-inch receiver, 7 feet above ground.

1932 - Sept.23	38.84
Oct. 7	38.20
Nov. 8	37.12
Nov. 26	32.63
Dec. 30	37.61
1933 - Feb. 1	34.15
Mar. 14	34.10
May 9	39.67
Oct. 26	40.52
1935 - Aug. 25	53.50
1936 - Feb. 28	37.52
May 12	48.92
Aug. 11	48.67
Sept.17	51.28
1937 - Jan. 2	40.26
May 24	52.70

Well 297 (Galveston County)

Chas. Schiro, 4 miles southeast of Alta Loma. Depth, 720 feet. Gas engine pump. Measuring point, top of casing, 6 inches above ground.

1932 - Sept.22	12.52
Oct. 7	11.71
Nov. 8	11.68
Nov. 26	11.48
Dec. 30	10.71
1933 - Feb. 1	10.66
Mar. 14	10.50
May 9	11.10
Oct. 26	11.82
1935 - Aug. 23	19.96
1936 - Feb. 28	19.10
May 12	19.50
Aug. 12	24.67
Sept.17	21.96
1937 - Jan. 2	25.47
May 24	30.33

a/ Pump running. b/ Pump running in nearby well.

Water level fluctuations in observation wells in areas north and northwest of Houston

Date	Depth to water (feet)
Well 205	
Humble Pipe Line Co., 6¼ miles southeast of Cypress; drilled. Depth, 700 feet. Air and oil pump. Measuring point, top of casing, 1 foot above ground.	
1931 - Apr. 7 -	25.91
May 19 -	23.34
June 19 -	24.13
July 23 -	24.17
Sept.24 -	26.22
Dec. 12 -	25.62
1932 - Jan. 13 -	25.30
Feb. 10 -	25.11
Mar. 16 -	24.70
May 25 -	24.56
June 24 -	25.29
Aug. 28 -	27.00
Nov. 28 -	27.30
Dec. 28 -	26.77
1933 - Mar. 11 -	26.02
1934 - Apr. 25 -	26.46
1935 - Aug. 20 -	27.17
1936 - Feb. 25 -	26.78
May 13 -	26.16
Aug. 17 -	21.46
Sept.10 -	27.87
1937 - Jan. 12 -	b/
May 18 -	b/
Well 206	
R. B. Tucker, 6½ miles southeast of Cypress; drilled. Depth, 450 feet +. Air and gas pump. Measuring point, top of board cover by suction pipe.	
1931 - Apr. 2 -	22.50
June 19 -	23.59
July 23 -	25.18
Sept.24 -	27.30
Dec. 12 -	26.51
1932 - Jan. 13 -	25.78
Mar. 16 -	23.67
Apr. 19 -	23.55
May 25 -	23.90
June 24 -	25.32
July 22 -	26.62
Sept.29 -	27.07
Oct. 28 -	27.94
1933 - Mar. 11 -	26.82
June 26 -	27.08
Nov. 20 -	28.38
1934 - Nov. 28 -	28.05
1935 - May 30 -	25.52
Aug. 20 -	27.84
1936 - Feb. 25 -	27.92
May 13 -	23.43
Aug. 17 -	26.86
Sept.10 -	26.93
1937 - Jan. 12 -	25.78
May 18 -	23.45
Well 256	
J. M. Blake, Houston-Conroe road, 14 miles north of Houston post office. Depth, 189 feet. Measuring point, plug in top of casing.	
1931 - Nov. 9 -	28.86
Dec. 9 -	28.80
1932 - Jan. 12 -	28.54
Feb. 9 -	28.24
Mar. 7 -	27.60
Apr. 11 -	27.28
May 7 -	27.28
July 1 -	27.53
Aug. 31 -	28.20
Oct. 2 -	28.92
Nov. 26 -	29.36
Dec. 30 -	29.30
1933 - Jan. 25 -	29.42
1933 - May 8 -	28.43
June 6 -	28.40
1934 - Apr. 26 -	28.75
Nov. 29 -	30.49
1935 - May 29 -	28.75
Aug. 22 -	29.00
1936 - Feb. 27 -	28.20
June 3 -	27.59
1937 - Jan. 29 -	28.91
May 18 -	28.26
Well 264	
Weary farm, 15 miles north of Houston post office. Depth, 1,610 feet. Water from 950 foot sand. Measuring point, top of casing. Abandoned well.	
1931 - May 29 -	3.00
Nov. 18 -	5.08
1932 - Jan. 19 -	5.36
Mar. 21 -	5.66
May 21 -	6.44
July 25 -	7.46
Sept.27 -	8.30
Oct. 21 -	8.36
Nov. 26 -	8.69
Dec. 30 -	8.66
1933 - Jan. 25 -	8.92
Mar. 15 -	8.96
May 8 -	9.66
June 24 -	10.10
1935 - Aug. 22 -	21.30
1936 - Feb. 26 -	21.37
Mar. 30 -	21.22
June 3 -	20.95
Sept.11 -	20.95
1937 - Jan. 11 -	22.43
May 18 -	23.52

a/ Pump running. b/ Pump running in nearby well.

TABLE 2

Analyses of water from wells in Houston, Texas

(Analyzed in laboratory of U. S. Geological Survey by Margaret D. Foster and others, unless otherwise specified.)

(Parts per million.)

Well No.	Owner	Date of collection	Depth (feet)	Total dissolved solids	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and Potassium (Na + K) (Calc.)	Bicarbonate (HCO_3)	Sulphate (SO_4)	Chloride (Cl)	Nitrate (NO_2)	Total hardness as $CaCO_3$ (Calc.)
a/589	City of Houston	Sept. 12, 1931	2,090	451	d/.2	25	9.1	144	330	9	82	--	100
b/600	do.	Oct. 7, 1929	558	400	d/14	63	14	64	293	24	65	--	215
620	Public Laundries	Mar. 30, 1935	1,379	328	.03	8.2	2.3	127	297	2.0	42	.64	30
688-690	City of Houston	May 9, 1932	-	362	.17	22	5.8	109.9	301	7.8	48	.0	79
b/710	Niels-Esperson Bldg.	Mar. 9, 1927	883	305	--	29	11	75	260	21	31	--	118
732	Gould Wet Wash Laundry	do.	1,392	415	--	7.2	11	148	373	8.6	50	--	63
740	Houston Electric Co.	July 21, 1933	537	258	.56	32	10	58	234	13	30	.0	121
744	City of Houston	May 9, 1932	1,860	---	--	--	--	--	380	1	91	.0	18
a/793	do.	Sept. 12, 1931	2,150	342	d/1.2	15	4.8	112	268	11	49	--	57
808	Gem Electric Co.	July 21, 1933	340	310	.14	62	14	41	270	12	48	.0	212
811	Harris County	do.	385	298	.09	71	12	29	254	9.2	51	.40	227
a/878	Houston Compress Co.	Nov. 9, 1929	905	267	d/4.2	23	6.4	69	220	14	28	--	83
879	City of Houston	May 9, 1932	1,037	286	0.16	34	7.5	61.1	239	16	26	0.20	116
a/892	Lone Star Cement Co.	Feb. 4, 1929	1,284	425	d/1.4	8.4	2.4	159	354	12	53	--	31
1,160	Allendale Subdivsion	Aug. 1, 1933	160	---	2.9	--	--		358	8	445	.96	454
c/1,168	Houston Lighting and Power Company	Mar. 1, 1922	979	281	d/1.4	18	6.7	83	229	14	35	.3	72
c/1,159	do.	do.	1,100	302	d/4.8	9.3	5.1	103	227	12	41	.5	44

a/ Analysis by Houston Laboratories.

b/ Analysis by Curtis Laboratories.

c/ Analysis by Penn Power and Light Company.

d/ Iron and aluminum oxides.

Analyses of water from wells in Harris County, Texas.. (Outside Houston.)
(Analyzed in laboratory of U. S. Geological Survey by Margaret D. Foster and others, unless otherwise specified.)
(Parts per million.)

Well No.	Owner	Date of collection	Depth (feet)	Total dissolved solids	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K) (Calc.)	Bicarbonate (HCO_3)	Sulphate (SO_4)	Chloride (Cl)	Nitrate (NO_2)	Total hardness as $CaCO_3$ (Calc.)
93	Missouri Pacific Ry.Co.	Mar.31,1936	1,070	344	.05	16	5.9	119	325	11	32	.05	64
136	J. Freeman	Aug. 7, 1933	138	258	.35	61	5.4	32	237	4.0	33	.0	175
169	Houston and Texas Central R.R.	Sept.28,1929	400	203	--	25	3.4	41	124	4.4	42	--	76
225	Trinity and Brazos Valley R.R.	Oct.27, 1931	616	332	--	65	5.7	41	189	12	75	--	186
b/281a	Humble City	Dec.31,1936	1,140	601	3	7.3	1.5	168	322	1.5	88		23
b/281b	do.	Dec.21,1936	--	595	3	7.5	1.3	166	319	1.3	88		25
b/321a	Black Cat Oil Test	do.	--	377	2	23	1.7	83	204	3.6	52		64
b/326	Gulf Pipe Line Co.	do.	533	432	3	9.1	2.1	106	251	5.8	36		31
370	J. M. Johnson	Aug. 2,1932	625	327	.10	68	7.3		254	11	47	.10	200
399	Gertie Rice Farm	Aug. 1, 1932	326	285	.03	69	7.0	35	260	4	42	.20	201
431	G. E. Wilkins	June 2,1936	800?	423	---	9.6	5.2	161	378	3	58	.0	45
492	Galveston, Houston & San Antonio Ry.	May 5, 1931	220	484	d/1.6	77	21	81	341	16	113	Trace	279
809	Gem Electric Co.	May 17,1936	1,100±	314	--	8.4	4.8	116	266	1	52	.65	41
828	Rio Brave Oil Co.	Aug.12,1933	248	---	.15	--	--	[illegible]	276	11	32	.2	183
829	C. S. Settegast	do.	350	---	-	--	--		272	14	31	1.1	183
906	Gardenvilla Subdivision	June 7,1929	875	316	d/2.6	26	6.6	88	256	16	38	--	88
1,103	Galveston, Harrisburg and San Antonio Ry.	Oct.6,1931	770	726	d/4.6	5.7	2.6	289	570	—	133	.9	25
1,151	Southern Pacific Ry.	Sept.19,1930	793	301	—	24	4.1	79	228	16	31	.50	77
1,162a	Sinclair Refining Co.	June 5,1936	1,300	399	—	4.4	2.6	162	390	1	37	.0	22
1,172	Texas Company	June 6, 1936	1,376	311	—	14	4.7	109	288	8	33	.0	54
1,201	Shell Petroleum Co.	June 5, 1936	860	564	--	5.0	2.5	230	510	1	74	.0	23
1,251	C. F. Smith	May 30, 1936	728	145	--	26	7.9	21	146	4	13	.75	97
1,302	City of Genoa	Mar.30,1935	832	461	.12	11	3.7	177	388	3.1	75	.12	43
1,329	J. W. Goar	July 20,1933	473	429	1.9	16	8.5	151	378	1.2	66	.12	75
1,329	do.	Mar.29,1935	473	522	1.5	24	15	169	392	4.1	115	1.7	122
1,364	Humble Pipe Line Co.	Aug. 1, 1933	81	--	.65	--	--	[illegible]	458	60	645	.60	352

b/ Analysis by A. J. Hartsook, Rice Institute.
d/ Iron and aluminum oxides.

Analyses of water from wells in Harris County--Continued
(Parts per million.)

Well No.	Owner	Date of collection	Depth (feet)	Total dissolved solids	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and Potassium (Na + K) (Calc.)	Bicarbonate (HCO_3)	Sulphate (SO_4)	Chloride (Cl)	Nitrate (NO_2)	Total hardness as $CaCO_3$ (Calc.)
1,365	Humble Pipe Line Co.	July 18,1933	652	465	.07	11	3.0	--	324	1.3	94	.10	40
1,366	Galveston-Houston Elec. Co.	1934	---	1,175	d/5.0	44	45	333	110	96	588	—	294

a/ Analysis by Houston Laboratories.
b/ Analysis by A. J. Hartsook, Rice Institute.
d/ Iron and aluminum oxides.

Analyses of water from wells in Waller County, Texas
(Analyzed in laboratory of U. S. Geological Survey by Margaret D. Foster and others, unless otherwise specified.)
(Parts per million.)

Well No.	Owner	Date of collection	Depth (feet)	Total dissolved solids	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and Potassium (Na + K) (Calc.)	Bicarbonate (HCO_3)	Sulphate (SO_4)	Chloride (Cl)	Nitrate (NO_2)	Total hardness as $CaCO_3$ (Calc.)
c/108a	Texas Louisiana Power Company	Jan. 2,1930	518	517	d/15	40	11	138	390	6.7	85	--	145
108b	do.	Jan. 6,1930	723	451	d/20	50	7.5	115	372	10	66	--	156
119	Prairie View State College	-- 1930	576	309	--	34	11	70	255	23	36	--	130
120	do.	Mar.24,1928	574	415	--	36	5.5	111	336	30	34	--	113
230	Francis Young	Aug. 1,1932	237	240	.02	63	5.9	24	220	2	37	.15	182

c/ Analysis by Curtis Laboratories.
d/ Iron and aluminum oxides.

Analyses of water from wells in Galveston County, Texas
(Analyzed in laboratory of U. S. Geological Survey by Margaret D. Foster and others, unless otherwise specified.)
(Parts per million.)

Well No.	Owner	Date of collection	Depth (feet)	Total dissloved solids	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and Potassium (Na + K) (Calc.)	Bicarbonate (HCO_3)	Sulphate (SO_4)	Chloride (Cl)	Nitrate (NO_2)	Total hardness as $CaCO_3$ (Calc.)
23	Joe L. Taylor	Oct.22,1927	800	--	—	12	2.0	---	268	—	72	—	38
23	do.	July 19,1933	800	586	9.2	51	33	141	520	7.2	97	.10	203
62	W. R. McClendon	May 10,1932	170	1,048	.96	30	20	Na 354 K 8.2	602	60	271	3.7	157
101	H. E. Carter	May 26,1928	200	913	d/3.0	33	15	318	806	2.7	123	—	144
108	Dickinson Ice Co.	Mar.29,1935	576	447	.04	5.0	1.5	181	370	1.7	75	.64	19
111a	Fig Plant	July 18,1926	875	1,920	d/3.2	15	7.0	736	334	1.7	985	—	66
111b	do.	July 16,1933	215	832	.34	20	12	Na 292 K 3.8	600	.8	175	.30	99
184	Southern Pacific Ry.	Sept.17,1931	600	703	d/3.9	8.9	2.1	---	443	—	182	1.2	31
223	Otis Walker	July 18,1933	246	366	.36	14	11	332	688	3.3	166	.61	80
a/224	Texas-Louisiana Power Company	Jan.13,1916	1,038/	1,496	—	20	11	---	261	—	767	—	95
a/226	do.	May 9, 1910	812	682	—	7.8	2.5	261	379	6.5	198	—	30
227	do.	July 18,1933	763	822	.20	8.5	3.0	Na 311 K 3.9	478	1.1	230	.20	34
230	Pan American Refining Corp.	July 19,1933	611	811	.82	7.7	3.1	Na 305 K 3.8	578	1.6	162	.12	32
239	Texas City Terminal Railway	do.	855	990	1.0	9.2	3.4	Na 371 K 3.5	511	.8	305	.20	37
264	City of Galveston	July 22,1933	843	852	.13	20	6.6	Na 302 K 3.8	331	1.2	330	.10	77
264	do.	Mar.29,1935	843	979	.15	26	8.0	356	333	2.6	422	.38	98
279	N. J. Mouna	July 22,1933	120	765	1.9	42	30	229	626	12	140	3.8	228
289	R. G. Roberts	do.	260	1,1095	2.9	23	18	398	598	4.5	355	.20	131
291	Hitchcock Ice & Fuel Company	do.	720	577	0.47	8.7	3.5	Na 213 K 2.2	399	1.3	124	0.05	36
293	L. Schansa	Oct. 10,1930	208	--	d/.7	22	5.8	---	304	—	302	—	79

a/ Analysis by Houston Laboratories.
d/ Iron and aluminum oxides.

Analyses of water from wells in Galveston County--Continued
(Parts per million.)

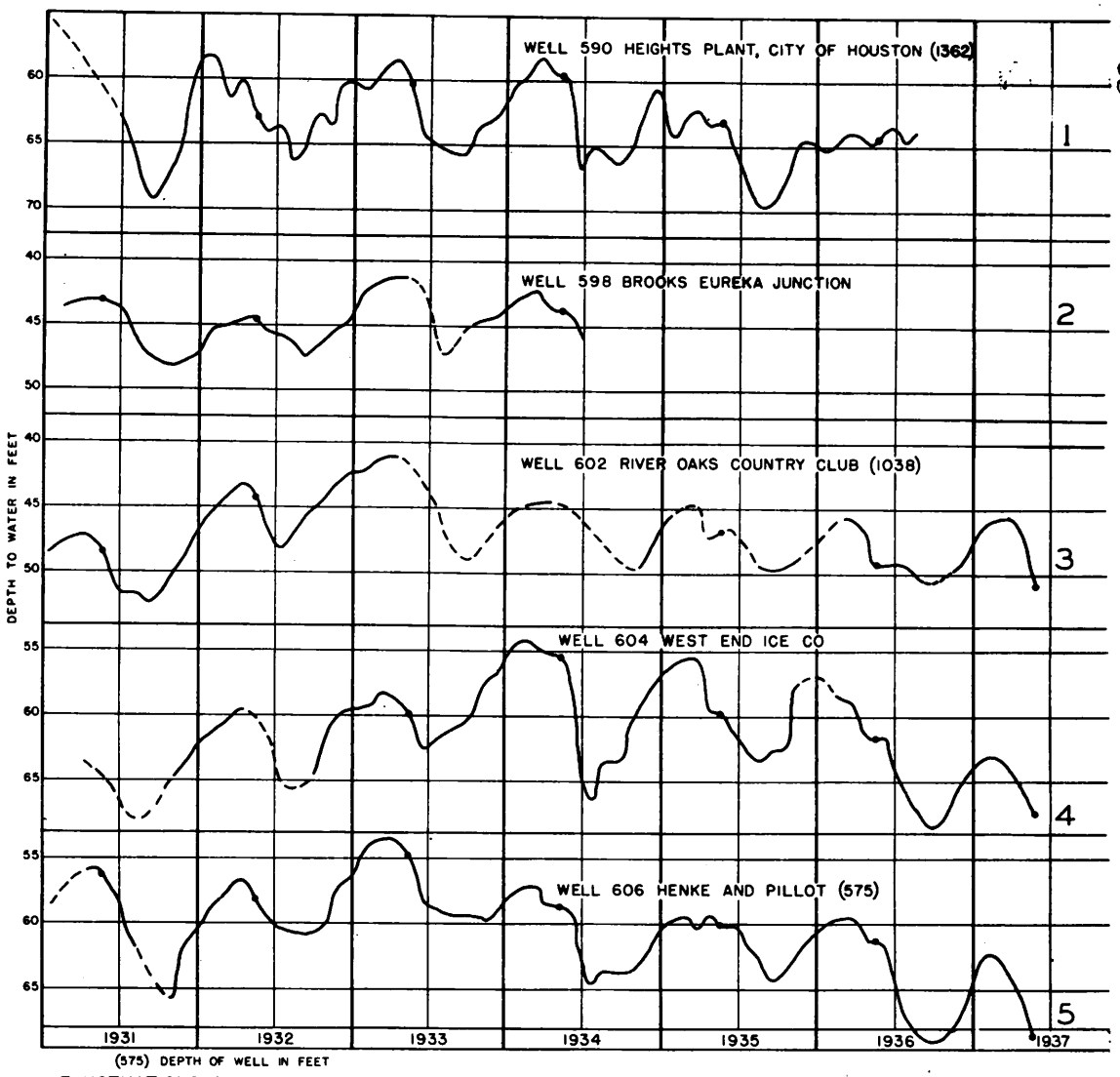
Well No.	Owner	Date of collection	Depth (feet)	Total dissolved solids	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and Potassium (Na + K) (Calc.)	Bicarbonate (HCO_3)	Sulphate (SO_4)	Chloride (Cl)	Nitrate (NO_2)	Total hardness as $CaCO_3$ (Calc.)
351	- Derringer	July 22,1933	533	569	3.3	7.1	2.8	226	431	1.5	118	.05	29
355	P. H. Naschke	July 19,1933	710	690	1.5	6.8	2.6	269	447	1.2	189	.15	28
356	R. L. Whitburn	July 18,1933	117	846	.89	49	18	274	664	2.2	171	4.5	196
360	Sinclair Refinery No. 3	July 19,1933	1,030	1,875	.38	28	12	Na 680 K 6.0	350	1.2	940	.50	119
412	Galveston Ice & Cold Storage Company	May 10, 1932	1,345	5,840	2.2	90	54	Na 2,096 K 23	331	.6	3,381	.0	446
a/416	Gulf Colorado and Santa Fe R.R.	Jan. 1, 1932	1,088	1,800	d/4.8	16	6.5	676	446	.9	830	--	66
417	Geo. Sealy	July 2, 1927	1,000	1,705	--	54	31	588	726	25	648	--	262

a/ Analysis by Houston Laboratories.
d/ Iron and aluminum oxides.

Analyses of water from wells in Fort Bend County, Texas

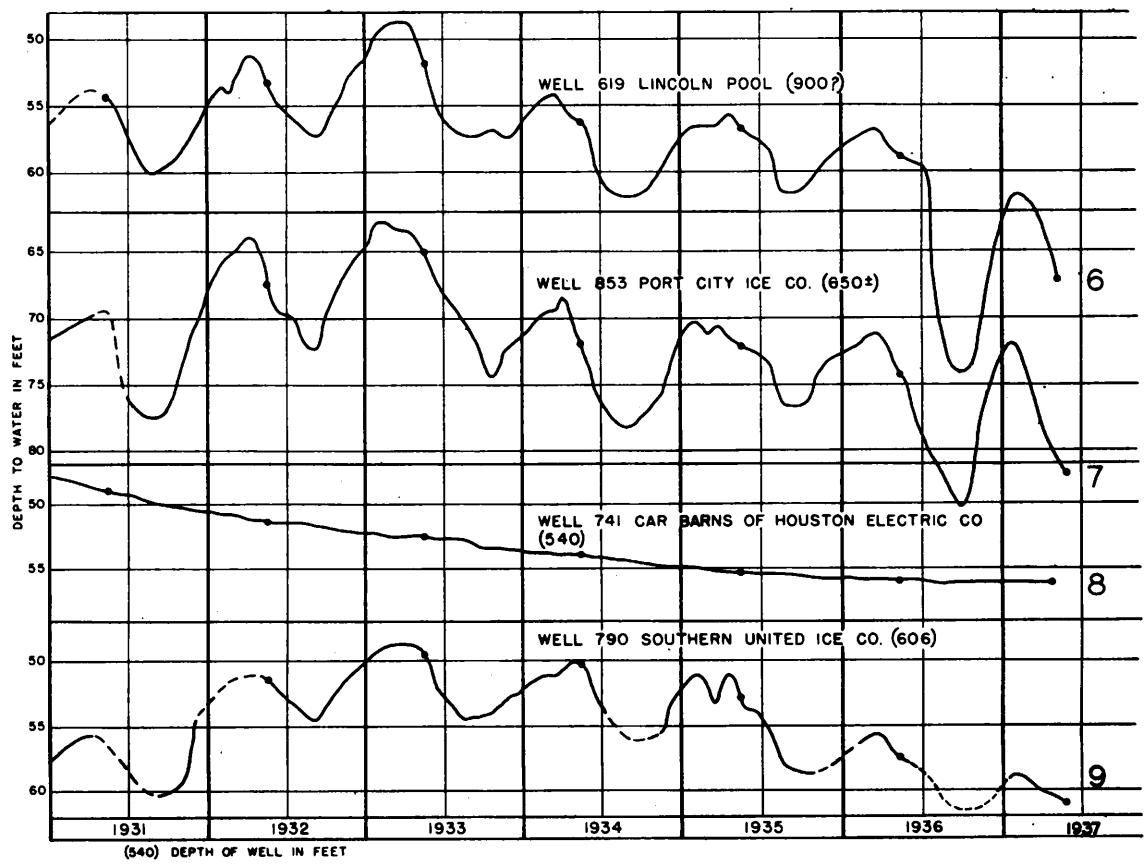
2	S. A. & A. P. R.R.	May 14,1931	900	--	d/2.6	47	4.9	---	222	--	38	0.23	138
23	G. Phillips	Aug. 7,1933	70	--	--	--	--	--	360	11	242	6.0	402
27	Southern Pacific Ry.	May 14,1931	200	--	d/3.4	77	6.5	---	294	--	50	.23	219
53a	Sugarland Ind.	June 2,1936	733	--	--	--	--	---	232	12	61	--	237
54	do.	do.	1,606	337	--	14	5.9	115	257	18	57	.25	59
70	State of Texas	Aug.16,1933	240	340	.02	56	17	55	279	13	62	.0	210
71	Sinclair-Prairie Oil Company	Aug. 15,1933	285	328	.08	44	11	72	277	15	49	.10	155
74	State of Texas	do.	304	775	.04	9.3	2.9	302	376	17	257	.53	35
91a	House Estate	June 8,1936	350?	313	--	14	--	74	378	1	37	.0	145

d/ Iron and aluminum oxides.



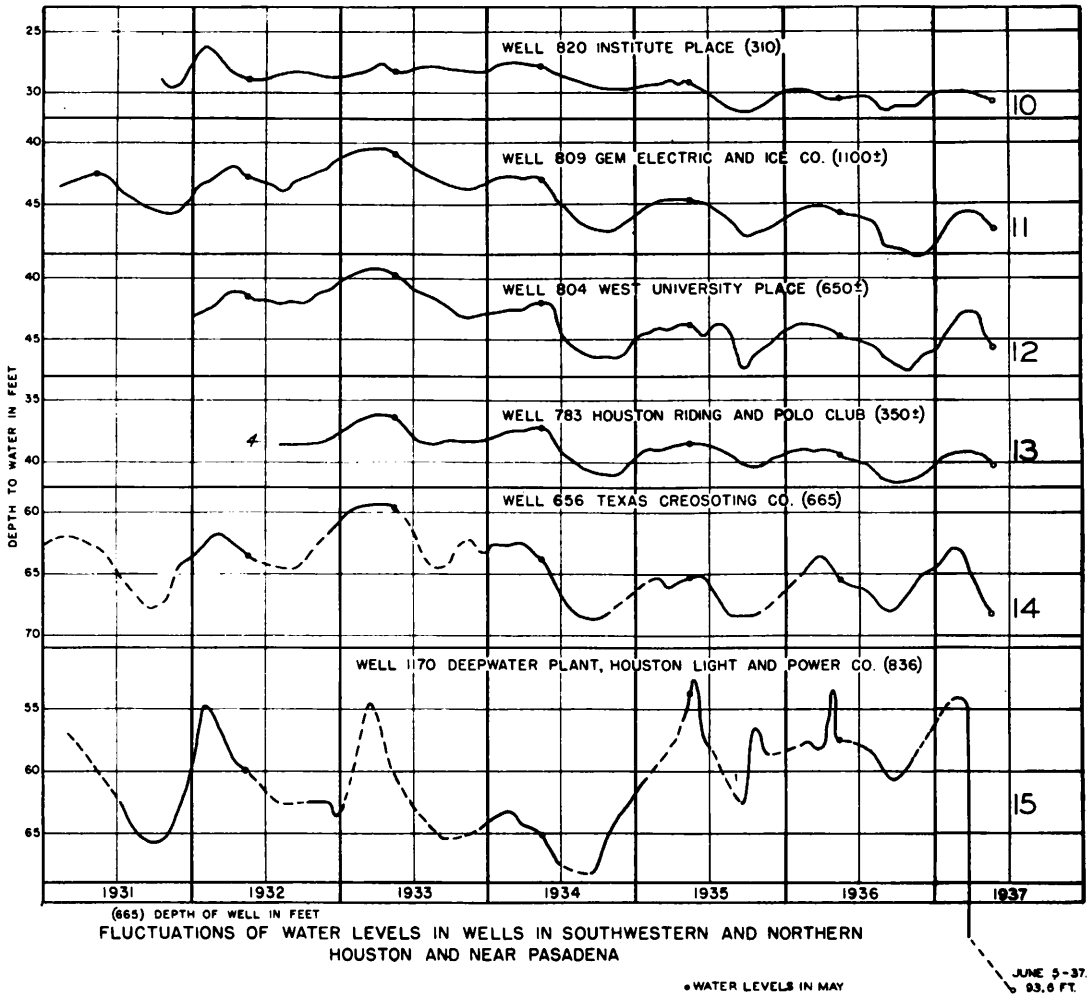
FLUCTUATIONS OF WATER LEVELS IN WELLS IN WESTERN AND NORTHWESTERN HOUSTON

• WATER LEVELS IN MAY

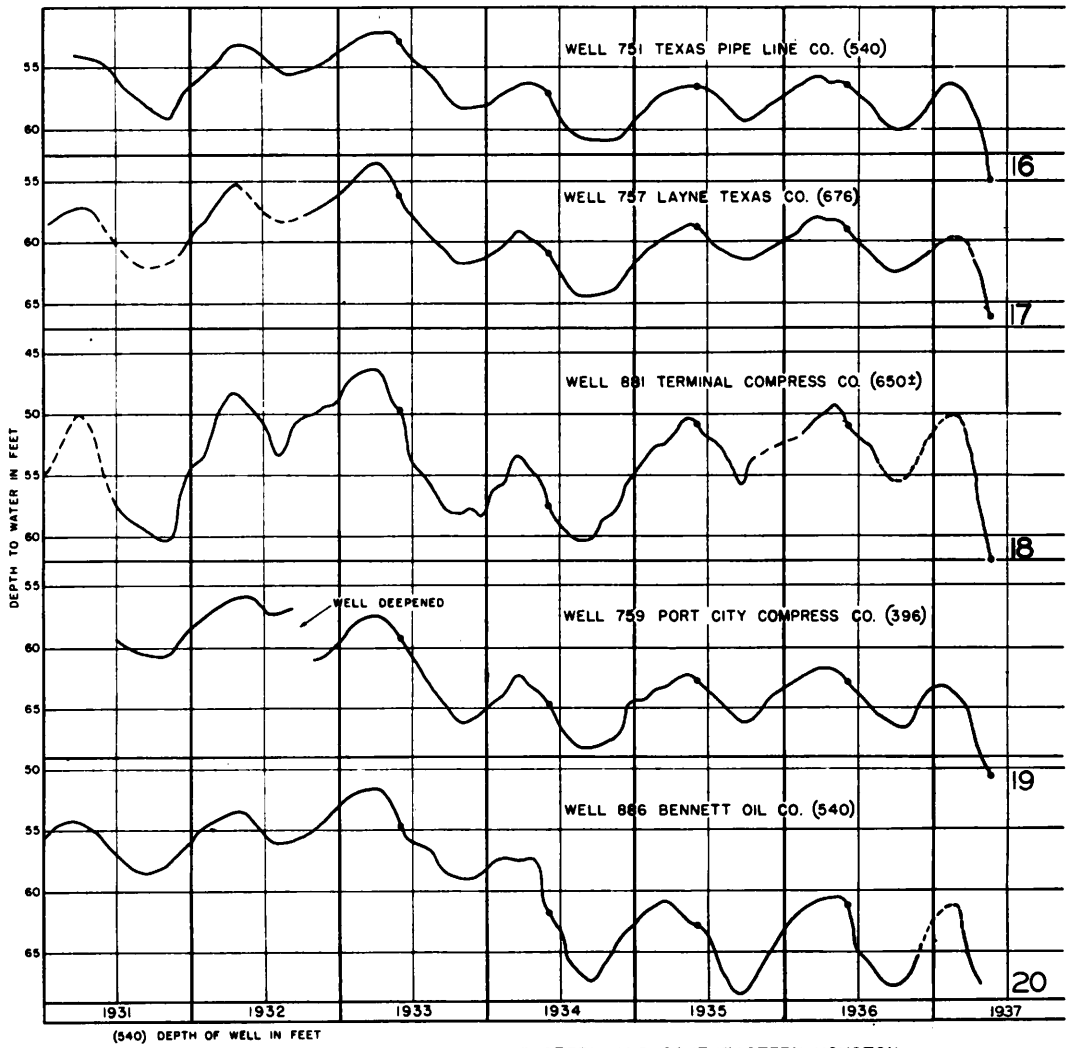


FLUCTUATIONS OF WATER LEVELS IN WELLS IN CENTRAL HOUSTON

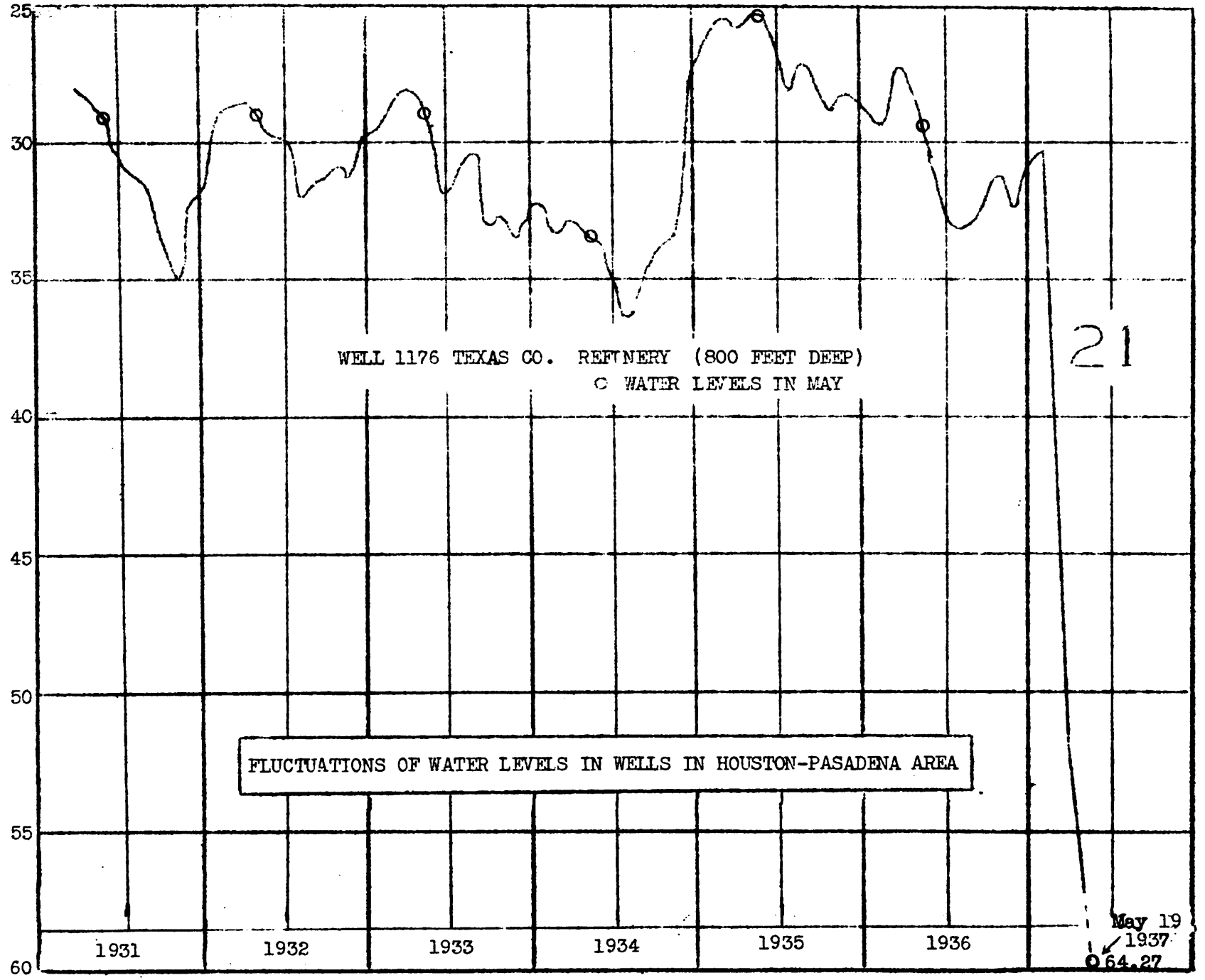
• WATER LEVELS IN MAY



FLUCTUATIONS OF WATER LEVELS IN WELLS IN SOUTHWESTERN AND NORTHERN HOUSTON AND NEAR PASADENA



FLUCTUATIONS OF WATER LEVELS IN WELLS IN EASTERN AND SOUTHEASTERN HOUSTON


25
30
35
40
45
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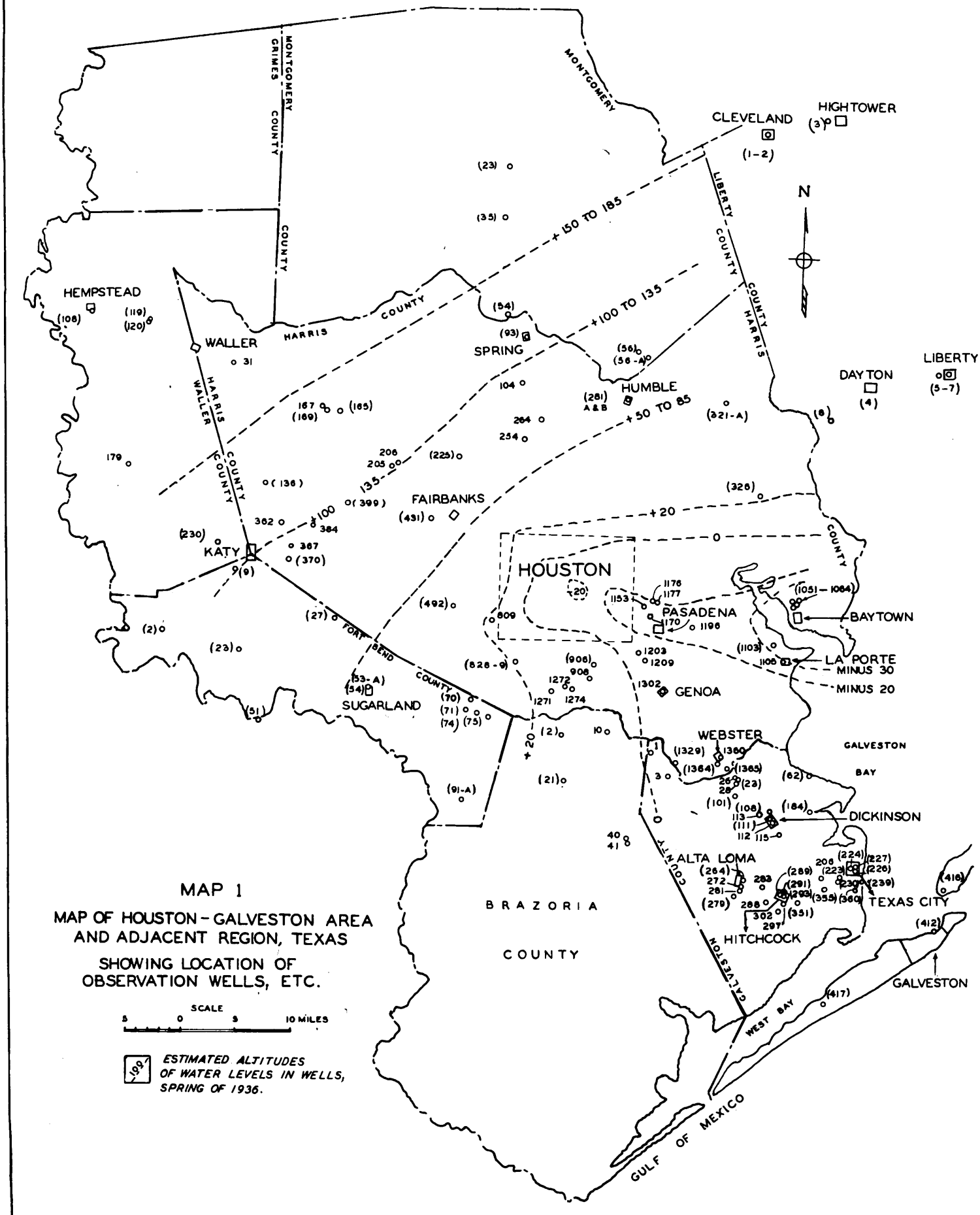
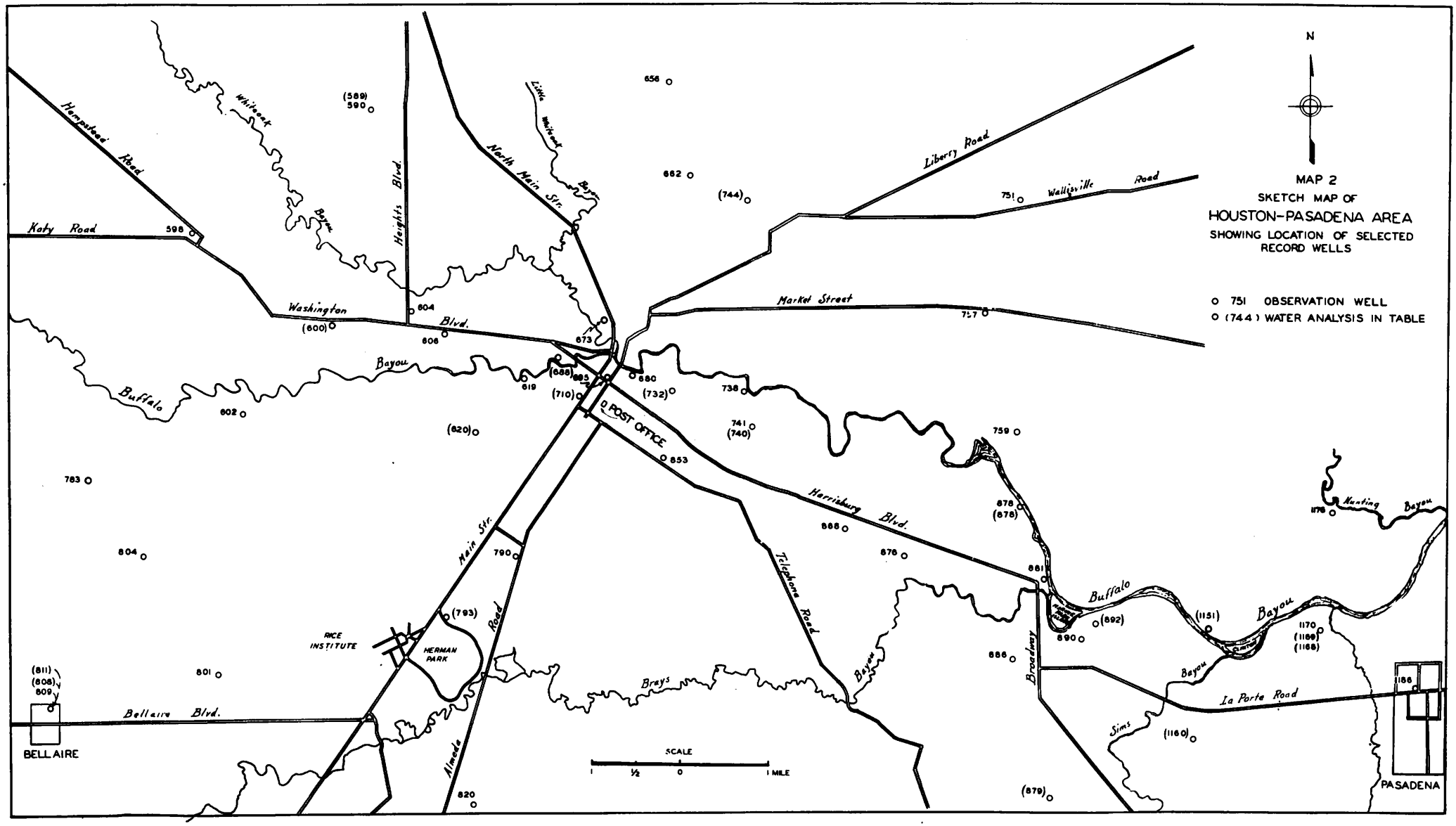
60
WELL 1176 TEXAS CO. REFINERY (800 FEET DEEP)
WATER LEVELS IN MAY
21
FLUCTUATIONS OF WATER LEVELS IN WELLS IN HOUSTON-PASADENA AREA
1931
1932
1933
1934
1935
1936
May 19
1937
64.27



MAP 1

MAP OF HOUSTON - GALVESTON AREA AND ADJACENT REGION, TEXAS

SHOWING LOCATION OF OBSERVATION WELLS, ETC.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MAP 2
SKETCH MAP OF
HOUSTON-PASADENA AREA
SHOWING LOCATION OF SELECTED RECORD WELLS
o 751 OBSERVATION WELL
o (744) WATER ANALYSIS IN TABLE
Hempstead Road
Katy Road
Washington Blvd.
Whiteoak Bayou
Heights Blvd.
North Main Str.
Little Whiteoak Bayou
Liberty Road
Wallisville Road
Market Street
Buffalo Bayou
POST OFFICE
Harrisburg Blvd.
Main Str.
Telephone Road
Almeda Road
Broadway
Brays Bayou
Hunting Bayou
La Porte Road
Sims Bayou
Bellaire Blvd.
RICE INSTITUTE
HERMAN PARK
BELLAIRE
PASADENA
SCALE
1 ½ 0 1 MILE

TEXAS STATE BOARD OF WATER ENGINEERS

Prepared in cooperation with the Geological Survey,
United States Department of the Interior

PROGRESS REPORT ON THE GROUND-WATER RESOURCES OF THE HOUSTON DISTRICT, TEXAS

By

Walter N. White

July 1, 1938

PROGRESS REPORT ON THE GROUND-WATER RESOURCES OF THE HOUSTON DISTRICT, TEXAS

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Walter N. White
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Prepared in cooperation between the Texas Board of Water Engineers and the Geological Survey of the U. S. Department of the Interior.

Introduction

An investigation of the supply of underground water, or ground water, available for Houston and the region surrounding it has been in progress for several years, as part of a survey of the ground-water resources of Texas by the Texas Board of Water Engineers in cooperation with the Geological Survey of the U. S. Department of the Interior.

The investigation has covered Harris, Galveston and Waller Counties, a large part of Montgomery, Fort Bend and Brazoria Counties, and a small part of Liberty and Grimes Counties. This is the fourth of a series of progress reports, the other three being dated October 17, 1932, December 29, 1933, and March 1, 1937. This report is devoted principally to a discussion of the decline in water levels in wells which has occurred in the Houston-Pasadena area since March 1, 1937.

Fluctuations in artesian pressure. Decline of water levels in wells since March 1, 1937.

Prior to 1937 the artesian pressures in the Houston-Pasadena area had reached a stage of comparative equilibrium, or displayed a very small annual decline. About March 1, 1937 a paper pulp mill was started near Pasadena which required an average supply of well water amounting to about 19,000,000 gallons a day. This represented an increase of almost 40 per cent over the average daily draft by all the wells of the Houston-Pasadena area in 1935 and 1936. Following this sudden heavy increase in pumping a pronounced decline in artesian pressures and lowering of water levels in wells was to be expected not only in the vicinity of Pasadena but even in localities many miles from the new wells. The following is copied from page 24 of the progress report of March 1, 1937, which was submitted to the city authorities early in March, 1937:

> When additional pumping at the rate of 20,000,000 gallons a day is started, a deep cone of depression will quickly be developed in the immediate vicinity of the wells, all of which are located within an area of about one square mile. In one area of similar size in this region, the increase in the average daily pumping from about 10,300,000 gallons a day to about 14,200,000 gallons a day caused the average static water level in the area to decline from about 46 feet below sea level in the spring of 1932 to about 68 feet below sea level in the spring of 1936, or a net decline of about 5.6 feet for each million gallons a day increase. In the Pasadena district the fresh water sands are materially thicker than in the area referred to and, if the permeability of the sands is about the same, the rate of decline is likely to be materially less. Nevertheless, with an increase in pumping of 20,000,000 gallons a day at Pasadena, it appears probable that locally the present cone of artesian depression will be deepened to considerably more than 100 feet below sea level. This new cone of depression will expand to adjacent areas. The amount of lowering in

any given direction from the new wells will decrease with the distance from them, but as the area affected expands the rate of decline will decrease and the progress of the regional drawdown can be watched. A pronounced drop in head is to be expected during the spring of 1937 in all wells in the vicinity of Pasadena and probably, also, in the wells of southeastern Houston. Before the end of the summer of 1937 a material decline in artesian head may occur in central and west central Houston eight to ten miles from the new project and necessitate the lowering of pumps in wells in which the water level during pumping is close to the suction limit of the pumps. With proper observation, however, it should be possible to anticipate pronounced regional drawdown at these distances.

The decline in artesian pressures in the area have occurred about as was expected when the report was written. The approximate amount of this decline to May 1938, as recorded in 24 observation wells in the Houston-Galveston area, is given in the table on the next page; the depth of the wells and their distance in an air line from the new development is also shown. The accompanying blueprints show graphically the fluctuations that occurred from 1931 to March, 1937.

The records of a few measurements of depths to water in five of the City wells before and after the increase in pumping near Pasadena are given below.

Central Well F-11

July 15, 1936,	87.0 feet	10 minutes after pump was shut down
Nov. 19, 1937,	72.0 "	30 " " " " " "
Jan. 8, 1938,	72.0 "	10 " " " " " "
Apr. 22, 1938,	77.87 "	1 hour " " " " "

Central Well F-12

Sept.11, 1935,	55.0 feet	1 day after pump was shut down
July 22, 1936,	79.0 "	5 minutes " " " " " "
Jan. 26, 1938,	53.7 "	2 " " " " " "
Jan. 26, 1938,	66.0 "	10 " " " " " "

Heights Well No. 5

Apr. 9, 1938,	58.0 feet	10 minutes after pump was shut down

Heights Well No. 6

Oct. 7, 1936,	79.2 feet	1 minute after pump was shut down
Apr. 14, 1938,	78.95 "	16 hours " " " " "

South End Well No. 6

July 24, 1936,	97.0 feet	20 minutes after pump was shut down
Apr. 14, 1938,	95.98 "	1 hour " " " " "

The following information relates to a few privately owned industrial wells that are not included in the list of observation wells in the table. According to report of Mr. G. L. Hess, Resident Engineer for the Sinclair Refining Company, well 6 at the refinery near Pasadena showed a decline in level of about 25 feet between February 1937 and February 1938. According to records obtained through L. H. Kendall, Chief Engineer, the water levels

Decline of water levels in Houston wells
January and February 1937 to March 1, 1938

Well	Depth (feet)	Distance from Pasadena paper pulp mill (miles)	Decline Jan. - Mar. to Oct.1937 (feet)	Rise from Oct. 1937 to Mar. 1938	Net decline Jan. - Mar. 1937 to Mar. 1, 1938	Decline or rise May 1937 to May 1938
1170	836	5/8 NW	43	8	35	--
1176	800 +	1¾ NNW	44	9	35	+ 4.9
890	1,284	3½	29	6	23	--
881	650 +	4 WNW	20	5	15	- 7.4
886	540	4 W	9	4	5	--
878	905	4⅛ NW	25?	?	?	-10.2
759	396	4¾ NW	19	2	17	- 9.3
876	?	5½ WNW	--	--	6 1/	- 3.6
757	676	6 NW	14	1.5	13	- 9.4
868	697	6¼ WNW	6	5	1 2/	+ 1.0
751	540	6⅝ NW	14	1	13	- 7.4
738	417	7⅜ NW	3	0	3	- 2.5
853	650	8¼ WNW	11	7	4	- 2.6
680	1,350 +	9 NW	18	4	14	+ 2.0
662	834	9⅛ NW	14	0.5	14	- 8.7
790	606	9⅝ W	3	4	+ 1	- 7.7
619	900	10 NW	8	5	3	- 5.1
656	665	10½ NW	--	--	11	--
606	575	11 NW	8	3	5	- 6.5
604	--	11½ NW	7	6	1	- 0.1
590	--	13	--	--	--	--
602	1,038	13 W	10	--	--	--
804	650 +	14 W	7	1 +	--	--
809	1,100 +	15 W	7	1	6	--
898	900		7		6	-9.0

1/ June 1937 to March 1, 1938

2/ Net decline in nearby well 1,200 to 1,300 feet deep reported about 30 feet in two years ending in fall of 1937. This doubtless is partly due to large increase in local pumpage.

in wells at the Shell refinery four or five miles east of Pasadena had a net decline from March, 1937 to March, 1938, ranging in different wells from 11 to 18 feet. A well 1,200 to 1,300 feet deep, at the Hughes Tool Company about six miles northwest of Pasadena, according to Mr. Goddard, Superintending Engineer, has had a decline in head of about 30 feet during the past two years. This well is within a few hundred feet of observation well No. 868, which is 697 feet deep and had a net decline of only about five feet during the last two years. The deeper well is one of two heavily pumped, closely spaced wells that supplied an average of about 1,500,000 gallons a day in 1936 and 1937, or about 1,000,000 gallons a day more than was pumped from them in 1935.

Most of the wells which were used in the regular observation program and which are listed in the table range from about 600 to about 900 feet in depth. Two of them, Nos. 680 and 890, are about 1,300 feet deep and two, Nos. 602 and 809, are about 1,100 feet deep. This observation-well set-up is obviously not wholly satisfactory for recording fluctuations in artesian pressures in all the water-bearing horizons. In this area the shallow sands from about 200 to about 400 feet are fairly well shut off from the sands at 600 to 1,100 feet and the latter in turn are shut off from the sands at 1,300 to 1,700 feet. The isolation apparently is not complete, but is sufficient to cause a lag varying from weeks to years in the transmission of declines in artesian pressure from one horizon to another. This has been known for several years and urgent recommendations have been made that additional wells, which now are tightly closed and inaccessible, should be opened up for measurement -- especially wells that tap the deeper sands. This, however, has not yet been done.

The attached map shows the location of the regular observation wells, the depth of the wells, all city pumping stations, and the pumping stations of the Champion Paper and Fiber Company.

A study of all the records given above leads to the conclusion that the decline in head, although serious, still has not reached major proportions at any considerable distance from the paper pulp mill. It is noted that the greatest decline seems to be toward the northwest, almost directly up the dip. The decline in downtown Houston between March 1937 and March 1938 ranged from three feet in well 619 to 14 feet in well 680. The records of water levels in the city wells at the Central, Heights, and South End stations are difficult to interpret because of the varying lengths of time the pumps were shut down before the measurements were taken. Apparently, wells Central F-11, Heights No. 6 and South End No. 6 have suffered loss in artesian head since 1936, but the decline has not been very large. Several of the regular observation wells showed a substantial rise during the winter and the water levels in three of them were higher in May 1938 than they were in May 1937. However, the records indicate clearly that the new pumping at Pasadena has caused a substantial lowering. A further decline in water levels is to be expected in the coming year and should be carefully watched.

Pumpage: present and proposed

The estimated daily pumpage in the Houston area and adjacent regions in 1937 is given below:

Estimated average daily pumpage in 1937
in Houston district and adjacent region
(Houston-Pasadena-Texas City-Galveston-Katy areas)

	Million gallons	
Houston Water Department	25.2	(City records)
Champion Paper and Fiber Co. (starting March 1)	19.0	
Miscellaneous Pumpage Houston-Pasadena and area along ship-channel Pasadena to La Porte	26.0	
Total	70.2	
Baytown	13.5	(Humble Oil & Refining Co. records)
Texas City, Alta Loma and Galveston City supply	15.0	
Miscellaneous pumpage Houston to Galveston	5.0	
Katy Rice area	16.0	
Grand Total	119.7	

As indicated by the table, the total pumpage in the Houston-Pasadena-Ship Channel area is estimated as about 70,000,000 gallons a day and the grand total for the region as about 120,000,000 gallons a day. With the exception of the draft by the wells of the paper pulp mill, the pumping in the Houston-Pasadena-Ship Channel area in 1937 probably was not much greater than that in 1930, the increase perhaps being of the order of 2,000,000 to 4,000,000 gallons a day. Since 1930 many new industries have been established in the area and Houston has had a substantial increase in population. However, most industries use a comparatively small amount of water and the increase in population apparently has not been followed by a comparable increase in the public demands for water.

Under normal conditions of growth in population and industry the available supply of ground water within comparatively easy reach of Houston should supply the needs of the Houston-Pasadena-Ship Channel district for many years. However, it appears that plans are to be made immediately looking toward a supply for the area averaging around 170,000,000 gallons a day or almost two and one-half times the present pumpage. This quantity, plus the amount now pumped in the Baytown, Galveston, Texas City, and Katy areas would make a grand total of 220,000,000 gallons a day.

Conclusions

So far as is known, withdrawals of ground water in quantities approximating 200,000,000 gallons a day have not been attempted anywhere in the world under conditions of ground-water occurrence comparable to those which exist in the Houston region. About 150,000,000 gallons a day is pumped from wells for the public supply of the City of Berlin in Germany and an approximately equal amount is pumped from wells on Long Island by the City of New York and by other communities and industrial establishments. However, both

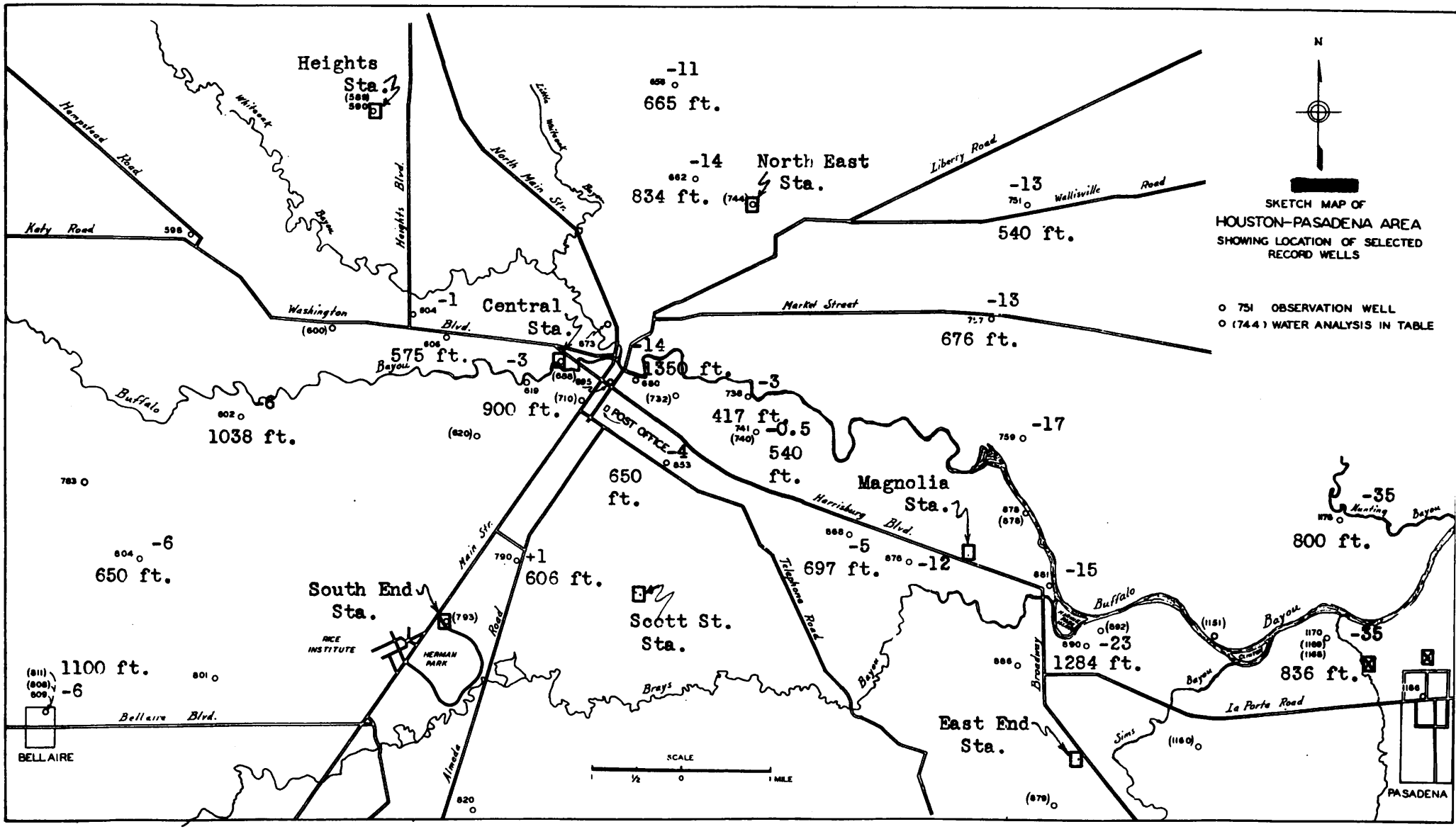
in the Berlin area and on Long Island the water is obtained from gravels and sand in glacial deposits which are subject to heavy replenishments by local rainfall. The water-bearing sands of the Houston region are buried beneath impermeable clays and probably are replenished only at their outcrops, located mostly in areas many miles from the well fields. In the case of the deeper wells at Houston the areas of intake may be 50 miles or more distant. Under these conditions the available supply is largely, if not entirely, determined by the capacity of the sands to transmit water from the outcrops to the wells. The carrying capacity of the sands varies directly with the hydraulic gradient and this is increased when depressions in artesian pressure are created by heavy pumping. However, in this region possibilities of such increase are limited by the fact that if the well fields are pumped too hard and the artesian pressures lowered too far below sea level, salt water will be drawn into the fresh water-bearing sands from areas down dip in the direction of the Gulf.

Under these circumstances it is probable that the ground-water reservoirs would not sustain the additional draft. If additional supplies are developed from surface sources, it seems almost certain that the ground-water resources of the Houston-Pasadena area will still need to be fully utilized.

Recommendations

The need of closely watching the ground-water situation at Houston is as great now as it ever was -- perhaps greater. A program commensurate with the importance of the problem would include the following:

Inventories of industrial pumpage in the Houston-Pasadena-Ship Channel area would be continued and made more accurate than it has heretofore been possible to make them with the limited funds available. More observation wells would be added to the present list -- especially deep wells -- and observations would be made monthly throughout the territory as well as within the Houston-Pasadena area itself. Some of the observation wells would be equipped with automatic water stage recorders. Samples of water would be frequently collected and analyzed from selected deep wells throughout Harris County. The ground-water studies would be extended to adjacent areas in Liberty, Fort Bend and Brazoria Counties, which thus far have not been fully covered.



-14 = Net decline of water levels in wells in feet, from January-March 1937 to March 1938.
650 ft. = Depth of well. ☐ City pumping stations. ☒ Paper mill pumping stations.

TEXAS STATE BOARD OF WATER ENGINEERS

Prepared in cooperation with the Geological Survey,
United States Department of the Interior

PROGRESS REPORT ON THE GROUND-WATER RESOURCES OF THE HOUSTON DISTRICT, TEXAS

By

Walter N. White

March 1, 1939

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March 1, 1939

Decline of water levels in wells in the Houston area, in 1937 and 1938

In the pages immediately following, (pages 4 to 12), the record of water level fluctuations in observation wells in and around Houston, given on pages 33 to 54 of the progress report of March 1, 1937, have been brought down to date, and hydrographs which were submitted at the end of that report showing fluctuations in a part of the wells from 1931 to May 1937 have been extended to the end of 1938. The net changes in water level in 21 representative wells during 1937 and 1938 are given in the table on the next page. (The locations of these wells are shown on the sketch map at the end of the March 1, 1937 report.)

All of these wells show a sharp net decline in water levels during the two-year period. One of the observation wells near the center of heavy pumping in the vicinity of Pasadena had a net decline in water level of about 35 feet and another a net decline of about 37 feet. In the five observation wells in east-central and southeastern Houston, the decline during the two years ranged from 7.57 feet to 28.58 feet and averaged 17.26 feet. The five observation wells in northeastern Houston displayed a net decline ranging from 16.30 feet to 26.60 feet and averaging 20.86 feet. In one well, (No. 264), located about 15 miles north of the Houston Post Office and four miles north of Aldine, the net drop amounted to 14.57 feet. The three observation wells in western Houston had a net decline ranging from 8.05 feet to 12.57 feet and averaging 11.12 feet, and the four in southwestern Houston a net decline ranging from 7.43 feet to 9.94 feet and averaging 8.87 feet.

Decline or rise in water levels in Houston and Pasadena wells, Texas-
early winter measurements
(All measurements except those noted were made in December)

Well No.	Depth (feet)	1936-37	Decline (-) or Rise (+) in feet 1937-38	1936-38
		Western Houston		
602	1038	- 4.44	- 3.61	- 8.05
606	575	- 0.02	-12.73	-12.75
619	900	+ 1.40	-13.97	-12.57
Average	837	- 1.02	-10.10	-11.12

Decline or rise in water levels in Houston and Pasadena wells, Texas - early winter measurements - continued
(All measurements except those noted were made in December)

Well No.	Depth (feet)	1936-38 Decline (-) or Rise (+) in feet 1936-37	1937-38	1936-38
		Southwestern Houston		
783	350±	- 2.32	- 5.11	- 7.43
790	606	+ 2.58	-11.34	- 8.76
804	650±	- 3.10	- 6.13	- 9.23
809	1100±	- 4.51	- 5.38	- 9.94
Average	846	- 1.85	- 6.99	- 8.84
		Northern and northeastern Houston		
656	665	--	--	-18.36 1/
751	540	-11.67	- 7.65	-19.32
757	676	-13.35	- 7.88	-21.23 2/
759	759	-16.85	- 9.75	-26.60 3/
662	834	- 7.35	- 8.95	-16.30
Average	695	-12.30	- 8.56	-20.86
		East-central and southeastern Houston		
680	1350±	-13.89	+ 0.88	-13.01
853	650	- 5.13	- 7.61	-12.74
878	905	-23.29	- 5.29	-28.58
881	650 ±	-16.70	- 7.69	-24.39
886	540	- 6.64	- 0.93	- 7.57 4/
898a	900	--	- 5.37	--
Average	685	13.13	- 4.63	-17.26
		Pasadena area		
1170	836	-41.65	+ 4.5	-37.15 5/
1176	800±	-43.28	+ 8.72	-34.56
Average	818	-42.46	+ 6.60	-35.86

1/ 1938 measurements made in November; 2/ 1936 measurements made in November; 3/ 1938 measurements made in November; 4/ 1936 and 1937 measurements made in November. 5/ 1936 measurements made in November.

Decline in water level in Well 264
15 miles north of Houston Post Office and
20 miles northwest of Pasadena - November 1936 to November 1938

264	1610 6/	-12.48	- 2.09	-14.57

6/ Water is reported to come from sand at depth of 950 feet.

(For location of wells see sketch map at the end of the progress report of March 1, 1937.)

The decline in these wells was largely due to the effect of new pumping amounting to around 19,000,000 gallons a day, which was started near Pasadena in the spring and early summer of 1937. This represented an increase of almost 40 per cent over the average daily draft by all the wells of the Houston-Pasadena area in 1935 and 1936. The following conclusions

were stated at the bottom of page 25 of the Progress Report of March 1, 1937:

> "No large increase in pumping over the volume of water pumped in 1936 should be made within the city limits or along the ship channel between the city limits and Baytown. Any large increase in ground-water withdrawals in or near the existing deep depressions in artesian pressure in down-town Houston and in the east Houston-Pasadena district would be especially undesirable. New wells involving heavy withdrawals of ground water should be located at distances of several miles from these depressions."

The water level record in the wells of the Houston-Pasadena area during 1937 and 1938 confirm the above statement. The new pumping has produced a further heavy decline in the artesian pressures near Pasadena. This depression has spread to Houston and is moving out to increasingly greater distances from the center of pumping.

Present ground-water investigation

In the fall of 1938 the sum of $5,000 was allocated by the City of Houston for continuing the cooperative ground-water investigation in the Houston-Pasadena area and surrounding territory, and this sum was matched with an equal amount of Federal funds. Following these allocations, Mr. C. R. Follett, Jr. Engineer, and Mr. Nicholas Rose, Assistant Geologist, were assigned full time to the territory and plans were formulated for making the investigation more complete and more extensive than ever before. Since the beginning of the new work, the observation wells in and around Houston have been nearly doubled in number and include the City-owned wells which are now measured for static levels once a month, and some of the observation wells have been equipped with automatic water stage recorders. The investigation has been extended to areas outside of Houston which heretofore had not been given detailed study. Quality of water studies are being made to determine whether, as the artesian pressures decline, changes in the mineral content of the water, especially the chloride, are occurring anywhere in the territory. Drillers' logs and electrical logs of water wells and oil tests have been collected and compiled to obtain information to guide a program of exploratory drilling which will be started about April 1, 1939.

Water level fluctuations in observation wells in the Houston area, Texas
(Descriptions of these wells and previous water level measurements are given in the Progress Report of March 1, 1937.)

Well 205

Humble Pipe Line Co. Depth, 700 feet.

Date	Depth to water (feet)
1937 - Aug. 14 -	32.52
Nov. 9 -	-- a/
1938 - Feb. 2 -	62.01 a/
Feb. 3 -	32.85
May 11 -	29.30
Oct. 24 -	34.84
Nov. 22 -	35.16
Dec. 22 -	-- a/
1939 - Jan. 25 -	32.96

Well 206

R. B. Tucker. Depth, 450± feet.

Date	Depth to water (feet)
1937 - Aug. 14 -	31.00
Nov. 9 -	28.72
1938 - Feb. 2 -	26.90 a/
May 11 -	26.33 a/
Oct. 24 -	28.94
Nov. 22 -	29.30 b/
Dec. 22 -	29.45
1939 - Jan. 25 -	27.36

Well 256

J. M. Blake. Depth, 189 feet.

Date	Depth to water (feet)
1937 - Nov. 10 -	31.08
1938 - Feb. 6 -	31.95
May 12 -	30.96
Oct. 26 -	33.13
Nov. 18 -	33.50
Dec. 17 -	33.82
1939 - Jan. 26 -	33.81

Well 264

Weary farm. Depth, 1,610 feet.

Date	Depth to water (feet)
1937 - Nov. 10 -	34.54
1938 - Feb. 6 -	34.77
May 12 -	34.21
Oct. 26 -	36.33
Nov. 18 -	36.63
Dec. 17 -	37.03

a/ Pump running. b/ Pump running in nearby well.

Water level fluctuations in observation wells in the Houston area - Continued

Well 602

Date	Depth to water (feet)
River Oaks Country Club. Depth, 1033 feet.	
1937 - June 21 -	51.02
July 19 -	51.63
Aug. 20 -	55.49
Oct. 26 -	55.72
Nov. 19 -	54.80
Dec. 17 -	53.25
1938 - Jan. 20 -	53.30
Mar. 1 -	-- a/
Mar. 24 -	54.15
Apr. 28 -	-- a/
May 21 -	-- a/
June 20 -	58.08
July 20 -	--
Aug. 25 -	61.54
Sept.23 -	66.98
Oct. 20 -	62.50
Nov. 22 -	61.57
Dec. 21 -	56.86
1939 - Jan. 20 -	59.22
Feb. 20 -	59.13

Well 604

Date	Depth to water (feet)
West End Ice Co. Depth, --.	
1937 - June 21 -	69.83
July 22 -	70.09
Aug. 20 -	71.00
Sept.23 -	70.97
Oct. 26 -	70.02
Nov. 18 -	69.90
Dec. 17 -	67.24
1938 - Jan. 20 -	64.22
Mar. 1 -	63.99
Mar. 23 -	65.85
Apr. 22 -	66.67
May 21 -	67.75
June 20 -	70.32
June 23 -	69.30
July 20 -	70.32
Aug. 25 -	70.12
Sept.22 -	68.15
Oct. 21 -	68.84
Nov. 21 -	67.18

Well 604-cont'd

Date	Depth to water (feet)
1938 - Dec. 20 -	66.70
1939 - Jan. 20 -	63.96
Feb. 20 -	62.97

Well 606

Date	Depth to water (feet)
Henke and Pillot. Depth, 575 feet.	
1937 - June 21 -	69.41
July 22 -	72.34
Aug. 20 -	72.33
Sept.23 -	75.05
Oct. 26 -	69.90
Nov. 18 -	69.73
Dec. 17 -	65.25
1938 - Jan. 20 -	67.40
Mar. 1 -	66.98
Mar. 23 -	67.42
Apr. 22 -	72.62
May 20 -	75.10
June 20 -	76.13
July 20 -	79.90
Aug. 25 -	81.09 b/
Sept.22 -	82.88 b/
Oct. 21 -	84.13 b/
Nov. 21 -	78.61 b/
Dec. 20 -	77.98
1939 - Jan. 13 -	75.34
Jan. 14 -	75.73
Feb. 20 -	74.65

Well 619

Date	Depth to water (feet)
City of Houston. (Lincoln Swimming Pool.) Depth, 900 feet.	
1937 - June 21 -	68.98 b/
July 22 -	74.89 b/
Aug. 20 -	73.33 b/
Sept.23 -	77.89 b/
Oct. 26 -	69.69 b/
Nov. 19 -	69.10
Dec. 17 -	63.47
1938 - Jan. 20 -	65.54
Mar. 1 -	64.15

Well 619-cont'd

Date	Depth to water (feet)
1938 - Mar. 23 -	68.44 b/
Apr. 28 -	70.75
May 21 -	73.86
June 23 -	80.24
July 20 -	82.82 b/
Aug. 25 -	85.60 b/
Sept.23 -	85.98
Oct. 21 -	86.62
Nov. 21 -	79.43
Dec. 20 -	77.44
1939 - Jan. 20 -	72.86
Feb. 20 -	77.52

Well 656

Date	Depth to water (feet)
Texas Creosoting Co. Depth, 665 feet.	
1937 - June 21 -	-- a/
June 22 -	70.04
July 20 -	57.13
Aug. 20 -	-- a/
Sept.23 -	-- a/
Oct. 26 -	-- a/
Nov. 18 -	-- a/
Dec. 17 -	-- a/
1938 - Jan. 19 -	75.27
Mar. 1 -	73.50
Mar. 23 -	-- a/
Apr. 22 -	74.35
May 21 -	-- a/
June 23 -	-- a/
July 20 -	79.60
Aug. 25 -	83.19
Sept.22 -	83.22
Oct. 21 -	83.79
Nov. 21 -	83.75
Dec. 20 -	-- a/
1939 - Jan. 14 -	80.47
Jan. 20 -	80.65
Feb. 20 -	-- a/
Feb. 27 -	79.63

a/ Pump running. b/ Pump running in nearby well.

Water level fluctuations in observation wells in the Houston area -- Continued

Well 662

Date	Depth to water (feet)
South Texas Cotton Oil Co. Depth, 834 feet.	
1937 - June 22 -	69.18
July 20 -	70.62
Aug. 20 -	-- a/
Sept.23 -	75.10
Oct. 26 -	74.86
Nov. 18 -	74.60
Dec. 17 -	72.70
1938 - Jan. 19 -	--
Mar. 1 -	72.53
Mar. 23 -	-- a/
Mar. 30 -	74.44
Apr. 22 -	75.50
May 21 -	74.55
June 23 -	79.45
July 20 -	80.70
Aug. 25 -	-- a/
Sept.22 -	-- a/
Oct. 21 -	87.10
Nov. 21 -	87.76
Dec. 20 -	81.65
1939 - Jan. 20 -	79.74
Feb. 20 -	-- a/

Well 673

Date	Depth to water (feet)
M. K. & T. Railway Co. Depth, 1,638 feet.	
1937 - June 21 -	57.87
July 22 -	52.13
Aug. 20 -	54.82
Sept.22 -	53.37
Oct. 26 -	53.33
Nov. 18 -	57.23
Dec. 17 -	51.54
1938 - Jan. 20 -	48.25
Mar. 1 -	47.77
Mar. 24 -	48.40
Apr. 22 -	49.09
May 23 -	50.00
June 23 -	50.55
July 20 -	50.16
Aug. 25 -	55.12
Sept.23 -	53.52
Oct. 21 -	53.94
Nov. 21 -	51.85
Dec. 20 -	48.70

Well 673-cont'd

Date	Depth to water (feet)
1939 - Jan. 20 -	47.20
Feb. 20 -	45.17

Well 680

Date	Depth to water (feet)
Houston Electric Co. Depth, 1,350 feet.	
1937 - June 21 -	65.25
July 20 -	65.35
Aug. 19 -	68.45
Sept.22 -	68.94
Oct. 25 -	66.38
Nov. 18 -	64.99
Dec. 15 -	66.40
1938 - Jan. 19 -	61.77
Mar. 1 -	62.18
Apr. 22 -	63.35
May 20 -	61.52
June 23 -	67.17
July 21 -	74.08
Aug. 25 -	68.51
Sept.22 -	69.55
Oct. 20 -	71.55
Nov. 21 -	66.86
Dec. 20 -	65.52
1939 - Jan. 20 -	63.50
Feb. 20 -	60.31

Well 695

Date	Depth to water (feet)
Harris County Court House. Depth, ___.	
1937 - June 21 -	54.08
July 20 -	54.96
Aug. 19 -	55.47
Sept.22 -	55.80
Oct. 25 -	55.74
Nov. 18 -	55.62
Dec. 15 -	54.90
1938 - Jan. 19 -	53.73
Mar. 1 -	53.17
Mar. 24 -	54.23
Apr. 22 -	54.57
May 20 -	49.82
June 23 -	51.90
July 21 -	52.47
Aug. 25 -	52.76

Well 695-cont'd

Date	Depth to water (feet)
1938 - Sept.22 -	53.49
Oct. 20 -	55.54
Nov. 21 -	55.93
Dec. 20 -	56.09
1939 - Jan. 20 -	55.92
Feb. 20 -	55.90

Well 738

Date	Depth to water (feet)
Houston Packing Co. Depth, 417 feet.	
1937 - June 21 -	65.12
July 20 -	65.58 b/
Aug. 20 -	66.05 b/
Sept.22 -	66.64 b/
Oct. 25 -	67.05
Nov. 18 -	67.29
Dec. 15 -	67.40
1938 - Jan. 19 -	67.39 b/
Mar. 1 -	67.39
Mar. 24 -	67.35
Apr. 22 -	67.30
May 20 -	67.30 b/
June 23 -	67.36
July 21 -	67.48 b/
Aug. 25 -	67.54 b/
Sept.22 -	67.65 b/
Oct. 20 -	67.76 b/
Nov. 20 -	67.82 b/
Dec. 20 -	67.79 b/
1939 - Jan. 20 -	67.82 b/
Feb. 20 -	67.77 b/

Well 741

Date	Depth to water (feet)
Houston Electric Co. Depth, 540 feet.	
1937 - June 21 -	56.37
July 20 -	56.47
Aug. 20 -	56.49
Sept.22 -	56.54
Oct. 25 -	56.57
Nov. 18 -	56.53
Dec. 15 -	56.58
1938 - Jan. 19 -	56.57
Mar. 1 -	56.58

(Continued on next page)

a/ Pump running. b/ Pump running in nearby well.

Water level fluctuations in observation wells in the Houston area -- Continued

Well 741-cont'd

Date	Depth to water (feet)
1938 - Mar. 24 -	56.62
Apr. 22 -	56.57
May 20 -	56.58
June 26 -	56.66
July 21 -	56.69
Aug. 25 -	56.72
Sept.22 -	56.70
Oct. 20 -	56.78
Nov. 21 -	56.80
Dec. 20 -	56.81
1939 - Jan. 20 -	56.81
Feb. 20 -	56.78

Well 751

Texas Pipe Line Co. Depth, 540 feet.

1937 - June 21 -	64.27
July 20 -	67.52
Aug. 20 -	67.21
Sept.22 -	69.13
Oct. 26 -	70.00
Nov. 18 -	69.65
Dec. 17 -	69.83
1938 - Jan. 19 -	71.48
Mar. 1 -	69.20
Mar. 23 -	68.90
Apr. 22 -	69.65
May 21 -	70.18
June 23 -	71.25
July 20 -	73.60
Aug. 25 -	77.52
Sept.22 -	81.82
Oct. 21 -	80.10
Nov. 21 -	79.35
Dec. 20 -	77.48
1939 - Jan. 20 -	75.57
Feb. 20 -	75.52

Well 757

Layne-Texas Co. Depth, 676 feet.

1937 - June 21 -	67.87
July 20 -	-- a/
Aug. 4 -	71.74
Aug. 20 -	72.91

Well 757-cont'd

Date	Depth to water (feet)
1937 - Sept.22 -	75.18
Oct. 26 -	75.92
Nov. 18 -	--
Dec. 17 -	75.17
1938 - Jan. 19 -	75.83
Mar. 1 -	74.40
Mar. 23 -	-- a/
Mar. 30 -	74.26
Apr. 22 -	74.86
May 21 -	75.42
June 20 -	83.35
July 20 -	83.35
Aug. 25 -	84.29
Oct. 21 -	-- a/
Nov. 21 -	85.43
Dec. 20 -	83.05
1939 - Jan. 20 -	80.83
Feb. 20 -	-- a/

Well 759

Port City Compress. Depth, 396 feet.

1937 - June 21 -	71.08
Sept.22 -	81.20
Oct. 26 -	81.70
Nov. 18 -	80.60
Dec. 15 -	80.64
1938 - Jan. 19 -	82.17
Mar. 1 -	80.19
Mar. 23 -	79.69
Apr. 22 -	79.83
May 21 -	80.93
June 23 -	83.04
July 20 -	85.28
Aug. 25 -	88.45
Oct. 21 -	91.16
Nov. 21 -	90.39
Dec. 20 -	-- a/
1939 - Jan. 20 -	86.32
Feb. 20 -	85.68

Well 783

Houston Riding & Polo Club. Depth, 350± feet.

1937 - June 21 -	42.75

Well 783-cont'd

Date	Depth to water (feet)
1937 - July 19 -	41.63
Aug. 20 -	42.69
Sept.24 -	44.27 b/
Oct. 26 -	43.45
Nov. 19 -	43.35
Dec. 17 -	43.12 b/
1938 - Jan. 20 -	42.25
Mar. 1 -	42.08
Mar. 24 -	42.25
May 21 -	43.73
June 24 -	45.80
July 20 -	46.60
Aug. 25 -	47.65
Sept.23 -	48.45
Oct. 20 -	48.90
Nov. 22 -	48.53
Dec. 21 -	48.22
1939 - Jan. 20 -	47.69 b/
Feb. 20 -	47.25

Well 790

Southern United Ice Co. Depth, 606 feet.

1937 - June 21 -	60.37
July 19 -	64.64
Aug. 20 -	65.13
Sept.23 -	65.84
Oct. 26 -	62.40
Nov. 19 -	61.70
Dec. 17 -	58.77
1938 - Jan. 20 -	58.17
Mar. 1 -	57.84
Mar. 24 -	58.92
Apr. 23 -	64.22
May 21 -	68.92
June 23 -	68.92
July 20 -	72.88
Aug. 25 -	74.18
Sept.23 -	74.69
Oct. 21 -	73.79
Nov. 22 -	72.07
Dec. 21 -	70.11
1939 - Jan. 20 -	69.18
Feb. 20 -	68.18

a/ Pump running. b/ Pump running in near'y well.

Water level fluctuations in observation wells in the Houston area -- Continued

Well 804

West University Place. Depth 650± feet.

Date	Depth to water (feet)
1937 - June 21 -	48.15
July 19 -	48.08
Aug. 20 -	48.88
Sept.24 -	51.52 b/
Oct. 26 -	50.10 b/
Nov. 19 -	50.35 b/
Dec. 17 -	49.26 b/
1938 - Jan. 20 -	49.02
Dec. 13 -	56.35
Dec. 21 -	56.17 b/
1939 - Jan. 20 -	55.39
Feb. 20 -	55.23 b/

Well 809

Gem Electric & Ice Co. Depth, 1,100± feet.

Date	Depth to water (feet)
1937 - June 21 -	47.43
July 19 -	49.95
Aug. 20 -	51.78
Sept.24 -	51.17
Oct. 26 -	53.42
Nov. 19 -	53.58
Dec. 17 -	52.50
1938 - Jan. 20 -	52.21
Mar. 1 -	52.28
Mar. 24 -	52.59
Apr. 23 -	52.88
May 21 -	52.78
June 24 -	54.02
July 20 -	55.64
Aug. 25 -	56.65
Sept.23 -	61.79
Oct. 20 -	58.40
Nov. 22 -	58.31
Dec. 21 -	57.88
1939 - Jan. 20 -	57.05
Feb. 20 -	56.09

Well 820

Institute Place. Depth, 310 feet.

Date	Depth to water (feet)
1937 - June 21 -	30.73
July 19 -	30.87
Sept.23 -	31.16
Oct. 26 -	30.12
Nov. 19 -	31.00
1938 - Jan. 20 -	30.91
Mar. 1 -	30.84
Mar. 24 -	31.19
July 20 -	32.81
Aug. 25 -	33.24
Sept.23 -	33.74
Oct. 20 -	34.25
Nov. 22 -	34.67
Dec. 21 -	34.86

Well 853

Port City Ice Co. Depth, 650 feet.

Date	Depth to water (feet)
1937 - June 21 -	83.58
July 20 -	85.44
Aug. 19 -	86.81
Sept.22 -	86.96
Oct. 25 -	83.20
Nov. 18 -	81.96
Dec. 15 -	78.41
1938 - Jan. 19 -	77.78
Mar. 1 -	76.40
Mar. 24 -	78.50
Apr. 22 -	79.84
May 20 -	84.43
June 23 -	89.11
July 21 -	91.70
Aug. 25 -	94.38
Sept.22 -	93.16
Oct. 20 -	93.94
Nov. 21 -	88.51
Dec. 20 -	86.02
1939 - Jan. 20 -	84.53
Feb. 20 -	83.41

Well 868

Hughes Tool Co. Depth, 697 feet.

Date	Depth to water (feet)
1937 - June 21 -	63.99 b/
July 20 -	64.93
Aug. 19 -	66.50
Sept.22 -	66.47
Oct. 25 -	63.00
Nov. 18 -	62.20
Dec. 15 -	59.54
1938 - Jan. 19 -	60.23
Mar. 1 -	58.08
Mar. 24 -	58.90
Apr. 22 -	59.26
May 20 -	61.43
June 23 -	66.40
July 21 -	67.97
Aug. 25 -	70.39
Sept.22 -	70.70
Oct. 20 -	70.59
Nov. 21 -	67.34
Dec. 20 -	65.45
1939 - Jan. 20 -	64.34
Feb. 20 -	62.26

Well 876

Houston Country Club. Depth, ____.

Date	Depth to water (feet)
1937 - June 19 -	59.47
June 21 -	59.30
July 20 -	62.13
Aug. 20 -	64.84
Sept.22 -	66.22
Oct. 25 -	64.38
Nov. 18 -	62.89
Dec. 15 -	61.37
1938 - Jan. 19 -	61.07
Mar. 1 -	65.50
Mar. 24 -	60.73
Apr. 22 -	60.86
May 20 -	63.15
June 23 -	68.78
July 21 -	71.82
Aug. 25 -	74.26
Sept.22 -	74.35
Oct. 20 -	73.35
Nov. 21 -	70.93
Dec. 21 -	69.83
1939 - Jan. 20 -	67.90
Feb. 20 -	66.30

a/ Pump running. b/ Pump running in nearby well.

Water level fluctuations in observation wells in the Houston area -- Continued

Well 878

Date	Depth to water (feet)
Houston Compress Co. Depth, 905 feet.	
1937 - June 21	-- a/
June 22	-- a/
July 19	-- a/
Aug. 20	68.51
Sept.22	70.03
Oct. 25	-- a/
Dec. 15	68.56
1938 - Mar. 1	-- a/
Apr. 22	-- a/
May 20	68.40
June 23	-- a/
July 20	-- a/
Aug. 25	74.44
Sept.22	76.06
Oct. 21	75.37
Nov. 25	-- a/
Dec. 20	73.85
1939 - Jan. 20	71.51
Feb. 20	70.48

Well 881

Date	Depth to water (feet)
Terminal Compress Co. Depth, 650± feet.	
1937 - June 21	64.64
July 19	67.58
Aug. 20	71.07
Sept.22	73.02
Oct. 25	72.16
Nov. 18	70.35
Dec. 15	69.23
1938 - Jan. 19	68.95
Mar. 1	68.33
Mar. 23	68.61
Apr. 22	67.73
May 20	69.30
June 23	72.24
July 20	75.00
Aug. 25	76.64
Sept.22	77.40
Oct. 20	79.48
Nov. 21	78.74
Dec. 20	76.92
1939 - Jan. 20	75.17
Feb. 20	74.83

Well 886

Date	Depth to water (feet)
Bennett Oil Co. Depth, 540 feet.	
1937 - June 21	-- a/
July 19	-- a/
Aug. 19	73.21
Oct. 25	74.33
Nov. 18	73.34
1938 - Mar. 1	71.64
Mar. 23	-- a/
Mar. 30	71.64
Apr. 22	72.20
May 20	-- a/
June 23	-- a/
July 20	-- a/
Aug. 25	-- a/
Sept.22	-- a/
Oct. 20	76.75
Dec. 20	74.27
1939 - Jan. 20	73.30
Feb. 20	72.83

Well 890

Date	Depth to water (feet)
Texas Chemical Co. Depth, 1,284 feet.	
1937 - June 21	-- a/
June 22	-- a/
July 19	-- a/
Aug. 9	89.67
Aug. 19	91.20
Sept.30	94.40
Oct. 25	92.33
Nov. 18	89.61
Dec. 15	94.13
1938 - Jan. 19	87.39
Mar. 1	86.80
Mar. 23	87.42
Apr. 22	85.82
May 20	-- a/
June 23	89.88
July 20	-- a/
Aug. 25	-- a/
Sept.22	94.57
Oct. 20	-- a/
Nov. 25	-- a/
Dec. 20	-- a/
1939 - Jan. 20	-- a/
Feb. 20	-- a/

Well 1105

Date	Depth to water (feet)
A. A. Womack. Depth, ____.	
1937 - June 21	55.77
July 20	59.54
Aug. 19	60.16
Sept.22	61.39
Oct. 25	60.92
Nov. 18	60.36
Dec. 15	59.87
1938 - Jan. 19	59.29
Mar. 23	60.01
Apr. 22	59.77
May 23	59.68
June 23	58.90
July 20	61.72
Aug. 25	62.20
Sept.22	62.75
Oct. 21	62.19
Nov. 23	61.88
Dec. 19	61.37
1939 - Jan. 18	61.07
Feb. 16	60.47

Well 1170

Date	Depth to water (feet)
Deepwater Plant of Houston Depth, 836 feet.	
1937 - June 19	95.8
June 26	97.2
July 3	98.2
July 10	97.2
July 17	98.3
July 24	95.8
July 31	96.5
Aug. 7	99.7
Aug. 14	101.1
Aug. 21	96.0
Aug. 28	99.7
Sept. 4	97.7
Sept.11	97.0
Sept.18	101.6
Sept.25	102.8
Oct. 2	103.8
Oct. 9	101.5
Oct. 16	98.1
Oct. 23	95.8
Oct. 30	95.0

(Continued on next page.)

a/ Pump running. b/ Pump running in nearby well.

Water level fluctuations in observation wells in the Houston area -- Continued

Well 1170-cont'd

Date	Depth to water (feet)
1937 - Nov. 8 -	91.17
Nov. 27 -	97.00
Dec. 4 -	96.25
Dec. 18 -	100.00
Dec. 29 -	99.00
1938 - Jan. 8 -	95.08
Jan. 22 -	95.08
Feb. 5 -	93.25
Feb. 19 -	94.25
Feb. 26 -	88.83
Mar. 4 -	90.83
Mar. 11 -	90.08
Mar. 13 -	94.42
Mar. 18 -	90.08
Mar. 25 -	92.17
Apr. 4 -	92.42
Apr. 11 -	96.50
Apr. 22 -	90.00
Apr. 29 -	93.83
May 5 -	97.00
May 23 -	95.58
June 1 -	96.00
June 10 -	92.83
June 17 -	96.4
June 24 -	96.25
July 1 -	92.58
Aug. 26 -	95.5
Sept. 2 -	93.0
Sept. 9 -	96.5
Sept.16 -	96.5
Sept.23 -	96.5
Oct. 3 -	97.5
Oct. 7 -	99.5
Oct. 14 -	101.0
Oct. 21 -	100.5
Oct. 28 -	99.5
Nov. 4 -	99.5
Nov. 18 -	95.5
Nov. 25 -	95.0
Dec. 2 -	95.5
Dec. 9 -	95.5
Dec. 30 -	95.5
1939 - Jan. 6 -	95.5
Jan. 13 -	96.5

Well 1176

Texas Co. Refg. Depth, 800± feet.

Well 1176-cont'd

Date	Depth to water (feet)
1937 - June 21 -	69.98
Aug. 4 -	72.35
Aug. 19 -	73.42
Sept.22 -	77.00
Oct. 26 -	74.55
Nov. 18 -	74.45
Dec. 15 -	74.42
1938 - Jan. 19 -	74.17
Mar. 1 -	65.58
Mar. 23 -	62.10
Apr. 22 -	63.82
May 23 -	59.36
June 23 -	62.21
July 20 -	60.68
Aug. 25 -	60.93
Sept.22 -	61.89
Oct. 21 -	68.26
Nov. 21 -	64.33
Dec. 20 -	65.71
1939 - Jan. 20 -	62.26
Feb. 20 -	62.94

Well 1187 c/

City of Pasadena, Pasadena City Hall property (South Well). Depth, unknown.

1937 - Sept.22 -	114.22
Oct. 25 -	114.22 b/
Nov. 12 -	106.60
Dec. 15 -	110.32
1938 - Jan. 19 -	109.29 b/
Mar. 1 -	101.69
Mar. 23 -	103.29
Apr. 22 -	100.60
May 20 -	105.96
June 23 -	109.81
July 20 -	-- a/
Sept.22 -	-- a/
Oct. 21 -	113.22
Nov. 21 -	113.20 b/
Dec. 20 -	115.17 b/
1939 - Jan. 20 -	110.72 b/
Feb. 20 -	111.39 b/

Well 1187a c/

Date	Depth to water (feet)
City of Pasadena, Pasadena City Hall property (North well). Depth, unknown.	
1937 - Aug. 19 -	112.33
Sept.22 -	118.63
Oct. -	-- a/
Nov. 18 -	106.00
Dec. 15 -	109.46
1938 - Mar. 1 -	101.10
Mar. 23 -	104.56
Apr. 22 -	103.11
May 23 -	102.96
June 23 -	111.07
July 20 -	114.31
Aug. 25 -	113.65
Sept.22 -	118.15
Oct. 21 -	112.80
Nov. 21 -	-- a/
Dec. 20 -	-- a/
1939 - Jan. 18 -	114.87
Jan. 20 -	-- a/
Feb. 20 -	-- a/

Well 1203

Harris County highway well. Depth, 600± feet.

1938 - Feb. 3 -	30.37
Mar. 11 -	36.45
Oct. 25 -	36.39
Nov. 23 -	41.18
Dec. 19 -	44.29
1939 - Jan. 27 -	44.23

Well 1209

Fireworks Co. Depth, 650± feet.

1937 - Aug. 13 -	48.01
Nov. 3 -	50.55
1938 - Feb. 3 -	52.35
May 11 -	51.02
Oct. 25 -	54.23
Nov. 23 -	55.75
Dec. 19 -	55.56
1939 - Jan. 27 -	55.24

a/ Pump running. b/ Pump running in nearby well.
c/ No previous measurements published.

Water level fluctuations in observation wells in the Houston area -- Continued

Well 1302

Date	Depth to water (feet)
City of Genoa. Depth, 832 feet.	
1937 - Aug. 13 -	65.18
1938 - May 11 -	71.20
Oct. 25 -	74.63
Nov. 23 -	-- a/
Dec. 19 -	75.56
1939 - Jan. 27 -	-- a/

Well 1324 c/

J. M. West, 1⅓ miles northwest from South Houston. Depth, 400± feet.

Date	Depth to water (feet)
1937 - Aug. 13 -	60.34 b/
1937 - Nov. 3 -	-- a/
1938 - Feb. 3 -	54.32
May 11 -	55.81
Oct. 25 -	59.42
Nov. 23 -	52.98
Dec. 19 -	58.70
1939 - Jan. 27 -	58.70

Well 1360

Date	Depth to water (feet)
Mrs. -- Fain. Depth, 659 feet.	
1937 - Nov. 3 -	-- a/
1938 - Feb. 3 -	48.34
May 11 -	49.59
Oct. 25 -	53.63
Nov. 23 -	52.98
Dec. 19 -	52.84
1939 - Jan. 27 -	52.62

a/Pump running. b/Pump running in nearby well. c/No previous measurements published.

Water level fluctuations in observation wells in Galveston County, Texas

Well 26

Galveston, Houston and Henderson Railway. Depth, 1,020 feet.

Date	Depth to water (feet)
1937 - Aug. 13 -	18.31
Nov. 3 -	18.14
1938 - Jan. 4 -	17.18
May 11 -	15.78
Oct. 25 -	17.66
Nov. 23 -	17.61
Dec. 19 -	17.87
1939 - Jan. 27 -	16.80

Well 112

Galveston, Houston and Henderson Railway. Depth, 750 feet.

Date	Depth to water (feet)
1937 - Aug. 13 -	49.82
Nov. 3 -	51.08
1938 - Jan. 4 -	48.41
May 12 -	54.85
Oct. 25 -	61.79
Nov. 23 -	60.25
Dec. 19 -	58.80
1939 - Jan. 27 -	56.07

Well 113

E. Menotti. Depth, 504 feet.

Date	Depth to water (feet)
1937 - Aug. 13 -	23.75
Nov. 3 -	-- a/
1938 - Jan. 4 -	24.43
May 11 -	25.07
Oct. 25 -	29.91
Nov. 23 -	30.87
Dec. 23 -	33.31 a/
1939 - Jan. 27 -	35.44 a/

Well 115

J. W. Palmer. Depth, 526 feet.

Date	Depth to water (feet)
1937 - Aug. 13 -	35.34
Nov. 3 -	36.06
1938 - Jan. 4 -	50.40 b/
May 12 -	42.45
Oct. 25 -	38.34
Nov. 23 -	56.54 b/
Dec. 19 -	42.00
1939 - Jan. 27 -	62.42 b/

Well 206

A. J. Biran. Depth, 926 feet.

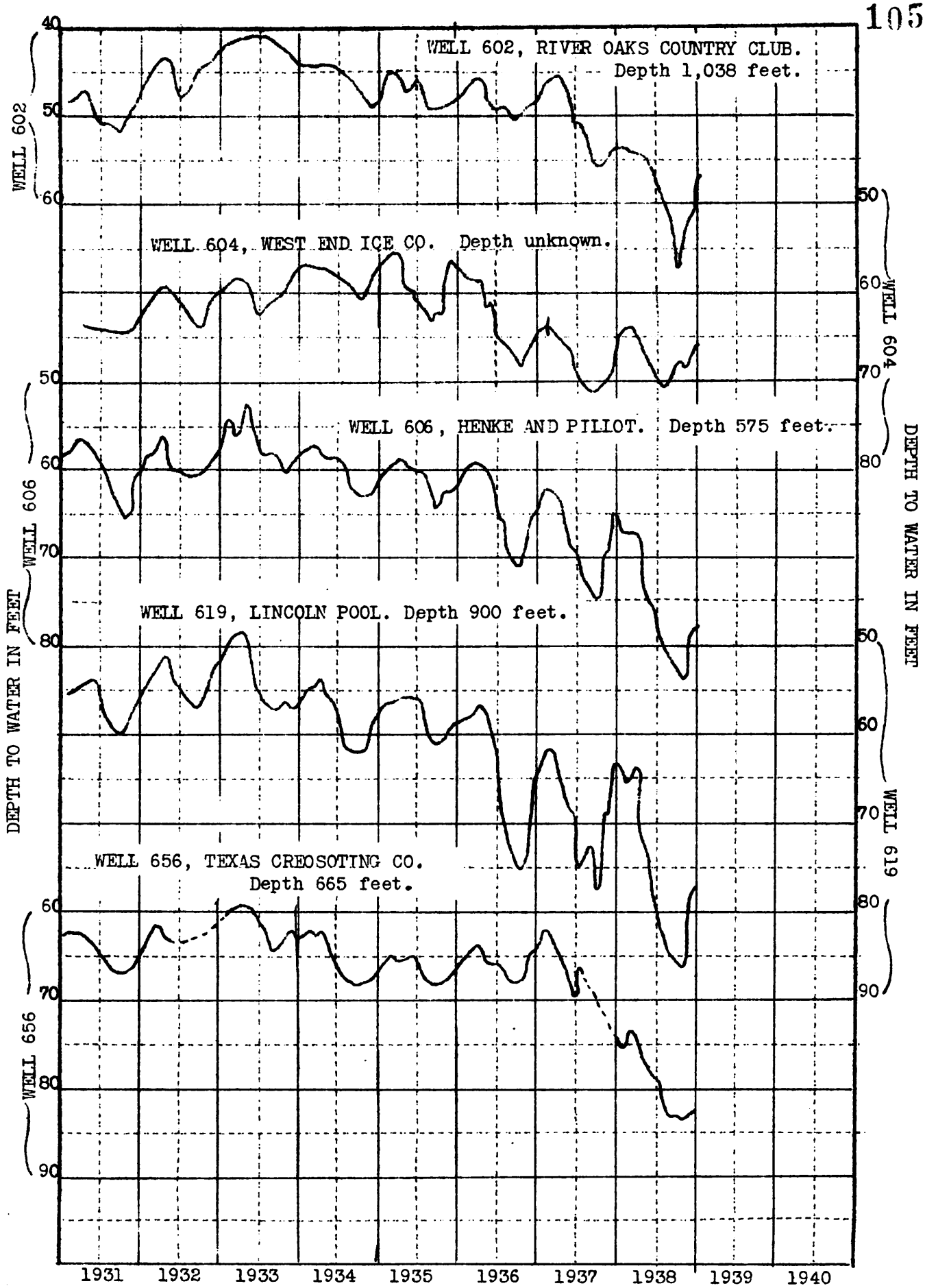
Date	Depth to water (feet)
1937 - Aug. 13 -	39.82
Nov. 3 -	41.52
1938 - Feb. 3 -	33.77
May 12 -	40.02
Oct. 25 -	42.93
Nov. 23 -	43.20
Dec. 19 -	39.96
1939 - Jan. 27 -	41.51

Well 272

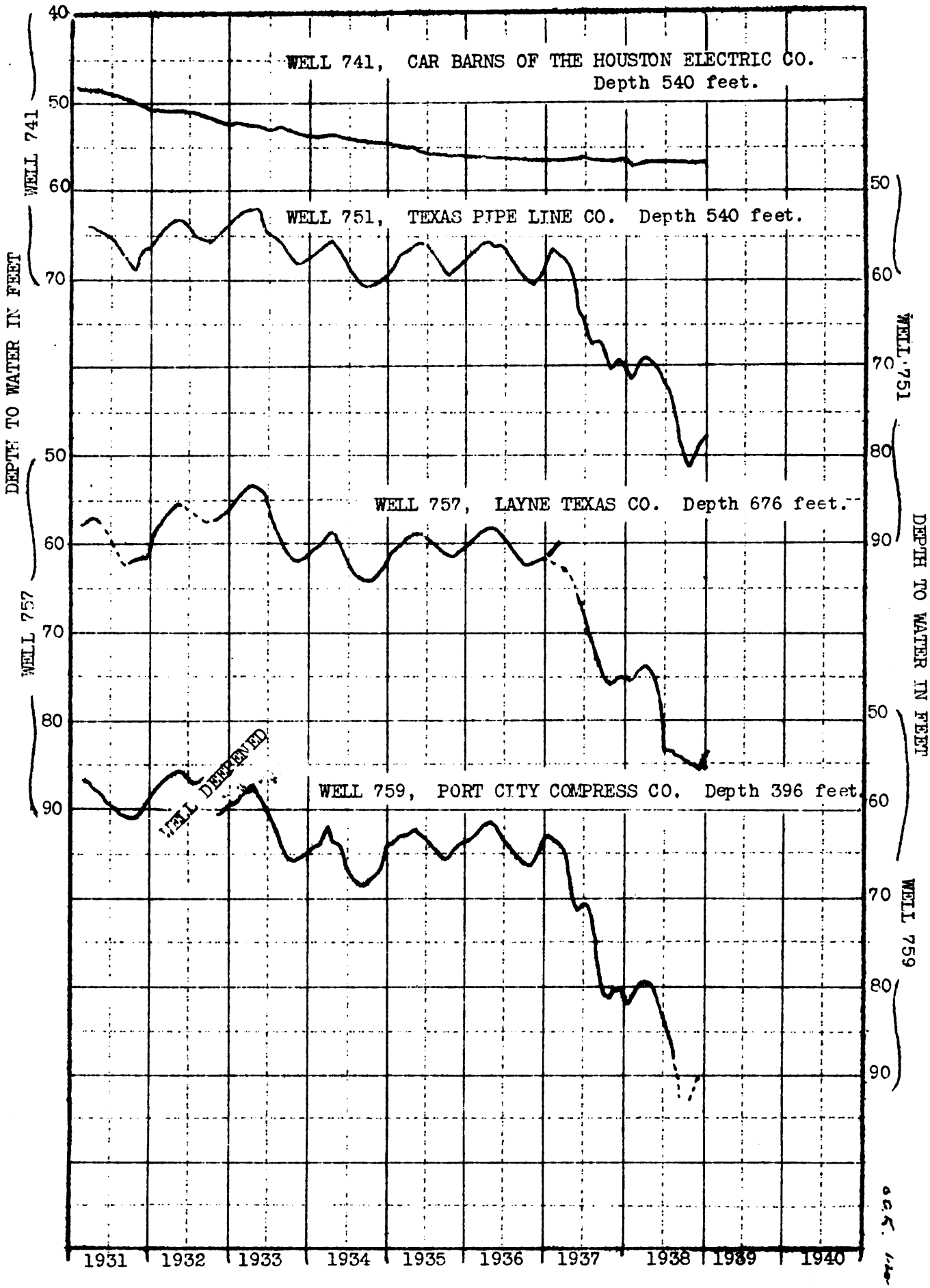
City of Galveston. Depth, 809 feet.

Date	Depth to water (feet)
1937 - Aug. 13 -	60.17
Nov. 3 -	55.81
1938 - Feb. 5 -	53.78 b/
May 12 -	61.65
Oct. 25 -	67.12 b/
Nov. 23 -	70.83
Dec. 19 -	66.50
1939 - Jan. 27 -	61.33

a/Pump running. b/Pump running in nearby well. c/No previous measurements published.



FLUCTUATIONS OF WATER LEVELS IN WELLS IN WESTERN AND NORTHWESTERN HOUSTON



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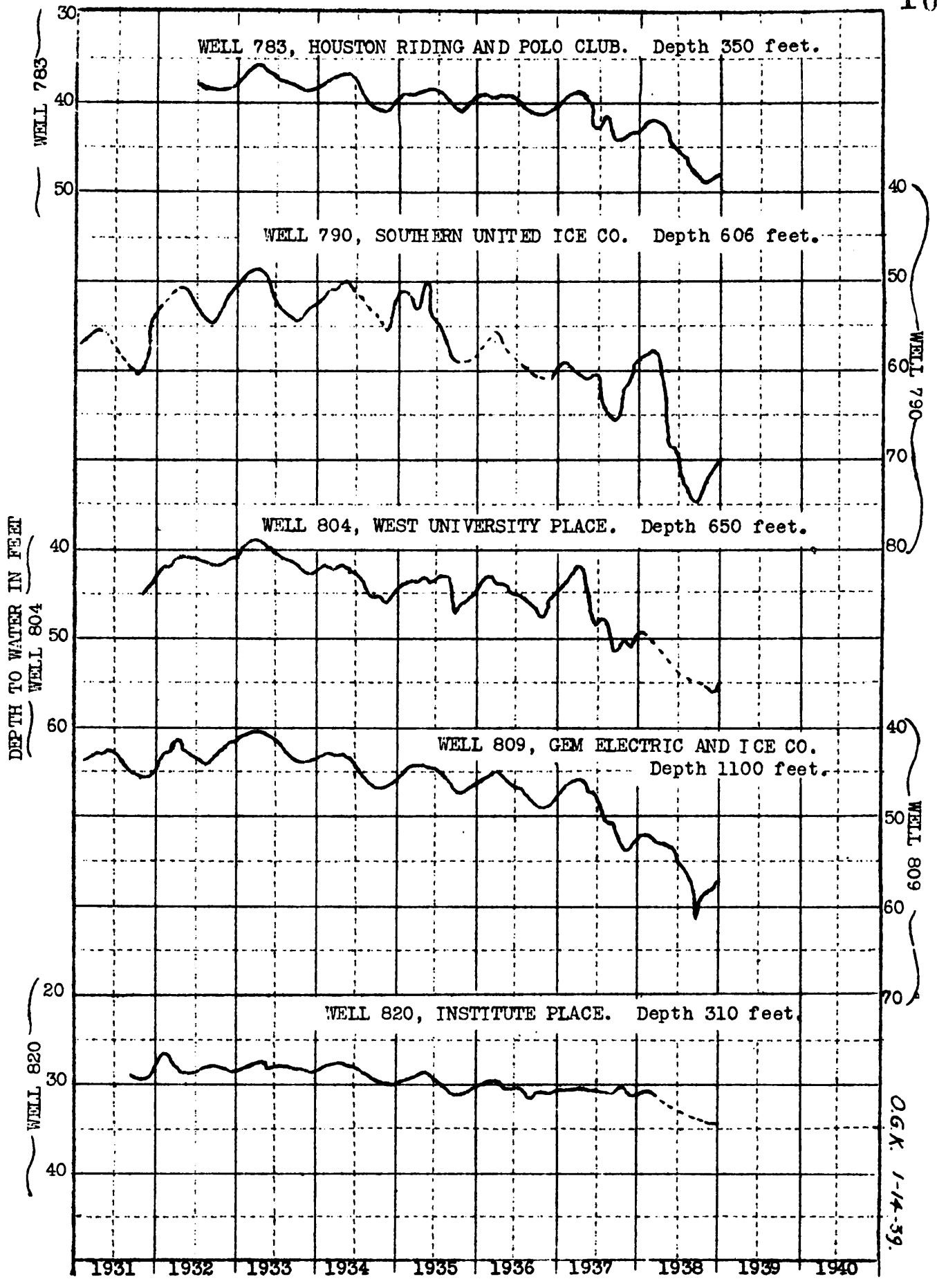
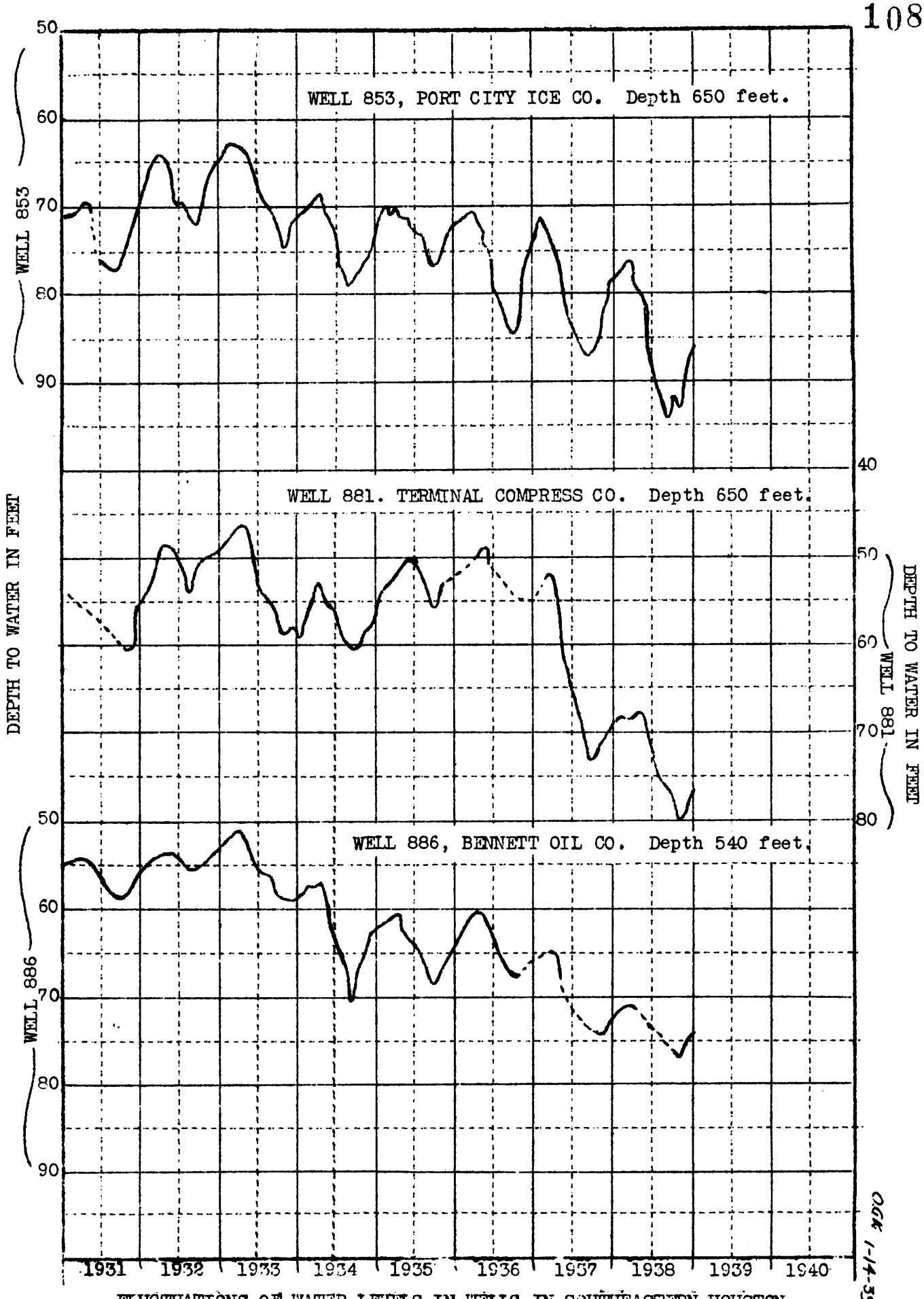


FLUCTUATIONS OF WATER LEVELS IN WELLS IN SOUTHWESTERN HOUSTON



FLUCTUATIONS OF WATER LEVELS IN WELLS IN SOUTHEASTERN HOUSTON

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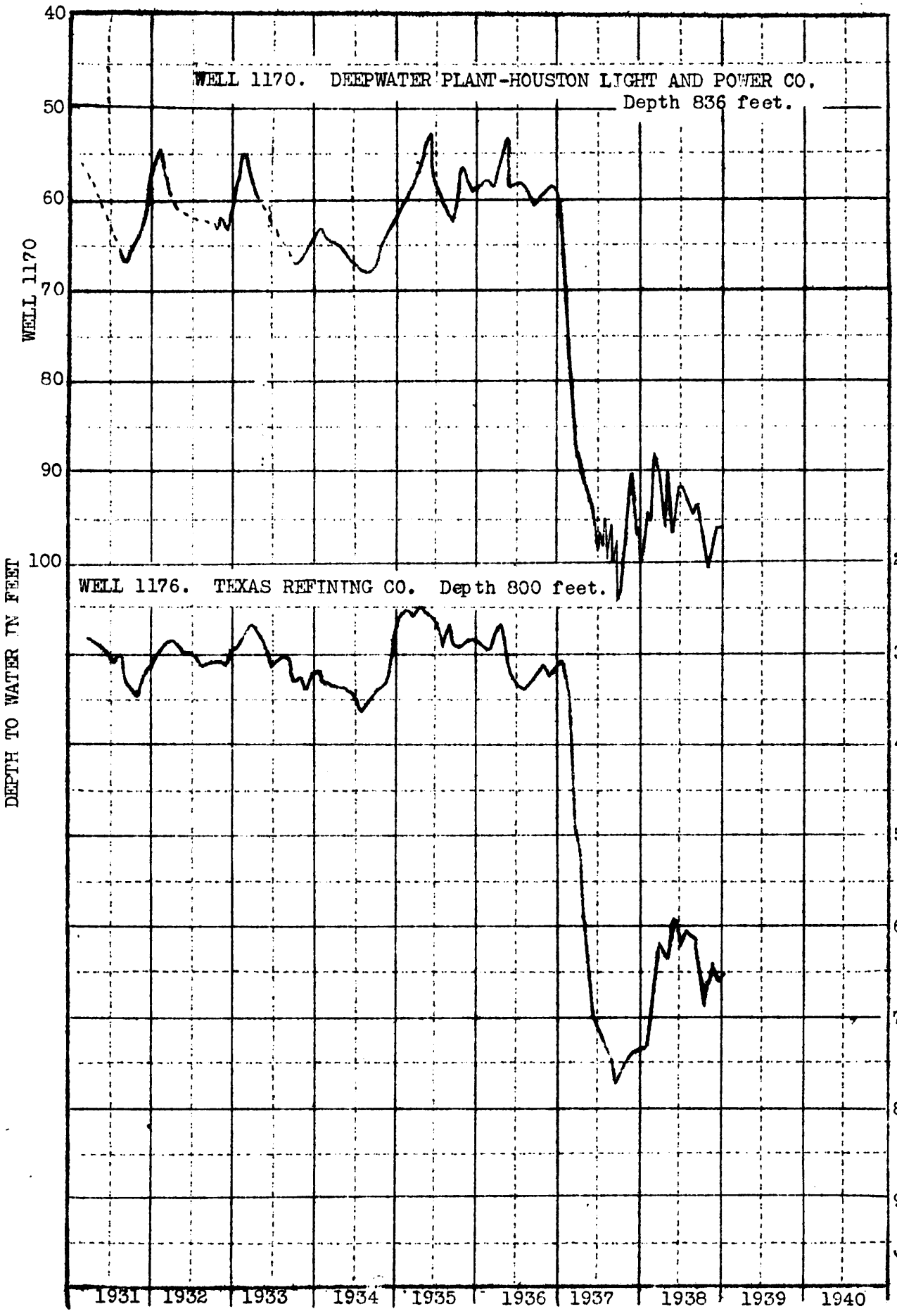

FLUCTUATIONS OF WATER LEVELS IN WELLS IN PASADENA AREA

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TEXAS

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BRAZORIA COUNTY, TEXAS
(East of the Brazos River)

Records of wells, drillers' logs, water analyses, and map showing location of wells

* * *

by
Samuel F. Turner and Penn Livingston

Mimeographed by
WORKS PROGRESS ADMINISTRATION
PROJECT 10443

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Prepared in cooperation with the United States Department of the Interior, Geological Survey.

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Austin, Texas
April 10, 1939

BRAZORIA COUNTY, TEXAS
(East of the Brazos River)

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Introduction

by
Samuel F. Turner
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United States Department of the Interior
Geological Survey

This pamphlet contains records of wells in the eastern part of Brazoria County, Texas, with tables of wells logs, well water analyses, and a map which shows all the wells described, each well having a number on the map corresponding to the number assigned to it in the well tables.

The records were obtained in the course of an investigation which was undertaken as part of a statewide study of the underground water resources of Texas. The investigation was made by the State Board of Water Engineers, in cooperation with the United States Department of the Interior, Geological Survey. The field work was carried out by Samuel F. Turner and Penn Livingston of the Geological Survey. The analyses were made in the laboratory of the Geological Survey at Washington by Margaret D. Foster. The field tests were made in Houston by Samuel F. Turner.

The well records serve as a guide to land owners and well drillers who may need information regarding wells and pumping plants, the depth to ground water in different parts of the county and the quantity and quality of water yielded by wells. They afford a basis for the more intensive investigation which is now being made.

These records were typed and mimeographed by employees of Works Progress Administration Project 10443, which is sponsored by the Texas Board of Water Engineers in cooperation with the Geological Survey.

Records of wells in Brazoria County, Texas
(All wells are drilled unless otherwise noted in "Remarks" column.)
(Principal water-bearing beds are sand or gravel.)

No.	Distance from Pearland	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
1	6½ miles west southwest	--	--	--	80±	2	--	--
d/ 2	4 miles west	Frank Doherty	Pete Rogers	--	80	2	--	--
3	do.	John Doherty	do.	1931	54	2	--	--
4	4 miles west southwest	do.	do.	1924	25	2	--	--
5	3½ miles west southwest	do.	do.	1926	65	2	--	--
6	3 miles west	Joe Benes	do.	1928	40	2	32	8
7	2¼ miles west	Brazoria County	do.	1932	37	1½	--	--
8	2 miles west	T. P. Mahaney	--	--	20	2	--	--
9	¼ mile west	C. W. Massey	--	--	140	12	--	--
10	At Pearland	Gulf Coast & Santa Fe R. R.	F. Standard	1916	507	8	461	46
11	2¾ miles west southwest	C. T. Densen	--	--	96	3	--	--
d/ 12	3½ miles southwest	C. W. Massey	--	--	100	6	--	--
13	4¾ miles southwest	-- Baldwin	--	--	30	1½	--	--
14	4½ miles southwest	H. Richards	H. Richards	--	25	6	--	--
15	4¼ miles southwest	C. W. Massey	--	--	13	4	--	--
16	4¼ miles south southwest	do.	--	--	30±	2	--	--
d/ 17	3½ miles south southwest	do.	--	--	30±	3	--	--
18	3¼ miles south	Berry Miller	--	--	40±	1½	--	--
19	5¼ miles southwest	Willis Patterson	--	--	40±	1¼	--	--
20	6 miles southwest	do.	--	--	40±	1¼	--	--
d/ 21	5¾ miles southwest	C. Natali	--	--	60	2	--	--
22	5¼ miles southwest	The Texas Co.	-- Patterson	--	300	6	--	--
23	6½ miles southwest	Victor Del Bello	Loran Davis	--	50	1¼	--	--

a/ Bench mark is point from which water-level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

b/ T, turbine; A, air or steam; F, artesian flow; J, jack or pitcher; B, bucket; O, oil: G, gasoline; W, windmill; H, hand.

Records obtained by Penn Livingston and Samuel F. Turner
(See "Table of field tests" for tests of hardness, chloride and sulphate.)

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
1	--	--	--	J,W	S	
2	--	--	--	J,W	D,S	
3	--	--	--	J,G, $1\frac{1}{2}$	D,S	
4	--	--	--	J,H	S	
5	--	--	--	J,W	S	
6	--	--	--	J,W	D,S	
7	--	--	--	J,W	S	
8	--	--	--	J,H	D,S	
9	--	--	--	J,H	D,S	
10	0	50.0	Apr. 16, 1931	J,-	RR	Casing; 477 feet of 8-inch and 30 feet of 6-inch. Stancliff screen set from 477 to 507 feet. See driller's log.
11	--	--	--	J,H	D,S	
12	--	--	--	J,W	S	
13	--	--	--	J,H	S	
14	--	--	--	J,H	D,S	
15	--	--	--	J,W	S	
16	--	--	--	J,W	S	
17	--	--	--	J,H	D,S	
18	--	--	--	J,W	S	
19	--	--	--	J,H	D,S	
20	--	--	--	J,H	D,S	
21	--	--	--	J,H	D,S	
22	--	--	--	A,S	Ind	
23	--	--	--	J,H	D,S	

c/ P, Public; I, irrigation; RR, railroad; Ind, industrial; D, domestic; S, stock; N, not used.
d/ See analysis table for analysis of water from this well.
e/ No field tests made on water from this well.

Records of wells in Brazoria County--Continued

No.	Distance from Pearland	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
24	6¼ miles southwest	C. Natali	Loran Davis	--	60	1¼	--	--
25	6½ miles southwest	S. Scopel	--	--	45	--	--	--
26	6¾ miles southwest	Joe Croce	--	--	54	1½	--	--
27	6½ miles southwest	Mrs. C. Maraschkin	--	--	20	1	--	--
28	do.	do.	--	1932	52	1	--	--
29	7¼ miles southwest	J. W. Lewis	--	--	27	2	--	--
30	8¼ miles south southwest	M. Pavlovich	--	--	65	--	--	--
31	7¼ miles south southwest	L. O. Callihan	Loran Davis	--	62	1¼	--	--
32	7 miles south southwest	do.	do.	--	35	1½	--	--
33	7½ miles south southwest	A. J. Hicks	-- McColley	--	80±	2	50	30
34	do.	A. Huepper	--	--	18	1¼	--	--
35	6½ miles south southwest	do.	--	--	40±	2	--	--
36	6¼ miles south southwest	F. A. Goedecke	--	--	18	1¼	--	--
d/ 37	do.	do.	--	--	37	1¼	--	--
38	5½ miles south	Frank Cisco	--	--	20	5	--	--
39	5¾ miles south	W. A. Idoux	--	--	20	3	--	--
40	9½ miles south southeast	Gulf States Utilities Co.	--	1922	158	10	--	--
41	do.	do.	--	1909	750	10	--	--

No.	Distance from Angleton	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
70	18½ miles north northwest	H. F. Hamilton Est.	--	--	510±	5	--	--
e/ 71	do.	do.	--	--	220	4	--	--
e/ 72	18 miles north	House & Brown	--	--	300±	1½	--	--
73	17½ miles north northwest	Judge Tignor	--	--	40	1¼	--	--

a/ Bench mark is point from which water-level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

b/ T, turbine; A, air or steam; F, artesian flow; J, jack or pitcher; B, bucket; O, oil; G, gasoline; W, windmill; H, hand.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
24	--	--	--	J,H	D,S	
25	--	--	--	J,E	D,S	
26	--	--	--	J,W	D,S	
27	--	--	--	J,H	D,S	
28	--	--	--	J,W	D,S	
29	--	--	--	J,H	D,S	
30	--	--	--	J,G	D,S	
31	--	--	--	J,H	D,S	
32	--	--	--	J,H	D,S	
33	0	7.0	Aug. 17, 1932	J,H	D,S	
34	--	--	--	J,H	D,S	
35	--	--	--	J,W	S	
36	--	--	--	J,H	D,S	
37	--	--	--	J,H	D,S	
38	--	--	--	J,H	D,S	
39	--	--	--	J,H	D,S	
40	1½	27.9	Apr. 16, 1931	A,-	P,RR	Supplies town of Alvin.
41	2	42.6	do.	A,-	P	Do.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
70	0	15.4	Apr. 10, 1931	J,H	D,S	
71	½	8.1	do.	J,W	S	
72	2½	19.9	do.	J,W	D,S	
73	--	--	--	J,H	D,S	

c/ P, public; I, irrigation; RR, railroad; Ind, industrial; D, domestic; S, stock; N, not used.

d/ See analysis table for analysis of water from this well.

e/ No field tests made on water from this well.

Records of wells in Brazoria County--Continued

No.	Distance from Angleton	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
e/ 74	17½ miles north northwest	State of Texas	--	1918?	700±	2	--	--
e/ 75	17 miles north northwest	do.	--	--	1,700	8	--	--
e/ 76	16½ miles north	J. A. Fite	J. D. Roberts	1923	906	26	361 506 858	65 55 46
e/ 77	16 miles north	H. L. Trammel	-- Patterson	--	300	2	--	--
e/ 78	15 miles north northwest	Otto Sims Club	do.	1925	792±	2	--	--
79	do.	Public School	Frank Turner	1927?	420	2	--	--
e/ 80	13 miles north northwest	-- Wallace	--	--	650±	6	--	--
81	10 miles north northwest	State of Texas	--	--	--	4	--	--
e/ 82	9½ miles north	J. A. Fite	Layne-Texas Co.	1926	923	24	239 327 563	77 113 35
91	16 miles north northeast	W. H. Booth	-- Patterson	1930	1,118	4	761 806	23 36
92	17½ miles northeast	T. Berthelsen	do.	1930	843	2	864 --	55 --
93	16 miles northeast	Houston Farm Development Co.	-- Benson	1920	1,300±	8	--	--
94	14 miles northeast	do.	do.	1920	1,380±	8	--	--
e/101	4¼ miles northwest	International & Great Northern R.R.	--	--	635	2	--	--
e/102	5¾ miles west	J. W. Sparks Well 1	Zionville Oil Co.	--	3,160	12	--	--
103	At Angleton	Texas-Louisiana Power Co.	Luther Patterson	1923	336	6	--	--
e/104	6½ miles east northeast	Rapid City Development Co.	Rycade-Amerada	--	6,284	--	--	--
e/105	19 miles east	-- Sweet Well 1	The Texas Co.	1926	1,387	--	--	--
e/106	7 miles south	Cochran & McClure Well 1	do.	1920	2,335	6	--	--
121	15 miles south southeast	Houston Light & Power Co.	--	--	--	8	--	--
e/122	14½ miles south southeast	Missouri Pacific lines	--	--	267	6	244	23
123	15 miles south southeast	--	--	--	--	--	--	--
124	16⅛ miles south southeast	E. D. Dorchester	--	--	1,100±	10	--	--

a/ Bench mark is point from which water-level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

b/ T, turbine; A, air or steam; F, artesian flow; J, jack or pitcher; B, bucket; O, oil; G, gasoline; W, windmill; H, hand.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
74	1½	4.8	Apr. 14, 1931	J,H	S	Ceased flowing in 1929. Darrington State Farm.
75	1½	4.9	do.	J,H	S	Do.
76	0	7.9	Apr. 10, 1931	T,O, --	I	Casing; 97 feet of 26-inch, 117 feet of 16-inch to bottom. Screens set at 364 to 425, 521 to 560, and 860 to 901 feet.
77	1	15.7	Apr. 13, 1931	A,E, ½	D,Ind	At Sandy Point.
78	1½	10.2	do.	None	N	
79	½	3.0	do.	J,H	P	Ceased flowing in 1929.
80	1½	5.0	do.	J,H	D,S	
81	--	+	--	F	S	Ramsey Farm. Estimated discharge at 4 gallons a minute. April 13, 1931.
82	1½	4.1	Apr. 13, 1931	T,-	S,I	Casing; 98 feet of 24-inch, 10 feet of 16-inch and 10-inch set at 523 feet. Well deepened in 1928 and 8-inch casing
91	0	8.0	Apr. 16, 1931	F	D,S	Temperature 79° F. set at 923 feet. Flowing 4.2 gallons a minute. April 16,
92	--	--	--	J,W	D,S	1931.
93	--	+	--	F	S	
94	--	+	--	F	D,S	Flows into tank 12 feet above ground level.
101	2	2.6	Apr. 14, 1931	J,H	D,S	Well ceased flowing in 1929.
102	--	+	--	F	--	
103	1½	17.5	Apr. 14, 1931	A,-	P	
104	--	--	--	--	--	Oil test, see driller's log.
105	--	--	--	--	--	Core test, see driller's log.
106	--	--	--	--	--	Oil test, see driller's log.
121	16	43.2	Apr. 14, 1931	A,-	P	At Freeport.
122	--	--	--	A,-	RR	See driller's log. At Velasco.
123	--	+	--	F	N	At Velasco.
124	--	+	--	F	N	Flow estimated at 300 gallons a minute, April 14, 1931. Temperature, 84° F.

c/ P, public; I, irrigation; RR, railroad; Ind, industrial; D, domestic; S, stock; N, not used.

d/ See analysis table for analysis of water from this well.

e/ No field tests made on water from this well.

Records of field tests of samples from wells in Brazoria County, Texas (Analyzed by Samuel F. Turner. Parts per million. For records of wells see corresponding numbers in well tables.)

Well No.	Owner	Date of collection	Depth of well (ft.)	Hardness as $CaCO_3$ a/	Chloride (Cl)	Sulphate (SO_4) b/
1	--	--	80±	350	50	5
2	Frank Doherty	--	80	320	30	5
3	John Doherty	--	54	340	270	15
4	do.	--	25	330	60	10
5	do.	--	65	650	500	120
6	Joe Benes	--	40	390	55	5
7	Brazoria County	--	37	350	20	5
8	T. P. Mahaney	--	20	400	35	5
9	C. W. Massey	--	140	360	40	15
10	Gulf Coast & Santa Fe RR.	Apr. 16, 1931	507	90	35	2
11	C. T. Densen	--	96	550	750	40
12	C. W. Massey	--	100	900	1,000	50
13	-- Baldwin	--	30	490	70	5
14	H. Richards	--	25	360	150	15
15	C. W. Massey	--	13	340	75	5
16	do.	--	30±	350	100	10
17	do.	--	30±	470	550	40
18	Berry Miller	--	40±	210	45	20
19	Willis Patterson	--	40±	340	30	5
20	do.	--	40±	300	75	5
21	C. Natali	--	60	340	30	5
22	The Texas Co.	--	300	150	95	40
23	Victor Del Bello	--	50	270	130	10
24	C. Natali	--	60	280	140	5
25	S. Scopel	--	45	240	40	5
26	Joe Croce	--	54	300	70	10
27	Mrs. C. Marasckin	--	20	300	85	15
28	do.	--	52	290	110	25
29	J. W. Lewis	--	27	310	140	5
30	M. Pavlovich	--	65	220	140	5
31	L. O. Callihan	--	62	300	70	1
32	do.	--	35	320	30	2
33	A. J. Hicks	Aug. 17, 1932	80±	250	140	5
34	A. Huepper	--	18	280	20	2
35	do.	--	40±	340	35	15
36	F. A. Goedecke	--	18	260	140	25
37	do.	--	37	280	140	10
38	Frank Cisco	--	20	220	85	10
39	W. A. Idoux	--	20	330	55	2
40	Gulf State Utilities Co.	Apr. 16, 1931	158	260	100	10
41	do.	do.	750	75	270	5
70	H. F. Hamilton Est.	Apr. 10, 1931	510±	180	120	2
73	Judge Tignor	--	40	2,000	1,600	30
79	Public School	Apr. 13, 1931	420	140	70	5
81	State of Texas	--	--	140	150	2
91	W. H. Booth	Apr. 16, 1931	1,118	60	290	25
92	T. Berthelson	--	843	75	290	5
93	Houston Farm Dev. Co.	--	1,300±	130	1,300	--
94	do.	--	1,380±	80	420	--
103	Texas-Louisiana Power Co.	Apr. 14, 1931	336	300	75	5
121	Houston Light & Power Co.	do.	--	160	220	2
123	--	--	--	600	3,000	2
124	E. D. Dorchester	--	1,100±	600	3,500	3

a/ Hardness as calcium carbonate by the soap method.

b/ Sulphate by turbidity method and may be as much as 25 per cent in error.

Analyses of water from wells in Brazoria County, Texas

Well No.	Owner	Date of collection	Depth of well (ft.)	Total dissolved solids (calc.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)
2	Frank Doherty	Aug. 19, 1932	80	2/ 427	--	0.93	101	22
12	C. W. Massey	do.	100	2/ 833	--	13	161	120
17	do.	July 22, 1933	30	2/ 424	--	4.6	94	61
21	C. Natali	do.	60	2/ 529	--	0.67	102	12
37	F. A. Goedecke	do.	37	2/ 771	--	0.5	58	35

1/ Combined figures for sodium and potassium were not determined, but were calculated as sodium.

(Parts per million. Well numbers correspond to numbers in table of records of wells.)

Well No.	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulphate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Total hardness as $CaCO_3$	Analyst
2	38		414	6	56	0	343	Margaret D. Foster
12	380		328	115	945	0.1	894	Do.
17	372		511	72	560	13	485	Do.
21	11		358	5.3	19	3.5	304	Do.
37	206		626	17	146	0.62	288	Do.

2/ Sum of constituents reported.

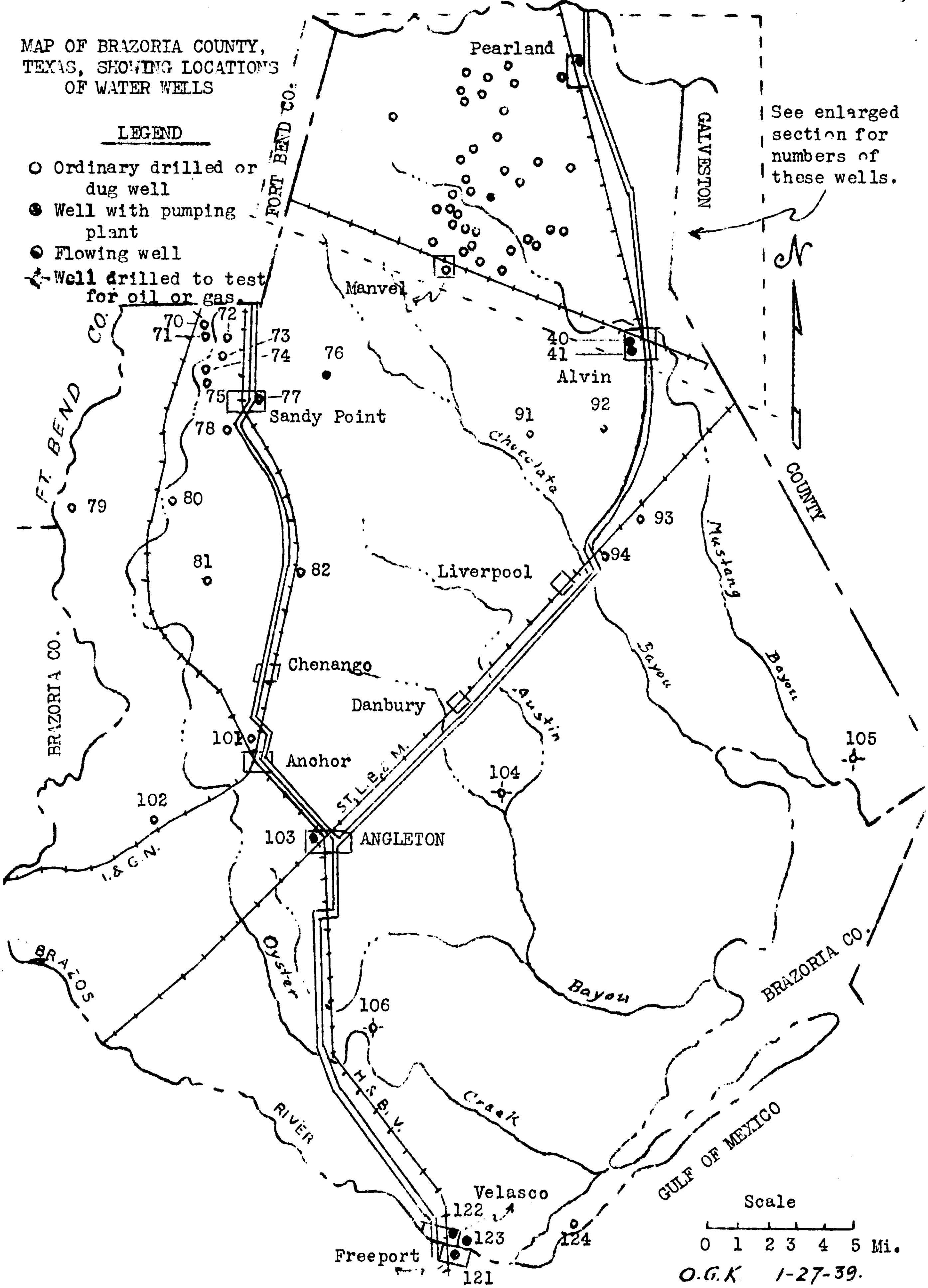
Table of Drillers' Logs, Brazoria County, Texas

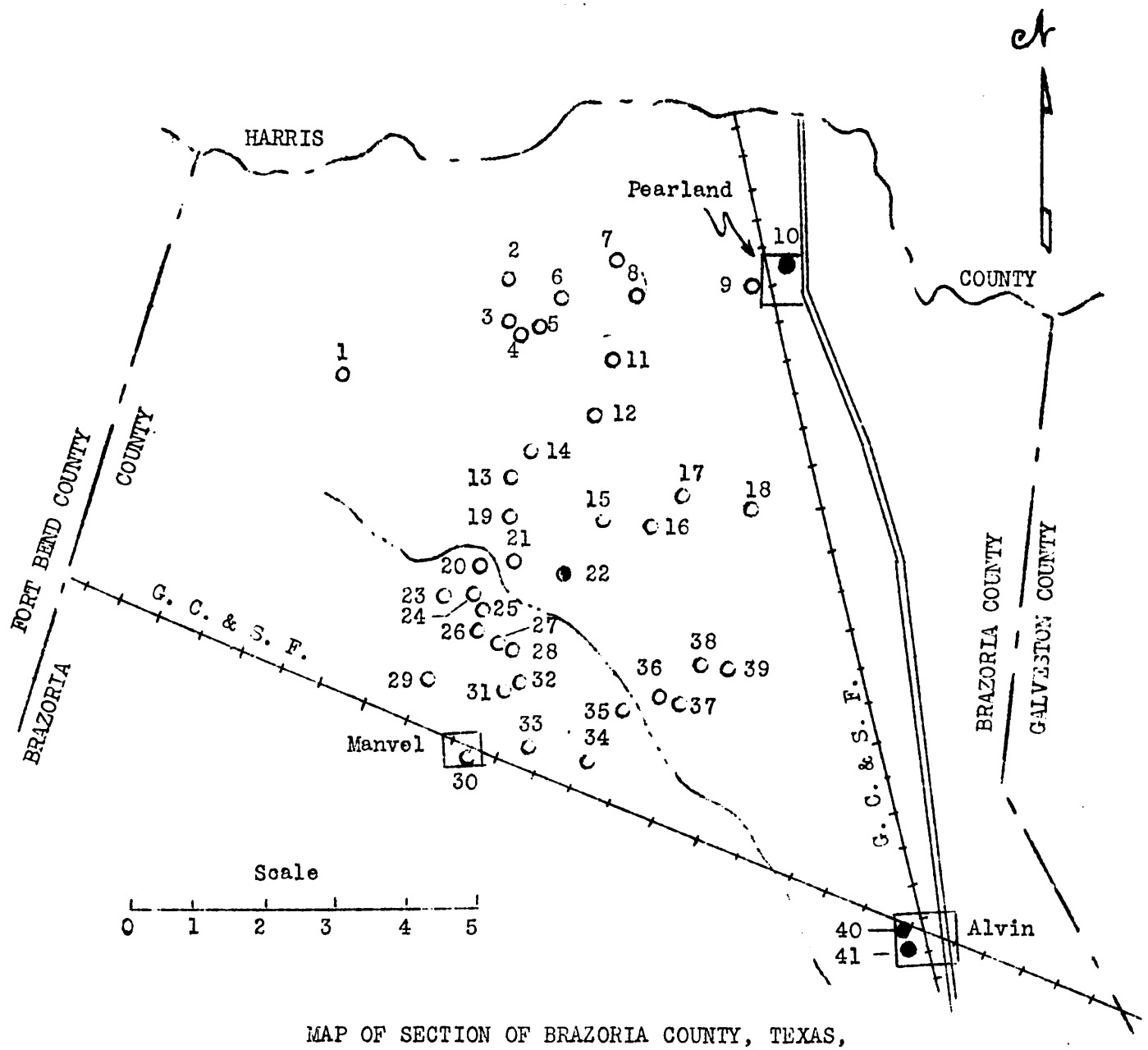
	Thickness (feet)	Depth (feet)
Driller's log of well 10		
Gulf Coast and Santa Fe Railroad, owners		
Soil	12	12
Fine sand	8	20
Yellow clay	60	80
Fine sand	12	92
Red clay	70	162
Blue clay	40	202
Fine sand	4	206
Blue clay	130	336
Joint clay	20	356
Coarse sand	15	371
Blue clay	90	461
Artesian sand	46	507
Driller's log of well 76		
J. A. Fite, owner.		
Clay	115	115
Sand	29	144
Clay	217	361
Coarse sand	65	426
Clay	4	430
Sand	33	463
Clay	43	506
Good sand	55	561
Clay	156	717
Sand	22	739
Gumbo	72	811
Sand	11	822
Gumbo	36	858
Good sand	46	904
Gumbo	2	906
Driller's log of well 82		
J. A. Fite, owner.		
Rotary to ground	4	4
Clay	25	29
Sand	2	31
Clay	12	43
Sand	74	117
Clay	122	239
Sand	77	316
Clay	11	327
Gray water sand	113	440
Gumbo	16	456
Coarse sand	30	486
Gumbo	12	498
Sand	14	512
Gumbo	16	528
Well deepened in February, 1928		
Rotary to bottom of 10-inch well	--	529
Clay	34	563
Sand	35	598
Clay	6	604

	Thickness (feet)	Depth (feet)
Driller's log of well 82--Continued		
Sand	14	618
Shale	19	637
Gumbo	58	695
Sand	8	703
Gumbo	58	761
Sand	23	784
Gumbo	22	806
Sand	36	842
Gumbo	22	864
Sand	19	883
Gumbo	3	886
Sand	33	919
Gumbo	4	923
Driller's log of well 102		
Zionville Oil Company's F. W. Sparks Number 1.		
Surface soil	10	10
Red clay	50	60
Sand and gravel	140	200
Gumbo	10	210
Gravel	15	225
Blue shale	65	290
Sandy gumbo	100	390
Blue shale and gumbo	25	415
Sandy gumbo	10	425
Gumbo	60	485
Red gumbo	43	528
Lime rock	12	540
Gumbo and lime	50	590
Sandy gumbo	33	623
Sandy blue shale	33	656
Gumbo and lime	59	715
Artesian water sand	60	775
Gumbo and lime	20	795
Blue sandy lime	55	850
Brown shale	24	874
Hard lime	14	888
Gumbo and boulders	20	908
Red gumbo	10	918
Lime rock	6	924
Gumbo	5	929
Water sand	136	1065
Gumbo	8	1073
Sand and boulders	7	1080
Gumbo and boulders	8	1088
Hard sand	27	1115
Sandy gumbo	29	1144
Rock	6	1150
Sand and boulders	56	1206
Hard sandy lime	31	1237
Gumbo	6	1243
Sand	11	1254

(Continued on next page)

	Thickness (feet)	Depth (feet)
Driller's log of well 102--Continued		
Hard sand and boulders	31	1285
Gumbo and boulders	30	1315
Sand and boulders	33	1348
Gumbo	3	1351
Sandy lime and boulders	44	1395
Gumbo	6	1401
Salty sand	19	1420
Gumbo	18	1438
TOTAL DEPTH		3160
Driller's log of well 104		
Rycade Amerada's Rapid City Development Company Number 1.		
Surface clay	23	23
Soft water sand	28	51
Clay	244	295
Red gumbo	30	325
Sand and gravel	27	352
Hard gumbo	125	477
Sand	45	522
Gumbo	78	600
Sand and boulders	37	637
Gumbo	15	652
Sand and boulders	41	693
Gumbo	58	751
Hard packed sand	150	901
Gumbo	59	960
Sand and boulders	34	994
Tough gumbo	28	1022
Hard sand	12	1034
Gumbo	160	1194
Sand	3	1197
Gummy shale	46	1243
Sand	3	1246
Gumbo	17	1263
TOTAL DEPTH		6284
Driller's log of well 105		
The Texas Company's Sweet Number 1.		
Soft brown soil	1	1
Stiff yellow clay and lime	13	14
Shell, sand and clay with salt water	12	26
Blue clay and shell	68	94
Gray sand, shell and gravel with fresh water	32	126
Soft blue gumbo	81	207
Sand, gravel and clay	34	241
Brown and blue gumbo	140	381
Soft gumbo and shell	88	469
Blue-gray-brown gumbo	258	727
Blue shale and shell	24	751
Tough gumbo	11	762
Sand, shell and sticky shale	129	891
Blue sandy shale	56	947
Shale, sand, gravel and shell	77	1024
Gray sand and shell	41	1065
Shale	77	1142
Brown sandy gumbo	67	1209
Shale, sand and gravel	38	1247
Gumbo	14	1261
Blue-gray sandy shale	126	1387
Driller's log of well 106		
The Texas Company's Cochran and McClure Number 1.		
Brown clay	20	20
White sand	7	27
Brown clay	33	60
Dark sand	15	75
Dark clay	55	130
White sand	16	146
Brown clay	26	172
Sand	14	186
Clay	59	245
White and black sand	21	266
Red clay	119	385
Sand and boulders	33	418
Pink gumbo	22	440
Chalk rock	72	512
Sand and boulders	144	656
Blue gumbo	49	705
Sticky shale	23	728
Packed sand	36	764
Blue gumbo	154	918
Packed sand	22	940
Brown clay and gumbo	176	1116
Red sand	21	1137
Pink gumbo	34	1171
Blue gumbo and shale	177	1348
TOTAL DEPTH		2335
Driller's log of well 122		
Missouri Pacific Lines, owner.		
Sub-soil	16	16
Red clay	24	40
Fine sand	30	70
Blue clay	40	110
Sand and shell	25	135
Blue clay and shell	42	177
Sand	8	185
Gumbo	59	244
Coarse sand	23	267


MAP OF BRAZORIA COUNTY, TEXAS, SHOWING LOCATIONS OF WATER WELLS
LEGEND
Ordinary drilled or dug well
Well with pumping plant
Flowing well
Well drilled to test for oil or gas
See enlarged section for numbers of these wells.
Pearland
FORT BEND CO.
GALVESTON
Manvel
Alvin
Sandy Point
Chocolate
COUNTY
FT. BEND CO.
Liverpool
Mustang Bayou
Bayou
Chenango
Danbury
Austin
BRAZORIA CO.
Anchor
ST. L. B. & M.
ANGLETON
I. & G. N.
BRAZOS
Oyster
Bayou
BRAZORIA CO.
H. & B. V.
Creek
RIVER
GULF OF MEXICO
Velasco
Freeport
Scale
0 1 2 3 4 5 Mi.
O.G.K 1-27-39.
40
41
70
71
72
73
74
75
76
77
78
79
80
81
82
91
92
93
94
101
102
103
104
105
106
121
122
123
124



MAP OF SECTION OF BRAZORIA COUNTY, TEXAS,
SHOWING LOCATION OF WATER WELLS

LEGEND

o Ordinary drilled or dug well

● Well with pumping plant

O.G.K. 1-27-39.

Please do not destroy or throw away this publication. If you have no further use for it, write to the State Board of Water Engineers, Austin, requesting return postage.

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TEXAS

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STATE BOARD OF WATER ENGINEERS
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J. W. Pritchett, Member

* * *

FORT BEND COUNTY, TEXAS
(East of the Brazos River)

Records of wells, drillers' logs, water analyses, and map showing location of wells

* * *

by

Penn Livingston and Samuel F. Turner

Mimeographed by
WORKS PROGRESS ADMINISTRATION
PROJECT 10443

* * *

Prepared in cooperation with the United States Department of the Interior, Geological Survey.

* * *

Austin, Texas
April 10, 1939

FORT BEND COUNTY, TEXAS
(East of the Brazos River)

* * *

Introduction

by
Samuel F. Turner
Associate Hydraulic Engineer
United States Department of the Interior
Geological Survey

This pamphlet contains records of wells in the eastern part of Fort Bend County, Texas, with tables of well logs, well water analyses, and a map which shows all the wells described, each well having a number on the map corresponding to the number assigned to it in the well tables.

The records were obtained in the course of an investigation which was undertaken as part of a statewide study of the underground water resources of Texas. The investigation was made by the State Board of Water Engineers, in cooperation with the U. S. Department of the Interior, Geological Survey. The field work was carried out by Penn Livingston and Samuel F. Turner of the Geological Survey. The analyses were made in the laboratory of the Geological Survey at Washington by Margaret D. Foster. The field tests were made in Houston by Samuel F. Turner.

The well records serve as a guide to land owners and well drillers who may need information regarding wells and pumping plants, the depth to ground water in different parts of the county and the quantity and quality of water yielded by wells. They afford a basis for the more intensive investigation which is now being made.

These records were typed and mimeographed by employees of Works Progress Administration Project 10443, which is sponsored by the Texas Board of Water Engineers in cooperation with the Geological Survey.

Records of wells in Fort Bend County, Texas
(All wells are drilled unless otherwise noted in "Remarks" column.)
(Principal water-bearing beds are sand or gravel.)

No.	Distance from Katy	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
1	11 miles southwest	Pecan Acres, Inc.	Layne-Texas Co.	1913	205	18	53 135	47 68
d/ 2	11½ miles southwest	S. A. & A. P. Ry.	--	--	900	--	--	--
3	13 miles southwest	J. H. Hinsch	Layne-Texas Co.	1909	371	24	248 327	43 31
4	14 miles southwest	A. F. Sager	do.	1909	361	24	110 282 308	161 25 43
e/ 5	8 miles southwest	Fulshear Gin Co.	Jean Davis	--	110±	4	100	10
6	6 miles southwest	P. V. Cook	Bud Southard	1930	596	16	--	--
7	5 miles southwest	C. C. Cardiff	Layne-Texas Co.	1925	653	24	115 282 339 570	85 33 70 65
8	3 miles southwest	Parker Est.	--	1900?	500±	--	--	--
d/ 9 e/	2⅛ miles southwest	Thomas Caraway	Bud Southard	1925	174	26	--	--
10	2 miles southwest	W. E. Denny	--	1900?	160±	72	--	--
e/ 11	1¾ miles south southwest	P. V. Cook	Bud Southard	1929	170±	28	--	--
12	½ mile west southwest	Stockdick Est.	--	--	--	18	--	--
e/ 13	1 mile southeast	L. G. Tucker	Layne-Texas Co.	1909	180	24	100 130	25 45
14	2 miles south	W. H. Weller	do.	1908	206	24	82 110	18 55
e/ 15	3¼ miles south southwest	P. V. Cook	I. W. Lawson	--	172	24	--	--
e/ 16	4 miles south southwest	C. C. Cardiff	C. R. Jensen	1925	337	24	115 184 214	62 20 57
17	5 miles south	H. L. Gordon	I. W. Lawson	1926	586	24	287 --	29 --
e/ 18	5¾ miles south	John Cope	do.	1928	723	26	132 197 343 683	58 15 25 30

a/ Bench mark is point from which water-level measurement was made and was usually top of casing, top of pump base, or top of water pipe clamp.

b/ T, turbine; J, jack; A, air; E, electric; G, gasoline engine (includes tractors); F, fuel oil engines; W, windmill; H, hand.

Records obtained by Penn Livingston and Samuel F. Turner
(See "Table of field tests" for tests of hardness, chloride and sulphate.)

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
1	1	28.6	Sept. 11, 1931	W	D,S	Well formerly used to irrigate rice. Casing; 104 feet of 18-inch and 101 feet of 12-inch. Screens set at 59 to 103 and
2	--	--	--	--	RR	Railroad well at Simonton. 145 to 202 feet.
3	--	65f/	1909	None	N	Reported yield 900 gallons a minute. f/
4	--	56f/	1909	None	N	Reported yield 1,100 gallons a minute.f/ Casing; 77 feet of 24-inch and 283 feet of 9 5/8-inch. Screens set at 175 to 251, 270 to 291, and 310 to 348 feet.
5	--	--	--	J,E	Ind	Water in coarse gravel.
6	--	--	--	T,E, 50	I	Yield 1,110 gallons a minute. July 27, 1932.
7	2	64.8	Aug. 25, 1931	T,E, 25	I	Yield 410 gallons a minute, July 27, 1932. Casing; 90 feet of 24-inch, 108 feet of 12-inch, and 430 feet of 10-inch. Screens set at 137 to 198, 284 to 303, 344 to 365
8	0	48.0	Mar. 18, 1933	T,G, --	S	Well formerly used to irrigate rice. and 583 to 624 feet.
9	--	--	--	T,E, 30	D,S,I	Temperature 72° F. Yield 910 gallons a minute, August 12, 1932.
10	0	42.4	Sept.29, 1932	None	N	Has two 8-inch wells drilled in bottom of 32-foot brick pit.
11	6	52.5	Mar. 18, 1933	T,E, --	I	Estimated yield 1,300 gallons a minute, June 11, 1931. Casing; 70 feet of 28-
12	½	25.0	Sept.11, 1932	None	N	inch and 12-inch to bottom.
13	--	--	--	T,E, 30	I	Yield 820 gallons a minute, Sept. 20, 1932. Casing; 74 feet of 24-inch, and 109 feet of 11 5/8-inch. Screen set at
14	--	--	--	None	N	Well abandoned and filled. Had 50 feet of 24-inch casing and 121 feet of 11 5/8-inch casing. Screens set at 85 to 97, and 116 to 171 102 to 178 feet.
15	½	52.3	Mar. 24, 1931	T,E, 40	I	Temperature 72° F. Yield 780 gallons a minute, Sept. 12, 1932. feet.
16	½	53.7	Mar. 3, 1931	T,E, 60	I	Yield 1,250 gallons a minute, August 20, 1932. Temperature 73° F. Casing; 98 feet of 24-inch, 14 feet of 18-inch, 159 feet
17	--	--	--	T,E, 75	I	Yield 1,330 gallons a minute, August 19, 1932. Casing; 100 feet of 24-inch, 140 feet of of 12-inch and 66 feet of 6-inch.
18	½	49.2	Mar. 24, 1931	T,E, 125	I	Yield 1,800 gallons a minute, August 19, 1932. Temperature 73° F. Casing; 132 feet of 26-inch, 83 feet of 12-inch and 508 feet 12-inch and 346 feet of 8-inch. of 8-inch.

c/ P, Public; I, irrigation; Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used.
d/ For analysis of water see under well number in table of analyses.
e/ See "Records of field tests" for partial analysis of water from this well.
f/ Reported by driller.

Records of wells in Fort Bend County--Continued

No.	Distance from Katy	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
c/ 19	4¾ miles south	R. Robertson	I. W. Lawson	1926	545	24	--	--
20	5¾ miles south southeast	L. Pauli	do.	1913	250	24	--	--
e/ 21	6 miles south	-- McDonald	--	Old	--	36	--	--
e/ 22	8 miles south	Mason Briscoe	Jean Davis	1927	137	2	--	--
d/ 23 e/	9 miles south	G. Phillips	--	1919	70	3	--	--
24	10½ miles south	Sugarland Ind.	J. Hobbs	1930	138	2	125	13
25	do.	do.	do.	1930	246	2	170	76
e/ 26	10 miles southeast	C. Pillot	Southern well Drilling Co.	1923	657	26	--	--
d/ 27	9½ miles southeast	Southern Pacific Ry.	--	--	200	10	--	--
e/ 28	do.	-- Thomoson	H. W. Weller	--	84	--	--	--

No.	Distance from Sugarland	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
d/ 51	10½ miles west southwest	Southern Pacific Ry.	Layne-Texas Co.	1913	351	16	282	69
52	1½ miles west	Central State farm	J. Hobbs	1930	257	2	235	22
53	At Sugarland	Sugarland Ind.	Layne-Texas Co.	1921	1,049	8	8 144	91 110
e/ 54	do.	do.	do.	1920	1,606	24	1,505	79
55	do.	do.	do.	1922	604	16	291 425 497	61 35 30
56	do.	do.	J. Hobbs	1916	715	16	531 571 499	34 30 83
57	½ mile east southeast	do.	do.	1931	258	2	583 648	56 61
58	3½ miles southeast	do.	do.	1931	353	2	234 296	24 57
59	do.	do.	do.	1931	160	2	151	9

a/ Bench mark is point from which water-level measurement was made and was usually top of casing, top of pump base, or top of water pipe clamp.

b/ T, turbine; J, jack; A, air; E, electric; G, gasoline engine (includes tractors); F, fuel oil engines; W, windmill; H, hand.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
19	0	34.5	Mar. 24, 1931	T,E, 75	I	Temperature 73° F. Casing; 100 feet of 24-inch, also 10 and 6-inch.
20	3½	48.8	June 11, 1931	T,E, 30	I	Also 10-inch casing.
21	½	39.9	Mar. 24, 1931	T,E, 40	I	Temperature 72° F.
22	--	--	--	J,W,E	D,S	¾ mile northeast of Foster.
23	--	--	--	J,W	D,S	At Foster.
24	--	27f/	1930	J,H	D,S	1½ miles southwest of Foster. f/
25	--	27f/	1930	J,H	D	1½ miles southwest of Foster.
26	--	--	--	T,F, 100	D,S,I	Casing; 82 feet of 26-inch to bottom. 220 feet of screen.
27	--	--	--	--	RR	At Clodine.
28	½	26.0	Sept. 3, 1931	J,H	D,S	Do.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
51	--	32f/	1913	A,F, 50	RR	At Rosenberg. Casing; 351 feet of 16-inch. Screened at 281 to 341 feet. Reported yield, 400 gallons a minute in 1913. f/
52	--	19.5 f/	Oct. 23, 1930	J,-	D,S	
53	--	--	--	T,E, 125	Ind	Casing; 737 feet of 8-inch. Screens set at 5 to 84 and 167 to 249 feet.
54	--	2f/	1920	T,E, 100	D	Casing; 92 feet of 24-inch, 1,400 feet of 10-inch and 61 feet of 8-inch screen.
55	--	--	--	T,E, 50	Ind	Casing; 88 feet of 16-inch, and 522 feet of 8-inch. Screens set at 293 to 353, 439 to 460, 505 to 527, 543 to 565 and 578 to 600 feet.
56	--	--	--	None	N	Casing; 93 feet of 16-inch, 501 feet of 8-inch and 147 feet of 6-inch. Screens set at 502 to 581, and 609 to 712 feet.
57	--	17f/	July 16, 1931	J,H	D,S	
58	--	13f/	July 9, 1931	J,H	D,S	
59	--	16f/	June 27, 1931	J,H	D,S	

c/ P, public; I, irrigation; Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used.

d/ For analysis of water see under well number in table of analyses.

e/ See "Records of field tests" for partial analysis of water from this well.

f/ Reported by driller.

Records of wells in Fort Bend County--Continued

No.	Distance from Sugarland	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
60	3¾ miles east	Captain Brooks	Layne-Texas Co.	1927	273	12	159 241	34 32
61	6 miles east	Jim Goodwin	J. Hobbs	--	298	2	278	20
e/ 62	do.	E. R. Robinson	-- Patterson	--	43	2	--	--
e/ 63	6½ miles east	C. Bigby	J. W. Jackson	1931	320	6	--	--
64	do.	Balke Elec. Co.	Layne-Texas Co.	1927	297	6	260	37
d/ 70	8½ miles east	State of Texas	--	1921	240	4	--	--
d/ 71	8 miles east southeast	Sinclair-Prairie Oil Co.	--	1931	285	6	--	--
d/ 72	do.	R. C. Duff	--	1922	60±	2½	--	--
d/ 73	do.	Walter Adams	Ruse Patterson	1923	70±	2	--	--
d/ 74	9 miles east southeast	State of Texas	--	1930	304	5	--	--
d/ 75	10 miles east southeast	Gulf Pipe Line Co.	--	1920	800±	6	--	--
e/ 90	12 miles southeast	G. C. & S. F. Ry.	Layne-Texas Co.	1925	509	10	104 237 460	27 -- 46
91	13 miles southeast	House Est.	--	--	1,300±	--	--	--
92	do.	do.	--	--	1,300±	--	--	--

a/ Bench mark is point from which water-level measurement was made and was usually top of casing, top of pump base, or top of water pipe clamp.

b/ T, turbine; J, jack; A, air; E, electric; G, gasoline engine (includes tractors); F, fuel oil engines; W, windmill; H, hand.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
60	--	18.5 f/	July 7, 1927	T,-	N	Casing; 110 feet of 12-inch and 174 feet of 8-inch. Screens set at 159 to 192, and 247 to 269 feet. Reported yield, 225 gallons a minute, July 7, 1927.f/
61	--	--	--	J,H	D	12 feet of 2-inch screen set at bottom. ½ mile southeast of Missouri City.
62	1	17.0	Sept. 4, 1931	J,E	D,S	At Missouri City.
63	--	--	--	T,E, 15	Ind	Well used to supply water to lake at Loma Linda.
64	--	--	--	T,E, 1/3	D	Casing; 67 feet of 6-inch and 228 feet of 4-inch. Screen set at 274 to 296 feet.
70	--	--	--	A,E, --	D,S	Three miles east-southeast of Missouri City. Prison Camp No. 2.
71	--	--	--	J,-	D,S, Ind	Three miles southeast of Missouri City.
72	--	--	--	J,H	S	Do.
73	--	--	--	J,H	D,S	Do.
74	--	--	--	J,E, 10	D,S	Four miles southeast of Missouri City. Prison Camp No. 1.
75	--	--	--	A,-	D,S	Five miles southeast of Missouri City.
90	--	18f/	1925	J,F, --	RR,D	At Duke. Casing; 271 feet of 10-inch. Screens set at 109 to 130 and 232 to 271 feet. Water from 460-feet stratum was not good for boilers.
91	0	10.3	Apr. 10, 1931	None	N	Formerly used to supply sugar mill.
92	0	10.5	do.	None	N	Do.

c/ P, public; I, irrigation; Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used.

d/ For analysis of water see under well number in table of analyses.

e/ See "Records of field tests" for partial analysis of water from this well.

f/ Reported by driller.

Records of field tests of samples from wells in Fort Bend County, Texas (Analyzed by Samuel F. Turner. Parts per million. For records of wells see corresponding numbers in well tables.)

Well No.	Owner	Date of collection	Depth of well (ft.)	Hardness as $CaCO_3$ a/	Chloride (Cl)	Sulphate (SO_4) b/
5	Fulshear Gin Co.	-	110±	280	110	5
9	Thomas Caraway	Mar. 18, 1933	174	200	80	3
11	P. V. Cook	do.	170±	200	85	5
13	L. G. Tucker	-	180	220	60	-
15	P. V. Cook	Mar. 24, 1931	172	200	85	5
16	C. C. Cardiff	Mar. 3, 1931	337	190	85	5
18	John Copo	Mar. 24, 1931	723	200	95	10
19	R. Robertson	do.	545	190	60	10
21	-- McDonald	do.	-	160	60	5
22	Mason Briscoe	-	137	250	100	15
23	G. Phillips	-	70	400	360	10
26	C. Pillot	-	657	210	70	5
28	-- Thompson	Sept. 3, 1931	84	210	95	5
54	Sugarland Ind.	-	1,606	80	-	6
62	E. R. Robinson	Sept. 4, 1931	43	230	70	5
63	C. Bigby	-	320	230	95	5
90	G. C. & S. F. R.R.	-	509	270	60	15

a/ Hardness as calcium carbonate by the soap method.
b/ Sulphate by turbidity method and may be as much as 25 per cent in error.

Analyses of water from wells in Fort Bend County, Texas

Well No.	Owner	Date of collection	Depth of well (ft.)	Total dissolved solids (c lc.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)
2	S. A. & A. P. R.R.	May 14, 1931	900	-	14	2/2.6	47	4.9
9	Thomas Caraway	Aug. 8, 1933	174	317	-	0.04	74	8.7
23	G. Phillips	Aug. 7, 1933	70	-	-	-	-	-
27	S. P. R.R.	May 14, 1931	200	-	20	2/3.4	77	6.5
51	do.	May 5, 1931	351	541	15	2/1.5	85	11
70	State of Texas	Aug. 16, 1933	240	340	-	0.02	56	17
71	Sinclair Prairie Oil Co.	Aug. 15, 1933	285	328	-	0.08	44	11
72	R. C. Duff	do.	60	-	-	-	-	-
73	Walter Adams	do.	70	-	-	-	-	-
74	State of Texas	do.	304	775	-	0.04	9.3	2.9
75	Gulf Pipe Line Co.	do.	800	-	-	-	-	-

1/ Sum of constituents reported.

(Parts per million. Well numbers correspond to numbers in table of records of wells.)

Well No.	Sodium and Potassium (Na-K) (calc.)	Bicarbonate (HCO_3)	Sulphate (SO_4)	Chloride (Cl)	Nitrate	Total hardness as $CaCO_3$	Analyst
2	-	222	-	38	0.23	138	C. S. Wilson
9	39	262	3.8	62	0.2	221	Margaret D. Foster
23	-	360	11	242	6.0	402	Do.
27	-	294	-	50	0.23	219	C. S. Wilson
51	103	292	19	160	Trace	258	Do.
70	55	279	13	62	0	210	Margaret D. Foster
71	72	277	15	49	0.1	155	Do.
72	-	552	15	120	1.1	222	Do.
73	-	422	16	48	0	312	Do.
74	302	378	17	257	0.53	35	Do.
75	-	366	24	248	0.3	81	Do.

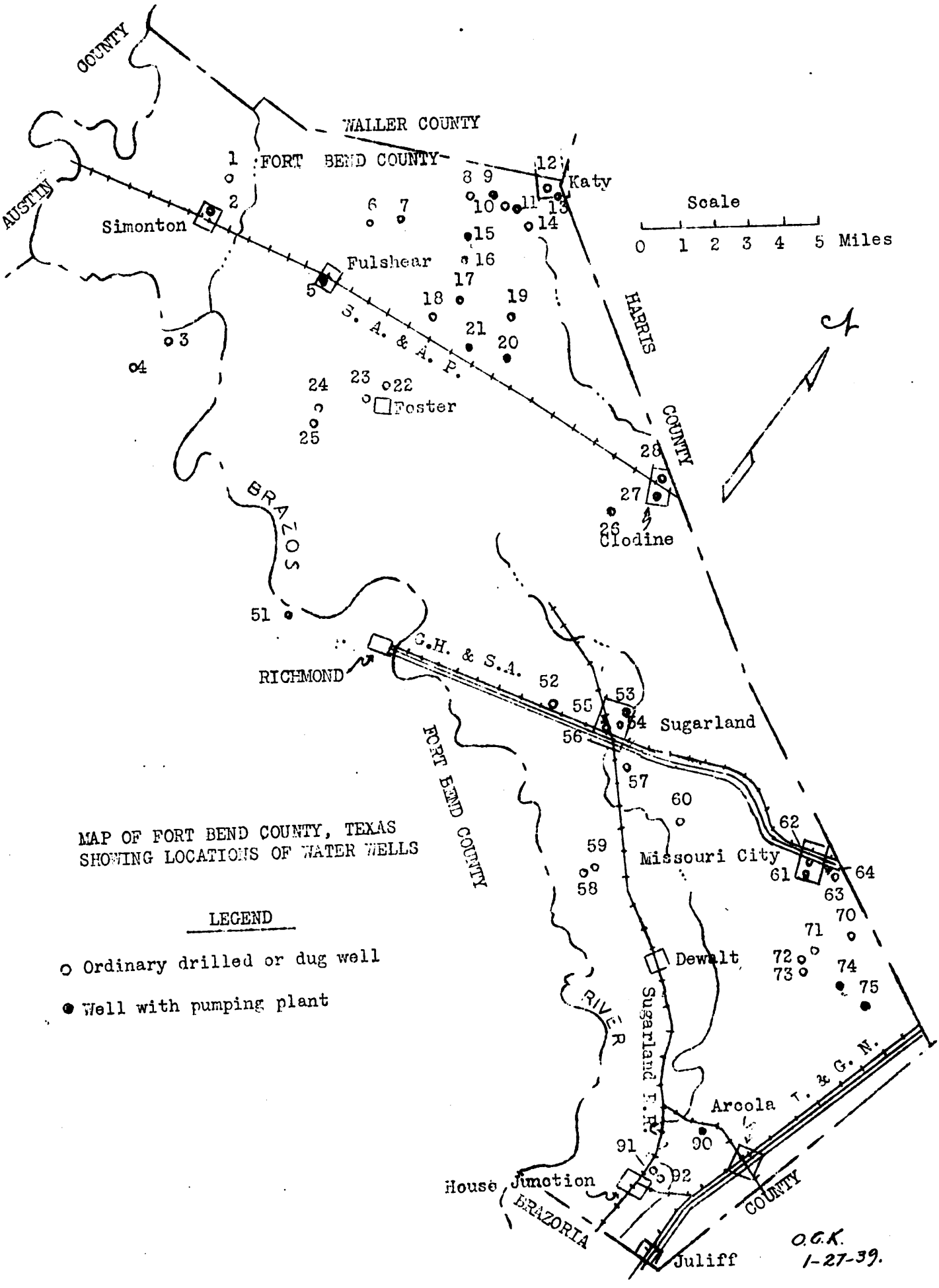
2/ Iron and aluminum oxides.

	Thickness (feet)	Depth (feet)
Driller's log of well 1		
Pecan Acres, Inc., owner.		
Clay	43	43
Fine sand	10	53
Coarse sand	47	100
Clay	12	112
Rock	1	113
Fine sand	4	117
Rock	1	118
Fine sand	3	121
Rock	1	122
Clay	13	135
Medium coarse sand	68	203
Gumbo	2	205
Driller's log of well 3		
J. H. Hinsch, owner.		
Clay	52	52
Sand	24	76
Caving clay	44	120
Fine sand	122	242
Clay and gravel	6	248
Gravel	21	269
Sand	22	291
Clay	3	294
Sand	4	298
Sand and rock	16	314
Gravel and clay	13	327
Gravel	20	347
Sand	11	358
Clay and gumbo	13	371
Driller's log of well 7		
C. C. Cardill, owner.		
Surface	3	3
Clay	42	45
Sand	65	110
Clay	5	115
Sand	60	175
Sand and gravel	25	200
Rock	3	203
Clay	14	217
Sand with streaks of rock	55	272
Rock	10	282
Coarse sand	33	315
Fine sand	16	331
Clay	8	339
Sand	70	409
Clay	10	419
Rock	1	420
Hard packed sand	18	438
Rock	2	440
Sand	8	448
Clay	92	540
Rock	2	542
Clay	18	560
Sand	10	570
Sand and gravel	65	635
Clay	18	653
Driller's log of well 13		
L. G. Tucker, owner.		
Soil	3	3
Clay	53	56
Fine sand	14	70
Clay	30	100
Fine sand	15	115
Coarse sand	10	125
Soft rock	5	130
Gravel	45	175
Clay	5	180
Driller's log of well 51		
Southern Pacific Railway, owner.		
Red clay	30	30
Quick sand	9	39
Red clay	20	59
Red sand	30	89
Sand rock	4	93
Coarse red sand	22	115
Red clay	46	161
Coarse sand and gravel	44	205
Blue gumbo	37	242
Medium fine sand	40	282
Coarse sand	40	322
Coarse sand and gravel	29	351
Driller's log of well 53		
Sugarland Industries, owner.		
Artificial fill	8	8
Sand	12	20
Soft clay	3	23
Sand	27	50
Packed sand	4	54
Sand	45	99
Packed sand	6	105
Sand	32	137
Clay	7	144
Sand	40	184
Clay	21	205
Sand	49	254
Clay	3	257
Sand	28	285
Gumbo	15	300
Sand	75	375
Clay	15	390
Sand	13	403
Clay	10	413
Sand	46	459
Clay	5	464

(Continued on next page)

	Thickness (feet)	Depth (feet)
Driller's log of well 53--Continued		
Sand	12	476
Clay	9	485
Sand	83	568
Clay	9	577
Sand	27	604
Gumbo	17	621
Sand and gravel	16	637
Rock	1	638
Sand	9	647
Clay	5	652
Sand	81	733
Tough gumbo	6	739
Soft clay	22	761
Gumbo	11	772
Clay	6	778
(bottom of well in 1931)		
Gumbo and boulders	5	783
Gumbo	39	822
Clay and boulders	8	830
Rock	2	832
Clay and boulders	13	845
Rock	2	847
Clay and boulders	17	864
Gumbo and boulders	2	866
Gumbo	19	885
Sand rock	2	887
Sand	4	891
Rock	3	894
Sand with hard layers	16	910
Yellow clay	6	916
Sand with hard layers	35	951
Clay and boulder	2	953
Clay	25	978
Sand rock	2	980
Clay and boulder	12	992
Sand and gravel	42	1034
Clay	15	1049
Driller's log of well 64		
Baltic Electric Company, owner.		
Clay	15	15
Sand	9	24
Clay	14	38
Sand	12	50
Limestone	12	62
Clay	98	160
Shale	20	180
Clay	25	205
Sand	7	212
Clay	48	260
Sand	37	297

	Thickness (feet)	Depth (feet)
Driller's log of well 90		
G. C. & S. F. Ry, owner.		
Black clay	6	6
Yellow clay	4	10
Red sandy clay	2	12
Red clay	18	30
Fine red sand	12	42
Fine yellow sand	33	75
Coarse sand	3	78
White clay	6	84
Fine red sand	20	104
Red sand, water	27	131
Clay	5	136
Red sandy clay	11	147
Red clay	9	156
Sandy clay	6	162
Lime rock	2	164
Red clay	23	187
Hard black shale	13	200
Hard pack sand	38	238
Sandstone	1	239
Hard pack sand water	34	273
Hard shale	19	292
Soft shale	16	308
Blue clay	16	324
Black shale	10	334
Pack sand	6	340
Tough blue clay	14	354
Soft clay	3	357
Blue clay	8	365
Hard fine sand	5	370
Soft clay	4	374
Gumbo	34	408
Sandy shale	20	428
Gumbo	32	460
Coarse sand	26	486
Hard sand	2	488
Coarse sand	18	506
Clay	3	509


COUNTY
WALLER COUNTY
FORT BEND COUNTY
AUSTIN
Simonton
Fulshear
Katy
Scale
0 1 2 3 4 5 Miles
S. A. & A. P.
HARRIS
COUNTY
Foster
Clodine
BRAZOS
RICHMOND
G.H. & S.A.
Sugarland
FORT BEND COUNTY
Missouri City
Dewalt
RIVER
Sugarland R.R.
Arcola
T. & G. N.
House Junction
BRAZORIA
COUNTY
Juliff
MAP OF FORT BEND COUNTY, TEXAS
SHOWING LOCATIONS OF WATER WELLS
LEGEND
Ordinary drilled or dug well
Well with pumping plant
O.G.K.
1-27-39.

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GALVESTON COUNTY, TEXAS

Records of wells, drillers' logs, water analyses, and map showing location of wells

* * *

by

Penn Livingston and Samuel F. Turner

Mimeographed by
WORKS PROGRESS ADMINISTRATION
PROJECT 10443

* * *

Prepared in cooperation with the United States Department of the Interior, Geological Survey

* * *

Austin, Texas
April 10, 1939

GALVESTON COUNTY, TEXAS

* * *

Introduction

by
Samuel F. Turner
Associate Hydraulic Engineer
United States Department of the Interior
Geological Survey

This pamphlet contains records of wells in Galveston County, Texas, with tables of well logs, well water analyses, and a map which shows all the wells described, each well having a number on the map corresponding to the number assigned to it in the well tables.

The records were obtained in the course of an investigation which was undertaken as part of a statewide study of the underground water resources of Texas. The investigation was made by the State Board of Water Engineers, in cooperation with the U. S. Department of the Interior, Geological Survey. The field work was carried out by Penn Livingston and Samuel F. Turner of the Geological Survey. The analyses were made in the laboratory of the Geological Survey at Washington by Margaret D. Foster. The field tests were made in Houston by Samuel F. Turner.

The well records serve as a guide to land owners and well drillers who may need information regarding wells and pumping plants, the depth to ground water in different parts of the county and the quantity and quality of water yielded by wells. They afford a basis for the more intensive investigation which is now being made.

These records were typed, assembled, and mimeographed by employees of Works Progress Administration Project 10443, which is sponsored by the Texas Board of Water Engineers in cooperation with the Geological Survey.

Records of wells in Galveston County, Texas
(All wells are drilled unless otherwise noted in "Remarks" column.)
(Principal water-bearing beds are sand or gravel.)

No.	Distance from League City	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
e/ 1	8 miles west northwest	-- Garretson	Layne-Texas Co.	1915?	600	24	400	200
e/ 2	6 miles west northwest	J. R. Williams	--	--	600±	8	--	--
e/ 3	5¾ miles west	Mrs. Annette Voss	Layne-Texas Co.	1910	763	24	506 705	149 50
21	At League City	R. G. Strickland	Pat O'Day	1932	200	3	--	--
d/ 22 e/	do.	Ed Lemoine	Wm. Boeske	1933	23	4½	--	--
d/ 23	do.	Joe L. Taylor	--	Old	800±	4	--	--
24	½ mile south	H. A. Carter	--	1930	88	2	--	--
25	At League City	G. H. & H. R. R. shops	--	--	208	8	--	--
e/ 26	do.	do.	Layne-Texas Co.	1905	1,020	8	935	85
d/ 27 e/	do.	Parke Well	--	--	88	--	--	--
28	do.	G. H. &. H. R R.	--	--	560±	4	--	--
29	do.	Emil Schenk	Fred Standard	1910?	575	3	--	--
30	5 miles east northeast	W. T. Heuwerth	--	1930	584	2	--	--
31	5¼ miles east northeast	Freund's Place	--	--	700±	4	--	--
32	5 miles east northeast	City of Kemah	Gus Warniecke	1907	864	4	--	--
e/ 33	5½ miles east	McClintock Est.	do.	1903	622	4	590	--
34	do.	G. V. Tripplet	--	--	12	3	--	--
35	do.	J. O. Derrick	Charles Ellis	--	75	2½	--	--
61	6½ miles east	R. O. Albright	-- Paladino	1928	25	3	--	--

a/ Bench mark is point from which water level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.
b/ T, deep well turbine; A, airlift; J, jack or suction; F, artesian flow; E, electric; S, steam; O, fuel oil; G, gasoline engine or tractor; W, windmill; H, hand.
c/ P, public; I, irrigation; Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used.
d/ See analysis table for analysis of water from this well.

Records obtained by Penn Livingston and Samuel F. Turner
(See "Table of field tests" for tests of hardness, chloride and sulphate.)

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
1	½	39.0	Oct. 11, 1931	T,G, 60	N	Casing: 50 feet of 24-inch, and 9 5/8-inch to bottom. Screen set at 474 to 596 feet. Water level was 8 feet below surface when well was completed. f/
2	--	16.4	do.	None	N	At site of old fig plant. An analysis of water probably from this well was
3	0	33.0	do.	T,G, --	D,S,I	Casing: given by Singley in 1893. g/ 55 feet of 24-inch and 11 5/8-inch to bottom. Screens set at 550 to 648 and
21	--	--	--	J,E, ½	D,S	700 to 755 feet. See driller's log.
22	--	--	--	J,H	D	
23	--	--	--	J,E, ½	P,D,S	Well reported to have had a flow until 10 years ago. Difference in two analyses indicates that casing is now probably
24	½	20.4	Oct. 20, 1932	J,E, ¼	P,D,S	leaking at shallow depth.
25	-9½	4.1	Apr. 15, 1931	J,G, --	N	
26	3	14.9	do.	None	N	Casing: 944 feet of 8-inch and 76 feet of 8¼-inch screen. See driller's log.
27	--	--	--	--	--	See analysis Ceased flowing in 1929. of water made for G. H. & H. Railroad.
28	0	25.3	Apr. 15, 1931	None	N	Exact location of well not known.
29	--	--	--	A,-	P,D	Well ceased flowing about 1922.
30	--	--	--	--	P,D,S	Public supply for Kemah.
31	--	--	--	J,E, --	P,D	
32	--	--	--	J,H	P,D,S	Well ceased flowing about 1917.
33	0	23.1	Sept. 8, 1931	None	N	Reported flow of 25 gallons a minute about 1912. h/ Well ceased flowing
34	--	--	--	J,H	D,S	about 1915.
35	--	15.2	Sept. 8, 1931	J,H	D,S	No screen. Open end casing in very fine sand.
61	½	9.5	Aug. 4, 1931	J,H	D	

e/ No field tests made on water from this well.
f/ Reported by driller.
g/ Singley, J. A., Preliminary reports on the artesian wells of the Gulf Coastal slope. Geological Survey of Texas, 4th Annual report, pp. 97-105, 1893.
h/ Deussen, Alexander, Geology and underground water of the southeastern part of the Texas Coastal Plain: U.S. Geological Survey Water-Supply Paper 335, pp. 154-176, 191
i/ See page

Records of wells in Galveston County--Continued

No.	Distance from League City	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
d/ 62	6½ miles east	W. R. McClendon	Charles Ellis	1931	170	2½	152	18
63	7 miles east	G. C. Perkins	-- Martin	1924	540±	--	--	--
64	6½ miles east	A. N. Lockart	A. N. Lockart	1929	42	--	--	--
e/ 65	8 miles east	-- Moore	Charles Ellis	1930	215	2½	203	12
66	7½ miles east	-- Sellman	do.	1930	218	2½	196	22
67	do.	S. J. Helton	do.	1930	227	2½	201	26

No.	Distance from Alta Loma	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water bearing bed: Depth to top of bed (ft.)	Principal water bearing bed: Thickness (ft.)
e/ 81	10 miles northwest	A. D. Dyess	-- Dimmitt	1916	600±	6	--	--
82	6 miles west northwest	St. L. B. & M. RR.	L. Patterson	1926	642	8	632	10
e/ 83	do.	do.	Layne-Texas Co.	1906	650	6	622	21
84	5½ miles west northwest	Algoa School	Ed Metzler	1916	444	4	--	--
e/ 85	5 miles west northwest	Algoa Townsite Co.	Layne-Texas Co.	1907	1,362	8	453 617	45 60
d/101	8 miles north	H. E. Carter	--	--	200±	3	--	--
102	do.	John Saracco	--	1924?	94	4	--	--
d/103	do.	Tony Emito	--	--	20±	1	--	--
104	do.	George Saracco	George Saracco	1932	22	48	--	--
105	5 miles north	R. T. Newell	--	1915?	240	4	--	--
106	6 miles north	Hans Gouldman	--	1924?	1,100±	3	--	--
107	do.	Foster Hoskins	--	1925?	215	3	--	--
d/108	6½ miles north northeast	Dickinson Ice Co.	Layne-Texas Co.	1922	576	6	497 531	20 41

a/ Bench mark is point from which water level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

b/ T, deep well turbine; A, airlift; J, jack or suction; F, artesian flow; E, electric; S, steam; O, fuel oil; G, gasoline engine or tractor; W, windmill; H, hand.

c/ P, public; I, irrigation; Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used.

d/ See analysis table for analysis of water from this well.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
62	--	--	--	J,H	D	Screen set at 155 to 170 feet. First water sand at 85 to 110 feet not screened.
63	--	--	--	J,G, 15	P,D,S	Public supply for Clifton by the sea.
64	--	--	--	J,H	D,S	
65	--	--	--	A,G, 1½	D	
66	--	--	--	J,H	D	Set 10 feet of screen in bottom.
67	--	--	--	J,H	D	Set 20 feet of screen in bottom.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
81	1	33.9	Oct. 11, 1931	J,G	D,S,I	Formerly Gulf Coast Orchard well.
82	--	--	--	J,S	RR	Water level reported as 17 feet below surface in 1929. Screen set at 632 to 642 feet.
83	--	--	--	None	N	Casing, 621 feet of 6-inch and 21 feet of 6-inch screen.
84	--	--	--	J,H	P	At Algoa.
85	--	--	--	T	N	Casing, 705 feet of 8-inch. Screens set at 459 to 481 and 626 and 686 feet. See driller's log
101	--	--	--	J,G, 5	D,S,I	
102	2	13.8	Oct. 20, 1932	J,W	S	
103	--	--	--	J,H	S	
104	--	--	--	J,H	S	Dug well.
105	0	6.7	Oct. 20, 1932	J,G, 3	D,S	
106	--	+	--	F,J,E, 3	S	Used to supply swimming pool.
107	--	--	--	J,E, ¼	D,S	Well flows at times in fall.
108	--	--	--	A,O	D,Ind	Casing, 578 feet of 6-inch with screens set at 498 to 519 and 535 to 578 feet. Water level was 3 feet below surface in 1922.f/

c/ No field tests made on water from this well.
f/ Reported by driller.
g/ Singley, J. A., Preliminary reports on the artesian wells of the Gulf Coastal slope: Geological Survey of Texas, 4th Annual report, pp. 97-105, 1893.
h/ Deusson, Alexander, Geology and underground water of the southeastern part of the Texas Coastal Plain: U.S.Geological Survey Water-Supply Paper 335, pp.154-176, 1914.
i/ See page

Records of wells in Galveston County--Continued

No.	Distance from Alta Loma	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
e/109	6½ miles north northeast	Dickinson High School	--	--	230	3	--	--
e/110	do	Nichols Well	--	--	600	3	--	--
d/111 2/	do.	Dickinson Fig Plant	--	--	875	8	210	20
e/112	do.	G. H. & H. R. R.	Gus Warnecke	--	750	3	650 750	--
113	7 miles north northeast	E. Menotti	--	1925?	504	6	--	--
114	do.	J. H. Bland	--	1894	850±	4	--	--
e/115	6 miles northeast	J. W. Palmer	--	1925	526	4	475	50
116	do.	do.	--	1912?	65	4	--	--
e/117	do.	--	--	--	--	3	--	--
118	2½ miles west northwest	Texas Dairy League	--	--	85	3	--	--
119	1½ miles west northwest	Santa Fe School	--	1928	68	2	--	--

No.	Distance from Texas City	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
e/151	8 miles northwest	Pete Witik	Pat O'Day	--	90	4	--	--
e/152	do.	-- Beaty	do.	--	185	--	--	--
e/153	do.	C. O. Casteel	-- Burns	1913	478	2	--	--
e/154	do.	L. F. Bachman	Charles Ellis	--	180	2½	158	22
e/155	do.	G. B. Slate	do.	1931	170	2½	144	26
e/156	8 miles north northwest	D. C. Richards	D. C. Richards	1924	580±	2½	550	--
e/157	do.	do.	do.	1923	185	3	--	--

a/ Bench mark is point from which water level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

b/ T, deep well turbine; A, airlift: J, jack or suction; F, artesian flow; E, electric; S, steam; O, fuel oil; G, gasoline engine or tractor; W, windmill; H, hand.

c/ P, public; I, irrigation: Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used.

d/ See analysis table for analysis of water from this well.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
109	0	13.4	Apr. 15, 1931	None	N	At Dickinson.
110	--	--	--	--	--	An analysis of water from this well was given by Singley in 1893.g/ Exact location of well not known.
111	--	--	--	A	Ind	Original depth was 875 feet and 1,926 analysis is of water from this depth. Well was reworked and plugged at 230 feet and 1933 analysis is of water from 210 to 230 feet.
112	1	18.9	Apr. 15, 1931	J,H	N	Water level reported as +3 feet about 1912.h/
113	½	14.9	Oct. 20, 1932	A,G, 2	D,S	
114	1½	12.0	Apr. 15, 1931	J,G	D,S	Water level reported as +8 feet about 1912.h/ Ceased flowing in 1923.
115	4	19.4	Oct. 20, 1932	None	N	
116	0	9.7	do.	J,G, 2	D,S	
117	1	11.2	do.	None	N	
118	--	--	--	J,E, 2	Ind	At Arcadia.
119	--	--	--	J,E	P,D	At Santa Fe School.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
151	--	--	--	J,H	D,S	
152	--	--	--	A,G, 2½	D,S	
153	--	--	--	J,H	D,S	
154	--	--	--	A,G, 5	D,S,I	Twenty feet of screen set at bottom of well.
155	--	--	--	J,W	D,S	Twelve feet of screen set at bottom of well.
156	--	--	--	--	D,S	
157	--	--	--	--	D,S	

e/ No field tests made on water from this well.
f/ Reported by driller.
g/ Singley, J. A., Preliminary reports on the artesian wells of the Gulf Coastal slope Geological Survey of Texas, 4th Annual report, pp. 97-105, 1893.
h/ Deusson, Alexander, Geology and underground water of the southeastern part of the Texas Coastal Plain: U.S.Geological Survey Water-Supply Paper 335, pp.154-176,1914.
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Records of wells in Galveston County--Continued

No.	Distance from Texas City	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
e/158	8 miles north northwest	D. C. Richards	D. C. Richards	1930	185	8	165	20
159	7½ miles north northwest	Charles Ellis	Charles Ellis	1924	547	2½	523	24
e/160	do.	C. J. Blume	-- Martin	1923	557	4	523	25
e/161	do.	R. M. Griffith	Charles Ellis	1924	665	4	641	24
e/162	8 miles north northwest	Trinity Bay Farm	-- Martin	1924	665	4	--	--
e/163	7½ miles north northwest	Experiment Farm	--	1908	185	12	--	--
e/164	8 miles north	-- Hodges	Charles Ellis	1930	175	2½	155	20
e/165	7½ miles north	E. M. Biggers	do.	1929	225	2½	204	21
e/166	7 miles north	-- Keith	do.	1930	187	2½	175	12
167	do.	Public Well at San Leon	--	Old	600±	4	--	--
e/168	do.	-- Butcher	Charles Ellis	1930	165	2½	153	12
169	do.	T. W. Saunders	do.	1929	225	4	202	23
e/170	do.	--	--	Old	--	--	--	--
e/171	do.	Galveston County	--	Old	600±	--	--	--
e/172	do.	--	--	Old	600	4	--	--
e/173	do.	--	--	Old	600	4	--	--
174	do.	R. E. Breeding	Charles Ellis	1928	227	4	201	26
e/175	do.	San Leon Development	--	1919	3,562	8	--	--
176	6½ miles north	G. J. Fromm	Charles Ellis	1931	160	2½	142	18
e/181	7 miles northwest	O. A. Butterfield	-- Burns	1912	480	2	--	--
e/182	7½ miles northwest	M. J. Sass	Charles Ellis	1929	165	2½	140	25
e/183	do.	do.	Pat O'Day	1924	600	4	--	--
d/184 e/	7 miles northwest	Southern Pacific Ry.	--	--	600	6	--	--
d/185 e/	do.	do.	--	--	600	4	--	--
e/186	do.	Fig Preserving Plant	-- Martin	--	600±	4	--	--
e/187	do.	George Knight	-- Burns	1913	487	2	--	--

No.	Height of bench mark above (+) ground (ft.) a/	Water level		Pump and kind and amount of power b/	Use of water c/	Remarks
		Below bench mark (ft.)	Date of measurement			
158	--	--	--	A,G, 23	D,S,I	Twenty feet of screen set at bottom of well.
159	--	--	--	A,G, 20	D,S,I	Temperature 77° F: 20 feet of screen set at 527 to 547 feet.
160	--	--	--	A,G, 6	D,S,I	
161	--	--	--	A,G, 23	D,S,I	Well flowed when completed.
162	--	--	--	A,G, 6	D,S,I	
163	--	--	--	None	N	
164	--	--	--	J,E	D,S	Twelve feet of screen set at bottom of well.
165	--	--	--	A,G, 3	D,S,I	Twenty feet of screen set at bottom of well.
166	--	--	--	A,G, 3	D,S,I	Ten feet of screen set at bottom of well.
167	--	--	--	J,H	D,S,P	Reported flow of 70 gallons a minute in 1893.g/ Stopped flowing in 1919.
168	--	--	--	J,W	D,S	Twelve feet of screen set at bottom of well.
169	--	--	--	J,H	D,S	At San Loon well had slight flow when completed.
170	--	--	--	None	N	Unused well on old railroad fill. Flowed at one time.
171	--	--	--	None	N	Unused well in road, once flowed.
172	--	--	--	F	D,S	
173	--	--	--	--	--	
174	--	--	--	J,W	D,S	Drilled to 735 feet but could not develop well in stratum at 717 to 735 feet and present bottom of well is 227 feet.
175	--	--	--	--	--	Oil test.
176	--	--	--	J,W	D,S	Water level at 2 feet below surface when drilled.
181	--	--	--	J,H	D,S	Well ceased flowing in 1928.
182	--	--	--	J,H	D,S	Ten feet of screen set at bottom. Reported yield of 40 gallons a minute when completed.f/
183	--	--	--	A,G, 6	D,S,I	
184	--	--	--	A	RR	At San Loon Station. Flowed until 1928. Water level reported as 6 feet below ground in 1931.
185	--	--	--	A	RR	
186	--	--	--	J,E	Ind	
187	--	--	--	--	D,S	Flowed until summer of 1931.

Records of wells in Galveston County--Continued

No.	Distance from Texas City	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
e/188	6½ miles northwest	-- Sutten	Charles Ellis	--	160	2½	138	22
e/189	4¼ miles north	Dollar Bay Fig Corporation	-- Conklin	Old	700±	4	--	--
201	4¾ miles west	Theodore Korenek	--	1912?	22	6	--	--
202	4½ miles west	Frank Bell	J. Anezan	1928	105	3	--	--
203	4¼ miles west	State Highway	F. A. Boehm	1904	860	9-5/8	800	60
e/204	4 miles west	G. H. & H. R. R.	Layne-Texas Co.	1918	909	9-5/8	861	35
205	do.	do.	do.	--	914	9-5/8	860	49
206	3½ miles west	A. J. Biron	do.	1907	926	11-5/8	294 365 828	54 21 67
221	2¾ miles northwest	J. Wetzel	--	--	--	4	--	--
d/222	2 miles west northwest	S. M. O'Callaghan	S. M. O'Callaghan	1932	30	4	--	--
d/223	1¾ miles west	Otis Walker	Charles Ellis	1931	246	2½	236	10
d/224	At Texas City	Texas-Louisiana Power Co.	Layne-Texas Co.	1915	1,038	24	--	--
e/225	do.	do.	do.	1914	791	8	697 742	35 27
d/226 e/	do.	do.	do.	1910	812	8¼	674 771	91 29
d/227	do.	do.	do.	1914	783	8	677 722	36 44
e/228	do.	"Depot Well"	--	1896	740	4¼	--	--
e/229	1½ miles west	Knox Process Corp.	Stoner & Conklin	1924	574	12	540	28
d/230 e/	2 miles west	Pan-American Refining Corp.	McMasters & Pomeroy	1933	611	12	440 471 536	20 12 34
e/231	At Texas City	Texas Sugar Refining Co.	Southern Well Drilling Co.	1923	582	10	425 535	80 47
e/232	do.	do.	do.	1924	610	10	392 546	144 62
e/233	do.	do.	do.	1929	598	16	420 503	58 44

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
188	--	--	--	J,W	D,S	Twenty feet of screen set at bottom of well.
189	--	+	--	F,J,W	D,S	
201	--	--	--	J,H	D,S	
202	1	11.0	Sept.21, 1932	J,E, ½	D,S	
203	0	2.2	Apr. 15, 1931	None	N	Casing: 800 feet of 9 5/8-inch and 60 feet of 9 5/8-inch screen.
204	--	--	--	J,H	D	Casing: 869 feet of 9 5/8-inch and 40 feet of 9 5/8-inch screen. At Lamarque.
205	2	6.2	Apr. 15, 1931	J	RR, D,S	Casing: 874 feet of 9 5/8-inch and 40 feet of 9 5/8-inch screen.
206	0	7.2	do.	J,W	D,S	Casing: 910 feet of 11 5/8-inch with screens set at 286 to 346. 362 to 382 and 790 to 894 feet. Flow reported as 380 gallons a minute in 1907, 200 in
221	--	--	--	J,W	D,S	1914.i/ and 50 in 1922.
222	--	--	--	J,H	D,S	
223	--	--	--	J,E, ¼	D,S	Ten feet of screen set in bottom of well.
224	--	+	--	F,T,E 20	P	Casing: 84 feet of 24-inch, 12-inch set at 762 feet, and 9 5/8 set at 964 feet but wooden plug set in top. Well drilled to 1,038 feet but plugged at 762 feet. Present flow estimated at 10 gallons a
225	--	--	--	None	N	Casing: 791 feet minute, Oct. 22, 1931. of 8-inch with screen set at 692 to 768
226	0	2.2	Oct. 22, 1931	None	N	Casing: 812 feet of 8¼-inch with feet. screens set at 715 to 756 and 776 to 795 feet. Had a flow of 68 gallons a minute
227	--	--	--	T,E, 20	P	Casing: 783 feet of when completed.f/ 8-inch with screens set at 685 to 706 and 724 to 765 feet. Ceased flowing in 1915.
228	½	7.7	Oct. 22, 1931	None	N	Ceased flowing in Temperature 81° F. 1928.
229	--	--	--	--	N	
230	--	--	--	T,E	Ind	Casing: 590 feet of 12-inch. Screens set at 440 to 460, 471 to 482, and 536
231	--	--	--	--	N	Casing: 463 feet of 10- to 570 feet. inch and 120 feet of 8-inch. Screens set at 463 to 503 and 543 to 583 feet.
232	--	--	--	--	N	Casing: 609 feet of 10-inch with screens set at 463 to 506 and 546 to 586 feet. Well abandoned in 1929 because of sand.
233	--	--	--	--	N	Casing: 421 feet of 16-inch and 171 feet of 8-inch with screens set at 427 to 486 and 506 to 547 feet. Static level 36 feet below ground in 1929.f/

Records of wells in Galveston County--Continued

No.	Distance from Texas City	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
e/234	At Texas City	Texas City Terminal Ry.	Layne-Texas Co.	1922	550	8¼	415 500	60 45
235	do.	do.	do.	1922	547	8	420 500	40 47
e/236	do.	do.	do.	1910	1,135	6	921	214
e/237	do.	do.	do.	1910	580	8	--	--
e/238	do.	do.	--	1912	800	8	--	--
d/239	do.	do.	--	1904	855	6	--	--

No.	Distance from Alta Loma	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
261	At Alta Loma	F. A. Bartlett	F. A. Bartlett	1929	120	4	--	--
e/262	do.	City of Galveston Well 1	Layne-Texas Co.	1914	840	24	715	102
263	do.	City of Galveston Well 6	do.	1924	888	12	--	--
d/264	do.	City of Galveston Well 7	do.	1927	843	24	698	141
265	do.	City of Galveston Well 2	do.	1914	855	24	721 762	32 83
266	¼ mile east southeast	City of Galveston Well 3	do.	1916	866	24	726	133
e/267	½ mile east southeast	City of Galveston Well 4	do.	1916	873	24	712	145
268	¾ mile east southeast	City of Galveston Well 5	do.	1916	888	24	705	167
e/269	At Alto Loma	City of Galveston Well 2	--	1896	768	7	740	18

a/ Bench mark is point from which water level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

b/ T, deep well turbine; A, airlift; J, jack or suction; F, artesian flow; E, electric S, steam; O, fuel oil; G, gasoline engine or tractor; W, windmill; H, hand.

c/ P, public; I, irrigation; Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used.

d/ See analysis table for analysis of water from this well.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
234	--	--	--	A	Ind	Casing: 550 feet of 8¼-inch with screens set at 444 to 480 and 501 to 540 feet.
235	--	--	--	T,E	Ind	Casing: 547 feet of 8-inch with screens set at 442 to 460 and 500 to 541
236	--	--	--	None	N	Casing: 1,136 feet of 6-inch with screen set at 1,079 to 1,136 feet. Well flowed salt water and was
237	--	--	--	None	N	Screen failed and well abandoned in 1919 or 1920.
238	--	--	--	None	N	Screen sanded up and well abandoned.
239	--	+	--	F	Ind	Well 3 or Inman well. Flow estimated as 5 gallons a minute.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
261	--	--	--	J,W	D,S	
262	--	--	--	T,E	P	Water level was 10 feet below surface in 1914. f/ Casing: 80 feet of 24-inch, and 12-inch to 840 feet. Screen set at 713
263	--	--	--	T,E	P	to 815 feet.
264	--	--	--	T,E	P	Water level was 28½ feet below surface in 1927. f/ Casing: 151 feet of 24-inch and 12-inch to 843 feet. Screen set at 739 to
265	2	36.3	Sept. 23, 1932	T,E	P	Water level was 32 feet below surface in 1927. f/ Casing: 80 feet of 24-inch and 12-inch to bottom. Screens set at 705 to 735 and 742 to 826 feet. Eighty feet of 8-inch screen set in bottom and 80 feet of 16-inch casing set in pit in
266	--	--	--	T,E	P	Water level was 14 feet below surface in 1916. f/ Twelve-inch screen set
267	--	--	--	T,E	P	Water level was 14 feet below surface in 1916. f/ Casing: 90 feet of 24-inch and 12-inch to bottom. Screen set at 712 to 855 feet.
268	--	--	--	T,E	P	Water level was 14 feet below surface in 1916. f/ Casing: 24-inch pit with 12-inch casing to bottom. Screen set at 715 to
269	3	37.0	Sept. 23, 1932	None	N	Water level was 22 feet above surface and average flow was 300 gallons a minute in 1898. i/ Water level was 1½ feet below ground in 1911. h/

e/ No field tests made on water from this well.

f/ Reported by driller.

g/ Singley, J. A., Preliminary reports on the artesian wells of the Gulf Coastal slope: Geological Survey of Texas, 4th Annual report, pp. 97-105, 1893.

h/ Deussen, Alexander, Geology and underground water of the southeastern part of the Texas Coastal Plain: U.S. Geological Survey Water-Supply Paper 335, pp. 154-176, 1914.

i/ See page

Records of wells in Galveston County--Continued

No.	Distance from Alta Loma	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
e/270	At Alta Loma	City of Galveston Well 4	--	1896	868	7	740	128
e/271	do.	City of Galveston Well 6	--	1896	793	7	757	36
e/272	do.	City of Galveston Well 8	--	1896	809	7	756	40
e/273	½ mile south	City of Galveston Well 14	--	1896	800	7	756	34
e/274	do.	City of Galveston Well 16	--	1896	838	7	755	40
e/275	¾ mile south	City of Galveston Well 18	--	1896	790	7	755	35
e/276	1¼ miles south	City of Galveston Well 24	--	1896	733	7	--	--
277	2 miles southwest	-- Friday	--	--	--	2	--	--
278	1½ miles south southwest	Mrs. H. Huntington	Frank Schultz	1925	38	3	--	--
d/279	1¼ miles south southwest	N. J. Mouna	Ed Metzler	1912	120	3	--	--
280	1 mile south southwest	N. S. Norris	Fred Conklin	1907	118	4	--	--
d/281	At Alta Loma	C. R. Platzer	C. R. Platzer	1910	34	2	--	--
e/282	do.	H. E. Stobart	H. E. Stobart	--	700	6	--	--
e/283	2 miles east southeast	James Balcher	Louis Cange	1894	720	4¼	--	--
284	2½ miles east southeast	W. F. Reitmeyer	J. Tacquard	1888	728	4	--	--
285	do.	do.	do.	1887	410	2	--	--
286	do.	A. Cook	do.	Old	720	6	--	--
287	do.	J. Tacquard	do.	1911	720	6	--	--
288	do.	H. L. Roberts	Louis Cange	1889	720	3	--	--
d/289	3¼ miles east southeast	R. G. Roberts	do.	1930	260	4	235	--
290	3½ miles east southeast	Charles Shiro	--	--	720	3	--	--
d/291	do.	Hitchcock Ice & Fuel Co.	Bob Conklin	1922	720	6	700	20
292	4 miles east southeast	Dora Pella	J. Anezan	--	97	3	--	--
d/293	do.	L. Schanza	--	1927	208	4	--	--
294	do.	H. L. Roberts	J. Tacquard	1911	710	4	--	--
295	do.	Gulf Coast & Santa Fe Ry.	Fred Standard	1913	687	8	635	54

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
270	1½	36.4	Sept.23, 1932	None	N	Water level was 2½ feet below ground in 1911 .h/
271	2	34.7	do.	None	N	Water level was 1½ feet below ground in 1911. h/
272	7	38.8	do.	None	N	Water level was 3 feet below ground in 1911. h/
273	2	30.0	do.	None	N	Water level was 1½ feet below ground in 1911. h/
274	6	27.4	do.	None	N	Water level was 1 foot below ground in 1911. h/
275	4	27.8	do.	None	N	Water level was 1½ feet above ground in 1911. h/
276	6½	28.8	do.	None	N	Water level was 2½ feet above ground and flowed about 70 gallons a minute in 1911. h/
277	--	--	--	J,H	D	
278	--	--	--	J,H	D,S	
279	--	--	--	J,H	D,S	
280	--	--	--	J,H	D,S	
281	--	--	--	J,W	D,S	
282	0	28.5	Nov. 2, 1932	None	N	Well had a flow when completed.
283	2	13.3	Sept.23, 1932	None	N	
284	--	--	--	J,G	D,S	Water level was 15 feet above ground in 1911. h/
285	--	--	--	J,H	S	Had a flow of 15 gallons a minute in 1911. h/
286	½	12.4	Sept.23, 1932	J	N	Had a flow of 100 gallons a minute in 1911. h/
287	2	16.0	Sept.22, 1932	J,G, 4	D,S	
288	1	4.3	do.	J,H	D,S	Had a flow of 30 gallons a minute in 1911. h/
289	1	2.7	do.	J,H	D,S	
290	--	--	--	J,W	D,S	
291	--	--	--	J,E, 1	D, Ind	
292	--	--	--	J,W	D,S	
293	--	--	--	J,E	D,S,P	At Hitchcock water level was 5 feet below surface in 1927. f/
294	--	--	--	J,E	D,S	Salt water was encountered at 1,100 feet in a test well near this well.
295	--	--	--	A	RR	Casing: 616 feet of 8-inch and 79 feet of 6-inch. Screen set at 609 to 660 feet.

Records of wells in Galveston County--Continued

No.	Distance from Alta Loma	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
e/296	4 miles east southeast	Gulf Coast & Santa Fe Ry.	J. L. Mayes	1891	726	6	711	15
297	do.	Charles Schiro	J. Tacquard	1911	720±	6	--	--
298	4¼ miles east southeast	J. A. Bret	Louis Cange	1932	40	4	--	--
e/299	4½ miles east southeast	R. T. Wheeler	do.	1889	720	3	700	20
e/300	4¾ miles east southeast	Chris Jensen	do.	1889	500	3	--	--
301	4½ miles east southeast	J. A. Minot	do.	1889	763	2	--	--
302	4 miles east southeast	Joe Tarraso	do.	1928	790	4	--	--
e/303	3½ miles east southeast	Fred Lemke	do.	1895	695	3	--	--
e/304	3¼ miles southeast	H. Schoeffler	--	--	252	2	--	--
305	5 miles southwest	H. G. Tacquard	Louis Cange	--	450±	4	--	--
e/306	7½ miles south	-- Coon Well 1	The Texas Co.	1925	1,100	--	--	--
307	7 miles south southeast	Hughes Est.	Louis Cange	1909	913	3	--	--
308	5 miles southeast	do.	--	--	100±	3	--	--
309	6½ miles southeast	Humble Oil & Refining Co.	-- Patterson	1932	240	6	--	--
d/351	5¼ miles east southeast	-- Derringer	Louis Cange	1929	533	6	--	--
d/352	6 miles east southeast	R. E. Meisterhans	--	1932	30	2	--	--
e/353	5½ miles east	J. A. Perthus	Louis Cange	1900?	495	3	--	--
354	do.	do.	do.	--	235	3	--	--

No.	Distance from Texas City	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
d/355	3½ miles west	P. H. Naschke	Bob Conklin	1931	710	8	670	40
d/356	3½ miles west southwest	R. L. Whitburn	J. Anezan	1930	117	3	--	--

a/ Bench mark is point from which water level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

b/ T, deep well turbine; A, airlift; J, jack or suction; F, artesian flow; E, electric; S, steam, O, fuel oil; G, gasoline engine or tractor; W, windmill; H, hand.

c/ P, public; I, irrigation; Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used.

d/ See analysis table for analysis of water from this well.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
296	--	--	--	None	N	Other strata of water sand at 18 to 26, 408 to 423 and 678 to 692 feet. Had a flow of 66 gallons a minute in 1911. h/
297	½	12.5	Sept 22, 1932	J,G, 3	D,S	
298	--	--	--	J,H	D,S	
299	--	--	--	None	N	Water level was 30 to 35 feet above ground in 1889. Well now abandoned and plugged.
300	0	10.9	Sept.22, 1932	None	N	Had a flow of 40 gallons a minute in 1911. h/
301	3	5.9	do.	J,H	D,S	Would flow 35 feet above ground when drilled. Had a flow of 60 gallons a minute in 1911. h/
302	0	26.7	do.	J,G, 3	D,S	
303	½	9.5	do.	J,G, 3	D,S	Water level was 32 feet above ground and would flow 100 gallons a minute at ground level in 1895. f/
304	--	--	--	J,H	D,S	
305	--	+	--	F	S	Estimated flow, 2 gallons a minute at ground level, Oct. 7, 1932.
306	--	--	--	None	N	Oil test, see driller's log.
307	2	+	--	F	S	Estimated flow at 25 gallons a minute at ground level. Sept. 22, 1932.
308	--	--	--	J,W	S	
309	--	--	--	T,E	Ind	Water used to drill oil test.
351	--	--	--	A,G, 22	S	Casing: 200 feet of 6-inch and 4-inch to bottom. Set 40 feet of strainer at bottom.
352	--	--	--	J,H	D,S	Water for analysis was taken from new well at same depth in 1933.
353	--	--	--	J,G, 5	S	Well originally flowed at 18 feet above ground but now water level is about 2 feet below ground.
354	--	--	--	J,W	D,S	

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
355	--	--	--	J,G, 3	D,S	
356	?	9.4	Sept.21, 1932	J,H	S	

a/ No field tests made on water from this well.
f/ Reported by driller.
g/ Singley, J.A., Preliminary reports on the artesian wells of the Gulf Coastal slope: Geological Survey of Texas, 4th Annual report, pp. 97-105, 1893.
h/ Deussen, Alexander, Geology and underground water of the southeastern part of the Texas Coastal Plain: U.S.Geological Survey Water-Supply Paper 335, pp.154-176,1914.
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Records of wells in Galveston County--Continued

No.	Distance from Texas City	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
357	3¾ miles west southwest	Texas City Natl. Bank	Layne-Texas Co.	1913	1,009	8	936	73
e/358	1 mile west southwest	Vacuum Oil Co.	J. A. Walling	1920	993	10	704 900	31 93
e/359	1 mile southwest	Sinclair Refining Well 1	--	1908	970	6	--	--
d/360 e/	do.	Sinclair Refining Well 3	--	1919	1,030	10	--	--
e/361	do.	Sinclair Refining Well 2	--	1919	1,030	8	--	--
e/362	do.	Sinclair Refining Well 4	--	1907	--	--	--	--
363	4 miles southwest	Texas Highway Dept.	Louis Cango	1916	185	--	--	--
364	do.	R. J. Powers	-- Whittington	--	50±	6	--	--

No.	Galveston	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
e/401	Galveston, End of Causeway	Galveston Wharf Co.	Layne-Texas Co.	1928	1,498	--	126 332 734	147 59 32
e/402	On Winnie St. or Ave. G. between 18th and 45th Sts.	City of Galveston	--	Old	900±	--	1,028 1,335 1,423 --	178 44 68 --
a/403	At 17th St. and Ave. G	do.	--	Old	1,346	--	840 1,346	-- --
e/404	Between 30 & 31st Sts. & G & H Ave.	do.	Galveston Artesian Well Co.	1893	3,070	26	--	--
405	41st St. & Ave. G	Galveston Rice Milling Co.	--	--	1,300±	--	--	--
e/406	33rd St. & Ave. F	Triple X Brewing Co.	Layne-Texas Co.	1911	1,335	10	759 1,124 1,194	49 19 143

a/ Bench mark is point from which water level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.
b/ T, deep well turbine; A, airlift; J, jack or suction; F, artesian flow; E, electric S, steam: O, fuel oil; G, gasoline engine or tractor; W, windmill; H, hand.
c/ P, public; I, irrigation; Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used.
d/ See analysis table for analysis of water from this well.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
357	1	+	--	F	S	Flow estimated at 5 gallons an hour, Oct. 12, 1931.
358	--	+	--	F	Ind	Casing: 98 feet of 10-inch, 891 feet of 6-inch and 43 feet of 4-inch.
359	--	+	--	F	Ind	
360	--	+	--	F	Ind	
361	--	+	--	F	Ind	
362	--	--	--	None	N	Well failed and abandoned.
363	1	+	--	F	D,S	Temperature 75° F.
364	--	--	--	J,H	N	

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
401	--	--	--	None	N	The water from each stratum was tested and was salty. The best water was found at 332 to 402 feet. Well abandoned and filled.
402	--	--	--	None	N	Group of 12 wells from 810 to 973 feet deep with original flows 28 to 380 gallons a minute used for city supply at Galveston until 1896. g/ h/ Wells are now abandoned. Water contained 2,000 to 2,500 parts per million of chloride. g/
403	--	--	--	None	N	Original flow 425 gallons a minute. Well now abandoned.
404	--	--	--	None	N	Test well for better supply but drillers record states that water was saltier each succeeding stratum. Each water stratum had a flow. Well abandoned.
405	--	+	--	F	Ind	Well has small flow of gas.
406	--	+	--	F	Ind	Well had a flow of 300 gallons a minute and temperature of 88° F. f/ Casing: 1,334 feet of 10-inch with screens at 764 to 805, 1,119 to 1,140 and 1,208 to 1,326 feet. One of 3 similar wells. Other two drilled in 1906.

e/ No field tests made on water from this well.

f/ Reported by driller.

g/ Singley, J. A., Preliminary reports on the artesian wells of the Gulf Coastal slope Geological Survey of Texas, 4th Annual report, pp. 97-105, 1893.

h/ Deussen, Alexander, Geology and underground water of the southeastern part of the Texas Coastal Plain: U.S.Geological Survey Water-Supply Paper 335, pp.154-176,1914.

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Records of wells in Galveston County--Continued

No.	Galveston	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
e/407	Santa Fe Shops	Gulf, Colorado & Santa Fe Ry.	--	1887	797	12	755	42
e/408	28th St. & Ave. F	Bagging Factory	--	Old	810	--	--	--
e/409	26th St. & Ave. E	Brush Electric Light & Power Co.	--	Old	813	--	--	--
e/410	22nd St. & Ave. A	Fraser Ice & Cold Storage Co.	Layne-Texas Co.	1914	1,346	6	825 1,254	57 83
411	do.	do.	--	1927	500± 800+	--	--	--
d/412	20th St. & Ave. A	Galveston Ice & Cold Storage Co.	Layne-Texas Co.	1912	1,345	10	818 1,217	38 125
e/413	do.	Texas Ice & Cold Storage Co.	do.	Old	856	6	--	--
e/414	18th St. & Ave. A	National Cotton Oil Co.	--	Old	1,328	--	--	--
e/415	20th St & Ave. I	Galveston City R. R. Co.	--	Old	330	--	--	--
e/416	Port Bolivar	Gulf Colorado & Santa Fe Ry.	Giles Williams	1913	1,088	10	972	35
e/417	Galveston, 11½ miles southwest	G. Sealy	Layne-Texas Co.	1929	1,000	10	589	53

a/ Bench mark is point from which water level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

b/ T, deep well turbine; A, airlift; J, jack or suction; F, artesian flow; E, electric; S, steam; O, fuel oil; G, gasoline engine or tractor; W, windmill; H, hand.

c/ P, public; I, irrigation; Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used.

d/ See analysis table for analysis of water from this well.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
407	--	--	--	None	N	Casing: 78 feet of 12-inch, 9-inch set at 755 feet and 7-inch to bottom. Drift-wood encountered from 350 to 400 feet and at 750 feet. Had a flow of 104 gallons
408	--	--	--	--	--	Temperature 83° F. a minute in 1911.h/ Record from Singley. g/
409	--	--	--	--	--	Record from Singley. g/
410	--	+	--	F	Ind	6-inch casing to bottom. Screens set at 840 to 884, and 1,261 to 1,336 feet. Original flow 128 gallons a minute, f/ present flow about 25 gallons a minute.f/
411	--	--	--	--	Ind	Two wells pumped for cooling water. Sample was composite from both wells.
412	--	--	--	F	Ind	10-inch casin to bottom. Screens set at 830 to 893 and 1,235 to 1,338 feet. Original flow 700 gallons a minute f/, present flow about 500 gallons a minute.
413	--	--	--	--	--	Three similar wells, record from Singley. g/.
414	--	--	--	--	--	Record from Singley. g/
415	--	--	--	--	--	Two similar wells. Water was said to be the least mineralized in city. Record
416	--	--	--	--	Ind	Casing: 10-inch at from Singley g/ 10 to 437, 8-inch at 304 to 976, and 6-inch at 932 to 1,088 feet. Screen set at 819 to 862 and 974 to 1,018 feet.
417	--	+	--	F	D,S	Casing: 10-inch 0 to 129, 8-inch 100 to 581, and 6-inch 557 to 641 feet. Screen set at 587 to 640 feet. Temperature 79½° F. Flowing with gas.

e/ No field tests made on water from this well.

f/ Reported by driller.

g/ Singley, J. A., Preliminary reports on the artesian wells of the Gulf Coastal slope: Geological Survey of Texas 4th Annual report, pp. 97-105, 1893.

h/ Deussen, Alexander, Geology and underground water of the southeastern part of the Texas Coastal Plain: U.S.Geological Survey Water-Supply Paper 335, pp.154-176,1914.

i/ Letter from Henry Miller, lumber dealer at Alta Loma, Texas, to N. H. Darton of the U. S. Geological Survey, dated April 17, 1898.

"The main artesian system at this place, which supplies the city of Galveston, 17 miles distant, with fresh water, consists of 30 wells, distant from each other from 1,000 to 1,500 feet, and extending in a line almost due north and south. The variation in depth is slight, from 875 to 950 feet. The casing of each is 9 inches Temperature is from 75° to 78°. Rise of water above surface is 22 feet. I have not the flow of each individual well, as they are all piped together 9 feet below the surface, discharging into a small reservoir, from which the water flows to Galveston through a 30-inch pipe, the city being some 17 to 18 feet lower than the reservoir. However, the individual discharge of these 30 wells varies but slightly, the total flow amounting to a little over 14,000,000 gallons each 24 hours, giving each well a yield of about 310 gallons per minute. You will understand this is natural flow, no pumping being done."

Records of field tests of samples from wells in Galveston County, Texas (Analyzed by Samuel F. Turner. Parts per million. For records of wells see corresponding numbers in well tables.)

Well No.	Owner	Date of collection	Depth of well (ft.)	Hardness as $CaCO_3$ a/	Chloride (Cl)	Sulphate (SO_4) b/
21	R. G. Strickland	--	200	160	190	1
23	Joe L. Taylor	--	800±	400	90	6
24	H. A. Carter	Oct. 20, 1932	88	300	110	10
25	G. H. & H. R. R. shops	Apr. 15, 1931	208	150	200	5
29	Emil Schenk	--	575	70	100	2
30	W. T. Hepwerth	--	584	50	240	5
31	Freund's Place	--	700±	45	240	5
32	City of Kemah	--	864	50	240	5
34	G. V. Tripplet	--	12	550	240	30
35	J. O. Derrick	Sept. 8, 1931	75	450	330	5
61	R. O. Albright	Aug. 4, 1931	25	240	100	5
62	W. R. McClendon	--	170	150	340	40
63	G. C. Perkins	--	540±	45	170	5
64	A. N. Lockart	--	42	270	70	10
66	-- Sellman	--	218	120	260	5
67	S. J. Helton	--	227	130	260	5
82	St. L. B. & M. R. R.	--	642	70	200	15
84	Algoa School	--	444	60	160	--
101	H. [illegible]. Carter	--	200±	140	140	2
102	John Saracco	Oct. 20, 1932	94	700	800	50
103	Tony Fmite	--	20±	450	350	35
104	George Saracco	--	22	330	150	5
105	R. E. Newell	Oct. 20, 1932	240	90	140	3
106	Hans Gouldman	--	1,100±	140	1,000	2
107	Foster Hoskins	--	215	150	370	1
108	Dickinson Ice Co.	--	576	30	120	1
113	E. Menotti	Oct. 20, 1932	504	25	80	10
114	J. H. Bland	Apr. 15, 1931	850±	45	180	2
116	J. W. Palmer	do.	65	500	450	50
118	Texas Dairy League	--	85	200	65	30
119	Santa Fe School	--	68	400	30	10
159	Charles Ellis	--	547	40	120	5
167	Public Well at San Leon	--	600±	40	150	10
169	T. W. Saunders	--	225	120	260	10
174	R. E. Breeding	--	227	100	250	5
176	G. J. Fromm	--	160	160	450	5
201	Theodore Korenek	--	22	340	65	10
202	Frank Bell	Sept. 21, 1932	105	270	190	5
203	State Highway	Apr. 15, 1931	860	45	250	10
205	G. H. & H. R. R.	--	914	140	800	5
206	A. J. Biron	Apr. 15, 1931	926	80	400	1
221	J. Wetzel	--	--	950	800	40
222	S. M. O'Callaghan	--	30	370	270	35
223	Otis Walker	--	246	75	170	5
224	Texas-Louisiana Power Co.	--	1,038	110	900	1
227	do.	--	783	35	230	1
235	Texas City Terminal Ry.	--	547	45	260	1
239	do.	--	855	45	340	1
261	F. A. Bartlett	--	120	200	110	5
263	City of Galveston No. 6	--	888	65	400	1
264	City of Galveston No. 7	--	843	75	320	1

a/ Hardness as calcium carbonate by the soap method.

b/ Sulphate by turbidity method and may be as much as 25 per cent in error.

Records of field tests of samples from wells in Galveston County--Continued

Well No.	Owner	Date of collection	Depth of well (ft.)	Hardness as $CaCO_3$ a/	Chloride (Cl)	Sulphate (SO_4) b/
265	City of Galveston No. 2	Sept. 23, 1932	855	55	310	1
266	City of Galveston No. 3	--	866	100	450	1
268	City of Galveston No. 5	--	888	75	400	1
277	-- Friday	--	--	380	100	10
278	Mrs. H. Huntington	--	38	290	40	1
279	N. J. Mouna	--	120	300	140	10
280	N. S. Norris	--	118	300	140	5
281	C. R. Platzer	--	34	390	70	5
284	W. F. Reitmeyer	--	728	35	120	2
285	do.	--	410	80	210	5
287	J. Tacquard	Sept. 22, 1932	720	55	230	1
288	H. L. Roberts	do.	720	130	230	2
289	R. G. Roberts	do.	260	150	360	30
290	Charles Schiro	--	720	700	490	45
291	Hitchcock Ice & Fuel Co.	--	720	30	120	1
292	Dora Polla	--	97	750	650	1,000
293	L. Schanza	--	208	160	350	30
294	H. L. Roberts	--	710	35	100	10
295	Gulf Coast & Santa Fe Ry.	--	687	40	130	5
297	Charles Schiro	Sept. 22, 1932	720±	45	100	5
298	J. A. Bret	--	40	480	210	3
301	J. A. Minot	Sept. 22, 1932	763	25	110	10
302	Joe Tarraso	do.	790	120	280	10
305	H. G. Tacquard	--	450±	25	110	1
307	Hughes Est.	--	913	90	750	5
308	do.	--	100±	500	300	35
309	Humble Oil & Rfg. Co.	--	240	140	400	5
351	-- Derringer	--	533	20	140	5
352	R. E. Meisterhans	--	30	550	500	50
354	J. A. Perthus	--	235	170	340	45
355	P. H. Naschke	--	710	20	190	30
356	R. L. Whitburn	Sept. 21, 1932	117	280	170	2
357	Texas City Nat'l Bank	--	1,009	75	700	5
363	Texas Highway Dept.	--	185	125	320	20
364	R. J. Powers	--	50±	3,000	2,000	16,000
405	Galveston Rice Milling Co.	--	1,300±	500	5,000	1
411	Fraser Ice & Cold Storage Co.	--	500± 800±	250	1,500	5
412	Galveston Ice & Cold Storage Co.	--	1,345	500	4,000	1

a/ Hardness as calcium carbonate by the soap method.

b/ Sulphate by turbidity method and may be as much as 25 per cent in error.

Analyses of water from wells in Galveston County, Texas

Well No.	Owner	Date of collection	Depth of well (ft.)	Total dissolved solids (calc.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)
22	Ed. Lemoine	Aug. 21, 1933	23	2/ 569	--	0.12	128	40
23-a	Joe L. Taylor	Oct. 22, 1927	800	--	--	--	12	2
23-b	do.	July 19, 1933	800	2/ 586	--	9.2	51	33
27	Parke well	Dec. 24, 1928	88	2/ 501	16	3/1.7	102	36
62	W. R. McClendon	May 20, 1932	170	1,048	14	0.96	30	20
101	H. E. Carter	Mar. 26, 1928	200	2/ 913	21	3/3	33	15
103	Tony Emite	Aug. 1, 1933	20	--	--	0.51	--	--
108	Dickinson Ice Co.	Mar. 29, 1935	576	2/ 447	--	0.04	5	1.5
111-a	Fig Plant	Aug. 16, 1926	875	2/1,920	--	3/9.2	15	7
111-b	do.	July 18, 1933	215	832	19	0.34	20	12
184-185	Southern Pacific Ry.	Sept.17, 1931	600	2/ 703	15	3/3.9	8.9	2.1
222	S. M. O'Callaghan	July 18, 1933	30	2/ 961	--	2.7	66	45
223	Otis Walker	do.	246	2/ 866	--	0.36	14	11
224-a	Texas-Louisiana Power Co.	Jan. 13, 1916	1,038	2/1,496	16	--	20	11
224-b	do.	May 10, 1932	1,038	1,608	36	0.17	26	11
224-c	do.	Mar. 29, 1935	1,038	--	--	--	--	--
226	do.	May 9, 1910	812	682	19	--	7.8	2.5
227-a	do.	July 18, 1933	783	822	21	0.20	8.5	3
4/227-b	do.	Mar. 30, 1935	758	2/ 821	--	0.18	9.1	3.4
230	Pan American Refining Corp.	July 19, 1933	611	811	22	0.82	7.7	3.1
239	Texas City Terminal Ry.	do.	855	990	20	1	9.2	3.4
264-a	City of Galveston	July 22, 1933	843	852	27	0.13	20	6.6
264-b	do.	Mar. 29, 1935	843	2/ 979	--	0.15	26	8
279	N. J. Mouna	July 22, 1933	120	2/ 765	--	1.9	42	30
281	C. R. Platzer	do.	34	2/ 464	--	0.11	115	32
289	R. G. Roberts	do.	260	2/1,095	--	2.9	23	18
291-a	Hitchcock Ice & Fuel Co.	do.	720	577	23	0.47	8.7	3.5
291-b	do.	Mar. 29, 1935	720	--	--	--	--	--
293	L. Schanza	Oct. 10, 1930	208	--	24	3/0.7	22	5.8
298	J. A. Bret	Aug. 1, 1933	40	--	--	2.5	--	--
351	-- Derringer	July 22, 1933	533	2/ 569	--	3.3	7.1	2.8
352	R. E. Meisterhans	Aug. 1, 1933	30	--	--	3.3	--	--
355-a	P. H. Naschke	July 19, 1933	710	2/ 690	--	1.5	6.8	2.6
355-b	do.	Mar. 30, 1935	710	--	--	--	--	--
356	R. L. Whitburn	July 18, 1933	117	2/ 846	--	0.89	49	18
366	Sinclair Refinery No. 3	July 19, 1933	1,030	1,875	30	0.38	28	12
412	Galveston Ice & Cold Storage Co.	May 10, 1932	1,345	5,840	35	2.2	90	54
416	Gulf Colorado & Santa Fe. R. R.	Jan. 1, 1932	1,088	2/1,800	44	3/4.8	16	6.3
417	Geo. Scaly	July 2, 1927	1,000	1,705	--	--	54	31

1/ Combined figures for sodium and potassium were not determined, but were calculated as sodium.

2/ Sum of constituents reported.

(Parts per million. Well numbers correspond to numbers in table of records of wells.)

Well No.	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulphate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Total hardness as $CaCO_3$	Analyst
22	32		451	12	105	30	484	Margaret D. Foster
23-a	--		268	--	72	--	38	Felix Paquin
23-b	141		520	7.2	97	0.10	263	Margaret D. Foster
27	41		532	1.5	40	0.39	403	Felix Paquin
62	354	8.2	602	60	271	3.7	157	Margaret D. Foster
101	318		806	2.7	123	--	144	Felix Paquin
103	--		510	36	325	2.3	345	Margaret D. Foster
108	181		370	1.7	75	0.64	19	Do.
111-a	736		334	1.7	985	--	66	Felix Paquin
111-b	292	3.8	600	0.8	175	0.30	99	Margaret D. Foster
184-185	--		443	--	182	1.2	31	C. S. Wilson
222	254		603	33	265	0.88	350	Margaret D. Foster
223	332		688	3.3	166	0.61	80	Do.
224-a	--		261	--	767	--	95	Houston Laboratories
224-b	578	5.6	346	1.4	775	0	110	Margaret D. Foster
224-c	--		355	1	758	--	114	Do.
226	261		379	6.5	198	--	30	Houston Laboratories
227-a	311	3.9	478	1.1	230	0.20	34	Margaret D. Foster
4/ 227-b	324		475	1.6	248	0.40	37	Do.
230	305	3.8	578	1.6	162	0.12	32	Do.
239	371	3.5	511	0.8	305	0.20	37	Do.
264-a	302	3.8	331	1.2	330	0.10	77	Do.
264-b	356		333	2.6	422	0.38	98	Do.
279	229		626	12	140	3.8	228	Do.
281	22		438	4.9	70	3.8	419	Do.
289	398		598	4.5	355	0.20	131	Do.
291-a	213	2.2	399	1.3	124	0.05	36	Do.
291-b	--		399	1	126	--	28	Do.
293	--		304	--	302	--	79	Felix Paquin
298	--		481	22	215	1.2	405	Margaret D. Foster
351	226		431	1.5	118	0.05	29	Do.
352	--		602	5/160	925	0.75	758	Do.
355-a	269		447	1.2	189	0.15	28	Do.
355-b	--		450	1	186	--	21	Do.
356	274		664	2.2	171	4.5	196	Do.
366	680	6	350	1.2	940	0.5	119	Do.
412	2,096	23	331	0.6	3,381	0	446	Do.
416	676		446	0.9	830	--	66	Houston Laboratories
417	588		728	25	648	--	262	Felix Paquin

3/Iron and aluminum oxides.
4/Drilled to take place of well No. 227-a.
5/Approximate.

Table of Drillers' Logs, Galveston County, Texas

	Thickness (feet)	Depth (feet)
Driller's log of well 3		
Mrs. Annette Voss, owner.		
Clay	128	128
Sand	6	134
Clay	23	157
Sand	12	169
Clay and shells	14	183
Gumbo and clay	176	359
Sand	11	370
Gumbo	31	401
Clay and shells	12	413
Hard layer	2	415
Gumbo	26	441
Sand	41	482
Clay	6	488
Sand	9	497
Clay	9	506
Sand	149	655
Clay	13	668
Sand	23	691
Clay	14	705
Sand	50	755
Clay	8	763
Driller's log of well 26		
Galveston, Houston and Harrisburg Railway, owner.		
Soil	8	8
Yellow clay	92	100
Blue shale	10	110
Fine sand	4	114
Blue clay	46	160
Sand	5	165
Clay and gravel	5	170
Hard pan	10	180
Clay	22	202
Sand	8	210
Clay and gravel	15	225
Blue clay	37	262
Fine sand	23	285
Blue clay	105	390
Blue sandy clay	60	450
Sand	20	470
Blue clay	30	500
Blue sand	8	508
Hard clay	15	523
Rock	1	524
Clay	121	645
Sandy clay	45	690
Rock	3	693
Clay	7	700
Good water sand	50	750
Clay	30	780
Blue clay	40	800
Blue sandy clay	130	930
Clay and gravel	5	935
Driller's log of well 26--Continued		
Good coarse sand	40	975
Sand and gravel	45	1020
Driller's log of well 85		
Algoa Townsite Company, owner.		
Clay and soil	36	36
Sand	14	50
Clay	45	95
Sand	5	100
Red clay	92	192
Gumbo	6	198
Rock	11	209
Sand	12	221
Rock	6	227
Hard and soft clay	49	276
Clay and gumbo	147	423
Sand rock	17	440
Packed sand	9	449
Hard sand rock	4	453
Sand	45	498
Gumbo	51	549
Sand rock	6	555
Gumbo	62	617
Sand	60	677
Rock	2	679
Sand	14	693
Gravel	43	736
Gumbo	20	756
Clay and boulders	5	761
Gumbo	17	778
Sand rock	5	783
Shale and gumbo	9	792
Sand and rock	4	796
Gumbo	77	873
Gravel	8	881
Gumbo	2	883
Sand rock	34	917
Hard clay	10	927
Gumbo	56	983
Sand	13	996
Gumbo	8	1004
Soft rock	6	1010
Gravel	19	1029
Gumbo	10	1039
Coarse sand	33	1072
Hard rock	3	1075
Gumbo	4	1079
Coarse sand	6	1085
Gumbo	22	1107
Sand, gravel and shell	21	1128
Gumbo	10	1138
Sand	42	1180
Gumbo	37	1217
Sand	9	1226

(Continued on next page)

Table of Drillers' Logs, Galveston County--Continued

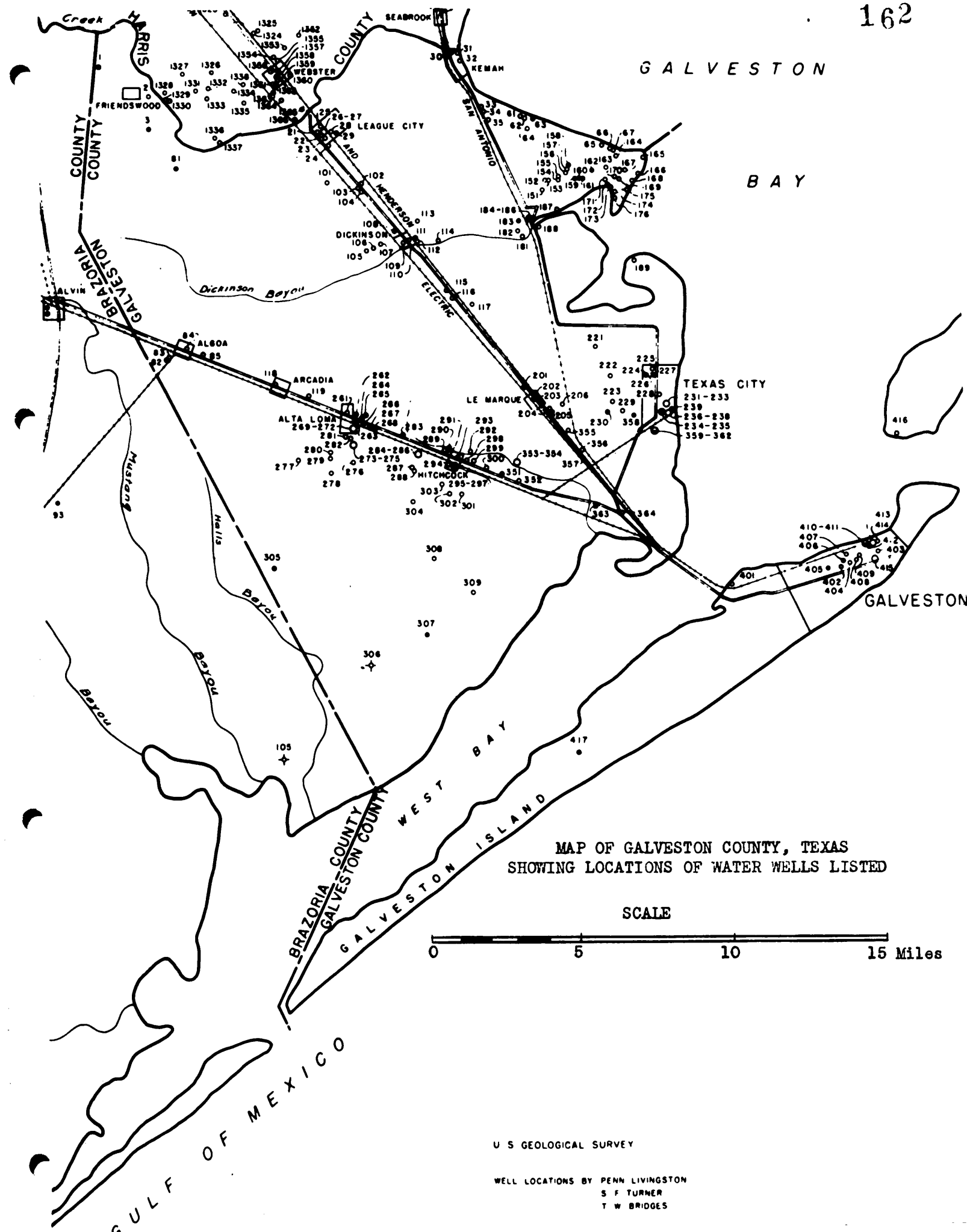
	Thickness (feet)	Depth (feet)
Driller's log of well 85--Continued		
Gumbo	30	1256
Rock	5	1261
Sand	37	1298
Gumbo	4	1302
Hard sand	14	1316
Very hard sand	3	1319
Hard sand	14	1333
Soft gumbo	3	1336
Soft sand	19	1355
Hard sand	4	1359
Rock	3	1362
Driller's log of well 108		
Dickinson Ice Company, owner.		
Clay	10	10
Sand	20	30
Clay	50	80
Sand	90	170
Clay	40	210
Shale	246	456
Fine sand	41	497
Sand	20	517
Gumbo	14	531
Sand	41	572
Gumbo	4	576
Driller's log of well 224		
Texas-Louisiana Power Company, owner.		
Soil and clay	6	6
Sand	26	32
Clay	20	52
Sand	9	61
Shale	31	92
Sand	24	116
Soft shale	45	161
Hard shale	41	202
Shale	332	534
Sand	36	570
Gumbo	69	639
Clay	32	671
Sand	38	709
Clay	81	790
Sand	40	830
Clay	18	848
Sand	190	1038
Clay	1	1039
Driller's log of well 268		
City of Galveston Number 5.		
Soil and clay	16	16
Sand	12	28
Clay	3	31
Sand	12	43
Sandy clay	39	82
Clay	20	102

	Thickness (feet)	Depth (feet)
Driller's log of well 268--Continued		
Sand	25	127
Clay	17	144
Sand	6	150
Clay	278	428
Sand	17	445
Clay	138	583
White sand	27	610
Clay	94	704
Sand	168	872
Clay	16	888
Driller's log of well 306		
The Texas Company's Coon Number 1.		
Yellow sand	20	20
Gray sand	47	67
Soft blue gumbo	31	98
Gray sand	24	122
Blue gumbo	41	163
Sand	20	183
Blue gumbo	34	217
Sand	22	239
Blue gumbo	64	303
Sand	21	324
Blue gumbo	160	484
Blue sand	10	494
Blue gumbo	152	646
Gray sand	20	666
Blue gumbo	162	828
Gray sand	268	1096
Blue gumbo	4	1100
Driller's log of well 406		
Triple X Brewing Company, owner.		
Sand and silt	37	37
Clay	33	70
Sand	10	80
Clay and shale	110	190
Rock	1	191
Clay and shale	86	277
Fine sand	39	316
Clay and shale	82	398
Sand	49	447
Clay	10	457
Sand	27	484
Clay	8	492
Sand	10	502
Sand and shale	51	553
Sand rock	9	562
Clay, shell and shale	130	692
Sand	6	698
Gumbo	61	759
Sand	49	808
Gumbo	25	833
Sand	7	840

(Continued on next page)

Table of Drillers' Logs, Galveston County--Continued

	Thickness (feet)	Depth (feet)
Driller's log of well 406--Continued		
Gumbo - - - -	135	975
Sand - - - -	10	985
Gumbo - - - -	42	1027
Sand - - - -	7	1034
Gumbo - - - -	40	1074
Rock - - - -	1	1075
Gumbo - - - -	12	1087
Sand - - - -	16	1103
Gumbo - - - -	11	1114
Hard rock - - -	10	1124
Shell and sand rock -	19	1143
Gumbo - - - -	19	1162
Sand rock - - -	10	1172
Gumbo - - - -	12	1184
Hard rock - - -	10	1194
Sand rock - - -	121	1315
Sand and gravel - -	12	1327
Gumbo - - - -	8	1335



MAP OF GALVESTON COUNTY, TEXAS
SHOWING LOCATIONS OF WATER WELLS LISTED

SCALE

0 5 10 15 Miles

U S GEOLOGICAL SURVEY

WELL LOCATIONS BY PENN LIVINGSTON
S F TURNER
T W BRIDGES

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GRIMES COUNTY, TEXAS

Records of wells, drillers' logs, water analyses, and map showing location of wells

* * *

by
Samuel F. Turner

Mimeographed by
WORKS PROGRESS ADMINISTRATION
PROJECT 10443

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Prepared in cooperation with the United States Department of the Interior, Geological Survey.

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Austin, Texas
April 10, 1939

GRIMES COUNTY, TEXAS

* * *

Introduction

by
Samuel F. Turner
Associate Hydraulic Engineer
United States Department of the Interior
Geological Survey

This pamphlet contains records of a few typical wells in Grimes County, Texas, with tables of well logs, well water analyses, and a map which shows the wells described, each well having a number on the map corresponding to the number assigned to it in the well tables.

The records were obtained in the course of an investigation which was undertaken as part of a statewide study of the underground water resources of Texas. The investigation was made by the State Board of Water Engineers, in cooperation with the U. S. Department of the Interior, Geological Survey. The field work was carried out by Samuel F. Turner of the Geological Survey. The analyses were made in the laboratory of the Geological Survey at Washington by Margaret D. Foster. The field tests were made in Houston by Samuel F. Turner.

The well records serve as a guide to land owners and well drillers who may need information regarding wells and pumping plants, the depth to ground water in different parts of the county and the quantity and quality of water yielded by wells.

These records were typed, assembled, and mimeographed by employees of Works Progress Administration Project 10443, which is sponsored by the Texas Board of Water Engineers in cooperation with the Geological Survey.

Records of wells in Grimes County, Texas
(All wells are drilled unless otherwise noted in "Remarks" column.)
(Principal water-bearing beds are sand or gravel.)

No.	Distance from Navasota	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
c/ 1	At Navasota	Missouri Pacific Ry.	McMasters & Pomeroy	1926	334	--	254 301	37 12
2	4¾ miles southeast	Gulf Coast & Santa Fe Ry.	Layne-Texas Co.	1930	406	8	41 98 156	22 45 17
c/ 3	6 miles south	R. B. Templemen well 1	Dearing & Noble	1931	4,559	--	--	--
c/ 4	10 miles south southeast	W. J. Lyles	--	1929	23	--	--	--
5	8 miles east southeast	State Highway	--	--	--	--	--	--
c/ 6	11½ miles east southeast	T. B. Stoneham	--	--	22	36	--	--
7	do.	do.	--	--	15	8	--	--
8	13 miles east southeast	State Highway	--	--	--	--	--	--
9	14 miles east southeast	J. A. Greenwood	--	1910	20	36	--	--
10	14½ miles east southeast	J. A. Neely	--	--	25	30	--	--
c/ 11	do.	P. B. Bookman well 1	Cullen & West	1930	3,452	10	--	--
12	do.	B. T. Williams	B. T. Williams	--	29	6	--	--

a/ Bench mark is point from which water-level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.
b/ A, air; J, jack; B, bucket; G, gasoline engine; W, windmill; H, hand.

Records obtained by Penn Livingston and Samuel F. Turner
(See "Table of field tests" for tests of hardness, chloride and sulphate.)

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
1	--	--	--	--	RR	See driller's log.
2	3½	22.5 d/	1930	A,-	RR	At Wood Station. Casing; 235 feet of 8-inch. Screens set at 39 to 60, 94 to 136 and 151 to 170 feet. See driller's log.
3	--	--	--	--	--	Oil test. See driller's log.
4	--	--	--	B,H	D,S	Dug well. Two miles southeast of Courtney.
5	--	--	--	None	S	One mile west of Yarborough. Spring at contact between sand and clay in road ditch.
6	1	8.7	Apr. 14, 1931	B,H	D,S	Dug well. At Stoneham.
7	2½	8.1	do.	B,H	D,S	At Stoneham.
8	--	--	--	None	S	Two miles east of Stoneham. Spring at contact between sand and clay in road ditch.
9	--	--	--	J,W,G, 3	D,S	Dug well. At Plantersville.
10	--	--	--	J,G, 2½	D,S	Do.
11	--	--	--	--	--	Oil test, see driller's log. Two miles south of Plantersville.
12	--	--	--	B,H	D,S	Two and one-half miles south of Plantersville.

c/ RR, railroad; D, domestic; S, stock.
d/ Reported by driller.
e/ No field tests made on water from this well.

Records of field tests of samples from wells in Grimes County, Texas (Analyzed by Samuel F. Turner. Parts per million. For records of wells see corresponding numbers in well tables.)

Well No.	Owner	Date of collection	Depth of well (ft.)	Hardness as $CaCO_3$ a/	Chloride (Cl)	Sulphate (SO_4) b/
2	G. C. & S. F. Ry.	-	406	230	100	50
5	State Highway	-	-	30	45	10
7	T. B. Stoneham	Apr.14, 1931	15	110	8	15
8	State Highway	-	-	25	20	10
9	J. A. Greenwood	-	20	110	45	10
10	J. A. Neely	-	25	200	230	10
12	B. T. Williams	-	29	110	180	10

a/ Hardness as calcium carbonate by the soap method.
b/ Sulphate by turbidity method and may be as much as 25 per cent in error.

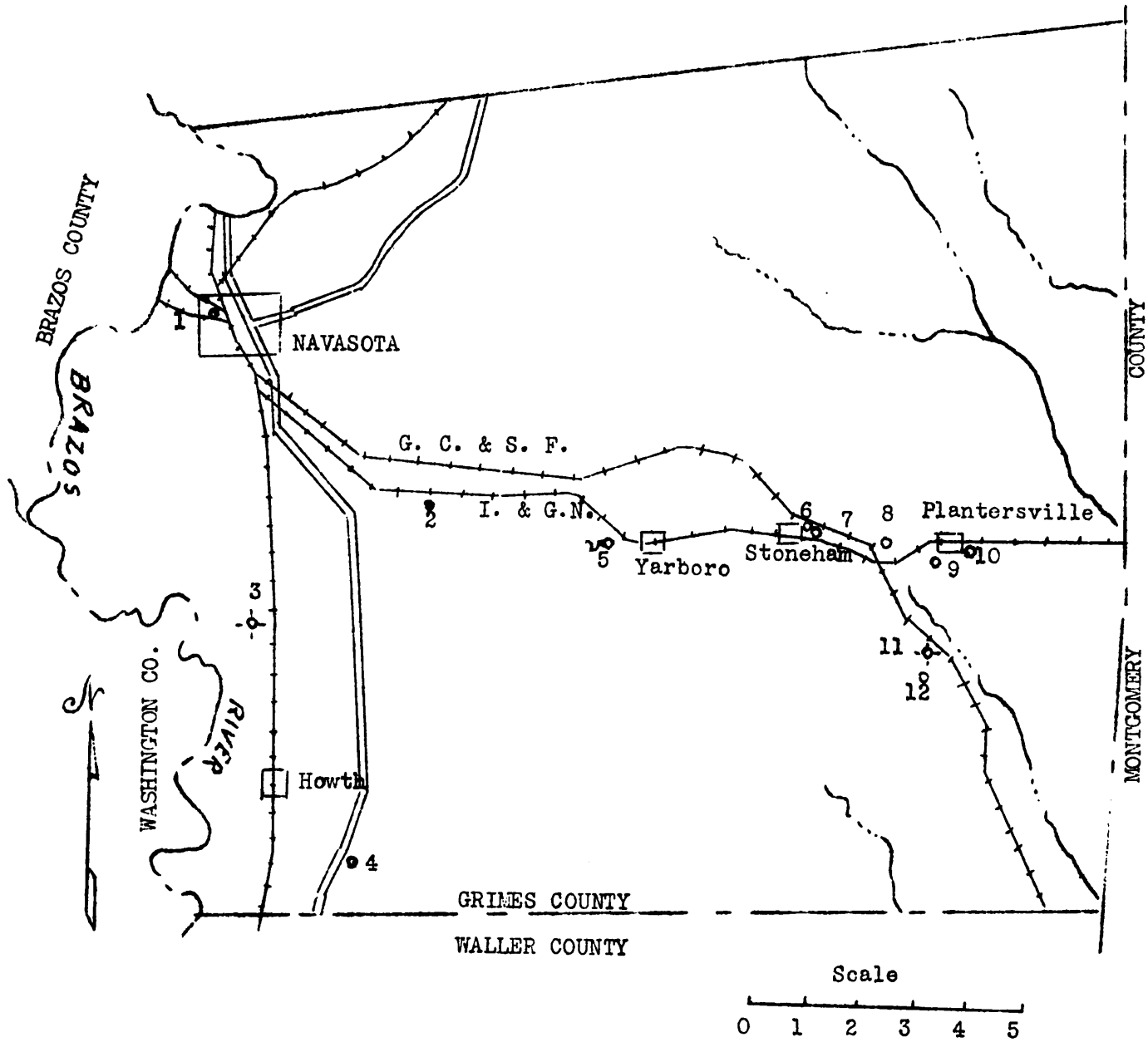
	Thickness (feet)	Depth (feet)
Driller's log of well 1		
Missouri Pacific Railway, owner.		
Surface soil	10	10
Sand and muck	65	75
Yellow clay	95	170
Gummy lime	49	219
Hard rock	1	220
Blue sand and shale	34	254
Good water sand	37	291
Gumbo	10	301
Good water sand and gravel	12	313
Gumbo	21	334
Driller's log of well 2		
Gulf Coast and Santa Fe Railway, owner.		
Soil	3	3
Clay	10	13
Sand	14	27
Clay	14	41
Sand	22	63
Sandy clay	35	98
Sand	45	143
Clay	12	155
Rock	1	156
Sand	17	173
Clay	5	178
Sand	4	182
Clay	11	193
Hard shale	19	212
Blue sandy shale	12	224
Rock	1	225
Sandy shale	31	256
Shale	44	300
Gumbo	12	312
Shale	26	338
Hard shale	25	363
Sand rock	12	375
Gumbo	30	405
Driller's log of well 3		
R. B. Templemen Number 1.		
Clay	20	20
Sand and gravel	69	89
Shale	40	129
Gravel	11	140
Shale	12	152
Sand	9	161
Shale	42	203
Sand	10	213
Shale	179	392
Gumbo	19	411
Sticky shale	66	477
Sand and gravel	14	491
Shell rock	1	492
Hard shale and gravel	11	503
Hard shale	10	513

	Thickness (feet)	Depth (feet)
Driller's log of well 3--Continued		
Water sand	4	517
Hard shale	14	531
Gumbo	7	538
Sticky shale	8	546
Sand	18	564
Gumbo	16	580
Sticky shale	15	595
Green sand	17	612
Sticky shale	37	649
Sand and gravel	18	667
Sticky shale	8	675
Gumbo, lime and shale	15	690
Sticky shale	99	789
Gumbo	25	814
Sandy shale	20	834
Gumbo and shale	82	916
Limey shale	66	982
Brown, blue and sandy shale	58	1040
Shale and boulders	18	1058
Sandy shale	27	1085
Sticky shale	12	1097
Shale	10	1107
Sandy shale	9	1116
Gumbo	15	1131
Gray sand	13	1144
Blue shale and sticky sand	19	1163
Gumbo	13	1176
TOTAL DEPTH		4559
Driller's log of well 11		
P. B. Bookman Number 1.		
Clay	18	18
Yellow sand	61	79
Gumbo	4	83
Yellow gumbo	37	120
Sand and streaks of gumbo	10	130
Sand and gravel	18	148
Soft white gumbo	14	162
Sand	12	174
Gumbo	10	184
Sand and boulders	113	297
Gumbo and boulders	72	369
Sand and boulders	29	398
Shale and boulders	62	460
Gumbo	104	564
Gumbo with sandy streaks	26	590
Blue shale	28	618
Loose sand and boulders	22	640
Gumbo and sand	19	659
Tough gumbo	72	731
Blue and pink gumbo	48	779
Gumbo	61	840

(Continued on next page)

Table of Drillers' Logs, Grimes County--Continued

	Thickness (feet)	Depth (feet)
Driller's log of well 11--Continued		
Sand - - - -	13	853
Gumbo - - - -	21	874
Sand or shale - - -	5	879
Coarse sand - - -	16	895
Slick hard shale - -	32	927
Gumbo - - - - -	59	986
Hard sand - - - -	4	990
Hard green sand - -	3	993
Tough gumbo and lime -	10	1003
Soft sand - - - -	4	1007
Shale and lime - -	3	1010
Gumbo and lime - - -	61	1071
Sand - - - - -	4	1075
Tough gumbo and lime -	67	1142
Gumbo, shale and lime -	15	1157
Sand - - - - -	15	1172
Gumbo and lime - - -	11	1183
TOTAL DEPTH - - - -		3452

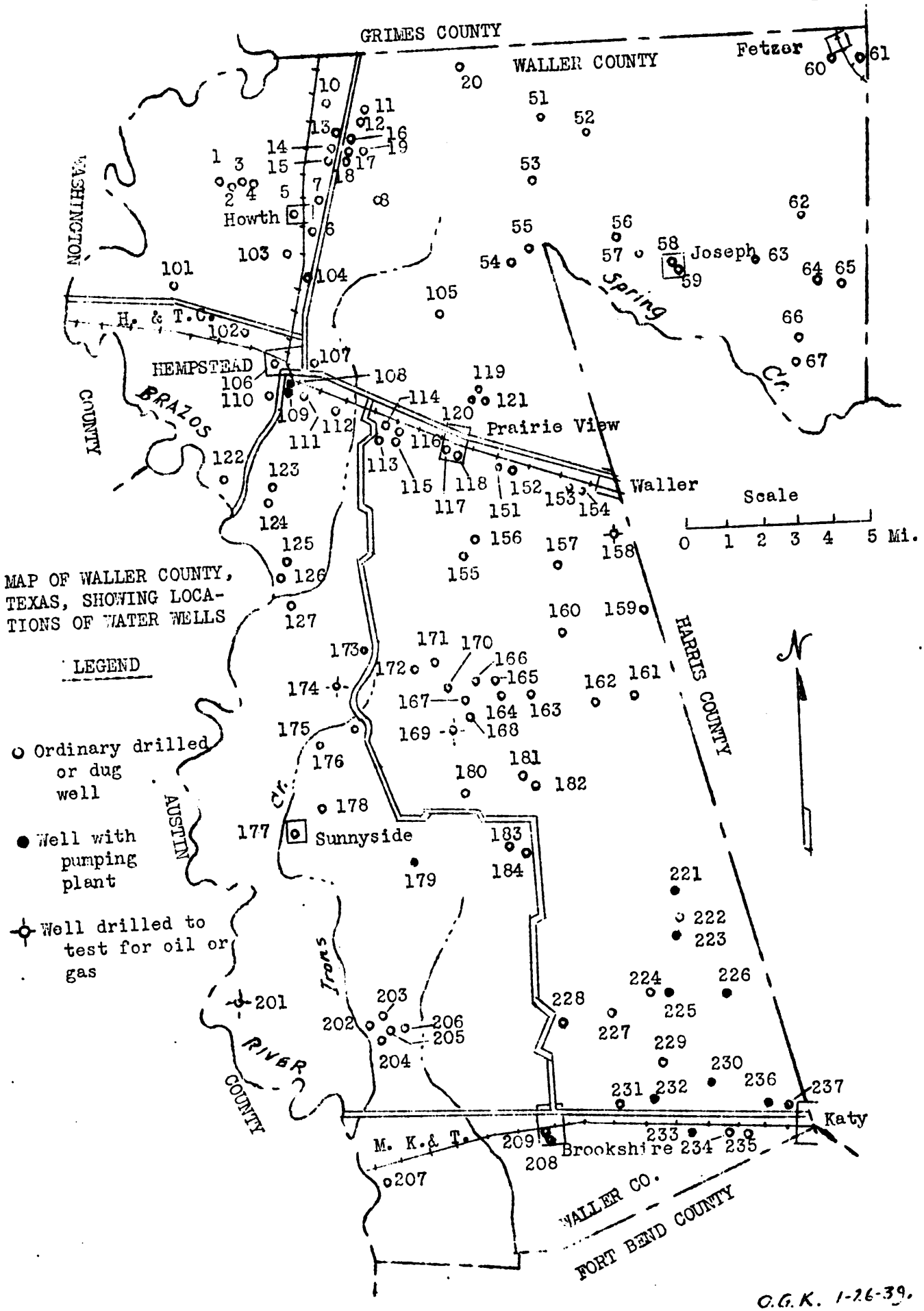


MAP OF GRIMES COUNTY, TEXAS,
SHOWING LOCATIONS OF WATER WELLS

LEGEND

- ○ Ordinary drilled or dug well
- ● Well with pumping plant
- ⊙ Well drilled to test for oil or gas
- Spring

O.G.K.
1-27-39.


GRIMES COUNTY
WALLER COUNTY
Fetzer
WASHINGTON COUNTY
Howth
H. & T. C.
HEMPSTEAD
BRAZOS COUNTY
Joseph
Spring Cr.
Prairie View
Waller
Scale
0 1 2 3 4 5 Mi.
MAP OF WALLER COUNTY, TEXAS, SHOWING LOCATIONS OF WATER WELLS
LEGEND
Ordinary drilled or dug well
Well with pumping plant
Well drilled to test for oil or gas
HARRIS COUNTY
AUSTIN CO.
Sunnyside
Trans
RIVER
M. K. & T.
Brookshire
Katy
WALLER CO.
FORT BEND COUNTY
N

O.G.K. 1-26-39.

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* * *

HARRIS COUNTY, TEXAS

Records of wells, drillers' logs, water analyses, and map showing location of wells

* * *

by

Penn Livingston and Samuel F. Turner

Mimeographed by
WORKS PROGRESS ADMINISTRATION
PROJECT 10443

* * *

Prepared in cooperation with the United States Department of the Interior, Geological Survey.

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Austin, Texas
April 10, 1939

HARRIS COUNTY, TEXAS

* * *

Introduction

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Geological Survey

This pamphlet contains records of wells in Harris County, Texas, with tables of well logs, well water analyses, and a map which shows all the wells described, each well having a number on the map corresponding to the number assigned to it in the well tables.

The records were obtained in the course of an investigation which was undertaken as part of a statewide study of the underground water resources of Texas. The investigation was made by the State Board of Water Engineers, in cooperation with the U. S. Department of the Interior, Geological Survey. The field work was carried out by Penn Livingston and Samuel F. Turner of the Geological Survey. The chemical analyses were made in the laboratory of the Geological Survey at Washington by Margaret D. Foster. The field tests were made in Houston by Samuel F. Turner.

The well records serve as a guide to land owners and well drillers who may need information regarding wells and pumping plants, the depth to ground water in different parts of the county, and the quantity and quality of water yielded by wells. They afford a basis for the more intensive investigation which is now being carried on.

These records were typed, assembled, and mimeographed by employees of Works Progress Administration Project 10443, which is sponsored by the Texas Board of Water Engineers in cooperation with the Geological Survey.

Records of wells in Harris County, Texas
(All wells are drilled unless otherwise noted in "Remarks" column.)
(Principal water-bearing beds are sand or gravel.)

No.	Distance from Waller	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal Water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
1	3 miles north	-- Stokes	--	--	60	4	--	--
2	2¾ miles north northwest	H. J. Voettcher	--	Old	31	10	--	--
e/ 3	1¼ miles northwest	T. W. Ray	--	1870?	71	24	--	--
4	¼ mile east	B. F. Quinn	U. S. Geological Survey	1931	20	3	15	5
5	¼ mile northeast	Dr. Berry	--	--	42	24	--	--
e/ 6	In Waller	H. H. Strickland	H. H. Strickland	1918	30	10	--	--
7	do.	Bob Robinson	do.	1931	124	--	--	--
8	½ mile southeast	Elmer Bennett	--	--	100+	4	--	--
e/ 9	¾ mile southeast	J. E. Ellison	-- Phillips	1911	120+	5	--	--
e/ 10	2½ miles east southeast	J. A. Hafner	U. S. Geological Survey	1931	21	3	19	2
e/ 11	do.	do.	H. Bennett	1905	70	6	--	--
d/ 12 c/	2¾ miles southeast	do.	H. H. Strickland	1900	61	6	60	--
13	do.	do.	--	Old	35	8	--	--
14	1¾ miles east	do.	H. H. Stricland	1926	122	4	--	--
e/ 15	4¾ miles north	W. P. Castle	W. Weaver	1925	90	4	--	--
c/ 31	4 miles east southeast	R. L. Burton	Layne-Texas Co.	1928	297	6	241	55
32	do.	do.	--	Old	40	8	--	--
c/ 33	5 miles east southeast	W. G. Neeley	--	1910?	61	10	--	--
34 e/	6¼ miles east southeast	O. M. Taylor	H. H. Strickland	1928	53	6	45	8
d/ 35 e/	do.	do.	do.	Old	35	--	--	--
36	do.	do.	U. S. Geological Survey	1931	22	3	20	2

a/ Bench mark is point from which water-level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.
b/ T, turbine; A, air; F, flow; C, centrifugal; J, jack or suction; B, bucket; E, electric; S, steam; O, oil; G, gas; H, hand.
c/ P, public; Irr, irrigation; Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used.

Records obtained by Penn Livingston and Samuel F. Turner
(See "Table of field tests" for tests of hardness, chloride and sulphate.)

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
1	2	20.1	Nov. 5, 1931	None	N	
2	--	--	--	None	N	Dry hole.
3	2	50.6	Nov. 6, 1931	None	N	Cased with 40 feet of 24-inch tile with 8-inch tile to 71 feet. Automatic water stage recorder installed on this well.
4	½	4.0	May 13, 1931	None	N	Test well used for water level measurement.
5	2½	36.6	Apr. 13, 1931	J,N	D,S	Also reported as 80 feet deep.
6	3	10.0	do.	B,H	D,S	Wood casing.
7	--	--	--	J,W	D,S	First water at 20 feet, second at 60 feet and third at 120 feet.
8	1	43.1	Nov. 5, 1931	J,H	N	
9	--	--	--	J,W	D,S	
10	½	4.6	May 13, 1931	None	N	Test well used for water level measurements.
11	½	45.2	Apr. 13, 1931	J,W	D,S	
12	3	48.2	do.	J,W	D,S	
13	0	21.0	do.	None	N	Tile casing. Well failed in dry seasons.
14	2	50.3	do.	J,W	N	
15	--	--	--	J,W	S	
31	½	43.8	Apr. 13, 1931	J,E, ¾	D,S	Casing; 6-inch 0 to 188 feet, 4-inch 163 to 291 feet. Screen set at 246 to 289 feet. Water level was 43.3 feet below ground in 1928 and would pump 60
32	0	29.0	do.	None	N	Unused well, gallons a minute. f/ cased with cypress.
33	1½	32.1	do.	J,W	D,S	In Hockley.
34	--	--	--	J,G, 2	D,S	Ten or 12 feet of screen at bottom. Strong water supply in gravel.
35	1	20.4	Apr. 25, 1931	B,H	S	Tile casing.
36	1	21.0	Nov. 3, 1931	None	N	Test well used for water level measurement.

d/ See table of analyses for analysis of water from this well.
e/ See "Table of field tests" for tests of hardness, chloride and sulphate in water from this well.
f/ Reported by driller.
g/ Measured by Southern Engine and Pump Company
h/ Measured by Layne-Texas Company.

Records of wells in Harris County--Continued

No.	Distance from Waller	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
37	8 miles east southeast	--	U. S. Geological Survey	1931	20	3	--	--
d/ 38	5½ miles east northeast	Louis Hogar	--	--	75±	7	--	--
d/ 39	7½ miles east	Mrs. Joe Blake	Joe Blake	1898	38	30	--	--

No.	Distance from Tomball	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
d/ 51	7¼ miles west	H. C. Nichols	--	1894?	54	42	--	--
d/ 52	5½ miles west	J. Hirsch	--	1907	37	42	--	--
d/ 53	3¼ miles west	E. Schultz	--	1913	33	6	--	--
d/ 54	1¾ miles west southwest	Bowers School	--	--	28	36	--	--
d/ 55	2¾ miles west southwest	Fritz Treichel	Fritz Treichel	1922	21	10	--	--
56	2¾ miles southwest	Hubert Reed Well 1	F. N. Bullock	1923	1,568	--	--	--
c/ 71	1¾ miles northeast	Stanolind Pipe Line Co.	N. B. Anderson	1923	65	4	--	--
72	In Tomball	Texas & Brazos Valley R.R.	do.	1919	67	12	47	20
73	do.	do.	Layne-Texas Co.	1907	211	9-5/8	186	25
d/ 74	2¼ miles south	M. F. Michel	M. F. Michel	1917	23	36	--	--
d/ 75	3 miles south	T. J. Keuhn	T. J. Kuehn	1885	30	60	--	--
d/ 76	5¾ miles south	W. M. Buvinghausen	N. B. Anderson	1916	96	4	--	--
d/ 77	6 miles south	A. Buvinghausen	A. Buvinghausen	1931	26	36	--	--
d/ 78	6¾ miles south	S. Bloom	S. Bloom	1896?	30±	48	--	--

No.	Distance from Spring	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
91	1¼ miles northwest	Barbecue Stand	--	--	33	36	--	--

a/ Bench mark is point from which water-level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

b/ T, turbine; A, air; F, flow; C, centrifugal; J, jack or suction; B, bucket; E, electric; S, steam; O, oil; G, gas; H, hand.

c/ P, public; Irr. irrigation; Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
37	0	3.5	Mar. 15, 1932	None	N	Test well used for water level measurement.
38	--	--	--	J,W	D,S	
39	--	--	--	J,W	D,S	Dug well lined with brick.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
51	--	--	--	J,W	D,S	Dug well lined with brick.
52	--	--	--	J,W	D,S	Do.
53	--	--	--	J,H	D,S	
54	--	--	--	J,H	P	Dug well lined with brick.
55	--	--	--	J,H	D,S	Wooden casing.
56	--	--	--	None	N	Oil test, see driller's log.
71	--	--	--	J,E	D, Ind	Eight feet of screen in bottom. Water level was 36 feet below ground in 1923.
72	--	--	--	J,S	RR	Casing; 48 feet of 12-inch and 21 feet of 10-inch screen. Large water supply from sand and gravel. f/
73	--	--	--	None	N	Casing; 190 feet of 9 5/8-inch and 18 feet of 9 5/8-inch screen. Water level 39 feet below ground in 1907. f/
74	2½	16.3	Sept. 4, 1933	J,W	D,S	Dug well lined with brick.
75	2	21.7	do.	J,G	D,S	Do.
76	--	--	--	J,H	D,S	
77	2	22.6	Sept. 4, 1933	J,H	D,S	Dug well lined with brick.
78	1½	22.0	do.	J,H	D,S	Do.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
91	2½	26.1	June 1, 1931	B,H	D,S	Dug well with wooden curbing.

d/ See table of analyses for analysis of water from this well.
e/ See "Table of field tests" for tests of hardness, chloride and sulphate in water from this well.
f/ Reported by driller.
g/ Measured by Southern Engine and Pump Company.
h/ Measured by Layne-Texas Company.

Records of wells in Harris County--Continued

No.	Distance from Spring	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
c/ 92	1½ miles west	E. N. Wunsche	--	--	35	36	--	--
d/ 93 e/	In Spring	Missouri Pacific R.R.	--	--	1,070	8	984	86
94	1½ miles west southwest	H. Reichert	--	--	25	33	--	--
95	1¾ miles south southwest	H. C. Middlestead	--	--	32	72	--	--
96	1½ miles south southwest	do.	--	--	30	6	--	--
97	1¾ miles southwest	do.	U. S. Geological Survey	1931	17	3	14	3
c/ 98	5½ miles southwest	R. W. Houk	H. L. Wilson	1925	137	4	--	--
99	5¾ miles southwest	do.	do.	1925	556	6	--	--
c/100	do.	C. B. Bammel	--	--	24	48	--	--
c/101	do.	do.	A. E. Fawcett	1929	142	4	132	10
c/102	4½ miles south	C. P. Addison	--	1926	20	48	--	--
c/103	do.	do.	--	--	40	6	--	--
c/104	do.	do.	--	1931	155	4	--	--
d/105 e/	4½ miles south southeast	Marshall Elzy	--	--	20	36	--	--
106	5½ miles south	Steve Pamuk	--	--	17	36	--	--

No.	Distance from Cypress	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
c/121	9½ miles west	Warren Ranch	--	--	--	6	--	--
c/122	8 miles west	do.	--	--	--	6	--	--
c/123	9 miles west	do.	--	1931	80±	6	--	--
124	do.	do.	--	--	--	4	--	--
c/125	10 miles west	do.	Texas Exploration Co. Well 3	--	2,151	6	--	--
c/126	10 miles west southwest	do.	--	1928	4,828	6	--	--

a/ Bench mark is point from which water-level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

b/ T, turbine; A, air; F, flow; C, centrifugal; J, jack or suction; B, bucket; E, electric; S, steam; O, oil; G, gas; H, hand.

c/ P public; Irr. irrigation. Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used.

Penn Livingston and Samuel F. Turner

No.	Height of Bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
92	2½	22.8	June 1, 1931	B,H	D,S	Dug well lined with brick.
93	--	+	--	F	P,RR	Temperature 82° F, Flow estimated at 50 gallons a minute in 1931.
94	--	--	--	J,E	D,S	
95	2	26.0	Nov. 9, 1931	J,H	N	Dug well lined with brick. Automatic water stage recorder installed on this well.
96	--	--	--	J,H	D,S	
97	½	16.5	Nov. 13, 1931	None	N	Test well used for water level measurements.
98	--	--	--	J,E, 5	D,S	
99	4	24.3	Oct. 28, 1932	A,G, 15	I	
100	½	19.7	Mar. 27, 1931	J,W	D,S	Dug well.
101	1	24.4	do.	J,G, 22	D,S	Ten feet of 2-inch screen set at bottom of well.
102	2	10.2	do.	A,E, ¼	D,S	Dug well.
103	2	18.4	Nov. 9, 1931	J,E.	D,S	
104	1	28.3	do.	J,E	D,S	
105	2	12.7	June 1, 1931	J,H	P,D,S	Dug well.
106	1	14.0	Nov. 9, 1931	J,H	D,S	Do.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
121	--	--	--	J,W	S	Oil test.
122	--	--	--	J,W	S	Do.
123	--	--	--	J,W	D,S	At Warren Ranch.
124	0	38.1	Oct. 28, 1931	None	N	
125	--	--	--	J,W	S	Oil test.
126	--	--	--	J,W	S	Do.

d/ See table of analyses for analysis of water from this well.
e/ See "Table of field tests" for tests of hardness, chloride and sulphate in water from this well.
f/ Reported by driller.
g/ Measured by Southern Engine and Pump Company.
h/ Measured by Layne-Texas Company.

Records of wells in Harris County--Continued

No.	Distance from Cypress	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
e/127	6 miles west	--	--	--	--	--	--	--
e/128	6 miles west southwest	--	--	--	--	--	--	--
129	4½ miles west northwest	Gano Switch	U. S. Geological Survey	1931	9	3	--	--
130	4½ miles southwest	--	--	--	100±	3	--	--
d/131 e/	5¼ miles southwest	C. E. House	Harry Bennett	1914	92	4	--	--
132	do.	do.	I. W. Lawson	1905	139	28	74 92 125	15 21 14
e/133	5¾ miles southwest	J. H. Huber	--	--	95±	--	--	--
134	9 miles southwest	Ira Southard	Ira Southard	1931	274	24	230	40
e/135	do.	do.	--	--	90	--	--	--
d/136 e/	do.	J. Freeman	--	--	138	24	--	--
137	8 miles southwest	W. E. Freeman	Layne-Texas Co.	1928	207	24	--	--
138	do.	do.	I. W. Lawson	1909	137	24	59 99	38 24
139	7¾ miles southwest	Oscar Kemp	Harry Bennett	1927	134	24	--	--
e/140	do.	do.	Layne-Texas Co.	1931	359	18	66 155 201 258 343	111 22 27 36 16
161	2 miles north	F. Kitzman	Harvey & Rusk	1930	4,425	--	--	--
162	do.	do.	do.	1930	81	6	--	--
163	do.	do.	do.	1926	80	4	--	--
164	do.	do.	do.	1926	4,200	--	--	--
e/165	1 mile northeast	P. H. Skinner	--	--	1,717	6	--	--
e/166	1¾ miles northwest	E. C. Smith	U. S. Geological Survey	1931	21	3	16	5
167	do.	do.	Layne-Texas Co.	1928	158	6	105	53
168	1½ miles northwest	do.	U. S. Geological Survey	1931	13	3	--	--
d/169 e/	1¼ miles northwest	H. & T. C. R.R.		--	400	8	--	--
e/170	In Cypress	E. H. Juergen	Harry Bennett	1915	102	4	--	--

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
127	--	--	--	J,W	S	
128	--	--	--	J,W	S	
129	½	2.9	Apr. 28, 1931	None	N	Test well used for water level measurement. Deepened to 21 feet on Nov. 4, 1931.
130	0	16.6	Oct. 28, 1931	None	N	
131	--	--	--	J,W	D,S	
132	1½	23.3	Oct. 28, 1931	T,G, 40	N	Casing; 62 feet of 28-inch and 9 5/8-inch to bottom. Water level reported as 16 feet below ground in 1905.
133	--	--	--	J,H	D,S	
134	--	--	--	T,E, 45	I	Casing; 80 feet of 24-inch and 10-inch to bottom. Yield 850 gallons a minute,
135	--	--	--	J,W	D,S	measured Aug. 18, 1932.
136	½	36.3	Mar. 24, 1931	T,E, 40	I	Temperature 71° F. Yield 1,360 gallons a minute, measured Aug. 18, 1932.
137	--	--	--	T,E, 5	I	Yield 980 gallons a minute, measured Aug. 23, 1932. Casing: 80 feet of 24-
138	--	--	--	T,E, 25	I	Casing; 64 inch and 12-inch to bottom. feet of 24-inch and 11 5/8-inch to bottom. Screen set at 69 to 127 feet.
139	1	35.8	Mar. 17, 1933	None	N	Casing; 70 feet of 24-inch and 12-inch to bottom.
140	--	--	--	T,E, 30	I	Temperature 71° F. Casing; 121 feet of 18-inch and 12-inch to bottom. Screens set at 73 to 113, 156 to 174, 208 to 228, 270 to 290 and 345 to 355 feet. Yield 960 gallons a minute, measured Aug. 18,
161	--	--	--	None	N	1933. Oil test. Cypress Oil Company. Well 2.
162	1	7.8	Apr 3, 1931	None	N	Supplied water for drilling oil test.
163	1	7.3	do.	A,S	N	Do.
164	--	--	--	None	N	Oil test. Cypress Oil Company. Well 1.
165	--	+	--	F	S	Oil test, flowing about 1 gallon of water a minute with gas.
166	½	14.7	Oct. 31, 1931	None	N	Test well used for water level measurements.
167	3	6.9	Apr. 3, 1931	None	N	Six-inch casing from top to bottom. Screen set at 134 to 158 feet.
168	½	3.8	May 13, 1931	None	N	Test well used for water level measurements.
169	½	12.5	Apr. 3, 1931	C,O, 20	RR	Eight-inch drilled well in bottom of dug well, 35 feet deep and 20 feet in diameter.
170	--	--	--	J,G, 6	D,S	

Records of wells in Harris County--Continued

No.	Distance from Cypress	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
171	In Cypress	E. H. Juergon	--	--	72	3	--	--
172	¾ mile southeast	--	U. S. Geological Survey	1931	13	3	--	--
d/173 o/	1½ miles southeast	C. L. Nash	--	1931	110	4	--	--
e/174	do.	do.	Layne-Bowler Co.	1907	2,830	--	--	--
175	2 miles southeast	--	U. S. Geological Survey	1931	18	3	14	4
176	2¾ miles southeast	E. E. Petry	--	1928	50	3	--	--
e/177	5 miles southeast	K. P. Black	J. H. Black	1929	65	3	--	--
178	do.	do.	--	Old	40	3	--	--
179	5¼ miles southeast	T. A. Hill	H. Tanner	--	60	4	--	--
180	5½ miles southeast	J. Williams	U. S. Geological Survey	1931	13	3	--	--
e/181	do.	do.	--	--	60	4	--	--
182	4½ miles south	Joel Schmidt	Joel Schmidt	1930	239	24	--	--
e/183	5¾ miles south	J. J Sweeney	--	1926	284	24	--	--
184	6 miles south southwest	-- Tucker, lessor	--	--	50	--	--	--
185	do.	do.	--	--	5,420±	12½	--	--
e/186	do.	do.	Layne-Texas Co.	1931	--	18	--	--
201	5¾ miles southeast	J. H. Clark	--	1929	23	4	--	--
d/202 e/	6 miles southeast	R. H. Richards	H. Tanner	1928	48	6	--	--
203	do.	do.	U. S. Geological Survey	1931	16	3	--	--
204	6¼ miles southeast	Humble Pipe Line Co.	--	--	125	6	--	--
e/205	do.	do.	--	--	700±	6	--	--
e/206	6½ miles southeast	R. B. Tucker	Layne-Bowler Co.	Old	450±	24	--	--
207	do.	do.	--	Old	7	10±	--	--
208	7¼ miles southeast	E. T. Weaver	--	--	65±	3	--	--
209	do.	H. & T. C. R.R.	U. S. Geological Survey	1931	16	3	--	--
210	do.	--	--	--	68	4	--	--
e/211	7½ miles northeast	E. T. Weaver	--	Old	40	4	--	--

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
171	2	8.5	Apr. 3, 1931	None	N	
172	1	4.3	Apr. 28, 1931	None	N	Test well used for water level measurements.
173	1	5.7	Apr. 3, 1931	J,E, 1	D,S	
174	--	+	--	F	P	Houston Hot Well, used for bathing. Temperature 104° F. Estimated flow, 50 gallons a minute.
175	½	17.3	Oct. 31, 1931	None	N	Test well used for water level measurements.
176	--	--	--	J,H	D,S	
177	1	2.9	Apr. 3, 1931	J,E	D,S	
178	½	2.4	do.	None	N	
179	--	4.4	Apr. 24, 1930	J,G	D,S	Temperature 67° F.
180	½	3.6	Apr. 25, 1931	None	N	Deepened to 20 feet on Oct. 30, 1931.
181	1	5.7	May 19, 1931	J,H	D,S	
182	--	--	--	T,O, 80	I	Yield 1,270 gallons a minute, measured Aug. 1, 1932.
183	0	24.0	Mar. 12, 1931	T,G	I	Yield estimated as 800 gallons a minute.
184	--	15.2	do.	None	N	
185	5	51.9	do.	None	N	Oil test. Cranfill and Reynolds well 1 Rorick.
186	1	21.6	do.	T,E	I	Yield 2,180 gallons a minute, measured Aug. 10, 1932.
201	--	--	--	J,H	D,S	Reported as strong supply of hard water.
202	1½	9.4	May 19, 1931	J,W	D,S	
203	½	7.8	May 5, 1931	None	N	Test well used for water level measurements.
204	--	--	--	A,O	P,Ind	
205	1	23.9	Apr. 2, 1931	A,O	P,Ind	Temperature 76° F.
206	½	22.5	do.	A,G	D,S	Formerly used for rice irrigation.
207	½	1.7	May 19, 1931	None	N	
208	½	20.2	Sept. 24, 1931	J,G, 1½	S	
209	½	4.5	May 14, 1931	None	N	Test well used for water level measurements. Deepened to 20 feet, Oct. 31, 1931.
210	1	11.4	Apr. 2, 1931	J,W	N	
211	2	7.8	do.	J,W	D,S	At Satsuma.

Records of wells in Harris County--Continued

No.	Distance from Cypress	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
d/212 e/	8 miles southeast	H. & T. C. R.R.	H. Tanner	1924	56	6	--	--
e/213	8¾ miles southeast	R. B. Herring	R. B. Herring	1931	30	1½	29	1
d/214	9 miles southeast	Mrs. J. A. Herring	--	1915?	66	--	--	--
e/215	do.	do.	--	1925	42	4	--	--
216	10 miles southeast	--	U. S. Geological Survey	1931	16	3	--	--
e/217	7¾ miles east	H. I. Mooney	H. I. Mooney	1928	40	6	--	--
218	8 miles east	do.	--	1930	13	4	--	--
d/219	do.	Tom Franklin	Tom Franklin	1926	19	18	--	--
d/220	9 miles east	Mrs. L. Hargrove	--	1931	28	3½	--	--
e/221	10¾ miles east	-- Eubanks	H. L. Wilson	--	210±	6	--	--
e/222	10½ miles east	S. Torpstra	do.	1928	194	3	--	--
d/223 e/	do.	G. Torpstra	do.	1930	94	4	--	--
e/224	12 miles east southeast	Ed Schoenfield	H. Tanner	--	65	3	--	--
d/225 e/	11½ miles east southeast	Trinity & Brazos Valley R. R.	McMasters & Pomeroy	1923	616	8	575	41

No.	Distance from Aldine	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
e/241	6 miles west southwest	C. H. Daniels	--	--	40	--	--	--
e/242	5½ miles west southwest	Mrs. Anna Foldin	--	--	48	4	--	--
d/243 e/	6 miles west southwest	H. H. Radley	--	1930	67	4	--	--
e/244	do.	J. W. White	H. Klores	1929	44	3	--	--
e/245	do.	-- Forney	--	--	54	36	--	--
e/246	5¾ miles west southwest	S. H. Hilderbranna	--	--	48	4	--	--

a/ Bench mark is point from which water-level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

b/ T, turbine; A, air; F, flow; C, centrifugal; J, jack or suction; B, bucket; E, electric; S, steam; O, oil; G, gas; H, hand.

c/ P, public; Irr, irrigation; Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
212	--	--	--	J,W	P	
213	--	--	--	J,H	D,S	
214	--	--	--	J,W	D,S	
215	2	12.2	May 19, 1931	J,W	S	
216	½	4.5	May 22, 1931	None	N	Test well used for water level measurements.
217	0	5.5	Mar. 28, 1931	J,H	D,S	Water strata at 13, 20, 28 and 40 feet.
218	--	--	--	J,H	D,S	Reported to have fine quality soft water.
219	--	--	--	J,H	D,S	
220	--	--	--	J,H	D,S	
221	--	--	--	J,H	D,S	
222	--	--	--	J,W	D,S	
223	--	--	--	J,G, 3	D,S	Well deepened to 238 feet in 1932.
224	--	--	--	J,H	D,S	At North Houston.
225	--	--	--	J,O, 10	RR	576 feet of 8-inch casing and 40 feet of 8-inch screen. Water level was 13 feet below surface in 1923. f/

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
241	--	--	--	J,H	D,S	
242	--	--	--	J,W	D,S	
243	--	--	--	J,W	D,S	
244	--	--	--	J,H	D,S	
245	--	--	--	J,W	D,S	Dug well, 27 feet with 27 foot drilled well in bottom. Water is reported to scald plants when used for irrigation.
246	--	--	--	J,H	D,S	

d/ See table of analyses for analysis of water from this well.
e/ See "Table of field tests" for tests of hardness, chloride and sulphate in water from this well.
f/ Reported by driller.
g/ Measured by Southern Engine and Pump Company.
h/ Measured by Layne-Texas Company.

Records of wells in Harris County--Continued

No.	Distance from Aldine	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
d/247 e/	5½ miles southwest	W. H. Wood	Geo. Walker	--	56±	4	--	--
e/248	do.	E. E. Redenz	E. E. Redenz	--	50±	4	--	--
e/249	7¾ miles southwest	A. Swanke	--	--	30	36	--	--
e/250	do.	do.	--	--	33	3	--	--
e/251	7½ miles southwest	Ed. E. Fox	--	--	50±	--	--	--
e/252	5½ miles southwest	Joe Polk	--	--	80	4	--	--
253	2 miles west	J. B. Batman	--	--	21	4	--	--
254	2½ miles west northwest	J. M. Blake	U. S. Geological Survey	1931	20	3	--	--
e/255	do.	do.	--	--	41	60	--	--
e/256	do.	do.	H. L. Wilson	1927	189	6	150	39
e/257	3 miles northwest	M. C. Oldham	--	1927	80±	6	--	--
e/258	3¾ miles northwest	-- Lipper Well 1	Kelly et al	--	3,213	10	--	--
259	4¼ miles northwest	O. J. Spears	--	1930	35	--	--	--
e/260	5 miles northwest	Steve Pamuk	-- Hardy	1923	112	6	--	--
e/261	5½ miles northwest	N. O. Alford	H. L. Wilson	--	200±	5	--	--
262	5 miles north northwest	John Williamson	John Logan	1927	174	6	120	51
e/263	4 miles north	O. D. Heath	O. D. Heath	--	45	6	--	--
264	3 miles north	H. Weary Place	P.S. Griffith	Old	1,610	9	200 650	-- --
e/265	2½ miles north	do.	--	Old	--	4	950 --	-- --
266	2¾ miles north northwest	M. C. Oldham	--	1927	80	6	--	--
267	2¾ miles south southwest	A. J. Covert	A. J. Covert	1931	45	2	41	3
281	3¾ miles north northeast	M. P. Hodges	M. P. Hodges	1931	27	6	--	--
e/282	4½ miles east southeast	L. M. Breno	L. M. Breno	1929	38±	2	--	--
e/283	4½ miles southeast	H. Ritter	H. Ritter	--	22	48	22	--
e/284	do.	do.	do.	--	50	6	34 50	-- --
301	12½ miles east northeast	J. H. Powell Well 1	Ralph C. Ely et al	--	2,108	--	--	--

Penn Livingston and Samuel F. Turner

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
247	--	--	--	J,H	D,S	
248	--	--	--	J,W	D,S	Weak supply at 20 to 30 feet, strong supply at 40 to 50 feet.
249	--	--	--	J,H	N	Originally was 21 feet dug well with good water but dried up and 10 feet drilled well in bottom brought in bad water.
250	--	--	--	J,H	D,S	
251	--	--	--	J,G, 2	D,S	
252	--	--	--	J,H	D	
253	1/2	2.3	Mar. 27, 1931	J,H	S	
254	1/2	6.6	Dec. 9, 1931	None	N	Test well used for water level measurements.
255	2	11.7	Mar. 27, 1931	J,W	D,S	Dug well, strong supply.
256	1	26.5	do.	None	N	
257	--	--	--	J,G, 1 1/2	D,S	
258	0	17.0	Nov. 18, 1931	J,G, 2	D,S	Oil test, used as water well, measured depth as 50 feet.
259	--	--	--	J,H	D,S	
260	--	--	--	J,G	D,S	
261	--	--	--	J,E, 1/4	D,S	
262	--	--	--	J,W	D,S	173 feet of 6-inch casing with screen set at 146 to 169 feet.
263	1	7.1	June 1, 1931	J,W	D,S	
264	1	3.0	May 29, 1931	None	N	Oil test, water flowed from 950 feet sand until 1930.
265	0	1.0	do.	None	N	
266	--	--	--	J,W	D,S	
267	1 1/2	17.9	June 1, 1931	None	D,S, Ind	New well, pump not yet installed.
281	0	5.7	May 29, 1931	None	D,S	Do.
282	0	5.4	May 28, 1931	J,H	D,S	
283	0	9.5	do.	J,H	D,S	
284	--	--	--	J,H	D,S	Water level reported as 16 feet below ground in summer of 1930. f/
301	--	--	--	None	N	Oil test, see driller's log. Five miles east southeast of Humble.

Records of wells in Harris County--Continued

No.	Distance from Aldine	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
e/321	In Crosby	Texas & New Orleans R.R.	--	1910?	560±	8	--	--
e/322	do.	T. E. Reidland	T. E. Reidland	1925	270	3	--	--
323	do.	do.	do.	--	237	2	--	--
324	Crosby 1 mile east of	Harris County	do.	1930	76	4	--	--
e/325	Crosby, 1½ miles south of	Harris Service Sta.	do.	1931	247	4	--	--
e/326	Crosby, 2 miles south of	Gulf Pipe Line Co.	Layne-Texas Co.	--	533	2	494	39
e/327	Crosby, 2¼ miles south	--	T. E. Reidland	--	220	2	--	--
e/328	Crosby, 2½ miles northeast of	J. Bennett	do.	1931	86±	2	--	--
e/329	Crosby, 4¾ miles northeast of	Sam Sampson	Sam Sampson	1928	25	36	--	--
330	Crosby, 5¼ miles northeast of	Odem Bros.	--	Old	500±	4	--	--

No.	Distance from Katy	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
351	6½ miles north northwest	--	--	--	--	4	--	--
352	5¾ miles north	A. E. Thompson	I. W. Lawson	1909	470	24	45 127 375	66 48 75
e/353	5½ miles north	do.	do.	1905	1,602	6	752 834 990 1,191	51 12 32 27
354	do.	do.	Layne-Texas Co.	1906	442	9-5/8	1,240 1,359	18 11
355	do.	do.	do.	1908	133	24	402 78	40 55
356	4 miles north	--	--	--	--	24	--	--
e/357	4½ miles north northeast	P. V. Cook	--	--	--	30	--	--
358	4 miles north northeast	Freeman Est.	--	--	--	48	--	--

a/ Bench mark is point from which water-level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

b/ T, turbine; A, air; F, flow; C, centrifugal; J, jack or suction; B, bucket; E, electric; S, steam; O, oil; G, gas; H, hand.

c/ P, public; Irr, irrigation; Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
321	-3	18.6	Oct. 29, 1931	None	N	Well flowed until about 1920.
322	--	--	--	J,E, 5	P	
323	--	--	--	A	P	
324	3	12.6	Oct. 29, 1931	None	N	Drilled to supply water for building highway.
325	--	--	--	J,E	D,S	Water level reported as 39 feet below ground in 1931. f/
326	1	22.9	Oct. 29, 1931	A,O	D,S, Ind	463½ feet of 6-inch casing and 60 feet of 6-inch screen.
327	0	12.7	do.	J,H	N	
328	--	--	--	A,G, 2	D,S	
329	0	12.8	Oct. 30, 1931	B,H	D,S	Dug well.
330	½	20.4	do.	None	N	

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
351	½	44.0	Apr. 28, 1931	J,W	D,S	
352	--	--	--	T,E, 35	I	Casing; 68 feet of 24-inch, 11 5/8-inch at 68 to 194 and 8¼-inch at 194 to 450 feet. Screens set at 68 to 180 and 392 to 450 feet. Yield, 780 gallons a minut
353	--	+	--	F	N	Six-inch casing measured Aug. 18, 1932. set at 1,423 feet. Screens set at 753 to 796, 834 to 853, 984 to 1,028, 1,193 to 1,217, 1,237 to 1,259 and 1,364 to
354	--	--	--	None	N	9 5/8- 1,385 feet. See driller's log. inch casing set at 442 feet. Screen set
355	--	--	--	None	N	Casing; 72 feet of at 402 to 442 feet. 24-inch and 9 5/8-inch to 134 feet. Screen set at 77 to 129 feet. Well
356	2½	45.5	Mar. 17, 1933	T	N	caved in and abandoned.
357	-1½	35.6	Mar. 24, 1931	T,E, 40	I	Temperature 71° F.
358	0	15.9	do.	T,E, 20	I	Casing; 100 feet of 24-inch and 11 5/8-inch to bottom.

d/ See table of analyses for analysis of water from this well.
e/ See "Table of field tests" for tests of hardness, chloride and sulphate in water from this well.
f/ Reported by driller.
g/ Measured by Southern Engine and Pump Company.
h/ Measured by Layne-Texas Company.

Records of wells in Harris County--Continued

No.	Distance from Katy	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
359	5½ miles north northeast	H. F. Jordan	I. W. Lawson	1914?	140	24	--	--
360	4½ miles north northeast	E. G. Stockdick	--	1907	180	72	--	--
e/361	6½ miles northeast	Acme Planting & Developing Co.	A. T. Jones	1929	368	12	--	--
e/362	4 miles northeast	E. G. Stockdick	--	1930	500±	24	--	--
e/363	3 miles northeast	F. M. Morton	I. W. Lawson	1930	188	18	--	--
364	1½ miles east northeast	John Cape	Lawson & Hardin	1925	789	24	--	--
e/365	In Katy	M. K. & T. R.R.	--	--	202	120	55 160	-- --
366	1¼ miles east	H. C. Lamb	--	--	180	12	200 --	-- --
367	3½ miles east northeast	W. C. Hickman	Layne-Texas Co.	1930	535	16	113 194 317 378	12 41 44 31
e/368	do.	do.	--	--	36	--	--	--
369	3 miles east	J. M. Johnson	Layne-Texas Co.	1929	110	4	90	20
d/370 e/	do.	do.	do.	1929	625	18	94 171 296 403 524	37 56 33 17 80
371	3 miles southeast	L. E. Morrison	I. W. Lawson	1925	374	24	--	--
381	7½ miles northeast	--	--	--	95±	6	--	--
382	6 miles northeast	C. Stockdick	--	1919?	185	24	--	--
383	do.	do.	Hardin & Lawson	1925?	380	24	--	--
384	do.	A. J. Jordan	I. W. Lawson	1930	505	18	--	--
385	do.	do.	Layne-Texas Co.	1931	359	18	--	--
386	5¾ miles east	W. R. Euten	Will Justman	1911?	254	24	--	--
e/387	4¾ miles east	H. B. Crowder	--	--	--	72	--	--
e/388	6½ miles east	--	--	--	180±	24	--	--

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
359	--	--	--	None	N	
360	--	--	--	T,E, 20	I	Yield, 630 gallons a minute, Aug. 17, 1932.
361	0	29.2	Mar. 12, 1931	T,E, 50	I	Temperature 71° F. Yield, 1,200 gallons a minute, Aug. 10, 1932.
362	1	32.8	do.	T,E, 40	I	Temperature 73° F. Yield, 1,240 gallons a minute, Aug. 17, 1932.
363	--	--	--	T,E, 20	I	Yield, 525 gallons a minute, Aug. 20, 1932. Water level was 38 feet below
364	--	--	--	T,E, 75	I	Yield, 1,440 ground when drilled. f/ gallons a minute, Aug.17, 1932.
365	--	--	--	J	RR	Dug well 55 feet deep with 2 drilled wells in bottom, 162 and 202 feet deep.
366	-½	37.2	Mar. 12, 1931	None	N	Automatic water stage recorder installed on this well from May, 1931 to Feb.,
367	--	36	May, 1930 f/	T,E	I	Casing; 150 feet of 16-inch, 12- 1933. inch at 138 to 301 and 10-inch at 301 to 412 feet. Screens set at 110 to 125, 195 to 232, 318 to 358 and 377 to 407 feet. Yield 1,110 gallons a minute,
368	--	--	--	J,H	D,S	Aug. 2, 1932.
369	--	28	Mar. 1929 f/	J,G	D,S	Casing; 42 feet of 4-inch and 3-inch to bottom. Screen set at 104 to 110 feet.
370	0	34 36.3	Jan.1929 f/ Mar.12, 1931	T,E, 75	I	Casing; 18-inch at 0 to 120, 16-inch at 120 to 164, 12-inch at 138 to 340, and 10-inch at 340 to 609 feet. Screen set at 119 to 129, 177 to 218, 299 to 320, 408 to 418 and 539 to 600 feet. Yield, 1,630 gallons a minute, Aug. 2, 1932.
371	--	--	--	T,E, 50	I	Casing; 70 feet of 24-inch, 10-inch to 200, and 8-inch to bottom. Yield, 1,100 gallons a minute, Aug. 19, 1932. Tem-
381	2½	25.6	Mar. 12, 1931	None	N	perature 73° F.
382	--	--	--	T,G	N	One hundred feet of 24-inch casing and 12-inch to bottom.
383	--	--	--	T,E, 50	I	Casing; 65 feet of 24-inch, 185 feet of 10-inch and 6-inch to bottom. Yield, 1,310 gallons a minute, August 17, 1932.
384	1	34.7	Mar. 17, 1933	None	N 4	Casing; 100 feet of 18-inch, 100 feet of 12-inch, 100 feet of 8-inch and 6-inch to bottom. Well did not yield
385	--	37.2	do.	T,E, 60	I	Casing; 125 feet of 18- enough water. inch and 12½-inch to bottom. Yield, 1,420 gallons a minute, August 17, 1932.
386	--	--	--	T,O, 32	I	Yield, 990 gallons a minute, Aug. 1, 1932.
387	2	40.7	Sept.14, 1932	None	N	Abandoned rice well, has 6-foot pit about 40 feet deep with drilled well in
388	1½	29.5	do.	J,W	S	Formerly used for rice irri- bottom. gation.

Records of wells in Harris County--Continued

No.	Distance from Katy	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
e/389	7½ miles east southeast	John Wendling	--	1912?	50±	4	--	--
e/390	8⅔ miles east southeast	-- Fitch	--	1918	33	2½	--	--
391	8¾ miles east	Mrs. -- Murphy	--	1910?	--	24	--	--
e/392	8 miles east	W. A. Euten	J. A. Matzke	1930	24	3	--	--
e/393	do.	-- Paddock	do.	1932	72	3	--	--
394	do.	-- Hammond	-- Hammond	1909?	37	3	--	--
e/395	7¼ miles east northeast	A. J. Jordens	Chas. Schultz	1917	120	3	--	--
d/396 e/	8 miles east northeast	H. Speckmaier	do.	1914	94	3	--	--
e/397	9¼ miles east northeast	August Otto	do.	--	--	3	--	--
398	9½ miles northeast	Gertie Rice Farm	I. W. Lawson	1906	280	24	117 171 229 242	38 49 10 30
d/399 e/	9¾ miles northeast	do.	do.	1906	326	30	65 167 182 234 269	63 3 11 26 10
400	11 miles northeast	-- Schmidt Est.	Schmidt Bros.	1926	258	12	--	--
e/401	12 miles northeast	W. H. Grisbee	W. H. Grisbee	1921	45	4	--	--
e/402	11 miles east northeast	Wm. Druesedow	Chas. Schultz	--	52	4	--	--
e/403	10⅔ miles east northeast	O. Beckendorf	O. Beckendorf	--	27	1¼	--	--
e/404	10½ miles east	Bear Creek Gun Club	--	--	100±	3	--	--
e/405	10¾ miles east	Schulz Bros.	-- Schulz	--	24	4	--	--
e/406	do.	Addicks School	--	--	105	3	--	--

a/ Bench mark is point from which water-level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

b/ T, turbine; A, air; F, flow; C, centrifugal; J, jack or suction; B, bucket; E, electric; S, steam; O, oil; G, gas; H, hand.

c/ P, public; Irr, irrigation; Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used.

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No.	Height of bench mark above (+) ground (ft.) a/	Water level		Pump and kind and amount of power b/	Use of water c/	Remarks
		Below bench mark (ft.)	Date of measurement			
389	--	--	--	J,W	D,S	
390	0	7.8	Sept.21, 1932	None	N	
391	1	13.2	Sept. 2, 1931	None	N	
392	--	--	--	J,H	D	Barker School.
393	--	--	--	J,H	S	At Barker.
394	1	16.8	Sept. 2, 1931	J,H	D,S	
395	--	--	--	J,W	D,S	
396	--	--	--	J,W	D,S	
397	--	--	--	J,H	D,S	
398	-3	7.2	Aug. 5, 1931	T,None	N	Casing; 55 feet of 24-inch, 165 feet of 9 5/8-inch and 6-inch set to 272 feet. Screens set at 125 to 154, 170 to 220, 228 to 238, and 238 to 246 feet.
399	--	--	--	T,O	I	Casing; 63 feet of 30-inch, and 11 5/8-inch set at 281 feet. Screens set at 79 to 143, 165 to 172, 183 to 193, 234 to 262 and 269 to 279 feet. Yield, 1,240 gallons a minute. August 1, 1932.
400	--	--	--	T,G	I	Casing; 60 feet of 12-inch, 100 feet of 8-inch and 6-inch to bottom. Yield, 560 gallons a minute, Aug. 1, 1932.
401	--	--	--	J,G, 2½	D,S	Temperature 70° F.
402	--	--	--	J,W	D,S	
403	--	--	--	J,W	D,S	
404	--	--	--	J,H	D	
405	--	--	--	J,E, 1/8	D	At Addicks.
406	-5	16.7	Sept. 3, 1931	J,E, 1/3	P	

d/ See table of analyses for analysis of water from this well.
e/ See "Table of field tests" for tests of hardness, chloride and sulphate in water from this well.
f/ Reported by driller.
g/ Measured by Southern Engine and Pump Company.
h/ Measured by Layne-Texas Company.

Records of wells in Harris County--Continued

No.	Distance from Fairbanks	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
e/421	4¾ miles west	Frank Edwards	Frank Edwards	--	70	1½	--	--
e/422	5 miles west southwest	J. C. Byers	--	--	--	3	--	--
e/423	6¼ miles southwest	-- Koehn	Chas. Schultz	--	107	4	105	2
d/424 e/	do.	L. Gastmann	--	--	20	36	--	--
e/425	6 miles southwest	J. J. Settegast Jr.	--	--	30+	4	--	--
e/426	5¼ miles south southwest	F. L. Sheckels	O. Luckenmeyer	--	42	3	--	--
e/427	4⅛ miles southwest	G. C. Cox	--	--	53	4	--	--
e/428	3 miles west southwest	H. A. Seathoff	H. A. Seathoff	--	20	3	12	8
429	3⅕ miles west southwest	--	--	--	26	4	--	--
430	2 miles west	G. E. Wilkins	Shelby or Lawson	1923?	2,000+	12	--	--
e/431	do.	do.	do.	1923?	200+	6	--	--
e/432	1¾ miles west	do.	--	--	--	3	--	--
d/433 e/	2¾ miles west	L. Z. Pledger	Ed. Haven	1924	41	6	34	--
e/434	do.	do.	-- Tanner	1930	58	4	--	--
e/435	2¼ miles northwest	R. C. Peters	do.	1928	45	4	--	--
e/436	1¾ miles northwest	G. F. Brown	Carl Schultz	1930	49	4	34	15
437	do.	do.	U. S Geological Survey	1931	11	3	--	5
e/438	1¼ miles northwest	W. A. Summermeyer	-- Tanner	1917?	56	6	--	--
d/439 e/	½ mile northwest	F. N. Tanner	--	1896	57	4	--	--
440	do.	C. W. Hahl	U. S. Geological Survey	1931	16	3	--	--
e/441	¼ mile northwest	J. F. Bloodworth	--	--	70	5	--	--
e/442	½ mile north northwest	Fairbanks School	-- Tanner	--	55+	--	--	--
e/443	¾ mile north	J. F. Bane	--	--	50+	--	--	--
e/444	½ mile north	J. Stevens	J. Stevens	1926	10	6	--	--

a/ Bench mark is point from which water-level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

b/ T, turbine; A, air; F, flow; C, centrifugal; J, jack or suction; B, bucket; E, electric; S, steam; O, oil; G, gas; H, hand.

c/ P, public; Irr, irrigation; Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used.

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No.	Height of bench mark above (+) ground (ft.) a/	Water level		Pump and kind and amount of power b/	Use of water c/	Remarks
		Below bench mark (ft.)	Date of measurement			
421	--	--	--	J,H	D,S	Driven well with sand point on bottom of casing.
422	--	--	--	J,G, 1½	D,S	
423	--	--	--	J,H	D,S,I	
424	--	--	--	J,H	D	
425	--	--	--	J,H	S	
426	--	--	--	J,H	D	
427	--	--	--	J,H	D	
428	--	--	--	J,W	D,S	
429	1	11.3	July 27, 1932	None	N	Drilled to supply water for drilling oil test.
430	1	5.3	June 24, 1932	None	N	Abandoned oil test.
431	5	+	--	Flow	S	Flow estimated at 100 gallons a minute, 5 feet above ground. Temperature 87° F.
432	--	--	--	J,H	D,S	
433	--	--	--	J,G	D,S	
434	--	--	--	J,E, ½	D,S	
435	1	6.3	May 19, 1931	J,E, ½	D,S	
436	--	--	--	J,E, ½	D	
437	½	5.2	May 14, 1931	None	N	Test well used for water level measurement.
438	--	--	--	J,H	D,S	
439	2	5.1	Apr. 2, 1931	J,W	D,S	
440	½	8.7	May 19, 1931	None	N	Test well used for water level measurement.
441	0	5.3	do.	J,E	D,S	
442	--	--	--	J,E	P	
443	--	--	--	J,W	D,S	
444	2	5.4	Apr. 9, 1931	J,H	S	

d/ See table of analyses for analysis of water from this well.
e/ See "Table of field tests" for tests of hardness, chloride and sulphate in water from this well.
f/ Reported by driller.
g/ Measured by Southern Engine and Pump Company.
h/ Measured by Layne-Texas Company.

Records of wells in Harris County--Continued

No.	Distance from Fairbanks	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
e/445	¾ mile north northeast	H. Collett	H. Collett	1923	72	4	--	--
d/446 e/	¾ mile northeast	C. W. Hahl Co.	-- Tanner	1930	60	4	--	--
e/447	¾ mile east northeast	L. A. Reneau	L. A. Reneau	1912	20	6	--	--
e/448	1 mile east northeast	C. Schmidt	--	--	--	--	--	--
e/449	1 mile northeast	J. C. Guhn	J. C. Guhn	1916	44	6	--	--
450	½ mile north	C. W. Hahl Co.	--	--	90	10	--	--
e/451	½ mile north northeast	John Reese	-- Tanner	--	55	3	--	--
e/452	¼ mile north	Henry Lange	--	1915	39	6	--	--
453	In Fairbanks	Mrs. -- Shulbert	-- Tanner	1929	55±	--	--	--
d/454 e/	do.	H. & T. C. R.R.	--	Old	124	16 feet	--	--
e/455	½ mile southeast	Aug. Walla	Aug. Walla	1931	47	4	18	25
456	do.	Frank Willberg	Layne-Texas Co.	1930	230	6	205	20
e/457	do.	do.	-- Tanner	1930	75±	--	--	--
e/458	1¼ miles southeast	R. D. Wirt	-- Wright	1900?	300±	3	--	--
459	1½ miles southeast	C. W. Hahl	U. S. Geological Survey	1931	20	3	--	--
e/460	1½ miles south	T. Rauh	M. R. Pretty	1932	138	4	118	--
e/461	1¾ miles south	R. F. Falk	H. Sauer	--	35	4	--	--
e/462	2¾ miles south	J. L. Sampson	do.	1931	60±	3	--	--
e/463	3¼ miles south southeast	C. E. Bang	--	Old	40±	2	--	--
e/464	do.	H. O. Bard	H. O. Bard	Old	24	36	--	--
d/465 e/	3¾ miles south southwest	W. R. Sonnen	--	1926	30±	3	--	--
e/466	4½ miles south southwest	Bauer Lumber Co.	--	--	50	3	--	--
467	do.	Texas State Highway	--	1918?	800±	--	--	--
e/468	4½ miles south	H. A. Riedel	--	--	42	3	--	--
e/469	5¾ miles south	S. T. Berry	--	--	40±	3	--	--
e/470	6 miles south	Henry Sauer	H. Sauer	--	75	3	--	--

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
445	--	--	--	J,H	D,S	
446	1	3.5	Apr. 9, 1931	J,H	D,S	
447	--	--	--	J,H	D,S	
448	--	--	--	A,E	D,S	
449	--	--	--	J,H	D,S	
450	1	4.6	Apr. 2, 1931	None	N	Abandoned rice well, 300± feet deep, is 20 feet south of this well.
451	½	2.9	do.	J,H	S	
452	--	--	--	J,W	D,S	
453	--	--	--	--	--	Tested for use in construction of concrete pavement at 200 gallons a minute.
454	2	4.5	Apr. 2, 1931	J,G, 6	D,S	Dug well 16 feet in diameter and 29 feet deep with 6-inch drilled well to 124 feet.
455	3	4.5	do.	J,H	D,S	
456	¼	30.0	do.	None	N	Casing; 194 feet of 6-inch and 4-inch to bottom. Screen set at 198 to 220 feet.
457	1½	3.2	do.	A,E	D,S	
458	--	--	--	A,G	D,S	Ceased flowing about 1910.
459	½	9.5	Aug. 13, 1931	None	N	Test well used for water level measurements.
460	--	--	--	A,G, 20	I	Casing; 118 feet of 4-inch with 20 feet of 20 gauge sound wire screen. Tested at 75 gallons a minute when drilled. f/
461	--	--	--	J,H	D,S	
462	--	--	--	J,G	D,S	
463	--	--	--	J,G	D,S,I	
464	--	--	--	J,H	D,S	
465	--	--	--	J,G, 2	D,S	
466	--	10.5	June 27, 1932	J,H	D	
467	2	33.6	Sept. 16, 1932	None	N	At Hillendahl.
468	--	--	--	J,G	D,S	
469	--	--	--	J,H	D,S	
470	--	--	--	J,H	D,S	

Records of wells in Harris County--Continued

No.	Distance from Fairbanks	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
e/471	6½ miles south	C. N. Ogden	Layne-Texas Co.	--	183	3	163	20
e/481	12½ miles southwest	Chris Pillot	Ed. Beeler	1912	102	3	--	--
e/482	10½ miles southwest	T. Gasaway	T. Gasaway	1921	50	2	--	--
e/483	9¾ miles southwest	V. Foster	V. Foster	1925	126	3	--	--
491	8¼ miles south southwest	W. F. Schneider	W. F. Schneider	1912?	113	2	--	--
d/492	8¾ miles south	G.H. & S.A. R.R.	G. C. Warnecke	--	220	9-5/8	180	40
e/493	15 miles south	T. X. Schuchert	-- Nichols	1931	37	2	--	--
e/494	do.	A. H. Eicke	Layne-Texas Co.	1928	334	6	246	85
495	do.	E. C. McDonald	J. Hobbs	1931	327	2	318	9
496	15½ miles south	Diamond "L" Ranch	Layne-Texas Co.	1928	315	6	267	48

No.	Distance from Houston Post Office	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
e/501	10½ miles northwest	F. Christoph	F. Christoph	--	28	2	--	--
e/502	9¾ miles northwest	J. A. Grein	J. A. Grein	1930	27	1½	--	--
e/503	9½ miles northwest	B. E. Eisman	--	--	105	4	--	--
e/504	do.	A. B. Smith	A. B. Smith	--	35	4	--	--
e/505	8¾ miles northwest	Mrs. -- Rogers	--	--	80±	--	--	--
e/506	8¼ miles northwest	White Oak School	--	--	30±	1½	--	--
e/507	9¾ miles west northwest	Otto Adams	Chas. Schultz	--	175	3	--	--
e/508	9½ miles west northwest	W. Hearold	J. W. Kanaly	1931	175+	3	--	--
e/509	do.	do.	A. E. Fawcett	1931	51	3	48	3

a/ Bench mark is point from which water-level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

b/ T, turbine; A, air; F, flow: C, centrifugal; J, jack or suction; B, bucket; E, electric: S, steam; O, oil; G, gas; H, hand.

c/ P, public; Irr, irrigation; Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used.

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No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
471	--	--	--	J,G, 1½	D,S	Casing; 177 feet of 3-inch with 6 feet of 3-inch screen to 183 feet. Tested at 400 gallons a minute when drilled.f/
481	--	--	--	J,G	D,S	Two miles north of Clodine.
482	--	--	--	J,W	S	
483	--	--	--	J,H	D	
491	--	--	--	J,H	D,S	One and three-quarters miles north northeast of Alief.
492	--	--	--	--	RR	At Jeannetta. Railroad reports 33,000 gallons a day pumped from this well. Nine and five-eights casing from top to 220 feet with 28½ feet of screen at bottom.
493	--	--	--	J,E	D,S	
494	0	20	Feb., 1928 f/	J,E	D,S	Casing; 296 feet of 6-inch with 4-inch to bottom. Screen set at 288 to 315 feet
495	0	25	May 28, 1931 f/	J,H	D	
496	0	24	June 9, 1928 f/	J,W	D,S	Casing; 64 feet of 6-inch and 4-inch to bottom. Screen set at 292 to 315 feet.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
501	--	--	--	J,G, 2	D,S	
502	--	--	--	J,G, 1½	D,S	
503	--	--	--	J,W	D,S	
504	--	--	--	J,H	D,S	
505	--	--	--	J,G, 1½	D,S	
506	--	--	--	J,H	D	
507	--	--	--	J,G, 3	D,S	Water level was 20 feet below surface when well was drilled.
508	1	7.3	May 21, 1931	J,E	D,S	
509	--	--	--	J,E	D,S	

d/ See table of analyses for analysis of water from this well.
e/ See "Table of field tests" for tests of hardness, chloride and sulphate in water from this well.
f/ Reported by driller.
g/ Measured by Southern Engine and Pump Company.
h/ Measured by Layne-Texas Company.

Records of wells in Harris County--Continued

No.	Distance from Houston Post Office	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
e/510	9½ miles west northwest	W. Hearold	--	--	25+	6	--	--
511	9¼ miles west northwest	Henry Koehler	-- Tanner	1929	52	6	--	--
e/512	8⅔ miles west northwest	Ed. Nichols	--	1927	50	6	--	--
513	8 miles west northwest	-- Jancoy	--	--	31	6	--	--
514	do.	--	U. S. Geological Survey	1931	19	3	--	--
e/515	7¼ miles northwest	Melrose Stock Farm	--	--	65	4	--	--
e/516	do.	-- Sabbath	-- Sabbath	--	110+	--	--	--
517	7 miles west northwest	J. W. Beall	Buffalo Oil Co.	1929	4,600	24	--	--
518	do.	do.	do.	1929	153	6	--	--
e/519	6¾ miles west northwest	F. M. Myers	-- Tanner	1930	52	4	--	--
e/520	7⅓ miles west northwest	Woodland Cemetery	J. W. Kanaly	1932	158	3	--	--
e/521	8 miles west northwest	M. R. Pretty	--	--	90+	4	--	--
e/522	6 miles west northwest	Bethel Cemetery	--	--	--	--	--	--
e/523	do.	M. L. Hilton	M. L. Hilton	--	60+	4	--	--
e/524	6¼ miles west northwest	W. T. Carter Jr.	Layne-Texas Co.	1929	293	6	226 273	21 20
e/525	6 miles west	H. C. Weiss	--	1930	173	6	140	33
e/526	6¼ miles west	C. H. Barnes	--	Old	80+	--	--	--
e/527	6 miles west	Chas. Fitch	--	--	150+	--	--	--
e/528	6⅓ miles west	Judge Kennelly	A. E. Fawcett	1932	250	4	--	--
e/529	5¾ miles west	T. Bertaui	do.	--	70	4	--	--
560	do.	do.	do.	1924?	165+	4	--	--
e/561	do.	U. H. Valintine	--	Old	118	--	--	--
e/562	do.	C. V. Wiseman	-- Powell	1932	118+	4	--	--
e/563	5¼ miles west	Tall Timber Stables	--	--	500+	3	--	--
e/564	5 miles west northwest	Hagan Service Station	--	--	--	--	--	--

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
510	½	3.7	May 30, 1931	J,H	D,S	
511	--	--	--	J,G, 3	I	
512	½	5.4	Mar. 20, 1931	A,E	D,S	
513	2	10.4	May 23, 1931	None	N	
514	½	11.8	June 19, 1931	None	N	Test well used for water level measurements.
515	--	--	--	J,G, 2	D,S	
516	--	--	--	J,H	D,S	
517	1	6.7	May 21, 1931	None	N	Abandoned oil test. Casing pulled and present well about 50 feet deep.
518	1	34.6	do.	None	N	Well used to supply water for drilling oil test.
519	1	5.4	Mar. 30, 1931	J,E	D,S	
520	--	--	--	A,G, 5	D,S,P	
521	--	--	--	J,E	D,S	
522	--	--	--	J,G	D,S,I	
523	--	--	--	J,H	D,S	
524	0	30	July 3, 1929 f/	T,E, 5	D,S	Casing; 225 feet of 6-inch, 66 feet of 4½-inch and 3-inch to bottom. Screens set at 225 to 247, and 274 to 294 feet. Yield, 110 gallons a minute when com-
525	0	40	July 26, 1930 f/	J,E, 1½	D,S	Casing; 172 feet of 6-inch pleted. f/ with screen set at 148 to 170 feet. Yield, 20 gallons a minute when complet-
526	--	--	--	J,H	D,S	ed. f/
527	--	--	--	J,H	D,S	
528	--	--	--	J,H	D,S	
529	--	--	--	J,G, 1½	D,S	Also has 2 dug wells about 40 feet deep.
560	1	31.6	June 20, 1932	None	N	
561	--	--	--	--	D,S	
562	--	--	--	A,G	D,S	Also have dug well about 40 feet deep.
563	--	--	--	A,G, 1½	D,S	
564	--	--	--	--	D,S	

Records of wells in Harris County--Continued

No.	Distance from Houston Post Office	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
e/565	5 miles west northwest	L. R. Bennett	--	Old	--	3	--	--
e/566	do.	Ida Zohn	M. R. Pretty	1932	204	4	190	--
e/567	4⅔ miles west northwest	L. H. Georgi	--	1912?	53±	4	--	--
d/568 e/	5½ miles west northwest	W. M. Volmer	--	--	31	36	--	--
e/569	5½ miles west northwest	N. Y. Niemann	--	--	40	36	--	--
e/570	5¼ miles northwest	O. M. Perkins	O. M. Perkins	1932	54	3	--	--
e/571	5½ miles northwest	F. R. Schawatk	--	--	260±	--	--	--
e/572	5¾ miles northwest	J. G. Alexander	--	1931	120	3	--	--
e/573	6 miles northwest	-- Beinhorn	-- Beinhorn	--	255	2	--	--
e/574	6¼ miles northwest	Ed. Pendarvis	A. E. Fawcett	1932	300±	2	--	--
d/575 e/	6 miles northwest	Heights Golf Course	-- Pollock	1932	162	3	--	--
e/576	5¾ miles northwest	Bill Monk	Bill Monk	--	120	3	--	--
e/577	9 miles northwest	John Rinkel	--	--	50±	2½	--	--
e/578	8½ miles north northwest	-- Wright	--	--	48	3	--	--
d/579 e/	7¼ miles north northwest	G. H. Mack	G. H. Mack	1900	35	8	--	--
e/580	6¾ miles north northwest	V. McVaney	-- Wilson	1931	135	4	--	--
e/581	6½ miles north northwest	H. R. Kerley	H. R. Kerley	--	44	2	--	--
582	5¾ miles north northwest	C. Terregrossa	A. E. Fawcett	1928	145	3	--	--
e/583	5½ miles north northwest	J. W. Herridge	--	Old	90	36	--	--
e/584	do.	J. C. Lawton	--	1925	45	4	--	--
e/585	4½ miles north	Houston Textile Mills	Taylor & Roberts	1924?	950	12	--	--
e/586	4½ miles northwest	Heights Ice Co.	McMasters & Pomeroy	1927?	305	10	224 261	19 44
587	do.	South Texas Cotton Oil Co.	Layne-Texas Co.	1921	654	--	132 388	40 29
e/588	do.	Oriental Textile Mills	--	1909	800±	6	589 --	66 --
d/589 e/	4¼ miles northwest	City of Houston	Layne-Texas Co.	1931	2,090	24	--	--
590	do.	do.	do.	1923	1,362	24	559 614 677 872 971	20 42 86 29 78

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
565	--	--	--	J,E	D,S	
566	--	--	--	J,W	D,S	
567	--	--	--	J,H	D,S	
568	--	--	--	J,H	D,S	Dug well.
569	--	--	--	--	D,S	Do.
570	--	--	--	J,H	I	
571	--	--	--	--	--	
572	--	--	--	J,G	D,S	
573	--	--	--	A,G	D,I	
574	--	--	--	--	--	
575	--	--	--	A,G, 5	D,I	
576	--	--	--	J,H	D,S	
577	--	--	--	J,H	D,S,I	
578	--	--	--	J,H	D,S	
579	--	--	--	J,E, ¼	D	
580	--	--	--	J,H	D,S	
581	--	--	--	J,E, ½	D	
582	--	--	--	A,E, 5	D,S,I	
583	--	--	--	J,H	D,S	
584	--	--	--	J,E, ¼	D,S	
585	1½	54.6	Mar. 21, 1931	A,E, 15	D,Ind	
586	--	49	Mar. 7, 1929 f/	T,E, ½	D,Ind	
587	--	43	Aug. 22, 1929 f/	None	N	Screens set at 143 to 163, 391 to 415, and 611 to 652 feet. Well reported caved.
588	--	--	--	A,S	D,Ind	
589	--	--	--	T,E, 150	P	Flowed when drilled.
590	0	55.7	Jan. 23, 1931	T,	N	Casing; 79 feet of 24-inch, 22 feet of 12-inch and 8-inch to 1,040 feet. Screens set at 514 to 564, 579 to 676, 692 to 740, 883 to 926, and 969 to 1,035 feet. Temperature 80½ F. g/

Records of wells in Harris County--Continued

No.	Distance from Houston Post Office	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
591	4¼ miles northwest	City of Houston	--	--	--	--	--	--
d/ 592	4 miles northwest	do.	Layne-Texas Co.	1928	1,271	24	677	570
593	3 miles north northwest	Port City Ice Co.	do.	1927	359	10	156 282	69 36
594	3 miles northwest	Community Ice Co.	McMasters & Pomeroy	1927	250	8	173 207 220	30 8 30
595	3⅛ miles northwest	International Vegetable Oil Co.	--	1917?	--	8	--	--
596	3¼ miles northwest	Swift & Co.	--	1911?	--	10	--	--
597	3 miles northwest	Community Cotton Oil Co.	--	1893	840	--	--	--
598	4⅛ miles west northwest	-- Brooks Est.	--	--	--	6	--	--
599	3¼ miles west northwest	Houston Ice & Cold Storage Co.	Layne-Texas Co.	1922	583	12	181 287 532	50 38 30
d/600	3 miles west northwest	City of Houston	do	1917	558	24	109 267 490	30 55 63
d/601	do.	do.	do.	1918	1,465	24	668	664
e/602	4 miles west	River Oaks Country Club	do.	1929	1,038	10	675	189
603	2⅛ miles west northwest	Guardian Trust Co.	--	Old	--	--	--	--
604	do.	West End Ice Co.	--	--	--	8	--	--
605	2 miles west northwest	Dickson Car Wheel Co.	Taylor & Roberts	1905?	900±	10	--	--
606	do.	Henke & Pillot	--	Old	575	6	290 391	45 19
e/607	do.	do.	McMasters & Pomeroy	1929	571	6	520 515	52 56
e/608	1¾ miles west northwest	Fidelity Products Co.	Layne-Texas Co.	1906	350	6	320	30
e/609	do	do.	--	1920?	825	8	--	--
e/610	do.	Standard Rice Milling Co.	Layne-Texas Co.	1908	853	6	760	78

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
591	--	--	--	T,E, 75	P	
592	--	--	--	T,E, 150	P	Casing; 260 feet of 24-inch and 12-inch to 1,271 feet. Screens set at 677 to 698, 788 to 827, 875 to 895, 966 to 1,003, 1,072 to 1,091, 1,110 to 1,128, 1,156 to 1,176, and 1,197 to 1,253 feet.
593	--	55	Aug. 8, 1927 f/	T,E, 15	D,Ind	Casing; 313 feet of 10-inch. Screens set at 163 to 216 and 279 to 309 feet.
594	--	54 66.8	Mar. 13, 1928 g/ Mar. 4, 1931	T,E	Ind	Set screen at 173 to 203, 207 to 215, and 220 to 250 feet. Well was deepened to 465 feet in 1932. Temperature 72° F. f/
595	9½	66.4	Jan. 23, 1931	A,S	Ind	
596	2	47.8	do.	A,S	Ind	
597	1	49.7	Jan. 11, 1931	A,S	Ind	
598	0	43.8	Mar. 20, 1931	None	N	
599	--	--	--	T	N	Casing; 79 feet of 12-inch and 6-inch to bottom. Screens set at 178 to 220, 299 to 319, and 540 to 561 feet.
600	--	20	Oct. 19, 1928 h/	T,E, 50	P	Casing; 96 feet of 24-inch and 13-inch to bottom. Screens set at 114 to 139, 269 to 322 and 495 to 553 feet. Yield, 900 gallons a minute with 60 feet drawdown, Oct. 19, 1928. h/
601	--	+18	Nov. 25, 1918 h/	T,E	P	Casing; 98 feet of 24-inch, 10-inch to 620 feet and 8-inch to bottom. Screens set at 686 to 708, 736 to 754, 795 to 850, 1,188 to 1,209, 1,226 to 1,266 and 1,311 to 1,332 feet.
602	2	48.5	Jan. 19, 1931	T,E, 30	P,I	Casing; 10-inch to 776 feet and 8-inch to 887 feet. Well was originally 776 feet deep but was reworked and screens set at 675 to 864 feet.
603	2	60.3	Mar. 20, 1931	None	N	
604	1½	71.3	Jan. 23, 1931	A	Ind	
605	--	--	--	A	Ind	
606	½	58.5	Jan. 22, 1931	None	N	
607	--	59	Aug. 15, 1929 f/	A,E	Ind	
608	3	69.4	Jan. 23, 1931	A	Ind	Three hundred and fifty feet of 6-inch casing with screen set at 315 to 350 feet.
609	3½	80.3	do.	A	Ind	
610	--	54	Jan. 25, 1931	A	Ind	Eight hundred and forty nine feet of 6-inch casing with screen set at 807 to 849 feet.

Records of wells in Harris County--Continued

No.	Distance from Houston Post Office	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
611	1½ miles northwest	Houston Car Wheel Co.	--	--	--	6	--	--
612	do.	Pheffer Rice Mill	--	1905?	300±	6	--	--
613	do.	Saxet Ice Cream Co.	--	Old	200±	4	--	--
614	do.	do.	--	--	800±	8	--	--
615	do.	do.	McMasters & Pomeroy	--	625	24	330 370 497	27 24 38
616	1 mile west northwest	City of Houston	Layne-Texas Co.	1927	1,975	24	546 904 1,121 1,368 1,417	58 18 72 176 18
617	do.	do.	do.	1927	1,509	24	888	--
618	do.	do.	do.	1927	1,944	24	893	--
619	do.	do.	--	--	--	6	--	--
d/620 e/	1½ miles west southwest	Public Laundries	Layne-Texas Co.	1927	1,379	6	1,282	95
621	do.	South End Ice Co.	--	--	560±	10	--	--
622	do.	do.	--	--	360±	8	--	--
d/651 e/	7¾ miles north	Tony Frank	--	1927	60±	2¾	--	--
653	8 miles north northeast	August Grabe	August Grabe	--	40±	4	--	--
d/654 e/	5½ miles north	H. A. Burden	H. A. Burden	1929	110±	3	58?	--
e/655	4½ miles north	J. W. Lambert	--	1926	53	2	--	--
e/656	do.	Texas Creosoting Co.	McMasters & Pomeroy	--	665	8	622	40
657	4 miles north	Robert Linder	do.	1924?	672	6	--	--
658	3¾ miles north	S. V. Danna	--	--	215	4	--	--
659	3¾ miles north northeast	Waldena Tourist Camp	--	--	40±	3	--	--
660	do.	do.	--	--	80±	3	--	--

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
611	--	--	--	A	Ind	
612	2	64.3	Jan. 22, 1931	A	Ind	
613	--	--	--	A	Ind	
614	--	--	--	A	Ind	
615	--	--	--	T,E, 30	Ind	Casing; 78 feet of 24-inch and 8-inch to bottom. Screens set at 339 to 361, 376 to 398, 498 to 540 and 561 to 605
616	--	71	May 18, 1928 h/	T,E, 125	P	Casing; 250 feet of 24-inch, 20 feet of 1.8-inch and 12-inch to 1,456 feet. Screens set at 894 to 914, 1,150 to 1,190, 1,249 to 1,401, and 1,416 to to 1,438. Temperature 82½° F. h/ Sixteen feet drawdown, pumping 710 gallons a minute, May 21, 1907. h/
617	--	28 76	Apr., 1927 h/ July 23, 1931 h/	T,E, 125	P	Casing; 252 feet of 24-inch, 12-inch set at 1,503 feet. Screens set at 889 to 911, 932 to 953, 1,139 to 1,179, 1,249 to 1,324, 1,340 to 1,379, and 1,425 to 1,484 feet.
618	--	66.8	July 23, 1931 g/	T,E, 125	P	Casing; 263 feet of 24-inch, 12-inch set at 1,540 feet. Screens set at 893 to 929, 1,159 to 1,194, 1,235 to 1,296, 1,318 to 1,399 and 1,439 to 1,499 feet.
619	2½	55.5	Jan. 30, 1931	None	N	
620	--	54	May 2, 1927 h/	T,E	Ind	Casing; 1,306 feet of 6-inch and 4-inch set at 1,379 feet. Screen set at 1,310 to 1,377 feet. Sixty six feet drawdown, pumping 150 gallons a minute, May 2, 1927. h/
621	2	71.3	Jan. 19, 1931	A	Ind	Screens set at 220 to 240 and 480 to 500 feet.
622	13	81.2	do.	A	Ind	
651	2	7.8	June 29, 1931	J,H	D,S	
653	0	12.1	June 28, 1931	None	N	
654	2	10.0	do.	A,G, 2	D,S	
655	1½	5.8	do.	J,H	D	
656	5	62.7	Jan. 9, 1931	A	Ind	Casing; 622 feet of 8-inch and 44 feet of 6-inch screen.
657	--	--	--	T,E, 15	P	Supplies subdivision of city.
658	1	60.4	Mar. 18, 1931	J	N	
659	0	4.6	Jan. 9, 1931	J	P	
660	0	50.5	do.	J	P	

Records of wells in Harris County--Continued

No.	Distance from Houston Post Office	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
661	2¾ miles north northeast	South Texas Cotton Oil Co.	Layne-Texas Co.	--	425	6	282 405	38 20
e/662	do.	do.	do.	1928	834	24	472 702 746 781	54 39 29 43
663	do.	do.	do.	1924	740	24	435 568	50 20
664	do.	Magnolia Provision Co.	do.	1907	462	6	669 711	35 29
665	do.	National Lumber & Creosoting Co.	--	1912?	552	--	429 --	25 --
666	2 miles north	do.	Taylor & Roberts	1912?	1,422	26	767 1,120 1,380	161 120 40
667	1 mile north	Sunshine Laundry	--	--	602	--	--	--
668	1½ miles north	Harlock Ice Co.	Layne-Texas Co.	1928	353	8	198 301	44 42
e/669	1¼ miles north northwest	Willbergs Laundry	do.	1932	958	6	902	54
670	1 mile northwest	H. & T. C. R.R.	--	1913	761	8	720	--
671	do.	Port City Ice Co.	--	--	--	--	--	--
672	do.	do.	--	--	--	--	--	--
673	1 mile north	M. K. & T. R.R.	Layne-Texas Co.	1910	1,638	12½	1,434 1,492 1,532 1,594	33 21 20 31
674	1¼ miles north northeast	Southern Pacific R.R.	--	1913	978	12	938	40
675	do.	do.	--	1913	562	12	522	40
676	¾ mile northeast	Southern United Ice Co.	--	1906?	600	10	--	--
e/677	do.	Houston Lighting & Power Co.	Taylor & Roberts	--	873	8	736 812	66 61
678	½ mile northeast	Houston Gas & Fuel Co.	Layne-Texas Co.	1910	1,342	8	1,216 1,303	30 37

Penn Livingston and Samuel F. Turner

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
661	--	--	--	None	N	Four hundred and twenty five feet of 6-inch casing with screens set at 299 to
662	--	51.6 62.9	Mar. 14, 1928 h/ Jan. 14, 1931	T,E, 50	Ind	Casing; 120 feet of 24-inch, 10-inch set at 695 feet and 8-inch to bottom. Screens set at 485 to 526, 702 to 740, 755 to 776, and 783 to 824 feet. Yield, 625 gallons a
663	--	56.3	do.	T,E	Ind	Casing; 108 feet of 24-inch, and 10-inch to bottom.
664	--	--	--	None	N	Four hundred and fifty five feet of 6-inch casing with screen from 434 to 455
665	2½	56.9	Jan. 14, 1931	A,S	Ind	
666	--	--	--	T	N	Deepened from 1,240 to 1,422 feet by Layne-Texas Co. Casing; 81 feet of 26-inch, 10-inch set at 911, 8-inch to 950 and 6-inch to 1,422 feet. Temperature 81½° F. Three other abandoned wells here. Screens set at 810 to 900, 1,132 to 1,242, and 1,382 to 1,422 feet.
667	--	--	--	T,E	Ind	
668	6	56 79.6	Mar. 14, 1928 Jan. 14, 1931	A	Ind	Casing; 353 feet of 8-inch with screen set at 200 to 240 and 303 to 344 feet. Thirty five feet drawdown, pumping 300 gallons a minute, Mar. 14, 1928. h/
669	--	70	Apr. 26, 1932	T,E, 7½	Ind	Casing; 903 feet of 6-inch and 4½-inch to 958 feet. Screen set at 903 to 936 feet. Ten feet drawdown, pumping 110 gallons a minute, Apr. 26, 1932. h/
670	--	--	--	A,S	RR	Roundhouse well. Eight-inch casing with 40 feet of 6-inch screen at bottom.
671	1½	65.8	Jan. 12, 1931	A	Ind	
672	4	78.1	do.	A	Ind	
673	½	52.3	Jan. 29, 1931	A	N	Roundhouse well. Casing; 52 feet of 12½-inch, 1,423 feet of 8¼-inch and 6-inch to bottom. Screens set at 1,433 to 1,468, 1,492 to 1,513, 1,532 to 1,552,
674	--	--	--	A,S	RR	Shop well. and 1,594 to 1,625 feet. Casing; 90 feet of 12-inch, 848 feet of 8-inch, and 40 feet of 6-inch screen.
675	--	--	--	A,S	RR	Shop well. Casing; 90 feet of 12-inch, 432 feet of 8-inch, and 40 feet of 6-
676	--	38.7	Jan. 29, 1931	None	N	There are 5 other abandoned wells at this plant, one 12-inch and four 8-inch wells, depths unknown. inch screen.
677	--	73.1	do.	A,S	Ind	Casing; 798 feet of 8-inch, and 6-inch to bottom. Screens set at 741 to 796
678	--	--	--	None	N	1,342 feet of 8-inch casing with screens set at 1,211 to 1,232, and 1,310 to 1,342 feet. and 818 to 873 feet.

Records of wells in Harris County--Continued

No.	Distance from Houston Post Office	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
679	½ mile northeast	Houston Gas & Fuel Co.	Layne-Texas Co.	1919	1,392	24	--	--
680	do.	Houston Electric Co.	--	--	1,350±	8	--	--
c/681	½ mile north	Southern Pacific R.R. Building	Taylor & Roberts	1923	861	8	632 782	42 79
682	¾ mile north	Merchants & Manufacturers Bldg.	--	--	1,300	8	--	--
683	½ mile north	Henke Artesian Ice Co.	J. A. Walling	--	825	--	--	--
684	do.	Houston Ice & Cold Storage Co.	--	--	745±	6	--	--
685	do.	Lone Star Creamery	--	--	1,400±	--	--	--
686	do.	Dixon Packing Co.	--	--	--	8	--	--
687	½ mile north northwest	Brazos Hotel	Layne-Texas Co.	1905	1,328	8	1,222	106
d/688	¾ mile northwest	City of Houston	do.	1925	1,535	24	1,144 1,260 1,399	65 86 118
689	do.	do.	do.	1925	1,213	24	700 802 890 1,135	30 53 89 74
d/690	do.	do.	--	--	--	--	--	--
691	½ mile north northwest	Henke & Pillot	J. A. Walling	1923	500±	6	--	--
692	¼ mile north	Union National Bank	--	1911?	1,500±	6	--	--
693	¼ mile north northeast	First National Bank	Layne-Texas Co.	1923	352	6	196 296	46 56
c/694	do.	do.	do.	--	350±	6	--	--

a/ Bench mark is point from which water-level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

b/ T, turbine; A, air; F, flow; C, centrifugal; J, jack or suction; B, bucket; E, electric; S, steam; O, oil; G, gas; H, hand.

c/ P, public; Irr, irrigation; Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
679	-2	27.7	Jan. 7, 1931	T,E	N	Casing; 54 feet of 24-inch and 8-inch to bottom.
680	--	33.3	Jan. 8, 1931	None	N	Water flowed at plant floor when well was drilled.
681	--	--	--	A	P	Casing; 780 feet of 8-inch and 6-inch to bottom. Also an abandoned 6-inch well, depth unknown, 416 feet to water from 1 foot above floor, Feb. 3, 1931.
682	--	54.2	Jan. 29, 1931	None	N	There are 9 other abandoned wells at this place, formerly owned by a brewery. Diameter and depths of wells unknown.
683	--	--	--	A	Ind	There are 9 wells on this property, part of Hamilton Estate (Brewery); 2 wells in use drilled by Walling, 825 and 400 feet deep; 7 abandoned wells, 6 with depths unknown and one 611 feet deep, 49.2 feet to water below top of casing, Jan. 7,
684	0	52.3	Jan. 7, 1931	A	Ind	Also have one abandoned well under sidewalk a short distance from 1931.
685	--	--	--	A	Ind	Part of Hamilton Estate well 684. (Brewery). There are 6 abandoned wells here, depths and diameter unknown.
686	0	37.9	Feb. 4, 1931	None	N	Another abandoned well is about 20 feet away.
687	--	--	--	None	N	1,328 feet of 8-inch casing. Screen set at 1,279 to 1,328 feet.
688	--	48	July, 1925 h/	T,E, 75	P	Casing; 155 feet of 24-inch and 10-inch to bottom. Screens set at 1,179 to 1,199, 1,279 to 1,356, and 1,411 to 1,51[illegible] feet. Temperature 83° F. Yield, 1,770 gallons a minute, July, 1925. h/
689	--	50	do.	T,E, 75	P	Casing; 155 feet of 24-inch and 10-inch to bottom. Screens set at 723 to 743, 823 to 864, 918 to 995, and 1,157 to 1,217 feet. Temperature 79° F. Yield, 1,680 gallons a minute, July, 1925. h/
690	--	--	--	None	N	Old central plant. About 50 wells were uncovered and sealed with concrete dur-
691	6	67.7	Feb. 6, 1931	A,E	P	ing the spring of 1934.
692	--	--	--	A	P	
693	--	--	--	A	N	Casing; 252 feet of 6-inch and 4-inch to bottom. Screens set at 206 to 248 and 322 to 363 feet. Water level was 40 below basement, May, 1923. h/
694	--	--	--	A	P	

d/ See table of analyses for analysis of water from this well.
e/ See "Table of field tests" for tests of hardness, chloride and sulphate in water from this well.
f/ Reported by driller.
g/ Measured by Southern Engine and Pump Company.
h/ Measured by Layne-Texas Company.

Records of wells in Harris County--Continued

No.	Distance from Houston Post Office	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
695	½ mile north northeast	Harris County Court House	-- Roberts	1910?	--	6	--	--
696	do.	Fannin Bldg.	--	--	--	--	--	--
697	do.	Stewart Bldg.	--	-	--	6	--	--
698	¼ mile north	Scanlon Bldg.	Gus Warniecke	1909?	--	4	--	--
699	¼ mile north northwest	Binz Bldg.	--	--	--	--	--	--
e/700	do.	Rice Hotel	--	1914?	1,395	8	1,303	80
701	do.	do.	J. A. Walling	1929?	896	16	--	--
702	do.	Houston Chronicle Bldg.	--	--	--	--	--	--
703	¼ mile northwest	Eureka Laundry	--	--	--	--	--	--
704	½ mile northwest	Ineeda Laundry	--	1922?	975±	4	--	--
705	½ mile west northwest	Rice Hotel Laundry	Taylor & Roberts	--	890±	--	--	--
706	¼ mile northwest	Texas Theatre	do.	1924	515±	12	240 320 460	40 20 50
707	do.	Bankers & Mortgage Co.	--	1919?	--	6	--	--
708	do.	Hotel Bristol	--	--	--	--	--	--
709	¼ mile west northwest	Second National Bank	--	1910?	927±	8	--	--
d/710 e/	do.	Niels Esperson Bldg.	Layne-Texas Co.	1925	883	8	821	59
711	¼ mile west	Bender Hotel	--	1930	884	6	--	--
712	do.	Lamar Hotel	McMasters & Pomeroy	1930	889±	--	--	--
713	½ mile west southwest	Humble Bldg.	--	1921?	840±	--	--	--
714	¼ mile west southwest	Y. M. C. A	J. A. Walling	1920?	400±	4	--	--
e/715	do.	Rossonion Apts.	Layne-Texas Co.	1910	890	8	775	100
716	¼ mile west	West Building	--	1913?	750±	--	--	--
717	do.	Cotton Hotel	J. A. Walling	-	888	4	--	--
718	¼ mile west northwest	Rusk Bldg.	--	--	600±	6	--	--
719	¼ mile northwest	Mason Bldg.	Layne-Texas Co.	1913	940	6	662 799 857	28 33 75

Penn Livingston and Samuel F. Turner

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
695	1	79.1	Feb. 4, 1931	None	N	Also have an abandoned 8-inch well near this well.
696	--	--	--	J	N	Abandoned well under sidewalk at entrance of building.
697	-6	59.5	Feb. 4, 1931	A	P	
698	--	--	--	A	P	
699	--	--	--	J	N	Abandoned well under Texas Avenue.
700	--	--	--	A	P	Casing; 1,221 feet of 8-inch and 4½-inch to bottom. Screen set at 1,303 to 1,383 feet.
701	--	--	--	A	P	
702	--	--	--	None	N	Abandoned well.
703	--	--	--	--	Ind	
704	--	--	--	A,E	Ind	
705	0	70	Dec. 27, 1929 f/	T,E, 15	Ind	
706	--	--	--	T,E	P	Casing; 240 feet of 12-inch, 8-inch to 460 feet and 6-inch to bottom. Screens set at 240 to 280, 320 to 335 and 460 to 515 feet.
707	--	--	--	A	P	
708	--	--	--	J	N	Has not been used for 12 years.
709	-1½	69	July 24, 1926	A	P	Yield, 155 gallons a minute, Feb. 3, 1931.
	-1½	87.4	Feb. 3, 1931			
710	-1	86.8	Feb. 18, 1931	A	P	Casing; 825 feet of 8-inch and 6-inch to bottom. Screens set at 843 to 893 feet.
711	--	--	--	T,E	P	Casing; 824 feet of 6-inch and 60 feet of 4-inch screen set at 824 to 884 feet.
712	-2	81.8	Feb. 5, 1931	A	P	Deepened from 708 feet by McMasters and Pomeroy. Oct. 1930.
713	--	--	--	A	P	
714	--	--	--	A	P	Supplies water to swimming pool.
715	--	--	--	A	P	Casing; 755 feet of 8-inch and 6-inch to bottom. Screen set at 813 to 873 feet.
716	--	--	--	A	P	
717	-8	84.0	Jan. 28, 1931	A	P	Four-inch casing inserted inside 6-inch casing as repair job.
718	--	--	--	A	N	
719	--	--	--	A	P	Casing; 940 feet of 6-inch with screens set at 662 to 684, 799 to 821 and 857 to 931 feet.

Records of wells in Harris County--Continued

No.	Distance from Houston Post Office	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
720	2 blocks northwest	Kress Bldg.	McMasters & Pomeroy	1931	542	8	--	--
721	do.	Texas State Hotel	Layne-Texas Co.	1930	895	8	331 488 659 768	64 71 34 84
722	1 block northwest	Texas Co. Bldg.	-- Roberts	1915	1,335	8	--	--
723	1 block north	Post Dispatch Bldg.	J. A. Walling	--	--	--	--	--
724	2 blocks east	Petroleum Bldg.	Layne-Texas Co.	--	690±	6	--	--
725	¼ mile east	Union R.R. Station	--	--	--	8	--	--
726	do.	do.	McMasters & Pomeroy	1931	704	10	210 618 673	36 43 35
727	½ mile east	Burkharts Laundry	--	1911?	370±	8	350±	--
e/728	do.	do.	McMasters & Pomeroy	1931	1,402	8	1,358	44
729	½ mile southeast	Independent Elec. Ice Co.	Taylor & Roberts	1921?	380±	6	--	--
730	do.	do.	do.	1927?	308	8	--	--
e/731	1 mile east	I. & G. N. R.R.	Layne-Texas Co.	1907	1,390	8	1,249 1,363	74 27
d/732 e/	do.	Gould Wet Wash Laundry	do.	1924	1,392	6	1,345	45
733	1 mile east northeast	Zero Ice Co.	do.	1923	865	16	--	--
734	do.	do.	do.	1923	646	24	305 453 615	51 63 21
735	1½ miles east northeast	Pritchard Rice Milling Co.	Gus Warniecke	1907?	600±	6	--	--
736	1½ miles east	Houston Packing Co.	--	--	1,700±	10	--	--
737	do.	do.	Layne-Texas Co.	1930	624	12	238 328 523	24 46 95
738	do.	do.	McMasters & Pomeroy	1918	417	8	240 345	22 72
739	do.	Trinity Portland Cement Co.	J. G. Taylor	--	700±	10	--	--

No.	Height of bench mark above (+) ground (ft.) a/	Water level		Pump and kind and amount of power b/	Use of water c/	Remarks
		Below bench mark (ft.)	Date of measurement			
720	-2	66.8	Feb. 1, 1931	T,E	P	Well was redrilled in 1931 because old casing had failed.
721	--	79	July, 1930 h/	A	P	Casing; 50 feet of 12-inch, 10-inch from surface to 210 feet and 8-inch from surface to 792 feet. Screens set at 320 to 382, 479 to 538, 654 to 674 and 758 to 778 feet. Yield, 400 gallons a minute with 57 feet drawdown, July, 1930. h/
722	-10	50.0	Jan. 31, 1931	A	P	
723	--	--	--	A	P	
724	--	--	--	A	P	
725	-8	69.3	Jan. 7, 1931	None	N	
726	3	75.1	do.	T,E, 25	P	Casing; 325 feet of 10-inch, and 8-inch to 708 feet. Screens set at 220 to 240, 619 to 661 and 685 to 708 feet.
727	--	--	--	None	N	Screen set at 350 to 370 feet.
728	--	78	July, 1931 f/	T,E, 10	Ind	Casing; 1,344 feet of 8-inch and 6-inch to bottom. Screen set at 1,358 to 1,402 feet. Temperature 80° F. f/
729	--	--	--	A	Ind	
730	2	63 73.9	Apr., 1929 Jan. 29, 1931	None	N	Temporarily unused. Cleaned by McMasters and Pomeroy. Apr., 1929.
731	--	--	--	T,E, 20	Ind	1,390 feet of 8-inch casing with screens set at 1,270 to 1,330 and 1,350 to 1,390 feet.
732	--	--	--	T,E, 15	Ind	1,341 feet of 6-inch casing and 4-inch to 1,391 feet. Screen set at 1,347 to 1,391 feet.
733	--	--	--	T,E, 30	Ind	Casing; 145 feet of 16-inch and 10-inch to bottom. Screens distributed between 149 and 693
734	--	--	--	T,E, 7½	Ind	Casing; 79 feet of 24-inch and 10-inch to bottom. Screens set at 320 to 355, 457 to 516 and 626 to 646 feet.
735	--	--	--	A	Ind	Also had 288-foot well, now abandoned.
736	--	--	--	A	Ind	
737	--	54	May, 1930	T,E, 25	Ind	Casing; 133 feet of 12-inch and 8-inch to 619 feet. Screens set at 234 to 256, 339 to 362, 522 to 546, and 578 to 611 feet.
738	2	62.4	Jan. 8, 1931	None	N	Casing; 415 feet of 8-inch with screens set at 243 to 264 and 354 to 415 feet. Also have abandoned well under the building, depth and diameter unkonwn.
739	2	72	Apr. 26, 1930	A	Ind	Casing; 10-inch to about 500 feet and 6-inch to bottom.

Records of wells in Harris County--Continued

No.	Distance from Houston Post Office	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal Water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
d/740 e/	1¾ miles east	Houston Elec. Co.	Gus Warniecke	--	537	6	514	23
741	do.	do.	Layne-Texas Co.	1921	540	6	364 512	60 28
742	1 mile east	Merchants & Planters Oil Co.	--	1888?	--	6	--	--
743	2¼ miles east	Exporters Compress & Warehouse Co.	--	--	--	4	--	--
d/744 e/	3 miles northeast	City of Houston	McMasters & Pomeroy	1931	2,150	24	--	--
745	3½ miles north northeast	Teneson Bros.	--	1928?	680+	4	--	--
746	3½ miles northeast	Texas & New Orleans R.R.	J. W. Jackson	1925	6[illegible]	6	615 642	21 5
e/747	do.	do.	do.	1925	948	8	693 789 828 913	94 20 30 30
e/748	5 miles northeast	Gulf Pipe Line Co.	Layne-Texas Co.	1911	72[illegible]	6	537 688	41 29
e/749	6 miles east northeast	H. Jaschke	A. E. Fawcett	1930	179	3	--	--
750	do.	Texas Pipe Line Co.	--	--	--	6	--	--
751	do.	do.	Taylor & Walling	1915	540	6	--	--
752	do.	Houston Steel & Foundry	--	1918?	600+	6	--	--
753	4¼ miles east northeast	Ford Jarvis Plant	--	1923	--	4	--	--
754	4½ miles east northeast	Lyon's Ave. Saw Mill	A. E. Fawcett	--	200+	--	--	--
755	do.	do.	do.	--	240	4	--	--
756	do.	do.	do.	--	500+	6	--	--
757	4¼ miles east	Layne-Bowler Co.	Layne-Texas Co.	1929	676	10	573 646	63 24

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
740	--	--	--	A	Ind	
741	½	48.0	Jan. 8, 1931	None	N	Casing; 540 feet of 6-inch with screens set at 364 to 420 and 519 to 539 feet. Also have another abandoned well, sealed with concrete in 1931.
742	4	37.6	Jan. 27, 1931	None	N	Two wells not used for 10 years. Water level 46.7 feet below top of casing, 2 feet above ground in second well.
743	--	--	--	A	Ind	Also have abandoned 6-inch well 20 feet south of pumped well. Water level, 61.6 feet below top of casing, 4 feet above ground
744	--	--	--	T,E, 200	P	Temperature 90° F. in abandoned well. Casing; 310 feet of 24-inch and 1,565 feet of 12½-inch with 20 feet overlap. Screens set at 1,015 to 1,025, 1,115 to 1,160, 1,225 to 1,245, 1,325 to 1,345 1,370 to 1,390, 1,570 to 1,615, 1,785 to 1,830 and 1,850 to 1,870 feet.
745	2	50.4	Mar. 19, 1931	A,E, 5	P	Supplies water for a small subdivision
746	6	63.2	Jan. 12, 1931	None	N	Casing; 593 feet of 6-inch and 4½-inch to bottom. Screen set at 613 to 655 feet. Also have an abandoned well, exact location, depth and diameter not known.
747	--	30	May, 1925	A	Ind	Creosote plant. Casing; 806 feet of 8-inch and 6-inch to bottom. Screens set at 739 to 757, 779 to 801, 847 to 868 and 927 to 947 feet.
748	2½	+4 50.2	Nov., 1911 h/ Jan. 14, 1931	A	D, Ind	720 feet of 6-inch casing. Screens set at 539 to 579 and 697 to 714 feet. Well had a flow of 40 gallons a minute when completed. h/
749	--	--	--	J,E, ¼	D,S	Formerly had 49-foot well but water was not good.
750	--	--	--	J,E	D	
751	4	54.1	Mar. 19, 1931	None	N	Well had a flow when drilled.
752	0	49.9	do.	J	N	Do.
753	--	--	--	A	Ind	
754	--	--	--	J,E	D	
755	--	--	--	S	Ind	
756	--	--	--	S	Ind	
757	0	54 57.6	Oct. 9, 1929 h/ Feb. 25, 1931	A	Ind	676 feet of 10-inch casing. Screens set at 577 to 635 and 649 to 670 feet. Yield 660 gallons a minute with 46 feet drawdown, July 17, 1929. h/

Records of wells in Harris County--Continued

No.	Distance from Houston Post Office	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
e/758	4¾ miles east	J. H. Passmore	-- Reidland	1931	148	3	--	--
759	do.	Port City Compress & Warehouse Co.	Morton & Son	--	396	4	--	--
760	do.	Houston Oil Terminal Co.	McMasters & Pomeroy	1920?	732	6	--	--
761	3¼ miles east	Reed Roller Bit	do.	1930	--	--	--	--
e/781	6¾ miles west southwest	Southern Floral Co.	-- Morton	--	196	4	--	--
e/782	6¼ miles west	Post Oak School	Layne-Texas Co.	1928	244	4	222	20
e/783	6 miles west	Houston Riding & Polo Club	--	1927?	350±	4	--	--
e/784	5¼ miles west	Houston Gun Club	--	1930	360±	--	--	--
785	5½ miles west	Mrs. Hugh Wheeler	--	--	--	--	--	--
786	4 miles west southwest	Kerr Florists	--	--	160	6	--	--
787	2½ miles west southwest	Marshall Ice Co.	-- Taylor	1926?	700±	10	--	--
e/788	1¼ miles southwest	Shoperd Laundries	McMasters & Pomeroy	1930	1,416	8	1,323 1,395	55 21
e/789	do.	Henke & Pillot	J. A. Walling	1923?	565	6	494	66
790	2 miles south southwest	Southern United Ice Co.	Layne-Texas Co.	1926	606	16	358 405 516	37 60 58
791	2¾ miles southwest	Warwick Hotel	McMasters & Pomeroy	1932	576	10	579 --	22 --
792	3 miles southwest	City of Houston	Layne-Texas Co.	1917	1,394	24	--	--
d/793 e/	do.	do.	do.	1931	2,121	24	--	--
794	do.	do.	do.	--	777	24	260	--
d/795	do.	do.	do.	--	1,340	24	489	--
796	do.	do.	do.	1919	1,127	24	377	--
e/797	3½ miles southwest	Rice Institute	do.	1910	910	6	833	69
798	do.	do.	do.	1916	900±	6	--	--

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
758	¾	33.9	Mar. 31, 1931	J,H	D,P	Well supplies Slumberland Tourist Camp.
759	1½	56.9	Feb. 26, 1931	A,E, 15	D,Ind	Well was redrilled in 1930.
760	--	--	--	A,S	D,Ind	Screen set at 672 to 732 feet.
761	--	--	--	T,E	Ind	
781	0	26.9	Apr. 7, 1931	A	I	
782	--	34	Apr. 20, 1928 h/	J,H	D,P	Casing; 224 feet of 4-inch and 2½-inch to bottom. Screen set at 223 to 243 feet.
783	--	--	--	A,G, 5	D,S	Two similar wells about 10 feet apart.
784	--	--	--	J,W	D	
785	2	33.1	June 20, 1932	None	N	
786	--	--	--	A,E, 5	D,I	
787	--	--	--	T	Ind	
788	--	80	July , 1930 f/	T,E, 15	Ind	Casing; 1,295 feet of 8-inch and 6-inch to bottom. Screens set at 1,336 to 1,377 and 1,395 to 1,416 feet.
789	--	--	--	A	Ind	
790	1½	57.0	Jan. 17, 1931	T,E, 40	Ind	Casing; 122 feet of 16-inch, and 10-inch to bottom. Screens set at 365 to 386, 420 to 458, 539 to 560, and 579 to 597 feet.
791	0	57.9	July 7, 1932	T,E	P	
792	--	13	Apr., 1917 h/	None	N	Sealed with concrete after casing collapsed.
793	--	--	--	T,E, 200	P	Screens set at 1,280 to 1,290, 1,340 to 1,440; and 1,455 to 1,595 feet.
794	--	--	--	T,E, 75	P	Casing; 100 feet of 24-inch and 10-inch to bottom. Screens set at 260 to 282, 347 to 409, 442 to 464, 500 to 514, 526 to 547, 590 to 611, 686 to 707, and 714 to 776 feet.
795	--	--	--	T,E, 75	P	Casing; 119 feet of 24-inch, 12-inch set at 1,030 feet and 8 and 10-inch to bottom. Well plugged at 975 feet. Screens set at 489 to 569, 644 to 824, and 964 to 975 feet.
796	0	47.3	May 23, 1933	None	N	Casing; 131 feet of 24-inch, 12-inch set at 806 feet and 8-inch to bottom. Screens set at 377 to 471, 525 to 588, 730 to 806, 847 to 911, 947 to 1,002, and 1,052 to 1,115 feet.
797	1½	68.4	Jan. 24, 1931	A	P	911 feet of 6-inch casing with screen set at 847 to 903 feet.
798	4	71.3	do.	A	P	

Records of wells in Harris County--Continued

No.	Distance from Houston Post Office	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
799	4¼ miles southwest	West University Place	J. A. Walling	--	540±	10	--	--
800	do.	do.	do.	--	600±	6	--	--
801	5½ miles southwest	Crane Ready Cut House Co.	do.	1926?	600±	8	--	--
802	5½ miles west southwest	West University Place	do.	1931	595	--	--	--
803	do.	do.	--	1924	125	2	--	--
804	do.	do.	J. A. Walling	1925?	650±	6	--	--
805	6½ miles southwest	T. G. Beard	Layne-Texas Co.	1922	413	4	--	--
806	7 miles west southwest	Gom Elec. Co.	--	1900?	965±	4½	--	--
807	do.	do.	--	1927?	115±	4	--	--
d/808 e/	do.	do.	McMasters & Pomeroy	1929	340	8¼	203	29
e/809	do.	do.	--	--	1,100±	4½	--	--
e/810	7½ miles west southwest	Harris County	Layne-Texas Co.	1917?	650±	8	--	--
d/811 e/	do.	do.	McMasters & Pomeroy	1931	385	6	348	38
812	do.	do.	--	1913?	400±	6	--	--
e/813	4 miles south southwest	-- Grant	--	--	28±	--	--	--
e/814	4¾ miles south southwest	R. O. Wood	--	--	60±	2½	--	--
e/815	5 miles south southwest	Greenwood Sanitarium	Layne-Texas Co.	1912	892	6	801	78
e/816	5½ miles southwest	Hans Peterson Nursery	--	--	--	48	--	--
e/817	6 miles southwest	Main Street Air Port	--	--	--	2½	--	--
e/818	5½ miles south southwest	-- Redford	--	--	36±	2½	--	--
d/819	do.	R. Ramon	--	--	30±	2½	--	--
820	5½ miles south southwest	Institute Place	Layne-Texas Co.	1928	310	8	254	56
d/821 e/	6¼ miles south southwest	Houston Gulf Gas Co.	--	1929	211±	3	--	--
e/822	6½ miles south southwest	Humble Pipe Line Co.	--	1929	256	4	--	--
e/823	7 miles south southwest	Moody Corporation	--	1912?	275	4	--	--

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
799	--	--	--	A,E	P	
800	0	48.5	Feb. 12, 1931	A,E	P	
801	1½	39.4	Jan. 24, 1931	A,E, 15	P	Yield, 80 gallons a minute with 50 foot drawdown, Oct. 20, 1931.
802	--	--	--	T,E	P	Screens set at 383 to 405, 426 to 447, 509 to 532, and 552 to 595 feet.
803	1	5.6	Jan. 24, 1931	None	N	
804	--	42	Mar. 14, 1931	None	N	College View water plant, standby well.
805	--	--	--	A,E, 2	D	Well had a flow when completed.
806	--	--	--	None	N	Now obstructed at 17 feet below top of casing.
807	0	17.4	Feb. 16, 1931	A	N	
808	--	21	Apr., 1929 f/	T,E, 20	P	Eight and one-fourth-inch casing with screen set at 204 to 232 feet.
809	4	43.6	Feb. 16, 1931	A	P	Well had a flow when completed.
810	--	--	--	T,E, 5	P	Harris County School for Girls.
811	7	33.1	Apr. 17, 1931	T,E	P	Harris County School for Girls. Yield, 220 gallons a minute with 21 feet draw-
812	--	--	--	A	P	Harris County School for Girls. down, April, 1931.f/
813	--	--	--	J	D	
814	--	--	--	J,E	D,S	
815	--	--	--	A,E, 5	P	892 feet of 6-inch casing. Screen set at 818 to 880 feet.
816	--	--	--	J,W	D,I	
817	--	--	--	J,G	D,I	
818	--	--	--	J,H	D	
819	--	--	--	J,W	S	
820	--	24 29.0	Apr. 25, 1928 h/ Sept.24, 1931	None	N	Casing; 100 feet of 8-inch and 6-inch to bottom. Screens set at 277 to 300 foot. Yield, 100 gallons a minute, with 75 foot drawdown, April 25, 1928.h/
821	--	--	--	J,E	D	
822	--	--	--	A,E	D	
823	--	--	--	A,E, 15	D	

Records of wells in Harris County--Continued

No.	Distance from Houston Post Office	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
e/824	7¼ miles south southwest	Geo. Jones	--	1923	65	2	--	--
e/825	do.	Navarro Oil Co.	Humble Oil & Refining Co.	1921	385	4	--	--
e/826	7⅓ miles south southwest	J. D. Hughes	--	1921	30±	--	--	--
d/827	do.	C. H. Driskoll	Burt Taylor	1933	34	2	--	--
d/828	7¾ miles south southwest	Rio Bravo Oil Co.	Layne-Texas Co.	1926	248	10	200	--
d/829	8 miles south southwest	C. S. Settegast	--	1928	350±	8	--	--
e/830	7¾ miles south southwest	Sam Taylor	--	1930	40±	4	--	--
e/831	do.	do.	Sam Taylor	1872	30	48	--	--
e/832	do.	Burt Taylor	-- Tiller	1930	100	4	--	--
d/833 e/	do.	W. E. Taylor	Sam Taylor	1913	60	2½	--	--
e/834	do.	Navarro Oil Co.	--	--	380	4½	--	--
e/835	do.	Gulf Production Co.	--	1921	220	6	--	--
836	do.	do.	--	1927	210	6	--	--
d/837	8½ miles south southwest	C. W. Mowery	C. L. Mowery	1922	260	4	--	--
d/838 e/	8¾ miles south southwest	E. E. Kelly	--	--	60±	4	--	--
e/839	7¾ miles southwest	L. N. Liesman	Layne-Texas Co.	1931	231	2	--	--
851	1¼ miles south	Polar Wave Ice Co.	Taylor & Roberts	1924	386	12	150 220	40 46
852	do.	do.	do.	1921?	660±	12	360 --	26 --
853	1 mile east southeast	Port City Ice Co.	--	--	--	6	--	--
854	do.	do.	Layne-Texas Co.	1925	919	16	224	--
855	2½ miles south southeast	City of Houston	do.	1926	1,620	24	1,323	--
856	do.	do.	do.	1925	1,603	24	651	--

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
824	--	--	--	J,H	D,S	
825	--	--	--	A,E, 15	D, Ind	
826	--	--	--	J,E	D,S	
827	--	--	--	J,W	D,S	
828	--	--	--	T,E	D. Ind	Set 50 feet of 4½-inch screen on bottom.
829	--	--	--	J,W	S	
830	--	--	--	J,W	D,S	
831	--	--	--	J,H	D,S	Dug well with brick curbing.
832	--	--	--	J,E, ¾	D,S	
833	--	--	--	J,W	D,S	
834	--	--	--	--	D	
835	--	--	--	A,E	D	
836	--	--	--	A	D, Ind	
837	--	--	--	J,W	D,S	
838	--	--	--	A,E	D	
839	--	--	--	A,E	D	
851	30	91.7	Jan. 17, 1931	A	Ind	Casing; 386 foot of 12-inch with screens set at 163 to 182, 222 to 264 and 364 to 386 feet.
852	--	--	--	T,E, 20	Ind	Temperature 76° F. Yield, 230 gallons a minute, May, 1932.
853	½	71.3	Jan. 8, 1931	None	N	
854	--	46	July, 1923	T,E	Ind	Casing; 116 foot of 16-inch, 10-inch set at 544 foot and 6-inch set at 854 foot. Yield, 510 gallons a minute with 49 foot drawdown, Aug., 1925. h/ Screens set at 224 to 266, 366 to 388, 421 to 442, 542 to 564, 704 to 764, and 831 to 853.
855	0	22 73.3	Jan., 1926 h/ May 23, 1933	T,E, 100	P	Temperature 84½° F. Casing; 156 feet of 24-inch, 1,204 foot of 16-inch and 8-inch to 1,521 feet. Screen set at 1,323 to 1,521 feet. Yield, 1,775 gallons a minute, Jan. 11, 1926.h/
856	--	48.8 77.9	June 5, 1925 h/ May 23, 1933	T,E, 60	P	Temperature 77½° F. Casing; 155 feet of 24-inch, 18-inch to 663 feet and 10-inch to 902 feet. Screens set at 651 to 711, 731 to 791 and 831 to 900 feet.

Records of wells in Harris County--Continued

No.	Distance from Houston Post Office	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
d/857	2¼ miles south southeast	City of Houston	Layne-Texas Co.	1928	1,366	24	553	--
d/858	do.	do.	do.	1931	2,145	24	1,037	--
859	3 miles south southeast	do.	do.	1916	482	6	454	23
860	1¾ miles east southeast	Henke & Pillot	do.	1931	--	--	--	--
861	1½ miles east southeast	Arctic Ice Co.	--	--	595±	8	--	--
e/862	do.	Houston Belt & Terminal R.R.	McMasters & Pomeroy	1924	832	8	--	--
863	2¼ miles southeast	Standard Ice Co.	do.	1928	1,000±	10	--	--
864	do.	do.	do.	1929	400±	8	--	--
865	do.	Texas & Fuel Co.	do.	1928	276	5	--	--
866	do.	do.	do.	1928	400±	10	--	--
867	3 miles southeast	do.	Taylor & Roberts	--	870	10	251	--
868	do.	Hughes Tool Co.	Layne-Texas Co.	1923	697	16	338 509 643	51 41 44
869	do.	do.	do.	1926?	1,192	24	811 945 1,056	66 108 49
e/870	2¾ miles east southeast	Hygeia Ice Co.	McMasters & Pomeroy	1928	728	10	--	--
871	3¼ miles south southeast	Houston Belt & Terminal R.R.	--	--	--	--	--	--
872	4¼ miles south southeast	do.	McMasters & Pomeroy	1924	832	8	780	40
873	4¼ miles east southeast	Geo. H. Graham	--	--	--	3	--	--
874	4 miles east southeast	Bailey-Nytex	--	--	--	4	--	--
875	do.	Markus Brothers	--	--	800±	3	--	--
876	3¾ miles southeast	Houston Country Club	Layne-Texas Co.	--	--	--	--	--

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
857	--	62	Aug. 4, 1928 h/	T, E, 150	P	Temperature 79° F. Casing; 265 feet of 24-inch, 16-inch set at 703 feet and 12-inch to 1,350 feet. Screens set at 553 to 576, 638 to 661, 671 to 724, 756 to 777, and 816 to 919 feet.
858	--	58	May, 1931 h/	T, E, 150	P	Casing; 320 feet of 24-inch and 12½-inch set at 1,756 foot. Screens set at 1,030 to 1,045, 1,061 to 1,082, 1,108 to 1,151, 1,344 to 1,366, 1,409 to 1,428, 1,472 to 1,513, 1,535 to 1,556, 1,586 to 1,606 and 1,688 to 1,750 feet.
859	--	5	Nov., 1916 h/	--	Ind	486 feet of 6-inch casing with screen set at 449 to 479 feet.
860	2	72.1	Aug. 12, 1931	T, E	D, Ind	
861	--	--	--	A	Ind	
862	--	--	--	A	RR	
863	--	--	--	T, E, 25	Ind	
864	--	50	Feb. 17, 1928 g/	T, E, 10	Ind	
865	--	--	--	A	D, Ind	Screen set at 256 to 276 feet.
866	--	--	--	A	D, Ind	Screens set at 256 to 276 and 360 to 400 feet.
867	12	23.5 72.9	-- 1921 f/ Jan. 16, 1931	A	D, Ind	870 feet of 10-inch casing. Screens set at 251 to 288, 374 to 415, 553 to 573, 682 to 720 and 830 to 870 feet.
868	--	50.3	Jan. 8, 1931	A	N	Casing; 110 feet of 16-inch and 10-inch to bottom. Screens set at 369 to 389, 520 to 562, and 657 to 694 feet.
869	--	32 62.6	May 3, 1926 h/ Jan. 8, 1931	T, E	Ind	Casing; 162 feet of 24-inch and 10-inch to 1,096 feet. Screen set at 838 to 877, 959 to 1,040, and 1,057 to 1,096 feet. Yield, 1,300 gallons a minute with 30-foot drawdown. May 3, 1926. h/
870	+1½	60.6	Jan. 16, 1931	T, E, 15	Ind	
871	--	--	--	A	RR, S	
872	--	27	July, 1924	A	RR	Casing; 777 feet of 8-inch and 6-inch to bottom. Screen set at 780 to 815 feet.
873	--	--	--	A, E, 2	D	
874	--	--	--	A	Ind	
875	--	--	--	A	N	
876	--	51.4	Jan. 16, 1931	T, E, 15	I	Also supplies water for swimming pool.

Records of wells in Harris County--Continued

No.	Distance from Houston Post Office	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
877	3½ miles southeast	Navigation Ice Co.	McMasters & Pomeroy	1928	508	--	--	--
d/878	4¾ miles southeast	Houston Compress Co.	Layne-Texas Co.	1929	905	15½	716 780 875	27 22 20
d/879	4¼ miles southeast	City of Houston	do.	1925	1,037	24	475	--
880	do.	do.	McMasters & Pomeroy	--	1,011	17	737	--
881	5½ miles southeast	Terminal Compress & Warehouse Co.	--	1911?	650±	6	--	--
882	6½ miles southeast	Humble Oil & Refining Co.	--	--	300±	4	--	--
e/883	6¾ miles southeast	Carnegie Steel Co.	McMasters & Pomeroy	1927	841	6	592 787	63 54
884	5½ miles southeast	City of Houston	--	--	--	10	--	--
885	do.	American Service Co.	--	--	--	--	--	--
886	do.	Texas Alkali Works	J. A. Walling	1930	540	10	--	--
887	6 miles southeast	Deepwater Oil & Refining Co.	McMasters & Pomeroy	1919?	1,350±	8	--	--
888	do.	do.	do.	1922	950±	6	--	--
889	do.	Texas Chemical Co.	--	1918	640	6	--	--
890	do.	do.	Layne-Texas Co.	1926	1,284	24	586	--
891	6¼ miles southeast	Lone Star Cement Co.	do.	1915	658	10	585 632	37 19
d/892 o/	do.	do.	do.	1921	1,284	12	767	--
893	do.	American Maid Flour	--	--	600±	6	--	--
894	do.	Southern Pacific R.R.	--	--	--	--	--	--
d/895	6½ miles east southeast	City of Houston	Layne-Texas Co.	1930	1,664	24	1,027	--

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
877	--	--	--	T,E	Ind	
878	0	42	Aug. 5, 1929	T,E	Ind	Casing; 177 feet of 15½-inch and 8-inch to bottom. Screens set at 713 to 754, 796 to 817, and 870 to 888 feet.
		47.8	Jan. 21, 1931			
879	--	40	June 5, 1925	T,E, 75	P	Casing; 125 feet of 24-inch and 12-inch to bottom. Screens set at 475 to 496, 513 to 533, 565 to 586, 685 to 705, 746 to 767, 787 to 806, 869 to 888, and 987 to 1,025 feet.
880	--	--	--	None	N	Casing; 86 feet of 17-inch and 10-inch to bottom. Screens set at 737 to 815, 838 to 861, 880 to 916 and 928 to 1,011 feet. Temperature 78° F.
881	+3½	54.4	Jan. 21, 1931	A	Ind	
882	--	--	--	A	D,S	Also have an abandoned 6-inch well about 600 feet deep.
883	--	--	--	A	D	Screens set at 617 to 660 and 798 to 841 feet.
884	0	11.4	Feb. 20, 1931	None	N	Flowed until 1919.
885	--	--	--	A	Ind	Two wells, 18 feet apart; no information available.
886	+4	54.7	Feb. 3, 1931	A	Ind	
887	--	--	--	A	Ind	
888	--	--	--	A	Ind	Also have an abandoned 3-inch well; depth unknown.
889	+2	67.3	Jan. 13, 1931	None	N	Flowed in 1918.
890	--	46.6	Aug., 1926	T,E	Ind	Casing; 142 feet of 24-inch and 10-inch to bottom. Screens set at 605 to 628, 752 to 809, 1,062 to 1,106 and 1,127 to 1,147 feet.
		68.9	Jan. 13, 1931			
891	+1	39.3	Jan. 21, 1931	None	N	Casing; 658 feet of 10-inch. Screens set at 583 to 621, and 629 to 651 feet.
892	+2½	40	May 25, 1928	A	Ind	Casing; 99 feet of 12-inch, 8-inch to 1,030 feet, and 6-inch to bottom. Screens set at 767 to 808, 945 to 1,044, 1,050 to 1,090, 1,150 to 1,171 and 1,237 to 1,380. Flowed when drilled. Flowed in 1928.
		68	June 27, 1930			
		72.3	Jan. 21, 1931			
893	--	--	--	A	Ind	
894	--	--	--	A	RR	
895	--	60	Sept. 8, 1930 h/	T,E, 160	P	Casing; 500 feet of 24-inch, and 12½-inch to bottom. Screens set at 1,084, 1,128 to 1,158, 1,176 to 1,195, 1,239 to 1,259, 1,526 to 1,566 and 1,588 to 1,648 feet. Temperature 86° F. Yield, 2,145 gallons a minute with 45 feet drawdown. Sept. 8, 1930. h/

Records of wells in Harris County--Continued

No.	Distance from Houston Post Office	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
896	8 miles east southeast	F. E. Maxwell	-- Powell	1929	466	6	--	--
897	8¼ miles east southeast	Glenbrook Subdivision	--	--	800±	6	--	--
898	6¾ miles east southeast	City of Houston	--	--	--	6	--	--
899	5½ miles east southeast	Golf Crest Club	-- Miller	1930	870±	6	--	--
c/900	do.	do.	Golf Crest Oil Co.	1930	2,560	10	--	--
901	4½ miles east southeast	G. L. Harris	--	--	750±	2	--	--
902	do.	City of Houston	--	--	--	6	--	--
903	4¾ miles south	M. E. Foster	-- Jackson	1928	580±	6	--	--
904	do.	do.	do.	--	350±	6	--	--
905	7½ miles south southeast	City Prison Farm	--	--	--	--	--	--
d/906	7¾ miles south southeast	Gardenvilla Subdivision	Layne-Texas Co.	1929	875	8	640	10
e/							655	20
907	do.	do.	do.	--	--	--	768	28
							--	--
908	9 miles south southeast	J. W. Maddon	--	--	600±	30	--	--
909	do.	do.	--	--	900±	30	--	--
910	9½ miles south southeast	O'Donald Estate	--	--	530±	30	--	--
911	8¾ miles south southeast	do.	--	--	500±	30	--	--
912	9 miles south	Geo. A. Swengel	Layne-Texas Co.	--	653	24	--	--
921	8½ miles northeast	J. M. Cordell	--	--	--	3	--	--
922	do.	Harris County Home	McMasters & Pomeroy	1922	585	8	--	--
923	9 miles northeast	F. P. Schalies	--	1920	130	2	100	30
e/924	do.	do.	--	--	130	2	100	30
925	9½ miles east northeast	Texas Company	Texas Company	--	640±	--	--	--
926	7 miles east	R. E. Brooks	--	1930	490±	6	--	--

Penn Livingston and Samuel F. Turner

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
896	--	--	--	J	N	Water stood 3 feet below surface in 1929.
897	--	25	June 16, 1926 g/	A,E, 15	P	Yield, 200 gallons a minute, June 16, 1926. g/
898	--	32	Sept., 1926	A	N	Two similar wells, about 25 feet apart. Measurement made on well nearest main door to pump house.
	½	58.5	Jan. 8, 1931			
899	--	--	--	A	I	60 feet of screen at bottom.
900	+1	48.7	Feb. 19, 1931	None	N	Oil test with 350 feet of 10-inch casing, and mud-filled hole below. Also have two abandoned wells, one 6-inch well about 800 feet deep, and one 3-inch well about 300 feet deep.
901	--	--	--	J,E, ½	D	
902	--	--	--	A	N	Old Brookline Addition well.
903	--	--	--	T,E, 7½	P	
904	--	--	--	J,E, 1	P	20 feet of screen at bottom. Seldom used now.
905	0	15.9	Apr. 9, 1931	T,E, 20	N	
906	--	31	June, 1929	T,E, 15	P	833 feet of 8-inch casing. Screens set at 631 to 671, and 753 to 793 feet.
907	--	--	--	T,E, 15	P	
908	+½	23.9	Apr. 9, 1931	None	N	Automatic water-stage recorder installed on this well.
909	+1½	20.3	do.	J,H	D	Flowed when drilled.
910	+1½	9.6	do.	J,W	D	Do.
911	0	-33.8	do.	None	N	Another abandoned well was reported near this well.
912	--	--	--	T	N	Casing; 53 feet of 24-inch and 10 to 13 inch casing to bottom. Screen set at 564 to 642 feet. A similar abandoned rico well is about one-fourth
921	--	--	--	A	Ind	Well miles northwest of this well. supplies water for brick factory.
922	+1½	36.6	Mar. 31, 1931	A,G, 6	D,S	Water stood 5 feet below surface when well was completed.
923	+1½	29.0	do.	None	N	Owner reports good water sand at 100 to 130 feet. Coarse gravel at 165 feet and fine sand at 45 and 65 feet. Eight
924	--	--	--	J,H	D,S	feet of screen set in bottom.
925	--	--	--	--	D, Ind	Have had four wells here; three are now abandoned.
926	--	--	--	J,E	Ind, P,S	Supplies small subdivision.

Records of wells in Harris County--Continued

No.	Distance from Houston Post Office	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
927	10 miles east	-- Graff	--	--	120±	6	--	--
e/928	10½ miles east	Harris County	--	--	125±	4	--	--
929	10½ miles northeast	do.	--	--	--	4	--	--
e/930	13½ miles northeast	Sheldon Kota	--	--	30	2	--	--
931	16 miles northeast	Riverside Prod. Co.	--	--	25±	6	--	--
e/932	do.	B. N. Garrett	A. E. Fawcett	--	240±	4	225	15

No.	Distance from Goose Creek 1/	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
e/941	7½ miles northwest	W. H. Gilbert	Theo. Reidland	1924	128	3	--	--
942	6¼ miles north northwest	E. W. McLean	A. Jenesee	1927	120±	2	--	--
e/951	9½ miles north	P. C. Ulrich	--	--	400±	10	--	--
e/952	do.	A. F. Ulrich	T. Reidland	1927	88	2	--	--
e/953	do.	Frank Casino	do.	1928	97	4	76	17
e/954	8½ miles north	N. P. Whisenhart	--	--	100±	3	--	--
e/955	7½ miles north	-- Whitlock	--	--	160	3	--	--
956	do.	J. W. Plummer	Amos Jennische	--	260	4	--	--
e/957	do.	do.	--	--	100	4	90	--
958	8 miles north	F. F. Peterson	A. Jennischo	1919	98	4	90	8
e/959	do.	S. M. Johnson	S. M. Johnson	1930	--	8	--	--
e/960	do.	J. M. Johnson	Amos Jennischo	--	344	4	--	--
e/961	7 miles north	J. W. Wilson	--	1929	94	4	--	--
e/962	4½ miles north	C. Spencer	Theo. Reidland	1930	102	4	--	--
e/963	4 miles north northeast	Mrs. J. E. Portis	--	--	360	3	--	--

a/ Bench mark is point from which water-level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

b/ T, turbine; A, air; F, flow; C, centrifugal; J, jack or suction; B, bucket; E, electric; S, steam; O, oil; G, gas; H, hand.

c/ P, public; Irr, irrigation; Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used. 1/ Records of all wells in Goose Creek area were furnished by P. A. Vasher, Humble Oil and Refining Co., Baytown.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
927	+1½	29.5	Mar. 28, 1931	None	N	Well formerly supplied sawmill.
928	+4	8.4	do.	J,H	N	Well drilled to supply water for building bridge piers.
929	+3½	38.7	Mar. 31, 1931	None	N	Well drilled to supply water for concrete on highway.
930	--	--	--	J,H	D,S	Water level was 11.2 feet below top of casing at ground-level in nearby 6-inch
931	0	12.4	Oct. 29, 1931	J,H	N	Well at cotton gin. well, 30 feet deep.
932	--	--	--	J,W	D,S	Water level reported as 18 feet below surface.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
941	--	--	--	J,E	D	
942	--	--	--	A,G	D,S	
951	--	--	--	J,W	D,S	Temperature 70° F.
952	--	10	Jan. 22, 1932	J,E, ¼	D	
953	--	--	--	J,H	D	Water level reported as 41 feet below surface, Jan. 14, 1928.
954	--	--	--	J,H	D	
955	--	--	--	J,H	D	Temperature 71° F.
956	--	16	Jan. 22, 1932	None	N	Well sanded up.
957	--	10	do.	J,W	D	Temperature 71° F.
958	--	½	--	J,W	N	Well pumped oil at first and water was bad.
959	--	8	Jan. 21, 1932	J,H	D	
960	--	34	do.	J,W	D	Temperature 72° F.
961	--	10	do.	J,H	D	
962	--	--	--	J,W	D	
963	--	--	--	J,W	D	Temperature 74° F.

d/ See table of analyses for analysis of water from this well.
e/ See "Table of field tests" for test of hardness, chloride and sulphate in water from this well.
f/ Reported by driller.
g/ Measured by Southern Engine and Pump Company.
h/ Measured by Layne-Texas Company.

Records of wells in Harris County--Continued

No.	Distance from Goose Creek	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
e/964	4⅜ miles northeast	H. F. Massey	-- Byrd	1931	330	2	--	--
e/965	5⅓ miles northeast	C. Thompkins	--	1931	344	4	318	10
966	do.	-- Thompkins	R. J. Thompkins	--	312	2	--	--
e/967	5 miles northeast	J. W. Newton	Amos Jennische	--	333	4	--	--
e/968	do.	Mrs. L. Terry	do.	1924	365	4	--	--
e/969	4¾ miles northeast	Saul Donelley	do.	1921	360	4	--	--
e/970	4¼ miles northeast	S. R. Brooks	do.	--	337	4	312	18
e/971	do.	R. O. Smith	do.	1928	315	2	290	25
e/972	4 miles north northeast	W. R. Rendon	--	1916	95	6	--	--
e/973	do.	G. M. Hamor	G. M. Hamor	1931	106	--	--	--
974	3¾ miles north northeast	J. B. Gurley	M. Genesseo	--	480	2	--	--
e/975	4 miles northeast	Cedar Bayou School	A. Jennische	1931	315	4	--	--
e/976	do.	Z. T. Wilburn	Z. A. Williams	1928	320	4-5/8	290	30
e/977	do.	A. W. Faylo	Byrd & Cannon	1929	327	4	300	27
e/978	do.	Faylo Estate	S. Williams	1912	330	4	300	27
e/979	do.	E. Ilfroy	M. Genesee	--	320	4	--	--
e/980	do.	E. G. Casey	--	1929	320	2	300	320
1001 c/	2½ miles north northwest	Bush Terrace Water Co.	--	1930	437	3	417	20
1002 c/	2¼ miles north northwest	do.	--	--	437	4	417	20
1003 c/	1¾ miles northwest	S. G. Davidson	--	--	20	4	--	--
1004 c/	1⅓ miles northwest	-- Beilstein	--	1923	110	4	100	10
1005 c/	1¼ miles northwest	do.	Gulf Production Co.	--	640	4	--	--
1006 c/	do.	Cullen & West	Fred Asher	1920	320	10	--	--
1007 c/	¾ miles west northwest	Crown Oil Co.	A. Parker	1916	575	8	--	--
1008 c/	¾ miles north	S. Loidmoyer	Amos Genesee	1925	109	4	99	10
1009	1 mile north	City of Polly	-- Riggs	1928	408	6	335	75

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No.	Height of bench mark above (+) ground (ft.) a/	Water level		Pump and kind and amount of power b/	Use of water c/	Remarks
		Below bench mark (ft.)	Date of measurement			
964	--	--	--	J,H	D	
965	--	20	Jan. 21, 1932	J,H	D	
966	--	20.3	do.	J,H	D	
967	--	--	--	A,G	D	Casing; 40 feet of four-inch and 2-inch to bottom.
968	--	--	--	J,G, 2½	D	
969	--	--	--	J,W	D	
970	--	31	July, 1931	J,W	D	Sand and gravel reported at 75 to 100 feet below surface.
971	--	--	--	A,E	D	
972	--	30	Jan. 19, 1932	A,G, 2	D	
973	--	--	--	J,H	D	
974	--	--	--	None	N	Well flowed when first completed.
975	--	15	Jan. 19, 1932	J,W	D	
976	--	--	--	J,W	D	Temperature 71° F.
977	--	--	--	J,E, ¾	D	
978	--	30	Jan. 19, 1932	J,W	D	
979	--	--	--	A,E, 1	D	Temperature 72° F.
980	--	--	--	A,E, 1	D	
1001	--	40	Nov. 11, 1931	A,G, 1½	P	
1002	--	--	--	J,W	P	Casing; 80 feet of 4-inch and 2-inch to bottom.
1003	--	--	--	J,H	D	Dug well.
1004	--	22	Nov. 12, 1931	J,W	D	Temperature 75° F.
1005	--	--	--	J,H	D	
1006	--	55	Nov. 18, 1931	Steam	Ind	
1007	--	--	--	A	D, Ind	
1008	--	2	Nov. 19, 1931	J,W	D	
1009	--	--	--	T,E, 15	P	

Records of wells in Harris County--Continued

No.	Distance from Goose Creek	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
1010 e/	2½ miles north	John Gillard	--	1931	19	30	--	--
1011 e/	3½ miles northeast	J. L. Sims	Amos Jennische	1918	325	4	300	25
1012 e/	do.	A. M. Wilburn	A. F. Genesee	--	320	4	--	--
1013 e/	3¾ miles northeast	C. McKinney	--	1926	325	4	305	20
1014 e/	do.	M. George	A. Jennische	1913	515	2	475	40
1015 e/	do.	Mrs. L. Sheperd	do.	1926	365	2	345	20
1016 e/	3 miles east northeast	John Kilgore	A. F. Genesee	--	490	2½	--	--
1017 e/	2½ miles east northeast	W. G. Bayliss	do.	--	100±	--	--	--
1018 e/	2¾ miles east northeast	W. Wright	A. Jennische	1930	85	4	60	18
1051 e/	3½ miles northwest	Humble Oil & Ref. Co. Well 12	Layne-Texas Co.	1925	562	24	399	158
1052	do.	Humble Oil & Ref. Co. Well 17	do.	1926	988	24	424 756 821 916	117 40 65 72
1053 e/	do.	Humble Oil & Ref. Co. Well 19	do.	1929	1,001	24	412 468 757 837 924	44 69 36 53 60
1054 e/	3¼ miles northwest	Humble Oil & Ref. Co. Well 15	do.	1926	572	24	305 422	38 146
1055	3 miles northwest	Humble Oil & Ref. Co. Well 8	do.	1922	962	24	--	--
1056 e/	3¼ miles northwest	Humble Oil & Ref. Co. Well 9	do.	1924	922	24	355 803	149 116
1057 e/	3 miles northwest	Humble Oil & Ref. Co. Well 7	do.	--	515	24	372	112
1058 e/	2¾ miles northwest	Humble Oil & Ref. Co. Well 13	do.	1925	542	24	385 491	100 19
1059 e/	do.	Humble Oil & Ref. Co. Well 18	do.	1927	1,687	26	1,008 1,325 1,456 1,527 1,546 1,645	12 18 19 13 61 42

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
1010	--	13	Nov. 18, 1931	J,H	D	Temperature 72° F. Dug well.
1011	--	40	Jan. 19, 1932	A,G, 20	D	
1012	--	30	do.	A,E, 2	D	
1013	--	--	--	A,E, 2	D	
1014	--	--	--	A,E	D	
1015	--	--	--	A,G, 3½	D	
1016	--	--	--	A,G	D	
1017	--	--	--	J,H	D	
1018	--	8	Jan. 19, 1932	J,W	D	
1051	--	66.6	Oct., 1931	T,E 125	Ind	Casing; 145 feet of 24-inch. 297 feet of 16-inch and 8-inch to bottom. Screen set at 385 to 535 feet. Temperature
1052	--	72.4	Aug., 1928	None	N	Well abandoned in 1928. Casing; 78° F. 438 feet of 24-inch, 257 feet of 16-inch, and 10-inch to bottom. Screens set at 493 to 589, 771 to 789, 832 to
1053	--	74.5	Oct., 1931	T,E, 150	Ind	Temperature 871, and 927 to 984 feet. 80° F. Casing; 415 feet of 24-inch, and 12-inch to 974 feet. Screens set at 427 to 448, 467 to 530, 751 to 772, 833 to 874, 916 to 936, and 953 to 974
1054	--	61.5	do.	T,E, 125	Ind	Temperature 74° F. Casing; 310 feet. feet of 24-inch, 64 feet of 18-inch, 94 feet of 12-inch and 8-inch to bottom. Screens set at 310 to 349 and 451 to 571
1055	--	--	do.	None	N	Well abandoned about 1925. feet.
1056	--	63.1	Oct., 1931	T,E, 150	Ind	Temperature 75° F. Casing; 334 feet of 24-inch, 206 feet of 18-inch, 265 feet of 12-inch and 217 feet of 6-inch. Screens set at 360 to 495 and 786 to
1057	--	59.8	do.	T,E, 200	Ind	Temperature 76° F. Casing; 914 feet. 325 feet of 24-inch and 18-inch to bottom. Screen set at 354 to 505 feet.
1058	--	65.1	do.	T,E, 125	Ind	Temperature 77° F. Casing; 145 feet of 24-inch, 259 feet of 16-inch and 10-inch to bottom. Screen set at 406 to 509
1059	--	19.2	do.	None	N	Temperature 89° F. Casing; 260 feet. feet of 26-inch, 1,313 feet of 12-inch and 10-inch to bottom. Screens set at 937 to 958, 999 to 1,016, 1,335 to 1,373 1,452 to 1,474, 1,516 to 1,554, 1,567 to 1,606 and 1,606 to 1,681 feet.

Records of wells in Harris County--Continued

No.	Distance from Goose Creek	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
1060	2⅝ miles northwest	Humble Oil & Ref. Co. Well 5	Layne-Texas Co.	1922	973	24	386 785	130 185
1061	do.	Humble Oil & Ref. Co. Well 3	--	--	869	12	509 781 840	83 36 27
1062	do.	Humble Oil & Ref. Co. Well 2	--	--	968	12	873	56
1063 e/	2⅛ miles northwest	Humble Oil & Ref. Co. Well 6	Layne-Texas Co.	1922	968	24	279 384 866	26 108 97
1064 e/	do.	Humble Oil & Ref. Co. Well 4	do.	1920	960	24	368 649 715 779	148 45 47 160
1065	3 miles northwest	Humble Oil & Ref. Co. Well 16	do.	1926	1,010	--	--	--
1066	2¼ miles northwest	Humble Oil & Ref. Co. Well 1	--	--	743	16	663	59
1067 e/	2¾ miles west northwest	Humble Oil & Ref. Co. Well 10	Layne-Texas Co.	1925	545	24	293 361 399	56 22 138

No.	Distance from South Houston	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
1101	8½ miles east northeast	Harris County	--	--	800±	24	--	--
1102	9½ miles east northeast	Strang Petroleum Corp.	--	--	--	6	--	--
1103 d/ e/	12 miles east	G. H. & S. A. R.R.	--	1909?	770±	10	--	--
1104 e/	13 miles east	City of La Porte	--	1925	570	10	--	--
1105	do.	A. A. Womack	Allen Bros.	1892?	--	6	--	--
1106	13⅛ miles east	G. R. Hamilton	--	1912	500±	2	--	--
1151 d/ e/	4 miles north	Southern Pacific R.R.	J. W. Jackson	1926	773	8	630 721	82 50
1152 e/	4½ miles north	Kirby Lumber Co.	--	--	--	6	--	--

a/ Bench mark is point from which water-level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

b/ T, turbine; A, air; F, flow; C, centrifugal; J, jack or suction; B, bucket; E, electric; S, steam; O, oil; G, gas; H, hand.

c/ P, public; Irr, irrigation; Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
1060	--	--	--	None	N	Casing; 83 feet of 24-inch and 12-inch to bottom. Screens set at 422 to 507 and 871 to 958 feet. Well abandoned
1061	--	--	--	None	N	Casing; 130 feet of 12-inch, about 1926. and 10-inch to bottom. Screens set at 512 to 592, 781 to 815, and 839 to 869
1062	--	--	--	None	N	Set 10-inch screen at 843 to foot. 944 foot.
1063	--	47.7	Oct., 1931	T,E, 150	Ind	Temperature 77° F. Casing; 100 feet of 24-inch and 12-inch to bottom. Screens set at 284 to 306, 388 to 489 and 879
1064	--	49.6	do.	T,E, 150	Ind	Temperature 78° F. Cas- to 963 foot. ing; 112 feet of 24-inch and 10 foot to bottom. Screens set at 428 to 504, 677 to 698, 742 to 761, 826 to 882 and 901
1065	--	--	--	None	N	Well was first developed to 921 foot. in 500-foot stratum but was not satisfactory and well was ruined while attempting to drill it deeper.
1066	--	42.0	Oct., 1931	None	N	Casing; 62 foot of 16-inch, 120 feet of 12-inch, 683 feet of 10-inch and 60 feet
1067	--	50.3	do.	T,E, 100	Ind	Temperature 76° F. of 8-inch strainer. Casing; 126 feet of 24-inch, 172 feet of 16-inch, and 8-inch to bottom. Screens set at 338 to 378, and 443 to 543 feet.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
1101	0	60.5	Nov. 28, 1932	None	N	Abandoned rice well in highway.
1102	+1	32.8	Apr. 2, 1931	None	N	Well drilled to supply water to oil test-drilling rig.
1103	--	--	--	A	RR	Two similar wells at Strong.
1104	+2	54.6	Apr. 2, 1931	A,E	P	Screen set at 500 to 570 feet.
1105	+2	54.1	Nov. 28, 1932	None	N	Reported flow 20 feet above ground when drilled.
1106	+2	19.1	Apr. 2, 1932	None	N	Reported flow 12 feet above ground when drilled.
1151	--	--	--	A,E	RR	Casing; 712 foot of 8-inch and 6-inch to bottom. Screens set at 643 to 703
1152	--	--	--	A,E	P	Supplies town and 731 to 771 foot. of Clinton.

d/ See table of analyses for analysis of water from this well.
e/ See "Table of field tests" for tests of hardness, chloride and sulphate in water from this well.
f/ Reported by driller.
g/ Measured by Southern Engine and Pump Company.
h/ Measured by Layne-Texas Company.

Records of wells in Harris County--Continued

No.	Distance from South Houston	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
1153	4½ miles north	Kirby Lumber Co.	Layne-Texas Co.	1924	549	3	287 501	19 21
1154	4¾ miles north	Sea Port Realty Co.	--	--	720±	8	--	--
1155 e/	4¼ miles north	Gulf Ref. Co.	Layne-Texas Co.	1922	752	24	504 595 702	36 54 48
1156	do.	do.	--	--	750±	6	--	--
1157	4 miles north	Clarion Oil Co.	--	--	--	4	--	--
1158	3¾ miles north	Gulf Compress Co.	--	--	500±	--	--	--
1159	3½ miles north	Manchester Terminal	Layne-Texas Co.	1932	--	12	--	--
1160 e/	2¾ miles north northwest	Allendale Subdivision	McMasters & Pomeroy	--	318	8	293	25
1160a d/	do.	do.	--	--	160	--	--	--
1161	3 miles north	Sinclair Ref. Co.	Layne-Texas Co.	1924	1,228	24	730 905 1,085	55 70 65
1162 e/	3¼ miles north	do.	do.	1924	1,223	24	625 704 1,105	67 54 118
1163	do.	do.	do.	1931	1,301	24	885 985 1,149	54 44 108
1164	3½ miles north	do.	--	1918	800±	8	1,264 --	32 --
1165	do.	do.	Layne-Texas Co.	1920	1,104	12	967 1,031 1,059 1,083	48 16 17 20
1166	3¾ miles north	do.	do.	1920	974	16	872	102
1167	do.	do.	do.	1918	800±	8	--	--
1168 d/	4¼ miles north	Houston Lighting & Power Co.	Southern Well Drilling Co.	1923	823	12	600 685	70 118
1169 d/	do.	do.	Layne-Texas Co.	1924	821	12	590 731	76 78
1170 e/	do.	do.	do.	1929	836	16	598 744	78 72
1171 e/	3½ miles north northeast	Houston Pipe Line Co.	-- Morton	--	264	6	--	--
1172	4¾ miles north northeast	Texas Company	Layne-Texas Co.	1929	1,376	24	282 771 864 1,018 1,315	28 22 24 61 60

No.	Height of bench mark above (+) ground (ft.) a/	Water level		Pump and kind and amount of power b/	Use of water c/	Remarks
		Below bench mark (ft.)	Date of measurement			
1153	4½	52.1	Mar. 27, 1931	None	N	Casing; 245 feet of 3-inch and 2-inch to bottom. Screens set at 288 to 310
1154	--	--	--	A,E, 10	P	Supplies small subdivision. and 504 to 525 feet.
1155	0	61.2	Mar. 27, 1931	T,E	D,Ind	Casing; 93 feet of 24-inch and 8-inch to bottom. Screens set at 499 to 543, 594 to 657, and 701 to 747 feet.
1156	+2	68.5	do.	None	N	
1157	--	--	--	J	N	Not used since about 1928.
1158	+4	15.4	Mar. 27, 1931	A	Ind	Also have two unused wells, one 8-inch and one 4-inch diameter.
1159	--	--	--	T,E	P,RR	
1160	--	--	--	J,G, 4	P	
1160a	--	--	--	J,W	P	Near well 1160
1161	--	--	--	T,E, 150	Ind	Casing; 156 feet of 24-inch, 12-inch to 1,118 feet and 8-inch to bottom. Screens set at 741 to 781, 925 to 965, and
1162	--	--	--	T,E, 150	Ind	Casing; 162 feet of 24-inch, 12-inch to 1,013 feet, and 8-inch to bottom. Screens set at 658 to 697, 718 to 758, 1,099 to 1,119 and 1,118 to 1,228 feet.
1163	0	82	June 24, 1931	T,E	Ind	Screens set at 936 to 979, 1,029 to 1,068, 1,197 to 1,236, 1,219 to 1,240 and 1,256 to 1,139 to 1,223 feet.
1164	--	--	--	A	N	1,277 feet.
1165	--	--	--	T,E, 75	Ind	Casing; 113 feet of 12-inch, 8-inch set at 922 feet, and 6-inch to bottom. Screen set at 965 to 1,009, 1,027 to 1,042, 1,054 to 1,072 and 1,081 to
1166	--	--	--	T,E, 150	Ind	Casing; 253 feet of 16-inch, 8-inch set at 824 feet, and 6-inch to bottom. Screen set at 887 to 1,099 feet.
1167	--	--	--	A	N	968 feet.
1168	--	--	--	A	Ind	Casing; 318 feet of 12-inch and 10-inch to bottom. Screens set at 630 to 670, 705 to 725, and 744 to 805 feet. Tem-
1169	--	--	--	A	Ind	Casing; 310 feet of 12-inch, and 10-inch to bottom. Screens set at 624 to 661 and 723 to 805 feet. perature 78° F.
1170	+1	56.8	Feb. 25, 1931	T,E, 50	Ind	Casing; 145 feet of 16-inch, and 10-inch to bottom. Screens set at 612 to
1171	--	--	--	J,G	D	672 and 752 to 811 feet.
1172	+½	40.1	Mar. 25, 1931	T,E, 100	Ind	Casing; 251 feet of 24-inch, 16-inch set at 275, 12-inch set at 1,294, and 8-inch to bottom. Screens set at 289 to 309, 772 to 793, 872 to 892, 1,046 to 1,111 and 1,307 to 1,373 feet.

Records of wells in Harris County--Continued

No.	Distance from South Houston	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
1173	4¾ miles north northeast	Texas Company	J. A. Walling	--	682	8	--	--
1174	do.	do.	Layne-Texas Co.	1930	802	24	419 600 743	49 67 56
1175	do.	do.	--	--	--	8	--	--
1176	5½ miles north northeast	do.	McMasters & Pomeroy	--	800±	8	--	--
1177	do.	do.	do.	--	800±	8	--	--
1178	5¾ miles north northeast	American Petroleum Co.	--	1922?	720±	6	--	--
1179 c/	do.	do.	McMasters & Pomeroy	1931	707	10	633	74
1180	5¼ miles north northeast	Horton & Horton	--	1925	420±	6	--	--
1181 c/	4¾ miles north northeast	Philip Petroleum Co.	--	--	691	4	--	--
1182	4½ miles north northeast	Houston Belt & Terminal Co.	--	--	--	6	--	--
1183	do.	Crown Oil Ref.	--	--	--	10	--	--
1184	do.	do.	McMasters & Pomeroy	--	--	10	--	--
1185	do.	do.	do.	--	--	10	--	--
1186	3¾ miles north northeast	American Service Co.	do.	--	220	6	--	--
1187 c/	3½ miles north northeast	City of Pasadena	do.	1930	--	--	648 726	62 29
1188	do.	J. E. Pomeroy	--	--	--	--	793 --	19 --
1189	3¼ miles north northeast	Lone Star Cement Co.	--	--	--	3	--	--
1190	do.	do.	McMasters & Pomeroy	1930	--	3	--	--
1191	5 miles northeast	Talford Jones	--	1902?	518	4	--	--
1192	do.	do.	--	--	850±	36	--	--
1193	do.	Jones Estate	McMasters & Pomeroy	1930	--	6	--	--
1194 c/	do.	Deepwater Subdivision	Layne-Texas Co.	--	811	--	--	--
1195 d/ e/	do.	Deepwater School	--	--	130±	2	--	--
1196	5½ miles east northeast	Talford Jones	--	--	550±	8	--	--
1197	6½ miles northeast	do.	McMasters & Pomeroy	1928	823	12	--	--

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No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
1173	--	--	--	A	Ind	Casing; 632 feet of 8-inch, and 6-inch to bottom. Screen set at 642 to 682
1174	+1½	43.6	Mar. 25, 1931	T,E, 100	Ind	Casing; 250 feet of 24-inch, and 12-inch to bottom. Screens set at 428 to 469, 621 to 661, and 750 to 791 feet.
1175	--	--	--	None	N	Had not been used for several years.
1176	+1	28.0	Mar. 25, 1931	None	N	Had not been used for four or five years.
1177	+2½	24.0	do.	None	N	
1178	--	--	--	A,E	N	Well kept as emergency supply.
1179	0	37	Mar. 4, 1931	T,E, 20	Ind	707 feet of 10-inch casing and screen. Screen set at 646 to 707 feet.
1180	+½	35.5	Feb. 20, 1931	J,G, 3	D,S	
1181	--	--	--	A,E, 1	Ind	
1182	0	55	Feb. 25, 1929	--	RR	
1183	--	--	--	A	Ind	
1184	--	--	--	A	Ind	
1185	--	--	--	T,E, 30	Ind	
1186	--	--	--	T,E, 7½	Ind	Pump removed and now used as observation well.
1187	--	--	--	T,E, 15	P	
1188	--	--	--	--	P	Supplies part of Pasadena subdivision.
1189	--	--	--	None	N	Abandoned in 1930.
1190	--	--	--	A	Ind	
1191	+2½	8.8	Apr. 1, 1931	None	N	Old rico irrigation well.
1192	--	--	--	None	N	
1193	--	--	--	A,E	D	
1194	--	--	--	T,E, 7½	P	
1195	--	--	--	J,H	P	
1196	+1	52.0	Apr. 1, 1931	A,O	D, Ind	
1197	+1	57.7	Apr. 2, 1931	T,E, 50	D, Ind	

Records of wells in Harris County--Continued

No.	Distance from South Houston	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
1198	8 miles northeast	Shell Petroleum	McMasters & Pomeroy	1929	790	16	290	28
							327	18+
1199	8 miles east northeast	do.	do.	1929	860	16	626	60
							707	27
1200 e/	do.	do.	Layne-Texas Co.	1928	487	--	745	42
							335	81
1201 e/	7⅛ miles east northeast	do.	McMasters & Pomeroy	1929	860	16	665	51
							741	119
							--	--
							310	190
							602	18
1202 e/	7¼ miles east northeast	-- Seabold	do.	1930	504	8	637	45
							748	47
1203	In south Houston	Harris County	F. F. Powell	1908	600+	3	831	27
							360	26
1204	do.	City of South Houston	do.	1908?	620+	2	426	78
							--	--
1205 e/	do.	do.	J. A. Walling	--	780+	8	--	--
							--	--
1206	¼ mile northeast	--	F. F. Powell	1908	600+	3	--	--
1207	¼ mile southeast	--	do.	1908	463	4	--	--
1208	do.	Christies Shows	do.	1908	250+	--	--	--
1209	½ mile southeast	Fireworks Co.	--	--	650+	--	--	--
1210	⅓ mile west	South Houston School House	F. F. Powell	1908	600+	4	--	--
1211	½ mile south southwest	Harris County	do.	1908	250+	--	--	--
1212 e/	1¾ miles south southwest	-- Head	--	--	106	6	--	--
1213 e/	2½ miles south	H. W. Boehm	H. W. Boehm	--	91	24	71	20
1214 e/	2 miles east	R. B. McCollough	McMasters & Pomeroy	1928	502	4	488	14
1215 e/	do.	A. Howard	--	--	125	3	120	5
1216	do.	-- Francois	--	1926	120	3	--	--
1217	2¼ miles east northeast	-- Carpenter	--	--	350	3	--	--
1218 e/	do.	J. K. Lee	--	--	125+	3	--	--
1219	2¼ miles east	-- Woodruff	--	--	120	3	--	--
1220 d/ e/	do.	Joe Hanson	--	--	25+	4	--	--
1221 e/	2 miles east	Vincent Lopez	--	--	35+	8	--	--

No.	Height of bench mark above (+) ground (ft.) a/	Water level Below bench mark (ft.)	Water level Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
1198	--	--	--	T,E, 150	Ind	Casing; 202 feet of 16-inch, and 12-inch to bottom.
1199	--	--	--	T,E, 150	Ind	Casing; 199 feet of 16-inch, and 12-inch to bottom.
1200	--	--	--	T,E, 50	Ind	Sands at 88 to 127, 236 to 266, 330 to 374, and 382 to 483 feet.
1201	--	--	--	T,E, 150	Ind	Casing; 211 feet of 16-inch, and 12-inch to bottom.
1202	--	--	--	T,E	P	Deer Park public supply.
1203	+½	34.7	Apr. 3, 1931	None	N	Well had a flow until 1913.
1204	+1	34.2	do.	None	N	
1205	--	--	--	A,E	P	South Houston public supply.
1206	--	--	--	None	N	Well once flowed. Now plugged at 2 feet below surface.
1207	--	--	--	J,H	N	Reported to have yielded good sulphur water; now plugged.
1208	--	--	--	None	N	Well never flowed.
1209	+4	39.5	Oct. 6, 1932	A	N	
1210	--	--	--	None	N	Now abandoned and plugged with rocks and sticks.
1211	--	--	--	J,O, 10	N	
1212	--	--	--	J,E, 12	P	
1213	--	--	--	J,W	D,S	Casing; 40 feet of 24-inch, and 9 5/8-inch to bottom. Screen set at 71 to 91 feet.
1214	--	--	--	J,G, 1½	D,S	
1215	--	--	--	J,H	S	
1216	--	--	--	None	N	Had good water for one year; water turned bad and well abandoned and filled.
1217	--	--	--	None	N	Had a 120-foot well and good water for about a year and water turned bad. Drilled deeper without success.
1218	--	--	--	J,H	S	
1219	--	--	--	A,G, 15	Ind	Reported to have bad effect on land.
1220	--	--	--	J,H	D,S	
1221	--	--	--	J,H	S	Dug for 18 feet and bored to 35 feet.

Records of wells in Harris County--Continued

No.	Distance from South Houston	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
1222 c/	2 miles east	Vincent Lopez	M. R. Pretty	1932	100	4	90	10
1223 c/	2½ miles east	C. A. Graham	C. A. Graham	1932	103	4	75	28
1224	3¼ miles east southeast	C. S. Woods	--	1908?	1,800±	10	--	--
1225 c/	3 miles east southeast	W. S. Craig	--	--	36±	4	--	--
1226	4 miles east southeast	Schoenmann Produce Co.	M. R. Pretty	1932	106	4	96	10
1227 c/	do.	do.	--	--	35	2⅔	--	--
1228	do.	do.	M. R. Pretty	1932	100	4	90	10
1251	11½ miles west southwest	C. F. Smith	Layne-Texas Co.	--	728	30	--	--
1252	9½ miles west southwest	J. M. Burkett	do.	1904	630	28	600 612	10 18
1271	8½ miles west southwest	--	--	--	1,240±	6	--	--
1272	7⅔ miles west southwest	Emil Able	--	--	1,600±	30	--	--
1273	do.	do.	--	--	600±	6	--	--
1274	7 miles west southwest	Mike Martin	--	--	975±	30	--	--
1275 d/ e/	do.	do.	--	--	40	1¼	--	--

No.	Distance from Webster	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
1301	8 miles northwest	-- Burnett	--	--	700	5	--	--
1302 d/ e/	7⅔ miles northwest	City of Genoa	Layne-Texas Co.	1928	832	6	657 701	18 16
1303	do.	do.	--	--	600	--	806 --	26 --
1304 e/	do.	G. H. & H. R.R.	--	1899	683	6	661	22
1305 e/	do.	-- Davidson	--	--	100±	3	--	--
1306 c/	7 miles northwest	C. D. Rogers	--	--	17	6	--	--

a/ Bench mark is point from which water-level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

b/ T, turbine; A, air; F, flow; C, centrifugal; J, jack or suction; B, bucket; E, electric; S, steam; O, oil; G, gas; H, hand.

c/ P, public: Irr, irrigation; Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
1222	--	--	--	A,G, 1½	Irr,D	
1223	+2½	11.6	Sept.29, 1932	A,G, 22	D,S, Irr	Screen set at 85 to 103 feet.
1224	--	--	--	None	N	Oil test. Reported flow of good water until casing collapsed.
1225	+1	10.5	Sept. 29, 1932	J,H	D,S	
1226	--	--	--	A,G	Irr	Screen set at 96 to 106 feet.
1227	--	--	--	J,H	D,S	
1228	--	--	--	A,G	Irr	Screen set at 89 to 100 feet. Reported yield, 100 gallons per minute.
1251	--	--	--	J,E	D	Casing; 50 feet of 30-inch and 9 5/8-inch to bottom. Well 484 in Water-
1252	+1	10.9	Apr. 9, 1931	None	N	Casing; 38 feet of Supply Paper 335. 28-inch pit, 8¼-inch set at 593 and screen to bottom. Well 488 in Water-
1271	+1½	13.1	do.	None	N	Drilled as oil test. Supply Paper 335. Reported 200 feet of casing sand.
1272	+1½	40.0	do.	T	N	Abandoned.
1273	--	6.5	do.	J,H	D	
1274	+1½	35.1	do.	None	N	Formerly used for rice irrigation.
1275	--	--	--	J,H	D,S	

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
1301	--	--	--	None	N	Well plugged at 9 feet. Well 517 in Water-Supply Paper 335. Flowed in 1891.
1302	+1	48.1	Apr. 3, 1931	J,W	P	In Genoa.
1303	--	--	--	None	N	Well flowed 4 feet above ground in 1902. Now abandoned under highway.
1304	--	--	--	J,O	RR	Also reported as about 100 feet deep.
1305	--	--	--	J,E, 1	D,S	In Genoa.
1306	--	--	--	J,H	D,S	

d/ See table of analyses for analysis of water from this well.
e/ See "Table of field tests" for tests of hardness, chloride and sulphate in water from this well.
f/ Reported by driller.
g/ Measured by Southern Engine and Pump Company.
h/ Measured by Layne-Texas Company.

Records of wells in Harris County--Continued

No.	Distance from Webster	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
1307	7 miles northwest	C. D. Rogers	-- Amshutz	--	110	3	100	10
1308 c/	6½ miles northwest	J. M. West	--	--	101	2	--	--
1309	do.	do.	--	--	85	6	--	--
1310	6 miles northwest	Layne & Woodburn	Layne-Texas Co.	--	1,003	12	355 575 676 726 802 854 938 --	192 29 31 20 23 37 23 --
1311	7 miles west northwest	T. C. Dunn	H. W. Boehm	--	550	24		
1312	do.	do.	Layne-Texas Co.	1905	885	24	690 762	40 83
1313 c/	do.	do.	--	--	100±	10	--	--
1314 d/ c/	5½ miles west northwest	do.	-- Lowry	1930	87	2	--	--
1315 c/	5 miles northwest	Steve Waldrip	do.	--	105	4	--	--
1316	6 miles northwest	William Jacobs	--	--	100	2	--	--
1317 d/ c/	5½ miles northwest	J. W. Alford	--	--	20	6	--	--
1318	do.	J. M. West	-- Cronshaw	--	90	2	--	--
1319	6 miles northwest	Ellington Field	--	--	85	2	--	--
1320	5½ miles northwest	do.	--	--	210	8	--	--
1321	5 miles northwest	Abandoned Fig plant	--	--	78	4	--	--
1322 e/	2¾ miles northwest	Roy West	--	--	--	--	--	--
1323 e/	do.	J. M. West	--	--	90±	2	--	--
1324 e/	1½ miles northwest	do.	--	1895?	400±	3	--	--
1325	1½ miles north northwest	do.	--	--	--	30	--	--
1326 e/	2¼ miles west	G. R. Peck	Pat O'Day	1923	510	4	470	40
1327	3± miles west	Frank Peck	Layne-Texas Co.	1906	733	30	464	140
1328 e/	4 miles west	J. W. Goar	--	--	32	10	--	--
1329 d/ e/	do.	do.	Pat O'Day	1924	473	3	--	--
1330	do.	J. T. Cantwell	do.	1924	243	4	--	--
1331 d/ e/	3 miles west	G. D. Scott	--	--	30±	2	--	--

No.	Height of bench mark above (+) ground (ft.) a/	Water level		Pump and kind and amount of power b/	Use of water c/	Remarks
		Below bench mark (ft.)	Date of measurement			
1307	+1	13.7	Sept.30, 1932	None	N	12 feet strainer at bottom.
1308	--	--	--	J,W	D,S	
1309	0	9.8	Oct. 6, 1932	None	N	
1310	--	--	--	None	N	Rice irrigation well, now caved in. Casing; 377 feet of 12-inch, 11 5/8-inch set at 547 feet, and 9 5/8-inch to 961 foot. Screens set at 377 to 547, 584 to 604, 675 to 707, 730 to 746, 805 to 825, 859 to 891, and 941 to 961 foot.
1311	--	--	--	T	N	Formerly used for rice irrigation.
1312	+1	28.1	Apr. 3, 1931	T	N	Do.
1313	+½	4.2	do.	J,W	S	
1314	--	--	--	J,H	D,S	
1315	+2	4.9	Oct. 6, 1932	J,E	D,S	
1316	--	--	--	J,W	D,S	
1317	--	--	--	J,E	--	Used at filling station.
1318	+1	11.6	Oct. 6, 1932	None	N	
1319	--	--	--	J,W	S	
1320	+3	9.5	Oct. 6, 1932	None	N	
1321	0	4.3	do.	None	N	
1322	--	--	--	T,E	Irr	
1323	--	--	--	J,W	S	
1324	+1	42.9	Oct. 7, 1932	J,W	S	
1325	+3½	52.1	do.	T	N	
1326	--	--	--	J,W	D,S	
1327	+1	43.2	Sept.11, 1931	T	N	679 feet of 9 5/8-inch casing. Screens set at 450 to 550 and 649 to 669 feet.
1328	--	--	--	J,H	D,S	
1329	--	--	--	J,H	D,S	Screen set at 433 to 473 feet.
1330	0	10.3	Oct. 7, 1932	J,H	D,S	Screen set at 220 to 240 feet.
1331	--	--	--	J,G	S	

Records of wells in Harris County--Continued

No.	Distance from Webster	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
1332	2½ miles west	Robert Bruce	--	1902?	500	24	--	--
1333	2½ miles west southwest	do.	--	--	500	4	--	--
1334 e/	1¾ miles west southwest	Banker's Mortgage Co.	--	1928	600±	4	--	--
1335 e/	1½ miles southwest	Raymond Pearson	Layne-Bowler Co.	1907	700	30	600	--
1336	3¼ miles southwest	--	--	--	20	4	--	--
1337	do.	Thomas Heitling	F. A. Boehm	1909	662	30	491 557 636	61 73 20
1338 d/ e/	1½ miles west southwest	H. W. Bouton	H. W. Bouton	1906	185	3	--	--
1351	2½ miles north northeast	S. T. Nishimura	-- Price	--	475	10	--	--
1352	1½ miles north northeast	Y. Koniski	Layne-Texas Co.	--	700±	10	--	--
1353	¾ miles north	L. Onishi	do.	--	615±	9-5/8	--	--
1354	½ mile northwest	Roy West	do.	--	677	24	--	--
1355	½ mile north	T. Onishi	Layne-Bowler Co.	1907	670±	10	--	--
1356 d/ e/	¼ mile northwest	A. A. Polk	-- Wilson	1932	130	4	103	22
1357 e/	In Webster	G. H. & H. R.R.	--	--	565±	--	--	--
1358 d/ e/	do.	D. F. Ervin	--	1890?	500±	4	--	--
1359 c/	do.	G. H. Whitcomb	Aberson & Altemus	--	563	2	--	--
1360	¼ mile east	Mrs. -- Fain	N. J. Bratcher	1903?	659	24	525	134
1361 e/	¼ mile southwest	F. M. Benschoter	F. M. Benschoter	--	20	14	--	--
1362 c/	do.	Webster School	Wylie Burns	1927	500±	3	--	--
1363	½ mile south southwest	Mrs. A. L. Smith	--	--	570	24	--	--
1364 d/ e/	¾ mile south	Humble Pipe Line Co.	--	--	81	4	--	--
1365 d/ e/	1¼ miles southeast	do.	Layne-Texas Co.	1927	652	10	560	92
1366 d/	2 miles south southeast	Galveston-Houston Electric Co.	do.	1910	788	6	564 609	21 44

a/ Bench mark is point from which water-level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

b/ T, turbine; A, air; F, flow; C, centrifugal; J, jack or suction; B, bucket; E, electric; S, steam; O, oil; G, gas; H, hand.

c/ P, public; Irr, irrigation; Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
1332	--	--	--	T	N	Well 533 in Water-Supply Paper 335.
1333	+2½	38.5	Oct. 7, 1932	A	N	
1334	--	--	--	A,G, 3	D,S	
1335	+½	32.4	Oct. 7, 1932	J,W	D,S	
1336	+1	16.2	Oct. 6, 1932	None	N	
1337	+1	18.1	do.	T	N	Casing; 55 feet of 30-inch and 11 5/8-inch to bottom. Screens set at 493 to 550 and 565 to 653 feet. Formerly used for rice irrigation.
1338	--	--	--	J,W	D,S	
1351	--	--	--	None	N	Well 526 in Water-Supply Paper 335.
1352	--	--	--	None	N	Well 532 in Water-Supply Paper 335.
1353	--	--	--	None	N	Well 527 in Water-Supply Paper 335.
1354	0	31.9	Apr. 3, 1931	T	N	
1355	--	--	--	None	N	Well 531 in Water-Supply Paper 335.
1356	--	--	--	J,E, ½	D,S	
1357	--	--	--	--	RR	
1358	--	--	--	J,E, ½	D,S	Reported flow 13 feet above ground in 1893.
1359	+2	39.2	Sept.30, 1932	J,E, 1	D,S	Reported water level as 17 feet below ground in 1929.
1360	+2	31.5	Apr. 3, 1931	J,E	D,S	Well 522 feet in Water-Supply Paper 335. Head reported as 18 feet above ground in 1903.
1361	--	--	--	J,H	S	
1362	--	--	--	J,E, ¾	D	
1363	+3	36.9	Oct. 7, 1932	T,O, 50	Irr	
1364	--	--	--	J,W	D,S	
1365	0	15.7	Sept.15, 1927	T,E, 25	Ind	Casing; 102 feet of 10-inch and 8-inch to bottom. Screen set at 583 to 649 foot.
1366	--	--	--	A,E	D,RR	788 feet of 6-inch casing. Screens set at 568 to 587 and 611 to 653 foot.

d/ See table of analyses for analysis of water from this well.
e/ See "Table of field tests" for tests of hardness, chloride and sulphate in water from this well.
f/ Reported by driller.
g/ Measured by Southern Engine and Pump Company.
h/ Measured by Layne-Texas Company.

Records of field tests of samples from wells in Harris County, Texas (Analyzed by Samuel F. Turner. Parts per million. For records of wells see corresponding numbers in well tables.)

Well No.	Owner	Date of collection	Depth of well (ft.)	Hardness as $CaCO_3$ a/	Chloride (Cl)	Sulphate (SO_4) b/
3	T. W. Ray	Nov. 6, 1931	71	70	60	5
6	H. H. Strickland	Apr. 13,1931	30	350	200	30
9	J. E. Ellison	-	120±	120	60	5
10	J. A. Hafner	May 13, 1931	21	190	90	-
11	do.	Apr. 13, 1931	70	85	65	1
12	do.	do.	61	50	60	4
15	W. P. Castle	-	90	90	60	3
31	R. L. Burton	Apr. 13, 1931	297	130	60	5
33	W. G. Neely	do.	61	150	85	20
34	O. M. Taylor	-	53	120	70	5
35	do.	Apr. 25, 1931	35	240	160	5
71	Stanolind Pipe Line Co.	-	65	50	20	-
92	E. N. Wunsche	June 1, 1931	35	75	190	25
93	I. & G. N. R. R.	-	1,070	40	40	5
98	R. W. Houk	-	137	190	35	2
100	C. B. Bammel	Mar. 27, 1931	24	110	60	5
101	do.	do.	142	120	40	5
102	C. P. Addison	do.	20	120	95	-
103	do.	Nov. 9, 1931	40	80	40	1
104	do.	do.	155	110	25	1
105	Marshall Elzy	June 1, 1931	20	300	160	30
121	Warren Ranch	-	-	60	40	1
122	do.	-	-	70	50	1
123	do.	-	80±	100	40	1
125	do.	-	2,151	90	30	1
126	do.	-	4,828	110	30	1
127	-	-	-	75	50	1
128	-	-	-	90	65	1
131	C. E. House	-	92	110	50	2
133	J. H. Huber	-	95+	120	55	2
135	Ira Southard	-	90	140	40	5
136	J. Freeman	Mar. 24, 1931	138	180	40	5
140	Oscar Kemp	-	359	150	40	10
165	P. H. Skinner	-	1,717	100	800	5
166	E. C. Smith	Oct. 31, 1931	21	120	15	5
169	H. & T. C. R. R.	Apr. 3, 1931	400	110	50	5
170	E. H. Juergen	-	102	150	50	2
173	C. L. Nash	Apr. 3, 1931	110	170	45	5
174	do.	-	2,830	300	3,500	30
177	K. P. Black	Apr. 3, 1931	65	300	20	5
181	J. Williams	May 19, 1931	60	240	15	5
183	J. J. Sweeney	Mar. 12, 1931	284	200	60	5
186	-- Tucker, leaser	do.	-	180	50	10
202	R. H. Richards	May 19, 1931	48	260	20	10
205	Humble Pipe Line Co.	Apr. 2, 1931	700±	220	50	10
206	R. B. Tucker	do.	450±	400	160	25
211	E. T. Weaver	do.	40	400	90	-
212	H. & T. C. R. R.	-	56	1,000	700	20
213	R. B. Herring	-	30	330	35	5
214	Mrs. J. A. Herring	-	66	550	190	25

a/ Hardness as calcium carbonate by the soap method.

b/ Sulphate by turbidity method and may be as much as 25 per cent in error.

Records of field tests of samples from wells in Harris County--Continued 246

Well No.	Owner	Date of collection	Depth of well (ft.)	Hardness as $CaCO_3$ a/	Chloride (Cl)	Sulphate (SO_4) b/
215	Mrs. J. A. Herring	May 19, 1931	42	300	95	10
217	H. I. Mooney	Mar. 28, 1931	40	-	12	-
221	-- Eubanks	-	210+	220	50	10
222	S. Terpstra	-	194	250	50	5
223	G. Terpstra	-	94	340	80	5
224	Ed Schoenfield	-	65	300	20	5
225	Trinity & Brazos Valley Rr.	-	616	180	74	10
241	C. H. Daniels	-	40	340	80	10
242	Mrs. Anna Foldin	-	48	390	130	15
243	H. H. Radley	-	67	1,100	750	20
244	J. W. White	-	44	310	200	30
245	-- Forney	-	54	500	450	40
246	S. H. Hilderbranna	-	48	300	100	10
247	W. H. Wood	-	56+	400	160	10
248	E. E. Radenz	-	50+	330	120	5
249	A. Swanke	-	30	2,000	2,000	90
250	do.	-	33	300	100	15
251	Ed E. Fox	-	50+	310	70	15
252	Joe Polk	-	80	310	65	5
255	J. M. Blake	Mar. 27, 1931	41	330	130	30
256	do.	do.	189	100	80	5
257	M. C. Oldham	-	80+	300	90	15
258	-- Lipper Well No. 1	Nov. 18, 1931	3,213	220	40	10
260	Steve Pamuk	-	112	300	65	5
261	N. O. Alford	-	200+	125	20	5
263	O. D. Heath	June 1, 1931	45	110	55	5
265	H. Weary Place	May 29, 1931	-	30	115	5
282	L. M. Bruno	May 28, 1931	38	180	40	10
283	H. Ritter	do.	22	260	110	30
284	do.	-	50	340	120	40
321	T. & N. O. Rr.	Oct. 29, 1931	560	1	-	-
322	T. E. Reidland	-	270	45	35	1
325	Harris Service Sta.	-	247	45	35	1
326	Gulf Pipe Line Co.	Oct. 29, 1931	533	45	30	10
327	-	do.	220	50	35	5
328	J. Bennett	-	86	210	40	1
329	Sam Sampson	Oct. 30, 1931	25	240	30	5
353	A. E. Thompson	-	1,602	500	2,000	40
357	P. V. Cook	Mar. 24, 1931	-	150	50	5
361	Acme Planting & Developing Co.	Mar. 12, 1931	368	170	55	5
362	E. G. Stockdick	do.	500	180	65	10
363	F. M. Morton	-	188	65	50	2
365	M. K. & T. R.R.	-	202	190	65	-
368	W. C. Hickman	-	36	200	30	5
370	J. M. Johnson	Mar. 12, 1931	625	180	60	10
387	H. B. Crowder	Sept. 14, 1932	-	120	45	50
388	-	do.	180	160	40	5
389	John Wendling	-	50	170	50	5
390	-- Fitch	Sept. 21, 1932	33	90	25	5
392	W. A. Euton	-	24	280	40	5

a/ Hardness as calcium carbonate by the soap method.

b/ Sulphate by turbidity method and may be as much as 25 per cent in error.

Records of field tests of samples from wells in Harris County--Continued

Well No.	Owner	Date of collection	Depth of well (ft.)	Hardness as $CaCO_3$ a/	Chloride (Cl)	Sulphate (SO_4) b/
393	-- Paddock	-	72	260	50	10
395	A. J. Jordens	-	120	250	40	5
396	H. Speckmaier	-	94	230	40	5
397	August Otto	-	-	280	60	5
399	Gertie Rice Farm	-	326	170	60	5
401	W. H. Grisbee	-	45	260	70	5
402	Wm. Druesedow	-	52	220	75	10
403	C. Beckendorf	-	27	300	40	5
404	Bear Creek Gun Club	-	100	270	65	5
405	Schulz Bros.	-	24	280	65	5
406	Addicks School	Sept. 3, 1931	105	280	50	5
421	Frank Edwards	-	70	400	70	5
422	J. C. Byers	-	-	300	70	5
423	-- Koehn	-	107	260	45	15
424	L. Gastmann	-	20	280	240	10
425	J. J. Settegast Jr.	-	80	280	70	5
426	F. L. Sheckels	-	42	460	95	5
427	G. C. Cox	-	53	320	50	10
428	H. A. Seathoff	-	20	280	35	5
431	G. E. Wilkins	-	200	20	55	5
432	do.	-	-	140	75	-
433	L. Z. Pledger	-	41	190	50	5
434	do.	-	58	170	50	5
435	R. C. Peters	May 19, 1931	45	250	35	5
436	G. F. Brown	-	49	240	35	5
438	W. A. Summermeyer	-	56	340	75	5
439	F. W. Tanner	Apr. 2, 1931	57	320	65	20
441	J. F. Bloodworth	May 19, 1931	70	360	30	20
442	Fairbanks School	-	55	380	110	10
443	J. F. Bane	-	50	430	160	10
444	J. Stevens	Apr. 9, 1931	10	550	380	40
445	H. Collett	-	72	450	240	10
446	C. W. Hahl Co.	do.	60	600	500	15
447	L. A. Reneau	-	20	380	90	5
448	C. Schmidt	-	-	450	80	5
449	J. C. Guhn	-	44	380	210	10
451	John Reese	Apr. 2, 1931	55	850	650	20
452	Henry Lange	-	39	450	65	10
454	H. & T. C. Rr.	Apr. 2, 1931	124	450	150	35
455	Aug. Walla	do.	47	340	50	5
457	Frank Willberg	do.	75	320	50	5
458	R. D. Wirt	-	300	300	75	5
460	T. Rauh	-	138	340	80	40
461	R. F. Falk	-	35	330	45	5
462	J. L. Sampson	-	60	300	10	5
463	C. E. Bang	-	40	300	20	5
464	H. C. Bard	-	24	300	35	5
465	W. R. Sonnen	-	30	440	210	5
466	Bauer Lumber Co.	June 27, 1932	50	280	75	25
468	H. A. Riedel	-	42	360	25	5
469	S. T. Berry	-	40	340	50	5
470	Henry Sauer	-	75	420	70	10
471	C. N. Ogden	-	183	240	65	5

a/ Hardness as calcium carbonate by the soap method.

b/ Sulphate by turbidity method and may be as much as 25 per cent in error.

Records of field tests of samples from wells in Harris County--Continued

Well No.	Owner	Date of collection	Depth of well (ft.)	Hardness as $CaCO_3$ a/	Chloride (Cl)	Sulphate (SO_4) b/
481	Chris Pillot	-	102	240	75	5
482	T. Gasaway	-	50	240	120	25
483	V. Foster	-	126	280	120	10
493	T. X. Schuchert	-	37	260	40	5
494	A. H. Eicke	Feb., 1928	334	240	130	10
501	F. Christoph	-	28	330	25	5
502	J. A. Grein	-	27	360	70	5
503	B. E. Eisman	-	105	330	60	10
504	A. B. Smith	-	35	260	70	5-
505	Mrs. -- Rogers	-	80	300	20	5-
506	White Oak School	-	30	270	60	5-
507	Otto Adams	-	175	360	120	10
508	W. Hearold	May 21, 1931	175	340	85	-
509	do.	-	51	300	110	15
510	do.	May 30, 1931	25	370	25	10
512	Ed. Nichols	Mar. 20, 1931	50	400	100	10
515	Melrose Stock Farm	-	65	310	45	5
516	-- Sabbath	-	110	400	100	5
519	F. M. Myers	Mar. 30, 1931	52	400	35	5
520	Woodlawn Cemetery	-	158	-	70	-
521	M. R. Pretty	-	90	240	70	5
522	Bethel Cemetery	-	-	300	65	5-
523	M. L. Hilton	-	60	-	35	-
524	W. T. Carter Jr.	July 3, 1929	293	210	75	5-
525	H. C. Weiss	July 26, 1930	173	-	60	-
526	C. H. Barnes	-	80	-	70	-
527	Chas. Fitch	-	150	-	60	-
528	Judge Kennelly	-	250	-	60	-
529	T. Bertani	-	70	-	35	-
561	U. H. Valintine	June 20, 1932	118	-	55	-
562	C. V. Wiseman	-	118	-	60	-
563	Tall Timber Stables	-	500	-	40	-
564	Hagan Service Sta.	-	-	320	40	-
					85	35
565	L. R. Bennett	-	--	350	50	140
566	Ida Zohn	-	204	260	70	10
567	L. H. Georgi	-	53	440	140	10
568	W. M. Volmer	-	31	360	270	20
569	N. Y. Niemann	-	40	420	180	25
570	O. M. Perkins	-	54	490	60	5
571	F. R. Schawatk	-	260	220	100	10
572	J. G. Alexander	-	120	190	65	10
573	-- Beinhorn	-	255	240	70	15
574	Ed. Pendarvis	-	300	250	65	5
575	Heights Golf Course	-	162	250	75	20
576	Bill Monk	-	120	300	90	20
577	John Rinkel	-	50	290	35	5-
578	-- Wright	-	48	240	70	10
579	G. H. Mack	-	35	340	55	10
580	V. McVaney	-	135	270	80	10
581	H. R. Kerley	-	44	360	60	5
583	J. W. Herridge	-	90	380	45	5-

a/ Hardness as calcium carbonate by the soap method.

b/ Sulphate by turbidity method and may be as much as 25 per cent in error.

Well No.	Owner	Date of collection	Depth of well (ft.)	Hardness as $CaCO_3$ a/	Chloride (Cl)	Sulphate (SO_4) b/
584	J. C. Lawton	-	45	400	40	15
585	Houston Textile Mills	Mar. 21, 1931	950	-	-	-
586	Heights Ice Co.	Mar. 7, 1929	3[illegible]5	210	65	5
588	Oriental Textile Mills	-	800+	110	30	3[illegible]
589	City of Houston	-	2,100	8[illegible]	70	5
602	River Oaks Country Club	Jan. 19, 1931	1,038	150	35	20
607	Henke & Pillot	Aug. 15, 1929	571	220	70	5-
608	Fidelity Products Co.	Jan. 23, 1931	35[illegible]	260	60	5
609	do.	do.	825	140	35	10
610	Standard Rice Milling Co.	Jan. 25, 1931	853	140	30	10
620	Public Laundries	May 2, 1927	1,379	65	40	5-
651	Tony Frank	June 29, 1931	60+	410	130	25
654	H. A. Burden	June 28, 1931	110+	300	60	10
655	J. W. Lambert	do.	53	280	45	10
656	Texas Creosoting Co.	Jan. 9, 1931	665	150	35	30
662	South Texas Cotton Oil Co.	Jan. 14, 1931	834	150	40	30
669	Willbergs Laundry	Apr. 26, 1932	958	90	35	5
677	Houston Lighting & Power Co.	Jan. 29, 1931	873	120	30	25
681	Southern Pacific Rr. Building	-	861	120	30	15
694	First National Bank	-	350±	190	45	10
700	Rice Hotel	-	1,395	150	40	10
710	Niels Esperson Bldg.	Feb. 18, 1931	883	130	30	10
715	Rossonion Apts.	-	890	135	30	10
728	Burkharts Laundry	July, 1931	1,402	30	40	10
731	I. & G. N. R.R.	-	1,390	30	50	5-
732	Gould Wet Wash Laundry	-	1,392	30	55	5-
740	Houston Elec. Co.	-	537	150	30	10
744	City of Houston	-	2,150	15	90	5-
747	Texas & New Orleans R.R.	May 1925	948	120	30	5
[illegible]	Gulf Pipe Line Co.	Jan. 14, 1931	721	240	160	-
749	H. Jaschke	-	179	250	70	15
758	J. H. Passmore	Mar. 31, 1931	148	230	70	30
781	Southern Floral Co.	Apr. 7, 1931	196	250	70	5
782	Post Oak School	Apr. 20, 1928	244	230	50	5
783	Houston Riding & Polo Club	-	350±	-	40	-
784	Houston Gun Club	-	360+	-	60	-
788	Sheperd Laundries	July, 1930	1,416	70	60	5-
789	Henke & Pillot	-	565	230	50	5
793	City of Houston	-	2,121	65	55	10
797	Rice Institute	Jan. 24, 1931	910	110	25	15
808	Gem Elec. Co.	Apr. 1929	340	230	50	10
809	do.	Feb. 16, 1931	1,100±	55	50	5-
810	Harris County	-	650+	180	40	5
811	do.	Apr. 17, 1931	385	230	50	10
813	-- Grant	-	28±	310	210	30
814	R. C. Wood	-	60±	370	250	100
815	Greenwood Sanitarium	-	892	110	30	10

a/ Hardness as calcium carbonate by the soap method.
b/ Sulphate by turbidity method and may be as much as 25 per cent in error.

Records of field tests of samples from wells in Harris County--Continued

Well No.	Owner	Date of collection	Depth of well (ft.)	Hardness as $CaCO_3$ a/	Chloride (Cl)	Sulphate (SO_4) b/
816	Hans Peterson Nursery	-	-	240	130	30
817	Main Street Air Port	-	-	210	40	30
818	-- Redford	-	36±	300	200	30
819	R. Ramon	-	30±	700	600	150
821	Houston Gulf Gas Co.	-	211±	200	50	5-
822	Humble Pipe Line Co.	-	256	220	55	5
823	Moody Corporation	-	275	200	35	20
824	Geo. Jones	-	65	230	180	5-
825	Navarro Oil Co.	-	385	270	65	5-
826	J. D. Hughes	-	30±	390	100	5
830	Sam Taylor	-	40±	350	35	5-
831	do.	-	30	400	100	5
832	Burt Taylor	-	100	340	60	5-
833	W. E. Taylor	-	60	350	45	5-
834	Navarro Oil Co.	-	380	160	30	5-
835	Gulf Production Co.	-	220	180	310	25
838	E. E. Kelly	-	60±	420	220	5
839	L. N. Liesman	-	231	210	50	30
862	Houston Belt & Terminal Rr.	-	852	100	55	5
870	Hygeia Ice Co.	Jan. 16, 1931	728	190	35	5
883	Carnegie Steel Co.	-	841	90	30	20
892	Lone Star Cement Co.	Jan. 21, 1931	1,284	35	45	30
900	Golf Crest Club	Feb. 19, 1931	2,560	30	40	5
906	Gardenvilla Subdivision	June, 1929	875	85	35	15
924	F. P. Schalies	-	130	180	40	25
928	Harris County	Mar. 28, 1931	125±	110	45	5
930	Sheldon Kota	-	30	450	40	30
932	B. N. Garrett	-	240±	85	30	5

Well No.	Owner	Date of collection	Depth of well (ft.)	Bicarbonate (HCO_3)	Chloride (Cl)	Sulphate (SO_4) b/
941	W. H. Gilbert	-	128	60	80	5
951	P. C. Ulrich	-	400±	210	240	-
952	A. F. Ulrich	Jan. 22, 1932	88	330	250	-
953	Frank Casino	-	97	340	220	-
954	N. P. Whisenhart	-	100±	350	160	-
955	-- Whitlock	-	160	340	120	-
957	J. W. Plummer	Jan. 22, 1932	100	350	55	-
959	S. M. Johnson	Jan. 21, 1932	-	440	130	-
960	J. M. Johnson	do.	344	370	105	-
961	J. W. Wilson	do.	94	390	50	-
962	C. Spenser	-	102	350	110	-
963	Mrs. J. E. Portis	-	360	260	40	-
964	H. F. Massey	-	330	350	170	-
965	C. Thompkins	Jan. 21, 1932	344	260	65	-
967	J. W. Newton	-	333	270	50	-
968	Mrs. L. Terry	-	365	270	55	-
969	Saul. Donelley	-	360	270	40	-
970	S. R. Brooks	July, 1931	337	290	120	-
971	R. C. Smith	-	315	260	45	-

a/ Hardness as calcium carbonate by the soap method.
b/ Sulphate by turbidity method and may be as much as 25 per cent in error.

Records of field tests of samples from wells in Harris County--Continued 251

Well No.	Owner	Date of collection	Depth of well (ft.)	Bicarbonate (HCO_3)	Chloride (Cl)	Sulphate (SO_4) b/
972	W. R. Rendon	Jan. 19, 1932	95	330	140	-
973	C. M. Hamor	-	106	310	140	-
975	Cedar Bayou School	Jan. 19, 1932	315	270	50	-
976	Z. T. Wilburn	-	320	260	50	-
977	A. W. Fayle	-	327	250	45	-
978	Fayle Estate	Jan. 19, 1932	330	330	40	-
979	E. Ilfrey	-	320	250	45	-
980	E. G. Casey	-	320	260	50	-
1001	Bush Terrace Water Co.	Nov. 11, 1931	437	320	60	-
1002	do.	-	437	290	60	-
1003	S. G. Davidson	-	20	35	70	-
1004	-- Beilstein	Nov. 12, 1931	110	340	70	-
1005	do.	-	640	330	110	-
1006	Cullen & West	Nov. 18, 1931	320	360	110	-
1007	Crown Oil Co.	-	575	370	290	-
1008	S. Leidmeyer	Nov. 1[illegible], 1931	109	310	250	-
1010	John Gillard	Nov. 18, 1931	19	-	65	-
1011	J. L. Sims	Jan. 19, 1932	325	280	460	-
1012	A. M. Wilburn	do.	320	260	490	-
1013	C. McKinney	-	325	270	50	-
1014	M. George	-	515	320	240	-
1015	Mrs. L. Sheperd	-	365	260	50	-
1016	John Kilgore	-	490	380	130	-
1017	W. G. Bayliss	-	100+	340	170	-
1018	W. Wright	Jan. 19, 1932	85	370	140	-
1051	Humble Oil & Ref. Co. Well 12	Oct., 1931	562	260	50	-
1053	Humble Oil & Ref. Co. Well 19	do.	1,001	320	140	-
1054	Humble Oil & Ref. Co. Well 15	do.	572	280	60	-
1056	Humble Oil & Ref. Co. Well 9	do.	922	380	92	-
1057	Humble Oil & Ref. Co. Well 7	do.	515	300	62	-
1058	Humble Oil & Ref. Co. Well 13	do.	542	300	99	-
1059	Humble Oil & Ref. Co. Well 18	do.	1,687	430	1,600	-
1063	Humble Oil & Ref. Co. Well 6	do.	968	310	100	-
1064	Humble Oil & Ref. Co. Well 4	do.	960	340	110	-
1067	Humble Oil & Ref. Co. Well 10	do.	545	290	75	-

Well No.	Owner	Date of collection	Depth of well (ft.)	Hardness as $CaCO_3$ a/	Chloride (Cl)	Sulphate (SO_4) b/
1103	G. H. & S A. R.R.	-	770+	35	130	5
1104	City of La Porte	Apr. 2, 1931	570	40	85	5
1151	Southern Pacific Rr.	-	773	85	30	15

a/ Hardness as calcium carbonate by the soap method.
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Records of field tests of samples from wells in Harris County--Continued

Well No.	Owner	Date of collection	Depth of well (ft.)	Hardness as $CaCO_3$ a/	Chloride (Cl)	Sulphate (SO_4) b/
1152	Kirby Lumber Co.	-	-	160	35	15
1155	Gulf Ref. Co.	Mar. 27, 1931	752	120	30	15
1160	Allendale Subdivision	-	318	19[illegible]	13[illegible]	5
1162	Sinclair Ref. Co.	-	1,223	60	45	10
1170	Houston Lighting & Power Co.	Feb. 25, 1931	836	85	40	1
1171	Houston Pipe Line Co.	-	264	130	35	10
1179	American Petroleum Co.	Mar. 4, 1931	707	95	40	5
1181	Philip Petroleum Co.	-	691	110	30	10
1187	City of Pasadena	-	-	50	35	15
1194	Deepwater Subdivision	-	811	70	50	15
1195	Deepwater School	-	130±	400	200	20
1200	Shell Petroleum Corp.	-	487	75	50	10
1201	do.	-	860	60	45	5
1202	-- Seabold	-	504	75	45	5
1205	City of South Houston	-	780±	30	45	5
1212	-- Head	-	106	320	70	5
1213	H. W. Boehm	-	91	370	45	5
1214	R. B. McCollough	-	502	100	70	5
1215	A. Howard	-	125	340	190	5
1218	J. K. Lee	-	125±	500	460	5
1220	Joe Hansen	-	25±	1,100	1,200	120
1221	Vincent Lopez	-	35±	1,300	1,400	40
1222	do.	-	100	430	270	25
1223	C. A. Graham	Sept. 29, 1932	103	310	140	5
1225	W. S. Craig	do.	36±	330	80	5
1227	Schoemann Produce Co.	-	35	390	30	5
1275	Mike Martin	-	40	500	400	50
1302	City of Genoa	Apr. 3, 1931	832	50	85	5
1304	G. H. & H. Rr.	-	683	250	55	5
1305	-- Davidson	-	100±	270	45	5
1306	C. D. Rogers	-	17	360	60	20
1308	J. M. West	-	101	300	60	5
1313	T. C. Dunn	Apr. 3, 1931	100±	350	75	10
1314	do.	-	87	400	140	5
1315	Steve Waldrip	Oct. 6, 1932	105	370	140	15
1317	J. W. Alford	-	20	500	270	20
1322	Roy West	-	-	70	70	5
1323	J. M. West	-	90±	400	130	10
1324	do.	Oct. 7, 1932	40±	40	50	5
1326	G. R. Peck	-	510	125	60	5
1328	J. W. Goar	-	32	550	550	30
1329	do.	-	473	85	65	5
1331	G. D. Scott	-	30±	700	600	10
1334	Banker's Mortgage Co.	-	600±	60	50	5
1335	Raymond Pearson	Oct. 7, 1932	700	450	320	15
1338	H. W. Bouton	-	185	140	120	5
1356	A. A. Polk	-	130	300	340	20
1357	G. H. & H. Rr.	-	565±	80	70	5
1358	D. F. Ervin	-	500±	45	45	5
1359	G. H. Whitcomb	Sept. 30, 1932	563	50	45	5
1361	F. M. Benschoter	-	20	460	460	45
1362	Webster School	-	500±	60	45	5
1364	Humble Pipe Line Co.	-	81	550	600	45
1365	do.	Sept. 15, 1927	652	45	130	5

a/ Hardness as calcium carbonate by the soap method.

b/ Sulphate by turbidity method and may be as much as 25 per cent in error.

Analyses of water from wells in Harris County, Texas

Well No.	Owner	Date of collection	Depth of well (ft.)	Total dissolved solids (calc.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)
6	H. H. Strickland	Aug. 2, 1933	30	-	-	-	-	-
12	J. A. Hafner	do.	61	2/ 122	-	4.1	12	3.2
35	O. M. Taylor	do.	35	-	-	-	-	-
38	Louis Hegar	Aug. 8, 1933	75	-	-	1.3	-	-
39	Mrs. Joe Blake	Aug. 5, 1933	38	-	-	0.95	-	-
51	H. C. Nichols	do.	64	-	-	0.43	-	-
52	J. Hirsch	do.	37	-	-	0.34	-	-
53	E. Schultz	Aug. 4, 1933	33	2/ 76	-	0.35	5.1	3.1
54	Bowers School	do.	28	-	-	0.3	-	-
55	Fritz Treichel	do.	21	-	-	0.63	-	-
74	M. F. Michel	do.	23	-	-	0.64	-	-
75	T. J. Kuehn	do.	30	2/ 164	-	0.4	17	9.1
76	W. M. Buvinghausen	do.	96	-	-	-	-	-
77	A. Buvinghausen	do.	26	-	-	10	-	-
78	S. Bloom	do.	30+	-	-	0.54	-	-
93	Missouri Pacific R.R. Co.	Mar. 31, 1935	1,070	2/ 344	-	0.05	16	5.9
105	Marshall Elzy	Aug. 8, 1933	29	-	-	-	-	-
131	C. E. House	Aug. 9, 1933	92	2/ 213	-	0.02	36	5.7
136	J. Freeman	Aug. 7, 1933	138	2/ 252	-	0.35	61	5.4
169	H. & T. C. R.R.	Sept. 28, 1929	400	2/ 203	26	-	25	3.1
173	C. L. Nash	Aug. 2, 1933	110	2/ 243	-	0	50	5.5
202	R. H. Richards	Aug. 19. 1932	48	2/ 400	-	1.3	87	15
212	H. & T. C. R.R.	May 9, 1932	56	2/1,344	28	0.41	278	59
214	Mrs. J. A. Herring	Aug. 2, 1933	66	-	-	-	-	-
219	Tom Franklin	Aug. 4, 1933	19	-	-	0.56	-	-
220	Mrs. L. Hargrove	do.	28	-	-	-	-	-
223	G. Terpstra	Aug. 3, 1933	94	2/ 474	-	1.2	81	36
225	Trinity & Brazos Valley R.R.	Oct. 27, 1931	616	2/ 332	40	-	65	5.7
243	H. H. Radley	May 9, 1932	67	1,429	24	0.15	266	99
247	W. H. Woods	Aug. 3, 1933	56	-	-	-	-	-
370	J. M. Johnson	Aug. 2, 1932	625	327	31	0.1	68	7.3
396	H. Speckmaier	Aug. 7, 1933	94	2/ 300	-	0.92	75	9.6
399	Gertie Rice Farm	Aug. 1, 1932	326	2/ 285	-	0.03	69	7.0
424	Louis Gastman	Aug. 7, 1933	20	-	-	-	-	-
433	L. Z. Pledger	Aug. 2. 1933	41	2/ 276	-	0.02	57	11
439	F. W. Tanner	Aug. 19, 1932	57	2/ 491	-	0.05	73	29
446	C. W. Hahl Co.	do.	60	2/ 959	-	0.05	104	50
454	H. & T. C. R.R.	Sept. 27, 1929	124	2/ 512	29	-	118	17
465	W. R. Sonnen	Aug. 7, 1933	30	-	-	1	-	-
492	G. H. & S A R.R.	May 5, 1931	220	2/ 484	6.5	3/1.6	77	21
568	W. M. Volmer	Aug. 27, 1932	31	2/ 969	-	0.08	102	24
575	Heights Golf Course	July 25, 1933	162	2/ 405	-	0.18	66	22
579	C. M. Mack	July 21, 1933	35	2/ 546	-	0.08	83	29
4/ 589-S	City of Houston	Apr. 22, 1931	2,090	2/ 618	14	3/8.0	6	1.8
5/ 589-S	do.	July 22, 1931	2,090	2/ 508	5	3/2	23	7.6

1/ Combined figures for sodium and potassium were not determined, but were calculated as sodium.

2/ Sum of constituents reported.

3/ Iron and aluminum oxides.

4/ Sample collected with well flowing.

(Parts per million. Well numbers correspond to numbers in table of records of wells.)

Well No.	Sodium	Potassium (K)	Bicarbonate (HCO_3)	Sulphate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Total hardness as $CaCO_3$	Analyst
6	-	-	24	23	196	240	336	Margaret D. Foster
12		31	50	5.3	46	1.7	43	Do.
35	-	-	35	2	138	84	177	Do.
38	-	-	16	1	8.0	28	36	Do.
39	-	-	38	2	22	2.1	33	Do.
51	-	-	28	1	14	6.7	26	Do.
52	-	-	44	2	30	44	51	Do.
53		16	20	2.2	15	25	25	Do.
54	-	-	103	5	16	9.2	111	Do.
55	-	-	12	1	31	47	51	Do.
74	-	-	12	2	84	327	172	Do.
75		34	26	2.7	72	36	80	Do.
76	-	-	134	3	24	0.2	114	Do.
77	-	-	70	3	52	2	60	Do.
78	-	-	124	4	207	22	255	Do.
93		119	325	11	32	0.05	64	Do.
105	-	-	285	13	149	13	318	Do.
131		41	167	3.7	44	0.4	113	Do.
136		32	237	4.0	33	0	175	Do.
169		41	124	4.4	42	-	76	C. S. Wilson
173		39	205	4.8	42	0.5	148	Margaret D. Foster
202		55	446	8	17	0.55	279	Do.
212	122	2.6	415	10	540	100	937	Do.
214	-	-	458	20	156	25	444	Do.
219	-	-	21	2	42	16	33	Do.
220	-	-	407	4	18	0.30	288	Do.
223		71	458	16	80	0.42	350	Do.
225		41	189	12	75	-	186	Do.
243	112	3.6	252	31	762	0	1,071	Do.
247	-	-	443	30	165	0.2	372	Do.
370	40	1.8	254	11	47	0.1	200	E. W. Lohr
396		30	271	13	39	0.3	227	Margaret D. Foster
399		35	260	4	42	0.2	201	Do.
424	-	-	361	18	294	3.3	234	Do.
433		34	200	4.4	59	12	188	Do.
439		83	462	19	59	0	301	Do.
446		203	532	25	315	0	465	Do.
454		46	427	29	55	8	365	C. S. Wilson
465	-	-	339	5	246	0.3	399	Margaret D. Foster
492		81	341	16	113	Trace	279	C. S. Wilson
568		216	380	40	242	158	353	Margaret D. Foster
575		63	303	10	94	0.3	255	Do.
579		98	548	14	50	6.2	326	Do.
4/ 589-S		240	469	7	110	-	24	Curtis Labs.
5/ 589-S		177	385	14	89	-	89	Do.

5/ Sample collected after pumping started.
6/ Composite sample.
7/ Screens
8/ Approximate
9/ Ship channel at deep water.

Analyses of water from wells in Harris County--Continued

Well No.	Owner	Date of collection	Depth of well (ft.)	Total dissolved solids (calc.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)
5/ 589-S	City of Houston	Sept. 12, 1931	2,090	2/ 451	19	3/ 0.2	25	9.1
6/ 589 & 592	do.	May 9, 1932	-	-	-	-	-	-
600	do.	Oct. 7, 1929	558	2/ 400	12	3/ 14	63	14
6/ 600 & 601	do.	May 9, 1932	-	-	-	-	-	-
620	Public Laundries	Mar. 30, 1935	1,379	2/ 328	-	0.03	8.2	2.3
651	Tony Frank	Aug. 8, 1933	60	-	-	2.3	-	-
654	H. A. Burden	July 21, 1933	110	2/ 404	-	0.08	78	21
6/ 688 & 690	City of Houston	May 9, 1932	-	2/ 362	20	0.17	22	5.8
710	Niels-Esperson Bldg.	Mar. 9, 1927	883	2/ 305	10	-	29	11
732	Gould Wet Wash Laundry	do.	1,392	2/ 415	6.5	-	7.2	11
740	Houston Electric Co.	July 21, 1933	537	2/ 258	-	0.56	32	10
744	City of Houston	May 9, 1932	2,150	-	-	-	-	-
793	do.	Sept. 12, 1931	2,150	2/ 342	17	3/ 1.2	15	4.8
6/ 793 & 795	do.	May 9, 1932	-	2/ 306	22	0.39	27	7.2
808	Gem Electric Co.	July 21, 1933	340	2/ 310	-	0.14	62	14
811	Harris County	do.	385	2/ 298	-	0.09	71	12
819	R. Ramon	May 10, 1932	30	1,482	21	0.12	140	79
821	Houston Gulf Gas Co.	Aug. 27, 1932	211	2/ 334	-	0.08	53	14
827	C. H. Driskell	Aug. 10, 1933	34	-	-	-	-	-
828	Rio Bravo Oil Co.	Aug. 12, 1933	248	-	-	0.15	-	-
829	C. S. Settegast	do.	350	-	-	-	-	-
833	W. E. Taylor	July 21, 1933	60	2/ 647	-	1	137	40
837	C. W. Mowery	Aug. 10, 1933	260	-	-	0.45	-	-
838	E. E. Kelly	July 21, 1933	60	2/ 626	-	3.2	80	38
6/ 857 & 858	City of Houston	May 9, 1932	-	-	-	-	-	-
878	Houston Compress Co.	Nov. 9, 1929	905	2/ 267	15	3/ 4.2	23	6.4
879	City of Houston	May 9, 1932	1,037	2/ 286	23	0.16	34	7.5
892	Lone Star Cement Co.	Feb. 4, 1929	1,284	2/ 425	14	3/ 1.4	8.4	2.4
895	City of Houston	May 9, 1932	1,050-1,664 7/	-	-	-	-	-
906	Gardenvilla Subdivision	June 7, 1929	875	2/ 316	15	3/ 2.6	26	5.6
1103	G. H. & S A R.R.	Oct. 6, 1931	770	2/ 726	10	3/ 4.6	5.7	2.6
1151	Southern Pacific R.R.	Sept. 19, 1930	773	2/ 301	35	-	24	4.1
1160a	Allendale Subdivision	Aug. 1, 1933	160	-	-	2.9	-	-
1168	Houston Lighting & Power Co.	Mar. 1, 1922	823	2/ 281	11	3/ 1.4	18	6.7
1169	do.	do.	821	2/ 302	14	3/ 4.8	9.3	5.1
1195	Deepwater School	Aug. 11, 1933	130	-	-	-	-	-
1220	Joe Hansen	Aug. 1, 1933	25	-	-	-	-	-

Analyses of water from wells in Harris County--Continued

Parts per million.

Well No.	Sodium	Potassium (K)	Bicarbonate (HCO_3)	Sulphate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Total hardness as $CaCO_3$	Analyst
5/ 589-S		144	330	9	82	-	100	Houston Labs.
6/ 589 & 592	-	-	313	8	62	0	74	E. W. Lohr
600		64	293	24	65	-	215	Curtis Labs.
6/ 600 & 601	-	-	260	12	50	0.2	182	E. W. Lohr
620		127	297	2	42	0.64	30	Margaret D. Foster
651	-	-	476	5	76	0.25	375	Do.
654		55	402	8.1	44	0	281	Do.
6/ 688 & 690	108	1.9	301	7.8	48	0	79	E. W. Lohr
710		75	260	21	31	-	118	Curtis Labs.
732		148	373	8.6	50	-	63	W. W. Curtis
740		58	234	13	30	0	121	Margaret D. Foster
744	-	-	380	1	91	0	18	E. W. Lohr
793		112	268	11	49	-	57	Houston Labs.
6/ 793 & 795	76	1.9	256	14	32	0.1	97	E. W. Lohr
808		41	270	12	48	0	212	Margaret D. Foster
811		29	254	9.2	51	0.4	227	Do.
819	298	4.8	342	136	640	0.25	674	Do.
821		60	276	17	54	0.20	190	Do.
827	-	-	504	8	107	0.5	294	Do.
828	-	-	276	11	32	0.2	183	Do.
829	-	-	272	14	31	1.1	183	Do.
833		46	440	10	126	71	506	Do.
837	-	-	281	14	27	0.6	162	Do.
838		112	377	17	192	1.2	356	Do.
6/ 857 & 858	-	-	301	10	46	0	63	E. W. Lohr
878		69	220	14	28	-	83	Houston Labs.
879	59	2.1	239	16	26	0.2	116	E. W. Lohr
892		159	354	12	53	-	31	Houston Labs.
895	-	-	402	1	38	-	4.5	E. W. Lohr
906		88	256	16	38	-	88	Houston Labs.
1103		289	570	-	133	0.9	25	C. M. Wilson
1151		79	228	16	31	0.5	77	C. S. Wilson
1160	-	-	358	8	445	0.96	454	Margaret D. Foster
1168		83	229	14	35	0.3	72	Penn. Power & Light Comm.
1169		103	227	12	41	0.5	44	Do.
1195	-	-	495	5	151	0.2	204	Margaret D. Foster
1220	-	-	287	72	570	1	428	Do.

Analyses of water from wells in Harris County--Continued

Well No.	Owner	Date of collection	Depth of well (ft.)	Total dissolved solids (calc.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)
1275	Mike Martin	Aug. 11, 1933	40	-	-	-	-	-
1302	City of Genoa	Mar. 30, 1935	832	2/ 461	-	0.12	11	3.7
1314	T. C. Dunn	Aug. 1, 1933	87	-	-	3.6	-	-
1317	J. W. Alford	do.	20	-	-	3.3	-	-
1329-A	J. W. Goar	July 20, 1933	473	2/ 429	-	1.9	16	8.5
1329-B	do.	Mar. 29, 1935	473	2/ 522	-	1.5	24	15
1331	G. D. Scott	Aug. 1, 1933	30	-	-	-	-	-
1338	H. W. Bouton	July 20, 1933	185	2/ 644	-	0.59	22	16
1356	A. A. Polk	do.	130	2/ 958	-	0.61	48	32
1358	D. F. Ervin	July 19, 1933	500?	2/ 334	-	0.16	15	4.1
1364	Humble Pipe Line Co.	Aug. 1, 1933	81	-	-	0.65	-	-
1365-A	do.	July 18, 1933	652	465	30	0.07	11	3.0
1365-B	do.	Mar. 29, 1935	652	-	-	-	-	-
9/1366	G-H Electric Co.	- 1924	788	2/ 1,175	10	3/ 5	44	45

1/ Combined figures for sodium and potassium were not determined, but were calculated as sodium.
2/ Sum of constituents reported.
3/ Iron and aluminum oxides.
4/ Sample collected with well flowing.

Analyses of water from wells in Harris County--Continued

Parts per million

Well No.	Sodium	Potassium (K)	Bicarbonate (HCO_3)	Sulphate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Total hardness as $CaCO_3$	Analyst
1275	-	-	452	8/ 112	328	1	282	Margaret D. Foster
1302	177		388	3.1	75	0.12	43	Do.
1314	-	-	476	7	137	1.1	318	Do.
1317	-	-	502	32	324	0.3	420	Do.
1329-A	151		378	1.2	66	0.12	75	Do.
1329-B	169		392	4.1	115	1.7	122	Do.
1331	-	-	705	14	595	14	675	Do.
1338	223		542	1.2	114	0.25	121	Do.
1356	289		468	22	335	1.4	251	Do.
1358	119		302	1.4	46	0	54	Do.
1364	-	-	458	60	645	0.6	352	Do.
1365-A	163	2.9	324	1.3	94	0.1	40	Do.
1365-B	-	-	326	1	94	-	36	Do.
9/1366	333		110	96	588	-	294	-

5/ Sample collected after pumping started.
6/ Composite sample.
7/ Screens.
8/ Approximate.
9/ Ship channel at deep water.

	Thickness (feet)	Depth (feet)
Driller's log of well 31		
R. L. Burton, owner.		
Soil	2	2
Clay	16	18
Sand	29	47
Clay	2	49
Good sand	10	59
Sand rock	1	60
Fair sand	22	82
Clay	7	89
Sand	48	137
Sand rock	1	138
Sand	4	142
Broken sand and sand rock	23	165
Sand	20	185
Clay	4	189
Sand	32	221
Clay	20	241
Sand	55	296
Sand rock	1	297
Driller's log of well 56		
F. N. Bullock's Hubert Reed No. 1, owner.		
Soil	8	8
Sand	6	14
Clay	18	32
Sand	10	42
Clay	38	80
Sand	7	87
Hard rock	4	91
Gumbo	59	150
Hard and soft sand	130	280
Shale and boulders	25	305
Gumbo	15	320
Sticky shale	25	345
Sand	20	365
Sticky shale	16	381
Gumbo	15	396
Gray water sand	41	437
Shale and boulders	53	490
Gumbo	22	512
Shale	14	526
Gumbo	14	540
Shale and boulders	33	573
Pink and lavender gumbo	77	650
Sand	42	692
Gumbo	6	698
Sand	41	739
Gumbo	8	747
Shale	21	768
Pink and lavender gumbo and lime	12	780
Sand	29	809
Sticky shale	20	829
Sand	27	856
Gumbo	10	866
Blue sticky shale	32	898
Gumbo	13	911
Shale and boulders	29	940
Blue gumbo	40	980
Pink gumbo	58	1038
Sticky shale	17	1055
Gumbo and blue lime	36	1091
Pink gumbo	18	1109
Gray sand	46	1155
Gumbo and blue lime	2	1157
Pink gumbo	37	1194
Gray water sand	15	1209
Gumbo and blue lime	42	1251
Shale and boulders	50	1301
Gray water sand	20	1321
Gumbo and blue lime	94	1415
Sand	6	1421
Gumbo and blue lime	55	1476
Red gumbo	59	1535
Gumbo and blue lime	27	1562
Shale and lime	6	1568
Driller's log of well 72		
Texas & Brazos Valley Railroad, owner.		
Clay with iron gravel	20	20
Fine quicksand	5	25
Broken joint clay	15	40
Fine quicksand	7	47
Coarse sand and gravel	20	67
Driller's log of well 93		
International & Great Northern Railroad.		
Clay	82	82
Fine sand	41	123
Clay	41	164
Sand	60	224
Clay	83	307
Sand	48	355
Clay	38	393
Rock	2	395
Clay	11	406
Rock	8	414
Clay	32	446
Boulders and fine sand	41	487
Lime rock	21	508
Gumbo	41	549
Rock	2	551
Gumbo	18	569
Rock	2	571

(continued on next page)

	Thickness (feet)	Depth (feet)
Driller's log of well 93 -- Continued		
Sand	18	589
Rock	2	591
Sand	18	609
Gumbo	22	631
Gumbo and rock	163	794
Clay	39	833
Rock	3	836
Clay	4	840
Sand	22	862
Gumbo	41	903
Shale	40	943
Gumbo	41	984
Water-bearing sand	86	1070
Driller's log of well 167		
E. C. Smith, owner.		
Soil	3	3
Clay	6	9
Sand	4	13
Clay	5	18
Sand	14	32
Clay	15	47
Sand	14	61
Clay	9	70
Sand	25	95
Clay	10	105
Sand	53	158
Driller's log of well 225		
Trinity & Brazos Valley Railroad, owner.		
Surface soil, clay, layers of rock, red sand and good sand	100	100
Yellow clay	120	220
Coarse sand	22	242
Rock	2	244
Sand	16	260
Clay and boulders	30	290
Coarse sand	65	355
Clay	15	370
Gumbo	100	470
Soft gumbo	28	498
Rock	3	501
Gumbo	17	518
Rock	4	522
Gumbo and boulders	53	575
Sand and gravel	41	616
Driller's log of well 262		
John Williamson, owner.		
Surface	4	4
Clay	26	30
Sand	15	45
Clay	35	80
Sand	10	90
Clay	30	120
Sand	51	171
Clay	3	174
Driller's log of well 301		
Ralph C. Ely et al, J. H. Powell No. 1, owners.		
Soil	25	25
Brown water sand	75	100
Soft gumbo	110	210
Gravel and shell	20	230
Shale and mud	110	340
Gumbo	30	370
Sand	12	382
Gumbo and shale	36	418
Hard sand	25	443
Gumbo	37	480
Artesian sand	97	577
Gumbo	5	582
Artesian sand	20	602
Gumbo and shale	93	695
Gravel	10	705
Hard sandy shale	10	715
Gumbo	10	725
Artesian sand	40	765
Gumbo	10	775
Artesian sand	70	845
Sandy shale and sand	45	890
Gray gumbo	22	912
Hard sandy shale	6	918
Gumbo	67	985
Sandy shale	10	995
Gumbo	10	1005
Sand	45	1050
Sandy shale	10	1060
Gumbo	27	1087
Sand	10	1097
Gumbo	21	1118
Sand	17	1135
Gumbo	15	1150
Sand and blue sandy shale	10	1160
Blue gumbo	30	1190
Gumbo and sandy shale	10	1200
Gumbo	10	1210
Sand	50	1260
Blue gumbo	28	1288
TOTAL DEPTH		2108

	Thickness (feet)	Depth (feet)
Driller's log of well 326		
Gulf Pipe Line Co., owner.		
Soil	1	1
Clay	153	154
Sand	15	169
Gumbo	77	246
Sand	6	252
Gumbo	37	289
Sand	14	303
Gumbo	30	333
Sand	45	378
Gumbo	116	494
Sand	39	533
Driller's log of well 353		
A. E. Thompson, owner.		
Clay	18	18
Quicksand	20	38
Tough red clay	37	75
Water-bearing gravel	53	128
Sand and hard rock	35	163
Boulders and clay	40	203
Sand and gravel	41	244
Shale rock	3	247
Soft clay	35	282
Boulders and clay	22	304
Hard rock	2	306
Tough blue and red gumbo	25	331
Clay and boulders	15	346
Hard rock	3	349
Sand and gravel	12	361
Boulders and clay	43	404
Sand and gravel (splendid water)	50	454
Blue shale and iron rock	3	457
Gravel and clay	64	521
Blue shale	22	543
Boulders and clay	72	615
Hard rock	2	617
Fine blue sand	10	627
Hard red clay	38	665
Rock, hard and soft layers	15	680
Fine blue sand	4	684
Hard rock	10	694
Fine blue sand	5	699
Soft clay and boulders	37	736
Brown shale	9	745
Hard rock	7	752
Sand and gravel	16	768
Blue clay	5	773
Sand and gravel	30	803
Blue gumbo and rock	31	834
Artesian sand	12	846
Blue gumbo and hard rock	27	873

	Thickness (feet)	Depth (feet)
Driller's log of well 353 -- Continued		
Clay	97	970
Gumbo	20	990
Sand	22	1012
Clay	4	1016
Sand	3	1019
Clay	1	1020
Sand	10	1030
Clay and gumbo	28	1058
Rock	4	1062
Sand	8	1070
Rock	4	1074
Gumbo and soft clay	67	1141
Gravel and clay	14	1155
Gumbo and clay	36	1191
White sand	27	1218
Gumbo	22	1240
Water sand	18	1258
Hard rock, gumbo and clay to TOTAL DEPTH		1602
Driller's log of well 399		
Gertie Rice Farm.		
Clay	10	10
Sand	5	15
Red clay	5	20
Quicksand	30	50
Red clay	15	65
Water sand	35	100
White clay	3	103
Sand	25	128
Clay	3	131
Sand	12	143
Gumbo	7	150
Rock	17	167
Sand	3	170
Rock	4	174
Red clay	8	182
Sand	11	193
Rock	7	200
Shale	15	215
Boulders and clay	12	227
Rock	7	234
Extra good water sand	26	260
Gumbo	9	269
Sand	10	279
Gumbo and gravel	16	295
Sand	15	310
Red clay	16	326

	Thickness (feet)	Depth (feet)
Driller's log of well 456		
Frank Willborg, owner.		
Soil and clay	15	15
White sand	10	25
Rock	1	26
Sand	7	33
Shale	10	43
Sand	5	48
Red gumbo	70	118
Gumbo	77	195
Red shale	10	205
Sand and gumbo	20	225
Rock	1	226
Gumbo	4	230
Driller's log of well 492		
Galveston, Houston and San Antonio Railroad, owner.		
Clay	85	85
Sand	33	118
Clay	7	125
Sand	10	135
Clay	7	142
Sand	8	150
Clay	30	180
Sand	40	220
Driller's log of well 589		
City of Houston, owner.		
Soil	8	8
Clay	18	26
Sand	22	48
Clay	69	117
Sandy clay	30	147
Clay	29	176
Sandy clay	20	196
Clay	41	237
Sand	15	252
Clay	10	262
Sand and shale	23	285
Clay and gravel	18	303
Clay	31	334
Sandy clay	22	356
Hard clay and boulders	30	386
Hard sand	5	391
Water sand	20	411
Clay	22	433
Sand	20	453
Sandy clay	18	471
Gumbo	25	496
Clay and gravel	65	561
Sand	14	575
Gumbo and boulders	47	622
Sand	21	643
Gumbo	33	676

	Thickness (feet)	Depth (feet)
Driller's log of well 589 -- Continued		
Sand	38	714
Sand and shale	29	743
Hard sand	12	755
Gumbo	10	765
Sand	40	805
Layers of sand and shale	21	826
Gumbo	35	861
Sand	36	897
Tough gumbo	76	973
Sand and shale	14	987
Gumbo with layers of sand and shale	4	991
Sandy shale	35	1026
Tough gumbo	27	1053
Fine sand	57	1110
Sand and layers of gumbo	15	1125
Gumbo	51	1176
Sandy clay	5	1181
Sand	38	1219
Fine sand and shale	22	1241
Gumbo	76	1317
Sand	8	1325
Gumbo	5	1330
Fine hard sand	15	1345
Gumbo	70	1415
Hard sandy shale and boulders	22	1437
Gumbo	11	1448
Gumbo and boulders	5	1453
Gumbo	40	1493
Sand and gumbo	14	1507
Gumbo	55	1562
Hard sandy shale	16	1578
Gumbo	18	1596
Sand and shale	17	1613
Sand	22	1635
Hard sand with layers of shale	26	1661
Shale	12	1673
Gumbo	18	1691
Shale and water sand	36	1727
Gumbo	53	1780
Shale and water sand	33	1813
Gumbo	8	1821
Hard shale and sand	22	1843
Rock	2	1845
Hard shale and sand	2	1847
Sand	4	1851
Rock	1	1852
Sand and shale	13	1865
Gumbo and shale	225	2090

	Thickness (feet)	Depth (feet)
Driller's log of well 744		
City of Houston, owner.		
Rotary to surface	5	5
Shale	107	112
Shale and fine sand	18	130
Shale	15	145
Sand	42	187
Gumbo and shale	105	292
Sand	3	295
Gumbo and shale	17	312
Gumbo and boulders	90	402
Rock	14	416
Gumbo, shale and lime	36	452
Sandy shale	10	462
Shale and gumbo	3	465
Sand and shale	3	468
Sand and boulders	3	471
Gumbo and boulders	70	541
Sand	96	637
Shale and boulders	2	639
Shale and sand	29	668
Shale and gumbo	22	690
Sand and gravel	34	724
Shale and gumbo	48	772
Rock, shale and lime	32	804
Gumbo	12	816
Gumbo, lime and boulders	40	856
Tough gumbo	43	899
Sand	10	909
Gumbo	12	921
Sand and boulders	104	1025
Sand	15	1040
Shale and gumbo	60	1100
Boulders	12	1112
Sand	8	1120
Sand rock	8	1128
Boulders	34	1162
Hard gummy sand	10	1172
Gumbo	40	1212
Hard sand	8	1220
Sand and gravel	33	1253
Gummy sand	15	1268
Water sand	8	1276
Blue shale	36	1312
Fine water sand	8	1320
Hard gummy sand	11	1331
Gumbo and boulders	39	1370
Sand rock	2	1372
Boulders	20	1392
Blue shale	7	1399
Sand and shale	49	1448
Gumbo, boulders and hard sand	39	1487
Ledges of rock	62	1549
Sand, shale and boulders	15	1564
Sand	10	1574
Boulders and rock	57	1631
Gumbo	53	1684
Rock	2	1686
Sand	2	1688
Gumbo and shale	102	1790
Rock	2	1792
Sandy shale	9	1801
Fine sand	31	1832
Sand	12	1844
Shale	6	1850
Sand	26	1876
Gumbo	23	1899
Hard shale	11	1910
Gray sandy shale	3	1913
Blue sand and pink shale	10	1923
Pink shale	8	1931
Shale	5	1936
Gumbo	40	1976
Broken lime	8	1984
Blue shale	29	2013
Gumbo	52	2065
Sand	40	2105
Sand and boulders	26	2131
Gumbo	3	2134
Sand	12	2146
Gumbo	4	2150
Driller's log of well 793		
City of Houston, owner.		
Surface	6	6
Fine sand	6	12
Clay	20	32
Sand	22	54
Rock	1	55
Sand	11	66
Clay	267	333
Sand	70	403
Sandy clay	38	441
Sand	21	462
Clay	41	503
Sand	11	514
Clay, some sand and gravel	39	553
Sandy shale	12	565
Gumbo	2	567
Sand	4	571
Gumbo and shale	11	582
Sand	16	598
Sandy shale	73	671
Sand	26	697
Sandy shale	14	711

(Continued on next page.)

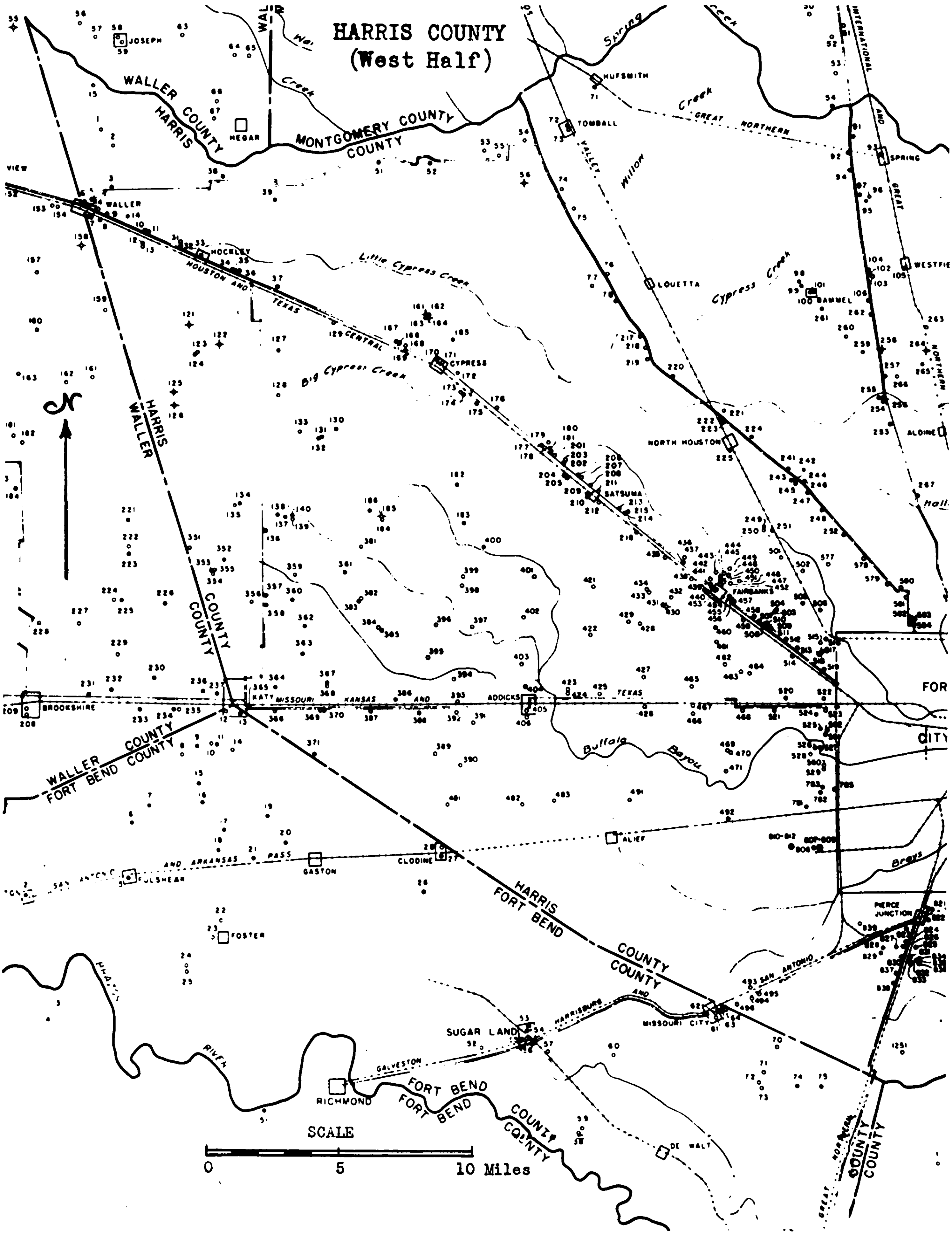
	Thickness (feet)	Depth (feet)
Driller's log of well 793 -- Continued		
Sand	52	765
Sandy shale	10	773
Sand	23	796
Gumbo		800
Sand, hard streaks	46	846
Gummy shale	12	858
Sand, streaks of shale	30	888
Gumbo	35	923
Sand and shale	29	952
Gummy shale	11	963
Sand, streaks of shale	14	977
Gummy shale	11	988
Hard sand, streaks of shale	19	1007
Gummy shale	5	1012
Sand, streaks of shale	29	1041
Sand	17	1058
Hard shale	4	1062
Sandy shale	30	1092
Gumbo	10	1102
Sand, hard layers	26	1128
Gumbo	38	1166
Gummy shale	21	1187
Gumbo	79	1266
Sand, hard layers	13	1279
Rock	1	1280
Layers of sandy shale	12	1292
Gumbo	36	1328
Sand, hard layers	69	1397
Sandy shale	3	1400
Rock	1	1401
Layers of sand and shale	23	1424
Gumbo	19	1443
Sand, streaks of shale	58	1501
Good sand	35	1536
Gumbo	7	1543
Layers of sand and shale	15	1558
Good sand	38	1596
Gumbo and shale	94	1690
Sand	14	1704
Shale and boulders	6	1710
Rock and shale	18	1728
Gumbo	6	1734
Sand	2	1736
Rock and gumbo	278	2014
Sandy shale	4	2018
Gumbo	45	2063
Sandy shale	13	2076
Gumbo	32	2108
Sand	13	2121

	Thickness (feet)	Depth (feet)
Driller's log of well 895		
City of Houston, owner.		
Clay	159	159
Shale	63	222
Sand	43	265
Gumbo	89	354
Sand	37	391
Gumbo	72	463
Sand	44	507
Gumbo	10	517
Sand	26	543
Gumbo	74	617
Sand	51	668
Gumbo	134	802
Coarse sand	55	857
Gumbo	79	936
Sand	71	1007
Gumbo	18	1025
Sand	73	1098
Gumbo	22	1120
Sand	44	1164
Gumbo	13	1177
Sand	25	1202
Gumbo	23	1225
Sand	5	1230
Gumbo	5	1235
Sand	35	1268
Gumbo	95	1363
Hard shale	63	1426
Gumbo	42	1468
Shale	33	1501
Gumbo	23	1524
Sand	54	1578
Gumbo	5	1583
Sand	81	1664
Driller's log of well 1064		
Humble Oil & Refining Co.'s No. 4 at Baytown.		
Clay	86	86
Fine sand	10	96
Sand and clay	43	139
Gumbo	143	282
Fine sand	48	330
Gumbo	22	352
Sand	8	360
Gumbo	8	368
Coarse white sand	148	516
Gumbo	28	544
Sand	8	552
Gumbo	43	595
Sand	17	612

(Continued on next page.)

	Thickness (feet)	Depth (feet)
Driller's log of well 1064 -- Continued		
Gumbo	17	629
Fine sand	6	635
Sandy clay	14	649
Medium gray sand	45	694
Gumbo	21	715
Medium gray sand	47	762
Gumbo	17	779
Medium salt and pepper sand	160	939
Gumbo	2	941
Driller's log of well 1366		
Galveston-Houston Electric Co., owner.		
Clay	24	24
Sand	12	36

	Thickness (feet)	Depth (feet)
Driller's log of well 1366 -- Continued		
Clay	14	50
Sand	54	104
Clay	14	118
Sand	116	234
Clay	67	301
Gumbo	125	426
Sand	16	442
Gumbo	44	486
Sand	16	502
Gumbo	32	534
Sand	51	585
Gumbo	24	609
Sand	44	653
Gumbo	82	735
Sand	8	743
Gumbo	45	788


HARRIS COUNTY
(West Half)
WALLER COUNTY
HARRIS COUNTY
MONTGOMERY COUNTY
COUNTY
JOSEPH
HEGAR
WALLER
HOCKLEY
HOUSTON AND TEXAS CENTRAL
Little Cypress Creek
Big Cypress Creek
CYPRESS
HUFSMITH
TOMBALL
LOUETTA
Willow Creek
Spring Creek
Cypress Creek
GREAT NORTHERN
INTERNATIONAL AND GREAT NORTHERN
SPRING
WESTFIE
BAMMEL
ALDINE
NORTH HOUSTON
SATSUMA
FAIRBANKS
HARRIS
WALLER
COUNTY
COUNTY
BROOKSHIRE
KATY
MISSOURI KANSAS AND TEXAS
ADDICKS
Buffalo Bayou
FOR
CITY
WALLER COUNTY
FORT BEND COUNTY
SAN ANTONIO AND ARKANSAS PASS
FULSHEAR
GASTON
CLODINE
ALIEF
HARRIS
FORT BEND
COUNTY
COUNTY
FOSTER
PIERCE JUNCTION
Brazos
SAN ANTONIO
HARRISBURG AND
MISSOURI CITY
SUGAR LAND
GALVESTON
RIVER
RICHMOND
FORT BEND
FORT BEND
COUNTY
COUNTY
DE WALT
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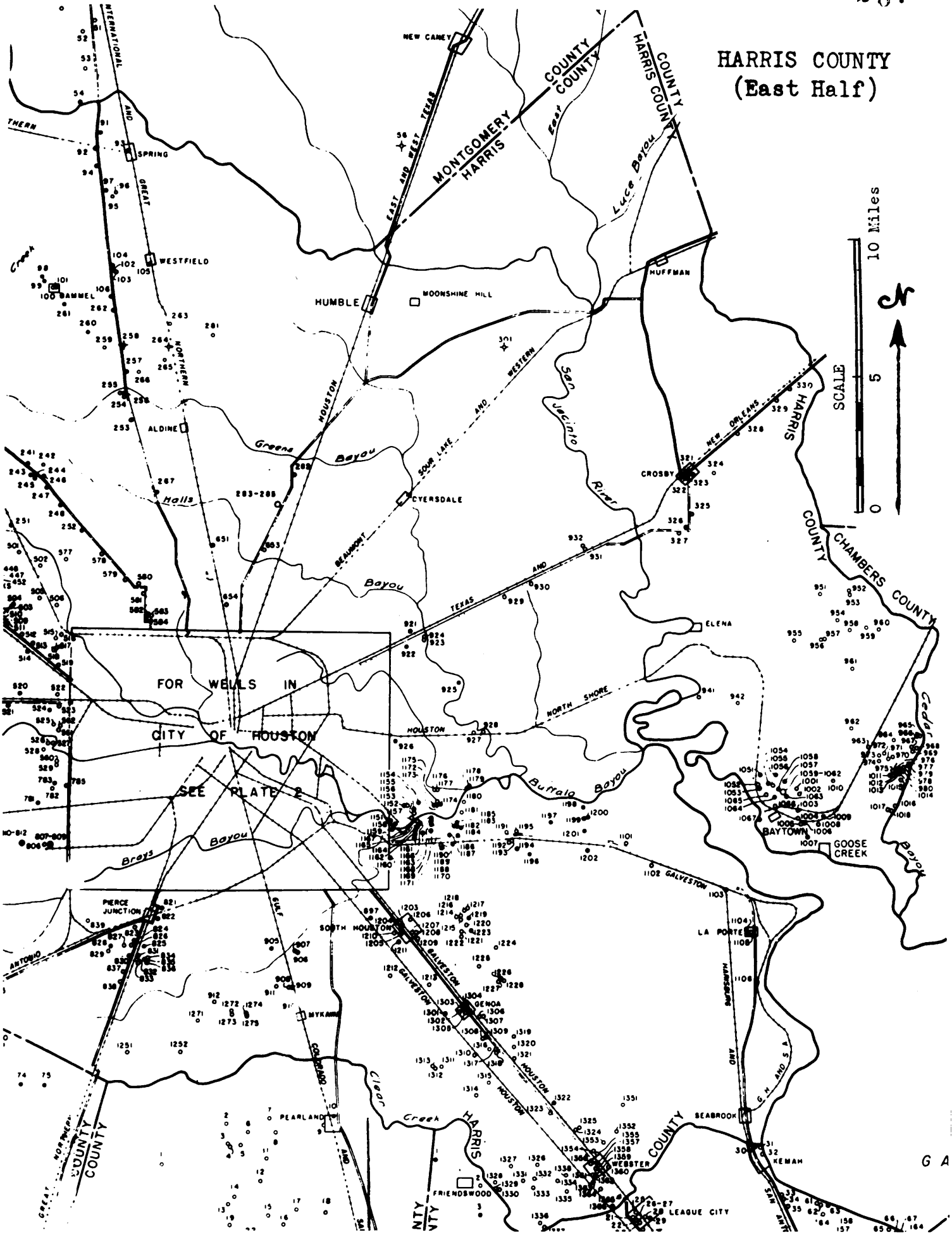
HARRIS COUNTY
(East Half)



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MONTGOMERY COUNTY, TEXAS

Records of wells, drillers' logs, water analyses, and map showing location of wells

* * *

by
Penn Livingston

Mimeographed by
WORKS PROGRESS ADMINISTRATION
PROJECT 10443

* * *

Prepared in cooperation with the United States Department of the Interior, Geological Survey.

* * *

Austin, Texas
April 10, 1939

MONTGOMERY COUNTY, TEXAS

* * *

Introduction

by
Samuel F. Turner
Associate Hydraulic Engineer
United States Department of the Interior
Geological Survey

This pamphlet contains records of wells in Montgomery County, Texas, with tables of well logs, well water analyses, and a map which shows all the wells described, each well having a number on the map corresponding to the number assigned to it in the well tables.

The records were obtained in the course of an investigation which was undertaken as part of a statewide study of the underground water resources of Texas. The investigation was made by the State Board of Water Engineers, in cooperation with the U. S. Department of the Interior, Geological Survey. The field work was carried out by Penn Livingston of the Geological Survey. The analyses were made in the laboratory of the Geological Survey at Washington by Margaret D. Foster. The field tests were made in Houston by Samuel F. Turner.

The well records serve as a guide to land owners and well drillers who may need information regarding wells and pumping plants, the depth to ground water in different parts of the county and the quantity and quality of water yielded by wells. They afford a basis for the more intensive investigation which is now being carried on.

These records were typed, assembled, and mimeographed by employees of Works Progress Administration Project 10443, which is sponsored by the Texas Board of Water Engineers in cooperation with the Geological Survey.

Records of wells in Montgomery County, Texas
(All wells are drilled unless otherwise noted in "Remarks" column.)
(Principal water-bearing beds are sand or gravel.)

No.	Distance from Conroe	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
1	20½ miles west northwest	Trinity & Brazos Valley R.R.	--	--	164	12	68 146	18 18
d/ 2	19½ miles west northwest	Stinson Est.	--	--	2,400±	6	--	--
3	19 miles west	Gulf Coast & Santa Fe R.R.	W. J. Giles	1913	746	8	520 695	40 51
4	18½ miles west northwest	The Texas Co.	Layne-Texas Co.	1907	109	9-5/8	75	4
5	do.	do.	do.	1907	440	9-5/8	190 297	35 23
6	12 miles northwest	J. H. Hall Well 2	Sprague Oil Co.	1924	4,316	--	410 --	30 --
7	8½ miles north	-- Shawver Well 1	Montgomery County Oil Co.	1924	3,515	--	--	--
d/ 8	7 miles north	F. W. Shawver	--	--	45	36	--	--
9	6½ miles north	State Highway	--	1931	27	--	--	--
10	6 miles north	-- Qualine	--	--	20	36	--	--
11	5¼ miles north	State Highway	--	1931	13	3	7	6
12	4¾ miles north	--	--	--	34	6	--	--
13	3¼ miles north northwest	--	--	--	30	6	--	--
14	3 miles north	W. B. Wood	--	1931	25	3	20	5
d/ 15	2½ miles north	Highway Spring	--	--	--	--	--	--
16	2¼ miles north	-- Hicks	--	--	20	6	--	--
17	1¾ miles north	State Highway	--	1931	29	3	26	3
18	1½ miles north	J. R. Grant	--	--	26	6	--	--
19	¾ mile north	L. S. Ross	--	--	37	30	--	--
20	At Conroe	State Highway	--	1931	20	3	--	--
21	do.	Gulf Coast & Santa Fe R.R.	R. C. Davant	1917	1,282	8	1,087 1,192	24 84
22	do.	City of Conroe	C. G. Hamil	1909	1,464	8	1,080	150

a/ Bench mark is point from which water-level measurement was made and was usually top of casing, top of pump base, or top of water pipe clamp.

b/ A, air; J, jack; F, artesian flow; B, bucket; E, electric motor; G, gasoline engine O, oil engine; H, hand.

Records obtained by Penn Livingston and Samuel F. Turner
(See "Table of field tests" for tests of hardness, chloride and sulphate.)

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
1	--	--	--	--	RR	Casing; 86 feet of 12-inch and 78 feet of 8-inch. Screens set at 68 to 86 and 146 to 164 feet.
2	--	--	--	F,J,G, 5	D,S	Temperature 93° F. Estimated yield, 25 gallons a minute, April 14, 1931.
3	--	--	--	--	RR	Casing; 582 feet of 8-inch and 184 feet of 6-inch. Screens set at 517 to 559 and 704 to 746 feet.
4	--	--	--	--	Ind	Casing; 85 feet of 9 5/8-inch. Screen set at 71 to 85 feet.
5	--	--	--	--	Ind	Casing; 440 feet of 9 5/8-inch. Screens set at 190 to 225, 297 to 309 and 427 to 440 feet.
6	--	--	--	--	--	Oil test, see driller's log.
7	--	--	--	--	--	Do.
8	0	43.8	Nov. 13, 1931	J,E	D,S	Dug well.
9	0	26.9	Dec. 22, 1931	None	N	Test well drilled by Geological Survey.
10	--	--	--	B,H	N	Dug well. Automatic water-stage recorder was maintained on this well for several months.
11	½	7.4	Nov. 17, 1931	None	N	Test well drilled by Geological Survey.
12	2	31.2	Nov. 11, 1931	B,H	D,S	Dug well.
13	2	29.5	Nov. 16, 1931	None	N	Do.
14	½	21.7	Nov. 17, 1931	None	N	Test well drilled by Geological Survey.
15	--	--	--	--	N	Seep spring at contact between sand and clay.
16	3	19.0	Nov. 13, 1931	None	N	Dug well.
17	½	28.3	Nov. 14, 1931	None	N	Test well drilled by Geological Survey.
18	2	15.9	Nov. 13, 1931	None	N	
19	2	35.2	do.	B,H	D,S	
20	1	5.1	Nov. 25, 1931	None	N	Test well drilled by Geological Survey.
21	2	-0.3	June 3, 1931	A,-	RR	Casing; 1,171 feet of 8-inch and 111 feet of 6-inch. Screens set at 1,070 to 1,170 and 1,202 to 1,282 feet.
22	2	1.4	do.	None	N	Casing; 185 feet of 8¼-inch, and 6-inch set to bottom. Screen set at 1,125 to 1,272 feet.

c/ P, public; Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used.
d/ See "Table of field tests" for tests of hardness, chloride and sulphate in water from this well.

Records of wells in Montgomery County--Continued

No.	Distance from Conroe	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
d/ 23	At Conroe	City of Conroe	Layne-Texas Co.	1924	1,221	8	1,060 1,186	106 35
d/ 24	do.	do.	--	--	205	6	--	--
25	do.	do.	--	--	205	6	--	--
26	2 miles northeast	J. H. Bennett	--	1926	50	36	--	--
27	½ mile south	-- Heath	--	1903	57	8	--	--
28	¾ mile southwest	Delta Land & Timber Co.	Layne-Texas Co.	1914	1,172	14	1,050 1,111	41 41
29	1¼ miles south	Brown Est.	--	--	25	48	--	--
d/ 30	1½ miles south	L. Johnson	--	--	33	48	--	--
d/ 31	1¾ miles south	Hogg Bros.	--	1931	13	3	12	1
32	3 miles south	--	--	1931	13	3	10	3
d/ 33	4¼ miles south	C. Johnson	--	--	60±	4	--	--
d/ 34	do.	do.	--	--	160±	5	--	--
d/ 35	4¾ miles south	W. T. Peoples	Charlie Smith	1928	385±	3	--	--
36	5 miles south	J. T. Peoples	--	--	10	48	--	--
d/ 37	3½ miles east	J. Youens	--	1932	47	36	--	--
d/ 38	3½ miles southeast	Mother's Place	--	1932	45	48	--	--
39	11 miles east northeast	H. W. McMaster Well 2	McMaster Oil Co.	1919	3,825	--	--	--
d/ 40	20½ miles west southwest	J. H. Rodgeson	Mike Lee	1918	110	2	--	--
d/ 41	19 miles west southwest	I. & G. N. R.R.	McMasters & Pomeroy	--	1,452	10	1,307	80
42	10 miles southwest	-- Chase Well 1	Cullen & West Production Co.	1929	3,516	--	--	--
43	6 miles south	Pierce-Fordyce Oil Association	Layne-Texas Co.	1916	3,706	--	--	--
44	8 miles south	--	--	1931	30	3	22	8
d/ 45	8½ miles south	Blair Store	--	--	21	24	--	--
46	9 miles south	E. W. Castleschouldt	--	--	35	24	--	--
d/ 47	do.	L. A. Smith	--	1907	900±	4	--	--
d/ 48	do.	Thomas Falvey	--	1906	1,800	8	1,540	40
d/ 49	9 miles south southeast	T. J. Harper	--	--	--	6	--	--

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
23	--	--	--	A	P	Casing; 1,221 feet of 8-inch. Screens set at 1,099 to 1,163 and 1,185 to 1,221 feet.
24	--	--	--	A	P	
25	--	--	--	A,E	N	
26	3	12.6	Nov. 17, 1931	None	N	Dug well.
27	--	--	--	None	N	An automatic water-stage recorder was maintained on this well for several months.
28	--	--	--	A,-	Ind	Casing; 950 feet of 10-inch and 6-inch to bottom. Screen set at 1,028 to 1,148 feet.
29	2½	27.0	Nov. 18, 1931	B,H	S	Dug well.
30	0	26.2	June 3, 1931	B,H	D,S	Do.
31	½	9.8	Nov. 13, 1931	None	N	Test well drilled by Geological Survey.
32	½	11.4	Nov. 12, 1931	None	N	Do.
33	4	9.9	Nov. 18, 1931	None	N	
34	--	+	--	None	N	Flows about 1 gallon in 24 hours.
35	3	+	--	F	P,D,S	Temperature 73° F. Estimated yield 5 gallons a minute, June 3, 1931.
36	2½	6.3	June 3, 1931	B,H	S	Dug well.
37	3	45	Aug. 24, 1932	B,H	D,S	Do.
38	3	42	do.	B,H	D,S	Do.
39	--	--	--	--	--	Oil test, see driller's log.
40	--	--	--	J,H	D,S	
41	--	--	--	J,O, --	RR, D,S	Casing; 1,307 feet of 10 and 8-inch, and 143 feet of 6-inch. Screen set from 1,307 to 1,389 feet.
42	--	--	--	--	--	Oil test, see driller's log.
43	--	--	--	--	--	Do.
44	½	27.3	Nov. 10, 1931	None	N	Test well drilled by Geological Survey.
45	2	17.3	June 2, 1931	B,H	D,S,P	Dug well.
46	2	31.8	do.	B,H	D	Do.
47	2	+	do.	F	D	Estimated yield, ½ gallon a minute, June 2, 1931.
48	15	+	do.	F	D,P	Casing; 80 feet of 4-inch and 4-inch drill stem to bottom.
49	2	+	do.	F	D	Estimated yield 10 gallons a minute, June 2, 1931.

Records of wells in Montgomery County--Continued

No.	Distance from Conroe	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
d/ 50	10 miles south	Grogan's Mill	--	--	173±	6	--	--
51	10½ miles south	--	--	1931	21	3	18	3
52	11 miles south	Sam Ashe School	--	--	50	30	--	--
53	12½ miles south	H. T. Temple	--	--	25	48	--	--
d/ 54	13½ miles south	C. L. Fitch	Brains et al	1927	2,285	4	--	--
55	17 miles east southeast	Vight-Schaedler Well 1	Black Hawk Oil Co.	1920	4,598	--	--	--
56	20 miles southeast	J. W. Reynolds Well 1	Rucker Oil & Refining Co.	1922	992	--	--	--

a/ Bench mark is point from which water-level measurement was made and was usually top of casing, top of pump base, or top of water pipe clamp.

b/ A, air; J, jack; F, artesian flow; B, bucket; E, electric motor; G, gasoline engine; O, oil engine; H, hand.

Penn Livingston and Samuel F. Turner

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
50	1	24.2	June 2, 1931	J,H	D,S	
51	½	18.2	Nov. 12, 1931	None	N	Test well drilled by Geological Survey.
52	3	30.6	June 2, 1931	B,H	P	Dug well.
53	2	27.9	Nov. 8, 1931	B,H	D,S	Do.
54	2½	+	--	F	D,S	Yield 9.5 gallons a minute, June 1, 1931. Oil test, see driller's log.
55	--	--	--	--	--	Oil test, see driller's log.
56	--	--	--	--	--	Do.

c/ P, Public; Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used.
d/ See "Table of field tests"for tests of hardness, chloride and sulphate in water from this well.

Records of field tests of samples from wells in Montgomery County, Texas
(Analyzed by Samuel F. Turner. Parts per million. For records of wells see corresponding numbers in well tables.)

Well No.	Owner	Date of collection	Depth of well (ft.)	Hardness as $CaCO_3$ a/	Chloride (Cl)	Sulphate (SO_4) b/
2	Stinson Est.	-	2,400±	80	220	10
8	F. W. Shawver	Nov. 13, 1931	45	65	16	1
15	Highway Spring	-	-	40	15	15
23	City of Conroe	-	1,221	110	60	40
24	do.	-	205	35	30	5
30	L. Johnson	June 3, 1931	33	40	30	10
31	Hogg Bros.	Nov. 13, 1931	13	140	80	15
33	C. Johnson	Nov. 18, 1931	60+	150	50	10
34	do.	-	160±	100	55	5
35	W. T. Peoples	-	385±	110	35	10
37	J. Youens	Aug. 24, 1932	47	900	1,000	50
38	Mother's Place	do.	45	20	15	2
40	J. H. Rodgeson	-	110	45	65	10
41	I. & G. N. R. R.	-	1,452	25	30	15
45	Blair Store	June 2, 1931	21	40	30	30
47	L. A. Smith	do.	900±	100	65	10
48	Thomas Falvey	do.	1,800	30	60	50
49	T. J. Harper	do.	-	110	60	40
50	Grogan's Mill	do.	173±	100	40	10
54	C. L. Fitch	-	2,285	150	60	10

a/ Hardness as calcium carbonate by the soap method.
b/ Sulphate by turbidity method and may be as much as 25 per cent in error.

	Thickness (feet)	Depth (feet)
Driller's log of well 3		
Gulf Coast and Santa Fe Railroad, Owner		
Black dirt	6	6
Yellow clay	6	12
Sand, shale and gravel	10	22
White lime rock	2	24
Brown clay	4	28
White lime rock	2	30
Brown clay	2	32
White lime rock	3	35
Brown and white clay	20	55
White lime rock	3	58
Gray clay	40	98
Brown sand	16	114
Gray gumbo	51	165
White lime rock	3	168
Gray clay	20	188
Gray gumbo	12	200
Red shale	12	212
Brown gumbo	34	246
Blue packed sand	31	277
Hard blue shale	13	290
White lime rock	21	311
Blue packed sand	23	334
White lime rock	6	340
Blue sand and shale	34	374
Blue gumbo	23	397
Blue shale and sand	14	411
White lime rock	8	419
Blue sand and shale	25	444
Hard blue shale	33	477
Blue gumbo	28	505
White lime rock	2	507
Blue gumbo	13	520
Water sand	40	560
Brown gumbo	26	586
White lime rock	2	588
Fine blue sand	4	592
White lime rock	1	593
Gray shale	19	612
White sand	4	616
Sand rock	3	619
Hard packed sand	14	633
Sand and shale	22	655
Sand rock	2	657
Sand	35	692
Sand rock	3	695
Sand	51	746
Driller's log of well 6		
Sprague Oil Company, J. H. Hall Number 2.		
Surface soil	8	8
Sand	40	48
Shale	12	60
Sandy shale	25	85
Sticky shale	100	185

	Thickness (feet)	Depth (feet)
Driller's log of well 6--Continued		
Shale and boulders	65	250
Sticky shale	60	310
Water sand artesian flow	20	330
Sticky shale	30	360
Hard sand	24	384
Sticky shale	64	448
Water sand artesian flow	22	470
Shale and boulders	42	512
Sticky shale	108	620
Sandy shale	130	750
Water sand artesian flow	24	774
Shale	46	820
Sticky shale	130	950
Water sand	22	972
Shale and boulders	52	1024
Sticky shale	76	1100
Sand	12	1112
Sticky shale	18	1130
Shale	44	1174
Sand and boulders	47	1221
Shale	89	1310
Sticky shale	90	1400
Water sand artesian flow	24	1424
Shale	36	1460
TOTAL DEPTH		4316
Driller's log of well 7		
Montgomery County Oil Company, Shawver Number 1.		
Surface sand	10	10
Clay	15	25
Sand	3	28
Gumbo	30	58
Shale	20	78
Sand	5	83
Shale and boulders	25	108
Sand and boulders	8	116
Gumbo and shale	71	187
Sand and boulders	10	197
Gumbo	31	228
Sand	20	248
Rock	1	249
Shale	6	255
Rock	3	258
Gumbo and boulders	16	274
Rock	1	275
Sandy shale	3	278
Rock	3	281
Gumbo and shale	82	363
Sand	35	398
Blue gumbo	10	408
Shale	13	421
Sandy shale and boulders	20	441
Shale	20	461

(Continued on next page)

	Thickness (feet)	Depth (feet)
Driller's log of well 7--Continued		
Sand	30	491
Gumbo	145	636
Shale	49	685
Sand rock	2	687
Sandy shale and boulders	12	699
Gumbo	48	747
Sand and boulders	50	797
Packed sand	20	817
Sand rock	33	850
Gumbo	48	898
Sandy shale	9	907
Packed sand and boulders	20	927
Gumbo	40	967
Shale	17	984
Gumbo	20	1004
Broken rock and sand	20	1024
Gumbo	90	1114
TOTAL DEPTH		3515
Driller's log of well 21		
Gulf Coast and Santa Fe Railroad, owner.		
Sand and clay	14	14
Yellow clay	44	58
Coarse yellow sand	24	82
Yellow clay	99	181
Yellow sand	21	202
Tough red clay	33	235
Sand rock	6	241
Gray gumbo	55	296
Sand rock	7	303
Gumbo	15	318
Sand rock	16	334
Gumbo	42	376
Rock	2	378
Gumbo	85	463
Rock	2	465
Gumbo and shale	102	567
Lime rock	22	589
Packed sand	9	598
Shale	33	631
Gumbo	51	682
Hard sand	13	695
Shale and gumbo	41	736
Red sand	29	765
Gumbo and shale	180	945
Rock	23	968
Tough blue shale and gumbo	18	986
Gumbo and shale	61	1047
Rock and sand	9	1056
Tough shale	5	1061
Rock	3	1064
Gumbo	23	1087
Coarse gray water sand	24	1111
Sand and rock	7	1118
Mixed shale and gravel	21	1139
Packed sand and rock	7	1146
Tough shale and soft rock	46	1192
Coarse gray water sand	22	1214
Sand rock	29	1243
Coarse gray water sand	33	1276
Tough shale	6	1282
Driller's log of well 59		
McMaster Oil Company, H. W. McMaster Number 2.		
Sand	5	5
Clay	19	24
Sand and gravel	12	36
Sticky shale	29	65
Water sand	305	370
Gumbo	38	408
Hard sand	12	420
Gumbo	52	472
Hard sand	10	482
Gumbo	18	500
Blue shale	24	524
Hard sand	9	533
Shale, gumbo and boulders	112	645
Red gumbo	17	662
Sand	43	705
Gumbo	35	740
Sand	35	775
Gumbo	90	865
Shale and boulders	30	895
Gumbo	93	998
Sand and boulders	30	1028
Gumbo and boulders	94	1122
Hard sand	63	1185
Gumbo	29	1214
Shale	24	1238
Sand	52	1290
Gumbo and boulders	22	1312
Chalk	6	1318
Sand	14	1332
Shale	26	1358
Sand	32	1390
Gumbo and boulders	70	1460
Broken sand	38	1498
Gumbo	92	1590
Coarse sand	62	1652
Gumbo	89	1741
TOTAL DEPTH		3825
Driller's log of well 41		
International and Great Northern Railroad, owner.		
Yellow clay	75	75

(Continued on next page)

Table of Drillers' Logs, Montgomery County--Continued

	Thickness (feet)	Depth (feet)
Driller's log of well 41--Continued		
Water sand	20	95
Joint clay	26	121
Water sand	25	146
Packed sand	42	188
Hard rock	16	204
Sand and boulders	74	278
Gumbo	125	403
Rock	2	405
Gumbo and boulders	110	515
Hard packed sand	89	604
Fine sand	36	640
Brown shale	67	707
Hard lime rock	1	708
Brown shale	10	718
Water sand	23	741
Packed sand	32	773
Gumbo	10	783
Hard sand	25	808
Brown shale	20	828
Water sand	7	835
Shale and gumbo	148	983
Sand and shale	45	1028
Gumbo	37	1065
Sand and gravel	20	1085
Gumbo	97	1182
Shale and boulders	10	1192
Tough gumbo	108	1300
Sand and gumbo	7	1307
Rock	2	1309
Water sand	12	1321
Lime rock	4	1325
Water sand	22	1347
Gumbo	4	1351
Rock	4	1355
Water sand	28	1383
Gumbo, sand and lime	6	1389
Packed sand	41	1430
Blue shale	16	1446
Tough gumbo	6	1452

Driller's log of well 42

Cullen and West Production Company's Chase Number 1.

Surface sand and clay	32	32
Sand and clay	133	165
Gumbo	42	207
Sand	250	257
Gumbo	10	267
Sand	33	300
Gumbo	57	357
Sticky shale	14	371
Sand and gravel	20	391
Gumbo	10	401
Sand and gravel	16	417
Rock	1	418
Sand and gravel	17	435
Sticky shale	75	510
Shale, lim and boulders	50	560
Rock	2	562
Gumbo	34	596
Shale	101	697
Sand and boulders	32	729
Sticky shale	23	752
Sand and boulders	75	827
Gumbo	22	849
Sand and boulders	31	880
Gumbo	20	900
Shale and gumbo	148	1048
Sand	4	1052
Hard sandy lime	16	1068
Gumbo	48	1116
Sand	32	1148
Gumbo	29	1177
Sand	5	1182
Gumbo	18	1200
Sticky shale	30	1230
Rock	1	1231
Sand and shale	10	1241
Sticky shale	23	1264
Sand	25	1289
Gumbo and lime	26	1315
Sand	20	1335
Shale	53	1388
Sand	48	1436
Gumbo and lime	76	1512
Sand	3	1515
Sticky shale	18	1533
TOTAL DEPTH		3516

Driller's log of well 43

Layne-Texas Company's Pierce-Fordyce Oil Association Number 1.

Clay and water sand	104	104
Clay	82	186
Water sand	19	205
Yellow clay	15	220
Sand	25	245
Gravel	20	265
Sand	30	295
Sand rock	3	298
Sand	27	325
Clay	50	375
Sand	15	390
Clay	45	435
Sand	65	500
Clay	70	570
Shale	4	574
Gravel and boulders	21	595
Clay	20	615

(Continued on next page)

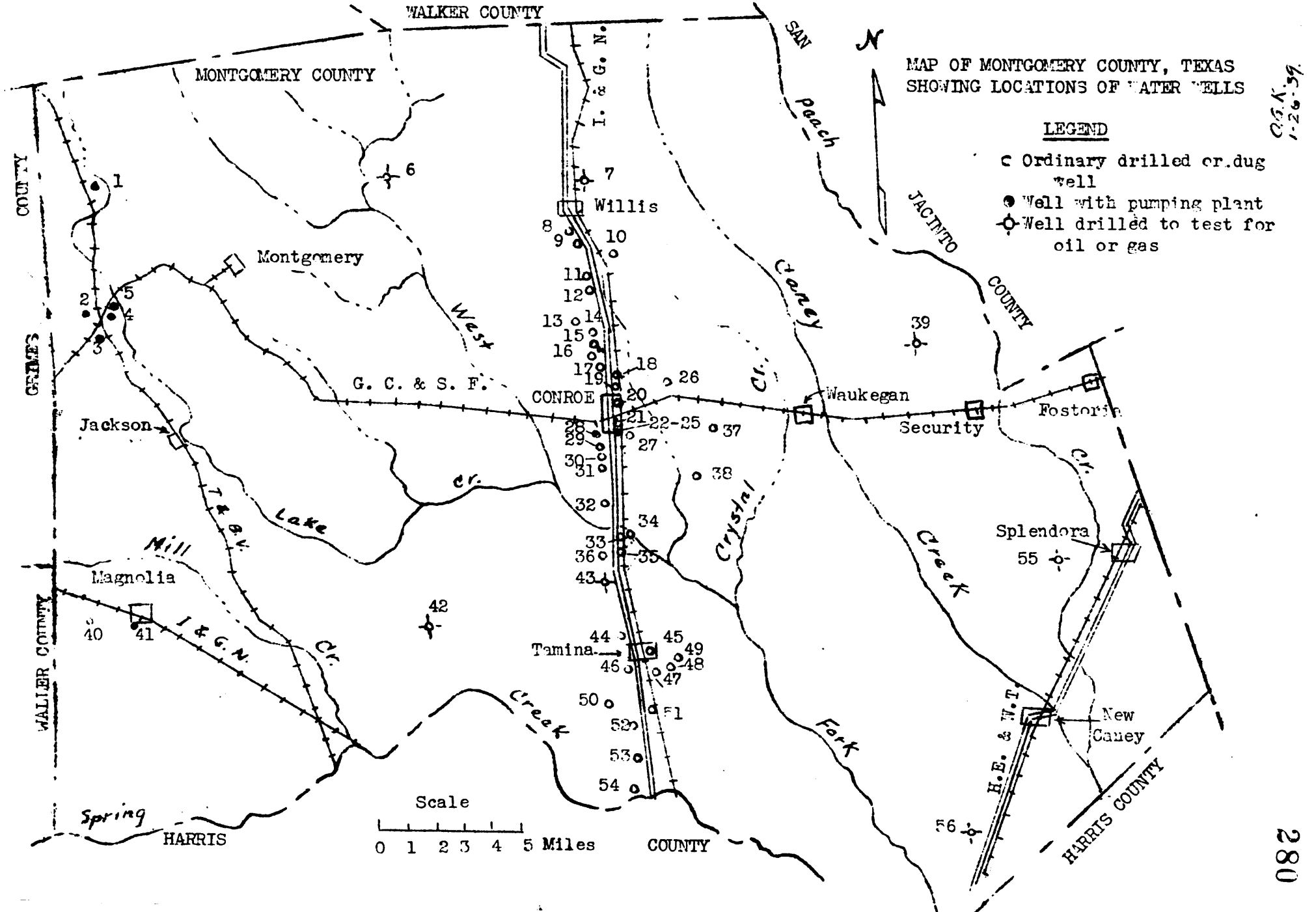
	Thickness (feet)	Depth (feet)
Driller's log of well 43--Continued		
Sand rock	4	619
Clay and shale	342	961
Sand and boulders	19	980
Sand rock	4	984
Gumbo and shale	84	1068
Sand and boulders	4	1072
Gumbo	135	1217
Soft rock	2	1219
Pink shale	30	1249
Shale	82	1331
Soft rock	11	1342
Shale and boulders	6	1348
Lime, boulders and sand	8	1356
Gumbo	32	1388
Sand	7	1395
Sand rock	1	1396
Soft sand	92	1488
Tough gumbo	42	1530
Hard shale and boulders	8	1538
Packed sand and gravel	49	1587
Gumbo	5	1592
TOTAL DEPTH		3706
Driller's log of well 54		
Brains et al Ash Number 1, C. L. Fitch, owner.		
Surface	13	13
Clay	7	20
White sand	79	99
Clay	3	102
White sand	36	138
Clay	11	149
Sand	4	153
Gumbo	37	190
Hard sand	26	216
Shale and boulders	40	256
Rock and gumbo	10	266
Rock and sand	13	279
Shale and boulders	21	300
Red and brown shale	68	368
Red gumbo	11	379
Hard sand	15	394
Pink gumbo	102	496
Rock	2	498
Brown shale	32	530
Pink gumbo	10	540
Brown shale	12	552
Pink gumbo	10	562
Rock	2	564
Gumbo	5	569
Rock	1	570
Pink gumbo	10	580
Sand and boulders	8	588
Pink gumbo and boulders	47	635
Blue shale	15	650

	Thickness (feet)	Depth (feet)
Driller's log of well 54--Continued		
Pink gumbo	13	663
Sandy shale	14	677
Pink gumbo	51	728
Blue sand	22	750
Blue water sand	15	765
Blue shale	23	788
White sandy shale	4	792
Hard rock	17	809
Blue shale	17	826
Water sand	92	918
Gumbo	32	950
Sandy shale and boulders	45	995
Gumbo	15	1010
Sandy lime	25	1035
Shale and gumbo	49	1084
Sandy shale and boulders	16	1100
Gumbo and lime	95	1195
Blue shale and boulders	15	1210
Gumbo	8	1218
Water sand	7	1225
Pink, blue and brown gumbo	90	1315
Blue sand	3	1318
Gumbo	10	1328
Pink and blue shale	43	1371
Sand and boulders	16	1387
Blue shale	15	1402
Packed sand and boulders	32	1434
Blue shale	6	1440
Hard white sand	15	1455
Blue and white sand	13	1468
Gumbo	62	1530
TOTAL DEPTH		2285
Driller's log of well 55		
Black Hawk Oil Company's Wight-Schaedler Number 1.		
Surface sand and clay	45	45
White sand	18	63
Red clay and streaks of sand	20	83
White sand	90	173
White gravel	7	180
Yellow clay	27	207
Gravel and sand	19	226
Rock	1	227
Yellow sandy clay	52	279
Rock	3	282
Red clay	28	310
Soft white sand	18	328
Pack sand and gravel	9	337
Rock	1	338
Soft white sand	48	386
White sand and gravel	58	444

(Continued on next page)

	Thickness (feet)	Depth (feet)
Driller's log of well 55--Continued		
Gumbo	28	472
Rock	2	474
Yellow clay and gravel	47	521
Gumbo	7	528
Yellow clay and gravel	45	573
Rock	2	575
Blue shale	75	650
Rock	2	652
Gumbo	37	689
Rock	3	692
Yellow gumbo and boulders	201	893
Rock	1	894
Hard lime rock	11	905
Blue shale	40	945
Gumbo and boulders	9	954
White pack sand	10	964
Gumbo	26	990
Blue shale	11	1001
Gumbo and boulders	109	1110
Tough gumbo	43	1153
White lime rock	4	1157
Blue sandy shale	6	1163
Pack sand	14	1177
Tough gumbo	72	1249
Sand rock	7	1256
Pack sand	4	1260
Rock	3	1263
TOTAL DEPTH		4598

	Thickness (feet)	Depth (feet)
Driller's log of well 56		
Rucker Oil and Refining Company's J. W. Reynold's Number 1.		
Sand	130	130
Sand	20	150
Red clay	15	165
Sand and boulders	25	190
Clay	15	205
Sand	45	250
Clay and gravel	30	280
Sand	45	325
Blue gumbo	15	340
Sand	55	395
Sandy clay	20	415
Clay	35	450
Sand	90	540
Clay	25	565
Sand	65	630
Clay	20	650
Sand	80	730
Gumbo	10	740
Sandy clay	26	766
Gumbo	20	786
Artesian water sand	94	880
Tough gumbo	6	886
Gumbo	26	910
Sandy shale	22	932
Sand	3	935
Sandy shale	5	940
Sand	8	948
Shale	4	952
Sand	6	958
Gumbo	9	967
Sand	13	980
Gumbo	12	992


MAP OF MONTGOMERY COUNTY, TEXAS
SHOWING LOCATIONS OF WATER WELLS
LEGEND
Ordinary drilled or dug well
Well with pumping plant
Well drilled to test for oil or gas
WALKER COUNTY
MONTGOMERY COUNTY
GRIMES COUNTY
WALLER COUNTY
HARRIS COUNTY
SAN JACINTO COUNTY
I. & G. N.
G. C. & S. F.
H.E. & W.T.
Willis
Montgomery
CONROE
Jackson
Magnolia
Tamina
Waukegan
Security
Fostoria
Splendora
New Caney
Spring
West Caney Cr.
Lake Cr.
Mill Cr.
Crystal Creek
Peach Creek
Caney Fork Creek
Scale
0 1 2 3 4 5 Miles

280

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WALLER COUNTY, TEXAS

Records of wells, drillers' logs, water analyses, and map showing location of wells

* * *

by

Samuel F. Turner and Penn Livingston

Mimeographed by
WORKS PROGRESS ADMINISTRATION
PROJECT 10443

* * *

Prepared in cooperation with the United States Department of the Interior, Geological Survey.

* * *

Austin, Texas
April 10, 1939

WALLER COUNTY, TEXAS

* * *

Introduction

by
Samuel F. Turner
Associate Hydraulic Engineer
United States Department of the Interior
Geological Survey

This pamphlet contains records of wells in Waller County, Texas, with tables of well logs, well water analyses, and a map which shows all the wells described, each well having a number on the map corresponding to the number assigned to it in the well tables.

The records were obtained in the course of an investigation which was undertaken as part of a statewide study of the underground water resources of Texas. The investigation was made by the State Board of Water Engineers, in cooperation with the U. S. Department of the Interior, Geological Survey. The field work was carried out by Samuel F. Turner and Penn Livingston of the Geological Survey. The analyses were made in the laboratory of the Geological Survey at Washington by Margaret D. Foster. The field tests were made in Houston by Samuel F. Turner.

The well records serve as a guide to land owners and well drillers who may need information regarding wells and pumping plants, the depth to ground water in different parts of the county and the quantity and quality of water yielded by wells. They afford a basis for the more intensive investigation which is now being carried on.

These records were typed, assembled, and mimeographed by employees of Works Progress Administration Project 10443, which is sponsored by the Texas Board of Water Engineers in cooperation with the Geological Survey.

Records of wells in Waller County, Texas
(All wells are drilled unless otherwise noted in "Remarks" column.)
(Principal water-bearing beds are sand or gravel.)

No.	Distance from Howth	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
1	2¾ miles west northwest	E. F. O'Connor	E. F. O'Connor	--	23	48	20	3
2	2 miles west northwest	T. D. Woods	W. E. Rinn	--	135	3	--	--
3	do.	do.	H. H. Strickland	--	62	4	--	--
4	1¾ miles west northwest	E. F. O'Connor	W. E. Rinn	1932	80	4	72	8
5	At Howth	H. Kloecker	--	Old	40	48	--	--
6	½ mile south	C. E. T. Hicks	W. E. Bush	1932	45	10	--	--
d/ 7	¼ mile east	A. H. Doweese	A. H. Deweese	1931	55	30	49	6
8	2 miles east	Negro church	--	--	30	8	--	--
e/ 10	3¼ miles north	Weaver Well 1 A. Weaver	Waller Oil Co.	1917	1,363	8½	--	--
11	3¼ miles north northeast	A. Kloecker	--	1900?	40	8	--	--
12	3 miles north northeast	do.	--	--	60	6	--	--
13	2¼ miles north northeast	-- Spurley	H. H. Strickland	--	50	6	--	--
d/ 14	2 miles north northeast	E. M. Taylor	W. E. Bush	--	57	8	--	--
15	do.	George Bennett	--	--	50	5	--	--
16	2¼ miles north northeast	-- Spurley	--	--	47	6	--	--
17	2 miles north northeast	H. C. Stephens	--	--	60	36	57	3
18	do.	Charley Marshall	--	--	30	6	--	--
19	2½ miles northeast	Vivian Harris	Vivian Harris	--	50	30	--	--
20	6 miles northeast	--	--	--	60	30	--	--

No.	Distance from Joseph (Bradbury's Gin)	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
51	5½ miles northwest	W. E. Cook	W. E. Cook	--	60	8	--	--

a/ Bench mark is point from which water-level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.
b/ T, turbine; A, air; C, centrifugal; J, jack; B, rope and bucket; E, electric; G, gasoline engine (inludes tractors); F, fuel oil engines; W, windmill; H, hand.
c/ P, public; I, irrigation; Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used.

Records obtained by Penn Livingston and Samuel F. Turner
(See "Table of field tests" for tests of hardness, chloride and sulphate.)

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
1	--	--	--	B,H	D,S	Dug well.
2	--	--	--	J,W	D,S, Ind	
3	--	--	--	J,H	D,S	
4	--	--	--	J,H	D,S	
5	--	--	--	J,G, 1½	D,S	Reported salt water in abandoned 35-foot well 100 yards north.
6	--	--	--	--	--	Well just finished, casing and pump not installed.
7	--	--	--	J,H	D,S	Dug well lined with tile.
8	--	--	--	B,H	D,S	
10	--	--	--	None	N	Oil test. See partial log.
11	½	24.0	Apr. 14, 1931	B,H	S	Reported all wells close as having bad water.
12	--	--	--	B,H	D,S	
13	--	--	--	B,H	D,S	Temperature 70° F.
14	--	--	--	B,H	D,S	Do.
15	--	--	--	J,H	D,S	
16	--	--	--	B,H	D,S	
17	--	--	--	B,H	D,S	Dug well.
18	--	--	--	B,H	D,S	
19	--	--	--	B,H	D,S	Dug well lined with tile.
20	--	--	--	B,H	D,S	Do.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
51	--	--	--	B,H	D,S	Water is reported as hard in rainy season and soft in dry season.

d/ For analysis of water see under well number in table of analyses.
e/ No field tests made on water from this well.
f/ Taylor, T. U., Underground waters of Coastal Plain of Texas; U. S. Geological Survey Water-Supply Paper 190, 1907.
g/ Reported by driller.

Records of wells in Waller County--Continued

No.	Distance from Joseph (Bradbury's Gin)	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
52	4½ miles northwest	A. Karstoter	--	1916	50	8	--	--
53	4¾ miles west northwest	-- Dawson	-- Imhoff	--	110	8	--	--
54	4¾ miles west	R. A. Hooker	--	--	60	4	--	--
e/ 55	4 miles west	W. F. Maxwell well 2	Ren Oil Co.	1926	1,200	--	--	--
56	1½ miles west northwest	School (Fields)	--	--	40	4	--	--
57	1 mile west	R. H. Jones	--	--	36	12	--	--
58	At Joseph	W. A. Bradbury	Andrew Bradbury	--	90	4	--	--
d/ 59	do.	do.	--	1915	20	12	--	--
60	7 miles northeast	Cordell's Mill	Andrew Bradbury	1915	150	6	--	--
61	do.	John Rodgeson	John Rodgeson	--	67	6	--	--
62	3¾ miles east northeast	F. F. Sneigi	F. F. Sneigi	1932	51	2	--	--
63	2¼ miles east	T. B. Stephenson	--	--	52	6	--	--
64	4 miles east	T. S. Dinkins	--	Old	42	36	--	--
d/ 65	4½ miles east	J. H. Turpin	J. H. Turpin	--	50	8	--	--
66	4 miles southeast	Lisle McPherson	Andrew Bradbury	1923	86	4	--	--
67	4¼ miles southeast	J. H. Turpin	J. H. Turpin	1924	21	8	--	--

No.	Distance from Hempstead	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
101	4 miles northwest	Giddings Est.	--	Old	125	6	--	--
102	1¾ miles northwest	G. W. Heard	--	Old	62	36	--	--
e/ 103	3 miles north	Roy Chapman Well 1	W. P. Morris	--	2,640	--	--	--
104	2½ miles north	-- Beard	--	--	40±	6	--	--
105	4½ miles east northeast	H. M. Cooke	--	Old	60	12	--	--

a/ Bench mark is point from which water-level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

b/ T, turbine; A, air; C, centrifugal; J, jack; B, rope and bucket; E, electric; G, gasoline engine (includes tractors); F, fuel oil engines; W, windmill; H, hand.

c/ P, public; I, irrigation; Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
52	--	--	--	B,H	D,S	
53	--	--	--	J,H	D,S	
54	--	--	--	J,G, 3	D,S	
55	--	--	--	--	--	Oil test. See partial log.
56	--	--	--	J,H	D	
57	--	--	--	B,H	D,S	
58	--	--	--	J,G, 3	D,S, Ind	Water used for boilers at gin.
59	--	--	--	B,H	D,S	
60	--	--	--	J,H	D,S	At Fetzer.
61	--	--	--	J,H	D,S	Do.
62	--	48	Aug. 10, 1932	None	--	New well, pump not yet installed.
63	--	--	--	B,H	D,S	
64	--	--	--	J,H	D,S	Dug well.
65	--	--	--	B,H	D,S	
66	--	--	--	J,W	D,S	
67	--	--	--	B,H	D,S	

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
101	--	--	--	J,W	D,S	
102	--	--	--	B,H	D,S	Very old dug well, lined with brick.
103	--	--	--	--	--	Oil test. See partial log.
104	--	--	--	J,W	S	
105	--	--	--	B,H	D,S	

d/ For analysis of water see under well number in table of analyses.
e/ No field tests made on water from this well.
f/ Taylor, T. U., Underground waters of Coastal Plain of Texas; U. S. Geological Survey Water-Supply Paper 190, 1907.
g/ Reported by driller.

Records of wells in Waller County--Continued

No.	Distance from Hempstead	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
106	At Hempstead	E. T. Hitt	H. H. Strickland	--	95	6	--	--
d/107	do.	B. R. Rehms	do.	--	85	4	--	--
d/108	do.	Texas-Louisiana Power Co.	Layne-Texas Co.	1930	868	--	212 481	60 33
e/109	do.	do.	G. Warkiecke	1897	1,100±	8	683 --	36 --
110	½ mile south southwest	J. S. Weatherford	-- Phillips	1910?	50	8	--	--
111	½ mile south southeast	Hempstead Cemetery	H. H. Strickland	1928	168	6	--	--
112	1½ miles east southeast	Southern Pacific Ry.	Andrew Bradbury	1914	180	10	--	--
e/113	2½ miles east southeast	--	--	Old	55	6	50	5
114	do.	-- MacDonald	D. D. Feagin	--	85	4	--	--
d/115	3 miles east southeast	D. D. Feagin	do.	1899	38	12	--	--
e/116	do.	do.	--	1931	30	3	29	1
e/117	4½ miles east southeast	Mrs. H. L. Milam	--	1931	20	3	--	--
118	4¾ miles east southeast	do.	H. H. Strickland	1926	60	4	--	--
d/119	5 miles east	Prairie View State College	Layne-Texas Co.	1930	576	12½	--	--
d/120 e/	do.	do.	do.	1920	571	6	483 550	50 21
e/121	do.	do.	--	Old	600±	--	--	--
122	3¼ miles south southwest	J. J. Perry	--	--	50	30	--	--
123	3 miles south	--	--	--	40	30	--	--
124	3¼ miles south	Mrs. Bob Robinson	--	Old	70	4	--	--
125	5 miles south	Judge Hardy	--	--	--	--	--	--
126	do.	do.	--	--	50	10	--	--
127	6 miles south	do.	H. H. Strickland	--	65	4	--	--

a/ Bench mark is point from which water-level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

b/ T, turbine; A, air; C, centrifugal; J, jack; B, rope and bucket; E, electric; G, gasoline engine (includes tractors); F, fuel oil engines; W, windmill; H, hand.

c/ P, public; I, irrigation; Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
106	--	--	--	J,E, ½	Ind	
107	1	54.6	Apr. 14, 1931	J,E, ½	D,S	
108	--	--	--	T,E, 15	P	Each water-bearing stratum tested, see table of analyses.
109	½	5.6	Apr. 14, 1931	A,F, --	P	Had a flow of 100 gallons a minute prior to 1907. g/
110	--	--	--	J,W	D,S	
111	--	--	--	J,H	D	
112	1	2.5	Nov. 7, 1931	J,H	D,RR	
113	--	--	--	J,H	D,S	First water stratum at 25 feet not used.
114	--	--	--	J,H	D,S	Very weak supply of water.
115	1	24.8	May 13, 1931	J,W	D,S	
116	0	29.0	Nov. 7, 1931	None	N	Test well drilled by Geological Survey.
117	½	4.4	May 28, 1931	None	N	Do.
118	1	43.5	Apr. 13, 1931	J,W	D,S	At Prairie View.
119	--	--	--	T,E, 25	P	
120	--	--	--	A,-	P	Casing; 571 feet of 6-inch casing. Screens set at 519 to 529 and 550 to 571 feet.
121	--	--	--	A,-	P	
122	1	46.0	Aug. 3, 1932	J,W	D,S	Dug well.
123	--	--	--	B,H	D,S	Do.
124	--	--	--	J,W	D,S	
125	--	--	--	J,E	D,S	Flow of 15 gallons a minute prior to 1907. Reported, f/ stopped flowing 3 years ago.
126	--	--	--	B,H	D,S	
127	--	--	--	J,W	D,S	

d/ For analysis of water see under well number in table of analyses.
e/ No field tests made on water from this well.
f/ Taylor, T. U., Underground waters of Coastal Plain of Texas; U. S. Geological Survey Water-Supply Paper 190, 1907.
g/ Reported by driller.

Records of wells in Waller County--Continued

No.	Distance from Waller	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
e/151	3¼ miles west	-- Stokes	--	Old	68	8	--	--
e/152	3 miles west	--	--	1931	20	3	10	10
e/153	1 mile west	G. O. Vaught	--	--	65	4	--	--
154	do.	W. D. Weaver	W. D. Weaver	Old	58	5	51	7
155	4½ miles west southwest	L. L. Menke	A. Bradbury	1910	105	4	98	7
156	4 miles west southwest	do.	B. D. Weaver	1928	148	6	140	8
157	2¾ miles southwest	--	--	--	80	4	--	--
158	1 mile south	W. H. Carter Well 1	Dome Oil Co.	--	3,527	--	--	--
d/159	3½ miles south	R. S. Montgomery	Harry Bennett	--	28	6	--	--
160	4¼ miles south southwest	W. M. Brumby	B. D. Weaver	--	81	6	--	--
e/161	5½ miles south	Jack Means	Elmer Gray	Old	50	12	--	--
d/162	6 miles south	Clyde Fuller	do.	1924	65	8	--	--
163	6 miles south southwest	F. H. Wawarofsky	do.	1919	54	9	27	27
164	6½ miles south southwest	W. M. Pohl	Jim White	1926	60	4	--	--
165	6¼ miles south southwest	W. O. Wawarofsky	do.	--	55	14	--	--
166	6½ miles southwest	Frank Wawarofsky	Andrew Bradbury	1920	104	4	--	--
167	7 miles southwest	E. C. Boethe	B. D. Weaver	--	63	4	--	--
168	7½ miles southwest	H. Boethe Est.	do.	--	54	4	--	--
e/169	8 miles southwest	H. Lass	--	--	1,018	--	--	--
170	7 miles southwest	Lizzie Davis	--	--	60	6	--	--
171	do.	M. A. Dodd	H. H. Strickland	1916	62	4	--	--
172	7¼ miles southwest	do.	W. D. Weaver	1928	60	4	--	--
173	8 miles southwest	do.	--	Old	50	4	--	--
e/174	9 miles southwest	John R. Young Well 1	--	--	--	--	--	--

a/ Bench mark is point from which water-level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

b/ T, turbine; A, air; C, centrifugal; J, jack; B, rope and bucket; E, electric; G, gasoline engine (includes tractors); F, fuel oil engines; W, windmill; H, hand.

c/ P, public; I, irrigation; Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
151	½	43.3	May 28, 1931	B,H	D,S	
152	½	3.3	do.	None	N	Test well drilled by Geological Survey.
153	--	--	--	J,W	D,S	
154	1	13.2	May 28, 1931	J,W	D,S	Well originally 45 feet deep but was deepened for better water.
155	--	--	--	J,W	S	Screen, 4-inch Stancliff, 4½ feet long at bottom.
156	--	--	--	J,W	D,S,I	Screen, 4-inch Stancliff, 4 feet long at bottom.
157	--	--	--	J,W	D,S	
158	--	--	--	--	--	Oil test. See partial log.
159	--	--	--	J,W	D,S	
160	--	--	--	J,W	D,S	Two similar wells.
161	--	--	--	None	N	Well caved in and now being repaired.
162	1	50	July 28, 1932	B,H	D,S	
163	--	--	--	J,W	D,S	Water in gravel.
164	--	--	--	J,H	D,S	
165	--	--	--	J,W	D,S	Tile casing. Water in gravel.
166	--	--	--	J,W	D,S	
167	--	--	--	J,W	D,S	
168	--	--	--	J,W	D,S	
169	--	--	--	--	--	Oil test, see log.
170	--	--	--	J,W	D,S	
171	--	--	--	J,W	D,S	Formerly had a dug well 35 feet deep.
172	--	--	--	J,W	D,S	
173	--	--	--	J,W	D,S	
174	--	--	--	--	--	Oil test. See partial log.

d/ For analysis of water see under well number in table of analyses.
e/ No field tests made on water from this well.
f/ Taylor, T. U., Underground waters of Coastal Plain of Texas; U. S. Geological Survey Water-Supply Paper 190, 1907.
g/ Reported by driller.

Records of wells in Waller County--Continued

No.	Distance from Waller	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
175	9½ miles southwest	F. S. Styers	--	1905	32	4	--	--
176	10½ miles southwest	F. A. Holik	-- Bennett	1899	57	12	--	--
177	13 miles southwest	Fritz Frey	--	--	48	30	--	--
178	12 miles southwest	M. E. Kerr	A. Bradbury	1924	45	6	--	--
179	11½ miles southwest	H. Lass	Harry Bennett	1926	738	6	690	42
180	9 miles south southwest	John Bonner	-- Bennett	1876	60	24	--	--
181	8 miles south southwest	-- Frey	--	--	70	4	--	--
182	8¼ miles south southwest	G. A. Menke	--	--	68	4	--	--
183	10 miles south southwest	J. B. Adams	W. M. Wenzel	--	37	10	--	--
184	do.	A. Miller	-- Bennett	--	74	4	70	4

No.	Distance from Katy	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed	
							Depth to top of bed (ft.)	Thickness (ft.)
c/201	16 miles west northwest	J. R. Garrett	Garrett Well 1	1927	840	--	--	--
202	12 miles west northwest	Mrs. J. B. Adams	--	--	1	--	--	--
203	do.	do.	W. M. Wenzel	--	20	6	--	--
204	do.	Will Clemons	--	Old	35	8	--	--
205	11¾ miles west northwest	Mrs. G. T. Patterson	--	--	30	1½	--	--
206	11½ miles west northwest	G. L. Buller, Sr.	--	--	20	6	--	--
207	12 miles west	Texas Construction Materials Co.	Thos. Haskit	1931	54	6	49	5
208	7½ miles west	Geo Harrison	do.	1930	82	6	58	24
e/209	do.	do.	-- Schulty	1901	66	5	--	--
221	7½ miles north northwest	Harry Hebert	Harry Hebert	1930	524	16	80 286 358 383 478	70 40 15 22 43

a/ Bench mark is point from which water-level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

b/ T, turbine; A, air; C, contrifugal; J, jack; B, rope and bucket; E, electric; G, gasoline engine (includes tractors); F, fuel oil engines; W, windmill; H, hand.

c/ P, public; I, irrigation; Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
175	--	--	--	J,W	D,S	
176	--	--	--	J,W	D,S	
177	--	--	--	J,W	D,S	
178	--	--	--	J,W	D,S	
179	--	+	--	F,C,G	S,I	Water stood 7 feet above ground when first drilled and flowed 30 gallons a a minute. Barely flowed in Sept., 1931.
180	--	--	--	B,H	D,S	
181	--	--	--	J,W	S	Weak supply of water.
182	1	63.0	July 28, 1932	J,W	S	
183	--	32.0	do.	B,H	D,S	
184	--	--	--	J,W	D,S	

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
201	--	--	--	--	--	Oil test, see log.
202	--	+	July 28, 1932	None	D,S	Spring in Iron's Creek valley. Estimated flow 5 gallons a minute.
203	3	18	do.	B,H	D,S	
204	1	25	do.	B,H	N	Strong sulphur smell.
205	--	--	--	J,H	D,S	
206	--	--	--	J,H	D,S	
207	--	--	--	J,E, 1½	D	
208	--	--	--	J,E, 3	P	At Brookshire. Water in gravel.
209	--	--	--	J,E,T	P	At Brookshire.
221	5	49.8	Feb. 10, 1931	T,E, 75	I	Temperature 72° F. Yield 1,510 gallons a minute, Aug. 18, 1932. Casing; 150 feet of 16-inch and 374 feet of 12-inch. Screens set at 110 to 150, 286 to 326, 358 to 375, 385 to 405 and 478 to 518 fee

d/ For analysis of water see under well number in table of analyses.
e/ No field tests made on water from this well.
f/ Taylor, T. U., Underground waters of Coastal Plain of Texas; U. S. Geological Survey Water-Supply Paper 190, 1907.
g/ Reported by driller.

Records of Wells in Waller County--Continued

No.	Distance from Katy	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Principal water-bearing bed: Depth to top of bed (ft.)	Principal water-bearing bed: Thickness (ft.)
e/222	7 miles northwest	T. B. Tucker	--	Old	--	26	--	--
223	6¾ miles northwest	do.	Layne-Texas Co.	1928	767	16	114	26
							167	30
							304	19
							328	14
							426	16
							465	22
224	5½ miles northwest	L. E. Morrison	--	--	--	--	592	41
							691	22
225	do.	do.	Layne-Texas Co.	1929	643	24	--	--
							160	11
							204	10
							313	36
e/226	4¼ miles northwest	Campbell & Jones	W. M. Justman	1930	470	16	385	60
							527	48
e/227	6 miles west northwest	American Rice Milling Co.	Layne-Texas Co.	1927	900	--	605	15
							--	--
e/228	7½ miles west northwest	Morris Gassner	do.	1908	432	24	62	102
							360	60
							80	35
							120	30
e/229	4½ miles west northwest	C. J. Ritter	do.	1906	464	9-5/8	206	12
							375	15
							413	19
							87	15
d/230	3 miles west northwest	Francis Young	-- Olsen	1922	273	26	388	32
							429	12
231	5 miles west	Texas Co., Pipe Line	--	--	--	--	449	15
							70	153
e/232	4¼ miles west	Shell Pipe Line Corp.	--	1929	128	6	233	40
							--	--
e/233	3¼ miles west	John Alt	--	1927	256	12	--	--
							130	40
							210	46
234	2 miles west	John Copo	I. W. Lawson	1909	545	24	98	47
							172	50
							471	44
e/235	do.	do.	do.	1932	--	--	--	--
236	1¼ miles west northwest	W. J. Alderson	--	1904	174	48	--	--
e/237	¾ mile west northwest	J. A. Bartlett	I. W. Lawson	1909	545	24	--	--

a/ Bench mark is point from which water-level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

b/ T, turbine; A, air; C, centrifugal; J, jack; B, rope and bucket; E, electric; G, gasoline engine (includes tractors); F, fuel oil engines; W, windmill; H, hand.

c/ P, public; I, irrigation; Ind, industrial; RR, railroad; D, domestic; S, stock; N, not used.

No.	Height of bench mark above (+) ground (ft.) a/	Water level: Below bench mark (ft.)	Water level: Date of measurement	Pump and kind and amount of power b/	Use of water c/	Remarks
222	1	47.8	Apr. 28, 1931	None	N	
223	½	49.2	Feb. 10, 1931	T,E, --	I	Temperature 71° F. Estimated yield 1,400 gallons a minute, June 12, 1931. Casing; 115 feet of 16-inch, 93 feet of 12-inch and 8-inch to bottom. Screens set at 117 to 145, 165 to 198, 304 to 343, 425 to 445, 467 to 488, 596 to 630 and 693 to 714 feet.
224	--	--	--	J,H	D,S	Shallow well for domestic use.
225	--	52 g/	Apr. 1929	T,E, 60	I	Yield 950 gallons a minute, Aug. 18,1932. Casing; 125 feet of 24-inch, and 12-inch to bottom. Screens set at 155 to 165, 201 to 211, 321 to 341, 381 to 443, 529 to 572 and 607 to 628 feet.
226	--	--	--	T,E	D,S,I	Yield 1,910 gallons a minute, August 23, 1931.
227	--	--	--	None	N	
228	0	55.5	Sept.30, 1931	None	N	Reported yield when drilled, 905 gallons a minute.g/ Casing; 60 feet of 24-inch and 9 5/8-inch to bottom. Screened at 80 to 100, 133 to 152, 207 to 227, 377 to 396 and 416 to 432 feet.
229	--	--	--	None	N	Casing; 464 feet of 9 3/8-inch. Screens set at 88 to 102, 340 to 420, 429 to 464 feet. Well reported as caved and abandoned.
230	--	--	--	T,F, --	I	Yield, 470 gallons a minute, Aug. 1, 1932. Casing; 68 feet of 26-inch and 12-inch to bottom.
231	--	--	--	J,E, --	Ind	
232	--	--	--	J,E, 5	Ind	
233	--	--	--	T,E, 40	I	Casing; 256 feet of 12-inch. Screens set at 130 to 170 and 210 to 256 feet. Yield, 1,080 gallons a minute, Aug. 11, 1932.
234	½	46.7	Mar. 12, 1931	T,E, 30	I	Yield 560 gallons a minute, Aug. 11, 1932. Casing; 65 feet of 24-inch, 159 feet of 12-inch and 292 feet of 8¼-inch set at 516 feet. Screens set at 106 to 142, 182 to 219 and 454 to 511 feet.
235	--	--	--	--	--	New well being drilled to replace well 234 which has caved.
236	--	--	--	T,E, 30	D,S,I	Casing; 60 feet of 48-inch, with one 8¼-inch and one 11 5/8-inch well in bottom of pit. Yield, 510 gallons a minute, Aug. 18, 1932.
237	--	--	--	T,E, 40	I	Yield, 430 gallons a minute, Aug. 10, 1932.

d/ For analysis of water see under well number in table of analyses.
e/ No field tests made on water from this well.
f/ Taylor, T. U., Underground waters of Coastal Plain of Texas; U. S. Geological Survey Water-Supply Paper 190, 1907.
g/ Reported by driller.

Records of field tests of samples from wells in Waller County, Texas (Analyzed by Samuel F. Turner. Parts per million. For records of wells see corresponding numbers in well tables.)

Well No.	Owner	Date of collection	Depth of well (ft.)	Hardness as $CaCO_3$ [a]	Chloride (Cl)	Sulphate (SO_4) [b]
1	E. F. O'Connor	-	23	400	170	10
2	T. D. Woods	-	135	90	15	5
3	do.	-	62	360	100	5
4	E. F. O'Connor	-	80	360	65	10
5	H. Kloecker	-	40	200	230	25
6	C. E. T. Hicks	-	45	180	250	20
7	A. H. Deweese	-	55	380	330	15
8	Negro church	-	30	410	380	45
11	A. Kloecker	Apr. 14, 1931	40	2,000	2,500	400
12	do.	-	60	500	190	15
13	-- Spurley	-	50	75	50	10
14	E. M. Taylor	-	57	1,000	800	40
15	George Bennett	-	50	85	25	3
16	-- Spurley	-	47	550	400	25
17	H. C. Stephens	-	60	750	700	70
18	Charley Marshall	-	30	480	150	20
19	Vivian Harris	-	50	500	240	10
20	-	-	60	400	175	20
51	W. E. Cook	-	60	100	70	3
52	A. Karsteter	-	50	85	75	5
53	-- Dawson	-	110	75	20	3
54	R. A. Hooker	-	60	70	40	1
56	School (Fields)	-	40	85	85	7
57	R. H. Jones	-	36	30	30	7
58	W. A. Bradbury	-	90	35	35	2
59	do.	-	20	80	60	30
60	Cordell's Mill	-	150	200	50	10
61	John Rodgeson	-	67	210	270	7
62	F. F. Sneigi	Aug. 10, 1932	51	140	80	20
63	T. B. Stephenson	-	52	210	220	2
64	T. S. Dinkins	-	42	270	230	40
65	J. H. Turpin	-	50	280	360	20
66	Lisle McPherson	-	86	110	30	5
67	J. H. Turpin	-	21	170	80	35
101	Giddings Est.	-	125	125	15	10
102	G. W. Heard	-	62	150	65	7
104	-- Beard	-	40+	110	65	5
105	H. M. Cooke	-	60	35	20	10
106	E. T. Hitt	-	95	150	230	100
107	B. R. Rhems	Apr. 14, 1931	85	210	70	8
108	Texas-Louisiana Power Co.	-	868	85	55	1
110	J. S. Weatherford	-	50	320	220	35
111	Hempstead Cemetery	-	168	250	70	5
112	Southern Pacific R.R.	Nov. 7, 1931	180	150	25	10
114	-- MacDonald	-	85	55	20	10
115	D. D. Feagin	May 13, 1931	38	65	40	20
118	Mrs. H. L. Milam	Apr. 13, 1931	60	75	40	5
119	Prairie View State College	-	576	-	-	-
122	J. J. Perry	Aug. 3, 1932	50	330	100	25

a/ Hardness as calcium carbonate by the soap method.
b/ Sulphate by turbidity method and may be as much as 25 per cent in error.

Records of field tests of samples from wells in Waller County--Continued

Well No.	Owner	Date of collection	Depth of well (ft.)	Hardness as $CaCO_3$ a/	Chloride (Cl)	Sulphate (SO_4) b/
123	-	-	40	550	210	15
124	Mrs. Bob Robinson	-	70	300	75	2
125	Judge Hardy	-	-	150	150	50
126	do.	-	50	450	130	200
127	do.	-	65	330	100	120
154	W. D. Weaver	May 28, 1931	68	130	115	10
155	L. L. Menke	-	105	40	30	2
156	do.	-	148	30	25	1
157	-	-	80	95	20	1
158	W. H. Carter Well 1	-	3,527	-	-	-
159	R. S. Montgomery	-	28	30	20	5
160	W. M. Brumby	-	81	45	35	1
162	Clyde Fuller	July 28, 1932	65	60	40	1
163	F. H. Wawarofsky	-	54	40	20	1
164	W. M. Pohl	-	60	15	20	2
165	W. O. Wawarofsky	-	55	30	20	1
166	Frank Wawarofsky	-	104	140	20	1
167	E. C. Boethe	-	63	150	20	3
168	H. Boethe Est.	-	54	190	70	5
170	Lizzie Davis	-	60	180	70	3
171	M. A. Dodd	-	62	15	12	1
172	do.	-	60	45	15	1
173	do.	-	50	120	35	2
175	F. S. Styers	-	32	160	50	3
176	F. A. Holik	-	57	220	25	5
177	Fritz Frey	-	48	280	140	2
178	M. E. Kerr	-	45	290	130	15
179	H. Lass	-	738	210	140	35
180	John Bonner	-	60	75	45	1
181	-- Frey	-	70	45	25	5
182	G. A. Menke	July 28, 1932	68	50	30	3
183	J. B. Adams	do.	37	60	90	1
184	A. Miller	-	74	115	40	2
202	Mrs. J. B. Adams	do.	1	140	9	5
203	do.	do.	20	450	20	8
204	Will Clemons	do.	35	750	130	5
205	Mrs. G. T. Patterson	-	30	200	18	10
206	G. L. Buller, Sr.	-	20	600	160	40
207	Texas Construction Materials Co.	-	54	450	110	40
208	Geo. Harrison	-	82	200	150	5
221	Harry Hebert	Feb. 10, 1931	524	180	50	5
223	T. B. Tucker	do.	767	140	55	5
224	L. E. Morrison	-	-	170	65	2
225	do.	Apr., 1929	643	160	55	10
230	Francis Young	-	273	180	55	5
231	Texas Co., Pipe Line	-	-	180	100	5
234	John Cope	Mar. 12, 1931	545	150	70	15
236	W. J. Alderson	-	174	240	65	2

a/ Hardness as calcium carbonate by the soap method.

b/ Sulphate by turbidity method and may be as much as 25 per cent in error.

Analyses of water from wells in Waller County, Texas

Well No.	Owner	Date of collection	Depth of well (ft.)	Total dissolved solids (calc.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)
7	A. H. Deweese	Aug. 2, 1933	55	-	-	-	-	-
14	E. M. Taylor	Aug. 19, 1932	57	1,604	-	0.07	376	24
59	W. A. Bradbury	Aug. 5, 1933	20	114	-	-	8	5.5
65	J. H. Turpin	do.	50	-	-	-	-	-
107	B. R. Rehms	Aug. 19, 1932	85	237	-	0.21	58	6.1
108-A	Texas Louisiana Power Co.	Jan. 2, 1930	2/ 485-518	517	29	3/ 15	40	11
108-B	do.	Jan. 6, 1930	2/ 687-723	451	-	3/ 20	50	7.5
115	I. I. Feagin	Aug. 2, 1933	38	139	-	0.13	15	6.1
119	Prairie View State College	1930	576	309	10	-	34	11
120	do.	Mar. 24, 1928	571	415	33	-	36	5.5
159	R. S. Montgomery	Aug. 9, 1933	28	66	-	0.72	2.8	1.6
162	Clyde Fuller	Aug. 19, 1932	65	115	-	0.12	8.0	5.1
230	Francis Young	Aug. 1, 1932	273	240	-	0.02	63	5.9

1/ Sum of constituents reported.
2/ Collected while drilling; total depth of well 868 feet.

(Parts per million. Well numbers correspond to numbers in table of records of wells.)

Well No.	Sodium and potassium (Na-K) (calc.)	Bicarbonate (HCO_3)	Sulphate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Total hardness as $CaCO_3$	Analyst
7	-	89	12	340	11	363	Margaret D. Foster
14	189	352	71	770	0.25	1,038	Do.
59	24	31	7.8	30	23	43	Do.
65	-	40	8	388	313	321	Do.
107	25	168	7	53	5.3	170	Do.
108-A	138	390	6.7	85	-	145	Curtis Laboratories
108-B	115	372	10	66	-	156	Do.
115	21	23	9.3	30	46	63	Margaret D. Foster
119	70	255	23	36	-	130	National Supply Co.
120	111	336	30	34	-	113	International Filter Co.
159	19	18	9.9	18	6.3	14	Margaret D. Foster
162	29	48	2	41	6.0	41	Do.
230	24	220	2	37	0.15	182	Do.

3/ Iron and aluminum oxides.

	Thickness (feet)	Depth (feet)
Driller's log of well 1[illegible]		
A. Weaver Number 1.		
Sand	2	2
Clay	10	12
Rock	2	14
Clay	3	17
Gypsum	3	20
Rock	1	21
Clay	9	3[illegible]
Gypsum	3	33
Clay and rock	104	137
Gumbo	33	170
Rock	2	172
Hard shale	16	188
Sand	19	207
Gumbo	3	210
Shale	8	218
Sand	8	226
Shale, gumbo and rock	65	291
Gypsum	2	293
Sand	27	320
Gumbo	6	326
Hard shale	14	340
Rock	4	344
Shale and gumbo	129	473
Gypsum	12	485
Hard sand	20	505
Rock	4	509
TOTAL DEPTH		1363
Driller's log of well 55		
W. F. Maxwell Number 2.		
Sand and clay	16	16
Sand	6	22
Sandy clay	96	118
Clay and boulders	22	140
Gumbo	204	344
Hard sand	10	354
Gumbo	18	372
Hard sand	11	383
Gumbo	25	408
Hard sand	10	418
Gumbo	78	496
TOTAL DEPTH		1200
Driller's log of well 103		
Roy Chapman Number 1.		
Clay	20	20
Sand	20	40
Clay	30	70
Sand	35	105
Clay	45	150
Black rock	4	154
Clay	33	187
Sand and shells	73	260
Shale	85	345

	Thickness (feet)	Depth (feet)
Driller's log of well 103--Continued		
Sand	59	404
Shale	36	44[illegible]
Sand and gravel	3[illegible]	47[illegible]
Gummy shale	6[illegible]	53[illegible]
Sand	3[illegible]	56[illegible]
Shale	54	614
Gumbo	46	66[illegible]
Shale	68	728
Hard sand	6	734
Gumbo	36	77[illegible]
Broken chalk and rock	20	79[illegible]
Shale	215	1005
Sand, strong gas showing	20	1025
Gummy shale	8	1033
Broken chalk and sand	8	1041
Sandy shale	64	1105
Sand	32	1137
Sandy shale	18	1155
Sand	10	1165
Sandy shale	35	1200
TOTAL DEPTH		2640
Driller's log of well 108		
Texas-Louisiana Power Co., owner.		
Soil	2	2
Clay	47	49
Coarse sand	38	87
Clay	20	107
Fine sand	12	119
Clay	8	127
Soft rock	9	136
Clay	34	170
Rock	1	171
Clay	8	179
Rock	1	180
Sand	31	211
Rock	1	212
Sand, hard layers test No. 1 static level 5[illegible] feet	60	272
Rock	1	273
Gumbo	84	357
Sand	19	376
Gumbo	12	388
Sand	14	402
Gumbo	26	428
Sand	19	447
Gumbo	34	481
Sand, test No. 2 static level 63 feet	33	514
Gumbo	169	683
Sand, test No. 3 static level 45 feet	36	719
Gumbo	149	868

	Thickness (feet)	Depth (feet)
Driller's log of well 120		
Prairie View State College Number 2.		
Surface soil	20	20
Red sand	60	80
Clay	220	300
Soft rock	1	301
Packed sand	30	331
Clay	23	354
Hard rock	1	355
Clay	90	445
Rock (?)	38	483
Sand	50	533
Clay	17	550
Sand	21	571
Driller's log of well 158		
W. H. Carter Number 1.		
Surface sand	10	10
Clay	40	50
Sand	30	80
Gravel	5	85
Gumbo	19	104
Sand	51	155
Gumbo	80	235
Shale and sand	39	274
Gumbo	42	316
Sand	41	357
Gumbo	83	440
Rock	5	445
Gumbo	8	453
Rock	12	465
Gumbo	23	488
Shale	14	502
Gumbo	137	639
Rock	1	640
Gumbo	60	700
Shale and boulders	45	745
Gumbo	303	1048
Boulders	20	1068
Gumbo	41	1109
Sand and shale	21	1130
Shale streaked with sand	15	1145
Gumbo	286	1431
Gypsum	8	1439
Rock	2	1441
Shale, rock and gypsum	59	1500
Water sand	35	1535
Shale and boulders	40	1575
TOTAL DEPTH		3527
Driller's log of well 169		
H. Laas oil test.		
Yellow clay	24	24
Red clay	19	43
Water sand, flowed	121	164
Sand rock	21	185
Blue gumbo	58	243
Dry sand	12	255
Blue gumbo	16	271
Sand and boulders	63	334
Blue gumbo, and sand rock	228	562
Sandy shale	7	569

	Thickness (feet)	Depth (feet)
Driller's log of well 169--Continued		
Sand and shale	10	579
Blue gumbo	4	583
Sand and shale	6	589
Blue gumbo	22	611
Sand and shale	59	670
Blue gumbo	12	682
Gray sand	9	691
Gray lime rock	8	699
Blue gumbo	70	769
Blue sand	12	781
Blue gumbo	114	895
Sandy shale	7	902
Blue gumbo	8	910
Hard sand rock	13	923
Sand and shale	4	927
Blue gumbo	5	932
Sand and shale	7	939
Blue sand	25	964
Blue gumbo	21	985
Blue sand	5	990
Blue gumbo	18	1008
Blue sand	10	1018
White shale	--	1018
Driller's log of well 174		
John R. Young Number 1.		
Surface soil	25	25
Sand	10	35
Water sand	12	47
Clay	2	49
Sand	7	56
Clay	5	61
Gravel and sand	18	79
Clay	17	96
Gumbo	8	104
Sand and boulders	10	114
Gumbo	12	126
Hard sand	17	143
Gumbo	15	158
Sand	26	184
Gumbo	31	215
Sticky shale	14	229
Sand	23	252
Gumbo	30	282
Sand	1	283
Gumbo and boulders	13	296
Gumbo	11	307
Sand	1	308
Hard sand	7	315
Gumbo	27	342
Sandy shale and boulders	29	371
Rock	2	373
Hard sand	3	376
Gumbo	35	411
Brown gumbo	82	493
Gray sand	11	504
Soft water sand	22	526
Gumbo	9	535
Hard sand	5	540
Blue gumbo and shale	26	566
Gumbo	55	621
Blue-gray soft sand	42	663
Boulders and gumbo	37	700
Sand and shale	7	707

(Continued on next page)

	Thickness (feet)	Depth (feet)
Driller's log of well 174--Continued		
Tough hard gumbo	51	758
Gumbo and lime	26	784
Hard rough sand	9	793
Gumbo	80	873
Hard sand rock	3	876
Sand and boulders	43	919
Hard gumbo	89	1008
TOTAL DEPTH		2088
Driller's log of well 179		
H. Laas, owner.		
Clay	18	18
Sand	16	34
Red clay	2	36
Coarse sand	35	71
Gravel	5	76
Clay, rock and shale	64	140
Gravel and sand	35	175
Clay	3	178
Rock, sand and gravel	4	182
Clay	6	188
Sand	3	191
Rock and blue gumbo	6	197
Rock and sand	23	220
Sand, shale and gumbo	60	280
White sand	20	300
Blue gumbo	110	410
Hard rock	1	411
Blue sand	36	447
Hard lime rock	1	448
Red sand and clay	38	486
Green sand	2	488
Hard lime	24	512
Gray sandy shale	178	690
Sand	42	732
Blue gumbo	2	734
Blue sand	4	738
White gumbo	--	738
Driller's log of well 201		
J. R. Garrett, Number 1.		
Clay	20	20
Sand	18	38
Clay	10	48
Sand	15	63
Red gumbo	12	75
Yellow gumbo	20	95
Gravel	4	99
Gumbo	36	135
Sand	6	141
Gumbo	25	166
Blue shale	4	170
Lime rock	6	176
Gravel	6	182
Lime rock	15	197
Gumbo	6	203
Gumbo and lime	62	265
Gravel	12	277
Gumbo	8	285
Sand	71	356
Gumbo and lime	168	524
Hard packed sand	12	536
Soft sand	11	547
Hard packed sand	2	549
Gumbo, lime and shale	73	622
Lime rock	3	625
Blue shale, lime and brown gumbo	106	731
Blue sandy shale and lime	18	749
Blue gumbo and lime	24	773
Lime and sandy shale	29	802
Sandy lime rock and pyrites	4	806
Blue sandy shale	3	809
Sticky shale	4	813
Packed sand	4	817
Blue shale	23	840
Driller's log of well 225		
L. E. Morrison, owner.		
Sandy soil	2	2
Clay	15	17
Sand	10	27
Clay	27	54
Coarse sand	25	79
Clay	10	89
Sand and gravel	12	101
Gumbo and clay	35	136
Rock	3	139
Tough gumbo	21	160
Sand and coarse gravel	11	171
Rock	1	172
Clay	20	192
Rock	2	194
Clay	10	204
Coarse sand, good	10	214
Tough gumbo	76	290
Sand	8	298
Tough gumbo	15	313
Fine sand	18	331
Rock	1	332
Fine sand	17	349
Tough gumbo	8	357
Rock	1	358
Gumbo	27	385
Sand, medium coarse	60	445
Gumbo	6	451
Shale	12	463
Tough gumbo	24	487

(Continued on next page)

Table of Drillers' Logs, Waller County--Continued

	Thickness (feet)	Depth (feet)
Driller's log of well 225--Continued		
Sand	12	499
Gumbo	8	507
Sand	10	517
Gumbo	10	527
Coarse packed sand, good	48	575
Gumbo and shale	30	605
Sand	15	620
Rock	1	621
Sand and rock	22	643
Driller's log of well 234		
John Cope, owner.		
Soil and clay	18	18
Sand	27	45
Clay	6	51
Sand	21	72
Red clay	26	98

	Thickness (feet)	Depth (feet)
Driller's log of well 234--Continued		
Sand and gravel	47	145
Clay	9	154
Pack sand	12	166
Tough clay	6	172
Sand and gravel	50	222
Boulders and clay	6	228
Honey-combed rock	32	260
Sand	10	270
Honey-combed rock and clay	86	356
Sand	29	385
Shale	54	439
Hard sand and rock	32	471
Sand and gravel	44	515
Gumbo	30	545