FLORIDA GEOLOGICAL SURVEY

REPORT OF INVESTIGATIONS NO. 23

GEOLOGY AND GROUND-WATER RESOURCES of MARTIN COUNTY, FLORIDA

WILLIAM F. LICHTLER

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REPORT OF INVESTIGATIONS NO. 23

GEOLOGY AND GROUND-WATER RESOURCES OF MARTIN COUNTY, FLORIDA

By
WILLIAM F. LICHTLER
U. S. Geological Survey

Prepared by the
UNITED STATES GEOLOGICAL SURVEY
in cooperation with the
FLORIDA GEOLOGICAL SURVEY
and the
CENTRAL AND SOUTHERN FLORIDA FLOOD CONTROL DISTRICT

TALLAHASSEE, FLORIDA
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LETTER OF TRANSMITTAL

Florida Geological Survey

Tallahassee

May 16, 1960

MR. ERNEST MITTS, *Director*
FLORIDA STATE BOARD OF CONSERVATION
TALLAHASSEE, FLORIDA

DEAR MR. MITTS:

The Florida Geological Survey will publish as Report of Investigations No. 23 a report on the "Geology and Ground-Water Resources of Martin County, Florida." This report was prepared as a cooperative study between the U. S. Geological Survey, the Central and Southern Florida Flood Control District and the Florida Geological Survey. Mr. William F. Lichtler wrote the report and included an inventory of wells, which was made by Mr. E. W. Bishop in 1953.

Both non-artesian shallow formations and artesian deep formations yield water to wells in Martin County. The shell and sand deposits of the Anastasia formation are probably the chief aquifer of the shallow ground water. Eocene limestones, that are very permeable and which compose the Floridan aquifer, are separated from the shallow aquifers by sediments of low permeability. The data contained in this report is necessary for the continued development of water resources in the area.

Respectfully yours,

ROBERT O. VERNON, *Director*

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GEOLOGY AND GROUND-WATER RESOURCES OF MARTIN COUNTY, FLORIDA

By

WILLIAM F. LICHTLER
U. S. Geological Survey

ABSTRACT

Martin County, in the southeastern part of peninsular Florida, comprises an area of about 560 square miles. It is in the Atlantic Coastal Plain physiographic province and includes parts of the Atlantic Coastal Ridge, the Eastern Flatlands, and the Everglades. Land-surface altitudes range from mean sea level to 86 feet above. The slope of the land surface is gentle except in the sandhill regions in the eastern part of the county.

The average annual rainfall in Martin County ranges from about 56 inches at Stuart to about 48 inches at Port Mayaca. The average annual temperature at Stuart is 75.2°F.

Formations penetrated by wells in Martin County include the Avon Park limestone and the Ocala group,[1] of Eocene age; the Suwannee limestone, of Oligocene age; the Hawthorn formation and possibly the Tampa and Tamiami formations, of Miocene age; the Caloosahatchee marl, of Pliocene age; and the Anastasia formation and the Pamlico sand, of Pleistocene age.

There are two major aquifers in Martin County: (1) the shallow (nonartesian) aquifer, 15 to 150 feet below the land surface, and (2) the Floridan (artesian) aquifer, 600 to 1,500 feet below the land surface. The Anastasia formation is probably the principal source of ground water in the shallow aquifer. Permeable parts of the Avon Park limestone and the Ocala group compose the principal producing zones of the Floridan aquifer. The two aquifers are separated by a thick section of sand and clay of low permeability.

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[1]The stratigraphic nomenclature used in this report conforms generally to the usage of the Florida Geological Survey. It conforms also to the nomenclature of the U. S. Geological Survey, except that Ocala group is used in this report instead of Ocala limestone, and Tampa formation is used instead of Tampa limestone.

At most places along the Atlantic Coastal Ridge open-end wells 60 to 130 deep can be constructed in thin rock layers or shell beds of the shallow aquifer. Some wells are screened at depths ranging from 15 to 60 feet. In the eastern part of the Eastern Flatlands, the geologic and hydrologic conditions are similar to those of the Atlantic Coastal Ridge. The rock layers wedge out in the central part of the county, and it is difficult to obtain large quantities of potable water at most places in the western part of the county. In the Indiantown area, a shell bed at a depth of 95 feet is the principal source of large ground-water supplies.

Most of the recharge to the shallow aquifer is supplied by rainfall within Martin County. Water from the shallow aquifer is discharged by outflow into streams, canals, and other surface-water bodies, by evapotranspiration, and by pumping. The principal recharge to the artesian aquifer in central and southern Florida is from rainfall in the topographically high areas centered in Polk and Pasco counties. Water is discharged from the Floridan aquifer in Martin County mostly through flowing wells.

Yields from wells in the Floridan aquifer range from about 10 to 750 gpm (gallons per minute). Yields from wells in the shallow aquifer range from a few gallons per minute to more than 500 gpm. The coefficients of transmissibility and storage of the shallow aquifer differ at different locations and depths, thus indicating that the composition of the aquifer is not uniform. Transmissibility coefficients obtained from test data range from 16,000 to 83,000 gpd (gallons per day) per foot, and storage coefficients range from 0.0001 to 0.0065.

Chemical analyses of 56 water samples from Martin County indicate that the water from the shallow aquifer, although hard, is generally of good quality. The water from the artesian aquifer is highly mineralized. Temperatures of water range from 70 to 82° F in the shallow aquifer and range from 75° to 91 F in the artesian aquifer.

Recent salt-water encroachment in the shallow aquifer has occurred on Hutchinson Island, Jupiter Island, and Sewall Point and in some coastal areas on the mainland. In some areas of western Martin County the lower part of the shallow aquifer contains salt water that entered the aquifer when the present land surface was under the sea, during the Pleistocene epoch. Sea water that entered the Floridan aquifer during that time is responsible also for much of the high mineral content of the artesian water.

Most of the water used for public, domestic, and industrial supplies and much of the irrigation and stock water is obtained

from the shallow aquifer. The water from the artesian aquifer is used for irrigation, stock watering, and swimming pools.

INTRODUCTION

LOCATION AND EXTENT OF AREA

Martin County is an area of about 560 square miles in the southeastern part of peninsular Florida. It is bounded by the Atlantic Ocean on the east, Lake Okeechobee and Okeechobee County on the west, St. Lucie County on the north, and Palm Beach County on the south. It includes all or parts of Townships 37-40 South and Ranges 37-43 East, and it lies between 26°57′24″ and 27°15′46″ north latitude and 80°4′49″ and 80°40′40″ west longitude (fig. 1). Martin County was established in 1925 from the northern part of Palm Beach County and a small part of St. Lucie County.

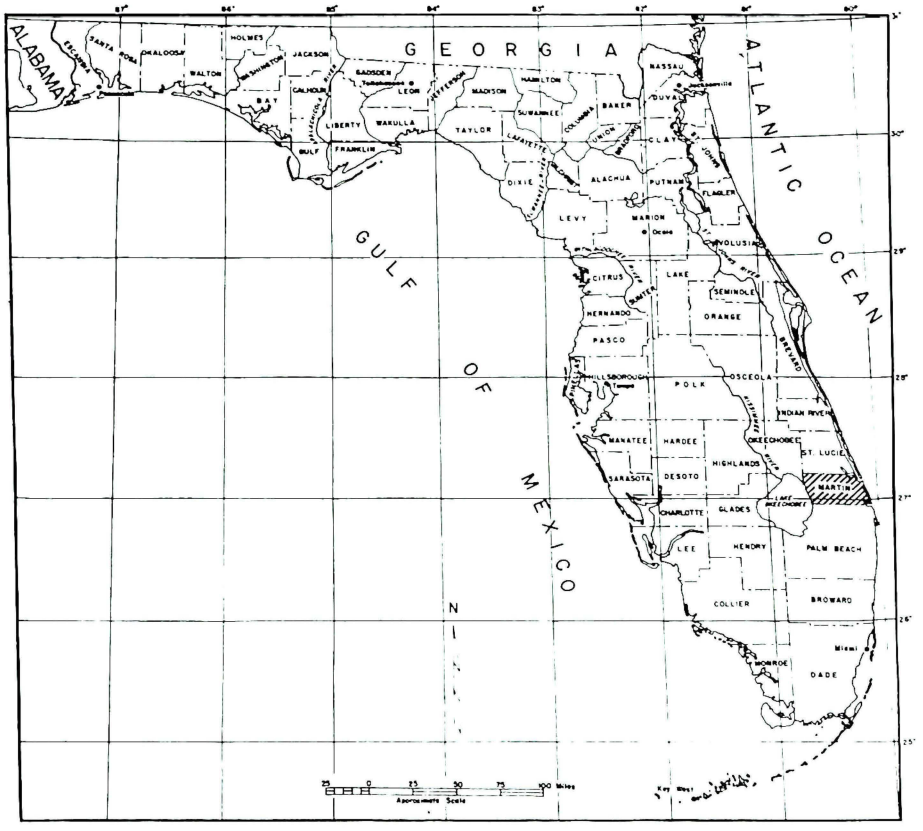


Figure 1. Location of Martin County.

PURPOSE AND SCOPE OF INVESTIGATION

The extensive and expanding use of ground water for domestic, municipal, industrial, and irrigation supplies has resulted in the need for a thorough understanding of the geology and ground-water hydrology of Martin County.

A preliminary inventory of wells was made during 1953 by E. W. Bishop, formerly of the U. S. Geological Survey. Further hydrologic and geologic data were collected by William F. Lichter during 1956-57, and the major part of the fieldwork was completed by June 1957. The investigation included a determination of the occurrence, movement, quantity, and quality of the water in the

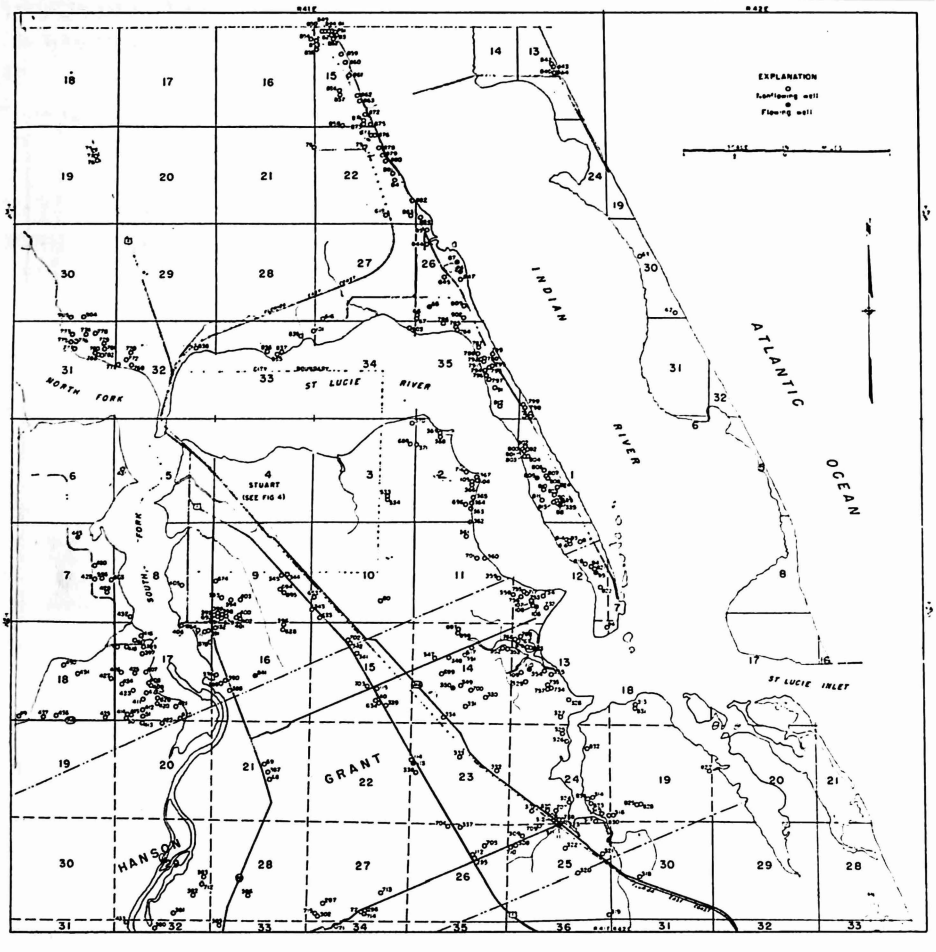


Figure 3. Northeastern part of Martin County showing the location of wells.

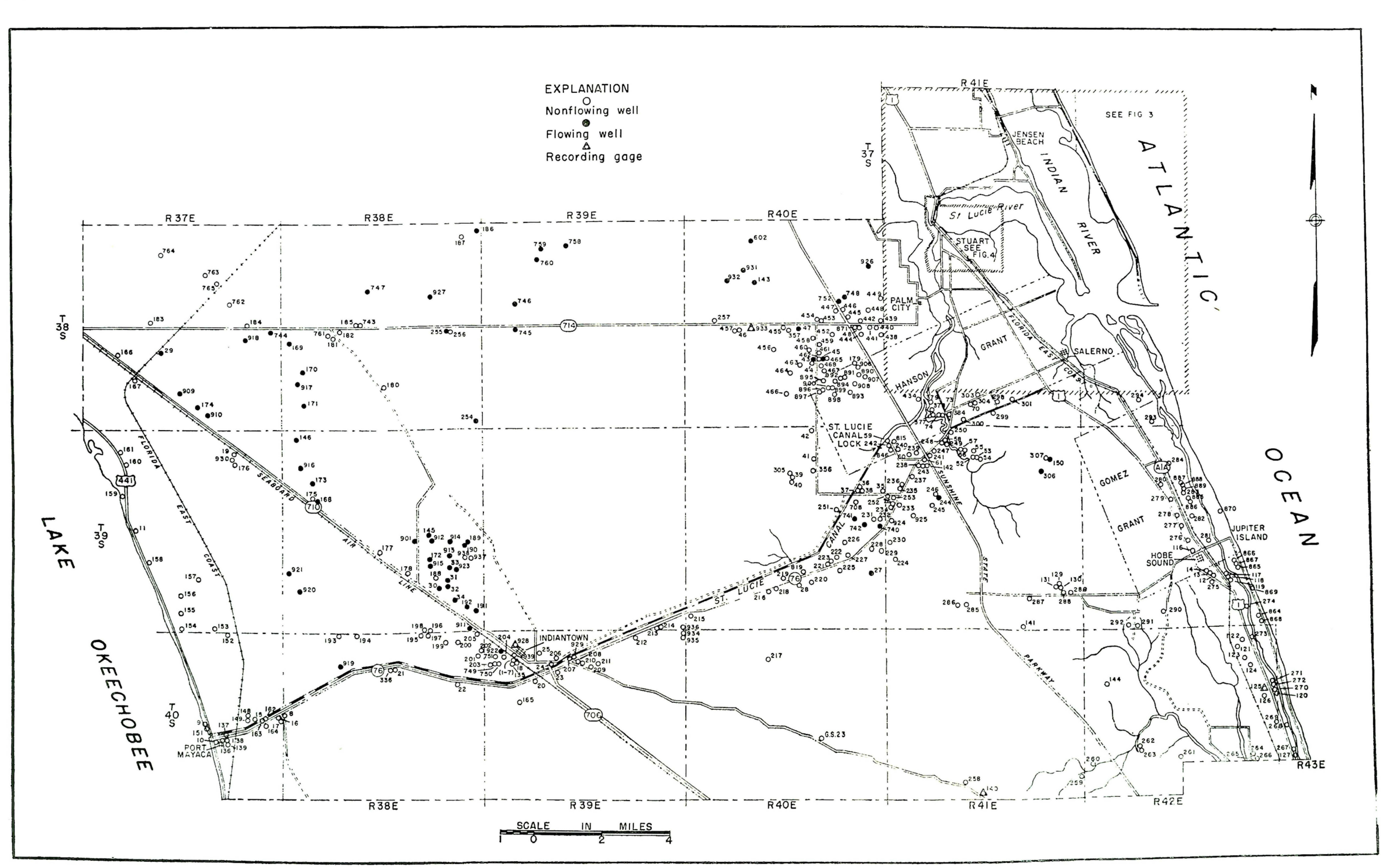


Figure 2. Location of wells.

nonartesian and artesian aquifers, and a study of the subsurface geology of the area. Part of the field investigation included an inventory of 939 representative wells in the county (figs. 2-4).

The investigation was under the general supervision of A. N. Sayre, then Chief of the Ground Water Branch, U. S. Geological Survey, Washington, D. C., M. I. Rorabaough, District Engineer, Tallahassee, Florida, Dr. Herman Gunter, then State Geologist and Director of the Florida Geological Survey, and under the direct supervision of Howard Klein, Geologist in charge of the Miami office. The Florida Geological Survey and the Central and Southern Florida Flood Control District cooperated with the Federal Survey in this study, which is part of a continuing program designed to appraise the ground-water resources of the State of Florida.

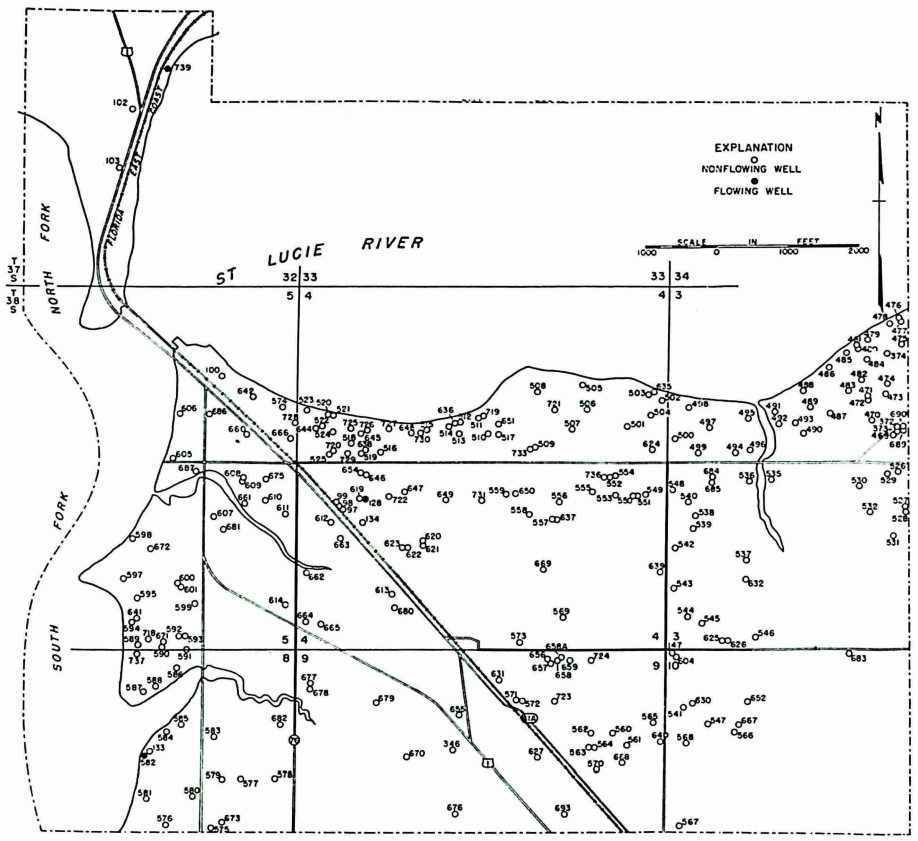


Figure 4. City of Stuart showing the location of wells.

PREVIOUS INVESTIGATIONS

A detailed study of the water resources of an area of about 25 square miles, in and adjacent to the city of Stuart, is contained in a report by Lichtler (1957) entitled, "Ground-Water Resources of the Stuart Area, Martin County, Florida."

Brief references to the geology or ground-water hydrology of Martin County were made by Matson and Sanford (1913, p. 176, 381-384), Mansfield (1939, p. 29-34), Parker and Cooke (1944, p. 41), Cooke (1945, p. 223, 269), and Parker, Ferguson, and Love (1955, p. 174-175, 814-815). Stringfield (1936, p. 170, 183, 193) in his discussion of artesian water in the Florida peninsula, refers to selected deep, flowing wells in Martin County.

References to water levels in Martin County were made in U. S. Geological Survey Water-Supply Papers 1166 (1950, p. 80-81), 1192 (1951, p. 65), 1222 (1952, p. 77), 1266 (1953, p. 80), 1322 (1954, p. 84), and 1405 (1955, p. 87). Data on the quality of water in Martin County are contained in reports by Collins and Howard (1928, p. 193-195, 220-221), Black and Brown (1951, p. 13), and Black, Brown, and Pearce (1953, p. 2, 5).

ACKNOWLEDGMENTS

Appreciation is expressed to the many residents of Martin County who furnished information about their wells, and to various public officials of the county. Special acknowledgment is given to the following well drillers of the area: Douglass Arnold, Stuart; William Athey, Fort Pierce; George Dansby, Wauchula; and McCullers and Raulerson, Vero Beach, who furnished logs of wells and permitted sampling and observation during drilling operations. Special appreciation is extended to Captain Bruce Leighton for his cooperation in allowing his wells; pumps, and other facilities to be used for pumping tests.

GEOGRAPHY

TOPOGRAPHY AND DRAINAGE

Martin County lies within the Atlantic Coastal Plain physiographic province of Meinzer (1923, pl. 28). The county is subdivided into three physiographic regions: (1) Atlantic Coastal Ridge, (2) Eastern Flatlands, and (3) Everglades (Davis 1943, p. 8). Each is a region in which a certain similarity of topography or relief prevails or a certain soil type or vegetation cover is

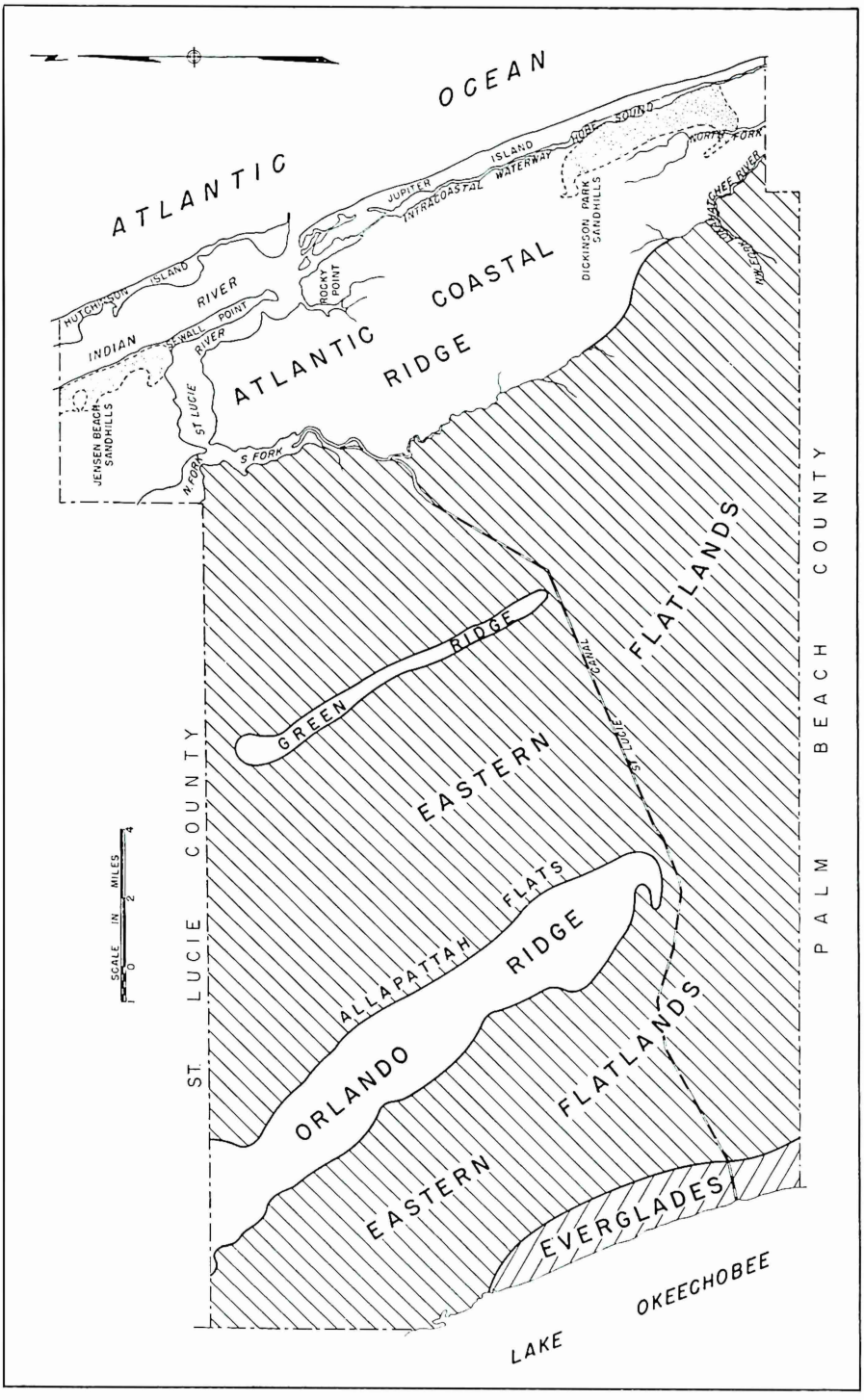


Figure 5. Physiographic subdivisions of Martin County.

common. Figure 5 is a map of Martin County showing the outline of these physiographic subdivisions.

Land-surface altitudes in Martin County range from mean sea level, in areas adjacent to the shoreline or tidal streams, to about 85 feet above mean sea level on the tops of a few sandhills along the coastal ridge. The sandhill areas in Jonathan Dickinson State Park, in the southeastern part of the county, and the Jensen Beach area north of Stuart are characterized by relatively great relief. The remainder of the county is virtually flat, and surface altitudes range from about 15 to 45 feet above mean sea level.

The St. Lucie River, the Loxahatchee River, and Lake Okeechobee form the major drainage basins within the county. The St. Lucie Canal is designed primarily to convey flood waters from Lake Okeechobee to the south fork of the St. Lucie River. After entering the St. Lucie River the water flows northward, eastward, and southward through the coastal ridge to the Indian River and then discharges into the Atlantic Ocean. Flow in the St. Lucie Canal is controlled by a lock and dam structure 1½ miles upstream from the confluence of the canal and the south fork of the St. Lucie River. The north and south forks of the St. Lucie River drain a major part of eastern Martin County, and their drainageways form part of the boundary between the Atlantic Coastal Ridge and the Eastern Flatlands. The Loxahatchee River drains a smaller area in the southeastern part of the county and forms part of the boundary between the coastal ridge and the flatlands. The several small streams that drain the western part of Martin County flow westward to Lake Okeechobee. The Allapattah Flats east of the Orlando Ridge (fig. 5) is a wide, poorly defined drainageway which remains marshy during most of the year. In general, drainage is to the southeast through canals.

ATLANTIC COASTAL RIDGE

The Atlantic Coastal Ridge in Martin County parallels the present coastline and varies in width from about three miles in the southeast corner of the county to about six miles in the central coastal area, and to about four miles in the northern area (fig. 5). The backbone of the coastal ridge is generally less than a mile wide and includes: (1) the sandhills of Jonathan Dickinson State Park, where altitudes are as high as 86 feet above mean sea level; (2) a lower ridge, which parallels the Intracoastal Waterway to Rocky Point with altitudes of about 25 to 35 feet above mean sea

level; (3) Sewall Point which rises to 37 feet above mean sea level; and (4) the sandhills of Jensen Beach, which rise to 80 feet above mean sea level. The St. Lucie River breaches the coastal ridge between Rocky Point and Sewall Point. The high sandhills of the coastal ridge are sand dunes built upon old beach ridges (Parker and others, 1955, p. 145). These dunes are quiescent and support growths of bunch grass, pines, and palmettos. They were formed during the Pleistocene epoch and are in nearly parallel rows inland from the present shore.

From the top of the ridge the land slopes eastward to Hobe Sound, the Intracoastal Waterway, and the Indian River. Westward from the top of the ridge the land slopes to what F. Stearns MacNeil (1950, p. 19), called "the Pamlico Intracoastal Waterway." In Martin County this ancient waterway is now occupied by the drainage basins of the north and south forks of the St. Lucie River and the north and northwest forks of the Loxahatchee River.

Hutchinson Island and Jupiter Island were probably formed as offshore bars during a high stand of the sea. They are now separated from the mainland by the shallow waters of the Indian River, Hobe Sound, and the Intracoastal Waterway. These bodies of water are usually less than six feet deep, but they are as much as nine feet deep in places. The land surface on Hutchinson Island ranges from mean sea level to 19 feet above, and is generally less than 10 feet. The land surface on Jupiter Island ranges from mean sea level to about 30 feet above, and is generally less than 20 feet.

The coastal ridge is blanketed by relatively permeable fine to medium sand. Drainage of the ridge is chiefly underground through the surface sands. Shallow depressions in the sandy ridge are occupied by intermittent ponds which flood during rainy seasons and dry up during dry seasons. These ponds are elongate in the direction of the axis of the ridge.

Because of the good subsurface drainage and the relatively high altitudes, the coastal ridge is flooded less frequently than inland areas, and the population and industry of the county have concentrated in the coastal areas.

EASTERN FLATLANDS AND ORLANDO RIDGE

The Eastern Flatlands occupy all the area from the Atlantic Coastal Ridge westward to the Everglades and Lake Okeechobee. This is a monotonously flat region with the exception of the

elongated ridge that MacNeil (1950, p. 103) calls the Orlando Ridge (fig. 5), and the narrow elongate ridge referred to on U. S. Geological Survey topographic quadrangle maps as Green Ridge. The altitude of the Orlando Ridge in Martin County ranges from about 30 to 50 feet above mean sea level, the highest altitude being near the southern part of the ridge. The altitude of Green Ridge is lower than that of Orlando Ridge, ranging from 30 to 35 feet above mean sea level. The altitude of the land surface in the remainder of the Eastern Flatlands generally ranges from slightly less than 20 feet above mean sea level to 30 feet above mean sea level.

In the area north of the St. Lucie Canal, the Eastern Flatlands rise gradually from the valley of the St. Lucie River to Green Ridge. West of Green Ridge the land surface is extremely flat, having an average altitude of 28 feet above mean sea level and a very slight slope to the south. West of the Orlando Ridge the Eastern Flatlands slope gently to the Everglades and the shore of Lake Okeechobee.

Immediately east of the Orlando Ridge is the poorly defined drainageway or slough which is called Allapattah Flats on U. S. Geological Survey topographic quadrangle maps, and Allapattah Marsh by Davis (1943, p. 43). The land-surface altitude along the Allapattah Flats is about 26 or 27 feet above mean sea level. Drainage from the Flats is ill defined, but is usually toward the southeast. Occasionally, during high-water stages some water may flow northward. The divide between the northward and southward flow probably shifts according to the relative surface-water stages north and south of the Flat.

South of the St. Lucie Canal the surface of the Eastern Flatlands rises gently toward the west from the valleys of the south fork of the St. Lucie River and the northwest fork of the Loxahatchee River to a broad crest south of the Orlando Ridge and then gradually slopes downward in a southwest direction to the edge of the Everglades. The altitude of the crest is about 25 feet above mean sea level.

Drainage throughout the Eastern Flatlands is chiefly underground, through the fine surface sands. Both surface and subsurface drainage is very sluggish, owing to the flatness of the land, and ponds are formed throughout most of the region during the rainy season. Surface drainage in the area east of Green Ridge is effected by the tributaries of the St. Lucie River. West of Green Ridge the drainage is ill defined, but in general, it is southward to the St. Lucie Canal or eastward through breaks in

Green Ridge. Drainage west of the Orlando Ridge is to streams flowing westward and southwestward to the Everglades and Lake Okeechobee. Because of the flatness of the land, drainage canals are frequently required in farming and ranching operations.

EVERGLADES

The Everglades, in general, is a flat region covered by organic soils formed by the growth and decay of saw grass. The narrow strip of the Everglades (fig. 5) in the southwestern part of the county, bordering Lake Okeechobee, is almost indistinguishable from the Eastern Flatlands. The boundary between the Everglades and the Flatlands is poorly defined, as the organic soils of the Everglades and the quartz sands of the Flatlands are intermixed. The Everglades area is maintained in a condition suitable for extensive agriculture by means of water control measures employing dikes, drainage canals, and a levee at the shore of Lake Okeechobee.

The maximum width of the Everglades area in Martin County is about 1½ miles. The altitude of the land surface ranges from about 15 feet above mean sea level at the shore of Lake Okeechobee to about 20 or 22 feet where the Everglades merges with the Eastern Flatlands.

TERRACES

During warm interglacial stages of the Pleistocene epoch the sea level was higher than at present, and parts of Florida were covered by the ocean. Whenever the sea level remained relatively stationary for a long period, wave and current action formed a virtually flat surface on the ocean floor. During glacial stages the sea retreated to lower levels, and the flat surfaces emerged as marine terraces having a slight seaward dip. The landward margin of such a terrace is the abandoned shoreline, which in some places is marked by a scarp.

Cooke (1945, p. 245-248, 273-311) postulated the existence of seven terraces which correlate with different levels of the sea during Pleistocene time. The Pamlico terrace, at 9 to 25 feet above mean sea level, the Talbot terrace, at 25 to 42 feet, and the Penholoway terrace, at 42 to 70 feet are within the range of land-surface altitudes in Martin County; however, the writer could

find no evidence of a shoreline scarp at the 25-foot, 42-foot, or 70-foot altitude.

F. S. MacNeil (1950, p. 99) states: "The Pamlico shoreline also is well preserved. The toe of the scarp along certain intracoastal shores is close to 40 feet, but the highwater mark was probably a little lower than the toe. The 30-foot contour was selected to show the coastal features of the Pamlico coast and is probably correct within 7 or 8 feet for the Pamlico sea level. An altitude higher than 30 feet is more likely than a lower altitude."

There is a pronounced scarp in Martin County at about 30 to 35 feet above mean sea level that fits the above description by MacNeil. It appears that the Orlando Ridge was a narrow peninsula or series of islands and shoals during Pamlico time, when the sea level was 30 to 35 feet higher than it is at present, and Green Ridge was an offshore bar with its crest at about sea level.

The Atlantic Coastal Ridge probably is of pre-Pamlico origin and was dissected and otherwise modified by the advance of the Pamlico sea. The high sandhills in the vicinity of Jensen Beach and Jonathan Dickinson State Park are believed to be remnants of an extensive area of sandhills that once covered the Atlantic Coastal Ridge in Martin County. A study of the topographic maps of the area shows that the north and south boundaries of the dune areas are sharply defined and have spitlike structures projecting westward (fig. 5). These features, plus the relatively high altitude of the sandhills, seem to indicate the possibility of a pre-Pamlico origin of the sandhills. The relative softness of the water from the dune areas (p. 55) lends support to this theory. It may be that water is softer in the sandhill areas because those areas were exposed to the leaching action of infiltrating rainfall for a longer period of time than most of the rest of Martin County.

CLIMATE

The climate of Martin County is subtropical, having an average annual temperature of 75.2°F. Rainfall is seasonal as 64 percent occurs during the rainy season from June through October. The average annual rainfall at Stuart is 56.15 inches (table 1).

During the summer and early fall the rain usually falls in heavy showers that cover a small area. Short-term rainfall records, therefore, are valid only in the immediate vicinity of a particular station.

TABLE 1.—Average Monthly Temperature and Rainfall in Martin County

Month	Temperature at Stuart[1] (°F)	Rainfall at Stuart[2] (inches)	Rainfall at St. Lucie Canal Lock[3] (inches)	Rainfall at Port Mayaca[3] (inches)
January	66.5	1.92	2.11	1.35
February	67.9	2.41	2.13	1.58
March	70.6	2.81	3.03	2.78
April	74.3	3.25	4.00	3.33
May	77.6	4.61	4.91	3.37
June	81.3	6.47	7.65	6.84
July	82.3	6.41	7.41	6.76
August	82.8	5.47	7.36	7.01
September	81.6	9.08	8.76	7.49
October	77.7	8.44	7.14	4.85
November	71.9	2.23	2.85	1.93
December	68.1	2.18	2.07	1.38
Yearly average	75.2	56.15	59.42	48.67

[1]U.S. Weather Bureau discontinuous record 1933-57.
[2]U.S. Weather Bureau discontinuous record 1935-57.
[3]U.S. Corps of Engineers record 1925-57.

POPULATION AND DEVELOPMENT

There are three incorporated towns in Martin County: Stuart, the county seat, is the largest; Jupiter Island is next in size; and Sewall Point, which was incorporated in 1957, is the smallest. In addition, there are several unincorporated communities including Jensen Beach, Rio, Salerno, Palm City, Hobe Sound, and Indiantown. In the 1950 census, Stuart had a population of 2,892 and Martin County had a total population of 7,665, most of which was concentrated along the Atlantic coast. During the winter tourist season the population of the county approximately doubles.

The tourist industry and agriculture are both very important to the economy of Martin County. The most important crops are citrus and other fruits and winter vegetables, including beans, tomatoes, cabbage, peppers, squash, eggplant, watermelons, lettuce, and cucumbers. Potatoes, corn, sugarcane, timber, forage crops, beef and dairy cattle, hogs, and poultry also are important.

Commercial fishing is important in Martin County, as is sport fishing, which is one of the leading attractions for the tourist industry.

The principal mineral resources of the county are sand, shell, marl, and peat.

GEOLOGY

Because the source, occurrence, movement, quantity, quality, and availability of ground water are directly related to the geology of the region, a study of the geology of the county was an essential part of this investigation.

GEOLOGIC FORMATIONS AND THEIR WATER-BEARING PROPERTIES

The igneous and metamorphic rocks that form the basement complex in peninsular Florida are covered in Martin County by approximately 13,000 feet of sedimentary rocks, most of which are of marine origin. In Martin County, the predominant rock types at depths below 700 feet are limestone and dolomite, but sediments above that depth are chiefly sand, silt, and clay. The deepest water wells in the county penetrate about 1,500 feet of sediments, which include the Avon Park limestone and limestones of the Ocala group, of Eocene age; the Suwannee limestone, of Oligocene age; the Hawthorn formation and possibly the Tampa and Tamiami formations, of Miocene age; the Caloosahatchee marl, of Pliocene age; and the Anastasia formation and the Pamlico sand, of Pleistocene age.

The Avon Park limestone is the oldest formation in Martin County for which geologic data are available, although there have been reports of wells penetrating the older Lake City limestone, of middle Eocene age. Most artesian wells in Martin County end in the Avon Park limestone, and most wells in the shallow aquifer probably end in the Anastasia formation.

EOCENE SERIES

Formations of the Eocene series known to have been penetrated by deep wells in Martin County include the Avon Park limestone and the Ocala group.

Avon Park limestone. The Avon Park limestone in Martin County shows lithologic changes both vertically and laterally. Generally it is a cream to tan, hard to medium soft, rather pure, chalky to finely crystalline limestone. It is differentiated from overlying and underlying formations primarily by its fossil content. The most important index fossils are foraminifers, including

Coskinolina floridana, Lituonella, Rotalia avonparkensis, Flintina avonparkensis, Valvulina avonparkensis, Spirolina coryensis, Dictyoconus cookei, Dictyoconus gunteri, and *Textularia coryensis.* The small echinoid *Peronella dalli,* which is an excellent index fossil of the Avon Park limestone in some areas of Florida, was noted in cuttings from a few deep wells in Martin County.

The thickness of the Avon Park limestone in Martin County is not known, because no wells are known to penetrate it completely. On the basis of well studies in nearby counties, however, it is estimated to be at least 400 feet thick.

Current-meter tests made in Martin County (see description of artesian aquifer, p. 35) show that highly permeable zones of the Avon Park limestone are separated by less permeable zones.

Where the salt content of its water is not excessive the Avon Park limestone is a good source of water for irrigation.

Ocala group. The Ocala limestone, of late Eocene age (Cooke, 1945, p. 53; Applin and Jordan, 1945, p. 130), was subdivided by Vernon (1951, p. 113-115), in descending order, into Ocala limestone (restricted) and Moodys Branch formation with Williston (top) and Inglis (bottom) members. Puri (1953, p. 130) raised the Williston and Inglis members to formational rank and dropped the name Moodys Branch. He also proposed the name Crystal River to replace Vernon's Ocala (restricted) and raised the name Ocala to group status to include all three formations.

Where the Ocala group is exposed, in northern Florida, the Crystal River, Williston, and Inglis formations can be distinguished by their lithology and fossil content. In Martin County only a few well cuttings are available for study; therefore, the Ocala group is not subdivided in this report.

The limestones of the Ocala group are generally granular, white to cream or slightly pink, soft to medium hard, and contain much crystalline calcite in some areas. In places the Ocala is a foraminiferal coquina composed almost entirely of tests of *Lepidocyclina, Operculinoides* and *Nummulites.* The Inglis formation, or lower part of the Ocala group, is usually characterized by an abundance of miliolid Foraminifera.

Diagnostic Foraminifera of the Ocala group include *Lepidocyclina ocalana, Operculinoides moodybranchensis, Heterostegina ocalana, Rotalia cushmani, Cibicides mississippiensis ocalanus,* and others. Further information about the fossils, stratigraphy, and zonation of the Ocala group is contained in a report by Puri (1957).

The Ocala group is generally less than 100 feet thick in Martin County, and it is only 20 feet thick at well 146. Figure 6, a contour map of the top of the limestones of the Ocala group, shows a general domelike structure in the north-central part of the county. The top of the Ocala, however, is an erosional surface, and the underlying formations do not have exactly the same configuration. Nevertheless, evidence from well logs suggests that the major features represented in figure 6 are present in the underlying Avon Park limestone. The principal purpose of the map is to show the approximate depth below sea level at which the first substantial flow of water can be expected from wells penetrating the Floridan aquifer.

Figure 6 shows a major subsurface fault having a displacement of 300 to 400 feet and a strike that is approximately parallel to and about five miles inland from the present coast. Available data are insufficient to permit determination of the exact strike, dip, and extent of the fault. There may be several faults or a wide fault zone rather than one single fault. If it is a single fault it is apparently hinged, as the dip of the top of the Ocala group west of the fault is southeast at a moderate angle but the dip east of the fault is apparently south-southwest at a much steeper angle.

The limestone of the Ocala group is generally porous and permeable and is an important part of the Floridan aquifer.

OLIGOCENE SERIES

Suwannee limestone. The Suwannee limestone is the only known formation of Oligocene age in Martin County. It lies unconformably on the eroded limestones of the Ocala group and is overlain unconformably by the Tampa formation, or by the Hawthorn formation where the Tampa is not present.

The Suwannee limestone is a cream colored, slightly porous, soft, granular mass of limy particles, many of which seem to be of organic origin. It contains very few distinguishable fossils.

The thickness of the Suwannee limestone ranges from about 20 to 60 feet on the western (upthrown) side of the fault, and from 100 to 170 feet on the eastern (downthrown) side. These differences in thickness indicate that movement along the fault probably started during late-Oligocene or post-Oligocene time and continued during post-Oligocene time when the Suwannee limestone was exposed to erosion. The downthrown block was protected from erosion; therefore, the thickness of the Suwannee limestone on the east side of the fault is greater than it is on the west side.

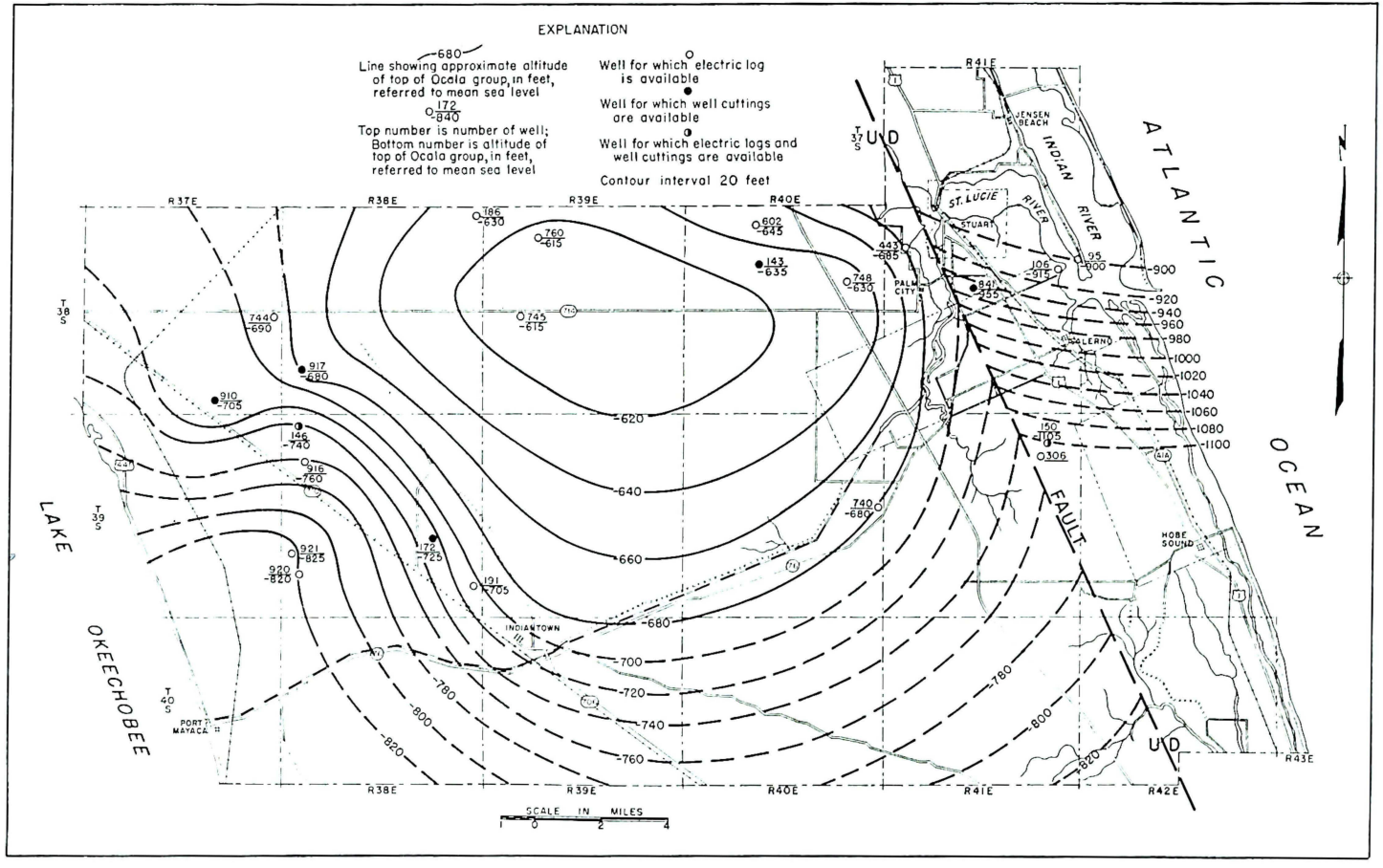


Figure 6. Approximate altitude of the top of the Ocala group in Martin County.

Additional slippage along the fault plane probably occurred during Miocene time. The faulting is probably associated with the crustal movements which formed the Ocala uplift, as discussed by Vernon (1951, p. 54-62).

The Suwannee limestone is part of the Floridan aquifer, and it yields moderate amounts of water to artesian wells. Its permeability is generally lower than that of the underlying formations, and the chloride content of the water is usually higher.

MIOCENE SERIES

The Miocene series in Martin County includes the Hawthorn formation of early and middle Miocene age and possibly the Tampa formation of early Miocene age and the Tamiami formation of late Miocene age.

Tampa formation. The Tampa formation is a fairly hard, dense, white to yellowish, very sandy limestone in the type area, near Tampa. Its presence in Martin County has not been definitely established, but about 10 to 15 feet of limestone just below the Hawthorn formation at well 841, about 2 miles south of Stuart (fig. 3, and well logs), is similar to the Tampa formation of the type area and is here tentatively correlated with the Tampa. This limestone forms the uppermost part of the Floridan aquifer in Martin County. It has moderate permeability and yields some water to artesian wells, but the chloride content of the water is generally higher than it is in water from the main producing zones of the Ocala group and the Avon Park limestone.

Hawthorn formation. The Hawthorn formation in northern Florida consists largely of gray phosphatic sand and lenses of green or gray fuller's earth (Cooke, 1945, p. 144). In Martin County the Hawthorn formation is composed of beds of dark green to white phosphatic clay containing silt and quartz sand. Thin layers of sandy phosphatic limestone and chert occur within the Hawthorn, especially in the lower part of the formation. Lenses and thin layers of phosphatic sand and shell are prevalent at some locations.

The Hawthorn formation underlies all of Martin County and probably rests conformably on the Tampa formation (where the Tampa is present) (Cooke, 1945, p. 138) or unconformably on the Suwannee or older limestones. Its contact with the overlying Tamiami formation is probably conformable.

The formation is 350 to 550 feet thick in Martin County. Its overall permeability is very low, and it serves as the confining bed

for the Floridan aquifer. It does not yield significant amounts of water to wells in Martin County.

Tamiami formation. Parker (1951, p. 823) defined the Tamiami formation as including all deposits of late Miocene age in southern Florida. In areas where there is no distinct lithologic break between the middle and upper Miocene sediments, the Tamiami formation can be separated from the Hawthorn formation only by a thorough examination of the fossils. There appears to be no distinct lithologic change between the middle and upper Miocene deposits in Martin County and its thickness and water-bearing characteristics have not been established.

POST-MIOCENE DEPOSITS

The post-Miocene deposits in southern Florida include the Caloosahatchee marl of Pliocene age and the Anastasia formation, the Fort Thompson formation, and the Pamlico sand of Pleistocene age.

Caloosahatchee marl. The Caloosahatchee marl is composed largely of sand and shells. Cooke (1945, p. 223) states: "The St. Lucie Canal cuts through the Pleistocene Anastasia formation into the Caloosahatchee marl from the entrance at Port Mayaca on Lake Okeechobee at a point about 3 miles below the Seaboard Railroad bridge at Indiantown. Throughout this distance Pliocene shell marl, some of it hard rock, has been thrown up by the dredge. . . . There are no exposures of the Caloosahatchee marl along this canal, for the Anastasia extends below water level."

The thickness of the Caloosahatchee marl in Martin County is unknown, but well 910, 15 miles northwest of Indiantown, penetrated a shell marl from 100 to 150 feet below the land surface; unfortunately, no samples were obtained from depths shallower than 100 feet.

Julia Gardner (1952, personal communication) reported that samples from the 188 to 209-foot interval in well 143, in the eastern part of Martin County, may be of Pliocene age.

Fort Thompson formation. The Fort Thompson formation as defined by Sellards (1919, p. 71-73) consists, in its type area, of alternating beds of fresh-water and brackish-water deposits as well as marine shell marl and limestone of Pleistocene age. A rock sample collected by a driller at a depth of 60 feet below the land surface, in a well north of Stuart, contains what appear to be

fresh-water gastropods; however, the rock samples collected at an equivalent depth from test well 905, north of Stuart, contained no fresh-water gastropods. In the absence of positive identification of substantial fresh-water deposits of the Fort Thompson formation in Martin County, all Pleistocene deposits below the Pamlico sand are herein tentatively assigned to the contemporaneous Anastasia formation.

Anastasia formation. The Anastasia formation differs in composition from place to place, ranging from almost pure coquina to almost pure sand. In Martin County, however, it consists mostly of sand, shell beds, and thin discontinuous layers of sandy limestone or sandstone. The Anastasia formation and the Pamlico sand are the only formations exposed in Martin County, and the Anastasia formation probably underlies the surficial Pamlico in all parts of the county where it is not exposed. The consolidated-coquina phase of the Anastasia formation crops out at Rocky Point, Jupiter Island, Hutchinson Island, and Sewall Point (fig. 5). There is evidence that the coquina is of two different ages, as it contains rounded boulders of an older coquina. The beds of coquina are probably not more than 10 to 20 feet thick, and only a few shallow wells are developed in them.

The Anastasia formation furnishes most of the fresh-water supplies east of the Indiantown area. It is probably more than 100 feet thick in the eastern part of the county, but it presumably thins to the west and pinches out or merges with the Fort Thompson formation west of Martin County.

The Anastasia lies unconformably on the Caloosahatchee marl or older formations and is overlain unconformably by the Pamlico sand. It is the principal source of fresh ground water in Martin County. The thin beds of permeable shell, limestone, or sandstone that occur at many places between 50 and 125 feet below the land surface usually yields large quantities of potable water to open-end wells. Moderate supplies of water can be obtained at most places from sandpoint wells at shallow depths.

Pamlico sand. The Pamlico sand unconformably overlies the Anastasia formation in Martin County, except in the high area of the Orlando Ridge and in the sandhills (fig. 5) where the land was not covered by the sea during Pamlico time. The Pamlico sand is only a few feet thick over most of the county, and it is probably just a thin veneer west of the coastal ridge. It is not a source of appreciable amounts of ground water in Martin County.

GROUND WATER

Ground water is the subsurface water in the zone of saturation, the zone in which all the voids of the soil or rocks are completely filled with water under greater than atmospheric pressure.

An aquifer is a water-bearing formation, group of formations, or part of a formation in the zone of saturation that is permeable enough to transmit usable quantities of water.

Ground water may occur under either nonartesian or artesian conditions. Where it only partly fills an aquifer and its upper surface is free to rise and fall, it is said to be under nonartesian conditions, and the surface is called the water table. Where the water is confined in a permeable bed that is overlain by a less permeable bed, its surface is not free to rise and fall, and water thus confined under pressure is said to be under artesian conditions. The height to which water will rise in tightly cased wells that penetrate an artesian aquifer defines the pressure or piezometric surface of the aquifer.

The zone of saturation, or ground-water zone, is the reservoir from which all wells and springs obtain their water. It is replenished by infiltration of precipitation, though not all precipitation reaches it. Some is returned to the atmosphere by evaporation and transpiration; some enters streams, lakes, oceans, or other bodies of surface water. The remainder is added to the ground-water reservoir. Ground water moves laterally under the influence of gravity to points of discharge such as springs, wells, streams, or the ocean.

SHALLOW AQUIFER

The shallow aquifer is the principal source of fresh-water supplies in Martin County. It includes the Pamlico sand, the Anastasia formation and possibly part of the Tamiami formation. The aquifer extends from the water table to about 150 feet below the land surface. It is a nonartesian aquifer composed principally of sand, but containing relatively thin beds or lenses of limestone, sandstone, or shell, which are generally more permeable than the sand. Most large-capacity wells are developed in the limestone, sandstone or shell. Some fairly large supplies of water and many small water supplies are obtained from the sand by the use of sandpoints and well screens.

The lithology of the aquifer changes laterally as well as vertically, so that the permeable beds are not always found at the same

depth; in fact, in some areas they are missing entirely. The permeable limestone, sandstone, and shell strata are more prevalent in the eastern part of the county than in the western part.

AQUIFER PROPERTIES

Atlantic Coastal Ridge. The Atlantic Coastal Ridge parallels the coastline and ranges from 3 to 6 miles in width. The crest of the coastal ridge is about a mile wide and includes the Jensen Beach sandhills, Sewall Point, Rocky Point, and the Jonathan Dickinson State Park sandhills (fig. 5).

In some places, such as Rocky Point and Sewall Point, coquina crops out, but at most places there does not appear to be any well defined rock core beneath the crest of the coastal ridge. In general, consolidated rock is first encountered at depths ranging from 40 to 60 feet below the land surface, and additional beds of consolidated rock are encountered to depths of about 150 feet. They are generally calcareous sandstones or sandy limestones in thin layers or lenses interbedded with sand and shells. In some places they are composed of masses of nodules, many of which are formed by the replacement of fossils. Very rarely can more than 5 to 10 feet of open hole be maintained below the well casing. The bottom of the shallow aquifer is about 150 feet below the land surface. The predominant materials between 150 and 750 feet are fine sand and clay, which will not yield appreciable quantities of water to wells.

Coarse sandstone was reported between depths of 40 and 60 feet in well 121, in Jonathan Dickinson State Park. (See fig. 2 for location.) Similar sandstones were reported between depths of 40 and 70 feet and depths of 95 and 117 feet in the Hobe Sound municipal well field. Well 617, south of Stuart, was drilled to 87 feet and penetrated only loose sand, except for a few rounded pieces of sandstone between 60 and 63 feet below the land surface. Well 820, at Salerno, was drilled to a depth of 166 feet and penetrated a single thin layer of sandstone at a depth of 105 feet. The remaining material was sand and fine shell fragments. Well 656, in the Stuart municipal well field, penetrated beds of limestone between depths of 52 and 88 feet and between depths of 103 and 136 feet. Well 615, near Jensen Beach, penetrated loose sand to a depth of 65 feet. A driller's log of well 80, at the Stuart airfield, reported that the well was uncased in a shell bed between depths of 72 and 80 feet. Well 841, four miles south of Stuart, penetrated limestone between depths of 82 and 87 feet and 126

and 140 feet. Well 905, north of Stuart, penetrated layers of limestone and sandstone between depths of 60 and 65 feet and 100 and 135 feet.

The foregoing data illustrate the nonuniformity of the shallow aquifer beneath the coastal ridge and the lack of continuity of the highly permeable zones. Exploratory drilling is desirable in any attempt to develop a ground-water supply in unexplored areas of the coastal ridge.

Open-end wells sometimes can be constructed in shell beds which contain loose sand and nodular sandstone. Wells are developed by pumping, or by blowing with compressed air, to remove the loose sand and finer material from the section below the casing, which thus forms a natural gravel pack around the end of the casing. The gravel pack tends to prevent further entrance of sand during normal use of the well.

In most areas of the Atlantic Coastal Ridge the sandy components of the shallow aquifer will yield potable water in quantities sufficient for domestic use. Most wells in the sand are 15 to 30 feet deep and are finished with 3- to 5-foot well points.

Eastern Flatlands, Orlando Ridge, and Everglades. The Eastern Flatlands extends throughout the major part of Martin County west of the coastal ridge (fig. 5). The thickness and character of the shallow aquifer in this area is about the same as it is on the Atlantic Coastal Ridge, but in general it does not contain as much consolidated rock.

A study of geologic samples taken during the drilling of well GS 23, 10 miles southeast of Indiantown, shows that there is no appreciable thickness of consolidated rock to a depth of 90 feet below the land surface. Well 1, drilled to a depth of 161 feet, on the Orlando Ridge at the Indiantown water plant, did not penetrate any consolidated rock. In the Indiantown area, small-diameter open-end wells can be constructed immediately below the hardpan, in permeable sand from 25 to 35 feet below the land surface. Open-end wells can be developed in shell beds from 95 to 110 feet below the land surface to yield moderate amounts of potable water.

North of Indiantown, on the Orlando Ridge, wells 937 and 938 penetrated dense sandy limestone from 126 to 196 feet below the land surface. At this interval the open hole beneath the casing will remain open even when blasted with a moderate charge of dynamite, in attempting to improve permeability. Well 937, 4 inches in diameter, is uncased between depths of 156 and 210 feet. Well 938, 3 inches in diameter, is uncased between depths of

126 and 180 feet. These two wells yielded 60 gpm (gallons per minute) and 70 gpm, respectively.

Consolidated material occurs locally at shallow depth in the Eastern Flatlands. One such location is south of the St. Lucie lock and dam (fig. 2), where many small-diameter open-end wells are constructed between 22 and 25 feet below the land surface. Consolidated material was also encountered in the vicinity of Port Mayaca, between 11 and 21 feet below the land surface.

Shell beds occur in many parts of the county but they are discontinuous and differ in thickness, character, and depth. They are more prevalent in the eastern part of the Flatlands than in the western part and are usually between 60 and 120 feet below the land surface.

As in the Atlantic Coastal Ridge, nodular sandstone is often associated with the beds of shell. Open-end wells capable of yielding relatively large quantities of water are often constructed in these beds by removing the fine material from an area around the bottom of the well and leaving the shells and rock fragments as a coarse gravel pack. Well 871, an 8-inch well at the Stuart maintenance station of the Sunshine State Parkway, yielded an estimated 500 gpm from a bed developed in this manner.

Most of the sand of the Eastern Flatlands area is of low to medium permeability, but sandpoint wells will yield enough water for most domestic needs. Where sufficient water cannot be obtained from a single well, two or more wells are sometimes connected to produce the required quantity. Most sandpoint wells are 15 to 45 feet deep and 1¼ to 2 inches in diameter.

The subsurface lithology in the Everglades is a continuation of the type of materials underlying the adjoining Eastern Flatlands area.

SHAPE AND SLOPE OF WATER TABLE

The water table is an undulating surface conforming in a general way to the topography of the land. It is higher beneath hills and ridges than it is beneath low areas and its slope is usually not as steep as the slope of the land surface. Generally, the depth to water is greater beneath the ridges than it is in the Flatlands. For example, the water level in well 837 on the Orlando Ridge is about eight feet below land surface or about 40 feet above mean sea level, and the water level in the Allapattah Flats, 1.5 miles west of the well, is above land surface or about 26 feet above mean

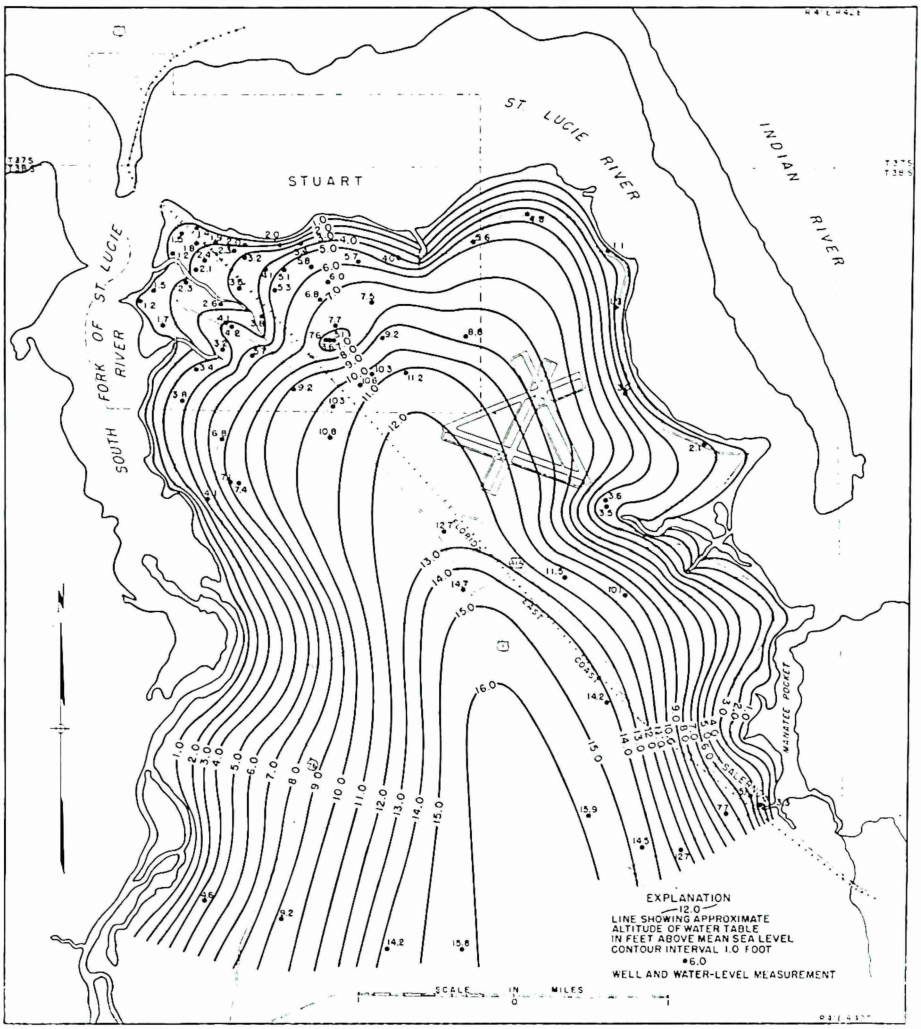


Figure 7. Water table in the Stuart area, July 6, 1955.

sea level. Most of Martin County west of the coastal ridge is relatively flat and the water table is close to the land surface.

The water levels in observation wells in the Stuart area were measured at various times to determine the altitude and shape of the water table in the area and to determine changes in ground-water storage in the aquifer.

The water table is highest in the south-central part of the Stuart area, and slopes east, north, and west toward points of ground-water discharge in the Manatee Pocket, the St. Lucie

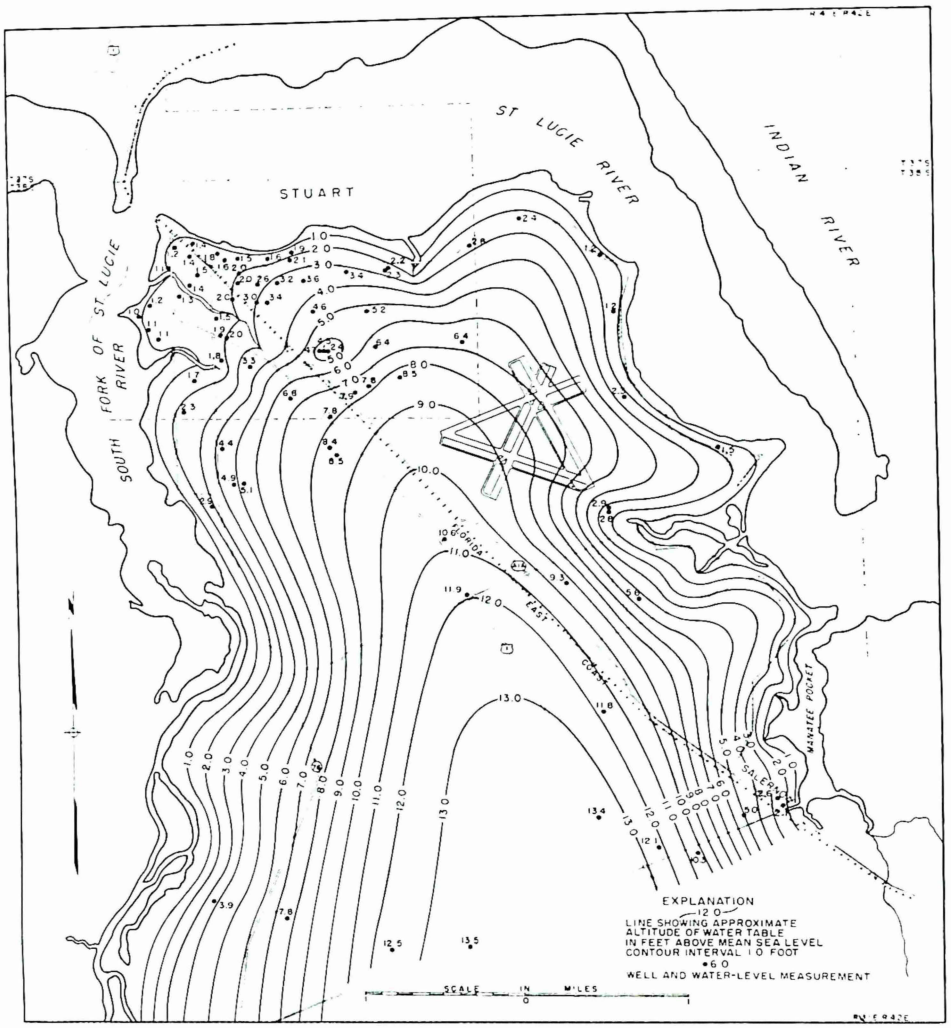


Figure 8. Water table in the Stuart area, October 5, 1955.

River, and the South Fork of the St. Lucie River (figs. 7, 8). Ground water flows approximately at right angles to the contour lines; therefore, it is apparent from figures 7 and 8 that practically all the recharge to the nonartesian aquifer in the Stuart area is derived from local rainfall. Much of the rainfall is quickly absorbed by the permeable surface sands and infiltrates to the water table. Evidence of this lies in the fact that the water level in well 656 (Stuart well field), 144 feet deep, rose 1.11 feet within 12 hours after a rainfall of 1.09 inches was recorded at Stuart. Surface

runoff generally is small, except after an exceptionally heavy rainfall.

Figures 9 and 10 show how pumping in the city well fields affects the water table. Figure 9 shows the water table on April 1, 1955, when the supply wells at the old city well fields, at the water plant and the ball park, were being pumped. Figure 10 shows the water table on May 3, 1955, when wells in the old well fields were shut down and wells in the new city well field, south of 10th Street and west of Palm Beach Road, were being pumped.

WATER-LEVEL FLUCTUATIONS

Six automatic water-level recording gages were installed on wells in Martin County. Five of the six gages, installed at different locations in the county, record data on the natural rise and fall of the water table during the year. The sixth gage, in the Stuart well field, records the natural fluctuations and the effects of pumping on the water levels (figs. 11-13). In addition, tape measurements of water level were made in many wells (table 8).

Well 125, in the sand-hills area of Jonathan Dickinson State Park, is 90 feet deep, and the water level in this well responds very slowly to rainfall, compared to the water levels in the other wells, because of the relatively greater depth to water. The water table in well 125 is 11 to 18 feet below the land surface, and downward infiltration of rainfall through the thick sand section is so retarded that the water is appreciably delayed in reaching the water table. Consequently, rainfall is added to the ground-water zone over relatively long periods.

The record from the gage on well 140 shows that the water level in this well responds more rapidly to rainfall than the water level in well 125. Well 140, 30 feet deep, is 13 miles southeast of Indiantown at the edge of a slough area in the Eastern Flatlands, and its water level usually is less than four feet below the land surface. During heavy rains the water rises as much as 2.5 feet within a few hours, because the rain has to infiltrate only a few feet to the water table. When the water table reaches the land surface, additional recharge is rejected and the excess water runs off as surface-water flow. The decline of the water table in the area of well 140 is gradual, owing to the slight slope of the water table. A large part of the water is discharged from the area by evapotranspiration, especially when the water table is within a foot of the surface. At such times, a distinct diurnal fluctuation of as much as 0.2 foot occurs.

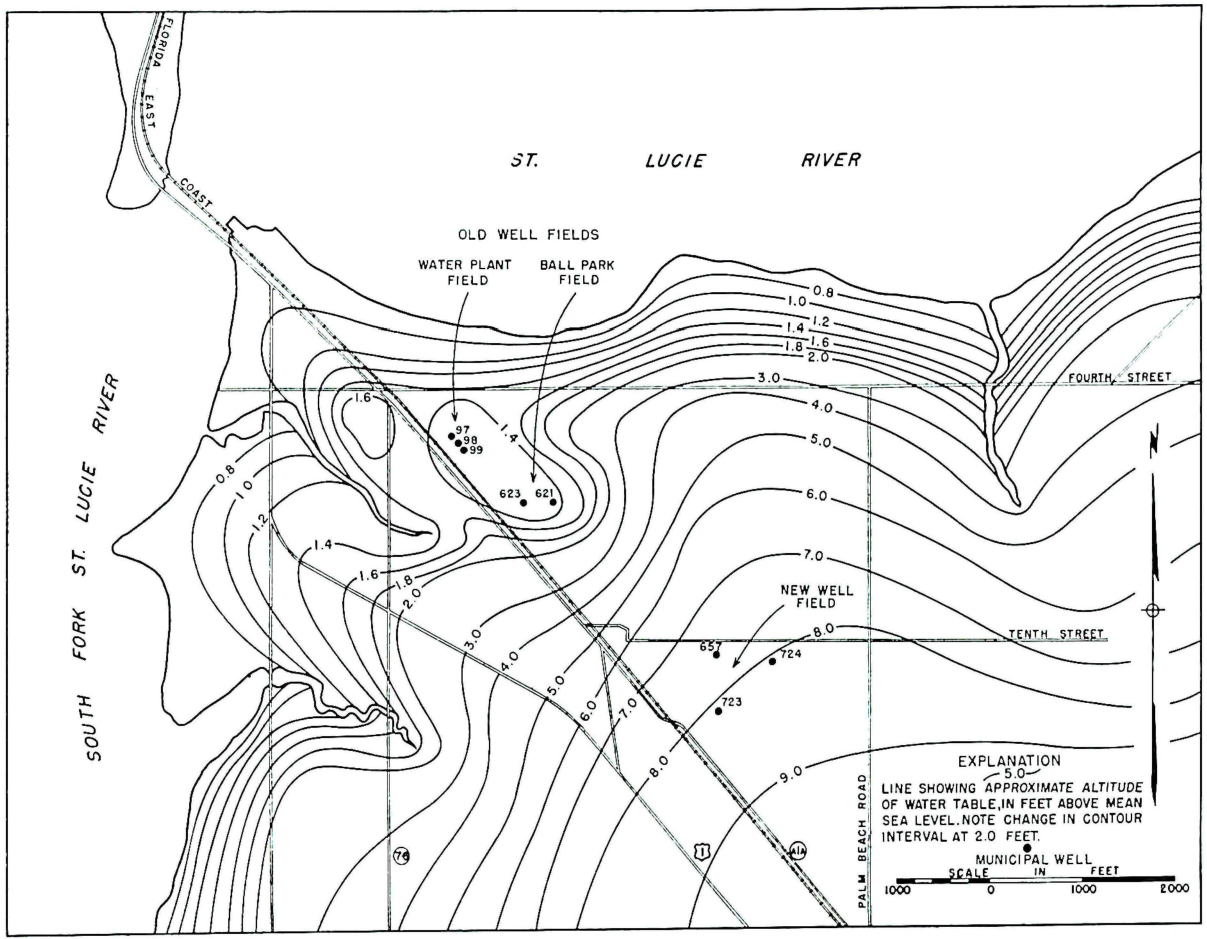


Figure 9. Water table within the Stuart city limits, April 1, 1955.

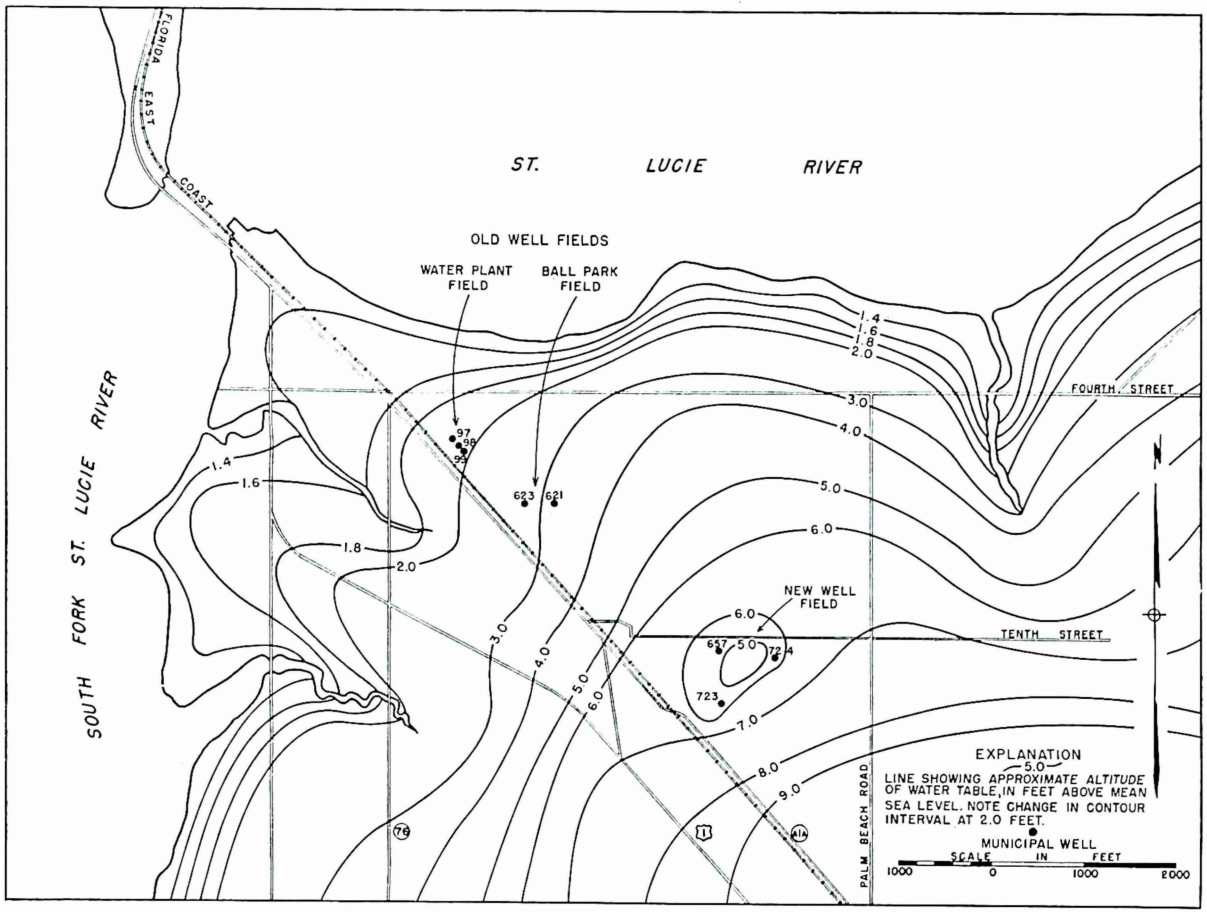


Figure 10. Water table within the Stuart city limits, May 3, 1955.

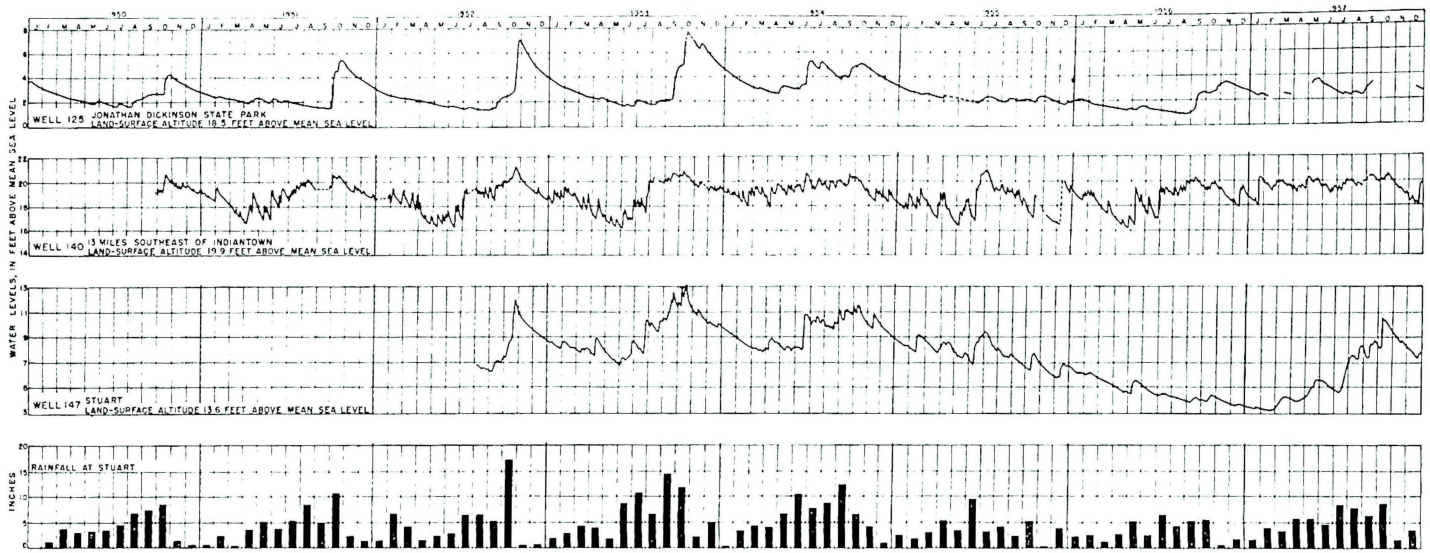


Figure 11. Hydrographs of wells 125, 140 and 147 and rainfall at Stuart.

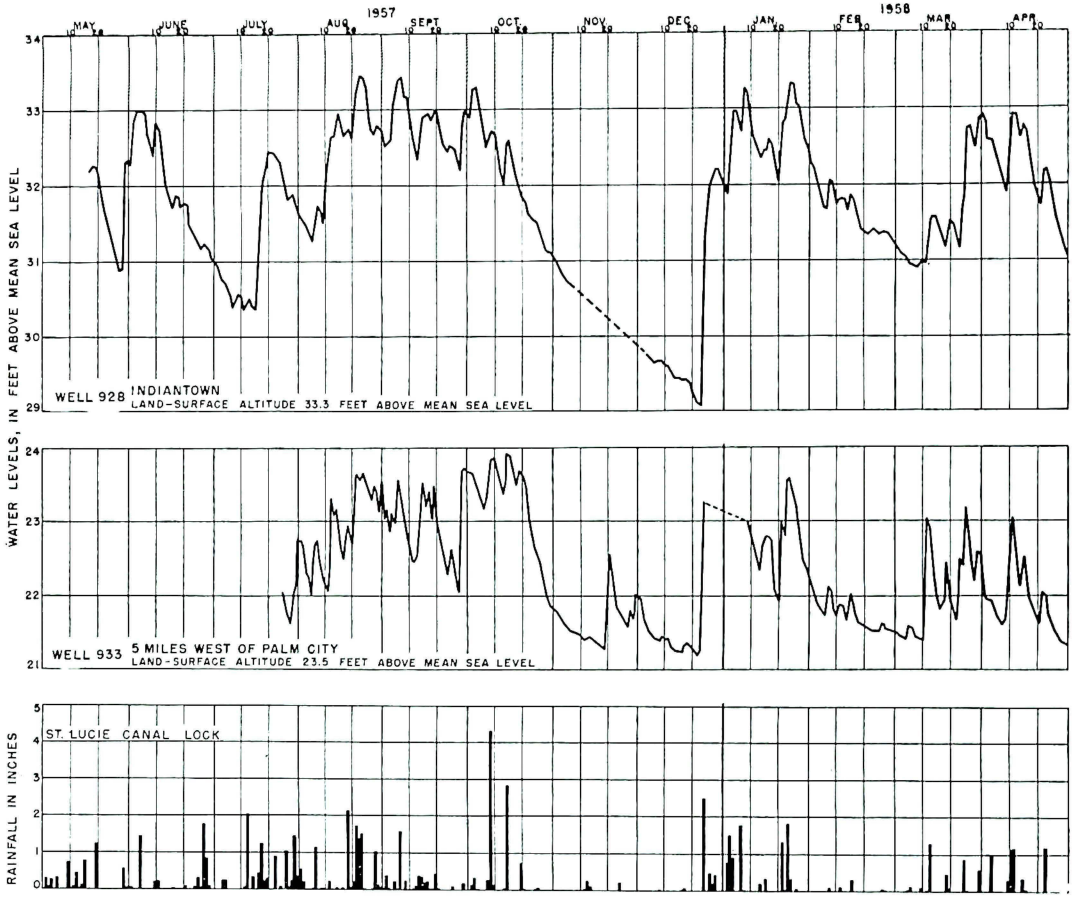


Figure 12. Hydrographs of wells 928 and 933 and rainfall at St. Lucie Canal Lock.

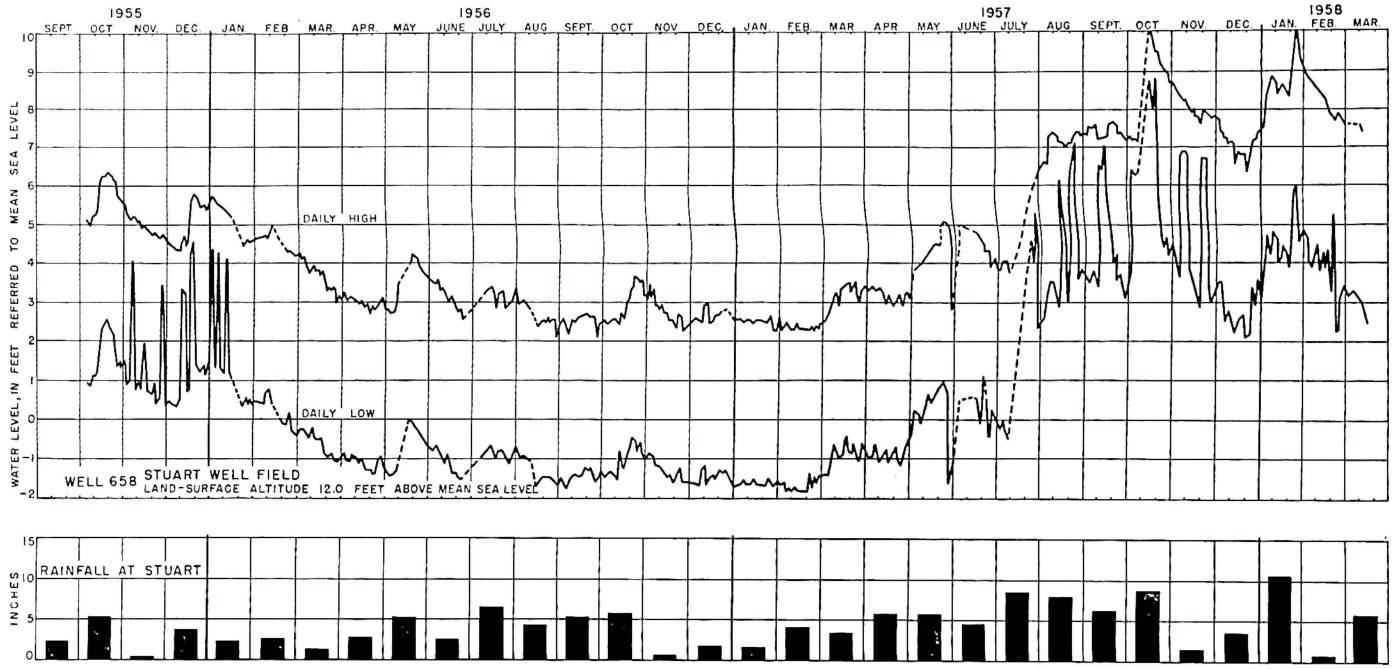


Figure 13. Hydrograph of well 658 and rainfall at Stuart.

Well 147, in the city of Stuart, is 74 feet deep, and its water level ranges from about 1 foot to 10 feet below the land surface. The material from the surface to a depth of 10 feet consists of fine to medium quartz sand. The hydrograph of this well (fig. 11) shows that the water table responds to rainfall more rapidly when it is near the surface. The record shows also a daily fluctuation of about 0.2 foot caused by pumping in the Stuart municipal well field, which is about one-quarter mile east of the well.

The gage on well 933, six miles west of Stuart, was installed in June 1957. The water level in this well is within three feet of the land surface most of the year, and it is often above the top of the ground during the rainy season (fig. 12). The well is 14 feet deep and about 50 feet from a drainage ditch. The material from the land surface to the bottom of the well is mostly fine, clean, quartz sand. The water level rises sharply (as much as 1.75 feet in an hour) because the rainfall can easily reach the water table through the permeable surface sand. The water level in the well usually drops rapidly from its peak because of the drainage effect of the nearby ditch. However, during prolonged periods of heavy rain the drainage ditch is filled and cannot accept groundwater inflow; under these conditions the water table remains high for a relatively long period.

Well 928, at Indiantown, is 11 feet deep and penetrates only fine quartz sand, except for a layer of hardpan between four and five feet below the land surface. The water level in the well fluctuates from slightly above land surface to about three feet below (fig. 12). It does not rise as fast as in well 933, probably because the surface sand is not as permeable and the vertical movement is impeded by the hardpan.

The gage on well 658, in the Stuart well field, records water-level fluctuations caused by pumping in addition to the natural fluctuations (fig. 13). Well 658 is 100 feet from a municipal supply well and about 300 feet from the center of the cone of influence caused by pumping the three municipal supply wells. The purpose of the installation is to record the progressive trend of water levels in the well field and to ascertain when they have reached equilibrium. A persistent decline eventually would expose the well field to salt-water encroachment from the St. Lucie River. Figure 13 shows the daily high and low water levels in well 658 for the period of record. The lowest point reached was 1.82 feet below mean sea level in February 1957, and the highest was 10 feet above mean sea level in October 1957 and January 1958. A study of the hydrograph reveals that the average water level does

not indicate a progressive decline at the existing pumping rate. The water levels in late 1957 and early 1958 were higher than they were shortly after the well field was put in operation, in 1955.

Comparison of the hydrograph of well 658 (fig. 13) with the daily rainfall at Stuart and the hydrograph of well 147 (fig. 11), on the edge of the well field, shows that water levels in the well field respond to changes in rainfall and reflect, in general, the natural fluctuations of water levels in the area. If hydrologic conditions remain essentially as they were during the period shown in figure 13, the well field should not be endangered by salt-water encroachment.

RECHARGE

The shallow aquifer in Martin County receives most of its recharge from rainfall in and immediately adjacent to the county. The average rainfall is about 60 inches a year, of which 65 percent occurs from June through October. Most of the county is covered by sand that is sufficiently permeable to absorb practically all the rainfall. In general, surface-water runoff is small except in the slough areas where the water table is at or above the land surface.

The hydrographs in figures 11, 12, and 13 indicate a general increase in ground-water storage due to abundant rainfall during June through October, and discharge of ground water from storage during November through April or May. A small amount of water may seep from the St. Lucie Canal during low ground-water stages; however, except near the St. Lucie locks, the water level in the canal is generally lower than the water table and ground water is discharged into the canal. A small amount of recharge to the shallow aquifer comes from the downward seepage of artesian water that was used for irrigation.

DISCHARGE

Ground water is discharged by flow into streams, springs, or lakes, by direct flow into the ocean, by evapotranspiration, and by pumping from wells. Many small streams and sloughs in Martin County discharge ground water to the Atlantic Ocean and Lake Okeechobee. In the central part of the county, where the water table is at or near the surface during most of the year, evapotranspiration is a very important means of discharge. In addition to natural means of discharge, much ground water is carried away

was reported to be too salty for irrigational use, and the well was sealed off at 1,100 feet, before its initial depth could be verified.

Most wells are cased only into the Hawthorn formation to a depth below which the driller feels the hole will stay open. This depth differs throughout the county ranging from 275 feet below the land surface, in well 443 near Palm City, to 795 feet, in well 128 in Stuart. The amount of casing in a well is generally related to the depth to the top of the Ocala group (fig. 6), but lithologic variations within the Hawthorn formation and the personal factor of the driller's judgment account for some of the differences in the length of casing in different wells.

Current-meter traverses were made in wells 748 (2 miles west of Palm City), 745 (12 miles west of Palm City), and 150 (3 miles south of Salerno) (figs. 14, 15) to determine the zones that were contributing water to the wells. A current-meter traverse in a well furnishes measurements of the velocity of the water at different depths. If the open hole that penetrates the aquifer is reasonably uniform in diameter, an increase in velocity in a particular interval indicates that water is entering the well bore within that interval. It is reasonable to assume, from the evidence gathered from lithologic and electric well logs and from observations made during the drilling of artesian wells, that the limestone of the Floridan aquifer in Martin County is fairly

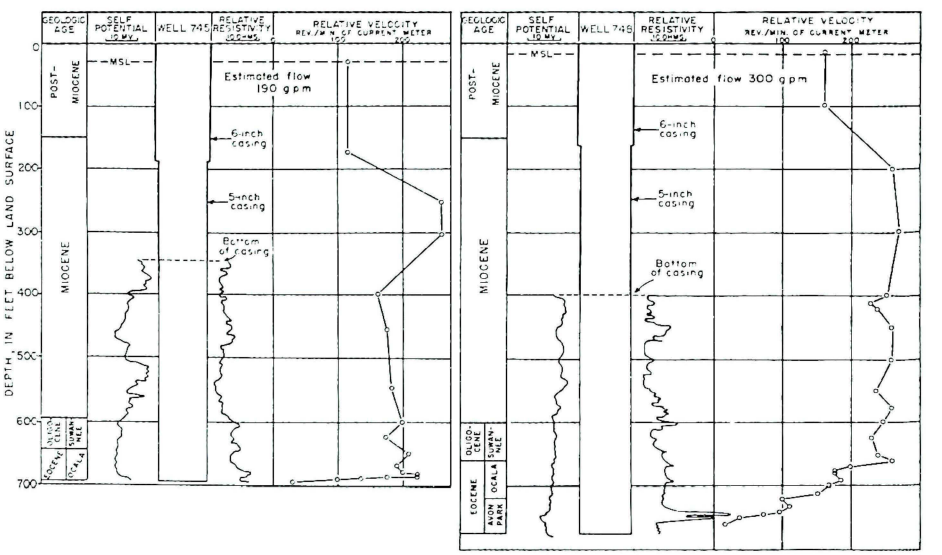


Figure 14. Data obtained from wells 745 and 748.

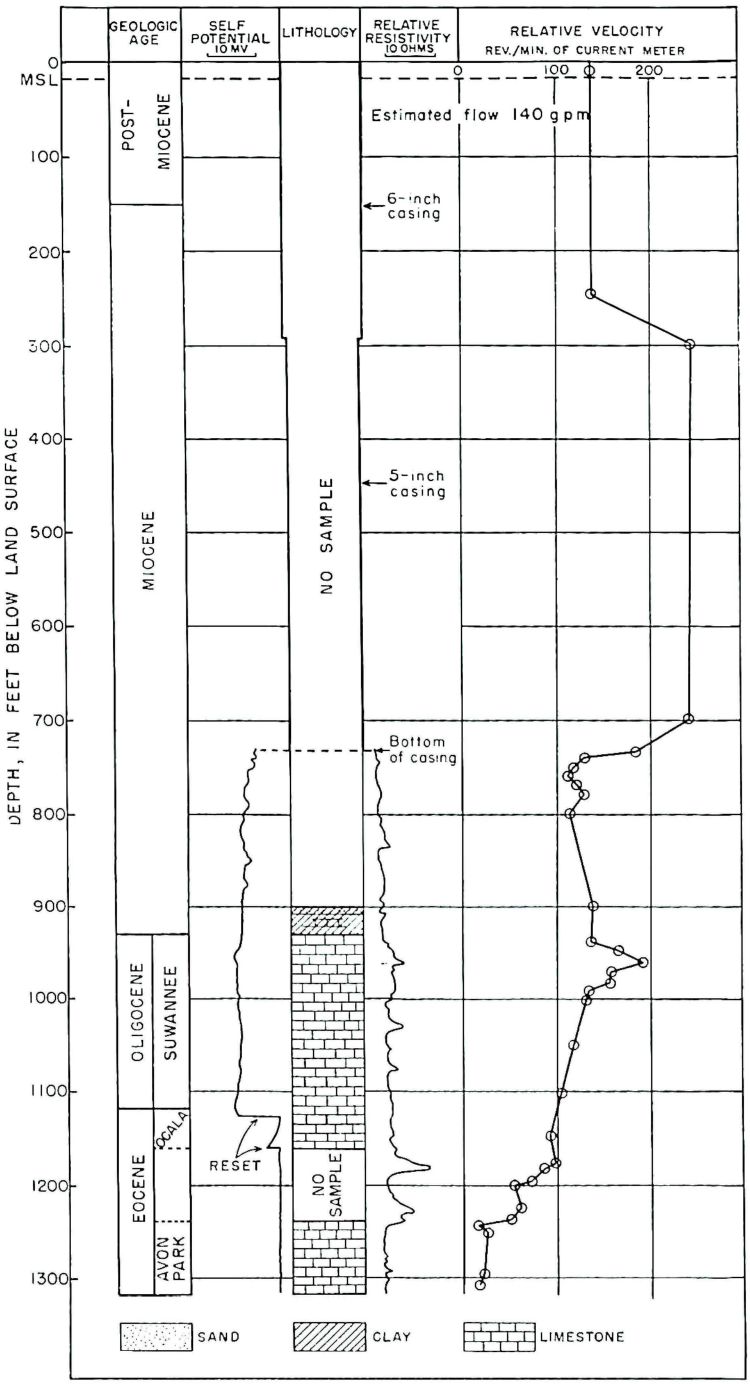


Figure 15. Data obtained from well 150.

homogeneous. The open hole is probably slightly smaller in the dense, less permeable zones than it is in the more permeable zones. This probably accounts for the small reversals in the velocity graphs of wells 748 and 150 (figs. 14, 15). By current-meter traverses it is possible to determine the main producing zones within the aquifer. If many strategically spaced wells were available for study in an area, the zones could probably be correlated. Unfortunately, there were only a few wells in Martin County of sufficient diameter to accommodate the current-meter tube.

A current-meter traverse of well 748, 2 miles west of Palm City (estimated flow 300 gpm), shows that about 30 percent of the flow enters the well between depths of 660 and 675 feet, about 25 percent between 700 and 720 feet, about 25 percent between 740 and 760 feet, and the remaining 20 percent from intervening sections and below 760 feet to the bottom of the well which is 773 feet below the land surface (fig. 14). Thus, it can be seen that about 80 percent of the water comes from 55 feet of the total 110 feet of open hole.

Well 745, 10 miles west of well 748, is 696 feet deep and has an estimated flow of 190 gpm. Nearly 100 percent of the water is entering the well between depths of 685 and 696 feet (fig. 14).

Well 150 (estimated flow 300 gpm) is located east of the fault (fig. 6). This traverse shows a different pattern of flow distribution because the producing zone is thicker than the producing zone west of the fault and the permeability is more uniform. Water is contributed to the well at a rather uniform rate throughout the part of the aquifer penetrated by the well; 18 percent of the water enters the well between depths of 960 and 970 feet, 18 percent enters between 1,235 and 1,245 feet, and the rest enters more or less uniformly from the intervening sections and between 1,245 feet and the bottom of the hole at 1,315 feet (fig. 15).

Well 841 (estimated flow 140 gpm) is south of Stuart and east of the fault line. The flow pattern in this well was noted during drilling operations and is similar to that in well 150; 20 percent of the water enters the well between depths of 820 and 830 feet, 20 percent enters between 866 and 888 feet, and the remaining 60 percent enters rather uniformly from the rest of the producing zone to the bottom of the well at 1,057 feet.

Well 910 (estimated flow 225 gpm) first began to flow at a depth of 850 feet. This well was drilled with a cable-tool machine, and only a part of the rock cuttings was cleared from the well during each bailing. The heavy drilling mud thus formed during drilling may have retarded the flow of water. The well might have

flowed at a shallower depth if all the rock cuttings had been removed from the well during drilling operations.

PIEZOMETRIC SURFACE

The piezometric surface is an imaginary surface representing the pressure head of the water confined in an artesian aquifer. It is the height to which water will rise in tightly cased wells that penetrate the artesian aquifer. In areas where the water level will rise above the land surface, the pressure head is usually measured with a pressure gage at the well outlet. The first survey of the piezometric surface of the Floridan aquifer was presented by Stringfield (1936) from data obtained in 1934. Figure 16 shows the piezometric surface of peninsular Florida, as defined by Stringfield, but revised to include the most recent data available in December 1957.

The artesian pressure head in Martin County ranges from 48 to 53 feet above mean sea level. The piezometric surface slopes in an east-southeasterly direction in Martin County; however, local cones of depression caused by relatively large withdrawals distort the regional pattern (fig. 17). The depressions in the vicinity of Palm City and Indiantown are caused by heavy use of water within these areas, and the depression in the northwest corner of the county is caused by heavy use in the southeastern part of neighboring Okeechobee County. Pressure measurements made in wells 150 and 306, in T. 39 S., R. 41 E., show a sharp drop in the piezometric surface compared to measurements made in nearby wells; however, wells 150 and 306 yield water having a relatively high salt content and, consequently, a higher specific gravity than that in other wells in the county. The column of water in wells 150 and 306 exerts a greater pressure against the aquifer than an equal column of fresh water. The pressure readings obtained at the top of these wells, therefore, do not represent the true pressure within the aquifer in terms of fresh water.

When corrections are made in accordance with the Ghyben-Herzberg principle (p. 64), to correlate the pressures observed in wells 150 and 306 with the pressures in areas where the water has less salt, the adjusted pressure head is about 48 feet. This pressure is consistent with the regional slope of the piezometric surface (fig. 16).

The piezometric surface is higher than the water table in all parts of Martin County. It is also above the land surface, except on the tops of some of the sandhills in the eastern part of the

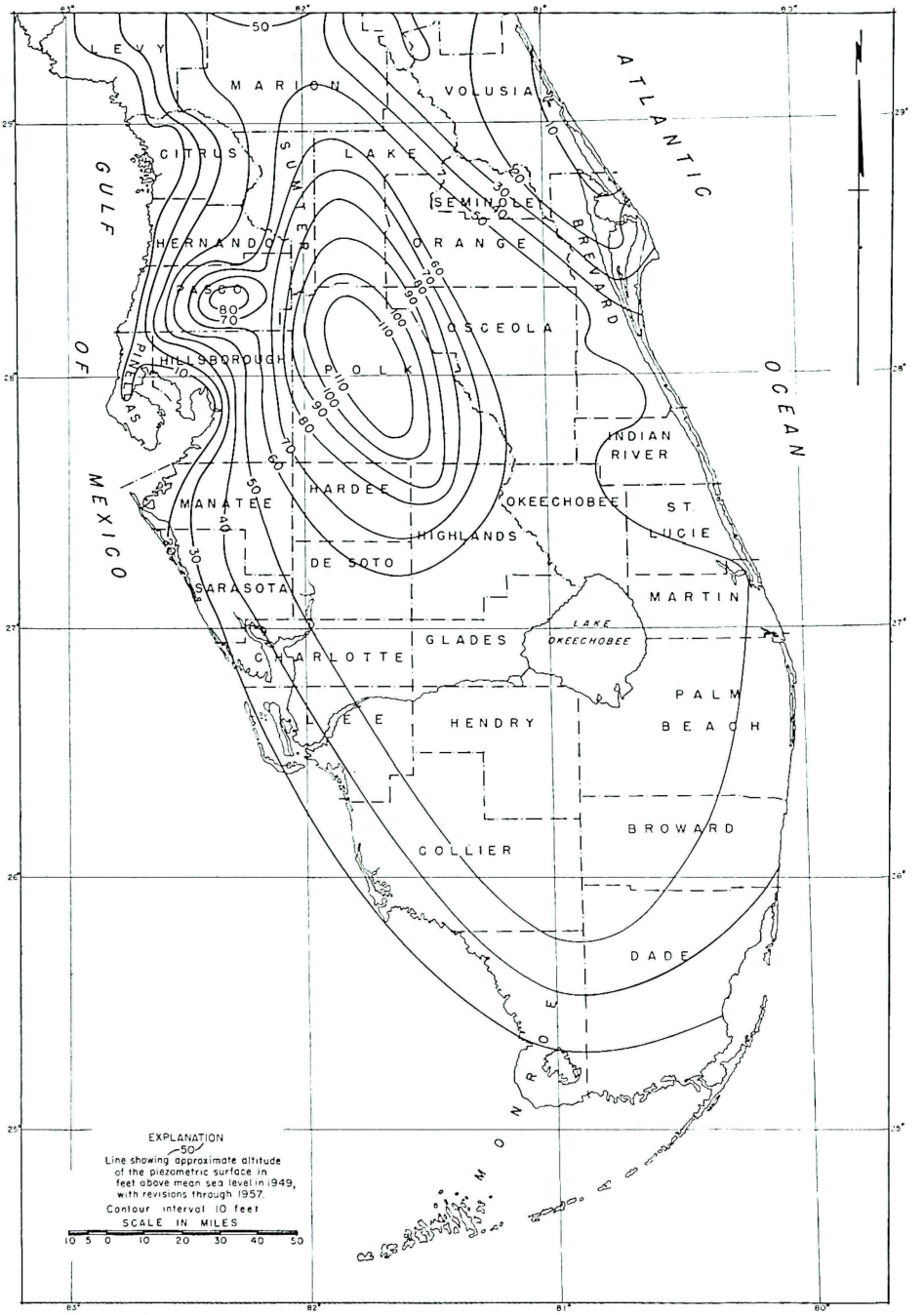


Figure 16. Piezometric surface of the Floridan aquifer, 1957, in peninsular Florida.

county. The land surface rises to 49 feet above mean sea level north of Indiantown, and there the piezometric surface is only slightly higher; consequently, most of the wells are equipped with pumps.

There is no apparent change in artesian pressure with depth in the aquifer, at least within the range of depths observed in Martin County.

WATER-LEVEL FLUCTUATIONS

The piezometric surface fluctuates in response to recharge by rainfall, discharge from wells, earthquakes, passing trains, and variations in barometric pressure (Parker and Stringfield, 1950, p. 441-460). The changes due to earthquakes, passing trains, and barometric pressure are of short duration, but changes due to recharge by rainfall and discharge from wells usually occur over a relatively long period. The fluctuations due to recharge by rainfall decrease in magnitude with increased distance from the recharge area. The principal recharge area for the artesian aquifer in southern Florida is centered in Polk and Pasco counties, approximately 100 miles from Martin County. At this distance, fluctuations of the piezometric surface due to seasonal rainfall in the recharge area are probably small.

No continuous, long-term records of the artesian pressure in Martin County are available, but changes in the amount of rainfall in the recharge area over a period of years would probably be reflected in the piezometric surface in Martin County. There is no evidence that rainfall within the county itself has any direct effect on the piezometric surface. Artesian water levels usually rise during the rainy season, probably because most wells are shut off during wet weather, not because the artesian aquifer is receiving local recharge.

Discharge from wells causes the greatest changes in the piezometric surface. A pressure gage was installed on well 748, 2 miles west of Palm City (fig. 2), and left for several weeks to record the natural fluctuations of the piezometric surface. Then, well 752, which had been closed during this period, was allowed to discharge at the rate of about 300 gpm for 24 hours. The pressure in the observation well, which is about 1,000 feet from the discharging well and about the same depth, showed a decline of about 0.5 foot at the end of the test. Continuous discharge of water from a number of wells over a period of years causes a wide cone of depression to form, as shown in figure 17.

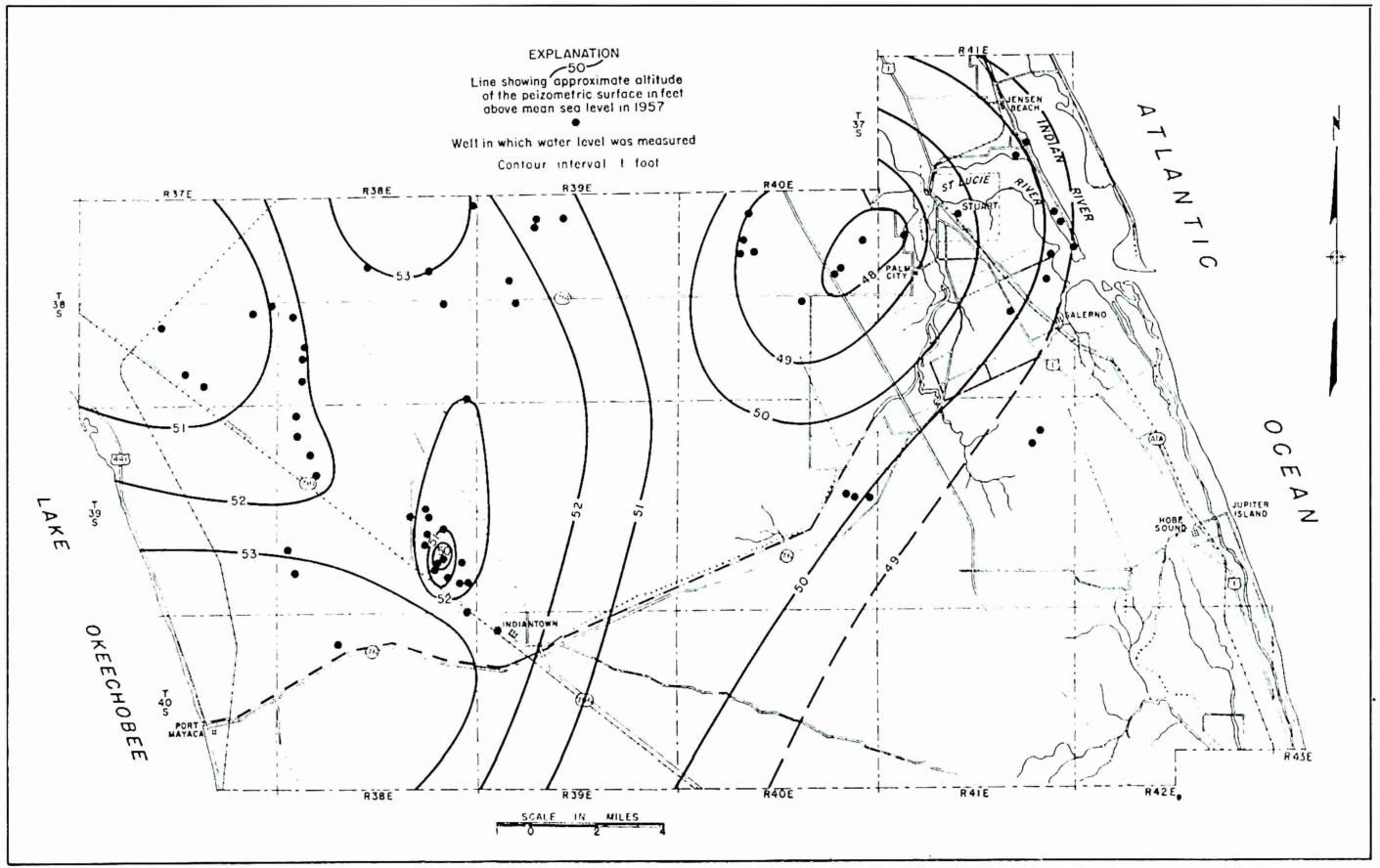


Figure 17. Piezometric surface of the Floridan aquifer, April 1957, in Martin County.

The available data on long-term trends of water levels in the artesian aquifer in Martin County are shown in table 2. The artesian pressure measurements, of the four wells that have the longest periods of record, show apparent declines of the piezometric surface ranging from 1.7 to 6.7 feet between 1946 and 1957. Some of the declines may be due to local water use at the time of measurement or to leakage through breaks in the casing below the ground level; however, declines are shown in all wells for which long-term records are available. They can probably be attributed to one or both of the following factors: (1) increased use of artesian water in the recharge area or the area between Martin County and the recharge area, either of which would reduce the flow of artesian water into Martin County; and (2) increased use of artesian water in Martin County.

TABLE 2. Artesian Pressures, in Feet Above Land Surface, at Selected Wells in Martin County, 1946-57

Well 33		Well 86		Well 143		Well 146	
Date	Water level	Date	Water level	Date	Water level	Date	Water level
7- 2-46	12.7	7-23-46	45.0	5-24-51	27.5	9-10-51	18.5
3- 2-53	11.0	3-27-52	43.2	3-27-52	27.7	3-26-52	17.7
1-25-57	6.0	7- 6-56	40.0	4-25-57	25.5	2-19-53	18.2
		5- 7-57	42.5			3- 6-57	16.8

RECHARGE

The Floridan aquifer is recharged where the permeable rocks that constitute the aquifer are at or near the surface or where the water table is higher than the piezometric surface and the confining bed is thin or relatively permeable.

The principal recharge area for central and southern Florida is in and around Polk County, where the piezometric surface is highest (fig. 16). In much of Polk County, limestone of the Floridan aquifer is overlain by semiconfining beds of the Hawthorn formation, which are not impermeable and may permit downward leakage. The semiconfining beds may have been penetrated by sinkholes which now are occupied by lakes. Possibly these sinkholes are filled with somewhat permeable sand which, in some places, permits downward movement of water.

DISCHARGE

The water level in the Floridan aquifer in Polk County and vicinity is at a higher altitude than it is in the surrounding areas. The water in the aquifer moves downgradient, perpendicular to the contour lines shown in figure 16, to points of discharge. The principal points of discharge are springs and wells, and where upward leakage occurs through the confining bed.

There are no known natural springs in Martin County, but there probably are submarine springs where the Floridan aquifer crops out on the ocean floor. If the slope of the top of the Floridan aquifer east of Martin County is approximately the same as it is in Martin County, the Floridan aquifer should crop out on the floor of the ocean about 25 miles offshore. Also if the slope of the piezometric surface and the salinity of the water are uniform, the pressure head near the outcrop area would be about 36 feet above mean sea level, or about eight feet higher than is necessary to balance the pressure of the sea water at 1,100 feet below mean sea level. The artesian water could, therefore, discharge into the ocean; however, the outcrop area is probably covered by somewhat impermeable sediments of relatively recent origin, which could restrict such discharge.

The total discharge from wells in Martin County was relatively small in 1957. The yields of the 80 artesian wells ranged from less than 10 gpm, in wells obstructed by an accumulation of clay in the open-hole part of the well, to 750 gpm, in free-flowing wells. The average yield is probably about 200 gpm; thus, the total discharge, if all wells were opened would be about 25 mgd (million gallons per day). The discharge probably averages less than 10 mgd, as most wells are used only a few months of each year and others are not used at all. A few wells in the high area north of Indiantown are equipped with pumps to increase their yields, because the artesian pressure and the natural flow are low.

Discharge by upward leakage through the confining beds of the Hawthorn formation is probably small in Martin County. The confining bed is composed of more than 500 feet of fine sand, silt, and "tough" green clay of extremely low permeability. The low permeability was illustrated in the following test made during the drilling of well 841, south of Stuart. Drilling operations were temporarily suspended, owing to mechanical failure. The casing was set at 230 feet and there was 400 feet of open hole in the Hawthorn formation. The well was being jetted with clear water, and when the jetting rods were removed the water level was

about 10 feet below the top of the casing. The water level remained static until the next day, when the casing was filled to the top with water and allowed to remain for 24 hours. During this 24-hour period the water level declined only about 2 feet, showing that the Hawthorn formation could absorb only a few gallons of water through 400 feet of open hole in 24 hours.

Further evidence that very little leakage was taking place through the confining bed was noted during the drilling of test well 656, in the Stuart well field. This well was drilled 150 feet below land surface, to the top of the Hawthorn formation. The chloride content of water samples taken during the drilling of the well remained constant at about 18 ppm (parts per million) as the well approached the top of the confining bed, even though the underlying artesian water had a chloride content of more than 1,000 ppm.

QUANTITATIVE STUDIES

The ability of an aquifer to transmit water is expressed as the coefficient of transmissibility. In customary units, it is the quantity of water, in gallons per day, that will move through a vertical section of the aquifer one foot wide and extending the full saturated height of the aquifer, under a unit hydraulic gradient (Theis, 1938, p. 892), at the prevailing temperature of the water. The coefficient of storage is a measure of the capacity of the aquifer to store water and is defined as the volume of water released from or taken into storage per unit surface area of the aquifer per unit change in the component of head normal to that surface. The "leakage coefficient" indicates the ability of the beds above and below the aquifer to transmit water to the main producing zone. It may be defined as the quantity of water that crosses a unit area of the interface between the main aquifer and its semiconfining bed, if the difference between the head in the main aquifer and in the bed supplying the leakage is unity. These coefficients are generally determined by means of pumping tests on wells.

The withdrawal of water from an aquifer causes a decline of water level (drawdown) in the vicinity of the point of withdrawal. As a result of this drawdown, the water table or piezometric surface assumes the approximate shape of an inverted cone having its apex at the center of withdrawal. The size and shape of this cone of depression depend on the transmissibility and storage coefficients of the aquifer and the rate of pumping.

PUMPING TESTS

Six pumping tests were made of the shallow aquifer in Martin County, four of these within the city limits of Stuart.

The first test was made in the new city well field on March 9, 1955, well 657 (municipal supply well 1) being pumped at the rate of 135 gpm for 11 hours. Water-level measurements were made during the test in wells 656, 658, and 659, respectively 11, 100, and 300 feet from the pumped well. Wells 658 and 659, are cased to 115 feet and have 10 feet of open hole in the underlying limestone. Well 656 is cased to 144 feet and has one foot of open hole. The water from well 657 was discharged into a ditch about 75 feet away, but because the ditch was choked with vegetation and has only a slight gradient, water remained in the vicinity and recharged the aquifer during the test.

The second test was made on March 23, 1955, also in the new city well field. Well 724 (municipal well 3) was pumped at a rate of 140 gpm for five hours, and water levels were observed in wells 659, 658, and 657, respectively 300, 500, and 600 feet from the pumped well. The wells are all cased to 115 feet, and have 10 feet of open hole in the underlying limestone. The water was discharged into a ditch 200 feet from the pumped well and remained in the area and recharged the aquifer, but this recharge did not affect the water levels as quickly as that in test no. 1.

The third test was made on the following day, March 24, at the same location as tests 1 and 2 (fig. 18). Well 723 (municipal well 2) was pumped at a rate of 112 gpm for 5 hours, and water levels were observed in wells 658 and 724, respectively 500 and 780 feet from the pumped well. All wells are cased to 115 feet, and have 10 feet of open hole in the underlying limestone. The water was discharged into a depression near the wells and remained in the area, probably recharging the aquifer.

The fourth test was made on May 27, 1955 in the new well field, which had been in operation prior to the test. Observation well 658A, 13 feet deep, was installed 100 feet from well 657 (municipal well 1) and immediately adjacent to observation well 658. Prior to the test the well field was shut down overnight to allow recovery of the water levels in the area. On the next morning the measured water level in both the deep and the shallow observation wells (658 and 658A) was 6.38 feet above mean sea level. Well 657 was pumped at a rate of 103 gpm for nine hours and at the end of this period the drawdowns in wells 658 and 658A were 3.58 and 0.34 feet, respectively (fig. 19). The water

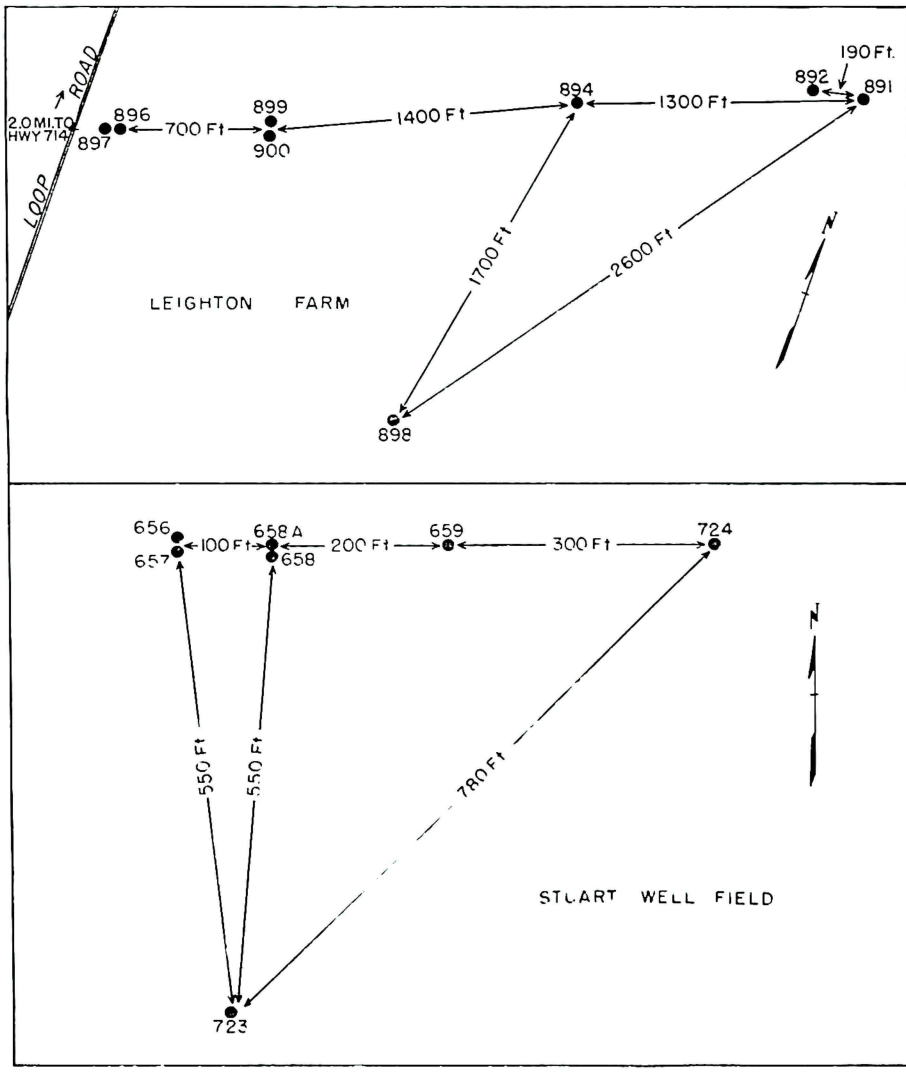


Figure 18. Location of wells used in pumping tests.

level in well 658 began to decline almost immediately after pumping started, and had fallen three feet after 21 minutes. Near the end of the test the water level in well 658 had nearly stabilized, whereas that in well 658A was still falling, but at a decreasing rate. The water was discharged into the city mains and so did not return to the aquifer.

Two pumping tests were made on the farm of Captain Bruce Leighton, about 10 miles west of Palm City, during the periods

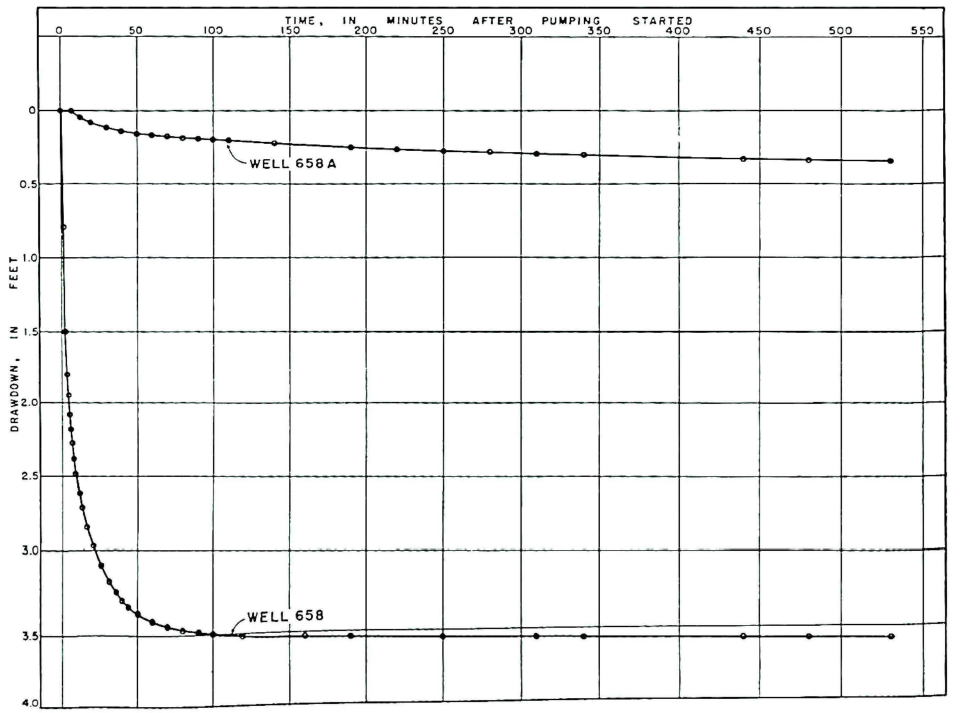


Figure 19. Drawdown observed in wells 658 and 658A during pumping test in the new city well field, May 27, 1955.

October 25-26, 1956, and July 10-12, 1957, using the irrigation wells on the farm. In the first test, well 891 was pumped for two hours at 500 gpm and 25 hours at 725 gpm. The water was discharged into a nearby irrigation ditch and remained in the area. During this test, tape measurements of the water level were made in observation well 892, located 190 feet from the pumped well (fig. 18). Automatic recording gages were installed on observation wells 894, 898, 900, 896, and 897, which were 1,300, 2,600, 2,700, 3,400, and 3,430 feet, respectively, from the pumping well. Significant drawdowns were observed in wells 892 and 894, but if any drawdowns occurred in wells 898, 900, 896, and 897, they were very slight and were masked by the natural decline of the water table and by the effects of barometric fluctuations.

The second test was made in the same area of the Leighton farm (fig. 18). Well 894 was pumped for 48 hours at the rate of 340 gpm. Automatic recording gages were installed on observation wells 899, 900, 898, and 896, which were 1,400, 1,400, 1,700, and

TABLE 3. Results of Pumping Tests in Martin County, 1955-57

Date of Test	Pumped well	Observation well	Depth of well (feet)		Distance to observation well (feet)	Pumping rate (gpm)	Coefficient of transmissibility (T=gpd/ft)	Coefficient of storage (S)	Leakage coefficient[1] $\frac{P}{m}$ = gpd/ft²/ft²	Maximum drawdown (feet)
			Pumped well	Observation well						
STUART WELL FIELD										
3- 9-55	657	656	125	144	11	135	18,000	0.0025	0.237	5.75
3- 9-55	657	658	125	125	100	135	23,000	.00015	.095	3.39
3- 9-55	657	659	125	125	300	135	27,000	.00035	.048	1.29
3-23-55	724	659	125	125	300	140	17,000	.00035	.048	1.76
3-23-55	724	658	125	125	500	140	23,000	.00051	.075	.67
3-23-55	724	657	125	125	600	140	24,000	.00056	.098	.41
3-24-55	723	658	125	125	550	112	26,000	.00038	.085	.63
3-24-55	723	724	125	125	780	112	22,000	.00064	.174	.10
5-27-55	657	658	125	125	100	103	16,000	.00010	.016	3.58
LEIGHTON FARM										
10-25-56	891	892	75	40	190	725	30,000	.00023	.027	9.86
10-25-56	891	894	75	75	1,300	725	83,000	.0065	.126	.38
7-10-57	894	899	75	35	1,400	340	35,000	.0021	.072	.25
7-10-57	894	900	75	135	1,400	340	55,000	.0012	.040	.44

[1]Hantush, 1956, p. 706.

[2]Gallons per day per square foot per foot of vertical head.

2,100 feet, respectively, from the pumped well. Significant drawdowns were observed in wells 899 and 900 (table 3).

INTREPRETATION OF PUMPING TEST DATA

Theis (1935, p. 519-524), using basic heat-transfer formulas, developed a method to analyze the movement of water through an aquifer which is (1) homogeneous and isotropic, (2) of infinite areal extent, (3) of uniform thickness, (4) bounded above and below by impermeable beds, (5) receiving no recharge, (6) fully penetrated by the discharging well, and (7) losing water only through the discharging well. If an aquifer meets all these conditions, the Theis nonequilibrium method, as described by Wenzel (1942, p. 87-90), will give a true transmissibility value for the aquifer, regardless of the distance of the observation well from the pumped well or the rate of pumping.

When the data from the tests in Martin County were analyzed by the Theis method, the computed values of the coefficient of transmissibility ranged from 18,000 to 170,000 gpd per foot for the same area, indicating that the aquifer does not meet all the above conditions. From well logs and cuttings and the performance of individual wells, the main producing zone which is at a depth of 103 to 140 feet in the new Stuart well field, appears to be reasonably homogeneous, isotropic, and uniform in thickness. For a test of short duration the aquifer is, in effect, of infinite areal extent, but it is not bounded above and below by an impermeable bed, as is shown by the fact that the water level in shallow well 658A (fig. 4) began to decline 8 minutes after pumping in well 657 began (fig. 19). The water was discharged on the ground in the vicinity of the pumped wells in tests 1, 2, 3, 5, and 6; consequently, the aquifer was receiving recharge. In addition, the pumped wells did not fully penetrate the aquifer.

After corrections were made for the effects of partial penetration and for the natural fluctuations of the water table, the corrected data were plotted on logarithmic graph paper as s versus $\frac{t}{r^2}$, or drawdown (s) versus time (t) since pumping began divided by the square of the distance (r) between the pumped well and the observation well. The resulting curves were compared with a family of leaky-aquifer type curves developed by H. H. Cooper, Jr. of the U.S. Geological Survey. This family of curves is based upon the equation for nonsteady flow in an infinite leaky aquifer developed by Hantush and Jacob (1955, p. 95-100) and described

by Hantush (1956, p. 702-714). The equations assume a permeable aquifer overlain by semipermeable beds through which water, under a constant head, can infiltrate to recharge the aquifer. The transmissibilities obtained by the leaky-aquifer method apply to the permeable aquifer and a second factor—called the leakage coefficient—applies to the semipermeable beds overlying the main producing zone. The coefficients of transmissibility, storage, and leakage for the six tests made in Martin County are shown in table 3.

The wells used in the pumping tests in the new Stuart well field were nearly uniform in depth. The observation wells were spaced at different distances from the pumped well (fig. 18), so the observed drawdowns gave a good picture of the cone of depression due to pumping. When the data for each test were analyzed, the calculated values for the coefficients of transmissibility (table 3) all fell within the narrow range of 16,000 to 27,000 gpd per foot, and it is reasonable to assume a value of about 20,000 gpd per foot for the area. The wells used in the pumping tests on the Leighton farm were irrigation wells, and they were not ideally situated for observing drawdowns. Most of the observation wells were spaced too far from the pumped wells, and all but one were developed at depths different from those of the pumped wells. As a result, the tests in the Leighton farm area show a much wider range of values for the coefficient of transmissibility than do the tests made in the Stuart well field.

QUALITY OF WATER

The water that falls on the earth's surface as rain or snow is relatively free of dissolved mineral matter except for very small quantities of atmospheric gases and dust. As it runs off or infiltrates into the ground, the water dissolves some of the material with which it comes in contact. Some minerals are dissolved much more easily than others; thus, the degree of mineralization of ground water depends generally upon the composition of the material through which the water passes.

Chemical analysis of 52 samples of water from Martin County (23 from the artesian aquifer and 29 from the shallow aquifer) has been made by the U. S. Geological Survey. The results of these analyses are listed in tables 4 and 5. In addition, determinations were made of the chloride content of the water from 767 wells; and these are shown in table 8. Determinations of 140 samples from 26 selected wells are listed also in table 6.

TABLE 4. Analyses of Water from Wells in the Artesian Aquifer in Martin County
(Analyses by U. S. Geological Survey. Chemical constituents are expressed in parts per million.)

Well number	Date of Collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	Specific conductance (micromhos at 25°C)	Color	pH
27	7- 3-56		0.04	144	118	905		180	336	1,640	0.7	.....	3,230	844	5,710	5	7.0
29	6-27-46		.43	70	72	453		74	309	760	.9	.....	1,740	471	3,130	3	6.5
30	6-28-46		.15	61	47	200		176	188	310	.8	0.8	894	345	1,600	3	7.1
	3-25-58	19	.04	82	52	250	6.4	169	182	450	.8	.3	1,126[b]	418	2,020	2	7.3
31	6-28-46		.04	98	69	337		186	216	625	.7	.....	1,440	528	2,610	1	7.0
43	7-17-46		.11	114	104	746		188	276	1,340	.8	.....	2,670	712	4,770	4	7.0
47	7- 7-46		.08	108	87	596		182	292	1,040	.8	.....	2,210	627	3,950	3	7.0
64	7-18-46		.14	99	122	984		156	223	1,790	1.6	.....	3,300	749	5,990	1	7.0
65	7-19-46		.02	92	83	506		192	235	900	.1	.....	1,900	571	3,450	1	7.3
86	7-23-46		.03	89	82	501		192	232	885	.1	.....	1,880	559	3,410	1	7.2
	7-15-57									890			2,070[b]	550	3,440		
87	7-23-46		.28	82	78	725		228	226	1,190	.1	.....	2,410	525	4,370	1	8.1
88	7-23-46		.06	92	83	537		190	247	940	.1	.....	1,990	570	3,570	3	7.1
95	7-24-46		.06	84	72	473		200	232	800	.1	.....	1,760	503	3,190	2	7.2
106	7-15-57									810			1,950[b]	540	3,150		
110	7-16-57									950			2,280[b]	610	3,580		
150	7-15-57									4,050			7,400[b]	1,310	11,300		
172	7-17-57									252			674[b]	220	1,190		
186	6-22-57[a]	17	.11	131	94	545	14	164	215	1,150	.8	.0	2,250	714	4,040	2	7.4
	3-11-58	17	.0	148	79	541	4.0	162	148	1,140	1.0	.9	2,910[b]	696	3,950	10	7.3
740	7-16-57									1,180			3,050[b]	740	4,760		
744	7-17-57									350			878[b]	320	1,450		
745	7-17-57									1,310			2,860[b]	780	4,470		
841	7-16-57									2,900			6,080[b]	1,100	9,380		
901	7-18-57									258			778[b]	300	1,310		

[a]Other determinations: Aluminum .0, Manganese .00, Lithium 2.0, Phosphate .00, Beta-gamma activity (Micromicrocuries per liter) 200, Radium (Micromicrocuries per liter) 11, Uranium (Micrigrams per liter) 1.2.

[b]Residue on evaporation at 180 C—other values for dissolved solids are sum of determined constituents.

TABLE 5. Analyses of Water from Wells in the Shallow Aquifer in Martin County
(Analyses by U. S. Geological Survey. Chemical constituents are expressed in parts per million.)

Well number	Date of Collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	Specific conductance (micromhos at 25°C)	Color	pH
GS 23	8-12-43		0.03	128	23	182		418	139	238		0.6	920	426	1,560	12	7.2
1	10- 3-45			64	7.4	16		231	17	13		.2	231	190	428	105	7.4
8	9-12-41		.1	82	5.7	3.2		269	9.7	5		.0	238	231	449	50	
9	9-12-41		.4	148	19	6.7		489	39	10		8.2	472	447	802	140	
12)																	
13)	3-24-48[a]		.01	39	2.1	9.7		120	5.1	16	0.1	.6	132	106	233	6	7.1
14)																	
15	10- 3-41		.91	124	10	51		396	24	79		.1	489	351	887	150	
17	10- 3-41		.79	59	5.0	1.2		189	8.0	5		.1	172	168	327	160	
19	6-27-46		.96	86	18	126		278	1	235	.4	1.0	605	289	1,150	53	7.3
22	7- 2-46		.08	128	30	124		548	34	161			747	443	1,380	60	7.0
36)																	
37)	7-16-46[a]		.02	93	4.0	19		256	24	37	.3	1.8	305	248	558	28	7.1
66	7-19-46		.04	77	3.2	7.8		244	1	15	.0	.1	224	205	411	1	7.4
81	7-23-46		.06	80	3.8	11		248	1	24	.0	1.0	243	215	461	18	7.1
97)																	
98)	3-24-48[a]		.04	102	4.6	35		224	12	108	.1	.8	373	273	701	7	7.0
99)																	
127	7-15-57									30			96[b]	64	180		
151	7-16-57									32			669[b]	470	916		
161	7-16-57									605			1,540[b]	440	2,570		
214	7-16-57									92			443[b]	266	746		
221	7-17-57									570			1,450[b]	390	2.520		

[a]Composite sample.
[b]Residue on evaporation at 180 C—other values for dissolved solids are sum of determined constituents.

TABLE 5. (Continued)

Well number	Date of Collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	Specific conductance (micromhos at 25°C)	Color	pH
455	7-17-57	...	...	...	...	...	...	...	...	35	...	...	234[1]	186	398	...	...
655	3-25-58	12	.02	70	.9	7.8	.7	220	.5	16	.1	.4	218[b]	178	386	8	7.6
657	6-14-57	14	.73	86	2.3	9.8	.4	272	.0	15	.1	.0	262	224	459	2	7.4
750	7-18-57	...	...	...	...	...	...	...	...	23	...	...	340[b]	270	561	...	...
755	7-15-57	...	...	...	...	...	...	...	...	26	...	...	229[b]	176	384	...	...
776	7-15-57	...	...	...	...	...	...	...	...	21	...	...	289[b]	238	486	...	...
835	7-18-57	...	...	...	...	...	...	...	...	27	...	...	224[b]	188	382	...	...
875	7-18-57	...	...	...	...	...	...	...	...	17	...	...	138[b]	67	240	...	...
894	7-17-57	...	...	...	...	...	...	...	...	...	...	...	478[b]	314	742	...	...
929	7-18-57	...	...	...	...	...	...	...	...	...	...	...	526[b]	312	862	...	...
930	7-17-57	...	...	...	...	...	...	...	...	...	...	...	483[b]	322	802	...	...
936	8-13-57	24	.28	134	35	459		492	128	626	.4	6.6	1,660	554	2,850	30	7.6
939	3-25-58	19	.03	109	3.4	7.4	1.4	362	1.8	16	.3	.1	334[1]	266	588	21	7.4

The water from the shallow aquifer generally has a much lower mineral content than the artesian water and is more potable.

HARDNESS

The hardness of water is commonly recognized as the soap-consuming property of water. It is the $CaCO_3$ equivalent of calcium, magnesium, and other cations having similar soap-consuming properties. The following table shows the hardness scale that is generally used by the U. S. Geological Survey in the classification of water.

Hardness as $CaCO_3$ (ppm)	Degree of hardness
0 to 60	Soft
61 to 120	Moderately hard
121 to 200	Hard
More than 200	Very hard

None of the samples collected in Martin County can qualify as soft. Three samples are in the slightly hard range, five samples are in the hard range, and the rest, including all from the artesian aquifer, are in the very hard range. One of the three samples in the slightly hard range was collected from a shallow well developed in the sandhills in the vicinity of Jensen Beach and the other samples came from shallow wells developed in the sandhills near Jonathan Dickinson State Park.

Outside these two areas most of the water in Martin County is either hard or very hard, but it may be commonly softened for household use. The greatest hardness noted in the shallow aquifer was 554 ppm in water from well 936, near Indiantown, and the lowest was 64 ppm from well 127, south of Jonathan Dickinson State Park. The greatest hardness in the artesian water was 1,310 ppm in well 150 on the Harris ranch six miles south of Stuart, and the lowest was 220 ppm in well 172 on the Adams ranch four miles northwest of Indiantown.

DISSOLVED SOLIDS

The amount of dissolved solids in water is approximately equal to the amount of mineral matter that remains after a quantity of water is evaporated. The maximum amount recommended by

the U. S. Public Health Service for drinking water is 500 ppm, although as much as 1,000 ppm is permissible if water of better quality is not available. Water having a dissolved-solids concentration greater than 1,000 ppm probably would have a noticeable taste and also would be unsuitable for many industrial uses. Most of the water from the shallow aquifer in Martin County has a dissolved-solids concentration of less than 500 ppm (table 5). All samples of water from the artesian aquifer contained dissolved solids in excess of 500 ppm, and only four had less than 1,000 ppm; thus, the artesian water in most instances is not suitable for public or domestic supplies.

SPECIFIC CONDUCTANCE

Specific conductance is a measure of water's ability to transmit an electric current. Distilled water and water of low mineral concentration is resistant to the conduction of electricity, whereas highly mineralized water conducts an electric current with relative ease.

The values for specific conductance can be used to estimate values for dissolved solids in the water samples from Martin County by multiplying by a factor of 0.6. The accuracy of the

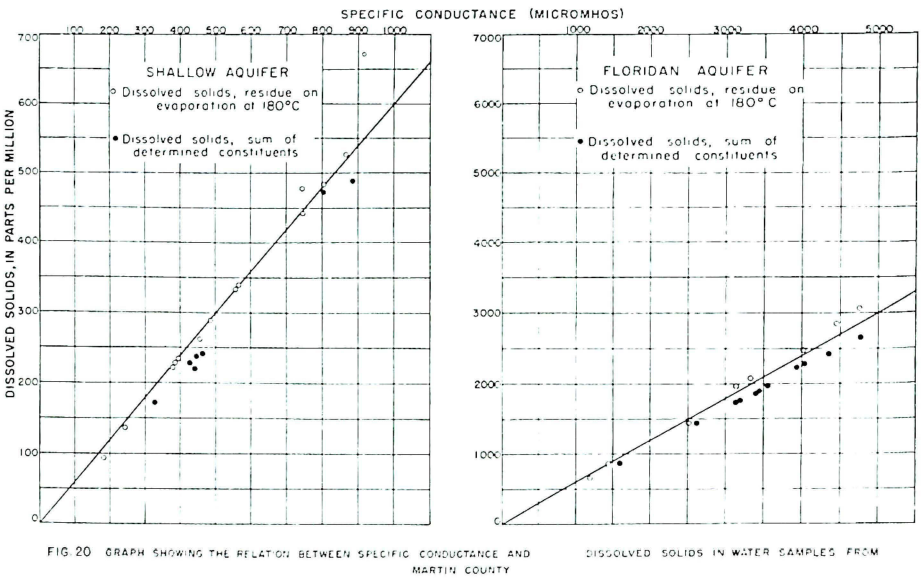


Figure 20. Relation between specific conductance and dissolved solids in water samples from Martin County.

approximation is indicated by figure 20, which is a graph of specific conductance versus dissolved solids of samples for which both have been determined.

HYDROGEN-ION CONCENTRATION (pH)

The hydrogen-ion concentration, expressed as pH, indicates whether the water is acid or alkaline. Values for pH higher than 7.0 indicate increasing alkalinity, and values lower than 7.0 indicate increasing acidity. A pH of 7.0 indicates a neutral solution.

Most of the water in the shallow aquifer is nearly neutral and only slightly alkaline. All water samples from the artesian aquifer except one were neutral or alkaline. This sample may have been contaminated or altered before analysis.

IRON (Fe) AND MANGANESE (Mn)

Iron differs from most other chemical constituents normally found in ground water, in that concentrations of only a few tenths of a part per million may cause the water to have a disagreeable taste and cause staining of fixtures, laundry, the outside of buildings, and even grass and shrubbery if it is used in a sprinkler type irrigation system. The iron remains in solution as a ferrous bicarbonate, $Fe(HCO_3)_2$, and the water is clear until it is exposed to the atmosphere, whereupon the iron is oxidized to the ferric state and precipitates as the hydroxide $Fe(OH)_3$ or oxide Fe_2O_3.

The U. S. Public Health Service recommends that the concentration of iron or iron and manganese together be under 0.3 ppm. Water having greater concentrations is not injurious to health, but will generally be unsatisfactory because of staining. The iron content of water from the shallow aquifer in Martin County ranges from 0.00 to 0.96 ppm. The occurrence of water having a high concentration of iron is unpredictable and may differ with depth as well as location. A well that produced iron-free water when it was first drilled may, with time and pumping, intercept water of high iron content from nearby areas.

Iron can be removed from water by aeration and filtration. Aeration exposes the water to the oxygen in the air and most of the iron is precipitated. The water is then passed through a filter, usually sand or charcoal, where the precipitate is removed.

CALCIUM (Ca) AND MAGNESIUM (Mg)

Dissolved calcium and magnesium are responsible for most of the hardness of water. These elements are dissolved from limestone (predominantly calcium carbonate) and dolomite (predominantly calcium and magnesium carbonate), and from shell material incorporated in sand deposits.

Water in Martin County is most readily available in layers of carbonate rock and shell, which accounts for the generally high calcium-magnesium content of the water.

The calcium concentration (59 to 148 ppm) in the shallow aquifer is generally much higher than the magnesium concentration (2 to 30 ppm), indicating that most of the carbonate material in Martin County is limestone rather than dolomite.

The artesian aquifer is composed principally of limestone and contains only minor amounts of dolomite; however, the magnesium content of the water is about as high as the calcium content. This is because the artesian aquifer in Martin County has not been completely flushed of the sea water which entered it during the Pleistocene epoch when the ocean stood above its present level. The magnesium content of ocean water is much higher than the calcium content; thus the high concentration of magnesium in the artesian water probably is the result of contamination by sea water rather than solution of dolomitic rock.

SODIUM (Na) AND POTASSIUM (K)

Small amounts of sodium and potassium are found in almost all natural water, and moderate amounts do not affect its potability. Large concentrations of these elements, however, make the water unsuitable for most purposes. The sodium concentration is usually much higher than the potassium concentration, and in tables of analyses one value is often given for both elements (tables 4, 5).

High concentrations of sodium are usually associated with contamination by salt water, since most of the sodium is associated with chloride in the form of salt solutions. Calculated values for sodium range from 1.2 to 459 ppm in samples from the shallow aquifer and from 200 to 984 ppm in samples from the artesian aquifer.

BICARBONATE (HCO_3)

The total alkilinity of a water sample is the sum of its hydroxide (OH), carbonate (CO_3) and bicarbonate (HCO_3) ions, expressed in terms of equivalent quantities of $CaCO_3$. Bicarbonate

results from the solvent action of water containing carbon dioxide on carbonate rocks ($CaCO_3+H_2O+CO_2 \longrightarrow Ca(HCO_3)_2$).

In the samples from the shallow aquifer in Martin County the bicarbonate content ranged from 120 to 548 ppm. The bicarbonate content of the artesian water (74 to 228 ppm) is generally lower than that of the shallow water.

SULFATE (SO_4)

The sulfate ion is of little significance in domestic water supplies, except where the concentration is so large (more than about 500 ppm) as to have a laxative effect. U. S. Public Health Service recommends that the concentration be no higher than 250 ppm in public water supplies. Industrial operators using steam boilers may consider high concentrations of sulfate objectionable if the water is high in calcium and magnesium, because of the character of the boiler scale produced.

Most of the water in the shallow aquifer in Martin County contains little sulfate. The range in the samples analyzed was from 0 to 39 ppm, except for a sample from well GS 23 (90 ft), which was 139 ppm, and one from well 936, which was 128 ppm. These samples may have been contaminated by trapped Pleistocene sea water, as the chloride contents were 238 and 626 ppm. Generally, a high sulfate concentration is associated with a high chloride content, although this is not always the case. The sulfate content of water in the artesian aquifer ranges from 188 to 336 ppm. The sulfates of calcium and magnesium cause noncarbonate hardness, which is more difficult to remove than carbonate hardness.

CHLORIDE (Cl)

The chloride content of water is generally a good indication of the extent of contamination by salt water. The U.S. Public Health Service has set a limit of 250 ppm of chloride for public supplies, except where no other water is available. Water with a chloride content of 500 ppm begins to taste salty to most people, and water with a chloride content much in excess of 750 ppm will cause damage to plants, shrubs, and even grass, if it is used for a long period of time; occasional wettings with water of high chloride content probably would not be harmful to most grasses. A high chloride content makes water more corrosive. Chloride will be discussed more thoroughly under "Salt-Water Contamination."

FLUORIDE (F)

Studies in some areas of the United States have shown that children who drink water that contains about one ppm of fluoride have fewer dental cavities than those who drink water with much less than one ppm (Black and Brown, 1951, p. 15). However, the presence of fluoride in concentrations of more than 1.5 ppm tends to mottle the enamel of the permanent teeth of young children who drink the water for a prolonged period of time. Only a few of the water samples from the shallow aquifer have been analyzed for fluoride content. In these samples it ranged from 0.0 to 0.4 ppm. The fluoride content of the artesian water ranges from 0.1 to 1.6 ppm.

SILICA (SiO_2)

A small amount of silica is present in almost all ground-water samples, but it is of relative unimportance, except in water in boilers, where it contributes to the formation of scale. Silica in two samples of water from the shallow aquifer was 14 ppm and 24 ppm (wells 657 and 936) and in one sample from the artesian aquifer was 17 ppm (well 186).

NITRATE (NO_3)

The presence of nitrate in excess of 50 ppm may be a contributing factor in the development of cyanosis, or methemoglobinemia, in infants (Black and Brown, 1951, p. 12). Most of the samples of water from the shallow aquifer contained less than two ppm of nitrate; however, two samples (from wells 9 and 936) contained 8.2 ppm and 6.6 ppm, respectively. The nitrate concentrations in water from the artesian aquifer were less than one ppm. The analyses indicate that nitrate is relatively unimportant in the water of Martin County.

HYDROGEN SULFIDE (H_2S)

Hydrogen sulfide is a gas which is held in solution in some ground water. Upon exposure to air some of the gas escapes and gives "sulfur water" its characteristic odor. Hydrogen sulfide is found in all water from the artesian aquifer in Martin County and in a few samples from isolated areas of the shallow aquifer. However, quantitative figures as to the amounts present are not

available. Most of the gas can be easily removed from water by aeration.

COLOR

Color in water generally is due to the presence of organic material dissolved from organic matter with which the water comes in contact. Color is sometimes due to precipitated iron, the water usually being clear when it comes from the well but becoming colored upon exposure to the air. Organic color is present in the sample as collected and is usually accompanied by a moldy odor, which is a clue to its origin.

Color in water from the shallow aquifer in Martin County referred to units on the platinum cobalt scale ranges from 1 to 160 and is usually higher in the western part of the county than it is in the eastern part. The color in the water from the artesian aquifer ranges from one to five.

TEMPERATURE

Collins (1925, p. 97-104) reported that "The temperature of ground water available for industrial supplies is generally from 2° to 3°F above the mean annual air temperature if the water is between 30 and 60 feet below the surface of the ground. An approximate average for the increase in temperature with depth is about 1°F for each 64 feet."

The mean annual temperature in Martin County is 75.2 F (table 1), and the water temperature of the shallow aquifer would be expected to average about 77.5°F. The actual average temperature of 120 water samples taken from the shallow aquifer was 75.5°F. The readings ranged from a low of 70°F to a high of 82 F in wells ranging in depth from 10 feet to 110 feet. The temperature of the water in the shallow aquifer varies with the seasons, the greater variance being in the water close to the surface. Water temperatures from individual wells are listed in table 8.

The temperature of the water from the artesian aquifer ranges from 75 to 91°F (fig. 21). If the above statement by Collins were valid for Martin County, the temperatures should range from 87 F in the north-central part of the county, where the aquifer is nearest the ground surface (fig. 6) to 94°F in the southeastern part of the county, where the aquifer is deepest. Instead, the coolest water (75°F) is found in the eastern part of the county, and the

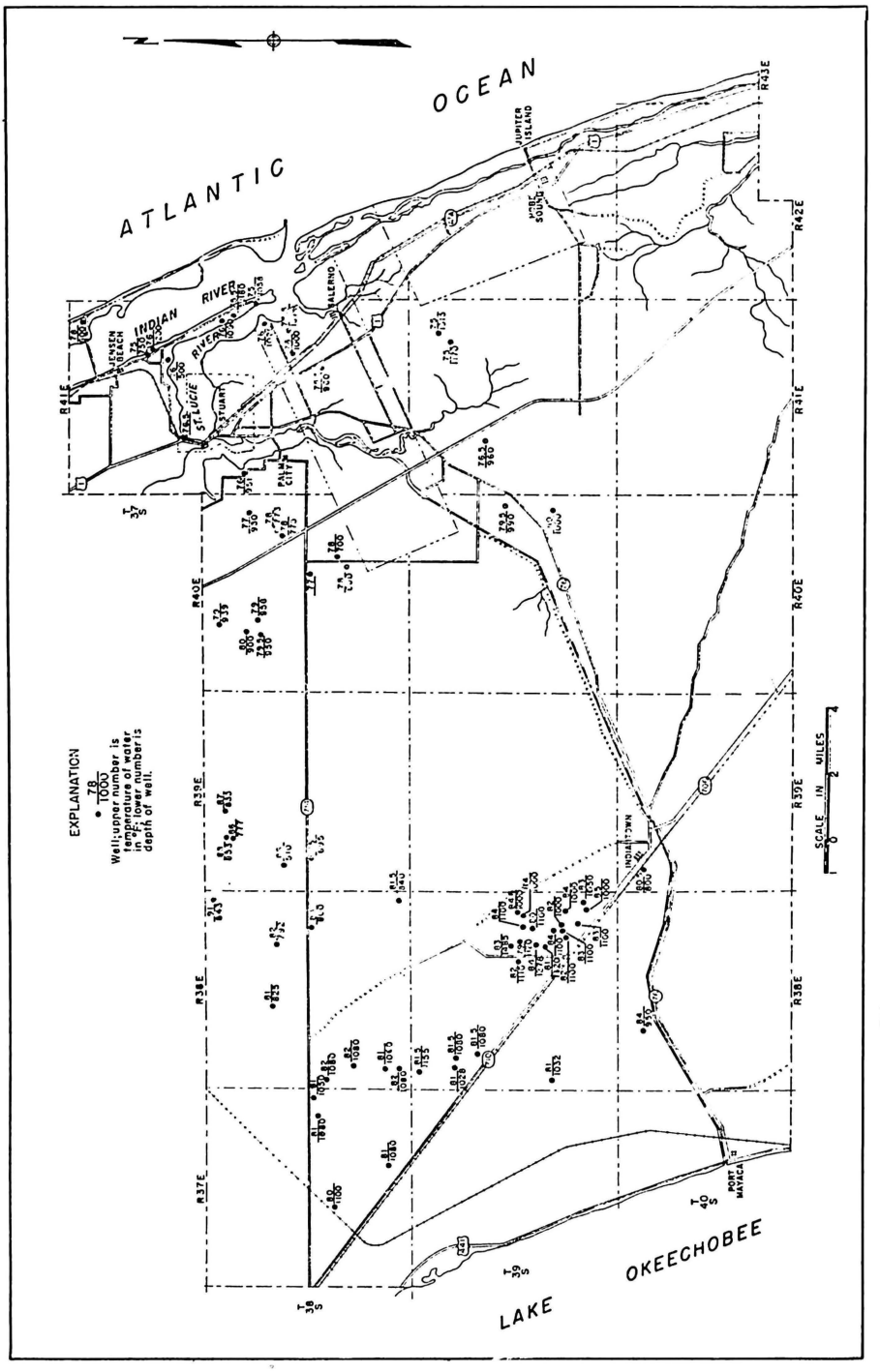


Figure 21. Temperature of water in artesian wells in Martin County.

warmest water (91°F) is found in the north-central part. The temperature of the artesian water in Martin County does not seem to be controlled by the depth of the well. Wells 186 and 747, in the north-central part of the county, are about the same depth and only three miles apart, yet the water in well 186 is 91°F while that in well 747 is only 81°F. The low temperature of the artesian water in the eastern part of the county may be due to the cooling effect of the ocean water, but that does not explain the temperature differences in other parts of the county. The radioactivity of the water (well 186, table 5) may be a factor; however, further investigation including additional analyses of radioactivity of water from different parts of Martin County will be needed to determine the cause of the temperature differences.

SALT-WATER CONTAMINATION

Salt-water contamination of the water in an aquifer is usually the result of encroachment of ocean water. In Martin County there are two major types of salt-water contamination: (1) recent contamination, where the salt water is in dynamic equilibrium with the fresh water, and the salt front fluctuates in accordance with changes in fresh-water head in the aquifer, and (2) contamination during the Pleistocene epoch, wherein ocean water entered the aquifer when the sea level was higher than it is at present and most of Florida was covered by the ocean. A third type of contamination may be due to connate sea water that was trapped in the sediments at the time of deposition; this type probably is not very important in Martin County.

RECENT CONTAMINATION

Recent encroachment of salt water is restricted to a relatively narrow strip of land bordering the ocean and other bodies of salt water. The relationship between fresh water and sea water was first investigated by William Badon-Ghyben in 1887 and apparently independently by Alexander Herzberg about 1900 (Brown, 1925, p. 16). These investigators found that in an area such as a small island or narrow peninsula the fresh water floats upon the salt water. This occurs because the density of fresh water is lower than that of sea water. The amount of fresh water below mean sea level is a function of the height of the fresh water above mean sea level, and the density of the sea water (fig. 22).

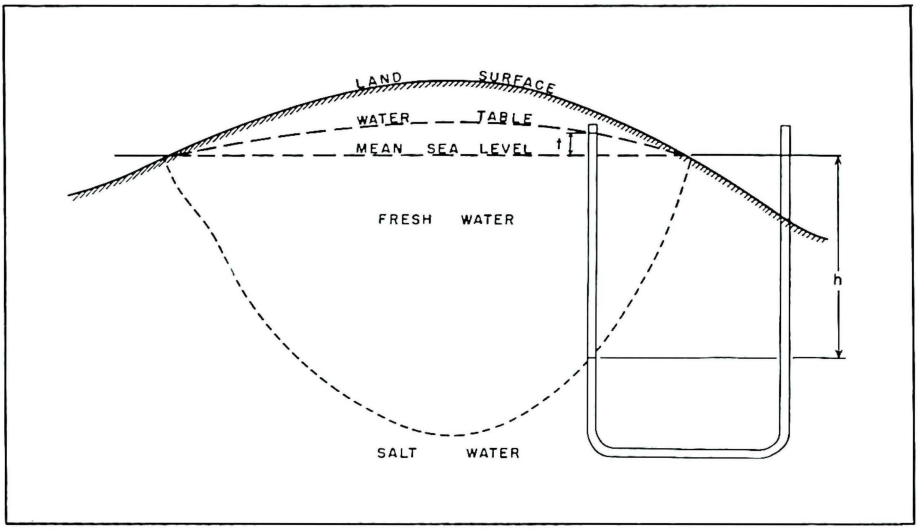


Figure 22. Relation between salt water and fresh water according to the Ghyben-Herzberg theory.

If

h=depth of fresh water below mean sea level;
t=height of fresh water above mean sea level;
g=specific gravity of sea water,
1.0=specific gravity of fresh water

then

$$h=\frac{t}{g-1}$$

The formula is illustrated in figure 22 which compares the occurrence of fresh water and sea water in a small island or narrow peninsula, with a large imaginary U-tube having one leg beneath the land and one leg in the sea. In such a U-tube the column of water which has a height of h+t will balance the column of sea water with a height h. The ratio of the heights of the columns of fresh and sea water is equal to the ratio of their specific gravities. That is $\frac{h+t}{h}=\frac{g}{1}$ which reduces to the above formula.

The specific gravity of sea water is about 1.025. When this value is substituted in the above equation, then h=40t. This indicates that the depth of fresh water below mean sea level is 40 times the height of the water table above mean sea level, or, stated simply, for each foot that the water table stands above mean

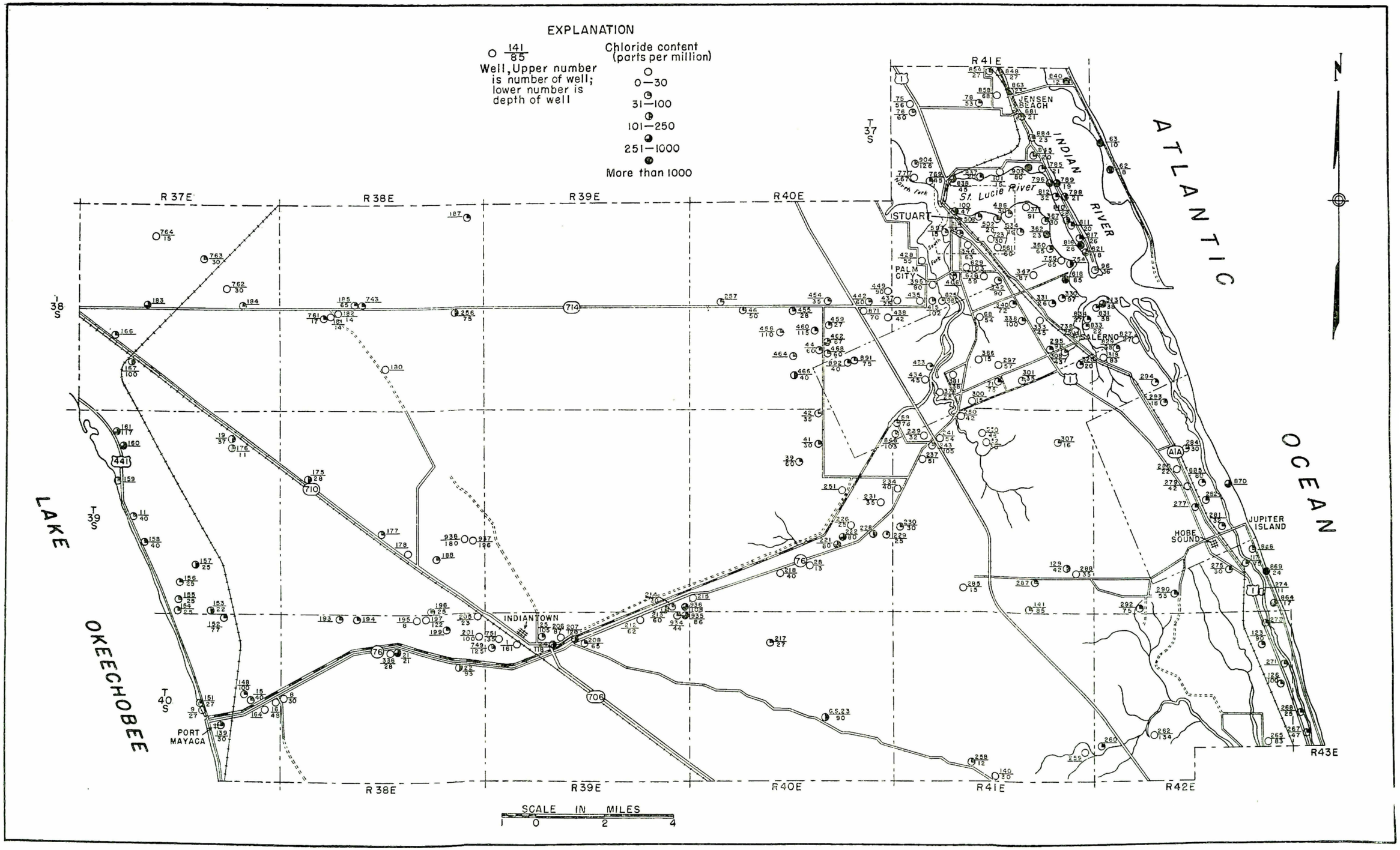


Figure 23. Chloride content of water in representative wells in the shallow aquifer of Martin County.

sea level, the fresh water will extend an additional 40 feet below sea level.

Further research by Hubbert (1940, p. 924), Glover (1959), and Henry (1959) has shown that under natural conditions this ratio is somewhat modified by the movement of the water, especially where the slope of the water table is steep. Variations in the composition of the water-bearing material and the salinity of the salt water can also produce modifications of the 1 to 40 ratio (Kohout and Hoy, 1953, and Cooper, 1959). The modifications are usually relatively minor and the Ghyben-Herzberg ratio is useful in estimating the minimum depth to salt water in areas adjacent to sea water.

The contact between fresh and salt water is gradational through a zone of diffusion in which the water gradually increases in salinity with depth. The zone of diffusion is formed by the mixing action caused by the fluctuation of the water table, the rise and fall of the tides, and the molecular diffusion of the salt water. The thickness of the zone of diffusion is variable. Parker (1945, p. 539) reports a thickness of about 60 feet in the Miami area and in Martin County it is probably about the same.

The concentration of chloride in the ground water is generally a reliable index to the degree of salt-water contamination, because more than 90 percent of the dissolved solids in ocean water are chloride salts. One or more chloride determinations have been made of water samples from 771 wells in Martin County. Locations of representative wells and the chloride content of their water are shown in figures 23, 24, and 26. Results of determinations of chloride content are shown in table 8.

Stuart Area

Salt water may enter the shallow aquifer in the Stuart area from either of two sources: (1) by lateral encroachment from bodies of sea water, including the St. Lucie River, the Manatee Pocket, and tidal creeks and canals, and (2) by upward movement of salt water from the artesian aquifer.

The most concentrated withdrawals of ground water in the county are made in and near the city of Stuart, and some salt-water encroachment has occurred in isolated areas during periods of dry weather. Water samples were collected from several hundred wells in the Stuart area for determinations of chloride content (fig. 24). Those wells yielding water having an appreciable chloride content were sampled periodically to detect

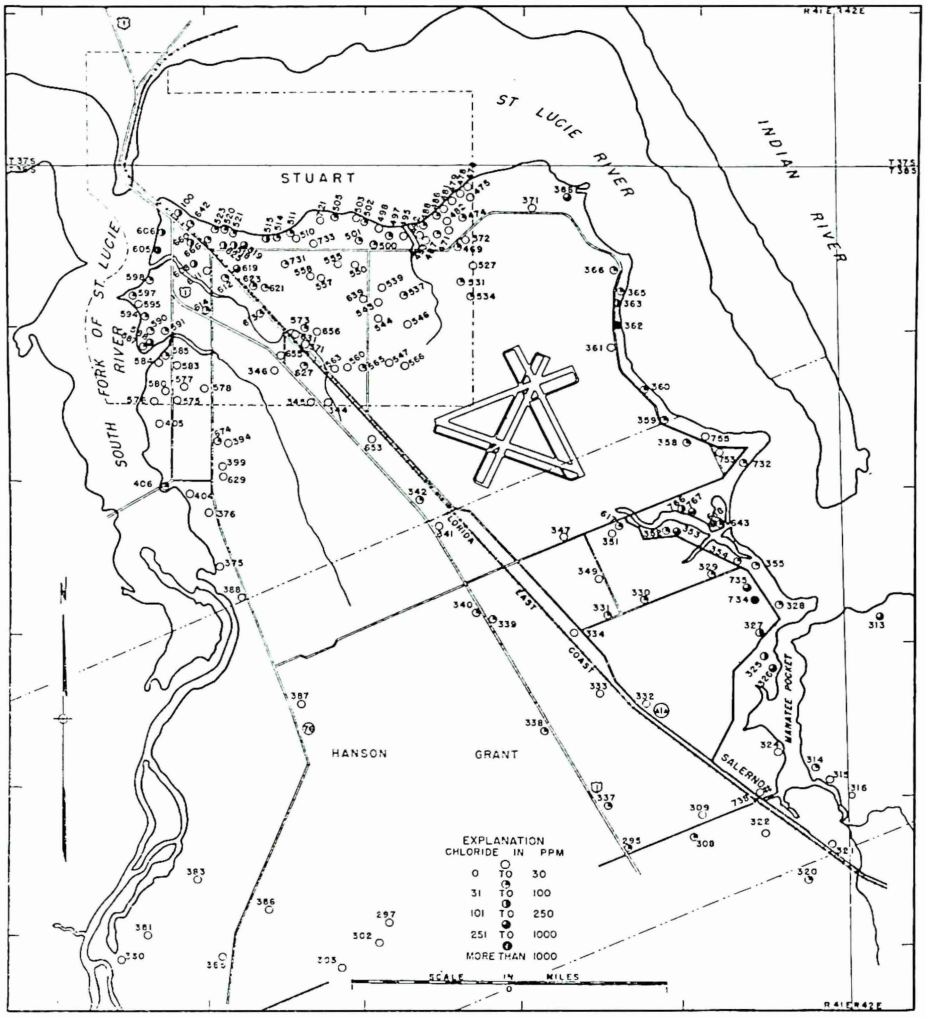


Figure 24. Chloride content of water from shallow wells in Stuart area.

any variations (table 6). In most cases the fluctuations are caused by variations in the amount of rainfall in the area or in the amount of pumping. Usually it is a combination of the two, because more ground water is needed for irrigation during dry periods, as in 1955, and less during wet periods, as in 1947-48.

In a few cases, notably in wells 647 and 722, the chloride content of the water dropped during a dry period, owing to the cessation of pumping in the old city well field and the plugging of a leaky artesian well, well 128 (fig. 4). Wells 619 and 654 showed

TABLE 6. Chloride Concentrations in Water Samples from Selected Wells

Well No.	Depth of well (feet below land surface)	Date of collection	Chloride content (ppm)
100	47	Sept. 20, 1946	110
		Oct. 7, 1946	131
		Dec. 10, 1946	138
		Feb. 6, 1947	124
		Mar. 13, 1947	153
		Apr. 24, 1947	118
		May 12, 1947	104
		June 25, 1947	111
		Mar. 10, 1948	104
		June 10, 1948	89
		Sept. 15, 1948	94
		Dec. 10, 1948	74
		Feb. 11, 1949	110
		July 1, 1949	113
		Apr. 27, 1952	185
		Jan. 28, 1955	161
		May 11, 1955	166
		June 29, 1955	148
105	88	Aug. 13, 1946	34
		Sept. 20, 1946	27
		Nov. 7, 1946	41
		Dec. 19, 1946	67
		Feb. 6, 1947	53
		Mar. 13, 1947	46
		June 25, 1947	49
		Mar. 10, 1948	37
		June 10, 1948	61
		Sept. 15, 1948	37
		Dec. 10, 1948	27
		Feb. 11, 1949	63
		Apr. 7, 1950	188
		Jan. 18, 1951	102
		Aug. 21, 1951	109
		Mar. 27, 1952	167
353	80	July 28, 1953	545
		Jan. 20, 1955	670
		June 30, 1955	580
		Aug. 16, 1955	680
362	23	Aug. 4, 1953	35
		Jan. 21, 1955	615
		June 30, 1955	1,370
		Aug. 16, 1955	2,020
		Sept. 8, 1955	1,980

Table 6. (Continued)

Well No.	Depth of well (feet below land surface)	Date of collection	Chloride content (ppm)
515	60	Oct. 6, 1953	106
		Jan. 11, 1955	131
		Apr. 20, 1955	123
		June 29, 1955	121
		Sept. 5, 1955	157
		Oct. 5, 1955	117
518	57	Oct. 6, 1953	46
		Jan. 10, 1955	160
		Jan. 27, 1955	103
		Apr. 20, 1955	87
		May. 11, 1955	80
		June 29, 1955	96
		Aug. 16, 1955	132
		Sept. 7, 1955	136
520	35	Oct. 6, 1953	64
		Jan. 10, 1955	66
		Apr. 20, 1955	75
		June 29, 1955	83
		Sept. 7, 1955	79
523	45	Oct. 6, 1953	53
		Jan. 10, 1955	36
		Apr. 20, 1955	33
		June 10, 1955	32
		Sept. 7, 1955	36
525	49	Oct. 6, 1953	91
		Jan. 10, 1955	85
		Apr. 20, 1955	95
		Sept. 7, 1955	124
588	50	Oct. 22, 1953	265
		Jan. 10, 1955	328
		Apr. 20, 1955	258
		June 29, 1955	400
590	20	Oct. 22, 1953	45
		Jan. 10, 1955	67
		Apr. 20, 1955	67
		June 29, 1955	70
597	15	Nov. 9, 1953	40
		Jan. 10, 1955	36
		Apr. 20, 1955	39
		June 29, 1955	29

Table 6. (Continued)

Well No.	Depth of well (feet below land surface)	Date of collection	Chloride content (ppm)
608	58	Nov. 23, 1953	100
		Jan. 10, 1955	88
		Apr. 20, 1955	87
		June 29, 1955	80
619	57	Apr. 15, 1955	550
		June 29, 1955	700
		Aug. 16, 1955	650
		Sept. 7, 1955	645
		Oct. 7, 1955	650
620	56	May 11, 1955	42
		June 29, 1955	43
		Aug. 16, 1955	49
		Sept. 7, 1955	47
622	56	Apr. 20, 1955	20
		May 11, 1955	16
		June 29, 1955	18
		Aug. 16, 1955	15
		Sept. 7, 1955	43
637	15	Jan. 11, 1955	245
		Apr. 29, 1955	48
		June 30, 1955	32
638	38	Apr. 20, 1955	230
		June 29, 1955	272
		Aug. 16, 1955	352
642	45	Apr. 20, 1955	56
		June 29, 1955	76
		Aug. 16, 1955	65
647	113	Apr. 15, 1955	98
		June 29, 1955	40
		Sept. 7, 1955	34
654	63	Feb. 3, 1955	197
		Apr. 20, 1955	312
		June 29, 1955	348
		Sept. 7, 1955	348
		Oct. 5, 1955	280
687	60	Apr. 19, 1955	775
		June 29, 1955	780
		Aug. 16, 1955	810

Table 6. (Continued)

Well No.	Depth of well (feet below land surface)	Date of collection	Chloride content (ppm)
720	104	Apr. 22, 1955	9,180
	84	Apr. 23, 1955	19
		May 11, 1955	14
		May 23, 1955	15
		June 29, 1955	30
		Aug. 16, 1955	15
		Sept. 7, 1955	15
722	112	Apr. 20, 1955	78
		May 26, 1955	61
		June 29, 1955	37
		Sept. 7, 1955	27
734	84	June 30, 1955	176
		Aug. 16, 1955	940
		Sept. 8, 1955	930
		Oct. 7, 1955	1,430
735	69	June 30, 1955	34
		Sept. 8, 1955	94
		Oct. 7, 1955	185
		Nov. 2, 1955	307

an increase and then a decrease in the chloride content of the water in 1955 (table 6). The decrease was probably caused by the flushing of the salty artesian water from the aquifer.

Contamination from Surface-Water Bodies. Encroachment from the St. Lucie River and the Manatee Pocket is not extensive at present. It has occurred only in areas near the coast, and no encroachment has been found more than half a mile from the river. The fresh-water head is high close to the shoreline, and in many places fresh water can be obtained from wells within 100 feet of salt-water bodies. It is reported that fresh water has been obtained from wells driven in the river bottom, but the writer has not confirmed this.

Heavy pumping in the areas adjacent to the St. Lucie River may cause sufficient lowering of the water table to allow salt water to invade the fresh-water zone. Water of high chloride content was detected in well 720, about 1,500 feet from the St. Lucie River, about midway between the river and the water-plant

well field. When the well was drilled, water containing 9,180 ppm of chloride was encountered at a depth of 104 feet. The well casing was immediately pulled back 20 feet, to a depth of 84 feet, where the chloride content of the water was only 19 ppm. A layer of fine sand between 84 and 104 feet apparently acts as a confining bed, because no appreciable increase in the chloride content occurred after several months of intermittent pumping to irrigate a lawn. It is believed that the salinity of the water in well 720 is the result of direct encroachment from the St. Lucie River, caused by heavy pumping at the water-plant and ball-park well fields. However, when well 622, in the city ball-park well field, was deepened from 56 feet to 115 feet the chloride content of the water decreased slightly, from 36 to 20 ppm, indicating that encroachment had not reached the vicinity of the well field at the ball park. The water in well 722, 600 feet east of the city water plant and 600 feet from the St. Lucie River, contained 78 ppm of chloride at a depth of 112 feet, indicating that encroachment of water of high chloride content had not reached the vicinity of the well field at the water plant. The salt-water front is probably now stationary or is being pushed back toward the river because of the increase of fresh-water head due to the cessation of pumping of the city water-plant and ball-park fields. The position of the salt-water front cannot be determined accurately because of the lack of deep observation wells.

Some salt-water encroachment is occurring along the eastern side of the Stuart area immediately adjacent to the St. Lucie River and the Manatee Pocket. A relatively high, discontinuous ridge parallels the eastern shoreline and is flanked on the west by low, swampy land. The lowland is drained by streams and ditches that flow parallel to the ridge until they reach gaps where they cross the ridge and discharge into the St. Lucie River and Manatee Pocket. They reduce the fresh-water head under the ridge by intercepting recharge from inland areas and depleting ground-water storage beneath the ridge. Streams are also subject to contamination during low ground-water stages and high tides. Even moderate pumping in such an area results in movement of salt water into the aquifer. The chloride content of the water in well 362 in this area (fig. 3) increased from 35 ppm in 1953 to more than 2,000 ppm in 1955 (table 6). This locality is especially vulnerable to contamination because of its proximinity to a drainage canal.

Contamination from Artesian Aquifer. The beds of relatively impermeable clay and fine sand of the Hawthorn formation act as

an effective barrier to the vertical migration of salt water from the artesian aquifer, except where the beds have been punctured by wells. In the Stuart area, the artesian water contains between 800 and 4,500 ppm of chloride and is under a pressure head of about 40 feet above the land surface. If this water were allowed to flow freely at the surface it could contaminate the fresh water in the shallow aquifer. The artesian water is highly corrosive, and, after a period of years, it may corrode the casings of the wells and create perforations through which the salty water can escape into the fresh-water aquifer even though the top of the well is tightly capped. An electric log, made by the Florida Geological Survey, of well 128, an artesian well within 300 feet of the Stuart water-plant well field, indicated many breaks in the casing at various intervals below the land surface. Salt water escaping through holes in the casing of this well is believed to be the source of chloride contamination in the old well field. The contamination could not be direct encroachment from the river because wells of the same depth as the municipal wells and situated a few hundred feet from the river bank, directly between the well field and the river, yielded water whose chloride content was lower than that in the municipal wells.

Evidence to support this conclusion was noted after the water-plant and ball-park well fields were shut down. The water in certain wells in the area increased markedly in chloride content and when the data were plotted on a map, the wells in which an increase had occurred formed a fan-shaped pattern extending down-gradient from the artesian well, the axis of the pattern closely paralleling the direction of the ground-water flow. The water in well 619, nearest the artesian well, had the greatest increase in chloride content, whereas that in wells farther away showed a smaller increase. Water in wells outside the area did not change appreciably. The observed changes in chloride concentration probably were caused by leakage of salty water from the artesian well. Prior to the shutting down of the water-plant well field, most of the salty artesian water was being drawn into the supply wells, where it was diluted by fresh water from within the area affected by pumping.

Well 128 was filled with cement on April 25, 1955, the day that pumping ceased in the water-plant well field, and the salty water in the aquifer after that time was artesian water which had not been flushed away. This residual artesian water moved down-gradient and was diluted by fresh water. As the salty water was

dispersed, the water from wells downgradient from the artesian well became fresher.

Jensen Beach and Rocky Point

Little or no salt-water encroachment has occurred in the Jensen Beach area from the St. Lucie County line southward to Sewall Point (fig. 5). Most wells in this area are sandpoint wells, 15 to 20 feet deep, and some are only a few feet from the Indian River. The high fresh-water heads that are maintained in the sandhills of the area keep the salt water from moving into the shallow aquifer. Much of the ground water discharges into the Indian and the St. Lucie rivers, through a zone extending from slightly above the shoreline to points some distance from the river banks (fig. 25). The upward seepage of fresh water along the river bottoms makes it possible to obtain fresh ground water immediately adjacent to the salt-water bodies. In some instances shallow wells drilled a short distance out in the rivers may yield

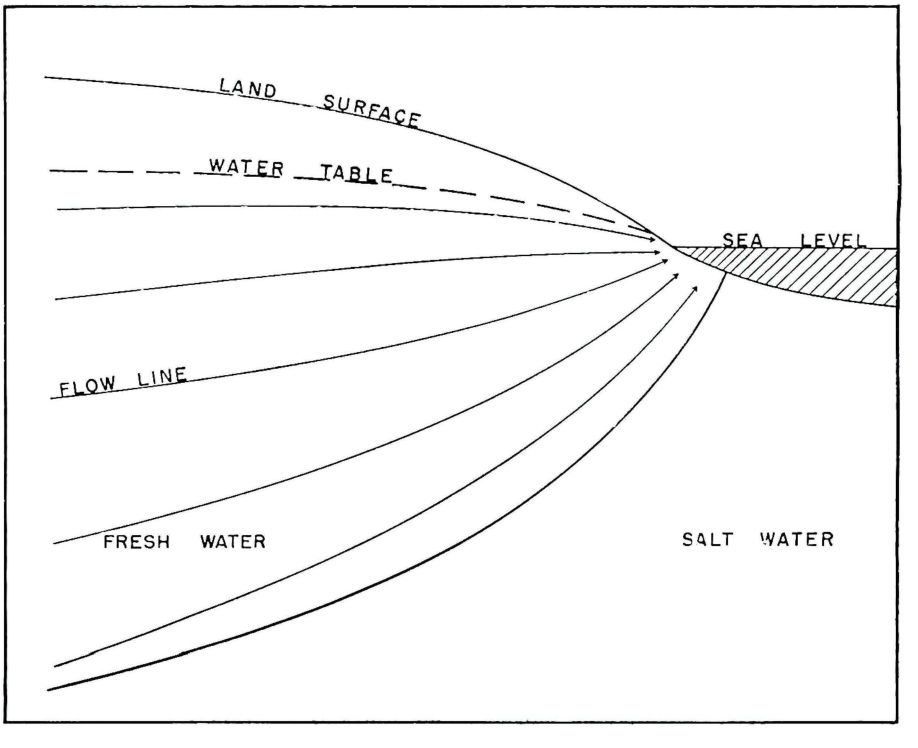


Figure 25. Discharge of fresh water into a salt-water body.

fresh water. These wells would probably pass out of the fresh water into salt water if they were drilled deeper.

A similar situation exists in the area west of the Intracoastal Waterway from Rocky Point southward to the Palm Beach County line (fig. 5). The fresh-water head is high enough along the coastal ridge to depress the salt front beyond the river banks in most areas.

Sewall Point

Sewall Point is a narrow peninsula almost surrounded by salt water. The source of the natural fresh water on the point is the rain that falls on and immediately north of the peninsula. The rainfall is rapidly absorbed by the permeable surface sand and much of it reaches the water table. However, as Sewall Point is very narrow, ground water has to travel only 500 to 1,000 feet to points of discharge.

The average height of the water table in the Sewall Point area is probably less than a foot above mean sea level, and from 15 to 30 feet below land surface. In accordance with the Ghyben-Herzberg ratio, this indicates a maximum of about 40 feet of fresh water beneath most of the peninsula. In the northern part, where the water table probably is slightly higher than in the rest of the peninsula, a sample of water with a chloride content of 14,500 ppm was obtained at 70 feet below mean sea level in well 903 (fig.3). Salt water was also reported at about 75 feet in a well drilled near well 809. Most wells extend only a few feet below mean sea level, so there is a considerable amount of fresh water beneath the bottom of the well. However, under conditions of sustained, heavy pumping the water table will decline below sea level and the salt water will rise and move laterally and vertically toward the well. (See "Quantitative Studies," p. 45.) Eventually, the water from the zone of diffusion may enter the well and temporarily destroy the usefulness of the well. This usually happens during prolonged periods of deficient rainfall when the aquifer received little or no recharge and the demand for water is great. With the cessation of pumping or the occurrence of heavy rainfall, the salt water will gradually move outward and downward in the aquifer.

A long period of deficient rainfall occurred during 1955-56. Analyses of water samples collected in June 1956 from many wells on Sewall Point show that salt water had encroached into the aquifer. Well 816, which is actually four closely spaced wells connected in manifold, was heavily pumped for lawn irrigation

and had the highest chloride content (1,000 ppm) on Sewall Point. In addition, well 816 is quite close to wells 93 and 814, which were being pumped. The combined pumpage of the wells in the small area lowered the water table sufficiently to allow the salt water to move in.

Hutchinson Island

The hydrologic conditions on Hutchinson Island are somewhat similar to those on Sewall Point except that the land is narrower and the land-surface altitudes are much lower. Consequently, the average altitude of the water table is lower than it is on Sewall Point, probably only a few inches above mean sea level.

Wells in many places on the island are still in fresh water a foot or so below the water table; however, even moderate pumping reduces ground-water levels below sea level and allows salty water to enter the well. Small supplies of water for domestic purposes might be developed in the most favorable locations on the island, but even these would be subject to contamination during prolonged drought periods.

Jupiter Island

The fresh-water lens on Jupiter Island is thicker than that on Hutchinson Island, but not as thick as it is on Sewall Point. The island ranges from 1,000 to 1,500 feet in width and from 0 to 30 feet in land-surface altitude,—greater than Hutchinson Island, but narrower and lower than Sewall point. Differences in the geologic and hydrologic conditions of the three insular areas probably account for some of the differences in the relative thickness of the fresh-water lenses.

Seven wells were inventoried and sampled during the investigation of Jupiter Island in August 1956. Water samples from four wells had chloride concentrations ranging between 570 and 1,190 ppm and samples from three wells had chloride concentrations ranging between 57 and 61 ppm. The three wells containing the smaller concentrations were near the golf course and were probably receiving recharge from the large quantities of fresh water used to irrigate the fairways and greens. Most of the water used on Jupiter Island is piped across Hobe Sound and the Intracoastal Waterway from wells on the mainland.

PLEISTOCENE CONTAMINATION

When Martin County and the rest of south Florida emerged from the ocean after the last major advance of the sea, all the land was saturated with salt water. Rain falling on the land and moving through the ground has gradually carried most of the salt water back to the ocean. The rate at which the salt water is carried away depends upon the rate at which the water can move through the ground. This in turn depends on the slope of the water table or piezometric surface and the permeability of the material.

Shallow Aquifer. Most of the Pleistocene sea water has been flushed from the shallow aquifer in Martin County. The residual Pleistocene sea water that has not been flushed out is mostly in the lower part of the aquifer, especially in the western part of the county. The shallow aquifer in the area of the Atlantic Coastal Ridge has been almost flushed of sea water, probably because of the generally steep slope of the water table and the high permeability of the material. West of the Atlantic Coastal Ridge and at considerable distances from present salt-water bodies, are many areas where salty water occurs in the lower part of the aquifer. One such area is east of Indiantown at the site of the Westbury Farm horse-training track. Analyses of water samples from wells 934, 935, and 936 (fig. 4) show that the chloride content of the water in general increases with depth in the aquifer. The chloride concentrations were as follows: at 22 feet, 32 ppm; at 44 feet, 42 ppm; at 63 feet, 86 ppm; at 86 feet, 810 ppm; and at 108 feet, 615 ppm.

The permeability of the material at 86 feet is quite high, but that between 60 and 80 feet is very low. Possibly, the rainwater cannot move rapidly through the relatively impermeable material between 60 and 80 feet to clear the 86-foot stratum of its salt contact. The area is very flat and is near the poorly defined divide between water draining toward Lake Okeechobee and water draining toward the Loxahatchee River and the Atlantic Ocean. This tends to create a water table with very little slope and consequently there is little ground-water flow.

Another example of apparent residual Pleistocene sea water is shown by data from well 161. This well (117 feet deep) is near the shore of Lake Okeechobee and yields water with a chloride content of 650 ppm (fig. 23). The water from a nearby well (of unknown depth) has a chloride content of 805 ppm. The geologic

and hydrologic conditions of this area probably are similar to those near the Westbury Farm racetrack.

Artesian Aquifer. The piezometric surface of the Floridan aquifer in Martin County is about 50 feet above mean sea level at the present time. In accordance with the Ghyben-Herzberg ratio this pressure head should be sufficient to insure at least 2,000 feet of fresh water below sea level. Artesian wells in Martin County range in depth from 700 to 1,485 feet; therefore, it appears that the high chloride content of the water (fig. 26) is due to contamination during the Pleistocene epoch rather than recent encroachment of sea water.

Analyses of water samples taken at 5-foot intervals during the drilling of wells 841 and 910 showed that the chloride content of the water decreased with increasing depth in the aquifer. In well 841, south of Stuart, the chloride content decreased from 4,050 ppm at 845 feet to 2,900 ppm at 1,057 feet. In well 910, northwest of Indiantown, the chloride content decreased from 935 ppm at 850 feet to 770 ppm at 1,096 feet. The water will probably be saltier again at greater depths. Very salty water was reported at a depth of 1,800 feet in a well at the Adams ranch north of Indiantown, but the well was sealed off at 1,100 feet before a sample could be taken.

It appears that there are relatively fresh and salty zones within the artesian aquifer. The fresh zones probably correlate with the permeable strata, and the salty zones with the relatively impermeable strata. Unfortunately, data are not sufficient to define accurately the zones of fresh water. It might prove profitable during drilling to analyze the water at different depths in the aquifer, so that the salty zones can be recognized and sealed off, and, thus, develop only the fresher zones in the well.

The artesian aquifer in Martin County in 1957 contained a certain amount of salt water. The quality of the water should improve as the salty water is discharged and replaced by fresh water from the recharge area. However, considering the great thickness and areal extent of the aquifer and the amount of salty water in storage in the aquifer, a considerable amount of time will have to elapse before any improvement is noticed.

USE

All public and most domestic supplies of water in Martin County are obtained from ground-water sources. In addition,

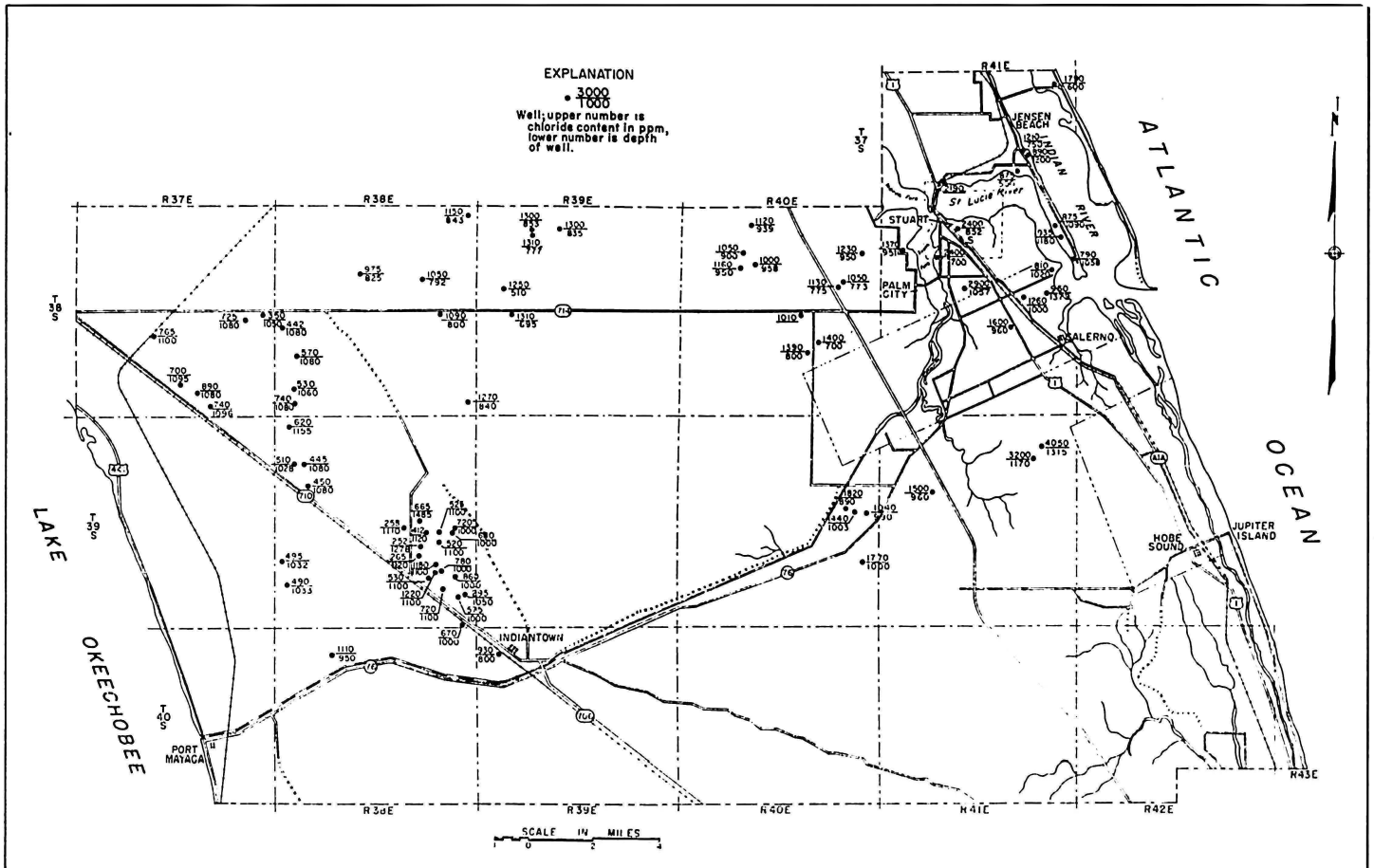


Figure 26. Chloride content of water in artesian wells in Martin County.

ground water is used extensively for irrigation, stock watering, industry, and air conditioning.

PUBLIC SUPPLIES

Three towns in Martin County have public water supplies: Stuart, Hobe Sound, and Indiantown. In 1957 Stuart obtained its supply from three wells (657, 723, and 724) developed in the shallow aquifer, and the pumpage in 1957 totaled 103 million gallons (table 7). Hobe Sound obtained its water from six wells located in the sandhills near Jonathan Dickinson State Park. Water from the town of Hobe Sound is pumped across the Intracoastal Waterway to the town of Jupiter Island because no large dependable supplies are available on Jupiter Island. The total pumpage in 1957 for Hobe Sound is not available. Indiantown obtained its water supply from 10 shallow wells and pumpage in 1957 was about 3.5 million gallons.

IRRIGATION AND STOCK SUPPLIES

Irrigation and stock watering probably account for the largest withdrawals of ground water in Martin County.

Water from the shallow aquifer is used for irrigation by the flower growers in the Stuart area, by farmers growing vegetables, citrus fruits, watermelons, potatoes, etc., and by ranchers for pastureland, stock watering, and feed crops.

Approximately 80 artesian wells have been drilled in Martin County for various types of irrigation and other uses. Many of the wells were originally drilled for irrigating such crops as tomatoes and watermelons. The land is often farmed for only one or two years, after which it is seeded for pasture. The wells are then used to irrigate the pasture and water the stock. The total use of artesian water for irrigation may be as much as 10 mgd during the dry season; however, during the rainy season most wells are turned off.

The shallow aquifer is the main source of water for the many small wells used to irrigate lawns and shrubbery. The greatest concentration of these wells is in and around the city of Stuart. A small amount of water from the artesian aquifer is used for lawn irrigation.

OTHER USES

Small quantities of ground water are used in other activities, such as industrial and cooling processes, and for swimming pools.

TABLE 7. Pumpage from Stuart Well Field, in Millions of Gallons Per Month

Year	Jan	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1941	2.63	2.77	3.23	2.89	2.70	2.82	2.48	2.68	2.57	2.69	2.91	2.62	32.98
1942	3.26	3.54	3.29	3.26	3.67	3.24	3.40	3.30	3.06	3.47	3.48	3.53	40.51
1943	3.53	3.42	3.57	3.62	3.80	3.57	3.49	3.61	3.44	3.63	3.74	3.94	43.35
1944	3.93	4.04	4.41	4.36	4.38	4.29	3.88	3.50	3.40	3.23	3.28	3.63	46.31
1945	3.86	3.60	4.25	3.89	3.71	3.34	3.02	3.28	3.12	3.11	3.18	3.64	42.00
1946	3.91	3.85	4.00	4.30	3.40	2.94	3.05	3.21	3.16	3.80	3.55	3.86	43.04
1947	4.14	3.74	3.98	3.61	3.77	3.11	3.48	3.50	3.10	3.27	3.29	3.50	42.47
1948	3.61	4.36	5.00	4.56	4.14	3.74	3.53	3.41	3.25	3.79	4.04	4.22	47.65
1949	4.32	4.17	4.77	4.27	3.94	3.13	3.34	2.83	3.96	3.58	3.74	4.01	46.05
1950	4.00	4.84	5.18	4.56	4.79	4.12	4.15	4.28	5.00	4.90	4.81	5.78	56.43
1951	6.08	5.71	6.73	5.30	6.73	5.18	4.27	5.43	4.19	3.68	4.55	5.01	62.86
1952	6.11	5.39	4.76	4.98	5.20	5.39	5.54	5.75	5.59	5.90	5.59	5.56	65.74
1953	6.34	5.85	6.35	6.18	6.47	5.37	5.93	5.34	5.44	5.03	5.23	5.90	69.42
1954	6.42	6.65	6.75	6.48	6.40	6.26	5.89	6.70	5.82	6.34	6.75	7.57	78.02
1955	8.32	7.23	8.21	7.54	8.15	7.91	6.85	7.11	6.67	7.55	7.95	7.57	91.07
1956	8.19	8.08	8.23	7.23	7.38	7.26	7.33	7.37	6.78	7.10	7.62	9.32	91.89
1957	9.24	9.19	9.57	8.05	8.30	8.08	7.96	7.77	7.95	8.32	9.33	9.08	102.83

SUMMARY AND CONCLUSIONS

The principal source of fresh water in Martin County is a shallow nonartesian aquifer which extends from the land surface to a depth of about 150 feet. This aquifer is composed of sand, thin limestone layers, and shell beds. It is nonuniform in its water-bearing properties but generally is more permeable in the eastern part of the county than in the western part. The aquifer in the western part of Martin County has only been partially explored and it may contain large quantities of water. In general, only a small part of the potential yield of the shallow aquifer was being used in 1957.

Salt-water encroachment into the shallow aquifer has not been extensive but it is a problem in areas bordering bodies of salt water, such as Sewall Point and Hutchinson and Jupiter Islands. Leaky artesian wells also have caused salt-water contamination in a few areas. Diluted sea water that entered during the Pleistocene epoch remains trapped in some parts of the shallow aquifer in western Martin County.

The artesian aquifer is composed of limestones of Eocene age that range from 600 to 800 feet below the surface. Large quantities of water are available from this aquifer but the water is usually highly mineralized. The degree of mineralization differs in different areas of the county and in different zones within the aquifer. The dissolved solids range from 674 to 7,400 ppm and the chloride concentrations range from 252 to 4,050 ppm. The fresh-water zones within the aquifer probably correspond to the more permeable layers and lie between saltier less permeable zones. Few wells tap the artesian aquifer in Martin County and much water of fair to poor quality could be developed.

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WELL LOGS

Well 143
(NW¼SW¼ sec. 9, T. 38 S., R. 40 E.)

Material	Depth, in feet below land surface
No sample	0- 30
Anastasia formation:	
Sand, brown, quartz, coarse to very coarse, average coarse, rounded to subrounded, frosted, with a few grains of smoky quartz; a few mollusk fragments	30- 42
Shell fragments and quartz sand; the sand ranges from fine to grit, rounded to subangular, frosted to clear, and contains small clusters of quartz grains cemented together with crystalline calcite; well-worn light to dark shell fragments containing numerous fragments of *Donax* sp., some of which show traces of original color.	42- 63
As above, plus some gray-brown micaceous, sandy clay containing foraminiferas, *Elphidium* sp., *Nonion* sp., and others	63-105
As above, plus some white to gray-brown very sandy, hard limestone	105-147

Material	Depth, in feet below land surface
No sample	147-186
Sand, light green, quartz, medium to very coarse, rounded, clear to frosted; mollusk fragments, coral, echinoid spines	186-188
Caloosahatchee(?) marl:	
Limestone, gray-brown, hard to soft clayey, very sandy calcitic, and some light green quartz sand and shells	188-209
Tamiami formation:	
As above plus foraminifers, *Amphistegina lessonii*	209-230
Sand, gray, quartz, medium to coarse, rounded, clear; a few grains are smoky; some clay and many fragments of pelecypods, gastropods, and coral	230-252
Shell fragments and sand as above, plus some very dark olive-drab montmorillonite clay	252-273
No sample	273-294
Hawthorn formation:	
Clay, very dark olive-drab, micaceous, nonplastic; very fine sand and white mollusk fragments	294-336
No sample	336-339
As at 294-336 feet, plus some nonplastic cream colored clay; mollusk fragments; foraminifers, *Robulus americanus*, *Uvigerina* sp., and others	339-420
As above, plus *Cibicides concentricus*	420-441
As above, plus some cream, hard to soft, dense, sandy, phosphatic limestone; coral	441-462
Limestone, cream, hard to soft, dense, sandy, phosphatic, plus some gray to black translucent chert, tan nonplastic clay, and a small amount of olive-drab clay; mollusk fragments, coral, and foraminifers	462-483
Clay, tan to olive-drab, nonplastic, plus some material as above; mollusk fragments, coral, shark's teeth, barnacle plates; foraminifers, *Robulus americanus* and others	483-525
As above, plus *Robulus americanus* var. *spinosus* and many others	525-546
No sample	546-567
Limestone, clay, quartz sand and chert; the limestone is hard to soft, finely crystalline to chalky or sandy, calcitic; the sand is tan to white, coarse, rounded, clear, some grains containing dark micaceous inclusions; dark colored chert; light green clay; mollusk fragments and coral; foraminifers, *Robulus americanus* and others	567-588
Suwannee(?) limestone:	
Limestone, cream, soft to hard, coarsely granular, porous; some light to dark phosphorite grains and much material	

Material	Depth, in feet below land surface
as above; mollusk fragments, echinoid spines, coral foraminifers. *Dentalina* sp. (common), *Lepidocyclina* sp. (rare)	588-668
Ocala group:	
Coquina, composed of large foraminifers: *Lepidocyclina ocalana*, var., *Operculinoides* sp. and others; much granular limestone as above and some cream, medium hard, porous, miliolid limestone; mollusk fragments, small gastropods, and echinoid spines	668-688
Limestone, cream, soft, coarsely granular, porous; foraminifers as above	688-722
No sample	722-728
As at 688-722 feet	728-732
Avon Park limestone:	
Limestone, cream to white, chalky to granular, soft, porous; foraminifers *Coskinolina floridana*, *Dictyoconus cookei*, *Textularia*, *coryensis*, *Lituonella floridana* and others	732-748
As above, plus light tan soft porous calcitic miliolid limestone, and some white to brown hard, dense, cryptocrystalline limestone; fauna as above	748-768
Miliolid limestone, tan, soft, porous, slightly calcitic; some white, hard, dense cryptocrystalline limestone; Avon Park fauna	768-788
Limestone, white to tan, soft to hard, chalky to granular, porous; Avon Park fauna	788-848
As above, plus some tan, hard, granular, porous, very calcitic limestone; *Peronella dalli*	848-888
Limestone, white to tan, soft to hard, chalky to granular, porous; Avon Park fauna, plus numerous specimens of *Dictyoconus? gunteri*	888-948
Limestone, tan, soft to hard, porous, coarsely granular, crystalline, with limestone as in 788-848 feet; *Dictyoconus gunteri* abundant	948-958
Well 146 (SE¼NW¼ sec. 36, T. 39 S., R. 38 E.)	
No sample	0-168
Upper Miocene:	
Shell marl, gray-brown, clay, silt, sand (sand, fine to very coarse, average medium, rounded to angular, clear), phosphorite; some cream medium hard, sandy limestone; pelecypod fragments, small gastropods, barnacle plates,	

Material	Depth, in feet below land surface
echinoid spines; foraminifers *Cibicides concentricus*, *Amphistegina lessonii*, and others	168-189
Hawthorn formation:	
Clay, olive-drab, silt and fine sand, micaceous, phosphoritic; mollusk fragments, barnacle plates; foraminifers, mostly *Nonion*, a few *Cibicides concentricus* and *Bulimina gracilis*	189-210
Clay, dark blue-green; silt, very fine sand, mica; mollusk fragments, foraminifers *Nonion*, *Bulimina gracilis*	210-231
Clay, blue-green, fissile; silt, sand, mica; mollusk fragments, foraminifers *Nonion*, *Bulimina gracilis*, *Bulimina curta*	231-252
As above, plus some very dark blue-green clay	252-273
As above, but with more sand, silt, and mica; *Bulimina gracilis* abundant	273-294
Shell marl, clayey, silty, sandy; (sand is fine to coarse, frosted); cream, medium-hard, sandy limestone; pelecypod fragments, small gastropods, scaphopods, coral, echinoid spines, foraminifers, mostly *Nonion*	294-315
Clay, dark blue-green, silty, sandy, micaceous; mollusk fragments and foraminifers as above	315-336
Sand, green, fine to very coarse, average coarse, rounded to subrounded, clear to frosted; some glauconite and material as above	336-357
Limestone, cream, medium hard, very sandy, phosphatic; sand as above; clay as in 315-336 feet; mollusk fragments, sponge spicules, echinoid fragments; foraminifers *Virgulina* cf. *punctata*, *Globorotalia menardii*, *Bolivina* sp., *Uvigerina* sp., and others	357-378
Silt, blue-green, clay, fine sand; mollusk fragments, sponge spicules, foraminifers *Textularia*, *miliolids*, and others	378-399
Silt, olive-drab; foraminifers *Textularia*, *miliolids*, *Nodosaria* sp., *Dentalina* sp., *Candorbulina? Uvigerina* sp.	399-420
Limestone, cream, slightly glauconitic, dense, finely crystalline; with some gray clay, silt, dark chert, phosphorite and sand; shark's teeth, sponge spicules, mollusk fragments, foraminifers—*Robulus americanus* var. *spinosus* abundant, *Marginula* sp., and others	420-437
Limestone, cream, soft, granular, much clay and fine sand; fossils as above, plus coral	437-461
As above, plus much coral and some brown chert	461-482
Clay, gray-green to tan, some material as above	482-524
Shell fragments, sand as in 336-357 feet, dark phosphorite, and chert; pelecypod fragments, scaphopods, small gastropods, shark's teeth, ostracods, foraminifers	524-609
Shell fragments and some tan clay, dark phosphorite, and and chert; mollusk fragments, coral	609-630

Material	Depth, in feet below land surface
Clay, tan to olive-drab, plus materials as above	630-651
As above, but clay is tan	651-693
As above; foraminifers common—*Cibicides concentricus* and others	693-714
Clay, tan; with cream to gray, sandy, phosphatic, dense limestone, dark chert, and phosphorite; mollusk fragments and coral	714-756
Suwannee limestone:	
Limestone, cream, soft, porous, granular, with some material as above; mollusk fragments, coral, *Lepidocyclina* sp.	756-777
Ocala group:	
Miliolid limestone, cream, soft to hard, calcitic; mollusk fragments, very small echinoids, large foraminifers, *Lepidocyclina ocalana* vars. *Heterostegina ocalana*, *Operculinoides floridensis*, and others	777-798
Avon Park limestone:	
Limestone, white, soft, chalky, slightly porous, calcitic; much material as above. Fossils as above, plus *Cribrobulimina cushmani*, *Textularia coryensis*, *Coskinolina floridana*, *Dictyoconus cookei*, *Lituonella floridana*, and others	798-815
Limestone as above, plus some miliolid limestone as in 777-789 feet. Fauna as above	815-819
As above, plus some finely crystalline, cream to tan, hard limestone. Fauna as above	819-840
Limestone, cream to tan, soft, porous, granular; some cream, porous, calcitic miliolid limestone; and some tan, hard, dense, cryptocrystalline limestone. Abundant *Charophyte oogonia*, *Coskinolina floridana*	840-861
As above, plus small gastropods	861-882
Miliolid limestone, tan, soft, porous, calcitic, and some white, soft, slightly porous, chalky limestone. Avon Park fauna	882-893
As above but less chalky limestone	893-903
Miliolid limestone, tan to cream, soft, porous, calcitic. Avon Park fauna	903-945
As above but less porous. *Charophyte oogonia*	945-966
As 903-945 feet plus some cream, soft, slightly porous, chalky limestone	966-987
As above, plus some very large miliolids	987-1,008
Miliolid limestone, tan-cream, soft, porous, calcitic, and and brown finely crystalline, dense, fairly hard dolomitic limestone; clear crystalline calcite, white, chalky limestone. Avon Park fauna	1,008-1,029

Material	Depth, in feet below land surface
Miliolid limestone, cream, soft to medium hard, very porous, calcitic	1,029-1,071
As above, plus much crystalline calcite	1,071-1,092
Miliolid limestone, cream, soft, porous, calcitic. Avon Park fauna	1,092-1,113
As above, plus some cream colored, hard to soft, chalky, porous limestone. Avon Park fauna	1,113-1,134
As above, plus some light brown, medium hard to hard, finely crystalline, dolomitic limestone	1,134-1,155

Well 596
(NE¼SE¼ sec. 7, T. 38 S., R. 41 E.)

Pamlico sand:	
Sand, gray, quartz, fine to medium, average fine, subrounded to angular, clear to frosted	0- 5
Anastasia formation:	
Sand, tan-gray, quartz, fine to medium, average fine, subrounded to angular, clear to frosted; noncalcareous	5- 10
As above, but light tan-gray	10- 21
Sand, light to dark tan-gray, quartz, fine to coarse, average fine, subrounded to angular, clear to frosted, clayey, (light blue clay in jet water), slightly calcareous	21- 26
Sand, dark olive-drab, quartz, very micaceous, clayey, (dark blue clay in jet water); sand is very fine to coarse, average fine, rounded to subangular, clear to frosted; contains organic particles; slightly calcareous	26- 31
Sand, dark-gray to yellow-green, quartz, slightly clayey, slightly calcareous; fine to coarse, average medium, subrounded to angular, frosted to clear, plus organic particles	31- 36
Sand, gray, quartz, slightly calcareous, very fine to medium, average fine, subrounded to angular, frosted to clear, and organic particles as above	36- 42
As above to 44 feet; from 44 feet to 47 feet—sand, gray, quartz, slightly micaceous, very fine to coarse, average medium, subrounded to angular, frosted; contains some soft, gray, sandy limestone, small dark rounded particles of phosphorite, and poorly preserved fossils	42- 47
Limestone, tan to dark gray, hard to soft, sandy, calcitic, plus small shell fragments; fine to very coarse quartz sand, phosphate as above, and a few mica flakes; very few foraminifers	47- 52
As above, and numerous shells and shell fragments	52- 57
Shell marl, gray to tan, with material as in 47-52 feet. Well-preserved microfauna	57- 58
As above, but contains fewer shells	58- 59

Material	Depth, in feet below land surface
Limestone, tan to dark gray, hard, dense to porous, sandy, calcitic; small shell fragments phosphatic; fine to very coarse quartz sand	59- 60
As above, but limestone is more porous	60- 61

Well 615
(SW¼SE¼ sec. 22, T. 37 S., R. 41 E.)

Pamlico sand:

Sand, cream, quartz, medium to coarse, average coarse, rounded to subangular, frosted, a few grains stained with orange-red clay; noncalcareous	0- 10

Anastasia formation:

Sand, dark red-brown, quartz, medium to very coarse, average coarse, rounded to subangular, frosted, carbonaceous, noncalcareous; some clay	10- 15
Sand, dark orange-red, quartz, medium to very coarse, average coarse, rounded to subangular, frosted; a few small shell fragments and clusters of calcite; some clay	15- 20
Sand, red-orange, quartz, medium, subrounded to subangular, clear to frosted, noncalcareous	20- 25
Sand, red-orange to cream, quartz, medium to coarse, average coarse, rounded to subangular, frosted to clear, and a few small red shell fragments	25- 30
Sand, cream, quartz, slightly micaceous, fine to very coarse, average medium, rounded to subangular, large grains frosted, small grains frosted to clear, scattered worn mollusk fragments and well preserved foraminifers; contains orange-red clay	30- 35
Sand, light tan-gray, quartz, fine to coarse, average medium, rounded to subangular, frosted to clear; a few scattered mollusk fragments, foraminifers, clear calcite particles, and mica flakes	35- 40
Sand, tan-gray, quartz, medium to coarse, average medium, rounded to subangular, frosted to clear; a few mica flakes, slightly calcareous	40- 45
As above, but noncalcareous	45- 60
Sand, dark orange-red, quartz, fine to very coarse, average medium, subrounded to subangular, frosted to clear; contains much clay and mica flakes; noncalcareous	60- 65

Well 617
(NW¼NE¼ sec. 14, T. 38 S., R. 41 E. Township and Range projected in Hanson Grant.)

Pamlico sand:

Sand, cream, quartz, fine to medium, average medium, subangular to subrounded, clear, noncalcareous	0- 5

Material	Depth, in feet below land surface
Anastasia formation:	
Sand, red-brown, quartz, medium to coarse, average medium, subangular to subrounded, clear to frosted, noncalcareous, carbonaceous	5- 10
Sand, tan-gray, quartz, medium to coarse, average medium, subangular to subrounded, clear to frosted, noncalcareous	10- 15
Sand, tan, quartz, medium to coarse, average coarse, rounded to subrounded, clear, noncalcareous	15- 20
Sand, tan, quartz, slightly clayey, slightly micaceous, noncalcareous	20- 25
Sand, dark gray, quartz, fine to coarse, average medium, rounded to subangular, with small shell fragments, very micaceous, calcareous, phosphatic (small, rounded, dark particles), clayey; few foraminifers	25- 30
Sand, dark gray, quartz, micaceous, very phosphatic (as above), clayey, fine to medium, average fine, angular to subrounded; some clear calcite particles and shell fragments as above; no micro-fossils noted	30- 40
As above, but with many foraminifers	40- 50
Sand, dark gray, quartz, very fine to fine, average fine, angular; micaceous, calcareous, very phosphatic, clayey (dark gray clay in jet water); small clusters of minute clear calcite particles and abundant mollusk remains	50- 60
As above; numerous macrofossils recovered at 63 feet (material from 50 to 63 feet) when well was blown with compressed air; sample consists of marine pelecypods, gastropods, echinoid fragments, crab claws, coral, and a few fresh-water gastropods; also, contains well-rounded pieces of hard, dark gray calcitic limestone	50- 63
Sand, dark gray, fine to medium, average fine, micaceous, calcareous, very phosphatic, clayey; small clusters of clear calcite along with numerous mollusk fragments; microfossils very abundant	63- 73
As above, but medium to coarse, average medium	73- 75
Sand, tan-gray, quartz, fine to medium, average medium, angular, micaceous, phosphatic, clayey (white clay in jet water); shell fragments, small clusters of minute clear calcite particles and particles of brown, hard, fossiliferous, calcitic limestone	75- 80
Sand, tan, quartz, fine to medium, average medium, angular to subangular, slightly micaceous, slightly phosphatic (as above), clayey; shell fragments	80- 87

Material	Depth, in feet below land surface
Well 623 (NE¼SW¼ sec. 4, T. 38 S., R. 41 E.)	
Pamlico sand:	
Sand, light gray, quartz, medium to coarse, average coarse, rounded to subrounded, clear to frosted	0- 5
Anastasia formation:	
Sand, dark brown, quartz, medium to coarse, average coarse, rounded to subrounded, clear to frosted, carbonaceous	5- 10
Sand, cream, quartz, medium to coarse, average coarse, rounded to subangular, clear to frosted, with some red-brown clay; slightly carbonaceous	10- 20
Sand, cream, quartz, medium to coarse, average medium, rounded to subangular, clear to frosted, and a few particles of red-brown clay	20- 25
As above, but coarse	25- 35
Sand, tan, quartz, very fine to fine, average fine, angular to subangular; contains a few particles of dark gray sandy clay and mica	35- 40
Sand, white, quartz, fine to medium, average medium, angular to subrounded, and a few particles of gray to red-brown clay and mica	40- 45
Sand, white, quartz, very fine, angular; a few small clusters of sand grains cemented together with iron oxide and a few particles of clear calcite; micaceous	45- 50
Sand, white, quartz, fine to coarse, average medium, rounded to angular, with some brown sandy clay, crystalline calcite and a very few dark shell fragments some of which are encased in crystalline calcite; micaceous; a few foraminifers	50- 52
Limestone, tan-gray, hard, porous, vuggy, fossiliferous; some dark particles of phosphorite	52- 55
Sand, fine to medium, quartz, clear, subrounded; layers of soft, cream limestone, and hard gray, nodular sandstone, composed of quartz sand and some shell fragments cemented with calcite	55-100
Sand, tan, quartz, fine to medium, clear, subangular to subrounded; shell fragments and foraminifers	100-110
Well 841 (NE¼SW¼ sec. 16, T. 38 S., R. 41 E.)	
Pamlico sand:	
Sand, quartz, medium, clear, angular; brown organic stains	0- 21
Anastasia(?) formation:	
Sand, quartz, medium, clear, subangular to subrounded, stained brown; some grains cloudy	21- 42

Material	Depth, in feet below land surface
Sand, quartz, fine to medium, clear, angular, slight brown stain	42- 55
Sand, light tan, quartz, medium, clear to cloudy, angular to subangular; a few shell fragments	55- 63
Sand, tan, quartz, fine to medium, clear to cloudy, angular to subangular, some shell material, a few small foraminifers; thin limestone and sandstone layers	63- 84
Sand, tan, quartz, very fine to medium, subrounded to angular, clear to cloudy; shell material; "quicksand" at about 88 feet	84-105
Sand, tan, quartz, very fine, clear, angular; shell fragments	105-116
Sand, tan-gray, quartz, very fine to fine, clear, angular; shell and very small phosphorite nodules	116-126
Sand, light gray, quartz, fine to medium, clear, angular; shell fragments and thin layers and lenses of limestone and sandstone; some phosphatic nodules. Sand coarser at 136-147 feet	126-147
Sand, light tan-gray, quartz, fine, clear, angular; shell fragments, some black grains of phosphorite or limestone; hard limestone layer at 150-152 feet; small foraminifers	147-168
Miocene (?):	
Sand, light gray, quartz, fine, clear, angular; slightly shelly; some phosphorite and small foraminifers	168-189
Sand, quartz, fine, clear, angular; gray-green clay, shell, and limestone lenses; micaceous	189-210
Sand, gray-green, quartz, fine, clear, angular; green clay, silt, phosphorite; layer of clay at 220 feet	210-231
Hawthorn (?) formation:	
Clay, green, sandy, silty, slightly shelly; few pebbles cemented by calcium carbonate; black and brown phosphorite grains; few foraminifers	231-252
As above, but more foraminifers, *Cibicides concentricus*	252-378
As above, and a few mica flakes	378-615
No sample (Driller reports "flint" layer 18 inches thick at about 645 feet)	615-647
Clay, dark green, silty and fine quartz sand; phosphatic nodules and flint fragments. *Cibicides concentricus*	647-653
Clay, light green, silty and sandy; many foraminifers, *Cibicides concentricus* and others; thin limestone layers and phosphatic nodules	653-660
As above, but dark green	660-664
As above, but less limestone and more sand	664-681
Clay, very light green; foraminifers as above; little sand or phosphate, flint fragments	681-683

Material	Depth, in feet below land surface
As above, but darker green color	683-697
Sand, black and brown, phosphatic; some clear, subrounded medium, quartz grains, foraminifers, and dark green clay	697-702
Limestone, cream, and light green clay in alternating layers; many foraminifers; some fine quartz sand, silt and shell fragments	702-715
As above, but more limestone	715-726
As above, but much phosphate	726-736
Limestone, cream, and light green to white clay layers; much brown and black phosphatic sand, fine to medium, clear quartz sand	736-747
As above, but a layer of tough, dark green clay at 752-755 feet	747-774
Clay, light green, and a few limestone layers; considerable quartz sand, clear to frosted, subrounded, medium to fine and dark phosphatic nodules (First flow of water at 779 feet; approximately 1 gpm)	774-779
As above, except more phosphatic sand	779-789
Sand, brown and black, phosphatic, and clear to cloudy, medium, subrounded quartz sand; light green to white clay	789-810
As above 810-820 feet; white, shelly hard limestone at 820 feet; estimated flow 30 gpm at 820-831 feet; water salty	810-831
Limestone, cream to white, and shell fragments; hard layer 835-837; foraminifers	831-842
Clay, green, tough, phosphatic, and fine to medium quartz sand; thin limestone lenses and shell fragments	842-856
As above but more sand	856-858
Tampa (?) formation:	
Limestone, white to cream, cryptocrystalline, sandy, phosphatic, chalky, much calcite; shell fragments and few foraminifers; hard limestone at 862-866 feet	858-866
Suwannee (?) limestone:	
Limestone, cream, soft, porous, granular, sandy, phosphatic; contains black flint fragments, calcite crystals, shell fragments and few distinguishable foraminifers; water flow increased from 30 to 60 gpm	866-888
As above, but more fine sand and harder; foraminifers	888-893
As above, but less sand, and softer	893-914
Same as above, but more sand	914-935
Same as above, but less sand	935-956
Same as above, but more calcite	956-967
Ocala group:	
Limestone, cream to light pink, hard, porous, many foraminifers, *Lepidocyclina ocalana*, *Operculinoides moodybranchensis*, and others; coral fragments, echinoid spines	967-987

Material	Depth, in feet below land surface
Same as above, but few foraminifers	987-1,010
As above, but white and hard	1,010-1,023
Limestone, cream, soft, little sand, many foraminifers and shell fragments; *Lepidocyclina* sp.	1,023-1,030
As above, *Lepidocyclina*, *Operculinoides*	1,030-1,044
As above, but hard	1,044-1,057

TABLE 8. Record of wells in Martin County.

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
GS 23	NW	NW	23	40	40	Soil Conservation Service	*91	4	85	OE	238	.....	8-12-43	...	T	..	Ca.
1	SE	SE	6	40	39	Indiantown Development Co.	*161	6	141	OE	13	.....	10- 3-45	...	T	..	Ca.
2	SE	SE	6	40	39	Indiantown Development Co.	35	2	...	SC	...	.....	.....	...	N	..	
3	SE	SE	6	40	39	Indiantown Development Co.	35	2	...	SC	...	.....	.....	...	N	..	
4	SE	SE	6	40	39	Indiantown Development Co.	35	4	...	SC	...	.....	.....	...	N	..	
5	SE	SE	6	40	39	Indiantown Development Co.	98	2	...	OE	...	.....	.....	...	N	..	
6	SE	SE	6	40	39	Indiantown Development Co.	125	6	...	OE	...	.....	.....	...	N	..	
7	SE	SE	6	40	39	Indiantown Development Co.	33	2	...	SP	...	.....	.....	...	N	..	
8	SE	NE	13	40	37	Port Mayaca	30	3	...	OE	5	.....	9-12-41	...	Ir.	78	Ca.; battery 4 wells.
9	SW	SE	15	40	37	Spender	27	1½	...	SC	10	.....	9-12-41	...	N	77	Ca.
10	NE	NE	22	40	37	Port Mayaca	...	6	...	..	...	.....	.....	...	N	..	
11	SE	SW	17	39	37	L. M. Maxey	40	2	...	OE	56	.....	9-11-41	...	D	77	
12	SE	NE	27	39	42	Hobe Sound Co.	117	12	...	OE	14	.....	8- 7-46	...	P	76	Ca.)
											18	.....	7-13-56	...		76	)
13	SW	NE	27	39	42	Hobe Sound Co.	80	12	...	OE	...	.....	.....	...	P		) Composite
14	SW	NE	27	39	42	Hobe Sound Co.	77	12	...	OE	32	.....	7-13-56	...	P	77	)
15	SW	NW	13	40	37	Kautz Dairy	40	2	...	..	79	.....	10- 3-41	...	S	76	Ca.
16	SE	NE	13	40	37	Port Mayaca	48	6	...	..	7	.....	9-12-41	...	D	78	
17	SE	NE	13	40	37	Bessemer Properties	32	4	29	OE	5	.....	10- 3-41	...	D	78	Ca.

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
18	SE	SE	6	40	39	Indiantown Development Co.	*31	1¼	25	OE	..	12.00	5-13-46	25	T	76	
19	NW	SE	2	39	37	W. T. Goode	38	1¼	36	OE	235	.....	6-27-46	12	D	..	Ca.
20	SE	NW	8	40	39	State Road Department	38	2	..	..	12	.....	7- 2-46	..	D,Ir.	79	
21	NE	NW	10	40	38	Sam Chastain	21	1½	..	OE	425	.....	7- 2-46	..	D	78	
22	SW	NW	12	40	38	W. F. Galloway	*94	1¼	..	OE	161	14.02	7- 2-46	..	D	74	Ca.
23	NW	NW	9	40	39	Orange State Oil Co.	25	1¼	..	..	16	.....	7- 2-46	..	D	74	
24	NE	NE	8	40	39	State Road Department	118	1¼	..	OE	196	.....	7- 2-46	..	D	..	
25	SW	NE	5	40	39	Troup Bros.	105	2	..	OE	32	.....	7- 3-46	..	D	75	
26	SE	NW	18	39	41	Louise Wineman	38	1¼	..	..	16	.....	7- 3-46	..	D,S	75	
27	SW	NE	25	39	40	M. C. Phipps	1,000	4	430	OE	1640	.....	7- 3-46	40	Ir.	80	Ca.; flowing well.
											1770	+24.0	4-22-57				
28	NE	SW	27	39	40	Unknown	*13	1¼	..	..	26	3.42	7- 3-46	..	S	78	
29	SE	SW	21	38	37	H. C. Williamson	1,100	4	..	OE	760	.....	6-27-46	150	S	80	Ca.; flowing well.
											740	+20.8	2-19-53				
											765	....	3- 6-57				
30	NW	SE	26	39	38	Indiantown Development Co.	1,100	6	450	OE	310	....	6-28-46	75	..	80	Ca.; flowing well.
											290	....	3- 2-53				
											530	+11.0	1-25-57			82	
											450	....	3-25-58				
31	NE	SE	26	39	38	Indiantown Development Co.	1,100	6	..	OE	625	....	6-28-46	200	Ir.	82	Ca.; flowing well.
											640	....	3- 2-53				
											780	....	1-25-57				
32	NE	SE	26	39	38	Indiantown Development Co.	1,100	4	..	OE	840	....	6-28-46	..	Ir.	..	Flowing well.
											1220	+7.0	1-25-57	70		83	
33	SE	NE	26	39	38	Indiantown Development Co.	1,100	6	..	OE	945	....	6-28-46	45	Ir.	..	Flowing well.
												+12.7	7- 2-46			84	
											925	+11.0	3- 2-53			84	
											1180	+6.0	1-25-57				

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
34	NW	NW	36	39	38	Indiantown Development Co.	1,100	6	..	OE	700 720	.... +12.2	6-28-46 3- 2-53 1-30-58	400	Ir.	83	Flowing well.
35	SE	SE	12	39	40	L. M. Boone	60	2	..	..	...	....	.....	...	D		
36	SW	SW	12	39	40	Arundel Corporation	35	2	..	..	47	....	7-16-46	...	In.	78	Ca.; composite sample wells 36-37.
37	SW	SW	12	39	40	Arundel Corporation	37	2	..	..	...	....	.....	...	In.	..	
38	SW	SW	12	39	40	Arundel Corporation	*23	1¼	..	..	...	8.50	7-16-46	...	D	..	
39	SE	NW	10	39	40	J. B. Woodham	60	2	..	..	32	....	7-16-46	...	D	74	
40	SE	NW	10	39	40	J. B. Woodham	30	1¼	..	..	30	....	7-16-46	...	S	76	
41	SE	SE	3	39	40	Henry Crews	30	1¼	..	..	57	...	7-16-46	...	D	74	
42	NE	NE	3	39	40	Vence Farms	35	2	..	..	64	...	7-17-46	...	D	..	
43	NE	NE	27	38	40	W. A. Hires	800	4	..	..	1,340 1,400 1,360 1,390	...	7-17-46 8-25-53 8-15-56 4-23-57	45	Ir.	78	Ca.; flowing well.
44	NE	NE	27	38	40	W. A. Hires	60	1¼	..	..	28	...	7-17-46	...	D	74	
45	SW	SW	23	38	40	A. J. Barrett	700	3	..	OE	1,350 1,350 1,370 1,400	... +28.0 +19.0	7-17-46 8-25-53 8-14-56 4-24-57	...	Ir.	78	Flowing well.
46	NW	NE	20	38	40	Vida Evans	50	1¼	..	..	68	...	7-17-46	..	D	..	
47	NW	NE	22	38	40	L. Van Ness	500	3	..	OE	1,020 1,010	+30.0	7-17-46 4-23-57	63	S	77	Ca.; flowing well.
48	NW	NW	24	38	40	Joseph Dilda	60	1¼	..	OE	42	...	7-17-46	..	D	82	
49	SW	SW	18	38	41	W. C. DeLong	30	1¼	..	..	30	...	7-17-46	..	D	74	

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
50	SW	SW	17	38	41	W. F. Donaldson	75	1¼	..	..	30	...	7-17-46	...	D	74	
51	SE	SW	17	38	41	H. O. Jordan	30	1¼	..	OE	..	...	.....	...	D	..	
52	SW	SE	4	39	41	Henry Paulson Ranch	30	2	..	SP	29	...	7-18-46	...	S	76	
53	SW	SE	4	39	41	Henry Paulson Ranch	*54	2	..	SP	..	4.59	7-18-46	...	N	..	
54	SW	SE	4	39	41	Henry Paulson Ranch	*21	1¼	..	SP	..	4.73	7-18-46	..	N	..	
55	SW	SE	4	39	41	Henry Paulson Ranch	40	2	..	SP	15	....	7-18-46	..	D,S	76	
56	SW	SE	4	39	41	Henry Paulson Ranch	30	2	..	..	..	....	.....	..	D,S	..	
57	SE	SW	4	39	41	Henry Paulson Ranch	30	1¼	..	..	..	....	.....	..	D,S	..	
58	SE	NE	5	39	41	E. J. Rhoades	28	2	..	SP	25	....	7-18-46	..	D	..	
59	h SW	NW	6	39	41	Corps of Engineers	78	8	..	OE	89 43	....	7-18-46 3-19-53	..	D,In.	..	
60	SE	SE	6	39	41	D. S. Greenlees	*32	2	..	..	8	.... 8.6	7-18-46 3-28-57	..	D,Ir.	..	
61	SW	SW	5	39	41	F. W. Loy	32	2	..	..	25	....	7-18-46	..	D,Ir.	74	
62	SW	SE	30	37	42	P. S. Fagin	8	1¼	..	..	3,920	....	7-18-46	..	D	..	
63	SE	NW	30	37	42	Mrs. Bamford	10	1¼	..	SP	4,080	....	7-18-46	..	D	..	
64	SE	NW	13	37	41	Gordon Brewer	600	4	..	OE	1,790	+30.3	7-18-46	..	Ir.	78	Ca.; flowing well.
65	SW	SW	26	37	41	V. C. Langford	500	4	..	OE	890 875	.... +27.0	7-19-46 5- 7-57	100 ..	S,Ir.	76	Ca.,; flowing well.
66	SW	SW	26	37	41	V. C. Langford	81	3	..	OE	15	....	7-19-46	..	D,Ir.	76	Ca.; battery 3 wells.
67	SW	SW	26	37	41	V. C. Langford	81	2	..	..	..	....	.....	..	Ir.	..	
68	h NW	SE	21	38	41	O. D. Quinlivan	54	1½	..	..	18	....	7-19-46	..	D	..	
69	h SW	NE	21	38	41	O. D. Quinlivan	54	2	..	OE	..	....	.....	..	Ir.	..	

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
70	h SW	NE	33	38	41	Jessie Oliver	60	2	..	..	28	....	7-19-46	...	D	..	
71	h NE	NW	34	38	41	C. H. Hardwick	75	1¼	..	..	31	....	7-19-46	...	D	75	
72	h SW	SE	27	38	41	J. C. Morse	50	1¼	..	..	27	....	7-19-46	...	D,Ir.	74	
73	SE	SE	32	38	41	Paul Jeffers	32	2	..	SP	23 14	....	7-19-46 8- 5-53	...	D	..	
74	NE	SE	32	38	41	Paul Jeffers	100	3	..	OE	23	....	7-19-46	...	D,Ir.	..	
75	NW	NE	19	37	41	George Casper	56	2	..	..	..	....	.....	...	D	..	
76	SE	NE	19	37	41	G. S. Wilkinson	60	1¼	..	OE	46	....	7-22-46	...	D	..	
77	SE	NE	19	37	41	G. S. Wilkinson	23	1¼	..	SP	23	....	7-22-46	...	D	..	
78	NE	NE	21	37	41	F. A. Hertel	53	1¼	..	SP	61	....	7-22-46	...	D,Ir.	..	
79	NE	NW	22	37	41	L. J. Gamble	26	1¼	..	SP	9	....	7-22-46	...	D	..	
80	SW	SE	10	38	41	U. S. Navy	80	6	70	..	..	....	.....	...	In.	..	
81	NW	NW	15	37	41	Sperti-Agar, Inc.	60	2	..	OE	25 20	....	7-23-46 2-11-49	...	In.	..	Ca.; battery 2 wells.
82	NW	NW	15	37	41	Sperti-Agar, Inc.	24	1¼	..	SP	13	....	7-23-46	...	In.	..	Battery 2 wells.
83	NW	NW	15	37	41	Sperti-Agar, Inc.	19	2	..	SP	16	....	7-23-46	...	In.	..	Battery 4 wells.
84	NE	SE	22	37	41	H. H. Hoke	19	2	..	SP	26	....	7-23-46	...	D	..	Battery 8 wells.
85	NW	NW	26	37	41	Lily A. Cary	26	1¼	..	SP	15	....	7-23-46	..	D	..	
86	SE	NW	26	37	41	Mt. St. Joseph Noviate	1,200	6	..	OE	880 870 880 890	+43.3 +42.2 +40.0 +42.5	7-23-46 3-26-52 7- 6-56 5- 7-57	..	Ir.	77 76	Ca.; flowing well.
87	SE	NW	26	37	41	Mt. St. Joseph Noviate	750	4	..	OE	1,210	+28.2	7-23-46	..	Ir.	75	Ca.; flowing well.

TABLE 8. (Continued)

Well No.	Location: ¼ Section	¼ Section	Section	Township, South	Range, East	Owner	Depth of well below land surface (feet)	Casing: Diameter (inches)	Casing: Depth (feet)	Casing: Finish	Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
88	SE	SW	1	38	41	A. J. L. Moritz	1,180	5	..	OE	915 945 935	+38.7 +36.3	7-23-46 6-20-56 5- 9-57	.. 250	Ir.	75 76	Ca.; flowing well.
89	SE	SW	1	38	41	A. J. L. Moritz	28	2	..	SP	65	....	7-23-46	...	D	78	Battery 2 wells.
90	SE	SW	1	38	41	A. J. L. Moritz	31	1½	..	SP	..	....	.....	...	D	..	
91	NE	SE	35	37	41	M. J. Perry	30	2	..	SP	..	....	.....	...	D	..	Battery 3 wells.
92	SW	NW	1	38	41	H. E. Bloomingdale	32	2	..	SP	300	....	7-24-46	...	D	..	Battery 2 wells.
93	NW	NE	12	38	41	T. O. Dunlap	28	1¼	..	SP	196 410	....	7-24-46 6-20-56	...	D	..	Battery 4 wells.
94	h SE	NE	12	38	41	W. M. Kiplinger	30	2	..	SP	25 378	....	7-24-46 6-20-56	...	D	..	
95	h SE	NE	12	38	41	W. M. Kiplinger	*1,058	6	748	OE	805 830 790	+30.9 +33.0	7-24-46 6-20-56 5- 9-57	...	Ir.	75	Ca.; flowing well.
96	NE	NE	13	38	41	W. M. Kiplinger	36	2	..	SP	40	....	7-24-46	...	D	..	
97	NW	SW	4	38	41	City of Stuart	55	4	..	SC	75 320 206 160	....	8- 7-46 1-20-54 5-26-55 12-15-55	...	P	78	Ca.; composite sample wells 97,98,99
98	NW	SW	4	38	41	City of Stuart	65	6	..	SC	152 141	....	5-26-55 12-15-55	...	P	78	
99	NW	SW	4	38	41	City of Stuart	75	6	..	SC	98 156	....	5-26-55 12-15-55	...	P	78	Gravel packed.
100	SE	NE	5	38	41	John's Dry Cleaning	47	2	..	OE	110 89 185 148	....	9-20-46 6-10-48 3-27-52 6-29-55	...	In.	..	
101	NE	NE	33	37	41	Thomas Collins	15	2	..	SP	15	....	8-12-46	...	D	..	

TABLE 8. (Continued)

Well No	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
102	NW	SE	32	37	41	R. F. Wiley	65	2½	...	OE	20	....	8-12-46	...	D	..	
103	NW	SE	32	37	41	H. L. Lance	60	2	...	OE	44 26 55 132	....	8-12-46 4-24-47 7- 1-49 4- 7-50	...	D	..	
104	NW	SE	2	38	41	A. M. Bauer	24	2	..	SP	49	....	8-13-46	...	D,Ir	..	
105	NW	SE	2	38	41	A. M. Bauer	88	2	..	OE	34 53 61 188 167	....	8-13-46 2- 6-47 6-10-48 4- 7-50 3-27-52	...	Ir.	..	
106	h SW	SW	12	38	41	Port Sewall Corporation	*1,020	3	698	OE	810 810	+36.6 +36.0	8-13-46 5- 3-57	...	Ir.	75	Cp.; flowing well.
107	h SW	SW	12	38	41	Port Sewall Corporation	22	2	..	SP	41	....	8-13-46	...	D		
108	h SW	SW	12	38	41	Port Sewall Corporation	*24	5	..	SC	...	11.35	8-13-46	...	N	..	Gravel packed.
109	h SW	NW	13	38	41	J. E. Kiernan	88	2	84	OE	50 62 100	....	8-13-46 7-28-53 1-20-55	...	D,Ir	...	
110	h SW	NW	13	38	41	J. E. Kiernan	1,379	6	..	OE	950 950 965 950	.... +40.0	8-13-46 7-28-53 1-20-55 5- 7-57	...	Ir.	75 76	Cp.; flowing well.
111	h SW	NW	25	38	41	P. O. Smith	27	1¼	...	SP	15	....	8-13-46	...	D	..	
112	h SW	NE	26	38	41	H. D. Smith	15	1¼	...	SP	...	....	.....	...	D	..	
113	h SW	NW	23	38	41	J. W. Stokes	960	5	...	OE	2,150 1,650 1,600	+28.0 +30.0	8-13-46 5-25-56 5- 3-57	...	Ir.	75 76	Flowing well.
114	h SW	NW	23	38	41	J. W. Stokes	120	2	..	SP	78	....	8-13-46	...	D	..	
115	h NW	SE	15	38	41	H. E. Hooper	20	2	..	SP	34	....	8-14-46	...	D	..	

TABLE 8. (Continued)

Well No.	Location: ¼ Section	¼ Section	Section	Township, South	Range, East	Owner	Depth of well below land surface (feet)	Casing: Diameter (inches)	Casing: Depth (feet)	Casing: Finish	Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
116	g SE	SW	22	39	42	Andrew Lester	30	2	...	SP	12	....	8-14-46	...	..	..	
117	SW	NW	26	39	42	Andrew Lester	75	4	...	OE	42	....	8- 7-46	...	In.	..	Composite sample wells 117,118,119.
118	SW	NW	26	39	42	Andrew Lester	70	4	...	OE	..	....	.....	...	In.	..	
119	SW	NW	26	39	42	Andrew Lester	82	6	...	OE	..	....	.....	...	In.	..	
120	SE	SE	12	40	42	Gene Tunney	20	2	...	SP	27	....	8-14-46	...	D,Ir	..	Battery 4 wells.
121	NW	SE	2	40	42	U. S. Army	89	12	...	SC	27 31	....	8-14-46 5-22-47	...	P	..	Composite sample wells 121, 126; gravel packed.
122	SW	NE	2	40	42	U. S. Army	81	12	...	SC	...	....	.....	...	P	..	Gravel packed.
123	SE	SE	2	40	42	U. S. Army	90	12	...	SC	...	....	.....	...	P	..	Gravel packed.
124	NE	NE	11	40	42	U..S. Army	90	12	...	SC	...	....	.....	...	P	..	Gravel packed.
125	SE	SW	12	40	42	U. S. Army	90	12	...	SC	...	....	.....	...	O	..	Gravel packed; water level recording gage installed 7-27-49.
126	NE	NW	13	40	42	U. S. Army	100	12	...	SC	32	....	4-15-42	...	P	..	Gravel packed.
127	NE	SW	19	40	43	Mr. Holchser	30	1¼	...	SP	30	....	8-14-46	...	D,Ir	..	Cp.
128	NW	SW	4	38	41	City of Stuart	*852	6	795	OE	4,500 1,800 2,400	.... +40.5	11-24-53 1-26-55 4-14-55	...	F	..	Flowing well.
129	NE	SW	25	39	41	Albert Welch	42	4	...	OE	142	....	8-15-46	...	Ir.	75	Composite sample wells 129, 130.
130	NW	SW	25	39	41	Albert Welch	40	4	..	OE	...	....	.....	...	Ir.	..	
131	SE	SW	25	39	41	Albert Welch	43	4	..	OE	...	....	.....	...	Ir.	75	
132	NW	NW	16	38	41	J. I. Craig	42	1¼	..	SP	8	....	8-15-46	...	D	..	
133	SW	NE	8	38	41	C. Albacht	85	2	..	OE	13	....	8-15-46	...	D	..	
134	NW	SW	4	38	41	Stuart Ice Co.	75	4	..	OE	...	....	.....	...	In.	..	

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
135	SE	SE	6	40	39	Indiantown Development Co.	31	2	25	OE	22	....	3-23-49	...	P	..	Battery 10 wells.
136	NE	NW	23	40	37	Port Mayaca Development Co.	*10	2½	9	OE	...	....	.....	...	N	..	
137	NE	NW	23	40	37	Port Mayaca Development Co.	*22	2½	22	OE	...	....	.....	...	N	..	
138	NE	NW	23	40	37	Port Mayaca Development Co.	*19	2	12	OE	...	....	.....	...	N	77	
139	NE	NW	23	40	37	Port Mayaca Development Co.	*30	2	28	OE	50	....	4-23-49	55	N	..	
140	SE	SE	28	40	41	U. S. Geological Survey	*31	6	30	OE	26	0.61	9-22-50	...	O	..	Water level recording gage installed 9-29-50.
141	SW	SW	35	39	41	R. M. Harris	85	8	85	SC	75	....	2- 4-53	400	Ir.	76	Slotted casing.
142	SE	SW	5	39	41	Joe Greenlees	*18	1¼	..	SP	...	5.36	3-27-57	...	N	..	
143	NW	SW	9	38	40	W. J. Matheson	*958	6	272	OE	... 940 950 1,000	+27.5 +25.5	5-23-51 5-24-51 3-27-52 4-25-57	550 230	Ir.	79	Flowing well; L.
144	NW	SE	7	40	42	John Harriman	72	8	60	OE	...	2.48	2-16-53	950	Ir.		
145	NE	NW	23	39	38	Joe Adams	1,485	6	425	OE	685 620 665	+12.5 + 9.0 +10.0	2- 5-53 1-25-57 4-17-57	300	Ir.	83 82	Flowing well.
146	SE	NW	6	39	38	H. C. Williamson	*1,155	5	432	OE	580 575 620	+18.5 +18.2 +16.8	12- 2-51 2-19-53 3- 6-57	300	S	.. 82	Flowing well; L.
147	NW	NW	10	38	41	U. S. Geological Survey	*74	6	73	OE	... 15 17	7.00	6-20-52 9-29-52 1-26-55	...	O	..	Gravel packed; water level recording gage installed 8-2-52
148	NE	SE	14	40	37	Robert Arrieta	100	2	..	OE	92	.....	2-10-53	...	D	..	
149	NE	SE	14	40	37	Robert Arrieta	45	6	..	OE	...	3.92	2-10-53	...	N	..	

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
150	SE	SE	2	39	41	R. M. Harriss	[a]1,315	6	740	OE	4,020 3,950 4,050	.... + 29.8 + 28.8	8-12-52 4-17-53 4-23-57	350	Ir.	75	Cp.; flowing well.
151	SW	SE	15	40	37	State of Florida	27	2	27	OE	32	....	2-10-53	...	D.	..	Cp.
152	NE	NW	2	40	37	Robert Arrieta	75	2	...	OE	90	....	2-10-53	...	D	75	
153	SE	SE	34	39	37	Robert Arrieta	22	6	20	OE	119	.....	2-10-53	5	S	74	
154	SE	SE	33	39	37	Robert Arrieta	25	6	20	OE	55	....	2-10-53	5	S	74	
155	SE	NE	33	39	37	Robert Arrieta	25	6	20	OE	99	....	2-11-53	5	S	74	
156	SE	SE	28	39	37	Robert Arrieta	25	6	20	OE	77	....	2-11-53	5	S	74	
157	NE	SW	27	39	37	Robert Arrieta	25	6	20	OE	140	....	2-11-53	5	S	75	
158	SE	SE	20	39	37	L. W. Scott	40	2	37	OE	67	....	2-11-53	10	D	77	Original depth 150 ft; water reported salty.
159	SW	SW	8	39	37	Joe Adams	..	2	...	..	37	....	2-11-53	...	D	77	
160	NW	NW	9	39	37	L. Maxcy	..	2	...	..	805	....	2-11-53	5	.	75	
161	NW	SW	5	39	37	G. H. Tucker	117	1¼	...	OE	605	....	2-11-53	5	D	74	Cp.
162	NE	SW	13	40	37	Bessemer Properties	..	2	...	..	...	....	.....	...	D	75	
163	NE	SW	13	40	37	Bessemer Properties	35	4	...	..	12	....	2-12-53	...	D	78	
164	NW	SE	13	40	37	Bessemer Properties	..	1¼	...	..	21	....	2-12-53	...	D	76	
165	NW	NW	17	40	39	P. L. Henson	..	1¼	...	..	110	....	2-17-53	10	D	75	
166	SW	SW	20	38	37	Minor Holmes	..	1¼	...	..	63	....	2-17-53	10	D	74	
167	SW	NE	29	38	37	F. E. C. Railroad	100	1¼	...	..	143	....	2-17-53	10	D,S	73	
168	SE	NE	18	39	38	H. C. Williamson	1,000	5	500	OE	428 450	+20.9 +19.9	2-19-53 3- 6-57	300	D	82	Flowing well.

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
169	NW	SW	19	38	38	H. C. Williamson	1,080	5	500	OE	415 442	+14.9 +12.9	2-19-53 3- 6-57 4-17-57	150	S,Ir.	82	Flowing well.
170	SW	NE	30	38	38	H. C. Williamson	1,080	5	500	OE	518 570	+16.3 +13.3	2-19-53 3- 6-57	150	S,Ir.	82	Flowing well.
171	SW	NE	31	38	38	H. C. Williamson	1,080	5	500	OE	600 740	+16.6 +14.6	2-19-53 3- 6-57 4-17-57	100	S,Ir.	82	Flowing well.
172	SE	SW	23	39	38	Joe Adams	1,278	6	425	OE	252 260 252	.... +10.0 +11.0	2-13-53 1-25-57 4-17-57	400	Ir.	83 84	Cp.; flowing well.
173	NE	SE	7	39	38	H. C. Williamson	1,080	5	500	OE	420 445	+20.3 +18.8	2-19-53 3- 6-57	175	S,Ir.	82	Flowing well.
174	SW	NE	34	38	37	Eber, Babbin, Harmon & Case	1,080	5	500	OE	865 890	+22.5 +20.6	2-19-53 1-23-57	175	Ir.	81	Flowing well.
175	SE	NE	18	39	38	H. C. Williamson	28	1¼	...	OE	181	....	2-19-53	10	D	71	
176	SW	SE	2	39	37	J. A. Clements	11	1¼	...	SC	217	....	2-19-53	5	D	70	
177	NE	SE	21	39	38	O. C. Smith	..	1¼	...	..	95	....	2-19-53	...	D		
178	SW	NE	27	39	38	H. B. Barrett	..	1¼	...	..	30	....	2-19-53	...	D	71	
179	h SW	NW	25	38	40	Unknown	55	8	...	..	...	....	.....	...	N	..	
180	SE	SE	28	38	38	Henry Hazelleaf	..	1½	...	..	6	....	2-24-53	10	D	75	
181	NW	NE	20	38	38	Fox Brown	14	2	12	OE	11 22	....	2-24-53 5-31-56	...	D	76	
182	NW	NE	20	38	38	Martin Brown	14	1¼	12	OE	11	....	2-24-53	10	D	73	
183	SW	SW	16	38	37	Unknown	..	1¼	...	..	... 342	2.64	2-24-53 5-31-56	...	D	..	

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
184	SW	SW	13	38	37	Mr. Jones	..	1¼	...	..	13 54	....	2-24-53 5-31-56	7	D	73	
185	SE	SW	16	38	38	Ruben Carlton	65	1½	...	SP	37	....	2-24-53	10	D	72	
186	NE	NE	1	38	38	Ruben Carlton	*843	5	373	OE	1,130 1,150	+25.2 +24.2	2-24-53 4-30-57	250 200	Ir.	91 91	Ca.; flowing well.
187	SE	NW	1	38	38	Ruben Carlton	..	1½	...	..	52	....	2-24-53	15	D	76	
188	SW	NE	26	39	38	Joe Adams	..	1½	...	..	67	....	3- 2-53	...	D	..	
189	SE	NW	24	39	38	Joe Adams	1,000	8	400	OE	545 720	....	3- 2-53 4-16-57	10	Ir.	85	Flowing well; pumped 400 gpm.
190	SE	NW	24	39	38	Joe Adams	1,000	8	400	OE	575 680	....	3- 2-53 4-16-57	10	Ir.	84	Flowing well; pumped 375 gpm.
191	SW	NE	36	39	38	Joe Adams	*1,050	5	400	OE	295 295	+13.5	3- 2-53 4-16-57	125	Ir.	83	Flowing well.
192	NE	NW	36	39	38	Joe Adams	1,000	5	400	OE	570 575	.... +11.0	3- 3-53 4-16-57	75	Ir.	85 85	Flowing well; pumped 220 gpm.
193	NW	NE	5	40	38	G. E. Jordan	..	1½	...	..	74	....	3- 3-53	10	S	74	
194	NW	NW	4	40	38	Unknown	..	1½	...	..	46	....	3- 3-53	10	D	75	
195	NW	NW	2	40	38	J. A. Slay	8	1¼	...	OE	23	....	3- 3-53	10	D	73	
196	SE	SW	35	39	38	J. A. Slay	25	1½	...	OE	38	....	3- 3-53	...	D	..	
197	NE	NW	2	40	38	J. A. Slay	122	1½	119	OE	22	....	3- 3-53	...	D	75	
198	SE	SW	35	39	38	J. A. Slay	18	1½	...	OE	33	....	3- 3-53	10	N	73	
199	SE	NE	2	40	38	W. E. Priest	..	1¼	...	..	75	....	3- 4-53	...	D	..	
200	SW	NW	1	40	38	W. E. Priest	..	1½	...	..	27	....	3- 4-53	...	D	75	
201	NE	SE	1	40	38	Mr. Williams	10[illegible]	2	...	OE	21	....	3- 4-53	...	D	..	

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
202	NE	SE	1	40	38	W. F. Roland	21	1¼	..	OE	18	....	3- 4-53	10	D	76	
203	NW	NW	7	40	39	J. M. Owens, Jr.	115	1¼	..	OE	20	....	3- 4-53	...	D	73	
204	SW	SE	6	40	39	S. G. Huddle	85	1¼	85	OE	22	....	3- 4-53	...	D	..	
205	NE	NE	1	40	38	Tom Taylor	23	1¼	22	OE	25	....	3- 5-53	10	D	74	
206	SW	SW	4	40	39	W. G. Bow	87	1½	..	OE	17	....	3- 5-53	...	D	..	
207	SW	SE	4	40	39	W. Z. Dalgety	120	1¼	110	OE	163	....	3- 5-53	...	D	..	
208	SW	SE	4	40	39	J. C. McCann	65	1½	..	OE	35	....	3- 5-53	...	D	..	
209	NW	NW	10	40	39	Unknown	..	1¼	..	..	20	....	3- 5-53	...	D	..	
210	NE	NE	9	40	39	P. L. Henson	..	1½	..	..	46	....	3- 5-53	...	D	..	
211	SE	SW	3	40	39	J. C. McCann	..	1½	..	..	55	....	3- 6-53	...	S	..	
212	NE	NW	2	40	39	J. W. Craghead	62	2	62	OE	10	....	3- 6-53	...	D	..	
213	SW	SW	36	39	39	E. Bowling	60	1½	..	OE	207	....	3- 6-53	...	D	..	
214	SW	SW	36	39	39	H. W. Bowling	30	1½	..	OE	92	....	3- 6-53	...	D	..	Cp.
215	NW	SW	31	39	40	Mary Kelly	..	1¼	..	..	18	....	3- 6-53	...	D	..	
216	SE	SW	28	39	40	Taylor Cattle Co.	..	1½	..	..	7	....	3- 6-53	...	D	..	
217	SE	SW	4	40	40	Taylor Cattle Co.	*27	2	..	OE	42	2.97	3- 9-53	10	S	76	
218	SW	SE	28	39	40	Taylor Cattle Co.	*23	2	..	OE	17	.... 4.02	3- 9-53 3-27-57	...	D	..	
219	NE	SE	28	39	40	Taylor Cattle Co.	40	2	..	OE	11	....	3- 9-53	...	D	..	
220	SW	NE	27	39	40	P. L. Bailey	*24	2	..	..	...	2.60	3- 9-53	...	N	..	
221	NE	NW	26	39	40	P. L. Bailey	80	1½	..	OE	570	....	3- 9-53	...	D	..	Cp.
222	SE	SW	23	39	40	P. L. Bailey	80	1¼	..	OE	396	....	3- 9-53	...	D	..	

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
223	SE	SW	23	39	40	P. L. Bailey	20	2	...	OE	...	....	.....	...	S	..	
224	SE	SW	19	39	41	M. G. Phipps	25	1¼	...	OE	52	....	3-10-53	10	S	76	
225	NW	NE	26	39	40	P. L. Bailey	22	1¼	...	OE	...	....	.....	...	S	..	
226	SW	NE	23	39	40	M. G. Phipps	25	2	...	OE	13	....	3-10-53	10	S	78	
227	NE	SE	23	39	40	M. G. Phipps	25	2	...	OE	38	....	3-10-53	10	S	76	
228	NE	SW	24	39	40	M. G. Phipps	..	2	...	OE	112	....	3-11-53	...	D	..	
229	NE	SE	24	39	40	M. G. Phipps	25	2	...	OE	43	....	3-11-53	10	S	76	
230	SW	NW	19	39	41	M. G. Phipps	30	2	...	OE	78	....	3-11-53	...	D	..	
231	NW	SE	13	39	40	Allen's Ranch	35	4	...	..	27	....	3-11-53	...	D	..	
232	NE	SE	13	39	40	Allen's Ranch	25	2	...	OE	22	....	3-11-53	10	S	76	
233	SE	NW	18	39	41	Jack Sutton	..	1½	...	..	18	....	3-11-53	...	D	76	
234	SE	NW	18	39	41	Leo Wroten	40	1½	...	..	17	....	3-11-53	...	D	..	
235	SW	SE	7	39	41	L. D. Lauton	49	2	...	..	19	....	3-11-53	...	D	..	
236	SW	SE	7	39	41	Barney Williams	..	1¼	...	..	22	....	3-19-53	10	D	76	
237	NE	SE	7	39	41	Lester Reddish	51	2	...	OE	29	....	3-19-53	...	D	76	
238	NW	NW	8	39	41	J. C. Reddish	38	1¼	36	SC	14	....	3-19-53	...	D	..	
239	SE	SE	6	39	41	Joe Sawtell	32	1¼	...	..	14	....	3-19-53	...	D	77	
240	h SE	SW	6	39	41	H. C. Ryals	52	2	...	OE	28	....	3-19-53	...	D	..	
241	SE	SW	5	39	41	D. G. Van de Water	54	3	...	..	30	....	3-19-53	...	D	..	
242	h NW	SW	6	39	41	Unknown	..	4	...	..	18	....	3-19-53	...	D,S	..	
243	SE	SW	5	39	41	F. W. Loy	105	2	103	OE	48	....	3-19-53	40	D	76	

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
244	NW	NE	17	39	41	J. C. Cress	960	6	350	OE	1,450 1,500	....	3-23-53 4-24-57	300	S,Ir.	77	Flowing well.
245	SE	NW	17	39	41	Unknown	...	1¼	...	..	38	....	3-23-53	15	D	75	
246	NW	NE	17	39	41	Unknown	...	1¼	...	..	...	....	.....	...	N	..	
247	SE	SW	5	39	41	H. N. Canes	32	1¼	...	SP	28	....	3-23-53	...	D	..	Battery 3 wells.
248	NW	SE	5	39	41	J. B. Sauvage	35	1¼	...	SP	27	....	3-23-53	...	D	..	
249	SE	NE	5	39	41	E. J. Rhoades	60	1½	...	SP	28	....	3-23-53	...	D	..	Battery 2 wells.
250	NE	NE	5	39	41	Robert Peck	42	2	...	SP	28	....	3-23-53	...	D	76	
251	SW	NE	14	39	40	Yates Simmons	30	1¼	...	SP	13	....	3-23-53	...	D	76	
252	NW	NW	18	39	41	L. E. Hurley	38	2	...	OE	14	....	3-24-53	...	D	..	
253	NE	NW	18	39	41	Unknown	38	2	36	OE	9	....	3-24-53	...	D	..	
254	NE	SE	36	38	38	Allapattah Cattle Co.	840	5	...	OE	1,240 1,270	26.0 26.0	3-24-53 4-30-57 5- 2-57	250	Ir.	82	Flowing well.
255	NE	NE	23	38	38	Allapattah Cattle Co.	800	6	...	OE	1,030 1,090 1,090	23.5 22.5	3-24-53 12-16-55 4-30-57	400	S	84	Flowing well.
256	NE	NE	23	38	38	Allapattah Cattle Co.	75	1¼	...	OE	104	....	3-24-53	...	D	..	
257	SE	SE	18	38	40	E. G. Skegg	...	1¼	...	..	32	....	3-24-53	15	D	75	
258	NE	SW	28	40	41	W. Brewster	12	1¼	...	SP	38	....	3-25-53	...	D	74	
259	NE	SE	25	40	41	Unknown	...	1½	...	..	25	....	3-25-53	...	D	..	
260	SE	SW	19	40	42	W. C. Merrill	...	3	...	..	46	....	3-25-53	...	D	..	
261	SE	SE	21	40	42	Unknown	...	1¼	...	...	...	....	.....	...	D	..	
262	NW	SE	20	40	42	Vence Nelson	134	.	...	OE	13	....	3-25-53	...	D	76	

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
263	NW	SE	20	40	42	Vence Nelson	134	.	...	OE	13	....	3-25-53	...	D	76	
264	SW	SW	24	40	42	R. J. Swint	60	.	...	OE	18	....	3-26-53	...	D	..	
265	SW	SW	24	40	42	H. J. Wilkinson	83	4	...	OE	17	....	3-26-53	...	D,Ir.	78	
266	SW	SW	24	40	42	City of Jupiter	30	2	...	SP	19	....	3-26-53	...	Ir.	..	
267	NE	SW	19	40	43	C. M. Carmeroto	47	2	...	SP	38	....	3-26-53	...	D	..	
268	SW	SW	18	40	43	Charles Genard	25	1¼	...	..	66	....	3-26-53	...	D	..	
269	SE	SE	13	40	42	R. A. Porter	30	2	...	SP	58	....	3-31-53	...	D	..	
270	SE	SE	12	40	42	Unknown	...	.	...	..	...	....	.....	...	..	..	
271	NW	SE	12	40	42	Unknown	...	3	...	..	45	....	3-31-53	...	..	..	Battery 4 wells.
272	NW	SE	12	40	42	Unknown	...	2	...	..	...	....	.....	...	..	..	Battery 5 wells.
273	SW	NW	1	40	42	Unknown	...	.	...	..	43	....	3-31-53	...	..	..	
274	SE	NE	35	39	42	H. E. Parsons	11	1¼	...	SP	13	....	3-31-53	...	D	78	
275	NE	SE	27	39	42	Howard Inches	30	1½	...	..	31	....	3-31-53	...	D	..	
276	g SW	NW	22	39	42	N. Algozzini	57	1½	...	OE	19 31	....	4- 1-53 8-16-56	...	D	..	
277	g NE	NE	21	39	42	DeLoach	...	2	...	..	26 62	....	4- 1-53 8-16-56	...	D	..	
278	g NE	SE	16	39	42	C. D. Funk	35	2	...	OE	38 38	....	4- 1-53 8-16-56	...	D	..	
279	g NW	NE	16	39	42	Dwight Funk	42	1½	..	OE	21 27	....	4- 1-53 8-16-56	...	D	..	
280	g SE	SW	9	39	42	J. R. Leonhardt	22	1¼	..	SP	23 23	....	4- 1-53 8-16-53	...	D	78	

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
281	g SW	NE	22	39	42	Florida Evangelistic Assoc.	32	2	...	SP	37 35	....	4- 1-53 8-11-56	...	D	..	
282	g NE	SW	15	39	42	Unknown	...	1½	...	..	55 28	....	4- 1-53 8-15-56	...	D	..	
283	g NW	NW	15	39	42	E. M. Taylor	...	.	...	..	46	....	4- 1-53	...	D	..	
284	g NW	NE	9	39	42	G. H. Tilton	30	1¼	...	SP	45 55	....	4- 1-53 8-16-56	...	D	..	
285	NE	NW	33	39	41	M. G. Phipps	15	1¼	...	SP	25	....	4-14-53	7	D	73	
286	NW	NW	33	39	41	M. G. Phipps	50	4	...	OE	...	....	.....	...	Ir.	..	
287	NE	NW	35	39	41	Unknown	...	2	...	..	52	....	4-14-53	...	D	..	
288	SE	SW	25	39	41	L. A. McKenzie	35	1½	...	OE	28	....	4-14-53	...	D	..	
289	SW	SE	25	39	41	Paul Thomas	...	3	...	..	54	....	4-14-53	...	D	75	
290	SE	NW	33	39	42	Roscoe Flora	53	2	50	OE	80	....	4-14-53	...	D,S	..	
291	SW	SE	32	39	42	Unknown	*15	1¼	...	..	...	2.90	4-14-53	...	N	..	
292	SE	SW	32	39	42	Paul Woschnik	75	2	...	OE	84	....	4-14-53	...	D	..	
293	g SW	SW	33	38	42	Aaron Miller	18	1¼	...	SP	49 31 26	....	4-14-53 1-21-55 8-16-56	15	D	76	

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
294	NW	NE	32	38	42	Unknown	...	1¼	...	..	49	....	4-14-53	10	D	76	
295	h SW	NE	26	38	41	C. E. Beedle	98	2	90	OE	43 36	....	4-17-53 1-20-55	...	D	..	
296	h SW	SE	27	38	41	J. C. Morse	86	1¼	...	OE	28 29	....	4-17-53 1-21-55	...	D,S	..	
297	h SW	SW	27	38	41	Raymond Darling	57	1¼	...	OE	28	....	4-17-53	...	D	..	
298	h SE	NW	34	38	41	Paul Thomas	60	1¼	...	OE	25	....	4-17-53	...	D	..	
299	NE	SW	34	38	41	Mark Witham	67	1½	...	OE	31	....	4-17-53	...	D	..	
300	h SW	SE	33	38	41	Minne Blissard	15	.	...	SP	18	....	4-17-53	...	D	..	
301	h NE	NE	34	38	41	R. C. Ward	35	1¼	...	..	85 32	....	4-17-53 1-21-55	...	D	73	
302	h SW	SW	27	38	41	E. D. Johnston	32	1¼	...	SC	29	....	4-17-53	...	D	..	
303	h NE	NE	33	38	41	L. O. Foskey	35	1¼	...	SP	24	....	4-17-53	...	D	..	
304	h SW	NE	33	38	41	Jim Merrit	...	2	...	..	29 25	....	4-17-53 1-21-55	...	D	..	
305	SE	NW	10	39	40	J. B. Woodham	*24	2	...	SP	...	2.61	3-28-57	...	N	..	
306	SW	NE	11	39	41	R. M. Harriss	*1,170	6	688	OE	3,180 3,200	30.0 30.0	4-17-53 4-23-57	150	Ir.	75	Flowing well.
307	SE	SE	2	39	41	R. M. Harriss	16	.	...	SP	50	....	4-17-53	15	D	75	
308	h NW	NW	25	38	41	D. H. Harvey	43	1¼	...	SP	35 37	....	4-20-53 6-30-55	...	D	..	
309	h NW	NW	25	38	41	Martha Whittle	36	1¼	...	SP	27	....	4-20-53	...	D	..	
310	h SW	SW	24	38	41	Leroy Frizeby	...	1½	...	..	16 21	....	4-20-53 1-20-55	...	D	..	

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
311	h SE	SW	24	38	41	Salerno Tomato Co.	...	2	...	..	24	....	4-20-53	40	N	77	
312	h SE	SW	24	38	41	Salerno Tomato Co.	...	3	...	..	...	....	.....	...	N	..	
313	h SE	SW	18	38	42	C. H. Williams	38	2	...	OH	194 236 305	....	4-20-53 1-20-55 6-27-56	...	D	..	
314	h SE	SE	24	38	41	P. Mispel, Jr.	30	.	...	..	39 13 24	....	4-20-53 1-20-55 6-27-56	...	D	..	
315	h SE	SE	24	38	41	Charles Pope	32	1¼	...	SP	18	....	4-20-53	...	D	..	
316	h SW	SW	19	38	42	D. Steenken	28	1¼	...	SP	21	....	4-20-53	...	D	..	
317	h SE	SE	24	38	41	J. F. Magos	44	1¼	...	SP	...	....	.....	...	D	..	
318	NE	SW	30	38	42	George Dunning	83	1¼	...	SP	19	....	4-20-53	...	D	..	
319	SE	SE	25	38	41	George Rahming	...	1¼	...	..	48 23	....	4-20-53 1-21-55	...	D	75	
320	NW	SE	25	38	41	Madie Marshal	20	1¼	...	SP	39 45	....	4-20-53 1-21-55	...	D	75	
321	h SE	NE	25	38	41	R. F. Saunderson	24	1¼	...	SP	21	....	4-21-53	...	D	..	
322	h NW	NE	25	38	41	J. F. Gaughan	43	1¼	...	SP	21	....	4-21-53	...	D	..	
323	h NW	NE	25	38	41	J. J. O'Conner	40	.	...	..	26	....	4-21-53	...	D	..	
324	h SW	SE	24	38	41	A. Irwin	40	1¼	...	SP	22	....	4-21-53	...	D	..	
325	h NW	NE	24	38	41	Charles Stiller	25	1¼	...	SP	185 152 159	....	4-21-53 1-20-55 6-30-55	...	D	..	
326	h NW	NE	24	38	41	Hubert Stiller	26	1¼	...	SP	320 192 123	....	4-21-53 1-20-55 6-30-55	...	D	..	

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
327	h	SE	SW	13	38	41	Eddie Csapo	80	2	...	SP	88 209 178	....	4-21-53 1-20-55 6-30-55	...	D	..	
328	h	SW	SE	13	38	41	J. E. Friday	30	2	...	SP	48 49 44	....	4-21-53 1-20-55 6-30-55	...	D,Ir.	..	Battery 2 wells.
329	h	NW	SW	13	38	41	H. L. Gerould	80	1¼	...	..	36	....	4-21-53	...	D	..	
330	h	SE	SE	14	38	41	Axel Nelson	97	2	...	OE	32 31	....	4-21-53 1-20-55	...	D	..	
331	h	SW	SE	14	38	41	O. Mancil	26	1¼	...	SP	73 71 77	....	4-21-53 1-20-55 6-30-55	....	D	..	
332	h	SE	NE	23	38	41	C. M. Johnson	30	1¼	...	..	29 38 34	....	4-21-53 1-20-55 6-30-55	...	D	..	
333	h	SE	NW	23	38	41	B. R. Sword	*45	1¼	...	SP	20	.... 3.2	4-21-53 4- 6-55	...	D	..	
334	h	SE	SW	14	38	41	R. M. Powell	90	1¼	...	OE	20 26	....	8-17-53 1-20-55	...	D	..	
335		SE	SW	1	38	41	A. J. L. Moritz	36	1¼	...	SP	900	....	6- 7-53	...	Ir.	..	
336		NE	NW	10	40	38	R. L. Chastain	28	1¼	...	SP	21	....	2-17-53	...	D	..	
337	h	NW	NE	26	38	41	E. J. Florentine	88	1¼	...	OE	46 53	....	7-27-53 1-20-55	...	D	..	
338	h	SW	NW	23	38	41	Chris Keck	100	1½	...	..	75 72 79	....	5- 1-53 1-20-55 6-30-55	...	D	..	
339	h	SE	SE	15	38	41	P. W. Hickman	65	1¼	...	..	39	....	5- 1-53	...	D	..	

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
340	h SW	SE	15	38	41	P. W. Hickman	72	2	...	OE	48 46	....	5- 1-53 1-20-55	...	D	..	
341	h SE	NW	15	38	41	G. H. Cook	83	2	...	OE	28 25	....	5- 1-53 1-20-55	...	D	..	
342	NE	NW	15	38	41	W. S. Walsh	90	2	...	OE	45 47	....	5- 1-53 1-20-55	...	D	..	
343	SW	SW	10	38	41	P. J. Bradel	18	1½	...	SP	...	....	.....	...	D	..	
344	NE	SE	9	38	41	R. L. Wall	18	1¼	...	SP	30	....	5- 1-53	...	Ir.	..	
345	NW	SE	9	38	41	R. L. Wall	40	1¼	...	OE	23 25	....	7-27-53 1-20-55	...	D	..	
346	SE	NW	9	38	41	H. W. Tressler	63	2	...	OE	20 21	....	7-27-53 1-20-55	...	D	..	
347	h SW	NW	14	38	41	T. G. Schreckengost	87	1½	...	..	22 23	....	7-27-53 1-20-55	...	D	..	
348	h SE	NW	14	38	41	Ralph Griggs	...	1¼	...	..	43	....	7-27-53	...	D	..	
349	h NE	SW	14	38	41	Rodger Allison	82	1¼	...	OE	25 23	....	7-27-53 1-20-55	...	D	..	
350	h NE	SW	14	38	41	Port Sewall Development Co.	1,000	8	...	OE	1,250 1,260	....	7-27-53 5- 3-57	50	N	76	Flowing well.
351	h SW	NE	14	38	41	T. B. Parish	56	1½	...	OE	26	....	7-23-53	...	D	..	
352	h NE	NE	14	38	41	S. NeKrassoff	63	2	...	OE	36 46	....	7-23-53 6-30-55	...	D	..	
353	h SE	NE	14	38	41	S. NeKrassoff	80	2	...	OE	545 670 580 680	....	7-28-53 1-20-55 6-30-55 8-16-55	...	D	..	
354	h SE	NW	13	38	41	W. F. Lawson	38	2	...	SP	70 62	....	7-28-53 6-30-55	...	D	..	

TABLE 8. (Continued)

Well No.	Location: ¼ Section	¼ Section	Section	Township, South	Range, East	Owner	Depth of well below land surface (feet)	Casing: Diameter (inches)	Casing: Depth (feet)	Casing: Finish	Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
355	h NE	SW	13	38	41	Unknown	25	2	...	SP	38	....	7-28-53	...	D	..	
356	NE	NE	10	39	40	H. B. Savage	*30	1¼	...	..	...	1.16	3-28-57	...	N	..	
357	NW	NW	22	38	40	L. Van Ness	*30	2	...	..	...	3.05	3-28-57	...	N	..	
358	h NE	SE	11	38	41	Martin County Golf Club	93	2	...	OE	37 36	....	8- 3-53 1-20-55	...	D	..	
359	NE	SE	11	38	41	C. T. Kemble	42	2	...	OE	35	....	8- 4-53	...	D	..	
360	SW	NE	11	38	41	E. Svilokos	65	2	64	OE	27 36 25	....	8- 4-53 1-20-55 6-30-55	...	D	..	
361	NW	NE	11	38	41	C. A. Lintell	...	2	...	..	25	....	8- 4-53	...	D	..	
362	SW	SE	2	38	41	Charles Boxwell	23	1¼	...	SP	35 615 1,370 1,980 2,050	....	8- 4-53 1-21-55 6-30-55 9- 8-55 8-16-55	...	D	..	
363	SW	SE	2	38	41	H. Thelosen	...	2	...	..	60 82 103	....	8- 4-53 1-21-55 6-30-55	...	D	..	
364	SW	SE	2	38	41	Drew King	...	.	...	..	139	....	8- 4-53	...	D	..	
365	SW	SE	2	38	41	Earl B. Dugan	37	1¼	...	OE	95 86	....	8- 4-53 6-30-55	...	D	..	
366	NW	SE	2	38	41	W. E. Oliver	52	2	52	OE	31	....	8- 4-53	...	D	..	
367	NW	SE	2	38	41	George Brooks	30	1½	...	..	43	....	8- 4-53	...	D	..	
368	NW	NW	2	38	41	George Sollitt	40	.	...	..	285 291	....	8- 4-53 1-21-55	...	D	..	Composite sample wells 368, 369.
369	NW	NW	2	38	41	George Sollitt	20	.	...	..	...	....	.....	...	D	..	

TABLE 8. (Continued)

Well No.	Location: ¼ Section	¼ Section	Section	Township, South	Range, East	Owner	Depth of well below land surface (feet)	Casing: Diameter (inches)	Casing: Depth (feet)	Casing: Finish	Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
370	NE	NE	3	38	41	M. F. Reynolds	...	2	...	..	24 26	....	8- 4-53 1-21-55	...	D	..	
371	NW	NW	2	38	41	R. G. Ross	91	2	91	OE	21 20	....	8- 5-53 1-21-55	...	D	..	
372	SW	NE	3	38	41	C. Allen	21	1¼	...	..	17	....	8- 5-53	...	D	..	
373	SW	NE	3	38	41	C. Allen	68	2	...	OE	...	....	.....	...	N	..	
374	NW	NE	3	38	41	J. L. Coleman	...	1¼	...	..	45 50 38	....	8- 5-53 1-11-55 6-30-55	...	D	..	
375	NW	SW	16	38	41	Frank Blackstone	65	2	65	OE	24	....	8-11-53	...	D	..	
376	NE	NE	17	38	41	Hubert Clements	55	2	...	OE	18	....	8-11-53	...	D	..	
377	h SW	SE	32	38	41	B. N. Fox	22	1¼	...	OE	20	....	8- 5-53	...	D	..	
378	h NE	SW	32	38	41	Percy Fuge	25	1¼	...	SP	13	....	8- 5-53	...	D	..	
379	h SE	NW	32	38	41	George Rackus	...	1¼	...	..	13	....	8- 5-53	...	D	74	
380	h NE	NW	32	38	41	V. Brennan	52	1¼	...	SP	18 20	....	8- 5-53 1-21-55	...	D	..	
381	h SW	SE	29	38	41	C. A. Lees	38	1¼	...	SP	15	....	8- 5-53	...	D	..	
382	h SE	SE	29	38	41	Fred Hironimus	57	.	...	SP	22 24	....	8- 6-53 1-21-55	...	D	..	
383	h NE	SE	29	38	41	J. B. Beach	40	1½	...	..	21	....	8- 6-53	...	D	..	
384	h SE	SE	32	38	41	Paul Baitinger	55	1¼	...	SP	28	....	8- 6-53	...	D	..	
385	h NW	NW	33	38	41	L. M. Johnson	68	2	68	OE	28	....	8- 6-53	...	D	..	
386	h SE	SW	28	38	41	Charles Green	*15	1½	...	SP	26 21	.... 4.12	8- 6-53 1-21-55 4- 7-55	...	D	78	

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
387	h NW	SE	21	38	41	Quindly	...	1¼	...	SP	18 21	....	8- 6-53 1-21-55	...	D	76	
388	NW	SW	16	38	41	C. L. Bruce	52	2	52	OE	28	....	8- 6-53	...	D	..	
389	NW	SW	16	38	41	George Smith	62	2	...	OE	...	....	.....	...	D	..	
390	NW	SW	16	38	41	Joe Mosley	52	1½	...	OE	21 22	....	8- 6-53 1-21-55	...	D	..	
391	NE	NE	17	38	41	E. M. Sellers	...	1½	...	..	14	....	8-11-53	...	D	..	
392	SW	SW	9	38	41	R. J. Triay	...	2	...	..	10 13	....	8-11-53 1-21-55	...	D	..	
393	SW	SW	9	38	41	Clifford Luce	55	4	55	OE	20	.....	8-11-53	...	Ir.	..	
394	SW	SW	9	38	41	Clifford Luce	80	2	80	OE	18	....	8-11-53	...	Ir.	..	Battery 2 wells.
395	NE	NW	17	38	41	A. H. Girard	90	1½	...	OE	21	....	8-13-53	...	D	..	
396	NW	NE	16	38	41	Stanley Smith	28	2	...	SP	30	....	8-11-53	...	Ir.	77	Battery 2 wells.
397	SE	NW	17	38	41	Frank Patzak	70	2	70	OE	23	....	8-13-53	...	D	..	
398	SW	SW	9	38	41	Harold Burkey	90	4	90	OE	16	....	8-13-53	...	D	77	
399	SW	SW	9	38	41	Harold Burkey	20	2	...	SP	22	....	8-11-53	...	Ir.	..	Battery 6 wells.
400	SE	SW	9	38	41	Cressie Baker	...	1¼	...	..	27 25	....	8-11-53 1-21-55	...	D	..	
401	SE	SW	9	38	41	Julius Csongedi	45	1½	...	OE	14	....	8-11-53	...	D	..	
402	SE	SW	9	38	41	Steve Hollo	42	1¼	...	OE	11	....	8-11-53	...	D	..	
403	SE	SW	9	38	41	Lilian Marr	62	1¼	...	..	16	....	8-11-53	...	D	77	
404	NE	NE	17	38	41	F. E. Glass	50	2	...	SP	13	.....	8-11-53	...	D	..	
405	NW	SE	8	38	41	D. E. Andrews	90	2	...	..	12 15	....	8-11-53 1-21-55	...	D	..	

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
406	NW	NE	17	38	41	E. A. Wood	79	2	...	OE	45 32 22	....	8-11-53 1-21-55 6-29-55	...	D	..	
407	NE	SW	17	38	41	H. Sudhoff	101	2	101	OE	24	....	8-13-53	...	D	..	
408	NE	SW	17	38	41	Charles Krumm	82	2	...	SP	15	....	8-13-53	...	D	..	
409	NE	SW	17	38	41	Charles Krumm	32	1¼	...	SP	16	....	8-13-53	...	Ir.	..	
410	NE	SW	17	38	41	H. J. Robinson	...	1½	...	..	25 27	....	8-13-53 6-22-56	...	D	..	
411	SE	SW	17	38	41	J. M. Toth	60	.	...	..	28	....	8-13-53	...	D	..	
412	SE	SW	17	38	41	Oscar Eng	...	2	...	..	38	....	8-13-53	...	D	..	
413	NE	NW	20	38	41	E. W. Ludlum	50	1½	...	SP	26 25	....	8-13-53 6-22-56	...	D	..	
414	SW	SW	17	38	41	Barney Osteen	60	1¼	...	..	22	....	8-13-53	...	D	..	
415	SW	SW	17	38	41	Buck Pendarvis	102	1½	102	OE	38	....	8-13-53	...	D	..	
416	NE	NW	17	38	41	J. E. Lower	65	1¼	...	SP	34	....	8-17-53	...	D	..	
417	NW	NW	17	38	41	Ernest Higbee	90	2	...	..	26	....	8-17-53	...	D	..	
418	NW	NW	17	38	41	Jim Murray	...	1¼	...	..	23	....	8-17-53	...	D	..	
419	NW	NW	17	38	41	Lipps	...	1¼	...	..	11	....	8-17-53	...	D	..	
420	SE	SW	17	38	41	O. B. Cadwell	45	2	...	..	31 39	....	8-17-53 6-22-56	...	D	..	
421	SW	SE	17	38	41	L. I. Simmons	98	2	98	OE	72 99	....	8-17-53 6-22-56	...	D	..	
422	NE	NW	20	38	41	Adam Fensley	36	1¼	...	SP	15 17	....	8-17-53 6-22-56	...	D	..	
423	NW	SW	17	38	41	W. H. Howe	45	.	...	..	11	....	8-17-53	...	D	..	

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
424	NW	SW	17	38	41	Charles Leighton	80	1¼	...	OE	10	....	8-17-53	...	D	..	
425	NW	SW	17	38	41	John Leighton	64	2	...	..	17	....	8-18-53	...	D	..	
426	NW	SW	17	38	41	Frank DeStefano	45	1½	...	..	17	....	8-17-53	...	D	..	
427	NE	SE	18	38	41	J. D. Nipper	...	.	...	..	26	....	8-17-53	...	D	..	
428	NE	SE	7	38	41	R. G. Hupfel	55	3	55	OE	26	....	8-17-53	350	Ir.	..	
429	NE	SE	7	38	41	Don Ward	50	3	50	OE	30	....	8-17-53	350	Ir.	..	
430	SE	NE	7	38	41	W. F. A. Robertson	96	2	96	OE	27	....	8-17-53	...	D	..	
431	NW	SW	5	38	41	H. M. Bedell	...	1¼	...	..	...	....	.....	...	D	..	
432	NW	SW	8	38	41	R. A. Williams	52	2	...	..	26	....	8-17-53	...	D	..	
433	¼ NW	NW	32	38	41	Mapp	...	1¼	...	..	92	....	8-18-53	...	D	..	
434	¼ NW	NW	32	38	41	G. E. Kroider	45	1¼	...	OE	17	....	8-18-53	...	D	..	
435	SE	SE	18	38	41	J. W. Johnson	...	.	...	..	26	....	8-18-53	...	D	..	
436	SE	SW	18	38	41	F. L. Tracy	135	1½	...	..	27	....	8-18-53	...	D	..	
437	SE	SW	18	38	41	J. W. Bolland	25	1¼	...	SP	30	....	8-18-53	...	D	77	
438	NE	NE	24	38	40	Dave Baker	42	1¼	...	SP	26	....	8-18-53	...	D	75	
439	SE	SE	13	38	40	William J. Matheson	...	.	...	..	29	....	8-20-53	...	D	..	
440	NW	NE	24	38	40	Earl Daniels	25	1½	...	..	28	....	8-20-53	...	D	..	
441	NW	NE	24	38	40	Paul Myers	78	1½	78	OE	28	....	8-20-53	...	D	..	
442	SE	SW	13	38	40	William J. Matheson	60	2	60	OE	34	....	8-20-53	...	D	..	
443	NW	NE	7	38	41	William J. Matheson	*951	6	275	OE	1,350 1,370	+36.0 +36.0	8-20-53 4-23-57	600 300	Ir.	.. 76	Flowing well.
444	NE	NW	24	38	40	Edward Kubay	40	1¼	...	SP	27	....	8-20-53	...	D	..	

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
445	NE	SE	14	38	40	W. A. Nelson	...	1½	...	..	17	....	8-20-53	...	D	..	
446	NW	SE	14	38	40	Odell Gore	...	1½	...	..	43	....	8-20-53	...	D	76	
447	NW	SE	14	38	40	J. W. Bell	26	1¼	...	SP	21	....	8-20-53	...	D	76	
448	NW	SE	13	38	40	J. M. Amendola	42	1½	...	SP	33	....	8-20-53	...	D	76	
449	SE	NE	13	38	40	Steve Blasko	90	1½	90	OE	28	....	8-20-53	...	D	..	
450	SE	NW	18	38	41	Unknown	...	1½	...	..	23	....	8-20-53	...	D	..	
451	NW	SE	18	38	41	H. M. L'Heureux	...	.	...	..	30	....	8-20-53	...	D	..	
452	SE	NW	23	38	40	Unknown	...	1¼	...	..	21	....	8-20-53	...	D	76	
453	SW	SW	14	38	40	S. C. Gale	38	1½	...	SP	22 34	....	8-20-53 8-17-56	...	D	..	
454	SW	SW	14	38	40	Rose Leighton	35	1¼	...	SP	98	....	8-20-53	...	D	..	
455	NW	NW	22	38	40	C. Savage	28	1½	...	SP	18 35	....	8-20-53 8-17-56	...	D	..	Cp.
456	NW	SE	21	38	40	Jack Grier	110	1½	...	OE	42 45	....	8-25-53 8-17-56	...	D	..	
457	NW	NE	20	38	40	Vida Y. Evans	80	1½	...	SP	34	....	8-25-53	...	D	76	
458	SE	NE	22	38	40	A. R. Lowe	...	1½	...	..	37 38	....	8-25-53 8-17-56	...	D	..	
459	NW	SW	23	38	40	A. D. Kindberg	27	1¼	...	..	41 55	....	8-25-53 8-17-56	...	D	..	
460	NE	SE	22	38	40	H. A. Lincoln	115	1½	...	OE	46 46	....	8-25-53 8-17-56	...	D	..	
461	SW	SW	23	38	40	Tom Lord	37	1¼	...	SP	169 205	....	8-25-53 8-17-56	...	D	..	
462	SW	SW	23	38	40	A. J. Barrett	87	1½	...	..	590	....	8-17-56	...	D	..	

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
463	NE	NW	27	38	40	H. S. Savage	...	1½	...	SP	22 38	....	8-25-53 8-17-56	...	D	76	
464	SW	NW	27	38	40	Unknown	...	1½	...	SP	26 54	....	8-25-53 8-17-56	...	D	76	
465	SW	SW	23	38	40	J. A. Csekey	...	1½	...	..	64 85	....	8-25-53 8-17-56	...	D	..	
466	SW	SW	27	38	40	W. O. Johns	40	1½	...	SP	135 132	....	8-25-53 8-17-56	...	D	..	
467	SW	NW	26	38	40	C. A. Moore	...	2	...	..	57 95	....	8-25-53 8-17-56	...	S	..	
468	NW	NW	26	38	40	C. A. Moore	60	1½	...	..	28 38	....	8-25-53 8-17-56	...	D	..	
469	SW	NE	3	38	41	D. B. Irons	15	1½	...	..	40	....	9- 9-53	...	Ir.	..	
470	SW	NE	3	38	41	M. K. de Medici	...	1½	...	..	47 32	....	9- 9-53 1-11-55	...	Ir.	..	
471	SW	NE	3	38	41	John Menninger	50	2	...	..	28	....	9- 9-53	...	Ir.	..	
472	SW	NE	3	38	41	John Menninger	18	1¼	...	SP	...	....	.....	...	N	..	
473	SW	NE	3	38	41	Anna Chisholm	50	1½	...	..	35	....	9- 9-53	...	D	..	
474	SW	NE	3	38	41	R. L. Minneham	16	2	...	SP	54 33	....	9- 9-53 1-11-55	...	Ir.	..	
475	NW	NE	3	38	41	A. O. Kanner	80	2	...	..	23	....	9- 9-53	...	D	..	
476	NW	NE	3	38	41	J. B. Frazier	55	.	...	OE	20	....	9- 9-53	...	Ir.	..	
477	NW	NE	3	38	41	J. B. Frazier	...	.	...	SP	16	....	9- 9-53	...	D	..	
478	NW	NE	3	38	41	D. F. Hudson	87	2	...	OE	19	....	9- 9-53	...	D	..	
479	NW	NE	3	38	41	C. R. Ashley	22	1½	...	SP	27	....	9-14-53	...	Ir.	..	

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
480	NW	NE	3	38	41	P. O. Thomas	...	2	...	..	31	....	9-14-53	...	Ir.	..	
481	NW	NE	3	38	41	D. H. Gleason	100	1½	...	..	27	....	9-14-53	...	D	..	
482	SW	NE	3	38	41	Fred Stafford	63	1½	...	OE	26	....	9-14-53	...	Ir.	..	
483	SE	NW	3	38	41	Unknown	...	1¼	...	..	27	....	9-14-53	...	Ir.	..	
484	NW	NE	3	38	41	Turner & Thompson	60	2	...	OE	...	9.39	9-15-53	...	N	..	
485	NE	NW	3	38	41	Arthur Dehon	...	1½	...	..	43	....	9-15-53	...	D	..	
486	NE	NW	3	38	41	Zack Mosley	30	1½	...	..	34	....	9-15-53	...	Ir.	..	
487	SE	NW	3	38	41	H. M. Godfrey	22	2	...	SP	44	....	9-15-53	...	Ir.	..	
488	SE	NW	3	38	41	Carrol Dunscombe	16	1¼	...	SP	61	....	9-15-53	...	D	..	Battery 2 wells.
489	SE	NW	3	38	41	T. T. Oughterson	18	2	...	SP	147 22	....	9-15-53 1-11-55	...	D	..	
490	SE	NW	3	38	41	R. G. Spicer	18	1¼	...	SP	20	....	9-15-53	...	Ir.	..	
491	SE	NW	3	38	41	J. D. White	....	2	...	..	25	....	9-15-53	...	D	..	Battery 3 wells.
492	SE	NW	3	38	41	R. D. Hauk	63	2	...	..	16	....	9-15-53	...	D	..	
493	SE	NW	3	38	41	Evans Crary	80	2	...	..	18	....	9-15-53	...	Ir.	..	
494	SW	NW	3	38	41	E. J. Green	62	2	...	OE	16	....	9-15-53	...	Ir.	..	
495	SW	NW	3	38	41	S. Peabody	60	2	...	OE	16	....	9-15-53	...	Ir.	..	
496	SW	NW	3	38	41	A. S. Laube	...	2	...	..	27	....	9-18-53	...	Ir.	..	
497	SW	NW	3	38	41	Ray Risavy	18	1¼	...	SP	23 48 62	....	9-18-53 1-11-55 6-30-55	...	Ir.	..	
498	SW	NW	3	38	41	S. G. Burt	68	2	...	..	14	....	9-18-53	...	Ir.	..	

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
499	SW	NW	3	38	41	C. A. Carriel	...	1¼	...	..	10	....	9-18-53	...	Ir.	..	
500	SW	NW	3	38	41	E. V. Lawrence	69	2	...	OE	32 21	....	9-18-53 1-27-55	...	Ir.	..	
501	SE	NE	4	38	41	H. D. Stone	80	2	...	..	37 29	....	9-28-53 1-27-55	...	Ir.	..	
502	SE	NE	4	38	41	B. J. Fox	20	.	...	..	68	....	9-28-53	...	D	..	
503	SE	NE	4	38	41	B. J. Box	72	1¼	...	..	16 18	....	9-28-53 1-11-55	...	Ir.	..	
504	SE	NE	4	38	41	B. J. Fox	18	1½	...	SP	9	....	9-28-53	...	Ir.	..	
505	SE	NE	4	38	41	J. M. Speiner	23	1½	...	SP	37 14	....	9-28-53 1-11-55	...	D	..	
506	SE	NE	4	38	41	Robert Fenton	62	1½	...	..	25	....	9-28-53	...	D	..	
507	SW	NE	4	38	41	S. E. Oakowsky	68	2	...	..	...	....	.....	...	Ir.	..	
508	SW	NE	4	38	41	Martin County Hospital	...	2	...	..	39 21	....	9-28-53 1-27-55	...	Ir.	..	Battery 4 wells.
509	SW	NE	4	38	41	Episcopal Church	...	2	...	..	18 20	....	9-28-53 1-27-55	...	Ir.	..	Battery 2 wells
510	SW	NE	4	38	41	W. Schumann	72	2	...	..	23 21	....	9-28-53 1-27-55	...	Ir.	..	
511	SE	NW	4	38	41	I. T. Rembert	22	1¼	...	SP	70 48	....	9-28-53 1-11-55	...	Ir.	..	
512	SE	NW	4	38	40	O. C. Smith	...	2	...	..	19	....	9-28-53	...	Ir.	..	
513	SE	NW	4	38	41	Presbyterian Church	50	2	...	..	17 19	....	9-28-53 1-27-55	...	Ir.	..	
514	SE	NW	4	38	41	H. W. Bessey	80	2	...	OE	96 62	....	9-28-53 4-20-55	...	Ir.	..	

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
515	SE	NW	4	38	41	R. C. Johns	60	2	...	...	106 157 117	....	10- 6-53 9- 7-55 10- 7-55	...	Ir.	..	
516	SW	NW	4	38	41	Catholic Church	...	2	...	...	113 125	....	10- 6-53 9- 7-55	...	Ir.	..	
517	SW	NE	4	38	41	S. J. Gilson	20	2	...	...	235 12	.... 4.93	10- 6-53 4-20-55	...	Ir.	..	
518	SW	NW	4	38	41	William King	57	1½	...	...	46 160 112	....	10- 6-53 1-10-55 5-20-56	...	Ir.	..	
519	SW	NW	4	38	41	Eugene Cabre	63	2	...	...	750 220	....	10- 6-53 1-11-55	...	Ir.	..	
520	SW	NW	4	38	41	H. W. Partlow	35	2	...	OE	64 79	....	10- 6-53 9- 7-55	...	D	..	
521	SW	NW	4	38	41	H. W. Partlow	60	2	...	OE	42	....	10- 6-53	...	Ir.	..	
522	SW	NW	4	38	41	E. F. Lyons	40	2	...	OE	49 39	....	10- 6-53 9- 7-55	...	Ir.	..	
523	SW	NW	4	38	41	Albert Cepec	45	1½	...	OE	53 36	....	10- 6-53 9- 7-55	...	Ir.	..	
524	SW	NW	4	38	41	M. G. Littman	20	2	...	...	64 44	....	10- 6-53 9- 7-55	...	Ir.	..	
525	SW	NW	4	38	41	Ernie Tyner	49	2	...	OE	91 85 124	....	10- 6-53 1-10-55 9- 7-55	...	Ir.	..	
526	NW	SE	3	38	41	Z. T. Mosely	...	1¼	...	...	86	....	10- 7-53	...	Ir.	..	
527	NW	SE	3	38	41	E. J. Brasgalla	76	1½	...	...	29	....	10- 7-53	...	D	..	
528	NW	SE	3	38	41	E. J. Brasgalla	*26	1¼	...	...	...	1.64	10- 7-53	...	N	..	
529	NW	SE	3	38	41	Allen Keaton	...	1¼	...	...	19	....	10- 7-53	...	D	..	

TABLE 8. (Continued)

Well No.	Location: ¼ Section	¼ Section	Section	Township, South	Range, East	Owner	Depth of well below land surface (feet)	Casing: Diameter (inches)	Casing: Depth (feet)	Casing: Finish	Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
530	NW	SE	3	38	41	M. A. Gresik	...	1¼	...	..	33	....	10- 8-53	...	Ir.	..	
531	NW	SE	3	38	41	A. T. Compton	22	1½	...	SP	33	....	10- 8-53	...	Ir.	..	
532	NW	SE	3	38	41	J. F. Henry	...	1¼	...	..	45 20	....	10- 8-53 1-11-55	...	D	..	
533	SW	SE	3	38	41	Karl Krueger	42	2	40	OE	...	....	.....	150	Ir.	..	
534	SW	SE	3	38	41	Karl Krueger	16	1¼	...	SP	36	....	10- 8-53	...	D	..	
535	NE	SW	3	38	41	A. P. Krueger	*17	1½	...	SP	...	10.90	10-12-53	...	N	..	
536	NW	SW	3	38	41	M. P. Nelson	...	1½	...	..	54 25	....	10-12-53 1-19-55	...	Ir.	..	
537	SW	SW	3	38	41	Aaron Cleveland	20	.	...	SP	35 32	....	10-12-53 1-19-55	...	D	..	Pattery 2 wells.
538	NW	SW	3	38	41	C. W. Long	68	2	68	OE	18	....	10-12-53	...	Ir.	..	
539	NW	SW	3	38	41	F. O. Button	74	2	74	OE	14	....	10-12-53	...	D	..	
540	NW	SW	3	38	41	May Holmes	65	1½	65	OE	16	....	10-12-53	...	Ir.	..	
541	NW	NW	10	38	41	P. G. Cockran	...	2	...	..	24	....	10-12-53	150	Ir.	..	
542	NW	SW	3	38	41	J. A. McCoy	40	1¼	...	..	20	....	10-12-53	...	D	..	
543	SW	SW	3	38	41	Frank Sutton	45	2	...	..	24	....	10-12-53	...	D	..	
544	SW	SW	3	38	41	D. S. Richardson	20	1½	...	..	25	....	10-12-53	...	D	..	
545	SW	SW	3	38	41	A. E. Jones	46	1½	...	..	40 32	....	10-12-53 1-19-55	...	D	..	
546	SW	SW	3	38	41	Anna Epspeena	46	1¼	...	..	13 13	....	10-12-53 1-19-55	...	D	..	
547	NW	NW	10	38	41	J. W. Pegram	60	2	...	..	20	....	10-12-53	...	D	..	

TABLE 8. (Continued)

Well No.	Location: ¼ Section	¼ Section	Section	Township, South	Range, East	Owner	Depth of well below land surface (feet)	Casing: Diameter (inches)	Casing: Depth (feet)	Casing: Finish	Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
548	NW	SW	3	38	41	W. C. Dias	...	1½	...	SP	19	....	10-13-53	...	D	77	
549	NE	SE	4	38	41	Jack Hartman	19	2	...	SP	40 15	....	10-13-53 1-11-55	...	D	..	
550	NE	SE	4	38	41	R. S. Hill	46	1¼	...	..	23	....	10-13-53	...	D	..	
551	NE	SE	4	38	41	R. S. Hill	*2	1½	...	OE	...	1.30	10-13-53	...	T	..	
552	NE	SE	4	38	41	Joe Greenlees	18	2	...	SP	56	....	10-13-53	...	Ir.	..	
553	NE	SE	4	38	41	R. S. Fisher	...	2	...	..	20	....	10-13-53	...	Ir.	..	
554	NE	SE	4	38	41	R. J. Randolph	*22	1½	....	..	...	4.71	10-13-53	...	N	..	
555	NE	SE	4	38	41	Ralph Hartman, Jr.	19	2	...	SP	26	....	10-13-53	...	Ir.	..	
556	NW	SE	4	38	41	N. Pezzoni	...	1¼	...	..	29 23	....	10-13-53 1-11-55	...	D	..	
557	NW	SE	4	38	41	R. W. Hartman, Sr.	17	1½	...	SP	39	....	10-13-53	...	Ir.	..	
558	NW	SE	4	38	41	W. W. Meggett	60	2	...	..	12	....	10-13-53	...	Ir.	..	
559	NW	SE	4	38	41	Herb Young	...	2	...	..	43 21	....	10-14-53 1-11-55	...	Ir.	..	
560	NE	NE	9	38	41	H. G. Kindred	30	.	...	..	23	....	10-14-53	...	D	..	
561	SE	NE	9	38	41	T. E. Pillsy	60	1½	...	..	22	....	10-14-53	...	D	..	
562	NE	NE	9	38	41	A. O. Pittman	...	1½	...	..	22	....	10-13-53	...	D	..	
563	SE	NE	9	38	41	W. L. Sullivan	60	1¼	...	OE	21 30	....	10-14-53 1-19-55	...	Ir.	..	
564	SE	NE	9	38	41	R. F. Longbottom	...	1¼	...	..	24	....	10-14-53	...	D	..	
565	NE	NE	9	38	41	H. G. Harper	55	2	55	OE	25 51 20	....	10-14-53 1-19-55 6-30-55	60	Ir.	..	Battery 2 wells.

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
566	NW	NW	10	38	41	Dave Giesbright	26	2	...	SP	26	....	10-14-53	...	D	..	
567	SW	NW	10	38	41	Unknown	...	1¼	...	..	40 29	....	10-20-53 1-19-55	...	D	78	
568	SW	NW	10	38	41	J. D. Baker	20	1¼	...	SP	17	....	10-20-53	...	D	..	
569	SW	SE	4	38	41	Unknown	...	1¼	...	..	51	....	10-20-53	...	D	..	
570	SE	NE	9	38	41	E. H. Hall	...	1¼	...	..	18	....	10-20-53	...	Ir.	..	
571	NW	NE	9	38	41	Elmer McGee	78	1¼	...	..	19	....	10-20-53	...	D	..	
572	NW	NE	9	38	41	Elmer McGee	...	1¼	...	..	23	....	10-20-53	...	D	..	
573	SW	SE	4	38	41	Fred Thompson	30	1¼	...	..	67	....	10-20-53	...	D	..	
574	SE	NE	5	38	41	O. S. Kanarek	...	.	...	..	37 45	....	10-20-53 1-10-55	...	Ir.	..	
575	SE	NE	8	38	41	L. D. Burchard	107	1½	107	OE	15	....	10-21-53	...	D	..	
576	SW	NE	8	38	41	George Zarnits	101	1½	...	..	15	....	10-21-53	...	D	..	
577	SE	NE	8	38	41	R. V. Johnson	120	1½	...	OE	17 19 28	....	10-21-53 1-10-55 6-29-55	...	Ir.	..	
578	SE	NE	8	38	41	H. Whalen	112	1½	...	..	19	....	10-21-53	....	D	..	
579	SE	NE	8	38	41	A. H. Guilmart	57	1½	...	SP	22	....	10-21-53	....	D	..	
580	SW	NE	8	38	41	W. F. May	87	1½	87	..	16	....	10-21-53	...	D	..	
581	SW	NE	8	38	41	J. N. Law, Jr.	...	2	...	..	14	....	10-21-53	...	Ir.	..	
582	SW	NE	8	38	41	C. Albracht	700	.	...	OE	2,400 2,400	....	10-21-53 1-10-55	20	Ir.	..	Flowing well.
583	NE	NE	8	38	41	J. O. Powell	103	1½	...	OE	14	....	10-21-53	...	D	..	

TABLE 8. (Continued)

Well No.	Location: ¼ Section	¼ Section	Section	Township, South	Range, East	Owner	Depth of well below land surface (feet)	Casing: Diameter (inches)	Casing: Depth (feet)	Casing: Finish	Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
584	NW	NE	8	38	41	G. F. Barber	98	2	...	..	14	....	10-21-53	...	D	..	
585	NW	NE	8	38	41	P. B. Caster	26	2	...	..	26 17 59	....	10-21-53 1-10-55 6-29-55	...	D	..	
586	NW	NE	8	38	41	C. Gutermuth	...	2	...	..	38	....	10-22-53	...	D	..	
587	NW	NE	8	38	41	Ivan Taylor	30	..	...	SP	35	....	10-22-53	...	Ir.	..	
588	NW	NE	8	38	41	E. F. Bulla	50	2	...	OE	265 328 258 400	....	10-22-53 1-10-55 4-20-55 6-29-55	...	D	..	
589	SW	SE	5	38	41	Stanley Smith	20	1½	...	..	...	....	.....	...	Ir.	..	
590	SW	SE	5	38	41	K. S. Stimmell	20	1½	...	..	45 67 70	....	10-22-53 1-10-55 6-29-55	...	Ir.	..	
591	NW	NE	8	38	41	R. H. Schwarz	22	1½	...	SP	36 56 60	....	10-22-53 1-27-55 4-20-55	...	D	..	
592	SW	SE	5	38	41	Unknown	40	2	...	SP	48 56	....	10-22-53 6-29-55	...	Ir.	..	
593	SW	SE	5	38	41	C. Munch	22	1½	...	..	6 64	....	10-22-53 4-20-55	...	Ir.	..	
594	SW	SE	5	38	41	J. R. Pomeroy	...	2	...	..	54 63	....	10-22-53 6-29-55	...	Ir.	..	
595	SW	SE	5	38	41	G. Schlesier	60	2	...	..	27	....	10-22-53	...	Ir.	..	
596	NE	SE	7	38	41	D. M. Ward	61	2	57	OE	...	1.56	11- 6-53	...	D	..	L.
597	SW	SE	5	38	41	A. H. Chappelka	15	48	15	OE	40 29	6.87	11- 9-53 6-29-55	...	Ir.		

TABLE 8. (Continued)

Well No.	Location: ¼ Section	¼ Section	Section	Township, South	Range, East	Owner	Depth of well below land surface (feet)	Casing: Diameter (inches)	Casing: Depth (feet)	Casing: Finish	Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
598	NW	SE	5	38	41	F. Schwarz	52	2	...	OE	32 42	....	11- 9-53 6-29-55	...	Ir.	..	
599	SW	SE	5	38	41	J. P. Skiff	50	...	...	..	13	....	11- 9-53	...	D	..	
600	SW	SE	5	38	41	V. Santarsiero	67	1½	...	OE	24 21	....	11- 9-53 1-27-55	...	Ir.	..	Composite sample wells 600, 601.
601	SW	SE	5	38	41	V. Santarsiero	35	1¼	...	SP	...	....	.....	...	Ir.	..	
602	SW	NW	4	38	40	Wm. J. Matheson	*939	6	418	OE	1,170 1,120	+28.5 +26.5	11-16-53 4-25-57	500 210	Ir.	79 79	Flowing well.
603	NE	SE	7	38	41	Unknown	*84	3	...	..	...	1.49	11-20-53	...	N	..	
604	NW	NW	10	38	41	U. S. Geological Survey	*3	1	3	OE	...	2.3	11-20-53	...	O	..	Gravel packed.
605	SW	NE	5	38	41	C. M. Fogt	50	2	...	..	1,650 1,530	....	11-23-53 1-10-55	...	Ir.	..	
606	SW	NE	5	38	41	Harry Harper	...	1¼	...	..	48 97 131	....	11-23-53 1-10-55 5-11-55	...	Ir.	..	
607	NE	SE	5	38	41	Lena Huff	...	1¼	...	..	38	....	11-23-53	...	D	..	
608	NE	SE	5	38	41	D. L. Williams	58	2	...	OE	100 80	....	11-23-53 6-29-55	...	Ir.	..	
609	NE	SE	5	38	41	D. L. Williams	25	1½	...	SP	...	9.01	11-23-53	...	N	..	
610	NE	SE	5	38	41	Peter Cooley	...	1¼	...	..	56 59	....	11-23-53 6-29-55	...	Ir.	..	
611	NE	SE	5	38	41	D. W. Anderson	83	2	...	OE	24	....	11-23-53	...	Ir.	..	
612	NW	SW	4	38	41	Robert Garner	46	1½	...	OE	99 34	....	11-23-53 4-20-55	...	Ir.	..	
613	SE	SW	4	38	41	Bernice Holmes	...	1¼	...	..	63	....	11-23-53	...	D	..	

TABLE 8. (Continued)

Well No.	Location: ¼ Section	¼ Section	Section	Township, South	Range, East	Owner	Depth of well below land surface (feet)	Casing: Diameter (inches)	Casing: Depth (feet)	Casing: Finish	Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
614	SE	SE	5	38	41	C. H. Hardwick	85	1½	...	OE	21 20 62	....	11-23-53 1-10-55 6-29-55	...	D	..	
615	SW	SE	22	37	41	Douglas Arnold	65	2	65	OE	...	....	.....	...	T	..	L.
616	SW	SW	27	37	41	E. F. Jenkins	78	2	68	OE	 24	5.31	12- 2-53 7- 5-56	...	D	..	
617	h NW	NE	14	38	41	C. G. Bischoff	*80	2	80	OE	36 35	6.76	12- 7-53 6-30-55	90	D	..	L.
618	h NW	NW	13	38	41	Jack Kuhn	*85	2	85	OE	13,800	7.57	12- 8-53	...	N	..	
619	NW	SW	4	38	41	City of Stuart	*58	2	...	OE	... 550 700 645 390	9.90	1-20-54 4-15-55 6-29-55 9- 7-55 5-25-56	...	T	..	
620	NE	SW	4	38	41	City of Stuart	*56	2	...	OE	... 42 49 77	8.45	1-20-54 5-11-55 8-16-55 12-15-55	...	T	..	
621	NE	SW	4	38	41	City of Stuart	56	4	...	OE	42 24	....	1-20-54 5-26-55	120	P	..	
622	NE	SW	4	38	41	City of Stuart	*55 115	2	...	OE	... 20 16 29 18	8.24	1-20-54 4-20-55 5-11-55 12-15-55 9-19-56	...	T	..	Deepened to 115 ft in 1956.
623	NE	SW	4	38	41	City of Stuart	55	4	...	OE	40 21 35	....	1-21-54 5-11-55 5-26-55	120	P	..	L.
624	SE	NE	4	38	41	B. J. Fox	*20	1½	...	SP	7	.... 11.45	1-11-55 2- 4-55	...	Ir.	..	

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
625	SW	SW	3	38	41	Ralph Hartman, Jr.	19	2	...	SP	26	....	1-18-55	...	D	..	
626	SW	SW	3	38	41	J. S. Leighton	71	2	...	OE	16	....	1-18-55	...	D	..	
627	SW	NE	9	38	41	Stanley Smith	40	2	...	OE	31 23	....	1-18-55 2- 4-55	...	D,Ir.	..	
628	NW	NE	16	38	41	Stanley Smith	59	3	...	OE	29	....	1-18-55	...	D,Ir.	..	
629	SW	SW	9	38	41	H. I. Burkey	103	4	...	OE	15	....	1-18-55	...	Ir.	..	
630	NW	NW	10	38	41	Paul Hoenshel	63	2	...	OE	21	....	1-18-55	...	Ir.	..	
631	NW	NE	9	38	41	Martin County Garage	53	2	...	OE	26 24	....	1-19-55 6-30-55	50	D	..	
632	SW	SW	3	38	41	Amos Schramm	67	4	...	OE	16	....	1-19-55	...	Ir.	..	
633	SW	SW	10	38	41	Lininger	...	.	...	..	32	....	1-20-55	...	D	..	
634	h SW	SE	15	38	41	P. W. Hickman	73	.	...	OE	44	....	1-20-55	...	S	..	
635	SE	NE	4	38	41	B. J. Fox	78	2	...	OE	14	....	1-11-55	...	D,Ir.	..	
636	SE	NW	4	38	41	J. M. Davis	...	2	...	..	17	....	1-11-55	...	Ir.	..	
637	NW	SE	4	38	41	R. W. Hartman, Sr.	15	1¼	...	SP	245 48 32	....	1-11-55 4-20-55 6-30-55	...	Ir.	..	
638	SW	NW	4	38	41	Eugene Cabre	38	2	...	SP	230 352 295 308	....	4-20-55 8-16-55 10- 7-55 5-25-56	...	Ir.	..	
639	SE	SE	4	38	41	City of Stuart	*72	4	71	OE	15	7.16	1-26-55	...	F	..	
640	SE	NE	9	38	41	City of Stuart	*70	4	...	OE	18	4.33	1-26-55	...	F	..	
641	SW	SE	5	38	41	J. R. Pomeroy	*30	2	...	SP	...	8.93	7- 6-55	...	N	..	

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
642	SE	NE	5	38	41	St. Lucie Hotel	*47	2	...	OE	... 56 76 65	11.5	1-28-55 4-20-55 6-29-55 8-16-55	...	N	..	
643	h NW	NW	13	38	41	Jack Kuhn	26	2	...	SP	75	....	1-20-55	...	D,Ir.	..	
644	SW	NW	4	38	41	Andrew Kerr	25	1¼	...	SP	...	12.41	2- 3-55	...	N	..	
645	SW	NW	4	38	41	Jenseon	*45	1¼	...	..	... 60	7.55	2- 3-55 4-20-55	...	N	..	
646	NW	SW	4	38	41	Fred Rue	*16	1½	...	SP	...	7.36	2- 3-55	...	N	..	
647	NE	SW	4	38	41	American Legion	*113	2	...	OE	... 98 40 34	6.48	2- 4-55 4-15-55 6-29-55 9- 7-55	...	N	..	
648	SE	NW	4	38	41	C. E. Schroder, Jr.	*19	1¼	...	SP	...	11.34	2- 4-55	...	N	..	
649	NE	SW	4	38	41	Martin County School	*21	1¼	...	SP	....	7.73	2- 4-55	...	N	..	
650	NW	SE	4	38	41	Dick Kinkade	*23	1¼	...	SP	....	7.28	7- 5-55	...	N	..	
651	SW	NE	4	38	41	Judge Contls	*26	1¼	...	SP	...	7.72	2- 4-55	...	N	..	
652	NW	NW	10	38	41	Donald Welton	84	3	...	OE	18	....	2- 4-55	...	Ir.	..	
653	SW	SW	10	38	41	Gerald Knouse	78	6	...	OE	24	....	2- 4-55	...	Ir.	..	
654	NW	SW	4	38	41	F. E. Rue	63	1¼	...	OE	197 312 302	....	2- 3-55 4-20-55 11- 2-55	...	Ir.	..	
655	NE	NW	9	38	41	Francis Rowell	63	2	...	OE	15	....	2- 4-55	...	D	..	Ca.
656	NW	NE	9	38	41	City of Stuart	*145	2	144	OE	...	7.04	2-14-55	...	O	..	
657	NW	NE	9	38	41	City of Stuart	125	4	115	OE	21 39	....	5-26-55 12-15-55	105	P	..	Ca.

TABLE 8. (Continued)

Well No.	Location: ¼ Section	¼ Section	Section	Township, South	Range, East	Owner	Depth of well below land surface (feet)	Casing: Diameter (inches)	Casing: Depth (feet)	Casing: Finish	Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
658	NW	NE	9	38	41	City of Stuart	*125	4	115	OE	...	4.34	3- 9-55	...	O.	..	Water level recording gage installed 10-4-55; removed 3-12-56.
658A	NW	NE	9	38	41	U. S. Geological Survey	13	1¼	13	SP	34	.....	5-24-55	...	O	..	
659	NW	NE	9	38	41	City of Stuart	125	2	115	OE	...	5.10	3- 9-55	...	O	..	
660	SE	NE	5	38	41	Casaboom	*45	2	...	OE	... 108 83	12.10	2-16-55 4-20-55 6-29-55	...	N	..	
661	NE	SE	5	38	41	B. D. Keck	*12	1¼	...	SP	...	10.46	2-16-55	...	N	..	
662	SW	SW	4	38	41	Gray	*16	1¼	...	SP	...	3.50	2-17-55	...	N	..	
663	NW	SW	4	38	41	I. W. Weishuhn	*28	1¼	...	SP	...	8.05	2-17-55	...	N	..	
664	SW	SW	4	38	41	Bruce & Harries Restaurant	*17	1½	...	SP	...	9.04	2-17-55	...	N	..	
665	SW	SW	4	38	41	Bruce & Harries Restaurant	*19	1½	...	SP	...	10.05	2-17-55	...	N	..	
666	SE	NE	5	38	41	Authur Tehono	*61	2	...	OE	... 66	11.59	2-17-55 4-19-55	...	N	..	
667	NW	NW	10	38	41	D. L. Welton	*27	2	...	SP	...	6.06	2-16-55	...	N	..	
668	SE	NE	9	38	41	R. D. Smith	*22	1¼	...	SP	...	3.79	2-23-55	...	N	..	
669	SW	SE	4	38	41	Curry	*18	1¼	...	SP	...	3.73	2-23-55	...	N	..	
670	SE	NW	9	38	41	Jack Martin	*63	1¼	...	OE	...	5.34	2-23-55	...	D	..	
671	SW	SE	5	38	41	Harry Dyer	*22	2	...	SP	...	9.62	2-28-55	...	N	..	
672	NW	SE	5	38	41	Rhiley Christoferson	*49	1¼	...	SP	...	9.43	2-24-55	...	N	..	
673	SE	NE	8	38	41	Herman Reitz, Jr.	105	2	...	OE	...	5.91	2-24-55	...	N	..	
674	NW	SW	9	38	41	Cliff Luce	103	2	...	OE	... 47	3.96	2-24-55 4-20-55	...	N	..	

TABLE 8. (Continued)

Well No.	Location: ¼ Section	¼ Section	Section	Township, South	Range, East	Owner	Depth of well below land surface (feet)	Casing: Diameter (inches)	Casing: Depth (feet)	Casing: Finish	Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
675	NE	SE	5	38	41	W. Alex Harrison	*28	1¼	...	SP	... 21	6.80	2-25-55 5-11-55	...	N	..	
676	SE	NW	9	38	41	Lon Tycon	*27	1¼	...	SP	...	4.31	2-25-55	...	N	..	
677	NW	NW	9	38	41	Ralph Kramer	*27	1¼	...	SP	...	10.72	2-25-55	...	N	..	
678	NW	NW	9	38	41	Ralph Kramer	*25	1¼	...	SP	...	10.74	2-25-55	...	N	..	
679	NW	NW	9	38	41	K. M. Wright	*61	2	...	OE	...	6.44	2-25-55	...	N	..	
680	SE	SW	4	38	41	Burton Cosden	*60	1½	...	OE	...	5.53	2-25-55	...	N	..	
681	NE	SE	5	38	41	Pete Benard	*58	2	...	OE	... 24	4.38	4- 1-55 4-20-55	...	N	..	
682	NE	NE	8	38	41	Gordon Hampton	*23	1¼	...	SP	...	8.20	2-25-55	...	N	..	
683	NW	NE	10	38	41	Authur Dehone	*17	1¼	...	SP	...	5.35	3- 2-55	...	N	..	
684	NW	SW	3	38	41	McPherson	*14	1¼	...	SP	...	7.99	3- 2-55	...	N	..	
685	NW	SW	3	38	41	McPherson	*18	1¼	...	SP	...	7.87	3- 2-55	...	N	..	
686	SE	NE	5	38	41	Jerry Doss	*21	2	...	SP	...	7.40	2-15-55	...	N	..	
687	NW	SE	5	38	41	Sheppard Public Park	*60	2	...	OE	... 775 810	7.08	2-16-55 4-19-55 8-16-55	...	N	..	
688	NE	NE	3	38	41	Unknown	*47	2	...	OE	...	6.95	3-10-55	...	N	..	
689	SW	NE	3	38	41	C. Allen	*66	2	...	OE	...	6.89	3-11-55	...	N	..	
690	SW	NE	3	38	41	C. Allen	...	1¼	...	..	...	....	.....	...	Ir.	..	
691	SW	SW	9	38	41	H. I. Berkey	90	4	...	OE	...	6.26	3-11-55	...	N	..	
692	SW	SW	9	38	41	H. I. Berkey	*23	2	...	SP	...	3.09	3-11-55	...	N	..	
693	SW	NE	9	38	41	J. F. Wester	*44	1½	...	OE	...	4.90	3-11-55	...	N	..	

TABLE 8. (Continued)

Well no.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
694	NW	SE	9	38	41	Goessling	*51	2	...	OE	...	4.38	3-11-55	...	N	..	
695	NW	SE	9	38	41	Goessling	*49	4	...	OE	...	5.04	3-11-55	...	N	..	
696	SW	SE	2	38	41	Edward Roemmelt	*27	1¼	...	SP	...	7.81	3-30-55	...	N	..	
697	h NE	NW	14	38	41	Martin County Golf Club	*17	1¼	...	SP	...	3.65	3-30-55	...	N	..	
698	h NE	NW	14	38	41	Martin County Golf Club	*20	1¼	...	SP	...	1.52	3-30-55	...	N	..	
699	h NE	SW	14	38	41	R. H. Malmstem	*20	1¼	...	SP	...	3.95	3-31-55	...	N	..	
700	h NW	SE	14	38	41	V. E. Howard, Sr.	*25	1¼	...	SP	...	3.59	3-31-55	...	N	..	
701	SW	NE	11	38	41	E. E. Fowler	*21	1¼	...	SP	...	5.57	3-31-55	...	N	..	
702	NE	NW	15	38	41	Don Plummer	*19	1¼	...	SP	...	6.05	4- 4-55	...	N	..	
703	h NW	SE	15	38	41	Florida Power & Light Co.	*61	4	...	OE	...	4.77	4- 4-55	...	N	..	
704	h NE	NW	26	38	41	George Browning	*20	1¼	...	SP	...	2.17	4- 6-55	...	N	..	
705	h SE	NE	26	38	41	G. B. Osborn, Sr.	*15	1¼	...	SP	...	4.53	4- 6-55	...	N	..	
706	h SE	SW	24	38	41	Emmery DeLoach	*17	1¼	...	SP	...	4.87	4- 4-55	...	N	..	
707	h SE	SW	24	38	41	G. B. Osborn, Jr.	*19	2	...	..	...	7.50	4- 6-55	...	N	..	
708	NW	NW	13	39	4	Joe Gay	*27	1¼	...	SP	...	6.88	3-26-57	...	S	..	
709	h NE	NW	25	38	41	Whinney Stevens	*30	1¼	...	..	...	5.81	4- 6-55	...	N	..	
710	h NW	NW	25	38	41	Kipchem	*32	1¼	...	SP	...	3.85	4- 6-55	...	N	..	
711	NE	NE	17	38	41	H. Johns	*15	1¼	...	SP	...	6.12	4- 7-55	...	N	..	
712	h NE	SE	29	38	41	John Grimm	*67	2	...	OE	...	2.64	4- 7-55	...	N	..	
713	h NW	SE	27	38	41	Unknown	*41	2	...	OE	...	1.75	4- 7-55	...	N	..	
714	h SW	SE	27	38	41	A. C. Morse	*31	1¼	...	..	...	2.59	4- 7-55	...	N	..	

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
715	h SW	SW	27	38	41	W. L. Merritt	*33	1¼	...	..	...	4.31	4- 7-55	...	N	..	
716	NE	SW	2	38	41	H. E. Stafford	*18	2	...	SP	...	8.97	4- 8-55	...	N	..	
717	h NW	SW	12	38	41	Jack Whiticar	*21	2	...	SP	... 48	15.64	4- 8-55 8-16-55	...	N	..	
718	SW	SE	5	38	41	Harry Dyer	24	2	...	SP	47	....	6-29-55	...	D,Ir	..	Battery 3 wells.
719	SE	NW	4	38	41	I. T. Rembert	53	1¼	...	OE	34 33	....	4-20-55 6-29-55	... ...	Ir.	..	
720	SW	NW	4	38	41	Ernie Tyner	*84	2	...	OE	19 15 21	....	4-22-55 5-23-55 5-25-56	...	Ir.	..	Chloride content of water at 104 ft 9,180 ppm; well pulled to 84 ft.
721	SW	NE	4	38	41	H. P. Hudson	84	2	...	OE	27 29	....	4-23-55 6-30-55	...	Ir.	..	
722	NW	SW	4	38	41	City of Stuart	*112	3	...	OE	78 61 37 35	....	4-20-55 5-26-55 6-29-55 11- 2-55	...	P,Ir	..	
723	NW	NE	9	38	41	City of Stuart	125	4	115	OE	24 22	....	5-26-55 12-16-55	100	P	..	Municipal well No. 2.
724	NE	NE	9	38	41	City of Stuart	125	4	115	OE	16 16	....	5-26-55 12-16-55	100	P	..	Municipal well No. 3.
725	SW	NW	4	38	41	R. B. MacCullough	30	1½	...	SP	37 77	....	5-11-55 9- 7-55	...	Ir.	..	
726	SW	NW	4	38	41	William King	57	2	...	OE	78 80	....	5-11-55 9- 7-55	...	Ir.	..	
727	SW	NW	4	38	41	William King	20	2	...	SP	54	....	5-11-55	...	Ir.	..	
728	SE	NE	5	38	41	W. Woodman	...	1¼	...	..	87	....	5-11-55	...	Ir.	..	

TABLE 8. (Continued)

Well No.	Location: ¼ Section	¼ Section	Section	Township, South	Range, East	Owner	Depth of well below land surface (feet)	Casing: Diameter (inches)	Casing: Depth (feet)	Casing: Finish	Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
729	SW	NW	4	38	41	M. B. Smith	32	2	...	SP	37 39	.... 	5-11-55 11- 2-55	...	..	..	
730	SE	NW	4	38	41	F. L. Hall	86	2	...	OE	45	....	5-11-55	...	Ir.	..	
731	NE	SW	4	38	41	Martin County High School	35	2	...	SP	49	....	5-11-55	...	Ir.	..	Battery 3 wells.
732	h SE	SW	12	38	41	Dutton	20	4	...	SC	81	....	5-11-55	...	Ir.	..	
733	SW	NE	4	38	41	St. Mary's Episcopal Church	105	3	...	OE	18 15	.... 	5-24-55 10- 7-55	...	Ir.	..	
734	h NE	SW	13	38	41	Danforth	84	3	...	OE	176 940 930 1,430 615	....	6-30-55 8-16-55 9- 8-55 10- 7-55 11- 2-55	...	D	..	
735	h NE	SW	13	38	41	Metcalf	69	4	...	OE	35 94 185 307 635	....	6-30-55 9- 8-55 10- 7-55 11- 2-55 5-25-56	125	D	..	
736	NE	SE	4	38	41	C. A. Christensen	115	2	...	OE	24	....	6-30-55	...	Ir.	..	
737	NW	NE	8	38	41	A. J. Rojt	46	2	...	OE	34	....	6-30-55	...	D	..	
738	h NW	NE	25	38	41	J. J. O'Connor	25	2	...	SP	27	....	6-30-55	...	D	..	
739	SW	NE	32	37	41	Unknown	...	6	...	OE	2,190	....	5-10-57	20	N	77	
740	SE	SE	13	39	40	Allen's Ranch	*990	6	474	OE	1,380 1,180 1,040	.... +28.7	12-16-55 4-18-57 1-12-58	650	Ir.	80	Cp.; flowing well.
741	NW	SW	13	39	40	Allen's Ranch	*890	6	460	OE	1,820 1,820	.... +27.5	12-16-55 4-18-57	235	S,Ir	...	Flowing well.
742	SE	SW	13	39	40	Allen's Ranch	*1,003	6	460	OE	1,530 1,440	.... +29.0	12-16-55 4-18-57	225	S,Ir	...	Flowing well

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
743	SE	SW	16	38	38	Rubin Carlton	...	1¼	...	OE	40	....	12-15-55	...	D	..	
744	NW	NE	24	38	37	H. C. Williamson	*1,050	5	398	OE	350 350	.... +13.8	12-16-55 6- 1-56 5-29-57	...	S,Ir.	81	Cp.; flowing well.
745	NE	NE	19	38	39	Allapattah Cattle Co.	*695	6	360	OE	1,310 1,310	.... +23.5	12-16-55 5- 1-57	190	S	85	Cp.; flowing well
746	NE	SE	18	38	39	Allapattah Cattle Co.	*510	6	...	OE	1,280 1,250	.... +22.0 +22.5	12-16-55 5-30-56 5- 1-57	325	S,Ir.	86	Flowing well.
747	SW	SE	9	38	38	Rubin Carlton	825	6	...	OE	1,020 975	.... +27.0	12-16-55 4-30-57	400	S,Ir.	81	Flowing well.
748	NE	NE	14	38	40	William Matherson	*773	6	397	OE	... 1,070 1,050	+31.2 +32.7	2-28-56 3- 2-56 4-23-57	300	Ir.	78	Flowing well.
749	NW	NW	7	40	39	James Owen, Jr.	125	1½	...	OE	35	....	3- 2-56	...	D	..	
750	NE	NW	7	40	39	James Owen, Jr.	130	2	...	OE	23	....	3- 2-56	...	Ir.	..	Cp.
751	SE	SW	6	40	39	James Owen, Jr.	35	1½	...	SP	19	....	3- 2-56	...	S	..	
752	SW	NE	14	38	40	William Matherson	*775	6	...	OE	1,020 1,130	+29.6 +31.6	5-23-56 4-23-57	300	Ir.	78	Flowing well.
753	h SW	SW	12	38	41	Andrew Berkey	68	2	...	OE	102	....	5-25-56	...	T	..	
754	h NE	SW	12	38	41	C. O. Rainey	...	2	...	...	159	....	5-25-56	...	D	..	
755	h NW	SW	12	38	41	Jack Whiticar	65	1½	...	OE	26	....	5-25-56	...	D	..	Cp.
756	h NW	SW	12	38	41	Charles Raymond	28	1¼	...	SP	39	....	5-25-56	...	D	..	
757	h NE	SW	13	38	41	Danforth	45	2	...	SP	46	....	5-25-56	...	D	..	Battery 3 wells.
758	NE	SW	4	38	39	Bettels	*835	6	650	OE	1,300	+22.8	4-26-57	360	Ir.	87	Flowing well.

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (Gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
759	NW	SE	5	38	39	Bettels	*353	6	650	OE	1,300	+23.0	5- 2-57	400	Ir.	88	Flowing well.
760	SW	SE	5	38	39	Bettels	*777	6	373	OE	1,310	+21.00	5- 2-57	200	Ir.	86	Flowing well.
761	NW	NE	20	38	38	Fox Brown	*17	1¼	...	SP	45	7.92	5-31-56	10	D	..	
762	SE	NW	14	38	37	C. Allen	30	1½	...	SP	22	.....	5-31-56	...	S	..	
763	SW	NE	10	38	37	Chester Underhill	30	1½	...	SP	65	.....	5-31-56	...	S	..	
764	SW	SW	4	38	37	Chester Underhill	15	1½	...	SP	14	.....	5-31-56	...	S	..	
765	NW	SW	11	38	37	Jones	*13	1¼	...	SP	...	5.40	6- 8-56	...	D	..	
766	h NW	NW	13	38	41	Jack Whitiear	68	2	...	OE	134	.....	6-11-56	...	D	..	
767	h NW	NW	13	38	41	Jack Whitiear	74	2	...	OE	695	.....	6-11-56	...	D	..	
768	h NW	NW	13	38	41	C. B. Simpson	73	4	70	OE	68	.....	6-11-56	...	D,Ir.	..	
769	SW	NW	32	37	41	Dr. Hewson	45	2	...	OE	63	.....	6-11-56	...	D	..	
770	SW	NW	32	37	41	D. A. Duguid	57	2	55	OE	44	.....	6-11-56	...	D	..	
771	SW	NW	32	37	41	Charles Lubahn	110	2	105	OE	34	.....	6-11-56	...	D	..	
772	SW	NW	32	37	41	C. B. Lancaster	115	2	110	OE	19	.....	6-11-56	...	D	..	
773	NW	NE	31	37	41	Major Smith	60	2	...	OE	43	.....	6-11-56	...	D	..	
774	NW	NE	31	37	41	W. A. Smith	28	2	...	SP	96	.....	6-11-56	...	D	..	
775	NW	NE	31	37	41	Warren	60	1½	...	OE	24	.....	6-11-56	...	D	..	
776	NW	NE	31	37	41	Robinson	110	2	105	OE	21	.....	6-11-56	...	D	..	Cp.
777	SW	NE	31	37	41	E. W. Burg	67	2	...	OE	18	.....	6-11-56	...	D	..	
778	NE	NE	31	37	41	Karl Herrlin	110	2	105	OE	29	.....	6-11-56	...	D	..	
779	NE	NE	31	37	41	I. W. Carey	118	2	113	OE	25	.....	6-11-56	...	D	..	

TABLE 8. (Continued)

Well No.	Location: ¼ Section	¼ Section	Section	Township, South	Range, East	Owner	Depth of well below land surface (feet)	Casing: Diameter (inches)	Casing: Depth (feet)	Casing: Finish	Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
780	SE	NE	31	38	41	J. G. Blain	65	2	60	OE	107	....	6-11-56	...	D	..	
781	SE	NE	31	37	41	Foss	56	2	...	OE	31	....	6-11-56	...	D	..	
782	SE	NE	31	37	41	R. R. Wason	60	2	...	OE	25	....	6-11-56	...	D	..	
783	SE	NE	31	37	41	Deke DeQuine	110	2	105	OE	68	....	6-11-56	...	D	..	
784	NE	NW	35	37	41	Childs	*15	2	...	SP	75	5.1	6-11-56	...	D	..	
785	NE	NW	35	37	41	Childs	*21	4	...	SP	96 71	6.0	6-11-56 10-18-56	55	D	..	
786	NE	NW	35	37	41	L. F. Dommeric	16	4	...	SC	410	....	6-18-56	...	D,Ir	..	Battery 4 wells.
787	SW	NE	35	37	41	W. H. Alley	18	2	...	SP	108	....	6-18-56	...	D	..	
788	SW	NE	35	37	41	C. E. Henriksen	25	2	...	OE	174	....	6-18-56	15	D	..	
789	SE	NE	35	37	41	R. H. Dewey	18	1¼	...	SP	845	....	6-18-56	...	D	..	
790	SW	NE	35	37	41	C. S. Nichols	22	1¼	...	SP	152	...	6-18-56	...	D	..	
791	SW	NE	35	37	41	B. H. Simmons	15	2	...	SP	80	....	6-18-56	...	D	..	
792	SW	NE	35	37	41	R. Dewey	20	2	...	SP	145	....	6-18-56	...	D	..	
793	SW	NE	35	37	41	B. J. Carlberg	20	1½	...	SP	186	....	6-18-56	...	D	..	Battery 3 wells.
794	SW	NE	35	37	41	E. L. Emery	21	2	...	SP	298	....	6-19-56	...	D	..	Battery 2 wells.
795	SW	NE	35	37	41	E. L. Emery	10	2	...	SP	675	....	6-19-56	...	Ir.	..	Battery 3 wells.
796	NW	SE	35	37	41	J. S. Cleary	...	2	...	SP	312	....	6-19-56	...	D	..	Battery 2 wells.
797	NW	SE	35	37	41	S. W. Sales	25	2	...	SP	67	....	6-19-56	...	D	..	
798	SW	SW	36	37	41	William Knapp	21	1½	...	SP	203	....	6-19-56	...	Ir.	..	
799	SW	SW	36	37	41	William Knapp	*23	3	...	SP	...	2.88	6-19-56	...	N	..	

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
800	SW	NW	1	38	41	Gene Dyer	30	2	...	SP	570	....	6-19-56	...	D	..	Battery 2 wells.
801	SW	NW	1	38	41	Gene Dyer	27	2	...	SP	695	....	6-19-56	...	D,Ir	...	Battery 2 wells.
802	SW	NW	1	38	41	Gene Dyer	*27	2	...	SP	...	19.15	6-19-56	...	N	..	
803	SW	NW	1	38	41	L. A. Knowls	28	2	...	SP	46	....	6-19-56	...	D	..	Battery 2 wells.
804	SW	NW	1	38	41	L. A. Knowls	*27	2	...	SP	...	20.2	6-19-56	...	N	..	
805	NW	SW	1	38	41	H. G. Hill	*1,090	6	...	OE	890 875	+26.6	6-19-56 5- 9-57	250	Ir.	76	Flowing well.
806	NW	SW	1	38	41	H. G. Hill	20	2	...	SP	190	....	6-19-56	...	D	..	Battery 2 wells.
807	NE	SW	1	38	41	J. J. Joungworth	21	2	...	SP	111	....	6-19-56	...	D	..	Battery 2 wells.
808	NE	SW	1	38	41	J. J. Joungworth	*21	1½	...	SP	...	7.44	6-19-56	...	N	..	
809	SE	SW	26	37	41	F. Langford	21	2	...	SP	41	....	6-19-56	...	D,Ir	...	Battery 6 wells.
810	NE	SW	1	38	41	C. B. Arbogast	28	1½	...	SP	125	....	6-20-56	...	D,Ir	...	Battery 4 wells.
811	SE	SW	1	38	41	W. A. Palmer	30	2	...	SP	60	....	6-20-56	...	D	..	Battery 2 wells.
812	SE	SE	35	37	41	F. M. Andrews	32	1½	...	SP	94	....	6-20-56	...	D	..	
813	SE	SW	1	38	41	A. J. L. Moritz	24	2	...	SP	470	....	6-20-56	...	D,Ir	...	Battery 4 wells.
814	NW	NE	12	38	41	Thomas Dunlap	28	2	...	SP	158	....	6-20-56	...	D	..	
815	NW	SW	6	39	41	R. H. Reddish	*28	1¼	...	SP	...	5.38	3-28-57	...	N	..	
816	NW	NE	12	38	41	E. H. Killheffer	26	1½	...	SP	1,060	....	6-20-56	...	D,Ir	...	Battery 4 wells.
817	NW	NE	12	38	41	E. H. Killheffer	26	2	...	SP	81	....	6-20-56	...	Ir.	..	
818	h SW	NE	12	38	41	C. Y. Banfill	26	2	...	SP	41	....	6-20-56	...	D	..	Battery 4 wells.
819	SE	NW	27	39	40	P. L. Bailey	*47	2	...	..	...	3.56	3-26-57	...	N	..	

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
820	h SE	SW	24	38	41	Salerno Fire Department	78	3	...	OE	...	....	.....	...	F	..	
821	h NE	SE	12	38	41	W. M. Kiplinger	18	2	...	SP	680	....	6-20-56	...	Ir.	..	Battery 3 wells.
822	h NE	SE	12	38	41	C. B. Arbogast	...	1½	...	SP	835	....	6-20-56	...	D,Ir.	..	Battery 2 wells.
823	NE	SW	1	38	41	George Shepard	18	1½	...	SP	71	....	6-20-56	...	D	..	
824	NE	SW	1	38	41	F. H. Kouch	21	1½	...	SP	41	....	6-21-56	...	D	..	
825	SW	SE	17	38	41	Ruel Deem	98	2	...	OE	55	....	6-22-56	...	D	..	
826	SE	SW	17	38	41	Henry Crews	100	2	...	OE	55	....	6-22-56	...	D	..	
827	h SE	NE	19	38	42	Jack Bloom	27	2	...	SP	28	....	6-27-56	...	D	..	
828	h SE	SW	19	38	42	Lawrence Bitter	25	2	...	SP	14	....	6-27-56	...	D	..	
829	h SE	SW	19	38	42	E. L. Blasingame	27	1¼	...	SP	34	....	6-27-56	...	D	..	
830	h SE	SE	24	38	41	Rugg	35	1½	...	SP	41	....	6-27-56	...	D	..	
831	h SE	SW	18	38	42	C. H. Williams	38	2	...	SP	...	11.74	6-27-56	...	D	..	Battery 2 wells.
832	h NE	NE	24	38	41	Ed. Lawrence	35	1½	...	SP	41	....	6-27-56	...	D	..	
833	h SE	SE	24	38	41	John Erickson	22	1½	...	SP	88	....	6-27-56	...	D	..	
834	h SE	SE	24	38	41	David Lowe	27	2	...	SP	37	....	6-28-56	...	D	..	
835	SW	NE	33	37	41	Edward Nelson	84	2	...	OE	27	....	7- 5-56	...	D	..	Cp.
836	SW	NE	33	37	41	Frank Novacasa	69	1½	...	OE	16	....	7- 5-56	...	D	..	
837	SW	NE	33	37	41	Fred Arnold	18	1¼	...	SP	44	....	7- 5-56	...	D	..	
838	SE	NE	32	37	41	Radio Station WSTU	45	1¼	...	OE	785	....	7- 5-56	...	D	..	
839	NE	NE	33	37	41	A. R. Miller	81	2	...	OE	41	....	7- 5-56	...	D	..	
840	SE	NW	13	37	41	Yerg & Anderson	12	2	...	SP	7,410	....	7- 6-56	...	D	..	

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
841	NE	SW	16	38	41	Stanley Smith	*1,057	4	454	OE	2,900	....	9- 4-57	140	Ir.	...	Cp.; flowing well; L.
842	SE	NW	13	37	41	W. C. Shepard	15	2	...	SP	3,250	....	7- 6-56	...	D	..	
843	SE	NW	13	37	41	J. K. Paterson	20	4	...	SC	6,320	....	7-14-46	...	D	..	
844	NW	NW	26	37	41	W. W. Bailey	20	1¼	...	SP	30	....	7- 6-56	...	D	..	
845	NE	SW	26	37	41	Mt. St. Joseph Noviate	20	2	...	SP	36	....	7- 6-56	...	D	..	Battery 4 wells.
846	h NW	SW	6	39	41	Bill Jernigan	103	4	...	OE	52	....	3-28-57	...	D,Ir	...	
847	NE	SW	26	37	41	Mt. St. Joseph Noviate	20	2	...	SP	39	....	7- 6-56	...	D	..	
848	NW	NW	15	37	41	E. J. Price	27	1½	...	SP	38	....	7-16-56	...	D	..	Battery 2 wells.
849	NW	NW	15	37	41	E. J. Price	87	3	...	OE	...	....	.....	...	N	..	
850	NW	NW	15	37	41	E. J. Price	20	1¼	...	SP	...	....	.....	...	N	..	
851	NW	NW	15	37	41	E. J. Price	20	2	...	SP	...	0.05	7-20-56	...	N	..	
852	NW	NW	15	37	41	H. Dietz, Jr.	18	1½	...	SP	41	....	7-20-56	...	D	..	
853	NW	NW	15	37	41	E. R. Watson	18	1½	...	SP	14	....	7-20-56	...	D	..	
854	NE	NE	16	37	41	A. Duym	27	1¼	...	SP	40	....	7-20-56	...	D	..	
855	NW	NW	15	37	41	Henry Ostron	55	2	...	SP	16	....	7-20-56	...	D	..	
856	NE	SW	15	37	41	W. B. Tilton	37	3	...	SP	39	....	7-20-56	...	D	..	
857	NE	SW	15	37	41	W. Y. Okamoto	103	3	...	SP	34	....	7-20-56	...	D	..	
858	NE	NW	22	37	41	C. T. Pontier	68	2	...	SP	15	....	7-20-56	...	D	..	
859	SE	NW	15	37	41	Argy Margarigas	25	1½	...	SP	29	....	7-27-56	...	D	..	Battery 2 wells.
860	SE	NW	15	37	41	Marian Senske	16	1¼	...	SP	26	....	7-27-56	...	D	..	
861	SE	NW	15	37	41	Harold Salzler	20	1½	...	SP	22	....	7-27-56	...	D	..	

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
862	NE	SW	15	37	41	Dupree	25	1¼	...	SP	26	....	7-27-56	...	D	..	
863	NE	SW	15	37	41	J. R. Bolling	23	1½	...	SP	27	....	7-27-56	...	D,Ir	...	
864	g NE	SW	36	39	42	F. W. Labrot	17	2	...	SP	700	....	8- 8-56	...	Ir.	..	Battery 6 wells.
865	g NE	NE	26	39	42	Albert Cole	...	2	...	SP	61	....	8- 8-56	...	Ir.	..	
866	g NW	NE	26	39	42	General Franklin	...	2	...	SP	57	....	8- 8-56	...	Ir.	..	
867	g NW	NE	26	39	42	E. M. Vorhis	...	2	...	SP	57	....	8- 8-56	...	Ir.	..	
868	g SE	SW	36	39	42	P. M. Frazier	...	2	...	SP	600	....	8- 8-56	...	Ir.	..	
869	g NW	SW	25	39	42	E. D. Johnson	24	2	...	SP	1,190	....	8- 8-56	...	Ir.	..	
870	g NW	SW	14	39	42	Betty Bordwin	...	2	...	SP	570	....	8- 8-56	...	Ir.	..	
871	NW	NW	24	38	40	Florida Turnpike Authority	70	8	...	OE	19	....	8-14-57	500	D	..	
872	SE	SW	15	37	41	Robert Weisenburger	32	2	...	OE	34	....	8-10-56	...	D	..	
873	SE	SW	15	37	41	C. C. Webb	20	1¼	...	SP	16	....	8-10-56	...	D	..	
874	SE	SW	15	37	41	Earl Temple	25	2	...	OE	30	....	8-10-56	...	D	..	
875	SW	SE	15	37	41	A. J. White	20	2	...	SP	17	....	8-10-56	...	D	..	Cp.
876	NW	NE	22	37	41	Rupert Jackson	16	1¼	...	SP	27	....	8-10-56	...	D,Ir	...	Battery 2 wells.
877	NW	NE	22	37	41	J. F. Murdock	31	4	...	OE	30	....	8-10-56	500	Ir.	81	Battery 2 wells.
878	NW	NE	22	37	41	W. B. Tilton	18	1¼	...	SP	35	....	8-10-56	...	D	..	Battery 2 wells.
879	SW	NE	22	37	41	O. S. Robertson	16	1¼	...	SP	18	....	8-11-56	...	D	..	
880	SW	NE	22	37	41	H. Hendry	26	2	...	SP	33	....	8-11-56	...	D	..	Battery 2 wells.
881	SE	NE	22	37	41	H. H. Hoke	21	2	...	OE	34	....	8-11-56	...	D	..	Battery 15 wells.
882	NE	SE	22	37	41	George Staples	...	2	...	SP	31	....	8-11-56	...	D,Ir	...	

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
883		SE	SE	22	37	41	Herb Gass	20	2	...	SP	33	10.0	8-11-56	...	D,Ir	...
884		SW	SW	23	37	41	John Langberg	23	2	...	SP	32	....	8-11-56	...	D,Ir	... Battery 9 wells.
885	g	NW	NW	15	39	42	Gulfstream Nursery	80	6	...	OE	44	....	8-16-56	950	Ir.	76
886	g	NW	NW	15	39	42	Gulfstream Nursery	33	2	...	OE	29	....	8-16-56	...	D,Ir	... Battery 7 wells.
887	g	SW	SW	10	39	42	Gulfstream Nursery	*10	2	...	SP	...	1.76	8-16-56	...	N	..
888	g	SW	SW	10	39	42	Gulfstream Nursery	32	2	...	SP	...	2.35	8-16-56	...	N	..
889	g	SW	SW	10	39	42	Gulfstream Nursery	...	6	...	OE	...	....	.....	...	N	..
890	h	SW	NW	25	38	40	Bruce Leighton	75	8	...	OE	...	....	.....	...	Ir.	..
891	h	NW	SE	26	38	40	Bruce Leighton	75	8	...	OE	88	....	3-10-58	725	Ir.	..
892	h	NW	SE	26	38	40	Bruce Leighton	40	2	...	OE	... 63	2.40	10-25-56 3-10-58	...	D	..
893	h	NE	NE	35	38	40	Bruce Leighton	75	8	...	OE	...	....	.....	...	Ir.	..
894	h	NE	SW	26	38	40	Bruce Leighton	75	6	...	OE	...	2.11	9-25-56	...	Ir.	.. Cp.
895	h	NW	SW	26	38	40	Bruce Leighton	75	8	...	OE	...	.....	.....	...	Ir.	.. Gravel packed.
896	h	SW	SW	26	38	40	Bruce Leighton	33	4	...	OE	...	1.41	9-25-56	...	Ir.	..
897	h	SW	SW	26	38	40	Bruce Leighton	133	4	...	OE	...	1.36	9-25-56	...	Ir.	..
898	h	NE	NW	35	38	40	Bruce Leighton	75	12	...	OE	...	1.36	9-25-56	...	Ir.	.. Gravel packed.
899	h	SE	SW	26	38	40	Bruce Leighton	35	4	...	OE	...	0.98	10-23-56	...	Ir.	..
900	h	SE	SW	26	38	40	Bruce Leighton	155	4	135	OE	...	1.28	10-24-56	...	Ir.	..
901		SE	NE	22	39	38	Joe Adams	1,110	8	490	OE	280 245 258	.... +9.0 +11.5	9-21-56 1-25-57 4-17-57	150	Ir.	82 Cp.; flowing well.

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
902	SE	SW	26	37	41	D. F. Childs	25	4	...	SP	293 43	....	9-19-56 10-18-56	...	D	..	
903	NE	NE	34	37	41	Evenrude	80	4	...	OE	14,500	...	9-19-56	200	.	..	Swimming pool.
904	SW	SE	30	37	41	C. B. Arbogast	*126	4	108	OE	43	4.04	11-14-56	115	T	..	
905	SW	SE	30	37	41	C. B. Arbogast	*126	4	109	OE	...	4.42	11-14-56	...	T	..	
906	h NW	NW	25	38	40	Bruce Leighton	33	4	...	OE	...	.....	.....	...	Ir.	..	
907	h NE	SW	25	38	40	Bruce Leighton	30	1½	...	OE	....	.....	.....	...	D	..	
908	h NW	SW	25	38	40	Bruce Leighton	35	2	...	OE	...	.....	.....	...	D	..	
909	NE	NE	33	38	37	Eber, Babbin, Harman & Case	1,095	6	...	OE	700	+22.0	1-23-57	300	Ir.	..	Flowing well.
910	NW	SE	34	38	37	Eber, Babbin, Harman & Case	*1,096	6	469	OE	770 740	....	10-21-56 1-23-57	225	Ir.	..	Flowing well.
911	SE	SE	36	39	38	Seaboard Railroad	1,000	6	...	OE	670	+16.5	5-21-57	...	In.	..	Flowing well.
912	NE	NW	23	39	38	Joe Adams	1,120	8	...	OE	480 412	+ 9.6 +10.6	1-24-57 4-17-57	130	Ir.	79	Flowing well.
913	NE	SE	23	39	38	Joe Adams	1,100	6	...	OE	510 520	+8.0 +9.0	1-24-57 4-17-57	120	Ir.	80	Flowing well.
914	SE	NE	23	39	38	Joe Adams	1,100	6	...	OE	520 525	....	1-25-57 4-17-57	75	Ir.	84	Flowing well.
915	NE	NW	26	39	38	Joe Adams	1,120	8	...	OE	300 265	+10.0 +11.0	1-25-57 4-17-57	160	Ir.	81	Flowing well.
916	NW	NE	7	39	38	H. C. Williamson	*1,028	5	487	OE	510	+19.5	3- 6-57	...	Ir.	81	Flowing well.
917	NE	SW	30	38	38	H. C. Williamson	1,060	5	...	OE	530	+15.5	3- 6-57	...	Ir.	81	Flowing well.
918	SE	NE	23	38	37	H. C. Williamson	1,080	5	...	OE	725	+12.0	3- 6-57	...	Ir.	81	Flowing well.
919	SW	SE	5	40	38	Smally Brothers	950	8	636	OE	1,110	+27.0	3- 7-57	750	Ir.	84	Flowing well.

TABLE 8. (Continued)

Well No.	Location					Owner	Depth of well below land surface (feet)	Casing			Chloride content of water (parts per million)	Water level above (+) or below land surface (feet)	Date water sample collected or water level measured	Estimated yield (gallons per minute)	Use of water	Temperature (°F)	Remarks
	¼ Section	¼ Section	Section	Township, South	Range, East			Diameter (inches)	Depth (feet)	Finish							
920	SW	SE	30	39	38	J. K. Stewart	*1,033	5	448	OE	490	+ 28.0	3- 7-57	225	Ir.	..	Flowing well.
921	NW	NW	30	39	38	J. K. Steward	*1,032	5	455	OE	495	+ 26.0	3- 7-57	250	Ir.	81	Flowing well.
922	NW	SE	6	40	39	Seaboard Railroad	800	6	...	OE	930	.... +17.0	3- 7-57 5-21-57	100	F	81	Flowing well.
923	NW	SW	25	39	38	Joe Adams	1,000	8	...	OE	860	+ 10.3	4-16-57	300	S,Ir.	84	Flowing well.
924	SW	SW	18	39	41	R. O. Beesch	32	1¼	...	SP	...	1.95	3-26-57	...	N	..	
925	NE	SE	18	39	41	R. O. Beesch	*36	4	...	SP	40	2.01	3-26-57	...	S	75	
926	SW	NE	12	38	40	William Matherson	950	6	...	OE	1,230	+ 34.3	4-23-57	100	Ir.	77	Flowing well.
927	NE	NW	14	38	38	Rubin Carlton	*792	6	...	OE	1,050	+23.8	5- 1-57	350	Ir.	82	Flowing well.
928	NE	SE	6	40	39	U. S. Geological Survey	*11	6	10	OE	...	1.00	5-17-57	...	O	..	Water level recording gage installed 5-17-57; gravel packed.
929	SW	SE	4	40	39	Laurance Clark	92	1½	...	OE	...	....	.....	...	D	..	Cp.
930	SW	SE	2	39	37	T. F. Clements	90	2	...	..	...	....	.....	...	D	..	Cp.; slotted casing.
931	SE	NE	8	38	40	William Matherson	900	6	...	OE	1,050	+ 26.1	4-25-57	60	S,Ir.	80	Flowing well.
932	NE	SW	8	38	40	William Matherson	950	6	290	OE	1,100	+ 26.0	4-25-57	350	S,Ir.	80	Flowing well.
933	NW	NW	21	38	40	U. S. Geological Survey	*15	6	14	OE	...	1.87	6-12-57	...	O	..	Water level recording gage installed 7-25-57; gravel packed.
934	NE	NE	1	40	39	Michael Phipps	*44	2	...	SP	42	....	8-13-57	...	S	..	
935	NE	NE	1	40	39	Michael Phipps	86	2	84	OE	810	....	8-13-57	...	S	..	
936	SE	SE	36	39	39	Michael Phipps	108	2	106	OE	615	....	8-13-57	...	S	..	
937	SE	SW	24	39	38	Norman Hall	196	4	156	OE	23	7.92	3-12-58	60	S	..	
938	SE	SW	24	39	38	Norman Hall	180	3	126	OE	30	8.15	3-12-58	70	S	..	
939	NW	SE	6	40	39	Frank Gorka	95	1½	95	OE	16	...	3-25-58	...	D	..	Ca.

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