STATE OF FLORIDA
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FLORIDA GEOLOGICAL SURVEY

Robert O. Vernon, Director

REPORT OF INVESTIGATIONS NO. 34

GEOHYDROLOGIC RECONNAISSANCE OF PASCO AND SOUTHERN HERNANDO COUNTIES, FLORIDA

By
W. S. Wetterhall

Prepared by the
UNITED STATES GEOLOGICAL SURVEY
in cooperation with the
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TALLAHASSEE
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LETTER OF TRANSMITTAL

Florida Geological Survey

Tallahassee

October 10, 1963

Honorable Farris Bryant, *Chairman*
Florida State Board of Conservation
Tallahassee, Florida

Dear Governor Bryant:

The Florida Geological Survey is publishing, as Report of Investigations No. 34, a study on the "Geohydrologic Reconnaissance of Pasco and Southern Hernando Counties, Florida." This report was prepared by W. S. Wetterhall, a geologist with the United States Geological Survey, as part of the cooperative investigation of the water resources of Florida. The area of study centers above a high point in the ground-water pressure system of the Florida artesian aquifer, and it can be considered to be a principal recharge area for much of the ground water of the western Gulf Coast of the mid-peninsula.

The extensive and expanded use of ground water that has paralleled the population growth along the Gulf Coast has made it necessary to develop a greater knowledge of geology and hydrology of Pasco and Hernando counties. This report presents this information in a comprehensive form.

Respectfully yours,

Robert O. Vernon
Director and State Geologist

Completed manuscript received
February 8, 1963
Published for the Florida Geological Survey
By E. O. Painter Printing Co.
DeLand, Florida

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GEOHYDROLOGIC RECONNAISSANCE OF PASCO AND SOUTHERN HERNANDO COUNTIES, FLORIDA

By
W. S. Wetterhall

ABSTRACT

Pasco County lies in the coastal plain physiographic province. The Brooksville Ridge, in the central part of the area, trends in a north-westerly direction and reaches a maximum altitude of 301 feet. The ridge is flanked by the Withlacoochee River valley on the east, the Hillsborough River valley on the south, and the Terraced Coastal Lowlands on the west. Relatively sharp breaks in slope occur at altitudes of about 25 feet and 100 feet which define the Pamlico and Wicomico terraces. The Pamlico terrace extends into the Gulf of Mexico to a submerged scarp at about 60 feet below sea level. Sinkholes are widely distributed on both the land and the submarine surfaces.

Surface drainage of the area is poorly developed. Northern Pasco County and Hernando County are drained primarily by underground seepage. This drainage is interrupted by prolonged above-normal rainfall which raises the ground-water level so that sinkholes that normally act as surface drains become springs and add to the excessive surface water.

A thick section of limestone underlies the area. The upper few hundred feet of limestone is comprised of the Tampa Limestone; the Suwannee Limestone; the Crystal River, Williston, and Inglis Formations; and the Avon Park and the Lake City Limestones. These limestones form a gross hydrologic unit—the Floridan aquifer—that is the source of practically all the water used in the area. The limestones are generally permeable, but the highest permeabilities usually occur in or near hard zones in the limestone. These hard zones are common in the base of the Suwannee Limestone, within the Inglis Formation, and from about 100 feet below the top of the Avon Park Limestone through the Lake City Limestone.

The highest points on the piezometric surface are near Dixie at an altitude of about 101 feet, and near St. Leo at an altitude of about 95 feet. These mounds are informally referred to as the "Pasco High." Water moves from these piezometric highs to the

Gulf of Mexico and to the Hillsborough and Withlacoochee rivers through the Floridan aquifer.

Ground water in the area generally meets U.S. Public Health Service drinking water standards except near the coast where chlorides and sulfates may exceed tolerable limits.

INTRODUCTION

PURPOSE AND SCOPE

The extensive and expanding use of ground water for domestic, municipal, industrial, and irrigation supplies has resulted in the need for a greater knowledge of the geology and hydrology of Pasco and southern Hernando counties. This report, prepared by the U. S. Geological Survey in cooperation with the Florida Geological Survey, will aid in the development of water supplies in the area.

A reconnaissance study was made from June 1960 to July 1961. Geologic sections were constructed from well logs and the water-bearing characteristics of the geologic formations were determined. One hundred and eight wells and 16 springs were inventoried, and water-level measurements were made to determine the piezometric surface. Long-term water-level records are presented for two wells in Pasco County. Water samples from wells, springs, and streams were analyzed by the Quality of Water Branch, U. S. Geological Survey. The discharge of springs was measured by the Surface Water Branch of the U. S. Geological Survey and by the author.

ACKNOWLEDGMENTS

The author appreciates the cooperation of the well owners who permitted access to their properties and wells. Well drillers who contributed well data are Ben Lovelace and Co., F. A. May and Son, and May Artesian Well Co., all of Tampa. Mr. Frank A. May accompanied the author on a tour of the area and assisted him in locating many wells. Colonel Conners, Commanding Officer, MacDill Air Force Base, furnished a helicopter for use in locating offshore springs.

PREVIOUS REPORTS

The geology of the area is discussed by Cooke (1945). Stringfield (1936) discussed the water-bearing rocks and first described the shape of the piezometric surface. Many other reports mention

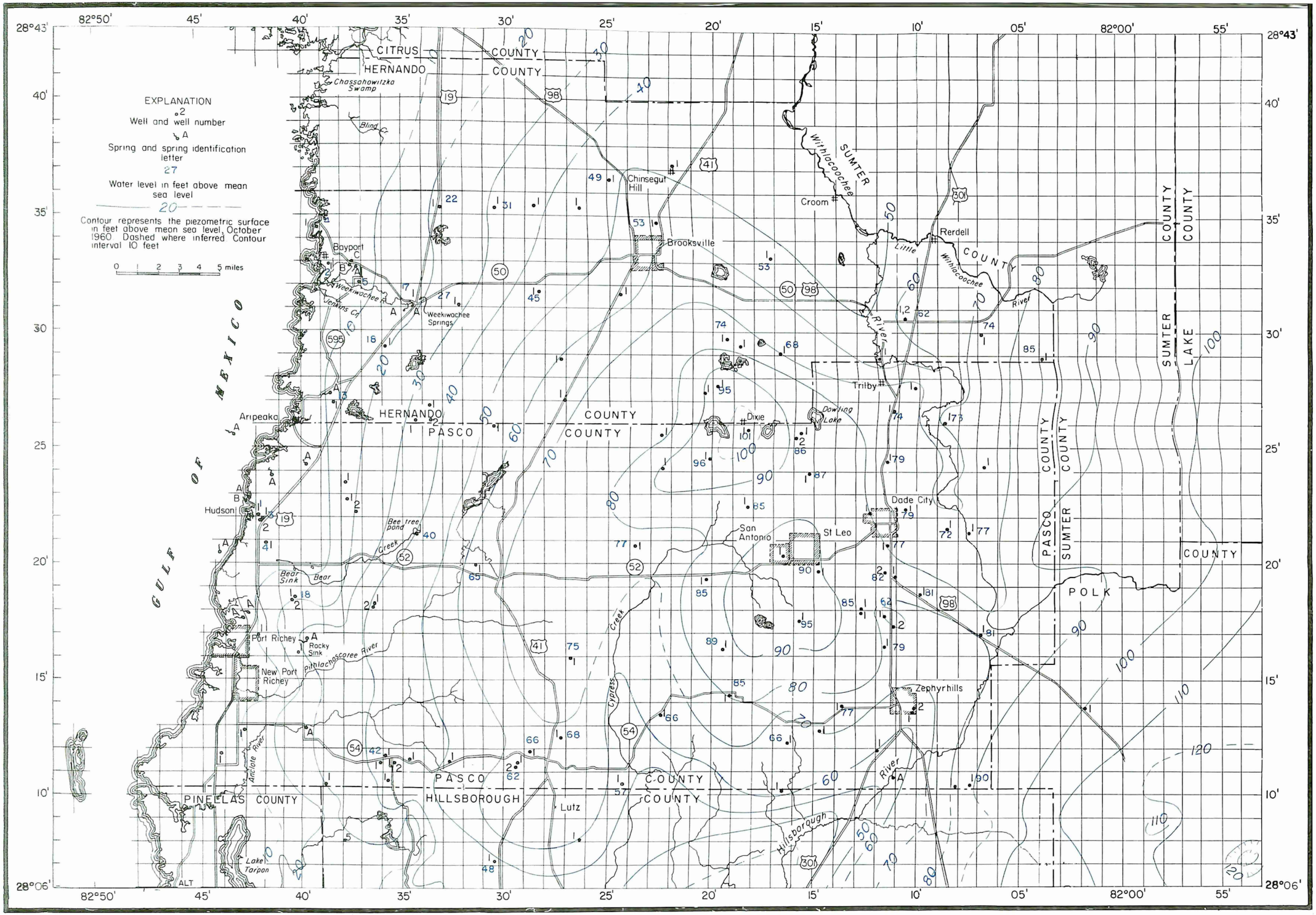


Figure 1. Location of wells and springs and piezometric surface of the Floridan aquifer in Pasco County and adjacent areas, Florida, October 1960.

the geology or water resources of the area in a brief, general manner.

WELL AND SPRING NUMBERING SYSTEM

Wells and springs inventoried during the study in Pasco and southern Hernando counties are shown on figure 1. The latitude and longitude location given by each well and spring number is explained in figure 2.

GEOGRAPHY

The area of this report lies between 28°10′ and 28°37′ N. latitude and between 82°00′ and 82°52′ W. longitude. It includes all of Pasco County and the Southern part of Hernando County. (fig. 3).

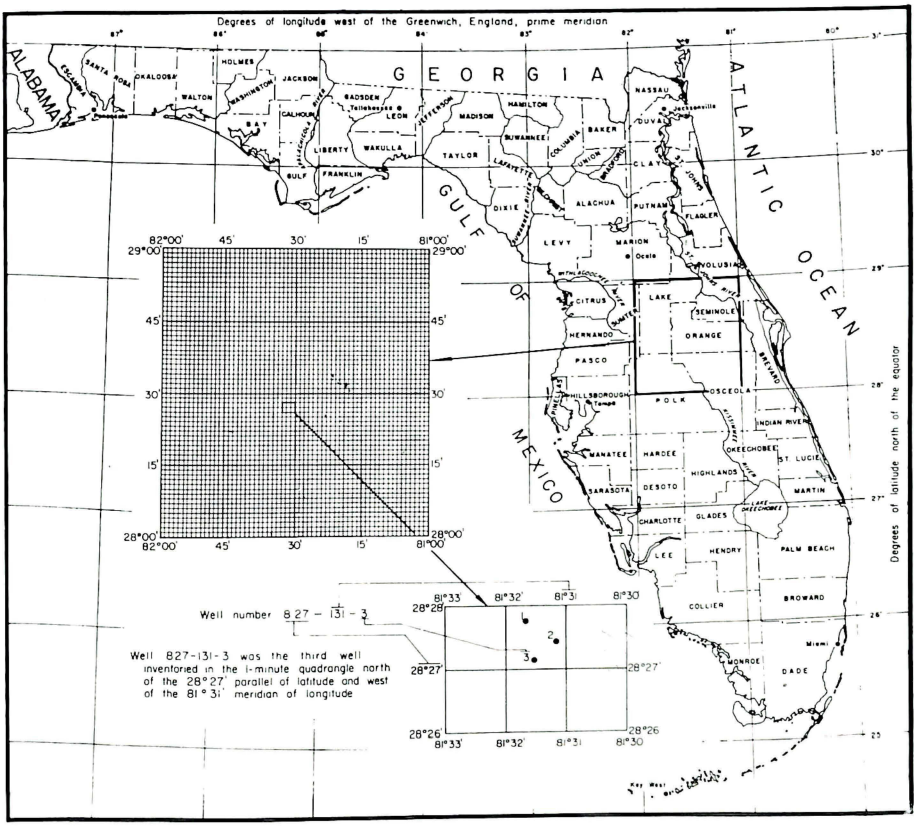


Figure 2. Explanation of well and spring numbering system.

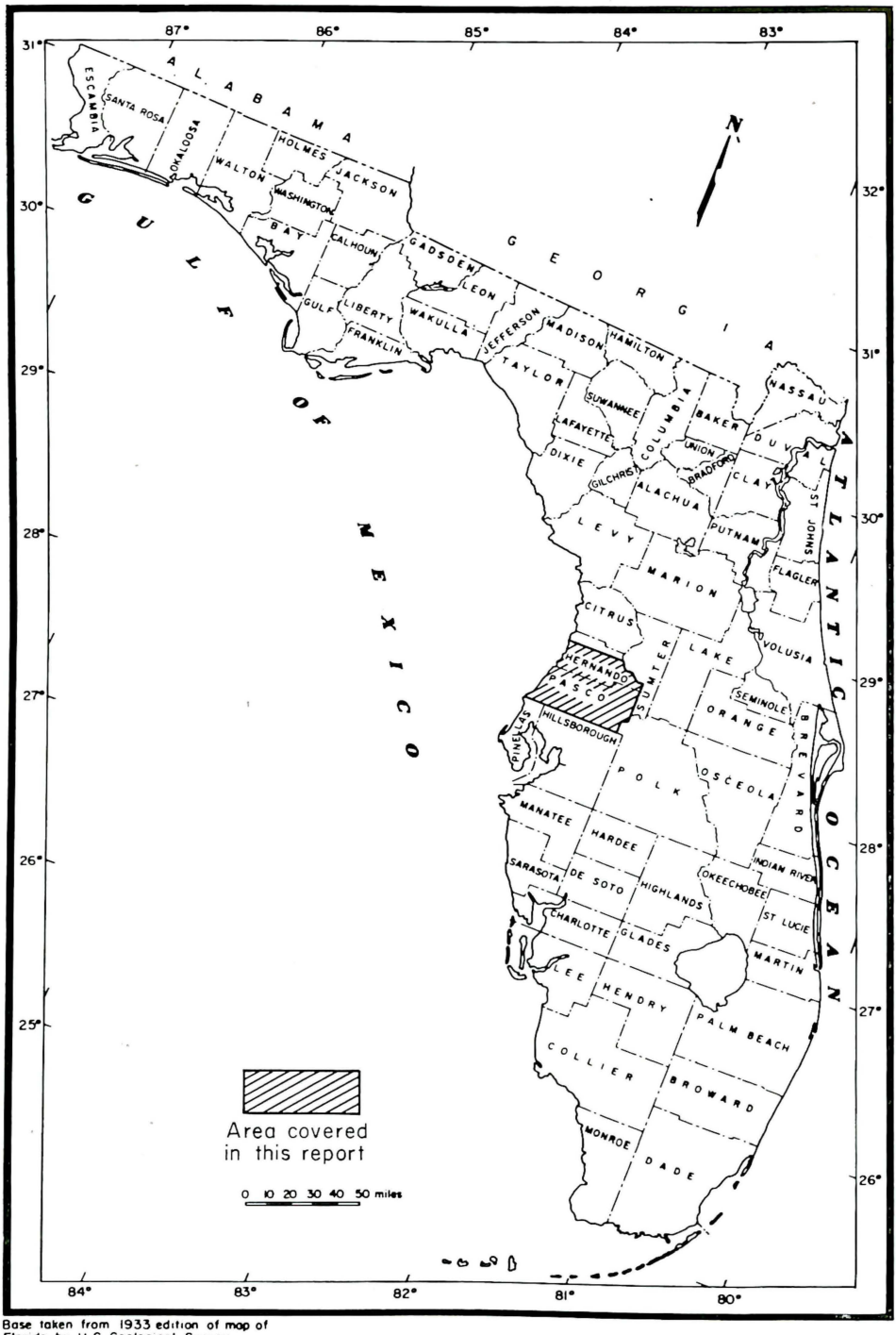


Figure 3. Location of study area.

CLIMATE

The average annual rainfall on the area is about 55 inches. The low, flat, coastal area receives about 52 inches and the ridge section receives more than 56 inches. About 37 inches of rain falls during the 5-month period—May through September. July, the wettest month, averages more than 9 inches; November, the driest month, averages about 2 inches.

Unusually heavy rainfall occurred in 1959 and 1960. An excess of about 44 inches over normal rainfall for that period was measured by the U. S. Weather Bureau at Chinsegut Hill near Brooksville. Heavy rains, totalling 12.73 inches, fell in August 1959 and flooded large areas. In March 1960, 17.70 inches of rain fell on the already waterlogged area, submerging some roads to a depth of more than 10 feet and flooding areas that are normally dry even in very wet periods.

The average annual temperature is about 72°F. July, the warmest month, has an average temperature of about 81°F, and January, the coldest month, has an average temperature of about 62°F. From 341 to 350 days per year are free of killing frost at the Chinsegut Hill weather station. The topography and the proximity to a large body of water largely determine the minimum temperature and the number of frost-free days. Low areas not near lakes or the Gulf of Mexico may expect an average of 341 frost-free days per year, and a minimum temperature of 17°F twice in 25 years or a temperature of 25°F or lower 23 times in 25 years. Higher areas may expect an average of 350 frost-free days per year, and a minimum of 22°F twice in 25 years or a temperature of 25°F or lower 8 times in 25 years.

TOPOGRAPHY

The area lies in the Coastal Plain Province of Fenneman (1938), and in the Tertiary Highlands, the River Valley Lowlands, and the Terraced Coastal Lowlands of Vernon (1951). The Tertiary Highlands form the northwest trending Brooksville Ridge, the dominant topographic feature in the central part of the area. Considerable local relief is developed along the ridge as a result of the numerous sinkholes. Clay Hill, 6 miles northwest of Dade City, reaches an altitude of 301 feet; whereas, Lake Dowling, a sinkhole lake 0.7 mile north of Clay Hill, reaches an altitude of only 75 feet. East of the ridge the Withlacoochee River lowland reaches an altitude of about 80 feet. The Withlacoochee River lowland is

a series of interconnected swamps separated by ridges of low relief. The west flank of the Brooksville Ridge drops rather steeply to the Wicomico terrace (Vernon, 1951) at an altitude of about 100 feet. The broad plain of the Wicomico terrace is terminated on the west by an escarpment above the Pamlico terrace (Vernon, 1951). The Pamlico terrace, at an altitude of about 25 feet, extends beneath present sea level to a submerged shoreline. The submerged part of the terrace is pocked by sinkholes and springs which retain many of the features of those on the emergent part of the terrace. A longshore current flowing northward in the Gulf of Mexico has filled many of the sinks and sluggish springs with sand, but they remain visible from the air as subrounded areas of different color or texture on the gulf bottom.

DRAINAGE

A large percentage of the water that falls on the surface returns to the atmosphere by evaporation and by transpiration of plants. The remainder drains from the area through the limestone that underlies the surface and through a few surface streams. Streams form only where the water level in the limestone is near the land surface or where material of low permeability overlies the limestone.

The larger streams are the Anclote, Pithlachascotee, Withlacoochee, and Hillsborough rivers (fig. 1). Tributaries of the Hillsborough River drain most of the southeast and south-central parts of the area. The Withlacoochee River and its tributaries drain the area east of the ridge. The Pithlachascotee and Anclote rivers drain the area that lies generally west of U. S. Highway 41 and south of State Highway 52.

Several small streams in the area terminate in sinkhole drains. The largest of these is Bear Creek which heads near Bee Tree Pond and ends, at normal flow, in Bear Sink about 7 miles to the west. At high stage Bear Creek flows past Bear Sink, over a low divide, under a bridge at State Highway 52, and into another sink about 4,300 feet northwest of Bear Sink. When the flow of Bear Creek exceeds the drainage capacity of the two sinkholes it flows westward through a poorly developed channel, across U. S. Highway 19 to the Gulf of Mexico.

During wet periods Pecks Sink, about 2.5 miles southwest of Brooksville, drains approximately 10 square miles west of Brooksville through a well developed stream channel. The water level of the sinkhole is normally about 30 feet below land surface. During

the flood of 1959-60 the water level was about 5 feet above the land surface.

Another sinkhole drain was noted about 4.5 miles east of U. S. Highway 41 and half a mile north of the Pasco-Hernando County line where a stream about 7 miles long drains several square miles northeast of the sink. "Rocky Sink," 3.5 miles east of Port Richey, drains several lakes in the surrounding area. Further investigation will probably reveal other sinkhole drains. The rapid disposal of surface water through sinkhole drains has precluded general development of well defined streams. Surface drainage is poorly developed and closed depressions that drain internally are common in the drainage areas of the streams.

Subsurface drainage is adequate during periods of normal rainfall, but during very wet periods, such as August 1959 to July 1960, the closed depressions become flooded and store large volumes of water. Most of this water is released to the ground-water body, raising the water level in the artesian aquifer. If the water level is raised sufficiently, as in 1959 and 1960, some low-lying sinkholes that normally drain off surface waters flow as springs. This results in damage to roads, forests, and farm properties.

Most of the water that enters the ground-water system emerges as springflow at or near the coast. Springflow generally increases during wet periods but the increase in springflow seemingly is not proportional to the increase in rainfall. The ratio of the annual flow of Weekiwachee Springs to the annual rainfall at Brooksville ranges from 1.54 to 5.20 cfs (cubic feet per second) per inch of rainfall. The average annual ratio, based on 30 years of record, is 2.75 cfs per inch. The range in ratio of annual rainfall to annual springflow may be in part due to lag effects and in part to other factors such as rainfall intensity not presently evaluated. The general relation of monthly rainfall to the flow of Weekiwatchee Springs as measured periodically is illustrated in figure 4.

GEOLOGY

Pasco and Hernando counties are underlain by several thousand feet of sedimentary rocks, principally limestones. The rocks considered in this report range in age from Eocene to Recent. The geologic units and their hydrologic properties are summarized in table 1. Figure 5, geologic sections in Pasco and Hernando counties, shows the relative positions and thicknesses of the formations studied. Formational contacts are probably unconformable except the contact between the Williston and the Inglis Formations which is conformable.

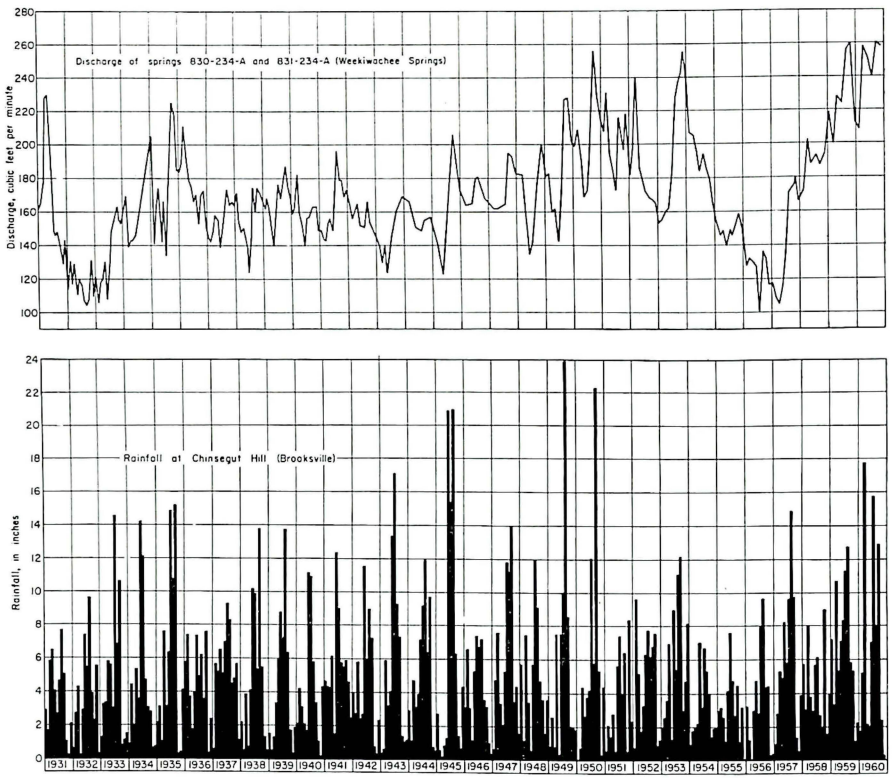


Figure 4. Discharge of springs 830-234-A and 831-234-A (Weekiwachee Springs) and monthly rainfall at Brooksville.

GEOLOGIC FORMATIONS AND THEIR WATER-BEARING CHARACTERISTICS

EOCENE SERIES

The oldest formation to be considered in this report is the Lake City Limestone of Eocene age. The Lake City Limestone is a soft to hard, fossiliferous, brown limestone with dark brown beds of dolomitic limestone at irregular intervals. The thickness of the formation beneath Pasco and Hernando counties is about 500 feet. The formation is, in part, highly permeable and will yield large quantities of water to wells. The Lake City Limestone is not commonly used as an aquifer because of its depth.

The Avon Park Limestone of Eocene age overlies the Lake City Limestone. Lithologically it is very similar to the Lake City Limestone. The thickness of the Avon Park Limestone in the area

TABLE 1. Geologic Formations and their Water-Bearing Characteristics[1]

Age		Formation	Lithology	Quality of water	Use
Recent and Pleistocene		Undifferentiated sand and clay	Interbedded sand and clay up to 250 feet thick.	Objectionable concentration of iron and high organic color are common.	Only a few small domestic wells.
Miocene		Tampa Limestone	White to gray, sandy, fossiliferous limestone.	Generally satisfactory for domestic supplies without treatment.	Most domestic and many irrigations wells produce water from the basal Suwannee Limestone. Some wells in southwestern Pasco County produce water from the Tampa Limestone if the Suwannee Limestone contains salty water.
Oligocene		Suwannee Limestone	Fossiliferous, yellow to white, fine-grained limestone. Hard at bottom.		
Eocene	Ocala Group	Crystal River Formation	Soft, chalky, white to tan coquinoid limestone.	Not well known but probably similar to water from Suwannee Limestone in most of area.	Only a few wells produce water from local cavities.
		Williston Formation			
		Inglis Formation	Hard, fossiliferous, brown to gray dolomitic limestone.	Contains more sulfate than water from overlying formations but probably does not exceed public health limits in most of area.	Most wells that produce more than 1,000 gpm penetrate the Inglis Formation and/or part of the hard brown dolomitic section of the Avon Park and Lake City Limestones.
		Avon Park Limestone	Soft to hard, fossiliferous, brown limestone with dark brown beds of dolomitic limestone. Some sapropel.		
		Lake City Limestone			

[1]The classification and nomenclature of rock units in this report conform to the usage of the Florida Geological Survey and also, except for the Ocala Group and its subdivisions, with those of the U. S. Geological Survey.

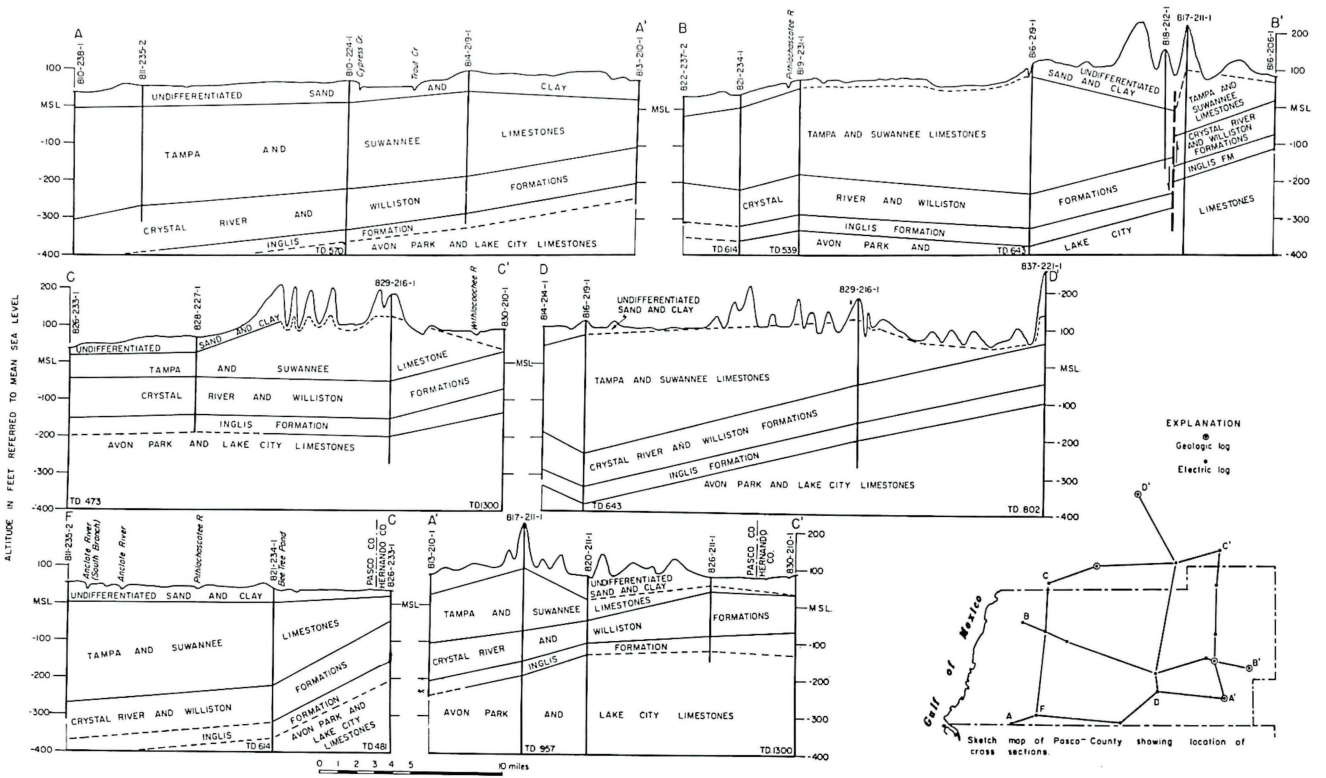


Figure 5. Geologic sections in Pasco and Hernando counties.

ranges from about 50 to about 500 feet. The dolomitic zone about 100 feet below the top of the formation is highly permeable and yields large quantities of water to wells.

The Ocala Group of late Eocene age is composed of the Inglis, Williston, and Crystal River Formations. The Inglis Formation, a brown to gray, fossiliferous, hard dolomitic limestone, overlies the Avon Park Limestone and in the area attains a thickness of 40 to 60 feet. The formation is highly permeable over much of the area and yields large quantities of water to wells. Wells that produce more than 1,000 gpm (gallons per minute) generally penetrate the Inglis Formation.

The Inglis Formation is overlain by the Williston Formation which is in turn overlain by the Crystal River Formation. Due to their lithologic and hydrologic similarity the Williston and Crystal River Formations were not differentiated in this study. Lithologically the formations are generally white to tan, soft, chalky, coquinoid limestones, composed of the remains of foraminifers and other fossils loosely cemented in a calcareous matrix. The formations attain a thickness of about 100-150 feet. The Williston and Crystal River Formations are not an important source of water in the area. Only a few wells produce water from cavities in these formations.

OLIGOCENE SERIES

The Suwannee Limestone of Oligocene age overlies the Crystal River Formation. The formation is generally a white to yellow, fine-grained, fossiliferous limestone. The lower part of the formation is generally harder, denser, and less fossiliferous than the upper part. The Suwannee Limestone is a very permeable, productive aquifer. Most domestic and many irrigation wells produce from the lower part of the Suwannee Limestone.

MIOCENE SERIES

The Tampa Limestone of Miocene age overlies the Suwannee Limestone. The Tampa Limestone is a white to gray, sandy, fossiliferous limestone. The thickness of the formation in the area is erratic because both the top and bottom surfaces are irregular erosional surfaces. The Tampa Limestone is not a major source of water in Pasco and Hernando counties; however, some wells in southwestern Pasco County produce water from the formation when the underlying Suwannee Limestone contains salty water.

PLEISTOCENE AND RECENT SERIES

Undifferentiated deposits of sand and clay of Pleistocene and Recent age overlie the Tampa Limestone. These sediments consist of interbedded sands and clays which reach a maximum thickness of 250 feet. A few small domestic wells produce water from the sand. The water generally contains an objectionable concentration of iron and is likely to be highly colored.

HYDROLOGY

The principal artesian aquifer in the area is the Floridan aquifer which underlies all of Florida and parts of the adjacent states. The Floridan aquifer in the area of this report is comprised of all or a part of the Lake City Limestone, the Avon Park Limestone, the Inglis, Williston, and Crystal River Formations, and the Suwannee and Tampa Limestones.

Horizontal layering and vertical jointing of the limestones result in varying horizontal and vertical permeabilities. Vertical permeability depends primarily on the size and distribution of vertical joints which vary in size from small cracks to solution-enlarged pipes more than 100 feet in diameter. Hard zones in the limestones are capable of maintaining small or large openings, but small openings in the soft coquinoid and pasty limestones generally are filled by the surrounding material. Larger openings which locally penetrate the softer zones result from collapse or solution of the limestones. Thus hard layers are favorable for the vertical movement of water and the softer layers tend to restrict vertical movement of water. The irregular distribution of vertical permeability in the discharge areas results in well-defined springs instead of large areas of seepage. In recharge areas drain sinks and deep sand-filled solution pipes represent the areas of high vertical permeability.

Horizontal permeability is restricted principally to hard zones in the limestones. Differences in permeability are reflected in the amount of water that can be produced from a given zone and in the relative water levels at various depths in areas of recharge or discharge of large volumes of water. Hard, competent, and highly permeable zones are found at random in the lithologically variable Tampa Limestone, in the basal 40 or 50 feet of the Suwannee Limestone, in the Inglis Formation, 100 feet or more below the top of the Avon Park Limestone, and in the Lake City Limestone to an undetermined depth. The water-bearing zones

in the Inglis Formation and the Avon Park and Lake City Limestones are referred to by well drillers as the "hard brown" limestone. Locally, other parts of the formations may yield substantial quantities of water but more than 90 percent of the industrial, irrigation, and public supply wells in the area produce water from hard zones.

PIEZOMETRIC SURFACE

The piezometric surface of an aquifer is the imaginary surface to which water will rise in tightly cased wells that penetrate the artesian aquifer. The shape of the piezometric surface of the Floridan aquifer in Pasco County and adjacent areas in October 1960 is shown in figure 1.

Piezometric highs occur near Dixie and St. Leo. The highest point, near Dixie, was about 101 feet above sea level and the high near St. Leo was about 95 feet above sea level in October 1960. These highs were mapped as a single high by Stringfield (1936) and have long been informally referred to as the "Pasco High." A broad nose on the southwest flank of the high, near Lutz, probably becomes a third high point during periods of low water levels.

Ground water moves down the hydraulic gradient, hence perpendicular to the contour lines shown in figure 1. Thus, water moves away from the local piezometric highs in all directions toward the rivers and the Gulf of Mexico. Ultimately all of the ground water, except that lost en route by evaporation and transpiration, flows to the Gulf of Mexico.

Changing rates of replenishment and discharge cause the piezometric surface to rise and fall and to change shape. The amount of rise and fall is indicated by the fluctuation of water levels in wells 815-226-1 and 816-211-1 (fig. 6). Highest water levels occur during periods of high rainfall and low water levels occur during periods of drought. The piezometric surface shown in figure 1 reflects the extremely high rate of precipitation during 1959 and 1960. During dry periods water levels near the piezometric highs probably decline about 20 feet. Water level fluctuations generally decrease toward the coast and the Withlacoochee and Hillsborough rivers since there are discharge areas and areas of flatter hydraulic gradients.

Recharge to the aquifer by rainfall is by direct movement of surface water into drain sinks, by downward percolation through the overlying sand and clay, and by lateral movement along the hydraulic gradient. Where the sands and clays overlying the

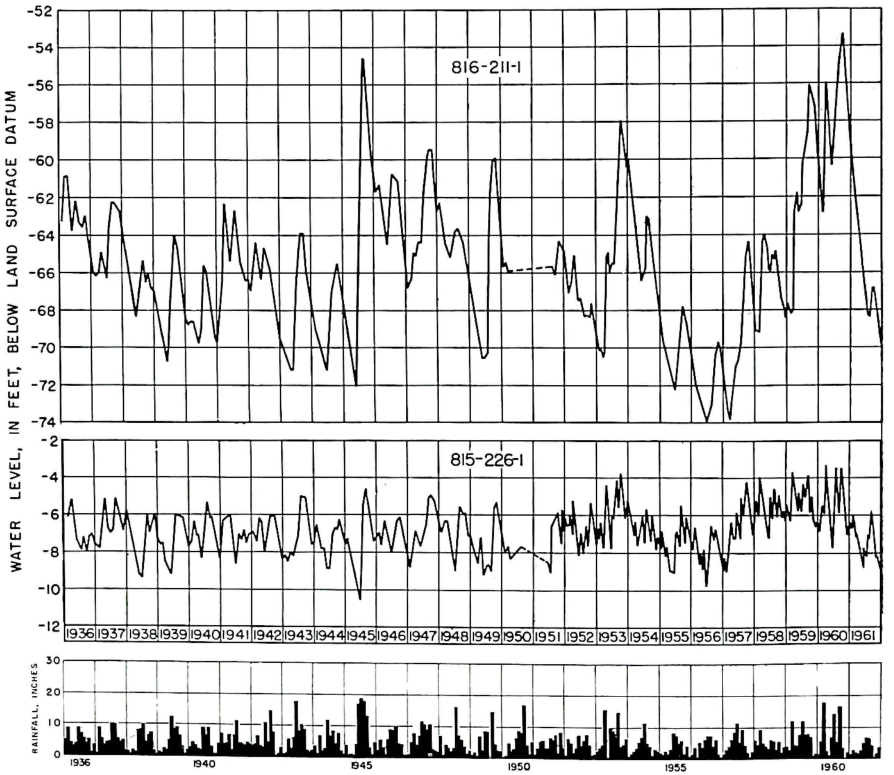


Figure 6. Fluctuation of water levels in wells 815-226-1 and 816-211-1, and monthly rainfall at St. Leo.

limestones are thick and continuous, drain sinks are probably the most important method of disposal of surface water and, consequently, of recharge to the aquifer. Where the sands and clays are thin, or not continuous, the rainfall enters the aquifer directly. Either avenue of recharge of the aquifer allows rapid movement of ground water and accounts for the short term water-level fluctuations of large magnitude.

SALT-WATER OCCURRENCE

Salt water occurs in the Floridan aquifer along the coastal area. The salt water may be the result of recent encroachment of sea water or it may be sea water trapped in the sediments during the Pleistocene Epoch when sea level was higher than at present. In the aquifer along the coast the salt-water fresh-water contact grades through a zone of diffusion in which the water gradually increases in salinity with depth and toward the coast. When the

natural conditions are disturbed and piezometric pressures are reduced the salt water moves landward. In addition to the landward movement induced by lowered pressures, natural vertical and horizontal cavities, abandoned wells, and salt-water canals are avenues for salt-water encroachment.

Intruded salt water may not be vertically continuous in the aquifer. Vertical layering or "zonation" of the aquifer allows fresh water to occur between layers of relatively salty water as demonstrated in well 822-241-1 at Hudson. This well was initially drilled to a depth of 84 feet and cased only a few feet. Water from the well tasted salty but not as salty as sea water. The casing was then driven to about 84 feet where the water tasted fresh (zone used for domestic supply in nearby well). The well was then deepened to 164 feet and the casing driven to 126 feet. The water from this zone contains 14,100 ppm (parts per million) chloride.

Zones of potable ground water may be found along the coast under conditions similar to those in well 822-241-1. Such hydrologic circumstances make continued yield of large amounts of potable water from wells in these zones highly speculative.

The most reliable indicator of salt-water intrusion is the chloride content of water. Normally the chloride content of fresh water in this area is less than 20 ppm. The chloride content of water in west-central Florida is generally related to specific conductance as

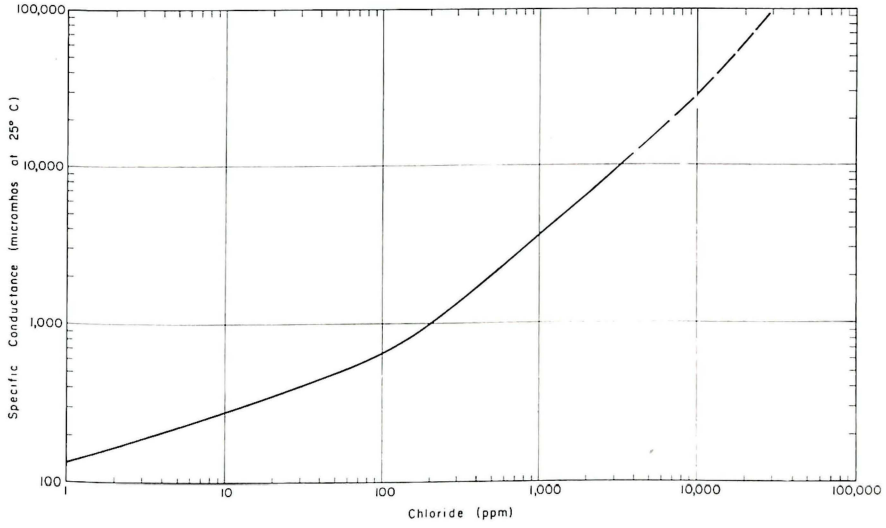


Figure 7. General relation between specific conductance and chloride content for natural waters in west-central Florida.

shown in figure 7. The specific conductance of near-coastal ground waters in the area is given in table 2. The table includes the results of surface water because surface streams commonly result from the discharge of ground water in the area. High concentrations of sulfate may rarely lead to inference of too high a chloride content from the specific conductance of a water. Therefore, the specific conductances probably indicate only the maximum chloride concentration in the uncontrolled measurements reported in table 2.

The chemical quality of ground and surface waters is given in table 3. All of the water samples analyzed except those from well 822-241-1 and springs 817-243-A and 823-241-A meet the drinking water standards of the U. S. Public Health Service.

TABLE 2. Specific Conductance of Waters Near the Gulf Coast of Pasco and Southern Hernando Counties, Florida

Specific Conductance (micromhos at 25°C)	Date	Description of Sampling Point
200	11-23-60	A creek at a culvert on U. S. 19, 1.2 miles north of the Pithlachascotee River.
1,200	11-23-60	A small creek at a culvert under a graded road 1,500 feet west of U. S. 19 and 700 feet east of spring 817-243-A.
2,050	11-23-60	Spring 817-242-A.
320	12- 1-60	A creek at a culvert under a paved road 1,200 feet west of U. S. 19 and 1.65 miles south of State Road 52.
6,300	11-28-60	Spring 823-241-A.
6,700	12- 1-60	Do.
320	12- 1-60	A small spring in the side of a canal 1,800 feet west of U. S. 19, 2.4 miles south of Aripeaka.
550	12-16-60	A cut into rock 400 feet south of State Road 50, 3 miles west of U. S. 19.
2,600	12-16-60	Spring 832-237-A.
4,100	12-16-60	A drain culvert under old State Road 50, 3.9 miles west of U. S. 19 and 200 feet south of State Road 50.
2,300	12-16-60	Spring 832-237-B.
8,500	12-16-60	A culvert under State Road 50, 0.1 mile west of Spring 832-237-B.
320	12-16-60	Weekiwachee River at State Road 595 bridge.
1,600	12-16-60	Jenkins Creek, north branch under bridge in State Road 595 about 0.75 mile south of the Weekiwachee River. (Flowing rapidly toward the Gulf of Mexico.)
1,400	12-16-60	Jenkins Creek, south branch under bridge in State Road 595 about 0.95 mile south of the Weekiwachee River. (Flowing sluggishly toward the Gulf of Mexico.)
4,000	12-16-60	A creek under bridge in State Road 595, 1.8 miles south of the Weekiwachee River. (No observable flow.)
11,000	12-16-60	A creek under bridge in State Road 595, 2.2 miles south of the Weekiwachee River. (Flowing rapidly toward the Gulf of Mexico.)
8,500	12-16-60	A creek under bridge in State Road 595, 2.4 miles south of the Weekiwachee River. (Flowing slowly toward the Gulf of Mexico.)

TABLE 3. Chemical Analyses of Waters from Wells, Springs, and Streams of Pasco and Southern Hernando Counties, Florida

(Results in parts per million except color, pH, and specific conductance. Analyses by U.S. Geological Survey.)
Water-bearing formation: A, Avon Park Limestone; I, Inglis Formation; S, Suwannee Limestone; T, Tampa Limestone.

Source of Sample	Water-bearing formation	Date of collection	Temperature (°F)	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)	Hardness as $CaCO_3$ Total	Hardness as $CaCO_3$ Non-carbonate	Specific conductance (micromhos at 25°C)	pH	Color
Well number:																			
816-240-1	S	7-12-60	76	----	------	------	----	----	----	88	--------	7.0	----	----	110	38	284	7.0	------
816-242-1	S	7-12-60	76	----	------	----	----	----	----	180	--------	31	----	----	156	8	363	7.1	----
818-236-2	S	7-11-60	----	----	------	------	----	----	----	136	--------	2.0	----	----	110	0	220	7.3	------
819-220-1	S, T,	7-21-60	----	------	------	------	----	----	----	198	--------	9.0	----	----	164	2	322	7.3	----
822-241-1	S	7-12-60	76	----	------	------	----	----	----	160	--------	14,100	----	----	4,700	4,569	36,800	7.2	----
826-238-1	S	7-13-60		----	------	------	----	----	----	124	--------	4.0	----	----	107	6	205	7.3	------
835-226-1	I	8-10-60	73	----	------	------	----	----	----	190	--------	13	----	----	172	16	343	7.1	----
835-233-1	I	9- 8-60			------	------	----			66		2.0	----		54	0	113	7.1	----
837-221-1	A	1-25-34	74	11	------	72	24	3.7	0.6	142	159	5.4	----	0.0	276	------	------	- -	----
Spring number:																			
812-239-A		5- 3-56	75	------	0.01	------	------	----	----	204	--------	8.5	----	----	164	0	318	7.7	------
817-243-A		11-23-60		----	----	------	------	----	----	134	--------	7.900	----	----	2,680	2,560	21,800	7.1	------
823-241-A		11-28-60	74	----	----	----	------	----	----	172	--------	2,100	----	----	885	744	7,200	7.2	------
827-238-A		7-13-60	75	----	----	----	----	----	----	104	--------	5.0	----	----	90	5	176	7.1	------
830-234-A		6-14-60	75	----	- -	----	------	----	----	150	--------	4.0	----	----	128	5	324	7.5	------
831-234-A		5- 2-56	----	----	.01	----	------	----	----	166	--------	5.0	----	----	148	12	283	7.9	------
Streams:																			
Pithlachascotee River near New Port Richey		5- 3-56	----	4.8	.01	58	2.8	4.2	.4	175	10	7.5	0.3	.0	156	12	312	7.9	10
Withlacoochee River near Dade City		8-18-58	----	2.9	a.48	8.0	1.2	4.7	.0	23	6.4	6.5	.3	.5	25	6	66.9	7.1	150
near Trilby		8-25-58	----	4.0	a.28	16	1.7	4.7	.0	54	6.8	7.0	.2	.2	96	4	112	6.7	150
at Rerdell		8-25-58	----	3.2	a.32	14	1.7	3.6	.1	44	5.6	6.5	.2	.2	42	6	96.3	6.7	150
at Croom		5- 2-56	----	4.3	.01	54	3.8	6.4	.4	178	6.5	9.0	.2	.1	150	.4	310	8.0	5

a Total Iron

TABLE 4.—Records of Wells in Pasco and Southern Hernando Counties, Florida

Altitude: e, estimated from topographic map or determined by hand level.
Water levels: Measured water levels are given to the nearest 0.1 foot; reported water levels are given to the nearest foot.
Use: D, domestic or commercial; I, industrial; Ir, irrigation; O, observation; P, public supply; R, return or drainage; S, stock watering; T, test hole; U, unused.
Remarks: Numbers preceded by W- or by Wgi- are Florida Geological Survey well numbers.

Well number	¼ Section	¼ Section	Section	Township, south	Range, east	Owner	Year drilled	Depth of well below land surface (feet)	Casing		Altitude of land surface (feet)	Water level		Use of water	Remarks
									Diameter (inches)	Depth (feet)		Above (+) or below land surface (feet)	Date of measurement		
810-207-1	SW	SW	33	26	22	Jim Walter	1960	55	2	47	94	7.4	6-13-60	U	
							------	-----	---	-----	-----	3.9	10-21-60	----	
810-208-1	SE	SW	32	26	22	G. T. Rowland	1959	517	3	507	95	15	1-10-60	D, S	Four wells within 100 feet of this well were abandoned because of quicksand.
810-216-1	NE	NE	2	27	20	I. A. Krusen	1954	540	12	56	67	8	11-15-54	----	W-3404. Drawdown 5 feet when pumping 1,000 gpm at 510 feet depth.
							------	-----	---	-----	-----	4.7	6-17-60	Ir	
							------	-----	---	-----	-----	3.3	9-26-60	----	
							------	-----	---	-----	-----	2.5	10-21-60	----	
810-224-1	SE	SE	33	26	19	E. N. Crowder	-----	570	10	145	75	21.2	7-11-60	Ir	Drawdown 33 feet while pumping 650 gpm.
							------	---	---	----	-----	17.4	10-21-60	----	
810-235-1	SW	SW	34	26	17	Odessa Groves Inc.	1954	255	8	-----	51e	9.6	9-17-57	Ir	
							------	-----	---	-----	-----	9.1	10-22-60	----	
810-238-1	SW	SW	31	26	17	Boyd and Mitchell	1954	603	10	43	37	----	----------	T	W-4645
811-211-1	NE	NW	27	26	21	Fla. State Rd. Dept.	1955	176	6	56	70	11	4-11-55	P	W-3512.
811-228-1	SW	NE	26	26	18	Frank Wilson	1944	65	2	-----	70	3.6	9-25-57	D	
811-229-1	SE	SE	27	26	18	G. L. Henley	1956	173	6	75	69e	5.7	9-25-57	Ir	
							------	-----	---	-----	-----	6.4	10-22-60	----	
811-229-2	SE	SE	27	26	18	..... do	1957	65	2	40	70	5.0	9-25-57	D	
811-232-1	NW	SE	30	26	18	R. C. Bigby	1942	43	3	-----	53e	1.7	9-18-57	D, S	
							-----	-----	---	-----	-----	2.4	10-22-60	-----	

811-234-1	NW	SW	26	26	17	R. C. Bigby	1942	58	2	-----	53	7.4	9-18-57	D, S	
811-235-1	SW	NW	27	26	17	J. B. Starkey	1937	130	6	-----	58	16.6	9-19-57	D, S	
811-235-2	NW	SE	27	26	17	C. A. Rudisill	1952	365	6	63	52	8.3	9-18-57	Ir	
811-236-1	NE	SE	28	26	17	W. H. Mitchell	1956	176	3	-----	47e	3.9	9-19-57	Ir	
							-----	-----	---	-----	-----	5.0	10-22-60	----	
811-244-1	NE	SE	30	26	16	A. H. Snell	1953	160	12	55	15e	4.4	9-20-57	Ir	
							-----	-----	---	-----	-----	5.2	10-22-60	----	
812-214-1	NW	NE	19	26	21	J. M. McLeod	1959	133	3	125	-----	3.3	10-25-60	U	
812-216-1	SW	SW	24	26	20	T. J. Griffin	-----	25	4	-----	75e	8.7	10-25-60	U	
812-227-1	SW	NW	19	26	19	D. D. Covington	1956	660	12	53	75	18	10-29-56	Ir	
							-----	-----	---	-----	-----	7.7	10-18-60	----	
812-243-1	NE	NE	20	26	16	Mr. Harvey	-----	165	12	-----	49e	34.2	9-20-57	Ir	
							-----	-----	---	-----	----	35.2	10-22-60	----	
813-201-1	SW	NE	17	26	23	U.S. Geological Survey	1959	252	3	40	105e	2.2	8- 4-59	-----	W-5352. Water temperature 74°F, 8-7-59.
							-----	-----	---	-----	-----	2.5	10-18-60	-----	
813-210-1	NW	NW	13	26	21	City of Zephyrhills	1942	325	8	81	79	12	8-28-42	P	W-658. Standby well. Drawdown 12 feet after pumping 250 gpm for 8 hours.
813-210-2	SW	SW	9	26	21	---------- do ----------	1942	330	8	78	81	13	9-11-42	P	W-662. Standby well. Drawdown 2.3 feet when pumped at 50 gpm, 4.3 at 100 gpm, and 10.3 at 200 gpm.
813-213-1	SW	SE	8	26	21	Zelma Geiger	1946	40	2	37	91e	13.6	10-25-60	U	
813-222-1	SE	SE	11	26	19	Immer and Co.	-----	1,000	6	-----	75	9.4	7-22-60	Ir, S	
							-----	-----	---	-----	----	8.9	10-21-60	----	
814-219-1	NW	SW	9	26	20	Louis Schroeder	-----	414	6	76	101e	18.3	10-25-60	Ir	
815-226-1	SW	NE	31	25	19	C. C. Cone	-----	49	6	43	80	5.4	10-19-60	O	Pasco County well 13 in U.S. Geol. Survey Water-Supply Paper 773-C. Well also reported in annual water-level measurements by the U.S. Geol. Survey. Water temperature 76°F, 7-30-59.
816-206-1	SE	NW	28	25	22	U.S. Geological Survey	1959	200	3	41	84	3.4	7-30-59	O	
							-----	-----	---	----	----	2.8	10-18-60	----	

TABLE 4. (Continued)

Well number	¼ Section	¼ Section	Section	Township, south	Range, east	Owner	Year drilled	Depth of well below land surface (feet)	Casing		Altitude of land surface (feet)	Water level		Use of water	Remarks
									Diameter (inches)	Depth (feet)		Above (+) or below land surface (feet)	Date of measurement		
816-211-1	NE	NE	34	25	21	A. Messick	1931	1,008	8	20	136	56.7	10-18-60	O	Pasco County well 16 in U.S. Geol. Survey Water-Supply Paper 773-C. Well also reported in annual water-level measurements by U.S. Geol. Survey. Measured depth 145 feet.
816-219-1	SE	NE	32	25	20	R. A. Wilson	.....	643	8/6	160	121	33.9	7-21-60	.....	Interval 73 to 90 not cased.
							.....	.....	.....	.....	.....	31.7	10-19-60	U	
816-240-1	SE	NW	35	25	16	P. Massey	1944	276	12/10	140	46	36	-44	.....	Cavity 224 to 276 feet. Pumps muddy water after several minutes pumping at 800 gpm, then clear water. Water temperature 75.5°F, 7-12-60.
							.....	.....	.....	.....	.....	21.7	7-12-60	Ir	
							.....	.....	.....	.....	.....	17.4	10-18-60	.....	
816-242-1	SE	NW	28	25	16	City of Port Richey	1955	200	10	104	22	15	6-23-55	.....	
							.....	.....	.....	.....	.....	13.7	7-12-60	P	W-3570.
							.....	.....	.....	.....	.....	10.6	10-18-60	.....	
817-211-1	SE	NE	22	25	21	I. A. Krusen	1950	957	18	146	225	163	5- 5-50	.....	
							.....	.....	.....	.....	.....	167.2	6-25-60	Ir	W-2160; see remarks for 817-211-2.
							.....	.....	.....	.....	.....	163.4	10-19-60	.....	
817-211-2	SW	SW	23	25	21	Barber Sand Co.	1959	255	6	90	95e	.....	.....	I	When 817-211-2 is pumped at 300 gpm, water level in 817-211-1 is drawn down 5 feet in 5 minutes.
817-212-1	NW	NE	21	25	21	H. B. Bozeman	1957	114	4	42	175	74.6	10-26-60	D, Ir	
817-215-1	SE	SW	24	25	20	Cicero Kirkland	.....	83	2	.....	119	24.0e	10-27-60	U	
818-209-1	SE	NW	13	25	21	Ray Townsend	1948	89	2	.....	147	67.7	10-27-59	U	
							.....	.....	.....	.....	.....	65.6	10-18-60		

818-212-1	NW	NE	21	25	21	H. B. Bozeman	1956	317	4	160	156	71.4e	10-26-60	U	
818-236-1	SW	SE	16	25	17	William Pomella	1960	138	2	----	46	8.0	7-11-60	U	
							-----	-----	----	-----	---	6.0	10-18-60		
818-236-2	SW	SE	16	25	17	..... do	1960	84	2	----	-----	----	----------	D	
818-240-1	NW	SE	14	25	16	Jasmine Lakes Service, Inc.	1960	---	---	---	----	19	5-12-60	----	W-5339. Drawdown 49 feet after pumping 250 gpm for 11½ hours at depth 295, 46 feet after pumping 290 gpm for 8 hours at depth 345.
							-----	345	12	199	37	21.2	7-14-60	P	
818-240-2	NW	SE	14	25	16	..... do	1960	517	5/4	195	36e	17.3	9- 2-60	T	Drawdown 20 feet after pumping 100 gpm for 1 hour.
							-----	-----	----	----	-----	17.3	10-18-60	----	
819-211-1	NW	SW	11	25	21	C. W. Hall	1959	116	3	75	-----	62	3- -59	D	
819-211-2	NE	SE	10	25	21	Minute-Maid Groves Corp.	-----	-----	8?	----	149	72.0	12- 4-59	Ir	
							-----	-----	---	-----	----	66.7	10-18-60	----	
819-214-1	SE	NW	7	25	21	L. C. Hawes	-----	535	12	----	223e	133.1	10-26-60	Ir	
819-220-1	NW	SW	8	25	20	R. E. McKendree	1955	128	4	48	112	29.6	7-21-60	D	
							-----	-----	----	----	----	27.2	10-19-60	----	
819-231-1	SW	SE	5	25	18	H. Kent	1957	-----	---	---	---	7	12-13-57	----	
							-----	639	8	47	77	11.8	10-18-60	U	
820-211-1	NE	NE	3	25	21	Evans Properties, Inc.	1957	475	12	297	79e	13	7-27-57	I	W-4468. Reported yield, 2,000 gpm.
							-----	-----	----	---	----	4.2	10-15-59	----	
							-----	-----	----	----	----	2.2	10-18-60	----	
820-216-1	NE	SE	2	25	20	Town of San Antonio	-----	---	---	---	---	79.2	4-23-35	---	
							1928	386	12	90	163e	75.5	7-21-60	P	Pasco County well 5 in W.S.P. 773-C.
							-----	-----	----	---	----	70.2	10-19-60	----	
820-223-1	NE	NW	3	25	19	Clyde McKendree	1954	---	---	---	---	8	4- 5-56	----	
							-----	103	4	42	80	3.0	10- 6-60	U	
							-----	-----	----	----	----	3.0	10-19-60	----	
820-241-1	SE	SW	34	24	16	Del Mar Corp.	1959	80	8	44	17	14.4e	7-13-60	P	W-5271. Drawdown 0.5 foot after pumping 300 gpm for 24 hours.
							-----	-----	----	-----	-----	12.8	10-19-60	----	
821-207-1	SE	NE	32	24	22	Cummer Cypress Co.	-----	37	1½	-----	82e	3.0	10-28-59	U	
							-----	-----	----	-----	----	3.0	10-18-60	----	
821-208-1	NE	NE	31	24	22	MacBrian	-----	280	4	-----	92e	20.7	10-28-59	D	
							-----	-----		----	-----	19.4	10-18-60	----	

TABLE 4. (Continued)

Well number	¼ Section	¼ Section	Section	Township, south	Range, east	Owner	Year drilled	Depth of well below land surface (feet)	Casing		Altitude of land surface (feet)	Water level		Use of water	Remarks
									Diameter (inches)	Depth (feet)		Above (+) or below land surface (feet)	Date of measurement		
821-234-1	SE	NE	35	24	17	J. L. Cone	1956					11	-56		
								614	12	185	38	8.8	6-25-60		
												+ 0.6	10-18-60	D	Water contains objectionable concentration of iron.
821-241-1	NE	SW	27	27	16	H. A. Rouland	1948	27	4		10	7.7	7-13-60	U	Well contaminated by kerosene.
												7.0	10-18-60		
821-241-2	NE	SW	27	27	16	do	1952	84	4	36	11	8	-52	D	
822-210-1	NE	NE	26	24	21	Frank Collura		78	6	21	76e	+ 0.9	10-27-59	Ir	Well entered 39-foot cavity at 40 feet depth, under 2 feet of limestone. Water temperature 74°F.
												+ 2.7	10-18-60		
							1952					79	5-28-52		
822-212-1	SE	NE	28	24	21	Withlacoochee River Electric Coop.		188	4	112	150	72.4	10-15-59	R	
												70.9	10-18-60		
822-218-1	NW	NW	27	24	20	Anthony Barthle	1954					34	-54	D, S	
								126	4	56	123e	37.2	10-28-60		
822-237-1	C	SW	20	24	17	Hamilton Growers, Inc.	1957	320	12	153	22	10.5	7-14-60	Ir	
												5.1	10-17-60		
822-237-2	SE	NE	29	24	17	do	1957	344	12	155		20.3	7-14-60	U	
822-241-1	NW	SW	27	24	16	Ralph Cooper	1959	164	2	126	5	3.7	7-12-60	D	Fresh water at 84 feet was cased off. Supplies salt water for shrimp tank. Temperature 74°F, 7-12-60.
												4.2	10-18-60		
823-215-1	NW	SW	18	24	20	Sickler and Tipton			4		144	57.0	10-28-60	U	
823-237-1	SW	SW	17	24	17	Swartsell Groves, Inc.		300	12	86	30	12.3	7-14-60	Ir	Reported yield, 1,200 gpm.
												7.4	10-17-60		
824-206-1	NE	SW	10	24	22	Cummer Cypress Co.		30	2		83e	10.1	11-13-58	U	
												7.9	10-17-60		

824-211-1	SE	SE	10	24	21	Tom Priest	1959	171	4	80	117e	42.3 37.7	12-18-59 10-17-60	D	
824-220-1	NW	SW	8	24	20	M. Z. Johnston		138	4	90+	145	49.1e	10-28-60	D, S	
824-222-1	SW	NW	13	24	19				4		102	11.6	10-28-60	S	
825-215-1	SW	NE	1	24	20	Sky View Groves, Inc.	1957	390	6	180	295	185	-57	D	Yields 2 gpm (est.) at 140 feet, 10 gpm at 180 feet.
825-215-2	NW	SW	1	24	20	Clay Hill Nursery		450	6	200	288	205.1 201.7	6-20-60 10-21-60	D	Water level in chert at 160 feet was 100 feet below surface.
825-218-1	NE	NE	4	24	20	Evans Properties, Inc.	1944	850	18	150	209e	108.2	10-28-60	Ir	
825-222-1	C	NE	2	24	19	J. A. Barthle	1951	126	4	52	118	41.1 41.6	9-20-60 10-19-60	U	Well blows gas in dry periods. Water muddy when 13 Mile Pond drains into sinkhole.
825-230-1	NW	NE	4	24	18	C. T. Irwin	1960	93	3	87	77	28.4 22.3	6-25-60 10-18-60	D	
826-208-1	NW	NE	6	24	22	Cummer Cypress Co.		29	2		77	11.7 3.8	11-13-58 10-17-58	S, O	
826-211-1	SE	NE	34	23	21	Fla. State Rd. Dept.	1949	226	6	49	80	8.3 6.4	10-23-59 10-17-60	O	
826-233-1	NE	NW	36	23	17	El Pico Ranch	1955			82	38	18 8.0 2.8	9- -55 6-25-60 10-18-60	U	Drawdown 50 feet when pumped at 1,500 gpm.
826-233-2	NW	SW	36	23	17	do	1955	461	12	65					
826-234-1	NW	SE	35	23	17	do	1955	243	12	85					
826-238-1	SW	SE	30	23	17	Harold Wallace	1959	101	2	63	13	.2 .1	7-13-60 10-17-60	D	
827-210-1	NW	NW	25	23	21	Cummer Cypress Co.		134	6		80	12.0 10.6	10-29-59 10-17-60	O	Nearby well pumping.
827-219-1	SE	NW	29	23	20	L. C. Hawes	1957	900	16	118	210	123 113.2	-57 10-21-60	Ir	
827-220-1	NE	SE	30	23	20	do	1952	300	6		220	138 135.0	-59 6-24-60	S	

TABLE 4. (Continued)

Well number	¼ Section	¼ Section	Section	Township, south	Range, east	Owner	Year drilled	Depth of well below land surface (feet)	Casing		Altitude of land surface (feet)	Water level		Use of water	Remarks
									Diameter (inches)	Depth (feet)		Above (+) or below land surface (feet)	Date of measurement		
827-227-1	NW	SW	30	23	19	Andy Oradec, Jr.	1924	120?	4	----	68	15.1	10-29-59	D, S	Pumping level.
							------	------	----	----	----	8.6	10-18-60	----	
828-203-1	SE	SW	13	23	22	E. H. Boyette	------	83	3	----	86	1.7	6- 3-59	O	
							------	------	----	----	------	1.6	10-17-60	------	
828-211-1	SE	SW	15	23	21	W. R. McElroy	1960	95	2	60	64	13.7	6-14-60	D	
							------	------	----	----	----	9.5	10-19-60	------	
828-227-1	SE	SE	13	23	18	City of Brooksville	1942					23	9-14-42	------	
							------	251	8	80	66	5.4	8- 9-60	U	W-708. Drawdown 11½ feet when pumped at 220 gpm.
							------	------	----	----	----	4.6	10-19-60	------	
829-206-1	NE	SW	9	23	22	Florida Forest Service	------	97	4	78	74	.6	5-29-59	O	Drawdown 6 feet after pumping 30 gpm for 1 hour. Water temperature 72°F, 5-29-59.
							------	----	----	----	----	.7	10-17-60	------	
829-216-1	NE	SE	14	23	20	Wayne Thomas	------	456	8	----	186e	124.0	6-15-60	U	
							------	----	----	----	------	118.2	10-17-60	----	
829-218-1	NW	NE	16	23	20	R. O. Mountain	1946	760	10	104	225	161	12- -46	Ir	Cavity 752 to 760. Drawdown 36 feet when pumped at 325 gpm at 400-foot depth; 36 feet when pumped at 410 gpm at 600-foot depth; 0 feet when pumped at 560 gpm at 752-foot depth.
829-219-1	SE	SE	8	23	20	P. Mountain	1956					155	4-23-56	------	
							----	422	6	108	244	169.9	6-20-60	D, Ir	
							------	------	----	----	------	170.4	10-19-60	------	
829-235-1	SW	NW	15	23	17	Bartelt Brothers	1960					21	6-22-60		
							------	170	8	60	35	17.1	9- 7-60	P	Supplies Unit 1 of Weekiwachee Woodlands Subdivision, Drawdown 3 feet after pumping 300 gpm for 24 hours.
							----	------	----	----	----	17.2	10-18-60	------	

830-210-1	SE	SW	2	23	21	Ridge Manor Estates	1957	1,300	12	150	89e	27.7	11- 6-59	P	W-4410.
							-----	-----	---	-----	----	26.2	10-17-60	-----	
830-210-2	SE	SW	2	23	21	----- do -----	1955	820	8	138	85e	34	9- -55	P	W-3675.
831-224-1	NE	SW	33	22	19	Florida Highway Patrol	1960	-----	4	190+	99e	44.0	10-19-60	D	Drilled in filled sinkhole.
831-228-1	SE	NE	35	22	18	Burton Hanson	-----	116	3	85	84	39.6	8-11-60	U	
							-----	-----	---	-----	----	39.4	10-17-60	-----	
831-232-1	SE	NE	6	23	18	Larry Die Polder	-----	60	2	40	28	+ 0.8	8-11-60	D	Measured depth 25 feet. Cavity at bottom of well. Water level in well was 0.82 foot above water level of nearby sinkhole which was flowing 8 cfs (estimated).
							-----	-----	---	-----	----	+ 1.0	10-17-60	-----	
831-234-1	SW	NE	2	23	17	Florida Inland Theaters, Inc.	-----	-----	---	-----	-----	5	-56	-----	
							1956	321	6	53	18	0.8	8-14-60	D	Wgi-708. Drawdown 15 feet when pumped at 200 gpm. Hole reduced to 4 inches at 288 feet depth.
							-----	-----	---	-----	-----	0.8	10-17-60	-----	
832-237-1	SE	SE	29	22	17	Presbyterian Youth Camp	-----	75	3	66	9	4.2	9- 8-60	U	
							-----	-----	---	-----	----	4.2	10-17-60	----	
832-238-1	SE	SW	19	22	17	M. L. Abbot	1960	54	3	44	18	15.8	9- 7-60	D	
							-----	-----	---	----	-----	15.6	10-17-60	-----	
833-217-1	NE	SE	22	22	20	M. C. Henderson	1960	418	4	399	100e	46.4	10-19-60	-----	
834-222-1	SE	SW	11	22	19	DaMac Utilities Corp.	1958	-----	---	- -	-----	51	6- 5-58	-----	
							-----	337	10	101	92	41.1	9-12-60	P	Drawdown 15 feet after pumping 500 gpm for 1 hour.
							-----	-----	---	-----	----	38.6	10-19-60	-----	
834-239-1	NW	NE	13	22	16	J. C. Plummer	-----	184	2	181	6	3.2	9- 8-60	U	Water too salty for live shrimp tank. Ten other wells on Pine Island from 20 to 175 feet deep have produced water high in chloride and iron.
							-----	-----	---	----	----	1.7	10-17-60	----	
835-226-1	NW	NE	7	22	19	Camp Concrete Rock Co.	----	-	---	-	-	134	2-25-57	----	
							1938	300	20	100	141	129.2	8-10-60	I	Reported yield, 2,500 gpm.
							-----	-----	---	-----	-----	106.7	10-17-60	-----	
835-228-1	NE	NW	11	22	18	Sunshine State Groves, Inc.	1960	1,210	12	-----	155	128	1-28-60	Ir	Drawdown 15 feet after pumping 1,800 gpm for 1 hour.

TABLE 4. (Continued)

Well number	¼ Section	¼ Section	Section	Township, south	Range, east	Owner	Year drilled	Depth of well below land surface (feet)	Casing: Diameter (inches)	Casing: Depth (feet)	Altitude of land surface (feet)	Water level: Above (+) or below land surface (feet)	Water level: Date of measurement	Use of water	Remarks
835-230-1	SW	NE	9	22	18	Sunshine State Groves, Inc.	-----	-----	---	-----	-----	76	-58	-----	
							1958	225	12	122	88	60.2	8-10-60	Ir	
							-----	-----	---	-----	-----	57.1	10-17-60	-----	
835-233-1	NE	NE	12	22	17	F. Haines	-----	-----	---	-----	-----	4	6- -60	-----	
							1960	65	2	42	24	1.1	9- 8-60	D	
							-----	-----	---	-----	-----	0.7	10-17-60	-----	
836-224-1	SW	SW	33	21	19	Seaboard Railroad	-----	-----	---	-----	-----	68	12- 4-56	-----	
							1956	231	6	-----	97	50.8	8-11-60	D	
							-----	-----	---	-----	-----	48.2	10-17-60	-----	
837-221-1	SW	NW	36	21	19	U.S. Department of Agriculture	1933	804	10	-----	258	227	-33	I	W-274.

TABLE 5. Records of Springs in Pasco and Southern Hernando Counties, Florida

Spring number	Name	Location	Flow			Chloride content		Temperature °F	Approximate water surface altitude (feet)	Remarks
			Gallons per minute	Cubic feet per second	Date of measurement	Date of measurement	Parts per million			
810-211-A	Crystal Spring	SW¼NW¼ sec. 35, T. 26 S., R. 21 E.	----	75	10-24-60	----------	----------	74	52	
812-239-A	Seven Springs	NW¼NW¼ sec. 24, T. 26 S., R. 16 E.	13 6	----- -----	5- 3-46 12-16-60	5- 3-56 ----------	8.5 ----------	----	15 --	
817-242-A	None	NE¼NW¼ sec. 21, T. 25 S., R. 16 E.	5	-----	----------	----------	----------	----	7	
817-243-A	Salt Spring	NE¼SE¼ sec. 20, T. 25 S., R. 16 E.	----	14	11-23-60	11-23-60	7,900	---	2	
820-243-A	None	SE¼NW¼ sec. 5, T. 25 S., R. 16 E.	----	-----	----------	12- 5-60	10,000	--	0	Submarine opening. No detectable flow 12-5-60.
822-242-A	Cedar Island Spring	NW¼SE¼ sec. 21, T. 24 S., R. 16 E.	---- ----	----- ----	---------- ----------	12- 5-60 12-11-60	5,000 8,000	63 68	0 ----	Submarine opening 22 ft. deep, below mean tide.
822-242-B	----------do----------	NW¼SE¼ sec. 21, T. 24 S., R. 16 E.	----	----	----------	12-11-60	10,000	71	0	Submarine opening 27 ft. deep, below mean tide.
823-241-A	Horseshoe Spring	SW¼NE¼ sec. 15, T. 24 S., R. 16 E.	---- ----	7 ----	11-28-60 ----------	11-28-60 12- 1-60	2,100 2,300	---- --	2 --	
824-239-A	None	NW¼NW¼ sec. 13, T. 24 S., R. 16 E.	2	-----	12- 1-60	12- 1-60	80	----	5	
825-243-A	The Jewfish Hole	sec. 5, T. 24 S., R. 16 E.	----	-----	----------	12- 5-60	4,200	58	0	Submarine opening. Detectable "slick" over spring 12-5-60.
827-238-A	None	NW¼SE¼ sec. 30, T. 23 S., R. 16 E.	----	1	7-13-60	7-13-60	5	75	8	Alligators lose epidermis when kept in this water 5 or 6 days.
830-234-A	Little Spring	NW¼SW¼ sec. 2, T. 23 S., R. 17 E.	---	17.6	3- 3-61	6-14-60	4	75	12	
831-234-A	Weekiwachee Spring	SW¼NE¼ sec. 2, T. 23 S., R. 17 E.	----	a258	11- 4-60	8-14-60	5	75	12	158 cfs average flow for period January 1931 to December 1946.
832-237-A	Salt Spring	NE¼NE¼ sec. 29, T. 22 S., R. 17 E.	----	24.7	----------	11-23-60	7,900	71	3	
832-237-B	Mud River Spring or Sulphur Spring	NE¼NW¼ sec. 29, T. 22 S., R. 17 E.	----	129	----------	12-16-60	9,500	69	1	
832-237-C	None	SE¼SW¼ sec. 20, T. 22 S., R. 17 E.	----	3	----------	12-16-60	2,800	----	2	

a Composite flow of springs 830-234-A and 831-234-A.

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