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GEOLOGY OF THE WESTERN EVERGLADES AREA SOUTHERN FLORIDA

Prepared in cooperation with
the Florida Geological Survey

UNITED STATES DEPARTMENT OF THE INTERIOR
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By Melvin C. Schroeder and Howard Klein

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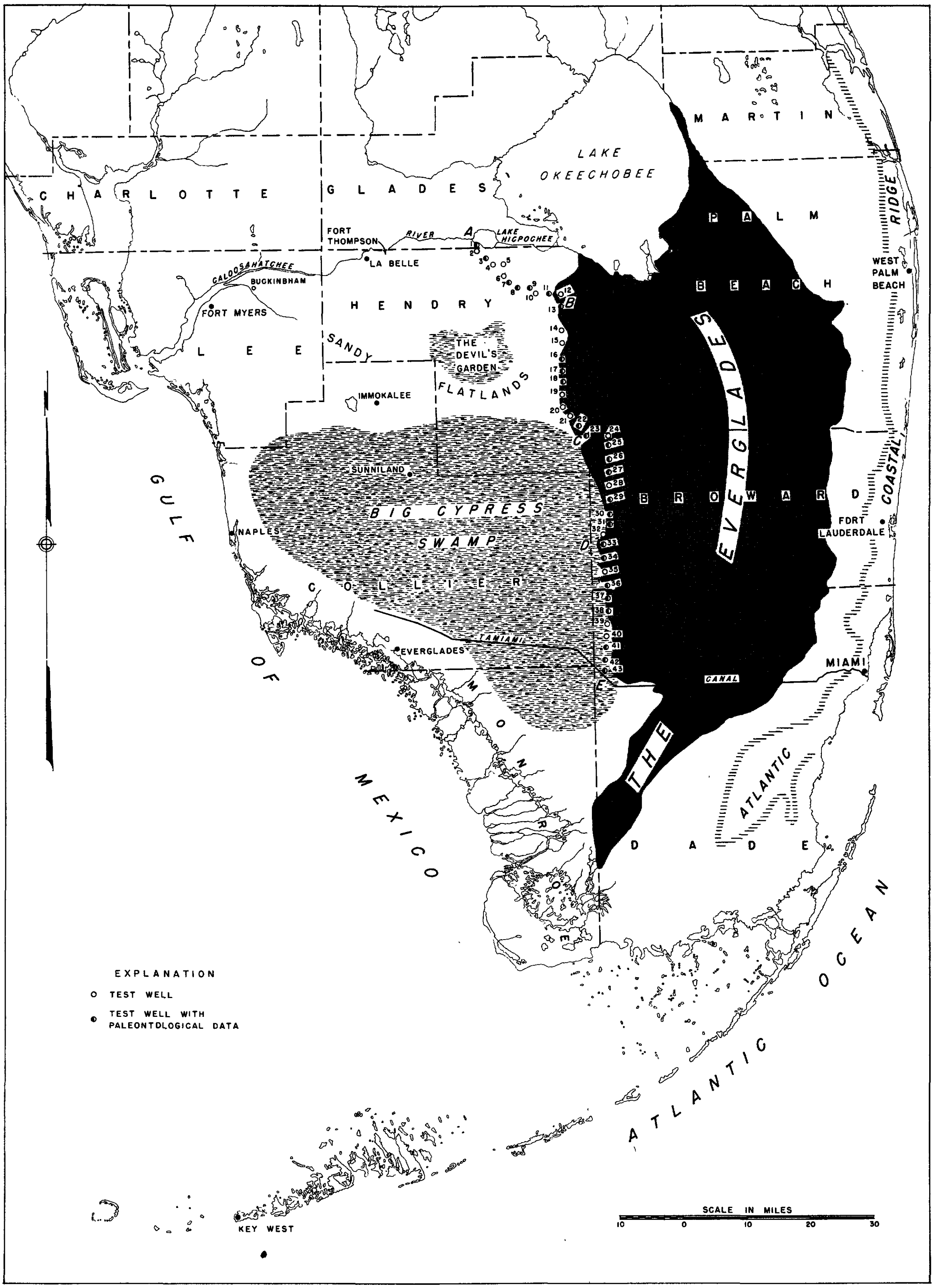

Figure 1.--Map of southern Florida showing location of test wells and geologic cross sections.

GEOLOGY OF THE WESTERN EVERGLADES AREA, SOUTHERN FLORIDA

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INTRODUCTION

Purpose and Scope of Investigation

During 1950, a series of 43 test wells 30 feet deep were drilled by the United States Corps of Engineers along the western edge of the Everglades from the Tamiami Canal northward to the Caloosahatchee River (see figure 1). The cores obtained from the wells afford geologic data along a line from the lower Everglades of Dade County, where both the geology and water resources have been investigated, to the Caloosahatchee River area, where the surface geology has been studied.

This report has been prepared chiefly to record and interpret the information obtained from the test wells. It is one of a series prepared on ground-water investigations by the United States Geological Survey, in cooperation with the Florida Geological Survey. When ground-water data become available they will be correlated with the geology of this report and will be presented in a later report on the Glades-Hendry Counties area. A few generalized inferences concerning ground water are made.

The investigation was under the general supervision of A. N. Sayre, Chief, Ground Water Branch, U. S. Geological Survey, Washington, D. C., and Herman Gunter, Director, Florida Geological Survey, and under the direct supervision of Nevin D. Hoy, District Geologist, U. S. Geological Survey, Miami, Fla.

Acknowledgments

The U. S. Corps of Engineers granted permission to examine cored material from test wells. Garald G. Parker, C. Wythe Cooke, and F. Stearns MacNeil of the U. S. Geological Survey, and R. O. Vernon of the Florida Geological Survey, assisted in interpreting the geology at the various formation type localities and in identifying fossils.

Previous Investigations

Numerous geological studies have been made in the areas which terminate the line of test wells. The area covered in this report is included in the investigations by Parker and Cooke (1944) who presented geologic descriptions and correlations with a discussion of ground-water resources. In a later paper, Parker (1951) revised the stratigraphic correlations of the formations.

TOPOGRAPHIC-ECOLOGIC DIVISIONS

General Features

The line of test wells (see figure 1) crosses three relatively distinct topographic subdivisions. The southern part of the line closely approximates the boundary between the Everglades and the Big Cypress Swamp in western Dade and Broward Counties. In eastern Hendry County, from the latitude of the Broward-Palm Beach County boundary, the line of test wells bears northward for about 20 miles along the western edge of the Everglades, then northwestward across the sandy flatlands to the western edge of Lake Hicpochee. Parker and Cooke (1944, p. 38-53) discuss these topographic-ecologic divisions in detail, hence only a brief discussion is included in this report.

The Everglades

The Everglades is a region covered by black organic soils. Although somewhat indefinite, the boundary between the Everglades and the areas to the east and west is generally placed where the saw grass (sedges) of the Everglades is replaced by true grasses or cypress. According to Parker and Cooke (1944, p. 48), the limestone which floors the Everglades is highest in the vicinity of the Miami Canal, 4 miles east of well 24, and slopes gently to the southern margin and northward toward Lake Okeechobee. The rock floor is composed of fresh-water and marine limestones and partially indurated marl of the Fort Thompson formation. Although the Miami oolite was not observed in any of the test wells, it occurs as a thin layer overlying the Fort Thompson formation in the southern part of the Everglades.

Big Cypress Swamp

To the west, the Everglades merges with the Big Cypress Swamp, which is a poorly defined region of alternating swamp and hammock areas. The elevation in general is slightly higher than the Everglades, but lower than the sandy flatlands on the north. The higher portions, where soils are aerated, support the growth of palmettos, pines, and bunch grasses, but the lower areas are marked with typical swamp growth of small cypress and sedges. In contrast with the Everglades, the surface material is mainly limestone and sandstone, but there are numerous small areas where thin marly deposits lie at the surface. The geology, as interpreted from the well cores, pertains only to the eastern edge of the Big Cypress Swamp.

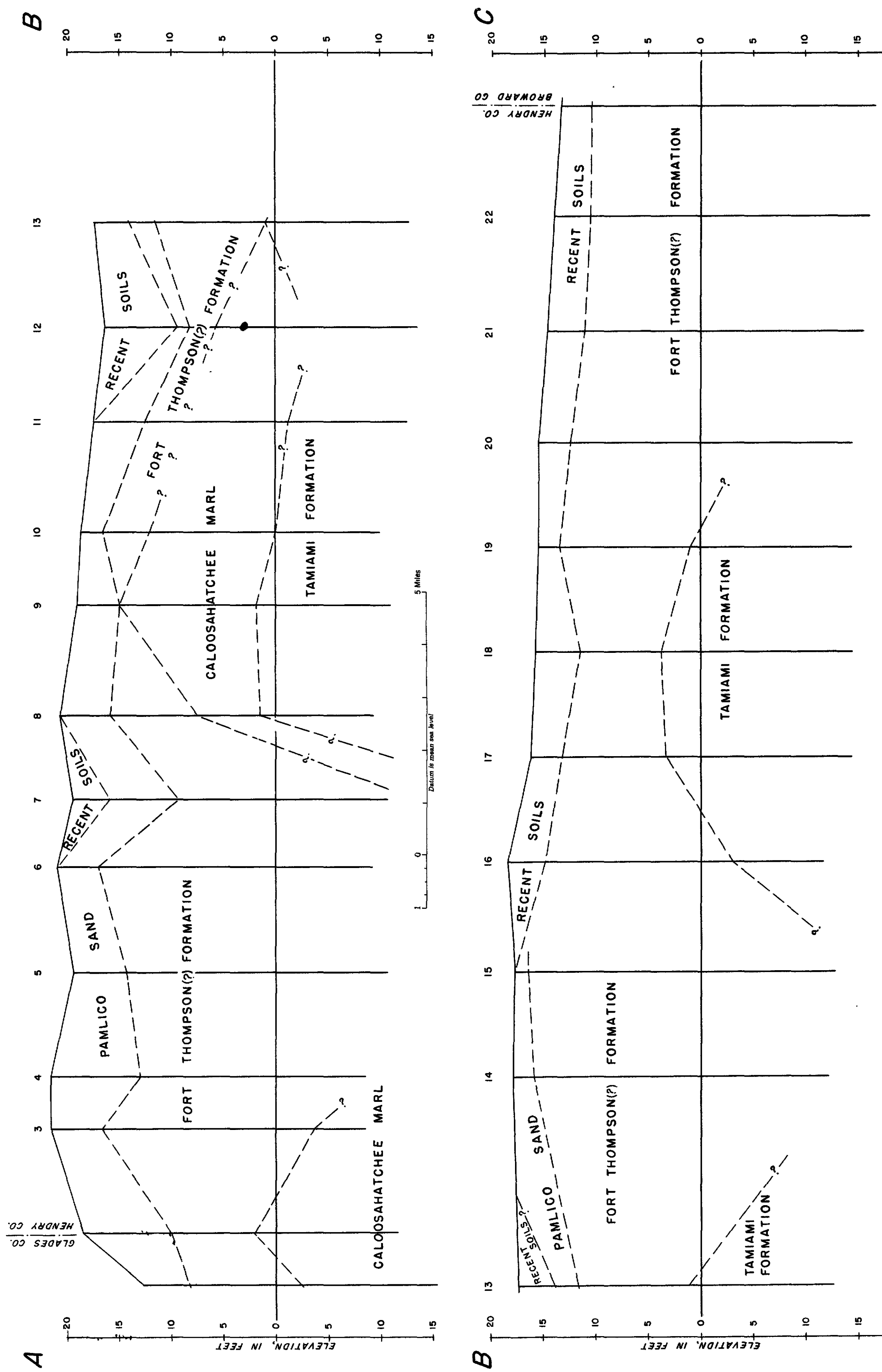

Figure 2. --Geologic cross section along the sandy flatlands southeast of Lake Hicpochee.

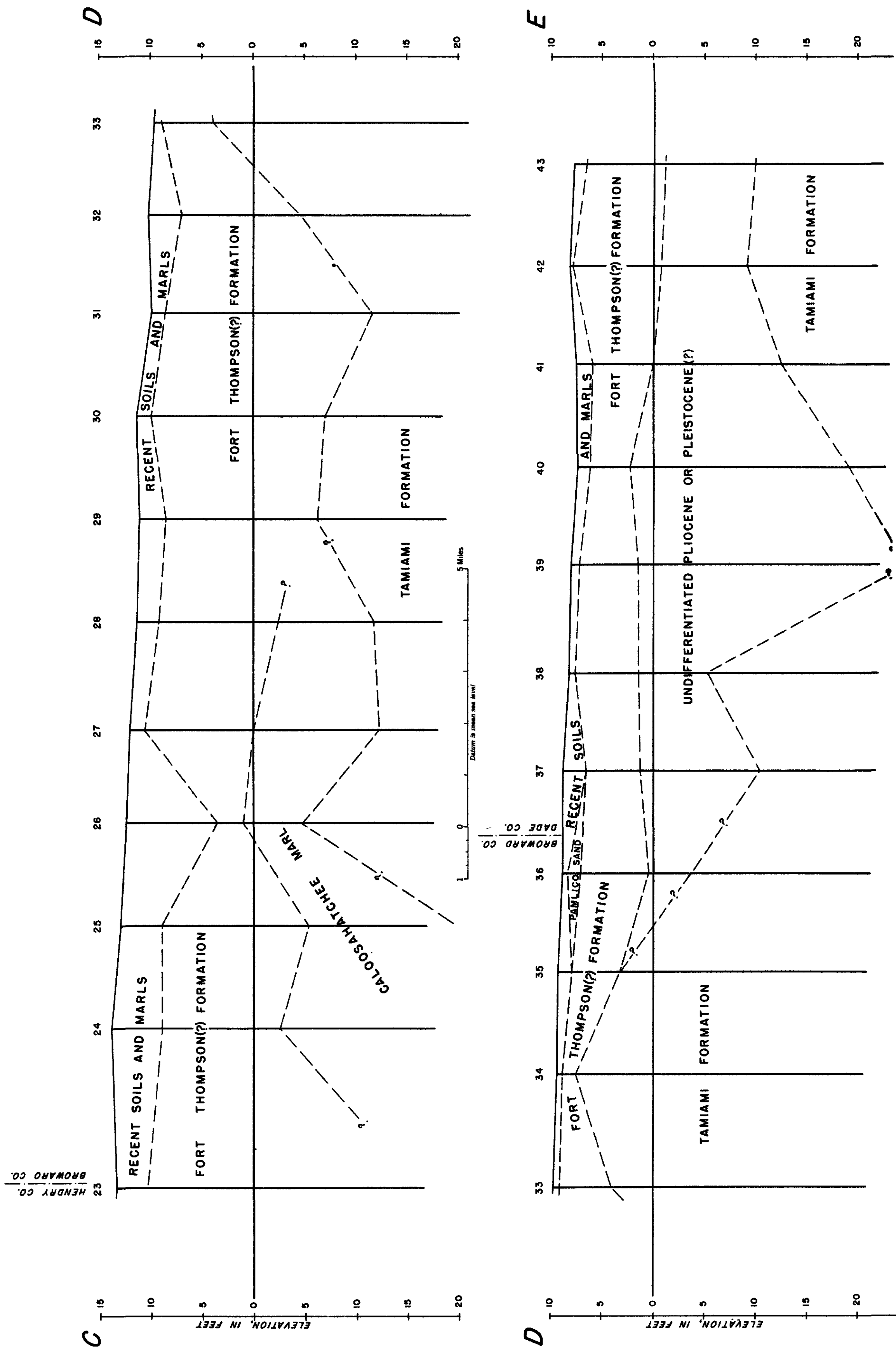

Figure 3.--Geologic cross section along the common margin of Big Cypress Swamp and the Everglades.

Sandy Flatlands

The northern extremity of the line of test wells crosses the sandy flatlands, which is slightly higher than the Everglades and the Big Cypress Swamp but does not exceed 25 feet. The sands were deposited as part of the marine Pamlico sand of Pleistocene age and are dotted with small shallow ponds and poorly defined marshy areas, one of which is the Devil's Garden. Drainage is chiefly underground through the permeable sand with very little, if any, surface runoff.

GEOLOGY

General Features

The materials penetrated by the test wells range in age from late Miocene through Recent; the oldest formation is the Tamiami formation of late Miocene age. Organic soils are still being formed in parts of the Everglades area. The Miami oolite of Pleistocene age occurs as a thin discontinuous veneer near the south end of the line but apparently was not penetrated by any of the wells. The late Miocene to Recent geologic formations in the area of the report are listed in the table below.

Miocene Deposits

Tamiami Formation

Definition.--The Tamiami formation, as redefined by Parker (1951, p. 823), includes all deposits of the upper Miocene in southern Florida. Thus, it includes the Tamiami and Buckingham limestones of Mansfield (1939, p. 8-16) and the upper part of the material assigned to the Hawthorn formation by Parker and Cooke (1944, p. 98-112).

Development.--The Tamiami is the only Miocene formation penetrated by the test wells. The top of the Tamiami formation (see figs. 2, 3) is an undulating surface which varies as much as 25 feet in elevation within a distance of 8 miles. This unevenness indicates that the upper part has been subjected to erosion. The deposition of the Caloosahatchee marl on top of and along the flanks of erosional remnants indicates that the Tamiami was dissected prior to Pliocene deposition and again during the Pleistocene. Apparently the deeper valleys were developed during the Pleistocene.

At Sunniland, Collier County, and Buckingham, Lee County, the Tamiami formation is about 50 feet thick. In Dade County, according to Parker (1954), the formation has a relatively uniform thickness of about 100 feet.

Lithology.--The Tamiami formation changes laterally from shelly marl, as typified at Buckingham, to soft silty limestone at Sunniland, to the silty sand and clayey marl that underlies Dade County. The hard sandy limestones of Mansfield's (1939, p. 8) type localities along the Tamiami Trail were not encountered among the subsurface materials of the core line. The lithologic characteristics of the Tamiami formation as noted in the cores are as diversified as the lithology between the areas of its known distribution. Cream to white soft limestone and clayey marl are the common constituents, but shell marl and silty sand are also present in colors ranging from white and cream to green.

Age.--The Tamiami formation overlies the Hawthorn formation at every locality where the Hawthorn has been penetrated in this area. Hoy and Schroeder (1953, personal communication) reported that the Tamiami formation is overlain unconformably by the Caloosahatchee marl of Pliocene age along Alligator Creek in Charlotte County. The Buckingham and Tamiami limestones, referred by Mansfield (1939, p. 8-16) to the late Miocene and Pliocene, respectively, were tentatively placed by Parker and Cooke (1944, p. 59-65) in the Pliocene, equivalent in age to the Caloosahatchee marl. Parker (1951, p. 822-823) subsequently recognized the Buckingham marl and the Tamiami limestone to be different facies of the same formation of late Miocene age, for which he retained the name Tamiami.

The faunal assemblage of the Tamiami formation commonly contains the mollusks Ostrea disparilis, Chione ulocyma, and Turritella pontoni, which, F. Stearns MacNeil (1951, personal communication) states, "..... are not only characteristic upper Miocene species, but they represent groups that have no known post-Miocene relatives, at least in this part of the world." The echinoid Encope macrophora tamiamiensis, according to Cooke (1942, p. 20-21), is not known in any other beds except what are now called the Tamiami formation.

A specimen of Ecphora quadricostata umbilicata (Wagner) found in the marl along the Caloosahatchee River at Banana Creek also indicates that the Tamiami formation is of late Miocene age.

Formations Penetrated by Test Wells

Age	Formations	Thickness (feet)	Character
Recent and Pleistocene	Organic soils and Lake Flirt marl.	0 - 9	Undifferentiated peat, muck, and fresh-water marl.
Pleistocene	Pamlico sand (shore at +25 feet).	0 - 9	Gray to brown sand.
	Fort Thompson formation.	3 - 9	Alternating marine and fresh-water limestone and marl.
	Anastasia formation.	0 - 25?	Marine sand, coquina, and sandy limestone.
Pliocene	Caloosahatchee marl.	0 - 20	Shells, sand, and marl.
Miocene (late)	Tamiami formation.	50 - 100	Silty sand and marl.

Pliocene Deposits

Caloosahatchee Marl

Definition.--The shell beds exposed along the upper reaches of the Caloosahatchee River were recognized in 1887 as Pliocene, but it was not until 1909 that Matson and Clapp (1909, p. 123) adopted the name Caloosahatchee marl for the beds. The Matson and Clapp definition has since been generally used.

Development.--The Caloosahatchee marl apparently is present in southern Florida as discontinuous erosion remnants. The most continuous exposures occur as thin beds along the Caloosahatchee and other rivers along the southwest Florida coast. The formation is at least 10 feet thick along the Caloosahatchee River and may be as much as 20 feet thick near Lake Hicpochee.

Lithology.--The Caloosahatchee marl consists predominantly of shells, sand, and silt. Fresh unweathered exposures are generally pale cream-colored to light gray, although green clay marls near LaBelle have been included in the formation. Green silty sands or sandy marls included in the Caloosahatchee along the line of the test wells appear to be restricted to the flanks of the hills of the Tamiami formation. Probably the greenish clastics are redeposited green clay marls of the Tamiami formation. The sand and shell variations of the Caloosahatchee marl can be separated from the marine formations of Pleistocene age only by identification of the mollusk faunas.

Age.--Dall (1890-1903) recognized 639 species of mollusks, of which, according to Cooke (1945, p. 216), half are not yet extinct. Mansfield (1939, p. 27-28) lists 40 of the more characteristic species which he collected from the marl. Both Mansfield and Dall accepted the original designation of the age of the marl as Pliocene.

Pleistocene Deposits

Fort Thompson Formation

Definition.--The alternating fresh-water and marine marls and limestones exposed at Fort Thompson were initially named the Fort Thompson beds by Sellards (1919, p. 71-72). Cooke and Mossom (1929, p. 211-215) later named this sequence the Fort Thompson formation and indicated that the beds lie unconformably on the Caloosahatchee marl and are overlain by the Lake Flirt marl of Pleistocene and Recent age.

Development.--The Fort Thompson formation at the type locality is about 6 feet thick. In the Miami area it attains a maximum thickness of 80 feet and constitutes the major part of the Biscayne aquifer as described by Parker (1951, p. 820-823). The southern 18 miles of the line of test wells is approximately the western boundary of the Biscayne aquifer. In this area the Fort Thompson formation ranges from 3 to 9 feet in thickness. The strata of Pleistocene age between wells 10 and 33 possibly are transitional beds between the Fort Thompson and Anastasia formations.

Lithology.--The Fort Thompson formation is composed of sand, marl, shell marl, sandstone, and limestone of fresh-water and marine origin. Marl and sand are the predominant constituents along the line of test wells. The occurrence of limestone in the Fort Thompson and Tamiami formations appears to be related to fluctuations of the water table accompanied by cementation with calcium carbonate.

Age.--Parker and Cooke (1944, p. 94-96) correlated the beds at old Fort Thompson with the inferred fluctuations of sea level during the Pleistocene epoch. Fresh-water beds have not been reported in the Pliocene of the Atlantic Coastal Plain, and they do not occur in the Caloosahatchee marl (Pliocene) in the outcrop area, although fresh-water shells are found, in places, mixed with the marine forms. Any sequence of marine and fresh-water beds, or fresh-water beds, older than the Lake Flirt marl is considered as representing the Fort Thompson formation.

Anastasia Formation

Definition.--The Anastasia formation was named by Sellards (1912) from outcrops of coquina on Anastasia Island, near St. Augustine, Fla. Cooke and Mossom (1929, p. 199) expanded this definition to include all the marine deposits of Pleistocene age underlying the lowest plain bordering the east coast of Florida, excluding the Key Largo limestone and the Miami oolite. Parker and Cooke (1944, p. 66) defined the formation as follows: "The Anastasia formation as here defined includes the coquina, sand, sandy limestone, and shelly marl of pre-Pamlico Pleistocene age that lies along both the Florida east and west coasts."

Development.--The pre-Pamlico deposits at the north and south ends of the line of test wells are definitely assigned to the Fort Thompson formation. The deposits of Pleistocene age between wells 10 and 33 have been questionably identified as the Fort Thompson formation. Thin marine sandstones of the Anastasia formation, which are present along the southwest coast, extend as a tongue into Collier and Hendry Counties. In northeast Collier County and southeast Hendry County this marine sandstone has been found within 4 to 6 miles of the line of test wells. The strata of Pleistocene age between wells 10 and 33, tentatively assigned to the Fort Thompson formation, apparently are transitional between the Fort Thompson and Anastasia formations.

Lithology.--The typical coquina of the Anastasia formation in the type locality does not occur in the western part of southern Florida. Sand, shell beds, marl, and calcareous sandstone are the most common materials.

Age.--Fossil evidence is not adequate for determining the age of the materials in the test wells that may be Anastasia but are assigned to the Fort Thompson. The geologic cross sections, however, suggest that the deposits are of Pleistocene age. Elsewhere in southern Florida, molluscan faunas establish a Pleistocene age for the Anastasia formation.

Pamlico Sand

Definition.--The Pamlico sand was extended from the typical locality in North Carolina by Parker and Cooke (1944, p. 74-75). They include in it all the marine deposits of Pleistocene age younger than the

Anastasia formation. These deposits are referable to terrace materials deposited during a +25-foot stand of the sea during the Pleistocene.

Development.--The Pamlico sand occurs along the test-well line only in the sandy flatlands of Hendry County, where its maximum thickness is about 9 feet.

Lithology.--The Pamlico sand is generally gray or brown. It is composed of quartz.

Age.--The sand that is referred to the Pamlico in southern Florida lies unconformably upon the Miami oolite and Fort Thompson and Anastasia formations, all of Pleistocene age, and upon the Caloosahatchee marl of Pliocene age and the Tamiami formation of late Miocene age. The Lake Flirt marl and deposits of Recent age of peat and muck overlie the Pamlico sand. Cooke (1952, p. 43) refers the Pamlico to a marine shoreline at 25 feet above sea level, which he (1952, p. 51) correlates with the third interglacial stage (Sangamon).

Recent Deposits

The deposits that have accumulated since the end of the Wisconsin glacial stage are Recent. These include organic soils of the Everglades and the Lake Flirt marl, though their development may have started in late Wisconsin time. The marl and the parent material of most of the soils accumulated in fresh water.

The test-well line follows the western margin of the Everglades and in many places the peat and muck are sandy. The gray Lake Flirt marl is penetrated by only a few wells, although its occurrence in the Everglades is common. The conditions of deposition are similar to those that existed in the Everglades area prior to the digging of the drainage canals.

Parker and Cooke (1944, p. 20) supposed that the Lake Flirt marl was deposited during late Wisconsin (fourth glacial stage) and Recent time, starting after the recession of the sea from the level of +25 feet to a level below the present sea level. Cooke (1952, p. 43) infers that sea level in the third glacial epoch was below the present level, rose to +25 feet in Pamlico time, dropped to +6 feet during formation of the Silver Bluff terrace, and then regressed to below present sea level during the Wisconsin ice advance. F. Stearns MacNeil (1950, p. 104) tentatively correlates the Silver Bluff shoreline with the peak of the Recent interglacial stage. Obviously, it is difficult to determine which parts of the Lake Flirt marl were deposited in the late Wisconsin and which in the Recent. However, most of the material was deposited in the Recent, and all post-Pamlico fresh-water marl deposits are included in the Lake Flirt marl. All fresh-water limestones or marls older than the Pamlico sand are included in the Fort Thompson formation.

Structural Interpretation

General Features

Structural interpretation of the geologic cross sections in this report seems to be restricted to the possible alternatives and combinations of folding, faulting, solution and slumping, and erosion. In interpreting the cross sections, all these items are considered and therefore, even though they are diverse, they are grouped together in this discussion.

Folding and Faulting

Most surface structural interpretations are based upon the identification and attitude of sedimentary structures such as bedding, ripple marks, swash marks, rill marks, and mud cracks in recognizable beds. However, of these features only bedding has been found in the sediments in southern Florida. Bedding is not common in exposures of the Tamiami formation or the Caloosahatchee marl, though locally it can be recognized by the alinement of fossils. In some places individual beds of the Pleistocene formations can be identified. Surface observations of the beds and indications of stratification suggest that the beds of the formations ranging from late Miocene to Pleistocene are horizontal or dip so slightly, that the attitudes are determinable only by detailed plane-table or spirit-level surveying.

Subsurface structural determinations are based upon identification of formations and contacts by differences of lithology or fossils. It is preferable to base structural maps upon conformable contacts rather than erosion surfaces. All the contacts shown in the cross sections of this report appear to be unconformable. The contacts between the formations observed in surface exposures in Charlotte, Glades, Hendry, and Lee Counties are all unconformable. Stratigraphic zones that can be used as markers are not recognizable by means of either lithology or fossils.

The data neither prove nor disprove that any of the beds are folded or faulted. If the beds shown in the cross sections are folded, the flexures are very slight. Faulting, if it is present, involves minor displacement. The major subsurface structure of Florida, the Peninsular arch, was formed during the Mesozoic, according to Applin (1951, p. 3-5), and the Ocala uplift, a surface feature cresting in Citrus and Levy Counties, was formed during the early Miocene, according to Vernon (1951, p. 53). Vernon (1951, pls. 3, 4) indicates by cross sections in central and northern Florida that there has been no faulting in post-Hawthorn time. Major structural disturbances therefore antedate the Tamiami formation and so could not have deformed the younger deposits of southern Florida.

E. W. Bishop (1953, personal communication), however, believes that topographic and geomorphologic evidence indicates faulting and tilting of the Pleistocene marine terraces in Highlands County. The authors' opinion, based upon the available data, is that the late Miocene to Recent deposits discussed in this report have not been folded or faulted. Parker and Cooke (1944, p. 19) suggest that there may have been a late Pliocene westward tilting of the Floridian Plateau.

Solution and Erosion

There are several places along the core line, such as at well 7, where sinkhole development is a possible explanation of the structure indicated by the formation contacts. Parker and Cooke (1944, p. 29-33) report on three sinkhole lakes: Deep Lake in Collier County, Rocky Lake in Hendry County, and Still Lake in Lee County. The diameters of these lakes range from 300 to about 1, 000 feet. The greatest depth of Still Lake is about 213 feet below the land surface, in an elliptical chimney 20 to 40 feet in diameter. The chimney probably extends down through limestones of the Tamiami formation into the Hawthorn formation. Deep Lake, midway between Sunniland and Everglades, is in limestone of the Tamiami formation, the greatest depth being 97 feet below the land surface. Rocky Lake, which is about 11 miles west of well 20, is about 50 feet deep, although there may be a chimney which was not detected by the preliminary sounding. A driller's log from a nearby well suggests that soft limestone of the Tamiami formation extends to about 65 feet in depth. The limestone does not appear to be a major constituent of the Tamiami formation along the core line, and it seems probable that the limestone section that predominates at Sunniland and Immokalee makes up less of the Tamiami formation as one progresses eastward. The absence of sinkholes along the core line may be attributed to the thinness of the limestone there.

The top of the Tamiami formation varies as much as 25 feet in elevation within a distance of 8 miles. This unevenness was probably produced by erosion rather than by deformation. The Caloosahatchee marl and Fort Thompson and Anastasia formations were deposited on this preexisting erosion surface, and erosion followed the deposition. The Pamlico sand was deposited on an eroded surface.

The position and shape of the beds shown in the cross sections of this report appear to be the result of deposition and erosion. Folding and faulting are believed not to be the cause of the configuration of the beds.

Ground-Water Occurrence

The southern part of the line of test wells is near the western edge of the Biscayne aquifer (Parker, 1951, p. 820-823); the Fort Thompson formation and younger deposits of Pleistocene age constitute the Biscayne aquifer over much of Dade County. About 25 miles west of the line of test wells, near Sunniland and east of Immokalee, the Tamiami formation becomes highly permeable and is an excellent aquifer. In that general area, soft fossiliferous limestones predominate over the silty sands of the formation. The highly permeable limestones of the Fort Thompson formation thin out or are missing, except possibly as solution-hole fillings in the Tamiami formation, in the vicinity of the Collier-Dade County line. Although in many places boundaries of the Biscayne aquifer cut across geologic formations, there appears to be little, if any, continuity in permeability between the Biscayne aquifer and the fossiliferous limestones of the Tamiami formation in northern Collier County.

The available data concerning ground-water levels in the area across which the test wells were drilled are very limited; however, a few general inferences can be made. Water levels in southeastern Hendry County and northeastern Collier County rise during the autumn and are commonly highest in October. Similar fluctuations of water level occur in the Everglades, corresponding to rainfall, which commonly is the greatest from June through October. During periods of high water levels, large areas are inundated and surface flow to the south occurs in both the Big Cypress Swamp and the Everglades. Generally, the greatest surface flow into and across the Tamiami Canal occurs near Monroe Station (14 miles west of the Dade-Collier County line) during September and October. The concentration of the runoff commonly migrates eastward and by midwinter it is within 10 miles of the coastal ridge. The main factors related to this migration are rainfall and the variation and difference in storage of ground and surface water. The Everglades area is underlain by the very permeable Biscayne aquifer, whereas the Big Cypress Swamp is floored by materials of low permeability. Therefore, ground-water flow to the south is less in the Big Cypress Swamp than in the Everglades. The water table in the Big Cypress Swamp is generally nearer to land surface than in the Everglades, and, because of the small ground-water storage capacity, surface flow starts in the swamp soon after the rainy season begins. Also, because of the slightly greater slope of the land surface, the capacity for the storage of surface water in the swamp is less than that in the Everglades. As ground-water storage increases in the glades area, the water table rises above land surface and flow increases with the concentration of the flow moving eastward.

Correlation Studies

General Statement

The correlations illustrated in the cross sections (figs. 2, 3) are based chiefly on lithologic similarity of the sediments. Vertical changes in lithology, although usually gradational, take place rapidly. There is almost no horizontal continuity of the beds, which makes exact correlation impracticable. Exposures of all of the formations along and near the western edge of the Everglades are scarce and therefore are of little use in substantiating the correlations.

The section which follows contains the logs of the 43 test wells drilled by the U. S. Engineers. Each test well was drilled to a depth of 30 feet; thus the bottoms of the wells range from 8.5 feet below mean sea level in well 3 in northern Hendry County to 22 feet below mean sea level in well 41 near the Tamiami Canal. Also included is a list of macrofossils collected at various depths throughout the 30-foot core sections. The lists were prepared by F. S. MacNeil of the U. S. Geological Survey. Collections were made wherever a relatively large assemblage occurred; not all core holes are represented because the areal distribution of shelly material was very inconsistent. If diagnostic fossils were noted, then that portion of the section was assigned to the indicated geologic age. Many of the species listed are of long stratigraphic range and were of little use in differentiating formations. Several forms occur in great numbers in both Pliocene and Pleistocene deposits; thus the boundary between the Caloosahatchee marl and the formations of Pleistocene age is usually indefinite unless a lithologic break or an unconformity is evident. Scarcity of these fossil forms in certain assemblages from the lower parts of the holes may be considered negative evidence of Miocene age. Unfortunately, identifiable specimens were not found in the cores in some critical areas. Boundaries between formations are tentative, for the writers believe that other interpretations are possible.

LOGS OF WELLS 1 TO 43

Well 1

Location and description	Depth (feet 1/)
NW$\frac{1}{4}$NW$\frac{1}{4}$ sec. 31, T. 42 S., R. 32 E., Glades County.	
Top of measured section (land surface)	+12.6
Pamlico sand:	
Sand, fine to medium quartz, carbonaceous, rust-brown	+12.0
Sand, fine to medium quartz, slightly marly, dark brown	+8.2
Fort Thompson formation:	
Sand, fine to medium quartz, shelly, marly, tan (mainly *Chione cancellata*)	+4.6
Limestone, fresh-water, hard, tan, shelly, tan to brown	+3.5
Limestone, sandy, shelly (mainly *Chione cancellata*), cream	+2.6
Limestone, fresh-water, hard, tan to brown; in part, a deposit filling a solution hole in sandy, shelly limestone of the Caloosahatchee marl	-2.4
Caloosahatchee marl:	
Marl, sandy, very shelly (mainly *Chione cancellata*), cream	-6.6
Shell marl, silty, sandy, gray	-15.4

Well 2

Location and description	Depth (feet 1/)
Center of sec. 6, T. 43 S., R. 32 E., Hendry County.	
Top of measured section (land surface)	+18.4
Pamlico sand:	
Sand, fine to medium, shelly (mainly *Chione cancellata*), brown	+10.0
Fort Thompson formation:	
Sand, fine to medium quartz, slightly marly, very shelly in top 0.5 foot, tan to buff	+8.0
Marl, very shelly, very sandy, tan to cream; in part indurated to sandstone	+4.9
Sandstone, hard, porous, fossiliferous, marine(?), tan	+3.4
Limestone, fresh-water(?), dense, hard, shelly, tan	+2.0
Caloosahatchee marl:	
Sand, silty, marly, very shelly (*Chione cancellata* abundant), cream to tan	-11.6

1/ Datum is mean sea level.

Well 3

Location and description	Depth (feet 1/)
NW$\frac{1}{4}$NW$\frac{1}{4}$ sec. 16, T. 43 S., R. 32 E., Hendry County.	
Top of measured section (land surface)	+21.5
Pamlico sand:	
Sand, fine to medium quartz, gray	+17.3
Sand, fine to medium quartz, dark brown	+16.7
Fort Thompson formation:	
Sandstone, friable, calcareous, case hardened, fossiliferous (mainly *Chione cancellata*), cream, top 0.3 foot	+14.5
Sand, fine to medium quartz, slightly marly, cream	+13.5
Sand, fine quartz, marly, shelly, cream; somewhat indurated to sandstone in lower part	+5.5
Sand, fine quartz, silty, very marly, shelly (*Chione cancellata*), cream	+4.0
Sand, fresh-water, quartz, very marly, silty, fine, shelly, cream	+1.5
Marl, sandy, fossiliferous, shelly (*Chione cancellata* with a few fresh-water gastropods), cream	-1.5
Marl, sandy, shelly (fresh-water gastropods), cream	-3.5
Caloosahatchee marl:	
Marl, clayey, shelly, brown	-8.5

Well 4

Location and description	Depth (feet 1/)
NW$\frac{1}{4}$NW$\frac{1}{4}$ sec. 22, T. 43 S., R. 32 E., Hendry County.	
Top of measured section (land surface)	+21.5
Pamlico sand:	
Sand, fine to medium quartz, gray	+20.0
Sand, fine to medium quartz, dark brown	+13.0
Fort Thompson formation:	
Sand, medium to coarse quartz, tan to cream	+10.0
Sand, fine quartz, silty, shelly, cream	+7.5
Sandstone, fine, silty, calcareous, fossiliferous, cream	+6.5
Sand, fine quartz, shelly, slightly silty, cream to tan	-5.5
Sand, coarse quartz, some quartz granules	-8.5

Well 5

Location and description	Depth (feet 1/)
NW¼NW¼ sec. 24, T. 43 S., R. 32 E., Hendry County.	
Top of measured section (land surface)	+19.4
Pamlico sand:	
Sand, carbonaceous, dark gray	+18.2
Sand, slightly marly, shelly, dark brown, locally cream	+14.4
Fort Thompson formation:	
Marl, sandy, indurated, shelly, cream	+13.0
Sand, fine quartz, silty, marly, shelly, tan	+8.8
Sandstone, friable, silty, very shelly, cream	+6.7
Sand, fine to medium quartz, shelly, tan	+4.4
Sand, fine quartz, slightly shelly, granules of quartz, in lower part, cream	-.6
Limestone, with coarse grains and granules of quartz and some pebbles; shelly and some friable sandstone in lower part, cream	-5.6
Sand, fine to coarse quartz, marly, slightly shelly, cream	-10.6

Well 6

Location and description	Depth (feet 1/)
SW¼SW¼ sec. 25, T. 43 S., R. 32 E., Hendry County.	
Top of measured section (land surface)	+20.9
Pamlico sand:	
Sand, fine to medium, light gray	+19.0
Sand, fine to medium, tan	+17.0
Fort Thompson formation:	
Sand, fine to medium quartz, slightly marly, shelly, cream to light gray	+16.2
Sand, fine quartz, marly, cream	+15.9
Sand, fine to medium quartz, shelly (Chione cancellata), light gray	+15.0
Marl, clayey, sandy, gray and cream	+14.0
Limestone, sandy, soft, fossiliferous, gray	+12.3
Marl, clayey, sandy, shelly, cream	+11.7
Sand, fine to coarse quartz, marly, cream to tan	+10.9
Sand, fine to medium quartz, tan	+.9
Sandstone, friable, very calcareous, fossiliferous, white to cream	-9.1

1/ Datum is mean sea level.

Well 7

Location and description	Depth (feet 1/)
SE¼SE¼ sec. 36, T. 43 S., R. 32 E., Hendry County.	
Top of measured section (land surface)	+19.4
Recent organic soils:	
Muck, sandy, black	+18.5
Sand, mucky, black	+16.0
Pamlico sand:	
Sand, fine to medium quartz, gray to tan	+14.0
Sand, fine to medium quartz, white	+12.0
Sand, fine quartz, white to cream	+9.4
Fort Thompson (?) formation:	
Sand, fine quartz, silty, slightly marly, slightly shelly, tan	+7.3
Sand, fine to medium quartz, very silty, very shelly, tan	+4.4
Sand, fine quartz, slightly shelly, tan to cream	-5.6
Shell marl (shells are worn and smooth), sandy, silty, grayish-cream	-7.0
Sand, fine to coarse quartz, some quartz granules, shelly, cream to white	-10.6

Well 8

Location and description	Depth (feet 1/)
NE¼NE¼ sec. 7, T. 44 S., R. 33 E., Hendry County.	
Top of measured section (land surface)	+20.6
Pamlico sand:	
Sand, fine to medium quartz, tan	+17.5
Sand, fine to medium quartz, rust	+15.8
Fort Thompson formation:	
Marl, sandy, somewhat indurated, tan	+14.4
Limestone, fossiliferous (many Chione cancellata preserved as molds), tan to brown	+13.5
Marl, sandy, shelly (Chione cancellata), gray to tan	+12.6
Sand, fine quartz, very shelly (Chione cancellata), silty, gray	+7.5
Caloosahatchee marl:	
Sand, fine quartz, slightly shelly, silty, tan, orange to light gray	+1.5
Tamiami formation:	
Marl, clayey, slightly sandy, shelly, greenish-tan to cream	-5.6

Well 8--Continued.

Location and description	Depth (feet 1/)
Tamiami formation--Continued.	
Sand, very marly, shelly, light greenish-tan	-8.0
Marl, very sandy, shelly, greenish-gray	-9.4

Well 9

Location and description	Depth (feet 1/)
$NW\frac{1}{4}NW\frac{1}{4}$ sec. 10, T. 44 S., R. 33 E., Hendry County.	
Top of measured section (land surface)	+19.0
Pamlico sand:	
Sand, fine to medium quartz, tan	+15.0
Caloosahatchee marl:	
Sand, fine to medium quartz, shelly, rust	+12.3
Sand, fine quartz, marly, silty, shelly, cream	+8.0
Marl, clayey, slightly sandy, phosphatic, shelly, cream	+5.0
Marl, clayey, very shelly, cream	+2.0
Tamiami formation:	
Marl, sandy, clayey, slightly shelly, cream to light grayish-green	-1.0
Marl, very sandy, phosphatic, very shelly, gray	-4.0
Marl, very sandy, very shelly (mainly fragments), grayish-tan	-11.0

Well 10

Location and description	Depth (feet 1/)
$NW\frac{1}{4}NW\frac{1}{4}$ sec. 14, T. 44 S., R. 33 E., Hendry County.	
Top of measured section (land surface)	+18.6
Pamlico sand:	
Sand, fine to medium, organic, dark brown	+16.6
Fort Thompson (?) formation:	
Sandstone, friable, silty, shelly (Chione cancellata), rust-yellow	+15.1
Limestone, very sandy, fossiliferous (pectens and Chione cancellata), tan	+12.6
Sandstone, fine, calcareous, friable, slightly fossiliferous, cream	+12.1
Caloosahatchee marl:	
Marl, sandy, very shelly (oysters), cream	+5.1
Shell marl, sandy, cream	+4.0
Sand, fine quartz, very silty, marly, shelly, cream-gray	+.1

Well 10--Continued.

Location and description	Depth (feet 1/)
Tamiami formation:	
Marl, clayey, very shelly, tannish-green	-4.0
Marl, clayey, sandy, very shelly, greenish-gray	-6.7
Marl, very sandy, clayey, shelly, cream	-8.7
Sand, fine quartz, clayey, light greenish-gray	-9.9

Well 11

Location and description	Depth (feet 1/)
$SW\frac{1}{4}SW\frac{1}{4}$ sec. 7, T. 44 S., R. 34 E., Hendry County.	
Top of measured section (land surface)	+17.4
Pamlico sand:	
Sand, fine to medium quartz, gray	+12.4
Fort Thompson (?) formation, and Caloosahatchee marl (undifferentiated):	
Sand, fine quartz, very marly, slightly shelly, tan to rust	+7.4
Sand, fine quartz, silty, slightly marly, very shelly, tan	+2.4
Sand, fine quartz, silty, marly, very shelly, greenish-brown	-1.3
Tamiami (?) formation:	
Sand, fine quartz, silty, marly, clayey, light tannish-green	-3.3
Sand, fine quartz, clayey, silty, marly, light olive-green	-7.0
Sand, fine to medium quartz, silty, greenish-gray	-12.6

Well 12

Location and description	Depth (feet 1/)
$SW\frac{1}{4}SW\frac{1}{4}$ sec. 9, T. 44 S., R. 34 E., Hendry County.	
Top of measured section (land surface)	+16.4
Recent organic soils:	
Peat, dark brown	+9.4
Pamlico sand:	
Sand, fine to medium quartz, carbonaceous, black	+8.4
Fort Thompson (?) formation:	
Sandstone, calcareous, friable, shelly, gray	+5.9
Undifferentiated:	
Sand, fine to medium quartz, silty, cream to white	+4.5
Sand, fine to medium quartz, rust-yellow	+3.4
Sand, fine to medium quartz, white	-13.6

1/ Datum is mean sea level.

Well 13

Location and description	Depth (feet 1/)
SW¼SW¼ sec. 21, T. 44 S., R. 34 E., Hendry County.	
Top of measured section (land surface)	+17.3
Recent organic soils:	
Peat, dark brown	+13.9
Pamlico sand:	
Sand, fine to medium quartz, tannish-gray	+13.5
Sand, fine to medium quartz, dark brown	+11.6
Fort Thompson (?) formation:	
Sand, fine to medium quartz, tan; locally indurated to friable sandstone	+10.4
Sand, fine, silty, tan to buff	+1.0
Tamiami formation:	
Sand, fine quartz, silty, shelly, cream; some fine phosphatic grains	-2.7
Sand, fine quartz, silty, tan to greenish-gray	-9.0
Sand, fine to medium quartz, silty, very shelly, brown to green; lower part indurated to greenish-gray sandstone, containing a few small pebbles of phosphate	-12.7

Well 14

Location and description	Depth (feet 1/)
SE¼SE¼ sec. 8, T. 45 S., R. 34 E., Hendry County.	
Top of measured section (land surface)	+17.9
Pamlico sand:	
Sand, fine to medium quartz, brown	+15.9
Fort Thompson (?) formation:	
Limestone, sandy, hard, tan to brown	+15.0
Marl, very sandy, cream	+14.2
Sand, fine to medium quartz, very marly, silty, cream	+10.2
Sand, fine quartz, silty, rust-yellow	+8.7
Sand, fine quartz, silty, buff	+7.2
Sand, fine to medium quartz, light gray	-12.1

Well 15

Location and description	Depth (feet 1/)
SW¼SW¼ sec. 21, T. 45 S., R. 34 E., Hendry County.	
Top of measured section (land surface)	+17.7

1/ Datum is mean sea level.

Well 15--Continued.

Location and description	Depth (feet 1/)
Pamlico sand:	
Sand, medium, light gray to brown	+16.4
Fort Thompson (?) formation:	
Sand, fine to medium quartz, white	+15.7
Sand, dark brown; "hardpan"	+14.4
Sand, fine to medium quartz, rust-brown	+13.7
Sand, fine to medium quartz, brown	+10.2
Sand, medium to coarse quartz, brown	+6.7
Sand, fine quartz, slightly marly, silty, tan	-1.7
Sand, fine quartz, silty, brown	-3.6
Sand, fine quartz, grayish-tan	-11.3
Sand, fine to medium quartz, silty, cream to light gray	-12.7

Well 16

Location and description	Depth (feet 1/)
NW¼NW¼ sec. 4, T. 46 S., R. 34 E., Hendry County.	
Top of measured section (land surface)	+18.3
Recent organic soils:	
Sand, quartz, carbonaceous, black	+16.3
Fort Thompson (?) formation:	
Sand, quartz, carbonaceous, dark brown	+14.9
Sand, fine to medium quartz, rust-brown	+11.3
Sand, fine quartz, marly, silty, light gray to cream	+7.3
Marl, clayey, light cream to white	-2.0
Marl, very sandy, shelly, white to light cream	-3.0
Tamiami formation:	
Sand, fine quartz, very marly, shelly, green-brown	-5.6
Sand, as above, except very shelly, green-tan; phosphate granules at -6.0 mean sea level	-8.9
Sand, fine to medium quartz, marly, shelly, green-brown	-11.7

Well 17

Location and description	Depth (feet 1/)
SW¼SW¼ sec. 9, T. 46 S., R. 34 E., Hendry County.	
Top of measured section (land surface)	+16.2
Recent organic soils and marls:	
Peat, brown	+15.3
Marl, sandy, gray	+13.2

Well 17--Continued.

Location and description	Depth (feet 1/)
Fort Thompson (?) formation:	
Marl (Chione cancellata), yellow; indurated, sandy in part	+10.2
Limestone, dense, hard, rust-yellow	+8.6
Sand, fine to coarse quartz, shelly (Chione cancellata), marly, cream	+7.4
Marl, clayey, sandy, shelly, white to cream	+3.3
Tamiami formation:	
Marl, clay, shelly, tan to cream	+1.0
Sand, very marly, tan to greenish-tan; some granules and small pebbles of black phosphate	-10.0
Marl, sandy, fine quartz, silty, slightly shelly, green to brown	-14.4

Well 18

Location and description	Depth (feet 1/)
SW¼SW¼ sec. 21, T. 46 S., R. 34 E., Hendry County.	
Top of measured section (land surface)	+15.8
Recent organic soils:	
Peat, dark brown	+14.8
Sand, mucky, black	+11.5
Fort Thompson (?) formation:	
Marl, sandy, yellow; in part indurated, cream	+9.8
Sandstone, coarse to very coarse quartz, friable, silty, slightly shelly, cream to white	+8.8
Sand, fine to medium quartz, marly, cream	+3.8
Tamiami formation:	
Sandstone, calcareous, fossiliferous, friable, silty, cream to white	-.2
Sand, very marly, fossiliferous, cream to white; in part indurated to friable sandstone	-10.5
Sand, fine to medium quartz, shelly, tan	-13.5
Marl, sandy, brown	-14.4

Well 19

Location and description	Depth (feet 1/)
SW¼SW¼ sec. 33, T. 46 S., R. 34 E., Hendry County.	
Top of measured section (land surface)	+15.5
Recent organic soils:	
Peat, dark brown	+13.5

1/ Datum is mean sea level.

Well 19--Continued.

Location and description	Depth (feet 1/)
Fort Thompson (?) formation:	
Sand, fine to medium quartz, tan to brown	+11.1
Sand, fine to medium quartz, marly, shelly, brown	+8.5
Sandstone, fine quartz, calcareous, fossiliferous (casts and molds), cream	+1.0
Tamiami formation:	
Sand, fine quartz, marly, silty, phosphatic, cream	-4.0
Sandstone, fossiliferous (casts), porous, calcareous, tan	-4.8
Marl, very sandy, silty, shelly, cream	-6.4
Marl, very sandy, shelly, tan	-8.5
Sand, fine to medium quartz, marly, brown	-11.5
Sand, slightly marly, silty, greenish-brown	-14.5

Well 20

Location and description	Depth (feet 1/)
SW¼SW¼ sec. 9, T. 47 S., R. 34 E., Hendry County.	
Top of measured section (land surface)	+15.5
Recent organic soils:	
Sand, carbonaceous, brown to black	+12.5
Fort Thompson (?) formation:	
Sand, coarse to medium quartz, rust-brown	+10.7
Sand, fine to medium quartz, shelly, silty, tan to cream	+9.7
Sand, coarse quartz, very shelly (Chione cancellata), tan; some small quartz pebbles	+8.5
Sand, medium to coarse quartz, tan to cream	+6.0
Sand, medium to coarse quartz, slightly shelly, white	+2.1
Sand, fine to medium quartz, marly, silty, slightly shelly, light gray to cream	-6.4
Sand, fine quartz, very silty, phosphatic, brown	-9.5
Sand, shelly, fine to medium quartz, tan	-11.3
Sand, fine quartz, shelly, phosphatic, marly, silty, tan	-14.5

Well 21

Location and description	Depth (feet 1/)
NE¼SW¼ sec. 22, T. 47 S., R. 34 E., Hendry County.	
Top of measured section (land surface)	+14.6
Recent organic soils:	
Sand, brown; top part contains organic material	+12.1
Sand, carbonaceous, black	+11.1

Well 21--Continued.

Location and description	Depth (feet 1/)
Fort Thompson (?) formation:	
Sand, coarse quartz, rust-brown	+9.6
Sand, fine to medium quartz, marly, light gray	+5.2
Sandstone, calcareous, porous, fossiliferous, light gray to cream; in part friable	+3.3
Sand, fine to coarse quartz, very marly, cream	+1.5
Sandstone, calcareous, fossiliferous, friable, cream	-1.1
Sand, fine quartz, silty, marly, cream; contains very small phosphate specks	-3.5
Marl, very sandy, cream	-5.1
Sand, fine quartz, marly, very shelly, cream	-7.5
Sand, fine to medium quartz, marly, light gray	-9.4
Sand, fine to medium quartz, marly, silty, cream to tan	-15.4

Well 22

Location and description	Depth (feet 1/)
SW$\frac{1}{4}$NE$\frac{1}{4}$ sec. 35, T. 47 S., R. 34 E., Hendry County.	
Top of measured section (land surface)	+14.0
Recent organic soils:	
Peat, brown	+13.0
Sand, fine to coarse quartz, carbonaceous, dark brown	+10.5
Fort Thompson (?) formation:	
Sand, fine to coarse quartz, brown	+9.7
Marl, sandy, clayey, brown	+7.3
Marl, sandy, cream	+4.5
Sand, fine quartz, very marly, cream	-3.5
Marl, sandy, shelly, cream to light gray; in part indurated	-10.0
Limestone, very sandy, fossiliferous, porous, friable, tan to brown	-16.0

Well 23

Location and description	Depth (feet 1/)
NE$\frac{1}{4}$NE$\frac{1}{4}$ sec. 12, T. 48 S., R. 34 E., Hendry County.	
Top of measured section (land surface)	+13.4
Recent organic soils:	
Peat, dark brown	+12.4
Peat and muck, sandy, dark brown	+10.4
Fort Thompson (?) formation:	
Limestone, sandy, hard, cream to brown; perforated by solution holes	+6.7

1/ Datum is mean sea level.

Well 23--Continued.

Location and description	Depth (feet 1/)
Fort Thompson (?) formation--Continued.	
Sand, medium to coarse quartz, slightly silty, shelly, cream to white; some phosphate granules	+.7
Sand, fine to medium quartz, marly, slightly shelly, tan	-4.0
Sand, fine quartz, silty, slightly marly, brown	-5.6
Sand, fine quartz, slightly silty, tan to brown	-16.6

Well 24

Location and description	Depth (feet 1/)
NW$\frac{1}{4}$NW$\frac{1}{4}$ sec. 10, T. 48 S., R. 35 E., Broward County.	
Top of measured section (land surface)	+13.9
Recent organic soils and marls:	
Peat, mucky, dark brown	+9.6
Marl, slightly sandy, gray	+9.0
Fort Thompson (?) formation:	
Marl, sandy, shelly, cream	+5.9
Limestone, sandy, fossiliferous, porous, tan to gray	+3.9
Marl, sandy, shelly, white to cream; some pieces of indurated marl	+.1
Limestone, soft, fossiliferous, white	-2.7
Caloosahatchee marl:	
Marl, very sandy, shelly, with grains of black phosphate, cream	-3.7
Sand, fine to medium quartz, marly, very shelly, phosphatic, cream to tan	-8.0
Marl, very sandy, shelly, cream to tan	-9.6
Sand, fine to medium quartz, marly, shelly, gray	-11.5
Sand, fine quartz, very marly, slightly shelly, tan to cream	-18.1

Well 25

Location and description	Depth (feet 1/)
SW$\frac{1}{4}$SW$\frac{1}{4}$ sec. 15, T. 48 S., R. 35 E., Broward County.	
Top of measured section (land surface)	+13.0
Recent organic soils and marls:	
Muck and peat, dark brown	+9.6
Marl, brownish-gray	+9.0
Fort Thompson (?) formation:	
Limestone, sandy, fossiliferous, tan	+8.0
Marl, sandy, shelly, cream to white; in places indurated to limestone	-5.2

Well 25--Continued.

Location and description	Depth (feet 1/)
Caloosahatchee marl:	
Marl, very sandy, and very marly sand, shelly, greenish-brown to green	-11.0
Sand, fine to medium quartz, silty, marly, very shelly (some Chione cancellata), cream	-17.0

Well 26

Location and description	Depth (feet 1/)
SW¼SW¼ sec. 27, T. 48 S., R. 35 E., Broward County.	
Top of measured section (land surface)	+12.5
Recent organic soils and marls:	
Peat, brown	+7.1
Muck, sandy, black	+6.3
Marl, sandy, clayey, gray to tan	+3.5
Fort Thompson (?) formation:	
Limestone, sandy, fossiliferous, porous, light cream to gray	+2.5
Marl, sandy, shelly, light gray	+1.0
Caloosahatchee marl:	
Sand, fine quartz, with some larger quartz granules, marly, shelly (some Chione cancellata), buff	-4.7
Tamiami formation:	
Sand, fine to medium quartz, very marly, very shelly, brownish-gray; with granules of phosphate, black; at -5.0 feet mean sea level	-6.5
Sand, fine to medium quartz, very marly, white to light cream, shelly; pebbles and granules of phosphate	-13.7
Marl, clayey, sandy, shelly, brownish-green	-17.5

Well 27

Location and description	Depth (feet 1/)
SW¼SW¼ sec. 3, T. 49 S., R. 35 E., Broward County.	
Top of measured section (land surface)	+12.1
Recent organic soils:	
Peat, sandy, brown	+10.6
Fort Thompson (?) formation:	
Sandstone, calcareous, tan to brown	+9.1
Marl, slightly shelly, cream-tan	+7.6

1/ Datum is mean sea level.

Well 27--Continued.

Location and description	Depth (feet 1/)
Fort Thompson(?) formation--Continued.	
Marl, slightly shelly (casts of shells, some Chione cancellata), light gray-cream to white	+2.3
Marl, very sandy, light cream-gray	+1.7
Marl, very sandy, shelly, cream; with some phosphate granules	+.1
Caloosahatchee marl:	
Sand, fine to very fine quartz, slightly silty, shelly (Chione cancellata), cream to light tan	-12.3
Tamiami formation:	
Sand, fine quartz, slightly shelly, marly, tan	-12.9
Marl, shelly, dark greenish-tan	-17.9

Well 28

Location and description	Depth (feet 1/)
SW¼SW¼ sec. 15, T. 49 S., R. 35 E., Broward County.	
Top of measured section (land surface)	+11.4
Recent organic soils:	
Sand, mucky, carbonaceous, dark brown to black	+9.2
Fort Thompson (?) formation:	
Marl, sandy, brown to tan	+3.4
Sand, very fine to fine quartz, slightly shelly, marly, silty, light brown to white	-2.6
Caloosahatchee marl:	
Sandstone, fossiliferous (some molds of Chione cancellata), calcareous, in part friable, tan to cream	-3.0
Sand, marly, shelly, cream to white	-8.6
Sand, fine quartz, silty, tan	-11.6
Tamiami formation:	
Marl, sandy, greenish-brown	-18.6

Well 29

Location and description	Depth (feet 1/)
SW¼SW¼ sec. 27, T. 49 S., R. 35 E., Broward County.	
Top of measured section (land surface)	+11.1
Recent organic soils:	
Peat, sandy, brown	+8.6
Fort Thompson (?) formation:	
Sand, dark brown	+7.5
Marl, sandy, silty, cream	+4.0
Sand, fine to medium quartz, very marly, cream	+2.1

Well 29--Continued.

Location and description	Depth (feet 1/)
Fort Thompson (?) formation--Continued.	
Sand, fine to very fine quartz, silty, tan	-2.9
Sand, marly, cream	-6.2
Tamiami formation:	
Marl, sandy, fossiliferous, white; indurated to a fossiliferous sandy limestone in places	-7.9
Sand, fine to very fine quartz, silty, cream	-13.7
Marl, silty, slightly shelly, cream	-18.9

Well 30

Location and description	Depth (feet 1/)
Western Broward County, 3 miles east of the Collier County line and 12.4 miles north of the Dade County line.	
Top of measured section (land surface)	+11.4
Recent organic soils and marls:	
Soil, sandy, brown	+11.0
Marl, sandy, gray	+10.1
Fort Thompson (?) formation:	
Sandstone, shelly, calcareous, hard, rust-yellow	+9.9
Marl, slightly sandy, fossiliferous, indurated, cream	+9.0
Marl, slightly sandy, slightly shelly, cream; locally indurated	-1.0
Sand, fine quartz, very silty and marly, slightly shelly (some _Chione cancellata_), cream	-6.9
Tamiami formation:	
Sand, very marly, clayey, shelly, brown to tan	-15.0
Marl, clayey, sandy, shelly, greenish-tan	-18.6

Well 31

Location and description	Depth (feet 1/)
Western Broward County, 3 miles east of the Collier County line and 10.4 miles north of the Dade County line.	
Top of measured section (land surface)	+10.0
Recent organic soils and Lake Flirt marl (undifferentiated):	
Peat, sandy, dark brown; dark brown at base	+9.0
Sand, clayey, dark gray; possibly fresh-water	+8.5

1 1/ Datum is mean sea level.

Well 31--Continued.

Location and description	Depth (feet 1/)
Fort Thompson (?) formation:	
Sandstone, calcareous, fairly hard, tan	+8.0
Marl, very sandy, shelly, cream	+5.5
Sandstone, calcareous, in part friable, cream	+5.0
Sand, fine, very silty, marly, light cream; with some concretions	-11.5
Tamiami formation:	
Sandstone, calcareous, in part friable, slightly porous, fossiliferous, silty, light gray to cream gray	-20.0

Well 32

Location and description	Depth (feet 1/)
Western Broward County, 2.2 miles east of the Collier County line and 8.6 miles north of the Dade County line.	
Top of measured section (land surface)	+10.2
Recent organic soils and marls:	
Peat, muck, dark brown	+8.6
Sand, carbonaceous, black	+7.8
Marl, clayey, brown to gray	+6.8
Fort Thompson (?) formation:	
Marl, sandy, partially indurated, cream	+5.5
Sand, fine to medium quartz, marly, white	+.7
Sand, fine quartz, very marly, white	-4.7
Tamiami formation:	
Marl, sandy, slightly shelly, white to cream	-8.8
Marl, very sandy, shelly, cream; in places indurated to sandstone	-13.5
Marl, sandy, silty, greenish-brown	-21.2

Well 33

Location and description	Depth (feet 1/)
Western Broward County, 2.0 miles east of the Collier County line and 6.8 miles north of the Dade County line.	
Top of measured section (land surface)	+9.7
Recent organic soils:	
Peat, brown	+9.1
Fort Thompson formation:	
Sand, brown	+8.9
Sandstone, hard, dense, tan to cream	+7.3

Well 33--Continued.

Location and description	Depth (feet 1/)
Fort Thompson formation--Continued.	
Sandstone, very silty, calcareous, very friable, cream	+4.0
Tamiami formation:	
Limestone, very sandy, fossiliferous (preserved by molds), cream to white; in places a friable sandstone	-12.5
Limestone, very sandy, very fossiliferous, soft, white	-15.3
Sandstone, shelly, calcareous, brown	-15.5
Sand, fine quartz, marly, silty, brown	-20.8

Well 34

Location and description	Depth (feet 1/)
$SW\frac{1}{4}NW\frac{1}{4}$ sec. 9, T. 51 S., R. 35 E., Broward County.	
Top of measured section (land surface)	+9.4
Recent organic soils:	
Peat, brown	+8.8
Fort Thompson formation:	
Marl, slightly indurated, cream	+8.4
Sandstone, very calcareous, slightly shelly, dense, hard, brown	+7.6
Tamiami formation:	
Marl, sandy, slightly shelly, in part indurated, tan	+5.7
Marl, sandy, cream to tan	+3.5
Marl, sandy, fossiliferous, in part indurated to a soft sandy limestone, cream	+1.3
Marl, sandy, cream; very shelly at top	-2.0
Sand, fine to medium quartz, very shelly, buff to orange	-4.7
Marl, very sandy, shelly, cream; in part cemented to calcareous sandstone	-8.4
Marl, sandy, cream; in part shelly	-10.0
Marl, sandy, cream; in part cemented to sandy limestone containing fossils (mainly echinoids)	-12.6
Marl, slightly sandy, slightly shelly, cream	-15.7
Limestone, very soft, sandy, silty, fossiliferous, porous, cream to white	-19.6
Marl, sandy, shelly, cream	-20.6

1/ Datum is mean sea level.

Well 35

Location and description	Depth (feet 1/)
$SW\frac{1}{4}NW\frac{1}{4}$ sec. 21, T. 51 S., R. 35 E., Broward County.	
Top of measured section (land surface)	+9.2
Recent organic soils:	
Peat, brown	+7.9
Fort Thompson formation:	
Limestone, sandy, dense, hard, cavernous, slightly shelly, tan to brown	+5.0
Sandstone, calcareous, porous, in part friable, tan to dark gray	+3.2
Tamiami formation:	
Marl, sandy, fossiliferous (similar to limestone in Sunniland pits), white to cream; in part indurated to a soft limestone	.0
Marl, very sandy, white to light gray	-2.0
Sand, fine to medium quartz, silty, marly, slightly shelly, buff to tan	-5.0
Sand, fine to medium quartz, very silty, marly, white	-6.8
Sandstone, calcareous, silty, very fossiliferous, in part friable, cream	-11.0
Marl, sandy, shelly, cream; in part cemented to a friable, calcareous, silty sandstone	-12.8
Marl, sandy, shelly, cream to buff	-13.5
Limestone, soft, silty, fossiliferous	-14.4
Marl, sandy, shelly, cream	-18.8
Marl, sandy, slightly shelly, tan	-20.8

Well 36

Location and description	Depth (feet 1/)
$SE\frac{1}{4}NW\frac{1}{4}$ sec. 33, T. 51 S., R. 35 E., Broward County.	
Top of measured section (land surface)	+8.9
Recent organic soils:	
Peat, brown	+8.3
Pamlico (?) sand:	
Sand, marly, brown	+7.2
Fort Thompson formation:	
Limestone, hard, sandy, containing some gastropods (possibly freshwater), light tan; possibly a deposit filling a cavity in underlying rock	+6.7
Limestone, sandy, fossiliferous, marine, cream; in part friable	+.6

Well 36--Continued.

Location and description	Depth (feet 1/)
Pliocene (?) or Pleistocene (?), undifferentiated:	
Sand, fine quartz, very marly, silty, white to cream	-3.7
Tamiami formation:	
Sandstone, silty, calcareous, fossiliferous, light gray; in part very friable	-6.4
Sand, fine quartz, very marly, silty, white	-7.5
Sand, fine to coarse quartz, very marly, silty, cream	-10.3
Marl, very sandy, fossiliferous, light gray to cream; in places locally indurated to a fossiliferous sandstone	-16.7
Marl, sandy, tan	-18.2
Sand, fine, marly, tan to brown	-21.2

Well 37

Location and description	Depth (feet 1/)
SW¼NE¼ sec. 9, T. 52 S., R. 35 E., Dade County.	
Top of measured section (land surface)	+8.7
Recent organic soils:	
Peat, brown	+7.4
Muck, black	+6.3
Fort Thompson formation:	
Sandstone, calcareous, hard, dense, tan to cream	+4.6
Marl, very sandy, silty, cream; in part indurated.	+2.1
Sandstone, calcareous, brown to tan.	+1.2
Pliocene (?) or Pleistocene (?), undifferentiated:	
Sand, fine quartz, very marly, silty, cream	-8.0
Sand, marly, silty, fine to medium, tan	-10.4
Tamiami formation:	
Limestone, very sandy, very soft, friable, fossiliferous, cream to tan	-14.3
Sand, shelly, calcareous, silty, tan.	-15.4
Marl, sandy, shelly, grayish-cream; indurated to a soft sandy limestone around the shells	-18.5
Marl, silty, sandy, fossiliferous, brown; in part indurated.	-21.7

1/ Datum is mean sea level.

Well 38

Location and description	Depth (feet 1/)
NW¼NE¼ sec. 16, T. 52 S., R. 35 E., Dade County.	
Top of measured section (land surface)	+8.2
Recent organic soils:	
Peat and muck, sandy, dark brown.	+7.6
Fort Thompson formation:	
Limestone, sandy, dense, cream to tan	+4.5
Sandstone, calcareous, fossiliferous, in part friable, cream.	+1.6
Pliocene (?) or Pleistocene (?), undifferentiated:	
Marl, very sandy, slightly shelly, light gray to cream	-.8
Sandstone, silty, calcareous, very friable, fossiliferous, cream to white.	-1.9
Sand, marly, silty, cream to white, fossiliferous; and white, calcareous, fossiliferous sandstone from -3.8 to -4.5	-5.3
Tamiami formation:	
Marl, very sandy, shelly, cream to white; in places indurated to a sandy fossiliferous limestone	-21.9

Well 39

Location and description	Depth (feet 1/)
SW¼NW¼ sec. 33, T. 52 S., R. 35 E., Dade County.	
Top of measured section (land surface)	+8.0
Recent organic soils:	
Muck and peat, dark brown.	+7.2
Fort Thompson formation:	
Sandstone, hard calcareous, tan to brown	+6.7
Marl, partially indurated, light cream	+4.8
Sandstone, calcareous, silty, white to light gray; fairly hard from +4.8 to +2.6; friable from +2.6 to +1.4	+1.4
Pliocene (?) or Pleistocene (?), undifferentiated:	
Sand, medium to coarse quartz, rust to light cream	-7.0
Sand, medium to coarse quartz, white	-22.0

Well 40

Location and description	Depth (feet 1/)
SE¼NE¼ sec. 8, T. 53 S., R. 35 E., Dade County.	
Top of measured section (land surface)	+7.4

Well 40--Continued.

Location and description	Depth (feet 1/)
Recent organic soils and Lake Flirt marl:	
Peat and muck, dark brown.	+6.8
Marl, sandy, gray to cream	+6.2
Fort Thompson formation:	
Limestone, sandy, hard, dense, cream to brown	+4.8
Marl, silty, sandy, tan.	+2.4
Pliocene (?) or Pleistocene (?), undifferentiated:	
Sand, fine to medium quartz, very silty, marly, cream	-.4
Sand, fine to medium quartz, slightly silty, buff	-1.5
Sand, fine to medium quartz, marly, light gray	-4.9
Marl, very sandy, fossiliferous, light gray; in part indurated, calcareous, fossiliferous sandstone	-6.3
Sand, fine to medium quartz, very silty, grayish-tan; in lower part fine to coarse quartz sand	-8.5
Sand, fine to medium quartz, light orange to rust	-10.7
Sand, medium to coarse quartz, marly, white; some friable fossiliferous sandstone from -14.0 to -14.5	-17.0
Sand, fine to medium quartz, slightly marly, shelly, cream	-19.2
Tamiami formation:	
Marl, very sandy, fossiliferous, white; in places indurated to sandy limestone	-22.6

Well 41

Location and description	Depth (feet 1/)
NW¼NE¼ sec. 20, T. 53 S., R. 35 E., Dade County.	
Top of measured section (land surface)	+7.5
Recent organic soils and Lake Flirt marl:	
Muck and peat, dark brown.	+7.1
Marl, sandy, gray	+6.0
Fort Thompson formation:	
Limestone, hard, slightly shelly, tan	+5.0
Marl, sandy, tan to buff; a few concretions around shell material	.0
Pliocene (?) or Pleistocene (?), undifferentiated:	
Marl, sandy, shelly, white; lower part partially indurated	-12.5

1/ Datum is mean sea level.

Well 41--Continued.

Location and description	Depth (feet 1/)
Tamiami formation:	
Limestone, sandy, fossiliferous, friable, white	-15.3
Marl, shelly, sandy, in part indurated, white to cream	-17.6
Marl, sandy, shelly, light gray to white; some gray, very shelly limestone	-20.8
Marl, sandy, shelly, tan to cream	-22.9

Well 42

Location and description	Depth (feet 1/)
NE¼NW¼ sec. 32, T. 53 S., R. 35 E., Dade County.	
Top of measured section (land surface)	+8.1
Recent organic soils:	
Peat, dark brown	+7.9
Fort Thompson formation:	
Limestone, sandy, silty, soft, fossiliferous, cream; in places an indurated marl	+5.6
Limestone, marine, sandy, dense, hard, light tan	+4.7
Limestone, sandy, hard, dense, fresh-water (?), dark gray	+4.0
Limestone, soft; indurated marl, sandy, rust-yellow	+3.0
Limestone, fresh-water, sandy, hard, dense, tan.	+2.6
Limestone, soft, sandy, cream	-.8
Pliocene (?) or Pleistocene (?), undifferentiated:	
Marl, sandy, cream to white	-3.0
Sand, fine quartz, marly, tan to rust	-4.3
Sand, fine quartz, white to light gray	-6.9
Sand, fine quartz, marly, very shelly (some <u>Chione cancellata</u>), white	-9.2
Tamiami formation:	
Shell marl, silty, sandy, white	-10.4
Marl, sandy, shelly, cream to tan	-21.9

Well 43

Location and description	Depth (feet 1/)
SW¼SW¼ sec. 5, T. 54 S., R. 35 E., Dade County.	
Top of measured section (land surface)	+7.7
Recent organic soils and Lake Flirt marl:	
Muck and peat, dark brown.	+7.1
Marl, clay, fresh-water, brown	+6.5

Well 43--Continued.

Location and description	Depth (feet 1/)
Fort Thompson formation:	
Sandstone, hard, calcareous, cream to brown; and limestone, hard fossiliferous, dark gray, as a cavity filling in sandstone (or the reverse) from +5.5 to +5.0	+4.1
Sandstone, calcareous, dense, fossiliferous, cream to tan	+3.7
Limestone, dense, hard, dark gray, as a cavity filling	+3.4
Sandstone, in part friable, cream	-1.1

1/ Datum is mean sea level.

Well 43--Continued.

Location and description	Depth (feet 1/)
Pliocene (?) and Pleistocene (?), undifferentiated:	
Sand, fine to medium quartz, and friable sandstone, white to cream, both shelly	-4.7
Sandstone, calcareous, in part friable, silty, porous, fossiliferous, gray	-7.5
Sand, silty, shelly, buff to tan	-10.0
Tamiami formation:	
Marl, sandy, silty, cream to white; in part indurated to sandstone; in places very shelly	-22.3

FAUNA FOUND IN WELLS 1 TO 43

Well 1

Fossils and range	Depth (feet 1/)
Fresh-water limestone containing Helisoma sp.	+4.2
Stratigraphic range: Fort Thompson formation.	
Serpula sp.	-1.0
"Vitrinellid".	
Calyptraea centralis (Conrad).	
Turritella subannulata Heilprin.	
Cerithium ornatissimum Heilprin.	
Mitra sp.	
Mitrella sp.	
Marginella precursor Dall.	
Cancellaria conradiana Dall.	
"Drillia" pogodula Dall.	
Terebra concava Say.	
Nuculana cf. N. acuta (Conrad).	
Arcopsis adamsi (Shuttleworth).	
Anadara sp. (fragment).	
Ostrea cf. O. sculpturata Conrad (fragment).	
Phacoides (Parvilucina) multilineatus Tuomey and Holmes.	
Phacoides (Bellucina) tuomeyi Dall.	
Gemma magna Dall.	
Venus sp. (fragment).	
Chione cancellata Linné.	
Corbula sp.	
Stratigraphic range: Caloosahatchee marl.	

1/ Datum is mean sea level.

Well 1--Continued.

Fossils and range	Depth (feet 1/)
Unidentified fragments of a large oyster and other pelecypods.	-12.0
Stratigraphic range: Formation indeterminate.	

Well 2

Fossils and range	Depth (feet 1/)
Natica canrena Linné.	-3.0 to -4.0
Turritella subannulata Heilprin.	
Cerithium sp.	
Busycon pyrum (Dillwyn).	
Oliva sp. cf. O. carolinae Gardner.	
Terebra sp. aff. T. protexta Conrad.	
Acteocina.	
Arcopsis adamsi (Shuttleworth).	
Anadara cf. A. transversa (Conrad).	
Anomia sp.	
Corbula sp.	
Chione cf. C. cribraria (Conrad).	
Chione cancellata Linné.	
Cardita (Carditamera) floridana (Conrad).	
Stratigraphic range: Caloosahatchee marl.	

Well 3

Fossils and range	Depth (feet 1/)
Lunatia? sp. Several genera of fresh-water gastropods. Stratigraphic range: Fort Thompson formation and Caloosahatchee marl.	+2.0
Nuculana acuta (Conrad). Several genera of fresh-water gastropods. Stratigraphic range: Fort Thompson formation and, possibly, Caloosahatchee marl.	-3.0

Well 7

Fossils and range	Depth (feet 1/)
Anadara improcera (Conrad). *Mulinia congesta* (Conrad). Stratigraphic range: Formation indeterminate.	+6.0
Turritella sp. *Oliva* cf. *O. carolinae* Gardner. *Arcopsis adamsi* (Shuttleworth). *Anadara* sp. *Mytilus*. *Parastarte*? sp. *Cardium* sp. Stratigraphic range: Formation indeterminate.	-6.5

Well 8

Fossils and range	Depth (feet 1/)
Turritella subannulata Heilprin. *Oliva* cf. *O. sayana* Ravenel. *Arneria*. *Dentalium*. *Anadara* cf. *A. transversa* (Conrad). *Chione cancellata* Linné *Dosinia* sp. *Transenella*? sp. Stratigraphic range: Fresh-water and marine mixture of Fort Thompson formation and Caloosahatchee (?) marl.	+11.0

Well 9

Fossils and range	Depth (feet 1/)
Cerithium glaphyrea var. *litharium* Dall. *Marginella limatula* Conrad. *Chione cancellata* Linné. Stratigraphic range: Caloosahatchee marl.	+12.5

1/ Datum is mean sea level.

Well 9--Continued.

Fossils and range	Depth (feet 1/)
Marginella sp. *Anadara transversa* Say. *Mulinia* cf. *M. lateralis* (Say). *Pecten* sp. *Ostrea sculpturata* Conrad. *Phacoides* (*Bellucina*) *tuomeyi* Dall. *Dosinia* sp. *Cardium* sp. Stratigraphic range: Caloosahatchee marl.	+4.0
Natica cf. *N. canrena* (Linné). *Turritella* cf. *T. variabilis* Conrad. *Cunearca* cf. *C. scalaris* (Conrad). *Anadara improcera* (Conrad). *Mulinia congesta* (Conrad). *Pecten* sp. *Chione* (*Lirophora*) *latilirata athleta* Conrad. *Chione cancellata* Linné. *Cardium* sp. Stratigraphic range: Tamiami formation.	-2.0
"*Solariella*" sp. *Arcopsis adamsi* (Shuttleworth). *Mytilus* sp. *Ostrea* sp. *Cardita* (*Carditamera*) sp. *Venericardia* (*Pleuromeris*) n. sp. ? Stratigraphic range: Tamiami formation.	-8.0

Well 11

Fossils and range	Depth (feet 1/)
Epitonium sp. *Cunearca* sp. *Anadara* cf. *A. delandensis* Mansfield. *Mulinia lateralis* (Say). *Anomia* sp. *Ostrea* sp. *Eontia variabilis* MacNeil. *Chione cancellata* Linné. Stratigraphic range: Caloosahatchee (?) marl.	+2.0

Well 13

Fossils and range	Depth (feet 1/)
Crepidula fornicata Say. *Turritella* sp. (juvenile). *Mitrella* sp. *Pleuroliria* sp. (fragment). *Olivella* sp. *Terebra dislocata* Say. *Acteon* sp.	.0

Well 13--Continued.

Fossils and range	Depth (feet 1/)
Ostrea sculpturata Conrad.	
Phacoides (Lucinisca) cribrarius (Say).	
Phacoides (Parvilucina) multilineatus (Tuomey and Holmes).	
Chione cancellata Linné.	

Stratigraphic range: Tamiami (?) formation.

Fossils and range	Depth (feet 1/)
Neverita cf. N. duplicata (Say).	-10.0
Turritella sp. (juvenile).	
Turritella variabilis Conrad.	
Serpula sp.	
"Nassa" cf. N. consensa Ravenel.	
Marginella limatula Conrad.	
Marginella denticulata Conrad.	
Olivella sp.	
*Cancellaria aff. C. venusta Tuomey and Holmes.	
Conus sp.	
Drillia lunata (Lea).	
Nuculana trochilia (Dall).	
Nuculana acuta (Conrad).	
Anadara improcera (Conrad).	
Cunearca sp.	
Mulinia congesta (Conrad).	
Mytilus sp.	
Pecten sp. cf. P. eboreus Conrad.	
Ostrea sculpturata Conrad.	
Dosinia sp.	
Chione cancellata Linné.	

Stratigraphic range: Tamiami formation.

Well 16

Fossils and range	Depth (feet 1/)
Cerithium glaphyrea var. litharium Dall.	-6.0
Marginella limatula Conrad.	
Oliva sp.	
Opercula.	
Anadara improcera (Conrad).	
Mulinia congesta (Conrad).	
Chione cancellata Linné.	

Stratigraphic range: Tamiami (?) formation.

Fossils and range	Depth (feet 1/)
Oliva cf. O. carolinae Gardner.	-10.0
Anadara improcera (Conrad).	
Mulinia congesta (Conrad).	
Pecten eboreus Conrad var. ?	
Eucrassatella sp.	

Well 16--Continued.

Fossils and range	Depth (feet 1/)
Phacoides (Cardiolucina) multistriatus (Conrad).	
Chione cancellata Linné.	

Stratigraphic range: Tamiami (?) formation.

Well 17

Fossils and range	Depth (feet 1/)
Turritella perattenuata Heilprin.	-1.0
Syrnola sp.	
Opercula.	
Nuculana acuta (Conrad).	
Mulinia congesta (Conrad).	
Phacoides (Bellucina) tuomeyi Dall.	
Gemma magna Dall.	

Stratigraphic range: Formation indeterminate, possibly the Tamiami formation.

Well 18

Fossils and range	Depth (feet 1/)
Nothing identifiable	+1.0
Discinisca sp.	-14.0

Stratigraphic range: Formation indeterminate.

Well 22

Fossils and range	Depth (feet 1/)
Pecten sp.	-7.0
Arbacia sp. cf. A. waccamaw Cooke (identified by C. W. Cooke).	

Stratigraphic range: Formation indeterminate, though C. Wythe Cooke believes it is possibly Pliocene.

Well 23

Fossils and range	Depth (feet 1/)
Cardita (Carditamera) sp.	+2.0
Chione cancellata Linné.	

Stratigraphic range: Formation indeterminate.

Well 25

Fossils and range	Depth (feet 1/)
Oliva sp.	-9.0
Abra aequalis (Say).	
Ostrea sp.	
Phacoides (Callucina) radians Conrad.	
Tellina sp.	

Stratigraphic range: Caloosahatchee (?) marl.

1/ Datum is mean sea level.
* More like specimens from Duplin marl at Natural Well, N. C.

Well 25--Continued.

Fossils and range	Depth (feet 1/)
Helisoma sp.	-12.0 to -13.0
Omphalius exoletus (Conrad).	
Turbonilla sp.	
Crepidula fornicata Say.	
Calyptraea centralis (Conrad).	
Polinices sp.	
Turritella perattenuata Heilprin.	
Cerithium muscarum Say.	
Cerithium caloosaënsis cf. var. heilprini Dall.	
Cerithium glaphyrea var. litharium Dall.	
Busycon sp. (juvenile).	
Pyrazisinus scalatus Heilprin.	
Urosalpinx perrugatus Conrad.	
Nassa vibex Say.	
Mitrella n. sp.	
Operculum.	
"Mitrella" sp.	
Marginella limatula Conrad.	
Oliva sp.	
Oliva cf. carolinae Gardner.	
Conus sp. (fragment).	
Bulla striata Bruguière.	
Gemma sp.	
Anadara lienosa (Say).	
Cardita (Carditamera) (juvenile).	
Phacoides (Pseudomiltha) anodonta (Say).	
Chione (Lirophora) latilirata athleta Conrad.	
Chione cancellata Linné.	
Dosinia sp. (fragment).	
Cardium (Trachycardium) sp.	

Stratigraphic range: Probably a mixture of Caloosahatchee marl and Tamiami formation.

Well 26

Fossils and range	Depth (feet 1/)
Turritella sp. cf. T. perattenuata Heilprin.	.0
Cerithium n. sp. aff. C. callisoma Dall.	
Nassa ambigua Montagu var. antillarum d'Orbigny.	
Olivella sp.	
Conus adversarius Conrad.	
Acteocina sp.	
Nucula sp.	
Glycymeris pectinata (Gmelin).	
Phacoides (Bellucina) tuomeyi Dall.	
Gemma magna Dall.	

1/ Datum is mean sea level.

Well 26--Continued.

Fossils and range	Depth (feet 1/)
Chione cancellata Linné.	
Bryozoa.	

Stratigraphic range: Caloosahatchee (?) marl and Tamiami (?) formation, possibly a mixture.

Fossils and range	Depth (feet 1/)
Turritella cookei gladeënsis Mansfield.	-5.0
Marginella sp.	
Nucula sp.	
Nuculana acuta (Conrad).	
Cardita (Carditamera) arata Conrad.	
Mulinia (juveniles).	
Chione sp.	
Cardium sp.	

Stratigraphic range: Tamiami formation.

Fossils and range	Depth (feet 1/)
Turritella (juvenile).	-7.0
Cerithium (juveniles).	
Marginella limatula Conrad.	
Oliva sp. (thick parietal callus).	
Mytilus sp.	
Anadara sp.	
Pecten cf. P. eboreus Conrad.	
Venericardia (Pteromeris) perplana (Conrad).	
Gemma magna Dall.	
Chione (Athleta).	
Chione (Lirophora) latilirata athleta Conrad.	
Chione cancellata Linné.	
Cardita (Carditamera) sp.	
Dentalium sp.	
Barnacle.	

Stratigraphic range: Tamiami (?) formation.

Fossils and range	Depth (feet 1/)
Nuculana trochilia (Dall).	-17.0

Stratigraphic range: Tamiami formation.

Well 27

Fossils and range	Depth (feet 1/)
Venus sp.	+8.5

Stratigraphic range: Formation indeterminate.

Fossils and range	Depth (feet 1/)
Epitonium sp.	+2.5
Pecten (Nodipecten?) sp.	
Phacoides (Parvilucina) cf. multilineatus (Tuomey and Holmes).	
Crassinella sp.	

Well 27--Continued.

Fossils and range	Depth (feet 1/)
Venus sp.	
Chione? sp.	
Parastarte sp.	
Stratigraphic range: Caloosahatchee (?) marl.	
Cerithium n. sp. aff. C. caloosaënsis Dall.	+.1
Oliva sp. (thick parietal callus).	
Dentalium sp.	
Chione sp. (juvenile).	
Stratigraphic range: Caloosahatchee (?) marl.	
Turritella sp. cf. T. perattenuata Heilprin.	-4.0
Cerithium n. sp. aff. C. caloosaënsis Dall.	
Marginella limatula Conrad.	
*Oliva sp. (thick parietal callus).	
Conus adversarius Conrad.	
Operculum.	
Cunearca scalaris (Conrad).	
Parastarte sp.	
Phacoides (Parvilucina) cf. crenulatus (Conrad).	
Anomia sp.	
Chione cancellata Linné.	
Venericardia (Pleuromeris) decemcostata Conrad.	
Pelecypod sp.	
Atrina sp.	
Stratigraphic range: Caloosahatchee marl.	
Nuculana trochilia (Dall).	-17.0
Pecten (Nodipecten?) sp.	
Venus? sp.	
Stratigraphic range: No definite evidence that Miocene was penetrated.	

Well 29

Fossils and range	Depth (feet 1/)
Anomia sp.	-18.0
Stratigraphic range: Formation indeterminate.	

Well 30

Fossils and range	Depth (feet 1/)
Turritella pontoni Mansfield.	.0
Serpula sp.	
Olivella sp.	

1/ Datum is mean sea level.
* Same form occurs in Duplin marl at Natural Well, N. C.

Well 30--Continued.

Fossils and range	Depth (feet 1/)
Acteocina sp.	
Pecten sp.	
Ostrea sp.	
Phacoides (Cardiolucina) cf. trisulcatus multistriatus (Conrad).	
Transenella n. sp.	
Dosinia sp.	
Stratigraphic range: Formation indeterminate.	
Pecten sp.	-5.0
Stratigraphic range: Formation indeterminate.	
Ostrea sculpturata Conrad.	-12.1
Phacoides (Cardiolucina) sp.	
Chione sp.	
Coral.	
Barnacle.	
Stratigraphic range: Tamiami (?) formation.	
Dentalium sp.	-17.0
Nucula sp.	
Pecten sp.	
Corbula sp.	
Stratigraphic range: Formation indeterminate.	

Well 31

Fossils and range	Depth (feet 1/)
Unidentifiable fragments of Pecten and barnacles.	-9.5
Stratigraphic range: Formation indeterminate.	
Fragmental mold of large Cardita cf. C. arata Conrad.	-15.0
Stratigraphic range: Tamiami (?) formation.	

Well 33

Fossils and range	Depth (feet 1/)
Glycymeris sp. cf. subovata (Say).	-1.0
Pecten cf. eboreus Conrad.	
Stratigraphic range: Tamiami (?) formation.	

Well 34

Fossils and range	Depth (feet 1/)
Chione cf. C. cancellata Linné.	+5.5
Cardita (Carditamera) sp.	
Stratigraphic range: Formation indeterminate.	
Pecten sp.	+1.0
Phacoides (Here) densatus (Conrad).	
Phacoides (Cardiolucina) sp.	
Mulinia cf. M. congesta (Conrad).	
Transenella n. sp.	
Chione sp.	
Cardita (Carditamera) sp.	
Encope sp.	
Stratigraphic range: Tamiami (?) formation.	
Phacoides (Cardiolucina) cf. trisulcatus multistriatus (Conrad).	-3.0
Transenella n. sp.	
Venericardia (Pleuromeris) decemcostata Conrad.	
Bryozoa.	
Barnacle.	
Stratigraphic range: Tamiami (?) formation.	
Parastarte sp.	-7.0
Phacoides (Here) densatus Conrad.	
Phacoides (Cardiolucina) cf. trisulcatus multistriatus (Conrad).	
Venericardia (Pleuromeris) decemcostata Conrad.	
Encope sp.	
Stratigraphic range: Tamiami formation.	
Unidentified gastropod.	-11.0
Pecten sp.	
Encope sp.	
Stratigraphic range: Tamiami formation.	
Turritella sp. aff. T. variabilis Conrad.	-17.0
Pecten sp. (gibbus var. ?).	

1/ Datum is mean sea level.

Well 36

Fossils and range	Depth (feet 1/)
Turritella cookei gladeënsis Mansfield.	-11.0
Stratigraphic range: Tamiami formation.	

Well 37

Fragment of large oyster.	-18.0
Stratigraphic range: Tamiami (?) formation.	

Well 38

Ostrea sp.	-2.0
Stratigraphic range: Formation indeterminate.	
Pecten eboreus Conrad.	-7.0
Ostrea sp.	
Stratigraphic range: Tamiami (?) formation.	
Anomia sp.	-12.0
Pecten sp.	
Encope sp.	
Stratigraphic range: Tamiami (?) formation.	
Pecten sp.	-16.0
Echinoid fragments.	
Stratigraphic range: Tamiami (?) formation.	
Echinoid fragments.	-21.0
Barnacle fragments.	
Stratigraphic range: Tamiami (?) formation.	

Well 41

Ostrea sculpturata Conrad.	-3.0
Chione aff. C. cancellata Linné.	
Cardita (Carditamera) sp. (juvenile).	
Stratigraphic range: Formation indeterminate.	
Cardita (Carditamera) sp.	-15.0
Stratigraphic range: Formation indeterminate.	

Well 41--Continued.

Fossils and range	Depth (feet 1/)
Anadara sp.	-20.0
Stratigraphic range: Formation indeterminate.	

Well 42

Fossils and range	Depth (feet 1/)
Glycymeris sp. Ostrea sculpturata Conrad. Transenella n. sp. Venericardia (Pleuromeris) decemcostata Conrad. Turritella pontoni Mansfield. Turritella cookei gladeënsis Mansfield.	-10.0
Stratigraphic range: Tamiami formation.	
Glycymeris subovata (Say). Ostrea sculpturata Conrad. Phacoides (Cardiolucina) trisulcatus multistriatus (Conrad). Divaricella cf. D. quadrisulcata (d'Orbigny). Macrocallista sp. Transenella n. sp. Cardium (Trachycardium) isocardia Linné. Venericardia (Pleuromeris) decemcostata Conrad. Omphalius exoletus (Conrad). Turritella cookei gladeënsis Mansfield.	-12.0 to -16.0
Stratigraphic range: Tamiami formation.	

Well 43

Fossils and range	Depth (feet 1/)
Ostrea sp.	-1.5
Stratigraphic range: Formation indeterminate.	
Venericardia (Pleuromeris) decemcostata Conrad.	-5.0
Stratigraphic range: Formation indeterminate.	
Transenella n. sp. Venericardia (Pleuromeris) decemcostata Conrad. Turritella pontoni Mansfield.	-12.0
Stratigraphic range: Tamiami formation.	

1/ Datum is mean sea level.

Well 43--Continued.

Fossils and range	Depth (feet 1/)
Pecten sp. Ostrea sculpturata Conrad. Donax fossor Say. Transenella n. sp. Venericardia (Pleuromeris) decemcostata Conrad. Cardium cf. C. robustum Solander. Turritella cookei gladeënsis Mansfield. Turritella pontoni Mansfield. Oliva mutica Say. Oliva sp. aff. sayana Ravenel.	-15.0
Stratigraphic range: Tamiami formation.	
Ostrea sp. Venericardia (Pleuromeris) decemcostata Conrad. Turritella cookei gladeënsis Mansfield. Turritella pontoni Mansfield. Oliva mutica Say.	-22.0
Stratigraphic range: Tamiami formation.	

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Well 41--Continued.

Fossils and range	Depth (feet 1/)
Anadara sp.	-20.0
Stratigraphic range: Formation indeterminate.	

Well 42

Fossils and range	Depth (feet 1/)
Glycymeris sp. Ostrea sculpturata Conrad. Transenella n. sp. Venericardia (Pleuromeris) decemcostata Conrad. Turritella pontoni Mansfield. Turritella cookei gladeënsis Mansfield.	-10.0
Stratigraphic range: Tamiami formation.	
Glycymeris subovata (Say). Ostrea sculpturata Conrad. Phacoides (Cardiolucina) trisulcatus multistriatus (Conrad). Divaricella cf. D. quadrisulcata (d'Orbigny). Macrocallista sp. Transenella n. sp. Cardium (Trachycardium) isocardia Linné. Venericardia (Pleuromeris) decemcostata Conrad. Omphalius exoletus (Conrad). Turritella cookei gladeënsis Mansfield.	-12.0 to -16.0
Stratigraphic range: Tamiami formation.	

Well 43

Fossils and range	Depth (feet 1/)
Ostrea sp.	-1.5
Stratigraphic range: Formation indeterminate.	
Venericardia (Pleuromeris) decemcostata Conrad.	-5.0
Stratigraphic range: Formation indeterminate.	
Transenella n. sp. Venericardia (Pleuromeris) decemcostata Conrad. Turritella pontoni Mansfield.	-12.0
Stratigraphic range: Tamiami formation.	

1/ Datum is mean sea level.

Well 43--Continued.

Fossils and range	Depth (feet 1/)
Pecten sp. Ostrea sculpturata Conrad. Donax fossor Say. Transenella n. sp. Venericardia (Pleuromeris) decemcostata Conrad. Cardium cf. C. robustum Solander. Turritella cookei gladeënsis Mansfield. Turritella pontoni Mansfield. Oliva mutica Say. Oliva sp. aff. sayana Ravenel.	-15.0
Stratigraphic range: Tamiami formation.	
Ostrea sp. Venericardia (Pleuromeris) decemcostata Conrad. Turritella cookei gladeënsis Mansfield. Turritella pontoni Mansfield. Oliva mutica Say.	-22.0
Stratigraphic range: Tamiami formation.	

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