GEORGIA
STATE DIVISION OF CONSERVATION
DEPARTMENT OF MINES, MINING AND GEOLOGY
GARLAND PEYTON, Director

THE GEOLOGICAL SURVEY
Bulletin Number 74

LOGS OF SELECTED WELLS IN THE
COASTAL PLAINS OF GEORGIA

by

Esther R. and Paul L. Applin

ATLANTA
1964
LETTER OF TRANSMITTAL

Department of Mines, Mining and Geology

May 4, 1964

His Excellency, Carl E. Sanders
Governor of Georgia and
Commissioner Ex-Officio
State Division of Conservation
Atlanta, Georgia

Dear Governor Sanders:

I have the honor to submit herewith Georgia Geological Survey Bulletin No. 74, "Logs of Selected Wells in the Coastal Plain of Georgia" by Esther R. and Paul L. Applin, formerly Geologists of the United States Geological Survey.

This report contains valuable data upon the geology and water-bearing formations beneath the Coastal Plain of Georgia. These studies of cuttings and cores of 31 selected wells will be of much use in supplying ground-water information needed by cities, industries, well drillers, mine plants and farmers. The geologic information will be used by geologists who are engaged in the search for oil and gas in Georgia.

I believe that the publication of this report is another of the valuable contributions to the search for water and oil that we have been privileged to make.

Very respectfully yours,

Garland Peyton
Director
LOGS OF SELECTED WELLS IN THE COASTAL PLAIN OF GEORGIA

By Esther R. Applin

Introduction

This report contains lithologic and paleontologic descriptions of cuttings and cores from 31 selected wells in the Coastal Plain of Georgia. These descriptive logs are based on microscopic studies made periodically from 1937 to 1962. Prior to my employment with the U.S. Geological Survey, the studies were on a commercial basis, but thereafter they were part of the regional investigations of the U.S. Geological Survey relating to stratigraphy and structure of Mesozoic rocks in the subsurface of the southeastern Gulf and Atlantic Coastal Plain. The logs of 21 oil tests deal chiefly with Cretaceous and older sedimentary rocks, and only incidentally with overlying Tertiary rocks; the other logs describe the Eocene and younger rocks penetrated in relatively shallow water wells. Microscopic study of the samples of the Cretaceous rocks provided a part of the basic data for reports by Paul L. Applin and Esther R. Applin that have been published by the U.S. Geological Survey. After retirement from the Federal Survey, I was requested by the Director of the Georgia Geological Survey to prepare logs of significant wells for publication. The original descriptions of the cuttings and cores from the wells were, in many instances, abbreviated notes, and the work of putting them into readable form fell to my husband, Paul L. Applin.
Figure 1. Well log locations of South Georgia described in this Bulletin.
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<td>Calhoun County</td>
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<td>Camden County</td>
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<td>GGS 54</td>
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<td>Charlton County</td>
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<tr>
<td>Clinch County</td>
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<td>GGS 144</td>
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<td>GGS 481</td>
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<td>Coffee County</td>
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<td>GGS 468, 509 &amp; 508</td>
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<tr>
<td>Colquitt County</td>
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<td>GGS 170</td>
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<tr>
<td>Decatur County</td>
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<td>GGS 67</td>
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<tr>
<td>Early County</td>
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<td>GGS 121</td>
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<td>Echols County</td>
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<td>GGS 150</td>
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<td>GGS 158</td>
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<td>GGS 169</td>
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<td>GGS 109</td>
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<td>Seminole County</td>
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<td>GGS 187</td>
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<td>GGS 204</td>
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<tr>
<td>Thomas County</td>
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<td>GGS 66</td>
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<td>GGS 99</td>
</tr>
<tr>
<td>Wayne County</td>
</tr>
<tr>
<td>GGS 55</td>
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</tbody>
</table>
### ATKINSON COUNTY

**Operator:** Sun Oil Company  
**Landowner:** Doster-Ladson Well 1  
**GGS. No.:** 107  
**Elevation:** 222 ft. (derrick floor)  
**Location:** Land District 7, Land Lot 71  
1650 ft. north and 660 ft. east of southwest corner of Land Lot 71.  
**Total depth:** 4296 ft.  
**Completed:** Jan. 30, 1945

#### Summary of Stratigraphy

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Thickness (feet)</th>
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<tbody>
<tr>
<td><strong>Tertiary</strong></td>
<td></td>
</tr>
<tr>
<td>Miocene</td>
<td>90</td>
</tr>
<tr>
<td>Oligocene</td>
<td>170</td>
</tr>
<tr>
<td>upper, Suwannee Limestone</td>
<td>270</td>
</tr>
<tr>
<td>middle and lower, Vicksburg Group</td>
<td>390</td>
</tr>
<tr>
<td>Eocene</td>
<td>1340</td>
</tr>
<tr>
<td>upper, Ocala Limestone, upper member</td>
<td>440</td>
</tr>
<tr>
<td>lower member</td>
<td>570</td>
</tr>
<tr>
<td>middle, upper middle, Tallahassee Limestone (?)</td>
<td>780</td>
</tr>
<tr>
<td>upper middle (?) or lower middle (?)</td>
<td>870</td>
</tr>
<tr>
<td>lower middle, Lake City Limestone</td>
<td>960</td>
</tr>
<tr>
<td>lower, beds of Wilcox age</td>
<td>1460</td>
</tr>
<tr>
<td>Paleocene</td>
<td>24</td>
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<tr>
<td>Clayton Limestone</td>
<td>1780</td>
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<tr>
<td><strong>Cretaceous</strong></td>
<td></td>
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<tr>
<td>Gulf</td>
<td>2066</td>
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<tr>
<td>Beds of Navarro age</td>
<td>1804</td>
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<tr>
<td>Beds of Taylor age</td>
<td>2447</td>
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<tr>
<td>Beds of Austin age</td>
<td>2798</td>
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<tr>
<td>Atkinson Formation, upper member</td>
<td>3135</td>
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<tr>
<td>lower member</td>
<td>3723</td>
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<tr>
<td>Comanche undifferentiated</td>
<td>3870</td>
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<tr>
<td><strong>Pre-Cretaceous</strong></td>
<td></td>
</tr>
<tr>
<td>Igneous rocks</td>
<td>4220</td>
</tr>
</tbody>
</table>

Lithologic and paleontologic description of cores and cuttings. Samples are cuttings unless otherwise stated.
Depth
(Feet)

Description

Tertiary

Miocene Series undifferentiated

90-100 Sandstone, quartz; composed of moderately fine to coarse, rounded grains; contains nodules of white sandy clay.

100-270 Samples of the Miocene rocks were not studied in detail, but consist, mainly, of sandstones and sandy limestones containing phosphatic material.

Oligocene Series

Upper Oligocene. Suwannee Limestone.

270-280 Chalk, white, non-sandy.

280-290 Limestone, white, moderately hard, porous; composed mainly, of masses of poorly preserved molds of microfossils, including specimens of *Coskinolina floridana*.

290-300 Limestone, like sample at 280-290 ft., but more dense; specimens of *Coskinolina floridana* common.

300-310 Like sample at 290-300 ft.; contains specimens of *Quinqueloculina ioeonensis*.

310-380 Limestone, white, chalky, calcitic, microfossiliferous, irregularly porous; contains many specimens of *Coskinolina floridana* and other species of Foraminifera common in the Suwannee limestone.

380-390 Limestone, cream; composed of rolled, usually well-rounded molds of microfossils and fragments of fossiliferous limestone; *Coskinolina floridana* common.

Middle and Lower Oligocene. Vicksburg Group.

390-400 Limestone, cream and white, hard, nodular, irregularly porous; contains abundant traces of poorly preserved microfossils and fragments of molds of macrofossils. Many calcitized fragments of echinoids are present. Sample contains numerous fragments of white chert.

400-410 Like sample at 390-400 feet. Sample contains molds of *Operculinoides*, sp.

410-420 Like sample at 400-410 ft., but fossil material is better preserved. Species of Foraminifera identified are: worn specimens *Operculinoides* sp., *Lepidocyclina mantelli*, and *Gypsina globula*. Specimens of *Coskinolina floridana* are present, but are possibly not indigenous.

420-430 Like sample at 410-420 ft.; contains poorly preserved specimens of other species of *Lepidocyclina* common to the Vicksburg of this area.

430-440 No sample
Depth (feet)

Description

Eocene Series

Upper Eocene. Ocala Limestone. Upper Member.

440-470 Lithology and fauna of three 10-foot samples are, in general, like sample at 420-430 ft. but show the introduction of fragments of a more chalky, highly fossiliferous limestone, and worn specimens of *Operculinoides floridana* and *Asteroyclina georgiana*; at 460-470 ft. specimens of *Pseudophragmina citrensis* are present.

470-570 Coquina, light-cream; composed of worn and fragmentary molds of microfossils, mainly *Operculinoides ocalanus*, several varieties of *Lepidocyclina ocalana*, *Asteroyclina georgiana*, and other Ocala species. Highest occurrence of *Heterostegina ocalana* is in the sample at 510-520 ft.

Upper Eocene. Ocala Limestone. Lower Member.

570-580 Lithology and fauna are, in general, like the samples at 470-570 ft., but this sample contains specimens of *Amphistegina pinarensis cosdenii*, marking the top of the lower member of the Ocala Limestone.

580-600 Limestone, cream, dolomitic, cryptocrystalline. No identifiable indigenous fossils were observed, although traces of fossil molds occur in the limestone; the sample contains fossils that are evidently caving from higher levels.

600-660 Samples in this interval are, in general, about 50 percent cream, porous, pitted, cryptocrystalline to very finely granular limestone, and 50 percent fine to moderately coarse grained quartz sand which may be caving.

660-670 Limestone, white and light-cream, unfossiliferous, in part chalky and in part dolomitic; about 25 percent of the sample is composed of fine to coarse, rounded grains of quartz sand.

670-720 Samples in this interval are like the sample at 660-670 ft., but contain seemingly indigenous specimens of *Lepidocyclina* sp., and chalky specimens of *Amphistegina pinarensis cosdenii*.

722-729 Core 1. Recovery 3 ft.

720-780 Samples in this interval are composed of limestone like the core at 722-729 ft. and contain specimens of *Amphistegina pinarensis cosdenii* and poorly preserved specimens of *Lepidocyclina* sp.

Middle Eocene. Upper Middle Eocene.

Tallahassee Limestone (?) equivalent.

780-810 Samples in this interval are composed of limestone like the samples at 720-780 ft. and contain, in addition, fragments of white,
Description

gray-spotted chalky limestone composed mainly of masses of chalky molds of Foraminifera and fragments of molds of macrofossils. Fragments and poorly preserved molds of at least two species of *Lepidocyclina*, worn molds of specimens of *Operculinoides* sp., and specimens of *Amphistegina pinarensis cosdeni* are present in the gray-spotted limestone.

810-820 Limestone, white, gray-spotted fossiliferous, like samples at 780-810 ft., but the fossil material consists of worn and rolled molds. Fossils present are sections of small miliolids, specimens of *Lepidocyclina* cf. *L. pustulosa*, *Operculinoides* sp., *Valvulina* sp., and a few specimens of *Amphistegina pinarensis cosdeni*.

820-830 Limestone, white, gray-spotted, porous, in part chalky and in part dolomitic; composed of a mass of worn and fragmental fossil material, in which the fossils are mostly too poorly preserved for identification. However, the fauna seems to be similar to that in the sample at 810-820 ft.

830-840 Limestone, like the sample at 820-830 ft., but more indurated and the fossil material is less well preserved.

840-850 Limestone, gray-spotted, chalky and dolomitic; contains bryozoan fragments and vague traces of other fossils.

843-858 Core 2. Recovery 2 ft.
Limestone, white, gray-spotted, porous; composed of a mass of molds of small miliolids and fragments of other microfossils.

850-870 Two 10-foot samples composed of material like the core at 843-858 ft.

Middle Eocene. Upper Middle(?)
or Lower Middle(?). Eocene.

870-880 Limestone, chalky, 50 percent of sample; similar to samples at 850-870 ft., but only slightly gray-spotted. Fine to coarse rounded grains of clear quartz sand compose 50 percent of sample.

880-890 Limestone, cream, in part dolomitic, highly fossiliferous; contains specimens of *Fabianina cubensis*, *Operculinoides* sp., and several species of *Lepidocyclina*; about 25 percent of sample is sand like that in sample at 870-880 ft.

890-900 Limestone, white and buff, highly dolomitic, somewhat chalky, 50 percent of sample. The dolomite is finely granular. Sand is 50 percent of the sample.

900-910 Limestone, like sample at 890-900 ft., is about 75 percent of sample; sand is 25 percent of sample.

910-930 Limestone, buff, finely granular, dolomitic; contains scattered chalky areas and selenite. Fossils present are chalky molds and fragments of *Lepidocyclina* sp., *Operculinoides* sp., and algal nodules.
LOGS OF SELECTED WELLS IN THE COASTAL PLAIN OF GEORGIA 5

Description

930-960
Dolomite, light-buff, finely granular; contains small chalky areas, specimens of two species of *Lepidocyclina*, and irregular-shaped chalky nodules that are probably of algal origin.

Middle Eocene. Lower Middle Eocene.
Lake City Limestone.

960-1000
Samples in this interval are similar to those at 930-960 ft., but are somewhat glauconitic and contain large inclusions of selenite. Sample at 970-980 ft. contains specimens of *Discocyclina* (*Astero­cyclina*) *monticellensis* and numerous fragments of several species of bryozoa.

1000-1060
Limestone, chalky, somewhat dolomitic; gypsum is common; glau­conite is rare. Samples contain specimens of *Discocyclina* (*Astero­cyclina*) *monticellensis*, *Lepidocyclina* sp., and numerous fragments of bryozoa. Sample at 1020-1030 ft. contains specimens of *Amphistegina lpeztrigoi* var.

1060-1100
Limestone, buff, irregularly chalky, finely dolomitic, somewhat glauconitic; contains abundant fragments of bryozoa, two species of echinoids, numerous specimens of several species of *Lepidocyclina* including numerous specimens of *L. (Polylepidina) antilea*, and a few fragments of *Discocyclina* sp.

1100-1140
Limestone, white, finely fragmental, slightly glauconitic, fissili­ferous; contains abundant fragments of bryozoa, many specimens of *Discocyclina* (*Astero­cyclina*) *monticellensis* and *Opeculino­ides* sp., and poorly preserved molds of smaller Foraminifera. Samples also contain fragments of buff, granular crystalline dolomite (which may be caving), and fragments of light-gray chert.

1140-1160
Like the samples at 1100-1140 ft., but *Opeculino­ides* sp. is the dominant foraminiferal species, and most of the remaining fossil material is very finely fragmental; specimens of *Discocyclina* sp. are also present.

1160-1180
Limestone, white, chalky, slightly glauconitic, containing very finely fragmented fossil material. Specimens of *Opeculino­ides* sp., *Cibicides* sp., and a few other species of smaller Foraminifera are present.

1180-1240
Samples in this interval are lithologically and faunally similar to the samples at 1160-1180 ft. The samples contain cavings from higher levels and about 25 percent fine to coarse-grained clear quartz sand that may also be caving.

1240-1250
Limestone, light-cream, chalky, slightly dolomitic, finely fragment­ed. Fossil material consists of a few specimens of small Fora­minifera, *Discocyclina* sp., *Opeculino­ides* (?) sp., and other fos­sils obviously caving from higher levels. Sample contains about 25 percent fine to coarse-grained quartz sand.
**Description**

**Depth (feet)**

1250-1290  Samples in this interval are similar to the sample at 1240-1250 ft., and samples from 1270-1290 ft. contain numerous fragments of light-gray chert.

1290-1300  Dolomite, buff, slightly chalky, finely granular, porous; many fragments of brownish-gray chert; a few fossils that probably are not indigenous.

1300-1350  Dolomite, like sample at 1290-1300 ft., but somewhat gray-spotted and slightly porous.

1350-1360  Limestone, soft, chalky; contains a little fine-grained sand, many fragments of *Lepidocyclina* (?), some fragments of *Cammerina* sp., and many specimens of *Lepidocyclina* (*Polyplepidina*) *antillea*.

1360-1390  Limestone, chalky and dolomitic, somewhat glauconitic, slightly sandy (fine-grained sand). Brownish-gray chert is present but may be caving. Fauna is like sample at 1350-1360 ft.

1390-1430  Limestone, chalky, fossiliferous, and many fragments of grayish-brown finely granular, crystalline dolomite. The samples contain fragments of brownish-gray chert like the samples at 1360-1390 ft.

1430-1460  Limestone, soft, chalky, finely fragmental, and fragments of dolomitic limestone like the samples at 1360-1390 ft.; abundant specimens of *Lepidocyclina* (*Polyplepidina*) *antillea*.

**Lower Eocene. Beds of Wilcox age.**

1460-1500  Samples in this interval are not satisfactory for precise description; they are seemingly like the samples at 1430-1460 ft., but are highly glauconitic.

1500-1510  Core 3. Recovery ½ ft.

1510-1520  Limestone, white, chalky, microfossiliferous. Sample is lithologically and faunally like samples from higher levels, and may not be representative of the rocks penetrated at this depth.

1520-1530  Limestone, moderately, hard, chalky, fossiliferous, glauconitic; contains many bryozoan fragments, and fragments of a number of species of *Lepidocyclina* that are probably caving, because they are similar to some observed at higher levels. Many fragments of pink-stained, glauconitic limestone. The sample is probably from the Salt Mountain Limestone, the top of which is at 1483 ft. on the electric log of the well.

1530-1540  Limestone, pink-stained, hard, somewhat glauconitic; contains many fragments of bryozoa.

1540-1550  Limestone, white, slightly pink-stained, hard, somewhat glauconitic; lithologically and faunally like the sample at 1530-1540 ft.
## Description

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1550-1560</td>
<td>Limestone, like the sample at 1540-1550 ft., but this sample contains fragments of a coarsely sandy limestone and a few fragments of <em>Pseudophragmina</em> (?).</td>
</tr>
<tr>
<td>1560-1610</td>
<td>Limestone, white, dense, somewhat glauconitic; contains scattered coarse grains of sand and a few poorly preserved specimens of <em>Discoecyclina</em>? sp. The samples at 1590-1610 ft. contain worn and broken fragments of <em>Ostrea</em> sp., and unconsolidated coarse-grained quartz sand.</td>
</tr>
<tr>
<td>1610-1620</td>
<td>Limestone, soft, chalky, and a little coarse-grained sand.</td>
</tr>
<tr>
<td>1620-17</td>
<td>Limestone, cream, dense, showing many sections of fragmental fossil material.</td>
</tr>
<tr>
<td>1640-1650</td>
<td>Limestone, cream, gray-spotted, hard, dense, showing abundant sections of fragmental fossil material.</td>
</tr>
<tr>
<td>1650-1680</td>
<td>Sandstone, white, very fine and even-grained, somewhat glauconitic, micaceous, irregularly chalky; contains traces of fossil fragments.</td>
</tr>
<tr>
<td>1680-1750</td>
<td>Sandstone, very fine grained, glauconitic, micaceous, calcareous; contains many fragments of fossil bivalves and some bryozoan fragments.</td>
</tr>
<tr>
<td>1750-1770</td>
<td>Sand, unconsolidated, very fine and even-grained, that seemingly, was deposited in a matrix of soft gray calcareous clay.</td>
</tr>
<tr>
<td>1770-1800</td>
<td>Sample unwashed but seems to be like the samples at 1750-1770; contains cavings from higher levels.</td>
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</table>

### Paleocene (?) Series

#### Clayton Limestone (?)

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>1780-1790</td>
<td>Limestone, white, hard, dense, glauconitic; contains poorly preserved fragments of fossils, including bryozoan. Paleontologic data are lacking on which to base the Paleocene age of the limestone. On the basis of electric log characteristics, the top of the limestone is at 1777 ft.</td>
</tr>
<tr>
<td>1790-1800</td>
<td>Sandstone, very fine and even-grained, somewhat micaceous, slightly glauconitic, calcareous; contains fragments of macrofossils. Sample also contains fragments of limestone like that in sample at 1780-1790 ft.</td>
</tr>
<tr>
<td>1800-1810</td>
<td>Limestone, cream, hard, irregularly sandy; contains many fragments of poorly preserved macrofossils and traces of specimens of Foraminifera.</td>
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</tbody>
</table>

### Cretaceous

#### Gulf Series

#### Beds of Navarro age

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>1810-1820</td>
<td>Sample seems to be mainly cavings but contains specimens of species of Foraminifer that are characteristic of the beds of</td>
</tr>
</tbody>
</table>
Description

Navarro age. The top of the beds of Navarro age is placed at 1804 ft. on the basis of electric log characteristics.

1820-1830 Limestone and calcareous sandstone like samples at 1780-1810 ft.

1830-1850 Clay, brownish-gray, finely sandy, somewhat carbonaceous and micaceous.

1850-1870 Sandstone, grayish-brown, very fine grained, argillaceous, micaceous, somewhat carbonaceous, and fragments of dark brownish-gray soft flaky clay. Sample at 1860-1870 ft. contains specimens of Robulus navarroensis.

1870-1890 Clay, gray, soft, flaky, micaceous, and argillaceous sandstone. Chalky fragments of fossils at 1880-1890 ft.

1890-2010 Clay, gray, soft, micaceous, somewhat carbonaceous, and dark brownish-gray, very fine grained, argillaceous, micaceous, carbonaceous sandstone. A few chalky fragments in the clay seem to be remnants of fossil shells. Sample contains small nodular fragments of gray limestone.

Top 5 ft. sandstone, gray, very fine and even-grained, argillaceous, micaceous; contains specimens of Robulus navarroensis, Globotruncana cretacea, and a few other specimens of species characteristic of the Navarro. Bottom 5 ft. clay, gray, micaceous; contains much fine-grained sand.

2020-2030 Sandstone, gray, very fine grained, argillaceous, micaceous, and fragments of light-gray, moderately hard, very fine grained, calcareous, micaceous sandstone. Specimens of Robulus navarroensis are fairly common in the sample.

2030-2040 Sandstone, light-gray, soft, very fine and even grained, chalky.

2040-2050 Sandstone, dark-gray, soft, fine-grained, argillaceous, micaceous.

2045-2055 Core 5. Recovery 10 ft.
Top 5 ft. Sandstone, light-gray, soft, very fine grained, micaceous, calcareous.
Bottom 5 ft. No change.

2050-2060 Sandstone, gray, soft, very fine grained, argillaceous, micaceous; contains a few specimens of foraminiferal species indicative of the Navarro age of the beds.

2060-2100 Sandstone, like the sample at 2050-2060 ft. Some of the samples in this interval show fragments of white, moderately hard, very fine grained, calcareous sandstone that seems to occur as lenses in the gray, soft argillaceous sandstone.

2100-2110 Core 6. Recovery 10 ft.
Top 5 ft. clay, gray, soft, sandy (fine-grained sand), micaceous. Bottom 5 ft. sandstone, gray, moderately soft, very fine grained, micaceous, calcareous, finely carbonaceous.

2100-2150 Clay and sandstone as described in core at 2100-2110 ft.
The samples contain specimens of Robulus navarroensis, and a
Description

few other foraminiferal species characteristic of the beds of Navarro age.

2150-2160 Core 7. Recovery 10 ft.
Top and bottom. Clay, gray, moderately hard, highly sandy (very fine-grained sand), micaceous; contains small fragments of carbonaceous material.

2150-2200 Sandstone, gray, soft, very fine-grained, argillaceous, micaceous; somewhat finely carbonaceous; contains specimens of Globigerina cretacea and a few other species of Foraminifera characteristic of beds of Late Cretaceous age.

2200-2210 Core 8. Recovery 5 ft. No sample.

2200-2300 Samples in this interval were unwashed but seem to consist of gray, highly sandy, micaceous clay; fossils, if present, were not visible.

2310-2317 Core 9. Recovery 7 ft.
Clay, gray, sandy (fine-grained sand), micaceous; contains small fragments of carbonaceous material.

2317-2327 Core 10. Recovery 0.

2327-2337 Core 11. Recovery 10 ft.
Top, sandstone, gray, moderately soft, very fine-grained, argillaceous, micaceous.
Middle and bottom. Like the top part of the core.

2337-2347 Core 12. Recovery 10 ft.
Like core 11, at 2327-2337 ft.

2347-2357 Core 13. Recovery 10 ft.
Top 3 ft. like core 12 at 2337-2347 ft. A few fragments of Robulus sp. in the core.
Middle 4 ft. and bottom 3 ft. No change.

2357-2367 Core 14. Recovery 6 ft.
Top 2 ft. and bottom 4 ft. Like core 13 at 2347-2357 ft.

2367-2377 Core 15. Recovery 10 ft.

2377-2387 Core 16. Recovery 0.

2387-2397 Core 17. Recovery 0.

2397-2407 Core 18. Recovery 3 ft.
Clay, gray, sandy (fine-grained sand), micaceous. Specimens of Ostracodes and Foraminifera are fairly common in the sample, but no diagnostic species were seen.

2400-2410 Clay, gray, highly sandy, micaceous. Specimens of Foraminifera identified are: Globotruncanarca arca, Globotruncana fornicata, Dorothia bulletta, Robulus spp. Anomalina pinguis, Clavulinoides trilaterus, Bulimina aspera, Pseudotextularia elegans. The sample contains many ostracodes. The fauna is Navarro in character.
<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2407-2417</td>
<td>Core 19. Recovery 4 ft. Clay, gray, very highly sandy (very fine grained sand), micaceous, calcareous, somewhat finely carbonaceous.</td>
</tr>
<tr>
<td>2410-2420</td>
<td>Clay, gray, sandy, micaceous; contains numerous specimens of Foraminifera and ostracodes. The fauna is Navarro in character.</td>
</tr>
<tr>
<td>2417-2427</td>
<td>Core 20. Recovery 3 ft. Like core 19, at 2407-2417 ft.</td>
</tr>
<tr>
<td>2420-2430</td>
<td>Like sample at 2410-2420 ft.</td>
</tr>
<tr>
<td>2427-2437</td>
<td>Core 21. Recovery 0.</td>
</tr>
<tr>
<td>2430-2440</td>
<td>Like sample at 2410-2420 ft.</td>
</tr>
<tr>
<td>2437-2447</td>
<td>Core 22. Recovery ½ ft. No sample.</td>
</tr>
<tr>
<td>2440-2450</td>
<td>Like sample at 2410-2420 ft.</td>
</tr>
</tbody>
</table>

**Beds of Taylor age.**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2450-2460</td>
<td>Clay, light-gray, soft, sandy, micaceous, calcareous. Foraminiferal fauna is like core 23 at 2447-2457 ft. and contains, in addition, many specimens of <em>Clavulinoides</em> n. sp.</td>
</tr>
<tr>
<td>2457-2467</td>
<td>Core 24. Recovery 0.</td>
</tr>
<tr>
<td>2460-2470</td>
<td>Like sample at 2450-2460 ft. Specimens of <em>Dorothia</em> cf. <em>D. stephensoni</em> are added to the fauna.</td>
</tr>
<tr>
<td>2467-2477</td>
<td>Core 25. Recovery 4 ft. Clay, light-gray, highly sandy (very fine grained sand), micaceous, glauconitic (fine grains), calcareous.</td>
</tr>
<tr>
<td>2470-2480</td>
<td>Clay, gray, soft, highly sandy (very fine grained sand), micaceous, calcareous. Fauna like that described in preceding samples from beds of Taylor age.</td>
</tr>
<tr>
<td>2477-2487</td>
<td>Core 26. Recovery 0.</td>
</tr>
<tr>
<td>2480-2490</td>
<td>Like sample at 2470-2480 ft. Fragments of <em>Inoceramus</em> present.</td>
</tr>
<tr>
<td>2487-2497</td>
<td>Core 27. Recovery 1 ft. Clay, moderately hard, highly sandy (extremely fine grained sand), micaceous, calcareous.</td>
</tr>
<tr>
<td>2490-2500</td>
<td>Lithology and fauna like that described in preceding samples from beds of Taylor age, with the addition to the fauna of many specimens of <em>Stensiööna americana</em> and <em>Planulina dumblei</em>.</td>
</tr>
<tr>
<td>Depth (feet)</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>2500-2510</td>
<td>Like sample at 2490-2500 ft; contains a few <em>Inoceramus</em> fragments.</td>
</tr>
</tbody>
</table>
| 2507-2517 | Core 29. Recovery 10 ft.  
Top. Clay, gray, highly sandy (extremely fine grained sand), micaceous, calcareous, contains small shreds of carbonaceous material.  
Bottom. No change. |
| 2510-2520 | Like sample at 2500-2510 ft. |
| 2517-2527 | Core 30. Recovery 10 ft.  
Sandstone, gray, very fine grained, argillaceous, micaceous, calcareous. |
| 2520-2530 | Lithology and fauna like that described in preceding cutting samples from beds of Taylor age; some fragments of *Inoceramus* present. |
| 2527-2537 | Core 31. Recovery 10 ft.  
Clay, gray, highly sandy (extremely fine grained sand), micaceous, calcareous. |
| 2530-2540 | Sandstone, gray, argillaceous, micaceous, calcareous. Microfauna is the same as in the preceding 100 feet of samples. |
| 2537-2547 | Core 32. Recovery 5 ft.  
Top. Clay, gray, highly sandy (very fine grained sand), micaceous, calcareous.  
Bottom. No change. |
| 2540-2550 | Clay, gray, highly sandy (fine-grained sand) micaceous. Specimens of Foraminifera are much less common than in preceding samples of beds of Taylor age. |
| 2547-2557 | Core 33. Recovery 10 ft.  
Like core 32 at 2537-2547 ft. |
| 2550-2560 | Like cutting sample at 2540-2550 ft. |
| 2557-2567 | Core 34. Recovery ½ ft.  
Clay, light-gray, sandy (fine-grained sand), micaceous, calcareous. |
| 2560-2570 | Clay, light-gray, sandy (very fine grained sand), micaceous, calcareous. Sample contains a few nondiagnostic species of Foraminifera. |
| 2567-2577 | Core 35. Recovery 0. |
| 2570-2580 | Like cutting sample at 2560-2570 ft. |
| 2577-2582 | Core 36. Recovery 4 ft.  
Clay, gray, highly sandy (fine-grained sand), micaceous, calcareous, and soft, argillaceous, very fine grained, micaceous sandstone. |
| 2580-2590 | Clay, gray, sandy, micaceous, somewhat fossiliferous. |
| 2582-2588 | Core 37. Recovery 6 ft.  
Like core 36 at 2577-2582 ft. |
| 2588-2598 | Core 38. Recovery 5 ft. |
**Depth (feet)**

<table>
<thead>
<tr>
<th>Depth Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2590-2600</td>
<td>Clay, gray, sandy (very fine-grained sand), micaceous, calcareous. Sample contains a few specimens of Foraminifera like those at higher levels in the beds of Taylor age.</td>
</tr>
<tr>
<td>2600-2610</td>
<td>Shale, gray, soft, flaky, micaceous; some fragments of gray sandy, micaceous clay, and light-gray, very fine grained calcareous sandstone.</td>
</tr>
<tr>
<td>2608-2618</td>
<td>Core 40. Recovery 4½ ft. Like core 39 at 2598-2608 ft. and somewhat carbonaceous.</td>
</tr>
<tr>
<td>2610-2620</td>
<td>Like cutting sample at 2600-2610 ft; contains few specimens of Foraminifera.</td>
</tr>
<tr>
<td>2620-2630</td>
<td>Clay, gray, sandy, micaceous, and some fragments of gray, soft, flaky, micaceous shale.</td>
</tr>
<tr>
<td>2628-2638</td>
<td>Core 42. Recovery 10 ft. Top 8 ft. clay, gray, sandy (extremely fine-grained sand), calcareous; gray micaceous clay; and thin lenses of gray micaceous shale. The core fragment studied contains traces of macrofossils. Bottom 2 ft. Shale, brownish-gray, micaceous, containing irregular inclusions of white, chalky, glauconitic, micaceous sandstone.</td>
</tr>
<tr>
<td>2640-2650</td>
<td>Cuttings of materials like the bottom of core 42 at 2628-2638 ft.</td>
</tr>
<tr>
<td>2648-2658</td>
<td>Core 43. Recovery 7 ft. Shale, dark brownish-gray, micaceous, somewhat carbonaceous, containing irregular streaks of light-gray, argillaceous, micaceous, slightly glauconitic, calcareous sandstone.</td>
</tr>
<tr>
<td>2650-2660</td>
<td>Clay, gray, soft, sandy (fine-grained sand), micaceous; contains very few specimens of Foraminifera, and no diagnostic species.</td>
</tr>
<tr>
<td>2658-2668</td>
<td>Core 44. Recovery 7 ft. Clay, dark, brownish-gray, sandy (very fine grained sand), micaceous, somewhat carbonaceous.</td>
</tr>
<tr>
<td>2660-2670</td>
<td>Like core 44 at 2648-2658 ft; contains a few nondiagnostic specimens of Foraminifera.</td>
</tr>
<tr>
<td>2658-2668</td>
<td>Core 45. Recovery 9 ft. Clay, gray, highly sandy (fine-grained sand), highly micaceous, containing small shreds of carbonaceous material.</td>
</tr>
<tr>
<td>2660-2670</td>
<td>Like core 45 at 2658-2668 ft.; contains few specimens of Foraminifera.</td>
</tr>
<tr>
<td>Depth (feet)</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| 2668-2678   | Core 46. Recovery 6 ft.  
Top. Like core 45 at 2658-2668 ft.  
Bottom. Clay, gray, irregularly sandy (fine-grained sand), micaceous. |
| 2670-2680   | Like core 46 at 2668-2678 ft. |
| 2678-2688   | Core 47. Recovery 2 ft.  
Clay, dark-gray, shaly, irregularly sandy (fine-grained sand), micaceous. |
| 2680-2690   | Like core 47 at 2678-2688 ft. |
| 2688-2698   | Core 48. Recovery 5 ft.  
Like core 47 at 2678-2688 ft. |
| 2690-2700   | Like Core 48 at 2688-2698 ft. |
| 2698-2708   | Core 49. Recovery 6 ft.  
Clay, gray, irregularly sandy (very fine grained sand), micaceous. |
| 2700-2710   | Like core 49 at 2698-2708 ft. |
| 2708-2716   | Core 50. Recovery 3 ft.  
Like core 49 at 2698-2708 ft. |
| 2710-2720   | Like core 50 at 2708-2716 ft. |
| 2716-2728   | Core 51. Recovery 7 ft.  
Clay, dark brownish-gray, shaly, irregularly sandy (very fine grained sand), micaceous. |
| 2720-2730   | Like core 51 at 2716-2728 ft. |
| 2728-2738   | Core 52. Recovery 3 ft.  
Clay, dark brownish-gray, micaceous. |
| 2730-2740   | No cutting sample. |
| 2738-2748   | Core 53. Recovery 6 ft.  
Top. Like core 52 at 2728-2738 ft. but irregularly sandy (fine-grained sand).  
Bottom. Clay, like top part, but containing irregular inclusions of light-gray, argillaceous, micaceous, calcareous, very fine grained sandstone. |
| 2740-2750   | Like core 53 at 2738-2748 ft. |
| 2748-2758   | Core 54. Recovery 5 ft.  
Like core 53 at 2738-2748 ft. |
| 2750-2760   | Like core 54 at 2748-2758 ft. |
| 2758-2768   | Core 55. Recovery 5 ft.  
Clay, dark brownish-gray, irregularly sandy (fine-grained sand), micaceous. |
| 2760-2770   | No cutting sample. |
| 2768-2778   | Core 56. Recovery ½ ft.  
Clay, like core 55 at 2758-2768 ft., containing irregular areas of light-gray, micaceous, highly sandy (fine-grained sand) clay. |
| 2770-2780   | Like core 56 at 2768-2778 ft. |
Description

2778-2788 Core 57. Recovery 5 ft.
Shale, dark brownish-gray, occurring in thin lenses; and dark-gray, micaceous, sandy (fine-grained sand) clay.

2780-2790 Like core 57 at 2778-2788 ft.

2788-2798 Core 58. Recovery 7 ft.
No sample.

2790-2800 Clay, brownish-gray, containing small flakes of mica; very fine and even-grained, micaceous, calcareous, somewhat glauconitic sandstone. The sample contains a few moderately large nodules of dark-green glauconite. Specimens of Foraminifera are present, but not abundant, and species are not diagnostic; Globo-truncana fornicata common; Globorotalites conicus present.

2798-2803 Core 59. Recovery 2 ft.
Top foot. Shale, brownish-gray, flaky, containing small flakes of mica and a few nodules of dark-green glauconite. Specimens of non-diagnostic species of Foraminifera are present.

Beds of Austin ? age.

Bottom foot. Shale, brownish-gray, flaky, micaceous, containing irregular streaks and inclusions of fine-grained, chalky, highly glauconitic sand. Chalky character of sand due to small fragments of microfossiliferous material and Inoceramus prisms.

2800-2810 Shale, brownish-gray, flaky, micaceous, and very fine grained, micaceous sandstone containing some small grains of glauconite.

2803-2813 Core 60. Recovery 10 ft.
3d and 4th feet, Marl, light-gray, chalky; micaceous, containing many small black phosphatic nodules, some fragments of fish scales, and abundant Inoceramus prisms. The chalky character of the material is due to abundance of comminuted microfossil shells. Specimens of Foraminifera present are: Eovigerina aculeata, Globorotalites conicus, Planulina texana, Globotruncana spp. (common), Clavulinoides n. sp. 9th and 10th feet. Clay, light-gray, chalky, sandy, micaceous, highly glauconitic.

2813-2823 Core 61. Recovery 2 ft.
2nd foot. Clay shale, brownish-gray, soft, flaky, micaceous, highly glauconitic; light-speckled appearance is due to abundance of small chalky microfossils, Inoceramus prisms, and broken and crushed small fragments of chalky fossil debris. Fauna is like that in core 60 at 2803-2813 feet, and the specimens are usually poorly preserved.

2823-2833 Core 62. Recovery 2 ft.
Marl, light-gray, sandy (very fine-grained sand), chalky, micaceous, highly glauconitic, highly microfossiliferous. The fossil material is usually composed of finely comminuted debris; Inoceramus prisms abundant; Robulus rotulata common; Cibicides harperi present.
### Description

<table>
<thead>
<tr>
<th>Depth (feet)</th>
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<th>Recovery</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2833-2843</td>
<td>63</td>
<td>1 ft.</td>
<td>Like core 62 at 2823-2833 ft.</td>
</tr>
<tr>
<td>2843-2853</td>
<td>64</td>
<td>10 ft.</td>
<td>No change.</td>
</tr>
<tr>
<td>2853-2863</td>
<td>65</td>
<td>10 ft.</td>
<td>1st to 7th foot like cores 62 (2823-2833 ft.), 63 (2833-2843 ft.), 64 (2843-2853 ft.). Beds of Austin age (definite) Gober Tongue (?) equivalent 8th, 9th and 10th feet. Marl, buff, sandy (very fine grained sand), somewhat micaceous, chalky. Contains a large amount of finely comminuted, poorly preserved, microfossil debris, and abundant <em>Inoceramus</em> prisms and fragments. Many specimens of Foraminifera present, including <em>Heterostomella austinianna</em>, <em>Planulina austinianna</em>, and <em>Loxostoma clavatum</em>.</td>
</tr>
<tr>
<td>2863-2873</td>
<td>66</td>
<td>5 ft.</td>
<td>1st foot. Marl, gray, light-spotted, dense, slightly micaceous. Speckled appearance is due to abundant microfossiliferous material and finely fragmented chalky fossil debris. Specimens of Foraminifera are usually very 'small'. <em>Globigerina</em>, <em>Gümbelina</em>, several species of <em>Globobrancana</em>, and a small <em>Anomalina</em> sp. strongly predominate; numerous specimens of <em>Globorotalites umbilicatus</em> are present. 2nd and 3rd feet: Similar to 1st foot, but slightly glauconitic. 4th and 5th feet. Marl, buff, light-spotted, slightly micaceous, highly microfossiliferous.</td>
</tr>
<tr>
<td>2873-2883</td>
<td>67</td>
<td>5 ft.</td>
<td>Like core 66 at 2863-2873 ft.</td>
</tr>
<tr>
<td>2883-2893</td>
<td>68</td>
<td>6 ft.</td>
<td>No change in lithology. <em>Inoceramus</em> prisms very abundant. Some specimens of <em>Ventilabrella austinianna</em> and <em>Nonionella austinianna</em> present, but fauna otherwise unchanged.</td>
</tr>
<tr>
<td>2903-2903</td>
<td>69</td>
<td>4 ft.</td>
<td>Marl, buff, slightly micaceous, containing abundant specimens of Foraminifera; fauna unchanged.</td>
</tr>
<tr>
<td>2903-2913</td>
<td>70</td>
<td>10 ft.</td>
<td>1st, 2nd and 3rd feet. Marl, buff, moderately hard, chalky, highly microfossiliferous. Fauna like core 69 at 2893-2903 ft. 6th, 7th and 8th feet. Marl, light-buff, chalky, glauconitic, highly microfossiliferous. 9th and 10th feet. Chalk, cream, slightly micaceous, highly glauconitic, highly microfossiliferous; pyrite inclusions common; fauna unchanged.</td>
</tr>
<tr>
<td>2910-2920</td>
<td>71</td>
<td></td>
<td>Cuttings contain specimens of <em>Kyphopyza</em>, which may have come from higher levels.</td>
</tr>
<tr>
<td>2913-2923</td>
<td></td>
<td>5 ft.</td>
<td>Marl, buff, light-speckled, micaceous, highly microfossiliferous. Dominant species of Foraminifera are: <em>Globigerina cretacea</em>,...</td>
</tr>
</tbody>
</table>
### Description

*Gumbelina* spp., and a small *Anomalina* sp. characteristic of the beds of Austin age. Also present are specimens of *Globotruncana austiniana*, *Globorotalites umbilicatus*, and *Planulina texana*; *Globigerina* and *Planulina* are the dominant forms.

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Core</th>
<th>Recovery</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2923-2933</td>
<td>72</td>
<td>8 ft.</td>
<td>Marl, grayish-tan, somewhat micaceous, highly microfossiliferous. Fauna like core 71 at 2913-2923 ft.</td>
</tr>
<tr>
<td>2933-2943</td>
<td>73</td>
<td>2 ft.</td>
<td>Like core 72 at 2923-2933 ft.</td>
</tr>
<tr>
<td>2953-2963</td>
<td>75</td>
<td>0 ft.</td>
<td>Core 75. Recovery 0.</td>
</tr>
<tr>
<td>2963-2968</td>
<td>76</td>
<td>5 ft.</td>
<td>Shale, brownish-gray, flaky, highly micaceous, somewhat glauconitic. Contains fragments of fish scales, green and brown mica, and a few small arenaceous species of Foraminifera. Other species of Foraminifera are like those in core 71 at 2913-2923 ft.</td>
</tr>
<tr>
<td>2968-2976</td>
<td>77</td>
<td>5 ft.</td>
<td>Marl, brownish-gray, micaceous, highly fossiliferous; contains abundant fragments and prisms of <em>Inoceramus</em>. The foraminiferal fauna is more representative than in core 76, and is Austin in character.</td>
</tr>
<tr>
<td>2976-2986</td>
<td>78</td>
<td>4 ft.</td>
<td>Shale, brownish-gray, micaceous, microfossiliferous.</td>
</tr>
<tr>
<td>2980-2990</td>
<td></td>
<td></td>
<td>Cuttings contains specimens of <em>Frondicularia undulosa</em>.</td>
</tr>
<tr>
<td>2986-2996</td>
<td>79</td>
<td>3 ft.</td>
<td>Like core 78 at 2976-2986 ft.</td>
</tr>
<tr>
<td>2996-3005</td>
<td>80</td>
<td>8 ft.</td>
<td>Top 4 feet. Shale, brownish-gray, highly glauconite, calcareous, microfossiliferous. Foraminiferal fauna is composed, largely, of specimens of <em>Gumbelina reussi</em>, <em>Globigerina cretacea</em>, <em>Globotruncana canaliculata</em>, and many specimens of <em>Globorotalites umbilicatus</em> and <em>Planulina</em> sp. (small forms). Bottom 4 ft. shale; brownish-gray, micaceous, calcareous, highly microfossiliferous.</td>
</tr>
<tr>
<td>3005-3015</td>
<td>81</td>
<td>5 ft.</td>
<td>Like core 80 at 2996-3005 ft.</td>
</tr>
<tr>
<td>3015-3025</td>
<td>82</td>
<td>6 ft.</td>
<td>No change.</td>
</tr>
</tbody>
</table>
| 3025-3035   | 83   | 5 ft.    | Top 3 ft. Shale, brownish-gray, somewhat micaceous, calcareous, very highly microfossiliferous, containing comminuted fossil debris, specimens of small Foraminifera and very abundant *Inoceramus* prisms and fragments. Microfauna consists, mainly,
**Description**

of *Globigerina cretacea*, *Gümbelina reussi*, *Gümbelina moremani* (specimens rare in preceding samples, common in this sample), a small *Anomalina* sp., a few specimens of *Globotruncana*, a large, flat form of *Globigerina(?) cretacea* (common), and a few specimens of *Globorotalites umbilicatus*.

**Bottom 2 feet. No samples.**

3035-3045 Core 84. Recovery 10 ft.
Top 9 feet. Like core 83 at 3025-3035 ft; contains abundant fragments of *Inoceramus* and other bivalves. Specimens of *Globotruncana* are more common than in core 83.

**Bottom 1 foot. Shale, light-gray, hard, dense, calcareous.** *Inoceramus* fragments are relatively scarce, but material is too well-indurated for fauna to wash from sample. Specimens identified are same as in core 83.

3045-3055 Core 85. Recovery 10 ft.
Top 5 (?) feet. Shale, brownish-gray, calcareous, very highly fossiliferous, giving shale a somewhat speckled appearance. No marked change in microfauna.

**2nd 4 feet. Marl, gray, somewhat micaceous, light-speckled owing to abundance of *Inoceramus* fragments and comminuted fossil debris. No marked change in microfauna.**

**Bottom (?) 1 foot. Shale, light-gray, hard, dense, calcareous, microfossiliferous.**

3055-3065 Core 86. Recovery 8 ft.
Top 2 feet. Material like bottom of core 85 at 3045-3055 ft. and lenses of smooth, dark-gray, flaky shale containing many irregular-shaped, gray, phosphatic nodules.

**Bottom 6 feet. Shale, greenish-gray, flaky, micaceous, containing crushed fragments of fossil (?) material and some fragments of fish scales. Microfauna consists of several species of *Gümbelina*, *Globigerina cretacea* (small variety), specimens of *Globorotalites umbilicatus*, a few specimens of *Globotruncana cretacea*, and specimens of *Planulina eaglerfordensis*.**

3065-3075 Core 87. Recovery 10 ft.
Shale, gray, flaky, calcareous, similar to core 86; contains small fragments of fish scales and an irregular-shaped area in which large amounts of crushed chalky material seem to be composed of small, broken fragments of fossils.

**Third 2 feet. Shale, dark-gray, flaky, slightly micaceous, calcareous. The speckled appearance of the shale is due to many rather evenly distributed small chalky specimens of Foraminifera and fragments of *Inoceramus*. An *Anomalina* sp. and two species of *Gümbelina* are the dominant specimens of Foraminifera, and specimens of *Eowigerina* cf. *E. austiniana* are also present.**
**Description**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Core</th>
<th>Recovery</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>3075-3085</td>
<td>88</td>
<td>5 ft.</td>
<td>Like core 87 at 3065-3075 ft.</td>
</tr>
<tr>
<td>3085-3095</td>
<td>89</td>
<td>7 ft.</td>
<td>No change.</td>
</tr>
<tr>
<td>3090-3100</td>
<td></td>
<td></td>
<td>Fragments of <em>Citharina texana</em> var. were first observed in this sample of cuttings, but the highest occurrence in the well may have been above this depth.</td>
</tr>
<tr>
<td>3095-3105</td>
<td>90</td>
<td>10 ft.</td>
<td>Top 5 feet. Shale, gray, flaky, microfossiliferous, like that described for the third 2 feet of core 87 at 3065-3075 ft. Core 90 contains fragments of <em>Inoceramus</em> and other macrofossils. Foraminiferal fauna is like core 87, but specimens of <em>Globigerina cretacea</em> var. are much more common, and some specimens of <em>Globotruncana</em> are present. Bottom 5 ft. Like the top 5 ft. but specimens of Foraminifera are less abundant and some specimens of <em>Citharina texana</em> var. are present.</td>
</tr>
<tr>
<td>3105-3115</td>
<td>91</td>
<td>10 ft.</td>
<td>Like core 90 at 3095-3105 ft. Fragments of <em>Inoceramus</em> and other macrofossils are present; microfauna is like core 90.</td>
</tr>
<tr>
<td>3115-3125</td>
<td>92</td>
<td>10 ft.</td>
<td>Like core 91 at 3105-3115 ft. with the addition of tubular inclusions of pyrite. <em>Inoceramus</em> fragments are common. Microfauna is like core 91 but specimens are somewhat less abundant; specimens of <em>Citharina texana</em> var. are common.</td>
</tr>
<tr>
<td>3125-3135</td>
<td>93</td>
<td>7 ft.</td>
<td>Like core 92 at 3115-3125 ft. Specimens of <em>Dorothia alexanderi</em> are present.</td>
</tr>
<tr>
<td>3135-3145</td>
<td>94</td>
<td>10 ft.</td>
<td>Top of deeper-water marine facies of upper member of Atkinson Formation. Top 9½ feet. Clay, dark brownish-gray, flaky, highly sandy and micaceous, somewhat carbonaceous and pyritic; contains many fragments of <em>Ostrea</em> sp. The sand grains are fine, even, and angular. Bottom ½ foot. Sandstone, soft, somewhat argillaceous, glauconitic, micaceous; the grains are fine, even angular, clear quartz.</td>
</tr>
<tr>
<td>3145-3155</td>
<td>95</td>
<td>10 ft.</td>
<td>Top 5 feet. Sandstone like bottom of core 94 at 3135-3145 ft., containing some thin lenses of brownish-gray, flaky, micaceous, carbonaceous, somewhat glauconitic clay. Fragments of <em>Ostrea</em> sp. are common. Bottom 5 feet. Like top 5 feet, but only slightly glauconitic.</td>
</tr>
</tbody>
</table>
LOGS OF SELECTED WELLS IN THE COASTAL PLAIN OF GEORGIA

Description

Depth

(Feet)

3155-3165
Core 96. Recovery 9 ft.
Top 7 feet. Clay, light-gray, highly sandy (fine-grained sand), highly-micaceous, glauconitic, calcareous. Bottom 2 feet. Clay, greenish-gray, irregularly sandy (very fine grained sand), micaceous, glauconitic, carbonaceous, calcareous. The clay contains numerous reddish-brown, small, irregular-shaped nodules of siderite, and some fragments of fish scales. A few specimens of *Globigerina cretacea* in the washed sample may not be indigenous.

3165-3175
Core 97. Recovery 9 ft.
Clay, greenish-gray, soft, somewhat sandy (fine-grained sand), highly micaceous, (biotite and muscovite), calcareous, slightly carbonaceous. The clay contains some small, grayish-brown, irregular-shaped nodules of siderite.

3175-3185
Core 98. Recovery 10 ft.
Clay, greenish-gray, flaky, micaceous, calcareous, containing irregular, highly sandy (fine-grained sand), glauconitic areas. The clay contains small gray and light-brown, irregular-shaped nodules of siderite.

3185-3205
Core 99. Recovery 1 ft.
Shale, olive-gray, flaky, somewhat micaceous, slightly carbonaceous, calcareous.

3195-3205
Core 100. Recovery 10 ft.
Shale, like core 99 at 3185-3195 ft. but irregularly sandy (fine-grained sand), and more highly micaceous. The shale contains some fragments of fish bones, fish scales, and nodules of siderite. The fauna is composed of a few *Inoceramus* prisms and specimens of *Planulina caglefordensis*, *Gümbelina* sp., *Valvulineria infrequens* var., *Globigerina cretacea*, and *Hastigerinella monmani* Cushman.

3205-3215
Core 101. Recovery 7 ft.
Like core 100 at 3195-3205 ft.

3215-3225
Core 102. Recovery 10 ft.
Clay, olive-gray, sandy (very fine grained sand), micaceous; contains fragments of fossil bivalves, fish bones and teeth, phosphatic nodules, a little glauconite and a few specimens of Foraminifera like core 100 at 3195-3205 ft.

3225-3235
Core 103. Recovery 7 ft.
Shale, greenish-gray, flaky, somewhat micaceous, containing irregular areas and thin lenses which are highly sandy (fine-grained sand) and somewhat glauconitic. The fauna is composed of small scattered fragments of fish bones and scales, and a few specimens of Foraminifera like core 100 at 3195-3205 ft.

3235-3245
Core 104. Recovery 10 ft.
Top 7 feet. Marl, gray, thinly laminated, slightly micaceous, containing irregular areas of very fine grained sand.
Middle 5 feet. Like the top 7 feet. Contains abundant specimens
Description

of Foraminifera; Planulina · eaglefordensis, Gümbelina · moremanii, Globigerina · cretacea var., and a very few specimens of Globotruncana · G. · arca, Ammobaculites · and Gaudryina · G. · foeda.

Bottom 3 feet. Marl, greenish-gray; contains a species of Massilina characteristic of the Eagle Ford shale in Texas.

Core 105. Recovery 10 ft.
Top 5 feet. Marl, gray, thinly laminated, micaceous; contains fish scales and specimens of Foraminifera.
Bottom 5 feet. Marl, gray, flaky, slightly micaceous; contains fish scales and many specimens of Foraminifera.

Core 106. Recovery 5 ft.
Top 3 feet. Shale, greenish-gray, irregularly sandy (moderately coarse grained sand), somewhat glauconitic.
Bottom 2 feet. Shale, gray, smooth, thinly laminated, containing fragments of macrofossils, and irregular light-gray silty and micaceous areas.

Core 107. Recovery 2 ft.
Top of shallow-water marine facies of upper member of Atkinson Formation. The electric log shows the top of 3253 ft.
Top 1 foot. Sandstone, light-gray, hard, moderately coarse grained, clear quartz and a few peach-colored grains. Contains fragments of Ostrea sp., and some scattered nodules of glauconite.
Bottom 1 foot. Shale, gray, smooth, moderately soft, argillaceous, moderately fine grained sandstone, containing fragments of carbonaceous material.

Core 108. Recovery 5 feet.
Top 1 foot. Sandstone, greenish-gray, moderately hard, argillaceous, micaceous, slightly glauconitic and sandy clay. Sand is very fine to moderately fine grained. Core contains fragments of macrofossils.
Second 1 foot. Clay, gray, highly micaceous, sandy (very fine grained sand), containing areas of smooth, blue-gray, marly shale. A few shell fragments present in the core.
Bottom 3 feet. Clay, shaly, greenish-gray, highly micaceous, sandy (fine-grained sand), carbonaceous.
Core contains many fragments of fossil bivalves.

Core 109. Recovery 4 ft.
Top. Like bottom 3 feet of core 108 at 3266-3271 ft. but more coarsely sandy. The sand is gray, argillaceous, highly micaceous.
Bottom. Sandstone, light-gray, moderately soft, argillaceous, moderately fine grained, micaceous; contains a few fragments of fossil bivalves and numerous fragments of carbonaceous material.
## Description

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Core</th>
<th>Recovery</th>
<th>Description</th>
</tr>
</thead>
</table>
| 3276-3286   | 110. | 5 ft.    | Top. Shale, greenish-gray, thinly flaky, highly micaceous, slightly carbonaceous.  
Bottom. Like the top part but more highly carbonaceous, and containing shell fragments. |
| 3286-3293   | 111. | 2 ft.    | Top 1 foot. Sandstone, light-gray, hard, dense, moderately fine grained; contains numerous fragments of *Gryphea* sp., and small nodules of black (phosphatic?) material.  
Bottom 1 foot. Alternating thin lenses of gray shale and very fine to moderately fine grained, glauconitic, micaceous, argillaceous sandstone. Core contains fragments of fossil bivalves. |
| 3293-3298   | 112. | 2 ft.    | Sandstone, white, soft, micaceous, argillaceous, very fine to moderately fine grained. |
| 3298-3308   | 113. | ½ ft.    | Sandstone, light-gray, hard, dense, fine to moderately fine grained; contains many fragments of fossil bivalves, fragments of carbonaceous material, and phosphatic nodules. |
| 3308-3318   | 114. | 6 ft.    | Top 4 feet. Sandstone, light-gray, soft, argillaceous, fine grained, highly micaceous, somewhat carbonaceous, slightly glauconitic.  
Bottom 2 feet. Shale, greenish-gray, thinly flaky, somewhat micaceous, irregularly interbedded with moderately fine grained argillaceous sandstone. The shale contains lenses of light-gray, slightly carbonaceous siltstone in which siderite pellets are present. |
| 3318-3328   | 115. | 8 ft.    | Top 4 feet. Shale, greenish-gray, micaceous, intergrading with light-gray, highly micaceous siltstone. The core contains fragments of carbonaceous material, phosphatic material, and a few traces of macrofossils.  
2nd 2 feet. Sandstone, light-gray, moderately hard, moderately fine grained, argillaceous, highly glauconitic and micaceous.  
Bottom 2 feet. Like the 2nd 2 feet but sandstone is somewhat coarser grained. |
| 3328-3338   | 116. | 5 ft.    | Top 4 ft. Sandstone, light-gray, moderately soft, moderately fine grained, highly glauconitic and micaceous.  
Bottom 1 foot. Sandstone, light-gray, moderately soft, silty to moderately coarse grained, cross-bedded, micaceous, somewhat carbonaceous. |
| 3338-3347   | 117. | 5 ft.    | Top 1 foot. Sandstone, light-gray, moderately hard, fine to moderately fine grained, argillaceous, glauconitic, somewhat |
**Description**

micaceous; contains fragments of fossil bivalves and many fragments of phosphatic material.

Bottom 4 feet. Sandstone, moderately soft, fine to moderately fine grained, glauconitic, argillaceous, somewhat micaceous; contains many inclusions of carbonaceous material.

Core 118. Recovery 5 ft.
Sandstone, light-gray, soft, silty to moderately fine grained, glauconitic.

Core 119. Recovery 10 ft.
Top 1 foot. Sandstone, light greenish-gray, like core 118 at 3347-3357 feet; contains many fragments of phosphatic material.
2nd 1 foot. Sandstone, light-gray, loosely consolidated, very fine to moderately coarse grained, glauconitic, micaceous.

Bottom 8 feet. Sandstone, loosely consolidated, silty to fine to coarse grained, glauconitic, micaceous.

Core 120. Recovery 5 ft.
Top 1 foot. Sandstone, loosely consolidated, fine to coarse-grained, micaceous.

Core 121. Recovery 6 ft.
Top 1 foot. Sandstone, light-gray, moderately soft, fine to moderately coarse grained, somewhat carbonaceous.
2nd 1 foot. Sandstone, soft, silty to fine to coarse-grained, somewhat micaceous, carbonaceous; contains nodules of light-brown to yellowish, soft limonite.

Bottom 4 feet. Siltstone, light-gray, moderately soft, micaceous.

Core 122. Recovery 8 ft.
Like bottom 4 feet of core 121 at 3377-3387 ft.

Core 123. Recovery 4 ft.
Sandstone, light-gray, moderately soft, coarse-grained, argillaceous, micaceous.

Core 124. Recovery ½ ft.
Sandstone, light-gray, fine-grained, micaceous.

Core 125. Recovery 4 ft.
Top 1 foot. Sandstone, light-gray, hard, dense, conglomeratic (fine to coarse-grained sand). Contains irregular-shaped inclusions of light greenish-gray and dark-gray clay; black, carbonaceous, highly pyritic clay; a few nodules of limonite; and a trace of glauconite.

Bottom 3 feet. Sandstone, light-gray, moderately soft, moderately fine grained, argillaceous.

Core 126. Recovery 4 ft.
Sandstone, light-gray, soft, poorly sorted, moderately fine to moderately coarse grained, argillaceous, containing highly micaceous, glauconitic, and lignitic lenses.
### Description

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<tr>
<td>3538-3558</td>
<td>Top 1 foot. Siltstone, greenish-gray, dense, finely micaceous, containing many fragments of carbonized plant remains. Bottom 4 feet. Sandstone, light greenish-gray, soft, moderately fine to coarse grained, silty, argillaceous.</td>
<td>Top 2 feet. Sandstone, light-gray, moderately hard, dense, moderately coarse-grained, slightly pyritic. The sand grains are clear quartz. Middle, 1 foot. Siltstone, white, soft, micaceous. Bottom 2 feet. Sandstone, light-gray, moderately hard, moderately coarse to coarse-grained, somewhat pyritic, containing worn fragments of a bivalve Ostrea (?) sp.</td>
<td>Top 1 foot. Sandstone, gray, hard, dense, coarse-grained, quartzitic, containing many irregular-shaped inclusions of greenish-gray clay, glauconite and carbonaceous plant fragments. 2nd 1 foot. Clay, light greenish-gray, micaceous, highly sandy (fine-grained sand). 3d 4 inches. Sandstone, white, moderately hard, dense, moderately fine-grained, glauconitic. 4th, 5 inches. Sandstone, greenish-gray, moderately coarse grained, argillaceous, micaceous, containing inclusions of thinly laminated green shale that seem to have been secondarily deposited in the sandstone. 5th 3 inches. Sandstone, light-gray, moderately hard, moderately fine to coarse-grained, mainly clear quartz but containing peach-colored grains.</td>
<td>Top 1 foot. Sandstone, light-gray, hard, dense, moderately fine grained, micaceous, clear quartz, containing a few pinkish grains, dark-green nodules of glauconite, and highly pyritic areas. 2nd 1 foot. Like top 1 foot. 3d 1 foot. Sandstone, light-gray, hard, fine-grained, micaceous, glauconitic. 4th 1 foot. Clay, greenish-gray, slightly sandy, micaceous and somewhat carbonaceous.</td>
<td>Top 1 foot. Sandstone, moderately hard, moderately coarse grained, micaceous, glauconitic, containing fragments of carbonaceous material, a few phosphatic nodules and greenish-gray inclusions (probably secondary).</td>
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</tr>
</tbody>
</table>
Description

Middle 1 foot. Silt, gray, somewhat carbonaceous, containing irregular areas that are sandy, micaceous and slightly glauconitic.

Bottom 1 foot. Sandstone, light-gray, hard, dense, moderately coarse-grained, micaceous, glauconitic.

Core 143. Recovery 8 ft.
Top 1 foot. Sandstone, hard, moderately coarse-grained, calcareous, glauconitic, composed mainly of clear quartz grains and few pink or peach-colored grains.

2nd 1 foot. Shale, greenish-gray, thinly flaky, silty to sandy, containing a few small carbonaceous fragments.

3d 2 feet. Sandstone, light-gray, hard, moderately coarse-grained, micaceous, glauconitic, containing numerous inclusions of carbonized plant fragments.

4th 2 feet. Clay, greenish-gray, silty, micaceous, containing lenses of dark-greenish-gray thinly laminated shale.

5th 2 feet. Sandstone, light-gray, hard, dense, moderately fine-grained, micaceous, glauconitic.

Core 144. Recovery 8 ft.
Top 3 feet. Shale, greenish-gray, flaky, micaceous, containing communinutated carbonaceous fragments.

2nd 1 foot. Conglomerate, composed of dense, moderately fine-grained, glauconitic sandstone containing secondary nodular inclusions of green and dark brownish-gray clay, limonite nodules, many worn and broken shell fragments, and fragments of carbonaceous material. Another part of the core is soft, coarse-grained, micaceous sandstone.

3d 3 feet. Siltstone, light-gray, glauconitic, micaceous, and lenses of dark greenish-gray, unctuous shale.

4th 1 foot. Sandstone, light-gray, hard, dense, conglomeratic, glauconitic; contains worn shell-fragments, fragments of pyritized lignite, and nodular fragments of greenish-gray clay and of limonite. Another part of the core is dense, glauconitic, micaceous sandstone containing abundant small scattered fragments of limonite.

Core 145. Recovery 7 ft.
Top 3 feet. Sandstone, light-gray, dense, very highly micaceous (muscovite and biotite), glauconitic.

Bottom 4 feet. Shale, greenish-gray to dark green, smooth-textured, slightly micaceous and carbonaceous, non-calcareous. The bottom foot is irregularly highly sandy (fine-grained sand) and micaceous.

Clay, brownish-gray, micaceous and fragments of light-gray and brownish-gray sandstone; shell fragments present.
<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3720-3730</td>
<td>Shale, greenish-gray, and many fragments of white, moderately fine grained glauconitic, micaceous sandstone; numerous shell fragments and a few carbonaceous fragments. Top of the lower member of the Atkinson Formation (marine facies) is at 3723 ft. on the electric log of the well.</td>
</tr>
<tr>
<td>3730-3750</td>
<td>Like sample at 3720-3730 ft.</td>
</tr>
<tr>
<td>3750-3760</td>
<td>Like sample at 3730-3750 ft; fragments of lignite are common, and a few, probably indigenous specimens of ostracodes are present.</td>
</tr>
<tr>
<td>3760-3770</td>
<td>Shale, gray and greenish-gray, and many fragments of irregularly sandy, somewhat glauconitic, highly macrofossiliferous limestone, which also contain specimens of ostracodes like those in sample at 3750-3760 ft. The sample contains fragments of sandstone and fragments of lignite.</td>
</tr>
<tr>
<td>3770-3790</td>
<td>No change.</td>
</tr>
<tr>
<td>3790-3800</td>
<td>Shale, olive-gray, flaky, and fragments of fossiliferous limestone.</td>
</tr>
<tr>
<td>3800-3810</td>
<td>Like sample at 3790-3800 ft; fragments of fossil bivalves; limestone fragments more abundant.</td>
</tr>
<tr>
<td>3810-3820</td>
<td>Shale, olive-gray, fragments of Ostrea(?) sp., and several types of sandstone. Sample contains specimens of Ammobaculites agrestis and Ammotium braunsteini.</td>
</tr>
<tr>
<td>3820-3830</td>
<td>Shale, greenish-gray, flaky, somewhat micaceous.</td>
</tr>
<tr>
<td>3830-3840</td>
<td>Shale, gray, containing shell fragments.</td>
</tr>
<tr>
<td>3840-3850</td>
<td>Shale, greenish-gray, flaky, 50 percent; and 50 percent moderately coarse grained quartz sandstone containing grains of pink feldspar.</td>
</tr>
<tr>
<td>3850-3860</td>
<td>Like sample at 3840-3850 ft., but sandstone is less than 50 percent.</td>
</tr>
<tr>
<td>3860-3870</td>
<td>Shale, greenish-gray, flaky, a little sandstone, and numerous fragments of white bentonite.</td>
</tr>
</tbody>
</table>

**Comanche Series. Undifferentiated**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3870-3880</td>
<td>Shale, flaky, and coarse-grained sandstone like sample at 3860-3870 ft. Sample also contains fragments of sandy (fine-grained sand) bentonite, first observed in sample at 3860-3870 ft., numerous fragments of brownish and purplish-red micaceous clay; siderite pellets (possibly caving from higher levels); fragments of pink-stained, nodular limestone.</td>
</tr>
<tr>
<td>3880-3890</td>
<td>Shale, gray and greenish-gray, flaky, and many fragments of brick-red, purplish-red, red and gray mottled, and mustard and gray mottled, micaceous, sandy shale; light greenish-brown siderite nodules; pink-stained limestone nodules; a little coarse-grained, unconsolidated sand.</td>
</tr>
<tr>
<td>3890-3900</td>
<td>Like sample at 3880-3890 ft., but no limestone nodules.</td>
</tr>
</tbody>
</table>


**Description**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3900-3910</td>
<td>Sand, unconsolidated, coarse-grained, quartz, and scattered grains of feldspar, about 75 percent; gray, thinly flaky shale, and red and multicolored shale about 25 percent of sample.</td>
</tr>
<tr>
<td>3910-3920</td>
<td>Sand, coarse-grained, and shale like sample at 3900-3910 ft., sample contains many grains of pink and yellow feldspar, and a few grains of greenish-yellow quartz (?).</td>
</tr>
<tr>
<td>3920-3930</td>
<td>Like sample at 3910-3920 ft., but shale fragments are more abundant.</td>
</tr>
<tr>
<td>3930-3940</td>
<td>No change.</td>
</tr>
<tr>
<td>3940-3950</td>
<td>Like sample at 3930-3940 ft., but fragments of red shale, red and mustard mottled shale, and purple shale are very abundant.</td>
</tr>
<tr>
<td>3950-3960</td>
<td>Sand, unconsolidated, pinkish-gray, coarse-grained, quartz, and many red-stained grains. Sample contains fragments of red, purple and mottled shale.</td>
</tr>
<tr>
<td>3960-4060</td>
<td>No change.</td>
</tr>
<tr>
<td>4060-4070</td>
<td>Mudstone, gray, red, purple, and mottled; unconsolidated sand like that described in sample at 3950-3960 ft. Grains of feldspar are common, and fragments of shale are abundant.</td>
</tr>
<tr>
<td>4070-4080</td>
<td>Clay, red, and fine to very coarse grained quartz sand; a little feldspar.</td>
</tr>
<tr>
<td>4080-4090</td>
<td>Sand, fine to very coarse grained; a little red feldspar.</td>
</tr>
<tr>
<td>4090-4095</td>
<td>Sand, like sample at 4080-4090 ft.; a little red shale; abundant cavings of gray shale.</td>
</tr>
<tr>
<td>4095-4100</td>
<td>Clay shale, bright red, 50 percent of sample; cavings of gray shale 50 percent.</td>
</tr>
<tr>
<td>4097-4102</td>
<td>Core 146. Recovery 0.</td>
</tr>
<tr>
<td>4100-4110</td>
<td>Clay, gray, one-third of sample; clay shale, one-third of sample; sand, one-third of sample.</td>
</tr>
<tr>
<td>4110-4120</td>
<td>Clay shale, red 75 percent; sand 25 percent.</td>
</tr>
<tr>
<td>4120-4130</td>
<td>Sand, fine to very coarse grained, subangular, red-stained quartz; staining probably from red clay matrix. Yellow grains of quartz, and grains of feldspar are present.</td>
</tr>
<tr>
<td>4130-4140</td>
<td>Sand, like sample at 4120-4130 ft.</td>
</tr>
<tr>
<td>4140-4150</td>
<td>Sand, yellow-tinted grains, and bright yellow clay that is probably the matrix in which the sand occurs; a few varicolored pebbles of igneous (?) rocks; rounded pebbles of red and yellow feldspar; rounded pebbles of yellow quartz.</td>
</tr>
<tr>
<td>4150-4160</td>
<td>Sand, moderately coarse grained, quartz; grains of feldspar and a little red clay.</td>
</tr>
<tr>
<td>4160-4170</td>
<td>Sand, fine to very coarse grained, quartz; a little feldspar; a few pebbles of igneous (?) rocks; a few small fragments of red clay.</td>
</tr>
<tr>
<td>4164-4167</td>
<td>Core 147. Recovery 3 ft.</td>
</tr>
<tr>
<td></td>
<td>Top. Clay, brownish-red, silty, micaceous.</td>
</tr>
</tbody>
</table>
Description

Bottom. Like top sample, and irregularly streaked with light bluish-gray, silty to sandy (fine-grained sand), argillaceous clay.

4170-4180 Clay, red, 75 percent; sand, like sample at 4160-4170 25 percent.
4180-4190 No change.
4190-4200 Sand, 50 percent; clay 50 percent. Sand is in part, like sample at 4160-4170 ft., and in part, fragments of fine-grained, even-grained, soft sandstone containing grains of red feldspar, and hard yellow clay.
4200-4210 Sandstone, fine to very coarse grained, composed of yellow and red-stained grains, and a few grains of feldspar; also medium-grained sandstone having small amount of matrix.
4210-4220 Sand, yellow and white, mostly coarse-grained, quartz and a little feldspar.

Pre-Cretaceous

4220-4280 Igneous rock.
4279-4282\(\frac{1}{2}\) Core 148. Recovery 3 ft. Igneous rock.
4280-4296 T.D. No samples.

BACON COUNTY

Operator: City of Alma Well 1  
Location: City of Alma, Ga.
GGS: No. 58  
Elevation: 195 ft. (approx.)
Total depth: 626 ft.
Completed: May 20, 1938

Summary of Stratigraphy

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Thickness (feet)</th>
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</thead>
<tbody>
<tr>
<td>Tertiary</td>
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<tr>
<td>Pliocene to Recent</td>
<td>Surface 50</td>
</tr>
<tr>
<td>No samples</td>
<td>50</td>
</tr>
<tr>
<td>Miocene undifferentiated</td>
<td>64 386</td>
</tr>
<tr>
<td>Oligocene upper, Suwannee Limestone</td>
<td>450 50</td>
</tr>
<tr>
<td>Eocene upper, Ocala Limestone upper member</td>
<td>500 total 126 depth</td>
</tr>
</tbody>
</table>

Lithologic and paleontologic description of cuttings and cores. Samples are cuttings unless otherwise stated.
**Description**

**Pliocene Series to Recent Series**

<table>
<thead>
<tr>
<th>Depth  (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0- 10</td>
<td>Sand, quartz, dark, reddish-brown, coarse-grained argillaceous.</td>
</tr>
<tr>
<td>10- 40</td>
<td>Clay, red, sandy. Washed residue, large; composed of fine-grained, angular, clear quartz sand, red-stained by the clay matrix.</td>
</tr>
<tr>
<td>40- 50</td>
<td>Sand, quartz, clear, coarse-grained, subangular, etched.</td>
</tr>
<tr>
<td>50- 64</td>
<td>No samples.</td>
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</tbody>
</table>

**Miocene Series undifferentiated**

<table>
<thead>
<tr>
<th>Depth  (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>64- 118</td>
<td>Clay, greenish-gray, sandy. Washed residue, large; composed of fine-grained, angular, clear quartz sand, and several fragments of carbonaceous material.</td>
</tr>
<tr>
<td>118</td>
<td>Clay, greenish-gray, sandy. Washed residue, large; composed of moderately coarse grained, subangular, moderately even grained, clear quartz sand, and a few fragments of the clay matrix.</td>
</tr>
<tr>
<td>118- 140</td>
<td>Chalk, white, sandy, soft. Washed residue, large; composed, chiefly, of nodules of hard sandy chalk, some of which contain worn fragments of macroscopic fossils (Ostrea (?) sp.); about 10 percent of washed residue is clear, uneven-grained, quartz sand.</td>
</tr>
<tr>
<td>140- 150</td>
<td>Clay, greenish-tan, sandy. Washed residue, moderately small; composed of fragments of clay and about 50 percent clear, angular, uneven-grained quartz sand.</td>
</tr>
<tr>
<td>150- 160</td>
<td>Clay, light-tan, sandy. Washed residue, small; composed of clear quartz sand, a few nodules of hard limestone as in sample at 118-140 ft., and a few fragments of greenish-gray carbonaceous clay.</td>
</tr>
<tr>
<td>160- 170</td>
<td>Clay, tan, sandy. Washed residue, moderately large; composed of very uneven grained, clear quartz sand, and about 10 percent fragments of hard clay.</td>
</tr>
<tr>
<td>170- 180</td>
<td>Clay, tan, somewhat sandy. Washed residue, small; composed of fragments of hard clay, and about 50 percent very uneven grained clear quartz sand.</td>
</tr>
<tr>
<td>180- 190</td>
<td>Clay, greenish-tan, sandy. Washed residue, moderately large; composed of nodular fragments of hard calcareous clay, and about 50 percent very uneven grained clear quartz sand.</td>
</tr>
<tr>
<td>190- 200</td>
<td>Clay, light-brown, sandy. Washed residue, moderately large; composed of very uneven grained, angular, clear quartz sand.</td>
</tr>
<tr>
<td>200- 210</td>
<td>Sand, quartz, clear, angular, uneven-grained, and about 25 percent light-brown chert; a few fragments of white chalky limestone.</td>
</tr>
<tr>
<td>210- 220</td>
<td>Sand, quartz, clear, uneven-grained; a few fragments of white chalky limestone, as in the sample at 200-210 ft., and a few fragments of grayish-green, sandy clay shale.</td>
</tr>
<tr>
<td>220- 230</td>
<td>Limestone, cream, soft, chalky, irregularly sandy, and about 25 percent uneven-grained quartz sand; a small amount of light-brown chert.</td>
</tr>
<tr>
<td>230- 240</td>
<td>Limestone, white, chalky, sandy, and greenish-gray, shaly, sandy clay. Washed residue, moderately large; composed of fragments</td>
</tr>
</tbody>
</table>
of hard limestone, and nodular fragments of calcareous clay; about 25 percent of the washed residue is uneven-grained, clear quartz sand.

240-260 Clay, greenish-tan. Washed residue, small; composed of small fragments of clay, and about 50 percent very uneven grained clear quartz sand; a few small, black, phosphatic pebbles.

260-270 Chalk, soft, sandy. Washed residue, moderately large; composed of about 75 percent nodular fragments of hard sandy chalk containing inclusions of shells (ostracodes?); about 25 percent fine, angular, clear quartz sand, and a few small, black, phosphatic pebbles.

270-280 Like sample at 260-270 feet, but nodular fragments of limestone constitute about 25 percent of the washed residue, and sand constitutes about 75 percent.

280-290 Sand, fine, uneven-grained, and a few nodules of hard sandy chalk.

290-300 Clay, tan, sandy (fine-grained sand). Washed residue, very small; composed of fine-grained, angular, clear quartz sand, and a few resistant fragments of light greenish-gray unctuous clay.

300-310 Clay, greenish-tan, sandy. Washed residue, small; composed of fine-grained, angular, clear (white) quartz sand.

310-320 Clay, greenish-gray, sandy (fine-grained sand). Washed residue, small; composed of fine-grained sand, and about 10 percent small, tough fragments of clay.

320-340 Bit sample.

340-350 Clay, greenish-gray, somewhat sandy. Washed residue, very small; composed of sand like sample at 320-340 ft., and about 10 percent fragments of hard clay.

350-360 Clay, greenish-gray, sandy. Washed residue is small, and similar to the sample at 340-350 ft.

360-370 Clay, sandy, and chalk. Washed residue, large; composed of fragments of hard sandy, chalky limestone, and about 25 percent uneven-grained, clear quartz sand. Some fragments of limestone show traces of embedded worn and broken fossil shells.

370-380 Like sample at 360-370 ft.; sand composes about 75 percent of the sample.

380-400 Limestone, white, nodular, is about 50 percent of the sample, and coarse, uneven-grained quartz sand is about 50 percent. The limestone shows traces of worn and fragmented fossil shells.

400-410 Limestone, light-gray and light-tan, hard, nodular, sandy, containing traces of fragmented and very much worn fossil shells. About 25 percent of the sample is composed of clear, angular, fine-grained quartz sand.

410-430 Limestone, white, sandy, nodular, containing a few small, black, phosphatic pebbles, and many worn fragments of fossil shells, among which are Barnea sp., Ostrea sp., large echinoid spines, and crab claws. About 50 percent of the sample is composed of fine-grained, angular, clear quartz sand, and many small, black, phosphatic pebbles.
## Logs of Selected Wells in the Coastal Plain of Georgia

### Description

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>430-450</td>
<td>Like sample at 410-430 ft., but showing an increase in sand content.</td>
</tr>
</tbody>
</table>

### Oligocene Series

**Upper Oligocene**

#### Suwannee Limestone

- **450-460**
  - Limestone, white, hard, nodular. Some fragments of the limestone are porous and oolitic, and many fragments contain worn and broken fossil shells. Megafossils are, chiefly, *Ostrea* sp., *Pecten* sp., and Echinoids. Microfossils are, chiefly, molds of a small, sharply conical form of *Coskinolina cookei*, poorly-preserved specimens of *Archais* sp. and *Rotalia* cf. *R. mexicana*, and a few specimens of *Gypsina* sp., *Elphidium* cf. *E. chapmani*, *Eponides* sp., and *Quinqueloculina* spp.

- **460-470**

- **470-490**
  - No change.

- **490-500**
  - Similar to samples at 450-470 ft., but the fossil material is less well preserved.

### Eocene Series

**Upper Eocene**

#### Ocala Limestone

- **500-510**
  - Limestone, cream, hard, highly fossiliferous. The dominant macrofossils are fragments of Bryozoan, *Ostrea* sp., and *Pecten* sp. Microfossils are, chiefly, specimens of *Operculina* cf. *O. floridensis*, *Lepidocyclina ocalana*, *Asterocyclus georgiana*, *Sphaerogypsina globula*.

- **510-520**
  - No sample.

- **520-530**
  - Limestone, cream, coquinoi d, composed, mainly, of calcitised bryozoan fragments, many specimens of *Operculina* sp., and a few specimens of *Lepidocyclina* sp.

- **530-540**
  - Limestone, white, hard, coquinoi d, composed of fragments of Bryozoan, *Ostrea* sp., *Pecten* sp., and many specimens of species of Foraminifera as in sample at 500-510 ft.

- **540-550**
  - Like sample at 530-540 ft., containing many specimens of Foraminifera. The most abundant species are: *Lepidocyclina ocalana*, *Operculina floridensis*, *Heterostegina ocalana*, *Asterocyclus georgiana*, *Cibicides lobatulus var.*, *Sphaerogypsina globula*, *Eponides budensis*. 
Description

Eponides jacksonensis
Eponides n. sp.
Guttulina irregularis
Siphonina jacksonensis
Nionion advenum var.

550- 560  Like sample at 530-540 ft. The most abundant species are: Operculina floridensis, Asterocyclus georgiana, and Heterostegina ocalana. Robulus limbosus var. is fairly common, and other species are as listed in sample at 540-550 ft.

560- 570  Like sample at 550-560 ft.
570- 580  Like sample at 550-560 ft. Specimens of Lepidocyclina cf. L. cookei are common.
580- 590  No sample.
590- 600  Like sample at 570-580 ft.
600- 626 T.D. Like sample at 570-580 ft.

BROOKS COUNTY

Operator: D. E. Hughes  GGS. No. 184
Landowner: E. M. Rogers, Sr., Well 1 B  Elevation: 136 ft. (derrick floor)
Location: Land District 12, Land Lot 454  Total depth: 3850 ft.
2830 ft. south and 1570 ft. west of  Completed: Apr. 12, 1949
northeast corner of Land Lot 454.

Summary of Stratigraphy

Tertiary

Paleocene

in beds containing Tamesi fauna;
1st sample at 2200 ft.

Cretaceous

<table>
<thead>
<tr>
<th>Beds of Navarro (?) age or</th>
<th>Depth (feet)</th>
<th>Thickness (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taylor (?) age</td>
<td>2230</td>
<td>100</td>
</tr>
<tr>
<td>Beds of Taylor age (definite)</td>
<td>2330</td>
<td>220</td>
</tr>
<tr>
<td>Beds of Austin age</td>
<td>2550</td>
<td>540</td>
</tr>
<tr>
<td>Atkinson Formation, upper member</td>
<td>3090</td>
<td>300</td>
</tr>
<tr>
<td>do lower member</td>
<td>3390</td>
<td>230</td>
</tr>
<tr>
<td>Comanche undifferentiated</td>
<td>3620</td>
<td>230</td>
</tr>
<tr>
<td></td>
<td>to total depth</td>
<td></td>
</tr>
</tbody>
</table>

Lithologic and paleontologic description of cuttings and cores. Samples are cuttings unless otherwise stated.
Logs of Selected Wells in the Coastal Plain of Georgia

Description

Tertiary

In Paleocene Series

2200-2210 Shale, gray, marly, and fine to medium-grained sand, 50 percent of sample; specimens of species of Foraminifera indicative of the beds of Paleocene age containing the Tamesí fauna, 50 percent of sample.

2210-2220 Sample not studied.

2220-2230 Like sample at 2200-2210 ft. and some large nodules of glauconite.

Cretaceous

Gulf Series

Beds of Navarro (?) age or Beds of Taylor (?) age.

2230-2240 Like sample at 2200-2210 ft., but contains a few specimens of Globotruncana sp. marking the top of the Cretaceous.

2240-2250 Shale, gray, marly, and a few fragments of glauconite about 50 percent of sample; fine to moderately coarse grained sand (possibly caving) about 50 percent of sample. Specimens of Globotruncana sp. and other Cretaceous Foraminifera present.

2250-2330 Samples not studied.

Beds of Taylor age (definite)

2330-2340 Shale, gray, marly. Fauna consists of many specimens of Foraminifera including the typical Taylor species Bolivinoides decorata and Bolivina incrassata.

2340-2350 Marl, like sample at 2330-2340 ft., a little light-gray chalky marl, and specimens of Stensisina americana and Globorotalites conicus.

2350-2550 Samples not described, but are composed, mainly, of medium-grained sand and gray, soft, chalky marl and shale.

Beds of Austin age (electric log correlation)

2550-2560 Shale, gray, several types, a little chalky marl, and a few fragments of white, hard unfossiliferous (?) chalk, about 50 percent of sample. Sand is about 50 percent of sample. The foraminiferal fauna contains specimens of typical Taylor species.

2560-2570 Marl, a little white hard chalk, fragments of Inoceramus, and the usual cavings of sand.

2570-2610 Samples not studied.

2610-2620 Similar, in general, to sample at 2560-2570 ft., but contains many Inoceramus fragments and a few chips of gray marly shale irregularly streaked with soft white chalk.

2620-2640 Samples not studied.
Description

2640-2650 Sand, 50 percent; several types of gray shale and a few fragments of chalk 50 percent. Material being drilled is possibly a soft white chalk containing many *Inoceramus* fragments and a non-diagnostic microfauna.

2650-2660 Like sample at 2640-2650 ft., and a few specimens of *Planulina austiniana*.

2660-2670 Sample not studied.

2670-2680 Like sample at 2640-2650 ft., and a few specimens of *Kyphopyxa christneri* and *Pseudogaudryinella capitosa* var. (early Taylor or late Austin age).

2680-2740 Samples not studied.

2740-2750 Sample is mainly sand (caving?), fragments of gray shale, and foraminiferal specimens from various higher levels. A few fragments and nodules of white chalk probably indicate the material being drilled at this depth. Many nodules of pyrite are present, and also a few specimens of Foraminifera and Ostracoda that are indicative of the early Taylor or late Austin age of the beds; *Inoceramus* fragments are fairly common.

2750-2760 Sample not studied.

2760-2770 Mainly cavings of sand, gray marl, and specimens of Foraminifera.

2770-2800 Samples are about 75 percent medium-grained, angular sand and 25 percent *Inoceramus* fragments and specimens of Foraminifera.

2800-2810 Shale, gray, marly, a little sand, a few *Inoceramus* fragments, and a few specimens of Foraminifera that are not narrowly restricted. Also observed were a few specimens of *Cytherea simpliicata* that is common in the beds of late Austin age although present in the beds of early Taylor age.

2810-2870 Like the sample at 2800-2810 ft.

2870-2880 Shale, gray, showing the typical speckled appearance of the lower part of the beds of Austin age.

2880-2910 Like the sample at 2870-2880 ft.

2910-2920 Shale, gray, marly, a little sand, and a few highly speckled fragments of shale. Specimens of Foraminifera are mainly *Globigerina* sp. and *Gämbelina* sp.; specimens of *Globorotalia umbilicata* (common in the lower part of the beds of Austin age in southern Georgia) are common. Fragments of *Ostrea* sp. are also present.

2920-3011 Samples not studied.

3011-3021 Core 2. Recovery 10 ft.

   Top. Sandstone, light-gray, soft, fine-grained, even-grained, argillaceous, micaceous slightly glauconitic.

   Middle. Sandstone, gray, fine-grained, argillaceous, micaceous, glauconitic, calcareous; fragments of *Ostrea* sp. present.

   Bottom. Like middle part of core.
Description

A sample of cuttings from this depth shows gray, hard, sandy nodules and many fragments of Ostrea sp., suggesting a beach or near-shore depositional environment.

3021-3040  Samples not studied.

3040-3050  Sand and sandstone, like sample at 3011-3021 ft.; many fragments of white, hard, highly sandy (fine-grained sand), somewhat glauconitic chalk; many fragments of Ostrea sp., microfauna nondiagnostic.

3050-3090  Samples not studied.

Atkinson Formation. Upper Member.

3090-3100  Shale, sandy and many fragments of Ostrea sp.; fragments of white, fine to medium-grained, calcareous sandstone, containing fragments of Ostrea sp., phosphatic bone fragments, and a trace of glauconite.

3100-3110  Shale, grayish-green, flaky; abundant fragments of sandstone, like sample at 3090-3100 ft., containing glauconitic and phosphatic material, and many fragments of shells.

3110-3120  Sample not studied.

3120-3130  Sandstone, shell fragments, and cavings from higher levels; a little grayish-green flaky shale.

3130-3380  Samples in this interval are composed of fragments of sandstone like the samples below 3090 ft.; cavings of shale from higher levels; fragments of grayish-green shale; fragments of shells of macrofossils; and a few nondiagnostic specimens of Foraminifera that are probably caving. The white-speckled appearance of some fragments of the grayish-green shale is due to the high content of comminuted tests of microfossils. A few fragments of lignite are usually present in the samples. The quantity of sandstone fragments decreases progressively with depth, and the samples in the lower part of the interval are composed mainly, of grayish-green shale, fine-grained sand and a few cavings from higher levels.

3380-3390  Shale, green, sandy (fine-grained sand), and a mixture of material caving from higher levels. Fragments of light greenish-gray, very finely granular limestone containing broken shells of macrofossils are probably from the strata penetrated near this depth. Fragments of the green shale contain a few specimens of Planulina eaglifordensis.

Atkinson Formation. Lower Member.

3390-3400  Like the sample at 3380-3390 ft.; a few fragments of green, flaky, waxy, highly micaceous shale, and a little greenish-gray fos siliferous limestone.

3400-3410  Shale, grayish-green, and sand; a little green, micaceous shale.
Description

Depth
( feet)

3410-3430    Samples not studied.
3430-3440    Shale, grayish-green.
3440-3460    Samples not studied.
3460-3470    Shale, grayish-green, containing a few specimens of Ammotium braunsteini (an arenaceous species characteristic of the lower member of the Atkinson Formation).
3470-3480    Shale, grayish-green, containing specimens of Ammobaculoides plummerae.
3480-3490    Shale, some fragments of which are microfossiliferous; a few fragments of cream pyritic limestone containing broken shells of macrofossils.
3490-3500    Shale, dark greenish-gray, containing a few dwarf specimens of Foraminifera, and a few specimens of arenaceous species characteristic of the lower member of the Atkinson Formation.
3500-3543    No change.
3543-3556    Core 3. Recovery 10 ft.
            Top. Sandstone, light-gray, soft, medium-grained, highly glauconitic, somewhat micaceous.
            Middle. Like the top sample, but slightly finer grained.
            Bottom. Sandstone, soft, medium to coarse-grained, loosely cemented.
3556-3560    No sample.
3560-3570    Shale, greenish-gray, and a little sandstone and unconsolidated sand.
3570-3620    No change.

Comanche Series undifferentiated

3620-3630    Shale, like the sample at 3560-3570 ft., and a little unconsolidated sand containing a few coarse grains; also, dull grayish-brown, waxy, somewhat carbonaceous and sandy (fine-grained sand) shale containing nodules of siderite.
3630-3640    Like the sample at 3620-3630, but without the coarse grains of sand and showing an increase in the grayish-brown shale.
3640-3660    No change.
3660-3670    Sand, unconsolidated, coarse to very coarse, quartz, containing a few pink-tinted and yellow-tinted grains, a little feldspar, and a little colorless mica.
3670-3750    No change.
3750-3760    Sand, like the sample at 3660-3670 ft., and a few fragments of dark-red, waxy, finely micaceous shale.
3760-3850 T.D. Sand, mainly coarse-grained quartz, containing some feldspar. At 3840-3845 ft. the samples show a few fragments of purplish-red, silty shale.
CALHOUN COUNTY

Operator: Sowega Minerals Exploration Co., Inc.  GGS. No 192
Landowner: J. W. West Well #1  Elevation: 345 ft.
Location: Land District 4, Land Lot 328; 200 ft. north of south line and 200 ft. east of west line of Land Lot 328.  Total depth: 5265 ft.
Completed: Jan. 13, 1950

Summary of Stratigraphy

Tertiary

Samples not studied

Cretaceous

Gulf

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Thickness (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>560^1</td>
<td>410</td>
</tr>
<tr>
<td>970</td>
<td>450</td>
</tr>
<tr>
<td>1420</td>
<td>680</td>
</tr>
<tr>
<td>2100</td>
<td>550</td>
</tr>
<tr>
<td>2650</td>
<td>270</td>
</tr>
<tr>
<td>2920</td>
<td>930?</td>
</tr>
</tbody>
</table>

Comanche undifferentiated

Triassic (?)

Upper Triassic (?) Newark (?) Group

clastic rocks  3850?  1340?
diabase  5190  75

to total depth

Lithologic and paleontologic description of cuttings and cores. Samples are cuttings unless otherwise stated.

Description

0-770  Samples not studied by E. R. Applin.

Cretaceous

Gulf Series

Beds of Navarro age

560-600  “Sand: fine to coarse-grained, angular grains. May represent basal Clayton Formation.”

Description

600-770

"Marl: gray, silty, micaceous, glauconitic, fossiliferous (macroshells, ostracodes, and Foraminifera); xxx, Anomalina pseudopapillosa at 680-690." This fossil is classified by E. R. Applin as Navarro age.

770-780

Description of samples by E. R. Applin begins at this depth. Sand, fine to coarse-grained, quartz; fragments of white limestone and a little glauconite, probably caving from higher levels; fragments of light-gray, sandy, (fine-grained sand), chalky clay, probably the material being drilled at this depth. Specimens of Anomalina pseudopapillosa present.

780-790

Like sample at 770-780 ft., and a few specimens of Globigerina cretacea.

790-800

Sand, fine-grained, angular grains; a little coarse-grained sand; a little glauconite; and fragments of white limestone, probably all caving from higher levels. Many fragments of light-gray, highly sandy (fine-grained sand), calcareous, somewhat micaceous clay, that is probably the material being drilled at this depth. Sample contains a few small fragments of Inoceramus and other fossil bivalves; specimens of several species of ostracodes; and specimens of species of Foraminifera that are typical of the upper part of the beds of Navarro age: Anomalina pseudopapillosa (fairly common), Globotruncana cretacea (small specimens), Robulus navarroensis, and Gaudryinella pseudoserrata.

800-810

Sample not studied.

820-860

Like sample at 790-800 ft.; a few phosphatic nodules at 820-830 ft.

860-870

Clay, gray, highly sandy (fine-grained sand), micaceous, like sample at 790-800 ft. Sample contains a trace of glauconite, a few phosphatic nodules, and a few nodules of pyrite. Specimens of Foraminifera are like those in sample at 790-800 ft., and in addition, many specimens of Anomalina pinguis, a few specimens of Cibicides harperi and several other rothalid forms; Globotruncana cretacea is slightly more common.

870-900

No change.

900-920

Like sample at 860-870 ft., but fine to coarse-grained sand is abundant. No change in fauna.

920-940

Clay, light-gray, highly sandy, calcareous, micaceous, glauconitic, or argillaceous sandstone. Sample contains a few phosphatic nodules, a few fragments of Inoceramus and shells of other fossil bivalves; microfauna is unchanged.

940-970

Like sample at 920-940 ft.; glauconite is about 10 to 20 percent of the samples.

---

Description

Beds of Taylor Age

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>970-980</td>
<td>Sand, fine to coarse-grained quartz; glauconite is about 10 percent of the sample. Sample contains sandy marl and a microfauna similar to that in the beds of Navarro age with the addition of specimens of <em>Anomalina sholtzensis</em>.</td>
</tr>
<tr>
<td>980-1010</td>
<td>No change.</td>
</tr>
<tr>
<td>1010-1020</td>
<td>Marl, gray, sandy, highly glauconitic. Nodules of dark-green glauconite are about 50 percent of the sample; sand is composed of fine to coarse, angular grains of quartz, with medium grains strongly dominant. Sample contains many specimens of <em>Planulina dumblei</em>, <em>Anomalina sholtzensis</em>, <em>Bolivina incrassata</em>, <em>Gyroidina globosa</em>, and other species of Foraminifera.</td>
</tr>
<tr>
<td>1020-1070</td>
<td>Marl, gray, sandy, like sample at 1010-1020 ft., and much fine to coarse-grained sand washing from the marl; phosphatic nodules, and nodules of pyrite are also present; about 50 percent of the sample is composed of dark-green, irregularly rounded nodules of glauconite. The sample contains fragments of <em>Inoceramus</em> and shells of other fossil bivalves. The foraminiferal fauna is like that in the sample at 1010-1020 ft., and several species of <em>Globotruncana</em> are common.</td>
</tr>
<tr>
<td>1070-1080</td>
<td>Like the samples at 1020-1070 ft., but glauconite is about 25 percent of the sample.</td>
</tr>
<tr>
<td>1080-1100</td>
<td>Sand, gray, argillaceous, glauconitic. Glauconite is about 50 percent of the sample, and the sand is mainly clear, angular, medium grains of quartz. Phosphatic nodules, nodules of pyrite, and fragments of <em>Inoceramus</em> and other macrofossil shells are present. The foraminiferal fauna is like the sample at 1020-1070 feet.</td>
</tr>
<tr>
<td>1100-1200</td>
<td>Sand, fine to very coarse, quartz; coarse grains common; glauconite is about 10 to 25 percent of the samples. Samples contain fragments of sandy clay, pyrite nodules, shell fragments, and specimens of Foraminifera like those in the samples of the beds of Taylor age already described.</td>
</tr>
<tr>
<td>1200-1210</td>
<td>Sand, mainly medium to coarse-grained, that seems to wash from a gray, soft marly clay matrix. The sample contains about 25 percent glauconite, a few phosphatic nodules, nodules of pyrite, fragments of <em>Inoceramus</em> and other shells. Specimens of Foraminifera include species that are characteristic of the lower part of the beds of the Taylor age: <em>Pseudogaudryinella capitosa</em>, <em>Kyphopyxx christneri</em>, <em>Planulina dumblei</em>, <em>Globorotalites conicus</em>, and many specimens of several species of <em>Globotruncana</em> and <em>Globigerina</em>.</td>
</tr>
<tr>
<td>1210-1330</td>
<td>No change.</td>
</tr>
<tr>
<td>1330-1340</td>
<td>Like the sample at 1200-1210 ft., but the marly clay is darker brownish-gray.</td>
</tr>
<tr>
<td>1340-1420</td>
<td>No change.</td>
</tr>
</tbody>
</table>
Description

Beds of Austin age

1420-1480  Shale, brownish-clay, calcareous.

1480-1510  Like the samples at 1420-1480 ft., and in addition, lenses of very fine-grained sandstone. The microfauna contains a few specimens of *Pseudoclavulina moorevillensis*, and many specimens of *Pseudogaudryinella capitosa var. serrulata*.

1510-1570  Like the samples at 1480-1510 ft. The material being drilled seems to be brownish-gray, soft clay shale and interbedded lenses of very fine grained sandstone. This fine-grained sandstone is about 75 percent of the samples. Medium-grained sand and glauconite in the samples is possibly caving. Shale is progressively more dominant with depth. The microfauna is like that in the sample 1480-1510 ft.

1570-1600  Like the samples at 1510-1570 ft., and in addition, a few fragments of *Citharina texana*.

1600-1630  Shale, gray, soft, flaky, micaceous; a little fine-grained, argillaceous, calcareous sandstone, and a few phosphatic nodules. Medium-grained sand and glauconite is possibly caving. No marked change in fauna; a few fragments of *Ostrea* sp., *Inoceramus*, and *Citharina texana*.

1630-1840  Like the sample at 1600-1630 ft., and many specimens of *Valvulineria infrequens*, many small *Günbelinae*, a few specimens of *Planulina austiniana* and *Citharina texana*. The samples contain a few specimens of arenaceous Foraminifera that may be caving from higher levels.

1840-1870  Shale, gray, micaceous; about 10 percent fine-grained sand, and 5 percent glauconite; a few nodules of pyrite and phosphatic nodules. The sample seems to contain less sand than those immediately above. The fauna is composed of specimens of Foraminifera like those at 1630-1840 ft., and fragments of *Ostrea* sp. and *Inoceramus*.

1870-1900  Shale, gray, a little fine-grained sand, and a few fragments of fine-grained, chalky, micaceous sandstone. No marked change in fauna.

1900-1930  No samples.

1930-1960  Like the samples at 1870-1900 ft., fragments of *Ostrea* sp. and *Inoceramus* are somewhat more abundant.

1960-1990  Like the samples at 1870-1900 ft., but the soft gray shale and fine-grained sand are each about 50 percent of the sample; a little glauconite present. No change in shell fragments and microfauna.

1990-2100  Like the samples at 1960-1990 ft., with the addition of a few fragments of light-gray, very finely granular limestone. Specimens of *Valvulineria infrequens* are fairly common in the microfauna.
**Description**

**Atkinson Formation. Upper Member.**

2100-2140  Lithology and fauna like the samples at 1990-2100 ft., with the addition of many fragments of white, fine to medium-grained, glauconitic, micaceous, somewhat phosphatic sandstone.

2140-2170  Like the sample at 2100-2140 ft., and also fragments of light greenish-gray flaky shale, a little carbonaceous material, a few coarse grains of sand, and a few large phosphatic nodules. The samples contain fragments of heavy-shelled *Ostrea*-like bivalves, specimens of *Planulina eaglefordensis*, an Eagle Ford type of *Valvulineria*, a small arenaceous form, and other specimens of Foraminifera that are caving from higher levels.

2170-2200  This sample seems to mark a change from the deeper-water marine facies of the upper Atkinson above, to the shallow-water marine facies, below.

Sand, fine to coarse-grained, quartz, in which coarse grains are common, and a few pink grains are present. The sample contains a few fragments of lignite, phosphatic nodules, nodules of pyrite, shell fragments, and a few siderite spherules.

2200-2300  Sand, coarse-grained, quartz, containing a few pink grains, a few large phosphatic nodules, and a few pyritized fragments of carbonaceous material.

2300-2330  Like the samples at 2200-2300 ft.; also a fragment of yellow, unctuous, sandy clay and a few siderite spherules.

2330-2360  Sand, moderately coarse-grained, clear, quartz; no colored shale or siderite.

2360-2390  Sand like the sample at 2330-2360 ft., and a few fragments of red and grayish-green mottled micaceous shale.

2390-2420  Sand like the sample at 2330-2360 ft.; no shale.

2420-2450  Sand and a few fragments of red and grayish-green mottled shale.

2450-2635  No change.

2635-2650  Sand, medium to coarse-grained, and a few siderite spherules.

**Atkinson Formation. Lower Member**

2650-2690  Sand, like sample at 2635-2650 ft., a few fragments of *Ostrea* sp., a little dark-gray, flaky shale, and a little grayish-green shale.

2690-2720  Like the sample at 2650-2690 ft., but showing an increase in the fragments of dark-gray flaky shale. A few small specimens of arenaceous species of Foraminifera are questionably indigenous.

2720-2750  Lithology and microfauna like the sample at 2690-2720 ft., although fragments of soft, gray, marly shale and specimens of Foraminifera from the beds of Austin age occur as cavings in this sample.

2750-2780  Sand, fine to coarse-grained, fragments of dark-gray and greenish-gray shale, and cavings from higher levels.
<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2791</td>
<td>Core? Sand fine to very coarse-grained, fragments of carbonaceous material, a few nodules of pyrite and many fragments of dark-gray flaky shale. The microfauna contains specimens of <em>Ammobaculites bergquistii</em> and <em>A. agrestis</em>, that are typical of the lower member of the Atkinson Formation.</td>
</tr>
<tr>
<td>2780-2810</td>
<td>Sand, fine to coarse-grained, many nodules of pyrite, fragments of pyritized carbonaceous material, a few phosphatic nodules, and fragments of heavy-shelled <em>Ostrea</em>-like bivalves.</td>
</tr>
<tr>
<td>2810-2840</td>
<td>Sand, fine to very coarse-grained, with coarse grains common; many nodules of pyrite; a little pyritized lignite; a few shell fragments; fragments of several types of clay and shale similar to those observed in samples at higher levels, including fragments of red and green mottled shale. The shale fragments are probably caving.</td>
</tr>
<tr>
<td>2840-2920</td>
<td>No change.</td>
</tr>
<tr>
<td>2920-2960</td>
<td>Comanche Series undifferentiated Sand, like sample at 2810-2840 ft., but containing many yellow-tinted grains, a little feldspar, and a few fragments of mustard-colored waxy clay, or ochre mudstone, that is slightly gray and red mottled.</td>
</tr>
<tr>
<td>2960-2990</td>
<td>Mainly coarse-grained quartz sand and a little feldspar.</td>
</tr>
<tr>
<td>2990-3020</td>
<td>Like the sample at 2960-2990 ft., and many yellow and red coated and tinted grains, and a little amber and white feldspar.</td>
</tr>
<tr>
<td>3020-3200</td>
<td>No change.</td>
</tr>
<tr>
<td>3200-3260</td>
<td>Sand, like sample at 2960-2990 ft., but medium to moderately coarse grains dominant.</td>
</tr>
<tr>
<td>3260-3290</td>
<td>Sand, like the sample at 3200-3260 ft., and a few fragments of purplish-red and gray mottled finely micaceous shale.</td>
</tr>
<tr>
<td>3290-3320</td>
<td>Sand like the sample at 3200-3260 ft. This sample contains no shale.</td>
</tr>
<tr>
<td>3320-3380</td>
<td>Sand, fine to coarse-grained, containing a few yellow and a few pink-tinted grains, and many grains of feldspar.</td>
</tr>
<tr>
<td>3380-3410</td>
<td>Sand, like the sample at 3320-3380 ft.; also fragments of bright red shale, and dull-red and greenish-gray mottled, highly micaceous shale.</td>
</tr>
<tr>
<td>3410-3440</td>
<td>Sand, like the sample at 3320-3380 ft., and a little red shale.</td>
</tr>
<tr>
<td>3440-3550</td>
<td>Like the sample at 3320-3380 ft., and a few fragments of dark purplish-red, micaceous shale.</td>
</tr>
<tr>
<td>3500-3530</td>
<td>Sand, like the sample at 3320-3380 ft.; and a few fragments of red and dull-green mottled shale.</td>
</tr>
<tr>
<td>3530-3560</td>
<td>Sand, and a few fragments of dull-red and yellowish-green mottled micaceous shale. The ratio of sand to shale is less than in the immediately preceding samples, and some red shale is probably being drilled.</td>
</tr>
</tbody>
</table>
Description

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3560-3620</td>
<td>Sand, but no red shale.</td>
</tr>
<tr>
<td>3620-3800</td>
<td>Sand, and a little dull-red and yellowish-green shale.</td>
</tr>
<tr>
<td>3800-3830</td>
<td>Sand, a little red and mottled shale, and many cavings of clay from the beds of the Gulf Series.</td>
</tr>
<tr>
<td>3830-3850</td>
<td>Like the sample at 3800-3830 ft., and a few large pebble-sized nodules of quartz and of feldspar.</td>
</tr>
</tbody>
</table>

Triassic (?)
Upper Triassic (?) Series

Newark (?) Group

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3850-3890</td>
<td>Sand, fine to very coarse-grained, many small pebbles of quartz and feldspar, and a few pebbles of basalt; a few fragments of red shale.</td>
</tr>
<tr>
<td>3890-3920</td>
<td>Like the sample at 3850-3890 ft., pebbles are less abundant.</td>
</tr>
<tr>
<td>3920-3950</td>
<td>Sand, fine to very coarse-grained, a few pebbles, and a few fragments of dull-red and green mottled shale.</td>
</tr>
<tr>
<td>3950-4010</td>
<td>No change.</td>
</tr>
<tr>
<td>4010-4040</td>
<td>Sand, fine to coarse-grained, and cavings.</td>
</tr>
<tr>
<td>4040-4070</td>
<td>Mainly cavings, and a little fine to very coarse grained sand.</td>
</tr>
<tr>
<td>4070-4100</td>
<td>Sand, fine to coarse-grained, quartz; a little feldspar and a few pebbles.</td>
</tr>
<tr>
<td>4100-4130</td>
<td>Mainly cavings, and some fine to coarse-grained sand.</td>
</tr>
<tr>
<td>4130-4160</td>
<td>Like the sample at 4100-4130 ft., and a few fragments of red and mottled shale.</td>
</tr>
<tr>
<td>4160-4220</td>
<td>Sand, fine to coarse-grained, a few fragments of dull-red and greenish-yellow mottled shale, and abundant cavings from the beds of the Gulf Series.</td>
</tr>
<tr>
<td>4220-4310</td>
<td>Sand, white, fine to coarse-grained, quartz; coarse grains common; a very few yellow and pink grains; a little feldspar.</td>
</tr>
<tr>
<td>4310-4370</td>
<td>Sand, fine to coarse-grained, quartz, but coarse grains are less common than in the samples at 4220-4310 ft. Sample contains a few pebbles, a few fragments of sandy limonite, and many cavings.</td>
</tr>
<tr>
<td>4370-4400</td>
<td>Sand, fine to coarse-grained, quartz, and a few pebbles.</td>
</tr>
<tr>
<td>4400-4430</td>
<td>Sand, like the sample at 4370-4400 ft., and cavings; each about 50 percent of sample.</td>
</tr>
<tr>
<td>4430-4460</td>
<td>Sand, fine to very coarse-grained; a few pebbles and a few fragments of sandy limonite. The sample is small, and before washing, was probably mainly cavings of sandy clay from the beds of the Gulf Series.</td>
</tr>
<tr>
<td>4460-4490</td>
<td>No sample.</td>
</tr>
<tr>
<td>4490-4580</td>
<td>Sand, fine to very coarse-grained; a few quartz pebbles and a few of sandy limonite; many cavings.</td>
</tr>
</tbody>
</table>
### Description

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4580-4610</td>
<td>Like the samples at 4490-4580 ft., and a little red mottled shale.</td>
</tr>
<tr>
<td>4610-4640</td>
<td>Sand, white, fine to coarse-grained, quartz; a few pebbles.</td>
</tr>
<tr>
<td>4640-4850</td>
<td>Like the sample at 4610-4640 ft.; a few fragments of red shale.</td>
</tr>
<tr>
<td>4850-4880</td>
<td>Sand, moderately coarse grained; quartz.</td>
</tr>
<tr>
<td>4880-5040</td>
<td>Sand, fine to moderately coarse grained, quartz; medium grains common.</td>
</tr>
<tr>
<td>5040-5050</td>
<td>Sand, fine to very coarse grained; about 75 percent of sample is cavings from higher levels.</td>
</tr>
<tr>
<td>5050-5060</td>
<td>Sand, medium-grained, quartz.</td>
</tr>
<tr>
<td>5060-5090</td>
<td>Sand, fine to coarse-grained quartz; abundant cavings.</td>
</tr>
<tr>
<td>5090-5100</td>
<td>Sand, fine to coarse-grained; a little feldspar.</td>
</tr>
<tr>
<td>5100-5170</td>
<td>Mainly cavings from beds of the Gulf Series; a little fine to very coarse grained sand.</td>
</tr>
<tr>
<td>5170-5180</td>
<td>Sand, fine to very coarse grained; a little feldspar; a few pink-stained nodules of sandy limestone.</td>
</tr>
<tr>
<td>5180-5190</td>
<td>Cavings from the beds of the Gulf Series and a little fine to coarse-grained sand.</td>
</tr>
<tr>
<td>5190-5200</td>
<td>Sand, fine to coarse-grained; abundant cavings from beds of the Gulf Series; many fragments of diabase, in part altered or weathered (?).</td>
</tr>
<tr>
<td>5200-5260</td>
<td>Diabase. The ratio of diabase to other materials in the cuttings increases progressively with depth.</td>
</tr>
</tbody>
</table>

5263-5265 T.D. Core. Diabase.

### CAMDEN COUNTY

**Landowner:** Kraft Corporation  
**Location:** St. Mary's Ga. (drilled by Layne-Atlantic Co.)  
**GGS. No.:** 54  
**Elevation:** 13 ft.  
**Total depth:** 1060  
**Completed:** ?

Fifty-one samples of cuttings were examined but not described in detail.†

### Summary of Stratigraphy

<table>
<thead>
<tr>
<th>Tertiary</th>
<th>Depth (feet)</th>
<th>Thickness (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pliocene or Pleistocene</td>
<td>0</td>
<td>70</td>
</tr>
<tr>
<td>Miocene</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lower and middle, Hawthorn Formation</td>
<td>70</td>
<td>420</td>
</tr>
<tr>
<td>No samples</td>
<td></td>
<td>490</td>
</tr>
</tbody>
</table>

†The depth to the top of each stratigraphic unit is based on paleontologic and lithologic data obtained from the microscopic study of the samples.
LOGGS OF SELECTED WELLS IN THE COASTAL PLAIN OF GEORGIA

Eocene
in upper, Ocala Limestone, upper member 560 300
lower member 860 170
to
upper middle, Avon Park Limestone 1030 total 30

depth

CAMDEN COUNTY

Operator: The California Company
Landowner: J. A. Buie, Well 1
Location: 4 miles west and 2 miles north of Tarboro, Ga.
Latitude 31° 03' 01" North
Longitude 81° 52' 48" West

Elevation: 65 ft. (derrick floor)
Total depth: 4955 ft.
Completed: Mar. 26, 1948

Lithologic and paleontologic description of side-wall cores.

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1550</td>
<td>Chalk, white, slightly gray-spotted, porous, highly micro-fossiliferous; fossils are fragmented and calcitized. Fauna contains specimens of Camerina sp. and numerous specimens of Asterigerina texana. Age: early middle Eocene (?)</td>
</tr>
<tr>
<td>2700</td>
<td>Dolomite, white, nodular, coarsely crystalline, unfossiliferous. Age: not determined.</td>
</tr>
<tr>
<td>2965</td>
<td>Chalk, white, dolomitic, and grayish-green clay shale; no determinable fossils. Age: not determined.</td>
</tr>
<tr>
<td>3065</td>
<td>Dolomite, white, somewhat chalky, unfossiliferous, and fragments of nodules of bluish-green glauconite. Age: not determined.</td>
</tr>
<tr>
<td>3430</td>
<td>Marl, gray, containing fragments of Inoceramus and specimens of Marginulina inconstantia, Pseudogaudryinella capitosa, Planulina dumplei. Age: beds of early (?) Taylor age.</td>
</tr>
<tr>
<td>3700</td>
<td>Marl, gray, and a few green and brown nodules; contains fragments of Inoceramus and specimens of Planulina austiniiana. Age: beds of Austin age.</td>
</tr>
<tr>
<td>3830</td>
<td>Shale, gray, flaky, marly. Fauna contains specimens of Globotruncana (an undescribed Austin form), Citharina texana, Globigerina sp., Gümbelina sp., Gaudryina sp. (an early Austin form), and ostracodes. Age: beds of early Austin age.</td>
</tr>
</tbody>
</table>
Description

Marl, brownish-gray, light-speckled, and unidentified green nodules.

Age: beds of Austin age.

Marl, gray, containing fragments of specimens of a thin-shelled species of *Inoceramus*, crushed specimens of *Globigerina* sp. and *Citharina texana* (common), and specimens of *Gaudryina austiniana* and *Planulina austiniana*.

Age: beds of Austin age.

Marl, dark gray, light-speckled, containing specimens of *Gümbe­lina* sp. and *Globigerina* sp.

Age: beds of Austin age.

Marl, gray, hard, containing specimens of *Globigerina* sp., and a few specimens of *Gümbe­lina* sp. and *Globotruncana* sp.

Age: not determined.

Like side-wall core at 4015 ft.

Marl, gray, containing a few fragments of fish bones and specimens of *Globigerina* sp., *Planulina eaglefordensis* (common), and *Valvulineria infrequens*.

Age: upper member of Atkinson Formation.

Shale, grayish-green, flaky, micaceous, containing many irregular-shaped siderite nodules. The fauna is composed of a few fish scales and fragments of fish bones, a few shell fragments and specimens of *Planulina eaglefordensis* which may have caved.

Age: upper member of Atkinson Formation (?)

Shale, dark-gray, hard micaceous.

Age: lower member of Atkinson Formation (?).

Shale, green, somewhat sandy in irregular areas, micaceous; contains a few moderately coarse grains and many green grains.

Age: lower member of Atkinson Formation (?).

Sand, moderately coarse, many green grains and a little pink feldspar.

Age: Comanche (?).

Igneous rock (?)

Age: not determined.

CHARLTON COUNTY*

Owner Operator: State of Georgia, GGS. No. 185
State Prison Camp (Folkston) Elevation: 75 ft.
Well 1

*Publication of this data is authorized by the Sun Oil Company, for whom the report was prepared on a commercial basis.*
Location: About 1 mi. south of Folkston, Ga., and 3 mi. north of bend in St. Marys River at Twp. 4N., Rge. 23E., Nassau County, Fla.


### Summary of Stratigraphy

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Thickness (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tertiary</td>
<td></td>
</tr>
<tr>
<td>In Miocene undifferentiated</td>
<td>90</td>
</tr>
<tr>
<td>Oligocene absent</td>
<td></td>
</tr>
<tr>
<td>No samples</td>
<td>416</td>
</tr>
<tr>
<td>Eocene</td>
<td>to 430 total 124 depth</td>
</tr>
</tbody>
</table>

Lithologic and paleontologic description of cuttings and cores. Samples are cuttings unless otherwise stated.

### Description

**Tertiary**

**In Miocene Series, undifferentiated**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>90- 100</td>
<td>Limestone, gray, sandy, nodular, porous; a few nodules contain fragments of macrofossils.</td>
</tr>
<tr>
<td>115- 125</td>
<td>Clay, light-tan, highly sandy, containing many black phosphatic nodules, and a few worn fragments of a fossil bivalve.</td>
</tr>
<tr>
<td>118- 128</td>
<td>Clay, gray, waxy, slightly carbonaceous, irregularly sandy, containing small fragments of fragile chalky shells, and a few poorly-preserved, chalky molds of specimens of Foraminifera; <em>Rotalia beccarii</em> common.</td>
</tr>
<tr>
<td>128- 138</td>
<td>No samples.</td>
</tr>
<tr>
<td>138- 149</td>
<td>Clay, greenish-gray, highly sandy. The sand is clear quartz and very uneven grained. The clay contains many large, black, phosphatic nodules, and many worn and fragmented shells of fossil bivalves.</td>
</tr>
<tr>
<td>149- 158</td>
<td>No samples.</td>
</tr>
<tr>
<td>158- 168</td>
<td>Like sample at 138-149 ft., but shell fragments are rare.</td>
</tr>
<tr>
<td>168- 182</td>
<td>Like sample at 158-168 ft.</td>
</tr>
<tr>
<td>184- 194</td>
<td>Like sample at 168-182 ft., but the sand is finer grained.</td>
</tr>
<tr>
<td>194- 215</td>
<td>No change.</td>
</tr>
</tbody>
</table>
Table:

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>215-225</td>
<td>No samples.</td>
</tr>
<tr>
<td>225-248</td>
<td>Sand, quartz, clear, uneven-grained (very fine to coarse), containing many black to brownish-black phosphatic nodules.</td>
</tr>
<tr>
<td>248-258</td>
<td>Sand, quartz, clear, coarse-grained, containing many moderately large, black, phosphatic nodules.</td>
</tr>
<tr>
<td>258-267</td>
<td>Clay, light-brown, gritty, highly sandy, phosphatic, containing a few calcareous nodules, and a few shell fragments that are possibly caving from higher levels.</td>
</tr>
<tr>
<td>267-277</td>
<td>Clay, greenish-gray, phosphatic, highly sandy (very uneven grained clear quartz sand), containing a few calcareous nodules.</td>
</tr>
<tr>
<td>278-286</td>
<td>Clay, grayish-tan, somewhat phosphatic, highly sandy (moderately fine, moderately even grained, clear quartz sand).</td>
</tr>
<tr>
<td>286-307</td>
<td>Clay, tan, somewhat calcareous, somewhat phosphatic, highly sandy (very uneven grained sand).</td>
</tr>
<tr>
<td>307-317</td>
<td>Sand, quartz, clear, moderately fine grained, moderately even grained (a few coarse grains), containing a few phosphatic nodules.</td>
</tr>
<tr>
<td>317-327</td>
<td>No samples.</td>
</tr>
<tr>
<td>327-357</td>
<td>Like sample at 307-317 ft.</td>
</tr>
<tr>
<td>357-367</td>
<td>Like sample at 307-317 ft.; sand is chiefly coarse-grained.</td>
</tr>
<tr>
<td>367-386</td>
<td>No change.</td>
</tr>
<tr>
<td>386-396</td>
<td>Like the preceding samples, but sand is chiefly fine-grained.</td>
</tr>
<tr>
<td>396-406</td>
<td>Clay, brown, gritty, calcareous, somewhat phosphatic, highly sandy; and black, carbonaceous clay. Nodules of the brown calcareous clay contain a few small fossil bivalves (Miocene forms).</td>
</tr>
<tr>
<td>406-416</td>
<td>Sand, quartz, clear, tan, argillaceous, slightly calcareous, fine-grained, moderately even grained, containing a few phosphatic nodules.</td>
</tr>
<tr>
<td>416-430</td>
<td>No samples.</td>
</tr>
</tbody>
</table>

Eocene Series

**Upper Eocene. Ocala Limestone. Upper Member.**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>430-445</td>
<td>Sand, quartz, clear, angular, moderately fine grained, moderately even grained, and about 10 percent small fragments of chalky limestone. A fragment of Operculina sp., and a bryozoan fragment occur in the limestone.</td>
</tr>
<tr>
<td>445-517</td>
<td>No samples.</td>
</tr>
<tr>
<td>517-526</td>
<td>Limestone, white chalky, containing many fragments of Operculina floridensis, many bryozoan fragments, and a few specimens of smaller Foraminifera common in the Ocala Limestone.</td>
</tr>
<tr>
<td>526-540</td>
<td>Limestone, chalky, fossiliferous, like sample at 517-526 ft., and about 50 percent fine-grained clear quartz sand that is probably caving from higher levels. The sample contains specimens of a species of Bryozoa characteristic of the Ocala Limestone, and the microfauna is like that in the preceding sample.</td>
</tr>
</tbody>
</table>
Description

542-547 Limestone and a little sand like sample at 526-540 ft.
547-554 T.D. No change.

CLINCH COUNTY

Operator: Sun Oil Company
Landowner: W. J. Barlow well 1
Location: Land District 12, Land Lot 373, 1478 ft. north and 1754 ft. east of southwest corner of Land Lot 373.

GGS. No. 144
Elevation: 177 ft. (derrick floor)
Total depth: 3848 ft.
Completed: March 5, 1947

Summary of Stratigraphy

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Thickness (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tertiary</td>
<td></td>
</tr>
<tr>
<td>Eocene</td>
<td></td>
</tr>
<tr>
<td>In middle, undifferentiated at 2100 ft.</td>
<td>?</td>
</tr>
<tr>
<td>lower, clastic beds of Wilcox (?) age</td>
<td>2260</td>
</tr>
<tr>
<td>Salt Mountain Limestone</td>
<td>2320</td>
</tr>
<tr>
<td>Paleocene, beds containing Tamesi fauna</td>
<td>2420</td>
</tr>
<tr>
<td>Cretaceous</td>
<td></td>
</tr>
<tr>
<td>Gulf</td>
<td></td>
</tr>
<tr>
<td>Beds of Taylor age</td>
<td>2855</td>
</tr>
<tr>
<td>Beds of Austin age</td>
<td>3055</td>
</tr>
<tr>
<td>Atkinson Formation, upper member</td>
<td>3360</td>
</tr>
<tr>
<td>lower member</td>
<td>3608</td>
</tr>
<tr>
<td>Comanche undifferentiated</td>
<td>3789</td>
</tr>
<tr>
<td>Ordovician¹</td>
<td></td>
</tr>
<tr>
<td>Lower Ordovician (?) quartzitic sandstone</td>
<td>3834 to total 14 depth</td>
</tr>
</tbody>
</table>

Lithologic and paleontologic description of cuttings and cores. Samples are cuttings unless otherwise stated.

Description

Eocene Series

In middle Eocene, undifferentiated

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2100</td>
<td>Samples not studied.</td>
</tr>
<tr>
<td>2100-2120</td>
<td>Limestone, white, irregularly sandy (fine-grained sand); glauconitic, and a few fragments of light-tan chert. Sample contains a few small specimens of nondiagnostic species of Foraminifera.</td>
</tr>
<tr>
<td>2120-2130</td>
<td>Like sample at 2100-2120 ft., and in addition, many fragments of light grayish-cream, highly glauconitic, sandy (fine-grained sand) limestone.</td>
</tr>
<tr>
<td>2130-2140</td>
<td>Like the sample at 2120-2130 ft., but few fragments of dark glauconitic limestone.</td>
</tr>
<tr>
<td>2140-2150</td>
<td>Limestone, white, somewhat glauconitic, and fragments of light grayish-tan chert. A few specimens of several species of Foraminifera, including a specimen of Asterigerina sp.</td>
</tr>
<tr>
<td>2150-2160</td>
<td>Limestone and chert like the samples at 2100-2150 ft., but some fragments of limestone are highly glauconitic.</td>
</tr>
<tr>
<td>2160-2170</td>
<td>Like sample at 2150-2160 ft., and many fragments of white, chalky, dense, cherty limestone; chert abundant.</td>
</tr>
<tr>
<td>2170-2180</td>
<td>Limestone, glauconitic, many fragments of chert, and a little white ash.</td>
</tr>
<tr>
<td>2180-2200</td>
<td>Limestone and chert, like sample at 2170-2180 ft.</td>
</tr>
<tr>
<td>2200-2210</td>
<td>Limestone, slightly glauconitic, fragmental, porous, composed of a mass of small fragments of chert-cemented calcite that are probably derived from molds of altered fossil material.</td>
</tr>
<tr>
<td>2210-2220</td>
<td>Limestone, like the sample at 2200-2210 ft., containing many inclu- sions of calcite; many moderately large irregular-shaped nodules of calcite, and a little chert.</td>
</tr>
<tr>
<td>2220-2230</td>
<td>Limestone, light-cream, fragmental, slightly glauconitic; much light-tan chert.</td>
</tr>
<tr>
<td>2230-2240</td>
<td>Like the sample at 2220-2230 ft., but some fragments of limestone are highly glauconitic.</td>
</tr>
<tr>
<td>2240-2260</td>
<td>Limestone, fragmental, and a little chert, like the sample at 2230-2240 ft. A section of Discocyclina sp. in the sample at 2240-2250 ft.</td>
</tr>
</tbody>
</table>

Lower Eocene. Clastic beds of Wilcox(?) age.

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2260-2280</td>
<td>Shale, light-green, micaceous; a few fragments of limestone and a little chert like that described in the samples of the middle Eocene beds.</td>
</tr>
<tr>
<td>2280-2300</td>
<td>Like the samples at 2260-2280 ft., and many specimens of small Foraminifera; Globigerina sp., Orbulina sp., and Discorbis sp. are common.</td>
</tr>
<tr>
<td>2300-2310</td>
<td>Shale, like the samples at 2260-2300 ft., and many fragments of light greenish-gray, highly glauconitic, irregularly sandy, porous limestone, streaked with thin veins of chalcedony. Limestone</td>
</tr>
</tbody>
</table>
Description

contains sections and small specimens of *Asterocylinia* sp. and a few bryozoan fragments.

2310-2320  Shale, light-green, highly glauconitic, irregularly sandy, containing phosphatic nodules and nodules of glauconitic limestone. A few nodules contain fragments of *Discoecylina* sp.

**Lower Eocene. Salt Mountain Limestone.**

2320-2340  Limestone, white, fragmental, somewhat glauconitic, that seems to be composed of worn, chalky, calcitic molds and fragments of fossils. A few specimens of *Discoecylina weaveri* are present, and *Asterigerina* sp. is common.

2340-2350  Like sample at 2320-2340 ft., and many fragments of light grayish-brown, micaceous, fossiliferous chert.

2350-2380  Limestone, fragmental, somewhat glauconitic, composed of tests and altered fragments of macrofossils and microfossils; among the latter is *Discoecylina weaveri*.

2380-2390  Limestone, finely fragmental, somewhat sandy and glauconitic.

2390-2420  Like the sample at 2380-2390 ft., but the sand content of the limestone is between 50 and 75 percent; fine-grained, evenly distributed glauconite is about 25 percent. The sample at 2410-2420 ft. contains a little fine-grained, calcareous, glauconitic sandstone.

**Paleocene Series**

**Beds containing Tamesi fauna**

2420-2440  Clay, soft, which, when washed, leaves a moderately large residue of fine-grained, angular clear quartz sand and a few fragments of calcareous sandstone like sample at 2410-2420 ft. Sample contains a few phosphatic nodules. Fairly common specimens of Foraminifera are: *Darbyella?* sp., *Lenticulina degolyeri*, *Nodosaria latejugata*, and *Globigerina* sp.

2440-2460  Like sample at 2420-2440, and a few specimens of other small Foraminifera.

2460-2480  Clay, sandy; washed residue composed of sand and a few phosphatic nodules like sample at 2420-2440 ft., fragments of calcereous, glauconitic sandstone, and specimens of small Foraminifera.

2480-2490  Like samples at 2460-2480 ft. Microfauna contains specimens of *Nodosaria latejugata*, *Lenticulina degolyeri*, and *Darbyella?* sp. like sample at 2420-2440 ft.; many specimens of *Globigerina triloculinoides*, and *Cibicides* cf. *C. praecursorius*, *Globorotalia acuta*, *G. velascoensis*, and *Eponides lotus* are common.

2490-2540  No change.

2540-2550  Moderately large washed residue composed of sand like sample at 2420-2440 ft., fragments of light-green, micaceous clay shale,
Description

and many fragments of light-gray, highly sandy (fine-grained sand), finely glauconitic limestone that is possibly nodular in the clay shale. Specimens of *Darbyella*? sp., *Lenticulina degolyeri*, and *Nodosaria latejugata* very common; *Globigerina* sp., *G. triloculinoides*, and other small Foraminifera, like sample at 2480-2490, are also present.

2550-2610

No change.

2610-2620

Like samples at 2540-2610 ft.; also abundant fragments of white, hard, dense, slightly glauconitic limestone, and several fragments of light-gray, fragmental, porous, slightly glauconitic limestone.

2620-2630

Sample seems to be a mixture of materials described from higher levels.

2828

Sidewall core 64. Recovery 1 in.

Clay, bluish-gray, slightly micaceous, somewhat glauconitic, highly calcareous, containing much comminuted microfossil material. Glauconite occurs as small bluish-green nodules. Microfossils are common, but are usually chalky, very small, and poorly preserved. The fauna, which is Paleocene in age, contains specimens of *Cibicides* sp., *Anomalina* sp., and *Globigerina triloculinoides*.

2630-2860

Cutting samples not studied.

Cretaceous

Gulf Series

Beds of Taylor age

The top of the beds of Taylor age is placed at 2855 ft. on the basis of electric log correlation supported by the data from samples.

2860-2880

Chalk, white, and cavings of light-green shaly clay. Fragments of *Inoceramus* wash from the chalk, and *Inoceramus* fragments and prisms are abundant in the sample. Specimens of Foraminifera and Ostracoda are common. Dominant species of Foraminifera are *Dorothia conula*, *Planulina cederkeyensis*, and *Planulina dumbeli*.

2880-2890

Like the samples at 2860-2880 ft.; numerous specimens of *Arenobulimina americana*, and a few specimens of *Kyphopyza christneri*.

2890-2900

Material and fauna like the samples of chalk in the beds of Taylor age at 2860-2890 ft.

2900-2940

Like the sample at 2890-2900 ft., but cavings of light-green clay shale are very abundant.

2940-2950

Chalk, white, and *Inoceramus* fragments about 50 percent of washed sample; cavings of light-green clay shale about 50 percent of washed sample.

Foraminiferal fauna contains species listed in samples at 2860-2880 ft. and 2880-2890 ft.
Description

2950-2960  Chalk, white, soft. The small washed residue of this sample is composed mainly of \textit{Inoceramus} prisms and fragments, and many specimens of Foraminifera. \textit{Globotruncan}a \textit{sp.}, \textit{Globigerina} \textit{cretacea}, and \textit{Gumbelina} \textit{sp.} are the most common species; \textit{Kyphopyza} \textit{christneri}, \textit{Pseudogaudryinella} \textit{capitosa}, \textit{Robulus} \textit{sp.}, and \textit{Marginulina} \textit{sp.} are also common. A few specimens of \textit{Globorotalites} \textit{umbilicatus}, \textit{Eouvierina} \textit{americana}, \textit{Heterostomella} \textit{austiniana}, and \textit{Planulina} \textit{austiniana} are present. On the basis of the microfauna, the age of the containing beds is classified as early Taylor or late Austin.

2960-3000  No change.

3000-3010  Limestone, light-gray, chalky, and nodules of pyrite. The small washed residue contains fragments of \textit{Inoceramus} and Ostrea-like bivalves, and a foraminiferal fauna similar to that in the sample at 2950-2960 ft.

3010-3060  No change.

**Beds of Austin age**

The top of the beds of Austin age is placed at 3055 ft. on the basis of electric log correlation supported by the data from samples.

3060-3070  Limestone, white, hard, chalky, containing much comminuted, calcitized fossil debris. Fragments of the limestone show masses of \textit{Oligostegina} that are common in the beds of Austin age. Fragments of \textit{Inoceramus} and shells of other fossil bivalves are common. The microfossil material is usually poorly preserved, and no species having a narrowly restricted vertical range were identified.

3070-3080  Limestone, like the sample at 3060-3070 ft., and a little gray marl. The sample contains many fragments of \textit{Inoceramus} and shells of other fossil bivalves; the microfossil material is like that in the sample at 3060-3070 ft.

3080-3090  Marl, gray; many fragments of \textit{Inoceramus}; a few fragments of moderately hard, white, limestone, like the sample at 3060-3070 ft.; abundant nodules of pyrite. The foraminiferal fauna is composed, largely, of specimens of \textit{Globigerina cf. G. cretacea}, and \textit{Gumbelina cf. G. moremani}; specimens of \textit{Valvulineria} \textit{sp.} and \textit{Planulina} \textit{austiniana} are common; a few specimens of \textit{Globotruncan}a \textit{sp.} and \textit{Dorothia} \textit{cf. D. alexanderi} (often common in the lower part of the beds of Austin age) are present. Specimens of ostracodes and a few specimens of arenaceous species of Foraminifera also occur in the sample.

3090-3120  No change.

3120-3130  Shale, gray, marly, and harder than in the sample at 3080-3090 ft. The microfauna is composed almost entirely of specimens of \textit{Globigerina} \textit{sp.} and \textit{Gumbelina reussi}, and a few specimens of \textit{Planulina cf. P eglefordensis} and \textit{Globotruncan}a \textit{sp.}

3130-3150  Like the sample at 3120-3130 ft.
Description

Like sample at 3120-3130 ft. The microfossil specimens are larger and more abundant than in the sample at 3120-3130 ft., but *Globigerina* spp. and *Günzelina* spp. are still strongly dominant in the fauna; *Globotruncanana* spp. are somewhat more common; fragments of *Citharina texana* are very common. *C. texana* is common near the base of the Mooreville chalk of Austin age at the outcrop in Alabama, and one of the species of *Globotruncanana* is also common in the lower part of the Austin chalk.

Like the sample at 3160-3170 ft.; *Citharina texana* is much less abundant.

Material and fauna like the preceding samples of the beds of Austin age are mixed with cavings from much higher levels.

Shale, greenish-gray, flaky, marly, slightly micaceous, containing *Inoceramus* fragments, a few fragments of fish bones, and abundant specimens of *Globigerina* cf. *G. Cretacea*, *Günzelina reussi*, *Globotruncanana* spp. (including an undescribed form characteristic of the beds of Austin age), and *Anomalina* sp. (small).

Shale, gray, marly, and fauna like the sidewall core 65 at 3190 ft.

Marl, light bluish-gray, chalky, containing abundant fragments of *Inoceramus* and shells of other fossil bivalves, and many specimens of Foraminifera like those in sidewall core 65 at 3190 ft. Also, specimens of *Neobulimina canadensis*, *Palmula suturalis*, *Palmula pilulata*, and *Valvulineria infrequens*. Specimens of ostracodes are common: *Cythere cornuta* var. and *Cytherella* sp.

Shale, gray, marly; *Inoceramus* prisms and fragments are common. The microfauna is composed of specimens of several species of ostracodes, and specimens of *Globigerina* sp., *Globotruncanana marginata*, *Kyphopyx christneri*, *Günzelina reussi*, *Valvulineria infrequens* (Austin var.), *Nodosaria* sp. (fragments), *Planulina austiniiana*, *Robulus münsteri*, and *Marginulina inconstantia*?

Chalk, light-gray, marly, typically Austin in character; contains specimens of *Oligostegina*, *Inoceramus* fragments and ostracodes, and abundant specimens of Foraminifera: *Globigerina* sp., *Günzelina reussi*, *Globotruncanana* spp. fairly common, and a few specimens of a small *Anomalina* sp.

Shale, gray, marly, and abundant fragments of dark brownish gray somewhat light-speckled and light-streaked shale.

Marl, gray, streaked and speckled with white chalk, highly microfossiliferous. The fauna is composed, mainly, of specimens of *Globigerina* sp., *Günzelina reussi*, *Globotruncanana arca*, Planu-
**Description**

*lin* *a texana*, and *Pleurostomella watersi*.

**3310-3320**
No samples.

**3316**
Sidewall core 70. Recovery 1/4 in.
Chalk, white, marly; fauna like sidewall core 69 at 3303 ft.

**3320-3330**
No samples.

**3324**
Sidewall core 71. Recovery 1 in.
Shale, greenish-gray, marly, sandy (fine-grained sand), glauconitic, micaceous, containing phosphatic nodules. The fauna is composed of fragments of fish bones, *Inoceramus*, and other fossil bivalves, specimens of several species of *ostracodes*, and specimens of Foraminifera: *Globigerina* spp., *Gümnelina reussii*, *Gümnelina moremani*, *Globotruncan a arca var.*, *Planulina texana*, *Palmula pilulata*, *Marginulina austinianna*.

**3330-3350**
Shale, gray, and some speckled shale; no change in fauna.

**3335**
Sidewall core 72. Recovery 1¼ in.
Shale, gray, marly, highly microfossiliferous. The fauna is composed of fragments of *Inoceramus* and fish bones, specimens of ostracodes, and specimens of Foraminifera; *Globigerina* sp., *Globotruncan a arca var.*, *Globorotaka cushmani?*, *Gümnelina reussii*, *Gümnelina moremani*, *Marginulina austinianna*, *Planulina texana*?.

**3350-3360**
Material and fauna like samples at 3330-3350 feet; also many fragments of white, moderately coarse grained, clear quartz sandstone, containing many phosphatic nodules, nodules of pyrite, and worn fragments of fossil bivalves.

**Atkinson Formation. Upper Member.**

**3360-3366**
Core 6. Recovery 8 in.
Sandstone, white, dense, calcareous, quartz; contains phosphatic nodules and fragments of *Ostrea-like* bivalves.

**3366-3367**
Core 7. Recovery 5 in.
Sandstone, grayish-white, moderately fine grained, calcareous, quartz, containing mica, glauconite, fragments of lignite and fossil bivalves.

**3367-3372**
Core 8. Recovery 5 ft.
Top ¾ ft. Sandstone, light-gray, hard, dense, micaceous, somewhat fossiliferous, containing fragments of fossil bivalves.
Middle 2 ft. Sandstone, light greenish-gray, soft, fine-grained, argillaceous, micaceous, containing small, black, phosphatic nodules, and thin lenses of gray and greenish-gray flaky shale.
Bottom 2½ ft. Sandstone, soft, like middle 2 ft., but the sand grains are slightly coarser. The sandstone contains irregular thin lenses of gray and greenish-gray, somewhat sandy and micaceous shale.

**3372-3382**
Core 9. Recovery 10 ft.
Top 4 ft. Siltstone and sandstone, greenish-gray, soft, fine-
grained, argillaceous, micaceous, glauconitic, pyritic, containing a few lenses of greenish-gray, flaky, sandy (fine-grained sand), micaceous shale.

Middle 3 ft. Shale, grayish-green, thinly laminated, and white, highly micaceous siltstone, containing a few fragments of carbonaceous material and a few nodules of pyrite. Parts of the core are predominantly shale that is micaceous, irregularly silty, and somewhat carbonaceous.

Bottom 3 ft. Sandstone containing lenses of shale. The sandstone is white, dense, fine to moderately fine-grained, angular, clear quartz, containing many phosphatic nodules and a few shell fragments. The shale is greenish-gray to green, usually micaceous and somewhat carbonaceous.

Core 10. Recovery 7 ft.


Bottom 2 ft. Sandstone, light greenish-gray, fine-grained, micaceous, argillaceous, slightly glauconitic; contains carbonaceous material and fossil bivalves.

Core 11. Recovery 4½ ft.

Top. Shale, light-gray, slightly micaceous, containing a few lenses of soft, fine-grained, micaceous sandstone.

Middle. Sandstone, white, dense, hard, somewhat glauconitic, containing a few phosphatic nodules and many fragments of fossil bivalves.

Bottom 1½ ft. Shale, grayish-green, and moderately fine-grained quartz sandstone containing phosphatic nodules.

Core 12. Recovery 7 ft.

Top 1½ ft. Shale, greenish-gray, and a little white, dense, moderately fine-grained sandstone containing many worn and broken fragments of Ostrea sp., bryozoan fragments, and phosphatic nodules.

Middle 2½ ft. Shale, light grayish-green, irregularly silty, micaceous, containing irregularly distributed soft, micaceous, slightly glauconitic siltstone.

Bottom 3 ft. Shale, light greenish-gray, silty, micaceous, carbonaceous, containing many phosphatic nodules, a little glauconite, many small fragments of Ostrea sp., and a few specimens of Ostracodes.

Core 13. Recovery 2½ ft.

Sandstone, light greenish-gray, soft, argillaceous, micaceous, glauconitic, containing a few shell fragments and phosphatic nodules.
<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
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</table>
Top 2 ft. sandstone, light greenish-gray, argillaceous, highly micaceous and glauconitic; contains phosphatic nodules and fragments of fossil bivalves.  
Bottom 2 ft. shale, grayish-green, somewhat micaceous, containing scattered grains of sand, fish bones, and a trace of glauconite. |
| 3430-3440   | Core 15. Recovery 8 ft.  
Top 5 ft. Sandstone, argillaceous, fine to moderately fine grained, micaceous, glauconitic; contains fragments and molds of fossil bivalves, and some fragments of phosphatized bones.  
Bottom 3 ft. Sandstone, light-green, soft, argillaceous glauconitic; contains a few shell fragments and small phosphatic fragments. |
| 3440-3450   | Core 16. Recovery 7 ft.  
No change. |
| 3450-3460   | Core 17. Recovery 9 ft.  
Top. Sand, like core 16 at 3430-3440 ft., containing thin, irregular lenses and splotches of grayish-green shale. The material is slightly glauconitic, phosphatic, and fossiliferous (fragments of Ostrea sp.).  
Middle. Like the top part of the core, but more glauconitic.  
Bottom. Like the middle part of the core. |
| 3460-3470   | Core 18. Recovery 2 ft.  
No change. |
| 3470-3480   | Core 19. Recovery 1½ ft.  
Top. Sandstone, white, hard, and green, soft, sandy clay. The sandstone is dense, fine to moderately fine grained, calcareous, and contains abundant fragments of white, chalky, shell fragments and many nodules of glauconite and phosphatic material.  
The green clay is highly sandy and contains a few shell fragments.  
Bottom. Sandstone, light-gray, dense, containing shell fragments and nodules of both glauconite and phosphatic material. |
| 3480-3488   | Core 20. Recovery 3 ft.  
Top. Sandstone, greenish-gray, glauconitic, phosphatic, like core 19 at 3470-3480 ft., and lenses of thinly flaky green shale. The sandstone contains shell fragments.  
Bottom. Shale, grayish-green, flaky, interlaminated with light-gray, soft, very fine grained, argillaceous, micaceous, phosphatic, glauconitic sandstone. |
| 3488-3498   | Core 21. Recovery ½ ft.  
Sandstone, light greenish-gray, very fine grained, in part dense, and in part argillaceous; contains mica, shell fragments, phosphatic nodules, and many irregular-shaped, gray nodules of calcic limestone. |
Description

Core 22. Recovery 4 1/2 ft.
Top. Sandstone, light grayish-green, shaly, micaceous, and lenses of dark grayish-green, thinly flaky shale; contains a few shell fragments, phosphatic nodules, and a little glauconite.
Middle. Shale, green, micaceous.
Bottom. Shale, like middle part of core, irregularly streaked with micaceous, pyritic, slightly carbonaceous siltstone; contains a few specimens of Ostracodes.

Core 23. Recovery 7 1/2 ft.
Top. Shale, like the middle and bottom parts of core 22 at 3498-3508 ft., containing many sandy areas. Fauna consists of a few fragmentary fish bones and a few small specimens of Globigerina cf. G. cretacea.
Middle. Sandstone, light greenish-gray, moderately soft, micaceous, somewhat phosphatic, and containing brown carbonaceous fragments; a few lenses of flaky green shale in the sandstone.
Bottom. Shale, green, irregularly sandy (fine-grained sand), micaceous, carbonaceous.

Core 24. Recovery 7 ft.
Top 3 ft. Shale, like bottom part of core 23 at 3508-3518 ft. Part of this section of core 24 is sandy, (coarse-grained sand), and contains many phosphatic nodules, nodules of pyrite, and fragments of Ostrea sp.
Middle 3 ft. Sandstone, light greenish-gray, soft, argillaceous, micaceous, glauconitic, pyritic, and a few thin, irregular lenses of green shale.
Bottom 1 ft. Sandstone, light greenish-gray, fine-grained, argillaceous, micaceous; contains a few fragments of carbonaceous material, phosphatic nodules and Ostrea sp.

Core 25. Recovery 7 ft.
Top. Sandstone, fine to moderately fine grained, slightly glauconitic, phosphatic, and pyritic, irregularly interbedded with green, micaceous, somewhat carbonaceous shale that occurs in lenses of variable thickness.
Middle. Like top of this core.
Bottom. Sandstone, white, hard to moderately hard, fine to moderately coarse grained, containing a few phosphatic nodules, a few nodules of glauconite, and chalky fragments of fossil bivalves.

Core 26. Recovery 3 ft. 8 in.
Top 30 in. Sandstone, light greenish-gray, soft, glauconitic, micaceous, somewhat carbonaceous, containing a few inclusions and thin lenses of shale.
Middle. 6 in. Sandstone, soft, argillaceous, somewhat glauconitic, micaceous, and carbonaceous, irregularly interlaminated with shale and siltstone.
**Description**

Bottom 8 in. Sandstone, light greenish-gray, argillaceous, micaceous, containing many fragments of lignite, a little phosphatic material, and a few fragments of glauconite-coated shells.

**Core 27. Recovery 6½ ft.**

Top ½ ft. Sandstone like bottom of core 26 at 3538-3548 ft., and irregular thin lenses of shale.

2nd 1 ft. Sandstone, light-gray, moderately hard, argillaceous, containing many shell fragments and black, phosphatic nodules, a little glauconite and mica, and a few thin irregular lenses of green shale.

3d 1 ft. Like the second foot, but containing a few rather large fragments of lignite.

4th 1 ft. Sandstone, light greenish-gray, soft, micaceous, containing a few shell fragments and thin lenses of shale.

5th 1½ ft. Sandstone, light greenish-gray, soft, argillaceous micaceous, containing a few shell fragments, phosphatic nodules and a little carbonaceous material.

6th 1½ ft. No sample?

**Core 28. Recovery 2⅔ ft.**

Top. Sandstone, light-gray, moderately hard, argillaceous, containing irregular laminae of green shale. The sandstone is micaceous, slightly glauconitic and carbonaceous, and contains a little magnetite and a few shell fragments.

Bottom. Like the top part of the core, but softer and contains phosphatic material.

**Core 29. Recovery 7 ft.**

Top 2 ft. Shale, greenish-gray, micaceous, silty, containing abundant fragments of *Ostrea* sp.; small fragments of carbonaceous material are fairly common.

Bottom 5 ft. Sandstone, grayish-green, fine-grained, micaceous, irregularly streaked with shale laminae, and containing many fragments of *Ostrea* sp. and a few phosphatic nodules.

**Core 30. Recovery 4½ ft.**

Top. Sandstone, light greenish-gray, soft, argillaceous, glauconitic, micaceous, containing a few shell fragments and thin lenses of grayish-green flaky shale.

Bottom. Sandstone similar to the top part of the core, containing small carbonaceous fragments and irregular thin streaks of shale.

**Core 31. Recovery 6½ ft.**

Top 2 ft. Like the bottom of core 30 at 3570-3578 ft., but fragments of lignite and small fragments of carbonaceous material are abundant.

Bottom 4½ ft. Sandstone, light-gray, moderately hard, calcareous, micaceous, containing abundant fragments of *Ostrea* sp., many small phosphatic fragments, and a little glauconite and carbonaceous material.
### Description

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>3588-3598</td>
<td>Top 1 1/2 ft. Sandstone, light greenish-gray, shaly and highly sandy clay shale. Parts of the core are white, hard, nodular, sandy (very fine grained sand) limestone, in which shell fragments and small phosphatic nodules are common.</td>
<td>Top 2 ft. Shale, grayish-green flaky, containing lenses composed of mica and moderately small fragments of lignite.</td>
<td>Top. Sandstone, like bottom part of core 33 at 3598-3608 ft.; contains moderately large areas of white sandy (fine-grained sand) limestone containing shell fragments. This part of the core seemed to be conglomeratic when first exposed.</td>
<td>Top. Shale, greenish-gray, sandy, slightly glauconitic, containing abundant worn and broken fragments of shells, and many specimens of <em>Valvulineria infrequens</em> (Eagle Ford variety), a few specimens of arenaceous species of <em>Foraminifera</em>, and a few ostracodes.</td>
<td>Top. Shale, grayish-green, flaky, somewhat micaceous, containing many fragments of macrofossils, a trace of glauconite, a few large, calcareous nodules, and specimens of <em>Valvulineria infrequens</em>.</td>
</tr>
<tr>
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<td>Middle 3 ft. Sandstone, light greenish-gray, hard, and a few irregular lenses of green, micaceous silt. The sandstone is glauconitic and contains many fragments of fossil bivalves and gastropods, and a few fragments of lignite.</td>
<td>Middle 2 ft. Sandstone, light-gray, moderately soft, fine-grained, micaceous, argillaceous, containing fragments of <em>Ostrea</em> sp., and a few very thin lenses of shale.</td>
<td>Bottom. Shale, grayish-green, sandy, slightly glauconitic, containing abundant worn and broken fragments of shells, and many specimens of <em>Valvulineria infrequens</em> (Eagle Ford variety), a few specimens of arenaceous species of <em>Foraminifera</em>, and a few ostracodes.</td>
<td>Bottom. Like the top part of the core, and containing a few fragments of carbonaceous material. No change in microfauna. In this part of the core a lens of light green, hard, sandy limestone contains abundant fragments of fossil bivalves, a few fragments of lignite, a trace of glauconite, and a little mica.</td>
<td>Top. Shale, grayish-green, flaky, somewhat micaceous, and a few fragments of limestone like that in the bottom part of core 36.</td>
</tr>
<tr>
<td></td>
<td>Bottom 1 ft. Sandstone like middle part of core, and lenses of grayish-green, micaceous shale that is usually silty and in places highly carbonaceous.</td>
<td>Bottom 1 1/2 ft. Sandstone, light-gray, very fine grained, micaceous and somewhat glauconitic. This part of the core is very dense and hard in places, and contains abundant small fragments of fossil shells.</td>
<td>Bottom. Shale, grayish-green, flaky, somewhat micaceous, and a few fragments of limestone like that in the bottom part of core 36.</td>
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</tr>
</tbody>
</table>

**Atkinson Formation. Lower Member.**
Description

35 at 3615-3625 ft. The shale contains highly micaceous and carbonaceous partings, many specimens of *Globigerina* sp., *Gümbelina* sp., and *Planulina* sp., and a few specimens of small arenaceous species of Foraminifera.

3629-3639 Core 37. Recovery 4 ft.
Top. Shale, gray, flaky, micaceous, somewhat carbonaceous; contains a foraminiferal fauna in which specimens of arenaceous species are strongly predominant: *Ammobaculoides plummerae* (common), *Ammobaculites advenus* (present).
Middle. Like the top part of the core; a few fragments of macrofossils present.
Bottom. Shale like the top part of the core containing fragments of carbonaceous material (common), a few fragments of macrofossils, and a few fish scales.

3639-3649 Core 38. Recovery 10 feet.
Top. Shale, greenish-gray, micaceous, slightly silty; contains specimens and fragments of fragile, thin-shelled macrofossils, young specimens of *Ammobaculites advenus*, and a few specimens of ostracodes.
Middle. No change.
Bottom. No change.

3649-3659 Core 39. Recovery 9 ft.
Top. Shale, gray, micaceous, containing irregularly distributed silty areas, and very thin shelled macrofossils.
Middle. No change.
Bottom. No change.

3659-3669 Core 40. Recovery 10 ft.
Top 8 ft. Shale, greenish-gray, containing fragments and molds of thin-shelled bivalves, fragments of fish bones and comatulids; common species of Foraminifera are: *Ammobaculites advenus*, *Ammobaculites agrestis*, *Ammobaculoides plummerae*, *Ammobaculites junceus*, *Trochammina wickendeni*, *Globigerina* sp., *Planulina eaglefordensis* var.; a few specimens of *Gümbelina* sp.
Bottom 2 ft. Shale, gray, containing many irregularly silty to finely sandy, micaceous, slightly glauconitic streaks, and small scattered fragments of lignite. The fauna is like that in the top part of this core.

3669-3679 Core 41. Recovery 9½ ft.
Like core 40 at 3659-3669 ft:

3679-3689 Core 42. Recovery 9 ft.
Top. Shale, greenish-gray, containing many thin irregular streaks and lenses that are silty, micaceous, pyritic, and slightly glauconitic.
Middle. Shale, gray, thinly flaky, micaceous, containing many small particles of carbonaceous material.
Description

Bottom. Like the middle part of this core.

Core 43. Recovery 10 ft.

Top. Shale, greenish-gray, containing fragments of casts and molds of small thin-shelled bivalves, and a few thin, silty, micaeous and somewhat carbonaceous streaks and lenses.

Bottom. Like the top part of this core, but more silty, micaeous, and carbonaceous.

Core 44. Recovery 10 ft.

Top 2 ft. Like the bottom part of core 43 at 3689-3699 ft.; contains a few fish bones and fish teeth, a few specimens of Ostracodes, and many specimens of Foraminifera. The common species of Foraminifera are: *Ammobaculites comprimatus* and *Globigerina* sp.

2nd 2 ft. Like the top 2 ft. of this core.

3d 3 ft. Shale like the preceding parts of this core, and many thin, highly sandy (very fine-grained sand) micaeous lenses. Bottom 3 ft. Shale like the preceding parts of this core, containing specimens of *Ammobaculites comprimatus* and a few specimens of *Ammolium braunsteini*.

Core 45. Recovery 10 ft.

Top 3 ft. Shale, gray, thinly bedded, somewhat carbonaceous, sandy (fine-grained sand), micaeous. Contains many shell fragments, and specimens of Foraminifera and Ostracoda. Dominant species of Foraminifera are: *Ammobaculites advenus*, *Ammobaculites agrestis*, *Ammobaculoides plummerae*, *Reophax* sp., *Placopsilina* sp., *Pseudoclavulina* sp., *Polyphragma* sp., *Citharina kochii*, *Anomalina plummerae*, *Frondicularia cf. F. inversa*, *Globigerina* sp.; *Dentalina* sp., *Quinqueloculina lirangula*, *Triloculina* sp. Common species of ostracodes are: *Cythereis burlesonensis*, *Cythere concentrica*, *Cythereoloides obliquirugata*, *Cytherella* sp., *Cytheridea graysonensis*.

Middle 4 ft. No change.

Bottom 3 ft. No change.

This core is the type locality of the fauna usually called the “Barlow fauna”.

Core 46. Recovery 10 ft.

Top 2 ft. Thinely interbedded gray, micaeous shale and gray, highly micaeous, somewhat carbonaceous siltstone.

2nd 2 ft. Shale, gray sandy (moderately coarse sand), micaeous, and argillaceous limestone containing a small quantity of moderately coarse, scattered sand grains.

3d 3 ft. Shale, gray, containing lenses of silty, micaeous shale and lenses of siltstone, fragments of thin-shelled fossil bivalves, and specimens of *Trochammina rainwateri*, *Ammobaculites ad-

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**Description**

*venus, Globigerina* sp., and *Cytheridea graysonensis.*

Bottom 3 ft. Shale, gray, containing small particles of carbonaceous material, and thin lenses of light-gray, very fine grained, micaceous, pyritic, slightly glauconitic sandstone.

3729-3739 Core 47. Recovery 9 ft.
Top 2 ft. Shale, gray, flaky, micaceous.
2nd 2 ft. Shale, gray, flaky, containing thin, silty, micaceous, slightly glauconitic lenses.
3d 2 ft. Sandstone, gray, argillaceous, micaceous, glauconitic, somewhat phospatic. Sand grains are poorly sorted, fine to very coarse (pebble-size).
Bottom 3 ft. Like the preceding part of this core.

3739-3749 Core 48. Recovery 10 ft.
Top 3 ft. Sandstone, light greenish-gray, argillaceous, micaceous, glauconitic sandstone, like the lower part of core 47 at 3729-3739 ft., and a few thin lenses of highly micaceous, flaky shale.
2nd 3 ft. Sandstone like the preceding part of this core; also a little soft, argillaceous, glauconitic, slightly micaceous sandstone.
3d 3 ft. Sandstone, light greenish-gray, soft, fine to moderately fine-grained, argillaceous, glauconitic, slightly micaceous.
Bottom 1 ft. Shale, gray, thinly flaky, micaceous, containing thin irregular, sandy (very fine-grained sand), glauconitic, micaceous streaks and lenses.

3749-3759 Core 49. Recovery 8 ft.
Top. Like the bottom part of core 48 at 3739-3749 ft.
Middle. Siltstone, irregularly and thinly laminated, soft, micaceous, argillaceous, and gray, flaky, somewhat glauconitic shale.
Bottom. Shale, gray, silty, micaceous, glauconitic, and fine to coarse-grained, glauconitic, phosphatic, argillaceous sandstone.

3759-3769 Core 50. Recovery 9 ft.
Top. Shale, gray, thinly flaky, containing a few rather evenly distributed, small fragments of lignite, and thin lenses of soft, very fine grained, glauconitic sand.
Middle. Shale, greenish-gray, highly sandy (fine to coarse grained sand), micaceous. Coarse to moderately coarse, well-rounded sand grains, are common.
Bottom. Like the middle part of this core.

3769-3779 Core 51. Recovery 4 ft.
Top. Sandstone, light-gray, soft, fine to coarse-grained, argillaceous, glauconitic, somewhat micaceous; moderately fine grains are common.
Bottom. Sandstone, light greenish-gray, soft, mostly fine-grained, argillaceous, micaceous, glauconitic.

3779-3788 Core 52. Recovery 3 ft.
Top. Like the bottom part of core 51 at 3769-3779 ft. The sand-
Description

Stone is mainly fine-grained, but coarse grains are fairly common.

Bottom. Shale, light bluish-green and reddish-brown mottled, highly micaceous, unctuous.

Comanche Series, undifferentiated

The top of the Comanche Series is placed at 3789 ft. on the basis of electric log correlation in connection with the data from samples.

3788-3793 Core 53. Recovery 4 ft.
Shale, mottled light-green, yellowish-brown, light purplish-gray, micaceous, unctuous.

3793-3803 Core 54. Recovery 9 ft.
Shale, mottled, dull brownish-red, green, mustard, bluish-gray, and lavender, somewhat micaceous, unctuous.

3803-3812 Core 55. Recovery 9 ft.
Top 3 ft. Clay, mottled, light-yellowish-green and purple, highly sandy, unctuous. The sand grains are fine to very coarse, rounded to subrounded, and etched; many grains show an orange tint.

Middle 3 ft. Clay, mottled, light-green, -purple, and yellow, unctuous, slightly sandy. Nodules of limonite are fairly common.

Bottom 3 ft. Clay, mottled, light bluish-green and reddish to yellowish-brown, unctuous.

3812-3819 Core 56. Recovery 7 ft.
Top. Clay, gray, purplish-gray, and yellow, sandy, unctuous. The sand is fine-grained, evenly distributed in the clay, and constitutes about 10 percent of the sample.

2nd part. Clay, dark grayish-purple, waxy, containing bands of red, yellow, and white-streaked sand. The sand is composed of fine to very coarse, rounded quartz grains, and a little feldspar.

3d part. Sandstone, white, bentonitic, fine to moderately coarse grained, micaceous; the fine-grained sand predominates.

Bottom. Sandstone, mottled, light-green, grayish-purple, and mustard, bentonitic, fine to moderately coarse grained, micaceous; the sand grains are etched.

3819-3829 Core 57. Recovery 7 ft.
Top. Sandstone, mottled, gray, light purplish-gray, and yellow, bentonitic, micaceous. The sand grains are fine to very coarse, etched quartz, and a little feldspar; many grains are tinted yellow and pink.

Bottom. Sandstone, very light green, fine to very coarse grained, bentonitic; the sand grains are etched, and a few are tinted yellow and pink.

3829-3831 Core 58. Recovery 1 ft.
Top. Sandstone, mottled, light-green, light purplish-red, and mustard, argillaceous and a little sandy clay in which the sand grains are poorly sorted, fine to coarse, rounded, etched, and
**Description**

irregularly distributed; many grains are tinted pink and yellow. Bottom. Clay, mottled and streaked, white, yellowish-brown, and mustard, waxy, sandy. The sand grains are poorly sorted, unevenly distributed and etched; one large fragment of quartzite (pebble?) is present.

3831-3835 Core 59. Recovery 4 ft.
Top. Quartzite pebble(?) or boulder(?), mottled tan, brown, and pale red.
Middle, Clay, mottled red and mustard, highly sandy.
Bottom. Sandstone, hard, ferruginous.

**Ordovician(?)**

Lower Ordovician(?) Series

3835-3835'4" Core 60. No recovery.
3835'4"-3835½ Core 61. Recovery 2 in.
- White quartzite.

3839 Fragments of white, hard, fine-grained sandstone and cavings.
3840 Fragments of white and pink, hard, moderately dense, fine-grained sandstone and cavings.
3841 Fragments of white, dense, fine-grained sandstone; a few fragments seem to be quartzitic. Many cavings.

3846½-3846¾ Core 62. No recovery.
3846¾-3847 Core 63. No recovery.
3847 Fragments of white and pink, dense to moderately dense fine-grained sandstone and quartzite(?)

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**CLINCH COUNTY**

Operator: Luke Grace Drilling Co. GGS. No. 338
Landowner: Lem Griffis well 1 Elevation: 176 ft. (derrick floor)
Location: Land District 13, Land Lot 36; center of Land Lot 36 Total depth: 4588 ft.
Completed: Jan. 24, 1953

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Summary of Stratigraphy

Tertiary
Not studied

Cretaceous

Gulf

Lawson Limestone upper member (?) 2790 110?

Beds of Taylor age 2900?

Beds of Austin Age (no samples 3100-3620 ft.)

Atkinson Formation upper member lower member (?)

Pre-Cretaceous

Igneous rocks 3843 to 745 total depth

Lithologic and paleontologic description of cutting samples.

Description

Cretaceous

Gulf Series

Lawson Limestone, Upper Member (?).

2790-2800 Dolomite, light-tan, moderately coarsely crystalline, somewhat porous; contains a few blebs of gypsum. The lithology suggests that the sample is from the upper member of the Lawson Limestone.

2800-2810 Like the sample at 2790-2800 ft. The dolomite contains a few blebs of gypsum.

2810-2900 No samples.

Beds of Taylor age.

2900-2910 Limestone, white, hard, chalky, containing irregularly distributed gray areas. Much finely fragmented calcitic material is embedded in the limestone, and is probably derived from broken molds and fragments of molds of small specimens of Foraminifera, and from fragments and prisms of Inoceramus. The foraminiferal fauna, which suggests the uppermost part of the beds of Taylor age, is composed of specimens of Anomalina cosdeni, Stensiolina americana, Globorotalites conicus, Bolivinoides deco-
Description

rata, Robulus sp., Globotruncana marginata, Bolivina incrassata, Buliminella carseyae, Anomalina sholtzensis, Planulina cedarkeysensis. The sample gives no indication that the lower member of the Lawson Limestone was penetrated in this well.

2910-2950 Samples not studied.
2950-2960 Chalk, white, soft. Washed residue is small, but contains a fauna similar to the sample at 2900-2910 ft.
2960-3000 Samples not studied.
3000-3010 Chalk, white, soft. Washed residue is small and is composed of a few nodules of hard chalk, a few small rounded nodules of pyrite, and fragments of Inoceramus and other fossil bivalves.
3010-3020 Like sample at 3000-3010 ft.; also fragments of echinoid spines and a few specimens of Anomalina sp.
3020-3030 Chalk, white. Washed residue is small and composed of a few fragments of hard chalk, a few fragments of Inoceramus, and echinoid spines.
3030-3040 Chalk, white. Washed residue is moderately large, and is composed of large fragments of indurated chalk in which are embedded fragments of Inoceramus, echinoid spines, specimens and calcite casts of specimens of Foraminifera, and small crystals of pyrite. No narrowly restricted species of Foraminifera were indentified.
3040-3050 Like the sample at 3030-3040 ft., but the chalk contains few embedded microfossils and fragments.
3050-3060 Chalk, white, soft, and a moderately large residue of cuttings of dolomite, fragments of Inoceramus and other fossil bivalves, and specimens of nondiagnostic species of Foraminifera. The sample may be largely cavings.
3060-3070 Chalk, white, soft. Washed residue is moderately large and composed of fragments of hard chalk, in which are embedded the finely fragmented debris of small fossils; many fragments of Inoceramus and other fossil bivalves; a few nodules of pyrite.
3070-3080 Chalk, white, soft. Washed residue is small and like the sample at 3060-3070 ft.
3080-3090 Chalk, soft, white. Washed residue is small and composed mainly of fragments of light-tan dolomite (probably caving), a few fragments of hard chalk, Inoceramus fragments, and sparse specimens of Foraminifera.
3090-3100 Dolomite, chalk-coated. Washed residue is large and composed of light-tan and light-brown, moderately finely crystalline, irregularly porous dolomite; nodules of hard chalk, and of pyrite; Inoceramus prisms; a few specimens of Foraminifera. The dolomite is probably caving. The sample contains nothing to suggest that the drill has penetrated a stratigraphic unit older than the beds of Taylor age.
3100-3620 No samples.
Description

Atkinson Formation. Upper Member?.
(electric log correlation)

3620-3800 No samples.

Atkinson Formation. Lower Member(?).

3800-3807 Sand, poorly sorted, fine to moderately coarse-grained, clear quartz. The sample contains small, colorless dolomite rhombs, irregular-shaped nodules of bright-green glauconite, a few phosphatic nodules, nodules of crystalline pyrite, and a few fragments of thin white shells of brackish-water (?) bivalves. The sand is almost exactly like the sand penetrated in the lower member of the Atkinson Formation in other nearby wells. A few cavings of the typical speckled shale of the lower part of the beds of Austin age is believed to indicate that the unit was penetrated in the part of the geologic section from which no samples were received.

3810 Sandstone like the sample at 3800-3807 in its general character, but more highly glauconitic; the sand grains are fairly well sorted and mostly of medium sized.

3821 Sand, coarse-grained, clear quartz; the average grain-size is about 1 to 1.5 mm. The sample contains a little glauconite, a few shell fragments, phosphatic nodules, and nodules of light grayish-brown, dense very finely crystalline, slightly glauconitic dolomite.

3820-3830 Like the sample at 3821, and some pebble-size grains of sand.

3830-3840 Sand like the samples below 3800 ft.; also many dark-gray, worn, sand-encrusted fragments of Ostrea sp. and a little glauconitic and phosphatic material.

3840-3850 Conglomerate (?) composed, chiefly, of hard, angular fragments of light bluish-green, light brownish-red, and mustard-colored weathered (?) igneous rock; also many fragments of dark brownish-red, and mottled red, green and mustard-colored clay shale that may be the matrix containing pebbles and fragments of igneous rock.

Pre-Cretaceous

3843-4588 T.D. Igneous rocks. The top of the igneous rock at 3843 ft. is based on the correlation of the electric log of the well.
Operator: H. L. Hunt  
Landowner: Alice Musgrove well 1  
GGS. No. 481  
Elevation: 147 ft. (derrick floor)  
Location: Land District 12, Land Lot 198; Northwest corner of southwest quarter of Land Lot 198.  
Total depth: 4088 ft.  
Completed: Jan. 18, 1944.

Summary of Stratigraphy

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Thickness (feet)</th>
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<tbody>
<tr>
<td>Tertiary</td>
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<tr>
<td>Oligocene</td>
<td></td>
</tr>
<tr>
<td>upper, Suwanee Limestone</td>
<td>390</td>
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<tr>
<td>Eocene</td>
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<tr>
<td>upper, Ocala Limestone, upper member</td>
<td>470</td>
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<tr>
<td>lower member</td>
<td>620</td>
</tr>
<tr>
<td>middle, upper middle, Avon Park Limestone</td>
<td>730</td>
</tr>
<tr>
<td>lower middle, Lake City Limestone</td>
<td>940</td>
</tr>
<tr>
<td>lower, Oldsmar Limestone</td>
<td>1460</td>
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<tr>
<td>Paleocene</td>
<td></td>
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<tr>
<td>in beds containing Tamesi fauna at 2370 ft.</td>
<td>?</td>
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<tr>
<td>Cretaceous</td>
<td></td>
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<tr>
<td>Gulf</td>
<td></td>
</tr>
<tr>
<td>Lawson Limestone, upper member (?)</td>
<td>2820</td>
</tr>
<tr>
<td>Beds of Taylor age</td>
<td>2860</td>
</tr>
<tr>
<td>Beds of Austin age</td>
<td>3080</td>
</tr>
<tr>
<td>Atkinson Formation, upper member</td>
<td>3390</td>
</tr>
<tr>
<td>lower member</td>
<td>3615</td>
</tr>
<tr>
<td>Comanche</td>
<td>undifferentiated</td>
</tr>
</tbody>
</table>

Ordovician

Lower Ordovician\(^1\) quartzitic sandstone and dark shale | 3953 to 135 total depth |

Lithologic and paleontologic description of cuttings and cores. Samples are cuttings unless otherwise stated.

Description

0 to 2370 Samples were studied microscopically but were not described. The different stratigraphic units of Oligocene and Eocene age were

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\(^1\)Bridge, Josiah, and Berdan, J. M., 1951, U. S. Geological Survey open-file report, p. 5 and map.
Description
determined on the basis of characteristic species of Foraminifera that were identified in the samples, and the approximate depth to the top of each unit is shown in the summary of stratigraphy.

In Paleocene Series

Beds containing Tamesi fauna

2370-2400 Limestone, gray, hard, marly, slightly glauconitic; a few fragments of the limestone are sandy. The sample contains a little light grayish-tan chert.

2400-2410 Chalk, cream, slightly glauconitic. The sample contains abundant specimens of very small, poorly preserved, non-diagnostic Foraminifera; Asterigerina sp. common.

2410-2420 Sample not described.

2420-2450 Limestone, light-gray and light-cream, hard, chalky. The sample contains a little chert, and specimens of small Foraminifera like the sample at 2400-2410 ft.

2450-2460 Sample not described.

2460-2470 Limestone, gray and cream, chalky, nodular, slightly glauconitic; many specimens of small Foraminifera like sample at 2400-2410 ft.

2470-2480 Sample not described.

2480-2490 Limestone, cream, nodular, somewhat glauconitic. The sample contains a little chert. The limestone has a sandy appearance because it contains a large amount of very finely fragmental calcitic material. The microfauna is composed of specimens of small Foraminifera like the sample at 2400-2410 ft.

2490-2550 No change.

2550-2560 Limestone, like sample at 2480-2490 ft., but more calcitic. White chert in the sample has a spicular appearance; the microfauna is unchanged.

2560-2680 No change.

2680-2690 Like sample at 2550-2560 ft., but the limestone is softer, contains fine-grained sand and large worn fragments of calcite; the microfauna is unchanged.

2690-2770 No change.

2770-2780 Sandstone, greenish-gray, very fine grained, glauconitic, containing much calcitic material. The sample contains gray, sandy, marly clay; specimens of Nodosaria affinis and a few other foraminiferal species.

2780-2800 Samples not described.

2800-2810 Chalk, white, sandy; and gray, very fine grained, somewhat glauconitic sandstone. The sample contains a little gray chert and non-diagnostic specimens of small Foraminifera.

2810-2820 Limestone, light-cream, chalky, glauconitic; light grayish-tan chert
**Description**

common. The sample contains specimens of small Foraminifera, specimens of *Globorotalia velascoensis*, and other species characteristic of the beds of Paleocene age that contain a Tamesí fauna.

**Cretaceous**

**Gulf Series**

*Lawson Limestone. Upper Member (?)*

- **2820-2830**: Limestone, white, like sample at 2810-2820 ft., a little glauconite, and a little light-gray spicular chert; many fragments of light-brown dolomite that possibly marks the top of the upper member of the Lawson Limestone (Navarro age).
- **2830-2840**: Dolomite, light-cream, finely granular, is the dominant material in this sample.
- **2840-2850**: Limestone, white, containing scattered small grains of dark-green glauconite. The limestone is more chalky than that in the overlying beds of Paleocene age. Indigenous specimens of Foraminifera are not abundant but specimens of *Globotruncan* *a area* are present.
- **2850-2860**: Like sample at 2840-2860 ft., but the limestone is only slightly glauconitic.

**Beds of Taylor age**

- **2860-2870**: Like sample at 2850-2860 ft.; highest appearance of *Inoceramus* fragments, and a few specimens of *Globorotalites conicus* and *Stenioïda americana*.
- **2870-2880**: Sample not studied.
- **2880-2890**: *Inoceramus* fragments are abundant.
- **2890-2970**: Samples not studied.
- **2970-2980**: Clay, gray and greenish-gray, soft, marly, begins to show in the samples and increases in amount in the samples below this depth. A little sand is present but may be caving.
- **2980-2990**: Like the sample at 2970-2980 ft.; fine to moderately fine-grained sand is about 20 percent of the sample.
- **2990-3060**: Samples not studied.
- **3060-3070**: Marl, gray.
- **3070-3080**: Sample not studied.

**Beds of Austin age**

The top of the beds of Austin age is placed at 3080 ft. on the basis of electric log correlation supported by the data from samples.

- **3080-3090**: Limestone, cream, and a few fragments of light-gray marl. The material being drilled seems to be gray and greenish-gray marl containing streaks of limestone. *Inoceramus* fragments are
Description

abundant; fine to coarse-grained sand is about 50 percent of the sample.

3090-3100 Marl, about 75 percent of the sample; fragments of glauconitic limestone are about 25 percent of the sample. *Inoceramus* fragments are common, and a few shell fragments are present in sandy fragments of the marl.

3110-3120 Marl. Highest occurrence of specimens of *Citharina texana* indicates the Austin age of the beds.

3120-3240 Samples not studied.

3240-3250 Marl, dark-gray, slightly speckled; highest occurrence of this type of lithology.

3250-3300 Samples not studied.

3300-3310 Shale, greenish, and brownish-gray thinly flaky shale. Specimens of *Globotruncana* sp., *Globigerina* sp., and *Günbelina* sp. are common; specimens of *Planulina austiniana* indicate the Austin age of the beds.

3310-3380 Samples not studied.

3380-3390 Shale, dark, flaky, speckled, and fragments of dark-brown, thinly flaky, speckled, greasy-looking shale.

Atkinson Formation. Upper Member.

3390-3400 Shale, like sample at 3380-3390 ft., and fragments of white, soft, fine-grained, glauconitic sandstone; most of the sand grains are angular.

3400-3410 Sample not studied.

3410-3420 Sand and sandstone like sample at 3390-3400 ft., and several types of gray and greenish-gray thinly flaky clay shale; a little green, smooth-textured, noncalcareous shale; a few fragments of fish bones.

3420-3477 Samples not studied.

3477 Sidewall core.

3477-3620 Sand, white, fine-grained, angular.

Atkinson Formation. Lower Member.

3615 Top of lower member of Atkinson Formation is placed on the basis of electric log correlation in connection with the data from samples.

3620-3630 Shale, green and gray, several types; sand; shell fragments.

3630-3640 Sample not studied.

3640-3650 Shale, green, flaky; many specimens of calcareous species of Foraminifera that are characteristic of the upper member of the Atkinson Formation, some or all of which are probably caving; several specimens of arenaceous species of Foraminifera that are indigenous to the lower Atkinson.
Comanche Series undifferentiated

3825 Top of Comanche Series is placed on basis of electric log correlation in connection with the data from samples.

3840-3850 Sand, unconsolidated, containing greenish-yellow and pink grains, coarse-grained, and a little feldspar.

3850-3870 Samples not studied.

3870-38802 Sand like sample at 3840-3850 ft., and yellow, green, and multicolored, hard, very finely micaceous shale.

CLINCH COUNTY

Operator: Wiley P. Ballard, Jr. GGS. No. 496
Landowner: Timber Products Co. Elevation: 214 ft. (derrick floor)
Well 1A
Location: Land District 7, Land Lot 306; 2050 ft. east and 1760 ft. south of northwest corner of Land Lot 306.

Completed: Feb. 8, 1956

Summary of Stratigraphy

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Thickness (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>492</td>
<td>188</td>
</tr>
<tr>
<td>680</td>
<td>260</td>
</tr>
<tr>
<td>940?</td>
<td>740</td>
</tr>
<tr>
<td>1680</td>
<td>340</td>
</tr>
</tbody>
</table>

2Samples below 3880 ft. not studied.
Paleocene
Beds of Midway age............................................. 2020  540

Cretaceous
Gulf
Beds of Navarro age........................................... 2560  320
Beds of Taylor age............................................ 2880  140
Beds of Austin age............................................ 3020  340
Atkinson Formation, upper member.......................... 3360  430
Atkinson Formation, lower member........................... 3790  220
Comanche undifferentiated.................................... 4010  145

Pre-Cretaceous
Igneous rocks.................................................. 4155 to 77 total depth

Lithologic and paleontologic description of cutting samples.

**Description**

**Tertiary**

**Eocene Series**

**Upper Eocene. Ocala Limestone. Upper Member.**

492- 522 Coquina, chalky, nodular; composed of worn and broken chalky specimens of Foraminifera. Dominant species are *Operculina ocalanus* and several varieties of *Lepidocyclina ocalana*. Other determinable fossils are *Asterocyclina* cf. *A. asterisca*, *Sphaero-gypsinia globula*, *Heterostegina ocalana*, and a few specimens of smaller Foraminifera. Fragments of bryozoans and fossil bivalves are also present.

522- 610 Coquina, like preceding sample but more chalky and more firmly consolidated. Samples contain worn fragments of large specimens of *Lepidocyclina* and *Operculina*, and some rounded quartz grains. Samples at 572-582 feet and 600-610 feet contain specimens of *Pseudophragmina flintensis*.

610- 620 Coquina, like preceding samples, but "mud conditioner" composes about one-half of washed concentrate.

620- 660 Coquina, composed mainly of worn and broken fragments of *Lepidocyclina, Operculina, Camerina?* and a few other genera of larger Foraminifera; also hard chalky nodules composed of comminuted fossil debris.

660- 680 Dolomite(?), light-brown, slightly chalky, highly calcitic, moderately porous; seems to be an altered coquina.
LOGS OF SELECTED WELLS IN THE COASTAL PLAIN OF GEORGIA

Description

Upper Eocene. Ocala Limestone. Lower Member.

680-700 Coquina, 50 percent of sample, composed of hard, chalky, worn, and finely comminuted fossil debris; 25 percent, grayish-brown, finely granular, calcitic dolomite.

700-720 Coquina, composed of worn and broken, moderately finely comminuted fossil debris; some small nodular fragments of finely granular grayish-brown dolomite. The chalky and dolomitic materials contain traces of pyrite(?). Samples contain poorly preserved specimens of Amphistegina pinarensis cosdeni, Fabiana cubensis, Rotalia cushmani, Gyroidina cf. G. nassauensis, calcareous algae and a few echinoid fragments.

720-730 Coquina, composed of chalky, worn, rolled, and broken molds of fossils. The chalky material shows traces of glauconite(?) and pyrite. Fauna is similar to that in the preceding sample with the addition of a few small specimens of Lepidocyclina sp.

730-740 Coquina, moderately hard, chalky, finely comminuted, containing a trace of glauconite. Fossil material abundant, but badly worn and mostly undeterminable. Amphistegina pinarensis is the dominant foraminifer; miliolids and a few other species of small Foraminifera are present. Sample contains a little dolomite.

740-760 No samples.

760-770 Coquina, worn and finely broken as in preceding sample. Sample contains many fragments of finely granular light-tan dolomite, but little determinable fossil material.

770-810 No samples.

810-820 Like sample at 760-770.

820-840 Coquina, dolomitic, chalky, containing glauconitic areas; dolomite composes about 50 percent of the coquina and is unevenly distributed. Fossils composing coquina are mainly several varieties of Lepidocyclina ocellana. Echinoid fragments are also present.

840-890 Chalk, white, dolomitic, calcitic, somewhat glauconitic; contains specimens of Lepidocyclina, and traces of an originally high, but now much altered fossil content. Sample at 880-890 contains much-caved material.

890-940 Dolomite, light-cream, porous, slightly chalky, calcitic; probably recrystallized coquina.

Middle Eocene. Undifferentiated.

940-970 Dolomite, light-tan, finely granular, porous, chalky, calcitic, containing worn chalky molds of Foraminifera, Amphistegina sp., Operculinoides, and others.

970-980 Chalk, light-cream, moderately hard, dolomitic, containing specimens of Amphistegina sp. and Lepidocyclina sp.

980-1000 Limestone, white, hard, nodular, porous, chalky, slightly dolomitic. Limestone is composed chiefly of well-sorted, worn, finely broken
**Description**

molds of small Foraminifera and other fossil debris. Seemingly indigenous specimens are *Amphistegina* cf. *A. nassauensis* and *Operculinoides* (?). Sample at 990-1000 ft. contains a small amount of fine-grained, subangular, quartz sand.

1000-1040
No samples.

1040-1050
Similar to material described at 980-1000, but less well consolidated; contains a few fragments of dark grayish-brown, finely granular dolomite, similar to that described at 700-720 ft.

1050-1090
Limestone, light-cream, moderately hard, chalky, calcitic, dolomitic, coquinoid. Limestone composed of fine to coarse, worn fragments of molds of *Operculinoides*, *Lepidocyclina*, *Operculina*, *Camerina*, bryozoan fragments and undeterminable microfossil and macrofossil debris.

1090-1160
Lithologically similar to the preceding sample, but contains many specimens of *Lepidocyclina* (*Pholepidina*) *r. douvillei* Lisson, and *L. cedarkyesensis*; also bryozoan and echinoid fragments.

1160-1190
Limestone, coquinoid, chalky, calcitic, composed of coarse to fine, worn fossil debris, not usually determinable, but includes *Lepidocyclina* sp., *Amphistegina* sp., bryozoan, echinoid and bivalve fragments. A trace of glauconite present on some of the fossil fragments.

1190-1220
No samples.

1220-1240
Sand, fine to medium-grained, subangular, clear quartz; fragments of grayish-white, very finely granular, slightly porous dolomite; and fragments of white, moderately hard, irregularly sandy, glauconitic coquina composed of worn and broken molds of microfossils and macrofossils. Note. The two samples, 1220-1230 and 1230-1240, seem to be out of place and were possibly misnumbered.

1240-1280
Coquina, white, moderately hard, calcitic, chalky, composed of worn fragments of microfossils and macrofossils and a small amount of irregularly distributed glauconite. The fossil material is usually undeterminable, but fragments of *Lepidocyclina* sp., bryozoans and echinoids were recognized.

1280-1310
Coquina, composed of worn and usually broken cream limestone molds of fossils, among which are specimens of *Amphistegina nassauensis*, *Epistomaria semimarginata*, *Discorbis inornatus*, *Eponides gunteri*, *Lepidocyclina* (*Polylepidina*) *antillea*, and many specimens of smaller Foraminifera and ostracods.

1310-1325
No samples.

1325-1370
Limestone, light-cream, porous, chalky, probably a water-worn, altered coquina showing only traces of fossil-molds. About 50 percent of sample is grayish-brown moderately finely crystalline dolomite, and a little light-gray chert. A trace of selenite is present in some of the chips of dolomite. Fragments of *Astrocyclina asterisoa* (an upper Eocene form) in sample at 1350-1360 ft. is probably caving.
LOGS OF SELECTED WELLS IN THE COASTAL PLAIN OF GEORGIA

### Description

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1370-1410</td>
<td>Limestone, white moderately hard, chalky, showing traces of fossil structure and ornamentation. Some limestone fragments are glauconitic. Washed concentrate contains worn fragments of larger Foraminifera, and a few fragments of dolomite and chert.</td>
</tr>
<tr>
<td>1410-1440</td>
<td>Limestone, white to light-cream, moderately hard, porous, chalky, containing abundant fragments of specimens of <em>Pseudophragminia (Proporocyclina) teres</em>, <em>Lepidocyclina (Polylepidina) antillea</em>, <em>Amphistegina lopesrigoi</em>, and many bryozoan fragments.</td>
</tr>
<tr>
<td>1440-1460</td>
<td>Limestone, cream, moderately hard, porous, coquinoïd, somewhat glauconitic and dolomitic, containing abundant broken and worn specimens of a number of species and genera of Bryozoa.</td>
</tr>
<tr>
<td>1460-1500</td>
<td>Limestone, cream, chalky, glauconitic, dolomitic, containing many bryozoan fragments, fragments of fossil bivalves and other fossil debris. The glauconite is dark green, and occurs as small irregular inclusions in depressions in the limestone and as partial filling for some of the fossils.</td>
</tr>
<tr>
<td>1500-1520</td>
<td>Limestone, white coquinoïd, chalky, dolomitic, glauconitic, containing abundant specimens of <em>Operculinoides gravelii</em> Cole, bryozoan fragments, and other undeterminable fossil debris.</td>
</tr>
<tr>
<td>1520-1570</td>
<td>No samples.</td>
</tr>
<tr>
<td>1570-1640</td>
<td>Coquina, 50 percent of sample, composed of worn and fragmental which limestone molds of small specimens of Foraminifera and other fossils; 50 percent of sample is fine-grained quartzitic sand containing a few phosphate nodules and fragments of dolomite limestone molds of small specimens of Foraminifera and 1/2 fragmental fossil material.</td>
</tr>
<tr>
<td>1640-1670</td>
<td>Sand, fine to medium-grained, subangular, clear quartz, containing a few black phosphatic nodules, is about 90 percent of sample. Fragmental fossil material is about 10 percent of sample. In the sample at 1650-1670, the sand and the fossil molds each compose about 50 percent of the cuttings.</td>
</tr>
<tr>
<td>1670-1680</td>
<td>Limestone, white, moderately hard, coquinoïd, containing abundant specimens of a strongly beaded tumid <em>Camerina?</em> sp., and of <em>Discocyclina (Asterocyclina) monticellensis</em> Cole and Ponton. Other fragmental fossil material is present but unidentifiable.</td>
</tr>
</tbody>
</table>

**Lower Eocene. Beds of Wilcox age.**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1680-1690</td>
<td>Limestone, chalky, dolomitic, glauconitic, containing a trace of fragmental fossil material and light-gray chert. Note. This material is similar to some in higher samples and may be out of place. Top of lower Eocene is based, in part, on electric log characteristics of the Ballard well.</td>
</tr>
<tr>
<td>1690-1700</td>
<td>Limestone, chalky, dolomitic, fossiliferous containing fragments of light-gray chert and specimens of <em>Asterocyclina monticellensis</em> Cole and Ponton, (probably caving); <em>Discocyclina weaveri</em> (characteristic of the Salt Mountain Limestone), fragments of large</td>
</tr>
</tbody>
</table>
Description

echinoid spines, and other fossil material. Robulus cf. R. midwayensis occurred in one fragment of limestone.

1700-1720 Sand, very fine to coarse.

1720-1750 Sand, like preceding sample, and about 50 percent small fragments of fossil material composed of white chalky limestone. Small black phosphatic nodules occur at 1740-1750 feet.

1750-1760 No sample.

1760-1770 Sand, very fine to coarse-grained, subangular, clear quartz, and some nodular fragments of white, hard, glauconitic, sandy limestone composed of broken and fragmental molds of fossils.

1770-1780 Sand as in the preceding sample, about 80 percent; about 20 percent white sandy limestone molds of fossil fragments.

1780-1800 Like the preceding sample with the addition of many fragments of limestone similar to that in sample at 1760-1770 feet.

1800-1820 No samples.

1820-1870 Sand, fine to very coarse, subangular, clear quartz; abundant gray and some white fragments of Ostrea-like bivalves that have been finely broken and worn; small nodules composed of white chalky limestone, fossil fragments, and glauconite. At 1850-1860 feet, sample contains fragments of several species of Bryozoa and some fragments of Camerina sp.

1870-1880 Sand, fine to very coarse, clear quartz, containing large black nodules of phosphate, constitutes most of sample. A smaller part of sample is composed of fragments of a coquinoïd limestone, part of which are gray, sandy and glauconitic, and part are white, porous, glauconitic and fossiliferous. A few worn specimens of Pseudophragmina (?) sp. are apparently indigenous.

1880-1900 No samples.

1900-1930 Sand, fine to very coarse, subangular, clear quartz. Sample contains a few specimens of Discocyclina weaveri and small fragments of other fossils like those described from higher levels in the lower Eocene.

1930-1980 Sand, like preceding sample, and abundant gray and white, sandy, somewhat glauconitic fragments of Ostrea, other fossil bivalves, and unidentified fossil material.

1980-2020 Sand, fine to very coarse, subangular, clear, quartz, containing a few phosphatic nodules, and many fragments of white, glauconitic, sandy, fossiliferous limestone; fragments of gray and white, sandy, glauconitic, badly worn, fossil bivalves; pink-stained, sandy, glauconitic, porous, fossiliferous limestone; and other fossil debris. Some of the material is probably caving.

Paleocene Series
Beds of Midway Age

2020-2040 Lithology and fauna like the preceding sample, with the addition
of many fragments of fine-grained, highly glauconitic dolomite. A few fragments contain selenite inclusions and a few are chalky. Some fragments of dolomite are sandy.

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2040-2060</td>
<td>No samples.</td>
</tr>
<tr>
<td>2060-2070</td>
<td>Sand, fine to very coarse, subangular, clear quartz, about 50 percent of sample; about 50 percent white, glauconitic, sandy limestone that contains small fragments of Ostracodes and undeterminable fossils.</td>
</tr>
<tr>
<td>2070-2090</td>
<td>Limestone, white, moderately hard, sandy, glauconitic, and somewhat fossiliferous like the preceding sample. Sample contains a little sand, and a few fragments of glauconitic sand cemented with selenite.</td>
</tr>
<tr>
<td>2090-2120</td>
<td>Sand, fine to very coarse grained, about 50 percent of sample; 50 percent white, moderately hard, sandy and glauconitic limestone like the preceding sample. The limestone contains fragments of microfossils and macrofossils.</td>
</tr>
<tr>
<td>2120-2130</td>
<td>No sample.</td>
</tr>
<tr>
<td>2130-2150</td>
<td>Limestone, light-gray, highly sandy, glauconitic; sand is moderately fine grained and contains a trace of mica.</td>
</tr>
<tr>
<td>2150-2180</td>
<td>Sand, fine to very coarse, and fragments of sandy limestone and worn fossils that are probably caving from higher levels.</td>
</tr>
<tr>
<td>2180-2200</td>
<td>Sand, fine to coarse-grained, with medium-sized grains common at 2180-2200 feet; many small fragments of light-gray, very finely sandy and glauconitic, chalky limestone. A few small poorly-preserved specimens of Foraminifera are possibly indigenous in the sample. Coarse grains of sand are common at 2190-2200 feet.</td>
</tr>
<tr>
<td>2200-2250</td>
<td>Sand, fine to coarse-grained, about 25 percent of sample; 75 percent gray, hard, finely sandy and glauconitic, calcareous clay, or argillaceous, calcareous sandstone. The clay contains scattered flakes of mica and small, poorly-preserved fragments of fossils. At 2210-2220 feet, a few fragments of <em>Nodosaria affinis</em> wash from the clay.</td>
</tr>
<tr>
<td>2250-2260</td>
<td>Sand, fine to coarse, about 25 percent of sample; 75 percent gray, glauconitic, finely sandy, calcareous clay. The clay contains specimens of <em>Nodosaria affinis</em>, <em>Robulus</em> sp., <em>Cibicides allenii</em>, and <em>Cytheropteron midwayensis</em>.</td>
</tr>
<tr>
<td>2260-2300</td>
<td>Like the preceding sample with the addition of abundant fragments of light-brown, hard, highly glauconitic, coquoid limestone composed mainly of finely comminuted fossil debris in a dolomitic and chalky matrix.</td>
</tr>
<tr>
<td>2300-2330</td>
<td>Limestone, white, hard, chalky, irregularly porous and glauconitic, containing many traces of fragmentary fossil material; a few poorly preserved free specimens of <em>Anomalina</em> sp., <em>Cibicides</em> (?) sp., and others.</td>
</tr>
<tr>
<td>2330-2380</td>
<td>Limestone, white, hard, very finely porous and glauconitic, show-</td>
</tr>
</tbody>
</table>
## Description

ing abundant traces of an original very finely fragmental fossil content. This material is more firmly consolidated than in the higher samples. A few fragments of *Nodosaria* cf. *N. affinis* are in the sample at 2370-2380 ft.

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2380-2400</td>
<td>Limestone, light-gray, argillaceous, chalky, very finely porous, containing irregularly distributed nodules of glauconite and of phosphate. Poorly preserved specimens of smaller <em>Foraminifera</em> are: <em>Robulus midwayensis</em>, <em>Nodosaria affinis</em>, <em>Vaginulina longiforma</em>, <em>Cibicides allenii</em>, <em>Cibicides howelli</em>, <em>Cibicides vulgaris</em>, <em>Chilostomelloides eocenica</em>, and many specimens of the ostracode <em>Bairdia suborbiculata</em>.</td>
</tr>
<tr>
<td>2400-2410</td>
<td>Like the preceding sample, but containing many fragments of light gray, chalky, very finely sandy, somewhat micaceous limestone.</td>
</tr>
<tr>
<td>2410-2430</td>
<td>No samples.</td>
</tr>
<tr>
<td>2430-2480</td>
<td>Sand, fine to coarse-grained, and cavings of fossiliferous material and limestone. The sample at 2450-2460 feet contains specimens of <em>Robulus midwayensis</em>, <em>Robulus degolyeri</em>, <em>Nodosaria affinis</em>, <em>Adhaerentia midwayensis</em>, <em>Ammobaculites paleonicea</em>, and <em>Ostracodes</em> as in sample at 2380-2400 ft.</td>
</tr>
<tr>
<td>2480-2510</td>
<td>Limestone, clayey, very finely sandy, slightly glauconitic and micaceous, and a few large, irregular-shaped, dull, phosphatic nodules. Some cavings from higher levels.</td>
</tr>
<tr>
<td>2510-2530</td>
<td>No samples.</td>
</tr>
<tr>
<td>2530-2540</td>
<td>Like the sample at 2480-2510 feet.</td>
</tr>
<tr>
<td>2540-2560</td>
<td>No sample.</td>
</tr>
</tbody>
</table>

## Cretaceous

### Gulf Series

#### Beds of Navarro age

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2560-2580</td>
<td>Sand, fine to very fine, clear quartz, about 75 percent of sample; about 25 percent fragments of several kinds of limestone from slightly higher depths, and some phosphatic nodules. Nodular fragments of pyrite fairly common; a few phosphatic molds and fragments of gastropods and cup-corals; a few specimens of <em>Globotruncana arca</em>, <em>Gyroidina</em> cf. <em>G. globosa</em>, and <em>Planulina spissicostata</em>.</td>
</tr>
<tr>
<td>2580-2610</td>
<td>Sand, fine to coarse-grained, and small fragments of limestone probably caving from higher levels; a few fragments of soft, gray, micaceous, silty clay. The fauna is the same as that in the preceding sample, with the addition of <em>Pseudotextularia plummerae</em>.</td>
</tr>
<tr>
<td>2610-2620</td>
<td>No sample.</td>
</tr>
<tr>
<td>2620-2630</td>
<td>Sand, very fine to coarse, clear quartz; very fine grains dominant. Sample also contains fragments of soft, gray, micaceous, very silty clay, many pyrite nodules, and some specimens of Fora-</td>
</tr>
<tr>
<td>Depth (feet)</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>2630-2640</td>
<td>No sample.</td>
</tr>
<tr>
<td>2640-2680</td>
<td>Clay, gray, soft, silty, about 50 percent of sample; 50 percent fine to very fine grained clear quartz sand; a few pyrite nodules and a few specimens of Navarro microfossils.</td>
</tr>
<tr>
<td>2680-2710</td>
<td>Clay, gray, soft, silty, micaceous, about 50 percent of sample; 50 percent fine to very fine grained sand; a few specimens of <em>Globotruncana</em> sp.</td>
</tr>
<tr>
<td>2710-2750</td>
<td>No samples.</td>
</tr>
<tr>
<td>2750-2770</td>
<td>Like sample at 2680-2710 feet.</td>
</tr>
<tr>
<td>2770-2780</td>
<td>No sample.</td>
</tr>
<tr>
<td>2780-2790</td>
<td>Like sample at 2680-2710 feet.</td>
</tr>
<tr>
<td>2790-2810</td>
<td>No samples.</td>
</tr>
<tr>
<td>2810-2830</td>
<td>Like sample at 2680-2710 feet.</td>
</tr>
<tr>
<td>2830-2840</td>
<td>No sample.</td>
</tr>
<tr>
<td>2840-2850</td>
<td>Like sample at 2680-2710 feet.</td>
</tr>
<tr>
<td>2850-2870</td>
<td>No samples</td>
</tr>
</tbody>
</table>

**Beds of Taylor age**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
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</tr>
</thead>
<tbody>
<tr>
<td>2870-2880</td>
<td>Sand, fine-to coarse grained, and gray shale, harder than in preceding samples; pyrite nodules fairly common; many fragments of <em>Inoceramus</em>. Fauna includes several species of <em>Globotruncana</em> not seen at higher levels and specimens of <em>Globigerina</em>, <em>Haplophragmoides calculus</em>, <em>Citharina wadei</em>, <em>Bolivina incrassata</em>, <em>Globorotalites conicus</em>, <em>Cibicides stephensonii</em>, <em>Planoglobulina glabrata</em>, <em>Kyphopyx christneri</em>, <em>Loxostoma clavatum</em>, <em>Gaudryina laevigata</em>, several species of ostracodes, and other fossils.</td>
</tr>
<tr>
<td>2880-2890</td>
<td>No sample.</td>
</tr>
<tr>
<td>2890-2900</td>
<td>Like sample at 2870-2880 feet, but contains no <em>Inoceramus</em> fragments.</td>
</tr>
<tr>
<td>2900-2910</td>
<td>No sample.</td>
</tr>
<tr>
<td>2910-2920</td>
<td>Like sample at 2870-2880 feet.</td>
</tr>
<tr>
<td>2920-3020</td>
<td>No samples.</td>
</tr>
</tbody>
</table>

**Beds of Austin age**

*(electric log correlation)*

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3020-3110</td>
<td>No samples.</td>
</tr>
<tr>
<td>3110-3130</td>
<td>Shale, gray, soft, and sand as in sample at 2870-2880 feet. Sample contains specimens of Foraminifera and a few Ostracodes. The Ostracodes were first observed in the sample at 2870-2880 feet. No <em>Inoceramus</em> fragments noted.</td>
</tr>
</tbody>
</table>
| 3130-3140   | Clay, gray, moderately soft, micaceous; pyrite nodules, and *Inoceramus* fragments; cavings of limestone and fossil fragments from higher levels. About 50 percent of sample is fine to
**Description**

medium-grained quartz sand containing a few cylindrical nodules of pyrite. Specimens of Cretaceous Foraminifera in the sample are, chiefly, several species of *Globotruncanana*, *Cibicides stephensoni*, *Citharina wadei*, *Bulimina* sp., and others.

3140-3160 Clay, gray, micaceous about 50 percent of sample; about 50 percent fine to coarse-grained sand; samples contains *Inoceramus* fragments and some specimens of Cretaceous Foraminifera. *Planulina texana* and *Bolivina incrassata* are fairly common.

3160-3200 Samples are lithologically similar to the preceding sample, and contain many fragments of *Inoceramus* and nodules of pyrite. Specimens of Cretaceous Foraminifera are fairly common, and many of them are probably indigenous. Species of *Globotruncanana* are most common; *Robulus* sp. is common; and several fragments of *Kyphopyx* are present. *Citharina texana* occurs at 3180-3190 feet.

3200-3220 Shale, brownish-gray, marly. Shale is more indurated than in the preceding samples, and contains many *Inoceramus* fragments. The sample contains a small amount of sand, some pyrite nodules, and a few nondiagnostic specimens of Cretaceous Foraminifera.

3220-3250 Shale, brownish-gray, marly, containing numerous very small specimens of *Gümbelina* and *Globigerina*. These minute, cream specimens of Foraminifera do not seem to be crushed, but give the shale a slightly speckled appearance. Specimens of several species of *Globotruncanana* are fairly common, and specimens of *Globigerina cretacea*, *Citharina wadei*, *Robulus* sp., and others are present.

3250-3260 No sample.

3260-3290 Like the sample at 3220-3250 feet.

3290-3300 No sample.

3300-3320 Like the sample at 3220-3250 feet.

3320-3330 Like the preceding sample with the addition of a small amount of very fine grained quartz sand and a little fine-grained glauconite.

3330-3350 Shale, brownish-gray, thinly flaky, containing a few fragments of *Inoceramus* and a few nodules of pyrite. About 20 percent of sample is very fine grained sand and some very fine grained glauconite. Fauna consists mainly of very small specimens of *Globigerina* and *Gümbelina*.

3350-3360 No sample.

**Atkinson Formation. Upper Member**

*(electric log correlation)*

3360-3380 The upper member of the Atkinson Formation in this well is a shallow-water marine facies. Shale, brownish-marl, marly, and cavings. At 3370-3380 feet, the sample is composed of 50 percent
<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3380-3390</td>
<td>No sample.</td>
</tr>
<tr>
<td>3390-3410</td>
<td>Shale, brownish-gray, flaky, and a little fine-grained, argillaceous, micaceous, glauconitic sandstone. Sample contains specimens of Cretaceous Foraminifera, many of which seem to be caving from higher levels.</td>
</tr>
<tr>
<td>3410-3420</td>
<td>Shale, brownish-gray flaky, containing pyrite nodules, <em>Inoceramus</em> fragments, and small specimens of long-ranging species of Cretaceous fossils (Foraminifera). Sample contains small irregular-shaped nodules of siderite similar to those usually present in sandy beds of the upper Atkinson in the southeastern region.</td>
</tr>
<tr>
<td>3420-3450</td>
<td>Shale, brownish-gray, flaky, and fragments of white, irregularly glauconitic, weakly phosphatic, calcareous, medium-grained sandstone, containing many fragments of <em>Ostrea</em>-like fossil bivalves. About two-thirds of the sample is composed of moderately coarse, subangular, clear quartz sand that washes from the sandstone. A few specimens of species of Cretaceous Foraminifera and Ostracoda in the sample are probably caving from higher depths.</td>
</tr>
<tr>
<td>3450-3470</td>
<td>Sandstone, fine-grained, glauconitic, irregularly micaceous, fossiliferous; fragments of brownish-gray, flaky shale; and very fine to coarse-grained unconsolidated sand that composes about one-third of the sample. Fragments of <em>Inoceramus</em>, and specimens of <em>Gümbelina</em>, <em>Globigerina</em>, and a few other non-diagnostic Cretaceous microfossils are present. Much of the fossil material is probably caving from higher levels, although fragments of <em>Ostrea</em>-like bivalves are probably indigenous. Shell fragments are common in the sandstone chips. The quartz grains in the sandstone seem to be finer than in the preceding samples, and the sandstone itself is less argillaceous and calcareous.</td>
</tr>
<tr>
<td>3470-3480</td>
<td>Shale, like the preceding sample; many fragments of white, dense, fine to medium-grained, calcareous, irregularly micaceous sandstone; some fine to coarse-grained unconsolidated sand; and cavings of limestone and <em>Inoceramus</em> fragments.</td>
</tr>
<tr>
<td>3480-3490</td>
<td>No sample.</td>
</tr>
<tr>
<td>3490-3500</td>
<td>Like sample at 3470-3480; very few specimens of Foraminifera and few shell fragments.</td>
</tr>
<tr>
<td>3500-3540</td>
<td>Shale, brownish-gray, flaky; a few fragments of sandstone, shells, phosphatized bones, and cavings from higher levels.</td>
</tr>
<tr>
<td>3540-3550</td>
<td>Shale, brownish-gray, flaky, is about two-thirds of the sample, and one-third is fine to medium-grained unconsolidated sand, and a few fragments of white, fine-grained, calcareous, glauconitic, irregularly micaceous sandstone. Sample also contains a few specimens of Foraminifera, <em>Inoceramus</em> fragments, and cavings of limestone from higher levels.</td>
</tr>
</tbody>
</table>
Description

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3550-3560</td>
<td>Like the preceding sample, but contains more sand and sandstone and proportionally less shale; shell fragments are common in the sandstone.</td>
</tr>
<tr>
<td>3560-3570</td>
<td>Sand, fine to moderately coarse, clear quartz; a small amount of shale; a few fragments of sandstone; cavings of material and fossils from higher levels.</td>
</tr>
<tr>
<td>3570-3580</td>
<td>No sample.</td>
</tr>
<tr>
<td>3580-3590</td>
<td>Like sample at 3560-3570 feet.</td>
</tr>
<tr>
<td>3590-3600</td>
<td>No sample.</td>
</tr>
<tr>
<td>3600-3610</td>
<td>Sand, fine to very coarse grained; some fragments of shale and shells; a few specimens of Foraminifera.</td>
</tr>
<tr>
<td>3610-3630</td>
<td>Like sample at 3600-3610 feet; a few pink grains in the sand, and a few fragments of very thick shelled bivalves.</td>
</tr>
<tr>
<td>3630-3640</td>
<td>No samples.</td>
</tr>
<tr>
<td>3640-3660</td>
<td>Like the sample at 3610-3630, but contains no pink grains of sand. Sample contains macrofossil shell fragments and many large nodules of pyrite.</td>
</tr>
<tr>
<td>3660-3680</td>
<td>No samples.</td>
</tr>
<tr>
<td>3690-3720</td>
<td>Shale, brownish-gray, about 75 percent of sample; 25 percent fine to medium-grained sand. Sample contains a few Inoceramus fragments, and a few fragments of other bivalves.</td>
</tr>
<tr>
<td>3720-3730</td>
<td>No sample.</td>
</tr>
<tr>
<td>3730-3770</td>
<td>Shale, brownish-gray; about 20 to 50 percent of sample is very fine to medium-grained clear quartz sand.</td>
</tr>
<tr>
<td>3770-3780</td>
<td>Shale about 75 percent of sample, and 25 percent very fine to medium-grained quartz sand. The sample contains fragments of several types of glauconitic sandstone, fragments of Inoceramus and other fossil bivalves, and a few specimens of Foraminifera.</td>
</tr>
<tr>
<td>3780-3790</td>
<td>Shale like the preceding sample, about 50 percent, and about 50 percent fine to medium-grained sand. Fragments of white, glauconitic, calcareous sandstone contain small pieces of shells of fossil bivalves.</td>
</tr>
</tbody>
</table>

Atkinson Formation. Lower Member.

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3790-3800</td>
<td>Like the preceding sample with the addition of a few fragments of light bluish-gray, hard limestone containing irregular sandy areas.</td>
</tr>
<tr>
<td>3800-3820</td>
<td>Shale, a few fragments of fine-grained glauconitic, irregularly micaceous sandstone, and some unconsolidated sand; fragments of phosphatized bone present, and nondiagnostic specimens of Foraminifera.</td>
</tr>
</tbody>
</table>
| 3820-3830   | Shale, like preceding samples, and many fragments of light-gray, hard, very finely sandy limestone containing shell fragments and mica in very sandy areas; a few fragments of phosphatized
bone are present, and a few small ostracodes that are probably indigenous.

Shale, like preceding sample, and fragments of sandy limestone containing embedded shell fragments.

Shale, like preceding sample, and many fragments of light-gray, hard, dense, irregularly silty to finely sandy limestone containing small worn fragments of heavy-shelled bivalves, *Ostrea?* sp. and others.

Shale, gray, flaky; abundant fragments of light-gray, hard, sandy limestone; hard, calcareous, very fine grained, very micaceous sandstone; large nodules of crystalline pyrite; phosphatic nodules; and small irregular-shaped siderite nodules. Fauna consists of *Inoceramus* fragments, specimens of small non-diagnostic Cretaceous Foraminifera (mainly *Günnelina*, *Globigerina*, and *Globotruncana*), fragments of macrofossils (in the sandstone and sandy limestone), fish-scales, a few ostracodes, and a few specimens of the foraminiferous species *Ammobaculites comprimatus* that occurs in beds of Woodbine age.

No sample.

Sandstone, fine to very coarse-grained, quartz, containing abundant, large, nodular fragments of siderite; the coarse sand contains grains of white and of pink feldspar. Shale like that in preceding samples, fragments of limestone, and many nodules of pyrite are present.

Sandstone, coarse-grained, quartz; many grains are stained red. Sample contains abundant, large, siderite nodules, fragments of flaky shale, shell fragments, and various other materials, and a few specimens of Foraminifera that have caved from higher levels.

No samples.

Sandstone, very coarse grained, quartz, containing many deep-yellow and reddish-tinted grains.

No samples.

**Comanche Series undifferentiated**

Sand and siderite nodules as in preceding samples; many fragments of gray shale, a few fragments of gray red-mottled shale, and some very small fragments of red clay-shale.

No samples.

Sand, very coarse, containing many yellow-tinted grains; a few fragments of red and light greenish-gray mottled shale.

No samples.

Sand, coarse to very coarse, quartz, containing many yellow and reddish-tinted grains, and a small amount of chert and feldspar. Sample contains many fragments of mottled red, gray, and sulfur-yellow micaceous mudstone.
**Description**

**Pre-Cretaceous**

- 4155: Igneous rock (electric log correlation).
- 4160-4190: No samples.
- 4090-4210: Igneous rock.
- 4210-4232 T.D.: No samples.

**COFFEE COUNTY**

Operator: Carpenter Oil Company  
Landowner: Composite log of C. T. Thurman wells 1 and 2 and J. H. Knight well 11  
Location: See footnote 1  
Elevation: 317 ft. (derrick floor. Thurman well 1)  
Total depth: 4130 ft. (Thurman well 1)  
Completed: 1955-1956  

**Summary of Stratigraphy**

<table>
<thead>
<tr>
<th>Tertiary</th>
<th>Depth (feet)</th>
<th>Thickness (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miocene undifferentiated</td>
<td>surface</td>
<td>360</td>
</tr>
<tr>
<td>middle, Hawthorn Formation</td>
<td>360</td>
<td>80</td>
</tr>
<tr>
<td>Oligocene undifferentiated</td>
<td>440</td>
<td>620</td>
</tr>
<tr>
<td>Eocene</td>
<td></td>
<td></td>
</tr>
<tr>
<td>upper, Ocala limestone, upper member</td>
<td>1060</td>
<td>200</td>
</tr>
<tr>
<td>middle(?) or upper(?)</td>
<td>1260</td>
<td>100</td>
</tr>
<tr>
<td>lower and middle, undifferentiated</td>
<td>1360</td>
<td>470</td>
</tr>
<tr>
<td>Paleocene</td>
<td>absent?</td>
<td></td>
</tr>
</tbody>
</table>

**Cretaceous**

- Beds of Navarro: 1830 430
- Beds of Taylor age: 2260 755
- Beds of Austin age: 3015(?) 235
- Tuscaloosa Formation: 3250 500
- Comanche(?) undifferentiated: 3750(?) 360

**Pre-Cretaceous**

- Granite: 4110 20

Lithologic and paleontologic description of cuttings and cores. Samples are cuttings unless otherwise stated.

Footnotes are on page 87.


**Description**

**Tertiary**

Miocene Series undifferentiated

**Surface 10** Sand, quartz, fine to very coarse grained and pebbles of sandy limonite.

10-20 Sand, clear quartz, fine to coarse-grained, angular to subangular, pitted or rough-textured; a few nodules of limonite.

20-30 Sand, quartz, fine to very coarse grained, like sample at 10-20 ft.; a few nodules of limonite; and a few nodules of white sandy clay.

30-40 Sand, fine to very coarse grained, like sample at 20-30 ft., and a few pebbles of sandy limonite. The coarse grains of sand seem to be derived from coarse-grained, poorly-sorted, quartzitic sandstone that was eroded, worn, transported, and redeposited at its present site.

40-50 Sand, like sample at 30-40 ft. The sand is yellow-stained from the matrix of deep-yellow clay in which it seems to be embedded. The sample contains a few nodules of limonite.

---

1This composite log is based on the microscopic study of the lithology and paleontology of the samples from three closely-spaced wells drilled by the Carpenter Oil Company. The wells are:

**Landowner:**

**C. T. Thurman well 1**

**Location:**

Land Dist. 1, Land Lot 189 center of S.E. 1/4

GGS. No. 468 Elevation: 317 ft. (derrick floor)

Total depth: 4130 ft.

Completed: Sept. 21, 1955

**Landowner:**

**C. T. Thurman well 2**

**Location:**

Land Dist. 1, Land Lot 189, 450 ft. N.W. of center of S.E. 1/4

GGS. No. 509 Elevation: 299 ft. (ground)

Total depth: 3556 ft.

Completed: May 1, 1956

**Landowner:**

**J. H. Knight well 1**

**Location:**

Land District 1, Land Lot 144 450 ft. N.W. of center of SE 1/4

GGS No. 508 Total depth: 4151 ft.

Completed: May 12, 1956

The samples from a well drilled by the Carpenter Oil Company near the three wells mentioned above were studied but are not used in connection with the preparation of this composite log. The well is:

**Landowner:**

**W. D. Wall well 1**

**Location:**

Land Dist. 1, Land Lot 86 660 ft. north of center of south line

GGS. No. 510 Elevation: 2734 ft.

Total depth: 2734 ft.

Completed: May 24, 1956

The lithologic and paleontologic descriptions shown on the composite log are based on samples from the different wells at the depths here stated:

<table>
<thead>
<tr>
<th>Well</th>
<th>Samples from</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thurman well 1</td>
<td>surface to 100 ft.</td>
<td></td>
</tr>
<tr>
<td>Thurman well 2</td>
<td>100 to 3510 ft.</td>
<td></td>
</tr>
<tr>
<td>Knight well 1</td>
<td>3510 to 4080 ft.</td>
<td></td>
</tr>
<tr>
<td>Thurman well 1</td>
<td>4080 to 4130 ft.</td>
<td></td>
</tr>
</tbody>
</table>

The decision to prepare a composite log rather than an individual log of each well is based, chiefly on the following considerations: a) no single well provides a complete and continuous sequence of samples; b) the quality of the samples from the different wells is not uniform, and varies at different depths in a single well: c) the electric logs that are available for each of the three wells aid in the correlation of the samples.

2MacNeil, F. S. 1947, Geologic map of Tertiary and Quaternary formations of Georgia: U.S. Geol. Survey, Oil and Gas Inv., Prelim. Map 72. The outcropping rocks in Coffee County are classified on the map as, chiefly, the undifferentiated Duplin Marl and Hawthorn Formation of the Miocene Series.

3Rock determination is by R. L. Griggs, U.S. Geological Survey (written communication to P. L. Applin, 1961), on the basis of petrographic examination of selected fragments of cuttings from the sample at 4120-4180 ft. in the Thurman well 1.
### Description

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>50- 60</td>
<td>Sand, like sample at 40-50 ft., but somewhat finer grained.</td>
</tr>
<tr>
<td>60- 70</td>
<td>Sand, fine to coarse-grained, and a few pebbles of limonite, as in the preceding samples.</td>
</tr>
<tr>
<td>70- 80</td>
<td>Sand, clear quartz, fine to medium-grained, subangular.</td>
</tr>
<tr>
<td>80- 90</td>
<td>Sand, fine to very coarse grained, and about 25 percent fragments of light greenish-white, waxy, bentonitic (?) clay that is sparsely to highly sandy. The sand in the clay is extremely fine to medium-grained and poorly sorted.</td>
</tr>
<tr>
<td>90- 100</td>
<td>Clay, like sample at 80-90 ft., and very coarse grains of sand that may be caving from higher levels.</td>
</tr>
<tr>
<td>100- 110</td>
<td>Sand, quartz, white, fine to very fine grained, subangular; a few coarse grains; a few nodular fragments of white sandy clay.</td>
</tr>
<tr>
<td>110- 120</td>
<td>Like sample at 100-110 ft., and a few fragments of white sandy, tubular bodies with branching centers that seem to be casts of worm-borings or sand-coated plant stems. The sandy bodies occur, also, in samples from the Knight well 1 at 100-110 ft.; in the Thurman well 1 at 130-150 ft.; and in the Wall well 1 at 160-170 ft.</td>
</tr>
<tr>
<td>120- 130</td>
<td>Like sample at 110-120 ft.</td>
</tr>
<tr>
<td>130- 140</td>
<td>Like sample at 110-120 ft. The inner part of the tubular bodies is partially coated with a light-brown crystalline substance.</td>
</tr>
<tr>
<td>140- 150</td>
<td>Sand, like sample at 100-110 ft., and about 25 percent small fragments of light greenish-yellow, soapy-textured sandy clay that seems to be the matrix containing the sand.</td>
</tr>
<tr>
<td>150- 160</td>
<td>Like sample at 140-150 ft. The sand and the fragments of clay are each about 50 percent of the washed concentrate. Another sample from the same depth is composed of fine-grained subangular sand; many small, black, phosphatic nodules and a few broken, polished, phosphatic nodules; a few broken and worn fragments of white and gray limestone showing traces of fossils. This sample may be out of place.</td>
</tr>
<tr>
<td>160- 170</td>
<td>Sand and clay, like the first sample described at 150-160 ft.</td>
</tr>
<tr>
<td>170- 180</td>
<td>Like sample at 160-170 ft.; sand is about 75 percent of the sample; and clay is 25 percent.</td>
</tr>
<tr>
<td>180- 190</td>
<td>Sand, clear quartz, well-sorted, fine-grained, angular to subangular; a few fragments of greenish-yellow clay; sparse flakes of colorless mica.</td>
</tr>
<tr>
<td>190- 200</td>
<td>Sand, fine-grained and about 10 percent flaky fragments of light yellowish-tan shaly clay. Scattered fragments of the clay contain specimens of diatoms.</td>
</tr>
<tr>
<td>200- 210</td>
<td>Sand, fine-grained, containing small particles of magnetite; about 5 percent of the sample is light greenish-yellow soapy-textured clay.</td>
</tr>
</tbody>
</table>
| Depth  
(foot) | Description                                                                                                                                                                                                 |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>210-220</td>
<td>Sand, fine-grained, containing a trace of colorless mica and a trace of magnetite; small fragments of greenish-yellow clay compose about 20 percent of the sample.</td>
</tr>
<tr>
<td>220-230</td>
<td>Sand, like sample at 210-220 ft., and about 1 percent fragments of greenish-yellow clay.</td>
</tr>
<tr>
<td>230-240</td>
<td>Like sample at 220-230 ft.</td>
</tr>
<tr>
<td>240-250</td>
<td>Sand and a few fragments of clay, like the sample at 220-230 ft., and in addition, many small, hard, rounded, nodular fragments of greenish-yellow clay.</td>
</tr>
<tr>
<td>250-260</td>
<td>Sand, mainly fine-grained, and a few medium to coarse grains. The sample contains a few fragments and nodules of clay like the sample at 240-250 ft.; a trace of mica; and a few black phosphatic nodules.</td>
</tr>
<tr>
<td>260-270</td>
<td>Like sample at 250-260 ft., but showing an increase in the amount of small, black to gray phosphatic nodules.</td>
</tr>
<tr>
<td>270-280</td>
<td>Sand, clear quartz, fine to medium-grained. About 5 percent of the sample is composed of fragments of light-cream irregularly sandy and silty clay, and a few hard nodules of clay.</td>
</tr>
<tr>
<td>280-290</td>
<td>Sand, mainly fine to medium-grained, but containing many coarse grains. About 5 percent of the sample is composed of small fragments of sandy clay like the sample at 270-280 ft. A very few black phosphatic nodules are present.</td>
</tr>
<tr>
<td>290-300</td>
<td>Sand, clear quartz, fine-grained, angular; about 5 percent of the sample is composed of small fragments of greenish-yellow clay.</td>
</tr>
<tr>
<td>300-310</td>
<td>Sand, clear quartz, fine to medium-grained, about 50 percent; fragments of light yellowish-gray clay, about 50 percent.</td>
</tr>
<tr>
<td>310-320</td>
<td>Like sample at 290-300 ft.</td>
</tr>
<tr>
<td>320-330</td>
<td>Sand, clear quartz, fine-grained, subangular, and about 10 percent small, light-gray, tan, and cream, round to irregular-shaped, phosphatic nodules.</td>
</tr>
<tr>
<td>330-340</td>
<td>Sand, clear quartz, fine-grained, subangular, many small phosphatic nodules like sample at 320-330 ft., and a few fragments of light-tan, sandy clay (fine-grained sand).</td>
</tr>
<tr>
<td>340-350</td>
<td>Like sample at 330-340 ft., and about 5 percent small fragments light-tan sandy clay.</td>
</tr>
<tr>
<td>350-360</td>
<td>Like sample at 340-350 ft.</td>
</tr>
<tr>
<td>360-370</td>
<td><strong>Miocene Series. Hawthorn Formation.</strong></td>
</tr>
<tr>
<td>360-370</td>
<td>Sand, clear quartz, fine to coarse-grained, subangular; about 10 percent small, black to gray phosphatic nodules; and a few fragments of white, sandy, phosphatic limestone containing debris of poorly-preserved and broken fossil shells. Among the fossils are fragments of bivalves and specimens of Barnea sp. About 5 percent of the sample is composed of fragments of clay that are probably caving from higher levels.</td>
</tr>
</tbody>
</table>
| 370-380| Similar to sample at 360-370 ft., but about 20 percent of the sample...
Description

is composed of phosphatic nodules, fragments of Barnea sp., and other shell debris.

380-390 Like sample at 370-380 ft.

390-400 Sand, clear quartz, fine to medium-grained, subangular; about 25 percent black to gray phosphatic nodules; and about 5 percent fragments of soft white limestone containing small fragments of shells and a few poorly-preserved calcite molds of specimens of small Foraminifera.

400-410 Like sample at 390-400 ft., and in addition, a few fragments of light-gray, soft, flaky, bentonitic (?) shale.

410-420 Sand, phosphatic, like the immediately preceding samples, and a very little white fossiliferous limestone and light-gray, bentonitic (?) shale.

420-430 Sand, like sample at 410-420 ft., and about 25 percent light-gray bentonitic (?) shale that seems to be irregularly sandy (fine-grained sand); phosphatic nodules are less abundant than in the preceding samples. The sample contains debris of gray, worn and broken molds of fossil shells, and a few fragments of rather thick-shelled fossil bivalves.

430-440 Like sample at 420-430 ft. A fragment of light-gray limestone contains a mold of a broken specimen of Archais sp.

Oligocene Series undifferentiated

440-450 Sand, fine to medium-grained, containing a few phosphatic nodules, about 50 percent of sample; cream, argillaceous, moderately hard limestone is about 50 percent. The cream limestone, which is somewhat spotted with light-gray areas, contains traces of fossil shells, among which are fragments of bivalves, Archais sp., and a mold of an ostracode. The sample contains a few fragments of cream, finely granular, dolomitic (?) limestone.

450-470 Limestone, cream, chalky, about 75 percent of sample; about 25 percent is sand and a few phosphatic nodules. The cuttings of limestone contain broken shells of fossils, among which are fragments of bivalves, bryozoan fragments, small fragments of Archais cf. A. compressus, fragments and specimens of Miogypsina antillea (Cushman) and M. gunteri Cole and a few specimens of ostracodes.

470-480 Like sample at 450-470 ft.

480-490 Clay, light-cream, chalky, about 75 percent of sample; about 25 percent fine-grained, angular, clear quartz sand. Sample contains bryozoan fragments and traces of other fragmentary fossils.

490-500 Sand, clear quartz, fine-grained, angular; about 1 percent small black phosphatic nodules; about 10 percent chalky clay like sample at 480-490 ft.; a few shell fragments, bryozoan fragments, and a phosphatic mold of a specimen of Elphidium leonis Applin and Jordan.
Logos of Selected Wells in the Coastal Plain of Georgia

Description

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>500-510</td>
<td>Mainly sand like sample at 490-500 ft.; a few phosphatic nodules and a little chalky clay; a few specimens of <em>Elphidium leonensis</em>.</td>
</tr>
<tr>
<td>510-520</td>
<td>Sand, clear quartz, fine-grained, angular to subangular; about 5 percent chalky clay shale; a few black phosphatic nodules; and a little fossil shell debris.</td>
</tr>
<tr>
<td>520-530</td>
<td>No sample.</td>
</tr>
<tr>
<td>530-540</td>
<td>Like sample at 510-520 ft. About 10 percent of the sample is composed of chalky clay shale; shell fragments are common.</td>
</tr>
<tr>
<td>540-550</td>
<td>No sample.</td>
</tr>
<tr>
<td>550-560</td>
<td>Like sample at 530-540 ft.</td>
</tr>
<tr>
<td>560-570</td>
<td>Clay, shaly, calcareous, and fragments of white to light-gray, moderately hard, chalky to granular limestone, showing traces of bryozoan fragments in a few chips. Some limestone fragments seem to be dolomitic, and some are nodular and sandy (fine-grained sand). The sample contains a few dolomite molds of immature bivalves.</td>
</tr>
<tr>
<td>570-580</td>
<td>Limestone, irregularly cream and gray, irregularly highly sandy (finely-grained sand).</td>
</tr>
<tr>
<td>580-590</td>
<td>Sand, fine-grained, angular, 50 percent; small fragments of chalky limestone, 50 percent.</td>
</tr>
<tr>
<td>590-600</td>
<td>Limestone, chalky, finely porous, spongy, 75 percent; foraminiferal specimens 25 percent. Specimens are, chiefly, <em>Streblist mexicanus mexitpecensis</em> (Nuttall); a few other species of Foraminifera common in the Oligocene are also present.</td>
</tr>
<tr>
<td>600-610</td>
<td>Like sample at 590-600 ft.</td>
</tr>
<tr>
<td>610-620</td>
<td>No change.</td>
</tr>
<tr>
<td>620-630</td>
<td>Like sample at 590-600 ft., but containing little recognizable fossil material.</td>
</tr>
<tr>
<td>630-640</td>
<td>Like sample at 620-630 ft. specimens of <em>Streblist</em> are fairly common.</td>
</tr>
<tr>
<td>640-650</td>
<td>Limestone, cream, chalky, containing abundant specimens of <em>Streblist mexicanus mexitpecensis</em>, and small tubular bodies of nearly uniform size that are possibly of algal origin.</td>
</tr>
<tr>
<td>650-660</td>
<td>Like sample 640-650 ft. The sample is composed, mainly, of specimens of <em>Streblist</em>, a few of the small tubular bodies mentioned in the preceding sample, a few bryozoan fragments, and a few small fragments of <em>Lepidocyclina (Eulepidina) undosa</em> Cushman.</td>
</tr>
<tr>
<td>660-670</td>
<td>Similar to sample 650-660 ft., but contains no fragments of <em>Lepidocyclina</em>.</td>
</tr>
<tr>
<td>670-680</td>
<td>Limestone, cream, soft, containing abundant specimens of <em>Streblist mexicanus mexitpecensis</em>, a few small tubular bodies, and a few bryozoan fragments. A little light-brown very fine grained dolomite also occurs in the sample.</td>
</tr>
<tr>
<td>680-690</td>
<td>Limestone, light-cream, microfossiliferous, containing many fragments of <em>Streblist</em>, 50 percent; light-brown, very finely crystal-</td>
</tr>
</tbody>
</table>
Description

690- 700 Sand, clear quartz, fine-grained, angular, is about one-third of sample; dolomite, like the sample at 680-690 ft., is about one-third of sample; cream, microfossiliferous limestone like sample at 670-680 ft., is about one-third of sample.

700- 710 Like sample at 690-700 ft., and in addition, a few fragments of very light cream coquinoioid limestone and a few fragmental specimens of Lepidocyclina (Eulepidina) undosa and Operculina dia.

710- 720 Sand, fine-grained, and dolomite like sample at 680-690 ft., about 10 percent; cream, probably water-worn limestone like samples beginning at 590-600 ft., 50 percent. One small fragment of Operculina dia Cole and Ponton was observed in the sample.

720- 730 Sand, fine to coarse-grained; about 5 percent small fragments of cream limestone; a few fragments of light-cream coquinaid limestone like sample at 700-710 ft.; and a few fragments of Operculina sp.

730- 740 Sand, like sample at 720-730 ft., but coarse grains are relatively rare; about 50 percent small fragments of cream, porous limestone containing many specimens of Streblus sp.

740- 750 Like sample 730-740 ft.

750- 760 Sand, like sample at 720-730 ft., and about 50 percent fragments of cream, moderately hard, finely porous, chalky limestone that seems to be water-worn. The sample contains a few fragments of Operculina sp., and a few poorly preserved specimens of Streblus that may be caving from higher levels.

760- 770 Like sample at 750-760 ft.

770- 780 Sand and about 75 percent small fragments of cream, irregularly and finely dolomitic limestone, like sample at 750-760 ft. The sample contains a few specimens of Operculina dia that seem to be indigenous in the limestone, a few specimens of Eponides byramensis, and a fragmental section of Lepidocyclina sp.

780- 790 Like sample 770-780 ft.

790- 800 Limestone, dolomitic in part, somewhat fossiliferous, like limestone in sample at 770-780 ft. The limestone contains few determinable fossils, but several specimens of Operculina dia and Streblus seem to be indigenous.

800- 810 Limestone, cream, chalky, partly dolomitic, like sample at 790-800 ft., and about 25 percent fine-grained sand which may be caving.

810- 820 Dolomite, light-brown, microsucros, highly and finely porous.

820- 830 Like sample at 810-820 ft.

830- 840 No change.

840- 850 Sand, clear quartz, fine-grained, angular, and about 5 percent fragments of dolomite like sample at 810-820 ft. A few fragments of chalky, fossiliferous limestone from several higher levels.
Description

850-860 Limestone, light-cream, finely porous, chalky, calcitic, irregularly sandy (fine-grained sand). The limestone contains much poorly-preserved, usually fragmental fossil material. Identifiable material includes molds of specimens of Quinqueloculina sp., Discorbis sp., a few fragments of Lepidocyclina sp., a few specimens of ostracodes, and a few echinoid spines.

860-870 Limestone, chalky, calcitic, highly porous, like sample at 850-860 ft., but rarely sandy. Some fragments of the limestone contain traces of fossils.

870-880 Like sample at 860-870 ft., and a few worn fragments of Lepidocyclina sp.

880-890 Like sample at 870-880 ft. The sample contains a few specimens of smaller Foraminifera that are probably indigenous, a few small fragments of Lepidocyclina sp., and specimens of Streblus that are probably caving.

890-900 No change.

900-910 Material and fauna like sample at 880-890 ft. Many specimens of Streblus seem to be definitely embedded in the limestone.

910-920 Like sample at 900-910 ft. The limestone cuttings contain a specimen of Dictyoconus floridanus.

920-930 No change.

930-940 No change. The limestone contains a trace of glauconite.

940-950 Like sample at 930-940 ft. Worn, broken and calcitized fossil debris is abundant; fragments of Lepidocyclina (Eulepidina) suwanneeensis Cushman are somewhat more common and better preserved than in the preceding samples; fragments of Operculina dia and a poorly-preserved specimen of Gypsina sp. are present.

950-960 Like sample at 940-950 ft. Several specimens of Dictyoconus floridanus occur in the limestone.

960-970 Similar to sample at 950-960 ft., but containing few specimens of D. floridanus.

970-980 The cuttings of limestone in this sample are softer, more chalky, and less calcitic than the limestone in the immediately preceding samples; the fauna is more abundant and somewhat better preserved. The sample contains many specimens of Streblus cf. S. byramensis, small fragments of Lepidocyclina sp., small fragments of chalk, and fossil debris composed of unidentified shell fragments. About 50 percent of the washed concentrate consists of specimens of Streblus sp.

980-990 Like sample at 970-980 ft.

990-1000 No change.

1000-1010 No change.

1010-1020 Similar to samples beginning at 970-980 ft., but fragments of nodular chalk are common, and molds and fragments of molds of microfossils are less abundant.
Description

1020-1030 Chalk, white, in finely cut fragments, and a few specimens of microfossils like those in the immediately preceding samples. About 25 percent of this sample consists of small fragments of grayish-brown, very finely crystalline dolomite.

1030-1040 Like sample at 1020-1030 ft. The nodules of chalk suggest an algal deposit.

1040-1050 No change.

1050-1060 Limestone, chalky, finely porous, containing worn and comminuted fossil debris. No marked change in fauna; the sample contains a little glauconite.

Eocene Series

Upper Eocene. Ocala Limestone. Upper Member.

1060-1070 Limestone, cream, like sample at 1050-1060 ft., and about 50 percent fragments of white limestone containing abundant bryozoan fragments.

1070-1080 Limestone, white, porous, coquinoi d, containing calcitic areas and a trace of glauconite. The limestone is composed mainly, of fragments of Lepidocyclina (Pliolepidina) pustulosa Douville, many fragments of Opcerculina floridensis (Heilprin), and a few fragments of Sphaero gypsina globula and Eponides sp. Other fossils in the sample are specimens of Asterocyclina nassauensis and Helicostegina polygyralis. The microfauna indicates a very young late Eocene age of the limestone.

1080-1090 Like sample at 1070-1080 ft.

1090-1100 No change.

1100-1110 No change.

1110-1120 Like the immediately preceding samples, but more calcitic.

1120-1130 Like sample at 1110-1120 ft., but about 50 percent of the washed residue is composed of finely crystalline, dolomitic chalk.

1130-1140 Like sample at 1120-1130 ft.

1140-1150 The sample is lithologically and faunally similar to the preceding upper Eocene samples, but fragmentary specimens of Lepidocyclina ocalana and fragments of Asterocyclina sp. are much more common; a few specimens of Sphaerogypsina sp. are present. The sample is typical of the Ocala Limestone.

1150-1160 Like sample at 1140-1150 ft.

1160-1170 No change.

1170-1190 No change.

1190-1200 Limestone, chalky, highly dolomitic, calcitic, coquinoi d, like sample at 1140-1150 ft., but containing little determinable fossil material.

1200-1210 Like sample at 1190-1200 ft.

1210-1230 No change.
<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1230-1240</td>
<td>Dolomite, chalky, glauconitic, fossiliferous, composes about two-thirds of the sample. About one-third of the sample is composed of fine-grained quartz sand and many nodules of dark-green glauconite. The fauna in the chalky dolomite is like that in the samples beginning at 1140-1150 ft.</td>
</tr>
<tr>
<td>1240-1250</td>
<td>Limestone, white, chalky, weakly glauconitic; about 50 percent of the sample is fine-grained, subangular, clear quartz sand; about 5 percent of the sample is composed of nodules of glauconite and a little chalky dolomite that may be caving. The small amount of fossiliferous material in the chalky limestone in this sample is composed, mainly, of a few molds of ostracodes and a few fragments of Operculina(?)</td>
</tr>
<tr>
<td>1250-1260</td>
<td>Sand, clear quartz, fine-grained, subangular, composes about 50 percent of the sample; about 50 percent is composed of white, chalky limestone that is irregularly sandy, irregularly dolomitic, and weakly glauconitic. The size of the crystals of dolomite is not uniform and their color ranges from light-brown to gray. The limestone contains many very small fragments of fossil shells, few of which are identifiable. Fragments of white-shelled fossil bivalves and a fragment of Pseudophragmina(?) were observed.</td>
</tr>
<tr>
<td>1260-1270</td>
<td>Sand, clear quartz, fine to medium-grained, subangular, composes about 75 percent of the sample; about 25 percent is composed of dark-green, rounded but irregular-shaped nodules of glauconite. The sample contains a few fragments of chalky limestone like that in the sample at 1250-1260 ft.</td>
</tr>
<tr>
<td>1270-1280</td>
<td>Like sample at 1260-1270 ft., but the sand grains are slightly coarser. This sample contains a few fish teeth.</td>
</tr>
<tr>
<td>1280-1290</td>
<td>Sand, clear quartz, fine to coarse-grained, subangular to rounded, and about 40 percent nodules of dark-green glauconite.</td>
</tr>
<tr>
<td>1290-1300</td>
<td>Like sample at 1280-1290 ft.</td>
</tr>
<tr>
<td>1300-1310</td>
<td>Sand, clear quartz, fine to medium-grained, subangular, and about 10 percent nodules of dark-green glauconite.</td>
</tr>
<tr>
<td>1310-1320</td>
<td>Like sample at 1300-1310 ft.</td>
</tr>
<tr>
<td>1320-1340</td>
<td>No change.</td>
</tr>
<tr>
<td>1340-1350</td>
<td>Sand, clear quartz, fine to medium-grained, and about 50 percent nodules of dark-green glauconite.</td>
</tr>
<tr>
<td>1350-1360</td>
<td>Like sample at 1340-1350 ft.</td>
</tr>
<tr>
<td><strong>Lower Eocene and middle Eocene undifferentiated</strong></td>
<td></td>
</tr>
<tr>
<td>1360-1370</td>
<td>Like sample at 1340-1350 ft., and in addition, a few fragments of white, chalky, glauconitic, fossiliferous limestone.</td>
</tr>
<tr>
<td>1370-1380</td>
<td>Clay, light greenish-gray, highly sandy (fine-grained sand), very finely glauconitic, slightly calcareous, soapy textured, containing a few sections of small chalky specimens of Foraminifera. About</td>
</tr>
</tbody>
</table>
Description

75 percent of the sample is sand and glauconite, like samples from 1260 to 1360 ft., and small fragments of white, chalky, fossiliferous limestone like that in samples above the glauconitic sand. This sample also contains a few fragments of light-gray clay that is not sandy.

1380-1390 Like sample at 1370-1380 ft.
1390-1400 No change.
1400-1410 Sample is about 50 percent fine to coarse-grained sand, and 50 percent glauconitic nodules. The sample contains a few fragments of sandy, glauconitic clay, like the samples at 1370-1380 ft., and a few molds of echinoid spines that seem to be indigenous in the clay.
1410-1420 Like sample at 1400-1410 ft.
1420-1430 Like sample at 1400-1410 ft., and containing a few fragments of Robulus sp., presumably indigenous in beds near the depth represented by this sample.
1430-1440 Sand and glauconite, like many of the preceding samples, and in addition a few fragments of light-green, silty, very finely micaceous, very finely glauconitic clay.
1440-1450 Like sample at 1430-1440 ft. Samples are much smaller than at higher levels, suggesting that clay is penetrated at this depth, although sand and glauconite compose much of the sample.
1450-1460 Sand, fine to coarse-grained, and about 50 percent fragments of light-gray, moderately hard, highly silty, finely micaceous, slightly glauconitic clay that was observed, first, in the sample at 1430-1440 ft.
1460-1470 Clay, highly silty, which is perhaps better described as micaceous, glauconitic siltstone, composes about two-thirds of the cuttings in this sample; about one-third of the cuttings are fine-grained quartz sand.
1470-1480 Like sample at 1460-1470 ft., but containing much less fine-grained quartz sand.
1480-1490 The relatively small washed sample is composed of a few fragments of soft gray clay, and many fragments of white to light-gray moderately hard limestone showing traces of fragmental fossil debris and a few broken calcite molds of small gastropods.
1490-1500 Like sample at 1480-1490 ft.
1500-1510 Limestone, very light gray, moderately hard, like that in the samples at 1480-1500 ft. The limestone contains faint traces of a highly fragmental fossil content, but little of the material is generically indentifiable. The fossil material consists of bryo­zoan fragments, fragments of molds of small gastropods and pelecypods, and a few fragments of echinoids.
1510-1520 Like sample at 1500-1510 ft.
<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1520-1530</td>
<td>Like sample at 1500-1510 ft., with the addition of a few fragments of sandstone, a little fine-grained sand, and many small fragments of shells of fossil bivalves.</td>
</tr>
<tr>
<td>1530-1540</td>
<td>Sand, quartz, fine to very coarse grained, and many worn and broken shell fragments. The shell fragments usually have attached sand grains, or form nodules with sand grains and calcitic cement.</td>
</tr>
<tr>
<td>1540-1550</td>
<td>Sand, clear quartz, fine to medium-grained, and about 20 percent shell fragments and sandy calcitic nodules, like the sample at 1530-1540 ft.</td>
</tr>
<tr>
<td>1550-1560</td>
<td>Shell fragments, worn, broken, sandy, and a few limy calcite nodules are about 75 percent of the same; 25 percent of the sample is sand, like the sample at 1540-1550 ft.</td>
</tr>
<tr>
<td>1560-1570</td>
<td>Shell fragments 50 percent and sand 50 percent, like the sample at 1550-1560 ft.</td>
</tr>
<tr>
<td>1570-1580</td>
<td>Like sample at 1560-1570 ft.</td>
</tr>
<tr>
<td>1580-1590</td>
<td>No change.</td>
</tr>
<tr>
<td>1590-1600</td>
<td>About 75 percent of the washed concentrate consists of loose shell fragments, and fragments of white and gray, sandy, phosphatic coquina composed of fragmental and partly calcitized shells, molds of small bivalves, gastropods, and ostracodes, and traces of other fossil debris.</td>
</tr>
<tr>
<td>1600-1610</td>
<td>Sand, fine to medium-grained, about 75 percent of sample; 25 percent is fragments of coquina, like the sample at 1590-1600 ft. The sample contains a few phosphatic nodules, molds of ostracodes, bryozoan fragments, fragments of molds and shells of macrofossils, and a little soft, brownish-gray to greenish-gray clay.</td>
</tr>
<tr>
<td>1610-1620</td>
<td>Like sample at 1600-1610 ft.</td>
</tr>
<tr>
<td>1620-1630</td>
<td>Sand, fine to very coarse grained, and about 10 percent shell fragments and small calcareous sandy nodules.</td>
</tr>
<tr>
<td>1630-1640</td>
<td>Sand, clear quartz, fine-grained, composes most of the sample; about 1 percent is shell fragments, sandstone nodules, and soft, gray, shaly clay. Soft clay or sandy clay is probably the material penetrated at this depth.</td>
</tr>
<tr>
<td>1640-1650</td>
<td>Sand, fine to medium-grained, and about 1 percent shell fragments, sandstone fragments and fragments of gray shaly clay.</td>
</tr>
<tr>
<td>1650-1660</td>
<td>Like sample at 1640-1650 ft.</td>
</tr>
<tr>
<td>1660-1670</td>
<td>Sand, shell fragments, and other material caving from higher levels. This small sample contains a few fragments of two kinds of gray and grayish-green, soft, platy shale.</td>
</tr>
<tr>
<td>1670-1680</td>
<td>Sand, clear, quartz, fine-grained, well-sorted, nodular, and a very small amount of shell and sandstone nodules.</td>
</tr>
<tr>
<td>1680-1690</td>
<td>Sand, fine to very coarse grained. The sample also contains a few shell fragments, nodules of sandstone and sandy limestone, a few fragments of gray clay shale, and a few small phosphatic</td>
</tr>
</tbody>
</table>
Description

<table>
<thead>
<tr>
<th>Depth</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1690-1700</td>
<td>Like sample at 1680-1690 ft.</td>
</tr>
<tr>
<td>1700-1710</td>
<td>No change.</td>
</tr>
<tr>
<td>1710-1720</td>
<td>Sand and a few shell fragments; shell and sand nodules like those in the sample at 1680-1690 ft., and other higher samples; a few fragments of several types of soft, gray, shaly clay. Several fragments of clay contain poorly-preserved specimens of very small Foraminifera; a fragment of a cup-coral is embedded in one fragment of sandy clay.</td>
</tr>
<tr>
<td>1720-1730</td>
<td>Like sample at 1710-1720 ft.</td>
</tr>
<tr>
<td>1730-1740</td>
<td>Sand and about 5 percent sandy shell fragments. The sample contains several phosphatic molds of ostracodes. A specimen of <em>Loxoconcha</em> cf. <em>L. creolensis</em>, indicative of beds of middle Eocene age, is attached to a small fragment of shell.</td>
</tr>
<tr>
<td>1740-1750</td>
<td>No sample.</td>
</tr>
<tr>
<td>1750-1760</td>
<td>Like sample at 1730-1740 ft.</td>
</tr>
<tr>
<td>1760-1770</td>
<td>Sand, clear quartz, fine to medium-grained, angular to subangular; about 10 percent of the sample is composed of fragments of poorly-preserved shells of <em>Ostrea</em> (?) sp., and a few nodules of shells and sand.</td>
</tr>
<tr>
<td>1770-1780</td>
<td>Sand; fine to very coarse grained, a few shell fragments, and a few cavings of material from higher levels.</td>
</tr>
<tr>
<td>1780-1790</td>
<td>Like sample at 1770-1780 ft., and many cavings.</td>
</tr>
<tr>
<td>1790-1800</td>
<td>Sand, clear quartz, fine to medium-grained, angular to subangular; a few shell fragments and a few cavings.</td>
</tr>
<tr>
<td>1800-1810</td>
<td>Sand, fine to very coarse grained, a few shell fragments and a few cavings.</td>
</tr>
<tr>
<td>1810-1820</td>
<td>Like sample at 1800-1810 ft.; a small sample; cavings are common.</td>
</tr>
<tr>
<td>1820-1830</td>
<td>Like sample at 1810-1820 ft.</td>
</tr>
</tbody>
</table>

Paleocene Series

The samples from the three wells that are the basis for this composite log contain no faunal evidence for beds of Paleocene age.

Cretaceous

Gulf Series

Beds of Navarro age

<table>
<thead>
<tr>
<th>Depth</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1830-1840</td>
<td>Sand, fine to medium-grained, and about 10 percent small fragments of hard, cream limestone and cavings. The sample contains a few specimens of <em>Robulus</em> sp., a few poorly-preserved specimens of other species of Foraminifera, and a few specimens of Ostracoda.</td>
</tr>
<tr>
<td>1840-1850</td>
<td>Sand, like sample at 1830-1840 ft., about 50 percent; about 50</td>
</tr>
</tbody>
</table>
Description

percent light-cream, moderately soft, irregularly sandy limestone, containing traces and few fragments of fossils. This material closely resembles the material in samples at higher levels and may be caving. A few fragments of several types of light-gray clay are also in the sample.

1850-1860 Sand, very fine grained and about 1 percent small fragments of limestone like that in the sample at 1840-1850 ft. The sample contains a few small fragments of shell and a little mica.

1860-1870 Sand, like sample, at 1850-1860 ft., and about 5 percent mica; a few cavings from higher levels; a few fragments of several types of gray clay.

1870-1880 Like sample at 1860-1870 ft.

1880-1890 No change.

1890-1900 Sand and mica like sample at 1860-1870 ft., a few fragments of gray clay, and a few cavings. The sample contains a few specimens of Robulus sp.

1900-1910 Sand, quartz, fine to coarse-grained, a few fragments of gray, soft, micaceous clay; a few fragments of materials and fossils caving from higher levels.

1910-1920 Like sample at 1900-1910 ft. This sample contains molds of several species of ostracodes, a fragment of Nodosaria affinis, a fragment of Marginulina lineata, and a few fragments of Robulus navarroensis.

1920-1930 Like sample at 1910-1920 ft., and several specimens of species of smaller Foraminifera, including Robulus navarroensis, Anomalinoides pinguis, Planulina correcta, Dorothis bulbetta, and Gaudryina rudita.

1930-1940 Sand, like immediately preceding samples, about 50 percent; about 50 percent small fragments of several types of siltstone, clay, and sandy clay, similar to material in samples at higher levels, and all probably caving. This sample contains many specimens of Robulus sp., Anomalina sp. and other species of smaller Foraminifera which occurred, also, in samples beginning at 1830-1840 ft.

1940-1950 Like sample at 1930-1940 ft.

1950-1960 No change.

1960-1970 Like sample at 1930-1940 ft., but specimens of ostracodes occur in the microfauna.

1970-1980 No change.

1980-2000 No change.

2000-2010 Sand, clear quartz, fine to coarse-grained, subangular, composes most of the large sample. About 5 percent of the sample is composed of small fragments of shell, and fragments of gray clay, sandy clay, siltstone, phosphatic fragments, and a few glauconite nodules. Specimens of species of Foraminifera and Ostracoda are like those in samples beginning at 1830-1840 ft.
## Description

<table>
<thead>
<tr>
<th>Depth (feet)</th>
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</tr>
</thead>
<tbody>
<tr>
<td>2010-2020</td>
<td>Sand, clear quartz, fine to medium-grained, subangular; also a few fragments of clay and of fossil debris similar to that in the immediately preceding samples. This sample contains a few black, phosphatic fragments, a trace of glauconite, and a trace of mica.</td>
</tr>
<tr>
<td>2020-2030</td>
<td>Like sample at 2010-2020 ft.</td>
</tr>
<tr>
<td>2030-2060</td>
<td>No change.</td>
</tr>
<tr>
<td>2060-2070</td>
<td>Sand, clear quartz, fine-grained, angular to subangular. About 1 percent of the large sample is composed of small irregular-shaped nodules of very dark green glauconite, and a few brownish-black phosphatic fragments. The sample contains a few fragments of light-gray, soft clay, and a very few fragments of caved material and fossil debris.</td>
</tr>
<tr>
<td>2070-2080</td>
<td>Like sample at 2060-2070 ft., but containing some very coarse grains of quartz and about 5 percent cavings.</td>
</tr>
<tr>
<td>2080-2090</td>
<td>Sand, clear quartz, very fine grained, angular, composes most of the sample. Also present are a little glauconite; phosphatic material and cavings.</td>
</tr>
<tr>
<td>2090-2100</td>
<td>Like sample at 2080-2090 ft.</td>
</tr>
<tr>
<td>2100-2110</td>
<td>Like sample at 2080-2090 ft., and a small amount of colorless mica.</td>
</tr>
<tr>
<td>2110-2120</td>
<td>Like sample at 2100-2110 ft.</td>
</tr>
<tr>
<td>2120-2130</td>
<td>Sand, clear quartz, fine to medium-grained. About 5 percent of the sample is composed of small fragments of shells, small nodules of glauconite, and a few fragments of clay, fossil debris, and other material like that in samples at higher levels.</td>
</tr>
<tr>
<td>2130-2140</td>
<td>Like sample at 2120-2130 ft., but showing an increase in the amount of cavings. A few black phosphatic fragments are present.</td>
</tr>
<tr>
<td>2140-2150</td>
<td>Sand, clear quartz, fine-grained, angular. About 1 percent of the sample is composed of cavings, small black phosphatic fragments, nodules of glauconite, and mica.</td>
</tr>
<tr>
<td>2150-2160</td>
<td>Like sample at 2140-2150 ft.</td>
</tr>
<tr>
<td>2160-2170</td>
<td>No marked change in material or fauna. The fauna is composed, chiefly, of specimens of a small <em>Robulus</em> sp., <em>Anomalina</em> sp., and shell fragments.</td>
</tr>
<tr>
<td>2170-2180</td>
<td>No sample.</td>
</tr>
<tr>
<td>2180-2190</td>
<td>Like sample at 2160-2170 ft.</td>
</tr>
<tr>
<td>2190-2200</td>
<td>No change.</td>
</tr>
<tr>
<td>2200-2210</td>
<td>Sand, clear quartz, very fine to coarse-grained. About 5 percent of the sample is composed of fragments of several kinds of gray clay and sandy clay, a few small fragments of shell material, a very few specimens of micro-fossils, a few nodules of glauconite, a few nodules of pyrite, and a few small fragments of phosphatic material. A few specimens of <em>Robulus</em> sp. are in the sample.</td>
</tr>
<tr>
<td>2210-2220</td>
<td>Sand, like sample at 2200-2210 ft. About 20 percent of the sample...</td>
</tr>
</tbody>
</table>
Description

is composed of several kinds of gray and brownish-gray, soft, micaceous, in part silty clay; a few shell fragments; a few specimens of species of Foraminifera already mentioned in the samples beginning at 1830-1840 ft.; a few fragments of light-gray, soft, very fine-grained, highly micaceous sandstone; a few nodules of glauconite, a few nodules of pyrite, and a few phosphatic nodules.

2220-2230 Sand, clear quartz; fine to medium-grained, and about 1 percent fragments of clay, shells, and other material like that in the sample at 2210-2220 ft.

2230-2240 Sand, fine-grained, angular, and about 1 percent small fragments of brownish-gray clay, mica, glauconite, phosphatic material, and shell fragments; specimens of species of Foraminifera are like those in the samples beginning at 1830-1840 ft.

2240-2250 Sand, fine to coarse-grained, and about 1 percent fragments of materials and fossils like those in the immediately preceding samples.

2250-2260 Like sample at 2240-2250 ft. In addition, this sample contains a few fragments of dark brownish-gray, weakly micaceous clay; very little glauconite and phosphatic material occur in the sample.

Beds of Taylor Age

The top of the beds of Taylor age in the Thurman well 2 is placed at 2260 ft. on the basis of samples and electric log correlation.

2260-2270 Like sample at 2250-2260 ft.

2270-2280 Like sample at 2250-2260 ft., but this sample contains more of the dark brownish-gray soft clay. Small particles of mica and glauconite, and a few very small specimens of Foraminifera are embedded in the clay.

2280-2290 Sand, fine to coarse-grained. About 10 percent of the sample is composed of small nodules of very dark green glauconite, fragments of dark brownish-gray clay, and a few fragments of very light yellowish-green clay. About 15 percent of the sample is composed of very small fragments of other kinds of clay and other material caving from higher levels.

2290-2300 Like sample at 2280-2290 ft. Glaucnconite is about 25 percent of this sample.

2300-2310 Sand, clear quartz, fine to coarse-grained. About 10 percent of the sample is composed of nodules of dark-green glauconite, fragments of light yellowish-green clay like sample at 2280-2290 ft., fragments of dark brownish-gray clay like samples beginning at 2250-2260 ft., and other material that is probably caving. A few specimens of small Foraminifera are also probably cavings.

2310-2320 Sand, fine to coarse-grained, about 50 percent of the sample. About 50 percent of the sample is composed of glauconite, small frag-
Description

- **2320-2330**
  - Glauconite, green, fine to coarse-grained; sand, like sample at 2310-2320 ft.; and about 25 percent fragments of several kinds and colors of clay and sandy clay; a few shell fragments and some cavings.

- **2330-2340**
  - Like sample at 2320-2330 ft. Fragments of light yellowish-green clay is the most common kind of clay in this sample.

- **2348**
  - Circulating.
    - Sand, clear, quartz; fine to medium-grained, subangular, and about 40 percent small, rounded, nodules of very dark green glauconite.

- **2355-2360**
  - Like sample at 2348 ft.

- **2360-2365**
  - Sand, clear quartz, fine to coarse-grained, subangular, and about 50 percent nodules of dark-green glauconite that are somewhat larger than those in the sample at 2355-2360 ft.

- **2365-2370**
  - Sand, fine to medium-grained, glauconitic.

- **2370-2375**
  - Sand, like the sample at 2365-2370 ft., a few fragments of dark brownish-gray clay, and a few *Inoceramus* fragments.

- **2375-2380**
  - Sand, fine to coarse-grained; about 20 percent of the sample is glauconite; a few fragments of gray clay.

- **2380-2385**
  - Like sample at 2375-2380 ft.

- **2385-2390**
  - Like sample at 2375-2380 ft., but smaller and contains relatively less glauconite.

- **2390-2395**
  - Sand, fine to coarse-grained, and a few fragments of light-cream, soft, chalky, sandy (fine-grained sand) clay.

- **2395-2400**
  - Sand and a few fragments of clay.

- **2400-2405**
  - Like sample at 2395-2400 ft. Sample contains fragments of light-colored sandy clay (or argillaceous sand) that was observed first in the sample at 2390-2395 ft.

- **2405-2410**
  - Sand, fine to very coarse-grained, 50 percent; 50 percent fragments of light-cream, sandy, chalky clay.

- **2410**
  - Circulating.
    - Sand, quartz, medium-grained, subangular, and a few fragments of cream, sandy clay like sample at 2405-2410 ft.

- **2410-2450**
  - No samples.

- **2450**
  - Circulating. Like sample at 2410 ft.

- **2450-2490**
  - No samples.

- **2490-2495**
  - Sand, clear quartz, fine-grained, and about 1 percent small nodules of glauconite.

- **2495-2500**
  - Sand, fine to medium-grained; a very little glauconite.

- **2500-2505**
  - Like sample at 2495-2500 ft.

- **2505-2525**
  - No change.
**Description**

**Depth (feet)**

<table>
<thead>
<tr>
<th>Depth</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2525-2530</td>
<td>Sand, quartz, fine to medium-grained. The sample contains a little coarse-grained sand, a few nodules of glauconite and a few fragments of brownish-gray, somewhat silty clay. A few very minute specimens of Foraminifera and a few shell fragments occur in the clay.</td>
</tr>
<tr>
<td>2530-2535</td>
<td>Like sample at 2525-2530 ft.</td>
</tr>
<tr>
<td>2535-2550</td>
<td>No change.</td>
</tr>
<tr>
<td>2550-2555</td>
<td>Sand, clear quartz, fine to medium-grained. Small nodules of dark-green glauconite compose about 1 percent of the sample.</td>
</tr>
<tr>
<td>2555-2560</td>
<td>Similar to sample 2550-2555 ft., but contains some coarse grains of sand.</td>
</tr>
<tr>
<td>2560-2570</td>
<td>No change.</td>
</tr>
<tr>
<td>2570-2575</td>
<td>Sand, clear quartz, fine to moderately coarse grained, subangular. The sample contains a few nodules of glauconite and a few fragments of an Ostrea-like bivalve.</td>
</tr>
<tr>
<td>2575-2580</td>
<td>Sand and a little glauconite, like the sample at 2570-2575 ft.; also a few shell fragments and a trace of mica.</td>
</tr>
<tr>
<td>2580-2585</td>
<td>Like sample at 2575-2580 ft.</td>
</tr>
<tr>
<td>2585-2605</td>
<td>No change.</td>
</tr>
<tr>
<td>2605-2610</td>
<td>Sand, fine to medium-grained; a trace of glauconite, a few shell fragments, and a few specimens of Robulus navarroensis, Citharina wadei, Clavulinoides insignis, and several species of ostracodes.</td>
</tr>
<tr>
<td>2610-2615</td>
<td>Sand, clear quartz, fine to medium-grained; a few nodules of glauconite, phosphatic nodules, shell fragments and specimens of ostracodes.</td>
</tr>
<tr>
<td>2615-2620</td>
<td>Like sample at 2610-2615 ft., and a few fragments of soft, gray, shaly clay.</td>
</tr>
<tr>
<td>2620-2625</td>
<td>Like sample at 2610-2615 ft., and in addition, a few fragments of white, hard, sandy limestone. The sample contains a few specimens of Cretaceous species of Foraminifera.</td>
</tr>
<tr>
<td>2625-2630</td>
<td>No change.</td>
</tr>
<tr>
<td>2630-2650</td>
<td>No change.</td>
</tr>
<tr>
<td>2650-2655</td>
<td>Sand, clear quartz, fine to coarse-grained, subangular. About 5 percent of the sample is composed of small amounts of shell fragments, fragments of gray, soft, micaceous clay, white, hard, sandy limestone, nodules of glauconite, and phosphatic fragments.</td>
</tr>
<tr>
<td>2655-2660</td>
<td>Sand and other materials like the sample at 2650-2655 ft., but coarse grains of sand are rare.</td>
</tr>
<tr>
<td>2660-2665</td>
<td>Like sample at 2650-2655 ft., but this sample is smaller and contains many specimens of ostracodes and many fragments of dark brownish-gray clay.</td>
</tr>
<tr>
<td>2665-2670</td>
<td>Sand, clear quartz, fine to coarse-grained, and about 10 percent worn, broken, sandy fragments of Ostrea-like bivalves; frag-</td>
</tr>
</tbody>
</table>
## Description

- **2670**: Circulating. Like sample at 2665-2670 ft.
- **2670-2720**: No samples.
- **2720-2725**: Sand, clear quartz, fine to coarse-grained, subangular, in a relatively small sample. The sample also contains about 1 percent shell fragments and a few fragments of clay and sandy limestone; a little glauconite and phosphatic material; and a few nodules of Foraminifera. Worn specimens of *Robulus navarroensis* and *Planulina correcta* are fairly common in the fauna; other specimens are *Globigerina saratogaensis*, *Gaudryinella pseudoserrata*, and specimens of ostracodes.
- **2725-2730**: Sand, fine to coarse-grained. About 50 percent of the sample is composed of fragments of several other materials that are chiefly fragments of dark brownish-gray, soft clay shale, containing specimens of minute Foraminifera and very finely fragmented fossil shells; fragments of several kinds of very sandy light-gray limestone; a few shell fragments. The sample contains a few specimens of Foraminifera that are probably caving.
- **2730-2735**: Sand, shell and other materials like the sample at 2725-2730 ft. The sample contains a few specimens of species of Foraminifera characteristic of the beds of Taylor age, among which are *Stensiöina americana* and *Planulina taylorensis*; a few specimens of ostracodes also occur.
- **2735-2740**: Like sample at 2730-2735 ft.
- **2740-2750**: No change.
- **2750-2755**: A small washed sample is composed chiefly of fine to coarse-grained quartz sand. The sample contains cuttings of slightly glauconitic, sandy (fine-grained sand) limestone (or calcareous, fine-grained sandstone), and cuttings of sandy limestone in which fragments of *Inoceramus* are embedded. The limestone (?) may, in fact, be calcareous nodules in sandy clay. A few shell fragments and a few nodules of glauconite also occur in the sample.
- **2755-2760**: Sand, fine to coarse-grained composes the largest part of the sample. The sample contains about 5 percent nodules of dark-green glauconite, and in addition, a few shell fragments and a few specimens of Foraminifera. The fossils are, in part, Cretaceous species (*Globigerina sp.*) and, in part, caving from post-Cretaceous beds.
- **2760-2765**: Like sample at 2755-2760 ft.
- **2765-2770**: Sand, fine to medium-grained, and about 5 percent nodules of dark-green glauconite. The sample contains, also, a trace of...
<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2770-2775</td>
<td>Like sample at 2765-2770 ft., mainly sand, but less glauconite.</td>
</tr>
<tr>
<td>2775-2780</td>
<td>No sample.</td>
</tr>
<tr>
<td>2780-2785</td>
<td>Sand, fine to coarse-grained; about 5 percent glauconite; a trace of mica; a few shell fragments; a few specimens of Robulus sp. and a few ostracodes.</td>
</tr>
<tr>
<td>2785-2790</td>
<td>Sand, fine-grained; a little glauconite; a trace of mica; a few specimens of Foraminifera that are caving from higher levels.</td>
</tr>
<tr>
<td>2790-2795</td>
<td>Like sample at 2785-2790 ft.; a few shell fragments and a few fragments of Inoceramus.</td>
</tr>
<tr>
<td>2795-2800</td>
<td>Like sample at 2790-2795 ft.</td>
</tr>
<tr>
<td>2800-2805</td>
<td>Sand, fine to coarse-grained; a little glauconite; a few shell fragments; a few specimens of Robulus sp., and a few ostracodes.</td>
</tr>
<tr>
<td>2805-2810</td>
<td>Sand, glauconite, and a few specimens of Robulus sp., like sample at 2800-2805 ft.</td>
</tr>
<tr>
<td>2810</td>
<td>Circulating. Like sample at 2805-2810 ft., and a few shell fragments, including fragments of Inoceramus.</td>
</tr>
<tr>
<td>2810-2850</td>
<td>No samples.</td>
</tr>
<tr>
<td>2850-2855</td>
<td>Sand, mainly fine to coarse-grained; about 1 percent glauconite; a few small fragments of worn shells.</td>
</tr>
<tr>
<td>2855-2860</td>
<td>Like sample at 2850-2855 ft.</td>
</tr>
<tr>
<td>2860-2865</td>
<td>No change.</td>
</tr>
<tr>
<td>2865-2870</td>
<td>Sand, mostly fine-grained, and a few coarse grains; about 10 percent glauconite; a few phosphatic fragments of clay and sandstone; a few very small fragments of shells.</td>
</tr>
<tr>
<td>2870-2875</td>
<td>Sand, fine to coarse-grained; about 1 percent glauconite; a few very small fragments of shells; a few nodules of several kinds of calcareous sandstone.</td>
</tr>
<tr>
<td>2875-2880</td>
<td>Sand, clear quartz, mainly fine to medium-grained; about 5 percent nodules of glauconite; a few fragments of sandstone.</td>
</tr>
<tr>
<td>2880-2885</td>
<td>Sand, clear quartz, fine to medium-grained, subangular; about 1 percent glauconite; a few phosphatic fragments; a few fragments of different kinds of sandstone; a few fragments of brownish-gray shale; a few very small fragments of shells.</td>
</tr>
<tr>
<td>2885-2890</td>
<td>Sand, clear quartz, fine-grained, angular; about 1 percent glauconite; a trace of mica; a few fragments of sandstone and a few fragments of shells.</td>
</tr>
<tr>
<td>2890-2895</td>
<td>Like sample at 2855-2890 ft.</td>
</tr>
<tr>
<td>2895-2900</td>
<td>Sand and other materials like the immediately preceding sample; coarse grains of sand are somewhat more common.</td>
</tr>
<tr>
<td>2900-2905</td>
<td>Sand, fine to coarse-grained; about 5 percent glauconite; a few shell fragments; a few fragments of several kinds of calcareous sandstone.</td>
</tr>
</tbody>
</table>
Description

2905-2910
Small sample composed of material like the sample at 2900-2905 ft. A few specimens of Robulus sp. occur in this sample.

2910-2915
Sand, fine to coarse-grained; about 1 percent glauconite; many fragments of several kinds of sandy limestone and several kinds of shaly clay that are obviously caving; relatively few fragments of worn shells. This sample is fairly large.

2915-2920
Sand, fine to medium-grained; about 1 percent glauconite; a few fragments of sandstone and a few of shaly clay; a few specimens of ostracodes and Foraminifera (Robulus sp. and some very small Foraminifera).

2920-2925
Materials like the sample at 2915-2920 ft. A few specimens of Cretaceous species of Foraminifera which seem to be indigenous, are: Globotruncanana spp., Globigerina sp. and Gëmbelïna globulosà. Other specimens of species indicative of the Taylor age of the beds are: Planulina tayloriensis, Marginulina directa, Loxostoma cushmani, and the ostracode Cytheres rugosissima.

2925-2930
The small, washed concentrate is composed mainly of fine to coarse-grained quartz sand; about 1 percent glauconite; a trace of mica, and a little lignite. Other materials in the washed sample are, a few fragments of several kinds of calcareous, micaceous sandstone; a few fragments of gray and brownish-gray, soft, shaly clay; a few specimens of Globotruncanana spp. and Globigerina sp. are probably indigenous, like the specimens in the sample at 2920-2925 ft. Other foraminiferal specimens are present, but may be caving.

2930
Circulating. Like sample at 2925-2930 ft.

2930-2935
Sand, fine to medium-grained; fine-grained sand predominates in this fairly large sample. The sample also contains about 5 percent glauconite; a very few shell fragments; a few fragments of dark brownish-gray, micaceous, shaly clay containing a few small pieces of fossil shells. The microfauna is like that in the sample at 2925-2930 ft.

2935-2940
A small sample that is like the sample at 2930-2935 ft., and in addition, contains a little carbonaceous material.

2940-2945
No change.

2945-2950
No change.

2954
Circulating. Sand, clear quartz, fine to coarse-grained; about 5 percent glauconite; a few shell fragments; a few fragments of light and dark-gray, flaky, clay shale; specimens of species of Foraminifera and Ostracoda that seem to be caving from several higher levels.

2950-2955
No change.

2955-3005
No change.

3005-3010
Sand and other materials and a few forams as in the immediately preceding samples; a few specimens of Planulina tayloriensis are possibly indigenous in the beds penetrated near this depth.
<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3010-3015</td>
<td>Sand, fine to coarse-grained; about 1 percent small nodules of glauconite; a few fragments of Ostrea-like bivalves; a few fragments of several kinds of gray and brownish-gray shale; a few fragments of sandstone and siltstone; a few specimens of Cretaceous Foraminifera but none are narrowly restricted forms.</td>
</tr>
<tr>
<td>3015-3020</td>
<td>A small sample like the sample at 3010-3015 ft. in character and fauna, but contains many fragments of gray, flaky, micaceous shale, which may be the material penetrated at this depth.</td>
</tr>
<tr>
<td>3020-3025</td>
<td>Like sample at 3015-3020 ft.</td>
</tr>
<tr>
<td>3025-3030</td>
<td>No change. The gray flaky shale contains fragments of carbonaceous material.</td>
</tr>
<tr>
<td>3030-3035</td>
<td>Sand, fine to coarse-grained; about 1 percent glauconite; many fragments of gray, slightly micaceous, irregularly carbonaceous shale containing a few poorly-preserved specimens of Cretaceous Foraminifera.</td>
</tr>
<tr>
<td>3035-3040</td>
<td>Like sample at 3030-3035 ft.</td>
</tr>
<tr>
<td>3040-3045</td>
<td>No change.</td>
</tr>
<tr>
<td>3045-3050</td>
<td>Sand, like the preceding samples; a little glauconite; about 50 percent fragments of gray, slightly micaceous, irregularly carbonaceous shale; a few fragments of extremely fine-grained, finely glauconitic, calcareous sandstone, one fragment of which contains a well-preserved part of a specimen of Citharina texana.</td>
</tr>
<tr>
<td>3050-3055</td>
<td>Shale, gray, soft, and sand like sample at 3045-3050 ft. The sample contains, in addition, fragments of light greenish-gray, extremely fine-grained, argillaceous, calcareous sandstone, and a few specimens of Cretaceous Foraminifera.</td>
</tr>
<tr>
<td>3055-3060</td>
<td>Mainly sand and glauconite, but relatively little shale. The fauna is sparse and composed of specimens of Cretaceous Foraminifera that are not narrowly restricted stratigraphically.</td>
</tr>
<tr>
<td>3060-3065</td>
<td>Like sample at 3055-3060 ft.</td>
</tr>
<tr>
<td>3065-3070</td>
<td>Sand, fine to coarse-grained; about 25 percent fragments of gray flaky shale; a few fragments of extremely fine-grained, argillaceous, calcareous sandstone; a few specimens of Cretaceous Foraminifera.</td>
</tr>
<tr>
<td>3070-3075</td>
<td>Like sample at 3065-3070 ft., but showing an increase in the percentage of fragments of gray, shale, which is more thinly flaky than in the preceding sample. The fauna contains a few specimens of Planulina austiniana.</td>
</tr>
<tr>
<td>3075-3080</td>
<td>Like sample at 3070-3075 ft.; a few specimens of Planulina austiniana.</td>
</tr>
</tbody>
</table>
| 3080        | Sample is composed of about 70 percent fine to coarse-grained sand; about 5 percent glauconite; and about 25 percent fra-
<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3085-3095</td>
<td>No samples.</td>
</tr>
<tr>
<td>3095-3100</td>
<td>Like sample at 3080 ft.</td>
</tr>
<tr>
<td>3100-3105</td>
<td>No change.</td>
</tr>
<tr>
<td>3105-3110</td>
<td>Sand, glauconite, and a little mica, as described in samples beginning at 3015-3020 ft. The sample contains, in addition, many fragments of several kinds of gray shale, a few fragments of extremely fine grained, argillaceous, calcareous, micaceous sandstone, a few fragments of <em>Inoceramus</em>, and a few specimens of Cretaceous Foraminifera.</td>
</tr>
<tr>
<td>3110-3115</td>
<td>Like sample at 3105-3110 ft.</td>
</tr>
<tr>
<td>3115-3120</td>
<td>No change.</td>
</tr>
<tr>
<td>3120-3125</td>
<td>Gray shale, sand, glauconite, and a few shell fragments like the sample at 3105-3110 ft.; also a few specimens of Cretaceous Foraminifera and Ostracoda.</td>
</tr>
<tr>
<td>3125-3130</td>
<td>Shale and sand, like sample at 3120-3125 ft.; very little glauconite; very few specimens of Foraminifera.</td>
</tr>
<tr>
<td>3130-3135</td>
<td>Like sample at 3125-3130 ft.</td>
</tr>
<tr>
<td>3135-3140</td>
<td>Material and fauna similar to the immediately preceding samples, but very coarse grains of sand are common at this depth.</td>
</tr>
<tr>
<td>3140-3145</td>
<td>Sand, quartz, fine to very coarse grained, a little glauconite, and a little mica, compose about 50 percent of the sample. About 50 percent is composed of fragments of gray, soft, thinly flaky, slightly micaceous shale; a few fragments of very finely granular limestone; a little argillaceous, calcareous, micaceous, glauconitic sandstone; a few fragments of phosphatic material; and a few worn fragments of fossil shells.</td>
</tr>
<tr>
<td>3145-3150</td>
<td>Like sample at 3140-3145 ft.</td>
</tr>
<tr>
<td>3150-3155</td>
<td>Sand, fine to coarse-grained, and a little glauconite compose about 50 percent of the sample. About 50 percent is composed of fragments of gray, soft, flaky shale; a few shell fragments; and a few specimens of Foraminifera, among which are fragments of <em>Citharina texana</em>. The gray shale contains irregularly distributed small flakes of mica, minute fragments of fossil shells, and sparse small fragments of carbonaceous material.</td>
</tr>
<tr>
<td>3155-3160</td>
<td>Like sample at 3150-3155 ft.</td>
</tr>
<tr>
<td>3160-3170</td>
<td>No change.</td>
</tr>
<tr>
<td>3170-3175</td>
<td>Sand, clear quartz, fine to coarse-grained, and a little glauconite compose about 75 percent of the sample. About 25 percent is composed of fragments of gray and dark brownish-gray, argil-</td>
</tr>
<tr>
<td>Depth (feet)</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>3175-3180</td>
<td>Like sample at 3170-3175 ft. A chip of gray marly shale contains an embedded fragment of a small bivalve.</td>
</tr>
<tr>
<td>3180-3185</td>
<td>Like sample at 3170-3175 ft. Specimens of <em>Robulus</em> sp. are common in the microfauna.</td>
</tr>
<tr>
<td>3185-3250</td>
<td>No change.</td>
</tr>
</tbody>
</table>

**Tuscaloosa Formation**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3250-3260</td>
<td>Sand, clear quartz, fine to coarse-grained (coarse grains fairly common), and a little glauconite. The sample contains a few fragments of several kinds of clay; a few fragments of siltstone; a few shell fragments; several specimens of Foraminifera and Ostracoda.</td>
</tr>
<tr>
<td>3260-3265</td>
<td>Sand, quartz, fine to coarse-grained, subangular; some cavings from higher levels.</td>
</tr>
<tr>
<td>3265-3270</td>
<td>Like sample at 3260-3265 ft. Many of the sand grains are more angular than in the preceding sample, and many grains are slightly etched.</td>
</tr>
<tr>
<td>3270-3275</td>
<td>Like sample at 3265-3270 ft., and a trace of lignite.</td>
</tr>
<tr>
<td>3275-3280</td>
<td>No change.</td>
</tr>
<tr>
<td>3280-3285</td>
<td>No change; coarse grains of sand are common.</td>
</tr>
<tr>
<td>3285-3290</td>
<td>No change.</td>
</tr>
<tr>
<td>3290-3300</td>
<td>Sand, quartz, fine to coarse-grained (medium grains strongly dominant), like the samples beginning at 3265-3270 ft.; a few fragments of lignite; fragments of several kinds of material caving from higher levels.</td>
</tr>
<tr>
<td>3300-3310</td>
<td>Like sample at 3290-3300 ft.</td>
</tr>
<tr>
<td>3310-3315</td>
<td>Like sample at 3290-3300 ft.; a few sand grains are tinted yellow and pink.</td>
</tr>
<tr>
<td>3315-3320</td>
<td>Like sample at 3290-3300 ft.; a few fragments of lignite, and a few large flakes of colorless mica.</td>
</tr>
<tr>
<td>3320-3325</td>
<td>Like sample at 3315-3320 ft.</td>
</tr>
<tr>
<td>3325-3335</td>
<td>No change.</td>
</tr>
<tr>
<td>3335-3340</td>
<td>Like sample at 3315-3320 ft., and sparse nodules of siderite.</td>
</tr>
<tr>
<td>3340-3350</td>
<td>Sand, like sample at 3335-3340 ft., but no siderite.</td>
</tr>
<tr>
<td>3350-3360</td>
<td>Sand, like sample at 3340-3350 ft., and a trace of mica.</td>
</tr>
<tr>
<td>3360-3370</td>
<td>Sand, mainly quartz, and a few grains of white feldspar.</td>
</tr>
<tr>
<td>3370-3375</td>
<td>No change.</td>
</tr>
<tr>
<td>3375-3380</td>
<td>Sand, clear quartz, fine to coarse-grained; a few spherules of siderite; a trace of lignite; a few cavings.</td>
</tr>
<tr>
<td>3380-3385</td>
<td>No change.</td>
</tr>
</tbody>
</table>
### Description

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3385-3420</td>
<td>No change.</td>
</tr>
<tr>
<td>3420-3425</td>
<td>Sand, like sample at 3375-3380 ft., but this sample contains more siderite spherules and more fragments of white feldspar.</td>
</tr>
<tr>
<td>3425-3430</td>
<td>No change.</td>
</tr>
<tr>
<td>3430-3435</td>
<td>Sand, quartz, fine to coarse-grained (medium grains dominant); a few grains of white feldspar, and a few siderite spherules.</td>
</tr>
<tr>
<td>3435-3440</td>
<td>Sand, white, quartz, fine to coarse-grained (coarse grains common). The sample contains a trace of mica; a few quartz grains tinted yellow and pink; a few grains of white feldspar; and a few nodules of siderite.</td>
</tr>
<tr>
<td>3440-3450</td>
<td>Like sample at 3435-3440 ft.</td>
</tr>
<tr>
<td>3450-3460</td>
<td>Sand, similar to sample at 3435-3440 ft., but fine grains are dominant. The sample contains a little glauconite that is probably caving.</td>
</tr>
<tr>
<td>3460-3465</td>
<td>Sand, fine to coarse-grained; a few grains of white feldspar; a few nodules of siderite; a few cavings.</td>
</tr>
<tr>
<td>3465-3470</td>
<td>Like sample at 3460-3465 ft.</td>
</tr>
<tr>
<td>3470-3500</td>
<td>No change.</td>
</tr>
<tr>
<td>3500-3505</td>
<td>Sand, quartz, fine to coarse-grained, subangular and a little white feldspar.</td>
</tr>
<tr>
<td>3505-3510</td>
<td>Sand, like sample at 3500-3505 ft.; a few quartz grains are tinted pink. The sample contains a few nodules of siderite.</td>
</tr>
<tr>
<td>3510-3520</td>
<td>No change.</td>
</tr>
<tr>
<td>3520-3590</td>
<td>No change.</td>
</tr>
<tr>
<td>3590-3600</td>
<td>Similar to sample at 3505-3510 ft.; a trace of white feldspar.</td>
</tr>
<tr>
<td>3600-3610</td>
<td>No change.</td>
</tr>
<tr>
<td>3610-3620</td>
<td>Sand, coarse-grained, pink-tinted grains are fairly common; a few nodules of siderite.</td>
</tr>
<tr>
<td>3620-3630</td>
<td>Sand, clear quartz, fine to coarse-grained (coarse grains strongly dominant); a few grains of white feldspar; a few nodules of siderite. Some quartz grains are tinted pink.</td>
</tr>
<tr>
<td>3630-3670</td>
<td>Like sample at 3620-3630 ft.</td>
</tr>
<tr>
<td>3670-3680</td>
<td>Sand, clear quartz, and a few pink grains; the sand is somewhat finer grained than in the sample at 3620-3630 ft. The sample contains a few nodules of siderite, a few grains of white feldspar, and a few small grains of obsidian(?).</td>
</tr>
<tr>
<td>3680-3690</td>
<td>Like sample at 3670-3680 ft.; obsidian(?) is rare.</td>
</tr>
<tr>
<td>3690-3700</td>
<td>Sand, clear quartz, coarse to very coarse grained; a few grains of pink-tinted quartz; a few grains of white feldspar.</td>
</tr>
<tr>
<td>3700-3710</td>
<td>Like sample at 3690-3700 ft.</td>
</tr>
<tr>
<td>3710-3750</td>
<td>No change.</td>
</tr>
</tbody>
</table>

**Comanche Series (?) undifferentiated**

| 3750-3760   | Sand, like immediately preceding samples. The sample contains, in |
Description

addition, a few nodules of siderite, and a few fragments of red, yellow, and gray mottled, micaceous silty mudstone. The unfossiliferous mudstone is lithologically similar to rocks that have been classified as Comanche in many wells in the southeastern Gulf Coast region. On the basis of the highest occurrence of the mudstone in the Knight well 1, supported by electric log characteristics, the top of the Comanche (?) is placed at 3750 ft.

3760-3770 Like sample at 3750-3760 ft.
3770-3810 No change.
3810-3820 Sand, clear quartz, coarse to very coarse-grained; a few grains of white feldspar. A few of the quartz grains are tinted pink.
3820-3850 Like sample at 3810-3820 ft.
3850-3860 Like sample at 3810-3820 ft., but this sample contains more white feldspar.
3860-3870 Sand, coarse to very coarse grained; a few pink-tinted grains of quartz; a few grains of white feldspar; a few grains of obsidian (?); and a few moderately large nodules of siderite.
3870-3880 Sand and other materials like sample at 3860-3870 ft., and in addition, fragments of light yellowish-green clay and red, finely micaceous clay.
3880-3890 Sand, white, very coarse grained; a few grains of white feldspar. A few quartz grains are tinted pink.
3890-3900 Sand, similar to the sample at 3880-3890 ft., but coarser grained; grains of white feldspar are fairly common.
3900-3910 Like sample at 3890-3900 ft., and in addition, a few fragments of red and greenish-yellow mottled micaceous clay.
3910-3920 Like sample 3900-3910 ft., but contains no mottled clay.
3920-3930 Sand, quartz, fine to very coarse-grained, and a little white feldspar. The sample contains, in addition, a few nodules of siderite, fragments of red, gray and greenish-yellow mottled, finely micaceous clay, and cavings of other materials.
3930-3940 Like sample at 3920-3930 ft.
3940-3950 Like sample at 3920-3930 ft., but contains more coarse grains of sand.
3950-3960 Sand, fine to very coarse grained; a few nodules of sandy siderite; a little limonite; many fragments of dark-red micaceous shale, greenish-yellow and gray mottled shale, and red and light-raspberry mottled shale. This sample contains other materials that are caving from higher levels.
3960-3970 Sand, fine to very coarse grained, like samples at 3950-3960 ft., and a very small amount of vari-colored shale.
3970-3980 Like sample at 3960-3970 ft.
3980-3990 Sand, fine to very coarse grained (coarse grains compose about 50 percent), and a little varicolored shale; a few nodules of
Description

siderite and cavings of various materials are components of the sample.

3990-4000 Like sample at 3980-3990 ft.
4000-4030 No change.
4030-4040 Sand, like sample at 3980-3990 ft.; yellow-tinted grains are fairly common. The sample contains a little yellow feldspar.
4040-4050 Like sample at 4030-4040 ft. and a few fragments of bluish-gray, weakly sandy (very fine grained sand) shaly clay.
4050-4060 Like sample at 4040-4050 ft., but fragments of the shaly clay are much more abundant.
4060-4070 No change.
4070-4080 No change.
4080-4090 Sand, yellow and red, fine to very coarse grained, the coarse grains being dominant; a few grains of feldspar; a trace of mica; and a few fragments of brick-red clay.
4090-4100 Sand, like sample at 4080-4090 ft.; grains of feldspar of various colors are common in the sand. The sample contains a few fragments of red and white mottled, sandy, micaceous clay.
4100-4110 Sand, like sample at 4090-4100 ft., but the grains are slightly coarser. The sample contains a trace of red, sandy, micaceous clay.

Pre-Cretaceous rocks

4110-4130 T.D. Sand, like sample at 4100-4110 ft., and fragments of granite. The top of the granite in the Thurman well 1 is placed at 4110 ft. on the basis of electric log correlation and the petrographic determination of selected fragments of cuttings.

COLQUITT COUNTY

Operator: R. T. Adams
Landowner: D. G. Arrington Well 1
Location: Land District 8, Land Lot 270; 760 ft. west of east line; 210 ft. north of south line of land lot 270.
GGS. No. 170
Elevation: 270 (est.)
Total depth: 4904 ft.
Completed: Aug. 25, 1948
Summary of Stratigraphy

Tertiary
Not studied

Cretaceous

Gulf

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Thickness (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tertiary</td>
<td></td>
</tr>
<tr>
<td>Cretaceous</td>
<td></td>
</tr>
<tr>
<td>Gulf Series</td>
<td></td>
</tr>
<tr>
<td>Beds of Navarro age</td>
<td>1680</td>
</tr>
<tr>
<td>Beds of Taylor age</td>
<td>1900</td>
</tr>
<tr>
<td>Beds of Austin age</td>
<td>2440?</td>
</tr>
<tr>
<td>Atkinson Formation upper member</td>
<td>2806</td>
</tr>
<tr>
<td>lower member</td>
<td>3290</td>
</tr>
<tr>
<td>Comanche undifferentiated</td>
<td>3510</td>
</tr>
</tbody>
</table>

Lithologic and paleontologic descriptions of cuttings and cores. Samples are cuttings unless otherwise stated.

Description

Depth (feet)

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1680</td>
<td>Samples not studied.</td>
</tr>
<tr>
<td>1680-1690</td>
<td>Shale, gray, and a little fine-grained sand probably indicate the material drilled at this depth; the fauna consists of a few specimens of Globotruncana arcuata and a few specimens of other Cretaceous species of Foraminifera. The sample contains many fragments of Limestone from the overlying Clayton (Midway) Formation.</td>
</tr>
<tr>
<td>1690-1900</td>
<td>Lithology and fauna like the sample at 1680-1690 ft.</td>
</tr>
<tr>
<td>1900-1910</td>
<td>Shale, gray, and many fragments of gray, sandy (very fine grained sand) clay shale, and light-gray, hard, very fine grained sandstone.</td>
</tr>
<tr>
<td>1910-1920</td>
<td>Like sample at 1900-1910 ft.; sample contains abundant specimens of Lituola taylorensis.</td>
</tr>
<tr>
<td>1920-2060</td>
<td>Samples not studied in detail.</td>
</tr>
<tr>
<td>2060-2070</td>
<td>Shale, gray, a little sandy shale, and specimens of Globorotalites conicus, Planulina dumbeii and Stensiolina americana.</td>
</tr>
<tr>
<td>2070-2710</td>
<td>Samples not studied in detail.</td>
</tr>
</tbody>
</table>
**George Georgia Geological Survey Bulletin 74**

**Description**

**Beds of Austin age**

2710 Sidewall core.

Shale, gray, containing glauconite and pyrite, fragments and prisms of *Inoceramus*, many specimens of *Citharina texana*, and a few specimens of other Foraminifera, mainly *Globotruncana* sp.

2710 Sidewall core.

Shale, gray, soft, chalky, containing abundant *Inoceramus* prisms and specimens of *Citharina texana*; specimens of *Gümbelina* sp. and *Globigerina* sp. are common.

2725 Sidewall core.

Sandstone, cream, moderately hard, chalky, very fine-grained, glauconitic; contains fragments of *Ostrea* sp.

2731 Sidewall core.

Shale, gray, soft, sandy (very fine grained sand), glauconitic. Fauna consists mainly of specimens of a small *Anomalina* sp. indicative of the beds of Austin age.

**Atkinson Formation. Upper Member.**

2806 Sidewall core.

Shale, gray, soft, fine-grained, argillaceous, containing a few fragments of phosphatic material, carbonaceous material, and a little mica.

2850-2860 Shale, gray, containing many fragments of *Ostrea* sp., a little carbonaceous material, and a few fragments of white, medium to fine-grained, somewhat phosphatic, slightly glauconitic sandstone. The fragments of *Ostrea* sp. are probably indigenous, but the few specimens of Foraminifera in the sample seem to cave from higher levels.

2860-2870 Like the sample at 2850-2860 ft.

2870-2880 Like the sample at 2850-2860 ft., and containing a few fragments of grayish-green shale.

2880-3000 No change. The specimens of Foraminifera are species that occur in the lower part of the beds of Austin age; species indicative of the upper member of the Atkinson Formation (Eagle Ford age) were not observed.

3000-3010 Like the samples at 2880-3000 ft., with the addition of grains of coarse sand.

3010-3020 Samples not studied.

3020-3030 Sand, coarse to very coarse, and a little nodular sandstone.

3030-3060 Samples not studied.

3060-3070 Sand, fine to coarse-grained (coarse grains common). The sample contains a few fragments of white, moderately hard, medium-grained sandstone showing a few pink-tinted grains.
Logs of Selected Wells in the Coastal Plain of Georgia

**Description**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3070-3200</td>
<td>Samples are like the sample at 3060-3070 ft. and contain cavings in variable amounts.</td>
</tr>
<tr>
<td>3200-3210</td>
<td>Sand and sandstone like the immediately preceding samples, and also many fragments of white, moderately hard, fine to medium-grained, glauconitic, somewhat phosphatic sandstone.</td>
</tr>
<tr>
<td>3210-3220</td>
<td>Like sample at 3200-3210 ft., showing an increase in the amount of glauconitic sandstone.</td>
</tr>
<tr>
<td>3220-3230</td>
<td>Sample not studied.</td>
</tr>
<tr>
<td>3230-3240</td>
<td>Sample is mainly cavings, and the material drilled at this depth is not clearly shown. The material in the sample consists of gray shale (probably from the beds of Austin age), a few fragments of glauconitic sandstone like that in the samples at 3200-3220 ft., and specimens of Foraminifera from higher levels. The sample contains fragments of carbonaceous material that increase progressively with depth from 3240 to 3290 ft.</td>
</tr>
<tr>
<td>3240-3290</td>
<td>Samples not studied in detail.</td>
</tr>
</tbody>
</table>

**Atkinson Formation. Lower Member.**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3290-3300</td>
<td>Like sample at 3230-3240 ft., and in addition, many fragments of white, fine to medium-grained, calcareous, glauconitic, somewhat micaceous sandstone containing many fragments of shells (<em>Ostrea</em> sp. and possibly other fossil bivalves).</td>
</tr>
<tr>
<td>3300-3320</td>
<td>Samples not studied.</td>
</tr>
<tr>
<td>3320-3330</td>
<td>Shale, dark-gray, hard, flaky, is probably the material drilled at this depth. The sample contains much gray clay shale that is caving from higher levels.</td>
</tr>
<tr>
<td>3330-3340</td>
<td>The sample shows an increase in the amount of dark-gray, micaceous shale described in the sample at 3220-3330 ft. The microfauna seems to be mainly caving from higher levels. Specimens of Foraminifera indicative of the lower member of the Atkinson Formation do not seem to occur in this sample, possibly because of the small amount of dark-gray shale in proportion to the large quantity of cavings. It is possible, also, that specimens, if present, were removed from the sample prior to this study.</td>
</tr>
<tr>
<td>3340-3510</td>
<td>Samples are mainly cavings of gray clay shale, dark micaceous shale, fine-grained sand, and glauconite; the microfauna is sparse and seems to have caved from higher levels.</td>
</tr>
</tbody>
</table>

**Comanche Series undifferentiated**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3513</td>
<td>Materials similar to those described in the sample from 3340 to 3510 ft., and also a little coarse-grained quartz sand.</td>
</tr>
<tr>
<td>3520-3530</td>
<td>Sand, coarse-grained, quartz; a few fragments of waxy, mustard-colored, red mottled shale; many cavings.</td>
</tr>
<tr>
<td>3530-3540</td>
<td>Like sample at 3520-3530 ft.</td>
</tr>
</tbody>
</table>
Description

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3540-3550</td>
<td>Like sample at 3530-3540 ft., and a few fragments of greenish-brown, red and light-gray mottled micaceous shale.</td>
</tr>
<tr>
<td>3550-3560</td>
<td>Like sample at 3540-3550 ft.</td>
</tr>
<tr>
<td>3560-3570</td>
<td>Sand, fine to very coarse grained (coarse grains common) quartz, and a few grains of feldspar; some of the quartz grains are red-tinted. Sand is about 50 percent of the sample. A few fragments of mottled or varicolored shale and cavings from higher levels compose about 50 percent of the sample.</td>
</tr>
<tr>
<td>3570-3600</td>
<td>No change.</td>
</tr>
<tr>
<td>3600-3610</td>
<td>Sand, varicolored shale, and cavings, like the sample at 3560-3570 ft., and many fragments of dark purplish-red, micaceous shale.</td>
</tr>
<tr>
<td>3610-3630</td>
<td>Sample not described.</td>
</tr>
<tr>
<td>3630-3640</td>
<td>Sand, 50 percent of sample, and 50 percent cavings of gray clay shale and a few fragments of red and mottled shale.</td>
</tr>
<tr>
<td>3640-3770</td>
<td>No change.</td>
</tr>
<tr>
<td>3770-3780</td>
<td>Sand, fine-grained, many fragments of brownish to purplish-red, gray and mustard-colored, micaceous shale, and many cavings.</td>
</tr>
<tr>
<td>3780-3800</td>
<td>No change.</td>
</tr>
<tr>
<td>3800-3810</td>
<td>Sand, white, mainly coarse-grained, quartz; a few amber and pink-tinted grains; a few grains of feldspar; a little red and mottled shale; cavings.</td>
</tr>
</tbody>
</table>

3810-4904 T.D. Samples not studied in detail. The material is sand, sandy clay, and varicolored clay, and is seemingly not older than Comanche.

COLQUITT COUNTY

Owner: City of Moultrie, well 3  
GGS No.  
Elevation: 340 ft. (est.)  
Total depth: 745 ft.  
Completed: Aug. (?) 1936

Summary of Stratigraphy

<table>
<thead>
<tr>
<th>Tertiary</th>
<th>Depth (feet)</th>
<th>Thickness (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pliocene to Recent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 sample at 150 ft.</td>
<td></td>
<td>?</td>
</tr>
<tr>
<td>Miocene undifferentiated</td>
<td></td>
<td>165</td>
</tr>
<tr>
<td>Oligocene</td>
<td></td>
<td>408</td>
</tr>
<tr>
<td>Eocene</td>
<td></td>
<td>670 total 75</td>
</tr>
<tr>
<td>upper, Ocala Limestone, upper member</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Depth
Lithologic and paleontologic descriptions of cutting samples.

### Description

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
</table>
| 150          | Pliocene Series to Recent Series  
|              | Sand, coarse-grained, subangular, clear quartz, and a few reddish-brown and gray sandy nodules. |
| 165          | Miocene Series undifferentiated  
<p>|              | Clay, white, sandy (fine-grained sand). Washed residue, large. Sand, fine-grained, moderately even-grained, angular, clear quartz, and a few nodules of clay. |
| 170          | Clay, white to light-green, sandy (fine-grained sand). Washed residue, large. Sand, very uneven-grained, clear quartz, and about 25 percent nodules of hard clay. |
| 210          | Clay, light-green. Washed residue, small. Sand, uneven-grained, angular, clear quartz, and about 10 percent small nodular fragments of light-green clay. |
| 220          | Clay, light-green. Washed residue, moderately small. Sand, very fine-grained, even-grained, angular, clear quartz, and a few fragments of hard clay. |
| 230          | Clay, light-green and tan, fairly hard. Washed residue, moderately small. Clay, and about 25 percent very fine-grained, clear quartz sand, and a few chalky lime nodules. |
| 235          | Clay, light-green and light-tan, sandy (fine-grained sand), slightly calcareous. Washed residue, moderately large. Clay, and about 25 percent fine-grained, angular, clear quartz sand. |
| 240 (?)      | Clay, light-green, somewhat sandy. Washed residue, small. Clay, and about 50 percent fine-grained clear quartz sand. |
| 245          | Like samples at 240 (?) ft. |
| 250          | Clay, light-green, fairly hard, sandy (fine-grained sand), and a few chalky lime nodules. Washed residue, small. Clay, and a small amount of sand. |
| 260          | Clay, olive-green, and lime nodules. Washed residue. Sand, moderately fine-grained, even-grained, clear quartz, and a few nodules of hard sandy clay. |
| 270          | Like the sample at 260 ft. |</p>
<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>280</td>
<td>Washed residue, large. Nodular fragments of sandy clay. Material and washed residue like sample at 270 ft., with the addition of a few fragments of grayish-green, flaky, somewhat carbonaceous shale.</td>
</tr>
<tr>
<td>290</td>
<td>Clay, olive-green, and nodules of white, calcareous clay. Washed residue, moderately large. Clay, nodular, highly sandy, calcareous, and about 25 percent very uneven grained, clear quartz sand and a few fragments of olive-green shale.</td>
</tr>
<tr>
<td>305</td>
<td>Clay, olive-green, and cream, calcareous, sandy nodules. Washed residue, moderately large. Clay, nodular, sandy, calcareous, and about 50 percent, uneven-grained, clear quartz sand and many fragments of light-green, shaly clay.</td>
</tr>
<tr>
<td>325</td>
<td>Clay, olive-green. Washed residue, moderately large. Clay, nodular, hard, sandy, calcareous, and a little uneven-grained, clear quartz sand.</td>
</tr>
<tr>
<td>365</td>
<td>Like the sample at 325 ft., with the addition of a few cream nodules of hard sandy chalk.</td>
</tr>
<tr>
<td>370</td>
<td>Clay, cream, shaly, sandy, unctuous. Washed residue, moderately large; composed of angular fragments of the clay, and about 50 percent fine-grained, moderately even grained, angular, clear quartz sand.</td>
</tr>
<tr>
<td>390</td>
<td>Clay, olive-green, sandy. Washed residue, moderately large. Sand, fine to coarse-grained, angular, clear quartz; a few fragments of carbonaceous material; about 10 percent nodules of the olive-green hard clay.</td>
</tr>
<tr>
<td>408</td>
<td>Clay, green, nodular, and fragments of white, chalky, sandy limestone. Washed residue, large. Fragments of the clay and limestone, and a little uneven-grained, clear quartz sand that washes from the clay nodules; a few poorly-preserved molds of ostracode carapaces, and a few vague impressions of fragments of fossils in the limestone cuttings.</td>
</tr>
<tr>
<td>420</td>
<td>Limestone, white, chalky, somewhat sandy; fragments of olive-green, sandy, shaly clay; a little clear quartz sand.</td>
</tr>
<tr>
<td>430</td>
<td>Limestone, white, sandy, very finely granular, containing impressions of fragments of fossils; a little clear quartz sand. The fossils are <em>Pecten</em> sp. and others that are not determinable.</td>
</tr>
<tr>
<td>440</td>
<td>Limestone, greenish-brown, nodular, dense, sandy, unfossiliferous(?).</td>
</tr>
<tr>
<td>465</td>
<td>Clay, green, shaly, and a few limestone nodules. Washed residue, small. Sand, uneven-grained, clear quartz; a few nodular, calcareous, sandy fragments of the green shaly clay; and a few reddish-yellow sandy nodules.</td>
</tr>
</tbody>
</table>
Description

480
Limestone, light-gray, hard, nodular, fossiliferous, and a few nodular fragments of brown, granular dolomite. The fossils are usually firmly embedded in the hard limestone nodules, and seem to be water-worn, but calcitized specimens of *Lepidocyclina* cf. *L. chattahocheensis*, *Gypsina globula*, and a few miliolids and fragments of *Pecten* sp. were identified.

500
Limestone, cream, hard, nodular, fossiliferous, lithologically and faunally similar to the sample at 480 ft. In addition to the fauna in the preceding sample, the limestone contains bryozoan fragments, a few highly ornamented echinoid spines, a few worn specimens of *Camerina* sp., *ostacode* carapaces, a large specimen of *Quinquiloculina* sp., *Asterigerina* sp., and a number of specimens of *Rotaliidae*, including *Rotalia* cf. *R. mexicana* var.

515
Dolomite, brown, granular, crystalline, and about 15 percent small fragments of white, chalky coquina.

530
Coquina, chalky, porous, and a few nodular fragments of brown, granular dolomite; abundant fragments of *Pecten* sp., *Bryozoa*, and echinoid spines; specimens of *Lepidocyclina mantelli*, *Operculina*? sp., *Rotalia mexicana* var., *Quinquiloculina* sp., *Asterigerina* cf. *A. subacuta*, and *Discorbis patteliformis* are common.

540
Like the sample at 530 ft., with specimens added to the fauna as follows: *Gypsina globula* (common), *Eponides* sp. and *Asterigerina* sp. (very common). *Rotalia* cf. *R. mexicana* var. is rare in this sample.

550
Like sample at 540 ft.

560
Dolomite, brown, granular, crystalline, and a few fragments of coquina, probably from closely overlying levels.

575
Like the sample at 560 ft.

585
Limestone, brown, granular, crystalline to cryptocrystalline, in which chalky fragments of specimens of *Lepidocyclina* cf. *L. pseudomarginata* and some fragments of *Pecten* sp. are embedded.

595
Like sample at 585 ft., but containing more abundant fossil material.

605
Like sample at 595 ft.

615
Dolomite, brown to light-tan, finely granular, somewhat chalky; fauna like the immediately preceding samples.

625
Like the sample at 615 ft., but the fauna consists only of a few sections of small miliolids. A few specimens of *Lepidocyclina* sp. in the sample may have caved from higher levels.

635
Limestone, dark-brown to cream, finely granular, crystalline, porous, containing a few very poorly preserved calcitized fragments of shell material and *Lepidocyclina* (?) sp.

650
Like the sample at 635 ft.

660
No change.
Description

Eocene Series

Upper Eocene. Ocala Limestone. Upper Member.

670 Limestone, white, chalky, fossiliferous, and about 20 percent nodular fragments of brown dolomite. The fauna consists of fragments of specimens of Asterocyclina georgiana; fragments of echinoids and echinoid spines; bryozoan fragments; fragment of bivalve (genus not determinable); fragments of specimens of Robulus alato-limbatus, Pecten sp., Eponides cf. E. jacksonensis, and Massilina sp.

700 Limestone, tan to cream, granular, crystalline, and a few fragments of coquina caving from higher levels; a few fragments of Lepidocyclina sp. and echinoids.

710 Most of this sample is like the one at 700 ft. but contains many fragments of light grayish-cream crypto-crystalline, porous limestone in which are embedded many sections of small miliolids, and a few molds of fragments of other fossils.

720 Limestone, chalky, nodular, microfossiliferous. The fauna is composed of bryozoan fragments and fragments of Asterocyclina georgiana and other species; also specimens of Robulus alato-limbatus, Eponides jacksonensis, and a few other Rotaliidae.

745 T.D. Limestone, white, chalky, highly fossiliferous; bryozoan fragments are abundant; specimens of Foraminifera in the sample are Asterocyclina georgiana, Robulus alato-limbatus, Eponides jacksonensis, and others.

DECATUR COUNTY*

Owner Operator: U. S. (War Department) Bainbridge Basic Flying School Well 2
Location: 6 mi. northwest of Bainbridge, Ga.
Elevation: 135
Total depth: 422 ft.
Completed: June 19, 1942

Summary of Stratigraphy

Tertiary

Oligocene(?) or Eocene(?) (1 sample) 82 ?

In Eocene

upper, Ocala Limestone, upper member 100 55
lower, upper middle, Avon Park Limestone 155 75

Publication of this data is authorized by the Sun Oil Company, for whom the report was prepared on a commercial basis.
lower middle, Lake City Limestone(?)

Lithologic and paleontologic description of cuttings and cores. Samples are cuttings unless otherwise stated.

**Description**

**Tertiary**

**Oligocene(?) or Eocene(?)**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>82</td>
<td>Sand, clear quartz, fine-grained, and very finely cut fragments of hard, white, chalky limestone.</td>
</tr>
</tbody>
</table>

**In Eocene**

Upper Eocene. Ocala Limestone. Upper Member.

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Limestone, white, chalky, fossiliferous, containing worn fragments of molds and a few sections of <em>Heterostegina ocalana</em>, <em>Sphaerogypsina globula</em>, and <em>Amphistegina pinarensis cosdeni</em>.</td>
</tr>
<tr>
<td>110</td>
<td>Limestone, white, hard, chalky, in nodular fragments that seem to be water-worn. The limestone contains worn molds of <em>Lepidocyclina</em> sp. and <em>Sphaerogypsina</em> sp.</td>
</tr>
<tr>
<td>120</td>
<td>Limestone, light-cream, moderately hard, chalky containing traces of fossils, among which fragmental sections of <em>Lepidocyclina</em> sp. are fairly common.</td>
</tr>
<tr>
<td>125</td>
<td>Limestone, chalky, porous, similar to sample at 120 ft. Very little of the fossil material is determinable, but poorly-preserved fragments of <em>Lepidocyclina</em> sp. are present.</td>
</tr>
<tr>
<td>130</td>
<td>Like sample at 125 ft.</td>
</tr>
<tr>
<td>144</td>
<td>Like sample at 125 ft.</td>
</tr>
</tbody>
</table>

Upper Eocene. Ocala Limestone. Upper Member.

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>155</td>
<td>Like sample at 125 ft. Sample contains specimens of <em>Amphistegina pinarensis</em> var., and a few specimens of small Foraminifera typical of the lower member of the Ocala Limestone.</td>
</tr>
<tr>
<td>168</td>
<td>Limestone, chalky, fossiliferous, having a water-worn appearance. The fauna consists of bryozoan fragments (common), fragments of specimens of <em>Lepidocyclina ocalana</em>, <em>Asterocyclina</em> sp., <em>Amphistegina alabamensis</em>, and specimens of small Foraminifera characteristic of the lower member of the Ocala Limestone.</td>
</tr>
<tr>
<td>178</td>
<td>Like sample at 168 ft.</td>
</tr>
</tbody>
</table>
| 195          | Limestone, chalky, fossiliferous. The fossils are better preserved than in the preceding samples, and the fauna contains several
Depth (feet)

Description

varieties of *Lepidocyclina oculana*, and many specimens of *Amphistegina alabamensis* and *A. pinarensis* var.

210 Limestone, white, dense, containing traces of fossils; also some fragments of white, crystalline, gysiferous limestone. The cuttings of limestone are very small.

215 Limestone, white, dense. The sample is composed of finely cut fragments.

220 Limestone, white, nodular. The sample is composed of finely cut fragments.

225 Like sample at 220 ft. The limestone contains molds of small Foraminifera that are too poorly preserved for identification.

Upper Middle Eocene. *Avon Park Limestone.*

230 Limestone, white, chalky, moderately hard, containing specimens of *Dictyoconus floridanus* and *Valvulina* sp.

235 Limestone, white, chalky, partly crystalline, containing specimens of *Dictyoconus floridanus* and poorly preserved molds of smaller Foraminifera.

238 Limestone, white, chalky, having a water-worn appearance. The fauna consists of poorly-preserved specimens that are chiefly fragments of *Lepidocyclina* sp., *Oперculina* sp., and *Camerina* sp., as in samples above 230 ft., and consequently may be caving, in part.

240 Limestone, white, nodular (small nodules), somewhat calcitic, containing a few poorly-preserved, largely unidentifiable molds of smaller Foraminifera, among which are specimens of a small *Cibicides* sp. and a few other questionable rotaliid forms.

245 Limestone, white, chalky, porous, nodular (small nodules), somewhat calcitic, containing specimens of several species of miliolids, and specimens of *Coskinolina floridana* and *Valvulammina* sp. common in the Avon Park Limestone.

248 Like sample at 245 ft.

Lower Middle Eocene. *Lake City Limestone*

(probable equivalent).

285 Limestone, white, dense, chalky, slightly glauconitic. The sample contains many poorly-preserved molds and fragments of *Lepidocyclina* sp., some of which may be caving from higher levels, but some are definitely indigenous, as *Lepidocyclina pustulosa*.

295 Limestone, in part chalky, in part dolomitic; crystals of dolomite are scattered through the chalky material. The limestone contains a little glauconite, and a few fragments of molds and small fragmental sections of *Lepidocyclina* sp. Like the sample at 285 ft., some of the fossil fragments may be caving.
Description

315
Sandstone, very fine grained, slightly glauconitic (fine-grained glauconite), is about 80 percent of the sample. About 20 percent of the sample is composed of small chalky fragments, much of which is probably worn and broken fossil debris that was irregularly scattered in the sandstone. Bryozoan fragments are common.

325
Sandstone, grayish-tan, very fine grained, calcitic, slightly glauconitic, like sample at 315 ft.; a few chalky fragments are present.

330
Sandstone, highly calcareous, very fine grained, slightly glauconitic. Many fragments of chalky, glauconitic limestone contain traces and fragments of fossils that indicate the material is probably caving from higher levels.

340
Limestone, white, chalky, glauconitic, containing many fragments of Operculinoides sp., Camerina sp., Lepidocyclina (Pollylepida) antillnea, and Discoocyclina flintensis.

365
Limestone, light bluish-gray, hard, dense, containing small scattered particles of glauconite.

373
Like sample at 365 ft.

422 T.D. Limestone, light-gray, moderately hard, sandy, glauconitic (fine-grained glauconite); no indigenous fossils.

DECATUR COUNTY*

Owner Operator: U. S. (War Department) Bainbridge Basic Flying School Well 1
Landowner: GGS. No. 57
Location: 6 mi. northwest of Bainbridge, Ga., and about 3/4 mi. southwest of Georgia Highway 1.

Elevation: 130 ft.
Total depth: 1035 ft.
Completed: May 28, 1942

Summary of Stratigraphy

<table>
<thead>
<tr>
<th>Tertiary</th>
<th>Depth (feet)</th>
<th>Thickness (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miocene(?) undifferentiated (1 sample)</td>
<td>20</td>
<td>?</td>
</tr>
<tr>
<td>Oligocene(?) do (1 sample)</td>
<td>55</td>
<td>?</td>
</tr>
<tr>
<td>No samples</td>
<td>60</td>
<td>55</td>
</tr>
</tbody>
</table>

In Eocene

upper, Ocala Limestone, upper member | 115 | 54 |
lower member | 169 | 137 |

*Publication of this data is authorized by the Sun Oil Company, for whom the report was prepared on a commercial basis.
Lithologic and paleontologic description of cuttings and cores. Samples are cuttings unless otherwise stated.

**Description**

**Tertiary**

Miocene (?) undifferentiated

**Oligocene (?) undifferentiated**

55 Limestone, chalky, water-worn, containing traces of fossils.

**In Eocene**

Upper Eocene. Ocala Limestone. Upper Member

115 Limestone, light-cream, chalky, porous, composed of poorly-preserved, fragmentary molds of fossil shells, among which are Lepidocyclina sp., Gypsina globula, bryozoan fragments, and echinoid spines.

130 Limestone, iron-stained, hard, chalky, water-worn, showing traces of fossil shells, among which are fragments of Lepidocyclina sp.

Upper Eocene. Ocala Limestone. Lower Member

169 Limestone, white, chalky, porous, fossiliferous. Among the poorly-preserved molds, fragments of molds, and impressions of shells, are specimens of Lepidocyclina sp., Operculina sp., worn fragments of Asterocyclina (?), Amphistegina pinarensis, Robulus sp., Amphistegina alabamensis, and specimens of a few other small Foraminifera (Ocala species).

185 Limestone, cream, hard, chalky. A few fragments of limestone contain traces of sections of microfossils.

195 Limestone, chalky. A very small sample.

205 Limestone, white, chalky, highly microfossiliferous, containing many specimens of Lepidocyclina ocalana and varieties, a few specimens of Operculina sp., and many specimens of Amphistegina alabamensis that is common in the lower member of the Ocala Limestone in western Florida.

220 Limestone, chalky, fossiliferous. Worn fragments of Lepidocyclina sp. are common, and specimens of Amphistegina pinarensis
Description

are abundant. Also present are poorly-preserved specimens of *Camerina* sp., *Operculina* sp., *Gypsina globula*, and bryozoan fragments.

270 Limestone, cream, chalky, fossiliferous. The foraminiferal material consists of worn chalky molds. The species seem to be the same as in the sample at 220 feet; but specimens of *Camerina* sp. are much more abundant.

290 Limestone, white and cream, hard, nodular, containing abundant traces of fossils and a few grains of glauconite. The sample contains fragments of a large coarsely beaded *Lepidocyclina* sp. This sample is possibly the equivalent of the Moody's Branch Marl at the base of the Jackson (upper Eocene) Group in Mississippi.

Middle Eocene

306 Unit A

Sandstone, clear quartz, very fine grained, somewhat glauconitic, chalky. The sandstone contains many calcitic fragments that seem to be derived from broken fossil shells; one poorly-preserved chalky specimen of *Lepidocyclina* sp.; and worn bryozoan fragments.

318 Like sample at 306 ft.

327 Limestone, white, hard, somewhat glauconitic, containing fragments of sections of *Operculinoides* sp., *Lepidocyclina* (*Poly-lepidina*) antillea, *Pseudophragmina* sp. About 50 percent of the sample is very uneven grained clear quartz sand. Cavings of limestone from higher levels are common.

340 Sand, like sample at 327 ft., and small fragments of white, hard, slightly glauconitic chalk. The fauna seems to be like the sample at 327 ft., but the specimens are too poorly presented for specific identification.

353 Unit B

Limestone, light-gray, dense, sandy (very fine grained sand), glauconitic (very fine grained glauconite). The grains of glauconite are evenly distributed in the limestone.

370 Like sample at 353 ft.

375 Like sample at 353 ft.

400 Limestone, light-gray, highly sandy, chalky. The sample contains a trace of mica, fragments of *Ostrea* sp. and *Echinoides*; and a very few specimens of smaller Foraminifera, including *Cibicides westi*.

426 Like sample at 400 ft.

430 Unit C

Chalk, highly sandy, slightly glauconitic, containing many worn fragments of a thin-shelled bivalve (*Ostrea*?) sp.). Several poorly-preserved specimens of small Foraminifera also occur,
Description

among which Asterigerina lisbonensis is the dominant form, and
Globigerina sp., Cibicides sp., and others are also present.

Limestone, iron-stained, hard, glauconitic (moderately coarse
grounded glauconite), sandy (moderately coarse-grained sand),
containing many fragments of a partly calcitized fossil bivalve.
The material has the appearance of having been weathered
during exposure at the surface.

Limestone, white, highly glauconitic (moderately coarse grained
glaucine), sandy (moderately coarse grained sand), containing
a trace of mica. Poorly-preserved fragments of macrofossils are
embedded in the limestone. About 50 percent of the sample is
very uneven grained clear quartz sand.

Like sample at 438 ft.

Sand, chalky, coarse-grained, uneven, glauconitic, containing worn
fragments of fossil bivalves, and several chalky, glauconitic
specimens of Asterigerina lisbonensis.

Like sample at 458 ft.

Sand, clear quartz, uneven-grained, glauconitic; sand grains and
angular to subangular. Several specimens of small Foraminifera
are present, among which Asterigerina lisbonensis is domi-
nant, and Gyroidina soldanii var. octocamerata is fairly common.
The sample also contains a few ostracodes and echinoid spines.

Limestone, white, hard, sandy, glauconitic, containing fragments
of molds of macrofossils.

Sand, clear quartz, moderately coarse-grained, moderately even
grained, glauconitic, containing a few fragments of a thin-
shelled Ostrea(?) sp., and a few chalky fragments of other
fossils.

Like sample at 490 ft., but both sand and glauconite are coarser
grounded, and nodules of glauconite are abundant.

Sand, clear quartz, slightly glauconitic. The sand grains are mod-
erately fine, moderately even, and angular.

Like sample at 500 ft.

Unit D

Sand, pinkish-tan, clear quartz, very uneven grained, angular to
subangular to rounded. Sample contains some glauconite (prob-
ably caving) and some fragments of pink clay.

Like sample at 537 ft.

Sand, pinkish-tan, clear quartz, moderately coarse, moderately
even grained; a trace of colorless mica. The color of the sand
is due to staining by the clay matrix.

Sand, light-tan. The sand is somewhat coarser than the sample
at 555 ft., and contains a few nodules of glauconite.

Like sample at 576 ft.

No change.
Description

625  No change.
642  No change.
651  No change.
664  No change.
666  No change.
681  No change.
697  Like preceding samples, but contains almost no glauconite.
721  Like sample at 697 ft.
755  Like sample at 721 ft., but contains no glauconite.
768  Like sample at 755 ft., but sand is coarser grained.
780  Like sample at 768 ft., but contains fragments of sandy limestone that are probably caving from higher levels.
820  No change.
909  No change.
925  No change.
940  Sand, like preceding samples, but finer grained, somewhat chalky, and containing many nodules of glauconite. The sample contains several poorly-preserved specimens of smaller Foraminifera, among which Robulus sp. (close to Lenticulina rotulata) is a common form; no diagnostic species seem to be present.
970  Sand, clear quartz, uneven grained, somewhat glauconitic, and similar, in general, to sample at 940 ft. This sample also contains a few specimens of nondiagnostic species of Foraminifera, and a few other specimens which probably caved from higher depths.
1035 T.D. Sand and a little glauconite like the sample at 970 ft., but the sand is somewhat finer grained.

DECATUR COUNTY

Operator: Hunt Oil Co.
Landowner: Metcalf Well 1
Location: Land District 21, Land Lot 260, center of NE ¼ of Land Lot 260

GGS. No. 168
Elevation: 104 ft. (derrick floor)
Total depth: 6152 ft.
Completed: Aug. 19, 1944

Summary of Stratigraphy

Tertiary

Paleocene
In beds containing Tamesi fauna at 1930 ft. ? ?
1st sample
Cretaceous

Gulf

Beds of Navarro age........................................ 2050  50
Beds of Taylor age........................................ 2100  380
Beds of Austin age........................................ 2480  420
Atkinson Formation, upper member....................... 2900  420
lower member............................................. 3320  280

Comanche undifferentiated................................ 3600 to 5250 ft.¹

Lithologic and paleontologic description of cuttings and cores. Samples are cuttings unless otherwise stated.

Description

In Paleocene Series

Beds containing Tamesi fauna

1930-1940 Clay, gray, marly, microfossiliferous; contains many specimens of Globigerina velascoensis and Globorotalia velascoensis. Other specimens common in the sample are Bulimina exigua and Alabama wilcoxensis.

1940-2020 Like sample at 1930-1940 ft.

2020-2030 Like sample at 1930-1940 ft.; contains specimens of Globorotalia velascoensis and G. pseudomenadii, which are common in the typical Tamesi (Velasco) in Mexico.

2030-2040 Not described.

2040-2050 Clay, marly, but harder and less falky than the preceding samples; contains many typical specimens of Globorotalia velascoensis.

Cretaceous

Gulf Series

Beds of Navarro age

2050-2060 Marl, gray; specimens of Globotruncan arca, common.
2060-2090 Not described.

Beds of Taylor age

2090-2100 Marl, gray, and a few fragments of fine-grained, chalky glauconitic sandstone. Sample contains specimens of Globorotalites

¹Samples not studied below 5250 ft.
**Description**

(conicus, Stensiöina americana, and a variety of Planulina dum-blei.

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2100-2350</td>
<td>Not described.</td>
</tr>
<tr>
<td>2350-2360</td>
<td>Marl, gray, containing abundant specimens of Foraminifera; common species are: Globotruncanps, Globigerina cretacea, Planulina texana, and Stensiöina americana. The sample is probably from the lower part of the beds of Taylor age.</td>
</tr>
<tr>
<td>2360-2480</td>
<td>Not described.</td>
</tr>
</tbody>
</table>

**Beds of Austin(?) age.**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2480-2490</td>
<td>Marl, gray, containing a specimen of Valvulineria umbilicata typical of the Austin Chalk in Texas, and specimens of Pseudogau-drinella capitosa.</td>
</tr>
<tr>
<td>2490-2570</td>
<td>Not described.</td>
</tr>
<tr>
<td>2570</td>
<td>Sidewall core. Clay, greenish-gray, marly, micaceous, containing a microfauna indicative of the Austin age of the beds.</td>
</tr>
<tr>
<td>2580-2590</td>
<td>Clay, gray and green, marly, containing specimens of Kypophyza christneri.</td>
</tr>
<tr>
<td>2590-2600</td>
<td>Clay, greenish-gray, shaly, calcareous.</td>
</tr>
<tr>
<td>2600-2790</td>
<td>Not described.</td>
</tr>
<tr>
<td>2790-2800</td>
<td>Shale, brown, thinly flaky, slightly speckled, and a little green, flaky, noncalcareous shale.</td>
</tr>
<tr>
<td>2800-2830</td>
<td>Not described.</td>
</tr>
<tr>
<td>2830-2840</td>
<td>Shale, dark brownish-gray, flaky, slightly speckled.</td>
</tr>
<tr>
<td>2840-2900</td>
<td>Not described.</td>
</tr>
</tbody>
</table>

**Atkinson Formation. Upper Member.**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2900-2910</td>
<td>Sandstone, moderately dense, very fine grained, highly micaceous, and fragments of speckled shale; a few shell fragments.</td>
</tr>
<tr>
<td>2910-2920</td>
<td>Like sample at 2900-2910 ft.; the sandstone is somewhat glauconitic.</td>
</tr>
<tr>
<td>2920-2930</td>
<td>Sandstone, like sample at 2900-2910 ft., and many fragments of Ostrea sp.</td>
</tr>
<tr>
<td>2930-2940</td>
<td>Not described.</td>
</tr>
<tr>
<td>2940-2950</td>
<td>Sandstone, similar to sample at 2900-2910 ft., but somewhat coarser grained and more micaceous; contains a few black phosphatic fragments, a little bluish-green glauconite, nodules of pyrite, and shell fragments.</td>
</tr>
<tr>
<td>2950-2960</td>
<td>Sandstone and abundant shell fragments, including fragments of Inoceramus.</td>
</tr>
<tr>
<td>2960-2970</td>
<td>Not described.</td>
</tr>
<tr>
<td>2975</td>
<td>Sidewall core. Sand, fine-grained, uneven-grained, angular, clear quartz, containing a little glauconite and a few shell fragments.</td>
</tr>
</tbody>
</table>
**Description**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2970-3030</td>
<td>Sand, fine to moderately fine grained, glauconitic, micaceous, containing shell fragments and fish bones. The various types of shale in the sample are probably cavings from higher levels.</td>
</tr>
<tr>
<td>3030-3040</td>
<td>Sand, like samples at 2970-3030 ft., and a little-green flaky shale; shell fragments are abundant.</td>
</tr>
<tr>
<td>3040-3060</td>
<td>Not described.</td>
</tr>
<tr>
<td>3060-3070</td>
<td>Sandstone, moderately coarse, glauconitic, fossiliferous; contains fairly large fragments of carbonaceous material, many shell fragments, fish bones, and a few bryozoan fragments. Below this depth, the sandstone becomes harder and finer grained, and shell fragments gradually decrease in abundance.</td>
</tr>
<tr>
<td>3070-3080</td>
<td>Not described.</td>
</tr>
<tr>
<td>3080-3090</td>
<td>Sandstone, white, dense, fine-grained, glauconitic, somewhat micaceous, containing phosphatic and carbonaceous material, shell fragments, and bryozoan fragments.</td>
</tr>
<tr>
<td>3090-3250</td>
<td>Not described.</td>
</tr>
<tr>
<td>3250-3260</td>
<td>Sand and shell fragments. Shell fragments are common.</td>
</tr>
<tr>
<td>3260-3270</td>
<td>Not described.</td>
</tr>
<tr>
<td>3270-3280</td>
<td>Clay, green and bluish-green, shaly, and a little sand. Specimens of Foraminifera are probably cavings.</td>
</tr>
<tr>
<td>3280-3320</td>
<td>Not described.</td>
</tr>
</tbody>
</table>

**Atkinson Formation. Lower Member.**

*(electric log correlation)*

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3320-3330</td>
<td>Clay, green, shaly and sand and sandstone like sample at 3270-3280 ft.</td>
</tr>
<tr>
<td>3330-3390</td>
<td>Shale, green, and other types of shale that seem to be cavings.</td>
</tr>
<tr>
<td>3390-3400</td>
<td>Shale, dark-gray, hard, is in cuttings at this depth.</td>
</tr>
<tr>
<td>3400-3420</td>
<td>Shale, dark-gray, micaceous, containing specimens of arenaceous species of Foraminifera typical of the lower member of the Atkinson Formation. The shale is the so-called “marine shale” of the Tuscaloosa Formation.</td>
</tr>
<tr>
<td>3420-3430</td>
<td>Shale, dark-gray, micaceous, containing specimens of <em>Ammobaculites bergquisti</em> (abundant), <em>A. comprimatus</em>, <em>Trochammina rainwateri</em>, <em>T. exigua</em>, and others.</td>
</tr>
<tr>
<td>3430-3440</td>
<td>Material and fauna like sample at 3420-3430 ft., but specimens of Foraminifera more abundant.</td>
</tr>
<tr>
<td>3440-3510</td>
<td>Not described.</td>
</tr>
<tr>
<td>3510-3520</td>
<td>Shale, gray, and a little green flaky shale; white, micaceous, glauconitic sandstone is also in cuttings at this depth.</td>
</tr>
<tr>
<td>3520-3530</td>
<td>Like sample at 3510-3520 ft.</td>
</tr>
<tr>
<td>3530-3540</td>
<td>Sandstone, white, fine-grained, glauconitic, pyritic, somewhat micaceous, slightly phosphatic, increases in abundance. The sandstone contains a few large grains of quartz.</td>
</tr>
<tr>
<td>Depth (feet)</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>3545</td>
<td>Sidewall core. Shale, green, thinly flaky, speckled; contains dwarf specimens of <em>Giumbelina</em> and <em>Globigerina</em> that give the shale a speckled appearance.</td>
</tr>
<tr>
<td>3555</td>
<td>Sidewall core. Sand, fine to coarse-grained, roughly angular, clear quartz; probably the basal sand of the Atkinson Formation.</td>
</tr>
<tr>
<td>3560-3570</td>
<td>Sand and sandstone, like the sample at 3510-3520 ft. and below.</td>
</tr>
<tr>
<td>3570-3580</td>
<td>Sand, coarse-grained, is dominant in the sample; contains many greenish-yellow quartzitic grains, and a few grains of pink feldspar.</td>
</tr>
<tr>
<td>3580-3590</td>
<td>Sand, like sample at 3570-3580 ft.; ankerite pellets are common.</td>
</tr>
<tr>
<td>3590-3600</td>
<td>Sand, like sample at 3570-3580 ft., and a few chips of dark brownish-red micaceous shale.</td>
</tr>
</tbody>
</table>

**Comanche Series undifferentiated**

| 3600-3610   | Sand, coarse-grained, containing greenish-yellow and pink grains, and a few grains of feldspar. The sample also contains cuttings of dark brownish-red, micaceous, sandy (fine-grained sand), unctuous, shaly clay. |
| 3608        | Sidewall core. Sand, poorly sorted, fine to coarse-grained, roughly angular quartz, containing a few greenish-yellow grains. |
| 3623        | Sidewall core. Mudstone, brick-red, green and ochre streaks and mottling, sandy (fine-grained sand), micaceous. |
| 3610-3900   | Samples not studied in detail. The material is, mainly, coarse-grained sand, and red, green and ochre mottled mudstone; grains of pink feldspar become progressively more abundant with depth. |
| 3900-5240   | Nodules of white, pink-stained, sandy limestone are in the samples at 3900 feet. The samples were not studied in detail, but are composed, mainly, of coarse-grained sand, mudstone and shale, and nodules of limestone. |
| 5240-5250   | Shale, purplish-red, raspberry, and varicolored, and many nodules of white, pink-stained, sandy limestone. The samples were not studied below 5250 ft. At this depth, the samples indicate that the well had not penetrated rocks older than Comanche age. |
DECATUR COUNTY

Operator: D. E. Hughes
Landowner: H. W. Martin well 1
Location: Land District 15, Land Lot 189, center of southeast 40 acres of S.E. ¼ of Land Lot 189

GGS: No. 191
Elevation: 132 ft. (derrick floor)
Total depth: 3717 ft.
Completed: Dec. 5, 1947

Summary of Stratigraphy

Tertiary
Not studied

Cretaceous

Gulf
Beds of Navarro age.................................................. 1670 210?
Beds of Taylor age..................................................... 1880? 620?
Beds of Austin age..................................................... 2500? 270?
Atkinson Formation, upper member............................... 2770 420
lower member......................................................... 3190 260
Comanche undifferentiated........................................ 3450 total 267 depth

Lithologic and paleontologic description of cuttings and cores. Samples are cuttings unless otherwise stated.

Description

Depth (feet)

0-1670 Samples not studied.

Cretaceous

Gulf Series

Beds of Navarro Age

1670-1680 Clay, gray, shaly, somewhat micaceous, irregularly and weakly silty, containing a few specimens of Globotruncana arca. The sample also contains abundant cuttings of the overlying white, chalky, silty, glauconitic Clayton (Paleocene) Limestone, specimens of Midway species of Foraminifera, and some species that occur in the Tamesi (Paleocene) fauna.

1680-1790 Materials and fauna like the sample at 1670-1680 ft. but showing gradual increase in the amount of gray shaly clay and specimens of Cretaceous species of Foraminifera.
Description

Clay, shaly, fine to coarse-grained sand, and cavings of the Clayton (Paleocene) Limestone. The specimens of Cretaceous species of Foraminifera are mixed with Midway species that have caved from higher levels.

Beds of Taylor age

1880-2000  The top of the beds of Taylor age is placed at 1880 ft. on the basis of electric-log characteristics. The highest occurrence of specimens of *Stenisiina americana*, a diagnostic Taylor species, is in the sample at 1960-1970 ft. If the species occurred at a higher level, the specimens were obscured by the coarse-grained sand that composes about 50-75 percent of the samples. Beginning with the sample at 1960-1970 ft., the sand content diminishes gradually, and is small in the sample at 2000-2010 ft.

2000-2010  Small sample, composed of fine-grained sand, glauconite, and fragments of gray shaly clay containing *Inoceramus* fragments, and specimens of *Stenisiina americana*, *Planulina dumbiei*, and other species of Foraminifera.

2270-2410  No change.

2420-2500  Not described.

Beds of Austin age

(electric log correlation)

2500-2520  Not described.

2520-2530  Clay, gray, shaly, fairly hard; contains *Inoceramus* fragments and fragments of specimens of *Kyphopyx christneri* (early Taylor(?) or late Austin(?) age).

2530-2560  Not described.

2560-2570  Highest occurrence of *Citharina texana* (definite Austin age).

2670-2680  Shale, gray, speckled, begins to show in the samples.

2770-2780  Clay, gray, shaly, and a little speckled shale like samples at 2670-
**Description**

2680 and below; in addition, many fragments of white, very fine grained, micaceous, slightly glauconitic sandstone, containing many fragments of *Ostrea* sp.

2784-2793

Core. Recovery?

Top. Sandstone, gray, moderately soft, extremely fine grained, highly micaceous and carbonaceous, weakly glauconitic.

Middle. Like the top part of the core, but is less carbonaceous and contains thin streaks of greenish-gray shale.

Bottom. Clay, gray, shaly, micaceous, sandy (medium-grained sand); contains glauconite, many phosphatic nodules, and a few shell fragments.

2780-2820

Cuttings not described.

2820-2830

Sandstone, white, very fine grained, somewhat glauconitic, micaceous, phosphatic, containing many fragments of *Ostrea* sp., is about 10-25 percent of the sample; a few fragments of greenish-gray, soft flaky shale. Cuttings of gray shaly clay that are probably caving from higher depths, composed most of one sample; the specimens of Foraminifera in the sample do not seem to be indigenous to the material penetrated at this depth, but are probably cavings.

2830-2860

Like sample at 2820-2830 ft.

2860-2870

Sandstone, white, medium-grained, phosphatic, glauconitic, micaceous, calcareous, containing many fragments of *Ostrea* sp., is at least 25 percent of the sample. The upper member of the Atkinson Formation seems to consist of clay, interbedded with *Ostrea*-bearing sandstone and relatively thin lenses of greenish-gray shale.

2870-2940

No change.

2940-2950

Sand, fine to coarse-grained is at least 75 percent of the sample; fragments of white, fossiliferous sandstone, like sample at 2860-2870 ft.; a few fragments of carbonaceous material. Cuttings of gray shaly clay are probably cavings.

2950-3030

No change.

3030-3040

The coarse-grained sand composes a smaller part of the cuttings than in the sample at 2940-2950 ft., and the gray clay and fossiliferous sandstone are relatively more abundant.

3040-3060

Not described.

3060-3070

Sandstone, white, medium-grained, glauconitic, phosphatic containing abundant fragments of *Ostrea* sp., composes most of the sample. Other constituents are a little clay, fine to coarse-grained sand, and a few fragments of grayish-green shale.

3080-3090

Clay fragments are dominant in the sample. Fragments of grayish-green shaly clay are more common here than in samples from higher parts of the upper member of the Atkinson Formation.

3090-3110

Not described.
Description

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3130</td>
<td>Sidewall core. Sandstone or siltstone, light greenish-gray, very fine grained, micaceous, glauconitic, carbonaceous.</td>
</tr>
<tr>
<td>3110-3170</td>
<td>Sample seems to be mostly cavings composed of sand and clay from higher levels.</td>
</tr>
<tr>
<td>3178</td>
<td>Sidewall core. Siltstone, light-gray, soft, finely glauconitic.</td>
</tr>
<tr>
<td>3170-3190</td>
<td>Not described.</td>
</tr>
</tbody>
</table>

**Atkinson Formation. Lower Member**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3190-3200</td>
<td>Shale, grayish-green, soft, flaky, somewhat micaceous and finely carbonaceous.</td>
</tr>
<tr>
<td>3200-3270</td>
<td>Samples are similar to the one at 3190-3200 ft., and contain varying amounts of shale that caves from higher levels.</td>
</tr>
<tr>
<td>3270-3280</td>
<td>Shale, grayish-green, that is the principal constituent of the sample, contains minute specimens of Foraminifera.</td>
</tr>
<tr>
<td>3280-3290</td>
<td>This sample is the highest occurrence of specimens of <em>Ammobaculites advenus</em>, a characteristic species of the lower member of the Atkinson Formation (Woodbine age).</td>
</tr>
<tr>
<td>3290-3358</td>
<td>Not described.</td>
</tr>
<tr>
<td>3358-3364</td>
<td>Core. Recovery?</td>
</tr>
</tbody>
</table>

**Top.** Sand, gray, soft, fine to medium-grained, argillaceous, micaceous, somewhat glauconitic.  
**Bottom.** Sand, light-gray, fine-grained, argillaceous, micaceous, glauconitic, containing fragments of carbonaceous material.

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3370-3380</td>
<td>Shale, greenish-gray, flaky, containing a little fine-grained sand and a few specimens of species of Foraminifera characteristic of the lower Atkinson.</td>
</tr>
<tr>
<td>3380-3410</td>
<td>No change.</td>
</tr>
<tr>
<td>3410-3420</td>
<td>Shale, like sample at 3370-3380 ft., but 50 percent of the sample is fine to coarse-grained, roughly angular, etched quartz and containing a little coarse-grained glauconite.</td>
</tr>
<tr>
<td>3420-3430</td>
<td>Not described.</td>
</tr>
<tr>
<td>3430-3440</td>
<td>Sandstone, fine to very coarse grained, containing a little glauconite and few phosphatic nodules. The washed sample is composed, chiefly, of loose sand and cemented fragments of the sandstone.</td>
</tr>
<tr>
<td>3440-3450</td>
<td>Not described.</td>
</tr>
</tbody>
</table>

**Comanche Series undifferentiated**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3450-3460</td>
<td>Sand, fine to coarse-grained, roughly angular, clear quartz, and a little feldspar; some sand grains are yellow and pink-tinted.</td>
</tr>
<tr>
<td>3460-3470</td>
<td>No change.</td>
</tr>
<tr>
<td>3470-3480</td>
<td>Sand, like sample at 3450-3460 ft., and a few small fragments of brownish-red, gray and green mottled, slightly micaceous shale.</td>
</tr>
</tbody>
</table>

3480-3717 T.D. The samples were not studied in detail and are composed, mainly, of sand like the immediately preceding samples, and sparse fragments of red and multi-colored shale. The samples do not suggest that the well penetrated beds older than Comanche.
EARLY COUNTY

Operator: Mont Warren et al  
Landowner: A. C. Chandler well 1  
Location: Land District 26, Land Lot 406, 250 ft. north and 968 ft. west of southeast corner of north one-third of Land Lot 406  
G.G.S. No. 121  
Elevation: 187 ft. (derrick floor)  
Total depth: 7320 ft.  
Completed: Oct. 2, 1943

Summary of Stratigraphy

Tertiary
Not studied

Cretaceous

Gulf
Beds of Navarro age 1200 158
Beds of Taylor age 1358 472
Beds of Austin age 1830 565
Atkinson Formation, upper member 2395 520
lower member 2915
Comanche undifferentiated 3140 2530 (?) or 2637 (?)

Triassic (?)

Upper Triassic (?)
Newark (?) Group 5670 (?) 930 (?) or 5777 (?) 823 (?)

Devonian (?)

Middle Devonian (?) Weathered (?) shale 6600 181
Devonian

Middle Devonian 1 Black shale 6781 459

Ordovician (?)

Lower Ordovician (?) White sandstone 7240 total 80 depth

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Swartz, F. M., 1949, Journal of Paleontology, v. 23, no. 3, p. 320, questionably classified the black shale as "Late Ordovician or Early Silurian in age."
Bridge, Josiah, and Berdan, J. M., 1951, U.S. Geological Survey open-file report, p. 7/ table-1, and map, tentatively classified the black shale as "Silurian or Upper Ordovician" and the underlying white sandstone as lithologically similar to rocks in wells in Florida which they had classified as Lower Ordovician.
J. M. Berdan (written communication to E. R. Applin, 1959) stated that on the basis of spores, J. M. Schopf, U.S. Geological Survey, classified the black shale as not older than Middle Devonian.
Lithologic and paleontologic description of cores and cuttings.
Samples are cuttings unless otherwise stated.

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1510</td>
<td>Samples not studied.</td>
</tr>
</tbody>
</table>

Cretaceous

Gulf Series

Beds of Navarro age

1200 Top of Cretaceous by Southeastern Geological Society Mesozoic Committee, 1949, Mesozoic cross section E-E, Bullock County, Alabama to Franklin County, Florida.

Beds of Taylor age

1358 Top of beds of Taylor age on the basis of the highest occurrence of *Stensiolina americana*.

1510-1525 Marl, dark gray; cream, hard, sandy limestone (fine-grained sand); fine to coarse-grained sand. Cuttings contain specimens of *Planulina dumbeii* and other Taylor species.

1525-1540 Sample composed, mainly, of fragments of sandstone, sandy limestone, and gray marl; unconsolidated sand; a little glauconite. Specimens of several species of Foraminifera indicate the Taylor age of the beds; a few specimens from higher levels also occur.

1540-1591 Like sample at 1525-1540 ft.

1591-1606 Shale, gray, marly, highly microfossiliferous and fragments of light-gray, hard, sandy limestone. Specimens of several species of Foraminifera that indicate the Taylor age of the beds; fragments of *Inoceramus* and *Ostrea* sp.; specimens of Foraminifera from higher levels.

1606-1787 Like sample at 1591-1606 ft.

1787-1804 Like sample at 1591-1606 ft., but contains specimens of *Kyphopyx christneri* and *Pseudogaudryinella capitosa* that are common in the lower part of the beds of Taylor age.

1804-1830 Like sample at 1787-1804 ft.

Beds of Austin age

(electric log correlation)

1830-1847 Like sample at 1787-1804 ft.

1847-1865 Like sample at 1787-1804 ft., but contains fragments of light greenish-gray marly shale. Coarse sand that composes part of the sample is probably caving.

1865-1905 Like sample at 1847-1865 ft.
Description

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1905-1935</td>
<td>Sandstone, gray, hard, very fine grained, calcareous; fine to coarse-grained unconsolidated sand; many <em>Inoceramus</em> fragments; a little dark-gray marly shale. The microfauna is a mixture of specimens of species from various levels, but includes specimens of species that are common only in the lower part of the beds of Taylor age and the upper part of the beds of Austin age.</td>
</tr>
<tr>
<td>1935-1940</td>
<td>No sample.</td>
</tr>
<tr>
<td>1940-1955</td>
<td>Shale, gray, marly, slightly micaceous, and some sand and other materials like sample at 1905-1935. The microfauna contains specimens of <em>Darbyella brownstownensis</em>, <em>Kyphopyza christneri</em>, and <em>Gaudryina ellisora</em>. <em>D. brownstownensis</em> is common in the upper part of the beds of Austin age, and the accompanying species are common only in the lower part of the beds of Taylor age and the upper part of the beds of Austin age.</td>
</tr>
<tr>
<td>1961-1977</td>
<td>This sample contains the highest occurrence of specimens of <em>Globorotalites umbilicatus</em>, a form typical of the beds of Austin age.</td>
</tr>
<tr>
<td>2000-2015</td>
<td>This sample contains the highest occurrence of specimens of <em>Citharina texana</em>.</td>
</tr>
<tr>
<td>2015-2153</td>
<td>Like sample at 1940-1955 ft.</td>
</tr>
<tr>
<td>2153-2168</td>
<td>Sand; fine-grained; small fragments of gray marly shale; abundant <em>Inoceramus</em> fragments. The foraminiferal fauna is a mixture from various levels, as in all the foregoing samples, but contains specimens of species typical of the beds of Austin age, <em>Hastigerinella watersi</em>, <em>Dorothia alexanderi</em> and others.</td>
</tr>
<tr>
<td>2168-2230</td>
<td>Like sample at 2153-2168 ft.</td>
</tr>
<tr>
<td>2230-2245</td>
<td>Shale, gray, calcareous, and fragments of dark brownish-gray, somewhat light-speckled, flaky, slightly carbonaceous shale. Abundant <em>Inoceramus</em> fragments and specimens of Foraminifera are seemingly caving from various depths.</td>
</tr>
<tr>
<td>2245-2260</td>
<td>No sample.</td>
</tr>
<tr>
<td>2260-2275</td>
<td>Shale, gray, slightly calcareous, somewhat micaceous. The fauna is composed of <em>Inoceramus</em> fragments and fairly numerous specimens of Foraminifera from higher levels. Small specimens of <em>Globigerina</em> sp. and <em>Gümnelina</em> sp. are the dominant forms; <em>Globotruncana</em> sp., <em>Planulina</em> cf. <em>P. eaglefordensis</em>, and <em>Globorotalites umbilicatus</em> are fairly common.</td>
</tr>
<tr>
<td>2275-2364</td>
<td>Like sample at 2260-2275 ft.</td>
</tr>
<tr>
<td>2364-2380</td>
<td>Similar to sample at 2260-2275 ft., but with the addition of many fragments of dark brownish-gray, light speckled, marly shale; no marked change in fauna.</td>
</tr>
<tr>
<td>2380-2395</td>
<td>Like sample at 2364-2380 ft.</td>
</tr>
</tbody>
</table>
Description

Atkinson Formation. Upper Member.

2395-2411 The upper member of the Atkinson Formation in this well is a shallow-water marine facies. Like sample at 2364-2380 ft., but with the addition of a few fragments of very fine grained, calcareous, micaceous, slightly glauconitic and phosphatic sandstone.

2411-2439 Like sample at 2395-2411 ft.

2439-2454 Like sample at 2395-2411 ft. but contains many fragments of the very fine grained sandstone, and a few fragments of light-gray, hard, micaceous, sandy (very fine grained sand) limestone.

2454-2481 Like sample at 2439-2454 ft., with the addition of many fragments of light-gray, moderately fine-grained, glauconitic, somewhat phosphatic sandstone containing many fragments of Ostrea sp.

2481-2495 Like sample at 2454-2481 ft., but this sample shows an increase in the fragments of the light-gray, fossiliferous sandstone.

2495-2510 Sandstone, light-gray, moderately fine to moderately coarse grained, clear quartz, containing glauconite, phosphatic material, and abundant fragments of Ostrea-like bivalves and bryozoan fragments.

2510-2525 Like sample at 2495-2510 ft. This sample is the highest occurrence of fragments of thinly flaky grayish-green shale.

2525-2540 Sand, unconsolidated, fine to moderately coarse grained, angular to subangular, quartz; fragments of the fossiliferous sandstone first observed in the sample at 2495-2510 ft.; and a few fragments of flaky grayish-green shale.

2540-2555 Sand, unconsolidated, fine to coarse-grained, quartz; many fragments of white, glauconitic, phosphatic sandstone containing bryozoan and shell fragments; a little grayish-green, flaky, unctuous, slightly carbonaceous shale.

2555-2565 No sample.

2565-2590 Like sample at 2540-2555 ft.

2590-2605 Sand, unconsolidated, fine to very coarse grained, clear quartz; fragments of fossiliferous sandstone and shells (Ostrea sp.) like sample at 2540-2555 ft., but much less abundant; increase in fragments of grayish-green shale.

2605-2628 Sand, unconsolidated, like sample at 2590-2605 ft.; fragments of Ostrea sp., phosphatic nodules, and fossiliferous sandstone; fragments of green shale slightly more common than in sample at 2590-2605 ft. Specimens of Valvulineria infrequens fairly common; Planulina eaglesfordensis and Gümbelina moremani also present. This sample seems to indicate a brief change to a deeper-water marine environment.

2628-2658 Sand, unconsolidated, like sample at 2605-2628 ft.; fossiliferous sandstone; fragments of Ostrea sp., flaky green shale, and phosphatic nodules.
Description

Sample almost entirely unconsolidated, fine to moderately coarse-grained quartz sand.

Sand, unconsolidated, fine to very coarse grained; white, slightly glauconitic, phosphatic, calcareous sandstone, containing embedded fragments of Ostrea sp.; grayish-green, flaky, carbonaceous shale.

Sample, mainly, unconsolidated fine to moderately fine-grained sand; a few fragments of other material like sample at 2668-2688 ft.

Like sample at 2688-2703 ft.

Sand, like sample at 2688-2703 ft.; fragments of fossiliferous sandstone and Ostrea sp. common; a few fragments of flaky, grayish-green shale; much caved material from higher levels.

No change.

Sand, unconsolidated, fine to moderately fine grained, quartz; abundant fragments of an Ostrea-like bivalve. Fossils apparently wash from a fine-grained, somewhat glauconitic, phosphatic, calcareous sandstone. The well may have penetrated a shell reef at this depth.

Like sample at 2625-2840 ft., and in addition, a few fragments of yellowish-brown and light bluish-green mottled shale, and reddish-brown shale. A few of the fossiliferous sandstone fragments are carbonaceous.

Sand, unconsolidated; fine to moderately fine grained; many fragments of Ostrea sp., and a few fragments of white, fine-grained; fossiliferous sandstone; many cavings from higher levels.

Like sample at 2855-2870 ft.; fragments of grayish-green shale are more common.

Atkinson Formation. Lower Member.

Like sample at 2870-2915 ft., but fragments of hard, very fine grained, calcareous, somewhat glauconitic, phosphatic, micaceous sandstone are fairly common.

Like sample at 2915-2934 ft., but fragments of sandstone are more common, and some of them contain embedded shell debris. Sample contains many fragments of grayish-green shale, and a few fragments of grayish-green shale, and a few fragments of flaky, somewhat micaceous, carbonaceous shale.

Sand, unconsolidated, fine to coarse-grained, and abundant fragments of gray and grayish-green, flaky shale.

Like sample at 2947-2962 ft., and a few fragments of very highly micaceous, slightly carbonaceous, fine-grained sandstone.

Shale, dark brownish-gray, flaky, micaceous, slightly carbonaceous, and a little grayish-green shale; a little highly micaceous sandstone like the sample at 2962-2978 ft.; fragments of Ostrea sp.
Description

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2993-3007</td>
<td>Like the sample at 2978-2993 ft.; contains a fragment of the highly micaceous sandstone that shows embedded fragments of grayish-green shale, and a fragment of a specimen of an arenaceous species of Foraminifera.</td>
</tr>
<tr>
<td>3007-3022</td>
<td>Shale, dark-gray, flaky, micaceous; grayish-green shale; a little sand and a few fragments of micaceous sandstone. The sample contains specimens of Ammobaculites comprimatus and Trochammina rainwateri.</td>
</tr>
<tr>
<td>3022-3037</td>
<td>Like the sample at 3007-3022. The microfauna is composed of specimens of Ammobaculites comprimatus, A. bergquisti, A. agrestis, A. avenus.</td>
</tr>
<tr>
<td>3037-3052</td>
<td>Like sample at 3007-3022 ft. The microfauna is composed of specimens of Ammobaculites bergquisti, A. agrestis, A. cf. A. fragmentarius, Ammobaculoides plumerae; Ammotium braunsteini, and fragments of Polyphragma sp.</td>
</tr>
<tr>
<td>3052-3067</td>
<td>Shale, gray and greenish-gray, flaky; a little fine-grained micaceous sandstone; a little unconsolidated sand. The microfauna is composed of specimens of Ammobaculites bergquisti, A. junceus, A. agrestis.</td>
</tr>
<tr>
<td>3067-3082</td>
<td>Like sample at 3052-3067 ft., and cavings of several kinds of material from higher levels; unconsolidated sand composes about 50 percent of the sample. Fragments of light-gray, silty, possibly nodular limestone are fairly common.</td>
</tr>
<tr>
<td>3082-3097</td>
<td>Shale; gray, soft, flaky, and many fragments of white to light-gray, fine-grained, calcareous, micaceous, sandstone and siltstone; a little silty, micaceous limestone. About 25 percent of the sample is unconsolidated fine to coarse-grained quartz sand.</td>
</tr>
<tr>
<td>3097-3112</td>
<td>Sand, unconsolidated, fine to moderately coarse grained, roughly angular, quartz; many nodules of dark-green glauconite and of pyrite.</td>
</tr>
<tr>
<td>3112-3127</td>
<td>Sand, unconsolidated, fine to coarse-grained, roughly angular quartz; fragments of several kinds of micaceous sandstone and siltstone.</td>
</tr>
<tr>
<td>3127-3142</td>
<td>Sand, like sample at 3112-3127 ft. Sample contains a few nodules of siderite, large flakes of colorless and pale-green mica, and a trace of glauconite.</td>
</tr>
</tbody>
</table>

3140  
Comanche Series undifferentiated  
(electric log correlation)

3142-3157  
Like sample at 3127-3142 ft., but contains no nodules of siderite.

3157-3172  
Sand, unconsolidated, fine to coarse-grained, roughly angular quartz; a few green-tinted grains; a few large flakes of mica. Phosphate nodules and shell fragments are probably caving.

---

1Samples from 3007 to 3067 feet contain specimens of species of Foraminifera characteristic of the so-called "Barlow" fauna described by E. R. Applin, 1955, U.S. Geological Survey Prof. Paper 264-I, p. 187-197, pls. 48 and 49.
<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3172-3182</td>
<td>No sample.</td>
</tr>
<tr>
<td>3182-3197</td>
<td>Like sample at 3157-3172 ft.</td>
</tr>
<tr>
<td>3197-3212</td>
<td>Sand, unconsolidated, fine to very coarse grained, roughly angular quartz; fragments of red and gray mottled shale and purplish-red, silty clay shale; a few siderite nodules.</td>
</tr>
<tr>
<td>3212-3227</td>
<td>Sand, unconsolidated, fine to very coarse grained, containing grains of feldspar; a little varicolored shale.</td>
</tr>
<tr>
<td>3227-3242</td>
<td>Like the sample at 3212-3227 ft. A few siderite nodules present.</td>
</tr>
<tr>
<td>3242-3298</td>
<td>No change.</td>
</tr>
<tr>
<td>3298-3314</td>
<td>Sand, unconsolidated, fine to very coarse grained, quartz; very coarse grains of quartz and grains of feldspar are common; a few small fragments of multi-colored clay shale are present.</td>
</tr>
<tr>
<td>3314-3329</td>
<td>No change.</td>
</tr>
<tr>
<td>3329-3408</td>
<td>Sand, like sample at 3298-3314 ft., but no shale present.</td>
</tr>
<tr>
<td>3408-3423</td>
<td>Sand, unconsolidated, coarse-grained, roughly angular. The color of the sand in the samples from 3329 to 3423 ft. changes progressively with depth from white to pink because of the steady increase of pink and yellow-tinted grains of feldspar and quartz.</td>
</tr>
<tr>
<td>3423-3438</td>
<td>Sand, like sample at 3408-3423 ft., but no shale; grains of pink feldspar very common.</td>
</tr>
<tr>
<td>3438-3453</td>
<td>Sand, like sample at 3408-3423 ft.; a few nodules of pink sandy limestone; feldspar grains abundant.</td>
</tr>
<tr>
<td>3453-3469</td>
<td>Sand, like sample at 3408-3423 ft., and a few fragments of dark brownish-red and bluish-gray mottled clay shale.</td>
</tr>
<tr>
<td>3469-3484</td>
<td>Sand, unconsolidated, fine to moderately fine, roughly angular quartz; a few coarse grains present; feldspar common.</td>
</tr>
<tr>
<td>3484-3499</td>
<td>Sand, like sample at 3469-3484 ft., and a few fragments of sandy, mustard-colored clay shale.</td>
</tr>
<tr>
<td>3499-3514</td>
<td>Sand, like sample at 3469-3484 ft., but coarse grains again common; many fragments of dark-brown and purplish-red and gray mottled, micaceous clay shale.</td>
</tr>
<tr>
<td>3514-3530</td>
<td>No samples.</td>
</tr>
<tr>
<td>3530-3545</td>
<td>Sand, unconsolidated, fine to coarse-grained, quartz; coarse grains rare; a little feldspar and a few fragments of multicolored shale.</td>
</tr>
<tr>
<td>3445-3639</td>
<td>No change.</td>
</tr>
<tr>
<td>3639-3747</td>
<td>Sand, unconsolidated, fine to coarse-grained; a little feldspar and a few fragments of dark-red and bluish-gray mottled, micaceous shale. No shale in sample at 3669-3685 ft.</td>
</tr>
<tr>
<td>3747-3762</td>
<td>Sand and a little mottled shale like the samples from 3639 to 3747 ft.; a few fragments of flaky, purplish-gray, slightly sandy, micaceous shale.</td>
</tr>
<tr>
<td>3762-3803</td>
<td>Sand, unconsolidated, fine to coarse-grained, quartz; a little feldspar; a few fragments of brownish-red and gray mottled shale; a little purplish-gray shale.</td>
</tr>
<tr>
<td>Depth (feet)</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>3803-3807</td>
<td>No sample.</td>
</tr>
<tr>
<td>3807-3867</td>
<td>Sand like the samples from 3762-3803 ft.; fragments of red, gray and mustard-colored shale more common.</td>
</tr>
<tr>
<td>3867-3967</td>
<td>Sand and a little multicolored shale like the samples from 3807-3867 ft.</td>
</tr>
<tr>
<td>3967-3978</td>
<td>Sand like the samples from 3867-3967 ft., and many fragments of brownish-red and gray mottled micaceous shale; a few fragments of bluish-green shale; a few fragments of red, gray, and mustard-colored mottled shale.</td>
</tr>
<tr>
<td>3978-3994</td>
<td>Shale, dark brownish-red, grayish-green mottled, highly micaceous; a few nodules of pink sandy limestone.</td>
</tr>
<tr>
<td>3994-4009</td>
<td>Shale, like the sample at 3978-3994 ft., 50 percent; unconsolidated sand 50 percent.</td>
</tr>
<tr>
<td>4009-4024</td>
<td>Sand, unconsolidated, fine to coarse-grained, roughly angular, quartz, and a little feldspar about 75 percent; multicolored shale fragments about 25 percent.</td>
</tr>
<tr>
<td>4024-4083</td>
<td>Sand and multicolored shale like the sample at 4009-4024 ft.; the amount of shale in the samples ranges from about 25 to 50 percent.</td>
</tr>
<tr>
<td>4083-4098</td>
<td>Sand, unconsolidated, fine to coarse-grained, 50 percent; 50 percent small fragments of red and gray mottled shale, and many large nodules of dark-green glauconite(?) or chlorite(?) that seem to come in at about this level.</td>
</tr>
<tr>
<td>4098-4115</td>
<td>Like the sample at 4083-4093 ft.; some sand grains are stained green, possibly from the glauconite(?) or chlorite(?) .</td>
</tr>
<tr>
<td>4115-4176</td>
<td>Sand, unconsolidated, fine to coarse-grained; glauconite(?) or chlorite(?) , and many green-tinted grains of sand; phosphatized fish remains and other phosphatic fragments; a little multicolored shale.</td>
</tr>
<tr>
<td>4176-4207</td>
<td>Sand, unconsolidated, and nodules of glauconite(?) or chlorite(?) like samples at 4115-4176 ft., fragments of red and gray mottled shale fairly common; fragments of red, hard (nodular?), sandy (very fine grained sand) limestone.</td>
</tr>
<tr>
<td>4207-4237</td>
<td>Sand, unconsolidated, fine to coarse-grained, quartz, containing many green-tinted grains, is about 75 percent of sample. Large nodules of dark-green glauconite(?) or chlorite(?), a little red and gray mottled clay, and a few phosphatic nodules, compose about 25 percent of sample.</td>
</tr>
<tr>
<td>4237-4297</td>
<td>Sand and glauconite(?) or chlorite(?) like sample at 4207-4237 ft., shale fragments, and a few fragments of red nodular limestone.</td>
</tr>
<tr>
<td>4297-4327</td>
<td>Sand like sample at 4237-4297 ft.; glauconite(?) less common; shale fragments rare; no red nodular limestone.</td>
</tr>
<tr>
<td>4327-4342</td>
<td>Sand and glauconite(?) like sample at 4297-4327 ft.; a few fragments of red shale and a few of dull-red nodular limestone.</td>
</tr>
<tr>
<td>Depth (feet)</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>4342-4357</td>
<td>Sand like the sample at 4327-4342 ft.; a little shale and no limestone; glauconite(?) and green-tinted sand grains less common.</td>
</tr>
<tr>
<td>4357-4372</td>
<td>Like sample at 4342-4357 ft.; a few small nodules of red limestone.</td>
</tr>
<tr>
<td>4372-4391</td>
<td>Sand, unconsolidated; glauconite(?); numerous fragments of red and gray mottled, micaceous, sandy clay shale; a few nodules of red limestone.</td>
</tr>
<tr>
<td>4391-4422</td>
<td>Sand, unconsolidated, fine to moderately coarse-grained, quartz; a little feldspar, but no green-tinted grains; a little glauconite(?), possibly caving, and a little red shale.</td>
</tr>
<tr>
<td>4422-4437</td>
<td>Sand, unconsolidated, fine to coarse grained, quartz; numerous fragments of red and gray mottled micaceous clay shale; a few nodules of red limestone.</td>
</tr>
<tr>
<td>4437-4452</td>
<td>Sand, fine to coarse-grained, quartz.</td>
</tr>
<tr>
<td>4452-4483</td>
<td>Sand, like sample at 4437-4452 ft.; many fragments of red and gray mottled micaceous shale.</td>
</tr>
<tr>
<td>4483-4498</td>
<td>Limestone, hard, cream, dense, containing a trace of glauconite and a few small specimens of Ostracodes; a few large fragments of chert; a little gray clay shale. (Note: This sample is definitely out of place.)</td>
</tr>
<tr>
<td>4498-4528</td>
<td>Sand, unconsolidated, fine to coarse-grained, quartz, and a little feldspar, about 80 percent of sample; small fragments of red shale, about 20 percent.</td>
</tr>
<tr>
<td>4528-4559</td>
<td>Sand, unconsolidated, fine to very coarse grained, containing many large deep-yellow-tinted grains; a little dull-red and gray mottled shale.</td>
</tr>
<tr>
<td>4559-4634</td>
<td>Sand, like sample at 4528-4559 ft.</td>
</tr>
<tr>
<td>4634-4669</td>
<td>Sand, unconsolidated, fine to coarse-grained; fragments of red and gray mottled micaceous shale common.</td>
</tr>
<tr>
<td>4669-4684</td>
<td>Like sample at 4634-4669 ft., a little glauconite(?) which may be caving.</td>
</tr>
<tr>
<td>4684-5088</td>
<td>No change.</td>
</tr>
<tr>
<td>5088-5106</td>
<td>Sand, unconsolidated, fine to coarse; green-tinted grains common; a little dark purplish-red clay shale.</td>
</tr>
<tr>
<td>5106-5135</td>
<td>No samples.</td>
</tr>
<tr>
<td>5135-5168</td>
<td>Sand, like sample at 5088-5106, a little red shale, and cavings from higher levels.</td>
</tr>
<tr>
<td>5168-5205</td>
<td>No change. The samples questionably show the material penetrated by the drill at this level.</td>
</tr>
<tr>
<td>5205-5309</td>
<td>Sand, unconsolidated, fine to coarse-grained quartz, containing green-tinted grains, a few pink and yellow-tinted grains, and a little feldspar; fragments of dark, dull-red and gray mottled, micaceous, somewhat sandy clay shale, and sparse nodules of red and gray silty limestone; cavings of gray marl and other material from much higher levels.</td>
</tr>
</tbody>
</table>
| 5309-5325   | Sand like samples at 5205-5309 ft., but coarse grains are rare; a
**Description**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5325-5340</td>
<td>No samples.</td>
</tr>
<tr>
<td>5340-5354</td>
<td>Sand, unconsolidated, fine to coarse-grained; a little red shale; purplish-red and purplish-gray, highly sandy, micaceous shale; a little very fine grained highly micaceous sandstone.</td>
</tr>
<tr>
<td>5354-5369</td>
<td>Sand like sample at 5340-5354 ft.; fragments of purplish-red and gray clay; green, highly sandy, micaceous clay fairly common; a few nodules of red and white limestone.</td>
</tr>
<tr>
<td>5369-5452</td>
<td>No change.</td>
</tr>
<tr>
<td>5452-5541</td>
<td>Sand, like sample 5340-5354 ft., and many fragments of dark purplish-red, and gray, highly micaceous, sandy shale; several fragments of bright-yellow, highly micaceous, sandy shale; a few nodules of limestone.</td>
</tr>
<tr>
<td>5541-5677</td>
<td>Mainly sand and a small amount of shale.</td>
</tr>
<tr>
<td>5672-5692</td>
<td>Sand, unconsolidated, fine to coarse-grained, quartz, containing many green-tinted grains; a little glauconite (caving?), a little red micaceous shale; a few nodules of red limestone.</td>
</tr>
<tr>
<td>5692-5727</td>
<td>No change.</td>
</tr>
<tr>
<td>5727-5777</td>
<td>No samples.</td>
</tr>
</tbody>
</table>

**Triassic(?)**

**Upper Triassic(?) Series**

**Newark(?) Group**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
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</tr>
</thead>
<tbody>
<tr>
<td>5777-5792</td>
<td>Sand, unconsolidated, fine to coarse-grained quartz; a few fragments of dark-red shale; a few fragments of light bluish-green shale, some of which are highly silty and micaceous.</td>
</tr>
<tr>
<td>5792-5807</td>
<td>Sand unconsolidated, fine to coarse-grained; red and light-green shale like the sample at 5777-5792 ft.; a few nodules of red and white sandy limestone.</td>
</tr>
<tr>
<td>5807-6007</td>
<td>No change.</td>
</tr>
<tr>
<td>6007-6023</td>
<td>No samples.</td>
</tr>
<tr>
<td>6023-6038</td>
<td>Core 1. Recovery 8 ft. Top. Sandstone, light greenish-gray and pink, thinly laminated, very fine to moderately fine grained, argillaceous, highly micaceous (black and green flakes). The sand grains are usually etched and roughly angular. Part of the sandstone has a white ashy (?) cement. Three feet from the top of the core, a streak of white soft sandstone is fine to very coarse grained and contains small pebbles, the cementing material is white and ashy(?). Middle. Sandstone, light green, very fine-grained, micaceous. Bottom. Sandstone, light-green, fine to moderately coarse grained, micaceous, bentonitic. The sand grains are usually etched and roughly angular.</td>
</tr>
</tbody>
</table>
### Description

<table>
<thead>
<tr>
<th>Depth (feet)</th>
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</tr>
</thead>
<tbody>
<tr>
<td>6024-6039</td>
<td>Sand, unconsolidated, fine to moderately coarse grained, and a few fragments of red shale.</td>
</tr>
<tr>
<td>6039-6190</td>
<td>Like the sample at 6024-6039 ft., with the addition of a few nodules of pink to red limestone.</td>
</tr>
<tr>
<td>6190-6222</td>
<td>Sand, unconsolidated, fine to moderately fine grained; a few coarse sand grains and a few fragments of red and gray mottled shale.</td>
</tr>
<tr>
<td>6222-6600</td>
<td>Sand, unconsolidated, fine to coarse-grained, quartz, and a little feldspar; many small fragments of dull, dark-red and gray mottled micaceous shale; a few nodules of red and pink limestone.</td>
</tr>
</tbody>
</table>

### Devonian(?)

**Middle Devonian(?).** Weathered(?) Shale.

- **6600-6607** Core 2. Recovery 3 ft. Corrected depth 6630-6637 ft.
  - Top. Shale, dull brick-red, sandy. The sand, which is fine to moderately fine grained quartz, constitutes about 10 percent of the fragment of core, and is rather evenly distributed. The shale contains a small amount of mica, a few small inclusions of greenish-yellow unctuous clay, and molds and impressions of small fossil bivalves.
  - Middle. Shale, dark reddish-brown and bright greenish-blue-streaked, micaceous, somewhat silty, containing yellowish-brown inclusions.
  - Bottom. Shale, greenish-blue and dull reddish-brown, silty, splintery.

- **6600-6615** Sand, unconsolidated, fine to coarse-grained, and fragments of the shale like core 2 at 6600-6607 ft. The sample contains one large fragment of white quartzite, and one of red-stained quartzite.

- **6615-6631** Sand, unconsolidated; fine to coarse-grained (probably caving), and fragments of several types of shale, including fragments of smooth, splintery, flaky, reddish-brown and yellowish-green-streaked shale.

- **6631-6646** Like the sample at 6615-6631 ft. and a few fragments of multicolored limestone nodules that seem to belong near this depth.

- **6646-6682** Sand, like sample at 6615-6631 ft., and fragments of several types of multicolored shale and a few nodules of multicolored limestone.

- **6682-6697** Sand and shale fragments like sample at 6646-6682 ft., and in addition, a few fragments of bright greenish-blue bentonitic (?) shale, and of red and greenish-gray, yellow-speckled, very fine grained sandstone.

- **6697-6707** Sand and fragments of several types of red, brown and blue shale.

- **6707-6722** Sand, unconsolidated, about 50 percent of sample, in contrast to 75-90 percent in samples about 100 feet higher in this well; the sand is probably caving from higher levels. The sample contains various types of multicolored shale and many fragments of...
**Description**

dark reddish-brown and greenish-blue-streaked shale which was not observed in samples from higher levels; the shale contains traces of impressions of small fossils.

6722-6737  Like sample at 6707-6722 ft., and in addition, a few fragments of bright bluish-green, micaceous siltstone.

6737-6766  Sand, shale, and siltstone like sample at 6722-6737 ft. Fragments of brownish-red and greenish-blue-streaked shale, green siltstone, and bright blue-green bentonic(?) shale are common in the sample.

6766-6781  Sand, unconsolidated, about 75 percent of sample. About 25 percent of sample is composed of fragments of several types of multicolored shale, green siltstone, and a few nodules of limestone. A fragment of black shale, which was not observed in samples from higher levels, is probably from near this depth.

**Devonian**

**Middle Devonian. Black Shale.**

6781-6842  Like sample at 6766-6781 ft.; increase in fragments of black shale.

6842-6872  Like sample at 6781-6842. Fragments of dark reddish-brown, smooth, splintery shale, very common; a little black shale.

6863-6873  Core 3. Recovery 0. Corrected depth 6893-6903 ft.

6872-6888  Sand, unconsolidated, and multicolored shale like sample at 6766-6781 ft. Fragments of bluish-green shale abundant; dark brownish-red shale common; a few fragments of black, waxy shale.

6888-6948  Like sample at 6872-6888 ft. A few fragments of black shale: a) smooth, flaky, splintery shale; b) rough-textured, micaceous shale having a conchoidal fracture.

6948-6965  Shale, mainly brownish-red, reddish-brown and green, and a little black shale.

  Top. Shale, dark-gray, smooth, thinly laminated, somewhat silty; in part, highly micaceous and highly pyritic (small crystals); small particles of carbonaceous material. Another part of the core is dark-gray, hard, laminated, micaceous siltstone, containing minute particles of carbonaceous material.
  Middle. Shale, dark-gray, laminated, containing minute particles of carbonaceous material, and a few specimens of *Lingula* sp. Bottom. Like the middle part of the core.

6985-7006  Core 5. Recovery 20 ft. Corrected depth 7015-7036 ft.
  Black shale containing specimens of *Lingula* sp.

7006-7009  No sample.

7009-7024  Sand, unconsolidated; multicolored shale, and black shale like core 4 (6965-6985 ft.) and core 5 (6985-7006 ft.)

7024-7039  Like sample at 7009-7024 ft.; fragments of black shale more abundant.
Description

No change. Samples contain much 'caved material. Sand, unconsolidated; fragments of multicolored shale, and black shale; a little light-tan, dense, fine-grained sandstone.

Ordovician

7240  Lower Ordovician(?). Quartzitic sandstone. (electric log correlation)

7251-7284  Like sample at 7221-7251 ft. Some fragments of the sandstone are moderately coarse grained, and a few fragments seem to be quartzitic.

7284-7320  T.D. No samples.

ECHOLS COUNTY

Operator: Hunt Oil Company  GGS No. 150
Landowner: Superior Pine Products Co.  Elevation: 144 ft. (derrick floor)
Well #3  Location: Land District 13, Land Lot 532; 218 ft. east and 242 ft. north of southwest corner of Land Lot 532.

Total depth: 4003 ft.  Completed: July 29, 1947

Summary of Stratigraphy

Tertiary

Samples not studied

Cretaceous

Gulf

Lawson Limestone, upper member(?)  2590(?)  80(?)
Beds of Taylor age  2670  280
Beds of Austin age  2950  370
Atkinson Formation, upper member  3320  145
lower member(?)  3465  160
Comanche(?) undifferentiated  3625  32

Ordovician

Middle Ordovician\(^1\) black shale and sandstone  3657 total 346 depth

\(^1\)Bridge, Josiah and Berdan, J. M. 1951, U.S. Geological Survey open-file report, p. 5 and map.
Lithologic and paleontologic descriptions of cuttings and cores. Samples are cuttings unless otherwise stated.

**Description**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2750</td>
<td>Samples not studied.</td>
</tr>
</tbody>
</table>

**Cretaceous**

**Gulf Series**

**Lawson Limestone. Upper Member(?).**

Top of the upper member(?) of the Lawson Limestone is placed at 2590 ft. on the basis of electric log correlation.

**Beds of Taylor age**

Top of the beds of Taylor age is placed at 2670 ft. on the basis of electric log correlation.

- **2750-2760** Chalk, white, containing abundant fragments of *Inoceramus* and other fossil bivalves, and many specimens of *Anomalina sholtz-ensis* and *Anomalina cosdeni*.

- **2760-2770** Like sample at 2750-2760 ft. Pyrite and pyritized shell fragments are common.

- **2770-2820** No change.

- **2820-2830** Like preceding samples with the addition of a little light greenish-gray marl.

- **2830-2840** Sample shows an increase in the light greenish-gray marl.

- **2840-2850** Like preceding samples and many cavings(?) of light-tan dolomite and moderately fine-grained sand. The sand is about 50 percent of the sample.

- **2850-2860** Like sample at 2840-2850 ft.

- **2860-2870** Chalk, white, tan dolomite, a little sand, and fragments of greenish-gray marl. The sample contains fragments of *Inoceramus* and other fossil bivalves, echinoid spines, and a few specimens of Foraminifera and Ostracoda. The microfossils seem to wash from the chalk which is probably caving.

- **2870-2880** Like sample at 2860-2870 ft.

- **2880-2890** The sample is composed of about 50 percent light-gray and greenish-gray marl; the remainder is white chalk and a little dolomite. The sample contains abundant fragments of *Inoceramus* and other fossil bivalves, echinoid spines, and a few specimens of Foraminifera and Ostracoda. The microfauna seems to wash from the chalk which is probably caving.

- **2890-2940** No change.
### Description

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2940-2950</td>
<td>Marl, light greenish-gray, chalky, is the largest part of the sample. In addition, the sample contains a little chalk and tan dolomite, fragments of <em>Inoceramus</em> and other fossil bivalves, and a few specimens of <em>Foraminifera</em>, all of which seems to have caved from higher levels.</td>
</tr>
<tr>
<td>2950-2960</td>
<td>Like sample at 2940-2950 ft., with the addition of a few fragments of a somewhat darker greenish-gray laminated marl. The top of the beds of Austin age is based in part, on electric log correlation.</td>
</tr>
<tr>
<td>2960-2970</td>
<td>Like sample at 2950-2960 ft.</td>
</tr>
<tr>
<td>2970-2980</td>
<td>The sample is mainly chalk, and a few fragments of marl and dolomite; a few <em>Inoceramus</em> fragments.</td>
</tr>
<tr>
<td>2980-2990</td>
<td>Marl, light-gray, chalky, is again dominant. Fossils are, chiefly, fragments of <em>Inoceramus</em> and other macrofossils, and a few specimens of <em>Foraminifera</em> from higher levels.</td>
</tr>
<tr>
<td>2990-3000</td>
<td>No change.</td>
</tr>
<tr>
<td>3000-3010</td>
<td>Like sample at 2980-2990 ft. The marl is somewhat softer, and microfossils are fairly well preserved. The microfauna contains specimens of <em>Globotruncanac sp.</em>, <em>Globotruncanac marginata</em>, <em>Planulina austiniana</em>, <em>Citharina texana</em>, and <em>Marginulina cf. M. plummerae</em>.</td>
</tr>
<tr>
<td>3010-3060</td>
<td>No change.</td>
</tr>
<tr>
<td>3060-3070</td>
<td>Marl, gray, and a few fragments of brownish-gray, somewhat light-speckled marl; contains specimens of <em>Foraminifera</em> like sample at 3000-3010 ft., and a few specimens of ostracodes.</td>
</tr>
<tr>
<td>3070-3100</td>
<td>No change.</td>
</tr>
<tr>
<td>3100-3110</td>
<td>Marl, darker gray, somewhat light-speckled; nodules of pyrite and pyritized fragments of <em>Inoceramus</em> are common. Microfossils are, chiefly, specimens of <em>Globigerina sp.</em>, <em>Globotruncanac marginata</em>, a few specimens of <em>Globorotalites umbilicatus</em>, and a few specimens of ostracodes.</td>
</tr>
<tr>
<td>3110-3180</td>
<td>No change.</td>
</tr>
<tr>
<td>3180-3190</td>
<td>Like the sample at 3100-3110 ft., and about 50 percent cavings (?) of fine to moderately coarse grained sand.</td>
</tr>
<tr>
<td>3175-3185</td>
<td>Core. Recovery 10 ft. Top. Chalk, gray, marly, somewhat light-speckled. The slightly speckled appearance is due to crushed fragments of fossil shells. The marl contains fragments and prisms of <em>Inoceramus</em> and a few fish scales.</td>
</tr>
<tr>
<td>3185-3195</td>
<td>Core. Recovery 10 ft. Top and bottom. Chalk, marly, as in core at 3175-3185 ft. A washed sample at the top part of the core contains specimens of <em>Globigerina sp.</em> and <em>Globotruncanac marginata</em> that are common in the lower part of the beds of Austin age.</td>
</tr>
<tr>
<td>Depth (feet)</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| 3195-3200   | Core. Recovery 10 ft.  
Top. Chalk, brownish-gray, marly, light-speckled. More highly speckled than the core at 3185-3195 ft.  
Bottom. Like top part of the core, but softer and more shaly. |
| 3200-3210   | Marl, gray, somewhat light-speckled, like the preceding cores. Nodules of pyrite and fragments of *Inoceramus* are fairly common. |
| 3210-3230   | No change. |
| 3230-3240   | Core. Recovery 2 ft.  
Marl, light brownish-gray, somewhat light-speckled, chalky, containing shreds of carbonaceous material. The sample of cuttings from the same depth as the core contains specimens of *Nionella austiniana*. |
| 3240-3250   | Sample not described. |
| 3250-3252   | Core. Recovery 1 1/2 ft.  
Like core at 3230-3240 ft. |
Top. Chalk, light brownish-gray, marly; contains a few shreds of carbonaceous material.  
Middle. Like top part of the core; contains fragments of *Inoceramus*; much fragmental, calcitized microfossilerous material, and specimens of *Globigerina* sp. (common).  
Bottom. Like middle part of the core, but more shaly and more highly speckled with crushed yellow, chalky fossil material. |
| 3262-3268   | Core. Recovery 6 ft.  
Top. Marl, light tan-gray, chalky.  
Bottom. Like top part of the core; contains fragments of *Inoceramus* and small fragments of calcitized microfossils. This kind of material commonly occurs in the lower part of the beds of Austin age. |
| 3268-3278   | Core. Recovery 5 ft.  
Top. Like core at 3262-3268 ft., but not as well consolidated.  
Bottom. Marl, light tan-gray, soft, chalky. |
| 3278-3288   | Core. Recovery 10 ft.  
Top. Marl, brownish-gray, yellow-speckled.  
Bottom. Marl, like top part of core; chalky. |
| 3288-3297   | Core. Recovery 8 ft.  
Top. Marl, tan-gray, containing darker bands or laminations of the same material; speckled with crushed, chalky, dark-stained, fragmental fossil shells.  
Bottom. Like top part of core. |
| 3297-3300   | Core. Recovery 3 ft.  
Top. Like core at 3288-3297 ft., but less highly speckled, and, in part, hard, white chalk. The marl is somewhat carbonaceous. |
Description

Bottom. Marl, brownish-gray, moderately hard, chalky, somewhat light-speckled.

3200-3310 Core. Recovery 10 ft.  
Top. Not described or no sample.  
Bottom. Like core 3297-3300 ft.

3310-3320 Core. Recovery 10 ft.  
Top. No sample.  
Middle. Chalk, white, hard, highly sandy. Sand is at least 50 percent and possibly 75 per cent of the sample.  
Bottom. Sandstone, light-tan, fine to moderately fine grained, highly pyritic, containing lenses of grayish-green shale.

Atkinson Formation. Upper Member.

The top of the Atkinson Formation may be at the middle part of the core at 3310-3320 ft.

3320-3328 Core. Recovery 7 ft.  
Top. Shale, grayish-green, containing lenses and inclusions of light-gray, fine-grained sandstone.  
Bottom. Like top part of core.

3328-3338 Core. Recovery 6 ft.  
Top. Clay, grayish-green, moderately soft, highly silty, irregularly sandy, micaceous.  
Bottom. Siltstone, light grayish-green, moderately soft, micaceous, and highly argillaceous.

3320-3340 Like the cores at 3320-3328 ft. and 3328-3338 ft., and cavings from higher levels.

3340-3350 Shale, grayish-green, flaky, and fragments of sandstone that may occur as lenses in the shale. The sandstone contains fragments of Ostrea sp.

3350-3360 Not described.

3360-3410 Like sample at 3340-3350 ft.; mainly shale and a little sand.  
3410-3430 Not described.

3430-3440 Shale, grayish-green, flaky, somewhat micaceous, and a little greenish-gray micaceous siltstone that may occur as lenses in the shale. The sample contains a few specimens of very small Gumbelina sp. and Globigerina sp. (common in the Eagle Ford Shale in Texas), and a few fragments of fish bones and carbonaceous material.

3440-3450 No change.

3450-3460 Shale, 50 percent; siltstone 50 percent. Shale contains a few specimens of Gumbelina sp., Globigerina sp., and Planulina eugelfor-densis. Small, brown, irregular-shaped nodules of siderite are in the sample.

3460-3470 Shale, grayish-green, flaky, and micaceous siltstone.
Description

Atkinson Formation. Lower Member.

The top of the lower member (?) of the Atkinson Formation is questionably placed at 3465 ft. on the basis of electric log correlation.

3470-3480 Like sample at 3460-3470 ft. The shale contains crushed fragments of chalky shells and specimens of Foraminifera; the species are not identifiable.

3480-3490 Shale, greenish-gray, flaky, and many fragments of cream, fine-grained sandstone.

3490-3500 Shale, green, flaky, and a little sandstone and siltstone.

3500-3510 Like the sample at 3490-3500 ft., and a few specimens of Planulina eaglefordensis, Gumbelina sp., and Globigerina sp.

3510-3520 No change.

3520-3530 No sample?

3530-3540 Shale, green, flaky, and a few fragments of light greenish-gray, poorly-sorted, fine to moderately coarse grained sandstone.

3540-3550 Like sample at 3530-3540, but showing an increase of sand; a few green-tinted moderately coarse grains.

3550-3560 Shale, green, flaky; a little siltstone. Shale contains small, crushed, white specimens of unidentifiable microfossils.

3560-3570 Like sample at 3550-3560 ft.

3570-3580 Shale and siltstone like the immediately preceding samples. A little fine to coarse-grained, soft, glauconitic sandstone.

3580-3590 Like sample at 3570-3580 ft.

3590-3600 Shale, green, flaky, somewhat silty; a little sand, and a little carbonaceous material; a few fragments of a thin-shelled Inoceramus.

3600-3610 Shale, and a few fragments of siltstone and sandstone.

3603-3623 Core. Recovery 13.3 ft.

4th 4 ft. Siltstone, light-gray, moderately hard, micaceous, argillaceous, containing thin lenses of white, fine-grained, glauconitic sandstone. Glauconite occurs in very small nodules. The sample contains a little siderite.

Comanche Series undifferentiated

3625-3635 Core. Recovery 4 ft.

Top. Sandstone, brownish-red, argillaceous, micaceous, poorly sorted, fine to coarse-grained.

Bottom. Clay, red and mustard mottled, moderately hard; contains scattered, fine to coarse quartz grains.

3635-3645 Core. Recovery 1 ft.

Sand, mottled red and mustard. Clay like the bottom of core at 3625-3635 ft.
Description

Core. Recovery 2½ ft.
Top 1 ft. Sandstone, red and gray, soft, fine to moderately fine grained, argillaceous, micaceous.
Middle 1 ft. Sand, red, soft, argillaceous.
Bottom ½ ft. Sandstone, red, and red and greenish-yellow mottled clay.

Core. Recovery ½ ft.
Top 3 in. Sand, soft, fine to coarse-grained, quartz, in matrix of red clay.
Bottom 3 in. Sandstone, light-red, pale-green and white mottled, fine-grained, highly argillaceous (possibly ashy); contains one large pebble of quartzite.

Ordovician
Middle Ordovician Series

The top of the Paleozoic is placed at 3657 ft. on the basis of electric log correlation. The samples from 3657 to 3735 ft. are possibly weathered Paleozoic rocks.

Core. Recovery 2 ft.
Top. Clay, brownish-red and yellowish-green mottled, hard, irregularly sandy, highly micaceous; contains a fragment of a fossil bivalve.
Bottom. Like the top part of core. Red clay with light greenish-gray streaks.

Core. Recovery 4 ft.
Top. Clay, shaly, red, moderately hard, highly micaceous.
Bottom. Clay, shaly, red, gray and greenish-yellow streaked, highly micaceous.

Core. Recovery 6 ft.
Top. Clay, shaly, like the core at 3667-3672 ft. in lithology and color, but highly sandy (fine-grained sand); might be classified as an argillaceous sandstone; contains a mold of an unidentified microfossil.
Middle. Clay, shaly, red, highly micaceous.
Bottom. Shale, red, showing yellowish-green and light bluish-gray streaks, and irregular areas of sandy shale.

Clay, shaly, red, and sandy micaceous clay and red sandstone like preceding cores; about 50 percent of the sample is composed of cavings of different kinds of material from higher levels.

Like the preceding sample from the same depth. Also contains a few fragments of a white and pink, hard, dense, fine-grained, quartzitic sandstone.

Like the sample at 3680-3685 ft.; red shale, sandstone, and quartzitic sandstone.
<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3690-3695</td>
<td>Like the sample at 3685-3690 ft.; but containing little quartzite.</td>
</tr>
<tr>
<td>3695-3700</td>
<td>Like the sample at 3690-3695 ft., and many fragments of purplish-red, very fine grained, moderately hard sandstone.</td>
</tr>
<tr>
<td>3700-3720</td>
<td>No change.</td>
</tr>
<tr>
<td>3720-3725</td>
<td>Mainly cavings of light purplish-red, hard, fine-grained sandstone, and a little light-green sandstone.</td>
</tr>
<tr>
<td>3725-3735</td>
<td>Clay, red, micaceous, sandy, and light purplish-red and light-green, hard, fine-grained sandstone; a few fragments of quartzite. About 50 percent of the sample is cavings from higher levels.</td>
</tr>
<tr>
<td>3735-3740</td>
<td>Like the sample at 3725-3735 ft., with the addition of a few fragments of black, unctuous, highly micaceous shale and hard black sandstone. This sample is probably the top of the unweathered Paleozoic rocks.</td>
</tr>
<tr>
<td>3745-3795</td>
<td>No change.</td>
</tr>
<tr>
<td>3790-3795</td>
<td>Cuttings are a mixture of red shale and sandstone, and materials from the Atkinson Formation; also, cuttings of the black, micaceous shale and black shaly sandstone of the Paleozoic.</td>
</tr>
<tr>
<td>3795-3800</td>
<td>Like the sample at 3790-3795 ft., and many fragments of light greenish-gray, hard, micaceous sandstone that is possibly interbedded with the black shale and the black, shaly, highly micaceous sandstone of the Paleozoic.</td>
</tr>
<tr>
<td>3800-3895</td>
<td>No change.</td>
</tr>
<tr>
<td>3892-3895</td>
<td>Core. Recovery 2 ft. Sandstone, light greenish-gray, very dense, very fine grained, quartzitic sandstone containing thin partings of black, highly micaceous, unctuous shale.</td>
</tr>
<tr>
<td>3900-3905</td>
<td>Sample at least 75 percent cavings from much higher levels; also fragments of the black shale and sandstone like core at 3892-3895 ft.</td>
</tr>
<tr>
<td>3905-3950</td>
<td>No change.</td>
</tr>
<tr>
<td>3950-3955</td>
<td>Cavings about 50 percent. The remainder of the sample is fragments of the black-shale-streaked sandstone described in core at 3792-3795 ft.</td>
</tr>
<tr>
<td>3955-3965</td>
<td>No change.</td>
</tr>
<tr>
<td>3965-3970</td>
<td>Similar to the immediately preceding samples, but with few fragments of the black shale, and many fragments of the light-green to white, highly micaceous, hard sandstone.</td>
</tr>
<tr>
<td>3970-3990</td>
<td>No change.</td>
</tr>
<tr>
<td>3990-3995</td>
<td>This sample shows an increase in the amount of black, micaceous shale and the gray micaceous sandstone.</td>
</tr>
<tr>
<td>3995-4003 T.D.</td>
<td>No change.</td>
</tr>
</tbody>
</table>
### ECHOLS COUNTY

Operator: Hunt Oil Company  
Landowner: Superior Pine Products Co.  
Well 4  
Location: Land District 13, Land Lot 219; from Northwest corner of Land Lot 219, go 1978 ft. east, thence 1106 ft. S. 8° W. to location.  

GGS. No. 158  
Elevation: 156 ft. (derrick floor)  
Total depth: 3916 ft.  
Completed: Mar. 16, 1948

### Summary of Stratigraphy

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Thickness (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2610(?)</td>
<td>70</td>
</tr>
<tr>
<td>2680</td>
<td>270</td>
</tr>
<tr>
<td>2950</td>
<td>322</td>
</tr>
<tr>
<td>3272</td>
<td>168</td>
</tr>
<tr>
<td>3440</td>
<td>189</td>
</tr>
<tr>
<td>3629</td>
<td>282</td>
</tr>
</tbody>
</table>

#### Tertiary

**Paleocene**  
In beds containing Tamesí fauna at 2600 ft.

#### Cretaceous

**Gulf**

- Lawson Limestone, upper member: 2610(?) ft. 70 feet
- Beds of Taylor age: 2680 ft. 270 feet
- Beds of Austin age: 2950 ft. 322 feet
- Atkinson Formation, upper member: 3272 ft. 168 feet
  - lower member: 3440 ft. 189 feet
- Comanche undifferentiated: 3629 ft. 282 feet

#### Ordovician

**Middle Ordovician**

- weathered(?) zone: 3911 ft. total 5 feet

Lithologic and paleontologic descriptions of cuttings and cores. Samples are cuttings unless otherwise stated.

### Description

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2620</td>
<td>Samples not studied.</td>
</tr>
</tbody>
</table>

### Cretaceous

**Gulf Series**

**Lawson Limestone. Upper Member.**

2610(?) ft. The top of the upper member of the Lawson Limestone (uppermost Cretaceous) is provisionally placed at 2610 ft. on the basis of electric log correlation.

---

### Description

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
</table>
| 2620-2630   | Sandstone, greenish-gray, fine and even grained, highly glauconitic, calcareous, containing many specimens of *Globorotalia velascoensis*, *Globigerina triloculinoides*, a small form of *Cibicides* sp., and other small Foraminifera.
| 2600-2610   | \(\text{est. depth}\) |
| 2630-2640   | Limestone, cream, hard, calcitic, gypsiferous, containing poorly-preserved molds and fragments of molds of macrofossils and a few microfossils. \(\text{est. depth}\) |
| 2640-2650   | Limestone, cream, chalky, composed, mainly, of a mass of poorly-preserved molds of microfossils and a few macrofossils. The microfauna in this sample is unusual, and is somewhat similar to the fauna that has been reported from the “Upper Cretaceous” beds in Trinidad; also, it contains several species occurring in the upper member of the Lawson Limestone in a few wells in Florida, and even seems to have certain Tertiary aspects. \(\text{est. depth}\) |
| 2650-2660   | Limestone, light-cream, somewhat gypsiferous, containing fragments of poorly preserved molds of fossils. The character of the material is somewhat like sample at 2640-2650. Among the unusual features, is a mold of a *Borelis*-like form in a fragment of the limestone, and a fragment showing distinct coralline structure. \(\text{est. depth}\) |
| 2660-2670   | Like sample at 2650-2660 ft., but contains more traces of molds and impressions of microfossils. \(\text{est. depth}\) |
| 2670-2680   | Like sample at 2660-2670 ft. A few fragments are highly pyritic, and a few others show a trace of glauconite. \(\text{est. depth}\) |

### Beds of Taylor age

2680-2690 Chalk, white, glauconitic. The fauna is composed of fragments of *Inoceramus*, a few specimens of Ostracoda, and many specimens of *Anomalina sholtzensis*, *Anomalina cosdeni*, *Globotruncanana arca*, *Bolivinoides decorata*, *Globorotalites conicus*.

2690-2700 Like sample at 2680-2690 ft. *Inoceramus* fragments and prisms abundant.

2700-2720 No change, but few well-preserved specimens of Foraminifera, and a decrease of glauconite.

2720-2730 Chalk, white, *Inoceramus* fragments and a few specimens of Foraminifera.

2730-2740 Chalk, white, containing much fragmental calcite material. *Inoceramus* prisms, specimens of Foraminifera, and fragments of

---

2This sample contains a foraminiferal assemblage closely resembling the Tamesi' fauna that occurs in beds of Paleocene age in many wells in western Florida and southern Georgia. The sample that follows at 2630-2640 ft., is classified as the upper member of the Lawson Limestone, which is Navarro (Late Cretaceous) in age. As a possible explanation of the discrepancy between the depth shown by the electric log characteristics and the depth of the hole at the time the samples were taken, we suggest a lag in the returns amounting to about 20 feet. On this basis, the estimated corrected depth of this sample would be 2600-2610 ft. and the estimated corrected depth of the next deeper sample would be 2610-2620 ft.
Description

molds of microfossils and macrofossils). The chalk is somewhat speckled with small grains of dark-green, glauconite and of pyrite; some fragments of chalk are highly pyritic.

2740-2750 Chalk, white; and a little gray marly chalk. The sample contains *Inoceramus* fragments and prisms, and a few specimens of long-ranging species of Foraminifera.

2750-2800 Like sample at 2740-2750 ft.

2800-2810 Chalk, white, *Inoceramus* fragments and prisms, many large nodules of pyrite, and a few specimens of Foraminifera.

2810-2820 Chalk, white, many fragments of *Inoceramus* and other fossil bivalves, a few specimens of Foraminifera, and a few fragments of light olive-gray marl.

2820-2830 Like sample at 2810-2820 ft.

2830-2840 Chalk, light olive-gray, and about 25 percent gypsum.

2840-2850 Chalk, light-gray, marly; abundant *Inoceramus* prisms, and a few specimens of Foraminifera and Ostracoda; also a few fragments of gypsum, which may be caving.

2850-2860 Like the sample at 2840-2850 ft.; *Anomalina* sp. is the common species of Foraminifera in the sample; no gypsum.

2860-2960 No change.

Beds of Austin age

The top of the beds of Austin age is placed at 2950 ft. on the basis of electric log correlation.

2960-2980 Chalk, white and light-gray, soft, and a few fragments of harder, light-speckled, olive-gray chalk. The sample contains abundant *Inoceramus* prisms, fragments of *Inoceramus* and other fossil bivalves and a few specimens of Foraminifera.

2980-2990 Chalk, dark-gray; marly; contains abundant *Inoceramus* prisms, abundant specimens of Foraminifera, and several species of Ostracoda. The common foraminiferal species are: *Globotruncanus* spp., *Globigerina* sp., *Planulina* sp., *Planulina austiniana*, a few specimens of *Valvulineria infrequens*, *Planulina texana*, *Günbelina* sp., *Robulus* sp., and *Kyphopyx christneri*. The sample is definitely Austin in age.

2990-3000 Like the sample at 2980-2990 ft.; contains specimens of *Citharina texana*.

3000-3100 No change.

3100-3110 Chalk, gray, somewhat white-speckled, marly containing many *Inoceramus* prisms and Austin species of Foraminifera.

3110-3180 No change.

3180-3190 Core 5. Recovery 8 ft.

Top 3 ft. Marl, gray, somewhat white-speckled (microfossiliferous). No change in fauna.

Middle 2 ft. Marl, somewhat lighter in color.
<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3190-3200</td>
<td>Bottom 3 ft. No change.</td>
</tr>
<tr>
<td>Core 6. Recovery 4 1/2 ft.</td>
<td>Top 3 ft. Chalk, gray, marly, containing Austin species of Foraminifera; Gümbelina sp. common.</td>
</tr>
<tr>
<td>Bottom 1 1/4 ft. Like top part of core, but slightly darker.</td>
<td></td>
</tr>
<tr>
<td>3200-3210</td>
<td>Core 7. Recovery 4 1/2 ft.</td>
</tr>
<tr>
<td>2nd 1 1/4 ft. Marl, dark-gray.</td>
<td></td>
</tr>
<tr>
<td>3d 8 in. No change.</td>
<td></td>
</tr>
<tr>
<td>Bottom 10 in. Marl, lighter gray.</td>
<td></td>
</tr>
<tr>
<td>3210-3215</td>
<td>Core 8. Recovery 5 ft.</td>
</tr>
<tr>
<td>Bottom 1 ft. Slightly darker marl; no change in fauna, but specimens of Foraminifera less abundant.</td>
<td></td>
</tr>
<tr>
<td>2nd 3 ft. Marl, dark-gray, light-speckled, containing fragments of fish scales, a few fragments of <em>Inoceramus</em> and specimens of Foraminifera.</td>
<td></td>
</tr>
<tr>
<td>3d 1 ft. Chalk, white, marly, moderately hard. No change in microfauna.</td>
<td></td>
</tr>
<tr>
<td>4th 2 ft. Marl, gray, somewhat white-speckled, containing fragments of fish scales and a <em>Pecten</em>-like bivalve. Dominant species of Foraminifera are: Gümbelina sp., Globigerina sp., and a small Anomalina sp.</td>
<td></td>
</tr>
<tr>
<td>3224-3234</td>
<td>Core 10. Recovery 10 ft.</td>
</tr>
<tr>
<td>2nd 2 ft. Chalk, light and dark-gray, marly; contains fish scales; no change in microfauna.</td>
<td></td>
</tr>
<tr>
<td>3d 3 1/2 ft. Marl, dark-gray, light-speckled.</td>
<td></td>
</tr>
<tr>
<td>Bottom 3 1/2 ft. Chalk, white, moderately hard, no change in microfauna.</td>
<td></td>
</tr>
<tr>
<td>3234-3244</td>
<td>Core 11. Recovery 3 1/2 ft.</td>
</tr>
<tr>
<td>Bottom 1 1/4 ft. Marl, gray, soft; no change in microfauna.</td>
<td></td>
</tr>
<tr>
<td>3244-3250</td>
<td>Core 12. Recovery 2 ft.</td>
</tr>
<tr>
<td>Bottom. No change.</td>
<td></td>
</tr>
</tbody>
</table>
Description

Depth (feet)

Top 1 ft. Like core 13 at 3250-3255 ft.
Bottom 2 ft. No change.

3265-3272 Core 15. Recovery 3½ ft.
Top. Marl, gray, white-speckled, and lens of light-gray chalk containing much comminuted calcitic, chalky debris of microfossils and macrofossils. No change in microfauna.

Atkinson Formation. Upper Member.

3272-3277 Core 16. Recovery 1 ft.
Shale, dark greenish-gray, flaky, unctuous. Core seems to be contaminated with drilling mud; no definitely indigenous specimens of Foraminifera observed.

3277-3285 Core 17. Recovery 3 ft.
Top. Shale, green, containing irregular vein-like silty streaks, and a few rounded, moderately coarse grains of quartz. The sample contains a few fragments of fine-grained, somewhat glauconitic sandstone, and a few fragments of Ostrea-like fossil bivalves.
Middle. Shale, green, flaky, interbedded with light-gray, micaceous, slightly glauconitic siltstone; contains a few small specimens of Planulina eaglefordensis.
Bottom. Siltstone, gray, soft, micaceous, interlensed with green shale; contains a few phosphatic fragments, a few shreds of carbonaceous material, and pyrite; a few small specimens of Planulina eaglefordensis.

3285-3287 Core 18. Recovery 2 ft.
Shale, green and light greenish-gray, argillaceous, micaceous, and very fine and even grained, soft sandstone, in thin alternating layers. The material contains a little phosphatic material and glauconite; a few carbonaceous shreds. The fauna is composed of shell fragments. Ostracodes, abundant specimens of Planulina eaglefordensis, Globigerina sp., and others.

3287-3297 Core 19. Recovery 6 ft.
Top. Sandstone, light greenish-gray, soft, very fine grained, argillaceous, micaceous, containing very thin partings and streaks of green shale; phosphatic nodules and traces of glauconite and pyrite.
Middle. No change.
Bottom. No change.

3297-3307 Core 20. Recovery 9 ft.
Top 4 ft. Siltstone, light greenish-gray, micaceous, finely glauconitic, containing very thin lenses of green shale; a few frag-
### Description

- **3300-3310**  Shale, green, a little micaceous siltstone, and cavings from higher levels.
- **3310-3330**  No change.
- **3330-3340**  Shale, and many cuttings of moderately hard, fine-grained, somewhat glauconitic, micaceous siltstone that contains phosphatic nodules and fragments of lignite and shells of *Ostrea*-like bivalves.
- **3340-3350**  Like sample at 3330-3340 ft.
- **3350-3360**  Sandstone, greenish-gray, containing abundant fragments of *Ostrea*-like bivalves; glauconite and phosphatic nodules (fairly common); a little green shale.
- **3360-3370**  Sandstone, shell fragments and phosphatic nodules; many fragments of green shale; a little glauconite and mica.
- **3370-3380**  Sandstone and sand, fine-grained, quartz; many fragments of *Ostrea* sp.; a little shale, a little mica, and a few phosphatic nodules.
- **3380-3390**  No change.
- **3390-3400**  Sand, fine-grained, even-grained, micaceous; containing many fragments of *Ostrea* sp. and other fossil bivalves; a few fragments of green shale; a few phosphatic nodules and fragments of carbonaceous material.
- **3400-3410**  Like sample at 3390-3400 ft.
- **3410-3430**  Sand, mica, and fragments of green shale; shell fragments much less abundant; a few fragments of carbonaceous material, and a trace of glauconite.
- **3430-3440**  Like sample at 3410-3430 ft., but green shale more abundant.

**Atkinson Formation. Lower Member.**

- **3440-3450**  Material like sample at 3410-3430 ft., but contains specimens of *Reophax pepperensis*, *Ammobaculites agrestis*, *A. juncus*, *Trochammina rainwateri*, and others.
- **3450-3460**  Shale, green, micaceous, and fine-grained sand; a few fragments of carbonaceous material and a few shell fragments.
- **3460-3470**  Shale, grayish-green, and a little silty, micaceous shale; a little fine-grained sand, probably caving. The sample contains a few fragments of carbonaceous material and of shells.
- **3470-3490**  Like the sample at 3460-3470, and a few fish teeth and fish bones.
- **3490-3500**  Similar to the samples at 3470-3490 ft., but fragments of very
Description

fine grained sandstone are common. The sample contains fragments of shells and fish bones and specimens of *Reophax* sp., and many specimens of *Ammobaculites agrestis* and *Ammobaculoides plummerae*.

3500-3510 Like the sample at 3490-3500 ft., but shale is strongly dominant, and the sample contains very few specimens of the arenaceous species of Foraminifera.

3510-3560 Like the sample at 3500-3510 ft.

3560-3570 Shale, green; and a little light-gray, micaceous siltstone; a few shell fragments and a few fragments of carbonaceous material.

3570-3580 Like the sample at 3560-3570 ft.

3585-3595 Core 21. Recovery 2½ ft.
Top. Sandstone, soft, light greenish-gray, fine-grained, even-grained, argillaceous, glauconitic, somewhat phosphatic.
Bottom. No change.

3595-3602 Core 22. Recovery 6 ft.
Top 4 in. Sand, unconsolidated, like the sandstone in core 21 at 3585-3595 ft. and fragments of gray and greenish-gray, micaceous shale.
2nd 4 in. Sandstone, greenish-gray, moderately hard, argillaceous, micaceous, glauconitic, very fine grained.
3d 4 ft. Like 2nd 4 inches of this core, but less firmly consolidated.
Bottom 16 in. Shale, greenish-gray, silty, micaceous, glauconitic, containing specimens of *Ammobaculites advenus*, and fragments of phosphatized fish bones.

3602-3612 Core 23. Recovery 10 ft.²
Top 1 ft. Clay, shaly, greenish-gray, silty to sandy (very fine grained sand), highly micaceous. Contains a few shreds of carbonaceous material, a little phosphatic material, a few specimens of Ostracodes, and small fragments of shells.
2nd 3 ft. Clay, shaly, greenish-gray, silty, somewhat glauconitic, highly micaceous, containing shreds of carbonaceous material, a few fragments of fish bones, a few specimens of *Ammobaculites advenus*, and a few specimens of ostracodés.
3d 8 in. Shale, greenish-gray, thinly laminated, slightly micaceous, silty, and carbonaceous; contains a few fragments of *Inoceramus*, specimens of *Trochammina wickenden*, and very small specimens of *Globigerina* sp. and *Gümbelina* sp.
4th 10 in. Shale, greenish-gray, micaceous, silty, irregularly glauconitic; contains pyrite nodules, a little phosphatic material, a few shell fragments, and a few minute specimens of *Globigerina* sp.

²Two feet of core unaccounted for.
Logs of Selected Wells in the Coastal Plain of Georgia

**Description**

Bottom 2½ ft. Shale, green, unctuous, containing silty micaceous partings (mainly drilling mud).

3612-3620 Core 24. Recovery 9 ft.
Top 8 ft. Sandstone, gray, soft, fine-grained, argillaceous, highly micaceous; contains a trace of glauconite, a few phosphatic nodules, and a little dark-gray shale, possibly occurring in thin lenses. The shale contains specimens of very small Foraminifera, and a few shreds of carbonaceous material.
Bottom 1 ft. An unsatisfactory sample of greenish-gray shale, fine to coarse-grained quartz sand, and a little glauconite, mica, and phosphatic material.

3620-3629 Core 25. Recovery 5 ft.
Top 3 ft. Sand, light grayish-tan, fine to moderately fine grained, etched, argillaceous, containing a few coarse-grains, fragments of gray shale, and a little mica.
2nd 1 ft. Sand, greenish-gray, fine to coarse-grained, argillaceous, glauconitic, quartz. The glauconite occurs in crevices in some coarse grains, and one highly glauconitic plant fragment was observed.
Bottom 1 ft. Sandstone, gray, soft, micaceous, argillaceous. The sandstone contains irregular partings of gray shale, and a few lenses of gray, flaky shale, in which occur faint traces of dwarf specimens of Foraminifera.

Comanche Series undifferentiated

3629-3639 Core 26. Recovery 7 ft.
Top 2 ft. Sandstone, light-gray, fine-grained, argillaceous (bentonitic?), the sand grains are etched and angular.
2nd 2½ ft. Clay, shaly, gray and red mottled highly micaceous, sandy (fine-grained sand).
Bottom 2½ ft. Sandstone, greenish-gray, soft, fine-grained, highly argillaceous and micaceous.

3639-3648 Core 27. Recovery 1 ft.
Top ½ ft. Sand, fine to coarse-grained (coarse grains common), etched, argillaceous, and a little light greenish-tan, unctuous, sandy (very fine grained sand) clay shale. The sand contains many lemon-yellow and a few pink grains of quartz and a few grains of feldspar.
Bottom ½ ft. Mudstone, light-gray, mustard, and light-red, mottled, unctuous, sandy, somewhat micaceous.

3648-3658 Core 28. Recovery 4½ ft.
Top 2½ ft. Clay, shaly, red and gray mottled, sandy, highly micaceous; the sand is fine to coarse-grained, and moderately fine grains are common.
Bottom 2 ft. Mudstone, gray, reddish-brown and mustard, mottled, highly micaceous.
<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
</table>
| 3658-3668   | Core 29. Recovery?  
Top. Sand, light-red, clay-stained, fine to coarse-grained, etched.  
Bottom. Sand, light-red and gray, mottled and stained, soft, argillaceous, quartz. The sand grains are mostly moderately fine and subangular. |
| 3668-3678   | Core 30. Recovery ½ ft.  
Sand, fine to very coarse-grained, containing many lemon-yellow, pink and a few rose quartz grains, and a little feldspar; a few fragments of purplish-red clay. |
| 3680-3700   | Mainly cavings of gray shale, brownish-red, purplish-red and mustard-yellow clay shale, sand and mica. |
| 3698-3708   | Core 33. Recovery 1½ ft.  
Top 1 ft. Sand, brownish-red stained, soft, fine-grained, subangular, argillaceous, highly micaceous; a few coarse grains of sand in the sample.  
Bottom ½ ft. Sandstone, red and gray, soft, fine to coarse-grained, argillaceous, highly micaceous. |
| 3708-3718   | Core 34. Recovery 1 ft. Sand, fine to coarse-grained, subangular to rounded, quartz, containing yellow and pink grains and a little feldspar. |
| 3718-3728   | Core 35. Recovery 3 in.  
Clay, red and gray mottled, silty, very highly micaceous. |
| 3728-3738   | Core 36. Recovery 2 ft.  
Top. Sand, light purplish-red, soft, fine to very coarse-grained (small pebbles), argillaceous, highly micaceous; yellow and pink-tinted grains abundant.  
Bottom. Sand, like top part of core, in a matrix of highly micaceous red clay. |
| 3738-3748   | Core 37. Recovery 1 ft.  
Top. Sand, light-red like core 36 at 3728-3738 ft., and mustard-yellow micaceous clay. The sand grains are moderately fine to moderately coarse.  
Bottom. Sand, light-red, fine to very coarse-grained, micaceous; many grains are tinted yellow and pink. |
| 3748-3758   | Core 38. Recovery 1 ft.  
Like core 37 at 3738-3748 ft. The sand is mainly quartz and a little feldspar. |
Top. Sand, light-red, mostly fine-grained, micaceous, argillaceous; a few moderately coarse grains, tinted yellow and pink.  
Bottom. Sand, red and gray mottled, fine-grained, even-grained, highly micaceous, quartz. |
| 3768-3770   | Core 40. Recovery ½ ft.  
Sand, red and gray, fine-grained, highly micaceous, argillaceous, quartz. |
<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3778-3788</td>
<td>Core 41. Recovery 3 ft. Top 2 1/2 ft. Sand, light-red and gray, soft, fine to coarse-grained, micaceous, argillaceous. Bottom 1/2 ft. Clay, brick-red, and gray mottled, silty to very finely sandy, micaceous.</td>
</tr>
<tr>
<td>3790-3800</td>
<td>Sand, fine to very coarse grained, a few fragments of red shale, and cavings of gray shale from much higher levels.</td>
</tr>
<tr>
<td>3798-3805</td>
<td>Core 43. Recovery 2 ft. Top. Sand, light-red, fine to moderately coarse grained, etched, somewhat micaceous, argillaceous. Bottom. Shale, dark-red, and some sand like top part of core. The appearance of the shale differs somewhat from the overlying red clay shale.</td>
</tr>
<tr>
<td>3805-3807</td>
<td>Core 44. Recovery 1 ft. Shale, red, like bottom part of core 43 at 3798-3805 ft.</td>
</tr>
<tr>
<td>3817-3827</td>
<td>Core 46. Recovery 1/2 ft. Shale, red, somewhat gray and mustard-yellow mottled, unctuous, somewhat silty.</td>
</tr>
<tr>
<td>3827-3837</td>
<td>Core 47. Recovery 3 in. Clay, red, and sand, unconsolidated.</td>
</tr>
<tr>
<td>3837-3840</td>
<td>Core 48. Recovery 3 in. Sand, fine to coarse-grained, roughly angular, and red shale.</td>
</tr>
<tr>
<td>3840-3850</td>
<td>Core 49. Recovery 2 ft. Sand, micaceous, and some red shale. The core seems to be contaminated.</td>
</tr>
<tr>
<td>3850-3860</td>
<td>Core 50. Recovery 1 ft. Sand, soft, fine to moderately fine-grained, micaceous, argillaceous; a few coarse grains of sand. The sand is similar to that in beds of definite Comanche age.</td>
</tr>
<tr>
<td>3860-3868</td>
<td>Core 51. Recovery 8 in. An unconsolidated lump of red shale and a little sand, as in the samples beginning at 3805 ft.</td>
</tr>
<tr>
<td>3870-3880</td>
<td>Sand, fine to very coarse-grained, red shale, and about 50 percent cavings from much higher levels.</td>
</tr>
<tr>
<td>3880-3900</td>
<td>No change.</td>
</tr>
<tr>
<td>3900-3903</td>
<td>Many cavings, and abundant fragments of bluish-green, fine-grained, sandstone; white and yellow, fine-grained quartzite; and fragments of an opaque green mineral. The sample may be from a bed of quartzite boulders and other material derived from the weathered surface of the underlying early Paleozoic rocks and redeposited in sedimentary beds near the base of the Mesozoic.</td>
</tr>
</tbody>
</table>
The top of the weathered (?) Paleozoic is placed at 3911 ft. on the basis of electric log correlation. 3912 Bit sample. Red and gray mottled irregularly silty shale, and fragments of quartzite. 3912-3916 T.D. Core. Recovery?

Top 3 in. Quartzite, light-green, very fine grained. Bottom. Shale, dull reddish-brown, thinly laminated, micaceous, somewhat silty.

**ECHOLS COUNTY**

Operator: Hunt Oil Company
Landowner: Superior Pine Products Co. Well 2
Location: Land District 13, Land Lot 317; southwest corner of Land Lot 317

**Summary of Stratigraphy**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Thickness (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Ordovician</td>
<td>quartzitic sandstone and shale</td>
</tr>
</tbody>
</table>

Lithologic and paleontologic description of cuttings and cores. Samples are cuttings unless otherwise stated.

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## Logs of Selected Wells in the Coastal Plain of Georgia

### Description

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Sample Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2890</td>
<td>Samples not studied.</td>
</tr>
</tbody>
</table>

### Cretaceous

#### Gulf Series

<table>
<thead>
<tr>
<th>Depth</th>
<th>Sample Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2700-2785</td>
<td>Lawson Limestone (Upper Member) (electric log correlation)</td>
</tr>
<tr>
<td>2785-2920</td>
<td>Beds of Taylor age. (electric log correlation)</td>
</tr>
</tbody>
</table>

- **2890-2900 ft.** Chalk, white, containing fragments of *Inoceramus* and other macrofossils, and a few specimens of ostracodes. Specimens of Foraminifera, if present, are indistinguishable owing to insufficient preparation of sample.

- **2900-2920 ft.** Like sample at 2890-2900 ft.

- **2920-2930 ft.** Chalk, like sample at 2890-2900 ft. and a few fragments of light-tan, hard cryptocrystalline limestone. *Inoceramus* fragments are common.

- **2930-2940 ft.** Like sample at 2920-2930 ft., and a few fragments of a large *Ostrea*-like bivalve.

- **2940-2950 ft.** Chalk, many fragments of hard, light-tan limestone, and a few fragments of light olive-gray chalk; *Inoceramus* fragments common.

- **2950-2960 ft.** Limestone, light-tan, hard, about 50 percent of sample.

- **2960-2970 ft.** Limestone, like sample at 2950-2960 ft. About 50 percent of sample; about 50 percent light greenish-gray chalk, a little white chalk, many fragments of *Inoceramus*, and a few fragments of other fossil bivalves.

- **2970-2980 ft.** Chalk, about 75 percent of sample; light-tan, hard limestone about 25 percent.

- **2980-2990 ft.** Sample is chiefly cavings from beds of Eocene age and higher levels.

- **2990-3000 ft.** Marl, light greenish-gray, chalky, and a few fragments of light-tan, hard, limestone; many fragments of *Inoceramus*, and some cavings.

- **3000-3020 ft.** No change.

- **3020-3030 ft.** Chalk, light-gray, marly, and cavings (?) of white chalk and light-tan limestone; many *Inoceramus* fragments.

- **3030-3070 ft.** No change.

### Beds of Austin age

(Bedford Geological Society, Mesozoic Committee, 1949, Cross Section CCf)

<table>
<thead>
<tr>
<th>Depth</th>
<th>Sample Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3070-3080</td>
<td>Chalk, light-gray and many cavings.</td>
</tr>
</tbody>
</table>
Description

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3080-3090</td>
<td>Chalk, light greenish-gray, and darker gray chalky marl. <em>Inoceramus</em> fragments and prisms common; specimens of <em>Globotrunca marginita</em>, <em>Planulina austiniana</em>, and other species of Foraminifera.</td>
</tr>
<tr>
<td>3090-3100</td>
<td>Like the sample at 3080-3090 ft.</td>
</tr>
<tr>
<td>3100-3110</td>
<td>Chalk, light greenish-gray, and darker gray chalky marl. <em>Inoceramus</em> fragments common, specimens of several species of oysters, and specimens of Foraminifera: <em>Globotrunca margo­mita</em>, <em>Globigerina</em> sp., <em>Planulina austiniana</em>, and <em>Marginulina austiniana</em>.</td>
</tr>
<tr>
<td>3110-3120</td>
<td>Like sample at 3100-3110 ft., and a few fragments of fish bones.</td>
</tr>
<tr>
<td>3120-3130</td>
<td>No change.</td>
</tr>
<tr>
<td>3130-3140</td>
<td>Marl, greenish-gray, and material and fauna like sample at 3100-3110 ft. Highest occurrence of specimens of <em>Citharina texana</em>.</td>
</tr>
<tr>
<td>3140-3150</td>
<td>Like sample at 3131-3140 ft.</td>
</tr>
<tr>
<td>3150-3300</td>
<td>No change.</td>
</tr>
<tr>
<td>3300-3310</td>
<td>Like samples at 3130-3140 ft. and below. The dominant species of Foraminifera are <em>Gümbelina reussi</em> and <em>Globigerina</em> sp.</td>
</tr>
<tr>
<td>3310-3350</td>
<td>No change.</td>
</tr>
<tr>
<td>3350-3360</td>
<td>No change. Fauna contains specimens of <em>Massilina</em> sp., indicative of the lower part of the beds of Austin age.</td>
</tr>
<tr>
<td>3360-3370</td>
<td>Marl greenish-gray, like the preceding samples, containing fragments of <em>Inoceramus</em>, and specimens of Foraminifera, mainly <em>Globigerina</em> sp. and <em>Gümbelina</em> sp.</td>
</tr>
<tr>
<td>3370-3390</td>
<td>No change.</td>
</tr>
<tr>
<td>3390-3400</td>
<td>Like preceding samples beginning at 3130-3140 ft.; contains in addition, many cuttings of dark-gray marl and dark brownish-gray, light-speckled marl. The speckled appearance is caused by crushed microfossil debris. Fish scales are common in the speckled marl.</td>
</tr>
<tr>
<td>3400-3410</td>
<td>Marl, chiefly gray-green, and fragments of brownish-gray speckled marl; many cavings.</td>
</tr>
<tr>
<td>3410-3420</td>
<td>Like sample at 3400-3410 ft.</td>
</tr>
<tr>
<td>3420-3430</td>
<td>Like the sample at 3400-3410 ft., and many cuttings of cream, chalky, highly microfossiliferous limestone containing abundant comminuted calcitic molds of small specimens of <em>Gümbelina</em> sp. and <em>Globigerina</em> sp. Sample also contains <em>Inoceramus</em> prisms and fish scales.</td>
</tr>
<tr>
<td>3430-3440</td>
<td>Like the sample at 3420-3430, and many cavings.</td>
</tr>
<tr>
<td>3440-3450</td>
<td>Mainly fragments of greenish-gray marl, and a few fragments of highly microfossiliferous chalky limestone. Many cavings from much higher depths.</td>
</tr>
<tr>
<td>3450-3460</td>
<td>Like the sample at 3440-3450 ft. A few fragments of the highly microfossiliferous chalk contain sandy areas.</td>
</tr>
</tbody>
</table>
Description

Atkinson Formation. Upper Member.

3460-3470
Sandstone, fine-grained, angular, clear quartz, containing glauconite, phosphatic nodules, mica and pyrite, is about 50 percent of the sample. The sandstone also contains fragments of fossil bivalves. Cavings are about 50 percent of the sample.

3470-3480
Sandstone, like the sample at 3460-3470 ft., and abundant fragments of green, thinly flaky shale. Sample contains a few fragile specimens of Planulina eagelfordensis.

3480-3490
Shale, grayish-green, thinly flaky, slightly micaceous, and fragments of very fine and angular grained, micaceous, carbonaceous sandstone that is probably interbedded with the shale.

3490-3500
Shale, like the sample at 3480-3490 ft., and much light-gray, micaceous siltstone that probably occurs as thin lenses in the shale.

3500-3510
Shale, like the sample at 3480-3490 ft., and a little siltstone.

3510-3520
Shale, about 75 percent of sample; soft micaceous siltstone about 25 percent.

3520-3530
No change.

3530-3540
Shale, gray-green, micaceous; also a little soft micaceous siltstone, and very fine grained sandstone, both of which are slightly carbonaceous.

3540-3550
Like the sample at 3530-3540 ft. The shale is more micaceous, and is slightly carbonaceous.

3550-3560
Like the sample at 3540-3550 ft. The shale contains small, crushed, chalky fragments of fossil shells; a few specimens of Planulina eagelfordensis, and very small irregular-shaped nodules of siderite.

3560-3570
Material like the sample at 3550-3560; but contains no determinable fossils. Reddish-brown, irregular-shaped nodules of siderite are common in some fragments of siltstone.

3570-3580
Like the sample at 3560-3570 ft.

Atkinson Formation. Lower Member.

3580-3590
Like the sample at 3560-3570 ft. The shale contains a few molds of macrofossils and fragments of fish bones. The top of the lower member of the Atkinson Formation is placed at 3578 ft. on the basis of electric log correlation. Earlier workers reported a microfauna characteristic of the lower Atkinson at the depth of 3778 ft., but at the time of this study, the samples contained no fossils.

3590-3600
Mainly shale and a little siltstone; no identifiable microfossils or macrofossils.

3603-3623
Core. Recovery?
Top. Sandstone, brownish-gray, hard, calcareous, argillaceous, slightly glauconitic; sample is, in part, a nodular (?) sandy limestone.
Depth (feet)

Middle. Sandstone, tan-gray, moderately hard, highly argillaceous, glauconitic, somewhat micaceous.
Bottom. Sandstone, gray, soft, fine-grained, highly argillaceous, micaceous, glauconitic.

Like cuttings at 3590-3600 ft.
Core. Recovery 4 ft.
Top. Clay, gray, silty, highly micaceous, slightly glauconitic.
Bottom. Like top part of core, but slightly carbonaceous.
No change in cuttings.
No change. A few specimens of Planulina eglefordensis, and a small Gumbelina sp.
No change. No determinable fossils.
Shale and a little micaceous siltstone; also many fragments of moderately soft, moderately fine-grained sandstone.
No sample?
Sandstone, poorly sorted, fine to coarse-grained; green-tinted grains common.
Sandstone, moderately fine to coarse-grained, slightly argillaceous, somewhat glauconitic, about 50 percent of sample; 50 percent grayish-green shale.
Mainly flaky gray-green shale; a little sand and sandstone.
Sand, fine to coarse-grained, and soft sandstone 50 percent of sample; green-tinted grains common; a little feldspar.
Like the sample at 3710-3720 ft.

Ordovician

Lower Ordovician Series
Like sample at 3710-3720 ft. and many fragments of light to dark-red fine-grained quartzite.
No change.
Quartzite, red to light-pink, fine-grained, and moderately hard sandstone. In addition, the sample contains many cavings of grayish-green, flaky, micaceous shale, and gray, micaceous, irregularly carbonaceous siltstone and very fine grained sandstone.
Like the sample at 3750-3760 ft., but very little quartzite.
Shale and sandstone, like the samples from the Atkinson Formation; very little quartzite.
Like the sample at 3770-3780 ft.
Core. Recovery 4 ft.
Sandstone, quartzitic, dense light greenish-gray, fine-grained, irregularly highly micaceous.
Sandstone, quartzitic, light greenish-gray, micaceous, like core at 3845-3855 ft., is about 50 percent of sample. The remainder of the sample is mainly cavings.
Description

3850-3900 Like sample at 3840-3850 ft.
3900-3910 Sandstone, dense, light-green, very fine grained, micaceous; a few fragments of red quartzite, and cavings from the upper Atkinson.
3910-3980 No change.
3980-3990 Like the samples from 3900 to 3980 ft., with the addition of a few fragments of red and reddish-brown quartzite.
3990-4062 T.D. No change.

ECHOLS COUNTY

Operator: Humble Oil & Refining Co. Landowner: Bennett and Langsdale

Well 1 Location: Land District 12, Land Lot 146; 660 ft. south and 666 ft. east of northwest corner of Land Lot 146

GGS. No. 189 Elevation: 181 ft. (derrick floor)

Total depth: 4185 ft. Completed: May 6, 1949

Summary of Stratigraphy

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Thickness (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tertiary</td>
<td></td>
</tr>
<tr>
<td>Paleocene</td>
<td></td>
</tr>
<tr>
<td>In beds containing Tamesí fauna;</td>
<td>?</td>
</tr>
<tr>
<td>1st sample 2700 ft.</td>
<td></td>
</tr>
<tr>
<td>Cretaceous</td>
<td></td>
</tr>
<tr>
<td>Gulf</td>
<td></td>
</tr>
<tr>
<td>Beds of Taylor age</td>
<td>2810</td>
</tr>
<tr>
<td>Beds of Austin age</td>
<td>3050</td>
</tr>
<tr>
<td>Atkinson Formation, upper member</td>
<td>3340</td>
</tr>
<tr>
<td>lower member</td>
<td>3550</td>
</tr>
<tr>
<td>Comanche undifferentiated</td>
<td>3760</td>
</tr>
<tr>
<td>Silurian</td>
<td></td>
</tr>
<tr>
<td>Upper Silurian¹ quartzitic sandstone</td>
<td>4120 total 65 depth</td>
</tr>
<tr>
<td>Diabase intrusion²</td>
<td>4125-4150</td>
</tr>
</tbody>
</table>

¹Bridge, Josiah, and Berdan, J. M. 1951, U.S. Geological Survey open-file report, p. 7 and map, tentatively classified the age of the quartzitic sandstone and dark shale as Early Ordovician. J. M. Schopf (written communication to J. M. Berdan, February 1953; written communication to P. L. Applin, July 1963), U.S. Geological Survey, classified the age of the rocks as Silurian on the basis of "acid resistant" microfossils in the sample at 4171 ft.

Lithologic and paleontologic descriptions of cuttings and cores. Samples are cuttings unless otherwise stated.

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2700</td>
<td>Samples not studied.</td>
</tr>
<tr>
<td>2700-2705</td>
<td>Marl, light-gray, chalky, highly silty, glauconitic, about 50 percent of sample. Fragments of grayish-green shale.</td>
</tr>
<tr>
<td>2705-2710</td>
<td>Mainly silty marl, like sample at 2700-2705 ft., and fragments of hard gray limestone that is probably lenticular in the silty marl. The fauna includes specimens of ostracodes and specimens of the small foraminifer <em>Globigerina triloculina</em>; also specimens of <em>Cibicides</em> sp., <em>Globorotalia velascoensis</em>, and a small <em>Robulus</em> sp.</td>
</tr>
<tr>
<td>2710-2740</td>
<td>Like the sample at 2705-2710 ft., but showing an increase of limestone fragments. No marked change in fauna.</td>
</tr>
<tr>
<td>2745-2790</td>
<td>No change in material.</td>
</tr>
<tr>
<td>2795-2810</td>
<td>Shale, gray, soft, silty, glauconitic, is probably drilled at this level. The microfauna in the samples at 2745-2790 ft. and 2790-2795 ft. includes specimens of <em>Spiroplectammina mexiaensis</em>, <em>Marssonella oxycona</em>, <em>Robulus midwayensis</em>, <em>Nodosaria affinis</em>, <em>Cibicides allenii</em>, <em>Anomalina acuta</em>, and <em>Globigerina pseudobulloides</em>.</td>
</tr>
</tbody>
</table>

Tertiary

In Paleocene Series

Beds containing Tamesi fauna

**Marl, light-gray, chalky, highly silty, glauconitic, about 50 percent of sample. Fragments of grayish-green shale.**

**Mainly silty marl, like sample at 2700-2705 ft., and fragments of hard gray limestone that is probably lenticular in the silty marl. The fauna includes specimens of ostracodes and specimens of the small foraminifer *Globigerina triloculina*; also specimens of *Cibicides* sp., *Globorotalia velascoensis*, and a small *Robulus* sp.**

**Like the sample at 2705-2710 ft., but showing an increase of limestone fragments. No marked change in fauna.**

**No change in material.**

**Shale, gray, soft, silty, glauconitic, is probably drilled at this level. The microfauna in the samples at 2745-2790 ft. and 2790-2795 ft. includes specimens of *Spiroplectammina mexiaensis*, *Marssonella oxycona*, *Planulina dumblei*, *Stensiolina americana*, and others.**

**Chalk, white, hard, somewhat glauconitic; many fragments of *Inoceramus*, other fossil bivalves, and echinoids. Microfauna as in sample at 2810-2815 ft.; many specimens of *Planulina dumblei*.**

**Chalk, white, moderately soft; many *Inoceramus* fragments, and microfauna as in the samples beginning at 2810 ft.**

**Chalk, white, moderately soft; many *Inoceramus* fragments, and microfauna as in the samples beginning at 2810 ft.**

**No change.**

Cretaceous

Gulf Series

**Limestone, white, hard, chalky, glauconitic, somewhat sandy (very fine-grained sand); sample contains fragments of *Inoceramus*, and cavings from higher levels. The fauna contains specimens of *Globotruncanina marginata*, *Marssonella oxycona*, *Planulina dumblei*, *Stensiolina americana*, and others.**

**Chalk, white, hard, somewhat glauconitic; many fragments of *Inoceramus*, other fossil bivalves, and echinoids. Microfauna as in sample at 2810-2815 ft.; many specimens of *Planulina dumblei*.**

**Chalk, white, moderately soft; many *Inoceramus* fragments, and microfauna as in the samples beginning at 2810 ft.**

**Chalk, white, moderately soft; many *Inoceramus* fragments, and microfauna as in the samples beginning at 2810 ft.**

**No change.**
**Description**

**Depth (feet)**  
2855-2860  
Washed residue, small, probably from a soft white chalk, containing fragments of green shale (caving?), abundant *Inoceramus* fragments and prisms. Microfauna similar to preceding Cretaceous samples: *Planulinia dimblei* (common), and many specimens of *Lituola taylorensis* (highest occurrence).

2860-2865  
Material and fauna is similar to the sample at 2855-2860 ft., but sample contains few fragments of *Lituola* sp.

2865-2900  
No change.

2900-2905  
Chalk, white, also fragments of hard gray limestone and soft gray marl that are probably caving. The fauna contains fragments of *Inoceramus*, specimens of *Lituola taylorensis* and other species as in the preceding Cretaceous samples, and specimens of several species of ostracodes.

2905-3910  
Material and fauna like sample at 2900-2905 ft.; about 25 percent of the washed sample is composed of fine to coarse-grained quartz sand (from drilling mud?).

2910-2915  
Like sample at 2905-2910 ft., but with about 50 percent sand.

2915-2920  
Marl, gray, soft, cavings from higher levels, abundant fragments of *Inoceramus*, and specimens of Foraminifera that are mainly, *Planulinia dimblei*, *Globotruncan* cretaceae, and a few fragments of *Lituola taylorensis*.

2920-2925  
Like sample at 2915-2920 ft. and a few fragments of *Kyphopyx* christneri.

2925-2945  
Material and fauna like samples at 2920-2925 ft.

2945-2950  
Washed residue, small. Probably from a soft gray marl, containing *Inoceramus* fragments, specimens of Foraminifera (*Globotruncan* sp. fairly common), and many small nodules of pyrite.

2950-2955  
Like sample at 2945-2950 ft. Specimens of *Robulus* sp. and *Globotruncan* sp. are dominant in the fauna, which contains, also, specimens of *Marginulina austini ana*.

2955-2965  
No change.

2965-2970  
Material and fauna as in immediately preceding samples; also a few specimens of *Psuedogaudryinella capitosa*.

2970-2975  
Like sample at 2965-2970 ft.

2975-2980  
Marl, gray, containing small nodules of pyrite, abundant *Inoceramus* fragments, and specimens of Foraminifera, among which *Globotruncan* sp. and *Robulus* sp. are common.

2980-2990  
No change.

2990-2995  
Material and fauna like sample at 2975-2980 ft., with the addition of specimens of *Citharina wadei*.

2995-3000  
Like sample at 2990-2995 ft. but specimens of *Citharina wadei* absent. Specimens of *Marginulina austini ana* and *Globigerina* sp. fairly common.

3000-3050  
Like sample at 2995-3000 ft. and abundant cavings.
Description

Beds of Austin age

3050-3060  Chalk, white, moderately hard; many fragments contain much very fine calcitic material, and abundant specimens of *Oligostegina*, characteristic of the beds of Austin age. Nodules of pyrite and fragments of *Inoceramus* are common.

3060-3070  No change.

3070-3075  Marl, brownish-gray, soft, is probably drilled at this level. Sample contains many *Inoceramus* fragments, nodules of crystalline pyrite, and cavings. Among the indigenous specimens of Foraminifera, *Globotruncanina marginata* and *Globigerina* sp. are dominant; *Planulina austiniana* and *Gümbelina reussi* are fairly common; specimens of *Valvulineria infrequens* (Austin var.) are present.

3075-3080  Like the sample at 3070-3075 ft.; also fragments of *Citharina texana*.

3080-3085  Not described.

3085-3090  Clay, gray, marly; contains many *Inoceramus* fragments and prisms, nodules of crystalline pyrite, and specimens of species of Foraminifera characteristic of the beds of Austin age.

3090-3100  Clay, gray, marly; contains a few *Inoceramus* fragments, nodules of pyrite, specimens of Foraminifera, and many ostracodes.

3100-3125  No change.

3125-3130  Clay, gray, marly; contains *Inoceramus* fragments and nodules of pyrite. Specimens of *Gümbelina* sp. and *Globigerina* sp. are dominant in the microfauna, which also contains many specimens of *Globotruncanina* sp. and a small *Anomalina* sp.

3130-3230  No change.

3230-3235  Washed residue, small. Contains fragments of gray marly clay, *Inoceramus* fragments, nodules of pyrite, and a few small fragments of dark brownish-gray slightly speckled, marly shale. The microfauna is like that in the sample at 3125-3130 ft.

3235-3240  Two separate samples at this depth.
   a. Like sample at 3230-3235 ft.
   b. Like sample at 3230-3235 ft., with the addition of many fragments of gray, hard, sandy (fine-grained sand) limestone, and fragments of *Ostrea*-like bivalves.

3240-3250  Materials and fauna like sample at 3230-3235 ft.

3250-3255  Core 4. Recovery 4 ft.
   Top. Clay, light-gray, marly slightly micaceous. Washed residue is small and consists of specimens of *Gümbelina* sp. and *Globigerina* sp., many specimens of *Globotruncanina marginata*, *Planulina austiniana* (small), and *Virgulina tegulata*; a few specimens of ostracodes, including *Cythereis dallasensis*.

3255-3265  Core 5. Recovery 3 ft.
   Clay, brownish-gray, marly, light-speckled. The fauna consists
**Description**

of a few fish scales, and specimens of Foraminifera and Ostracoda like sample at 3250-3255 ft.

**Core 6. Recovery 4 ft.**

Top. Chalk, light-gray, moderately hard. The fauna consists of specimens of Foraminifera and Ostracoda like sample at 3250-3255 ft., with the addition of specimens of *Citharina texana.*

Bottom. Like top part of core, but no *C. texana.*

**Core 7. Recovery 5 ft.**

Top. Marl, gray (darker gray than preceding cores), light speckled. No change in fauna.

Bottom. No change.

**Core 8. Recovery 5 ft.**

Top. Marl, gray and brownish-gray, light speckled. No change in fauna.

Bottom. Marl, gray, soft. No change in fauna.

**Core 9. Recovery 4 ft.**

Top. Chalk, white, moderately hard; few specimens of Foraminifera wash free.

Bottom. Marl, dark-gray, highly light-speckled. Microfauna like the preceding core samples.

**Core 10. Recovery 9 ft.**

Top. Chalk, white, moderately hard. No change in fauna.

Middle. Like top of core.

Bottom. Marl, gray and brownish-gray, speckled; contains thin hard lenses composed of masses of calcitized microfossils and microfossil fragments; no change in fauna.

**Core 11. Recovery 10 ft.**

Top 3 ft. Marl, dark brownish-gray, speckled, highly pyritic. No change in fauna.

2nd 3 ft. Chalk, light-gray, moderately hard; contains much calcitized microfossiliferous material (*Inoceramus* prisms and specimens of Foraminifera). *Globigerina* sp. and *Gümbelina* sp. very abundant; also many specimens of *Globotruncanula* sp. typical of the lower part of the Austin chalk.

3d 3 ft. Chalk, white, moderately hard, similar in general character and fauna to the 2nd 3 ft.

Bottom 1 ft. No change.

**Clay, gray, calcareous, and speckled marl. Sample contains many *Inoceramus* fragments, nodules of pyrite, and specimens of Foraminifera like the preceding cores; also a few specimens caving from higher levels.

**Material and fauna like sample at 3310-3320 ft.; also a few fragments of very fine grained, somewhat glauconitic, calcareous sandstone that contains specimens of many small foraminiferal species like those mentioned in preceding cores.
Description

Core 13. Recovery 10 ft.

Top 1 ft. Clay, shaly, gray, soft, silty. Sample contains small nodules of glauconite, a few nodules of pyrite, and many specimens of Foraminifer. Specimens of a small Globigerina sp. and a small Planulina sp. are common; specimens of Gumbelina sp. are in the fauna, though not abundant.

2nd 2 ft. Marl, gray, containing a very large amount of Inoceramus prisms and calcitized molds of specimens of Foraminifer. Common forms are: Globigerina sp., Globotruncanum sp. (lower Austin form), Gumbelina sp., and a few Planulina sp., like the top part of the core.

3d 4 ft. Marl, light-gray, chalky, like the preceding part of the core in character and fauna.

Bottom 3 ft. Marl, gray, highly microfossiliferous, somewhat white speckled. No change in fauna.


Top 5 ft. Marl, gray, soft. Fauna composed of Inoceramus prisms and specimens of Globigerina sp. and Gumbelina sp.

2nd 4 ft. Marl, gray, sandy (medium-grained to moderately coarse-grained sand). Phosphatized fragments of fish bones common. Washed residue large; composed of 50 percent sand and 50 percent Inoceramus prisms and specimens of Foraminifer. Fauna like core 13 at 3320-3330 ft., and a few specimens of Planulina eaglefordensis and Cythere is eaglefordensis.

Atkinson Formation. Upper Member.

Bottom 1 ft. Marl, gray, soft, sandy, like top part of core, and gray, hard, sparsely sandy limestone containing fragments of fossil bivalves. The limestone marks the top of the upper member of the Atkinson Formation.

Core 15. Recovery 4 ft.

Top 2 ft. Sandstone, white, hard, fine to medium-grained, calcareous, highly pyritic; contains phosphatic fragments and fragments of fossil bivalves.

2nd 1 ft. Sandstone, white, hard, medium to coarse-grained, calcareous, pyritic; contains fragments of phosphatized fish bones, and fragments of fossil bivalves.

Bottom 1 ft. Sandstone, light-gray, hard, calcareous, very fine grained, and sandy limestone, containing many shell fragments, a little phosphatic material, a trace of fine-grained, bright-green glauconite, a trace of mica, and a few specimens of ostracodes.

Core 16. Recovery 3 ft.

Top ½ ft. Siltstone, light-gray, moderately soft, micaceous, slightly glauconitic; contains fragments of Ostrea sp. (common), and fragments of phosphatized fish bones. Washed residue contains much fine to medium-grained quartz sand.
Description

2nd ½ ft. Sandstone, light-gray, hard, calcareous, and sandy limestone; contains abundant shell fragments, and is irregularly micaceous and somewhat phosphatic.

Bottom 2 ft. Sandstone, light-gray, fine-grained; calcareous, micaceous; contains many shell fragments and phosphatized fragments of fish bones.

3350-3355 Core 17. Recovery 2 ft.
Top ½ ft. Shale, gray-green, flaky, slightly silty; contains phosphatic fragments, shell fragments, and a few specimens of ostracodes.

Bottom 1½ ft. Siltstone, light-gray, soft, micaceous, calcareous; contains fairly common specimens of several species of ostracodes, and specimens of Valvulineria infrequens (Eagle Ford variety), and of a very small Gümbelina sp.

3358-3362 Core 19. Recovery?
Washed sample is very fine grained sandstone and a few shell fragments.

3362-3367 Core 20. Recovery 5½ ft.
Top. Sand, fine to medium-grained quartz; containing many worn and broken shell fragments, a few phosphatic nodules, and a few specimens of ostracodes.

Bottom. Sandstone, fine to medium-grained, soft, quartz, containing many worn and broken shell fragments (Ostrea? sp.), pyrite, a trace of glauconite, mica and phosphatic material.

3367-3372 Core 21. Recovery 5 ft.
Top. Clay, light greenish-gray, soft, sandy, micaceous; contains a few shell fragments and phosphatic nodules.

Bottom. Shale, greenish-gray, soft, sandy (fine-grained sand), slightly glauconitic.

3372-3377 Core 22. Recovery 5 ft.
Top. Like bottom part of Core 21 at 3367-3372 ft.

Bottom. Clay, light greenish-gray, sandy (fine to medium-grained sand), micaceous, slightly glauconitic, somewhat phosphatic.

3375-3380 Sand, light-gray, fine-grained, and shale; contains many shell fragments, many bryozoan fragments, specimens of Foraminifera from younger beds, a few fragments of light-green shale, and a little glauconite.

3380-3390 No change.

3390-3395 Like sample at 3375-3380 ft. The microfauna contains specimens of Foraminifera that have caved from various levels, but also contains specimens of species that are typical of the upper member of the Atkinson Formation. Common species are: Gümbelina sp. (small), Valvulineria infrequens (Eagle Ford variety), and small specimens of Planulina eagefordensis.

3395-3400 Like sample at 3390-3395 ft. Sample composed, mainly, of frag-
**Description**

ments of *Ostrea* sp., bryozoan fragments, a few fragments of fine-grained, micaceous sandstone, and a few specimens of Foraminifera caving from the beds of Austin age.

3400-3420 No change.

3420-3425 Sample composed of shell fragments, bryozoan fragments, loose sand, and micaceous sandstone; also many fragments of white, sandy limestone, containing many embedded shell fragments.

3425-3430 Like the sample at 3420-3425 ft.

3430-3435 Dominant materials in the sample are about 50 percent fine to moderately coarse grained sand, and fragments of white, irregularly sandy, macrofossiliferous limestone reported in the sample at 3420-3425 ft. Sample also contains bryozoan fragments, shell fragments, phosphatic nodules, and a few fragments of sandstone.

3435-3475 No change.

3475-3480 Like sample at 3430-3435 ft., but fragments of white, fine to medium-grained, glauconitic, micaceous sandstone are slightly more common. Sample also contains a few fragments of flaky green shale.

3480-3500 No change.

3500-3505 Sandstone, white, medium-grained, calcareous, somewhat glauconitic and phosphatic; contains many fragments of *Ostrea* sp. and a small *Gryphea*. Loose sand and shell fragments compose about 75 percent of the sample.

3505-3555 No change.

**Atkinson Formation. Lower Member.**

The top of the lower member of the Atkinson Formation is placed at 3550 ft. on the basis of electric log correlation supported by the samples.

3555-3560 Sample is composed mainly of loose sand and abundant shell fragments, but also contains many fragments of light-tan, hard, sandy limestone in which shell fragments are embedded.

3560-3570 No change.

3570-3575 Washed sample, composed mainly of sand and shell fragments.

3575-3580 Washed sample, small; composed of fragments of gray, micaceous siltstone; fragments of the sandy, fossiliferous limestone reported in sample at 3555-3560 ft.; a little loose sand; and phosphatic nodules. The material drilled at this level is probably siltstone and soft, greenish-gray shale, a few fragments of which are in the sample.

The sample contains specimens of arenaceous species of Foraminifera, among which are specimens of *Ammobaculites stephensoni*.

3580-3585 No change.
**Description**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3585-3590</td>
<td>No change in material, but no specimens of arenaceous Foraminifera observed.</td>
</tr>
<tr>
<td>3590-3595</td>
<td>No change in material but contains specimens of <em>Ammobaculites stephensoni</em>; specimens of <em>Planulina eglefordensis</em>, and some other species that are probably caving from higher levels.</td>
</tr>
<tr>
<td>3595-3605</td>
<td>No change.</td>
</tr>
<tr>
<td>3605-3610</td>
<td>Washed sample, small; composed of fragments of grayish-green shale, a little loose sand, and a few shell fragments. The microfauna contains specimens of <em>Ammobaculoides plummerae</em> and <em>Ammobaculites adventus</em>.</td>
</tr>
<tr>
<td>3610-3620</td>
<td>No change.</td>
</tr>
<tr>
<td>3620-3625</td>
<td>Washed sample, small; composed of greenish-gray and light-brown, somewhat micaceous shale. Shell fragments and sparse specimens of Foraminifera are probably caving.</td>
</tr>
<tr>
<td>3625-3630</td>
<td>Material like sample at 3620-3625 ft.; specimens of Foraminifera like sample at 3605-3610 ft.</td>
</tr>
<tr>
<td>3630-3660</td>
<td>No change.</td>
</tr>
</tbody>
</table>
| 3660-3665   | Core 23. Recovery 1 ft.  
Shale, olive-gray, flaky, slightly micaceous; contains a few small reddish-brown, irregular-shaped nodules of siderite, and a few specimens of Ostracodes. |
| 3665-3670   | Core 24. Recovery 5 ft.  
Top 1 ft. Shale, gray, flaky, containing irregular streaks of light-gray, micaceous silt.  
2nd 1 ft. Material like top 1 ft.  
Washed residue, small; composed of fragments of shale and siltstone, and abundant small, irregular-shaped nodules of siderite. The microfauna contains specimens of *Ammobaculites compri- natus*, *Trochammina rainwateri*, specimens of small *Globigerina* sp., small *Planulina* sp. (related to *P. eglefordensis*), and small *Gumbelina* sp.  
3d 1 ft. Shale, olive-gray, micaceous, and a little siltstone, containing a few small irregular-shaped nodules of siderite, a few comatulid fragments, and specimens of Foraminifera like preceding part of core.  
4th 1 ft. Shale, gray, slightly micaceous, containing a few silty areas. No change in microfauna.  
Bottom 1 ft. No change. |
| 3670-3680   | Core 25. Recovery 10 ft.  
Top 3½ ft. Shale, gray, micaceous; almost no washed residue.  
Middle 3½ ft. Shale, like top part of core, and a little siltstone. Fauna like core 24 at 3665-3670., and in addition, many specimens of *Ammobaculoides plummerae*.  
Bottom 3 ft. Unaccounted for. |
Description

Core 26. Recovery 10 ft.
Top 1 ft. Shale, gray, flaky.
2nd 1 ft. Shale, gray, micaceous, somewhat carbonaceous, containing lenses of siltstone and very fine grained micaceous sandstone.
3d 2 ft (?). No sample?
4th 4 ft. Shale, gray.
Bottom 2 ft. Shale, gray, flaky, containing lenses of light-gray, micaceous siltstone. The shale contains scattered specimens of very minute dwarf species of Foraminifera.

Core 27. Recovery 10 ft.
Top 1 ft. Shale, gray, and gray, hard, silty clay. Washed sample. Sand, fine to coarse-grained, quartz, worn and broken shell fragments, and phosphatized bone fragments.
2nd 2 ft. Sandstone, gray, very fine grained, calcareous, micaceous, slightly glauconitic, containing abundant specimens of small Güm belina sp. and small Planulina sp., a few specimens of ostracodes, and small fragments of shells. Thin lenses of gray shale contain specimens of Ammobaculites agrestis, and two species of Güm belina.
3d 2 ft. Sandstone, very fine-grained, calcareous, micaceous, slightly glauconitic, containing shell fragments, and phosphatic material.
4th 3 ft. Clay, gray, sandy (fine-grained sand). Washed sample. Sand, fine-grained, containing many shell fragments, echinoid spines, nodules of pyrite, and many specimens of species of Foraminifera characteristic of the so-called “Barlow” fauna. Common species are: Ammobaculites agrestis, A. advenus. Haplophragmoides langs dalensis, Trochammina rainwateri, Citharina kochi, Placopilina langs dalensis, Quinqueloculina lirellangula, Marsonella cf. M. elisiorae, Ammobaculites juncoeus, Globigerina sp., Nodosaria sp., Discorbis cf. D. minima; several species of ostracodes also common
Bottom 2 ft. Siltstone, gray, micaceous; gray, micaceous shale; soft, argillaceous, medium to coarse-grained sandstone; a little glauconite; a few fragments of worn shells; a few phosphatic nodules. The lenses of shale contain many small, irregular-shaped nodules of siderite and of glauconite, fine-grained sand, and a few small specimens of Ammobaculites.

Core 28. Recovery 10 ft.
Top 3 ft. Shale, gray, slightly micaceous, containing lenses of gray, very fine grained, calcareous sandstone. The sandy lenses contain the “Barlow” fauna described in the 4th 3 ft. of Core 27 at 3690-3700 ft., with slight difference in the species. Globi-

Description

*gerina* sp. is common in this sample, and *Ammobaculoides plummerae* is fairly abundant.

Middle 3 ft. Shale; gray; lenses of gray, highly sandy (fine-grained sand), micaceous shale, and of hard, very fine grained, calcareous sandstone. The sample contains shell fragments; fish teeth; specimens of several species of ostracodes; many specimens of *Globigerina* sp.; and a few specimens of other species of Foraminifera common in the "Barlow" fauna.

3d 2 ft. Shale, gray, containing scattered silty and sandy (very fine grained sand) areas; many small shell fragments; phosphatized fish bones; a trace of glauconite and mica; many specimens of Ostracodes; and a few specimens of *Globigerina* sp. and other Foraminifera common in the "Barlow" fauna.

Bottom 2 ft. Sandstone, gray, very fine grained, micaceous, argillaceous, or highly sandy shale containing thin lenses of light-gray, hard, fine-grained, calcareous, slightly glauconitic sandstone, in which pyritic areas and small fragments of carbonaceous material are fairly common. Some lenses of shale contain a few specimens of ostracodes, small fragments of shells, and a few specimens of Foraminifera.

3710-3720 Core 29. Recovery 3 ft.
Top 2 ft. Limestone, gray, hard, sandy, argillaceous. The sand is medium-grained, and seems to be evenly distributed in the fragments of limestone. Softer parts of the core contain very fine grained argillaceous sand, mica, and a little glauconite.

Bottom 1 ft. Shale, dark-gray, thinly laminated.

3720-3730 Core 30. Recovery 10 ft.
Top 2 ft. Clay, gray, soft, sandy (fine to medium-grained sand), micaceous; contains some coarse grains of sand and a few phosphatic nodules.

2nd 4 ft. Shale, gray, somewhat micaceous and glauconitic; a few small worn shell fragments.

3d 2 ft. Shale, gray, containing a little fine-grained sand and glauconite.

Bottom 2 ft. Clay, gray, soft, highly arenaceous. The sand is fine to very coarse grained quartz, in general, but some grains are about the size of small pebbles. A few shell fragments and phosphatic nodules are in the sample.

3730-3740 Core 31. Recovery 5 ft.
Top 2 ft. Sand, gray, soft, highly argillaceous, containing lenses of buff-gray, sandy, slightly glauconitic limestone. The sand is poorly sorted, fine to coarse-grained, and composes about 50 percent of the sample. A few shell fragments are in the sample.

Bottom 3 ft. Sandstone, gray, highly argillaceous. The sand is fine to very coarse grained; coarse to very coarse grains are common. The sample contains a few shell fragments and a few phosphatic nodules.
Depth (feet) | Description
--- | ---
3740-3750 | Core 32. Recovery 5 ft. Sandstone, light-gray, soft, argillaceous. The sand is poorly sorted, fine to coarse-grained, roughly angular, slightly etched; contains a few pink-tinted grains.
3755-3765 | Core 34. Recovery 11 ft. Top 2 ft. Clay, greenish-gray, irregularly red-streaked, micaceous, sandy (fine to medium-grained sand), and a few fragments of brownish-red waxy shale.
3765-3775 | Core 35. Recovery 8 ft. Top 4 ft. Sandstone, dull-red, argillaceous, micaceous, moderately coarse grained. The sand grains are roughly angular, etched quartz and a little feldspar; the mica is biotite and muscovite. Bottom 4 ft. Clay, dull-red and greenish-yellow mottled, silty to sandy (fine-grained sand), micaceous.
3775-3780 | Sand, coarse to very coarse grained, quartz, and a little feldspar; many grains red-tinted.
3780-3880 | No change.
3880-3890 | Sand, like sample at 3775-3780 ft., and a few fragments of dark-red clay shale.
3890-3900 | Sand, very coarse grained, quartz, (many amber-tinted grains), and a little feldspar; a few fragments of red shale.
3900-3930 | No change.
3930-3940 | Sand, very coarse grained, quartz, and feldspar; many of the grains are amber-tinted and pink-tinted; a little mica.
3940-3990 | No change.
3990-4000 | Sand, fine to very coarse grained, and a little feldspar; many grains are amber-tinted.

**Comanche Series undifferentiated**

The top of the Comanche is placed at 3760 ft. on the basis of samples and electric log correlation.

2nd 5½ ft. Clay, dull-red and greenish-gray mottled, waxy, micaceous, highly sandy. Washed sample contains fragments of gray and dull purplish-red sandy clay, and fine to coarse grains of sand washed from the clay; also flakes of biotite and muscovite. Bottom 3½ ft. Clay, light greenish-gray, waxy, irregularly sandy, micaceous. The clay shows irregularly stained red and mustard-yellow areas probably caused by oxidation of iron minerals.
<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4000-4010</td>
<td>No change.</td>
</tr>
<tr>
<td>4010-4020</td>
<td>Sand, coarse to very coarse grained quartz, and a little feldspar; many grains are amber-tinted and pink-tinted; also a few fragments of “basement” rocks.</td>
</tr>
<tr>
<td>4020-4120</td>
<td>Like sample at 4010-4020 ft., and a few fragments of weathered Paleozoic shale.</td>
</tr>
</tbody>
</table>

**Silurian**  
*Upper Silurian Series*

| 4120-4127   | Sand, like sample at 4020-4120 ft., and fragments of red and gray mottled, thinly laminated shale that are probably from the weathered surface of the Paleozoic sedimentary rocks. |
| 4130-4135   | Cuttings of diabase, and cavings from higher levels. |
| 4135-4140   | Diabase fragments, mainly, and a few fragments of the weathered (?) Paleozoic rocks. |
| 4140-4145   | Like sample at 4135-4140 ft., with the addition of fragments of dark brownish-gray, hard, material (resembles dolomitic limestone) attached to fragments of diabase; a few fragments of dark-gray shale (Paleozoic). |
| 4145-4150   | Not described or no sample. |
| 4150-4155   | Diabase, like preceding samples, many fragments of reddish (weathered (?) Paleozoic) shale, and a few fragments of black shale (Paleozoic). |
| 4155-4160   | Sandstone, gray, quartzitic, extremely fine-grained, a little black shale, and cavings. |
| 4160-4165   | Diabase, quartzitic sandstone, and a little black shale. |
| 4169-4170   | Core 36. Recovery 1 ft.  
Bottom ½ ft. Quartzite, gray, and thin lenses of black shale. |
| 4170-4185   | T.D. Paleozoic sedimentary rocks. |

**LOWNDES COUNTY**

Owner: U.S. Government (War Department) well 3  
Location: 3 mi. southeast of Base (Moody Field) at Ordnance Site  
GGS. No. 182  
Elevation: 202 ft.  
Total Depth: 248 ft.  
Completed:

*Publication of this data is authorized by the Sun Oil Company, for whom the report was prepared on a commercial basis.*
Summary of Stratigraphy

Tertiary

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Thickness (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miocene undifferentiated</td>
<td>5</td>
</tr>
<tr>
<td>lower, Tampa Limestone</td>
<td>165</td>
</tr>
</tbody>
</table>

Oligocene

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Thickness (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>upper, Suwannee Limestone</td>
<td>190 to 15</td>
</tr>
</tbody>
</table>

Lithologic and paleontologic description of cuttings and cores. Samples are cuttings unless otherwise stated.

Description

Tertiary

Miocene Series undifferentiated

- 5 ft. Clay, red, highly sandy.
- 10 ft. Like sample at 5 ft.
- 20 ft. Clay, pinkish-tan sandy.
- 30 ft. Sand, clear quartz, iron-stained, coarse; rounded grains. Sample contains nodules of limonite that were probably embedded in red clay.
- 34 ft. Clay, yellowish-tan, highly sandy (coarse-grained sand).
- 37 ft. Like sample at 34 ft.
- 50 ft. Like sample at 45 ft., and many white, moderately soft, polished nodules.
- 55 ft. Like sample at 50 ft.
- 60 ft. Like sample at 55 ft., but much less sandy.
- 70 ft. Clay, light-gray, sandy (fine-grained sand).
- 75 ft. Clay, cream, highly sandy (very fine-grained sand); contains a trace of carbonaceous material.
- 80 ft. Clay, light-tan, highly sandy, sticky.
- 85 ft. Clay, white, highly sandy, sticky.
- 90 ft. Sand, white, moderately fine-grained, argillaceous.
- 95 ft. Like sample at 90 ft.
- 100 ft. Clay, white, highly sandy; some fragments show dendritic markings.
- 105 ft. Like sample at 100 ft.
<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>110</td>
<td>Like sample at 100 ft.</td>
</tr>
<tr>
<td>115</td>
<td>Clay, white, highly sandy, sticky.</td>
</tr>
<tr>
<td>120</td>
<td>Clay, white, sandy, containing nodules of light-green, unctuous clay.</td>
</tr>
<tr>
<td>125</td>
<td>Sand, clear quartz, containing nodules of white sandy clay.</td>
</tr>
<tr>
<td>130</td>
<td>Clay, greenish-white, highly sandy.</td>
</tr>
<tr>
<td>135</td>
<td>Clay, white and light-brown, sticky, somewhat sandy.</td>
</tr>
<tr>
<td>140</td>
<td>Sand, clear quartz, uneven-grained. The sample contains many nodules of white clay, and a few worn fragments of shells of fossil bivalves.</td>
</tr>
<tr>
<td>145</td>
<td>Sand, clear quartz, uneven-grained, and a few nodules of white sandy clay.</td>
</tr>
<tr>
<td>150</td>
<td>Like sample at 145 ft.</td>
</tr>
<tr>
<td>155</td>
<td>Like sample at 145 ft., and a few cream, sandy, calcareous nodules.</td>
</tr>
<tr>
<td>160</td>
<td>Like sample at 155 ft.</td>
</tr>
</tbody>
</table>

**Lower Miocene. Tampa Limestone.**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>165</td>
<td>Limestone, white, moderately hard, chalky, slightly sandy, containing echinoid fragments, fragments of fossil bivalves and crab claws, and fragmentary sections of Sorites? sp.</td>
</tr>
<tr>
<td>170</td>
<td>Like sample at 165 ft.</td>
</tr>
<tr>
<td>175</td>
<td>Sand, chalky; a small sample.</td>
</tr>
<tr>
<td>180</td>
<td>Limestone, tan, hard, somewhat sandy.</td>
</tr>
<tr>
<td>185</td>
<td>Limestone, reddish-tan, hard, somewhat sandy.</td>
</tr>
</tbody>
</table>

**Oligocene Series**

**Upper Oligocene. Suwannee Limestone.**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>190</td>
<td>Limestone, white, moderately hard, chalky; also fragments of tan, slightly sandy limestone, and a little unconsolidated clear quartz sand.</td>
</tr>
<tr>
<td>195</td>
<td>Like sample at 190 ft.</td>
</tr>
<tr>
<td>200</td>
<td>Limestone, light-cream. The cuttings are nodular, seem to be somewhat water-worn, and contain vague traces of impressions of fossil fragments. The sample also contains a few fragments of partially dolomitized limestone, and cavings from higher levels.</td>
</tr>
<tr>
<td>205</td>
<td>Limestone, white, hard, containing traces of fossils. The sample also contains fragments of brown dolomitic limestone, cavings from higher levels, and a few calcitized specimens of Rotalia cf. R. byramensis.</td>
</tr>
</tbody>
</table>
MITCHELL COUNTY

Operator: Stanolind Oil & Gas Co.  GGS. No. 109  
Location: Land District 10, Land Lot  
133, 700 ft. south of north line, and  
700 ft. west of east line of Land Lot  
133  
Total Depth: 7490 ft.  
Completed: Aug. 14, 1944

Summary of Stratigraphy

Tertiary

In Eocene
lower  Beds of Wilcox age;  
1st sample 1335 ft.

Paleocene
Clayton Limestone  1560  130

Cretaceous

Gulf
Beds of Navarro age  1690  220  
Beds of Taylor age  1910  440  
Beds of Austin age  2350  480  
Atkinson Formation, upper member  2830  530
lower member  3360  280

Comanche undifferentiated  3640  2580

Triassic(?)

Upper Triassic(?)
Newark (?) Group  6220 (?) total 1270

Lithologic and paleontologic description of cores  
and cuttings. Samples are cuttings unless other-
otherwise stated.

Description

Tertiary
In Eocene

Lower Eocene. Beds of Wilcox age.

1335-1350  Limestone, white, chalky, underlies a sequence of glauconitic sand  
and gray glauconitic clay. The sample is probably in the Salt  
Mountain Limestone, the top of which is at about 1320 ft. as  
suggested by the electric log of the Pullen well. Specimens of
## Logs of Selected Wells in the Coastal Plain of Georgia

### Description

*Discocyclina weaveri* occur in the other samples of the limestone, although none were observed in this sample.

<table>
<thead>
<tr>
<th>Depth</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1350-1560</td>
<td>Samples not described.</td>
</tr>
</tbody>
</table>

### Paleocene

**Clayton Limestone**

<table>
<thead>
<tr>
<th>Depth</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1560-1575</td>
<td>The top of the Clayton Limestone is at about 1560 ft. on the basis of the electric log of the Pullen well. This sample contains the highest occurrence of white, hard, rough-textured limestone.</td>
</tr>
<tr>
<td>1575-1590</td>
<td>No samples.</td>
</tr>
<tr>
<td>1590-1605</td>
<td>Limestone, white, hard, chalky, and abundant fragments of grayish-brown chert. The sample contains a few specimens of <em>Anomalina alleni</em>.</td>
</tr>
<tr>
<td>1605-1620</td>
<td>Limestone, white, hard, chalky (composed of very small chalky fragments), and abundant fragments of chert. The sample contains some specimens of Foraminifera indicative of the Clayton Limestone. Same to:</td>
</tr>
<tr>
<td>1680-1695</td>
<td>Limestone, somewhat sandy (fine-grained sand) and slightly glauconitic; chert is abundant and seems to occur in streaks in the limestone. Specimens of <em>Anomalina vulgaris var.</em>, <em>A. alleni</em>, and other forms typical of the Clayton Limestone are common in the sample. Beds of Midway age seem to overlie the Clayton Limestone, inasmuch as specimens of <em>Vaginulina robusta</em> occur in cavings in this sample.</td>
</tr>
</tbody>
</table>

### Cretaceous

**Gulf Series**

**Beds of Navarro age**

The top of the beds of Navarro age is placed at 1690 ft. on the basis of lithologic data and electric log characteristics. The highest occurrence of specimens of Foraminifera that definitely indicate the Cretaceous age of the beds is at 1800 ft. The highest occurrence of *Globotruncana area* is in the sample at 1815-1830 ft.

<table>
<thead>
<tr>
<th>Depth</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1695-1710</td>
<td>Samples not described.</td>
</tr>
<tr>
<td>1710-1725</td>
<td>Clay, dark brownish-gray, marly, occurs in this sample and increases in abundance in the samples just below this depth.</td>
</tr>
<tr>
<td>1725-1845</td>
<td>Samples not described.</td>
</tr>
<tr>
<td>1845-1860</td>
<td>The microfauna in this sample contains specimens of species characteristic of the beds of Navarro age; <em>Pseudogümbelina costulata</em>, <em>Anomalina pseudopapillosa</em>, <em>Globotruncana cretacea</em>, <em>Pseudoclavulina clavata</em>.</td>
</tr>
<tr>
<td>1860-1870</td>
<td>Limestone, light-gray, hard, very finely glauconitic, sandy (fine-grained sand), occurs in this sample and in the sample at 1845-1860 ft. The microfauna is sparse and Navarro in character.</td>
</tr>
</tbody>
</table>
Description

Beds of Taylor age

The top of the beds of Taylor age is placed at 1910 ft. on the basis of electric log characteristics.

1905-1920
Material like the sample at 1860-1870 ft. The sample contains one specimen of *Planulina dumbeii*, many specimens of *Anomalinoidea pinguis*, and a few fragments *Bolivinoides decorata*.

1920-1935
Like sample at 1905-1920 ft., with the addition of specimens of *Lituola taylorensis* (common).

1935-1950
Like sample at 1920-1935 ft., and some fragments of light-green bentonite.

1950-1965
Sandstone, gray, hard, fine-grained, calcareous; specimens of *Lituola taylorensis* are common.

1965-1980
Shale, gray, composes most of a very small sample. The sample contains some *Inoceramus* prisms and a few specimens of *Heterostomella americana*.

1980-1995
Like sample at 1965-1980 ft. Fragments of *Inoceramus* are common.

1995-2010
The microfauna in this sample contains specimens of species characteristic of the beds of Taylor age; *Planulina texana, Gyroidina umbilicata, Globorotalites conicus, Bolivina incrassata, Bulimus carseae*.

2010-2025
No sample.

2025-2040
Sample is mainly cavings from higher levels. Some specimens of *Stensioina americana* are in the sample but these may have caved, as the species usually occurs at or near the top of the beds of Taylor age.

2040-2295
Samples not described.

2295-2310
Sandstone, extremely fine-grained, calcareous; micaceous, containing abundant fragments of *Inoceramus*, many nodules of pyrite, and some fragments of gray, micaceous marl. The microfauna is a mixture of specimens from several stratigraphic units but includes specimens of *Planulina taylorensis* and other Taylor species.

2310-2325
Like sample at 2295-2310 ft., but marly shale fragments are dominant in the relatively small sample. The microfauna contains species of Foraminifera that are characteristic of the beds of Taylor age.

2325-2370
Like sample at 2310-2325 ft.

Beds of Austin age

The top of the beds of Austin age is placed at 2350 ft. on the basis of electric log correlation.
### Description

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2370-2385</td>
<td>Similar to sample at 2310-2325 ft., but the material is somewhat harder, more calcareous, and leaves a larger, washed residue. The fauna is also similar to that in the samples below 2310 ft., but contains a few specimens of <em>Pseudoclavulina clavata</em> and <em>Heterostomella austiniana</em>.</td>
</tr>
<tr>
<td>2385-2400</td>
<td>Like samples at 2370-2385 ft., and containing <em>Globorotalites umbilicatus</em> and <em>Gaudryiná austiniana</em>.</td>
</tr>
<tr>
<td>2400-2460</td>
<td>Samples not described.</td>
</tr>
<tr>
<td>2460-2475</td>
<td>Clay, dark-gray, soft, marly, containing specimens of <em>Pseudogaudryinella capitosa</em>, <em>Planulina dumbeii</em>, <em>Globotruncaná arca</em>, and <em>Globorotalites conicus</em>.</td>
</tr>
<tr>
<td>2475-2505</td>
<td>Samples not described.</td>
</tr>
<tr>
<td>2505-2520</td>
<td>Clay, dark-gray, soft, marly, containing specimens of <em>Globorotalites umbilicatus</em>.</td>
</tr>
<tr>
<td>2520-2580</td>
<td>Samples not described.</td>
</tr>
<tr>
<td>2580-2595</td>
<td>Sandstone, gray, extremely fine grained, glauconitic, calcareous, micaceous, and some fragments of gray, flaky, marly, micaceous shale. The sample contains many fragments of <em>Inoceramus</em> and of <em>Ostrea</em> sp. The microfauna is largely a mixture of specimens that caved from higher levels, but contains some specimens of species that are characteristic of the beds of Austin age.</td>
</tr>
<tr>
<td>2595-2610</td>
<td>Like sample at 2580-2595 ft.</td>
</tr>
<tr>
<td>2610-2685</td>
<td>No change.</td>
</tr>
<tr>
<td>2685-2700</td>
<td>Shale, brownish-gray, marly, a few fragments of gray, fine-grained sandstone, and many fragments of <em>Inoceramus</em>. The foraminiferal fauna is chiefly a mixture of specimens that caved from higher levels, but contains a few specimens of species that are characteristic of the beds of Austin age.</td>
</tr>
<tr>
<td>2700-2730</td>
<td>No change.</td>
</tr>
<tr>
<td>2730-2745</td>
<td>Like sample at 2685-2700 ft., with the addition of fragments of light-cream, hard, dense, sandy (fine-grained, sand) limestone.</td>
</tr>
<tr>
<td>2745-2760</td>
<td>Like sample at 2730-2745 ft., but showing an increase in the amount of fragments of sandy limestone. The fauna is a mixture of specimens of Foraminifera from higher levels, including species characteristic of the beds of Austin age.</td>
</tr>
<tr>
<td>2760-2785</td>
<td>The sample is composed, mainly, of gray marly shale and a small amount of sandy limestone. The fauna is similar to that in the sample at 2745-2760 ft.</td>
</tr>
<tr>
<td>2785-2790</td>
<td>No sample.</td>
</tr>
<tr>
<td>2790-2805</td>
<td>Shale, gray, flaky, marly, and a few fragments of greenish-gray marly shale. The foraminiferal fauna is a mixture of specimens from various higher levels, but Austin forms, especially <em>Citharina texana</em> are very abundant.</td>
</tr>
<tr>
<td>2805-2830</td>
<td>No change, except that specimens of <em>Citharina texana</em> are much less abundant.</td>
</tr>
</tbody>
</table>
Description

Atkinson Formation. Upper Member.

2830-2850 Shale, dominantly greenish-gray, and some gray shale. The shale contains small, brown, granular, irregular-shaped nodules of siderite. Specimens of *Pleurostomella watersi* and *Valvulineria infrequens* (Eagle Ford variety) are present. The samples from 2830 to 2895 ft. are characteristic of the deep-water marine facies of the upper member of the Atkinson Formation.

2850-2865 Sample not described.

2865-2880 Like sample at 2830-2850 ft.; contains specimens of *Gaudryina* cf. *G. bosquensis*.

2880-2895 Like sample at 2830-2850 ft.; contains in addition, specimens of *Ammobaculites* sp., characteristic of the Eagle Ford Shale in Texas.

2895-2900 Sandstone, quartz, light-gray to white, fine-grained, containing many fragments of *Ostrea* sp., and some fish bones, glauconite, and mica. The samples from 2895 to about 3360 ft. are characteristic of the shallow-water marine facies of the upper member of the Atkinson Formation. The depth of 2895 ft. is probably the top of the Tuscaloosa Formation of some geologists.

2900-2910 No sample.

2910-2925 Like sample at 2895-2900 ft., with the addition of fragments of flaky, smooth, green shale.

2925-2940 Shale, gray, flaky, fragments of green shale, fragments of *Ostrea* sp., and fragments of light-gray, micaceous, glauconitic sandstone which also contains phosphatic material and fish bones.

2924-2933 Core. Recovery?

Sand, clear quartz, fine-grained, well-sorted, containing a little mica and some tan-gray flaky clay. The clay contains small fragments of carbonaceous material.

2933-2943 Core. Recovery?

Top. Shale, bluish-green, thinly flaky, containing a few sandy and pyritic flakes, small fragments of brown and black carbonaceous material, a little mica, and a trace of blue-green glauconite. No specimens of Foraminifera were observed.

Middle. Like top part of core.

Bottom. Sandstone, light-greenish-gray, fine-grained, highly micaceous, containing inclusions of flaky green shale and small fragments of carbonaceous material that is highly pyritic in small scattered areas.

2940-2955 Shale, green, flaky and many cavings from higher levels.

2955-2970 Like sample at 2940-2955 ft., and many fragments of *Ostrea* sp. that are probably cavings.

2970-2985 Shale, flaky, many fragments of *Ostrea* sp., and fragments of white, fine-grained, well-sorted sandstone that contains a little light-green glauconite, mica, and a few fragments of *Ostrea* sp.
<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2985-3060</td>
<td>No change.</td>
</tr>
<tr>
<td>3060-3075</td>
<td>Like sample at 2970-2985 ft. and in addition, many moderately large fragments of brown, fibrous, carbonaceous material.</td>
</tr>
<tr>
<td>3075-3120</td>
<td>No change.</td>
</tr>
<tr>
<td>3120-3135</td>
<td>Shale, flaky, and sandstone as described in the immediately preceding sample. The sample also contains fragments of oyster shells and large grains of quartz.</td>
</tr>
<tr>
<td>3135-3150</td>
<td>No sample.</td>
</tr>
<tr>
<td>3150-3160</td>
<td>Like sample at 3120-3135 ft., and also very coarse grains of quartz and some grains of pink feldspar.</td>
</tr>
<tr>
<td>3160-3210</td>
<td>No change.</td>
</tr>
<tr>
<td>3210-3225</td>
<td>Like sample at 3150-3160 ft., about 50 percent, and about 50 percent fragments of dark-brown carbonaceous material.</td>
</tr>
<tr>
<td>3225-3255</td>
<td>No change.</td>
</tr>
<tr>
<td>3255-3270</td>
<td>Shale, greenish-gray, and some bluish-green shale; a little coarse-grained sand and carbonaceous material like the sample at 3210-3225 ft.</td>
</tr>
<tr>
<td>3270-3315</td>
<td>Samples not described.</td>
</tr>
<tr>
<td>3315-3330</td>
<td>Like immediately preceding samples, but the shale is more micaceous and irregularly sandy (very fine grained sand). The only fossils seemed to be caving from beds of Austin age.</td>
</tr>
<tr>
<td>3330-3345</td>
<td>Like sample at 3315-3330 ft., and in addition, specimens of Gümbeleinia sp. that are characteristic of the upper member of the Atkinson Formation (Eagle Ford age).</td>
</tr>
<tr>
<td>3345-3375</td>
<td>Like sample at 3330-3345 ft.; also fragments of Ostrea sp. and of carbonaceous material, all of which may be caving.</td>
</tr>
</tbody>
</table>

**Atkinson Formation. Lower Member.**

The top of the lower member of the Atkinson Formation is placed at 3360 ft. on the basis of electric log correlation.

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3375-3420</td>
<td>Samples not described.</td>
</tr>
<tr>
<td>3420-3435</td>
<td>The sample is composed of material similar to the immediately preceding samples, and, in addition, fragments of darker gray, flaky, unctuous shale that resembles the characteristic “marine shale” of the Tuscaloosa Formation.</td>
</tr>
<tr>
<td>3435-3465</td>
<td>Samples not described.</td>
</tr>
<tr>
<td>3465-3480</td>
<td>Shale, dark-gray, flaky, somewhat carbonaceous, is strongly dominant in the sample. Specimens of Foraminifera in the sample seem to be caving from much higher levels.</td>
</tr>
<tr>
<td>3480-3495</td>
<td>No sample.</td>
</tr>
</tbody>
</table>
| 3495-3510   | Shale, grayish-green, flaky, slightly micaceous. The sample contains one specimen of *Trochammina rainwateri* which is characteristic of the lower member of the Atkinson Formation (Woodbine age). The base of the “marine shale” of the Tuscaloosa is
Description

placed at 3500 ft. on the basis of electric log correlation.

3510-3525 Like sample at 3495-3510 ft., and, in addition the sample contains specimens of species of *Ammobaculites agrestis* that are characteristic of the lower member of the Atkinson Formation.

3525-3540 Sample is mainly shale, but contains, also, fragments of white, fine-grained, somewhat glauconitic sandstone.

3540-3570 No change.

3570-3585 Sample contains much gray flaky shale, and some coarse-grained sand. Many, worn fragments of *Ostrea* sp. and other bivalves, with attached sand grains are also present. The shell fragments seem to be indigenous in beds near this depth; they are chalky, and grains of glauconite and phosphatic grains are attached to them.

3585-3615 Samples not described.

3615-3640 Shale, flaky, is the dominant material; siderite pellets, some glauconitic sandstone, and some shell fragments are also present.

**Comanche Series undifferentiated**

3640-3660 Shale fragments, like sample at 3615-3640 ft., some coarse-grained sand, and a few fragments of red, highly ferruginous clay.

3660-3675 No sample.

3675-3690 Like sample at 3640-3660 ft., and many small fragments of red and mustard-colored clay.

3690-3705 Clay, gray, that may be caving, and small fragments brick-red clay.

3705-3720 Sand, coarse, subangular, containing a few pink grains, a few greenish-yellow grains, and a few grains of feldspar.

3720-3810 No change.

3810-3825 Sand, coarse, like sample at 3705-3720 ft.; pink and yellow grains are more abundant.

3825-3870 No change.

3870-3885 Sand, coarse, like sample at 3810-3825 ft.; greenish-yellow grains very abundant.

3885-3960 No change.

3960-3975 Sand, like sample at 3870-3885 ft.; and a fragment of mulberry-colored, somewhat micaceous clay-shale.

3975-4200 Samples are, mainly, sand like the preceding samples, and a few scattered fragments of gray, hard, dense, very fine-grained sandstone.

4200-4210 Sand, like the samples at 3975-4200 ft., and the highest occurrence of multicolored (gray, purplish-red, and mustard-colored), very finely and highly micaceous shale. The multicolored shale occurs in the upper part of the Comanche Series in many wells in the southeastern Gulf region.

4210-4250 Samples not described.
Core. Recovery?

4250-4251  Sand, quartz, very fine to moderately coarse, angular, and about 50 percent fragments of brown and green streaked ferruginous clay shale.

4251-4270  Samples not described.

4270-4285  Sand, fine to coarse-grained, and many fragments of gray and brick-red streaked, finely micaceous, highly sandy (very fine-grained sand) clay; also some fragments of raspberry-colored clay shale.

4278-4288  Core. Recovery?

Top. Sand, pink-stained, fine-grained, moderately well sorted, and many flakes of colorless and colored mica.

Middle. Sand, etched, fine-grained, moderately well sorted, about 10 percent pink grains, and a few grains of feldspar; gray mica flakes are abundant; brown, gray and green mica flakes are common.

Bottom. Sand, fine-grained, and small fragments of dark brownish-red and yellowish-green, sandy, micaceous clay.

4288-4298  Core. Recovery?

Top. Clay, highly sandy (very fine-grained sand), highly micaceous, highly ferruginous.

Bottom. Washed sample. Sand, pink-stained, fine-grained, angular, well-sorted, and mica (mostly colorless).

4298-4308  Core. Recovery?

Top. Sand, quartz, fine to coarse-grained, roughly angular; some greenish-yellow and some pink grains of feldspar; a little mica.

Another part of core. Clay, red-brown, streaked with bluish-gray and yellowish-green areas, micaceous, highly sandy (very fine-grained sand).

4308-4318  Core. Recovery?

Top. Sand, poorly sorted, very fine to very coarse grained; many greenish-yellow grains; some feldspar.

Bottom. Sand, like top part of core but contains some mica.

4318-4328  Core. Recovery?

Top. Sand, fine to very coarse grained; many greenish-yellow grains and some pink grains; feldspar common.

Bottom. Clay, greenish-gray, highly sandy (very fine grained sand), highly micaceous. Much of the mica is dark (brown, gray and green), but some is colorless.

4328-4338  Core. Recovery?

Top. Sand, fine to coarse-grained.

Bottom. Clay, red, sandy (fine to moderately coarse grained).

4338-4348  Core. Recovery?

Clay, tan, sandy (fine to coarse grained sand); many sand grains are etched.
Description

Core. Recovery?
Clay, bluish-gray and yellowish-brown streaked, hard, sandy (very fine grained sand), highly micaceous.

Core. Recovery?
Sand, fine to coarse-grained, roughly angular, somewhat micaceous.

Core. Recovery?
Sand, fine to moderately coarse grained; many greenish-yellow grains and some feldspar; a little mica.

Core. Recovery?
Top. Sand, mainly fine-grained and a few coarse grains; a little mica.
Middle. Clay, brick-red, streaked with bluish-green areas; highly micaceous.
Bottom. Clay, red, sandy, very highly micaceous. The flakes of mica are coarse, and green and brown flakes are common.

Core. Recovery?
Bottom. Sand, mainly moderately fine grained, poorly sorted. Many sand grains are greenish-yellow and a few are pink. Both colorless and colored flakes of mica are present.

Sample not described.

Core. Recovery?
Sand, coarse-grained; many greenish-yellow grains; a few grains of tourmaline (?); a little mica.

Sand, coarse-grained; many grains are greenish-yellow. The sample contains cavings of gray clay and varicolored micaceous clay.

No change.

Core. Recovery?
Sand, fine to coarse-grained, green, brown, and gray flakes of mica are common, some of which seem to show transition to glauconite.

Core 23. Recovery 3½ ft.
Top 1½ ft. Sand, quartz, fine to medium-grained, in a matrix of gray clay.
Middle 1 ft. Like top part of core, but fine grains are strongly dominant.
Bottom 1 ft. Sand, quartz, fine to coarse-grained, roughly angular, in a matrix of gray clay; medium grains are dominant.

Sand, quartz, fine to coarse-grained, roughly angular; coarse grains are dominant; a few grains are pink, a few are yellow. The sample contains a few fragments of dark-red and grayish-green mottled, micaceous shale.

Core 24. Recovery 7 ft.
Sand, quartz, fine to coarse-grained (medium grains dominant) in a matrix of gray clay. The sample contains a few tinted
Depths (feet)

<table>
<thead>
<tr>
<th>Depth</th>
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</tr>
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</table>
| 4470-4480 | Core 25. Recovery 3 ft. 2 in.  
Grains, and a few grains of feldspar. |
| 4480-4490 | Core 26. Recovery 4 ft.  
Top 2 ft. Shale, red and grayish-green, mottled.  
Bottom 2 ft. shale, red and grayish-green, mottled, unctuous. |
| 4490-4500 | Core 27. Recovery 1 1/2 ft.  
Sand, quartz, light-gray, soft, fine to medium-grained, argillaceous; mica common. |
| 4495-4510 | Sand, quartz, coarse-grained; some feldspar. About 25 percent of the sample is red and green mottled shale.  
Washed sample composed of coarse-grained sand, like sample at 4495-4510 ft., and a few fragments of red and grayish-green mottled shale. |
| 4525-4555 | No change. |
| 4555-4570 | Sand, like sample at 4510-4525 ft., and about 25 percent red and gray mottled, finely micaceous shale. |
| 4570-4585 | Sand and about 10 percent shale, like sample at 4555-4570 ft., some cavings. |
| 4580-4590 | Core 28. Recovery?  
Sand, quartz, fine to coarse-grained, in a matrix of soft white clay; medium grains are dominant; a few tinted grains, and a few grains of feldspar are present.  
Washed sample; composed of fine to coarse-grained quartz sand and some feldspar; coarse grains are common. The sample contains many cavings of material from the Gulf Series.  
Like sample at 4585-4600 ft., and in addition, a few fragments of red and gray mottled shale. |
| 4615-4630 | No change. |
| 4630-4645 | Like sample at 4600-4615 ft., and in addition, a few nodules of red-stained limestone. |
| 4645-4660 | Sand, quartz, fine to coarse-grained (coarse grains common); some sand grains are tinted yellow and some pink. The sample contains a few grains of feldspar and a few fragments of red and gray mottled shale. |
| 4660-4690 | No change. |
| 4690-4705 | Mainly sand, like sample at 4645-4660 ft., and a few fragments of red chert. |
| 4705-4735 | No change. |
| 4735-4750 | Sand, mainly coarse grains; a few tinted grains; a little feldspar. The sample contains a few fragments of gray, moderately hard, highly micaceous, silty clay. |
| 4750-4765 | Sand, like sample at 4735-4750 ft., and a few fragments of red shale. |
Depth

<table>
<thead>
<tr>
<th>Depth (feet)</th>
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</tr>
</thead>
<tbody>
<tr>
<td>4765-4774</td>
<td>No change.</td>
</tr>
<tr>
<td>4774-4780</td>
<td>Core 29. Recovery 5½ ft. Top 5 ft. 3 in. Sand, quartz, fine to coarse-grained (fine to medium grains dominant), argillaceous, and some feldspar, in a matrix of white, bentonitic clay. Bottom 3 in. Clay, mottled red, gray, and mustard-colored, micaceous, somewhat sandy.</td>
</tr>
<tr>
<td>4780-4790</td>
<td>Core 30. Recovery 8 ft. Sand, light-gray, micaceous, fine to coarse-grained (medium grains dominant).</td>
</tr>
<tr>
<td>4795-4810</td>
<td>Sand, fine to coarse-grained (coarse grains dominant), mainly quartz and some feldspar. Some sand grains are tinted pink and some yellow.</td>
</tr>
<tr>
<td>4810-4890</td>
<td>No change.</td>
</tr>
<tr>
<td>4890-4900</td>
<td>Core 31. Recovery 3 ft. Sand, gray and red, soft, fine-grained, argillaceous.</td>
</tr>
<tr>
<td>4900-4915</td>
<td>Sample not described.</td>
</tr>
<tr>
<td>4915-4930</td>
<td>Sand, fine to coarse-grained, and about 10 percent fragments of dark purplish-red, gray-mottled, very finely micaceous shale.</td>
</tr>
<tr>
<td>4930-4987</td>
<td>No change.</td>
</tr>
<tr>
<td>4987-4989</td>
<td>Core 32. Recovery? Sand, clear quartz, etched, coarse-grained, in a matrix of soft white ashy clay.</td>
</tr>
<tr>
<td>4990-5005</td>
<td>Sand, fine to coarse-grained and about 25 percent fragments of red shale.</td>
</tr>
<tr>
<td>5005-5020</td>
<td>Sand, fine to coarse-grained. About 10 percent of the sample is composed of red shale. The sample contains many cavings.</td>
</tr>
<tr>
<td>5020-5035</td>
<td>Sand, about 50 percent of the sample; cavings about 50 percent; a little red shale.</td>
</tr>
<tr>
<td>5035-5050</td>
<td>No change.</td>
</tr>
<tr>
<td>5050-5065</td>
<td>Small washed sample composed of about 50 percent sand, and 50 percent red shale.</td>
</tr>
<tr>
<td>5065-5080</td>
<td>No change.</td>
</tr>
<tr>
<td>5080-5095</td>
<td>Mainly sand, about 50 percent coarse grains, and 50 percent fine grains.</td>
</tr>
<tr>
<td>5095-5110</td>
<td>Shale, red, about 75 percent; sand about 25 percent.</td>
</tr>
<tr>
<td>5110-5125</td>
<td>Sand, coarse and fine-grained in roughly equal amounts constitutes about 75 percent of the sample; about 25 percent of the sample is composed of red shale and a few nodules of limestone.</td>
</tr>
<tr>
<td>5125-5155</td>
<td>Sand, like the samples at 5110-5125 ft., and about 10 percent red shale.</td>
</tr>
<tr>
<td>5155-5170</td>
<td>Sand, like sample at 5110-5125 ft., a few nodules of limestone, and 50 to 75 percent dark-red, very finely micaceous shale.</td>
</tr>
</tbody>
</table>
Description

Depth (feet) | Description
--- | ---
5170-5185 | No change.
5185-5200 | Sand, many nodules of limestone, some of which are red-stained, and about 10 percent red shale.
5200-5230 | No change.
5230-5245 | Sand, nodules of limestone, and about 25 percent dark-red shale, like the sample at 5185-5200 ft.
5245-5260 | Sand, nodules of limestone, and about 5 percent red shale.
5260-5290 | No change.
5290-5305 | No change in materials, but red shale composes about 25 percent of the sample.
5305-5320 | No change.
5320-5335 | Sand, fine to coarse-grained, many nodules of limestone, some of which are red-stained; a little red shale.
5335-5350 | Sample contains red shale, some nodules of limestone, and a little sand, like the immediately preceding samples; 50 to 75 percent of the sample is composed of cavings of materials from various levels in the Gulf Series.
5350-5625 | No change.
5625-5650 | Sand, fine to coarse-grained; nodules of limestone, and about 25 percent dark-red, finely micaceous shale, and some grayish-green, slightly red-mottled, micaceous shale.
5650-5665 | Mainly cavings.
5665-5680 | Sand, nodules of limestone, a little red shale, and abundant cavings.
5680-5695 | Sand, many nodules of limestone, a little red shale, abundant cavings.
5695-5710 | No change.
5710-5725 | Shale, dark-red, finely micaceous, is about 50 percent of the sample; 50 percent is composed of a little sand, many nodules of limestone, and abundant cavings.
5725-5740 | Like sample at 5710-5725 ft., but the red shale is about 25 percent of the sample.
5740-5830 | No change.
5830-5845 | Shale, dark-red, micaceous, is about 50 percent of the sample; 50 percent is composed of a little sand, many nodules of limestone, and abundant cavings. Many of the limestone nodules are sandy.
5845-5890 | No change.
5890-5905 | The indigenous material seems to be a conglomerate composed of pebbles of varicolored quartzite, but amber is the most common color. The individual grain-size varies in different fragments of the quartzite. Other materials in the sample are sand, nodules of limestone, fragments of red shale, and cavings, all of which occur in the immediately preceding samples.
5905-5920 | No change.
5920-5935 | Mainly cavings and a little red shale.
Description

Like the sample at 5920-5935, with the addition of a few nodules of limestone.

Like the sample at 5935-5950, but with the addition of fragments of green shale, and an increase in the amount of limestone nodules. Some of the nodules are sandy.

No change.

Like the sample at 5950-5965 ft., with the addition of a few fragments of chert and a few fragments of quartzite.

No change.

Shale, red and green mottled; many nodules of limestone; a little sand (including a few fragments of green pebbles), a few coarse grains of chert, and a few of quartzite.

No change.

Shale, red and grayish-green mottled; some cavings.

Shale, red (in part bright-red), and some mottled red and grayish-green; many nodules of limestone; fragments of chert; fragments of quartzite; fragments of green slate(?), and other materials.

Triassic(?)

Upper Triassic (?) Newark (?) Group

Like sample at 6205-6220 ft., but bright-red shale is much more common.

No change.

Shale, bright-red, moderately hard; a little sand, nodules of limestone, and fragments of chert, like the sample at 6205-6220 ft. The red shale shows a little mottling of light grayish-green, and contains a few pebbles.

No change.

Shale, bright-red, slightly grayish-green mottled, and many fragments of light-pink to greenish-gray, fine-grained micaceous sandstone.

No sample.

Like sample at 6385-6400 ft.

Shale, like sample at 6385-6400 ft., a few nodules of limestone, and a few fragments of pebbles of various kinds of material.

No change.

Shale, bright-red with light-green mottling, like samples beginning about 6205-6220 ft. The shale contains irregular-shaped nodules of siderite (?) and a few fragments of chert.

Like sample at 6510-6525 ft., but siderite seems to be absent.

No change.

Shale, like sample at 6510-6525 ft., and many fragments of diabase, some of which is possibly weathered.
### Logs of Selected Wells in the Coastal Plain of Georgia

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6560-6570</td>
<td>Like sample at 6550-6560 ft., but contains less diabase.</td>
</tr>
<tr>
<td>6580-6640</td>
<td>No change.</td>
</tr>
<tr>
<td>6640-6650</td>
<td>Shale, red; much less diabase than in the samples beginning at 6550 ft.; many fragments of light-red, fine-grained, argillaceous sandstone.</td>
</tr>
<tr>
<td>6650-6660</td>
<td>Like sample at 6640-6650 ft., but contains less sandstone.</td>
</tr>
<tr>
<td>6660-6670</td>
<td>Shale, red, mottled with green areas; some diabase that is probably caving; very little sandstone; a few fragments of red chert.</td>
</tr>
<tr>
<td>6670-6680</td>
<td>No change.</td>
</tr>
<tr>
<td>6680-6690</td>
<td>Shale, red, mottled with light-green areas; a few fragments of chert pebbles; a few cavings of diabase. The shale is a somewhat duller shade of red than in the preceding samples.</td>
</tr>
<tr>
<td>6690-6780</td>
<td>No change.</td>
</tr>
<tr>
<td>6780-6790</td>
<td>Shale, and a few cavings of diabase; a few fragments of pink, moderately hard, fine-grained, argillaceous, micaceous sandstone.</td>
</tr>
<tr>
<td>6790-6800</td>
<td>No change.</td>
</tr>
<tr>
<td>6800-6810</td>
<td>Shale, like sample at 6780-6790 ft., and in addition, a few fragments of light pinkish-tan, fine to medium-grained sandstone containing colored grains of different kinds of materials that give the sandstone a finely speckled appearance.</td>
</tr>
<tr>
<td>6810-6820</td>
<td>No change.</td>
</tr>
<tr>
<td>6820-6830</td>
<td>Mainly shale; a few fragments of sandstone, like sample at 6800-6810 ft.; a few cavings of diabase.</td>
</tr>
<tr>
<td>6830-7030</td>
<td>No change.</td>
</tr>
<tr>
<td>7030-7040</td>
<td>Shale, red, somewhat green-mottled.</td>
</tr>
<tr>
<td>7040-7059</td>
<td>No change.</td>
</tr>
<tr>
<td>7059-7065</td>
<td>Core 33. Recovery?</td>
</tr>
<tr>
<td>7065-7070</td>
<td>No sample.</td>
</tr>
<tr>
<td>7070-7080</td>
<td>Shale, red, somewhat green-mottled, and a few fragments of diabase.</td>
</tr>
<tr>
<td>7080-7100</td>
<td>Shale, red, and a few fragments of diabase.</td>
</tr>
<tr>
<td>7100-7110</td>
<td>Shale and about 25 percent diabase.</td>
</tr>
<tr>
<td>7110-7120</td>
<td>Shale and a little diabase.</td>
</tr>
<tr>
<td>7120-7130</td>
<td>Shale, and about 10 percent diabase.</td>
</tr>
<tr>
<td>7130-7140</td>
<td>Mainly red shale, and a little diabase.</td>
</tr>
<tr>
<td>7140-7230</td>
<td>No change.</td>
</tr>
<tr>
<td>7230-7240</td>
<td>Shale and a little diabase, like sample at 7130-7140 ft., with the addition of fragments of light-red, hard, fine-grained, micaceous sandstone.</td>
</tr>
</tbody>
</table>
Description

Depth (feet) | Description
--- | ---
7240-7250 | Like sample at 7230-7240 ft., but showing an increase in fragments of sandstone.
7250-7260 | Shale, red; a little diabase; a few fragments of sandstone.
7260-7310 | No change.
7310-7320 | Shale, and some fragments of diabase like sample at 7250-7260 ft. A few fragments of shale contain small inclusions of limestone.
7320-7330 | No sample.
7330-7340 | Like sample at 7310-7320 ft.
7340-7350 | Like sample at 7330-7340 ft., and many cavings.
7350-7360 | Shale, red, and many fragments of black shale similar in texture to the red shale. The black coloring is due, possibly, to alteration by intrusions of diabase.
7360-7370 | Similar to samples at 7350-7360 ft., but this sample contains less black shale and more diabase.
7370-7380 | Shale, red, and 50 percent diabase.
7375-7377 ½ | Core 34. Recovery 14 in.

Diabase

7380-7390 | Shale, red, and about 25 percent diabase.
7390-7400 | Shale, red, and from 50 to 75 percent diabase.
7400-7410 | No change.
7410-7420 | Like sample at 7390-7400 ft., and in addition, a few fragments of splintery gray shale which may be indigenous in beds near this depth.
7420-7430 | Shale, red, about 20 percent diabase, and a few fragments of gray to greenish-gray shale.
7430-7440 | Shale, red, about 50 percent diabase, and a few fragments of quartzite pebbles.
7440-7450 | Shale, red, and about 75 percent diabase.
7450-7480 | No change.
7483 | Bit sample?
| Like the immediately preceding samples, with the addition of many fragments of pink, hard, dense, fine-grained, arkosic sandstone.
7480-7487 | Like sample at 7483 ft., but this sample contains less sandstone.
7486-7489 | Core 39. Recovery?
| Top 14 in. Unidentified black material.
| Bottom 5 in. Sandstone, pinkish-gray, dense, somewhat arkosic, very fine grained.
7489-7490 T.D. | No sample.
SEMINOLE COUNTY

Operator: Mont Warren
Landowner: W. E. Harlow Est. Well 1
Location: Land District 27, Land Lot 82; 660 ft. from south line; 660 ft. from east line of Land Lot 82.

GGS. No. 187
Elevation: 145 ft. (derrick floor).
Total depth: 3572 ft.

Summary of Stratigraphy

Paleocene
In beds of Midway age; 1st sample at 1420 ft.

Tertiary

Cretaceous

Gulf
- Beds of Navarro age
- Beds of Taylor age
- Beds of Austin age
- Atkinson Formation, upper member
- lower member

Comanche undifferentiated

3279 total 293 depth

Lithologic and paleontologic description of cores and cuttings. Samples are cuttings unless otherwise stated.

Description

Tertiary

In Paleocene Series

1420-1430 Chalk, light-gray, highly sandy (very fine-grained sand), glauconitic, and a little medium-grained sand. Sample contains many specimens of Midway species of Foraminifera.

Cretaceous

Gulf Series

Beds of Navarro age

1430-1440 Like sample at 1420-1430 ft., but less chalk and more sand. Many specimens of Globotruncan sp., Gümbe valley sp., and other Cretaceous species of Foraminifera.
Description

Sample not studied.

Washed sample. Sand, fine to medium-grained; fragments of hard, silty to sandy chalk (Paleocene); and fragments of white, glauconitic, slightly sandy chalk.

Samples not studied in detail.

Beds of Taylor age

Washed sample; large residue. Sand, medium to coarse-grained; fragments of chalky, glauconitic siltstone; and somewhat silty, glauconitic hard chalk. Sample contains many specimens of *Lituola taylorensis*; a few specimens of *Steneisina americana*, *Globorotalites conicus*, and many other species of Foraminifera.

Samples not described in detail.

Samples from 1520 to 1550 ft. like sample at 1510-1520 ft. with the addition of *Inoceramus* fragments at 1550 ft. Below 1700 ft., the samples are smaller, and contain fine to coarse-grained sand; glauconite and *Inoceramus* fragments; fragments of gray, somewhat silty clay shale; and many specimens of Foraminifera.

Beds of Austin age

Shale, gray, marly; a little sand; nodules of pyrite; many fragments of *Inoceramus*. Abundant specimens of Foraminifera: *Pseudogaudryinella capitosa* var. (Austin variety); a few specimens of *Kyphopyx christneri* (upper part of beds of Austin age or lower part of beds of Taylor age); a few specimens of species of ostracodes that, usually, are indicative of the beds of Austin age.

Shale, gray. The samples usually contain fragments of *Inoceramus* in varying amounts, some nodules of pyrite, and many specimens of Foraminifera and Ostracoda. Herrick (1961, p. 355) reported the occurrence of specimens of *Citharina texana* in a sample at 2310-2320 ft.

Highest occurrence (2420 ft.) of fragments of speckled shale, which are progressively more abundant in deeper samples.

Atkinson Formation. Upper Member.

Like samples from 2160 to 2540 ft., with the addition of many fragments of *Ostrea* sp., also a few fragments of very fine grained, somewhat micaceous, argillaceous sandstone containing a little carbonaceous material and a trace of glauconite.

No change.

Highest occurrence of grayish-green, micaceous, somewhat sandy (fine-grained sand) shale.

LOGS OF SELECTED WELLS IN THE COASTAL PLAIN OF GEORGIA

Description

2570-2600  Shale, grayish-green; many fragments of Ostrea sp.; a few fragments of fine-grained sandstone like sample at 2540-2550 ft. The sample also contains loose sand, shale, and specimens of Foraminifera caving from different higher levels.

2600-2616  Core 1. Recovery 6 ft.
Top. Sandstone, light-gray, fine to medium-grained, glauconitic, somewhat phosphatic, slightly micaceous.
Middle. Sandstone, like top part of core, but more glauconitic, and containing fragments of Ostrea sp.
Bottom. Sandstone, light-gray, hard, fine to medium-grained, glauconitic, somewhat phosphatic, calcareous.

2616-2770  Samples are a mixture of cavings from higher levels, composed of fragments of grayish-green shale; several types of fine-grained, micaceous sandstone; and fragments of Ostrea sp. in varying amounts. The material drilled is interpreted as, mainly, fine to medium-grained sandstone and some coarse-grained sand, containing fragments of Ostrea sp., phosphatic nodules, and glauconite.

2770-2780  Sand, coarse-grained, containing phosphatic nodules, and glauconite; also a few fragments of hard, calcareous, fine to medium-grained sandstone. The sample contains fragments of Ostrea sp. and a little lignite.

2780-2940  Samples are similar to sample at 2770-2780 ft. The lignite is progressively more abundant in the samples to 2830 ft., and although present in the samples from 2830 to 2940 ft., it may be caving, in part.

2940-2950  Mainly sand and shell fragments; also fragments of sandstone and lignite (as in the samples from 2770 to 2940 ft.), and a little grayish-green, splintery shale. This sample contains a few specimens of Planulina eagelfordensis.

3030-3040  Mainly cavings of gray clay shale. Also in the sample are fragments of grayish-green, irregularly micaceous shale, in which crushed fossil debris is fairly common.

3040-3050  Like sample at 3030-3040 ft., but fossil debris is more abundant.

Atkinson Formation. Lower Member.

3050-3060  Shale, gray, flaky, micaceous, slightly carbonaceous is fairly common in the sample.

3060-3100  Samples not described.

3100-3110  Gray, irregularly micaceous shale, and fragments of hard, fine-grained, glauconitic sandstone compose most of the sample; specimens of Ammobaculites advenus also occur.

3110-3197  Samples not described.

3197-3216  Core 2. Recovery 7 ft.
Description

Top 3 ft. Sandstone, gray, medium-grained, argillaceous, glauconitic, micaceous, somewhat phosphatic.

2nd 22 in. Shale, dark-gray, flaky, containing partings of light-gray, soft, medium-grained, glauconitic, micaceous sand.

3d 22 in. Sand-streaked shale like middle part of core.

Cuttings are mainly, gray shale like samples below 3050 ft., a little-fine-grained sand and glauconite, and cavings from higher levels.

Core 3. Recovery 10 ft.

Top 1* ft. Sandstone, gray, fine to very coarse grained, containing pebbles of phosphatic material, glauconite, and large fragments of pyritized lignite. The sandstone is streaked with lenses of gray, flaky shale like core 2 at 3197-3216 ft.

Middle 3½ ft. Shale, gray, flaky, slightly micaceous, containing partings of fine-grained, glauconitic sandstone. The bottom 4 in. of this part of core 3 is gray, hard, micaceous, glauconitic, calcareous sandstone, containing fragments of carbonaceous material.

Bottom 5 ft. The upper 2 ft. of this part of core 3 is fine to moderately coarse-grained, roughly angular sand in a tan, waxy clay matrix, containing, also, light-brown, irregularly-shaped nodules of siderite(?)

Comanche Series undifferentiated

The lower 3 ft. of the bottom 5 ft. of core 3 is medium to coarse-grained, roughly angular sand in a white, somewhat micaceous, bentonitic matrix.

Sand, mainly coarse-grained, roughly angular, quartz, and a little white feldspar. Some sand grains are pink-tinted quartz.

No change.

Like sample at 3290-3300 ft., but with the addition at this depth of fragments of mustard-yellow and gray mottled waxy shale.

Mainly coarse-grained quartz sand (a few pink-tinted and yellow-tinted grains); a little white feldspar; a few fragments of mustard-yellow shale; and a few fragments of red and gray mottled, silty, micaceous clay shale.

SEMINOLE COUNTY

Operator: Mont Warren  
Landowner: Grady Bell Well 1A 
Location: Land District 27, Land Lot 61; 560 ft. north of south line; 660 ft. east of west line of Land Lot 61

GGS. No. 204  
Elevation: 114 ft. (derrick floor)  
Total depth: 3810 ft.  
Summary of Stratigraphy

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Thickness (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tertiary</td>
<td></td>
</tr>
<tr>
<td>Paleocene</td>
<td></td>
</tr>
<tr>
<td>In beds containing Tamesi fauna; 1st sample at 1860 ft.</td>
<td>?</td>
</tr>
<tr>
<td>Cretaceous</td>
<td></td>
</tr>
<tr>
<td>Gulf</td>
<td></td>
</tr>
<tr>
<td>Beds of Navarro age</td>
<td>1900</td>
</tr>
<tr>
<td>Beds of Taylor age</td>
<td>1955</td>
</tr>
<tr>
<td>Beds of Austin age</td>
<td>2400</td>
</tr>
<tr>
<td>Atkinson Formation, upper member</td>
<td>2700</td>
</tr>
<tr>
<td>lower member</td>
<td>3110</td>
</tr>
<tr>
<td>Comanche undifferentiated</td>
<td>3420</td>
</tr>
</tbody>
</table>

Lithologic and paleontologic description of cuttings and cores. Samples are cuttings, unless otherwise stated.

Description

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Samples not studied.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1860</td>
<td>Samples not studied.</td>
</tr>
</tbody>
</table>

Tertiary

In Paleocene Series

1860-1870 Clay, gray; about 25 percent of sample is fine to coarse-grained, subangular, quartz sand, and many specimens of Foraminifera that are a mixture of Midway and Tamesi (Velasco) species.

1870-1880 Like sample at 1860-1870 ft., but sand is 50 to 75 percent of sample.

1880-1890 No change.

1890-1900 Like sample at 1870-1880 ft., with the addition of a little glauconite.

Cretaceous

Gulf Series

Beds of Navarro age

1900-1910 Like the preceding samples with the addition of a few fragments of cream, fossiliferous limestone and specimens of Globotruncana sp.

1910-1960 Clay fragments decrease in abundance and specimens of Late Cretaceous species of Foraminifera show an increase.
Description

Beds of Taylor age

The top of the beds of Taylor age is placed at 1955 ft. on basis of electric log correlation supported by sample data.

1960-1970
Washed sample, small. Sand, fine to coarse-grained; fragments of glauconitic clay; a little chalky marl. Sample contains specimens of *Globotruncana* sp. *Stensiolina americana*, *Bolivina incrassata*.

1970-2400
Samples not studied in detail. In general, the samples consist of soft, gray, calcareous, somewhat glauconitic shale and varying amounts (usually small) of fine to coarse-grained sand.

Beds of Austin age

2400
The samples do not seem to contain lithologic or paleontologic data that definitely place the top of the beds of Austin age. The top of the unit is provisionally placed at 2400 ft. on the basis of electric log correlation. The highest occurrence of the speckled shale characteristic of the lower part of the beds of Austin age is near 2600 ft.

2400-2700
Like samples at 1970-2400 ft.

Atkinson Formation. Upper Member.

2700
The top of the upper member of the Atkinson Formation is placed at 2700 ft. on the basis of electric log correlation supported by sample data.

2710-2720
Highest occurrence of hard, very fine grained, calcareous, phosphatic, micaceous sandstone.

2720-2730
Sandstone, cream, very fine grained, micaceous, slightly glauconitic, phosphatic, calcareous, that seems to contain fragments of *Ostrea* sp.

2730-2740
Sandstone, like the sample at 2720-2730 ft.; fragments of grayish-green, slightly carbonaceous shale, containing thin partings of fine-grained, micaceous, slightly glauconitic sandstone; a few fragments of *Ostrea* sp.

2740-2750
The sample is at least 50 percent cavings of shale from higher levels. The possibly indigenous part of the sample is composed of very fine-grained sand; fragments of gray, soft, fine-grained, micaceous, weakly glauconitic sandstone; a few fragments of greenish-gray flake shale; fragments of fish bones and fish scales; and specimens of *Foraminifera* that are, mainly, caving.

2750-2820
Samples are similar, in general, to sample at 2740-2750 ft.; but the amount of greenish-gray shale seems to increase progressively with depth. The material drilled seems to be grayish-green, flaky, slightly carbonaceous shale, containing thin beds of fine-grained, micaceous, weakly glauconitic sandstone.
Shale, grayish-green, flaky, and many fragments of moderately hard, very fine grained, micaceous, slightly glauconitic sandstone containing fragments of Ostrea sp. Sample contains a few specimens of Planulina eugelfordensis.

Sand, fine-grained; fragments of sandstone; fragments of grayish-green, flaky shale; fragments of Ostrea sp. The samples contain a few specimens of Planulina eugelfordensis.

Core 1. Recovery?
Top. Shale, grayish-green, flaky; about 20 percent very fine grained sand; and traces of glauconite and carbonaceous material.

Other parts of the core are, mainly, shale containing fine-grained sand, a little glauconite, a few small specimens of Globigerina sp., and a few fragments of Ostrea sp.

Shale, grayish-green; a few fragments of speckled shale that may be caving; many fragments of Ostrea sp. and bryozoan fragments; a little glauconite and phosphatic material. The specimens of Foraminifera in the sample seems to be caving.

Sample not described or no sample.

Sandstone, medium-grained, calcareous, somewhat glauconitic, containing many fragments of Ostrea sp. and a few phosphatic nodules. The sample contains a few fragments of grayish-green shale, bryozoan fragments, and a few specimens of Planulina eugelfordensis.

No change.

Shale, flaky, and fine-grained sand; a few fragments of Ostrea sp.

Samples not studied in detail, but the strata drilled seem to be alternating beds of grayish-green flaky shale, and light-gray, fine-grained, glauconitic, phosphatic, sandstone in which fragments of Ostrea sp. are common.

Atkinson Formation. Lower Member.

The top of the lower member of the Atkinson Formation is placed at 3110 ft. on the basis of electric log correlation supported by sample data.

Like samples at 2960-3120 ft. with the addition of a few fragments of dark-gray flaky shale.

Samples are like the samples at 3120-3130 ft., but the amount of dark shale increases progressively with depth and the shell fragments decrease.

Shale, dark-gray, flaky, slightly carbonaceous, containing fragments of fish bones, fish scales, and white, micaceous, moderately hard siltstone.

No change.

Like sample at 3270-3280 ft., with the addition of specimens of
Description

Ammobaculites agrestis, and a few other species common in the lower Atkinson.

3310-3400  Like sample at 3300-3310 ft. No change in fauna.
3400-3410  Sand, coarse-grained, quartz, about 75 percent of sample; also a little dark-gray shale like the preceding samples, a few large phosphatic nodules, fragments of lignite, and Ostrea sp.
3410-3420  Sample almost entirely coarse-grained quartz sand, a few shell fragments and a few large phosphatic nodules.

Comanche Series undifferentiated

3420-3510  The top of the Comanche is provisionally placed at 3420 ft. on the basis of electric log correlation. The samples from 3420 to 3510 ft. seem to contain much caved material and the top of the Comanche may be, in fact, at 3510 ft. where the sample shows the characteristic lithology of the Comanche.
3510-3520  Sand, coarse to very coarse, roughly angular quartz in a white, bentonitic matrix. The sand contains a few pink-tinted and a few yellow-tinted grains, and a few grains of feldspar.
3520-3550  Like sample at 3510-3520 ft.
3550-3560  Highest occurrence of fragments of red and gray mottled micaceous, silty shale.
3560-3810  T.D. Sand; coarse to very coarse, quartz, containing a few pink-tinted and a few yellow-tinted grains, and a few grains of feldspar.

THOMAS COUNTY*

Owner: U. S. Government (War Dept.)  GGS No. 19
Operational Training Station Well 1  Elevation: 227 ft.
Location: 8 mi. northeast of Thomasville, Ga.  Total Depth: 295 ft.
Completed: Sept. 14, 1942

Summary of Stratigraphy

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Thickness (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miocene undifferentiated</td>
<td>5 115</td>
</tr>
<tr>
<td>lower, Tampa Limestone</td>
<td>120 15</td>
</tr>
</tbody>
</table>

*Publication of this data is authorized by the Sun Oil Company, for whom the report was prepared on a commercial basis.
## Logs of Selected Wells in the Coastal Plain of Georgia

### Depth and Thickness

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Thickness (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>135</td>
<td>90</td>
</tr>
<tr>
<td>225</td>
<td>35</td>
</tr>
<tr>
<td>260</td>
<td>30</td>
</tr>
</tbody>
</table>

### Oligocene

- upper, Suwannee Limestone
- do, *Dictyoconus* zone
- middle and lower, Vicksburg Group

### Eocene

- upper, Ocala Limestone upper member

Lithologic and paleontologic description of cuttings and cores. Samples are cuttings unless otherwise stated.

#### Description

**Tertiary**

**Miocene Series undifferentiated**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Sand, clear quartz, fine-grained, sharply angular.</td>
</tr>
<tr>
<td>10</td>
<td>Clay, yellow and white streaked, highly sandy.</td>
</tr>
<tr>
<td>15</td>
<td>Sandstone, tan, moderately fine-grained, argillaceous.</td>
</tr>
<tr>
<td>20</td>
<td>Sandstone, yellowish-brown, white-streaked, argillaceous.</td>
</tr>
<tr>
<td>25</td>
<td>Like sample at 20 ft., but loosely consolidated.</td>
</tr>
<tr>
<td>30</td>
<td>Like sample at 25 ft.</td>
</tr>
<tr>
<td>35</td>
<td>Like sample at 25 ft.</td>
</tr>
<tr>
<td>40</td>
<td>Like sample at 25 ft.</td>
</tr>
<tr>
<td>45</td>
<td>Like sample at 25 ft.</td>
</tr>
<tr>
<td>50</td>
<td>Clay, tan, argillaceous, sandy (fine-grained angular sand). The sample contains a few small nodules of chalk.</td>
</tr>
<tr>
<td>55</td>
<td>Like sample at 50 ft., and a few small fragments of lignite.</td>
</tr>
<tr>
<td>60</td>
<td>Sand, white, argillaceous, containing small particles of limonite.</td>
</tr>
<tr>
<td>70</td>
<td>Like sample at 60 ft.</td>
</tr>
<tr>
<td>75</td>
<td>Like sample at 60 ft.</td>
</tr>
<tr>
<td>80</td>
<td>Like sample at 60 ft.</td>
</tr>
<tr>
<td>85</td>
<td>Like sample at 60 ft.</td>
</tr>
<tr>
<td>90</td>
<td>Like sample at 60 ft.</td>
</tr>
<tr>
<td>95</td>
<td>Like sample at 60 ft.</td>
</tr>
<tr>
<td>100</td>
<td>Like sample at 60 ft.</td>
</tr>
<tr>
<td>105</td>
<td>Clay, white, sandy, and a few large nodules of sandy clay showing dendritic markings; a few nodules of quartz.</td>
</tr>
<tr>
<td>110</td>
<td>Sand, clear quartz, white, fine-grained, sharply angular, argillaceous.</td>
</tr>
<tr>
<td>115</td>
<td>Like sample at 110 ft., and a few nodules of cream sandy limestone.</td>
</tr>
</tbody>
</table>
Description

Lower Miocene. Tampa Limestone.

120 Limestone, cream, hard, sandy, irregularly porous, nodular, containing traces of impressions of fossils.
125 Like sample at 120 ft.
130 Like sample at 120 ft.

Oligocene Series

Upper Oligocene. Suwanee Limestone

135 Limestone, white, chalky, microfossiliferous. The microfauna contains specimens of *Rotalia byramensis* and *Asterigerina subacuta*, which are characteristic of the Oligocene in this area.
140 Like sample at 135 ft.
145 Like sample at 135 ft.
150 Limestone, white, moderately hard. Large chips of the limestone contains molds and fragments of molds of fossil bivalves, and a few echinoid spines.
155 Like sample at 150 ft. Sections of small miliolids are common in some fragments of the limestone.
160 Like sample at 155 ft.
165 Like sample at 155 ft.
170 Limestone, chalky, hard, nodular, like sample at 155 ft., and a few nodules of flint.
175 Like sample at 170 ft.
180 Like sample at 170 ft.
185 Limestone, white, hard, chalky, coquinoid, composed chiefly of chalk-cemented, worn and rounded molds of microfossils and fragments of macrofossils. The fauna contains a few specimens of *Archaias* (?), sp. that is characteristic of phases of the Oligocene in Florida; specimens of *Rotalia mecatepocensis* and small miliolids are common.
190 Like sample at 185 ft.
195 Like sample at 185 ft., but the determinable fossils are *Rotalia* cf. *R. choctawensis*, echinoid spines and sections of miliolids. The sample contains a few fragments of flint.
200 Similar to sample at 195 ft., but softer. Specimens of several species of small Foraminifera that are common in this sample are characteristic, also, of the Oligocene in Florida.
205 Like sample at 200 ft.
210 Like sample at 200 ft.
215 Like sample at 200 ft. Fragments of echinoids are fairly common.
220 Limestone, white, hard, chalky, nodular, containing fragments of *Pecten* sp., and traces of molds and fragments of molds of microfossils.
## Description

### Upper Oligocene. Suwannee Limestone

#### Dictyoconus Zone.

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>225</td>
<td>Limestone, chalky, hard, fossiliferous. The fossils are, mainly, poorly preserved molds. Among the megafossils are fragments of <em>Pecten</em> sp. and large echnoid spines. The microfauna contains specimens of species characteristic of the Oligocene; <em>Valvulammina</em> sp., <em>Valvulina</em> sp., <em>Dictyoconus</em> sp., and <em>Lepidocyclina</em> sp.</td>
</tr>
<tr>
<td>230</td>
<td>Like sample at 225 ft.</td>
</tr>
<tr>
<td>235</td>
<td>Like sample at 225 ft.</td>
</tr>
<tr>
<td>240</td>
<td>Limestone, chalky, fossiliferous, nodular, and numerous fragments of brown, dense, dolomitic (?) limestone.</td>
</tr>
<tr>
<td>245</td>
<td>Dolomite, dark-brown, porous, granular crystalline.</td>
</tr>
<tr>
<td>250</td>
<td>Dolomite, like sample at 245 ft., and moderately soft chalky limestone.</td>
</tr>
<tr>
<td>255</td>
<td>Dolomite, brown, and a little chalky limestone that is possibly caving from higher levels.</td>
</tr>
</tbody>
</table>

#### Middle and lower Oligocene. Vicksburg Group.

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>260</td>
<td>Limestone, dolomite, like sample at 255 ft., and white chalky limestone that contains abundant irregular-shaped, rounded, chalky algal concretions, and many specimens of <em>Lepidocyclina mantelli</em>.</td>
</tr>
<tr>
<td>265</td>
<td>Limestone, chalky, fossiliferous, concretionary, like sample at 260 ft. Fauna like sample at 260 ft.; <em>Lepidocyclina mantelli</em> is common, and fragments of <em>Lepidocyclina yurinagunensis</em> also occur.</td>
</tr>
<tr>
<td>270</td>
<td>Material and fauna like sample at 265 ft. Specimens of <em>Lepidocyclina mantelli</em> and <em>L. yurinagunensis</em> are very abundant.</td>
</tr>
<tr>
<td>275</td>
<td>Like sample at 270 ft., but the fauna is much less abundant and less well preserved.</td>
</tr>
<tr>
<td>280</td>
<td>Like sample at 275 ft.</td>
</tr>
<tr>
<td>285</td>
<td>Like sample at 275 ft.</td>
</tr>
</tbody>
</table>

### Eocene Series

#### Upper Eocene. Ocala Limestone. Upper Member

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>290</td>
<td>Limestone, white, hard, porous, fossiliferous, that seems to be a water-worn coquoinoid limestone.</td>
</tr>
<tr>
<td>295 T.D.</td>
<td>Limestone, like sample at 290 ft., and a small amount of fine-grained clear quartz sand. Specimens of <em>Lepidocyclina</em> like those in the samples at 260-270 ft. are probably cavings. Specimens of <em>Lepidocyclina ocalana</em> (two varieties) in the sample indicate the upper Eocene age of the limestone.</td>
</tr>
</tbody>
</table>
THOMAS COUNTY

Owner: City of Thomasville, Ga.
Well 4

GGS. No. 56
Elevation: 263 ft.
Total Depth: 305 ft.
Completed: Aug. 20, 1936

Summary of Stratigraphy

Tertiary and Quaternary

Pliocene (?) to Recent (?) Undifferentiated 5 30

Tertiary

Miocene Undifferentiated 35 140

Oligocene

upper, Suwannee Limestone 175 53
to 228 total depth
middle (?) or lower (?), Vicksburg (?) Group 77

Lithologic and paleontologic description of cuttings and cores. Samples are cuttings unless otherwise stated.

Description

Tertiary and Quaternary

Pliocene (?) Series to Recent (?) Series

Undifferentiated

5 Sand, deep-orange, argillaceous.
Washed residue, large. Clear, subangular, moderately fine, moderately well sorted sand, and a few fragments of clay matrix; no fossils.

15 Sand, like sample at 5 ft.

25 Sand, lemon-yellow, argillaceous.
Washed residue, large. Fine-grained, angular, well sorted quartz sand, containing a few hard fragments of clay matrix; no fossils.

\*The occurrence of specimens of *Lituonella floridana*, the abundance of specimens of *Dictyococcus floridanus*, and the absence of specimens of typical Oligocene species in the samples from 286 ft. to the bottom of the hole, suggest that the rocks in this 19-foot interval may be middle Eocene (Avon Park Limestone) rather than Oligocene in age. Nothing in the samples suggests the well penetrated beds of upper Eocene age.
Description

Tertiary

Miocene Series undifferentiated

35  Clay, white, sandy.
    Washed residue, small. Fine-grained, angular, clear quartz sand, and a few clay nodules.

45  Clay, white and very light green, chalky.
    Washed residue, moderately small. Fine-grained, angular, clear quartz sand, like the sample at 35 ft., a few fragments of indurated clay, and about 25 percent small, white, chalky nodules; no fossils.

55  Clay, light-green, sandy, slightly calcareous. Washed residue, large. Clear, angular, fine-grained, quartz sand, and about 50 percent small nodules of clay.

65  Like sample at 55 ft.

70  Like sample at 55 ft.

80  Like sample at 55 ft.

85  Clay, light-greenish-gray, sandy (fine-grained sand), somewhat calcareous. Washed residue, moderately large. Very fine-grained, angular, clear quartz sand, and about 25 percent fairly large, greenish-gray nodules of limestone; no fossils.

95  Clay, greenish-cream, hard, sandy, bentonitic. Washed residue, moderately large. Fragments of sandy clay, and about 50 percent fine-grained, angular, clear quartz sand; a few charcoal stems.

106 Clay, cream, hard, sandy (fine-grained sand) calcareous. Washed residue, large. Fragments of clay, and about 50 percent moderately fine grained, moderately well sorted angular, clear quartz sand; a few specimens of arenaceous Foraminifera, possibly of brackish-water origin.

110 Like sample at 106 ft., but no Foraminifera present.

115 Clay, light yellowish-green, sandy (fine-grained sand), finely granular, calcareous clay, containing a very few questionable specimens of arenaceous Foraminifera.

125 Limestone, cream, hard, slightly sandy, irregularly porous (water-worn?), containing fragments of molds and fragments of impressions of bivalves (Pecten sp. and others); a few traces of specimens of small Foraminifera, but no determinable species.

136 Limestone, white (chalky), sandy (fine-grained sand), porous (water-worn?), nodular. The sand content of the limestone is about 25 percent. The limestone seems to have been originally highly fossiliferous, but much of the fossil material may have been destroyed by percolating water, leaving only a very few poorly-preserved fragmentary casts and molds.

145 Like sample at 136 ft.

155 Limestone, white, chalky, hard, somewhat sandy, showing a few fragments of fossil molds.
Description

Like sample at 155 ft.

Limestone, deep-cream, dense, cryptocrystalline, somewhat sandy, showing a very few questionable sections of microforams.

Like sample at 167 ft.

Like sample at 170 ft., and, in addition, a few fragments of white, soft, sandy, finely granular limestone.

Oligocene Series

Upper Oligocene. Suwannee Limestone.

Limestone, white, very finely granular, slightly sandy, and a few nodules of deep-cream, dense, limestone. The sample contains a few fragmentary casts and impressions of fossils, among which are a few echinoid spines, bryozoan fragments, and many calcite-encrusted specimens of smaller Foraminifera. Small-mesh screenings of the sample contain about 10 percent fine-grained, angular, clear quartz sand.

Limestone, similar to the sample at 175 ft., but the fossils are more abundant, and small calcitic nodules are common. The fauna contains fragments of echinoid spines and plates; a cast of Operculinella (? ) sp.; many specimens of Dictyoconus cookei; and a fauna of small Foraminifera. Among the small Foraminifera specimens of Rotalia mexicana var. and Asterigerina subacuta are the most common species; several species of miliolids are also present.

Limestone, white, calcitic, highly microfossiliferous; many of the fragments contain a large number of specimens of miliolids; echinoid spines are common, and the foraminiferal fauna is like that in the sample at 180 ft. This sample also contains many small calcitic nodules, and a few fragments of dense brown limestone.

Limestone, white, porous, highly microfossiliferous, having an oolith appearance because of the abundance of molds of specimens of small Foraminifera. The sample also contains a few nodules of light-brown, granular, dolomite or dolomitic limestone. The fossil material occurs, chiefly, as calcite molds that are usually lime-encrusted. Specimens of miliolids are common, as in the sample at 183 ft.; specimens of a large Quinqueloculina sp., and specimens of Asterigerina subacuta are common.

Limestone, white, chalky, microfossiliferous, and a few nodules of brown, cryptocrystalline limestone; fauna is like that in the sample at 190 ft.

Limestone, white, hard, nodular, somewhat calcitic, slightly porous, containing a number of poorly-preserved casts of macrofossils and microfossils. The material and the fauna are similar to those described in the sample at 190 ft. Asterigerina sp. is the most abundant microfossil.
**Description**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>Limestone, white, chalky, porous, microfossiliferous, having an oolitic appearance because of the abundance of poorly preserved molds of specimens of miliolids and other small Foraminifera. The sample contains nodules of calcite, and the fauna is similar to that in the sample at 197 ft.</td>
</tr>
<tr>
<td>203</td>
<td>Limestone, white, chalky, highly calcitic, somewhat porous, fossiliferous. The fossils are very poorly preserved in the form of molds and casts that are usually fragmentary and chalk-coated. The recognizable fossils are the same as those in the immediately preceding samples.</td>
</tr>
<tr>
<td>207</td>
<td>Limestone, white, chalky, porous, highly fossiliferous. The fossils are usually in the form of chalk-coated molds and fragments of molds. Among the common and recognizable specimens of Foraminifera are Asterigerina subacutá, Rotalia mexicana var., and Dictyoconus cookei.</td>
</tr>
<tr>
<td>214</td>
<td>Like sample at 207 ft. Miliolids are more common in the fauna in this sample than in the sample at 207 ft.; otherwise the fauna is the same.</td>
</tr>
<tr>
<td>218</td>
<td>Like sample at 214 ft.</td>
</tr>
</tbody>
</table>

Middle(?) or lower(?) Oligocene

**Vicksburg(?) Group**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>228</td>
<td>Similar to sample at 218 ft. The sample contains many bryozoan fragments, and a few fragments of Lepidocyclina sp. Specimens of Asterigerina sp., Rotalia cf. R. mexicana, and miliolids are common.</td>
</tr>
<tr>
<td>237</td>
<td>Like sample at 228 ft.</td>
</tr>
<tr>
<td>247</td>
<td>Limestone, white, hard, highly calcitic, microfossiliferous. The fauna seems to be, in general, like that in the sample at 237 ft., although few of the fossils are identifiable; Rotalia cf. R. mexicana is the most common identifiable species.</td>
</tr>
<tr>
<td>257</td>
<td>Limestone, porous, highly fossiliferous. The fossils are usually poorly preserved in the form of molds and casts. Bryozoan fragments are common, and the fauna contains many specimens of miliolid Foraminifera and Rotalia cf. R. mexicana.</td>
</tr>
<tr>
<td>267</td>
<td>Like sample at 257 ft. The sample contains several specimens of Dictyoconus cookei, a few fragments of Lepidocyclina sp., and specimens of small Foraminifera, as in the preceding sample.</td>
</tr>
<tr>
<td>276.5</td>
<td>Like sample at 267 ft. Specimens of Dictyoconus cookei are common at this depth; the small Foraminifera are like those in the sample at 257 ft.</td>
</tr>
<tr>
<td>286</td>
<td>Similar to the sample at 276.5 ft. but the limestone is harder and more calcitized; a few nodules of dark-brown dolomite are present. The fauna contains many bryozoan fragments and abundant specimens of Dictyoconus floridanus; echinoid spines and</td>
</tr>
</tbody>
</table>
Description

fragments are common; also occurring are a few fragments of Pecten sp., several specimens of Lituonella floridana and Pseudochrysalidina floridana, and specimens of two species of large miliolids.

296 Limestone, cream, calcitic, porous, highly fossiliferous. The fauna seems to be similar to that in the sample at 286 ft. but there are few well-preserved specimens.

298 Material and fauna like the sample at 296 ft. and, in addition, many fragments of dark-brown granular dolomite.

300 Dolomite, dark-brown, granular, composes most of the sample. A few fragments of white, calcitic, highly microfossiliferous limestone are possibly caving from higher levels.

305 T.D. Dolomite, dark-brown, granular, porous, composes most of the sample. In addition, the sample contains fragments of calcite, fragments of white fossiliferous limestone as in the sample at 300 ft., and fragments of white, hard, sandy limestone showing impressions of a few fragments of macrofossils (Pecten sp.)

THOMAS COUNTY

Owner: City of Meigs, Ga. GGS. No. 59
Elevation: 340 (approx.)
Total Depth: 1530 ft.
Completed:

Summary of Stratigraphy

<table>
<thead>
<tr>
<th>Tertiary</th>
<th>Depth</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miocene undifferentiated</td>
<td>25</td>
<td>459</td>
</tr>
<tr>
<td>Oligocene</td>
<td></td>
<td></td>
</tr>
<tr>
<td>upper, Suwannee Limestone</td>
<td>484</td>
<td>102</td>
</tr>
<tr>
<td>middle(?) or lower(?) , Vicksburg (?) Group</td>
<td>586</td>
<td>80</td>
</tr>
<tr>
<td>Oligocene(?) or Eocene(?)</td>
<td>666</td>
<td>149</td>
</tr>
<tr>
<td>Eocene</td>
<td></td>
<td></td>
</tr>
<tr>
<td>upper, Ocala Limestone, upper member</td>
<td>815</td>
<td>?</td>
</tr>
<tr>
<td>no samples from 835 to 1320 ft.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>middle(?) , undifferentiated</td>
<td>1320 total 210(?)</td>
<td>depth</td>
</tr>
</tbody>
</table>

Lithologic and paleontologic description of cuttings and cores. Samples are cuttings unless otherwise stated.
### Description

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Tertiary</th>
</tr>
</thead>
<tbody>
<tr>
<td>0- 25</td>
<td>No samples.</td>
</tr>
<tr>
<td>25- 55</td>
<td>Sand, clear quartz, angular, coarse-grained, somewhat ironstained, unfossiliferous. The sand seems to be contained in a matrix of red clay.</td>
</tr>
<tr>
<td>55- 135</td>
<td>Clay, light-tan, compact, laminated, diatomaceous; a very small amount of fine-grained quartz sand washes from the clay.</td>
</tr>
<tr>
<td>135- 157</td>
<td>Sand, clear quartz, angular; poorly-sorted, somewhat ironstained, and a few fragments of clay similar to sample at 55-135 ft., but containing fine-grained sand.</td>
</tr>
<tr>
<td>157- 185</td>
<td>Clay, tan, highly sandy (fine-grained sand); greenish-gray, unctuous clay; and about 50 percent fine-grained, angular, poorly-sorted, clear quartz sand.</td>
</tr>
<tr>
<td>185- 205</td>
<td>Clay, in part, gray and, in part, tan, sandy (fine-grained sand); about 50 percent poorly-sorted, angular, clear quartz sand; a few nodules of limonite, and a few fragments of white sandy limestone.</td>
</tr>
<tr>
<td>205- 246</td>
<td>Limestone, cream, hard, sandy (fine-grained sand); a small amount of greenish-gray clay, and angular, fine-grained sand, no fossils.</td>
</tr>
<tr>
<td>246- 270</td>
<td>No samples.</td>
</tr>
<tr>
<td>270- 289</td>
<td>Limestone, cream, highly sandy (fine-grained sand), containing a few impressions of fragments of microfossils, and a few indistinct sections of molds of specimens of Foraminifera. About 10 percent of the washed sample is composed of poorly-sorted clear quartz sand.</td>
</tr>
<tr>
<td>289- 293</td>
<td>Like sample at 270-289 ft.</td>
</tr>
<tr>
<td>293- 302</td>
<td>Like sample at 270-289 ft., but about 50 percent of sample is unconsolidated, angular, clear quartz sand; no fossils.</td>
</tr>
<tr>
<td>302- 312</td>
<td>Like sample at 293-302 ft., and also a few fragments of greenish-gray sandy clay.</td>
</tr>
<tr>
<td>312- 320</td>
<td>No samples.</td>
</tr>
<tr>
<td>320- 334</td>
<td>Like sample at 302-312 ft., but about 75 percent of sample is fine to coarse-grained, angular, clear quartz sand.</td>
</tr>
<tr>
<td>334- 346</td>
<td>No samples.</td>
</tr>
<tr>
<td>346- 365</td>
<td>Limestone, cream, hard, sandy, containing fragments of molds, and impressions of fragments of fossils. One chip of limestone showed a few fairly well preserved sections of Archaeas sp. About 25 percent of the sample is composed of fine-grained sand and a little tan clay.</td>
</tr>
<tr>
<td>365- 388</td>
<td>No samples.</td>
</tr>
</tbody>
</table>
| 388- 417    | Sand, quartz, angular, very poorly sorted; a few fragments of
Description

cream, argillaceous sandstone; a few fragments of sandy limestone like sample at 346-365 ft., no fossils.

417- 459 Limestone, cream, irregularly sandy, a few fragments of which show indistinct impressions of fossils. About 25 percent of the sample is composed of coarse-grained quartz sand.

462- 484 Limestone, hard, sandy, irregularly porous, containing a few impressions of fossils, and a few hard greenish-gray areas. About 10 percent of the sample is composed of unconsolidated quartz sand.

Oligocene Series

Upper Oligocene. Suwannee Limestone.

484- 511 Limestone, cream, hard, porous, somewhat glauconitic, highly microfossiliferous. Macrofossils are, chiefly, fragments of Pecten sp. and echinoid spines. Among the many poorly-preserved foraminiferal specimens, the most common species are Rotalia mecatepencensis, Asterigerina subacuta, Gypsina sp., and a fragment of Lepidocyclina sp.

511- 586 Limestone, white, hard, containing many specimens of Lepidocyclina undosa, Camerina dia, Elphidium cf. E. Chapmani, and Asterigerina subacuta.

Middle(?) or lower(?) Oligocene.

Vicksburg(?) Group.

586- 606 Limestone, white, gray-spotted, hard, nodular, highly fossiliferous. Macrofossils are, chiefly, bryozoan fragments, echinoid spines and crab claws. Among the microfossils, the common species of Foraminifera are Lepidocyclina undosa, Camerina dia, Asterigerina subacuta, Lepidocyclina mantelli, Rotalia mecatepencensis, Elphidium cf. E. chapmani, Asterigerina sp., Cibicides choctawensis, and Eponides alabamensis.

606- 632 Limestone, cream, nodular, in part finely crystalline, and about 10 percent coarse-grained quartz sand. The fauna contains echinoid spines, specimens of Rotalia sp. and Asterigerina sp., a few specimens of Camerina sp. and a few small fragments of Lepidocyclina sp.

605- 620 Core. Limestone, white, chalky, gray-spotted, microfossiliferous, partially calcitized. The fauna contains many echinoid spines, and specimens of Rotalia mecatepencensis and Asterigerina subacuta.

620- 641 Core. Limestone, deep-cream, gray-spotted, hard, porous, partially calcitized, highly fossiliferous. The limestone seems to have been altered by percolating water. The fauna, which is similar to that in the samples starting at 586-606 ft., is characterized by large echinoid spines, specimens of Rotalia mecatepencensis, and poorly preserved specimens of Lepidocyclina sp., Camerina
Description

sp., and Massilina sp. Many of the core fragments are composed of brown, coarsely crystalline dolomitic limestone that shows few traces of fossils.

641-666  Core. Limestone, light-brown, hard, crystalline, containing soft, chalky, very poorly preserved molds of fossils fragments. The fauna, which contains traces of Lepidocyclina sp. and Rotalia sp., seems to be related to the fauna in the sample at 620-641 ft.

Oligocene(?) Series or Eocene(?) Series

Middle (?) or lower (?) Oligocene or upper (?) Eocene.

666-688  Core. Limestone, white, hard, calcitic, containing many poorly preserved traces of microfossils but no determinable forms.

688-727  No samples.

727-753  Limestone, brown, crystalline; a little water-worn (?) chalky, limestone; a few fragments of thinly laminated gray-green shale; and about 20 percent coarse-grained sand. The sparse foraminiferal fauna contains specimens of Camerina sp., Asterigerina sp., Lepidocyclina sp., and other species, like the samples starting at 586-606 ft. Some of the cuttings in this sample, and possibly all the fossil material, may be caving from higher levels.

753-770  Like sample at 727-753 ft., with the addition of nodules of limonite. The sample may be composed entirely of cavings.

770-796  Core. Dolomite, light-brown, granular, containing abundant traces of chalky microfossils, all of which are too poorly preserved for identification. A part of the core is composed of dense, very finely granular dolomite that shows no trace of fossils.

796-815  Core. Dolomite, brown, hard, dense, very finely granular; no fossils.

Eocene Series

Upper Eocene. Ocala Limestone. Upper Member.

815-835  Core. Limestone, cream, chalky, containing many specimens of Foraminifera. The common species are Cibicides ocalanus, Robulus alato-limbatus, Uvigerina dumblei, Dentalina jacksonensis, Reussella sculptilis, Siphonina jacksonensis, Cribrorotalia maricicina, Operculina mariannensis, Anomalina bilateralis, Robulus sp., Eponides jacksonensis.

835-1320  No samples.

Middle (?) Eocene. Undifferentiated.

1320-1530 T.D. Sand, clear quartz, moderately fine grained, angular, highly glauconitic; containing fairly numerous specimens of small Foraminifera and Ostracoda. Among the specimens of Foraminifera are Robulus alato-limbatus, R. alabamensis, R. cf. R. pseudo-mamillicigerus, Textularia dibollensis, Globorotalia crassata densa, Valvulineria persimillis, Globigerina rotunda var., Coleites sp., and others.
WAYNE COUNTY

Operator: The California Company
Landowner: Brunswick Peninsula Corp.
Well 1
Location: Land Lot 7, Williams Survey
625 ft. from south line; 2500 ft. from west line of Land Lot 7.

GGS. No. 52
Elevation: 73 ft. (derrick floor)
Total depth: 4626 ft.
Completed: Dec. 17, 1944.

Summary of Stratigraphy

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Thickness (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tertiary
Not reported

Cretaceous

Gulf

- Beds of Navarro age: 2862 ft. thick
- Beds of Taylor age: 3497 ft. thick
- Beds of Austin age: 3571 ft. thick
- Atkinson Formation, upper member: 3889 ft. thick
  lower member: 4308 ft. thick

Comanche undifferentiated: 4462 ft. thick

Pre-Cretaceous(?)

- Arkosic quartzite: 4570 ft. thick

Lithologic and paleontologic description of cuttings and cores. Samples are cuttings unless otherwise stated.

Description

Cretaceous

Gulf Series

- Beds of Navarro age

Sample is a mixture of sand, sandstone, gray sandy marly shale, and limestone, that are probably mostly caving. However, specimens of Globotruncana cretacea, Gumi belina striata, and Gumi belina carseyae indicate the Cretaceous age of the beds. The top of the beds of Navarro age is placed at 2862 ft. on the basis of electric log correlation.
**Logs of Selected Wells in the Coastal Plain of Georgia**

**Description**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2887-2903</td>
<td>Mainly fragments of cream, chalky limestone (Tertiary); fragments of light-gray, extremely fine-grained, calcareous micaceous, glauconitic sandstone; and some fine to coarse-grained loose sand. A few specimens of Navarro species of Foraminifera are in the sample.</td>
</tr>
<tr>
<td>2903-2990</td>
<td>No change. The quantity of loose sand in the samples below 2856-2887 ft. decreases progressively with depth.</td>
</tr>
<tr>
<td>2990-3000</td>
<td>Core 4. Recovery? Part A. Siltstone, slightly argillaceous, micaceous, carbonaceous, glauconitic, which grades into extremely fine-grained sandstone; contains specimens of <em>Globotruncanacretacea</em>, <em>Gümzelina striata</em>, and other Navarro species. Part B. Like part A, but sand is slightly coarser grained, and specimens of Foraminifera are slightly more abundant; <em>Globotruncanacretacea</em> and <em>Gümzelina</em> are dominant. Part C. Like part B.</td>
</tr>
<tr>
<td>3000-3011</td>
<td>Sand, very fine to moderately fine-grained, loose, quartz; many fragments of buff to pink chalky limestone (caving); fragments of extremely fine-grained sandstone (several types, caving from higher levels); nodules of glauconite; fragments of gray marly shale; specimens of species of Foraminifera as in the preceding samples.</td>
</tr>
<tr>
<td>3011-3071</td>
<td>No change.</td>
</tr>
<tr>
<td>3071-3086</td>
<td>Materials like sample at 3000-3011 ft.; specimens of <em>Robulus</em> sp. also in the microfauna.</td>
</tr>
<tr>
<td>3086-3102</td>
<td>No samples.</td>
</tr>
<tr>
<td>3102-3118</td>
<td>Core 5. Recovery? Part A. Sandstone, brownish-gray, hard, dense, silty to extremely fine grained, micaceous, glauconitic, highly calcareous; contains a fauna of small specimens of species of Foraminifera that are nondiagnostic, for the most part; a few typical Navarro species occur in the sample. Part B. Like part A. Part C. Sandstone, gray, very fine grained, argillaceous, micaceous, somewhat glauconitic. Common species of Foraminifera are <em>Globotruncanacretacea</em>, <em>Gümzelina striata</em>, and <em>Gümzelina carseyae</em>.</td>
</tr>
<tr>
<td>3118-3146</td>
<td>Washed residue, small. Like sample at 3000-3011 ft.</td>
</tr>
<tr>
<td>3146-3191</td>
<td>No change.</td>
</tr>
<tr>
<td>3191-3201</td>
<td>No sample?</td>
</tr>
<tr>
<td>3201-3215</td>
<td>Core 6. Recovery? Part A. Sandstone, greenish-gray, extremely fine grained, argillaceous, calcareous, micaceous, glauconitic. The microfauna consists, mainly of specimens of <em>Globotruncanacretacea</em>, <em>Gümzelina</em> spp., <em>Pseudotextularia elegans</em>; fairly common specimens are <em>Dorothia bulletta</em> and <em>Clavulinoides trilaterus</em>; several arena-</td>
</tr>
</tbody>
</table>
Depth (feet)

Description

C蚬ous species of Foraminifera characteristic of the Navarro also occur.

Part B. No change.

Part C. Clay, gray, highly sandy (very fine grained sand), micaceous, calcareous. Fauna like part A of this core.

Part D. No change.

3215-3221 Sand, fine to coarse-grained, and many fragments of extremely fine grained micaceous sandstone and highly sandy clay; nodules of glauconite; cavings of buff to pink chalky limestone; microfauna like part A of core 6 at 3201-3215 ft.

3221-3283 No change.

3293 Bit sample.

Clay, gray, sandy, micaceous.

3293-3309 Core 7. Recovery?

Parts B, C, and D. No change.

3309-3325 Very small sample, composed of fine to moderately fine grained sand; a few fragments of very fine grained micaceous sandstone; fragments of the buff to pink chalky limestone; and a few specimens of Navarro species of Foraminifera.

3325-3358 Like sample at 3309-3325 ft., with the addition of a few fragments of gray marly shale. A few specimens of *Globotruncana fornicata* are added to the microfauna.

3362-3374 Core 8. Recovery?

Part A. Shale, gray, silty, somewhat, micaceous, calcareous. Microfauna like core 7 at 3293-3309 ft. with the addition of specimens of *Globotruncana* sp., and *Spiroplectammina semicomplana*.

Part B. Shale, gray, somewhat sandy (extremely fine grained sand), micaceous, highly calcareous. Fauna like part A.

Part C. No change.

3374-3376 Shale, gray, micaceous, somewhat silty, and a little loose, fine-grained sand; microfauna like part A of core 8 at 3362-3374 ft.

3376-3427 Shale and sandy shale-like sample at 3374-3376 ft., and about 50 percent fine-grained sand: No change in fauna.

3429-3444 Core 9. Recovery?

Part A. Shale, gray, micaceous, silty, and thin lenses of light-gray, fine-grained sandstone. No change in fauna.

Part B. No change.

Part C. No change.

3444-3460 Marl, green, somewhat sandy, micaceous; fragments of light-gray, fine-grained sandstone; about 25 percent of sample is loose, fine-grained sand.

3460-3495 No change.
Description

Beds of Taylor age

3497-3510  Core 10. Recovery?
Part A. Marl, gray, hard, in part highly sandy (fine-grained sand).

3514-3526  Shale, gray, marly, micaceous; a little fine-grained sand and fine-grained, argillaceous sandstone. Fauna like core 10 at 3497-3510 ft.

3526-3540  Like sample at 3514-3526 ft., with the addition of many fragments of *Inoceramus*. The microfauna contains specimens of *Planulina spissocoetata*, *Planulina dumbelei*, and *Globorotalites conicus*, a typical Taylor fauna.

3540-3571  No change.

Beds of Austin age

3571-3587  Like sample at 3540-3571 ft., with the addition of many fragments of white hard chalk highly impregnated with specimens of *Oligostegina*. The chalk is typically Austin in character, and the specimens of *Oligostegina* are typical of the top of the beds of Austin age in many wells in southern Georgia and northern Florida.

3587-3602  Like sample at 3571-3587 ft.

3612-3626  Core 11. Recovery?
Part A. Chalk, gray, hard, like the white chalk in the samples from 3571 to 3602 ft. Dominant species in the microfauna are: *Pseudoclavulina moorevillensis* (characteristic of the upper part of the outcropping Mooreville Limestone in Alabama and Mississippi), *Globorotalites umbilicatus*, *Planulina texana*.
Part B. No change.
Part C. No change.
Part D. Chalk like part A, but softer, and leaving a washed residue composed almost entirely of *Inoceramus* prisms and specimens of Foraminifera:
Characteristic species are:
*Pseudoclavulina moorevillensis*
*Neoflabellina suturalis*
*Ammobaculites subplanatus*
*Gaudryina austini*iana*
*Pseudoclavulina clavata*
*Ventilabralla eggeri*
*Kyphopyxa christneri*
*Planulina texana*
**Description**

*Globorotalites umbilicatus*

*Robulus pondi.*

The fauna indicates the upper part of the beds of Austin age.

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<th>Depth</th>
<th>Sample Description</th>
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<tr>
<td>3626-3632</td>
<td>Sample is mainly cavings, composed of gray sandy marl, light-gray sandstone, and loose sand. Some specimens of Foraminifera are like those in core 11 at 3612-3626 ft.; others are cavings from higher levels.</td>
</tr>
<tr>
<td>3632-3642</td>
<td>Like sample at 3626-3632 ft., and fragments of the hard gray chalk reported in core 11 at 3612-3626 ft.</td>
</tr>
<tr>
<td>3642-3693</td>
<td>Mainly fragments of hard white chalk and hard gray chalky marl; a little sand, gray marl, and sandy marl, probably cavings from higher levels; many <em>Inoceramus</em> fragments and prisms. The microfauna is mainly a mixture of specimens cavings from higher levels.</td>
</tr>
<tr>
<td>3693-3738</td>
<td>Like sample at 3642-3693 ft., with the addition of a few fragments of dark-gray flaky shale. The washed sample at this depth is much smaller than the immediately preceding samples, suggesting that the shale, which washes out, probably was the largest part of the unwashed sample.</td>
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<tr>
<td>3746-3760</td>
<td>Core 12. Recovery?</td>
</tr>
<tr>
<td>Part A. Marl, gray, hard; and light-gray, hard, dense, highly microfossiliferous, slightly sandy limestone, composed of a mass of microfossils, small fragments of macrofossils, and <em>Inoceramus</em> prisms. The microfauna is, mainly, small specimens of <em>Globigerina cretaeoa</em>, <em>Gimbelinea globulosa</em>, <em>Planulina austiniana</em>, and a few specimens of <em>Eouvigerina</em> sp.</td>
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<tr>
<td>Part C. Like part A, and containing a few fragments of <em>Citharina texana</em> var. and a few specimens of <em>Dorothisa alexanderi</em>. A similar fauna occurs in the Ector Tongue of the Austin chalk in Texas.</td>
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<tr>
<td>Part D. Limestone, gray, hard, marly, containing abundant specimens of <em>Oligostegina</em> that occur in the lower part of the beds of Austin age in many wells in southern Georgia and northern Florida.</td>
<td></td>
</tr>
<tr>
<td>3760-3776</td>
<td>Clay, gray, shaly; gray sandy shale; light-gray sandstone; and loose sand. The material and the microfauna are probably cavings from higher levels.</td>
</tr>
<tr>
<td>3776-3823</td>
<td>Washed sample, small. Like sample at 3760-3776 ft., but contains a little dark-gray marly shale. No marked change in microfauna.</td>
</tr>
<tr>
<td>3838-3847</td>
<td>Core 13. Recovery?</td>
</tr>
<tr>
<td>Part A. Limestone, gray, hard, marly. Specimens of <em>Citharina texana</em> are fairly common; otherwise the microfauna is similar to core 12 at 3746-3760 ft.</td>
<td></td>
</tr>
<tr>
<td>Part B. Like part A.</td>
<td></td>
</tr>
<tr>
<td>Part C. Shale, gray, marly. The washed residue contains frag-</td>
<td></td>
</tr>
</tbody>
</table>
Description

ments of the gray shale, many *Inoceramus* fragments, fragments of *Ostrea* sp., and specimens of Foraminifera and Ostracoda. Common in the fauna are: *Globigerina cretacea*, *Globotruncan*ns spp., *Planulina austiniana*, and *Dorothia alexanderi*.

3849-3859

Washed residue, small; composed of dark-gray, soft, marly shale, and a little fine-grained sand that may be caving. The material drilled is probably dark-gray, waxy, calcareous shale. No change in microfauna.

3859-3877

No change.

Atkinson Formation. Upper Member.

3889-3899

Shale, dark-gray, soft; fragments of light-gray, very fine-grained sandstone; a little coarse-grained quartz sand. Fragments of gray flaky shale, lignite, and fine to moderately fine grained sand are common.

3899-3920

No change.

3930-3944

Core 14. Recovery?

Part A. Shale, gray, flaky, that seems to be lenticular in light-gray, very fine grained, micaceous, somewhat carbonaceous sandstone. A little carbonaceous material also occurs in the shale, and a few brown irregular-shaped nodules of siderite are present. The microfauna is composed of a few specimens of ostracodes, and specimens of *Globigerina cretacea* var., *Gümbe*lna sp., *Valvulinera infrequens*, and *Ammobaculites* sp.

Part B. No change.

3944-3950

Shale, dark-gray, flaky, slightly carbonaceous, and fragments of brownish-gray, very fine grained micaceous sandstone; a few specimens of Foraminifera and Ostracoda.

3950-3960

Like sample at 3944-3950 ft. Fragments of gray flaky shale are more abundant.

3960-3972

Like sample at 3950-3960 ft. Many of the shale fragments are thinly flaky and smoother in texture than in the preceding samples.

3972-3987

Like sample at 3960-3972 ft.

3994-4004

Core 15. Recovery?

Part A. Marl, dark-gray, hard, containing fragments of *Ostrea* sp. and fish scales. Specimens of Foraminifera common in the sample are: *Globigerina cretacea*, *Gümbe*lna *moremani*, *Gümbe*lna *reussi*, *Neobulimina* sp., *Valvulinera infrequens*, *Planulina eaglefordensis*; other species are: *Globotruncan*ns sp., and fragments of *Citharina texana*.

Part B. Like part A, but contains no specimens of *Neobulimina* sp.

Part C. No change.

4004-4013

Shale, dark-gray, marly, flaky, and fragments of light-gray, fine-
grained, micaceous sandstone containing fragments of *Ostrea* sp. and a microfauna like core 15 at 3994-4004 ft.

Washed sample, small. Composed mainly of fragments of gray and some greenish-gray flaky shale, and fragments of light-gray, fine-grained, micaceous sandstone. The microfauna is like core 15 at 3994-4004 ft.

This sample seems to mark a change from the deeper-water marine facies of the upper Atkinson, above, to the shallow-water marine facies, below. The electric log indicates that the change in facies is at 4060 ft. The sample is composed, chiefly, of fragments of light-gray, dense, very fine to fine-grained, micaceous sandstone, many fragments of lignite, and a little shale like the samples just above.

Core 16. Recovery?

Part A. Sandstone, clear quartz, fine-grained, moderately even grained, angular, micaceous, somewhat pyritic.

Part B. Sandstone, clear quartz, fine to moderately coarse-grained, micaceous; and greenish-gray, flaky, smooth-textured shale containing a few fragments of lignite.

Sandstone, white, and a little olive-green flaky shale like core 16 at 4096-4112 ft.; also cavings of shale and sandstone from higher levels.

Like sample at 4112-4124 ft. with the addition of a few coarse grains of clear quartz sand.

Sand, coarse-grained, clear quartz; and fine-grained, dense, micaceous, clear quartz sandstone; gray and greenish-gray flaky shale; many fragments of lignite.

Core 17. Recovery?

Part A. Sandstone, clear quartz, moderately fine and even grained, loosely consolidated, micaceous.

Part B. Sandstone, hard, dense, moderately fine grained, somewhat uneven grained; conglomeratic, containing many fragments of carbonaceous material, nodules of gray clay, fragments of greenish-gray shale, quartz pebbles, and nodules of limonite.

Shale, gray and greenish-gray, flaky; also coarse-grained quartz sand; lignite; fragments of the conglomeratic sandstone reported in core 17 at 4155-4171 ft.

No change.

Core 18. Recovery?

Part A. Sandstone, light-gray, very hard, dense, fine-grained to silty, containing many highly micaceous lenses, and a few lenses of gray flaky shale.

Part B. Sandstone, white, loosely consolidated, uneven-grained, silty, micaceous.

Shale, gray, flaky; and fragments of white, fine-grained sandstone; a few shell fragments.
Description

4242-4253 Shale, gray, flaky, and many fragments of white, moderately coarse grained, highly fossiliferous, calcareous sandstone.

4253-4260 Core 19. Recovery?
   Part A. Sand, clear quartz, fine-grained, even-grained, angular; also fragments of gray flaky shale, containing many small pieces of carbonaceous material and a trace of mica.
   Part B. Like part A.
   Part C. Sand, clear quartz, fine to moderately fine grained, angular; also many fragments of carbonaceous material, and a few shell fragments.
   Part D. Sand, clear quartz, fine to moderately fine grained; also many fragments of gray, flaky, slightly micaceous, carbonaceous shale that seem to be embedded in the sand.

4260-4269 Shale, gray, and fragments of white, hard, highly microfossiliferous, calcareous sandstone; a few fragments of lignite.

4269-4308 No change.

4308-4325 Core 20. Recovery?
   Part A. Sandstone, light-gray, dense, fine-grained, micaceous, somewhat glauconitic.
   Part B. Limestone, light-gray, very hard, dense, microfossiliferous; contains a few fragments of carbonaceous material, and is partially dolomitized.
   Part C. Fragments of limestone like part A, and many fragments of greenish-gray, micaceous siltstone, containing abundant worn and broken shells of fossil bivalves, a few molds of small gastropods, a trace of glauconite, a few phosphatic nodules, and shreds of carbonaceous material.
   Part D. Shale, gray, micaceous, containing much carbonaceous material, fish scales, many fragments of an Ostrea-like bivalve; and a few lenses of light-gray, sandy shale in which the sand is very fine grained.

4325-4331 Shale, greenish-gray, and white, hard, fossiliferous limestone.

4331-4347 No change.

4347-4359 Like the preceding samples of the lower Atkinson, but shale fragments are relatively more abundant. The microfauna is composed of a few specimens of ostracodes, and a few specimens of Ammobaculites agrestis and other species characteristic of the so-called "marine shale" of the Tuscaloosa.

4360-4371 Core 21. Recovery?
   Part A. Sandstone, gray, hard, silty to very fine grained, micaceous.
   Part B. Shale, gray, hard, sandy, micaceous, containing many fragments of Ostrea-like bivalves.
Description

Part C. Sand, clear quartz, fine to coarse-grained, micaceous; and many fragments of light-gray, soft, micaceous, finely carbonaceous siltstone.

Part D. Sand, clear, quartz, fine to coarse-grained and fragments of very fine grained, micaceous, somewhat glauconitic sandstone containing worn fragments of Ostrea-like bivalves and a little carbonaceous material.

4371-4380 Sandstone, light-gray, hard, dense, calcareous, containing worn and broken fragments of microfossils; also cuttings of gray and greenish-gray flaky shale.

4380-4389 Sandstone, gray, dense, highly micaceous; and gray and greenish-gray shale.

4389-4419 Like sample at 4380-4389 ft., but shale fragments are dominant.

4419-4437 Core 22. Recovery?

Part A. Sandstone, dark-gray to black-streaked, very fine grained, highly micaceous, argillaceous.

Part B. Like part A, and a little loose, coarse-grained sand.

Part C. Sand white, loosely consolidated, fine to very coarse grained, micaceous.

Part D. Like part C.

4437-4449 Sand like part C and part D of core 22 at 4419-4437 ft.

4440-4462 Like sample at 4437-4449 ft. The sand contains a few yellowish-green grains.

Comanche Series undifferentiated

4462-4477 Like sample at 4449-4462 ft. Greenish-yellow grains are common in the sand, which also contains many pink grains.

4477-4497 Core 23. Recovery?

Part A. Shale, hard, mottled, gray, mustard-yellow, purple, and reddish-brown, micaceous, unctuous; contains small siderite spherules.

Part B. Like part A, siderite common.

Part C. Like part B, and white, fine to coarse-grained, clay-cemented, clear quartz sand.

Part D. Clay, multicolored, hard; and fine to coarse-grained sand; abundant siderite spherules.

4497-4506 Like core 22 at 4477-4497 ft., and a few fragments of pink and white, moderately coarse-grained, calcareous sandstone.

4506-4515 Like sample at 4497-4506 ft., and many fragments of pink sandstone.

4515-4529 Sand, fine to very coarse grained; clear quartz, and fragments of multicolored shale. The sand contains many greenish-yellow and pink grains.

4529-4544 Sand, similar to sample at 4515-4529 ft., but is composed mainly
Description

of white and yellow grains and a little white feldspar; also a little multicolored shale.

4555-4575 Core 24. Recovery?
Part A. 2 ft. Sandstone, pinkish-white, loosely consolidated, fine to moderately coarse grained, somewhat calcareous, cemented with white bentonitic clay; pink-tinted and greenish-yellow grains are fairly common.
Part B. Like part A, but sand is mostly coarse grained.

Pre-Cretaceous (?)
The top of the pre-Cretaceous (?) rocks is placed at 4570 ft. on the basis of electric log correlation, supported by sample data.

4575-4585 Like core 24 at 4555-4575 ft., and also fragments of reworked and weathered “basement” rocks.
4585-4595 Like sample at 4575-4585 ft., but the reworked and weathered “basement” material is dominant.
4595-4604 Pink and gray arkosic quartzite.
4607-4616 Top of black “basement” material; igneous rock?
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