Claiborne County
Geology and Mineral Resources

ALVIN R. BICKER, JR.

THEO H. DINKINS, JR.

CHARLES H. WILLIAMS, JR.

THOMAS E. McCUTCHEON

BULLETIN 107

MISSISSIPPI GEOLOGICAL, ECONOMIC AND
TOPOGRAPHICAL SURVEY

WILLIAM HALSELL MOORE
DIRECTOR AND STATE GEOLOGIST

JACKSON, MISSISSIPPI
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LETTER OF TRANSMITTAL

Office of the Mississippi Geological, Economic and
Topographical Survey
Jackson, Mississippi

November 18, 1966

Mr. Henry N. Toler, Chairman, and
Members of the Board
Mississippi Geological, Economic & Topographical Survey

Gentlemen:

It is with pleasure that I transmit to you Bulletin 107 of the Mississippi Geological Survey, "Claiborne County Geology and Mineral Resources," by Alvin R. Bicker, Jr. and others.

This is the latest in a series of comprehensive investigations of the mineral resources of Mississippi Counties. The financial participation by these Counties has allowed the Mississippi Survey to utilize the facilities and talents of testing laboratories, ceramics engineers, etc., that were not available to the Survey for many years. The incorporation of this testing data with the excellent surface and subsurface studies made by the Survey's staff has resulted in a bulletin of much value to the further development of Claiborne County.

Respectfully submitted,

William H. Moore
Director and State Geologist

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CLAIBORNE COUNTY GEOLOGY

ALVIN R. BICKER, JR.

ABSTRACT

Claiborne County, located in west central Mississippi, lies within the parallels 31°45′ and 32°15′ north latitude and the meridians 90°40′ and 91°15′ west longitude. It is within the Gulf Coastal Plain physiographic province.

The bedrock strata exposed is a part of the Miocene series of the Tertiary system. The Catahoula formation is the only unit of the Miocene exposed. The unit is overlain locally by deposits of pre-loess terrace materials, loess and alluvium.

Lenticularity of the sands and clays make surface determination of structure almost impossible. Near surface strata shows three known piercement type salt domes present in the subsurface. Natural gas is being produced from the structure caused by one of these salt intrusions.

Surface rocks and minerals of possible economic importance include natural clay mixtures, sand and gravel. The clays may be used in brick and tile manufacture, production of lightweight aggregate and foundry bond clay. Sand and gravel may be utilized in road and highway construction and in the building industry. In the subsurface, salt in the Bruinsburg Dome is the most likely prospect for possible future development.

INTRODUCTION

The field work for the present investigation began in May 1965 and was terminated in March 1966. The investigation consisted of studies of the character, distribution, and thicknesses of the various geologic units and of the possible surface expression of subsurface geologic structures which may affect these units. In addition to these considerations, especial attention was given a search for materials of possible economic importance. Sixty-nine test holes were drilled in order to gain stratigraphic and structural information and to obtain samples for various laboratory tests and paleontological studies. A total of 14,173 feet was drilled and cored. These holes were drilled with the Survey's Failing 750 and 1500 drilling rigs. Electrical logs were run on all of the test holes, using the Survey's Widco and Neltronic logging instruments.

In addition to the test holes drilled by the Survey, many electrical logs of water wells and oil test wells were used in the investigation. This information saved time and money by allowing the Survey to plan the course of field work more efficiently.

PREVIOUS INVESTIGATIONS

Although no comprehensive geological investigation of Claiborne County has been conducted in the past, certain aspects of the geology and mineral resources have been discussed in previous reports.

Wailes[1] in 1854 and Harper[2] in 1857 discussed briefly the formations exposed in Claiborne County. Wailes examined the strata at a few localities in the County. From his report we know he visited the bluffs at Grand Gulf and at Grindstone Ford, where the old Natchez Trace crossed Bayou Pierre. Wailes named the strata he found exposed at these localities the Grand Gulf sandstone.

Hilgard[3] apparently examined the strata in Claiborne County several times. His writings list various exposures in the

Figure 1.—Interbedded Catahoula clay and sandstone overlain by loess, exposed in the bluff escarpment at Grand Gulf, on the road to Fort Cobun. The section represents a portion of Bed No. 3 of Hilgard's section at Grand Gulf. Perry Nations photo. April 22, 1966.

Figure 2.—Gray indurated Catahoula sandstone in bluff escarpment at Grand Gulf. Bed No. 2 of Hilgard's section at Grand Gulf. Perry Nations photo. April 22, 1966.

County. Concerning the exposure of strata on the bluffs overlooking Grand Gulf he made the following observation:

"No outcrop, perhaps, is more characteristic, and represents within a small space so many pecularities of the formation, as that from which it takes its name — that forming the Bluffs at Grand Gulf, on the Mississippi River, where it is overlain by the calcareous silt of the Bluff formation. The following is a detailed section obtained by myself, on the spot:

Feet	Character of Strata	No.
60-70	Calcareous silt of the Bluff formation, forming the hilltops.	12
14	"Grand Gulf Sandstone," in ledges 10 inches to 2 feet in thickness; stratification often discordant and curved.	11
15	Gray sandy material, sometimes soft sandstone, with an argillaceous cement; alternating with harder ledges, 6 to 10 inches thick, of friable, whitish sandstone.	10
2.5	Solid whitish sands, one of good quality.	9
2.5	Greenish-gray clay with white veins of carbonate of lime.	8
1	Soft white sandstone.	7
0.5	Grayish-yellow pipeclay.	6
1	Dark-gray, brittle sandstone.	5
3	Gray, semi-indurated, clayey sand.	4
17	Gray and yellowish sands and clays, semi-indurate, interstratified.	3
3	Semi-indurated, gray sand.	2
2	Greenish-gray clay with veins of carbonate of lime.	1"

Crider[4] in a general discussion of the geology of the State mentioned portions of the County. Logan[5] in 1908 briefly discussed the geology and brick clay industry of the County.

Lowe[6] in his first report on the geology of the State discussed the Grand Gulf Group and suggested that recent studies indicated the possibility that the Grand Gulf Group would have to be broken up into several formations. In 1919[7] and 1925[8] Lowe made revisions and corrections of his earlier work. In these reports he subdivided the Grand Gulf Group into the Catahoula, Hattiesburg and Pascagoula formations.

Hubricht[9] in 1962 discussed and listed the species of land snails found in the loess at various localities in the County.

The Water Resources Division of the United States Geological Survey has published several reports on the ground water resources of the County. These reports, which are compilations of the water resources of several counties, gave only a brief summary of the geology of the County.

DESCRIPTION OF THE AREA

LOCATION AND SIZE

Claiborne County, located in southwestern Mississippi, lies within the parallels 31°45′ and 32°15′ north latitude and the meridians 90°40′ and 91°15′ west longitude. The County is an irregular shaped area containing some 311,040 acres or 486 square miles. The maximum north-south and east-west extents are both about 30 miles. Claiborne County is bounded on the north by Warren County; on the east by Hinds and Copiah Counties; and on the south by Jefferson County and on the west by Tensas Parish Louisiana. Port Gibson, the County seat, is located 28 miles south of Vicksburg, Mississippi; 65 miles southwest of Jackson, Mississippi; and 125 miles north of Baton Rouge, Louisiana.

ACCESSIBILITY

Several State maintained highways make Claiborne County readily accessible from the north, east and south. Ferry boat service from Bruinsburg connects the County with St. Joseph, Louisiana, to the west.

U. S. Highway 61 traverses the County from north to south connecting Port Gibson with Vicksburg and Natchez.

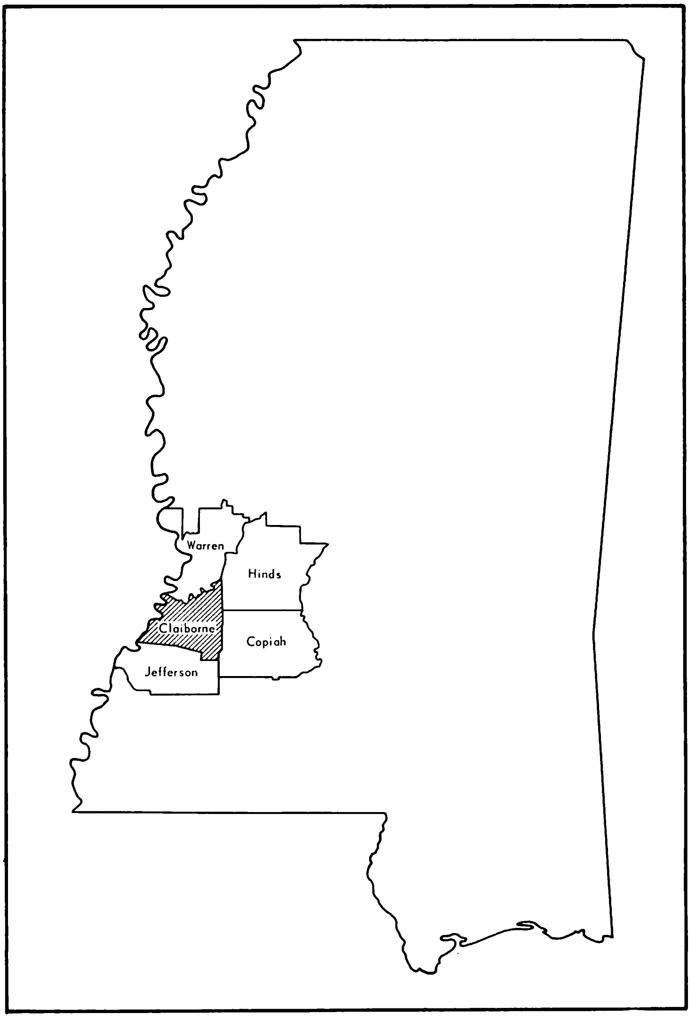


Figure 3.—Location of Claiborne County.

State Highway 18 extends from Port Gibson eastward and provides a hard surfaced thoroughfare to Jackson. State Highway 547, in part asphalt surfaced, traverses the southeastern part of the County connecting Port Gibson with Brookhaven and McComb. The road from Port Gibson to the Bruinsburg Ferry landing, locally known as the "Ferry Road," is completely hard surfaced. The northwestern part of the County is linked to Port Gibson by a series of hard surfaced roads, making most parts of the County readily accessible, except during periods of extremely heavy rainfall. The historical route of the Natchez Trace Parkway, which will extend from Natchez to Nashville, Tennessee, crosses the County from the southwest to the northeast. The portion of the Parkway from Bayou Pierre northeast to the Hinds County line has been completed. Construction on the unfinished segment is in progress and should be completed in the near future.

Several rail lines serve Claiborne County. The Yazoo and Mississippi Valley Branch of the Illinois Central Railroad crosses the County from north to south, connecting Port Gibson with Memphis and New Orleans. The Little J. Branch line of the Illinois Central system, which follows the road bed of one of the earliest railroads in the State, connects Jackson with Natchez and crosses the County in a northeast-southwest direction. This line services the communities of Carlisle, Hermanville and Pattison.

A recent industrial feasibility study has been conducted concerning the establishment of a river port on the Mississippi River in the vicinity of Grand Gulf. If this plan is fulfilled, low cost river transportation will be available for further industrial development.

POPULATION

The 1960 census shows a total population for Claiborne County of 10,845, a decrease of 8.9 percent from the 1950 census figure of 11,944. The density of population is 22.3 persons per square mile. However, 26.7 percent of the total is concentrated in Port Gibson, which has a population of 2861. Approximately another 5 percent live in unincorporated towns of which Hermanville (pop. 225) is the largest.

Other communities shown on the general highway map are Alcorn College, Barland, Burnell, Carlisle, Grand Gulf, Rocky Springs, Russum, Tillman, Westside and Willows.

CLIMATE

The climatological data given herein was compiled from United States Department of Commerce, Weather Bureau reports. The measurements of temperature and precipitation were made at the recording station at Port Gibson. Sample recordings used in the compilation of Table 1 were for a 10-year period, January 1956 through December 1965. Average temperature was 63.5 degrees. Characteristically, the summers are long and hot, and the winters are short and mild. Maximum tempera-

Table 1

Normal, Monthly, Seasonal, and Annual Temperature and Precipitation at Port Gibson, Claiborne County, Mississippi*

Month	Temperature			Precipitation		
	Average	Absolute maximum	Absolute minimum	Average	Absolute maximum	Absolute minimum
	F°	F°	F°	Inches	Inches	Inches
December	46.5	80	7	4.89	9.74	1.34
January	42.9	80	0	4.98	8.61	2.30
February	48.7	84	7	4.88	8.42	1.89
Winter	46.0	84	0	14.75	20.24	10.30
March	54.2	89	20	7.10	15.57	2.32
April	64.7	90	31	4.45	11.99	.63
May	72.7	97	40	3.02	4.53	.55
Spring	63.9	97	20	14.57	23.36	4.76
June	77.6	102	48	5.08	8.38	1.36
July	80.9	99	60	3.69	6.57	.18
August	79.9	100	53	3.33	6.44	.55
Summer	79.5	102	48	12.10	19.90	4.14
September	75.0	96	45	2.47	6.94	.21
October	63.9	97	28	2.22	5.46	T[1]
November	54.5	85	19	5.39	12.03	1.64
Fall	64.5	97	19	10.08	18.51	5.42
Year	63.5	102	0	51.50	63.65[2]	49.68[3]

*Average temperature and precipitation based on a 10 year record; compiled from available recordings in U. S. Department of Commerce, Weather Bureau, "Climatological Data," January, 1956 through December, 1965.

[1]Trace [2]1963 [3]1960

ture recorded was 102 degrees in June 1963 and minimum temperature was 0 degrees January 1962. Average rainfall is 51.5 inches, the greatest occurring during the winter and spring months. The largest annual rainfall was in 1963 when 63.65 inches was recorded. Excessive amounts were recorded during April and November of that year.

CULTURE AND INDUSTRY

Basically the economy of Claiborne County is agricultural, with the largest part of the acreage in timber, pasture and feed crops. The principal source of farm income is about equally divided between livestock and forest products.

Figures supplied by the Mississippi Employment Security Commission show the annual average work force in Claiborne County for the period 1962-1965 totaled 3170 persons in 1965. Of these, 680 were employed in manufacturing, 600 in agricultural endeavors and 1730 employees in the non-agricultural wage and salary group.

Manufacturing concerns produce cotton and soybean oils, lumber products, paper tube products and plastic specialities. Most of these industries utilize locally produced raw materials.

TOPOGRAPHY

Claiborne County is within the Gulf Coastal Plains Province and includes parts of three physiographic divisions: (1) The Mississippi Alluvial Plain, represented by the area between the Loess or Bluff Hills and the Mississippi River; (2) The Loess or Bluff Hills, a broad hill belt extending through most of the County; and (3) The Long Leaf Pine Hills, which includes the southeastern corner of the County.

The Mississippi Alluvial Plain is an area of low relief that extends eastward from the Mississippi River to the Loess or Bluff Hills. That part of the alluvial plain which is in Claiborne County is from one-half to five miles in width. Relief is caused by differences in elevation between natural levees and abandoned stream channels. Maximum relief on the plain is about 25 feet. Altitudes range from 60 to 80 feet above sea level.

The Loess or Bluff Hills are characterized by steep slopes and severely dissected stream valley walls which in many areas form vertical or near vertical escarpments. The western boundary of the Loess Hills is marked by a prominent escarpment which rises several hundred feet above the nearly flat surface of the Mississippi Alluvial Plain. Elevations in the Loess Hills region range from about 100 feet above sea level in the bottoms of the stream valleys to over 400 feet on the hilltops in the northeastern portion of the region. An outstanding topographic feature of this region is a prominent east-west ridge crossing the northern half of the County, forming the divide between the Big Black River and Bayou Pierre drainage systems.

Eastward the loess cover thins and the slopes become more gentle than those typical of the Loess Hills region. Consequently, there is no sharp boundary between the typical Loess topography and the more gentle rolling topography of the Long Leaf Pine Hills. The range of elevations in the Long Leaf Pine Hills region are similar to those found in the Loess Hills division. The highest elevation in the County is near the Jefferson County boundary in Sec.35, T.10N., R.4W. Here an elevation exceeding 440 feet above sea level has been recorded.

Recently published topographic maps are available for the entire County. Their use enables the field investigator to locate quickly and accurately positions of outcrops and other physical features without the aid of surveying equipment. The St. Joseph quadrangle which covers the entire southwestern part of Claiborne County is a 15 minute series map on the scale of 1:62,500 or approximately 1 inch equals one mile. This map was published in 1958. The remaining quadrangles are of the 7 1/2 minute series with a scale of 1:24,000 or approximately 2.6 inches equals one mile. These quadrangles are: Big Black, Barlow, Carlisle, Cayuga, Dentville NW, Grand Gulf, Hermanville, McBride, Port Gibson, Red Lick, Utica West and Willows. All of these maps were published in 1963 except Utica West which was published in 1962. The area of coverage of each map is shown in Figure 4.

The topographic maps of Claiborne County and other areas of Mississippi may be secured at the offices of the Mississippi Geological Survey, 2525 North West Street, Jackson, Mississippi. An index to topographical coverage is available on request. Orders are accepted by mail. Mailing address of the Survey is P. O. Box 4915, Jackson, Mississippi, Zip Code 39216.

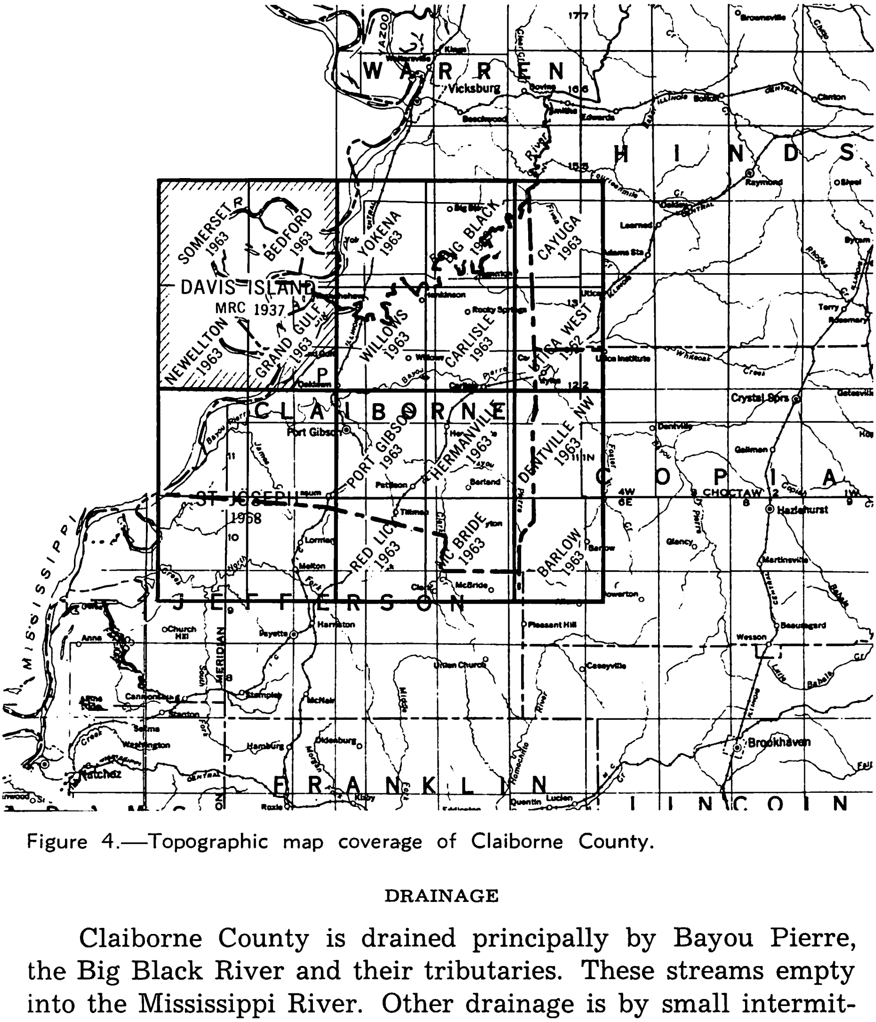


Figure 4.—Topographic map coverage of Claiborne County.

DRAINAGE

Claiborne County is drained principally by Bayou Pierre, the Big Black River and their tributaries. These streams empty into the Mississippi River. Other drainage is by small intermittent streams flowing directly into the Mississippi River.

Bayou Pierre, a westward flowing stream, drains the central and southern parts of the County. This stream is formed by the confluence of the North Fork of Bayou Pierre and Little Bayou Pierre. Both of these streams flow more or less in a westerly direction. The North Fork of Bayou Pierre flows through the central part of the County. Its tributaries are small intermittent and spring fed creeks. Little Bayou Pierre drains all of the southeastern part of the County. It flows westward through the south central part turning northwestward and joining the North Fork in the vicinity of Port Gibson. Some of the tributaries of Little Bayou Pierre have a substantial base flow throughout the year. Brandywine, Clarks, Willis and Baker Creeks are the major tributaries. These streams all flow northward and themselves drain parts of southwestern Copiah and northwestern Jefferson Counties. There are numerous smaller streams that are tributaries for Little Bayou Pierre. Past the place where the two major forks of Bayou Pierre join, the river continues its westward flow until it empties into the Mississippi River near Bruinsburg Bend. Widow

SYSTEM	SERIES	STRATIGRAPHIC UNIT	THICKNESS (feet)	LITHOLOGIC CHARACTER
QUATERNARY	RECENT	Alluvium	0–100	Fine–to coarse–grained sand, gravel, silt and clay. Some organic material.
	PLEISTOCENE	Loess	0–80	Tan to brown silt. Contains land snail shells.
		Pre–Loess Terrace deposits	0–100	Fine–to coarse–grained sand. Chert and quartz gravel. Numerous clay lenses. Petrified wood.
TERTIARY	MIOCENE	Catahoula formation	0–900	Gray, buff, green and red clays. White to gray silt. White to gray kaloinitic sand, locally indurated. Fine–grained sandstone, extremely indurated.

Figure 5.—Generalized section of exposed strata in Claiborne County.

Creek and James Creek are the larger tributaries that flow into the main body of Bayou Pierre.

Big Black River drains the northern part of the County. Many small intermittent and spring fed creeks flow into the Big Black. The larger tributaries are Big Sand Creek, Little Sand Creek, Kenison Creek and Gunns Bayou. The headwater area of Big Sand Creek is in southwestern Hinds County. Big Sand Creek, Kenison Creek and Gunns Bayou have a base flow even during periods of extreme drought. These creeks are fed by a large number of springs that flow from the base of the terrace gravels. Although some of these springs cease to flow during periods of drought the writer observed a number of springs flowing during the summer and early fall of 1965.

STRATIGRAPHY

GENERAL STATEMENT

The bedrock exposed in Claiborne County is a part of the Miocene series of the Tertiary system. The strata exposed in Claiborne County are composed of sediments deposited in a regressive sea and are classed as non-marine. Sediments in this environment of deposition include a variety of lithologies; sand, clay, silt, sandstone. The strata dips generally to the south. The younger deposits are found at the higher elevations in the southern part of the County. The total thickness of strata exposed is approximately 750 feet.

In most areas the bedrock is covered by surficial materials consisting of loess, terrace deposits, alluvium, colluvium and soils of the Pleistocene and Recent series of the Quaternary system. A generalized section of the exposed strata is shown in Figure 5. The areal extent of the various strata is shown on the Geologic Map, Plate 1.

CATAHOULA FORMATION

The name Catahoula was introduced by Veatch[10] in 1905 for exposures in Catahoula Parish, Louisiana. He proposed the name as a replacement for the lower part of the Grand Gulf Group which he considered to be encumbered with too many younger formations.

The Catahoula underlies the entire County. In most of its outcrop area it is covered by loess and/or terrace deposits. Only

Figure 6.—Interbedded Catahoula clay and sandstone overlain by loess at Grand Gulf. Perry Nations photo. April 22, 1966.

Figure 7.—White, kaolinitic Catahoula sandstone lense exposed on north side of county road in SW.¼, SW.¼, Sec.64, T.11N., R.2E. Perry Nations photo. April 22, 1966.

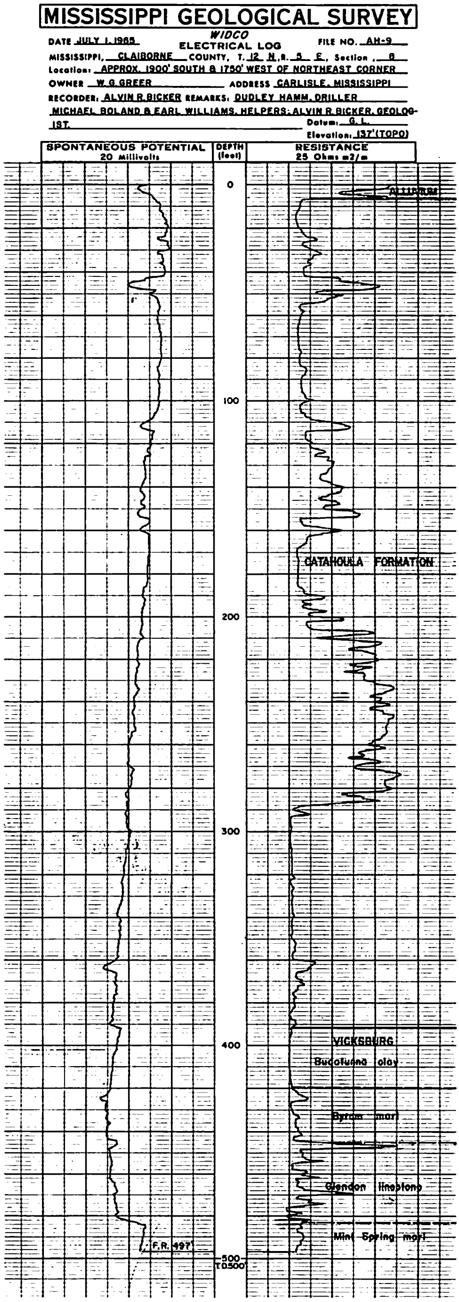


Figure 8.—Electrical log of Catahoula and Vicksburg section.

in the younger stream valleys, when alluvial plains have not developed, are Catahoula outcrops found without overlying surficial deposits.

The formation consists of gray, green, buff, red and purple, silty to very silty, sandy, clays and light-gray to gray, clayey silts, containing lignite rarely. The sands, which are characteristic of the Catahoula are present as lenses or discontinuous beds that grade laterally and vertically into silts and clays, with which they are interbedded. Figure 6 shows interbedded sandstone and clay exposed in the lower part of the escarpment near Grand Gulf. The 3 feet of strata included in the figure represents a portion of bed No. 3 of Hilgard's measured section at Grand Gulf. On outcrop the sands are predominately white, very fine- to coarse-grained. Locally they are cemented to form sandstones of varying degrees of hardness. At many localities the white color of the sands is imparted by kaolinitic material present as interstitial material.

The thickness of the sands vary from a few inches to many feet. Most exposures in the County indicate the sand members to be a few inches to several feet thick. One notable exception occurs in the SW.¼, SW.¼, of Sec.64, T.11N., R.2E., approximately 0.3 of a mile east of Russum. At this locality, 25 feet of white, kaolinitic, sandstone overlain by approximately 12 feet of loess is exposed in the road cut (Figure 7). The total thickness of this sand can not be ascertained as its base is concealed. Test Hole AH-68, drilled in Sec.19, T.10N., R.4E., encountered a sand that measured 190 feet in thickness. This sand was divided near its center by 12 feet of sandy silt. In most areas in Claiborne County existing records of test wells indicate the Catahoula to be predominately clay. However, Test Hole AH-68 shows that locally the Catahoula section contains thick sand bodies.

The entire thickness of Catahoula is not present in Claiborne County. Its lower contact with the Vicksburg Group is found to the north in Warren County, and its upper contact with the Hattiesburg clay is a few miles to the south of the Jefferson County boundary. The maximum thickness of Catahoula to be found in the County would be along the southern boundary of T.10N., R.4W. At this latitude it is estimated that the Catahoula should be more than 900 feet thick. Test Hole AH-68, penetrated 788 feet of Catahoula sediments. The test hole was drilled in Sec.19, T.10N., R.4E., approximately three and one-half miles north of the area of estimated maximum thickness. A core hole drilled during 1946 in Sec.16, T.10N., R.4W., encountered the Catahoula-Vicksburg contact at a depth of 855 feet. No record of the first 140 feet of this well is available for examination, however, surface indications permits the assumption that the Catahoula is overlain by less than 10 feet of loess and that the maximum thickness of the Catahoula in this area would be approximately 845 feet.

As previously stated, surface exposures of the contact of the Catahoula with the underlying Vicksburg group are not present within the County. Consequently, any discussion of this contact is based upon information obtained from test hole cuttings. Previous reports have disagreed as to whether the contact was conformable or unconformable. The earlier works were handicapped by insufficient observations and incorrect placement of members within the respective stratigraphic units. Some early geologists placed the Bucatunna member of the Vicksburg group in the Catahoula. Cooke[11] in 1935 proposed that the Bucatunna member should be included in the Vicksburg group. Mellen[12] stated that the contact was unconformable in Warren County. Moore[13] observing outcrops and cores in Hinds County used the term disconformity in describing the Catahoula-Vicksburg contact.

During the field investigation of Claiborne County, eight test wells were drilled through the Catahoula-Vicksburg contact. Careful examination of the well cuttings and electrical logs reveal continuity that would be expected of normal deposition in four of the eight holes. The records of the remaining test holes indicate various degrees of erosion on the surface of the Vicksburg group. Moore pointed out that in some areas of Hinds County similar conditions exist where the Catahoula is in contact with different members of the Vicksburg group. The electrical logs of a number of core tests and oil test wells widely dispersed throughout Claiborne County, also show the same conditions. Plate 2, a stratigraphic-structural cross section, shows three wells in which stratigraphic discontinuity is present. The large sand body present above the Vicksburg in two of the wells could be the results of channel filling. However, other

Figure 9.—Interbedded Catahoula clay and sandstone exposed in stream bed on the Natchez Trace. NW.¼, SE.¼, Sec.60, T.13N., R.4E. June 14, 1966.

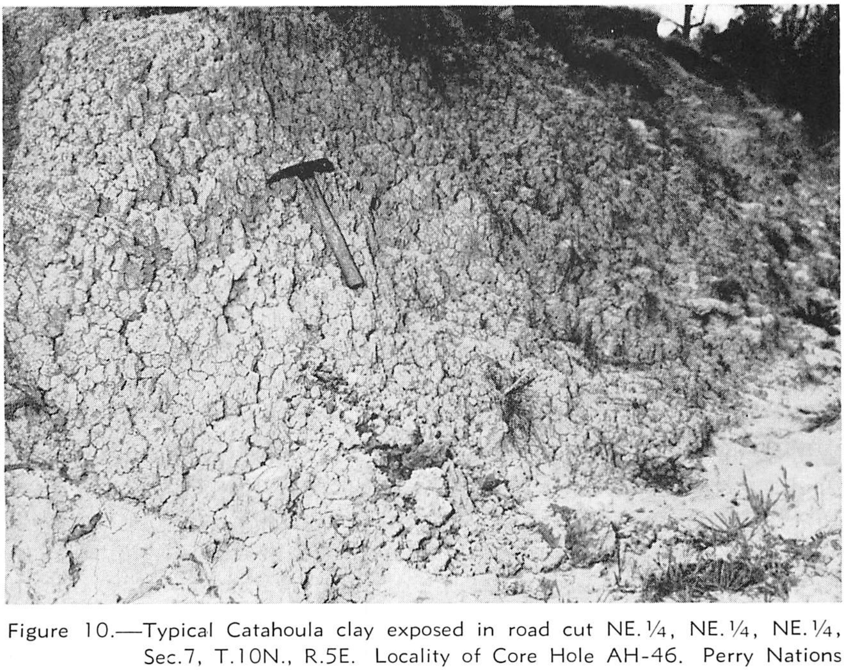


Figure 10.—Typical Catahoula clay exposed in road cut NE.¼, NE.¼, NE.¼, Sec.7, T.10N., R.5E. Locality of Core Hole AH-46. Perry Nations photo. April 22, 1966.

locations where typical Catahoula clays are in contact with eroded Vicksburg would preclude this type of deposition. It is the writer's opinion that the contact of the Catahoula with the underlying Vicksburg is unconformable.

Outcrops of Catahoula are most numerous in the eastern half of the County. Westward the thick covering of loess masks the formation. In the western part of the County the formation is exposed only in deep stream valleys and along the bluff escarpment. On the escarpment, colluvium and dense foliage cover the outcrop and hamper attempts to measure and describe the section.

In the northeastern portion of the County, in the SW.¼, SE.¼, Sec.60, T.13N., R.4E., on the Natchez Trace the following section is exposed in the valley of an intermittent stream:

	Feet	Feet
Colluvium		3
Sand and gravel	3	
Catahoula formation		10
Clay, very light-gray, to buff, silty	3	
Clay, light-gray to white, sandy grading laterally to clayey sand with hard sandstone lenses 3 inches thick	3	
Clay, light-gray to buff, silty	4	

A short distance to the north in the NW.¼, SE.¼, Sec.60, T.13N., R.4E., the following section is exposed (Figure 9).

	Feet	Feet
Catahoula formation		20
Clay, light-gray, silty	4.0	
Sand, light-gray, indurated fine-grained	1.5	
Clay, light-gray, silty	5.0	
Sand, light-gray, clayey	1.5	
Clay, light-gray, sandy	8.0	

What could be termed typical Catahoula clay can be observed in a roadcut exposure in the NE.¼, Sec.7, T.10N., R.5E., (Figure 10). Approximately 7 feet of light-gray, silty clay is exposed. Visual examination showed the material to be less silty than some outcrops and prompted the drilling of a core test to obtain samples for testing. Chemical analysis for this clay is listed in Table 1, Claiborne Clay Tests, under sample number AH-46. Lithology of the cored section is as follows:

Figure 11.—Interbedded Catahoula sandstone and clay overlain by terrace material and loess on the north side of State Highway 462. SW.¼, Sec.1, T.13N., R.4E. April 14, 1966.

	Feet	Feet
Loess		7.0
Silt, tan	7.0	
Catahoula formation		21.0
Clay, yellowish-gray, slightly silty	6.5	
Silt, white to very light-gray argillaceous, sandy	1.5	
Clay, yellowish-gray, slightly silty	3.0	
Clay, yellowish-gray, plastic, slight limonitic staining	4.0	
Silt, yellowish-gray, argillaceous, sandy, heavy iron staining	6.0	

The surficial deposits that overlie the Catahoula can be observed in several localities. The road cut exposure in the SW.¼, Sec.1, T.13N., R.4E., (Figure 11) exemplifies one type of contact. At this locality the Catahoula is overlain by a thin bed of material which is an admixture of terrace sands, gravel and loess. This admixture is probably the result of colluviation occurring during initial deposition of the loess. Above this zone lie several distinct beds of loess. At other locations the Catahoula is overlain by distinct terrace deposits which are in turn overlain by loess. These contacts are easily identifiable as characteristic Catahoula clays are directly overlain by sands and gravels. These contacts occur at elevations ranging from as low as 85 feet to over 300 feet above sea level. Eighteen of the sixty-nine test wells show the Catahoula to be overlain by loess at their respective locations. The elevations of these Catahoula-Loess contacts range from 160 feet to 325 feet above sea level. These contacts are sharply definable.

In Claiborne County the Catahoula is, for the most part, a non-marine deposit. The sediments were deposited similar to those now occurring along the Gulf Coast in the vicinity of the Mississippi Delta. Several test holes contain sands with rare glauconite content. Moore[14] reported thin glauconitic sands

Figure 12.—Waterfall formed by ledge of indurated Catahoula sandstone in the bed of Owens Creek. NE.¼, NE.¼, Sec.20, T.13N., R.5E. Perry Nations photo. April 22, 1966.

present in the Catahoula in Hinds County. No fossils were observed in the Catahoula of Claiborne County. Berry[15] described the flora of the Catahoula. He reported *Palmoxylon cellulosum,* a specie of palm wood, collected from Bayou Pierre in Claiborne County. Matson[16] considered that this fossil wood was derived from the Catahoula. The writer doubts this stratigraphic placement of material recovered from Bayou Pierre or its alluvial plain. Catahoula sandstone does occur at several localities in the river bed, however, it is the writer's opinion that the fossil wood found in the Bayou Pierre Valley was originally deposited in the terrace material that cap the surrounding highlands. Hilgard[17] reported fossil wood in the area around Rocky Springs. This area is almost completely surrounded by terrace deposits at higher elevations, and the wood found in the Rocky Springs area was derived from the terrace deposits.

Lignite was encountered within the Catahoula in some of the test holes. At places it consists of very thin beds. However, a two foot bed was present in Test Hole AH-3, Sec.3, T.14N., R.5E., at a depth of 108 feet. Wailes[18] observed a two foot bed of lignite in the bank of a small branch in Sec.47, T.13 N., R.2 E. Wailes may have been in error as to the geographical location and possibly was referring to T.13N., R.3E. Brown[19] reports lignite in that vicinity. Test Hole AH-5 located approximately two miles east-northeast did not encounter lignite in the Catahoula.

Figure 13.—Terrace gravels overlain by thin mantle of loess in roadcut of Highway 462, near center of Sec.2, T.12N., R.3E. Perry Nations photo. April 22, 1966.

PRE-LOESS TERRACE DEPOSITS

All sands and gravel deposits not associated with the present-day alluvial plains are here designated pre-loess terrace deposits. One major exception to this designation will be discussed at the end of this section. Most areas of the County contain some surficial terrace material above the Catahoula formation, although the Geologic Map (Plate I) does not show this. The reason for not illustrating all terrace material on the Geologic Map is twofold: (1) The thick cover of loess in some areas makes it necessary to identify the terraces from test hole information. All terrace material encountered in test holes which was less than 20 feet thick were not mapped. However, terrace material was encountered in 51 of the 69 test holes drilled. (2) In areas where the mapping of a lower terrace would obliterate the outline of a higher level terrace the lower terrace has been omitted.

The terrace deposits found at higher elevations usually consist of gravel, fine- to coarse-grained sands, silts and clay lenses. The gravel is predominately chert with occasional quartz. The sand is usually red or reddish-orange. Clays are generally pink or red at the surface exposures. Light-gray, tan, buff or purple colored clays were encountered in the subsurface. Large conglomeratic, ferruginous boulders are associated with the high terrace deposits in various locations. In some areas in the northeastern part of the County, silicified wood is common near the base of the high terrace deposits. The deposits at successive lower elevation are composed of finer grained material. Although these deposits occasionally contain a minor amount of gravel near the base of the deposit, they are usually composed of sand and silt.

Figure 14 shows the elevations of the base of some of the terrace deposits in Claiborne County. Differences of elevations and the composition of the various deposits suggest that the terraces are not all contemporaneous. However, there are deposits that can be correlated. The extensive high terrace deposits occupying the divide between the Big Black and Bayou Pierre drainage systems located in T.12N. and T.13N., R.3E. and R.5E., can be traced from the eastern boundary of the County to as far west as Sec.6, T.12N., R.3E., approximately 2 miles west

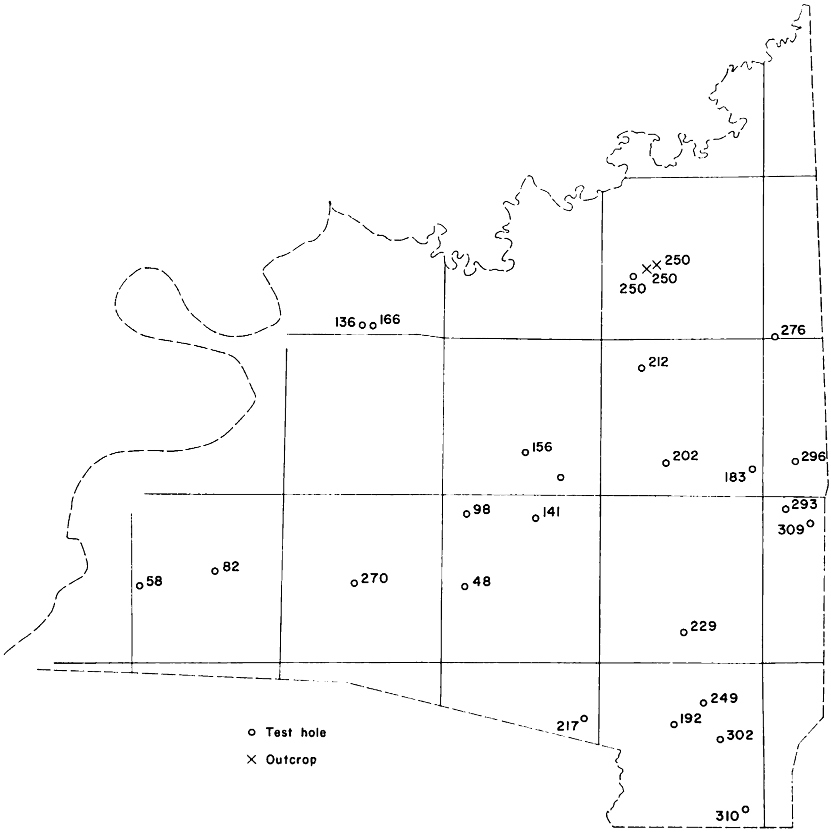


Figure 14.—Elevations of the base of various terrace deposits as determined from test holes.

of Willows. If the deposit extends further west of this point the loess cover obscures all surface exposures of terrace material along this divide. The deposit is continuous except near the western extremity where surface elevations are below 250 feet. At the eastern boundary of the County the base of this deposit lies at an elevation of 300 feet or slightly above. Westward the base is progressively lower and near Willows, the elevation of the base is about 250 feet. This represents a west dip of about 4 to 5 feet to the mile. The surface of the deposit is very irregular and thickness of the deposit varies. Average thickness along the divide was estimated to be 45 feet. Maximum thickness would be found in Sec.50, T.13N., R.4E. Estimated thickness in this area is approximately 100 feet. This high level terrace deposit correlates with the pre-loess terrace deposits mapped by Moore[20] in southwestern Hinds County.

The high terrace deposit located in T.10N., R.4E., are correlative to those found along the Big Black-Bayou Pierre divide. These terrace materials can be traced continuously from the southern boundary of the County, beginning in Sec.36, T.10N., R.4E., northward into Sec. 13, T.10N., R.4E. Maximum thickness of this deposit as measured in Test Hole AH-37 is 94 feet. The location of the test hole is in Sec.15, T.10N., R.4E. It is possible that the maximum thickness may be as much as 110 feet along the southern boundary of the township where surface elevations are 15 to 20 feet higher than those in the vicinity of the test hole. Elevation of the base of this high terrace deposit is 310 feet in Sec.37, T.10N., R.4E., 3 miles to the north in Section 15 the elevation is 302 feet, indicating apparent north dip of about 3 feet per mile. Outcrops indicate a westward distribution of this terrace for several miles, however, the basal contact was not exposed and the possibility of westward dip on the base of this deposit was not determined. Enough information was gathered to indicate that if west dip was present it would not exceed 2 to 3 feet per mile. Using the base of the high terrace as partial criteria for correlation of the terrace deposits, it would be necessary to include the material lying above 290 feet in T.11N. and T.12N., R.5E., in the same unit with high terrace deposits listed above.

In the immediate area of the high terrace other terrace materials are present whose bases are at lower elevations. In some areas the lower terraces onlap the high terrace and in some localities can be traced almost continuously from the highest terrace downward to the alluvial materials of present day stream valleys. The composition of these lower terraces is almost entirely sand. Locally a small percentage of gravel is present in the bottom 4 to 5 feet of the deposit.

The high terrace deposits have been the object of several reports. Matson[21] included pictures of the deposits at Rocky Springs in his paper on the Citronelle. He included all terrace deposits within the Citronelle and subdivided the unit into four plains, based upon surface elevations, each lower plain being of younger age than the preceding one. He discussed the plains in western Mississippi in their regional setting and did not definitely identify the deposits at Rocky Springs with any of the four plains. Based upon relative elevations Matson gave for each plain, the present writer can only surmise that he would have included the high terrace deposits of Claiborne

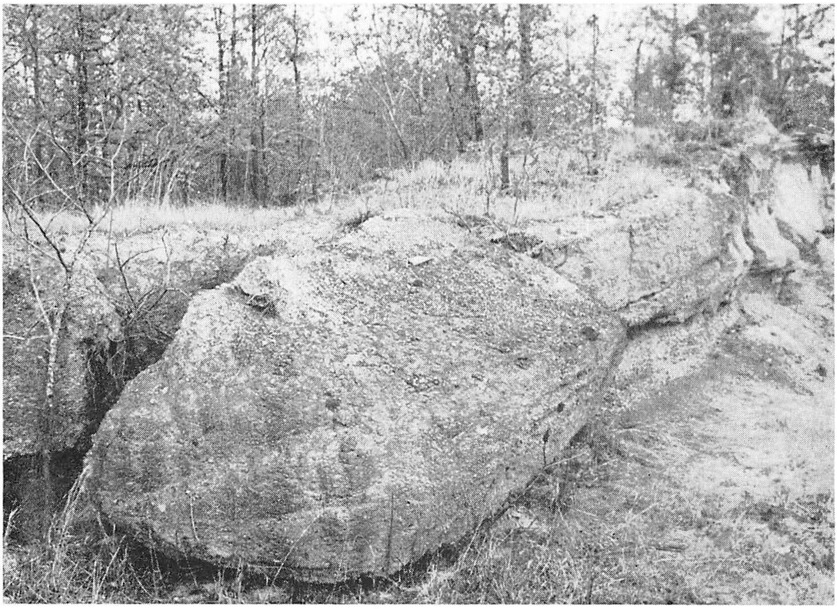


Figure 15.—Graveliferous claystone boulder at the top of terrace deposit in gravel pit. NW.¼, NW.¼, Sec.13, T.10N., R.4E. Perry Nations photo. April 22, 1966.

County in the Sardis Plain, the second oldest of the four plains. Doering[22] places the terrace deposits at Rocky Springs in the Lissie formation. Mapping the terrace deposits in this area he shows the surface of the Lissie to be about 400 feet in elevation. He indicates that the Citronelle deposits would have to be at elevations above 450 feet in Claiborne County and concludes that the terrace deposits are of younger age than Citronelle. Other authors concur with Doering concerning the post-Citronelle age of the terrace deposits in Claiborne County. Belt et al[23], constructing a geologic map of Mississippi, restricted the Citronelle to the south and east of the County. Neither Matson nor Doering discussed the high terraces in the southern part of the County. Based upon the surface elevations, the elevation of the base of the deposits and the composition of the deposits, the writer correlates these deposits with the high terrace at Rocky Springs. On the basis of the present areal investigation the author does not suggest the name Lissie for these high terrace deposits, but does subscribe to the post-Citronelle age.

The terrace deposits located in the area between Bayou Pierre and Little Bayou Pierre, with the exception of those previously discussed in T.11N. and T.12N., R.5E., are of later age and some probably represent reworked material of earlier terrace deposits that occupied the area before erosion downgraded the uplands. Their usual composition is sand, although gravel is present locally at the base of some deposits. Clay, which composes a high percent of the material of the high terrace, is conspicuous by its absence. The deposits vary in thickness from a few feet to as much as 75 feet or more.

In the western portion of the County most terrace deposits are covered by a thick blanket of loess. In the extreme western part this cover is as thick as 75 feet. The composition of most of the terrace deposits in this portion of the County is similar

Figure 16.—Sharply defined contact of terrace gravels and loess at intersection of county roads near center of SW.¼, Sec.32, T.13N., R.4E. June 14, 1966.

to that of the lower deposits found elsewhere in the County. Several deposits located in the central part of T.11N., R.2E., can be correlative to the other high terraces of the County. They are similar in lithologic content. The elevation of the base of the high terrace deposits in T.11N., R.2E., is about 270 feet. This suggests that the high terraces in T.11N., R.2E., and the other high terraces in the County were deposited upon a surface of approximately the same base level.

The contact of the terrace materials with the subjacent Catahoula formation is definitely unconformable. Most observations were made from the test hole records as very few surface exposures are available. In most areas the contact is sharply defined as the terrace materials overlie silty Catahoula clays. Several test holes presented problems in defining the contact between the two formations as terrace sands were overlying sands that are of possible Catahoula age. This problem was exemplified in Test Hole AH-17 where 8 feet of terrace sands were in contact with definite Catahoula sands. This condition is apparently restricted to the lower, more recent terrace deposits. During the present investigation this condition was not encountered outside the area embraced by the Bayou Pierre and Little Bayou Pierre.

The majority of the surface exposures of the contact of the terrace materials with the overlying loess is sharply defined as shown in Figure 16. There are a few contacts that are gradational. This gradational contact is a zone not exceeding two feet in thickness and consisting of loess and sand with a minor amount of gravel interspersed in the mixture. Although, this gradational contact was observed only several times at the surface, information from test holes indicate these conditions may be more common at lower elevations.

The terrace deposit shown on the Geologic Map in T.11N., R.1W., differs from the usual high terrace found in Claiborne County. It is not a pre-loess terrace and is discussed in this section merely for convenience. Deposition of this terrace began during late loess or post-loess deposition, whereas, the other high terraces are pre-loess deposits. The terrace was identified by examination of samples secured from Test Hole AH-69. The areal extent of the terrace is unknown. The area illustrated on the geologic map is based upon the physiography of the region, and it is possible that the terrace deposit is more wide-spread than shown. A prominent high, relatively flat plain exists in the vicinity of Westside, which forms a drastic contrast to the typical loess topography prevalent elsewhere in the southwestern part of the County. The lithology of this flat area suggests that the area is the remnant of an alluvial plain of a late loess or a post-loess age stream. The stratigraphic sequence at the location of the test hole shows 44 feet of terrace deposit overlying 72 feet of loess which in turn overlies 56 feet of pre-loess terrace deposits.

The 44 feet of terrace material that was overlying the loess consists of 20 feet of tan silt containing approximately fifty percent of medium- to very coarse-grained sand with some light-gray clay nodules. The physical appearance of this 20 feet interval is very similar to materials found in low areas where recent erosion has transported and redeposited weathered and reworked loess. The lower 24 feet of the deposit was composed of fine- to very coarse-grained sand with some tan silt, pyrite nodules and gray, silty sandstone. The elevation of the terrace is progressively lower from south to north suggesting that the material possibly was deposited by a northward flowing stream much the same as James Creek does at this time. It is quite likely that the stream now known as James Creek furnished the transportation for this material when the stream was at a higher level. The source of the material would be pre-loess terraces that undoubtedly existed in the highlands that surround the plain.

Although only a few terraces are shown on the Geologic Map in the western half of the County there are undoubtedly more present. Their presence is obscured from observation by a loess cover that ranges from 30 to 78 feet in thickness.

LOESS

The loess covers all of Claiborne County except recent stream valleys or where it has been removed by erosion. From a maximum thickness of more than 78 feet near the river bluffs the loess progressively thins eastward until it is a few feet thick in the southeastern part of the County. The maximum

Figure 17.—Silicified log from pre-loess terrace deposits near center Sec.49, T.13N., R.4E. Perry Nations photo. April 22, 1966.

thickness observed during field operations was 78 feet in Test Hole AH-58 which was located approximately three and one-half miles east of the bluff escarpment.

The loess maintains uniform texture over a wide area. Fresh loess at one place in the County is much the same as in others. It is chiefly composed of silt size particles within the range of 0.05 to 0.005 millimeter in diameter. Vestal[24] indicated that in the loess of Adams County that this grain size range amounted to 86.9 percent of the total volume. The color may be gray, buff, brown or red. The most common color seen in Claiborne County is tan to reddish-brown. Color is due to iron minerals or organic material that have been altered by weathering agencies.

The mineral composition of loess is chiefly quartz with varying amounts of clay and iron minerals, calcite, dolomite and feldspar. Chemical composition of loess from Test Hole AH-63 is as follows:

Silicon Dioxide (SiO_2)	68.82
Aluminum Oxide (Al_2O_3)	11.35
Ferric Oxide (Fe_2O_3)	3.97
Calcium Oxide (CaO)	3.93
Magnesium Oxide (MgO)	2.59
Sodium Oxide (Na_2O)	0.95
Potassium Oxide (K_2O)	1.60
Sulfer Trioxide (SO_3)	none
Phosphorous Pentoxide (P_2O_5)	0.24
Loss on Ignition	6.25

Screen analysis of the above material shows 99.1 percent to have a particle size of less than 0.25 millimeter. Chemical analysis of loess material that was subjected to erosion and redeposition compares favorably to the above. Analysis of Test Hole AH-61 shows an increase in the percentage of silicon dioxide and decreases in calcium, magnesium and carbonaceous material. The loess in Adams County differs somewhat in its chemical composition, the most striking differences being in the following components:

Aluminum oxide	0.139
Ferric oxide	5.920
Sodium Oxide	11.934

The comparison of the chemical components of known extremely weathered loess with slightly oxidized loess in Claiborne County suggests that the differences noted between the loess in Claiborne and Adams Counties may have been inherent to the original deposition and not merely a result of oxidation and leaching.

The three zones of loess which Mellen[25] and Vestal[26] noted in Warren and Adams Counties are not as conspicuous in Claiborne County. These zones are; a basal unoxidized zone, a median oxidized but unleached zone, and a surficial oxidized but leached zone. The basal phase which the above authors identify as bluish-gray unoxidized and slightly oxidized silt was not identified on surface outcrops in Claiborne County. In only one test hole, AH-69, were any materials found that could definitely be classified as basal phase on the basis of unoxidized coloration. It is possible that the extremely narrow ridges on which the loess is deposited allowed the loess to be oxidized to some extent throughout. Snowden[27] in a study of the loess in Warren County recognized a section of basal loess which had been oxidized and leached to some extent. The second zone is more easily identified. This zone consists of slightly oxidized to oxidized and partially leached loess. At most localities this section contains numerous shells of land snails. The third zone of loess consists of material that has been thoroughly oxidized and leached.

The contact of the loess with the subjacent rocks is disconformable. Approximately 25 percent of the field observations showed the loess to be in contact with the Catahoula formation. At other localities the loess overlies terrace material. Many of the contacts are sharply defined as illustrated in Figure 16. At a few exposed contacts and in some test holes the contact is somewhat gradational from terrace material to loess. Examination of the surface exposures where there is no sharp contact indicates a material that is an admixture of loess and sand with small amounts of gravel. The thickness of observed sections varied from a few inches to a maximum of 18 inches. Vestal[28] reported contacts in Adams County where the fine silt appears to have worked down into the underlying terrace material. Where observed in Claiborne County this section has been termed colluvium. Figure 11 is an example of colluvial material lying between the loess and Catahoula.

Pleistocene mammalian remains have been reported from the loess in nearby counties. None were found during the present investigation of Claiborne County. Many species of pulmonate gastropods, land snails, are present in the loess. Hubricht[29] identified the following species obtained from the loess two miles south of Port Gibson:

Stenotrema stenotrema (Peiffer)	*Haplotrema concavum*
Stenotrema leai aliciae	*Mesomphix capnodes*
Stenotrema fraternum	*Ventridens intertextus*
Mesodon thyroides	*Anguispira alternata*
Mesodon clausus	*Anguispira strongylodes*
Mesodon elevatus	*Discus patulus*
Mesodon inflectus	*Helicodiscus notius*
Triodopsis fosteri	*Succinea ovalis*
Triodopsis albolabris	*Cionella morseana*
Allogona profunda	*Pomatiopsis lapidaria*
Helicina orbiculata	*Mesodon zaletus*

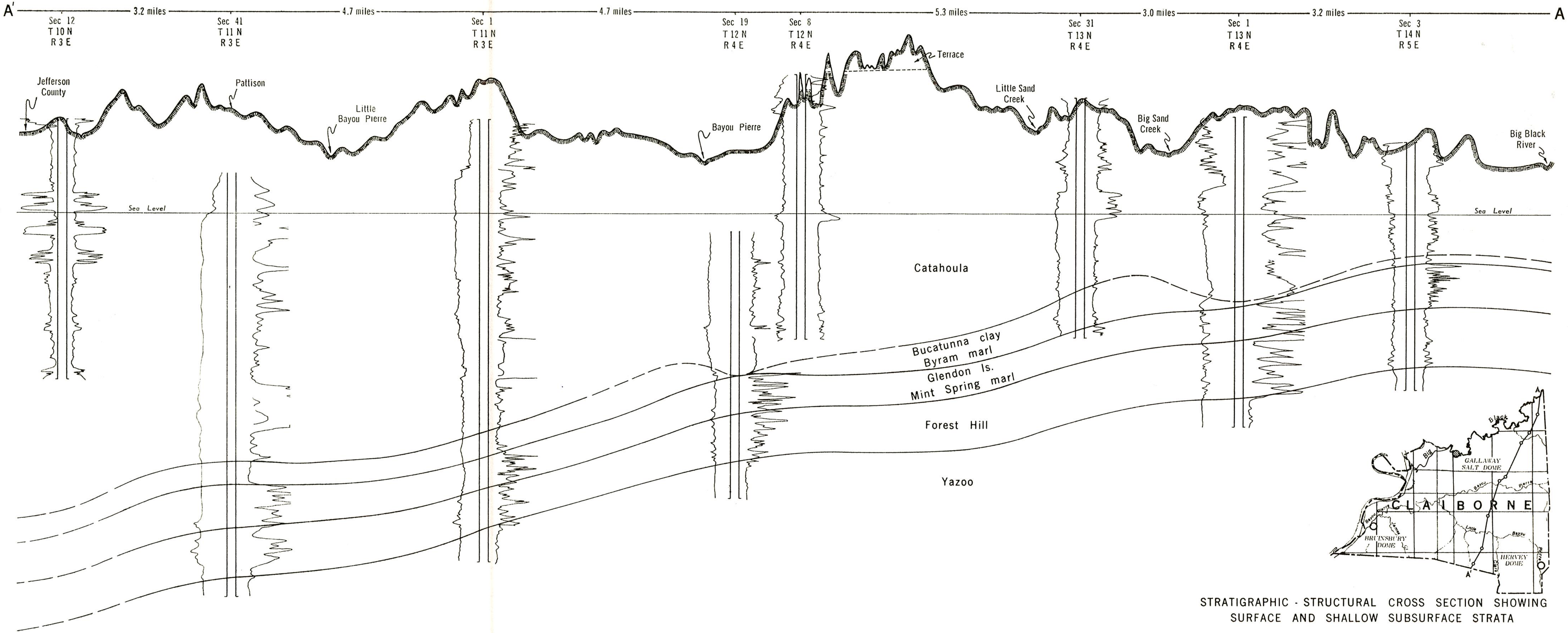
ALLUVIUM

Only the larger streams that have developed extensive alluvial plains are illustrated on the Geologic Map of the County. The alluvium consists of discontinuous beds of sand, silt, clay and gravel. The beds are generally stratified with gravel near the base overlain by sand, sand and silt with occasional beds of clay. The beds are usually interfingered and interwedged. The deposits range in thickness from a few feet on the smaller streams to as much as 200 feet in the Mississippi Alluvial Plain.

That part of the Mississippi Alluvial Plain within Claiborne County varies from less than one mile to more than six miles in width. In Warren County as much as 200 feet of alluvium have been encountered and similar thickness should be found in Claiborne County. Test Hole AH-65, located near Grand Gulf, penetrated 96 feet of alluvium. The bedrock beneath most of the alluvial plain is strata of the Catahoula formation. Near the northern border of Claiborne County it is possible the alluvium overlies bedrock of Vicksburg age.

The alluvial plain of the Big Black River extends across the greater part of the northern border of the County. Maximum width of the alluvial plain within Claiborne County is approximately two miles. The alluvium varies in thickness with the greatest thickness approaching 100 feet. For approximately six miles upstream from its confluence with the Mississippi River the Big Black flows across alluvial sediments deposited by the Mississippi. The thickness of the alluvium in this area may approach maximum thickness present in the Mississippi Alluvial Plain. In the eastern part of the plain the bedrock is of Vicksburg age, and it may be possible that some part of the Vicksburg group is subjacent to the alluvium throughout the course of the river.

The alluvial plains of Bayou Pierre and Little Bayou Pierre seldom exceed two miles in width, and for most of its length the alluvial plain of Little Bayou Pierre is less than a mile wide. Near its confluence with the Mississippi River, Bayou Pierre flows across alluvium deposited by the Mississippi River for eight miles. The alluvium of both streams range in thickness from a few feet to as much as 70 feet where the streams traverse the uplands. Strata of the Catahoula formation forms



STRATIGRAPHIC - STRUCTURAL CROSS SECTION SHOWING SURFACE AND SHALLOW SUBSURFACE STRATA the bedrock under the alluvial plains of both Bayou Pierre and Little Bayou Pierre. During periods of low stream flow bedrock can be observed at several localities in both stream channels.

STRUCTURE

Claiborne County lies within the Gulf Coast geosyncline that is commonly referred to as the Mississippi Embayment. Most of the County is located on the western limb of the Embayment. The axis of the syncline is near the eastern boundary of the County. The regional dip of the surface Miocene strata is to the south with local variation to the southeast and the southwest.

Plate 2, a stratigraphic-structural cross section from northern to southern Claiborne County, shows the relationship of the

Figure 18.—Catahoula sandstone with apparent north dip at intersection of county roads. SE.¼, SE.¼, NE.¼, Sec. 29, T.10N., R.4E. Perry Nations photo. April 22, 1966.

surface strata with the underlying subsurface units. The southward regional dip is well illustrated by the subsurface beds. The logs of the test holes used in the cross section clearly show the lack of a suitable marker within the Catahoula formation with which regional dip could be determined.

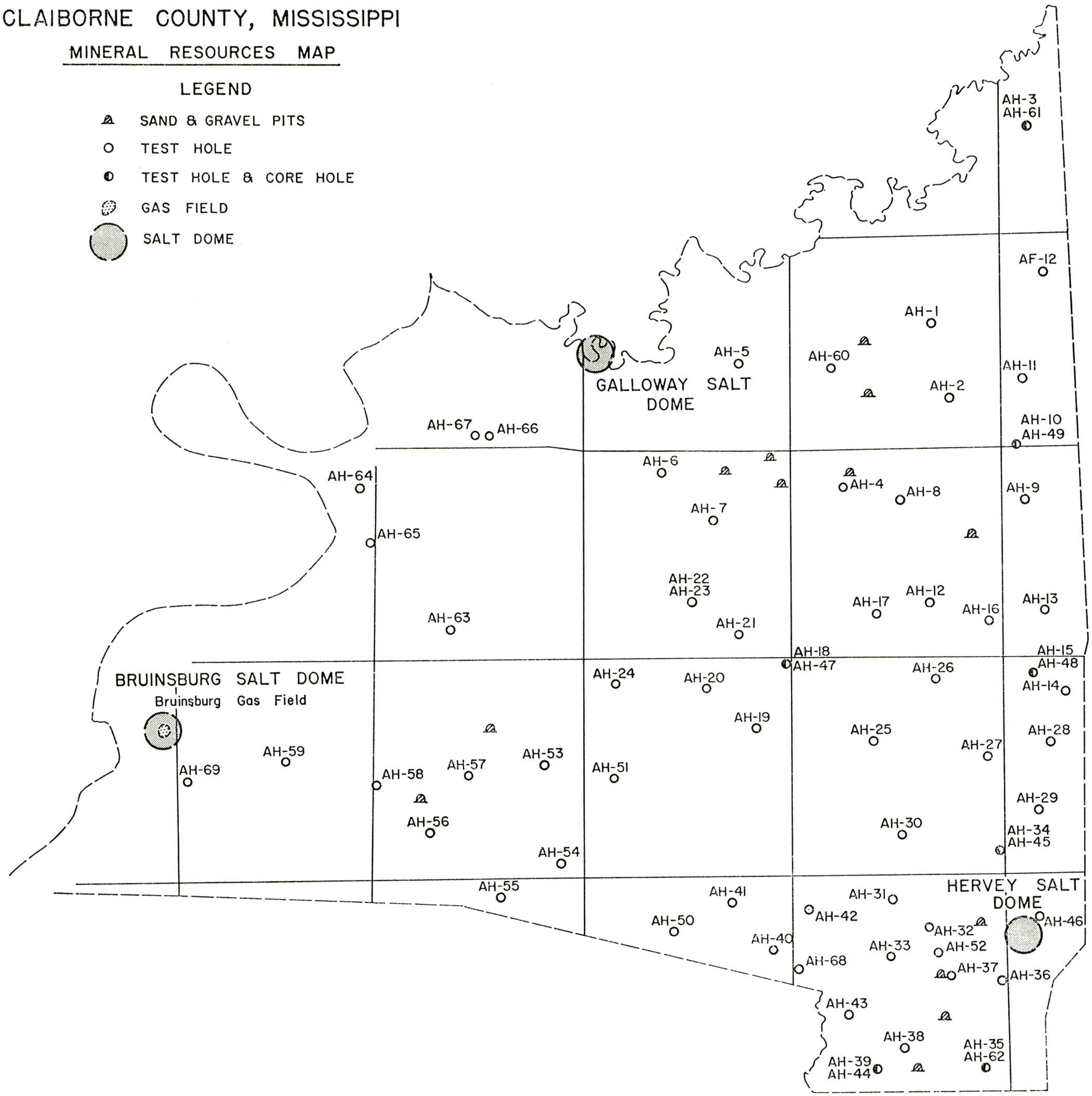
Lenticularity of the sand and clay lenses that compose the Miocene strata and the unconformable contact of the Catahoula formation with the overlying surficial deposits make surface determinations of dip almost impossible as to their authenticity. The writer is skeptical of apparent local dip due to slump and bedding features. Figure 18 shows a ledge of indurated sandstone with apparent dip to the northwest. At the same locality directly across the road, beds exhibit dip to the south. The ridge on which the outcrop is situated terminates a short distance to the north and slopes of the ridge are in that direction. It is evident that the apparent northwest dip is due to slump. Approximately 1500 feet to the south of the outcrop Test Hole AH-38 encountered sand five feet below the level of the indurated sandstone. There was no definite characteristics in either the sand or indurated sandstone to prove or disprove the possibility of their being the same bed. If they are the same, then dip of the bed would be southward at a rate of 17-18 feet to the mile. Subsurface mapping of the Glendon limestone by Charles H. Williams in the section "Claiborne County Structural Geology," based on limited control indicates that dip on the Glendon limestone in this area is about 50 feet to the mile to the south.

Williams' map of the Glendon (Plate 1, Williams) shows structural disturbance of the limestone over known salt domes located in Claiborne County. The magnitude of the disturbances indicate that the regional dip of the Catahoula should be affected in the area of the salt domes. The Bruinsburg Dome, located in the flood plain of Bayou Pierre, and the Galloway Dome, located in the Big Black flood plains, exhibit no surface expression. The surface area overlying the Hervey Dome is partially covered by alluvium and sufficient exposures of Catahoula are not present to allow accurate structural determination.

ECONOMIC GEOLOGY

GENERAL STATEMENT

The primary purpose of the investigation of Claiborne County was to locate and report mineral deposits of known or probable economic value. Because of the expense of testing materials in


CLAIBORNE COUNTY, MISSISSIPPI
MINERAL RESOURCES MAP
LEGEND
SAND & GRAVEL PITS
TEST HOLE
TEST HOLE & CORE HOLE
GAS FIELD
SALT DOME
GALLOWAY SALT DOME
BRUINSBURG SALT DOME
Bruinsburg Gas Field
HERVEY SALT DOME
AH-3
AH-61
AF-12
AH-1
AH-5
AH-60
AH-2
AH-11
AH-10
AH-49
AH-67
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commercial laboratories and the limited funds available for this phase of the investigation only those materials that were thought to be representative were selected for testing. Other factors such as accessibility, thickness and overburden were additional criteria observed when selecting samples to be tested. The latter properties were of the utmost consideration in determining the location of the test holes. The Economic Geology Map shows the larger number of the test borings were concentrated in the eastern half of the County where overburden would be less.

Of the 69 holes drilled or cored, 12 yielded samples that were selected for further testing. The scarcity of outcrops made it necessary to drill test holes in the search for favorable materials.

Some of the mineral resources are now being utilized. These mineral industries and their production are discussed under their appropriate heading.

NATURAL CLAY MIXTURES

Clay-like materials are abundant in Claiborne County. The term clay is commonly used to refer to a wide range of chemical and physical compositions. Moore[30] in discussing the clay and clay-like material of Hinds County found it appropriate to define clay and to suggest the term "natural clay mixtures" for the silty and sandy clays existing in the Catahoula and other formations. In defining clay, Moore referred to Grim in his text on clay mineralogy where Grim defines clay as "a rock term and also a particle-size term in the mechanical analysis of sedimentary rocks and soils, etc. As a rock term it is difficult to define precisely, because of the wide variety of materials that have been called clays. In general the term clay implies a natural earth, fine-grained material which developes plasticity when mixed with a limited amount of water. By plasticity is meant the property of the moistened material to be deformed under the application of pressure, with the deformed shape being retained when the deforming pressure is removed. Chemical analysis of clays shows them to be essentially silica, alumina and water, frequently with appreciable quantities of iron, alkalies and alkaline earths .... As a particle size term, the clay fraction is that size fraction composed of the smallest particles. The maximum size of particles in the clay size grade is defined differently in different disciplines. In geology the tendency has been to follow the Wentworth scale and to define the clay grade as material finer than about 4 microns."

Inasmuch as the Catahoula formation in Claiborne County consists of silty and sandy clays similar to those found in Hinds County it is appropriate to retain the term "natural clay mixtures." For simplicity all materials tested for ceramic and chemical properties are grouped under this heading.

The field work consisted of a study of the clay exposures and of cuttings of test holes. Of the 12 core holes drilled to obtain samples for testing, nine were in Catahoula clays, two in the Loess and one in the Alluvium. Two separate samples were obtained from two of the Catahoula clay core holes and two blends composed of Catahoula clays and Loess were tested.

The ceramic tests were conducted by Thomas E. McCutcheon, Ceramic Engineer, in the laboratories of Georgia Institute of Technology. In conjunction with the ceramic testing, the residues from screen analysis were examined and described by Theo H. Dinkins, Staff Geologist, Mississippi Geological Survey. The chemical analyses of the cored material was performed by Shilstone Testing Laboratory of New Orleans, Louisiana.

The Catahoula formation which crops out over the entire County contains many beds of clays. In general the clays contain large amounts of sand, silt and other impurities. Although several types of clay that differ somewhat in chemical and physical properties are present, the clays are referred to by general descriptive classification based on field observation. Several of the general descriptive types are:

(1) light-gray to gray, slightly silty to silty, plastic clay

(2) light-gray to gray, very silty clay and clayey silt

(3) tan to greenish-gray, slightly silty plastic clays

Although outcrops of Catahoula clay were relatively scarce, Types (1) and (2) were observed. Surface observations in most instances indicated many outcrops with a high silt content and were eliminated as sampling localities. Most locations for core holes were selected on the basis of information gained from previously drilled test holes where one or more of the three types of clays were present. Core Holes AH-42, 43, 44, 45, 46, 47, 48, 49 and 62 were sampled for Catahoula clay. The thickness of the deposits ranged from 6 to 15 feet.

Loess was sampled in Core Hole AH-63 and weathered loess was sampled in AH-61. Chemical analyses and ceramic tests were made using both materials. Also, ceramic tests were performed using a mixture of loess and Catahoula clay. Blend A was composed of 20 percent Catahoula clay from Core Hole AH-47 and 80 percent loess. Blend B contained 20 percent Catahoula clay from Core Hole AH-44 and 80 percent loess.

The possibility of the future establishment of a river port near Grand Gulf, which would provide economical transportation, and previous ceramic tests conducted on alluvial material, which indicated the usefulness of this material for the manufacture of lightweight aggregate, caused the drilling of a test hole in the area of the Mississippi Alluvial Plain. Alluvial material was secured from Core Hole AH-64. Results of the ceramics tests and chemical analysis of the alluvium are given in the section Claiborne County Clay Tests.

Figure 19.—Gravel pit in Pre-Loess terrace deposits in NW.¼, SE.¼, Sec.5, T.12N., R.4E. June 14, 1966.

SAND AND GRAVEL

Deposits of sand and gravel are numerous in northeastern and southeastern Claiborne County in the area of pre-loess terrace deposits. Sand and gravel from these deposits are presently used exclusively for local road maintenance. Wash gravel and sand is currently being produced commercially from alluvial deposits along Bayou Pierre.

The pre-loess terrace deposits in northeastern Claiborne are widespread. Most of the higher elevations are capped by sand and gravel overlain by loess. The thickest and most extensive deposit is found on the divide between the Big Black River and Bayou Pierre. This deposit is centered in Sections 50 and 63, Township 13 North, Range 4 East. The thickness should be as much as 100 feet. There are no active gravel pits at this locality and to the writer's knowledge these thick deposits have never been worked.

Other pre-loess terrace deposits are found in the northeastern part of the County at successively lower elevations. Some of the deposits that are being utilized are as low as 240 feet above sea level. These lower deposits are not as thick as the previously mentioned deposit. The largest deposit currently being worked is in Section 5, Township 12 North, Range 4 East. Figure 19 shows a small portion of this gravel pit. The terrace sand, gravel and clay in this pit total about 45 feet in thickness. They are overlain by a loess cover averaging about eight feet in thickness.

At several locations in the southeastern part of the County where ground elevations approach and exceed 400 feet above sea level, terrace deposits are as much as 100 feet in thickness. Test Hole AH-37 drilled in the SW.¼, Sec.15, T.10N., R.4E., penetrated 96 feet of terrace material overlain by four feet of loess. These deposits are mined in the SW.¼ of Section 24 and the NW.¼ of Section 35, Township 10 North, Range 4 East.

The area located between Bayou Pierre and Little Bayou Pierre contains some pre-loess terrace deposits. These deposits are made up almost entirely of sand and contain little or no gravel. They have been utilized in the past as topping material

Figure 20.—Dredging barge at gravel washing operations on Bayou Pierre near center of NW. 1/4 of irregular Sec.24, T.12N., R.4E. Perry Nations photo. April 22, 1966.

Figure 21.—Separator at gravel washing plant. Perry Nations photo. April 22, 1966.

in highway construction. The deposits range in thickness from a few feet to as much as 76 feet. Test Holes AH-20 and AH-21 penetrated 73 and 76 feet of terrace sand. Test Hole AH-20 contained minor amounts of gravel and Test Hole AH-21 contained no gravel.

There are local deposits of sand and gravel beneath the alluvial plains and in stream beds of most of the streams in the County. Most of the deposits are small and would furnish material only for local use. However, Traxler Sand and Gravel Company is currently mining sand and gravel from Bayou Pierre. The location of the operation is approximately one mile upstream from the bridge at Carlisle. Mining consists of dredging the material from a point bar and pumping it to a separator on the south bank of the river. The deposit contains an estimated 200,000 cubic yards of material. Similar operations were conducted at this location a number of years ago. According to a representative of the company such a deposit can be reworked on the average of once every fifteen years.

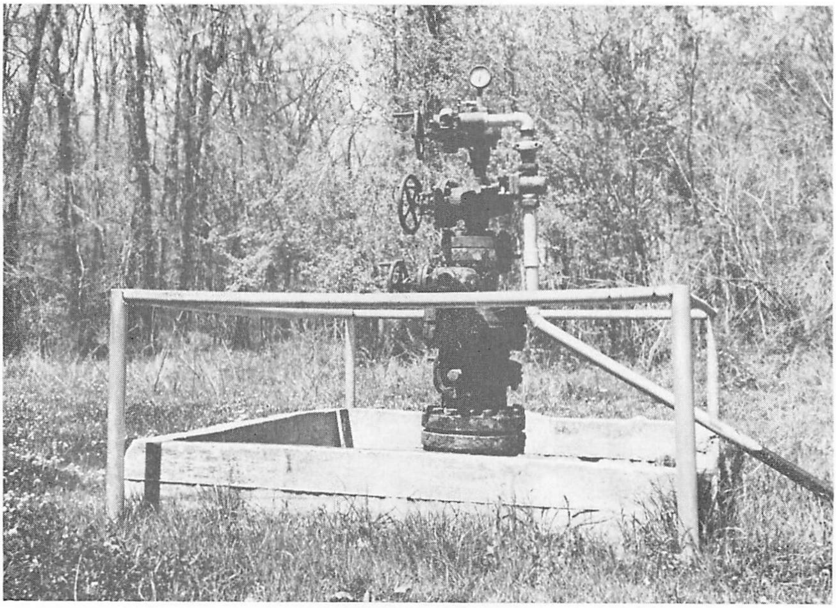

Figure 22.—Sun No. 3 Hammett, producing gas well in Bruinsburg Gas Field. Perry Nations photo. April 22, 1966.

OIL AND GAS

A total of 47 test wells have been reported drilled in the search for oil and gas. To date only one small gas field has been discovered in the County.

The Bruinsburg Gas Field is located in southwestern Claiborne County, approximately 11 miles southwest of Port Gibson. Gas was originally discovered by the drilling of the Sun Oil Company, No. 1-A Hammett, test well. Discovery date was November 22, 1944. Production was from Cockfield sands at a depth of 890 to 910 feet. A total of nine test wells were drilled in an effort to establish commercial production. Sufficient reserves of gas were not proven to justify a carrier at that time. For a number of years following the initial drilling the field remained dormant. In 1961 a group of individuals operating under the name of Waco Pipe Line Company reworked one of the old wells and established production of dry gas. A pipe line was constructed to Alcorn A and M College, a distance of about four miles to the south of the field. Delivery of gas began in 1963. Latest figures available from the Mississippi Oil and Gas Board show the cumulative production as of December 31, 1966 to be 225,573,000 cubic feet of gas from one productive well.

An official of the pipe line company indicated that two wells are presently capable of production and that the company would like to expand its facility to supply other consumers.

SALT

Three known piercement type salt domes are known to be present in the County. The Bruinsburg Dome is located in Sec.2, T.11N., R.1W., the Hervey Dome in Sec.7, T.10N., R.5E., and the Galloway Dome in Sec.43, T.13N., R.3E. Depths to the salt varies from 2020 feet in the Bruinsburg Dome to 4196 feet in the Hervey Dome. The shallower depth to salt of the Bruinsburg Dome make it the most likely prospect for possible future development. In 1961 the Atomic Energy Commission conducted an investigation of the Bruinsburg Dome in connection with Project Dribble. Cores of the overburden and salt were obtained during the investigation. The project at the Bruinsburg Dome was abandoned, but it was continued at the Tatum Dome in Lamar County. At the present time, the International Salt

Company has an option to explore the Bruinsburg Dome to determine the possibilities of salt dome production.

BUILDING STONE

Sandstone of the Catahoula formation was used in the past as a local building stone. The rock occurs in beds from a few inches to as much as a few feet in thickness and exhibits some qualities of crushing strength required of a good building stone. However, lack of uniformity of hardness limits its usefulness. The material could be used for road metal and rip-rap.

GROUND-WATER RESOURCES

A study of the ground water was included as part of the regular geological investigation in order to add to the existing information of the area. It is hoped that this study will provide an aid to the water well contractors and prospective well owners. Previous investigation of the County's water resources are included as parts of regional studies. Some information is available in an early report on, "The Ground Water Resources of Mississippi," by Stephenson[31] et al in 1928. More recent data is included in a report on the "Water Resources of Adams, Claiborne, Jefferson and Warren Counties," by Callahan, et al in 1963.

The field investigation for the present study consisted of an inventory of representative water wells of both domestic and public supplies. Samples of water (for analysis) were collected from those wells for which no analyses were available. Collection was limited to those wells that were considered of value to this report. All shallow wells not equipped with some mechanical method of lift and all springs were omitted from the inventory.

Locations of the inventoried wells are shown in Figure 23. A grid system adopted by the Water Resources Division of the United States Geological Survey is followed herein to avoid confusion in the indexing of wells. Grid lines generally follow township lines except for areas where less than a township exists. These smaller areas are included with adjoining townships. The data listed in Table 3 include the date of completion, depth, depth to top of screen, elevation of land surface, water level, water bearing unit, method of lift and use of water. Most of the information was obtained from the individual well own-

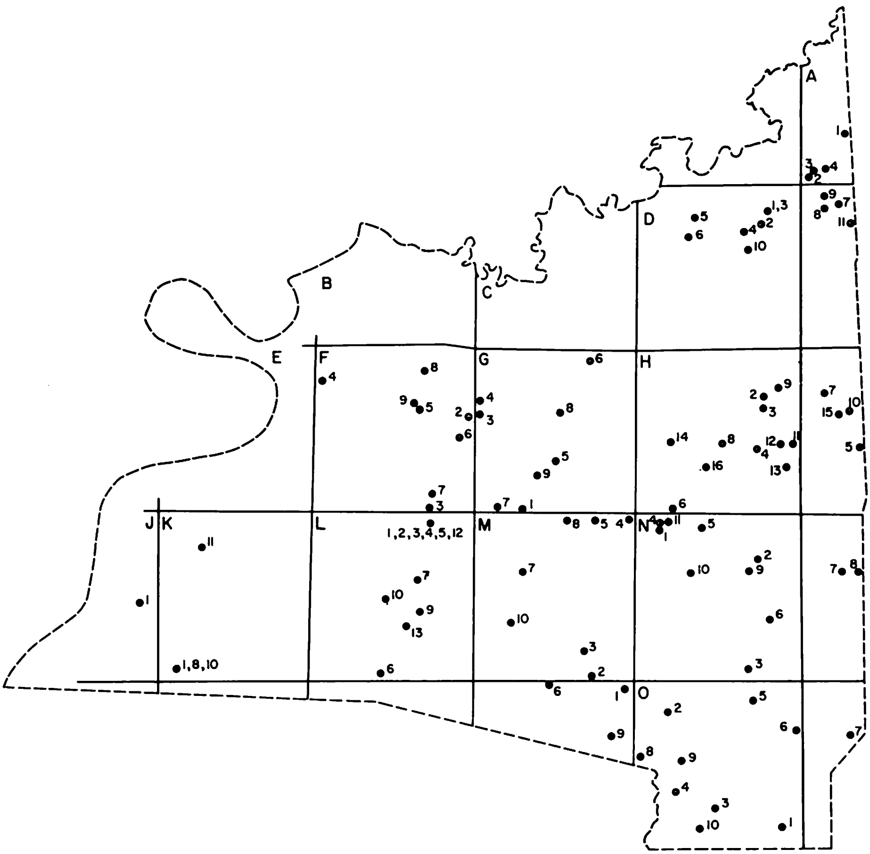

Figure 23.—Location of inventoried water wells in Claiborne County.

ers. Data thought to be in error were checked with other sources or not included in the inventory.

AVAILIBILITY

Although a number of households still rely on cisterns, springs and shallow dug wells for domestic water supply, the trend in recent years is to deeper wells. The most likely objective for the drilling of deeper wells are the alluvial sands and gravels or the sands of the Catahoula formation. The alluvium beneath the flood plains of the Mississippi River, the Big Black River and the Bayou Pierre contains varying amounts of sand and gravel that can be utilized as a source of domestic and possibly industrial supplies. In other areas of the County the only available aquifer is the Catahoula formation.

In the aquifers below the Catahoula the quality of the ground water is generally undesirable. The inventory shows one well completed in the Forest Hill formation and one well in the Cockfield formation. The Forest Hill well is the only flowing well in the County. It flows at a rate of about three gallons of water per minute. The chemical analysis in Table 2 shows the water to be highly colored and high in alkalinity and chloride. Data concerning the Cockfield well was sparse and could not be verified. Reported depth does indicate that the producing aquifer is the Cockfield. Water from the well is highly colored. Both of these wells are located in the northeastern part of the County.

WATER BEARING UNITS

CATAHOULA FORMATION

The Catahoula formation is the most widespread of the available aquifers. It underlies all areas of the County. However, the sands are very lenticular and are not dependable as drilling objectives. In several areas in the northeastern part of the County the Catahoula contains no sands suitable for the completion of water wells. Fortunately, these areas are limited in areal extent.

The Catahoula varies in thickness from less than 100 feet in the northeastern part of the County to about 900 feet in the southern part. Consequently, the depths to the sands can vary from near the surface to as deep as 900 feet. The sands range in thickness from a few feet to more than 100 feet. The sands are fine- to very coarse-grained, with fine-grained material being predominant.

Municipal supplies at Port Gibson and Hermanville are derived from Catahoula sands. Port Gibson is presently supplied by four wells, producing from sands at depths ranging from 170 to 250 feet. The wells yield from 100 to 400 gallons per minute. At the present time, a community system is being installed at Hermanville. The system will be supplied by one well producing from a sand at 435 to 475 feet in depth. Yield is reported to be 600 gallons per minute.

ALLUVIUM

Wells in the Mississippi Alluvial Plain are shallow, ranging from 20 to 40 feet in depth. These wells are producing small quantities of seep water of objectional quality from the upper portion of the Alluvium. The basal part of the Alluvium contains sand and gravel that could furnish large volumes of water. The depths to the basal sand and gravel vary with the thickness of the Alluvium, which ranges from 70 to 175 feet. To the north in Warren County a number of large volume industrial wells are developed in this basal aquifer.

Domestic supplies have been developed locally in the Alluvium of the Big Black River and the Bayou Pierre. These wells range from 35 to 70 feet in depth. The sands and gravels provide adequate supplies for domestic and stock purposes. In some areas where the bedrock is near the surface, the aquifer is not present.

QUALITY OF WATER

Chemical analyses of water from selected wells are shown in Table 3. Generally the water from the Alluvium and the shallow Catahoula sands is hard and contains objectionable amounts of iron. However, locally, wells produce good quality water. The quality of water in the Catahoula sands generally improves at greater depths.

The water supply at Alcorn A and M College is chlorinated. At Port Gibson the public supply is treated by chlorination, aeration and filtration. An analysis of the public supply at Hermanville indicates no treatment is needed other than chlorination.

TABLE 2

Chemical analysis of selected water wells
Constituents in parts: per million

Well No.	D-1	L-5	K-1	N-11	1*
Depth of well	530	207	692	475	245
Date of Collection	6-14-66	4-16-62	10-28-60	5-18-66	9-27-61
Water Bearing Unit	Tf	Tm	Tm	Tm	Qa
Turbidity	--------	2	--------	--------	--------
Color	400	--------	280	--------	3
Temperature	73	66	--------	--------	--------
Total solids	--------	298	846	--------	330
Hardness ($CaCO_3$)	10	10.4	12	--------	278
Alkalinity (P)	4	--------	--------	6	--------
Alkalinity (M)	704	252	--------	296	--------
Calcium (Ca)	--------	4.17	2.1	--------	62
Magnesium (Mg)	--------	--------	1.7	--------	30
Iron (Fe)	.05	0	0.3	.1	0
Carbon dioxide (CO_2)	0	--------	--------	0	--------
pH	8.3	6.8	8.0	8.3	7.6
Floride (F)	--------	--------	1.8	--------	.3
Chloride (Cl)	260	6	270	14	29
Sodium (Na)	--------	119	333	--------	17
Silica (SiO_2)	--------	8	2	--------	18
Sulfate (SO_4)	--------	8.89	--------	--------	10

1* Well in the Mississippi River alluvium, Adams County.

L-1, K-1 From the U. S. Geological Survey.

TABLE 3
Water Well Records

Well No.: Location of well on Figure 23.

Water Bearing Unit: Qa, Alluvium; Tm, Miocene, Catahoula, Tf, Forest Hill.

Water level: Levels shown in feet as reported by owner or driller.

Altitude: Elevation of land surface as determined from topographic maps.

Method of lift: A, air lift; C, clyinder; J, jet; R, rod; S, submergible; T, turbine.

Use of water: D, domestic; P, public supply; S, stock.

Remarks: A, chemical analysis; D, drillers log; E, electrical log; S, sample log.

Well No.	Owner	Contractor	Date Completed	Depth of well (ft.)	Diameter of well (in.)	Depth to top of screen	Altitude of land surface	Water Level: Above (+) or below land surface	Water Level: Date of measurement	Water bearing unit	Method of lift	Use of water	Remarks
A 1	Anderson Tulley	Enloe Tool Co.	1954	254	4	----	250	70	1954	Tm	J	D,S	Yield 80 GPM
2	T. G. Peyton	J. McWhorter	1956	90	2	85	234	78	1956	Tm	J	D	Yield 6 GPM
3	J. C. Templeton	J. McWhorter	1959	298	2	----	235	40	1959	Tm	J	D,S	
4	R. L. Templeton	A. Petrich	1964	110	2	105	233	26	1964	Tm	J	D	Yield 5 GPM
D 1	Moon Construction Co.	Enloe Tool Co.	1960	530	3	----	120	+1	1966	Tf	----	S	A. E. S.
2	Paul Vaughan	J. McWhorter	1959	142	3	----	220	42	1959	Tm	J	D,S	
3	Marvin Ross	Bean Drilling Co.	1958	104	3	----	120	30	1961	Tm	J	D,S	

TABLE 3.—(Continued)

Well No.	Owner	Contractor	Date Completed	Depth of well (ft.)	Diameter of well (in.)	Depth to top of screen	Altitude of land surface	Water Level: Above (+) or below land surface	Water Level: Date of measurement	Water bearing unit	Method of lift	Use of water	Remarks
4	T. I. Chapman	A. Petrich	1965	136	2	130	204	42	1965	Tm	J	D,S	Yield 5 GPM
5	W. H. Moulder	W. H. Moulder	1954	49	6	48	195	31	1954	Tm	J	D	Yield 20 GPM
6	W. H. Greer	J. McWhorter	1961	130	2	125	225	54	1961	Tm	J	D,S	
7	J. R. Crawford	J. McWhorter	1958	99	2	89	195	50	1958	Tm	J	D,S	Yield 5 GPM
8	J. H. Sanders	J. McWhorter	1956	80	2	70	155	48	1956	Tm	J	D,S	
9	A. B. Crawford	A. Petrich	1965	80	2	70	155	7	1965	Tm	J	D	
10	Paul Vaughan	J. McWhorter	1959	127	2	121	220	30	1959	Tm	J	D,S	
11	J. P. Mathews	B. Burney	1962	118	2	98	210	42	1962	Tm	J	D	Yield 5 GPM
F 2	T. Norwood	J. McWhorter	1957	86	4	----	120	33	1957	Tm	J	D,S	
3	Port Gibson Oil Mill	Layne Central	1954	265	10x8	----	120	54	1954	Tm	T	I	Yield 400 GPM
4	Grand Gulf Park	J. McWhorter	1961	257	4	----	110	67	1961	Tm	S	P	
5	Lake Claiborne	J. McWhorter	1955	250	6	----	165	110	1955	Tm	T	D,S	
6	J. W. Smith	Kelley	1948	80	2	70	110	35	1948	Tm	J	D	
7	Addison High School	Forest Drilling Serv.	1962	241	2	231	100	81	1962	Tm	----	P	
8	YMCA Camp	McKay	1964	240	4	220	250	147	1964	Tm	S	P	
9	T. A. Caruthers	Waterwells Inc.	1966	240	4x2	220	----	118	1966	Tm	J	D	Yield 15 GPM, E
G 1	H. M. McConathy	J. McWhorter	1959	140	2	----	250	----	----	Tm	C	D	
3	D. E. Nelson	J. McWhorter	1946	80	2	----	125	33	1946	Tm	C	D	

	4	T. R. Trevilion	J. McWhorter	1958	133	2	----	125	36	1958	Tm	J	D,S	
	5	J. J. Millsaps	J. McWhorter	1956	115	2	105	135	----	----	Tm	J	D,S	
	6	Miss. Forestry Comm.	J. McWhorter	1956	133	3	----	285	----	----	Tm	C	D	
	7	J. E. Jones	E. B. Fore	1963	155	2	150	210	90	1963	Tm	J	D	
	8	D. E. McCaa	J. McWhorter	1958	38	2	28	163	10	1965	Qa	J	D,S	
	9	Com-Plex. Inc.	Forest Drilling Serv.	1963	266	4x2	246	175	75	1963	Tm	----	I	
H	2	L. R. Anderson	J. McWhorter	----	263	2	----	170	----	----	Tm	J	D	
	3	L. R. Anderson	J. McWhorter	1961	96	3	----	170	24	1961	Tm	J	D	
	4	S. Sorrels	J. Porter	1952	126	2	----	170	70	1952	Tm	J	D,S	
	5	R. C. Jenkins	J. McWhorter	1954	170	2	----	----	----	----	Tm	J	D,S	
	6	W. R. Seeman	J. McWhorter	----	75	2	----	230	65	1961	Tm	J	D,S	
	7	W. G. Greer	L. Tanner	1952	200	2	190	178	80	1952	Tm	J	D,S	
	8	Barland Brothers	E. B. Fore	1965	290	4	275	150	45	1965	Tm	S	S	Yield 50 GPM
	9	W. H. Byrne	E. B. Fore	1965	265	2	250	190	----	----	Tm	J	D,S	Yield 10 GPM, E
	10	V. Geiselman	A. Petrich	1966	28	1	24	150	5	1966	Qa	J	D	
	11	Burton Byrnes	J. McWhorter	1961	80	2	70	175	40	1961	Tm	J	D,S	
	12	E. Jones	J. McWhorter	1961	180	2	170	215	----	----	Tm	J	D,S	
	13	L. B. Patton	J. McWhorter	1958	242	2	227	278	80	1958	Tm	R	D,S	
	14	Seeman Brothers	J. McWhorter	1956	60	2	50	140	20	1965	Qa	J	D,S	
	15	R. Durham	E. B. Fore	1964	85	2	75	152	----	----	Tm	J	D,S	
	16	H. G. Everett	B. Burney	1966	403	4x2	371	250	144	1966	Tm	J	D,S	D,E
J	1	H. F. Catledge	J. McWhorter	1958	185	2	175	250	140	1958	Tm	C	D,S	
K	1	Alcorn College	Layne Central	1960	1204	4	----	260	----	----	----	----	----	Test Well. A,E
	8	Alcorn College	Layne Central	1961	300	8	----	255	141	1961	Tm	T	P	
	10	Alcorn College	Layne Central	1961	----	10	----	250	285	1961	Tm	T	P	
	11	T. K. Hammett	Hammett	1951	180	2	174	225	----	----	Tm	C	D	
L	1	Town of Port Gibson	Layne Central	1936	180	12	----	120	110	1961	Tm	T	P	
	2	Town of Port Gibson	Layne Central	1946	167	12	----	120	109	1961	Tm	T	P	
	3	Town of Port Gibson	Layne Central	1956	153	12	----	120	85	1957	Tm	T	P	

TABLE 3.—(Continued)

Well No.	Owner	Contractor	Date Completed	Depth of well (ft.)	Diameter of well (in.)	Depth to top of screen	Altitude of land surface	Water Level: Above (+) or below land surface	Water Level: Date of measurement	Water bearing unit	Method of lift	Use of water	Remarks
4	Town of Port Gibson	Layne Central	1961	177	12	----	125	102	1961	Tm	T	P	
5	Town of Port Gibson	Layne Central	1910	250	10	----	120	85	1961	Tm	----	O	
6	T. L. Furr	Tanner	1953	130	2	120	180	----	----	Tm	J	D,S	
7	H. Q. Stamoley	Tanner	1949	148	2	138	----	60	1949	Tm	J	D,S	
9	Robert Segrest	J. Beasley	1960	187	2	----	----	82	1960	Tm	C	D	
10	H. L. Stephens	Dean Griner	1962	140	2	134	265	80	1962	Tm	C	D	
12	Town of Port Gibson	W. Young	1909	1760	----	116	----	----	----	----	----	----	Test Well
13	Agnes Coleman	Reeves	1962	139	4x2	129	225	140	1962	Tm	----	D	
M 1	J. S. Middleton	B. Kelly	1946	150	4	----	----	80	1946	Tm	J	D,S	
2	Pattison Consolidated School	J. McWhorter	1954	170	3	----	----	----	----	Tm	J	P	
3	W. Smith	L. Tanner	1957	160	3	----	----	80	1957	Tm	J	D,S	
4	Hermanville School		1950	200	3	----	220	----	----	Tm	J	P	
5	F. Delores Smith	D. Griner	1954	32	2	28	238	10	1965	Tm?	J	D	
6	A. J. Hannis	L. Tanner	1950	100	2	----	----	----	----	Tm	J	D,S	
7	J. Whiting	Newsome	1948	26	10	24	112	4	1960	Qa	P	D	
8	E. D. Newsom	E. B. Fore	1965	190	2	185	250	75	1965	Tm	J	D	Yield 5 GPM
9	J. E. Owens	Herring Pump Co.	1963	274	2	269	275	174	1963	Tm	R	D,S	

	10	J. Ellis	J. Ellis	1941	35	8	35	135	20	1966	Tm	----	D	
N	1	Claiborne Co. Lbr.	J. McWhorter	1954	100	4	----	210	56	1961	Tm	S	I	A
	2	M. H. Bruce	B. Burney	1963	142	4	116	230	79	1963	Tm	S	D,S	Yield 10 GPM
	3	A. Polk	J. McWhorter	1958	40	2	----	180	----	----	Tm	C	D,S	
	4	E. T. Chapman	J. McWhorter	1956	85	2	----	190	60	1956	Tm	J	D	
	5	Hugh Rials	Forest Drlg. Co.	1961	200	2½	----	270	126	1961	Tm	J	D,S	A. E.
	6	J. H. Tigner		1953	125	2	----	198	80	1965	Tm	J	D	
	7	R. W. Trim	L. Tanner	1935	90	2	87	266	70	1965	Tm	J	D	
	8	J. F. Trim		1860	70	36	----	275	60	1965	Tm	J	D,S	
	9	W. P. Bruce	J. McWhorter	1960	135	2	130	265	50	1965	Tm	J	D,S	
	10	C. C. Carter	J. McWhorter	1961	80	2	77	232	19	1961	Tm	J	D,S	
	11	Town of Hermanville	Robert Ratliff	1966	568	10x8	435	224	122	1966	Tm	S	P	Yield 600 GPM, A, E
O	1	M. R. Shannon	L. Tanner	1955	212	2	209	305	70	1955	Tm	J	D,S	
	2	S. E. Sorrels	Herring Butane Co.	1960	168	2	163	215	80	1960	Tm	J	D,S	
	3	V. Y. Jones	J. McWhorter	1962	117	2	----	250	67	1962	Tm	C	D,S	
	4	R. Rogers	Enloe Tool Co.	1957	307	4	----	250	----	----	Tm	J	D,S	
	5	E. Lewis	J. McWhorter	1962	75	2	65	286	30	1962	Tm	J	D,S	Yield 10 GPM
	6	W. T. Segrest	J. McWhorter	1960	80	2	77	255	35	1965	Tm	J	D,S	
	7	Mrs. E. Dixon	J. McWhorter	1961	102	2	96	295	40	1961	Tm	J	D,S	
	8	B. Cessna	J. McWhorter	1961	168	2	160	245	100	1961	Tm	J	D	
	9	Earl Loyd	Dean Griner	1964	110	2	100	315	35	1964	Tm	R	D,S	Yield 10 GPM
	10	W. H. Rogers	J. McWhorter	1956	177	2	157	290	55	1956	Tm	J	D	

ACKNOWLEDGEMENTS

The writer wishes to express his sincere appreciation to the Claiborne County Board of Supervisors and the Claiborne County Port Commission for their assistance and support in the various phases of this work and to the many local citizens for their help during the course of the field work.

Acknowledgements are due the various oil companies for core hole logs and to the Water Resources Division of the United States Geological Survey for water well logs and samples.

TEST HOLE AND CORE HOLE RECORDS

The following are descriptions of cuttings and cores from tests drilled during the field investigations of the mineral resources of Claiborne County. The prefix AH is the code designation for Claiborne County in the Survey's County Sample Index System. The prefix aids in the permanent indexing and identification of all material secured and tested in the course of geological and mineral investigations.

The location of each test and core hole was accomplished with the aid of topographic quadrangle maps. Approximate footage was scaled from the topographic maps using an engineering scale. References to man-made objects were included where possible as an aid to on the ground location in the field. Ground elevations at the drill site were interpreted directly from the topographic map. When reference points were available, elevations were obtained by the use of a hand level.

The purpose for drilling each test is stated in the heading of each hole along with information concerning availability of electrical log. Other remarks are included where appropriate.

AH-1

Location: In road juncture of county roads southwest of Midway Church. Approximately 2600 feet south and 375 feet west of the northeast corner, Sec.31, T.13N., R.4E.

Elevation: 220 feet (hand level) Date: June 10, 1965

Purpose: Drilled to 450 feet for stratigraphic information. Electrical log to 442 feet.

Thickness	Depth	Description
		Loess
10	10	Silt, tan, sandy, shell fragments.
2	12	Silt, reddish orange, slightly sandy.
		Catahoula formation
6	18	Sand, white, fine- to coarse-grained, some limonitic staining.
7	25	Clay, greenish yellow, silty.

5	30	Sand, white, fine- to very coarse-grained.
18	48	Clay, greenish yellow, slightly silty, finely micaceous.
10	58	Clay, yellowish gray, slightly silty and sandy.
22	80	Clay, light-gray, slightly silty.
20	100	Clay, light-gray to yellowish gray, very silty, interbedded with sand, white, coarse-grained.
10	110	Clay, light-gray to yellowish gray, slightly silty and sandy, micaceous.
16	126	Sand, white, fine-grained.
4	130	Clay, yellowish gray, slightly silty and sandy.
6	136	Sand, white, medium- to coarse-grained.
6	142	Clay, gray, silty, slightly micaceous.
34	176	Clay, yellowish gray, slightly silty, micaceous, pyritic.
50	226	Sand, white, coarse- to very coarse-grained, dark grains of chert.
24	250	Clay, yellowish gray, slightly silty, pyritic.
10	260	Clay, yellowish gray, silty, slightly sandy, micaceous.
30	290	Clay, very light-gray, silty, sandy to very sandy.
14	304	Clay, yellowish gray, slightly silty, plastic.
58	362	Clay, yellowish gray, silty, interbedded with thin sand, white, medium- to very coarse-grained.
		Vicksburg group (Bucatunna clay)
34	396	Clay, medium to dark-gray, silty, micaceous, slightly carbonaceous.
7	403	Marl, gray-green, fossiliferous, glauconitic.
7	410	Clay, dark-gray, silty.
		Vicksburg group (Byram marl)
20	430	Marl, light-gray, slightly fossiliferous, clayey, glauconitic, sandy.
		Vicksburg group (Glendon limestone)
4	434	Limestone, gray, fossiliferous, glauconitic.
6	440	Marl, light-gray, fossiliferous, glauconitic.
10	450	Limestone, gray interbedded with marl.

AH-2

Location: In bed of logging trail. Approximately 450 feet north and 1200 feet east of southwest corner, Sec.50, T.13N., R.4E.

Elevation: 385 feet (topographic map) Date: June 11, 1965

Purpose: Drilled to 40 feet for stratigraphic information. Electrical log to 29 feet.

Thickness	Depth	Description
		Loess
4	4	Silt, tan, sandy.
		Terrace deposit
4	8	Gravel, chert, argillaceous.
4	12	Clay, red, silty, sandy.
4	16	Sand, yellow, coarse- to very coarse-grained; gravel, chert, pea to cobble size.
4	20	Silt, red, argillaceous.
20	40	Sand, gray, coarse- to very coarse-grained, graveliferous.

AH-3

Location: 50 feet north of field road in pasture. Approximately 1000 feet south and 2500 feet west of northeast corner, Sec.3, T.14N., R.5E.

Elevation: 135 feet (topographic map) Date: June 17, 1965

Purpose: Drilled to 470 feet for stratigraphic information. Electrical log to 465 feet.

Thickness	Depth	Description
		Alluvium
24	24	Silt, light-brown to reddish brown; sand, white, coarse-grained; ferruginous concretion; some chert gravel.
22	46	Sand, white, medium- to coarse-grained; chert gravel; silt, light-gray, argillaceous.
		Catahoula formation
24	70	Clay, yellowish gray, slightly silty to silty.
8	78	Clay, yellowish gray, slightly silty.
20	98	Sand, gray, fine- to medium-grained, clayey.
10	108	Sand, gray, medium-grained.
2	110	Lignite.
22	132	Sand, gray, fine-grained.
14	146	Silt, light-gray, sandy.
8	154	Sand, gray, fine- to medium-grained, silty.
6	160	Silt, light-gray, slightly sandy, carbonaceous.
28	188	Sand, gray, fine-grained, silty.
28	216	Silt, gray, sandy, carbonaceous, micaceous.
		Vicksburg group (Byram marl)
14	230	Marl, gray, fossiliferous, clayey.
		Vicksburg group (Glendon limestone)
2	232	Limestone, white to light-gray, glauconitic, fossiliferous.
8	240	Marl, medium-gray, fossiliferous, clayey.
4	244	Limestone, light-gray to white, glauconitic, fossiliferous.
2	246	Marl, medium-gray, fossiliferous, clayey.
2	248	Limestone, white to light-gray, glauconitic, fossiliferous.
1	249	Marl, medium-gray, fossiliferous, clayey.
2	251	Limestone, white to light-gray, glauconitic, fossiliferous.
3	254	Marl, medium-gray, fossiliferous, clayey.
2	256	Limestone, white to light-gray, glauconitic, fossiliferous.
1	257	Marl, gray, fossiliferous, clayey.
1	258	Limestone, white to light-gray, glauconitic.
2	260	Marl, gray, fossiliferous, clayey.
2	262	Limestone, light-gray, fossiliferous, glauconitic.
4	266	Marl, light-gray, fossiliferous, glauconitic, clayey.
1	267	Limestone, light-gray.
1	268	Marl, light-gray, fossiliferous, clayey.
2	270	Limestone, light-gray, fossiliferous, glauconitic.
4	274	Marl, light-gray, sandy, argillaceous.
2	276	Limestone, light-gray, fossiliferous.
2	278	Marl, light-gray, fossiliferous.
1	279	Limestone, light-gray, fossiliferous.
2	281	Marl, light-gray, fossiliferous.
1	282	Limestone, light-gray, glauconitic, sandy.
		Vicksburg group (Mint Spring marl)
4	286	Marl, gray-green, sandy, glauconitic.
28	314	Sand, light-gray, fine- to coarse-grained, glauconitic; marl, light-gray, sandy.
		Forest Hill formation
24	338	Clay, medium-gray, very silty, lignitic.
7	345	Sand, gray, fine-grained, lignitic.
22	367	Clay, gray, very silty, lignitic, micaceous.
7	374	Sand, gray, fine-grained, lignitic.
18	392	Clay, medium- to dark-gray, very silty, lignitic.
32	424	Sand, gray, fine-grained, with thin beds of silt, lignitic.
		Yazoo formation
46	470	Clay, gray-green, slightly silty in upper few feet.

AH-4

Location: In clearing 50 feet west of county road. Approximately 400 feet south and 2700 feet east of northwest corner, Sec.8, T.12N., R.4W.

Elevation: 260 feet (topographic map) Date: June 22, 1965

Purpose: Drilled to 500 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Loess
8	8	Silt, tan.
		Terrace deposit
4	12	Sand, white, fine- to coarse-grained, gravel at base.
6	18	Clay, yellow to pink, sandy.
26	44	Sand, white to yellow, medium- to very coarse-grained, limonitic staining.
		Catahoula formation
10	54	Clay, white to yellow, slightly sandy, heavy limonitic staining.
6	60	Sand, white, fine- to medium-grained, silty, micaceous, kaolinitic.
10	70	Sand, white to yellow, medium- to very coarse-grained.
4	74	Sandstone, yellow, fine-grained, silty, slightly calcareous, micaceous.
6	80	Silt, light-gray, slightly sandy, micaceous.
15	95	Clay, light-gray, slightly silty.
3	98	Clay, medium-gray, silty.
4	102	Silt, light-gray, slightly sandy.
14	116	Clay, very light-gray, slightly silty and micaceous, pyritic.
2	118	Sandstone, white, fine-grained, kaolinitic.
30	148	Silt, light-gray, slightly sandy, clayey, micaceous, pyritic.
4	152	Sandstone, white, fine- to medium-grained, kaolinitic.
18	170	Clay, very light-gray to light-gray, slightly silty to very silty, pyritic, slightly sandy in part.
40	210	Silt, very light-gray, slightly sandy, clayey in part.
18	228	Clay, very light-gray, slightly silty, micaceous.
28	256	Silt, very light-gray, clayey in part.
4	260	Sand, white to reddish orange, medium- to very coarse-grained, some iron concretions.
16	276	Sand, white, fine-grained, kaolinitic.
24	300	Clay, very light-gray, silty to slightly sandy.
30	330	Clay, very light-gray, very silty.
50	380	Clay, very light-gray to light-gray, micaceous, silty in part.
10	390	Clay, pale greenish yellow, sandy in part.
10	400	Clay, very light-gray, slightly silty, pyritic.
48	448	Silt, very light-gray, slightly sandy, clayey, some pyrite.
14	462	Clay, very light-gray, silty in part.
22	484	Silt, light-gray, slightly sandy, clayey, lignitic.
16	500	Sand, white to light-gray, fine-grained, silty, some kaolinitic material.

AH-5

Location: In pasture, 150 feet east of county road. Approximately 2700 feet south and 750 feet west of northeast corner, Sec.39, T.13N., R.3E.

Elevation: 220 feet (topographic map) Date: June 24, 1965

Purpose: Drilled to 500 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Loess
10	10	Silt, brown.
8	18	Silt, grayish orange, slightly sandy.

		Catahoula formation
16	34	Clay, very light-gray, silty.
26	60	Silt, very light-gray, argillaceous, sandy.
20	80	Clay, very light-gray, slightly silty to silty, micaceous.
28	108	Silt, greenish gray, argillaceous, very micaceous, siltstone in part.
6	114	Sand, light-gray, fine-grained, silty.
24	138	Silt, light-gray, argillaceous, micaceous, siltstone in part.
8	146	Sand, gray, fine- to medium-grained.
6	152	Clay, grayish-yellow, plastic, slightly sandy.
44	196	Clay, grayish-yellow, very silty, slightly sandy, micaceous, some pyrite.
4	200	Sand, gray, medium- to coarse-grained.
20	220	Clay, grayish-yellow, silty, micaceous.
10	230	Clay, grayish-yellow, plastic, some pyrite.
20	250	Clay, grayish-yellow, silty, micaceous, pyritic, slightly sandy.
8	258	Sand, white to gray, fine- to medium-grained, argillaceous, micaceous, kaolinitic.
12	270	Clay, very light-gray, silty, slightly sandy, pyritic.
58	328	Clay, brownish-gray to grayish-yellow, slightly silty and micaceous, some pyrite.
28	356	Clay, brownish-gray to grayish-yellow, very silty, slightly sandy, abundant pyrite.
22	378	Sand, light-gray, fine- to medium-grained, lignitic, silty in part.
34	412	Clay, grayish-yellow, silty, slightly sandy, abundant pyrite.
		Vicksburg group (Byram marl)
15	427	Marl, greenish-gray, clayey, glauconitic, fossiliferous.
		Vicksburg group (Glendon limestone)
3	430	Limestone, light-gray, fossiliferous, glauconitic, slightly sandy.
6	436	Marl, greenish-gray, clayey, glauconitic, fossiliferous.
9	445	Limestone, light-gray, fossiliferous, glauconitic, with thin stringers of marl.
3	448	Marl, greenish-gray, clayey, glauconitic, fossiliferous.
7	455	Limestone, light-gray, fossiliferous, glauconitic, with thin stringers of marl.
3	458	Marl, greenish-gray, clayey, glauconitic, fossiliferous.
10	468	Limestone, light-gray, fossiliferous, glauconitic, with thin stringers of marl, light-gray, fossiliferous, glauconitic.
		Vicksburg group (Mint Spring marl)
16	484	Marl, light-gray, clayey, fossiliferous.
16	500	Marl, gray, glauconitic, clayey, fossiliferous, slightly sandy.

AH-6

Location: Right-of-way of county road. Approximately 1300 feet north and 800 feet east of southwest corner, Sec.5, T.12N., R.3E.

Elevation: 303 feet (topographic map) Date: June 28, 1965

Purpose: Drilled to 40 feet for stratigraphic information. Electrical log to 34 feet.

Thickness	Depth	Description
		Loess
10	10	Silt, tan to brown.
4	14	Silt, brown, slightly sandy.
		Terrace deposit
10	24	Sand, white to orange, medium- to very coarse-grained, gravel, chert.
16	40	Clay, pink to red, sandy, graveliferous.

AH-7

Location: In pasture 300 feet north of stock pond. From northwest corner of section, approximately 800 feet along southwest section line, then at right angles 1800 feet northeast, Sec.19, T.12N., R.3E.

Elevation: 180 feet (topographic map) Date: June 29, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
2	2	Soil
		Loess
8	10	Silt, tan, sandy.
8	18	Silt, brownish-yellow, sandy.
		Catahoula formation
52	70	Clay, very light-gray, silty, sandy.
10	80	Clay, light-gray, slightly silty.
10	90	Sand, gray, fine- to medium-grained, silty.
32	122	Clay, very light-gray, silty, slightly sandy.
6	128	Clay, very light-gray, very sandy.
22	150	Clay, light-gray, sandy.

AH-8

Location: In bed of logging trail 200 feet north of county road. Approximately 3400 feet south and 600 feet east of northwest corner, Sec.10, T.12N., R.4E.

Elevation: 160 feet (topographic map) Date: June 29, 1965

Purpose: Drilled to 130 feet for stratigraphic information. Electrical log to 128 feet.

Thickness	Depth	Description
		Colluvium
7	7	Sand and silt.
		Loess
7	14	Silt, brown.
6	20	Silt, reddish-brown, sandy.
		Catahoula formation
20	40	Clay, very light-gray to yellowish-orange, silty.
13	53	Clay, very light-gray, slightly silty, some pyrite.
21	74	Sand, light-gray, fine- to medium-grained, carbonaceous, thin laminae of gray clay.
40	114	Sand, white to light-gray, medium- to very coarse-grained, dark grains of chert, heavy minerals.
16	130	Silt, very light-gray, sandy.

AH-9

Location: 150 feet southwest of bridge across Payton Branch. Approximately 1900 feet south and 1750 feet west of northeast corner, Sec.8, T.12N., R.5E.

Elevation: 137 feet (hand level) Date: July 1, 1965

Purpose: Drilled to 500 feet for stratigraphic information. Electrical log to 497 feet.

Thickness	Depth	Description
		Alluvium
6	6	Sand and silt.
		Catahoula formation
18	24	Clay, very light-gray to grayish-yellow, slightly silty.
20	44	Clay, very light-gray, silty, thin beds of sandstone, gray, fine-grained.
10	54	Sand, white, medium- to coarse-grained, some kaolinitic material.
54	108	Clay, very light-gray, silty, some pyrite.

6	114	Sand, white, fine-grained, kaolinitic.
8	122	Clay, grayish-yellow, silty, sandy.
28	150	Silt, grayish-yellow, sandy, pyritic.
4	154	Sand, white, fine-grained, kaolinitic.
4	158	Clay, very light-gray, silty.
10	168	Sand, white, fine-grained, argillaceous.
22	190	Clay, very light-gray, slightly silty.
16	206	Clay, very light-gray, silty, sandy in part.
24	230	Sand, white, medium- to coarse-grained.
30	260	Sand, light-gray, fine-grained.
10	270	Sand, light-gray, fine- to medium-grained.
20	290	Sand, light-gray, medium- to very coarse-grained, dark grains, chert, heavy minerals.
60	350	Clay, grayish-yellow, plastic, finely micaceous, some pyrite.
10	360	Clay, grayish-yellow, very silty, sandy, pyritic.
5	365	Sand, light-gray, fine-grained, pyritic.
26	391	Silt, gray, sandy, argillaceous, carbonaceous.
		Vicksburg group (Bucatunna clay)
29	420	Clay, dark-gray, finely carbonaceous.
		Vicksburg group (Byram marl)
26	446	Marl, light-gray, fossiliferous, glauconitic, sandy.
		Vicksburg group (Glendon limestone)
2	448	Limestone, light-gray, fossiliferous, glauconitic.
20	468	Marl, greenish-gray, fossiliferous, glauconitic, with thin beds of soft limestone.
2	470	Limestone, light-gray, glauconitic.
12	482	Marl, light-gray to gray, glauconitic, with thin beds of soft limestone.
1	483	Limestone, light-gray, glauconitic, argillaceous.
17	500	Marl, light-gray, glauconitic, clayey, fossiliferous.

AH-10

Location: In bed of dirt road, approximately 100 feet north and 2050 feet east of southwest corner, Sec.31, T.13N., R.5E.

Elevation: 304 feet (topographic map) Date: July 2, 1965

Purpose: Drilled to 87 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Loess
6	6	Silt, tan to reddish-orange, slightly sandy.
		Terrace deposit
16	22	Sand, reddish-orange, medium- to very coarse-grained, argillaceous, small amount of chert gravel.
4	26	Clay, gray, silty, slightly sandy.
2	28	Sand, tan, coarse-grained, heavy lignitic staining, sandstone in part.
		Catahoula formation
24	52	Clay, very light-gray, limonitic staining in top few feet.
6	58	Silt, very light-gray, argillaceous, sandy in part.
24	82	Clay, bluish-gray, very silty, micaceous, sandy in part, some pyrite.
5	87	Sand, white, fine-grained, some kaolinitic material.

AH-11

Location: In pasture 300 feet west of deserted farm house. Approximately 1200 feet south and 2400 feet west of northeast corner, Sec.30, T.13N., R.5E.

Elevation: 270 feet (topographic map) Date: July 8, 1965

Purpose: Drilled to 140 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Loess
8	8	Silt, tan to reddish-brown, sandy.
		Terrace deposit
15	23	Sand, yellow to reddish-orange, argillaceous, chert gravel.
		Catahoula formation
9	32	Clay, very light-gray to grayish-yellow, slightly silty.
11	43	Sand, light-gray, fine-grained, very silty.
35	78	Clay, very light-gray to gray, silty, sandy in part.
10	88	Sand, white, fine-grained, kaolinitic.
22	110	Clay, grayish-yellow, silty.
6	116	Sand, white, medium- to coarse-grained, kaolinitic.
16	132	Sand, white, fine- to medium-grained, argillaceous.
8	140	Clay, light-gray, silty, slightly sandy.

AH-12

Location: In field just south of private road. Approximately 2100 feet south and 75 feet west of northeast corner, Sec.37, T.12N., R.4E.

Elevation: 215 feet (topographic map) Date: July 9, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Loess
7	7	Silt, brown.
		Terrace deposit
7	14	Sand, white to reddish-orange, silty, limonitic, indurated in part.
		Catahoula formation
8	22	Clay, very light-gray, silty, finely micaceous.
2	24	Sand, light-gray, fine-grained.
12	36	Clay, light-gray, silty with thin interbeds of sand.
40	76	Sand, white to yellow, fine- to medium-grained.
44	120	Clay, very light-gray, silty, pyritic, sandy in part.
30	150	Clay, very light-gray, plastic, slightly silty in lower part.

AH-13

Location: West shoulder of logging road, approximately 1650 feet north and 700 feet east of southwest corner, Sec.29, T.12N., R.5E.

Elevation: 340 feet (topographic map) Date: July 12, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log to 148 feet.

Thickness	Depth	Description
		Loess
11	11	Silt, tan to brown, sandy.
		Terrace deposit
33	44	Sand, white to orange, fine- to medium-grained, argillaceous, coarse-grained in bottom 4 feet.
		Catahoula formation
8	52	Clay, very light-gray to yellow, silty, limonitic.
13	65	Silt, gray, finely micaceous, carbonaceous, sandy in lower 4 feet.
45	110	Sand, gray to yellow, fine- to medium-grained, kaolinitic in part, limonitic staining, thin beds of lignite at 85 and 95 feet.

16	126	Sand, orange, coarse- to very coarse-grained, limonitic.
8	134	Clay, yellow to pink, silty.
16	150	Clay, very light-gray, micaceous, very sandy, thin interbeds of sand, gray, fine-grained.

AH-14

Location: In bed of logging trail, 1000 feet east of Howard Road. Approximately 200 feet north and 1750 feet west of southeast corner, Sec.5, T.11N., R.5E.

Elevation: 330 feet (topographic map) Date: July 13, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log to 148 feet.

Thickness	Depth	Description
		Loess
14	14	Silt, brown, sandy, small amount of gravel near bottom.
		Terrace deposit
7	21	Sand, light-gray, fine-grained, argillaceous, gravel, chert.
30	51	Clay, light-gray, sandy.
9	60	Sand, light-gray, fine-grained, argillaceous.
35	95	Clay, grayish-yellow, silty, thin interbeds of sand, gray, fine-grained.
11	106	Sand, gray, fine-grained, silty.
44	150	Sand, gray to reddish-orange, fine- to coarse-grained, kaolinitic, limonitic, thin interbeds of clay between 124 and 142.

AH-15

Location: On west shoulder of logging trail, approximately 2200 feet south and 1000 feet west of northeast corner, Sec.6, T.11 N., R.5E.

Elevation: 325 feet (topographic map) Date: July 14, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log from 15 to 149 feet.

Thickness	Depth	Description
		Loess
7	7	Silt, moderate brown.
		Terrace deposit
24	31	Sand, gray to reddish-orange, fine- to medium-grained, argillaceous, becoming coarse-grained in bottom 3 feet.
		Catahoula formation
25	56	Clay, very light-gray, slightly silty, finely micaceous.
9	65	Clay, very light-gray, sandy, some pyrite.
12	77	Sand, white, fine-grained, argillaceous, some kaolinitic material.
12	89	Clay, gray, very silty, micaceous, carbonaceous, thin beds of ferruginous siltstone.
34	123	Sand, light-gray to white, fine-grained, argillaceous, kaolinitic, thin interbeds of clay, gray, silty.
27	150	Sand, white, medium- to coarse-grained, small grains of chert.

AH-16

Location: In pasture 1200 feet west of north-south road. Approximately 100 feet north and 2200 feet west of southeast corner, Sec.39, T.12N., R.4E.

Elevation: 265 feet (topographic map) Date: July 14, 1965

Purpose: Drilled to 133 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Loess
10	10	Silt, reddish-brown, sandy.

		Terrace deposit
35	45	Sand, white to yellowish-orange, medium- to coarse-grained; silt, dark brown, ferruginous, micaceous; some chert gravel in upper few feet.
23	68	Sand, white to orange, coarse-grained.
14	82	Sand, white to orange, medium- to very coarse-grained, some ferruginous material, gravel, chert and possible igneous material.
		Catahoula formation
4	86	Clay, greenish-gray, pyritiferous.
14	100	Sand, white, fine-grained, clayey, in part indurated.
33	133	Clay, very light-gray, slightly silty, micaceous.

AH-17

Location: In field 300 feet west of Highway 18, approximately 1600 feet north and 2400 feet west of southeast corner, Sec.36, T.12N., R.4E.

Elevation: 238 feet (topographic map) Date: July 15, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Loess
8	8	Silt, tan.
		Terrace deposit
28	36	Sand, white to orange, fine- to coarse-grained, argillaceous.
		Catahoula formation
58	94	Sand, white, fine- to coarse-grained, slightly kaolinitic, dark grains, chert, heavy minerals.
14	108	Clay, very light-gray, interbedded with sand, very light-gray, fine-grained, kaolinitic.
42	150	Clay, very light-gray to grayish-yellow, slightly silty, finely micaceous.

AH-18

Location: In pasture 1000 feet south of Highway 18, approximately 1000 feet south and 750 feet west of northeast corner, Sec.1, T.11N., R.3E.

Elevation: 220 feet (topographic map) Date: July 19, 1965

Purpose: Drilled to 500 feet for stratigraphic information. Electrical log to 495 feet.

Thickness	Depth	Description
		Loess
10	10	Silt, tan.
		Catahoula formation
8	18	Clay, yellow to tan, silty, slightly sandy.
32	50	Clay, grayish-yellow, silty, finely micaceous, carbonaceous in part.
6	56	Sand, white to yellow, coarse- to very coarse-grained, kaolinitic, some grains heavily stained with limonite.
10	66	Clay, grayish-yellow, silty.
28	94	Clay, yellowish-brown to reddish-brown, slightly silty, finely micaceous, interbedded with clay, light-gray, slightly silty, finely micaceous.
16	110	Clay, grayish-yellow, silty, micaceous, slightly pyritic, slightly sandy.
10	120	Sand, white to gray, fine- to medium-grained.
12	132	Sand, white to gray, medium- to coarse-grained, micaceous, pyritic, lignitic.

15	147	Sand, white to gray, fine-grained, micaceous, chert, smoky; sand coarse-grained in bottom few feet.
15	162	Clay, very light-gray, silty, sandy, micaceous, slightly carbonaceous.
4	166	Sandstone, white, fine-grained, kaolinitic, pyritic.
36	202	Clay, very light-gray, slightly silty.
22	224	Clay, grayish-yellow, silty, sandy, sandstone in part.
25	249	Clay, grayish-yellow, slightly silty, micaceous.
7	256	Clay, grayish-yellow, silty, sandy.
36	292	Clay, very light-gray, slightly silty, pyritic.
58	350	Clay, very light-gray, silty, sandy, micaceous; siltstone in part.
20	370	Sand, white to light-gray, fine- to very coarse-grained, kaolinitic.
22	392	Clay, very light-gray, slightly silty, finely micaceous, pyritic.
24	416	Clay, very light-gray, silty, sandy, pyritic.
18	434	Clay, very light-gray, slightly silty, pyritic.
66	500	Clay, grayish-yellow to light-gray, slightly silty to sandy.

AH-19

Location: On south slope of hill 1000 feet southeast of pond. Approximately 400 feet north and 1400 feet west of southeast corner, Sec.16, T.11N., R.3E.

Elevation: 185 feet (topographic map) Date: July 20, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Terrace deposit
2	2	Sand, gray to red, clayey; gravel, pea-size to cobble-size.
7	9	Clay, dark-gray to red, sandy.
3	12	Sand, white to reddish-orange, fine- to coarse-grained, argillaceous.
1	13	Clay, very light-gray, sandy.
25	38	Sand, white, fine-grained, slightly micaceous.
5	43	Sand, orange, fine-grained.
		Catahoula formation
9	52	Clay, gray, silty, slightly carbonaceous.
10	62	Sand, white to yellow, fine-grained, silty.
34	96	Clay, very light-gray, slightly silty, pyritic.
10	106	Silt, gray, sandy, clayey, carbonaceous.
4	110	Sand, gray, fine-grained.
12	122	Silt, gray, sandy, clayey, carbonaceous.
12	134	Sand, gray, fine-grained.
16	150	Sand, gray, fine-grained, lignitic; interbedded with silt, gray.

AH-20

Location: In clearing of abandoned church yard, 50 feet east of road to Douglass Cemetery. Approximately 4300 feet south and 2300 feet east of northwest corner, Sec.4, T.11N., R.3E.

Elevation: 235 feet (topographic map) Date: July 20, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log to 147 feet.

Thickness	Depth	Description
		Loess
10	10	Silt, brown.
11	21	Silt, reddish-orange, slightly sandy.
		Terrace deposit
5	26	Sand, white, very coarse-grained, chert gravel.
4	30	Clay, very light-gray, silty.
40	70	Sand, white, fine- to coarse-grained.

12	82	Sand, white, coarse- to very coarse-grained, gravel, chert.
4	86	Clay, very light-gray, sandy.
8	94	Sand, white, very coarse-grained; gravel, chert and some quartz, limonitic material.
		Catahoula formation
16	110	Clay, gray, silty.
10	120	Clay, very light-gray, slightly silty, pyritic.
5	125	Sand, gray, fine-grained.
7	132	Clay, very light-gray, micaceous, pyritic.
12	144	Sand, white, fine-grained.
6	150	Clay, gray, silty.

AH-21

Location: In clearing 50 feet north of logging trail, 100 feet west of fence line. Approximately 1800 feet south and 2400 feet east of northwest corner, Sec.46, T.12N., R.3E.

Elevation: 234 feet (topographic map) Date: July 21, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Loess
10	10	Silt, reddish-brown.
		Terrace deposit
48	58	Sand, white to reddish-orange, fine- to medium-grained, argillaceous; silt, tan.
20	78	Sand, white, fine- to medium-grained.
8	86	Sand, white to yellow, very coarse-grained.
		Catahoula formation
16	102	Clay, very light-gray, slightly sandy, pyritic.
6	108	Sand, white to gray, fine-grained.
8	116	Clay, very light-gray, silty.
10	126	Sand, white to yellow, fine- to very coarse-grained.
24	150	Clay, gray, silty, sandy, micaceous.

AH-22

Location: In pasture 500 feet southeast of pond. From the south corner of Sec. 55 approximately 1500 feet northwest along section line, then southwest 700 feet to location in Sec.28, T.12N., R.3E.

Elevation: 165 feet (topographic map) Date: July 21, 1965

Purpose: Drilled to 40 feet for stratigraphic information. Lost circulation, abandoned hole, no electrical log.

Thickness	Depth	Description
		Loess
15	15	Silt, tan.
		Catahoula formation
20	35	Clay, yellow, silty.
5	40	Clay, very light-gray, silty, sandy.

AH-23

Location: In pasture approximately 2400 feet north and 4500 feet west of southeast corner, Sec.28, T.12N., R.3E.

Elevation: 192 feet (topographic map) Date: July 22, 1965

Purpose: Drilled to 91 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Loess
12	12	Silt, tan, shells of land snails, sandy.
		Terrace deposit
2	14	Sand, tan to yellow, fine- to medium-grained.
11	25	Clay, yellow to red, silty, iron concretions.
11	36	Sand, white to orange, fine-grained, argillaceous.
		Catahoula formation
34	70	Clay, very light-gray, silty, finely micaceous, limonitic staining.
11	81	Silt, light-gray, sandy, finely micaceous.
10	91	Sand, multi-colored, fine- to coarse-grained.

AH-24

Location: In pasture, approximately 1500 feet north and 600 feet east of the southwest corner, Sec.7, T.11N., R.3E.

Elevation: 155 feet (topographic map) Date: July 22, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Loess
10	10	Silt, brown.
9	19	Silt, tan, slightly sandy.
		Terrace deposit
11	30	Clay, white to yellow, silty, sandy, ferrugineous concretions.
10	40	Silt, tan to red, clayey, siltstone in part.
10	50	Silt, light-gray, sandy, interbedded with sand, fine- to very coarse-grained.
7	57	Sand, white, coarse- to very coarse-grained, quartz pebbles.
		Catahoula formation
3	60	Clay, grayish-yellow, slightly silty.
8	68	Silt, light-gray, sandy, carbonaceous.
4	72	Sand, gray, fine- to coarse-grained.
14	86	Clay, very light-gray, silty, sandy.
12	98	Sand, white, very coarse-grained, kaolinitic, dark chert grains.
12	110	Clay, very light-gray, very silty, sandy, pyritic.
3	113	Sandstone, light-gray, fine-grained, silty.
37	150	Clay, light-gray, silty, pyritic.

AH-25

Location: In pasture 500 feet north of farm house. Approximately 2000 feet north and 2400 feet west of southeast corner, Sec.19, T.11N., R.4E.

Elevation: 170 feet (topographic map) Date: July 23, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Loess
10	10	Silt, yellowish-orange, sandy.
		Terrace deposit
12	22	Clay, tan to reddish-orange, very sandy, gravel in bottom 4 feet.
		Catahoula formation
23	45	Clay, grayish-yellow, silty, sandy, interbedded with sand, white, fine-grained.

9	54	Sand, white to yellow, fine-grained, kaolinitic, limonitic staining abundant.
6	60	Clay, yellow, sandy.
10	70	Sand, yellow, coarse- to very coarse-grained, limonitic.
10	80	Sand, white, fine- to medium-grained, dark grains, chert, heavy minerals.
10	90	Sand, white, fine- to coarse-grained, kaolinitic.
36	126	Clay, very light-gray, silty, pyritic.
14	140	Clay, grayish-yellow, slightly silty.
10	150	Clay, light-gray, slightly silty.

AH-26

Location: In pasture approximately 2200 feet north and 700 feet east of southwest corner, Sec.2, T.11N., R.4E.

Elevation: 240 feet (topographic map) Date: July 26, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
3	3	Loessal soil and silt.
		Catahoula formation
7	10	Clay, tan to light-gray, silty, sandy.
38	48	Clay, grayish-yellow, silty.
8	56	Sand, white, fine-grained, micaceous.
22	78	Clay, very light-gray, sandy.
11	89	Clay, light-gray, very silty, pyritic.
29	118	Sand, gray, fine-grained, lignitic, pyritic, dark grains, chert.
22	140	Clay, grayish-yellow, pyritic, finely micaceous.
10	150	Clay, very light-gray, silty.

AH-27

Location: In pasture 500 feet northwest of farm house, 25 feet south of dirt road. Approximately 1700 feet north and 1900 feet east of southwest corner, Sec.16, T.11N., R.4E.

Elevation: 220 feet (topographic map) Date: July 27, 1965

Purpose: Drilled to 40 feet for stratigraphic information. Electrical log to total depth. At total depth encountered quartizite which could not be penetrated.

Thickness	Depth	Description
		Loess
8	8	Silt, tan, sandy.
		Catahoula formation
24	32	Clay, tan, sandy.
8	40	Sand, white, medium-grained, kaolinitic, lignitic, sandstone in part.

AH-28

Location: In pasture 25 yards west of stock pond. Approximately 1900 feet south and 1350 feet east of northwest corner, Sec.17, T.11N., R.5E.

Elevation: 252 feet (topographic map) Date: July 27, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log to 145 feet.

Thickness	Depth	Description
		Loess
8	8	Silt, brown, sandy.
		Catahoula formation
44	52	Clay, white to light-gray, silty, sandy, limonitic staining.

16	68	Sand, white to yellow, fine-grained, micaceous, kaolinitic, limonitic staining.
17	85	Silt, light-gray, sandy, micaceous, carbonaceous.
37	122	Sand, white, fine-grained, lignitic; coarse-grained, silty in bottom 10 feet.
28	150	Clay, very light-gray, silty, pyritic, finely micaceous.

AH-29

Location: In pasture 200 feet east of county road and 25 feet south of driveway to farm house. Approximately 700 feet south and 1100 feet west of northeast corner, Sec.30, T.11N., R.5E.

Elevation: 205 feet (topographic map) Date: July 28, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Terrace deposit
10	10	Silt, yellow to tan, sandy, micaceous, small limonite concretions.
8	18	Sand, white to yellow, fine- to medium-grained.
		Catahoula formation
12	30	Clay, light-gray to gray, silty, sandy, limonitic staining.
18	48	Clay, very light-gray, slightly sandy, finely micaceous, with limonite concretions.
26	74	Clay, very light-gray, silty, sandy, finely micaceous.
10	84	Sand, white, medium-grained; dark grains, chert.
20	104	Sand, white to gray, fine-grained, pyritic, some kaolinitic material.
16	120	Clay, light-gray, slightly silty.
12	132	Clay, very light-gray, silty, sandy, finely micaceous.
8	140	Clay, grayish-yellow, silty.
10	150	Clay, grayish-yellow, silty, sandy, pyritic.

AH-30

Location: In pasture in the northwest quadrant of road juncture, 1000 feet northeast of Whitehall Church. Approximately 500 feet north and 600 feet east of southwest corner, Sec.32, T.11N., R.4E.

Elevation: 262 feet (topographic map) Date: July 28, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Loess
10	10	Silt, brown.
		Terrace deposit
20	30	Sand, white, fine- to coarse-grained, interbedded with pink clay.
3	33	Sand, white, fine-grained, in part ferruginous sandstone, limonitic concretions.
		Catahoula formation
36	69	Clay, very light-gray, silty, sandy.
11	80	Clay, light-gray, silty.
18	98	Clay, very light-gray, slightly silty, finely micaceous, some limonitic staining.
14	112	Clay, grayish-yellow, plastic.
8	120	Clay, grayish-yellow, silty.
10	130	Clay, very light-gray, silty, sandy, pyritic.

20	150	Sand, white, fine- to coarse-grained, kaolinitic; with many dark grains, chert, heavy minerals; some thin beds of clay, gray, sandy.

AH-31

Location: 800 feet west of farm hourse, approximately 2000 feet north and 1300 feet west of southeast corner, Sec.4, T.10N., R.4E.

Elevation: 245 feet (topographic map) Date: July 29, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Terrace deposit
12	12	Silt, yellow, sandy, limonitic concretions.
		Catahoula formation
8	20	Clay, light-gray to yellow, silty, sandy, small limonitic concretions.
8	28	Clay, very light-gray, silty, slightly sandy.
8	36	Sandstone, white, fine-grained, kaolinitic interbedded with clay, very light-gray.
18	54	Sand, white, medium- to very coarse-grained; dark grains, chert and heavy minerals.
8	62	Clay, light-gray, silty.
8	70	Sandstone, gray, fine-grained, argillaceous.
6	76	Clay, grayish-brown, slightly silty.
15	91	Clay, light-gray, very silty, micaceous.
11	102	Clay, very light-gray, slightly silty, finely micaceous.
10	112	Clay, light-gray, silty.
38	150	Clay, grayish-yellow, slightly silty.

AH-32

Location: In pasture approximately 2400 feet north and 900 feet west of southeast corner, Sec.11, T.10N., R.4E.

Elevation: 300 feet (topographic map) Date: August 2, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Loess
6	6	Silt, brown.
		Terrace deposit
45	51	Sand, white to orange, fine-grained.
		Catahoula formation
11	62	Clay, very light-gray to yellow, silty, sandy, limonitic staining.
7	69	Sand, gray, fine-grained, silty, siltstone in part.
16	85	Clay, dark-gray to black, silty, carbonaceous.
15	100	Sand, tan to yellow, fine-grained.
10	110	Clay, yellowish-orange, silty.
28	138	Clay, very light-gray, silty, finely micaceous.
12	150	Sand, white to yellow, fine-grained; dark grains, chert, heavy minerals.

AH-33

Location: Near apex of hill 600 feet south-southeast of farm house. Approximately 1100 feet south and 1500 feet west of northeast corner, Sec.17, T.10N., R.4E.

Elevation: 250 feet (topographic map) Date: August 3, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Loess
8	8	Silt, brown.
		Terrace deposit
5	13	Sand, white to orange, fine-grained.
5	18	Clay, light-gray to red, sandy.
40	58	Sand, white to yellow, fine- to coarse-grained; gravels, chert, quartz.
		Catahoula formation
1	59	Clay, very light-gray, silty, micaceous.
8	67	Sand, yellow, fine-grained, micaceous, kaolinitic, sandstone in part.
15	82	Clay, light-gray, silty.
7	89	Clay, very light-gray, sandy, silty, micaceous, sandstone in part.
13	102	Clay, grayish-yellow, slightly silty, limonitic staining in part.
22	124	Clay, grayish-yellow, silty, finely micaceous, sandy in part.
16	140	Clay, brownish-gray, silty.
10	150	Clay, very light-gray, finely micaceous.

AH-34

Location: Near apex of hill 1000 feet east of farm house, 25 feet south of field road. Approximately 2700 feet south and 300 feet west of northeast corner, Sec.44, T.11N., R.4E.

Elevation: 280 feet (topographic map) Date: August 3, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Loess
8	8	Silt, tan.
		Terrace deposit
7	15	Sand, white, medium-grained.
5	20	Clay, yellow to red, sandy.
10	30	Sand, white to yellow, coarse- to very coarse-grained.
		Catahoula formation
20	50	Clay, light-gray to grayish-brown, finely micaceous.
13	63	Clay, grayish-yellow, silty, finely micaceous.
7	70	Sand, white, medium-grained, sandstone in part, kaolinitic.
6	76	Sand, white to yellow, fine-grained.
14	90	Clay, light-gray, silty, sandy.
24	114	Sand, white, fine-grained, kaolinitic, sandstone in part, coarse-grained in bottom 4 feet.
36	150	Clay, light-gray, silty.

AH-35

Location: In clearing on south flank of prominent hill 1200 feet south-southeast of farm house. Approximately 1900 feet south and 1400 feet east of northwest corner, Sec.37, T.10N., R.4E.

Elevation: 330 feet (topographic map) Date: August 6, 1965

Purpose: Drilled to 500 feet for stratigraphic information. Electrical log to 497 feet.

Thickness	Depth	Description
		Loess
2	2	Silt, brown.
		Terrace deposit
6	8	Sand, white to orange, fine-grained; gravel, chert.

11	19	Sand, white to yellow, fine-grained, argillaceous, ferruginous material near bottom.
		Catahoula formation
11	30	Clay, light-gray to red, silty, heavy iron staining.
20	50	Clay, very light-gray, plastic.
8	58	Sand, white, fine-grained, silty, kaolinitic.
20	78	Clay, pale yellowish-brown, blocky.
5	83	Clay, pale yellowish-brown, sandy.
12	95	Clay, very light-gray to pink, slightly sandy.
9	104	Sand, white, fine- to medium-grained.
32	136	Clay, light-gray to grayish-brown, silty, finely micaceous, slight limonitic staining.
8	144	Clay, gray, silty.
11	155	Clay, pale yellowish-brown, slightly silty, finely micaceous.
19	174	Clay, light-gray, silty, finely micaceous.
18	192	Sand, white, medium-grained, dark grains of chert, heavy minerals, sandstone in part.
10	202	Clay, gray, silty, sandy.
3	205	Sand, white, coarse-grained.
17	222	Silt, gray, sandy, clayey, carbonaceous.
4	226	Clay, light-gray to tan, slightly silty.
8	234	Sand, gray, medium-grained, silty, sandstone in part.
22	256	Sand, white to light-gray, fine- to coarse-grained, dark grains of chert, heavy minerals.
28	284	Sand, white to yellow, fine-grained, slight iron staining.
5	289	Sand, white to light-gray, medium- to coarse-grained, dark grains of chert, heavy minerals.
10	299	Clay, very light-gray, silty, slightly sandy.
3	302	Sand, white, fine-grained, some kaolinitic material.
18	320	Silt, very light-gray, sandy.
12	332	Clay, light-gray to gray, silty, slightly sandy.
8	340	Clay, very light-gray to pale yellowish-brown, silty to slightly silty.
16	356	Clay, light-gray, silty.
4	360	Clay, very light-gray to white, plastic.
14	374	Clay, very light-gray to pale yellowish brown, slightly silty, plastic, some limonitic staining.
8	382	Silt, grayish-yellow, clayey.
16	398	Clay, light-gray to pale yellowish-brown, plastic.
20	418	Clay, light-gray to grayish-yellow, silty.
8	426	Clay, grayish-yellow, slightly silty.
36	462	Sand, white, fine-grained, pyritic, interbedded with silt, gray.
24	486	Sand, white, coarse- to very coarse-grained, dark grains, chert, heavy minerals.
14	500	Clay, light-gray to grayish-yellow, slightly silty, finely micaceous.

AH-36

Location: In pasture 500 feet northwest of farm house. Approximately 900 feet north and 300 feet west of southeast corner, Sec.14, T.10N., R.4E.

Elevation: 260 feet (topographic map) Date: August 9, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log from 35 to 114 feet.

Thickness	Depth	Description
		Loess
4	4	Silt, brown.
		Terrace deposit
26	30	Sand, white to orange, fine-grained, argillaceous.

30	60	Sand, white to yellow, fine-grained, few dark grains, chert, heavy minerals.
18	78	Sand, white, medium- to very coarse-grained, some chert gravel.
16	94	Sand, white, fine- to medium-grained, slight iron staining.
8	102	Clay, very light-gray to yellow, silty, sandy, limonitic staining.
8	110	Sand, white, fine- to medium-grained, gravel, chert.
25	135	Sand, white to yellow, coarse; chert gravel; clay, yellow, pink, silty, sandy.
		Catahoula formation
15	150	Clay, very light-gray, slightly silty.

AH-37

Location: 50 feet east of fire tower, approximately 1250 feet north and 1850 feet east of southwest corner, Sec.15, T.10N., R.4E.

Elevation: 410 feet (hand level) Date: August 10, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Loess
4	4	Silt, brown.
		Terrace deposit
14	18	Sand, orange, coarse-grained, argillaceous, chert gravel.
62	80	Sand, orange, coarse-grained.
18	98	Sand, orange to reddish-brown, coarse, ferruginous silt.
		Catahoula formation
15	113	Clay, very light-gray, silty, sandy, limonitic staining.
16	129	Sand, white, fine-grained, argillaceous.
17	146	Clay, light-gray, silty.
4	150	Sand, white to yellow, fine-grained, limonitic staining.

AH-38

Location: On ridge 500 feet south of stock pond, 200 feet west of county road. Approximately 1400 feet north and 450 feet east of southwest corner, Sec.28, T.10N., R.4E.

Elevation: 305 feet (topographic map) Date: August 11, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Loess
8	8	Silt, brown.
		Catahoula formation
17	25	Clay, light-gray, silty, sandy, limonitic.
13	38	Sand, white, fine-grained.
4	42	Clay, light-gray, sandy.
22	64	Sand, yellow, fine-grained, micaceous.
8	72	Clay, very light-gray, silty, finely micaceous.
30	102	Clay, light-gray to red, silty.
20	122	Clay, gray, silty, carbonaceous, slightly sandy.
20	142	Sand, yellow, fine-grained, argillaceous, in part ferruginous sandstone interbedded with red, yellow and purple clay.
2	144	Clay, grayish-yellow, silty.
6	150	Sand, yellow, fine-grained, argillaceous, heavy limonitic staining.

AH-39

Location: In field 50 feet west of county road, approximately 1400 feet south and 1350 feet east of northwest corner, Sec.34, T.10N., R.4E.

Elevation: 290 feet (topographic map) Date: August 12, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Loess
4	4	Silt, tan.
		Catahoula formation
10	14	Clay, grayish-yellow, silty.
9	23	Clay, very light-gray, slightly silty.
13	36	Clay, very light-gray, silty.
4	40	Sand, white, fine-grained, silty.
35	75	Clay, grayish-yellow, very silty, sandy.
5	80	Sand, white, fine-grained, clayey.
6	86	Clay, grayish-yellow, silty.
10	96	Sand, white, fine-grained.
14	110	Clay, grayish-brown, silty, micaceous.
11	121	Clay, grayish-brown, sandy.
9	130	Clay, olive-gray, waxy, plastic.
13	143	Clay, grayish-yellow, silty.
3	146	Sand, gray, fine-grained.
4	150	Clay, grayish-yellow, silty.

AH-40

Location: In pasture 200 feet west of county road. Approximately 200 feet south and 2200 feet east of northwest corner, Sec.16, T.10N., R.4E.

Elevation: 275 feet (topographic map) Date: August 12, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Loess
10	10	Silt, brown.
		Terrace deposit
6	16	Sand, orange, fine-grained.
4	20	Clay, orange, sandy.
32	52	Sand, tan, fine-grained, micaceous.
6	58	Clay, gray, yellow, pink, silty, sandy.
		Catahoula formation
38	96	Clay, very light-gray, finely micaceous, slightly silty, limonitic staining.
8	104	Clay, gray, slightly silty.
9	113	Clay, very light-gray, silty.
5	118	Clay, grayish-brown, silty, micaceous.
32	150	Clay, very light-gray, silty, sandy.

AH-41

Location: In pasture approximately 1700 feet north and 900 feet east of southwest corner, Sec.2, T.10N., R.3E.

Elevation: 238 feet (topographic map) Date: August 13, 1965

Purpose: Drilled to 50 feet for stratigraphic information. Electrical log to total depth. Losing circulation during drilling, no cuttings recovered 30 to 50 feet.

Thickness	Depth	Description
		Loess
6	6	Silt, brown.
		Catahoula formation
24	30	Clay, very light-gray, silty, sandy, finely micaceous.
20	50	Clay.

AH-42

Location: 15 feet north of Highway 547, approximately 2000 feet north and 200 feet east of southwest corner, Sec.7, T.10N., R.4E.

Elevation: 178 feet (topographic map) Date: August 16, 1965

Purpose: Cored to 22 feet to secure clay for testing. No electrical log.

Thickness	Depth	Description
		Road fill
3	3	Silt, sand and gravel.
		Catahoula formation
1.5	4.5	Clay, brownish-gray, silty, slightly sandy.
1.0	5.5	Clay, light-gray, finely micaceous, silty, mottled red and yellow with ferruginous staining.
4.5	10.0	Clay, very light-gray, silty, finely micaceous.
2.5	12.5	Clay, very light-gray, silty, finely micaceous, sandy in part.
0.5	13.0	Siltstone, very light-gray, sandy, argillaceous.
9	22	Clay, yellowish-gray, silty.

AH-43

Location: In pasture southeast of road juncture, 125 feet south of northwest-southeast road and 50 feet east of road south. Approximately 700 feet north and 2150 feet west of southeast corner, Sec.21, T.10N., R.4E.

Elevation: 258 feet (topographic map) Date: August 16, 1965

Purpose: Cored to 32 feet to obtain clay sample for testing. No electrical log.

Thickness	Depth	Description
		Loess
7	7	Silt, tan.
		Terrace deposit
5	12	Silt, yellow, slightly sandy; gravel; iron concretions.
2	14	Sand, orange, fine-grained; gravel, chert, jasper.
		Catahoula formation
4	18	Clay, yellowish-gray, finely micaceous, slightly silty.
3.5	21.5	Sand, white to yellow, fine-grained, kaolinitic, limonitic staining.
6	27.5	Clay, very light-gray, silty, sandy.
4.5	32	Sand, light-gray, fine-grained, micaceous, iron staining.

AH-44

Location: In field 50 feet west of county road approximately 1400 feet south and 1350 feet east of northwest corner, Sec.34, T.10N., R.4E.

Elevation: 290 feet (topographic map) Date: August 17, 1965

Purpose: Cored to 32 feet to secure clay for testing. No electrical log.

Thickness	Depth	Description
		Loess
7.5	7.5	Silt, tan.
		Catahoula formation
2.5	10	Clay, light-gray, slightly silty.

3	13	Silt, very light-gray, argillaceous, sandy.
10	23	Clay, yellowish-gray, slightly silty.
1	24	Silt, very light-gray, argillaceous, micaceous.
8	32	Clay, very light-gray to grayish-yellow.

AH-45

Location: Near apex of hill 1000 feet east of farm house, 25 feet south of field road; 30 feet east of test hole AH-34. Approximately 2700 feet south and 300 feet west of northeast corner, Sec.44, T.11N., R.4E.

Elevation: 280 feet (topographic map) Date: August 18, 1965

Purpose: Drilled to 35 feet, then cored from 35 to 52 feet to obtain clay samples for testing. No electrical log.

Thickness	Depth	Description
		Loess
8	8	Silt, tan.
		Terrace deposit
7	15	Sand, white, medium-grained.
5	20	Clay, yellow to red, sandy.
10	30	Sand, white to yellow, coarse- to very coarse-grained.
		Catahoula formation
5	35	Clay, light-gray to grayish-brown.
15	50	Clay, yellowish-gray, plastic.
2	52	Clay, yellowish-gray, silty, finely micaceous.

AH-46

Location: In pasture 40 feet west of county road. Approximately 850 feet south and 175 feet west of northeast corner, Sec.7, T.10N., R.5E.

Elevation: 222 feet (topographic map) Date: August 18, 1965

Purpose: Cored to 28 feet to obtain clay samples for testing. No electrical log.

Thickness	Depth	Description
		Loess
7	7	Silt, tan.
		Catahoula formation
6.5	13.5	Clay, yellowish-gray, slightly silty.
1.5	15	Silt, white to very light-gray, argillaceous, sandy.
3	18	Clay, yellowish-gray, slightly silty.
4	22	Clay, yellowish-gray, plastic, slight limonitic staining.
6	28	Silt, yellowish-gray, argillaceous, sandy, heavy iron staining.

AH-47

Location: In pasture 1000 feet south of Highway 18, 15 feet north of test hole AH-18. Approximately 1000 feet south and 750 feet west of northeast corner, Sec.1, T.11N., R.3E.

Elevation: 220 feet (topographic map) Date: August 18, 1965

Purpose: Drilled to 20 feet, then cored from 20 to 42 feet to obtain clay samples for testing. No electrical log.

Thickness	Depth	Description
		Loess
10	10	Silt, tan.
		Catahoula formation
10	20	Clay, yellow to tan, silty, slightly sandy.
2	22	Clay, grayish-yellow, silty, finely micaceous, small partings of manganese.
18	40	Clay, grayish-yellow, slightly sandy.

1	41	Clay, light-gray, silty.
1	42	Clay, light-gray, finely micaceous, silty, heavy iron staining.

AH-48

Location: In bed of logging trail, 10 feet southeast of test hole AH-15. Approximately 2200 feet south and 1000 feet west of northeast corner, Sec.6, T.11N., R.5E.

Elevation: 325 feet (topographic map) Date: August 19, 1965

Purpose: Hole drilled to 33 feet, then cored from 33 feet to 52 feet to obtain core samples for testing. No electrical log.

Thickness	Depth	Description
		Loess
7	7	Silt, moderate brown.
		Terrace deposit
24	31	Sand, gray to reddish-orange, fine- to medium-grained, argillaceous, becoming coarse-grained in bottom 3 feet.
		Catahoula formation
13	44	Clay, very light-gray, plastic, slightly silty.
8	52	Clay, yellowish-gray, silty, sandy, pyritic.

AH-49

Location: In bed of dirt road, 20 feet southwest of test hole AH-10. Approximately 2050 feet east and 100 feet north of southwest corner, Sec.31, T.13N., R.5E.

Elevation: 304 feet (topographic map) Date: August 19, 1965

Purpose: Hole drilled to 35 feet, then cored from 35 feet to 52 feet to obtain clay samples for testing. No electrical log.

Thickness	Depth	Description
		Loess
6	6	Silt, tan to reddish-orange.
		Terrace deposit
16	22	Sand, reddish-orange, medium- to very coarse-grained, argillaceous, small amount of chert gravel.
4	26	Clay, gray, silty, slightly sandy.
2	28	Sand, tan, coarse-grained.
		Catahoula formation
17	45	Clay, light-gray, silty.
3	48	Clay, yellowish-gray, some pyrite.
4	52	Clay, very light-gray, slightly silty, finely micaceous.

AH-50

Location: In pasture 25 feet west of county road, 50 feet north of gate. Approximately 2700 feet north and 2500 feet west of southeast corner, Sec.12, T.10N., R.3E.

Elevation: 187 feet (topographic map) Date: August 25, 1965

Purpose: Drilled to 500 feet for stratigraphic information. Electrical log to 498 feet.

Thickness	Depth	Description
		Loess
10	10	Silt, tan.
		Terrace deposit
8	18	Sand, white to tan, fine-grained.
		Catahoula formation
12	30	Clay, grayish-brown, silty.
17	47	Clay, bluish-gray, silty, sandy, finely micaceous.
23	70	Clay, tan, sandy, silty, indurated.
6	76	Silt, yellowish-gray, sandy, clayey, micaceous.

10	86	Clay, brownish-gray, slightly silty.
11	97	Clay, very light-gray, silty, sandy, micaceous.
19	116	Clay, pale green, silty.
10	126	Clay, pale green, silty, sandy.
6	132	Silt, light-gray, sandy.
14	146	Clay, greenish-gray, silty.
12	158	Sand, white, fine- to medium-grained; dark grains of chert, heavy minerals.
8	166	Clay, gray, silty, micaceous.
16	182	Sand, white, medium-grained; dark grains of chert, heavy minerals.
28	210	Silt, light-gray, sandy.
16	226	Sand, light-gray, fine-grained.
30	256	Clay, grayish-green, silty, pyritic.
4	260	Sand, white, coarse-grained, pyrite.
3	263	Clay, yellowish-gray, silty, sandy.
10	273	Sand, white, very coarse-grained; dark grains of chert, heavy minerals.
4	277	Clay, light-gray, silty, sandy.
3	280	Sand, white, very coarse-grained.
18	298	Clay, grayish-green, slightly silty.
31	329	Clay, light-gray, silty, sandy, pyrite.
23	352	Clay, very light-gray, slightly silty.
22	374	Clay, yellowish-gray, silty.
6	380	Clay, yellowish-gray, silty, sandy.
12	392	Clay, light-gray, slightly silty.
8	400	Clay, gray, silty, sandy.
7	407	Sandstone, white, fine-grained, kaolinitic.
23	430	Clay, grayish-yellow, silty.
20	450	Clay, very light-gray, silty, limonite staining.
10	460	Silt, yellowish-gray, sandy, argillaceous.
18	478	Clay, very light-gray, silty, finely micaceous.
6	484	Sand, white, very coarse-grained.
6	490	Clay, grayish-yellow, silty.
10	500	Sand, white, coarse-grained.

AH-51

Location: On apex of knoll in pasture 50 feet east of county road. Approximately 3600 feet north and 3800 feet west of southeast corner, Sec.28, T.11N., R.3E.

Elevation: 204 feet (topographic map) Date: August 26, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Loess
6	6	Silt, tan.
9	15	Silt, tan, argillaceous, sandy, graveliferous.
		Terrace deposit
8	23	Sand, white to orange, fine-grained.
9	32	Clay, gray to pink, sandy, graveliferous.
56	88	Sand, white to orange, fine-grained; gravel, chert; dark grains of chert, heavy minerals; mica.
38	126	Sand, white to orange, very coarse-grained.
20	146	Sand, white, medium-grained, dark grains of chert, heavy minerals; very coarse sand in bottom few feet, gravels, ferrigenous material.
		Catahoula formation
4	150	Clay, light-gray, sandy.

AH-52

Location: In pasture near abandoned pit. Approximately 900 feet south and 50 feet west of northeast corner, Sec.16, T.10N., R.4E.

Elevation: 325 feet (topographic map) Date: August 26, 1965

Purpose: Drilled to 100 feet for stratigraphic information. Electrical log to 97 feet.

Thickness	Depth	Description
		Loess
5	5	Silt, tan.
		Catahoula formation
12	17	Clay, very light-gray, sandy.
1	18	Sand, white, clayey, fine-grained.
5	23	Clay, very light-gray, sandy.
1	24	Sand, white, kaolinitic.
6	30	Clay, very light-gray, sandy.
2	32	Sand, white, fine-grained.
12	44	Clay, very light-gray, very sandy.
56	100	Sand, white, medium-grained, slight limonite staining; dark grains of chert, heavy minerals, micaceous.

AH-53

Location: In clearing 150 feet east of county road. Approximately 1400 feet south and 1200 feet west of northeast corner, Sec.46, T.11N., R.2E.

Elevation: 192 feet (topographic map) Date: August 27, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Loess
18	18	Silt, brown.
		Catahoula formation
12	30	Clay, light-gray, plastic, limonitic staining.
6	36	Clay, yellowish-gray, silty, sandy.
1	37	Sand, very light-gray, fine-grained.
33	70	Clay, yellowish-gray, silty, thin layers of sand at 40 and 64 feet.
41	111	Sand, white, fine- to coarse-grained.
6	117	Clay, light-gray, silty, sandy.
3	120	Sand, light-gray, silty.
30	150	Clay, light greenish-gray, silty, sandy, some pyrite.

AH-54

Location: On apex of ridge 250 feet west of farm dwelling. Approximately 3600 feet south and 800 feet west of northeast corner, Sec.70, T.11N., R.2E.

Elevation: 225 feet (topographic map) Date: August 30, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Loess
10	10	Silt, brown.
		Catahoula formation
20	30	Sand, white, fine-grained, argillaceous, some kaolinitic material.
20	50	Clay, light-gray, slightly silty.
14	64	Clay, very light-gray, silty, micaceous.
15	79	Silt, light-gray, clayey, sandy.
13	92	Sand, white, fine-grained, silty.

18	110	Silt, gray, sandy, argillaceous.
8	118	Sand, gray, fine-grained, clayey.
32	150	Sand, gray, coarse-grained; dark grains of chert, heavy minerals.

AH-55

Location: In pasture 10 feet north of abandoned road bed. Approximately 1000 feet south and 800 feet east of northwest corner, Sec.6, T.10N., R.2E.

Elevation: 225 feet (topographic map) Date: August 31, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Loess
10	10	Silt, brown.
10	20	Silt, tan, shell fragments.
		Catahoula formation
22	42	Clay, very light-gray, silty, finely micaceous, limonitic staining.
10	52	Clay, very light-gray, silty, sandy.
8	60	Sand, white, medium-grained, some kaolinitic interstitial material.
24	84	Sand, white, coarse- to very coarse-grained, kaolinitic.
16	100	Sand, white to yellow, medium-grained, limonitic staining.
15	115	Sand, gray, coarse-grained; dark grains of chert, heavy minerals; thin stringers of clay.
11	126	Clay, gray, silty; thin stringers of sand, gray, coarse-grained.
24	150	Sand, gray, coarse-grained; thin stringers of gray silt.

AH-56

Location: In pasture 400 feet north of county road. Approximately 1400 feet north and 2500 feet west of southeast corner, Sec.57, T.11N., R.2E.

Elevation: 280 feet (topographic map) Date: September 1, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Loess
20	20	Silt, tan.
		Loess and soil
4	24	Silt, tan, sandy.
		Catahoula formation
25	49	Clay, very light-gray, slightly silty, micaceous.
13	62	Sand, white, coarse-grained, clayey.
12	74	Clay, very light-gray, silty, micaceous.
6	80	Sand, white, fine-grained.
10	90	Clay, yellowish-gray, silty, micaceous.
30	120	Clay, yellowish-gray, very silty.
21	141	Clay, very light-gray, slightly silty.
9	150	Sand, gray, medium-grained, pyrite.

AH-57

Location: On ridge 300 feet southeast of county road. Approximately 200 feet north and 300 feet east of southwest corner, Sec.43, T.11N., R.2E.

Elevation: 300 feet (topographic map) Date: September 2, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Loess
6	6	Silt, brown.
		Loess and soil
6	12	Silt, brown, sandy.
6	18	Silt, brown, sandy, graveliferous.
		Terrace deposit
3	21	Gravel; sand, orange.
9	30	Clay, gray, tan, sandy, graveliferous.
		Catahoula formation
4	34	Sandstone, white, fine-grained, kaolinitic.
3	37	Clay, light-gray, silty, sandy.
17	54	Sand, white, fine-grained, kaolinitic, sandstone in part.
46	100	Clay, light-gray, silty.
24	124	Sand, white, fine-grained, silty, kaolinitic, sandstone in part.
18	142	Clay, yellowish-gray, silty, sandy.
6	148	Sand, white, fine-grained, silty, kaolinitic.
2	150	Clay, yellowish-gray, silty, sandy.

AH-58

Location: In pasture, approximately 2500 feet south and 700 feet east of northwest corner, Sec.37, T.11N., R.2E.

Elevation: 260 feet (topographic map) Date: September 2, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Loess
20	20	Silt, tan.
		Loess and soil
10	30	Silt, tan, sandy.
		Catahoula formation
16	46	Sand, white, fine-grained, kaolinitic.
16	62	Clay, very light-gray, silty, sandy.
26	88	Clay, light-gray, slightly silty, micaceous, limonitic staining.
11	99	Clay, light-gray, silty, sandy.
7	106	Sand, white, medium- to coarse-grained.
2	108	Clay, very light-gray, sandy.
6	114	Sand, white, medium- to coarse-grained.
2	116	Clay, very light-gray, sandy.
9	125	Sand, white to yellow, medium-grained.
25	150	Clay, grayish-yellow, silty.

AH-59

Location: On logging trail 25 feet north of county road. Approximately 2500 feet south of northwest corner of section and 2600 feet west of Beechland Church, Sec.28, T.11N., R.1E.

Elevation: 225 feet (topographic map) Date: September 3, 1965

Purpose: Drilled to 150 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Loess
24	24	Silt, brown, shell fragments.
32	56	Silt, tan, slightly sandy.
20	76	Silt, dark yellowish-orange, argillaceous.
2	78	Silt, tan, sandy.

		Terrace deposit
8	86	Sand, yellow, coarse-grained, graveliferous.
16	102	Clay, light-gray to yellow, sandy, limonitic staining.
41	143	Sand, white to yellow, coarse-grained, argillaceous, pea size gravel.
		Catahoula formation
7	150	Clay, gray, very silty, sandy.

AH-60

Location: Near intersection of county roads. Approximately 800 feet north and 50 feet west of southeast corner, Sec.38, T.13N., R.4E.

Elevation: 302 feet (topographic map) Date: October 22, 1965

Purpose: Drilled to 600 feet for stratigraphic information. Electrical log to 598 feet.

Thickness	Depth	Description
		Loess
17	17	Silt, tan, few disseminated sand grains.
		Terrace deposit
3	20	Sand, tan, fine- to coarse-grained; gravel.
25	45	Clay, yellow, silty, micaceous.
7	52	Sand, tan, fine- to coarse-grained, ferruginous; gravel.
		Catahoula formation
8	60	Clay, bluish-gray, slightly silty.
14	74	Sand, white, glauconitic, argillaceous, some pyrite.
6	80	Clay, very light-gray, silty, micaceous, pyritic.
10	90	Sand, white, fine-grained, argillaceous.
6	96	Clay, light-gray to gray, micaceous, lignitic.
12	108	Clay, light-gray, interbedded with sand.
32	140	Clay, very light-gray, slightly silty, some pyrite.
10	150	Sand, white, fine- to medium-grained, lignite at 145 feet.
32	182	Clay, yellowish-gray, sandy to very sandy.
26	208	Clay, yellowish-gray, slightly silty.
27	235	Clay, light-gray, silty.
3	238	Sandstone, white, medium-grained, pyritic, some kaolinitic material.
12	250	Clay, very light-gray, silty, micaceous.
10	260	Clay, very light-gray, sandy, micaceous.
52	312	Clay, bluish-gray, slightly silty, micaceous.
68	380	Sand, white, coarse-grained, heavy minerals.
20	400	Clay, bluish-gray, sandy.
20	420	Clay, light-gray, silty.
50	470	Clay, light-gray to grayish-yellow, silty.
20	490	Clay, light-gray, silty.
		Vicksburg group (Bucatunna clay)
23	513	Clay, gray, silty, finely micaceous, glauconitic.
		Vicksburg group (Byram marl)
19	532	Marl, gray-green, fossiliferous, glauconitic.
		Vicksburg group (Glendon limestone)
2	534	Limestone, gray, fossiliferous, glauconitic.
4	538	Marl, gray, glauconitic, fossiliferous.
2	540	Limestone, gray, fossiliferous, glauconitic.
44	584	Marl, gray, glauconitic, fossiliferous with thin beds of gray limestone.
		Vicksburg group (Mint Spring marl)
16	600	Marl, light-gray, fossiliferous, glauconitic, sandy.

AH-61

Location: In pasture 50 feet north of field road, 10 feet east of test hole AH-3. Approximately 1000 feet south and 2500 feet west of northeast corner, Sec.3, T.14N., R.5E.

Elevation: 135 feet (topographic map) Date: October 26, 1965

Purpose: Cored to 20 feet to obtain sample for testing. No electrical log.

Thickness	Depth	Description
		Colluvial deposit
3	3	Silt, tan, slightly sandy, small ferrugineous concretions.
14	17	Silt, brown, slightly sandy, micaceous, small ferrugineous concretions.
3	20	Sand, gray to tan, fine- to coarse-grained, silty.

AH-62

Location: On south flank of prominent hill, 50 feet west of field road approximately 400 feet south of test hole AH-35. Approximately 2300 feet south and 1200 feet east of northwest corner, Sec.37, T.10N., R.5E.

Elevation: 300 feet (topographic map) Date: October 27, 1965

Purpose: Cored to 56 feet to obtain clay for testing. No electrical log.

Thickness	Depth	Description
		Loess
8	8	Silt, tan, sandy.
		Terrace deposit
1	9	Sand, tan, medium-grained, argillaceous, gravel.
		Catahoula formation
9	18	Sand, white, fine- to medium-grained, clayey.
15	33	Clay, tan, red and gray mottled, plastic.
6	39	Sand, white to yellow, medium-grained, slightly kaolinitic, few heavy mineral grains.
4	43	Clay, green, silty.
12	55	Clay, gray to red, plastic.
1	56	Clay, grayish-green, silty.

AH-63

Location: On ridge in timbered land. From southwest corner go approximately 2600 feet northeast then at right angles go 3000 feet northwest, Sec.12, T.12N., R.2E.

Elevation: 210 feet (topographic map) Date: October 28, 1965

Purpose: Cored to 48 feet to obtain samples for testing. No electrical log.

Thickness	Depth	Description
		Loess
8	8	Silt, tan to brown, micaceous.
36	44	Silt, tan, shell fragments.
2	46	Silt, brown, sandy.
		Terrace deposit
2	48	Sand, orange, silty.

AH-64

Location: In old river course on the alluvial plain of Mississippi River, approximately 3000 feet northwest of Gin Lake. Approximately 3200 feet west and 300 feet south of Church at Grand Gulf, Sec.1, T.12N., R.1E.

Elevation: 64 feet (topographic map) Date: October 29, 1965

Purpose: Cored to 29.5 feet to obtain sample for testing. No electrical log.

Thickness	Depth	Description
		Alluvium
10	10	Silt, gray, micaceous.
9	19	Sand, gray, fine- to medium-grained, silty.
10.5	29.5	Silt, gray, sandy, clayey.

AH-65

Location: In pasture 40 feet southeast of road and 300 feet southwest of bridge. Approximately 2100 feet north and 200 feet west of southeast corner, Sec.4, T.12N., R.1E.

Elevation: 74 feet (topographic map) Date: November 3, 1965

Purpose: Drilled to 120 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Alluvium
20	20	Silt, gray, sandy, micaceous, argillaceous.
10	30	Silt, gray to tan, very sandy.
10	40	Sand, gray, very fine- to coarse-grained, carbonaceous, heavy minerals.
18	58	Sand, gray, coarse-grained, heavy minerals.
32	90	Sand, gray, coarse-grained, heavy minerals, graveliferous.
4	94	Gravel, chert and quartz, various sizes, some coarse-grained sand.
		Catahoula formation
26	120	Clay, grayish-green, sandy, micaceous.

AH-66

Location: In woods approximately 1550 feet north and 1750 feet east of southwest corner, Sec.37, T.13N., R.2E.

Elevation: 260 feet (topographic map) Date: November 8, 1965

Purpose: Drilled to 220 feet for stratigraphic information. Electrical log to 76 feet. Original objective Glendon limestone, drilling discontinued because of slow drilling rate.

Thickness	Depth	Description
		Loess
10	10	Silt, buff to tan, slightly sandy, micaceous.
30	40	Silt, buff to tan, shell fragments.
22	62	Silt, tan.
		Terrace deposit
14	76	Sand, white to yellow, medium-grained.
18	94	Sand, gray to yellow, medium- to coarse-grained; clay, gray, sandy; gravel.
		Catahoula formation
6	100	Clay, green, silty.
10	110	Sand, gray, fine- to medium-grained.
34	144	Clay, very light-gray, silty.
8	152	Sand, white, medium- to coarse-grained, some pyrite.
8	160	Clay, very light-gray, sandy.
15	175	Sand, white, medium- to coarse-grained, pyrite.
20	195	Clay, greenish-gray, sandy, micaceous.
25	220	Sand, white, medium-grained, some kaolinitic material, pyrite, heavy minerals.

AH-67

Location: Approximately 1750 feet north and 300 feet west of southeast corner, Sec.36, T.13N., R.2E.

Elevation: 240 feet (topographic map) Date: November 11, 1965

Purpose: Drilled to 588 feet for stratigraphic information. Electrical log to 586 feet.

Thickness	Depth	Description
		Loess
20	20	Silt, tan to brown.
20	40	Silt, buff to brown, shell fragments.
10	50	Silt, buff, shell fragments.
17	67	Silt, tan to orange, sandy, organic material.
		Terrace deposit
27	94	Sand, orange, coarse-grained; gravel various sizes, chert, some quartz.
		Catahoula formation
25	119	Clay, grayish-green, sandy, limonitic staining.
11	130	Sand, white, fine- to medium-grained, slightly glauconitic, heavy minerals, some kaolinitic material.
30	160	Clay, grayish-green, sandy, silty, micaceous.
20	180	Sand, white, fine-grained, argillaceous.
16	196	Clay, light-gray, silty.
12	208	Sand, gray, fine- to coarse-grained, argillaceous.
72	280	Sand, white, coarse-grained, heavy minerals.
46	326	Clay, light-gray, very silty in top few feet.
24	350	Sand, white, coarse-grained, heavy minerals, pyrite.
50	400	Clay, greenish-gray, silty, some pyrite.
20	420	Clay, light-gray, interbedded with sand.
34	454	Sand, gray, fine- to medium-grained, interbedded with gray clay.
10	464	Clay, very light-gray, silty.
34	498	Sand, gray, fine- to medium-grained, argillaceous, some pyrite.
		Vicksburg group (Bucatunna clay)
26	524	Clay, gray, silty, fossiliferous.
		Vicksburg group (Byram marl)
48	572	Marl, gray, argillaceous, fossiliferous, slightly sandy.
		Vicksburg group (Glendon limestone)
2	574	Limestone, gray, glauconitic, fossiliferous.
1	575	Marl, gray, fossiliferous, glauconitic, clayey.
2	577	Limestone, gray, glauconitic, fossiliferous.
5	582	Marl, gray, fossiliferous, glauconitic.
2	584	Limestone, gray, glauconitic, fossiliferous.
2	586	Marl, gray, glauconitic, fossiliferous.
2	588	Limestone, gray, glauconitic, fossiliferous.

AH-68

Location: In pasture, 200 feet north of barn. Approximately 2200 feet north and 700 feet east of southwest corner, Sec.19, T.10N., R.4E.

Elevation: 208 feet (topographic map) Date: March 4, 1966

Purpose: Drilled to 870 feet for stratigraphic information. Electrical log to 868 feet.

Thickness	Depth	Description
		Alluvium
10	10	Silt, tan to yellow, sandy.
11	21	Sand, coarse, gravel.
		Catahoula formation
39	60	Clay, gray-green, silty.
8	68	Silt, gray, sandy.
54	122	Clay, green, silty, sandy.
24	146	Sand, fine- to medium-grained, very silty.

9	155	Silt, gray, sandy.
129	284	Sand, fine- to coarse-grained, with thin streaks of silt.
12	296	Clay, gray-green, silty, sandy.
18	314	Sand, fine- to coarse-grained.
29	343	Clay, gray-green, silty.
19	362	Sand, fine- to coarse-grained.
38	400	Silt, gray, sandy, interbedded with sand.
10	410	Sand, fine- to coarse-grained.
38	448	Clay, gray-green, silty.
12	460	Silt, gray, sandy.
60	520	Sand, fine- to coarse-grained, thin beds of silt.
22	542	Silt, gray, sandy, micaceous.
24	566	Sand, fine- to coarse-grained, silty.
46	612	Clay, green, silty, pyritic.
88	700	Sand, fine- to very coarse-grained.
12	712	Silt, gray, sandy.
90	802	Sand, medium- to very coarse-grained, a few thin beds of silt.
8	810	Clay, green, silty, pyritic.
		Vicksburg group (Bucatunna clay)
6	816	Clay, gray, carbonaceous.
		Vicksburg group (Byram marl)
10	826	Marl, grayish green, fossiliferous.
		Vicksburg group (Glendon limestone)
2	828	Limestone, gray to white, fossiliferous, glauconitic.
6	834	Marl, gray-green, fossiliferous, glauconitic.
2	836	Limestone, gray to white, fossiliferous, glauconitic.
3	839	Marl, gray, fossiliferous, glauconitic.
1	840	Limestone, gray, fossiliferous, glauconitic.
10	850	Marl, green, fossiliferous, glauconitic.
2	852	Limestone, gray, fossiliferous, glauconitic.
18	870	Marl, green, fossiliferous, glauconitic.

AH-69

Location: In pasture south of Ferry Road, 100 yards south of stock pond. Approximately 5400 feet north and 800 feet east of southwest corner, Sec.33, T.11N., R.1E.

Elevation: 230 feet (topographic map) Date: March 10, 1966

Purpose: Drilled to 700 feet for stratigraphic information. Electrical log to total depth.

Thickness	Depth	Description
		Terrace deposit
20	20	Silt, tan; sand, medium- to very coarse-grained; clay nodules, light-gray, micaceous.
24	44	Sand, fine- to very coarse-grained, pyrite nodules; silt, tan, some gray silty sandstone.
		Loess
6	50	Silt, tan, calcareous, snail shell fragments.
22	72	Silt, tan.
8	80	Silt, gray, calcareous.
10	90	Silt, tan.
10	100	Silt, reddish tan.
16	116	Silt, reddish tan, some manganiferous material.
		Terrace deposit
24	140	Sand, white to orange, coarse- to pebble-size, quartz and chert; some tan silt and clay, micaceous.
32	172	Sand, white to orange, fine- to coarse-grained.

		Catahoula formation
26	198	Clay, gray-green, slightly silty.
16	214	Silt, gray, slightly sandy.
28	242	Sand, gray to white, medium- to coarse-grained, some indurated sandstone, slightly kaolinitic.
50	292	Silt, gray-green, clayey.
20	312	Clay, gray-green, silty.
38	350	Clay, gray-green, slightly silty.
38	388	Silt, gray, slightly sandy, some glauconite.
30	418	Clay, gray, slightly silty.
28	446	Clay, gray-green, micaceous, slightly sandy.
16	462	Silt, gray, sandy.
36	498	Clay, gray, micaceous, silty.
10	508	Sand, gray, fine- to medium-grained, silty.
10	518	Clay, gray-green, silty.
14	532	Silt, gray, sandy.
12	544	Clay, green, silty, micaceous.
14	558	Silt, gray, sandy.
14	572	Clay, gray-green, silty.
8	580	Sand, medium- to coarse-grained.
14	594	Sand, fine- to medium-grained, silty, pyritic.
54	648	Silt, sandy, nodules of gray clay.
		Vicksburg group (Bucatunna clay)
12	660	Clay, gray, fossiliferous, carbonaceous.
		Vicksburg group (Byram marl)
12	672	Marl, gray-green, glauconitic, fossiliferous.
		Vicksburg group (Glendon limestone)
2	674	Limestone, gray to white, glauconitic, fossiliferous.
3	677	Marl, gray, fossiliferous, glauconitic.
3	680	Limestone, gray, fossiliferous.
5	685	Marl, gray, fossiliferous, glauconitic.
1	686	Limestone, gray, glauconitic, fossiliferous.
4	690	Marl, gray, fossiliferous.
2	692	Limestone, gray, glauconitic, fossiliferous.
4	696	Marl, gray, fossiliferous, sandy.
1	697	Limestone, gray, fossiliferous, argillaceous.
3	700	Marl, gray, fossiliferous, glauconitic.

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SUBSURFACE STRATIGRAPHY OF CLAIBORNE COUNTY

THEO H. DINKINS, JR.

ABSTRACT

The stratigraphic column applicable to the subsurface of Claiborne County includes strata from the Hosston formation of Lower Cretaceous age to the Bucatunna formation of Oligocene age.

The formations and their contacts are discussed in general terms. The formations discussed in this report, with the exception of the Clayton formation, are based on rock unit subdivisions and should be regarded as such.

Although the search for oil and gas in Claiborne County has been disappointing, examination of cuttings and cores indicates that future exploration for oil and gas with more emphasis on possible stratigraphic traps may prove favorable.

STRATIGRAPHY

GENERAL STATEMENT

The stratigraphic column applicable to the Claiborne County subsurface follows the terminology now in use in Mississippi. This column, with the range of thickness of the units and their general lithologic descriptions, is shown by Plate 3, Dinkins. Because of the standard use of this terminology, no derivation of nomenclature of these units is given.

With the exception of the Selma-Clayton contact, the correlations in this report are based on rock-stratigraphic units. The units are defined on lithologic characteristics and supplemented with paleontological and electric log data. Correlations are constituted so that their boundaries are as sharp and distinct as possible, being drawn on practical mappable rock units. The units are distinguishable from adjacent formations by reasonably obvious gross lithologic characteristics. The stratigraphy and correlation points of the rock units in this report are generally applicable to the immediately adjacent areas.

Contact relationships discussed in this report are based on extensive examination of samples. The writer's conclusions on the nature of these formational contacts is, of necessity, based on the gross character of sediments on either side of the contacts. Quality of the samples, lack of cored sections at the formation contacts and the incomplete sampling techniques leaves much to be desired in any study of contact relationships. Until such time as the contact zones are cored, actual contact relationships will be subject to conjecture.

Due to lack of deep well data in Claiborne County, lithologic descriptions, correlations and contacts of formations from the Mooringsport to the Hosston are restricted to one well, the Pan American Petroleum Corporation No. 1 H. B. Campbell Estate in Sec.51, T.13N., R.3E. In this down-dip area, the Lower Glen Rose and Hosston formations are difficult to differentiate. Regional geologic aspects were taken into consideration in the placement of these formation contacts.

HOSSTON FORMATION

The oldest strata penetrated in Claiborne County, other than salt, is the Hosston formation of Lower Cretaceous age. Only one well, the Pan American Petroleum Corporation No. 1 H. B. Campbell Estate, penetrates the Hosston shale and sandstone sequence. At total depth, the No. 1 Campbell Estate penetrated 1800 feet of sediments of Hosston age.

The Hosston shales are predominantly silty and micaceous, red, dark and dull red and maroon. Minor amounts of black shale are also present, particularly in the upper Hosston. Subordinate amounts of light-gray, light greenish-gray and purple mudstones are present in the Hosston.

Hosston sandstones are white and red, generally micaceous, rarely lignitic and calcareous and are, for the most part, in the fine- to medium-grained range with intervals of coarse-grained sandstones. The red sandstones are predominantly very fine- to fine-grained.

The top of the Hosston is placed below the lowest shale and sandstone sequence of the Sligo formation. The character of the sandstones is the main criterion for differentiation of Hosston and Sligo sediments. The Hosston sandstones, as compared to those of the Sligo, are coarser-grained and more massive in character.

System	Series	Group	FORMATION	Thickness (feet)	GENERAL LITHOLOGY
TERTIARY	OLIGOCENE	VICKSBURG	Bucatunna formation	0–60	Gray and dark-gray, finely carbonaceous clay.
TERTIARY	OLIGOCENE	VICKSBURG	Byram formation	0–25	Grayish-green, sandy, fossiliferous marl.
TERTIARY	OLIGOCENE	VICKSBURG	Glendon formation	22–68	Pale-gray to cream-colored, fossiliferous and glauconitic limestones and marls.
TERTIARY	OLIGOCENE	VICKSBURG	Mint Spring formation	15–52	Grayish-green, fossiliferous and glauconitic sands and marls.
TERTIARY	OLIGOCENE		Forest Hill formation	90–165	Gray and light-gray, silty, micaceous, finely carbonaceous clays, sandstones and silts.
TERTIARY	EOCENE	JACKSON	Yazoo formation	410–500	Light bluish-gray and pale-gray, calcareous, fossiliferous clay.
TERTIARY	EOCENE	JACKSON	Moodys Branch formation	10–18	Greenish-gray, calcareous, fossiliferous, glauconitic clayey sand and marl.
TERTIARY	EOCENE	CLAIBORNE	Cockfield formation	550–685	Gray, silty, micaceous and carbonaceous clays. Silty, argillaceous and commonly lignitic sandstones. Reddish-brown clay ironstones.
TERTIARY	EOCENE	CLAIBORNE	Cook Mountain formation	165–270	Light-gray and gray, finely carbonaceous clay and clay shale. Pale-gray to white, impure, glauconitic chalk.
TERTIARY	EOCENE	CLAIBORNE	Kosciusko formation	915–1020	Gray and dark-gray, silty, occasionally sandy, commonly carbonaceous clay and clay shale. Light-gray argillaceous, micaceous, commonly lignitic and occasionally calcareous sandstones and siltstones. Rare glauconitic sandstone.
TERTIARY	EOCENE	CLAIBORNE	Zilpha formation	230–400	Gray clay shale.
TERTIARY	EOCENE	CLAIBORNE	Winona formation	90–170	Pale-gray to white, impure, glauconitic chalk and minor amounts of light-gray and greenish-gray clay shale.
TERTIARY	EOCENE	CLAIBORNE	Tallahatta formation	105–180	Pale-gray and light-gray, glauconitic, limy siltstone and minor amounts of light greenish-gray clay shale.
TERTIARY	EOCENE	WILCOX	Wilcox (undifferentiated)	3150–3310	Gray to black, carbonaceous, micaceous, silty shale. White to gray, argillaceous, carbonaceous, occasionally glauconitic and limy, rarely sideritic sandstone and siltstone. Thin seams of lignite and clay ironstone.
TERTIARY	PALEOCENE	MIDWAY	Midway Shale (Porters Creek formation)	985–1140	Dark-gray and black shale.
TERTIARY	PALEOCENE	MIDWAY	Clayton formation	50–90	Pale-gray and light-gray, impure chalk.
UPPER CRETACEOUS	GULF	SELMA	(Navarro age beds) (Taylor age beds) (Austin age beds)	720–895	Pale-gray and light-gray, impure, occasionally micaceous and glauconitic chalk. Black flakey and splintery shales and black micaceous and coarsely micaceous, calcareous and glauconitic shales. Thin seams of bentonite. Calcareous and chalky, glauconitic sandstone.
UPPER CRETACEOUS	GULF	EUTAW	Eagle Ford formation (Lower Eutaw)	235–300	Dark-gray and black, flakey and splintery, finely micaceous, silty, sparingly fossiliferous shale. Gray, argillaceous, calcareous, glauconitic sandstone and siltstones.
UPPER CRETACEOUS	GULF	TUSCALOOSA	Upper Tuscaloosa	485–630	Gray, dark-gray, black and red shales. Pale-gray, light-gray, light-green, red and purple mudstones. White, generally micaceous, silty and occasionally cherty sandstone.
UPPER CRETACEOUS	GULF	TUSCALOOSA	Middle Tuscaloosa	95–270	Dark-gray, black and red shales. Vari-colored mudstones. Subordinate amounts of pale-gray to white silty, limy, usually micaceous sandstones and siltstones.
UPPER CRETACEOUS	GULF	TUSCALOOSA	Lower Tuscaloosa	20–280	Gray, dark-gray, black, red and dark-red shales. Vari-colored mudstones. Pale-gray to green, conglomeritic, ashy sandstone. Vari-colored quartz and chert pebbles and chips.
LOWER CRETACEOUS	COMANCHE	WASHITA FREDERICKSBURG	Washita-Fredericksburg (undifferentiated)	1050–1490	Dark-red, maroon and black, finely micaceous and silty shales. Pale-gray, light-gray and gray fossiliferous and pseudo-oolitic, sparingly glauconitic limestones. White, usually micaceous and sparingly glauconitic and fossiliferous sandstone. Subordinate amounts of red sandstone.
LOWER CRETACEOUS	COMANCHE	TRINITY	Paluxy formation	1400–1530	Red, dark-red and maroon silty micaceous shales. Subordinate amounts of black shale and vari-colored mudstones. White and red sandstones.
LOWER CRETACEOUS	COMANCHE	TRINITY — UPPER GLEN ROSE Restricted	Mooringsport formation	900	Red, dark-red and maroon shales. Black, flakey and splintery shales and calcareous shales. Pale-gray, light-gray and gray, fossiliferous and pseudo-oolitic limestones. White and red sandstones.
LOWER CRETACEOUS	COMANCHE	TRINITY — UPPER GLEN ROSE Restricted	Ferry Lake formation	120	White anhydrite. Black shale and calcareous shale. Pale-gray, gray and dark-gray fossiliferous and pseudo-oolitic limestones.
LOWER CRETACEOUS	COMANCHE	TRINITY — LOWER GLEN ROSE Sub-group	Rodessa formation	760	Red and dark-red, finely micaceous shale. Black shale and occasionally calcareous and fossiliferous shale. Pale-gray, light-gray and gray, fossiliferous and pseudo-oolitic limestones. White, calcareous, micaceous and occasionally fossiliferous sandstone and subordinate amounts of red sandstone. White anhydrite.
LOWER CRETACEOUS	COMANCHE	TRINITY — LOWER GLEN ROSE Sub-group	Pine Island formation	286	Red and dark-red, silty, finely micaceous shales. Black shales and calcareous and fossiliferous shales. Minor amounts of light-gray mudstone. White, rarely fossiliferous sandstone and red sandstones. Light-gray and gray, fossiliferous limestones.
LOWER CRETACEOUS	COMANCHE	TRINITY — LOWER GLEN ROSE Sub-group	Sligo formation	254	Dark-red, silty, micaceous shales. Black shales and calcareous and fossiliferous shales. White, rarely fossiliferous sandstones and red sandstones. Light-gray and gray, fossiliferous limestone. Nodular limestone.
LOWER CRETACEOUS	COAHUILA		Hosston formation	1800+	Red, dark-red and maroon silty, micaceous shales. Minor amounts of black shale and vari-colored mudstones. Red and white sandstones and subordinate siltstone. Nodular limestone.

Stratigraphic column of subsurface of Claiborne County.

The contact of the Hosston with the overlying Sligo formation appears to be transitional. Essentially contemporaneous deposition in the transition zone is suggested and would seem to be indicated by similar lithology on either side of the Hosston-Sligo contact.

SLIGO FORMATION

The Sligo includes all beds between the top of the Hosston and the base of the overlying Pine Island formation.

The upper part of the Sligo is essentially a "red bed" section of dark-red silty and micaceous shales. It contains inclusions of red nodular limestone and a lower clastic section of white fine-grained micaceous sandstones with subordinate amounts of red and black shales.

The middle portion consists primarily of white fine-grained micaceous sandstones with minor amounts of dark-red and black shales and a few thin light-gray dense to chalky fossiliferous limestones.

The lower part of the Sligo is a sequence of dark-red and black shales and white and red, very fine- and fine-grained micaceous sandstones. The sandstones are rarely fossiliferous. Rare thin light-gray and gray fossiliferous limestones are also present.

On the basis of core evidence, the Sligo-Pine Island contact appears to be conformable. The upper "red bed" section of the Sligo grades into the basal black calcareous and fossiliferous shales of the Pine Island with no apparent break in sedimentation. This change in color from red to black is regarded as being related to a change from oxidizing to reducing conditions during deposition.

PINE ISLAND FORMATION

The Pine Island formation, in the Claiborne County subsurface, is a 286 foot shale, limestone and sandstone sequence between the top of the Sligo and the base of the overlying Rodessa formation. The Pine Island-Rodessa contact is probably transitional. The nature of the sediments indicates essentially contemporaneous deposition in a shallow near-shore to marine environment.

The top of the Pine Island is picked on the presence of black, flakey and splintery shales, subordinate amounts of light-gray mudstone and very fine- and fine-grained sandstones stratigraphically below fine- and medium-grained sandstones of the basal Rodessa formation.

The above sequence, representing the upper 40 feet of the Pine Island, is followed by a succession of alternating shales, limestones and sandstones.

The shales are red, dark-red and black and usually finely micaceous and silty. Some of the black shales, especially in the basal Pine Island, are limy and fossiliferous.

The limestones are light-gray to gray, dense to chalky in appearance and fossiliferous. The first few feet of the upper limestone sequence is characterized by what appears to be partially oxidized fossils. In appearance, this oxidation is similar to selective replacement. The ochre color of the oxidized fossils is distinct in its contrast to the light-gray and gray color of the limestones.

The sands of the Pine Island are in a finer-grained range than the sands of the underlying Sligo or the overlying Rodessa. The sands and siltstones are predominantly white, very fine- and fine-grained and rarely fossiliferous. Rare red sandstones appear in the basal part of the formation. The sandstones and siltstones are non-calcareous to limy and usually micaceous.

RODESSA FORMATION

The top of the Rodessa formation is placed below the lowest massive anhydrite of the Ferry Lake formation. The contact is sharp but conformable.

The Rodessa consists of an alternating and intercalated sequence of shale, limestone and sandstone with a 30 foot stringer of white anhydrite. The Rodessa in the Pan Am No. 1 Campbell Estate is 760 feet thick.

The Rodessa shales are red, dark-red and black and usually finely micaceous. The black shales are occasionally calcareous and fossiliferous. The limestones range in color from pale-gray to gray and are dense to chalky, fossiliferous and pseudo-oolitic or spherulitic. The sandstones are predominantly white, very fine-, fine- and medium-grained, calcareous, usually micaceous and occasionally fossiliferous. Minor amounts of red very fine- and fine-grained sandstones are present in the Rodessa.

The upper part of the Rodessa consists of fossiliferous and pseudo-oolitic limestones and a stringer of white anhydrite in the upper portion. The lower portion is a sequence of interbedded red and black shales, fossiliferous and pseudo-oolitic limestones and minor amounts of very fine- and fine-grained sandstones.

The middle part of the Rodessa is made up of associated red and black shales and pale-gray to gray fossiliferous limestones in the upper part. Fine- and medium-grained sandstones and fossiliferous limestones predominate in the lower portion.

The lower part of the Rodessa is a sequence of interbedded red and black shales, very fine- to medium-grained sandstones and fossiliferous and pseudo-oolitic limestones.

FERRY LAKE FORMATION

The Ferry Lake anhydrite is a key marker in wells penetrating this formation. Its distinct lithology is readily recognizable in cuttings. One hundred and twenty feet of Ferry Lake has been penetrated in northeast Claiborne County.

The top of the Ferry Lake anhydrite is placed at the conformable contact between the white massive anhydrite with the overlying basal Mooringsport limestones.

The Ferry Lake formation consists of a sequence of white massively bedded anhydrite with associated black shales and pale-gray, gray and dark-gray fossiliferous and pseudo-oolitic or spherulitic limestones.

MOORINGSPORT FORMATION

The transitional contact of the Mooringsport formation with the overlying Paluxy formation is picked on a general decrease in grain size and amount of sandstone in the samples. There is also a corresponding increase in amount of black flakey and splintery shales and red, dark-red and maroon shales. The Pan

Am Petroleum Corporation No. 1 H. B. Campbell Estate penetrated 900 feet of Mooringsport sediments.

The upper part of the Mooringsport is a sequence of red, dark-red and maroon shales and black flakey and splintery shales with subordinate amounts of predominantly white very fine- and fine-grained sandstones. Minor amounts of red very fine- and fine-grained sandstones and rare white medium-grained sandstone are also present.

The lithology of the lower half of the Mooringsport is similar to the above sequence with some interbedded pale-gray, light-gray and gray fossiliferous and pseudo-oolitic or spherulitic limestones. The basal beds of the formation are predominantly limestone with subordinate red and black shales.

PALUXY FORMATION

Only two wells, the Pan American Petroleum Corporation No. 1 H. B. Campbell Estate in Sec.51, T.13N., R.3E., and the Amerada Petroleum Corporation No. 1 Florine Disharoon in Sec.12, T.11N., R.3E., pentrate the entire thickness of the Paluxy formation in Claiborne County. The Paluxy is 1400 feet thick in the No. 1 H. B. Campbell Estate. The Paluxy thickens to the south. The No. 1 Florine Disharoon pentrated 1530 feet of Paluxy.

The contact of the Paluxy with sediments of the overlying Washita-Fredericksburg group appears to be transitional. The top of the Paluxy is placed at the base of a section containing predominantly dark-red, maroon and black shales with subordinate amounts of fine-grained sandstones. The Paluxy sands are, for the most part, coarser and more massive in character than those of the overlying Washita-Fredericksburg group. The top of Paluxy in Mississippi is generally picked at a lower horizon than in Louisiana. The top of Paluxy in Louisiana is generally picked on the first sandstone sequence below the last Washita-Fredericksburg limestone.

The lithology of the Paluxy is consistent, being a sequence of shales and sandstones with minor amounts of mudstone.

The shales are predominantly red, dark-red and maroon and are usually micaceous. Subordinate amounts of black shale are present in the basal Paluxy section. Minor amounts of pale-gray, light-gray and purple mudstones are present throughout the formation.

The white, light-red and red micaceous sandstones of the Paluxy range in grain-size from very fine- to coarse-grained. Abundant red sandstones are present. The Paluxy contains more red sandstones than either the overlying Washita-Fredericksburg group or the underlying Mooringsport formation. Minor amounts of small quartz pebbles are present in the Paluxy, generally, in the upper half.

WASHITA-FREDERICKSBURG GROUP

Five wells, located on prominent structural features, (Plate 1, Dinkins) penetrate the entire thickness of the Washita-Fredericksburg sediments in Claiborne County.

The Washita-Fredericksburg group is an undifferentiated sequence of shales, thin limestones and sandstones ranging in thickness from 1050 to 1490 feet, thickening to the south. The shales are dark-red and maroon, silty and finely micaceous and black, flakey and splintery. The limestones are pale-gray, light-gray and gray, dense to chalky, fossiliferous, rarely pseudo-oolitic or spherulitic and sparingly glauconitic. A thin zone of partially oxidized fossils, similar to the zone present in the Pine Island formation, is present in the upper Washita-Fredericksburg section. Minor amounts of red very fine- and fine-grained sandstones may be present in the Washita-Fredericksburg, usually in the lower half of the section.

The lithology of the Washita-Fredericksburg group is consistent throughout Claiborne County, although the lithologic top of the Lower Cretaceous may be a gray limy fossiliferous shale, a dark-red or maroon silty micaceous shale, a fossiliferous limestone or a sandstone. This variety of lithologic tops is due to the erosional surface of the Washita-Fredericksburg.

The top of the Lower Cretaceous is placed at the unconformable contact of eroded shales, limestones or sandstones of Washita-Fredericksburg age with the basal ashy conglomeritic sands of the overlying Tuscaloosa group. The contact is usually easily distinguishable in cuttings.

TUSCALOOSA GROUP

GENERAL

In the subsurface of Claiborne County, the Tuscaloosa group is divided into Upper Tuscaloosa, Middle Tuscaloosa and Lower Tuscaloosa. The Tuscaloosa group, in general, thickens to the south and southeast.

LOWER TUSCALOOSA

The Lower Tuscaloosa, in Claiborne County, is a transgressive sequence of ashy, chloritic and rarely glauconitic sandstones, conglomeritic sandstones and vari-colored mudstones and shales.

In most of the County, the top of the Lower Tuscaloosa is picked on the appearance, in cuttings, of medium- to coarse-grained ashy, chloritic sandstones stratigraphically below the very fine- and fine-grained sandstones and vari-colored shales and mudstones of the Middle Tuscaloosa. In the southern part of the County the uppermost portion of the Lower Tuscaloosa generally contains some white very fine- and fine-grained glauconitic sandstones which may be associated with a few thin lentils of pale-gray and light-tan "shelly" limestone. Distinctive electrical characteristics of the Lower Tuscaloosa usually facilitate electrical log determinations of this formation top.

The Lower Tuscaloosa consists of a 20 to 280 foot sequence of shales, mudstones and sandstones. The shales are gray, dark-gray, black, red and dark-red. The red and dark-red shales are frequently finely micaceous. The vari-colored, light-gray, pale-gray, light-green, light-red, purple and ochre, mudstones may be slightly sandy and are commonly mottled. The light-gray mudstones may contain siderite concretions. The fine- to coarse-grained conglomeritic, ashy sandstones are pale-gray, light-gray, light-green, green and white. They commonly contain inclusions of shale, mudstone, lignitic material, mica, quartz pebbles and vari-colored chert grains, pebbles and chips. Some of the upper sandstones are sparingly fossiliferous and glauconitic. Most of the Lower Tuscaloosa sands are usually quite chloritic or contain scattered inclusions of chlorite. The finely divided chlorite in the sandstones produces the various shades of green which are indigenous to the basal Tuscaloosa sands in Claiborne County and surrounding areas. The abundance of volcanic ash present in these basal Tuscaloosa sandstones must have been derived from the volcanic Sharkey-Monroe uplift area to the north.

Some wells in the southern part of the County contain a few thin pale-gray and light-tan argillaceous "shelly" limestone lentils at the top or directly above the top of the Lower Tuscaloosa.

Where the thickness of the Lower Tuscaloosa exceeds 110 feet, an ashy, conglomeritic, usually porous and permeable basal sandstone with incorporated vari-colored chert and quartz pebbles and chips is present above the eroded Washita-Fredericksburg sediments. These basal Tuscaloosa sediments are correlative with the Buckhorn Sand of Spooner[1] in Tensas Parish, Louisiana. Where present, this basal sand forms a fairly continuous reservoir, and stratigraphic traps, if present, may contain commercial reserves of hydrocarbons.

The lenticular upper Lower Tuscaloosa sands are typically less porous and permeable than the basal sands and they are generally non-conglomeritic.

The variable thickness, 20 to 280 feet, of the Lower Tuscaloosa is directly influenced by the eroded surface of the Lower Cretaceous beds upon which it was deposited. The thicker sections of Lower Tuscaloosa sediments were deposited in those areas which were topographically lowest on the pre-Tuscaloosa erosional surface.

Structural movements before and after deposition of the Lower Tuscaloosa are reflected in comparison of the Lower Tuscaloosa isopach map (Plate 2, Dinkins) and the structure map on the top of the Lower Cretaceous (Plate 1, Dinkins). Examples of such structural movements are exhibited by a comparison of the basal Tuscaloosa sections in the Sun Oil Company No. 1 Parker Brothers in Sec.27, T.13N., R.2E., and the Pan American Petroleum Corporation No. 1 H. B. Campbell Estate in Sec.51, T.13N., R.3E. The structure map on top of the Lower Cretaceous shows a difference of 329 feet between the two wells; the No. 1 Campbell Estate being topographically higher (Plate 2, Dinkins). The Lower Tuscaloosa isopach map, however, indicates that during deposition of Lower Tuscaloosa sediments the area around the No. 1 Parker Brothers was topographically high (Plate 2, Dinkins). This is shown by the thinner Lower Tuscaloosa interval. Conversely, the area around the No. 1 Campbell Estate was topographically low as indicated by a thicker Lower Tuscaloosa interval (Plate 2, Dinkins). The Lower Tuscaloosa interval penetrated in the No. 1 Campbell Estate was probably a channel or valley fill deposit. This is indicated by the thicker section measured on electric logs and a concentration of coarser materials in the samples from the Pan American well. Subsequent uplift in the area of the No. 1 Campbell Estate and downwarping in the area of the No. 1 Parker Brothers is primarily responsible for the difference in sub-sea elevation of the top of Lower Cretaceous in these two wells.

MIDDLE TUSCALOOSA FORMATION

The Middle Tuscaloosa is composed of 95 to 270 feet of shales, mudstones and minor amounts of very fine- to fine-grained sandstones and siltstones.

The shales and mudstones are similar to those of the underlying Lower Tuscaloosa. The sandstones and siltstones are pale-gray to white, very fine- to fine-grained, silty to limy, rarely ashy, usually micaceous and sparingly glauconitic. Rare thin argillaceous and "shelly" limestone lentils may be present in the basal part of the Middle Tuscaloosa in southern Claiborne County.

The top of the Middle Tuscaloosa is picked on an increase of shales and mudstones below basal porous and occasionally cherty, Upper Tuscaloosa sandstones. Black flakey and splintery shales and gray splintery mudstones usually are present at or near the top of the Middle Tuscaloosa in wells examined. The associated sandstones and siltstones of the Middle Tuscaloosa are in a finer grained range than those of the overlying Upper Tuscaloosa.

The Middle Tuscaloosa thickens generally to the south and southeast. Regionally, the Middle Tuscaloosa expands at the expense of the Upper Tuscaloosa. The contact of the Middle Tuscaloosa with the Upper Tuscaloosa appears to be transitional.

UPPER TUSCALOOSA FORMATION

The Upper Tuscaloosa sediments consist of a 485 to 630 foot sequence of interbedded shales, mudstones and sandstones.

The shales are occasionally micaceous and are, for the most part, various shades of red, but beds of dark-gray, gray and black shale are also present. The mudstones are usually light-gray, pale-gray, and light-green with some shades of red and purple also present. Siderite concretions are associated with the light-gray, pale-gray and light-green mudstones. The sandstones are usually white, very fine- to medium-grained, rarely sideritic and occasionally contain vari-colored chert grains. Some of the sands are variably silty and micaceous and rarely ashy.

The top of the Tuscaloosa group is placed at the first appearance, in cuttings, of light-gray and pale-gray mudstones below the glauconitic Eutaw sandstones. Small brown siderite concretions are generally present as inclusions in these mudstones.

Sample work is the only accurate method of determining the contact between the Tuscaloosa and the overlying Eutaw, as no reliable electric log correlations exist. The Tuscaloosa-Eagle Ford (Lower Eutaw) contact is conformable. The dark shales in the topmost Tuscaloosa beds are indistinguishable from those of the overlying Eagle Ford.

The Upper Tuscaloosa thickens to the south and southeast toward the axis of the Mississippi Embayment. Regional thinning of the Upper Tuscaloosa at the expense of the Middle Tuscaloosa is not generally evident throughout Claiborne County.

EUTAW

GENERAL

Forgotson[2] applied the term Rapides shale to the interval in central Louisiana between the base of the Ector chalk and the top of the uppermost Tuscaloosa sands. Spooner[3] assigns this term to the same stratigraphic interval in Tensas Parish, Louisiana. In this report, the writer favors the term Eagle Ford for those sediments between the base of the Ector chalk and the top of the Tuscaloosa.

In the subsurface of central and eastern Mississippi, the Eutaw consists of interbedded glauconitic sandstones and dark-gray and black micaceous shales. That facies of the Eutaw in Claiborne County which is represented by a chalk section is included in the overlying Selma group.

EAGLE FORD (LOWER EUTAW)

Where beds of Upper Eutaw age are represented by a chalk facies, the chalk and the underlying Eagle Ford (Lower Eutaw) shales, sandstones and siltstones are separable. Cores from Claiborne County wells indicate that the Eagle Ford is essentially an interbedded shale, sandstone and siltstone sequence 235 to 300 feet thick. The Eagle Ford thickens generally to the southeast.

Top of the Eagle Ford is placed at the first interbedded sequence of dark-gray micaceous shales and very fine-grained glauconitic sandstones and siltstones stratigraphically below the basal Selma chalk.

Eagle Ford shales are dark-gray and black flakey and splintery, finely micaceous, silty, occasionally sandy and sparingly fossiliferous. Some of the shales are minutely laminated with very fine-grained sandstones and siltstones.

The sandstones and associated siltstones are various shades of gray, very slightly to non-porous, glauconitic, argillaceous, micaceous and commonly calcareous. The sandstones are generally in the very fine- to fine-grained range. Basal Eagle Ford sandstones are fine- and medium-grained, generally porous, micaceous, occasionally ashy and chloritic and fossiliferous.

SELMA GROUP

In this report, the Selma group includes the entire Upper Cretaceous "chalk" section. This 720 to 895 foot section includes beds of Navarro, Taylor and Austin age.

The Selma group is divisible into three distinct lithologic units — an upper chalk and shale section; a middle "micaceous shale" section and a lower chalk and shale section. The Selma is not divided into formations in this report, and no attempt is made to differentiate restricted paleontologic zones. These lithologic units, as set forth in this report, have approximate standard time correlations.

During Selma time, influx of sediments from the Sharkey-Monroe uplift area, resulted in the deposition of a sequence of argillaceous, glauconitic and bentonitic chalks; calcareous, micaceous, glauconitic, occasionally sandy and rarely bentonitic shales;

thin calcareous, chalky and glauconitic sands and thin beds of bentonite.

The upper lithologic division of the Selma group consists of interbedded light-gray and pale-gray to white argillaceous, bentonitic and rarely glauconitic chalks and dark-gray and black flakey and splintery shales. Rare pale-gray bentonite is occasionally observed in samples.

The middle division of the Selma group is a distinctive sequence of dark-gray and black coarsely micaceous, usually glauconitic and occasionally sandy shales. This sequence contains minor amounts of light-gray very fine- and fine-grained calcareous and limy glauconitic sandstone. A few thin beds of light-gray and gray argillaceous and occasionally micaceous chalk may be present in this section.

The lower division of the Selma group is essentially a chalk and shale sequence containing thin beds of very fine- and fine-grained, calcareous and chalky glauconitic sandstone. Similarity of these sandstones to those of the underlying Eagle Ford sandstones may make lithologic determination of the base of the Selma group difficult.

The chalks are pale-gray, light-gray and gray, argillaceous, occasionally micaceous and glauconitic and contain varying amounts of volcanic ash. The dark-gray and black shales are finely micaceous, variably calcareous and sandy and generally glauconitic. The sandstones are light-gray and gray, very fine- and fine-grained, calcareous, chalky and glauconitic. The Jett Drilling Company No. 1 Alex Wilson in Sec.15, T.10N., R.1W., contains a rather prominent bed of pale-gray bentonite and bentonitic chalk at the top of this lower chalk section.

The Selma group thins to the northwest at the expense of the upper lithologic division. This thinning complements the northwest expansion of the "micaceous shale" unit.

The top of the Selma group (top of Cretaceous) may be readily differentiated by electrical log characteristics. Paleontological evidence substantiates this electrical correlation. The chief micro-faunal marker for chalks of the Upper Selma group is *Globotruncana arca.*

Though the upper part of the Selma group and the overlying Clayton formation (basal Paleocene) are lithologically similar, paleontologic evidence indicates that this contact is unconformable.

MIDWAY GROUP

CLAYTON FORMATION

The Clayton formation consists of 50 to 90 feet of light-gray and pale-gray impure, occasionally bentonitic, chalk. The average thickness of the Clayton is 74 feet being generally thicker in the southwestern part of the County. Variations in thickness are due, in part, to the unconformable Selma-Clayton contact.

MIDWAY SHALE (PORTERS CREEK FORMATION)

Conformably overlying the Clayton formation is a homogeneous lithic unit comprised of dark-gray and black shales, herein referred to as the Midway shale. As defined, this shale is probably all Porters Creek in age, although some beds of Naheola age may be present.

The Paleocene-Eocene boundary has not been satisfactorily established in the subsurface of Mississippi. The Midway-Wilcox contact is usually chosen arbitrarily on electric logs at the base of the lowest sandstone sequence of the Wilcox group. Sample examination indicates a facies invasion of the basal Wilcox by the Midway shale. This indicates that the Midway-Wilcox contact in Claiborne County is transitional, at least in part. The Midway shale thickens in a general southeasterly direction. It ranges in thickness from 985 to 1140 feet throughout the County.

WILCOX GROUP

Lithologically, the Wilcox group is a heterogenous mass of complexly interbedded, interfingering and interlensing shales, sandstones, siltstones, thin lignites and clayironstones 3150 to 3310 feet in thickness. The Wilcox sediments thicken in a general southeasterly direction throughout the County.

The Wilcox shales are gray, dark-gray and black carbonaceous and generally micaceous and silty. The sandstones are white, light-gray and gray and predominantly in the fine- and medium-grained range with subordinate amounts of very fine-grained sandstones and siltstones. The sandstones range from argillaceous to limy, are usually lignitic or carbonaceous, occasionally glauconitic and rarely sideritic. Some of the sandstones contain occasional grains of chert and clayironstone. Rare thin zones containing shell fragments may be present. Lignite is found disseminated throughout the sandstones and shales and in thin seams. The clayironstones are brown and reddish-brown and occasionally contain sand grains and glauconite.

The Wilcox group is treated as a rock unit and, as such, includes some strata which may well be a facies of late Midway deposition. No subsurface zonation or correlation is attempted. Subsurface correlations of the Wilcox are based on the numerous sand bodies, lignite seams and shale breaks which are locally reliable.

The top of the Wilcox group is placed at the contact of calcareous glauconitic sometimes carbonaceous or lignitic sandstones of the uppermost Wilcox with the overlying limy siltstones of the Tallahatta formation. The contact zone, in wells examined, appears to be one of apparent transition.

MIDDLE AND UPPER EOCENE

CLAIBORNE GROUP AND JACKSON GROUP

GENERAL

Regionally, Claiborne County was part of a depocenter during Middle and Upper Eocene time. The Claiborne and Jackson groups thicken generally from south to north within the County. The thickness and general trend of individual formations within these groups vary and will be discussed in the sections on each formation. Depositional patterns of these formations conform to the structural configuration presented on the Lower Cretaceous structure map (Plate 1, Dinkins).

CLAIBORNE GROUP

TALLAHATTA FORMATION

The Tallahatta formation (basal Claiborne) consists of 105 to 180 feet of pale-gray and light-gray glauconitic limy siltstones with subordinate amounts of light greenish-gray clay shale. The Tallahatta thickens generally from south to north within the County.

WINONA FORMATION

Overlying the Tallahatta formation with apparent conformity and subjacent to the Zilpha formation is the Winona formation. The Winona is made up of 90 to 170 feet of pale-gray to white, impure glauconitic chalks and minor amounts of light-gray and greenish-gray clay shale. The basal Winona chalks generally are sparingly silty at the contact with the underlying Tallahatta. The Winona thickens from south to north.

ZILPHA FORMATION

The Zilpha formation, consisting of 230 to 400 feet of gray clay shales, conformably overlies the Winona formation. The basal Zilpha is glauconitic and slightly calcareous at the Winona-Zilpha contact. The upper Zilpha is variably sandy, representing a facies invasion of the overlying Kosciusko formation. The presence in cuttings of *Cyclammina caneriverensis* in what appears on electric logs to be a basal Kosciusko sand indicates that the Zilpha-Kosciusko contact is transitional. The Zilpha thickens generally from south to north, however, the thickest Zilpha section encountered is in the Jett Drilling Company No. 1 Alex Wilson in Sec.15, T.11N., R.1W., in the southwest corner of the County. The No. 1 Wilson penetrated 400 feet of Zilpha. The Zilpha expands at the expense of the overlying Kosciusko formation.

KOSCIUSKO FORMATION

Overlying the Zilpha is a 915 to 1020 foot sequence of clays, clay shales, sandstones, siltstones, thin lignites, clayironstones and silty limestones. This sequence of beds is known as the Sparta formation to many geologists. The term Kosciusko formation is used by the Mississippi Geological Survey.

The clays and clay shales are gray and dark-gray, usually silty, occasionally sandy and commonly lignitic or carbonaceous.

The sandstones and siltstones are usually light-gray and argillaceous, occasionally calcareous, micaceous and lignitic or carbonaceous and only rarely do the sands contain scattered glauconite. The grain sizes of the sandstones range from fine to coarse. Some of the siltstones are light-brown in color, calcareous and limy, micaceous and lignitic.

The clayironstones are usually reddish-brown or brown in color, occasionally sandy and glauconitic. The limestones are usually brown or tan in color and are variably silty and sandy.

The average thickness of the Kosciusko is greater in the southern part of Claiborne County. This general north-south thickening of the Kosciusko complements the general northward thickening of the Zilpha.

COOK MOUNTAIN FORMATION

The 165 to 270 foot clay and chalk sequence of the Cook Mountain formation unconformably overlies the Kosciusko formation.

The upper part of the Cook Mountain is light-gray and gray finely carbonaceous clays and clay shales. At the contact of the Cook Mountain with the overlying Cockfield formation, the clays and clay shales are generally sandy. Lithology of the contact zone between the Cook Mountain and the overlying Cockfield formation suggests that the contact is transitional, at least in part.

The lower part of the Cook Mountain consists of pale-gray to white impure, silty, glauconitic, fossiliferous chalk with minor amounts of gray and light-gray shales. The basal Cook Mountain sediments contain some sand and rare fragments of lignite reworked from the underlying Kosciusko formation.

The Cook Mountain formation thickens to the southeast. The lower part of the Cook Mountain, the chalk section, maintains a fairly constant thickness throughout the County. The upper clay and clay shale section thickens down-dip at the expense of the Cockfield.

COCKFIELD FORMATION

The Cockfield formation consists of a 550 to 685 foot sequence of clays, sandstones and siltstones and thin beds of lignite and clayironstone. The Cockfield thickens in a northwestward direction, complementing the northwestward thinning of the underlying Cook Mountain.

The contact between the Cockfield and the overlying Moodys Branch appears to be unconformable. The contact is marked by a sharp change from the lignitic clays, silts and sandstones of the Cockfield to the limy fossiliferous sands and marls of the Moodys Branch.

JACKSON GROUP

MOODYS BRANCH FORMATION

The thickness of the Moodys Branch formation is fairly constant in Claiborne County, averaging 15 feet. The thickness varies from 10 to 18 feet within the County.

The Moodys Branch consists of greenish-gray calcareous, fossiliferous, glauconitic, clayey sands and pale-gray, fossiliferous, sandy, glauconitic marls.

The contact of the Moodys Branch with the overlying Yazoo formation appears conformable. The contact zone is gradational and the top of the Moodys Branch is arbitrarily placed at the point where the lithology of the sediments becomes predominantly sand.

YAZOO FORMATION

The Yazoo formation is a homogeneous unit consisting of 410 to 500 feet of light bluish-gray and pale-gray calcareous fossiliferous clay. The formation thickens from south to north within the County.

The Yazoo is very limy and usually quite glauconitic. It is somewhat sandy at its contact with the underlying Moodys Branch. Thin soft white and cream-colored chalky and glauconitic limestone beds may be present in the basal Yazoo.

At the contact with the Forest Hill, the Yazoo clay is variably silty. The Yazoo-Forest Hill contact is generally unconformable. The contact between the light bluish-gray calcareous clays of the Yazoo and the gray finely micaceous and carbonaceous clays and sands of the overlying Forest Hill is generally sharp.

FOREST HILL FORMATION

In the past, various authors have considered the Forest Hill to be Eocene in age, however, it is now generally accepted to be Oligocene in age. The writer concurs with this generally accepted view and places the Forest Hill in the Oligocene as a formation.

The Forest Hill consists of 90 to 165 feet of gray silty, micaceous, finely carbonaceous clays and lenticular light-gray and gray, generally angular very fine- to medium-grained clayey and occasionally lignitic or carbonaceous sandstones and siltstones. This variation in thickness is due in part to an apparent expansion of the Forest Hill at the expense of the underlying Yazoo formation, being thickest generally in the southern part of the County.

The top of the Forest Hill is placed at the contact between the carbonaceous deltaic sands and clays of the Forest Hill and fossiliferous sands and marls of the Mint Spring. The Forest Hill-Mint Spring contact is regarded as being generally unconformable and is usually easily recognized in cuttings. Monsour[4] stated that in Warren County, both in cores and cuttings, the contact appears to be one of gradation. No cores were available of the Forest Hill-Mint Spring contact in Claiborne County and the actual contact in core samples may be difficult to pick.

VICKSBURG GROUP

GENERAL

Classification of the Vicksburg group as a rock-stratigraphic unit includes in ascending order the Mint Spring formation, the Glendon formation, the Byram formation and the Bucatunna formation. This classification is applied to stratigraphic units which are divisible into formations both electrically and lithologically throughout Claiborne County and the surrounding area.

Mellen[5] and Moore[6] noted that the Glendon limestones develop locally at the expense of the associated marls of the Vicksburg group. They also noted that neither the top nor the base of the Glendon is marked by a single constant bed of limestone.

Both the underlying Mint Spring marls and the overlying Byram marls are similar lithologically to the alternating marls separating the limestone beds of the Glendon. This intimate lithologic relationship necessitates arbitrary placement of formation contacts between the Glendon formation, the subjacent Mint Spring formation and the overlying Byram formation.

The thickness of the Vicksburg group is variable throughout the County, being affected only moderately by structure. Where all four of the formations of the Vicksburg group are present the Vicksburg varies from 70 to 100 feet in thickness. This variation in thickness is partially due to the unconformable Forest Hill-Byram contact.

MINT SPRING FORMATION

The Mint Spring formation consists of grayish-green fine- to medium-grained, well rounded, highly fossiliferous, glauconitic sandstones and grayish-green fossiliferous, glauconitic, variably sandy marls. Locally, phosphatic fossil material is present in the basal Mint Spring. The average thickness of the Mint Spring is 27 feet, although as little as 15 feet and as much as 52 feet was noted. This variation in thickness is due partially to the unconformable surface upon which it was deposited.

The base of the Mint Spring is placed at the unconformable contact between the fossiliferous sands and marls of the Mint Spring and the deltaic, carbonaceous and micaceous sands, silts and clays of the underlying Forest Hill.

The top of the Mint Spring is placed at the base of the lowest indurated limestone bed of the overlying Glendon. This contact appears to be conformable. As mentioned previously, the intimate lithologic relationship of the Mint Spring to the marls of the Glendon, as well as, the lack of a continuous basal limestone bed necessitates an arbitrary placement of formation contacts within the Vicksburg group.

GLENDON FORMATION

The Glendon formation is made up of an alternating sequence of limestones and marls. The limestones are pale-gray to cream-colored, dense to chalky, quite fossiliferous, glauconitic and sparingly sandy. Scattered pinpoint porosity was noted in some of these limestones. The marls are grayish-green, fossiliferous, glauconitic and variably sandy.

The Glendon has an average thickness of 51 feet but varies from 22 to 68 feet. This variable thickness of the Glendon is due in part to the fact that the Glendon limestones apparently expand at the expense of the associated marls within the Glendon formation. Some of the thinning is due to the locally unconformable contact of the Glendon with the Catahoula formation.

The top of the restricted Glendon is placed at the top of the upper-most indurated limestone ledge. The contact of the Glendon with the overlying marls of the Byram formation is normally conformable, although locally both the Byram and the overlying Bucatunna may be eroded. Generally, the locally unconformable Glendon-Catahoula contacts are located in areas which were structurally high at the end of Vicksburg time. Not all wells with unconformable Glendon-Catahoula contacts are located on prominent structural features. In a dip-section (Plate 2, Bicker) unconformable Glendon-Catahoula contacts are shown which undoubtedly represent channel fills of old drainage systems.

BYRAM FORMATION

The Byram formation consists of grayish-green fossiliferous, glauconitic marl, the basal part of which is generally sandy.

The Byram has an average thickness of 13 feet, varying from 0 to 25 feet in thickness. The variations in thickness are due to an expansion of the underlying Glendon, but may be due partially to erosion where unconformable Byram-Catahoula contacts are noted.

The top of the Byram formation is placed at the normally conformable contact between the grayish-green marl of the Byram and the dark-gray finely carbonaceous clays of the Bucatunna formation.

BUCATUNNA FORMATION

The Bucatunna formation is a homogeneous unit consisting of gray and dark-gray finely carbonaceous, slightly silty clay. The Bucatunna averages 39 feet in thickness, but varies from 0 to 60 feet. This variation in thickness is due, in part, to the unconformable contact between the Bucatunna and sands of the overlying Catahoula formation. A thin lense of phosphatic fossils was noted at the Bucatunna-Catahoula contact in the Sohio No. 1 Mackey in Sec.4, T.10N., R.3E., in the southern part of the County.

OIL AND GAS POSSIBILITIES

The search for oil and gas in Claiborne County has been disappointing, with only rare questionable shows of oil and gas being reported. The only established production is gas at Bruinsburg Field in the southwest part of the County. This production is from the Cockfield and this formation should continue to be an objective in any future drilling program.

Examination of cuttings and cores indicates that the Lower Tuscaloosa is the most promising objective for future exploration for oil and gas in Claiborne County. Oil and gas are produced from the Lower Tuscaloosa to the south in Jefferson County, Mississippi and to the west in Tensas Parish, Louisiana.

In the exploration for oil and gas, in the past, the primary objectives have been based on structural prospects with less emphasis on stratigraphic possibilities, especially to the possibilities existing in the Lower Tuscaloosa. The depositional history of these sediments presents conditions favorable for the generation, migration and trapping of hydrocarbons. The Lower Tuscaloosa contains many feet of porous and permeable sands. It also contains some discreet beds of shale which may function as seals to form stratigraphic traps into which hydrocarbons may migrate.

Claiborne County is generally considered to be north of the most favorable area for oil and gas production from the Wilcox, however, shows of oil were reported in Hinds County in Wilcox sands at the Brownsville Dome and oil was produced from the Wilcox at Oakley Dome. Claiborne County is north of Wilcox productive areas in Jefferson County. The Wilcox contains many feet of alternating sands and shales and the possibility of future oil and gas production from the Wilcox in Claiborne County should not be discounted.

Deeper objectives, in the Lower Glen Rose, have not been sufficiently tested. Oil and gas are produced from the Rodessa and Sligo formations in Hinds County at Bolton Field and limited oil production was obtained from the Rodessa formation at Morgans Field before it was abandoned.

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CLAIBORNE COUNTY STRUCTURAL GEOLOGY

CHARLES H. WILLIAMS, JR.

ABSTRACT

Subsurface structure of Claiborne County, Mississippi is illustrated by contoured maps using as datums the top of Lower Cretaceous, Wilcox and Glendon limestone. Datums were obtained from oil and/or gas tests and core holes.

Claiborne County is situated on the west flank of the Mississippi Embayment. Present-day structural dip is to the south and southeast. The maps show the axis of the Mississippi Embayment and a synclinal area centered in T.12N., R.2E. Two ridges with low relief culminations and five salt piercements are shown. Isopachous maps indicate all features, excluding the salt piercements, existed prior to Lower Tuscaloosa deposition. Salt stocks penetrate Wilcox and Upper Eocene sediments.

The deepest well in Claiborne County reached a total depth of 16,515 feet, penetrating the Hosston formation.

INTRODUCTION

Subsurface structural configuration of Claiborne County is shown on contoured maps using as datums the top of Lower Cretaceous, Wilcox and Glendon limestone. These maps illustrate structure at deep, intermediate and shallow depths. Datums were obtained from electrical logs of the thirty-eight oil and/or gas tests drilled in Claiborne County. Logs of wells in adjacent counties were utilized for additional control. Datums obtained from numerous core holes drilled by the Mississippi Geological Survey and major oil companies enhance the accuracy of the Glendon structure map.

REGIONAL STRUCTURE

Regionally, Claiborne County is situated on the west flank of the Mississippi Embayment. The synclinal axis of the Embayment trends north-south along the eastern part of the County. Present-day structural dip is to the south and southeast with several interruptions due to uplift and salt-intrusion. Five known piercement-type salt structures influence the configuration of Claiborne County; two within the County and three in border counties. The salt structures are: Bruinsburg and Hervey Domes in Claiborne County, Galloway and Newman Domes in Warren County and McBride Dome in Jefferson County.

LOCAL STRUCTURE

Subsurface structural features shown on the accompanying maps are: (1) synclinal axis of Mississippi Embayment, (2) synclinal area centered in T.12N., R.2E., (3) northwest-southeast trending ridge in the southwestern part of the County, (4) north-south trending ridge through the center of the County, (5)-(9) piercement-type salt domes. These features are reflected in varying degrees on all the maps. Isopachous studies indicate that most of the features existed prior to Lower Tuscaloosa deposition, excluding the salt piercements.

The Pan American No. 1 Campbell, Sec.51, T.13N., R.3E., is the deepest well in Claiborne County. It was drilled in 1963 and reached a total depth of 16,515 feet. The oldest formation penetrated is the Hosston formation. The highest elevation of the Lower Cretaceous is -9348 feet in the La Grange Petroleum Company No. 1 Clark Estate, Sec.1, T.10N., R.12E. The lowest elevation is -9950 feet in the Gulf Coast No. 1 Davidson, Sec.20, T.11N., R.5E., near the axis of the Mississippi Embayment. The highest Wilcox datum noted in Claiborne County is -2548 feet on the Bruinsburg Dome, Sec.1, T.11N., R.1W. The lowest Wilcox elevation is -3669 feet in the Midstates No. 1 Headley, Sec.12, T.12N., R.2E. The highest Glendon limestone is -95 feet in the Mississippi Geological Survey well AH-3, Sec.3, T.14N., R.5E. The lowest Glendon elevation is -672 feet in the southeastern part of the County.

The aforementioned structural features are described as follows:

(1) The axis of the Mississippi Embayment trends north-south along the eastern part of Claiborne County. Rate of dip into the axis is approximately 100 feet per mile on the Lower Cretaceous datum (Plate 1, Dinkins) and approximately 60 feet per mile on the Wilcox (Plate 2, Williams). The axis of the Mississippi Embayment is apparent on the Glendon limestone map, but a combination of thickness of Eocene sediments and southward tilting has significantly detracted from the original feature (Plate 1, Williams).

(2) A prominent synclinal area is centered in T.12N., R.2E. The Midstates No. 1 Headley, Sec.12, T.12N., R.2E., not only has the lowest Wilcox datum in the County but also exhibits the greatest sedimentary thickness. The Wilcox structural interpretation shows this area as an embayment connected to the main axis of the Mississippi Embayment (Plate 2, Williams). Isopachous maps offer support to this interpretation. On the Lower Cretaceous structure map, the low area is inferred from available data (Plate 1, Dinkins). This feature is also in evidence on the Glendon limestone map, although thickness of Eocene sediments and southward tilting has the combined effect of opening the embayed area to the south (Plate 1, Williams).

(3) A northwest-southeast trending ridge with low relief culminations is shown in the southwestern part of Claiborne County. The Lower Tuscaloosa isopachous map exhibits thinning across this feature indicating the area was topographically high prior to Tuscaloosa deposition (Plate 2, Dinkins). The feature is shown on the Glendon limestone map as strong nosing with closure at the southeastern extension (Plate 1, Williams).

(4) A north-south trending ridge is shown in the approximate center of the County. The Lower Cretaceous (Plate 1, Dinkins) and Wilcox structure maps (Plate 2, Williams) show closure near the southern end of the trend. The Lower Tuscaloosa isopachous map indicates this ridge is pre-Tuscaloosa age (Plate 2, Dinkins). The Glendon limestone reflects the ridge as structural nosing; thickness of Eocene sediments and southward tilting having removed any evidence of closure (Plate 1, Williams).

(5)-(9) Five known piercement-type salt domes affect the Claiborne County subsurface structure. Isopachous studies show the piercements occur in, or adjacent to, areas containing the thickest accumulation of sediments.

BRUINSBURG DOME

The Bruinsburg Salt Dome, located in Sec.1, T.11N., R.1W., Claiborne County, was discovered in 1944. The discovery well is the Freeport Sulphur Company No. 2 Hammett. Salt has been logged at a depth of 2020 feet. Upper Eocene strata are penetrated by the salt stock. Gas production is established from Cockfield formation on this dome.

HERVEY DOME

The Hervey Salt Dome is located in Sec.7, T.10N., R.5E., near the axis of the Mississippi Embayment. The Sun Oil Company No. 1 Segrest, drilled in 1945, encountered salt at 3547 feet below the surface. The salt stock has penetrated Wilcox strata. Doming is evident on the Wilcox and Glendon maps. (Plates 2 and 1, Williams).

GALLOWAY DOME

This dome was discovered in 1945. It is located in Sec.43, T.13N., R.3E., Warren County, immediately adjacent to Claiborne County. Salt was encountered at a depth of 4196 feet in the Osmond No. 1 Anderson-Tully well. Wilcox sediments are penetrated by the salt. Galloway Dome is on the northeast flank of a prominent synclinal area.

NEWMAN DOME

The Newman Dome is located along the axis of the Mississippi Embayment near the northeastern corner of Claiborne County. Specifically, it is in Sec.12, T.14N., R.4E., Warren County. The salt stock penetrates Wilcox strata. Salt was found at 5114 feet below surface in the Magnolia Oil Company No. 1 Paxton-Brown. Both Wilcox and Glendon limestone datums are anomalously low indicating the well is positioned in a rim syncline (Plates 2 and 1, Williams).

MCBRIDE DOME

This piercement is located in Sec.10, T.9N., R.4E., Jefferson County, and is near the axis of the Mississippi

Embayment. The McBride Dome is mentioned in this report only because it may exert a minor structural influence in the southernmost part of Claiborne County. Salt was encountered at a depth of 2250 feet and has penetrated Upper Eocene deposits.

CLAIBORNE COUNTY CLAY TESTS

THOMAS E. McCUTCHEON

ABSTRACT

The Claiborne County clays tested are of three types, namely, bond clays from the Catahoula formation, loess clays and alluvial deposits.

1. Bond clays from the Catahoula exhibit properties suitable for plastic and semi-plastic applications relative to the manufacture of refractories, heavy clay products and abrasives. They also may have use as a bond in foundry sand and as a lubricant and suspending agent in earthy drilling operations.

2. Loess clays have use in brick and tile manufacturing when blended with more plastic clays. They have possible use as a filler in glues, linoleum, asphalt tile and similar products.

3. The alluvium is best suited for the manufacture of light-weight aggregate. It could be used in making thin-walled garden pottery. It also could be blended with the loess as a plastic and strengthening agent in the manufacture of brick and heavy clay products.

INTRODUCTION

Twenty-three core hole clay samples were tested under standard conditions to determine their ceramic properties and other characteristics. The work was conducted in the laboratories of the Ceramic Engineering School at the Georgia Institute of Technology. A five pound ground and screened cut of each sample was furnished the Survey to obtain chemical analysis and other tests. The chemical analyses were made by the Shilstone Testing Laboratory. The screen analyses were made by the writer and the description of the screen residue was made by Theo H. Dinkins, Jr.

Test hole records showing the location from which the samples were taken, the description of the various strata and the stratigraphic position of the samples tested and related strata are given here under Test Hole Records. This work was conducted by Alvin R. Bicker, Jr.

The ceramic test data is shown in Tables No. 5 and No. 6 under the headings of "Physical Properties in the Unburned State" and "Pyrophysical Properties." Other data concerning special tests is given in this report.

Specific tests were conducted to better evaluate the use of the Catahoula clays as bond clays and the alluvium as a light-weight expanded clay aggregate.

SUMMARY OF TESTS

CHARACTERISTICS

The Catahoula clays represented by seventeen samples from nine test holes aggregate 165 feet of tested strata.

Chemical and screen analyses. The detailed chemical analyses and screen analyses of the samples are shown in Tables No. 3 and No. 4. A recapitulation of this data is given below for comparative purposes.

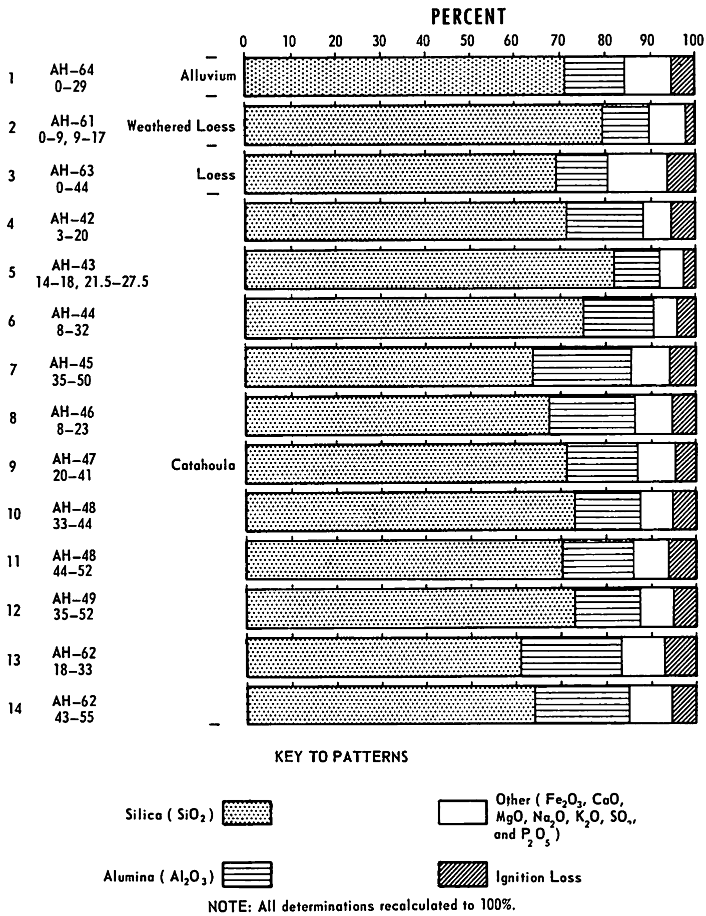


Figure 1.—Plotted chemical analysis of Claiborne County clay samples tested. See data, Table 3.

TABLE NO. 1
SUMMARY OF CHEMICAL AND SCREEN ANALYSES
CATAHOULA CLAYS

Sample	Silica Percent SiO_2	Alumina Percent Al_2O_3	Iron Percent and Titania Fe_2O_3 and TiO_2	Alkalies and Phosphorus Percent as Oxides	Screen Residue Percent +250 mesh
AH-42					
3′-20′	71.93	16.72	4.17	1.75	7.90
AH-43					
14′-18′					
21.5′-27.5′	82.37	9.96	3.30	1.42	19.40
AH-44					
8′-32′	75.28	14.96	3.54	1.59	5.40*
AH-45					
35′-50′	63.50	22.15	5.39	2.60	1.60
AH-46					
8′-23′	68.2	17.76	5.44	3.00	6.48*
AH-47					
20′-48′	71.6	15.15	4.56	3.88	16.20*
AH-48					
33′-44′	72.61	16.08	3.75	3.13	3.20
AH-48					
44′-52′	70.10	16.77	4.64	2.37	6.00
AH-49					
35′-52′	72.98	15.65	3.91	2.49	11.30*
AH-62					
18′-23′	60.73	22.72	6.40	2.89	0.70
AH-62					
43′-55′	64.15	20.57	6.53	2.34	1.50
Average	70.30	17.10	4.68	2.45	7.24

* Weighted average

The silica content shown in the chemical analysis includes excess or free silica such as sand or quartz and other minor minerals. It will be noted that the clays which have a high silica content in the chemical analysis also have a high percent of residue retained on plus 250 mesh screens. Conversely, the alumina content of the clays, which is a measure of its purity, is highest with individual clays when the plus 250 mesh screen residue is lowest. The silica content (total) of the clays varies between 60.73% and 82.37%. The weighted average is 70.30%. The alumina content varies between 9.96% and 22.72%, the weighted average being 17.10%. The plus 250 mesh screen residue varies between 0.70% and 19.40% and the average is 7.24%.

The iron content of the clays indicated in the chemical analysis as Fe_2O_3 apparently includes titania, TiO_2. These two minerals are often combined as a unit because titania is normally a minor constituent. It will be noted from the preceding table that the iron content of the clays increases with the increase of alumina and decreases with the increase of silica and screen residue. In extremely weathered clays in their natural state, iron manifests its being as a coloring of pink, yellow, red and brown. The Catahoula clays are generally gray. Tan to brown colors are prevalent in samples from Test Hole AH-62. Chemically, and in a pyrophysical relation, iron and alumina are kindred. It is believed that most of the iron content of the clays is combined as part of the hydrous clay mineral complex. The iron-titania composition varies between 3.30% and 6.53%.

In the chemical analysis, alkalies, phosphorous and sulfur are shown as oxides. Actually they do not exist in a clay as such. This is also true of alumina and silica except where silica or quartz, commonly referred to as sand and silt, is considered extraneous material. The elements, calcium, magnesium, potassium, and phosphorus, as well as sulfur, are combined with alumina, silica, and iron, and other elements in various mineral forms as carbonates, silicates, sulfates, etc. In a clay, this group of minerals constitutes a very minor part of such clays as are commonly known as fire clays, ball clays, white-ware clays, and other clays noted for their purity. Common ware clays as used in brick and tile manufacture and for many other uses, necessarily contain this group of minerals as a portion of its composition. It is this group of minerals, along with the iron minerals, that determine the burning characteristics of a clay, its color, and its uses. The alkalies and phosphorous average 2.45%. Individual clays contain as little as 1.42% and as much as 3.88%. There seems to be no particular relation between the percent of alkalies with respect to other clay minerals.

Plasticity. The clays are unusually plastic. This may be expressed in terms of water of plasticity, which is the amount of water added to dry clays to make them suitable for moulding and extrusion. For seventeen samples, the average water of plasticity on the wet basis is 24.20% and that on the dry basis, 32.0%.

Linear Drying Shrinkage. The clays have a high drying shrinkage. The average is 7.10%. Excess drying shrinkage induces warpage and cracking in common ware products when this type of clay is the principal constituent of the body. On the other hand, a high drying shrinkage indicates that the clays have good bonding strength when used as a minor portion of many ceramic bodies.

Extrusion and Warpage. Because of their very plastic property, the clays may be extruded and otherwise formed into almost any shape. However, because of their high water of plasticity and high drying shrinkage, the clays have a tendency to warp on drying. The clays when used as a minor part of semi to non-plastic ceramic mixtures would impart to it the necessary characteristics for a good moulding and extrudable body.

Modulus of Rupture. Modulus of rupture is a measure of breaking strength of the clays expressed in pounds per square inch. As a rule of thumb, it approximates the crushing strength when multiplied by three. Clays best suitable for brick and tile manufacture test in the range of 300 to 400 pounds per square inch in the unburned state. There are many manufacturing plants making brick and tile utilizing clays with lesser or greater strengths. The Catahoula clays, in the unburned state, average 1346 pounds per square inch. The maximum and minimum strengths range between 1840 and 1085 pounds per square inch.

Bonding Strength. In various ceramic manufacturing procedures non-plastic materials are used as a minor and as a major constituent of the product. When the inherent strength and plasticity of compounded ceramic bodies is deficient, bond clay is added. The standard test for a bond clay is to blend it with 50% non-plastic material and then determine the properties of the mixture. In some cases the strength of the half and half plastic and non-plastic mixtures exceeds the nominal strength of the bond clay alone. Bond clays are used in a wide range of applications and in various amounts. The clays also serve as a fired ceramic bond. Small amounts of bond clay permanently adhere to very refractory materials as in the manufacture of fire brick and abrasives. In foundry sand use and in ladle linings, the clays serve as dry and fired bond at the same time as only a portion of sand or lining is subjected to full heat. In a drilling mud this type of clay is the major part of the mixture.

In the course of normal ceramic testing it was observed that the loess clay was deficient in dry strength and did not have sufficient plasticity to be extruded in a desirable manner. Twenty percent bond clay (Sample AH-47, 20′-41′ and Sample AH-44, 8′-21′) was blended with 80% loess (Sample AH-63, 0′-44′) for blends A and B. The effect of the bond clay when combined with loess was to increase the plasticity and extrusion behavior of the loess to such an extent that the mixtures became suitable for brick and tile manufacture. The dry strength of the loess as in Blend A was increased from 220 lbs./sq. in. to 714 lbs./sq. in. and for Blend B the increase was to 726 lbs./sq. in. On burning, the strength of the loess ranged between 535 and 3760 lbs./sq. in. With Blend A the range was between 941 and 3300 lbs./sq. in., and with Blend B the range was between 1220 and 4200 lbs./sq. in. It is likely that ten to fifteen percent of bond clay would be adequate for blending with loess to make this widespread deposit a continuing source of raw material for heavy clay products.

Pyrophysical Properties. On burning the Catahoula clays, it was found that they mature at relatively low temperatures but are not overburned at temperatures several hundred degrees higher (2014-2264°F.).

The clays may be classified into three groups having common properties. This could be coordinated with screen analysis and chemical analysis except that some of the chemical analyses represent more than one sample. A coordination between pyrophysical properties and screen analysis is expressed in the tables below as "percent purity," which represents the amount of the clay sample passing a 250 mesh screen. In most instances the "purity" of the clays parallels other physical properties. The exceptions are thought to be caused by the silica content finer than determined and which is indicated in the chemical analysis.

TABLE 2

COORDINATION BETWEEN PYROPHYSICAL PROPERTIES AND SCREEN ANALYSIS

Clay	Porosity Percent	Absorption Percent	Total Shrinkage Percent	Modulus of Rupture lbs./sq. in.	Purity Percent
			GROUP I		
AH-45 35′-50′	1.82	0.86	13.1	4090	98.4
AH-46 17′-23′	1.76	0.90	11.0	3250	91.2
AH-62 18′-33′ Light	2.22	0.93	12.5	3900	99.3
AH-62 18′-33′ Dark	4.70	1.90	11.7	4330	99.3
AH-62 43′-55′ Light	3.00	1.49	11.5	4551	97.7
AH-62 43′-55′ Dark	4.68	2.08	11.70	6980	98.5
Average	3.03	1.36	11.75	4517	96.8
			GROUP II		
AH-42 3′-20′	11.92	6.12	11.1	3218	92.1
AH-44 8′-21′	12.62	6.06	10.3	3630	97.2
AH-46 8′-17′	8.41	4.24	11.0	2890	91.2

TABLE 2—(Continued)

Clay	Porosity Percent	Absorption Percent	Total Shrinkage Percent	Modulus of Rupture lbs./sq. in.	Purity Percent
AH-47 32'-41'	11.31	5.55	12.0	2780	92.2
AH-48 44'-52'	11.72	5.90	11.50	2523	94.0
AH-49 45'-52'	12.80	5.95	13.33	2300	88.7
Average	11.46	5.64	11.04	2890	92.6
		GROUP III			
AH-43 14'-18' 21.5'-27.5'	21.58	10.61	9.20	1802	81.6
AH-44 21'-32'	19.71	10.11	9.25	2460	91.4
AH-47 20'-32'	17.35	9.00	11.40	1980	80.7
AH-48 33'-44'	14.40	7.13	10.8	2516	96.8
AH-49 35'-45'	22.15	12.00	10.2	2800	92.4
Average	19.04	9.77	9.99	2311	88.6

The Group I clays are especially suited for use in the manufacture of abrasives, foundry sand, and ladle linings. Their uses include those given in the Group II and III classification.

The Group II clays have particular application in the manufacture of medium duty refractories such as kiln furniture, aggregate or grog in cast refractories, saggers, burner parts, and other uses as noted for Group III.

Group III clays, having higher porosity and absorption values, lend themselves to the production of common brick and fireproofing. A blend of these clays with the loess could be suitable for face brick, structural tile, and other heavy clay products such as drain tile and flue lining.

Some of the Group II clays and the Group III clays could be beneficiated to remove excess sand and extraneous minerals which would set them in the class of the best of bond clays.

SPECIAL BOND CLAY TESTS

Because of the high dry strength of the Catahoula clays, as shown in the tables of "Physical Properties in the Unburned State," two of the clays were blended with abrasive materials, fine clay grog and potters flint. The blends were processed and tested to determine the quality of the bond clay in specific uses.

The non-plastic materials listed below were used in the tests:

1. Boron carbide B_4C, melting point 2350°C.-4626°F.—blue-black crystals—80 mesh-200 mesh—hardness 9.

2. Silicon carbide SC, carborundum, melting point 2700°C.-4892°F.—100 mesh—light green crystal powder—hardness 9.

3. Fused alumina Al_2O_3, alumdom, clear rounded aggregate—melting point 2050°C.-3740°F.—18-40 mesh—hardness 9.

4. Flint SiO_2, ground silica, melting point 1470°-1670°C.-2678°-3038°F.—white powder—200 mesh.

5. Fire clay grog—burned fine clay—melting point approximately 3000°F.—grain size 3/16mm. to dust.

PROCEDURE

The boron carbide, the silicon carbide and the fused alumina were blended with 15 percent bond clay (AH-62, 18′-33′) and mulled with enough water to make the mixtures damp. The blends were semi-dry pressed into 1″x1″x6″ bars under a pressure of 1000 lbs. per sq. in. The bars were dried and tested for dry strength and shrinkage and then burned and later tested for burned strength and shrinkage.

The flint and fire clay grog were mixed with 50 percent bond clay (AH-44, 8′-21′), mulled with water to make plastic and then extruded into 1″x1″x6″ bars. These were tested for water of plasticity, shrinkage, and strength in the dry state, and after burning were tested for absorption shrinkage and strength.

The test data obtained is given below:

Boron carbide, 85%, bond clay 15%

Modulus of rupture, oven dried	54	lbs./sq.in.
Modulus of rupture, fired 2167°F.	450	lbs./sq.in.

Drying shrinkage 0.0%, fired shrinkage +0.5%

Silicon carbide, 85%, bond clay 15%

Modulus of rupture, oven dried 31.8 lbs./sq.in.
Modulus of rupture, fired 2167°F. 2540 lbs./sq.in.
Drying shrinkage 0.0%, fired shrinkage +0.5%

Fused alumina, 85%, bond clay 15%

Modulus of rupture, oven dried 19.4 lbs./sq.in.
Modulus of rupture, fired 2167°F. 392 lbs./sq.in.
Drying shrinkage 0.0%, fired shrinkage +0.5%

Fire clay grog, 50%, bond clay 50%

Water of plasticity, wet basis 14.5%, dry basis 16.25%
Linear drying shrinkage 3.0%
Modulus of rupture, dry basis 196 lbs./sq.in.
Absorption, 2264°F., 10.35%
Total linear shrinkage, 2264°F., 5.0%
Modulus of rupture, 2264°F., 595 lbs./sq.in.

Flint, 50%, bond clay 50%

Water of plasticity, wet basis 18.8%, dry basis 32.1%
Linear drying shrinkage 4.5%
Modulus of rupture, dry basis 955 lbs./sq.in.
Absorption, 2264°F., 13.3%
Total linear shrinkage, 2264°F., 6.0%
Modulus of rupture, 2264°F., 2860 lbs./sq.in.

In the manufacture of abrasives as little clay as possible is used to bond together the abrasive grains because it interferes with the cutting action. Very good results were obtained with the fine-grained silicon carbide. The coarser grained boron carbide mixture gave fair results. The fused alumina mixture using large rounded grains was too weak in the dry and burned states. The need of a variation in grain size is indicated.

The plastic mixtures using flint and grog with 50% bond clay gave excellent results in both the dry and fired states. The fifty-fifty mixture was used because it is a standard test composition.

Manufacturers of refractories, pottery, tile, refractories and abrasives should be encouraged to experiment with the Catahoula bond clays relative to their particular application.

THE LOESS CLAYS

The loess clays represented by samples from Test Holes AH-61 and AH-63 are composed chiefly of silt and contain very little clay. The material is relatively non-plastic and when burned at moderate temperatures is too porous to make good brick. In the course of routine testing, blends A and B were made consisting of 80% loess from Test Hole AH-63 and 20% bond clay from Test Holes AH-47 and AH-44. These mixtures gave very satisfactory results, making it possible to utilize the loess in the manufacture of brick and structural tile.

THE ALLUVIAL DEPOSITS

The alluvium is represented by sample AH-64, 0′-29′. The clay is silty and very plastic. It has a high drying shrinkage and a high dry strength. The clay when used alone has undesirable firing properties as it tends to bloat or swell. It probably could be used as a blend with the loess in making garden pottery, brick, and tiles.

SPECIAL EXPANDED CLAY AGGREGATE TESTS

Because of the tendency of the alluvium to bloat on firing, special firing tests were made to determine the possibility of the clay for use as a lightweight expanded clay aggregate. The procedure was as follows: A 15 pound sample of the clay was mixed with water and mulled to make plastic. The plastic clay was extruded as a 1 inch square column and cut into 1 inch cubes which in turn were rounded into 1 inch balls. The balls were dried and calcined to 700°F. to drive out moisture. The balls were fired quickly in an electric kiln and samples were withdrawn between the temperatures of 1800°F. and 2200°F. at 50° intervals. The samples were buried in sand to cool and then the data in the table below was determined, from which a graphic representation was made.

PYROPHYSICAL PROPERTIES OF ALLUVIUM
SAMPLE AH-64, 0-29′

Temp. %F.	Porocity Percent	Absorption Percent	Volume Change* Percent	Specific Gravity Bulk	Specific Gravity Apparent	Lbs. per Cu. Ft.
1800	28.7	15.20	+0.47	1.865	2.615	116.0
1850	26.1	14.10	—0.22	1.900	2.530	118.0
1900	23.8	12.10	—3.84	1.956	2.570	121.5
1950	15.4	7.33	—14.30	2.120	2.520	126.0
2000	13.2	6.10	—13.50	2.180	2.510	127.0
2050	0.22	0.137	—10.00	2.080	2.150	130.0
2100	36.60	25.90	+29.30	1.390	2.170	86.9
2150	51.00	48.30	+78.80	1.060	2.160	66.1
2200+	44.90	74.50	+216.00	0.603	0.856	37.6

* From 700°F.

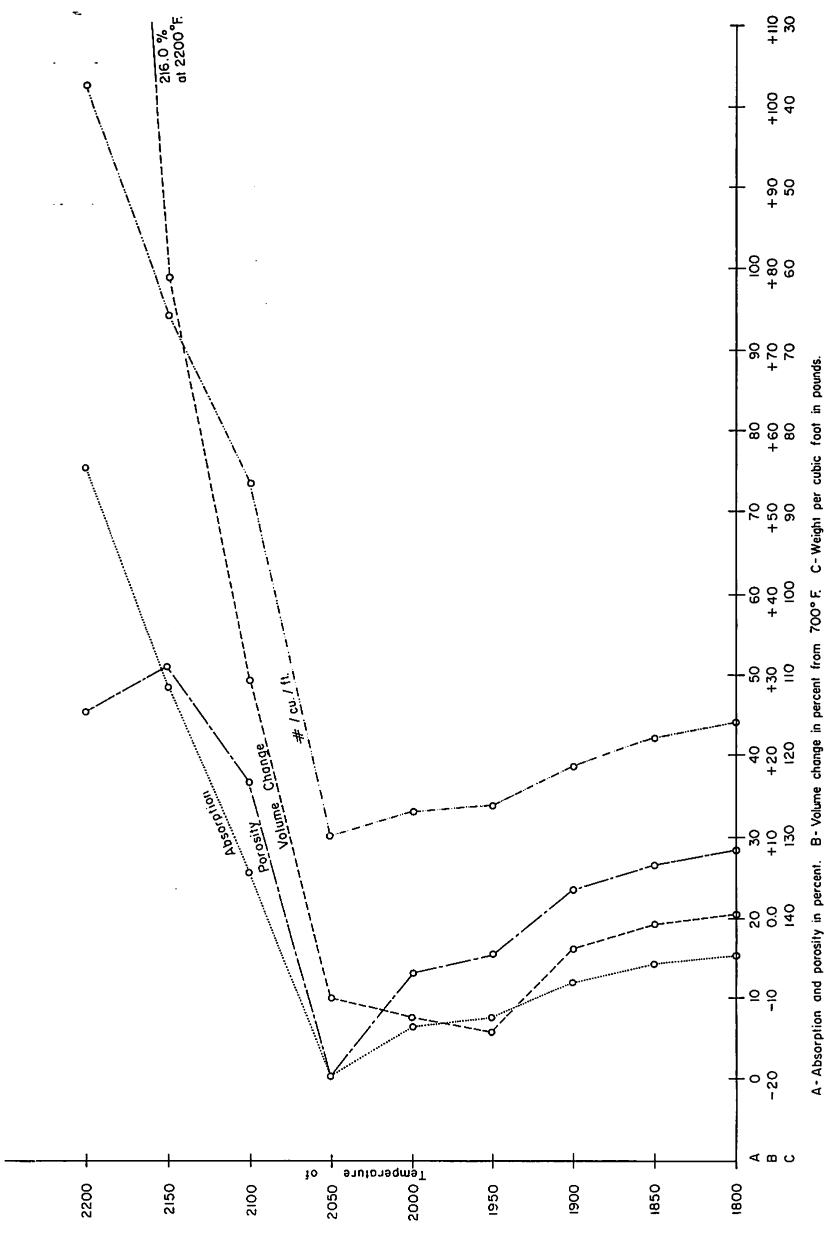


Figure 2.—Graphic illustration of pyrophysical properties of alluvium. Sample AH-64.

Note that the alluvium vitrifies between 2000°F. and 2050°F. At higher temperatures it begins to expand, developing a cellular structure. This continues through 2200°F., and at this temperature the clay begins to melt.

The clay produces a good aggregate through a practical firing range of approximately 100°F. The temperature range between 2100°F. and 2150°F. is probably the optimum.

TABLE 3

CHEMICAL ANALYSES OF CLAYS
CLAIBORNE COUNTY, MISSISSIPPI
SHILSTONE TESTING LABORATORY, ANALYST

Sample No.	Geologic Unit	SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	Na_2O	K_2O	SO_3	P_2O_5	Ign.	Total
AH-42 (3-20)	Catahoula	71.69	16.67	4.16	0.15	0.90	0.24	0.35	0	0.11	5.41	99.68
AH-43 (14-27)	Catahoula	82.04	9.92	3.12	0.02	0.68	0.09	0.52	0	0.11	3.10	99.60
AH-44 (8-32)	Catahoula	72.90	14.88	3.52	0	0.94	0.09	0.43	0.05	0.13	4.56	99.50
AH-45 (35-50)	Catahoula	64.90	22.65	5.51	0.60	1.08	0.12	0.67	0	0.17	6.51	102.21
AH-46 (8-23)	Catahoula	67.96	17.70	5.42	0.75	1.19	0.30	0.65	0	0.11	5.58	99.66
AH-47 (20-41)	Catahoula	71.47	15.09	4.54	0.53	1.39	0.77	1.07	0	0.11	4.62	99.59
AH-48 (33-44)	Catahoula	72.18	15.99	3.73	0	0.95	0.10	0.69	0.22	0.16	5.40	99.42
AH-48 (44-52)	Catahoula	70.20	16.79	4.65	0.51	1.04	0.08	0.54	0.12	0.15	6.01	100.14
AH-49 (35-52)	Catahoula	73.29	15.71	3.93	0.53	1.00	0.16	0.68	0	0.12	4.99	100.41
AH-61 (9-17)	Loess	79.35	10.36	3.22	0.75	0.92	0.94	1.63	0	0.20	2.66	100.03
AH-62 (18-33)	Catahoula	61.52	23.01	6.48	0.58	1.13	0.12	0.90	0	0.19	7.37	101.30
AH-62 (43-55)	Catahoula	64.73	20.75	6.69	0.48	0.90	0.08	0.73	0	0.17	6.37	100.90
AH-63 (0-44)	Loess	69.48	11.46	4.01	3.97	2.62	0.96	1.62	0	0.24	6.61	100.97
AH-64 (0-29)	Alluvium	70.82	13.55	4.01	1.94	1.58	0.87	1.90	0	0.36	5.34	100.27

TABLE 4

SCREEN ANALYSIS

TEST HOLE AH-42, 3 TO 20 FEET

SIEVE SIZE (MESH)	PERCENT RETAINED	CHARACTER OF RESIDUE
35	0.5	Silt nodules (C) white, limonitic in part; sandstone (C) very fine-grained; opaline material (S) pale gray & ochre, probably a dense cryptocrystalline clay, sub-conchoidal fracture; manganiferous material (S) pyrite (S) quartz (S) organic material (S) schistose material (T)
60	0.5	Silt nodules (A) white, limonitic in part; quartz (C) opaline material as above; manganiferous material (S) organic material (T)
100	0.9	Silt nodules (C) white, limonitic in part; quartz (C) manganiferous material (S) organic material (S) opaline material as above (S) pyrite (T)
250	6.0	Quartz (A) silt nodules (C) white, limonitic in part; manganiferous material (S) mica (S)
PAN	92.1	Silt (C) clay (C)

TABLE 4 (Continued)

SCREEN ANALYSIS

TEST HOLE AH-43, 14 21 TO 18 27 FEET

SIEVE SIZE (MESH)	PERCENT RETAINED	CHARACTER OF RESIDUE
35	0.1	Silt nodules (A) limonitic & white; quartz (C) manganiferous material (C) pyrite (C) limonite (T)
60	0.4	Quartz (A) silt nodules (C) limonitic & white; manganiferous material (S) pyrite (S) organic material (T)
100	2.3	Quartz (A) silt nodules (C) limonitic & white; manganiferous material (S) pyrite (S)
250	15.6	Quartz (A) silt nodules (S) limonitic & white; manganiferous material (S) pyrite (S)
PAN	81.6	Silt (A) clay (S)

TABLE 4 (Continued)

SCREEN ANALYSIS

TEST HOLE AH-44 . 8 TO 21 FEET

SIEVE SIZE (MESH)	PERCENT RETAINED	CHARACTER OF RESIDUE
35	0.1	Silt nodules (C) white; opaline material (C) pale gray, developing conchoidal fracture, soft, translucent on thin edges, probably a dense cryptocrystalline clay; quartz (S) siltstone (S) manganiferous & limonitic; organic material (S)
60	0.1	Silt nodules (A) white, limonitic & manganiferous; opaline material as above (C) quartz (C) organic material (T)
100	0.2	Silt nodules (A) white, limonitic; opaline material as above (C) quartz (C) manganiferous material (S) organic material (T)
250	2.4	Quartz (A) silt nodules (C) white & limonitic, manganiferous material (S) mica (S)
PAN	97.2	Silt (A) clay (C)

TABLE 4 (Continued)

SCREEN ANALYSIS

TEST HOLE AH-44. 21 TO 32 FEET

SIEVE SIZE (MESH)	PERCENT RETAINED	CHARACTER OF RESIDUE
35	0.2	Silt nodules (A) white & limonitic in part; quartz (C) stained with limonite in part; opaline material (S) manganiferous material (S) organic material (S)
60	0.2	Silt nodules (A) white & limonitic in part; quartz (C) opaline material (C) white; manganiferous material (C) organic material (S)
100	0.4	Silt nodules (C) white & limonitic in part; quartz (C) manganiferous material (C) organic material (T)
250	7.8	Quartz (A) silt nodules (C) white & limonitic; opaline material (S) mica (S) manganiferous material (S)
PAN	91.4	Clay (A) silt (S)

TABLE 4 (Continued)

SCREEN ANALYSIS

TEST HOLE AH-45, 35 TO 50 FEET

SIEVE SIZE (MESH)	PERCENT RETAINED	CHARACTER OF RESIDUE
35	Nil	Clay nodules (A) white & limonitic in part; quartz (C) pyrite (S) organic material (S) manganiferous material (T)
60	0.4	Clay nodules (A) white & limonitic in part; pyrite (S) organic material (S)
100	0.4	Clay nodules (A) white & limonitic; quartz (C) pyrite (C) organic material (S)
250	0.8	Clay nodules (A) white & limonitic; quartz (S) pyrite (S) organic material (S)
PAN	98.4	Silt (A) clay (C)

TABLE 4 (Continued)

SCREEN ANALYSIS

TEST HOLE AH-46 . 8 TO 17 FEET

SIEVE SIZE (MESH)	PERCENT RETAINED	CHARACTER OF RESIDUE
35	Nil	Silt nodules (A) limonitic & white in part; opaline material (C) pale gray & white; quartz (S)
60	0.1	Silt nodules (A) limonitic & white in part; quartz (C) opaline material as above (C) manganiferous material (S) organic material (T)
100	0.2	Quartz (A) silt nodules (C) limonitic & white; clay nodules (C) limonitic & white; opaline material (S) white; manganiferous material (S)
250	8.5	Quartz (A) clay nodules (C) limonitic & white; manganiferous material (S)
PAN	91.2	Silt (A) clay (S)

TABLE 4 (Continued)

SCREEN ANALYSIS

TEST HOLE AH-46 . 17 TO 23 FEET

SIEVE SIZE (MESH)	PERCENT RETAINED	CHARACTER OF RESIDUE
35	Nil	Clay nodules (C) limonitic; opaline material (C) pale gray & yellow; quartz (S) silt nodules (S) white; organic material (T)
60	Nil	Clay nodules (A) limonitic & white in part; quartz (C) opaline material (C) white & limonitic in part; organic material (T)
100	Nil	Clay nodules (A) limonitic & white in part; quartz (C) manganiferous material (S) organic material (T)
250	3.0	Quartz (A) clay nodules (C) limonitic & white in part; manganiferous material (S)
PAN	97.0	Clay (A) silt (S)

TABLE 4 (Continued)

SCREEN ANALYSIS

TEST HOLE AH-47 . 20 TO 32 FEET

SIEVE SIZE (MESH)	PERCENT RETAINED	CHARACTER OF RESIDUE
35	0.2	Silt nodules (A) white, kaolinitic, limonitic in part; sandstone (C) kaolinitic; silt nodules (C) hematitic; opaline material (C) white; manganiferous material (C)
60	0.2	Silt nodules (A) tan & white; clay nodules (C) tan; opaline material (C) white; manganiferous material (C) clay nodules (C) limonitic & hematitic; mica (S) quartz (S)
100	1.1	Quartz (A) silt nodules (C) tan; clay nodules (C) tan; mica (C) manganiferous material (C)
250	17.8	Quartz (A) clay nodules (C) white; mica (S) manganiferous material (S)
PAN	80.7	Silt (A) clay (S)

TABLE 4 (Continued)

SCREEN ANALYSIS

TEST HOLE AH-47, 32 TO 41 FEET

SIEVE SIZE (MESH)	PERCENT RETAINED	CHARACTER OF RESIDUE
35	Nil	Silt nodules (C) limonitic & white in part; quartz (C) stained with limonite in part; organic material (S)
60	Nil	Silt nodules (A) limonitic & white; quartz (C) manganiferous material (S) organic material (S)
100	Nil	Quartz (A) silt nodules (C) limonitic & white; manganiferous material (C) opaline material (C) pale gray & white; pyrite (C) mica (S) organic material (S)
250	7.8	Quartz (A) mica (C) manganiferous material (C) silt nodules (S) limonitic & white; opaline material (S) pale gray & white
PAN	92.2	Silt (A) clay (C)

TABLE 4 (Continued)

SCREEN ANALYSIS

TEST HOLE AH-48 . 33 TO 44 FEET

SIEVE SIZE (MESH)	PERCENT RETAINED	CHARACTER OF RESIDUE
35	Nil	Clay nodules (C) quartz (C) limonite (C) organic material (S)
60	Nil	Clay nodules (C) white; quartz (C) pyrite (S) manganiferous material (S) organic material (S) hematitic material (S)
100	0.1	Clay nodules (A) white; quartz (C) pyrite (C) manganiferous material (S) hematitic material (S)
250	3.1	Quartz (A) clay nodules (C) white; pyrite (S) mica (S) manganiferous & hematitic material (S) organic material (T)
PAN	96.8	Silt (A) clay (S)

TABLE 4 (Continued)

SCREEN ANALYSIS

TEST HOLE AH-48, 44 TO 52 FEET

SIEVE SIZE (MESH)	PERCENT RETAINED	CHARACTER OF RESIDUE
35	0.3	Silt nodules (C) white; pyrite (C) quartz (C) organic material (S) lignitic material (T)
60	0.5	Silt nodules (A) white; quartz (C) pyrite (C) organic material (S) manganiferous material (S)
100	1.0	Silt nodules (A) white; quartz (C) pyrite (C) manganiferous material (S) organic material (S)
250	4.2	Silt nodules (C) white; quartz (C) pyrite (C) manganiferous material (S) organic material (S)
PAN	94.0	Silt (A) clay (C)

TABLE 4 (Continued)

SCREEN ANALYSIS

TEST HOLE AH-49, 35 TO 45 FEET

SIEVE SIZE (MESH)	PERCENT RETAINED	CHARACTER OF RESIDUE
35	Nil	Silt nodules (A) white, limonitic in part; pyrite (C) quartz (C) stained with limonite in part
60	0.2	Silt nodules (A) white; quartz (C) pyrite (C) organic material (T)
100	0.3	Silt nodules (A) white; quartz (C) pyrite (C) organic material (T)
250	7.1	Quartz (A) silt nodules (C) white; pyrite (S) mica (S) manganiferous material (S)
PAN	92.4	Clay (A) silt (S)

TABLE 4 (Continued)

SCREEN ANALYSIS

TEST HOLE AH-49 . 45 TO 48 FEET

SIEVE SIZE (MESH)	PERCENT RETAINED	CHARACTER OF RESIDUE
35	0.5	Silt nodules (A) white & limonitic in part; pyrite (C) quartz (S) stained with limonite in part; limonite (S) organic material (S)
60	0.6	Silt nodules (A) white & limonitic in part; pyrite (C) quartz (C) stained with limonite in part; organic material (S)
100	1.0	Silt nodules (A) white; pyrite (S) quartz (S) organic material (T)
250	3.4	Silt nodules (C) white; quartz (C) pyrite (S) mica (S) organic material (T)
PAN	94.5	Clay (A) silt (S)

TABLE 4 (Continued)

SCREEN ANALYSIS

TEST HOLE AH-49 . 48 TO 52 FEET

SIEVE SIZE (MESH)	PERCENT RETAINED	CHARACTER OF RESIDUE
35	0.4	Clay nodules (A) white & limonitic in part; quartz (C) pyrite (S) organic material (S)
60	3.0	Clay nodules (A) white; quartz (S) pyrite (T) organic material (T)
100	6.5	Clay nodules (A) white; quartz (S) organic material (T)
250	10.7	Clay nodules (A) white; quartz (S) organic material (T)
PAN	79.4	Silt (C) clay (C)

TABLE 4 (Continued)

SCREEN ANALYSIS

TEST HOLE AH-61 . 0 TO 9 FEET

SIEVE SIZE (MESH)	PERCENT RETAINED	CHARACTER OF RESIDUE
35	Nil	Quartz (A) silt nodules (C) limy, pale gray & tan, leached; organic material (C) clay (S) dark gray; lignite (S) chert (S) vari-colored; manganiferous material (S) magnesite (T)
60	0.2	Silt nodules (C) limonitic; silt nodules (C) manganiferous; organic material (C) silt nodules (S) limy, pale gray & tan; chert (S) vari-colored; lignite (S) clay nodules (S) white
100	0.3	Quartz (A) silt nodules (C) limonitic; silt nodules (C) manganiferous; organic material (C) silt nodules (S) limy, pale gray; clay nodules (S) pale gray; chert (S) vari-colored; pyrite (T) foraminifera (T)
250	1.2	Quartz (A) silt nodules (C) limonitic; silt nodules (C) manganiferous; organic material (C) chert (S) vari-colored
PAN	98.3	Silt (A) clay (S)

TABLE 4 (Continued)

SCREEN ANALYSIS

TEST HOLE AH-61, 9 TO 17 FEET

SIEVE SIZE (MESH)	PERCENT RETAINED	CHARACTER OF RESIDUE
35	0.3	Quartz (A) silt nodules (C) limonitic & manganiferous; chert (S) organic material (S)
60	0.1	Quartz (A) silt nodules (C) limonitic & manganiferous; chert (S) organic material (T)
100	1.8	Quartz (A) silt nodules (C) limonitic & manganiferous; chert (S) organic material (T)
250	5.6	Quartz (A) silt nodules (C) manganiferous & limonitic; chert (S)
PAN	92.2	Silt (A) clay (S)

TABLE 4 (Continued)

SCREEN ANALYSIS

TEST HOLE AH-62, 18 TO 33 FEET

SIEVE SIZE (MESH)	PERCENT RETAINED	CHARACTER OF RESIDUE
35	Nil	Clay nodules (A) limonitic, white & pale gray; quartz (C) organic matter (C) lignite (S) pyrite (T) kaolinitic material (T)
60	Nil	Clay nodules (A) limonitic, white & light red & pink in part; organic matter (C) quartz (S) magnetite (T) kaolinitic material (T)
100	0.1	Clay nodules (A) limonitic, white & light red & pink in part; quartz (C) organic material (S) lignite (S)
250	0.6	Clay nodules (A) limonitic, white & light red & pink in part; quartz (C) organic material (S)
PAN	99.3	Clay (C) silt (C)

TABLE 4 (Continued)

SCREEN ANALYSIS

TEST HOLE AH-62, 43 TO 55 FEET

SIEVE SIZE (MESH)	PERCENT RETAINED	CHARACTER OF RESIDUE
35	Nil	Quartz (C) stained with limonite in part; clay nodules (C) limonitic; organic material (C)
60	Nil	Clay nodules (A) limonitic & white in part; quartz (C) organic material (S)
100	0.1	Quartz (A) clay nodules (C) limonitic & white in part; organic material (S) pyrite (S)
250	2.9	Quartz (A) clay nodules (C) manganiferous material (S)
PAN	97.0	Silt (C) clay (C)

TABLE 4 (Continued)

SCREEN ANALYSIS

TEST HOLE AH-62 . 18 TO 33 FEET

SIEVE SIZE (MESH)	PERCENT RETAINED	CHARACTER OF RESIDUE
35	Nil	Clay nodules (A) limonitic & white in part; quartz (C) stained with limonite in part; organic material (S)
60	Nil	Clay nodules (A) limonitic, white & light red in part; organic material (C) quartz (S)
100	0.1	Clay nodules (A) limonitic, white & light red in part; quartz (C) organic material (S)
250	0.6	Clay nodules (A) limonitic, white & light red in part; quartz (C) organic material (S)
PAN	99.3	Silt (A) clay (C)

TABLE 4 (Continued)

SCREEN ANALYSIS

TEST HOLE AH-62 . 43 TO 55 FEET

SIEVE SIZE (MESH)	PERCENT RETAINED	CHARACTER OF RESIDUE
35	Nil	Clay nodules (A) limonitic; organic material (C) limonite (S) silt nodules (S) white; quartz (T)
60	Nil	Clay nodules (A) limonitic & hematitic; quartz (C) organic material (C) pyrite (S) limonite (S)
100	0.2	Quartz (A) clay nodules (C) limonitic, hematitic & white in part; manganiferous material (S) pyrite (S) organic material (S)
250	1.3	Quartz (A) clay nodules (C) limonitic, hematitic & white in part; manganiferous material (S) organic material (S) pyrite (T)
PAN	98.5	Silt (A) clay (C)

TABLE 4 (Continued)

SCREEN ANALYSIS

TEST HOLE AH-63 . 0 TO 44 FEET

SIEVE SIZE (MESH)	PERCENT RETAINED	CHARACTER OF RESIDUE
35	0.3	Silt nodules (A) limy, tan, sucrosic; organic material (S) shell fragments (S) manganiferous material (T) quartz (T)
60	0.1	Silt nodules (A) limy, tan, sucrosic; shell fragments (C) manganiferous material (S) organic material (S) quartz (T)
100	0.1	Silt nodules (A) limy, tan, sucrosic; shell fragments (C) manganiferous
250	0.4	Silt nodules (C) limy, tan, sucrosic; quartz (C) manganiferous material (C) shell fragments (S) mica (S) organic material (T)
PAN	99.1	Silt (A) clay (S)

TABLE 4 (Continued)

SCREEN ANALYSIS

TEST HOLE AH-64, 0 TO 29 FEET

SIEVE SIZE (MESH)	PERCENT RETAINED	CHARACTER OF RESIDUE
35	Nil	Organic material (A) quartz (C) some with brown limonite stain; lignitic material (S) silt nodules (C) limonitic
60	Nil	Organic material (A) lignite (C) silt nodules (C) limonitic; quartz (S) mica (S)
100	0.2	Quartz (A) lignitic material (C) organic material (C) mica (C) chert (S) clay nodules (S) white
250	7.9	Quartz (A) lignitic material (C) mica (C) chert (S) organic material (S)
PAN	91.9	Silt (A) clay (S)

TABLE 4 (Continued)

SCREEN ANALYSIS

TEST HOLE AH-64 , 0 TO 29 FEET

SIEVE SIZE (MESH)	PERCENT RETAINED	CHARACTER OF RESIDUE
35	Nil	Organic material (A) silt nodules (S) limonitic; quartz (S)
60	Nil	Organic material (A) quartz (C) lignitic material (S) silt nodules (S) limonitic
100	Nil	Organic material (C) quartz (C) lignitic material (C) silt nodules (S) limonitic; mica (S)
250	2.0	Quartz (A) organic material (C) lignitic material (C) mica (C) silt nodules (C) white & limonitic
PAN	98.0	Silt (A) clay (C)

TABLE 5

PHYSICAL PROPERTIES IN THE UNBURNED STATE

HOLE NO.	DEPTH	WATER OF PLASTICITY WET BASIS (PERCENT)	WATER OF PLASTICITY DRY BASIS (PERCENT)	LINEAR DRYING SHRINKAGE (PERCENT)	MODULUS OF RUPTURE 1BS. SQ. IN.	PLASTICITY	EXTRUSION	WARPAGE	COLOR (DRY BAR)	REMARKS
				CATAHOULA CLAYS						
AH 42	3-20'	25.0	33.4	7.5	1345	Good	Good	Yes	Gray	
AH 43	14-18' 21-27'	22.4	28.7	7.5	1470	Good	Good	Yes	Light Gray	
AH 44	8-21'	22.0	28.3	7.0	1270	Good	Good	Yes	Light Gray	
AH 44	21-32'	20.7	26.1	7.0	1362	Good	Good	Yes	Gray	
AH 45	35-50'	27.9	35.9	8.2	1475	Good	Good	Yes	Light Gray	
AH 46	8-17'	23.7	30.7	7.5	1870	Good	Good	Yes	Light Gray	
AH 46	17-23'	24.8	32.9	6.7	1720	Good	Good	Yes	Light Gray	
AH 47	20-32'	23.6	30.9	7.5	1410	Good	Good	Yes	Light Gray	
AH 47	32-41'	25.8	36.2	7.5	1200	Good	Good	Yes	Light Gray	
AH 48	33-44'	24.0	31.4	8.0	1385	Good	Good	Yes	Light Gray	
AH 48	44-52'	24.9	33.8	7.5	1115	Good	Good	Yes	Light Gray	
AH 49	35-45'	23.2	30.2	8.5	1370	Good	Good	Yes	Light Gray	
AH 49	45-52'	28.7	40.0	9.5	1140	Good	Good	Yes	Light Gray	
AH 62	18-33' Light	26.0	35.1	7.0	1260	Good	Good	Yes	Light Tan	

TABLE 5 (Continued)

PHYSICAL PROPERTIES IN THE UNBURNED STATE

HOLE NO.	DEPTH	WATER OF PLASTICITY WET BASIS (PERCENT)	WATER OF PLASTICITY DRY BASIS (PERCENT)	LINEAR DRYING SHRINKAGE (PERCENT)	MODULUS OF RUPTURE 1BS. SQ. IN.	PLASTICITY	EXTRUSION	WARPAGE	COLOR (DRY BAR)	REMARKS
AH 62	18-33' Dark	24.6	32.6	7.0	1200	Good	Good	Yes	Dark Tan	
AH 62	43-55' Light	22.7	29.3	6.7	1085	Good	Good	Yes	Light Brown	
AH 62	43-55' Dark	21.5	27.4	7.5	1210	Good	Good	Yes	Orange Brown	
				LOESS	CLAYS					
AH 61	0-9'	18.1	22.1	0.5	254	Weak	Poor	No	Brown	
AH 61	9-17'	18.6	22.8	0.5	266	Weak	Poor	No	Brown	
AH 63	0-44'	18.7	22.5	0.5	220	Weak	Poor	No	Brown	
				ALLUVIUM	CLAY					
AH 64	0-29'	20.2	25.4	8.5	1240	Good	Good	Yes	Dark Gray	
			CATAHOULA CLAY AND LOESS CLAY BLENDS							
	Blend A	18.5	22.7	4.5	714	Good	Good	No	Gray Brown	20% AH-47, 20-41' 80% AH-63, 0-44'
	Blend B	19.1	23.6	4.5	726	Good	Good	No	Gray Brown	20% AH-44, 8-21' 80% AH-63, 0-44'

TABLE 6

PYROPHYSICAL PROPERTIES

HOLE NO.	DEPTH	TEMPERATURE °F.	AT CONE	POROSITY (PERCENT)	ABSORPTION (PERCENT)	BULK SPECIFIC GRAVITY	APPARENT SPECIFIC GRAVITY	TOTAL LINEAR SHRINKAGE (PERCENT)	MODULUS OF RUPTURE IN 1B./SQ. IN.	COLOR	REMARKS
					CATAHOULA CLAYS						
AH 42	3-20'	2014	03	13.30	6.75	1.93	2.23	10.5	2830	Buff	
AH 42	3-20'	2079	01	10.45	6.96	1.80	2.16	11.0	3520	Buff	
AH 42	3-20'	2134	3	10.70	5.20	1.98	2.22	11.0	3350	Tan	Flashed
AH 42	3-20'	2167	4	10.90	5.47	1.99	2.24	11.0	3620	Tan	Flashed
AH 42	3-20'	2185	5	12.50	5.96	2.10	2.40	11.5	2840	Light Red	
AH 42	3-20'	2264	7	13.70	6.70	2.03	2.35	12.0	3150	Red	
AH 43	14-18' 21-27'	2014	03	22.50	9.80	2.28	2.29	9.0	1470	Light Red	
AH 43	14-18' 21-27'	2079	01	21.00	10.80	1.92	2.44	9.0	1840	Buff	
AH 43	14-18' 21-27'	2134	3	21.80	11.10	1.92	2.46	9.5	1825	Tan	Flashed
AH 43	14-18' 21-27'	2167	4	23.60	11.90	1.90	2.50	9.0	1965	Tan	Flashed
AH 43	14-18' 21-27'	2185	5	18.50	9.40	1.96	2.41	9.5	1910	Red	
AH 43	14-18' 21-27'	2264	7	21.80	10.70	1.95	2.50	----	----	Red	No Data

TABLE 6 (Continued)

PYROPHYSICAL PROPERTIES

HOLE NO.	DEPTH	TEMPERATURE °F	AT CONE	POROSITY (PERCENT)	ABSORPTION (PERCENT)	BULK SPECIFIC GRAVITY	APPARENT SPECIFIC GRAVITY	TOTAL LINEAR SHRINKAGE (PERCENT)	MODULUS OF RUPTURE IN 1B./SQ. IN.	COLOR	REMARKS
AH 44	8-21'	2014	03	14.75	7.46	1.98	2.35	9.7	1750	Buff	
AH 44	8-21'	2079	01	11.45	5.55	2.06	2.32	10.0	3170	Buff	
AH 44	8-21'	2134	3	12.50	5.68	2.24	2.57	10.5	3300	Tan	Flashed
AH 44	8-21'	2167	4	10.85	5.25	2.08	2.33	10.5	4570	Tan	Flashed
AH 44	8-21'	2185	5	12.30	5.80	2.11	2.35	10.5	5470	Light Red	
AH 44	8-21'	2264	7	13.90	6.60	2.11	2.45	11.0	3520	Red	
AH 44	21-32'	2014	03	18.95	9.80	1.95	2.41	8.5	2260	Buff	
AH 44	21-32'	2079	01	20.30	10.45	1.95	2.45	9.0	2380	Buff	
AH 44	21-32'	2134	3	20.30	10.60	1.94	2.43	9.0	2340	Tan	Flashed
AH 44	21-32'	2167	4	20.00	10.20	1.97	2.46	9.5	2340	Tan	Flashed
AH 44	21-32'	2185	5	17.80	9.00	1.99	2.43	9.5	2560	Light Red	
AH 44	21-32'	2264	7	20.90	10.60	1.95	2.50	10.0	2970	Light Red	

TABLE 6 (Continued)
PYROPHYSICAL PROPERTIES

HOLE NO.	DEPTH	TEMPERATURE °F.	AT CONE	POROSITY (PERCENT)	ABSORPTION (PERCENT)	BULK SPECIFIC GRAVITY	APPARENT SPECIFIC GRAVITY	TOTAL LINEAR SHRINKAGE (PERCENT)	MODULUS OF RUPTURE IN 1B./SQ. IN.	COLOR	REMARKS
AH 45	35-50'	2014	03	0.00	0.00	2.17	2.17	12.5	2920	Tan	
AH 45	35-50'	2079	01	0.00	0.00	2.18	2.18	13.5	4250	Tan	
AH 45	35-50'	2134	3	1.52	0.72	2.13	2.17	13.0	4620	Brown	Flashed
AH 45	35-50'	2167	4	2.90	1.37	2.18	2.22	13.5	4650	Brown	Flashed
AH 45	35-50'	2185	5	1.29	0.59	2.19	2.21	13.5	3100	Red	
AH 45	35-50'	2264	7	5.24	2.48	2.14	2.26	13.5	5000	Red	
AH 46	8-17'	2014	03	8.55	4.17	2.04	2.24	10.5	2500	Light Red	Cracked
AH 46	8-17'	2079	01	6.71	3.98	2.06	2.24	----	----	Light Red	No Data
AH 46	8-17'	2134	3	----	----	----	----	10.0	1390	Brown	No Data Cracked
AH 46	8-17'	2167	4	7.86	3.78	2.09	2.46	12.0	3280	Brown	Flashed
AH 46	8-17'	2185	5	----	----	----	----	----	----	Red	No Data Cracked
AH 46	8-17'	2264	7	10.50	5.04	2.10	2.34	----	----	Red	No Data Cracked

TABLE 6 (Continued)

PYROPHYSICAL PROPERTIES

HOLE NO.	DEPTH	TEMPER-ATURE °F.	AT CONE	POROSITY (PERCENT)	ABSORPTION (PERCENT)	BULK SPECIFIC GRAVITY	APPARENT SPECIFIC GRAVITY	TOTAL LINEAR SHRINKAGE (PERCENT)	MODULUS OF RUPTURE IN 1B./SQ. IN.	COLOR	REMARKS
AH 46	17-23'	2014	03	0.18	0.06	2.31	2.34	10.5	2680	Light Red	
AH 46	17-23'	2079	01	1.85	0.67	2.16	2.18	11.0	3190	Light Red	
AH 46	17-23'	2134	3	2.18	1.03	2.14	2.18	11.0	3900	Brown	Flashed
AH 46	17-23'	2167	4	3.85	1.85	2.10	2.20	11.0	3480	Brown	Flashed
AH 46	17-23'	2185	5	----	----	----	----	11.0	2995	Red	No Data
AH 47	20-32'	2014	03	19.20	9.87	1.94	2.39	11.0	1340	Light Red	
AH 47	20-32'	2079	01	18.40	9.26	1.95	2.38	10.5	1790	Light Red	
AH 47	20-32'	2134	3	17.50	9.10	1.91	2.32	10.5	1720	Tan	Flashed
AH 47	20-32'	2167	4	13.30	8.40	1.58	2.07	11.0	1855	Brown	Flashed
AH 47	20-32'	2185	5	18.50	9.20	2.01	2.48	12.5	2660	Red	
AH 47	20-32'	2264	7	17.20	8.20	2.38	2.74	13.0	2550	Red	

TABLE 6 (Continued)

PYROPHYSICAL PROPERTIES

HOLE NO.	DEPTH	TEMPERATURE °F	AT CONE	POROSITY (PERCENT)	ABSORPTION (PERCENT)	BULK SPECIFIC GRAVITY	APPARENT SPECIFIC GRAVITY	TOTAL LINEAR SHRINKAGE (PERCENT)	MODULUS OF RUPTURE IN 1B./SQ. IN.	COLOR	REMARKS
AH 47	32-41'	2014	03	11.00	5.44	2.04	2.29	11.5	1980	Light Red	
AH 47	32-41'	2079	01	11.45	5.65	2.03	2.29	12.0	2680	Light Red	
AH 47	32-41'	2134	3	10.25	5.06	2.02	2.25	11.0	2780	Tan	
AH 47	32-41'	2167	4	10.50	5.20	2.02	2.27	12.0	3320	Brown	
AH 47	32-41'	2185	5	11.00	5.20	2.11	2.38	12.5	3010	Red	
AH 47	32-41'	2264	7	13.65	6.76	2.02	2.34	13.0	2920	Red	
AH 48	33-44'	2014	03	15.60	7.95	1.95	2.30	9.5	870	Light Red	Cracked & Stained
AH 48	33-44'	2079	01	15.80	8.16	1.93	2.30	10.5	1570	Light Red	Cracked & Stained
AH 48	33-44'	2134	3	12.30	6.12	2.02	2.29	11.0	3240	Tan	Stained
AH 48	33-44'	2167	4	12.70	6.10	2.02	2.32	11.5	1150	Brown	Cracked Flashed
AH 48	33-44'	2185	5	13.45	6.55	2.06	2.38	----	----	Red	Cracked & Stained No Data
AH 48	33-44'	2264	7	16.50	7.90	2.11	2.52	11.5	5750	Red	Stained

TABLE 6 (Continued)

PYROPHYSICAL PROPERTIES

HOLE NO.	DEPTH	TEMPERATURE F.	AT CONE	POROSITY (PERCENT)	ABSORPTION (PERCENT)	BULK SPECIFIC GRAVITY	APPARENT SPECIFIC GRAVITY	TOTAL LINEAR SHRINKAGE (PERCENT)	MODULUS OF RUPTURE IN LB. SQ. IN.	COLOR	REMARKS
AH 48	44-52'	2014	03	12.60	6.45	1.96	2.24	10.0	----	Light Red Specked	No Data Cracked
AH 48	44-52'	2079	01	11.00	5.35	2.06	2.31	10.5	1300	Red Specked	
AH 48	44-52'	2134	3	9.22	4.57	2.01	2.22	11.5	2625	Brown Specked	Flashed
AH 48	44-52'	2167	4	10.01	4.98	2.03	2.68	12.0	3720	Brown Specked	Flashed
AH 48	44-52'	2185	5	12.70	6.45	1.97	2.24	12.5	2610	Brown Specked	Cracked
AH 48	44-52'	2264	7	14.80	7.60	1.72	2.02	12.5	2360	Red Specked	Cracked
AH 49	35-45'	2014	03	25.30	13.70	1.85	2.48	9.0	1453	Buff	
AH 49	35-45'	2079	01	22.20	13.55	1.65	2.11	9.5	2260	Buff	
AH 49	35-45'	2134	3	22.20	11.80	1.87	2.18	10.5	3320	Buff	
AH 49	35-45'	2167	4	19.60	10.45	1.84	2.34	10.5	3190	Buff	
AH 49	35-45'	2185	5	20.70	10.60	1.93	2.44	10.5	2930	Buff	
AH 49	35-45'	2264	7	23.00	11.90	1.90	2.52	11.0	3650	Buff	

TABLE 6 (Continued)

PYROPHYSICAL PROPERTIES

HOLE NO.	DEPTH	TEMPER-ATURE °F.	AT CONE	POROSITY (PERCENT)	ABSORPTION (PERCENT)	BULK SPECIFIC GRAVITY	APPARENT SPECIFIC GRAVITY	TOTAL LINEAR SHRINKAGE (PERCENT)	MODULUS OF RUPTURE IN 1B./SQ. IN.	COLOR	REMARKS
AH 49	45-52'	2014	03	12.10	7.35	1.63	1.86	12.0	1170	Buff	
AH 49	45-52'	2079	01	11.70	5.74	1.95	2.21	13.0	1480	Buff	
AH 49	45-52'	2134	3	8.30	4.20	1.96	2.14	13.5	2480	Brown	Flashed
AH 49	45-52'	2167	4	10.80	5.20	1.99	2.22	13.5	2740	Brown	Flashed
AH 49	45-52'	2185	5	10.85	5.35	2.04	2.28	13.5	2910	Red	
AH 49	45-52'	2264	7	15.00	7.58	1.98	2.34	14.5	2810	Red	
AH 62	18-33' Light	2014	03	0.00	0.00	2.20	2.20	12.5	4075	Light Red	
AH 62	18-33' Light	2079	01	0.23	0.10	2.20	2.26	12.5	----	Light Red	No Data Cracked
AH 62	18-33' Light	2134	3	0.00	0.00	2.20	2.20	12.5	3270	Brown	Flashed
AH 62	18-33' Light	2167	4	4.70	1.78	2.68	2.71	12.5	2690	Brown	Flashed
AH 62	18-33' Light	2185	5	----	----	----	----	12.5	4260	Brown	No Data
AH 62	18-33' Light	2264	7	6.18	2.75	2.24	2.38	12.2	5250	Red	

TABLE 6 (Continued)

PYROPHYSICAL PROPERTIES

HOLE NO.	DEPTH	TEMPERATURE °F	AT CONE	POROSITY (PERCENT)	ABSORPTION (PERCENT)	BULK SPECIFIC GRAVITY	APPARENT SPECIFIC GRAVITY	TOTAL LINEAR SHRINKAGE (PERCENT)	MODULUS OF RUPTURE IN 1B./SQ. IN.	COLOR	REMARKS
AH 62	18-33' Dark	2014	03	2.56	1.16	2.18	2.23	11.2	5300	Light Red	
AH 62	18-33' Dark	2079	01	2.00	0.91	2.20	2.27	12.0	5100	Light Red	
AH 62	18-33' Dark	2134	3	4.16	2.11	2.17	2.28	12.0	3920	Brown	Flashed
AH 62	18-33' Dark	2167	4	5.16	2.46	2.10	2.23	11.0	3250	Brown	Flashed
AH 62	18-33' Dark	2185	5	3.94	1.80	2.18	2.27	12.0	4450	Red	
AH 62	18-33' Dark	2264	7	6.60	2.95	2.24	2.46	12.2	5250	Red	
AH 62	43-55' Light	2014	03	0.45	0.19	2.26	2.28	11.5	5900	Light Red	
AH 62	43-55' Light	2079	01	0.96	0.43	2.26	2.28	12.0	7050	Light Red	
AH 62	43-55' Light	2134	3	0.72	0.43	2.22	2.24	11.5	2720	Brown	Flashed
AH 62	43-55' Light	2167	4	6.54	3.92	2.24	2.40	11.5	3320	Brown	Flashed
AH 62	43-55' Light	2185	5	2.86	1.11	2.42	2.42	11.5	5125	Red	
AH 62	43-55' Light	2264	7	6.45	2.88	2.20	2.35	11.5	4770	Red	

TABLE 6 (Continued)

PYROPHYSICAL PROPERTIES

HOLE NO.	DEPTH	TEMPERATURE F.	AT CONE	POROSITY (PERCENT)	ABSORPTION (PERCENT)	BULK SPECIFIC GRAVITY	APPARENT SPECIFIC GRAVITY	TOTAL LINEAR SHRINKAGE (PERCENT)	MODULUS OF RUPTURE IN 1B./SQ. IN.	COLOR	REMARKS
AH 62	43-55' Dark	2014	03	7.92	3.56	2.23	2.42	11.50	8980	Light Red	
AH 62	43-55' Dark	2079	01	3.96	1.77	2.25	2.34	12.00	7050	Light Red	
AH 62	43-55' Dark	2134	3	5.50	2.44	2.26	2.39	11.50	6420	Brown	Flashed
AH 62	43-55' Dark	2167	4	2.78	1.27	2.18	2.24	11.50	4700	Brown	Flashed
AH 62	43-55' Dark	2185	5	1.95	0.86	2.28	2.39	12.00	7760	Red	
AH 62	43-55' Dark	2264	7	5.93	2.62	2.26	2.40	----	----	Red	No Data
					LOESS CLAYS						
AH 61	0-9'	2014	03	27.10	17.00	1.80	2.06	2.0	672	Red	
AH 61	0-9'	2079	01	29.70	16.45	1.77	2.52	4.0	940	Red	
AH 61	0-9'	2134	3	15.50	7.50	2.04	2.40	6.0	1200	Brown	Flashed
AH 61	0-9'	2167	4	17.20	8.60	2.00	2.42	8.5	1865	Brown	Flashed
AH 61	0-9'	2185	5	6.85	3.18	2.15	2.31	8.0	2070	Reddish Brown	
AH 61	0-9'	2264	7	3.57	1.67	2.16	2.23	----	----	Reddish Brown	No Data

TABLE 6 (Continued)
PYROPHYSICAL PROPERTIES

HOLE NO.	DEPTH	TEMPERATURE °F.	AT CONE	POROSITY (PERCENT)	ABSORPTION (PERCENT)	BULK SPECIFIC GRAVITY	APPARENT SPECIFIC GRAVITY	TOTAL LINEAR SHRINKAGE (PERCENT)	MODULUS OF RUPTURE IN 1B./SQ. IN.	COLOR	REMARKS
AH 61	9-17'	2014	03	28.60	15.00	1.90	2.23	1.5	853	Red	
AH 61	9-17'	2079	01	27.10	15.00	1.82	2.48	2.5	1000	Red	
AH 61	9-17'	2134	3	18.80	9.25	2.14	2.34	6.0	1440	Brown	Flashed
AH 61	9-17'	2167	4	9.21	4.31	2.02	2.50	8.5	1865	Brown	Flashed
AH 61	9-17'	2185	5	11.45	5.26	2.18	2.46	8.5	3650	Reddish Brown	
AH 61	9-17'	2264	7	2.41	1.14	2.11	2.16	----	----	Reddish Brown	No Data
AH 63	0-44'	2014	03	28.80	13.95	2.08	2.90	0.5	535	Light Red	
AH 63	0-44'	2079	01	23.80	10.75	2.21	2.89	1.5	880	Light Red	
AH 63	0-44'	2134	3	24.20	12.70	1.90	2.50	4.0	1650	Grayish Brown	Flashed
AH 63	0-44'	2167	4	14.95	6.50	2.30	2.70	----	----	Grayish Brown	No Data Flashed
AH 63	0-44'	2185	5	4.12	2.04	2.22	2.32	10.0	3760	Brown	
AH 63	0-44'	2264	7	----	----	----	----	----	----	Green	Melted

TABLE 6 (Continued)
PYROPHYSICAL PROPERTIES

HOLE NO.	DEPTH	TEMPERATURE °F.	AT CONE	POROSITY (PERCENT)	ABSORPTION (PERCENT)	BULK SPECIFIC GRAVITY	APPARENT SPECIFIC GRAVITY	TOTAL LINEAR SHRINKAGE (PERCENT)	MODULUS OF RUPTURE IN 1B./SQ. IN.	COLOR	REMARKS
					ALLUVIAL CLAYS						
AH 64	0-29'	2014-2185	03-5	----	----	----	----	----	----	Red	No Data Bloated
					CATAHOULA CLAY BLENDS						
	Blend A	2014	03	35.40	20.90	1.70	2.59	4.5	1140	Light Red	
	Blend A	2079	01	36.30	21.80	1.65	2.60	4.0	941	Light Red	
	Blend A	2134	3	22.40	11.60	1.94	2.50	7.5	2625	Grayish Brown	
	Blend A	2167	4	20.15	10.08	2.02	2.51	----	----	Brown	No Data
	Blend A	2185	5	15.20	7.00	2.18	2.56	12.0	3300	Brown	
	Blend A	2264	7	----	----	----	----	----	----		Melted
	Blend B	2014	03	35.40	20.90	1.70	2.59	4.5	1220	Light Red	
	Blend B	2079	01	34.40	20.40	1.68	2.67	3.5	1200	Light Red	
	Blend B	2134	3	29.20	13.80	2.11	2.91	8.0	3500	Grayish Tan	Flashed
	Blend B	2167	4	14.60	6.20	2.36	2.74	10.0	4120	Brown	Flashed
	Blend B	2185	5	15.85	7.40	2.14	2.54	11.2	4200	Brown	
	Blend B	2264	7	----	----	----	----	----	----		Melted

CLAIBORNE COUNTY, MISSISSIPPI

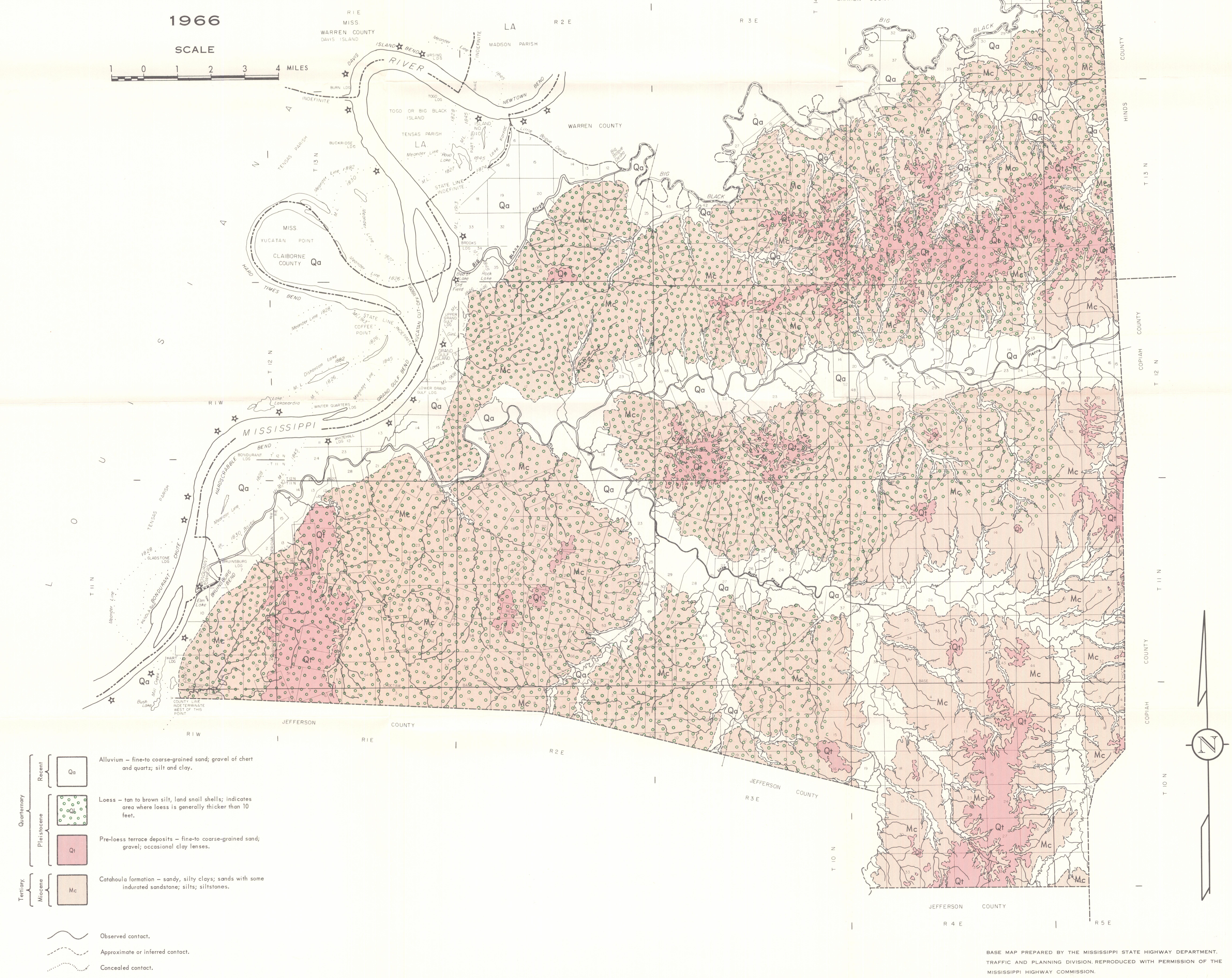
GEOLOGIC MAP

GEOLOGY BY ALVIN R. BICKER JR.

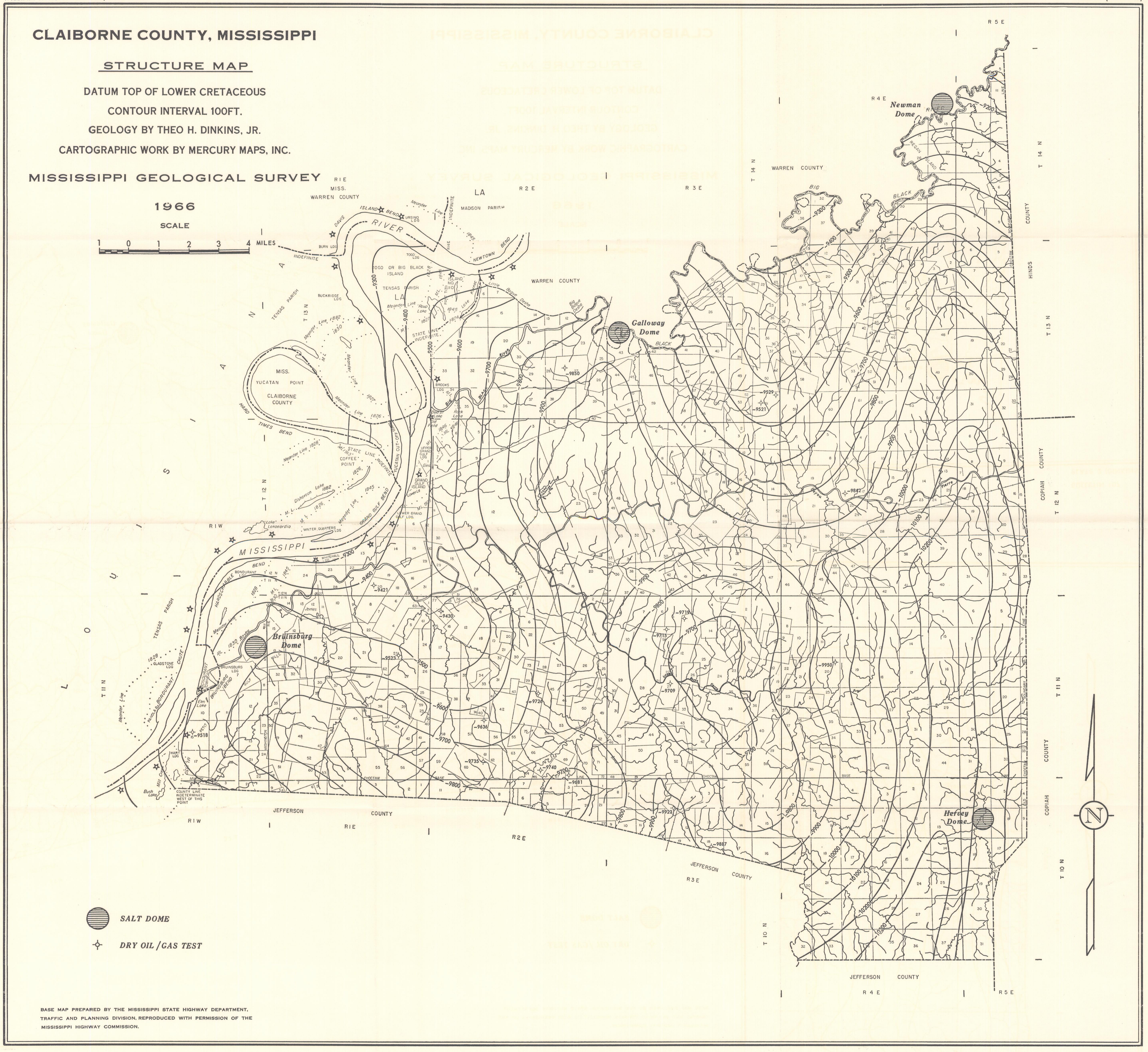
CARTOGRAPHIC WORK BY MERCURY MAPS INC.

MISSISSIPPI GEOLOGICAL SURVEY

1966



BASE MAP PREPARED BY THE MISSISSIPPI STATE HIGHWAY DEPARTMENT. TRAFFIC AND PLANNING DIVISION. REPRODUCED WITH PERMISSION OF THE MISSISSIPPI HIGHWAY COMMISSION.


CLAIBORNE COUNTY, MISSISSIPPI
STRUCTURE MAP
DATUM TOP OF LOWER CRETACEOUS
CONTOUR INTERVAL 100FT.
GEOLOGY BY THEO H. DINKINS, JR.
CARTOGRAPHIC WORK BY MERCURY MAPS, INC.
MISSISSIPPI GEOLOGICAL SURVEY
1966
SCALE
1 0 1 2 3 4 MILES
SALT DOME
DRY OIL/GAS TEST
Newman Dome
Galloway Dome
Bruinsburg Dome
Hefvey Dome
WARREN COUNTY
HINDS COUNTY
COPIAH COUNTY
JEFFERSON COUNTY
TENSAS PARISH
MADISON PARISH
MISSISSIPPI RIVER
BASE MAP PREPARED BY THE MISSISSIPPI STATE HIGHWAY DEPARTMENT, TRAFFIC AND PLANNING DIVISION, REPRODUCED WITH PERMISSION OF THE MISSISSIPPI HIGHWAY COMMISSION.

CLAIBORNE COUNTY, MISSISSIPPI

ISOPACHOUS MAP

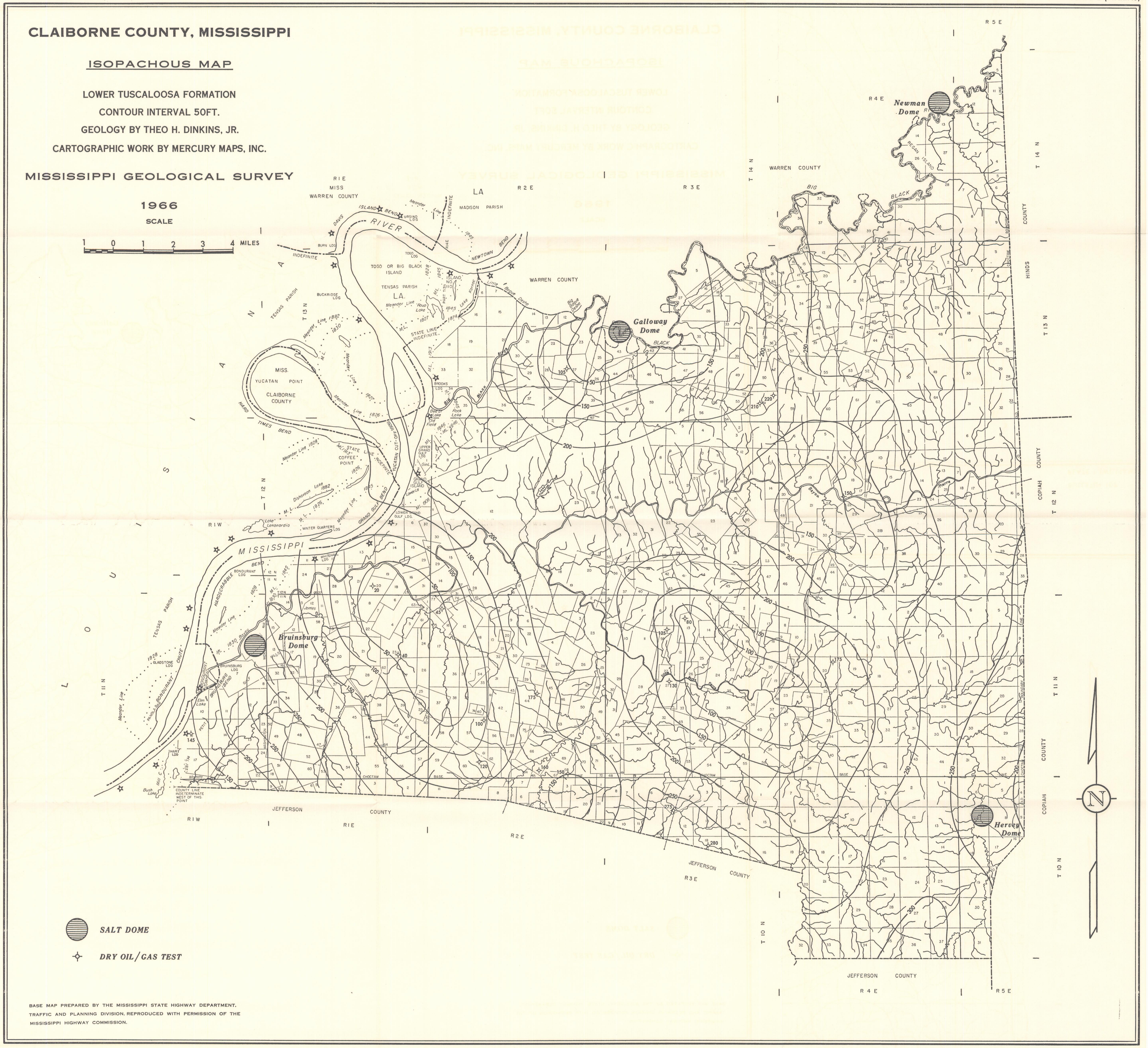
LOWER TUSCALOOSA FORMATION
CONTOUR INTERVAL 50FT.
GEOLOGY BY THEO H. DINKINS, JR.
CARTOGRAPHIC WORK BY MERCURY MAPS, INC.

MISSISSIPPI GEOLOGICAL SURVEY

1966

SCALE

1 0 1 2 3 4 MILES



SALT DOME

DRY OIL/GAS TEST

BASE MAP PREPARED BY THE MISSISSIPPI STATE HIGHWAY DEPARTMENT, TRAFFIC AND PLANNING DIVISION. REPRODUCED WITH PERMISSION OF THE MISSISSIPPI HIGHWAY COMMISSION.

MISSISSIPPI GEOLOGICAL, ECONOMIC & TOPOGRAPHICAL SURVEY
WILLIAM HALSELL MOORE, DIRECTOR

CLAIBORNE COUNTY, MISSISSIPPI

STRUCTURE MAP

DATUM TOP OF GLENDON LIMESTONE

CONTOUR INTERVAL 20FT.

GEOLOGY BY CHARLES H. WILLIAMS, JR.

CARTOGRAPHIC WORK BY MERCURY MAPS, INC.

MISSISSIPPI GEOLOGICAL SURVEY

1966

SCALE

1 0 1 2 3 4 MILES

SALT DOME

DRY OIL/GAS TEST

GAS WELL

CORE HOLE

BASE MAP PREPARED BY THE MISSISSIPPI STATE HIGHWAY DEPARTMENT, TRAFFIC AND PLANNING DIVISION. REPRODUCED WITH PERMISSION OF THE MISSISSIPPI HIGHWAY COMMISSION.

CLAIBORNE COUNTY, MISSISSIPPI

STRUCTURE MAP

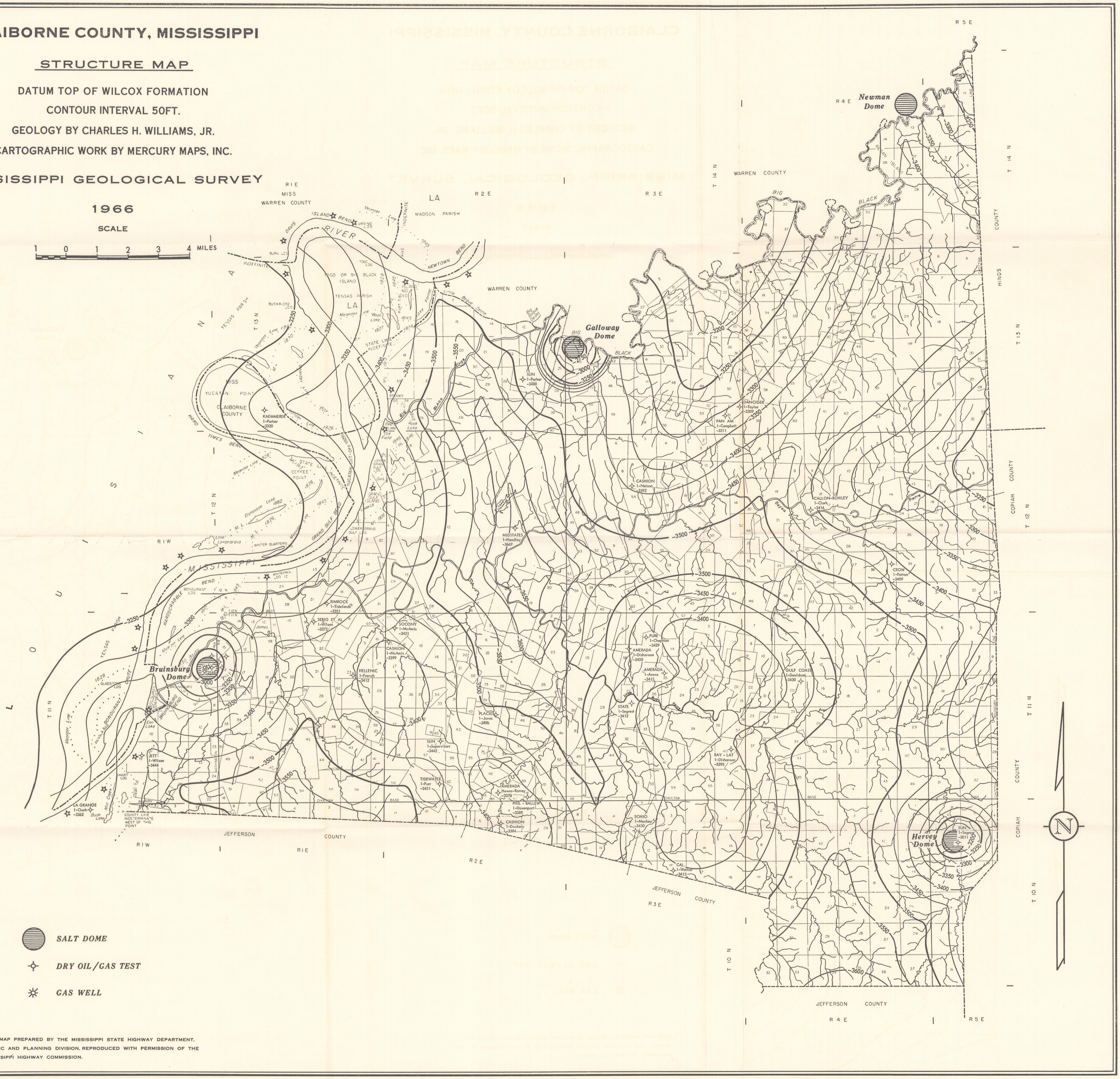
DATUM TOP OF WILCOX FORMATION
CONTOUR INTERVAL 50FT.
GEOLOGY BY CHARLES H. WILLIAMS, JR.
CARTOGRAPHIC WORK BY MERCURY MAPS, INC.

MISSISSIPPI GEOLOGICAL SURVEY

1966

SCALE

1 0 1 2 3 4 MILES



SALT DOME

DRY OIL/GAS TEST

GAS WELL

BASE MAP PREPARED BY THE MISSISSIPPI STATE HIGHWAY DEPARTMENT, TRAFFIC AND PLANNING DIVISION, REPRODUCED WITH PERMISSION OF THE MISSISSIPPI HIGHWAY COMMISSION.

RECENT BULLETINS

97. Mississippi Geologic Research Papers - 1962; Contains: Economic Potential of Alumina-rich Clays and Bauxite in Mississippi, by Marshall K. Kern; Stratigraphic Implications from Studies of the Mesozoic of Central and Southern Mississippi, by William H. Moore; Land Snails from the Loess of Mississippi, by Leslie Hubricht; Pleistocene Land Snails of Southern Mississippi and Adjacent Louisiana, by Leslie Hubricht; Problem of Dessication Sinking at Clarksdale, by Tracy W. Lusk; and Geologic History and Oil and Gas Possibilities of Mississippi, by E. H. Rainwater. 106 pp., 50 figs., 1963. $1.00

98. Geologic Study Along Highway 25 from Starkville to Carthage: Tracy W. Lusk. 48 pp., 15 figs., 3 pl., 1963. $1.00
This is the fourth in a series of geologic studies made by the Survey along State Highways. Beds from Upper Cretaceous to Middle Eocene are profiled and described.

99. Attala County Mineral Resources: William S. Parks, et al. 192 pp., 32 figs., 6 pl., 12 tables, 1963. $2.00
The report contains additional sections: Attala County Ceramic Tests, by Thomas E. McCutcheon; Attala County Subsurface Geology, by William H. Moore; and Water Resources of Attala County, Mississippi, by B. E. Wasson.

100. The Mississippi Geological Survey, A Centennial: Contains: Report of a Geological Reconnaissance of Parts of the Counties of Yazoo, Issaquena, Washington, Holmes, Bolivar, Tallahatchie, Coahoma, Mississippi During the Months of October and November, 1870, by Eugene A. Smith; History of the Mississippi Geological Survey, by Ephraim N. Lowe; Memorial to Ephraim N. Lowe (1864-1933), by William C. Morse; Address at Recognition Dinner Honoring Dr. W. C. Morse and Prof. F. E. Vestal, upon their Retirements, by Frederic F. Mellen; Memorial to William Clifford Morse, by Franklin E. Vestal; Employment in the Mining Industry in Mississippi, by William T. Hankins; The Present Course of the Mississippi Geological Survey by Frederic F. Mellen and William S. Parks; The Survey's enabling act; List of State Geologists; Index to Bulletins 1-99, by William S. Parks. 183 pp., 32 figs., frontispiece. 1963. $2.00

101. An Investigation of Iron Ore of Mississippi: Marshall K. Kern, 77 pp., 11 figs., 6 tables, frontispiece. 1963. $1.00
Numerous test holes were drilled and many chemical analyses were made. A summary is given of ore produced and sold in the past and of the one smelting operation in 1913 at Winborn.

102. Mississippi Geologic Research Papers - 1963: Contains: Regional Stratigraphy of the Midway and Wilcox in Mississippi, by Edward H. Rainwater; Late Pleistocene and Recent History of Mississippi Sound Between Beauvoir and Ship Island, by Edward H. Rainwater; and Geology of Northeast Quarter of the West Point, Mississippi Quadrangle, and Related Bentonites, by Thomas F. Torries. 98 pp., 22 figs., 22 graphic logs, 3 tables, 1 plate. 1964. $1.00

103. Survey of Lightweight Aggregate Materials of Mississippi; Geology by William S. Parks; Economics by Clyde A. McLeod; and Tests by Allan G. Wehr. 115 pp., 18 figs., 10 tables. 1964. $2.00

104. Mississippi Geologic Research Papers - 1964: Contains: Type Localities Sampling Program by William H. Moore, William S. Parks and Marshall K. Kern; Hilgard as a Geologist by Henry V. Howe; Plant Microfossils from the Eocene Cockfield Formation, Hinds County, Mississippi by Donald W. Engelhardt; Current Projects of the Mississippi Geological Survey by Frederic F. Mellen; Well Logging by Mississippi Geological Survey by Alvin R. Bicker, Jr., and Frederic F. Mellen. 127 pp., 19 figs., 1 table, 6 plates. 1964. $2.00

105. Hinds County Geology and Mineral Resources: by William H. Moore, and others. The report contains additional sections: Hinds County Structural Geology: by Alvin R. Bicker, Jr.; Hinds County Water Resources: by Alvin R. Bicker, Jr., et al; Hinds County Clay Tests: by Thomas E. McCutcheon; and Hinds County Mineral Industries: by William S. Parks. 244 pp., 82 Figs., Plates, tables and a surface geologic map in color. 1965. $3.00

106. Sediments and Microfauna off the Coasts of Mississippi and Adjacent States: Charles F. Upshaw, Wilgus B. Creath and Frank L. Brooks. 127 pp., 97 figs., plates and tables. Two plates in color. 1966. $2.00.