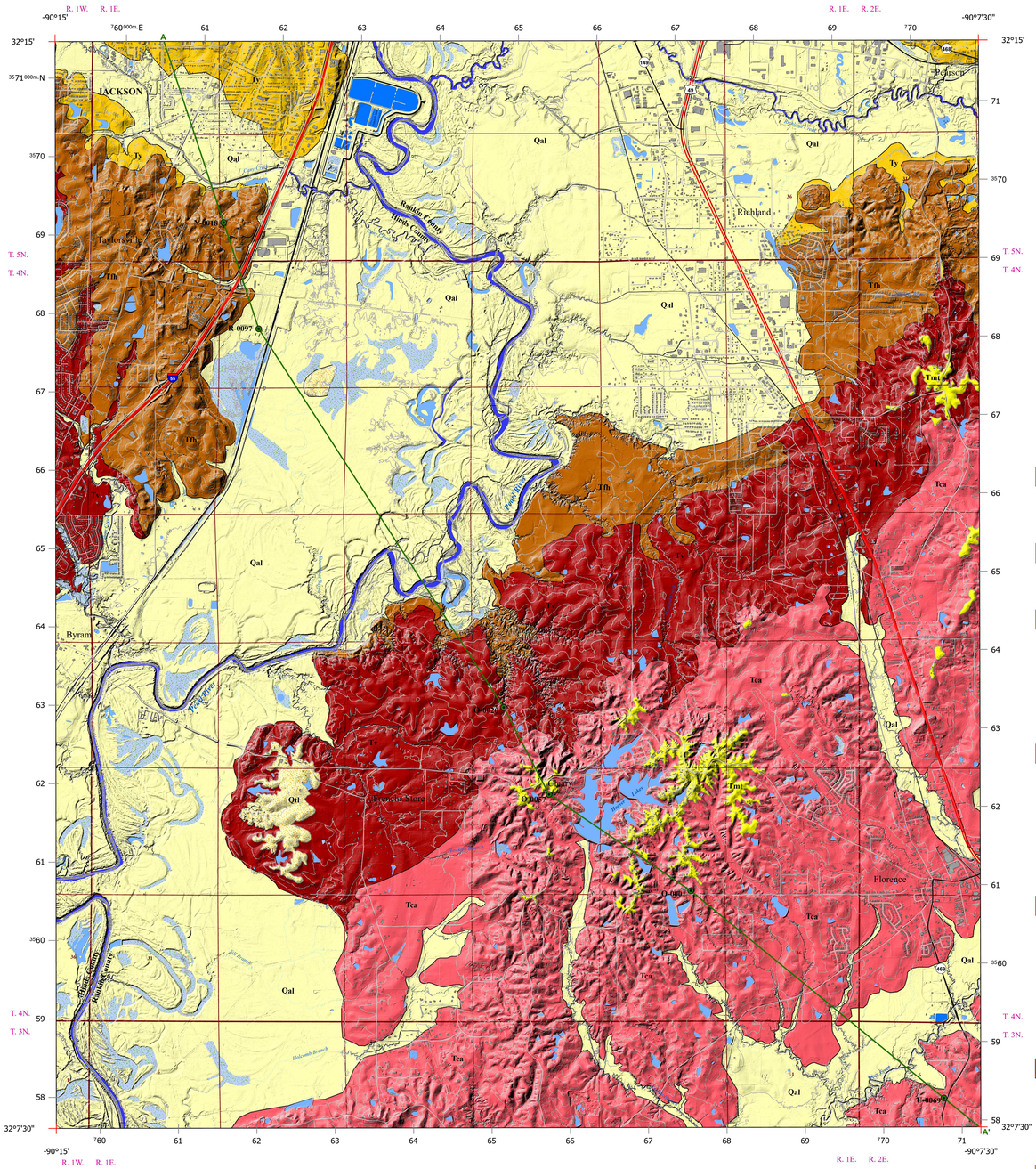
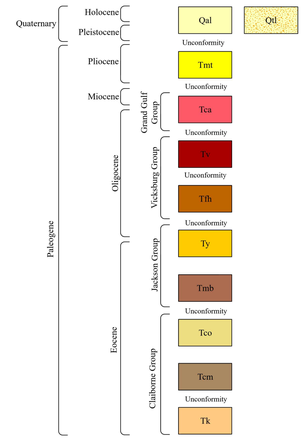
MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF GEOLOGY SURFACE MAPPING DIVISION
MISSISSIPPI GEOLOGICAL SURVEY

Prepared in cooperation with
UNITED STATES GEOLOGICAL SURVEY
NATIONAL COOPERATIVE GEOLOGIC MAPPING PROGRAM

GEOLOGIC MAP OF THE 7.5-MINUTE
FLORENCE QUADRANGLE
OPEN-FILE REPORT 361



Correlation of Map Units



Descriptions of Map Units

Qal — **Alluvium (Pleistocene to Holocene)**
Sand, yellow- to brownish-white in color, fine- to coarse-grained, subrounded to rounded, predominately quartzose, silty, clayey; humus lenses common. Streams on clay subcrop will exhibit shallow, wide alluvial plains while streams on sand subcrop tend to incise creating steep valleys with narrow alluvial plains, silicified wood common. Thickness approximately 50 feet along larger streams, thinning up tributaries.

Qtl — **Stream Terrace (Pleistocene to Holocene)**
Fluvial deposits associated with base elevation change with the incision of the Pearl River during the Pleistocene epoch just west of French's Store; Sand, yellow- to brownish-white in color, fine- to coarse-grained, subrounded to rounded, predominately quartzose, locally graveliferous, silty to clayey; humus lenses common. Silicified wood may be common.

Tmt — **Magee Terrace (Pliocene to Pleistocene)**
Generally fining-upward sequence of fluvial siliciclastic deposits attributed to courses of the Plio-Pleistocene ancestral Tennessee–Ohio River system. Sand is yellow, orange, purple, red, and pink; fine to coarse grained; predominantly quartzose; cross bedded to massive. Graveliferous, containing pea to cobble size clasts typically not exceeding lengths of 3 in; clasts composed chiefly of chert with lesser amounts of quartz. Clay is kaolinitic, pink to white and occurs as discontinuous lenses and as basal rip up clasts. Relic floodplain silts and clays are preserved above approximately 550 ft MSL. The base of the unit is unconformable at roughly 400 ft MSL. Conglomeritic ironstone is commonly developed at the contact with the underlying Catahoula Formation.

Grand Gulf Group

Tca — **Catahoula Formation (Oligocene to Miocene)**
Deltaic to marine sands, silts, clays, sandstone, and sparse gravel. Sand is gray, pale yellow to white; fine to coarse grained; cross bedded to massive. Contains rare thinly bedded pea gravel layers. Gravels consist of highly polished black chert and milky quartz, ranging from subangular to well rounded. Sand is commonly indurated near the surface to sandstone. Predominantly quartzose with lesser amounts of chert, metaquartzite, mica, and heavy minerals; slightly glauconitic in places. Silicified wood and fossil palm fragments are common. Clay is green, gray, and brown; weathers white to brown in color; silty to sandy. Lignite is common in basal clay intervals. Unit is fossiliferous in part, particularly bioturbated in the lower beds and commonly containing leaf fossils in the upper beds. The Catahoula Formation unconformably overlies and locally incises into the underlying Bucatunna Formation. Total thickness of the formation not achieved on this map.

Vicksburg Group

Tv — **Vicksburg Limestone Undifferentiated (Oligocene)**
Includes the undifferentiated successive marine units, listed in descending stratigraphic order: Bucatunna Formation, Byram Formation, Glendon Formation, Marianna Formation; and Mint Spring Formation. The Bucatunna Formation consists of carbonaceous clays dark brown to gray in color, silty to fine sandy, averaging about 45 ft in thickness. The Byram Formation is composed of sandy to clayey marl, glauconitic and fossiliferous, with a thickness of up to approximately 12 ft. The Glendon Formation consists of semi crystalline limestone interbedded with softer clayey marls and represents the marine highstand of the early Oligocene Vicksburg sequence. The underlying Marianna consists of soft clay marls. Collectively the Glendon-Marianna section reaches a maximum thickness of about 30 ft in the mapping area; The Mint Spring Formation consists of gray to green colored glauconitic and fossiliferous marly quartz sand. The Vicksburg Group is biostratigraphically characterized by the presence of the mollusk *Pecten byramensis* and the large benthic foraminifera *Lepidocyclina* sp. The Vicksburg Group unconformably overlies the Forest Hill Formation.

Tth — **Forest Hill Formation (Oligocene)**
Deltaic sands, silts, and clays. Sand is fine-grained, silty, and quartzose; clay is carbonaceous and laminated, with lignite seams and silicified wood common. Carbonized plant fossils occur along fissile partings in clay intervals. The Forest Hill Formation unconformably overlies and commonly incises into the underlying Yazoo Formation and represents the lowermost member of the Vicksburg Group, distinguished from overlying units by its terrestrial to deltaic depositional setting. Approximate thickness is 80 ft in the mapping area.

Jackson Group

Ty — **Yazoo Formation (Eocene to Oligocene)**
Outer neritic to bathyal marine clay. Clay is calcareous and montmorillonitic, blue-green when unweathered. Sparingly fossiliferous, with marine mollusk shell hash common along partings. Bentonite seams present. Limestone ledges occur in places. The Yazoo Formation is marked by the planktonic foraminifera *Hantkenina alabamensis*. The Yazoo Formation conformably overlies the Moodys Branch Formation. Total thickness is approximately 400 ft in mapping area.

Cross Section Units Not Exposed at the Surface

Tmb — **Moodys Branch Formation (Eocene)**
The Moodys Branch Formation is the basal member of a marine transgression towards the close of the Eocene epoch in the northern Gulf, situated unconformably above the deltaic to estuarine Cockfield Formation and conformably below the outer neritic to bathyal clays of the Yazoo Formation. It consists of sandy, fossiliferous marl containing abundant marine mollusk shells of the genera *Glycymeris* and *Venericardia*. The unit unconformably overlies the Cockfield Formation, reflecting the delta destructional phase and subsequent marine transgression, and it conformably grades upward into the Yazoo Formation. Total thickness is approximately 15 ft.

Claiborne Group

Tco — **Cockfield Formation (Eocene)**
Deltaic to estuarine deposits dominated by clays in the upper portions of the formation and sands in the lower portion. Clays are gray to brown in color, silty to fine sandy, plastic, highly carbonaceous with thin beds of lignite common, slightly micaceous, and locally pyritic. Sands are quartzose, cross bedded to massive, locally lignitic, and can be silty to clayey. The unit conformably overlies the Cook Mountain Formation. Thickness is approximately 250 ft in mapping area.

Tcm — **Cook Mountain Formation (Eocene)**
Marine clays, silts, and sands. Clay, chocolate brown in color. Silt, dark yellowish-brown, carbonaceous, clayey, glauconitic, micaceous, sandy. Sand, light-gray to grayish-brown, fine- to coarse-grained, quartzose, fossiliferous, silty, clayey, micaceous, carbonaceous; shaley in upper portions, cross bedded in lower portions. Unconformably overlies the Kosciusko Formation. Thickness is approximately 60 ft.

Tk — **Kosciusko Formation (Eocene)**
Sand, gray to light olive gray, massive to cross bedded, very fine- to very coarse-grained, quartzose, micaceous, locally exhibits scattered weak ledges of limonitic sandstone; interbedded to interlaminated with silt and clay, light olive gray to brownish gray, locally carbonaceous. Locally unconformable at base. Total thickness not represented in cross section. Consitutes the Sparta Aquifer.

Field Photographs

Limonite-stained coarse-grained quartz sand, quartz, deeply weathered chert gravel, and ferruginous sandstone of the Magee Terrace exposed along a road cut in Section 27, Township 4 North, Range 1 East.

Slightly indurated limonite-stained coarse-grained quartz sand, quartz, and deeply weathered chert gravel of the Magee Terrace exposed along a road cut in Section 23, Township 4 North, Range 1 East.

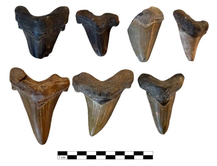
Indurated fine-grained clayey sands of the Catahoula Formation outcropping along a clearing in Section 23, Township 4 North, Range 1 East.

Shallow marine decapod burrow casts of the ichnogenus *Thalassanoides* weathering in relief in a boulder float of indurated fine-grained clayey sands of the Catahoula Formation along an outcrop in Section 23, Township 4 North, Range 1 East.

Indurated sandy fossiliferous marl at the type locality of the Byram Formation member of the Vicksburg Group exposed along the western bank of the Pearl River beneath the Swinging Bridge near the town of Byram in Section 19, Township 4 North, Range 1 East.

Conformable contact between the deeply weathered clay marl of the Marianna Formation and the subjacent fossiliferous marly sands of the Mint Spring Formation exposed along an intermittent stream in the "Devil's Backbone" region near Cleary in Section 22, Township 4 North, Range 1 East.

Conformable contact between the deeply weathered clay marl of the Marianna Formation and the subjacent fossiliferous marly sands of the Mint Spring Formation exposed along an intermittent stream in the "Devil's Backbone" region near Cleary in Section 22, Township 4 North, Range 1 East.


Fossil teeth of the mega-toothed lamniform shark *Otodus auriculatus* recovered from the Mint Spring Formation in the "Devil's Backbone" area near Cleary in Section 22, Township 4 North, Range 1 East.

Algae-stained ambulacrum of the fossil cassiduloid echinoid, *Rhyncholampas gouldii*, reworked from the Mint Spring Formation into the quartz and ferruginous sandstone alluvium along the active channel of a stream in Section 22, Township 4 North, Range 1 East.

Heavily bioturbated contact of the unconformity of the shallow marine sandy marl of the Mint Spring Formation and the underlying deltaic carbonaceous silty clays of the Forest Hill Formation exposed along a stream channel in Section 22, Township 4 North, Range 1 East.

Unconformable contact between the shallow marine sandy marl of the Mint Spring Formation and the underlying deltaic carbonaceous silty clays of the Forest Hill Formation exposed along a stream channel in Section 22, Township 4 North, Range 1 East.

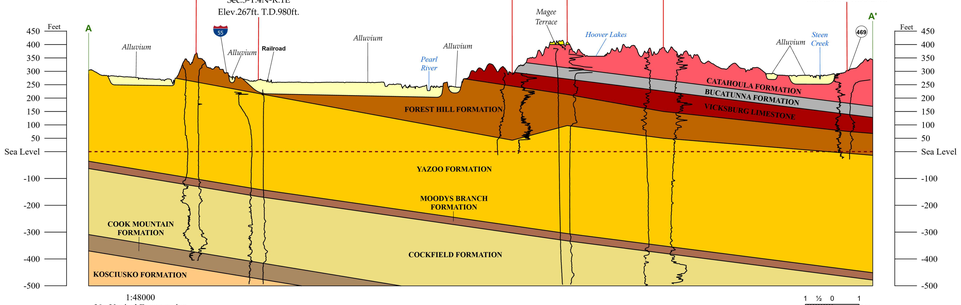
Carbonized fossil palm frond exposed along a fissile parting in carbonaceous deltaic clay in an outcrop of the uppermost Forest Hill Formation exposed along a stream channel in the "Devil's Backbone" area near Cleary in Section 22, Township 4 North, Range 1 East.

Lignite seam above laminated fine-grained carbonaceous clayey sand of the upper Forest Hill Formation exposed along a stream channel in the "Devil's Backbone" area near Cleary in Section 22, Township 4 North, Range 1 East.

Laminated clay with carbonaceous silty partings of the upper Forest Hill Formation exposed along a stream channel in the "Devil's Backbone" area near Cleary in Section 22, Township 4 North, Range 1 East.

Deeply weathered calcium montmorillonitic clay of the Yazoo Formation unconformably overlain by silty to fine sandy stream alluvium of Caney Creek exposed along a cutbank in Section 31, Township 5 North, Range 1 East.

Structural Cross-Section of the Florence 7.5-Minute Geologic Quadrangle

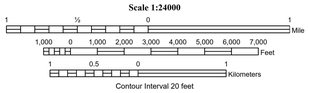


Base map produced by the Mississippi Office of Geology
PCS: NAD 1983 UTM Zone 15N
GCS: GCS North American 1983
Projection: Transverse Mercator
Datum: North American 1983
Units: Meter
Declination: USGS MS Florence 2024 Topographic Map
MDEM base map data from MARIS
Borehole data from Mississippi Office of Geology.

Adjoining 7.5' Quadrangles

UTM GRID AND 2023 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

Scale 1:24000



Contour Interval 20 feet
North American Vertical Datum 1988 Geoid 12A

This geologic map was funded in part by the USGS National Cooperative Geologic Mapping Program under STATEMAP award number #G25AS00030.

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GEOLOGIC MAP of the FLORENCE 7.5-MINUTE QUADRANGLE

Hinds and Rankin Counties, Mississippi

2026

Geology by
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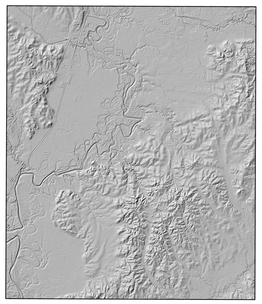
James E. Starnes, RPG, and Timothy J. Palmer, RPG

Surface Mine
O-0057 Drill Hole Locality and Identification Number
Formational Contact
A A' Line of Section



Geologic maps are only a guide to current understanding and do not eliminate the need for detailed investigations of specific sites for specific purposes. The views and conclusions contained in this Open-File Report are those of the geologists and should not be interpreted as representing the official policies, either expressed or implied, of the State of Mississippi or of the United States Government.

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