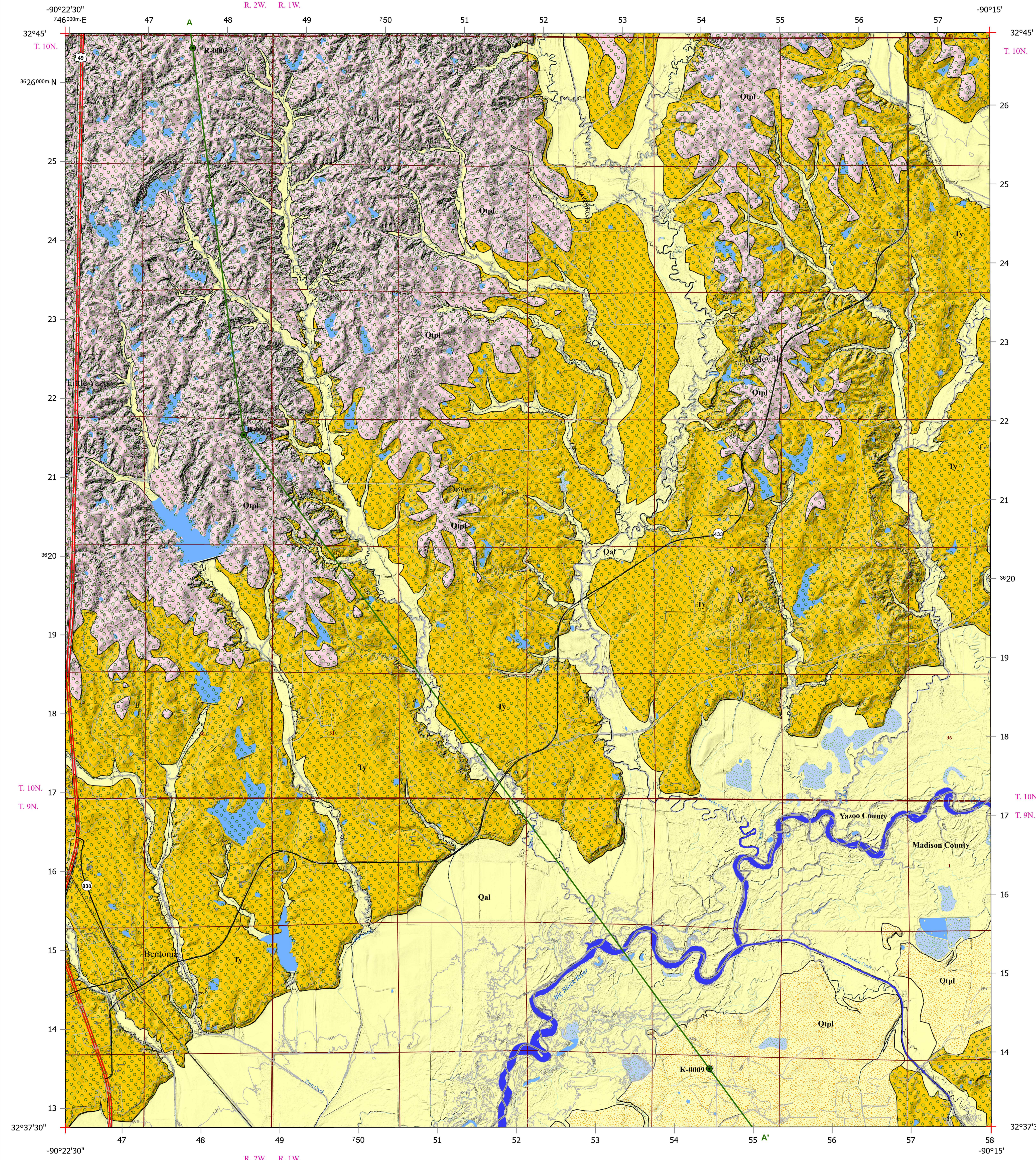
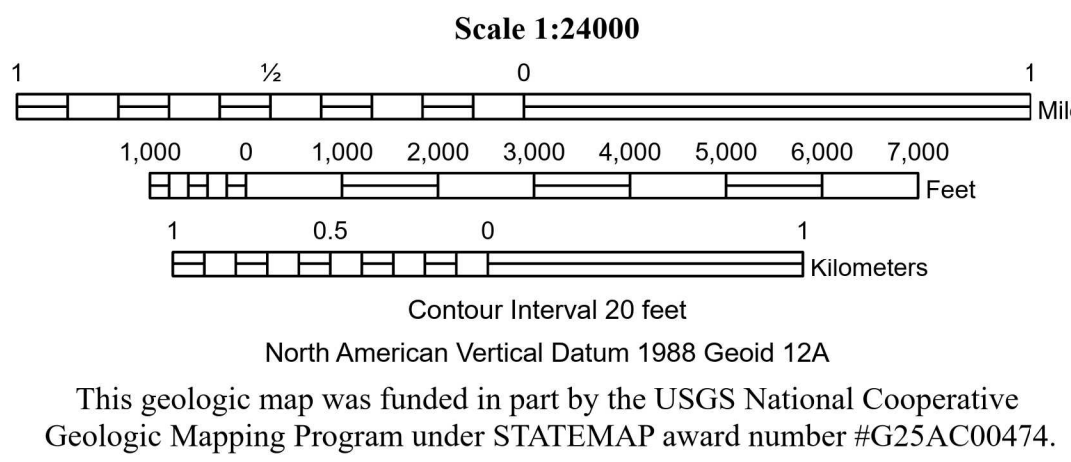




Base map produced by the Mississippi Office of Geology
PCS: NAD 1983 UTM Zone 15N
GCS: GCS North American 1983
Projection: Transverse Mercator
Datum: North American 1983
Units: Meter
Declination: USGS MS Bentonia 2024 Topographic Map
MDEM base map data from MARIS
Borehole data from Mississippi Office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



Mississippi Office of Geology
Open-File Report 365

GEOLOGIC MAP of the BENTONIA 7.5-MINUTE QUADRANGLE

Madison and Yazoo Counties, Mississippi

2026

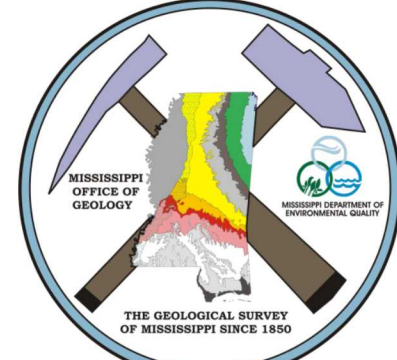
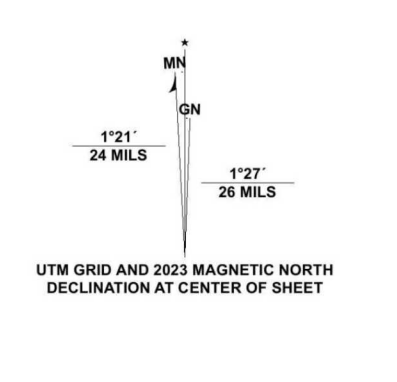
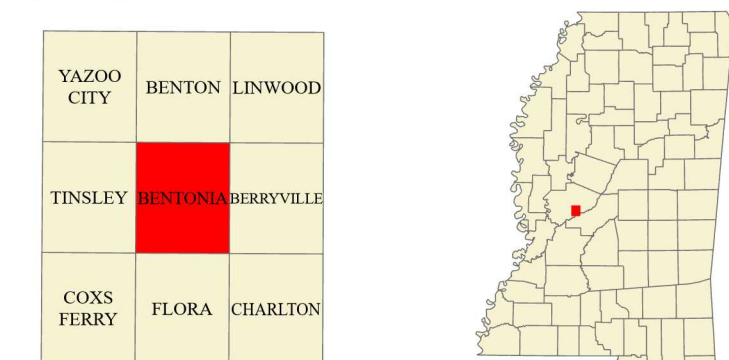
Geology by
Timothy J. Palmer, RPG, Jonathan R. Leard, PhD, RPG,
James E. Starnes, RPG, and Natalya S. Usachenko, GIT



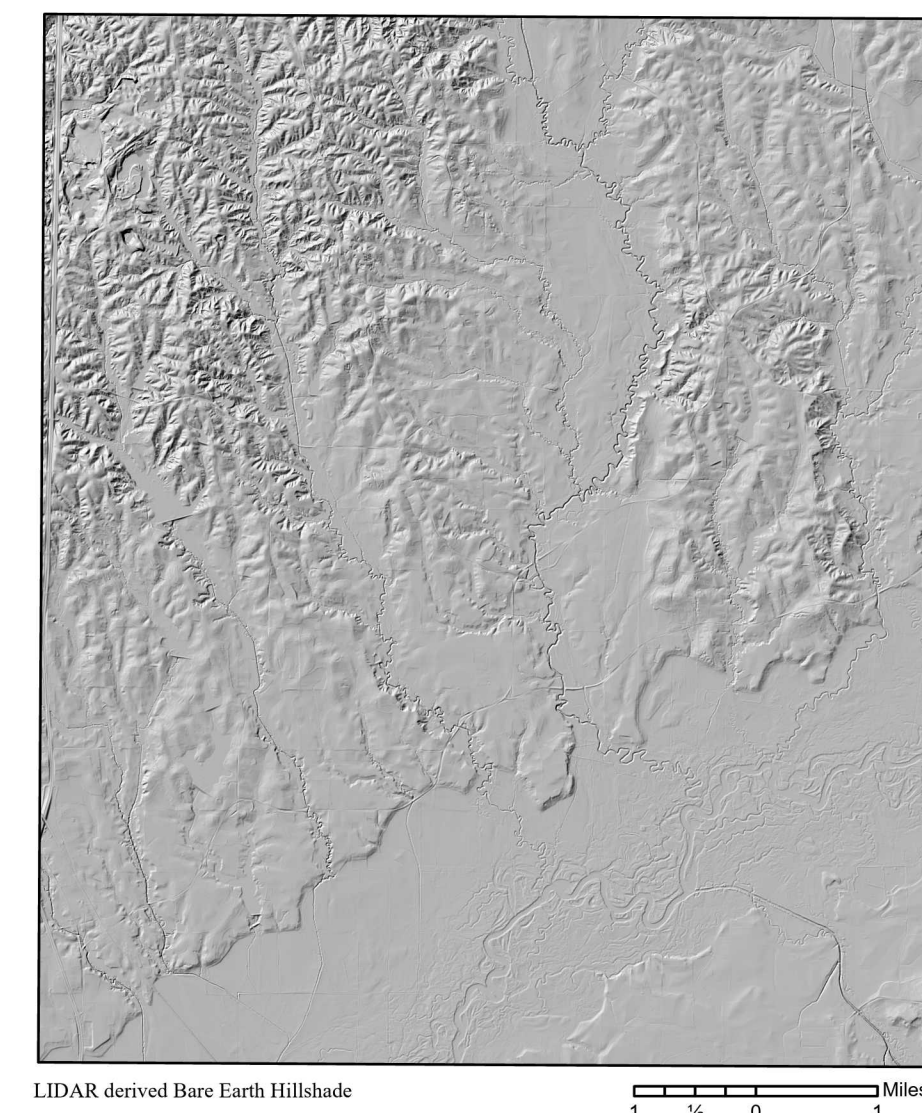
Mississippi Department of Environmental Quality
Mississippi Office of Geology - Surface Mapping Division
Mississippi Geological Survey
700 North State Street
Jackson, Mississippi 39225

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Adjoining 7.5' Quadrangles



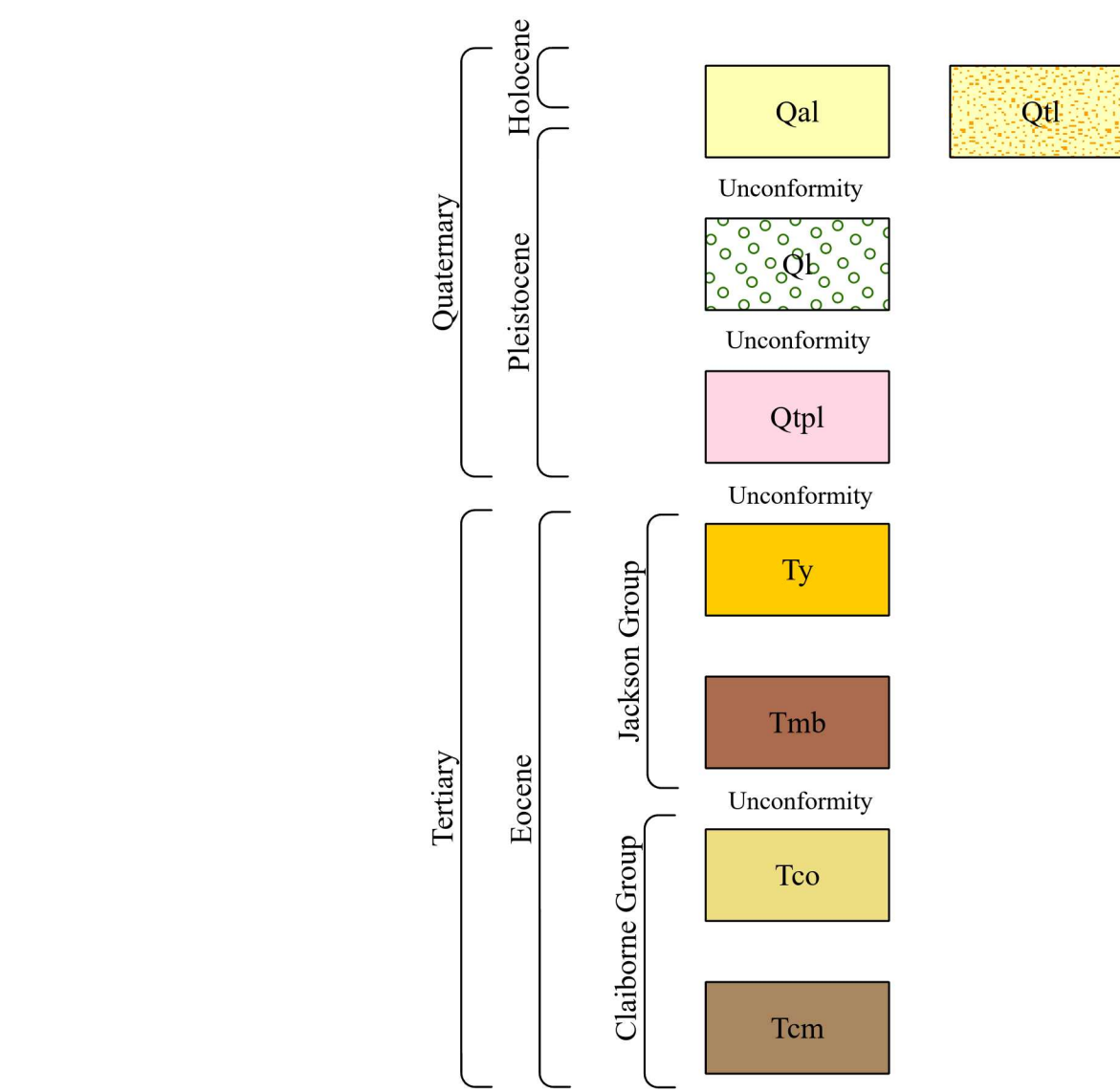
Surface Mine
Drill Hole Locality and Identification Number
Formational Contact
Line of Section



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.

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

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 15 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.
- Qpl** **Loess (Pleistocene)**
Silt, buff to tan, pale yellow, red, gray to gray-green where in anoxic conditions, quartzose to feldspathic. Loess is considered an eolian deposit derived from glacial outwash. Loess is typically calcareous with dolomite and calcite; however, the upper portion of the loess can be deeply weathered, leached / noncalcareous, and has been commonly referred to as "brown loam." Loess deposits unconformably blanket the pre-loess topography with substantial local variations in thickness but generally thickening towards the west. In places, weathered loess contains secondary deposits of small calcareous concretions such as caliche and loess dolls. Loess can be locally and sparingly fossiliferous, commonly containing tests or stemircons of pulmonate gastropods and less commonly containing fossils of Pleistocene vertebrates.
- Qpl** **Pre-loess Terrace Deposits (Pleistocene)**
Pleistocene ancestral Mississippi River terraces deposited prior to Pleistocene loessification. Sand, yellow, orange, purple, red, pink, fine- to coarse-grained, predominantly quartzose, cross-bedded to massive; graveliferous, pea to large cobble size clasts, boulder size ice-rafted clasts of sandstone and chert. Economically significant gravels are predominantly chert with lesser amounts of vein quartz, metaquartzite, agate, sandstone, and rare rhyolite clasts; clay, pink to white, generally occurring as discontinuous lenses and as rip-up clasts up to boulder-size. Conglomeratic ironstone ledges are common in the graveliferous sands at the base of the deposits. The base of this terrace occurs at approximately 250 ft NSL and is marked by about 40 ft of loess overburden.
- 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 *Hankienia alabamensis*. The Yazoo Formation conformably overlies the Moodys Branch Formation. Total thickness is approximately 400 ft.
- 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 *Venerocardia*. 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 and are cross bedded to massive, locally lignitic, and can be silty to clayey. Conformably overlies the Cook Mountain Formation. Thickness is approximately 400 feet.
- 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 Koscusko Formation. Thickness is approximately 60 feet.

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

