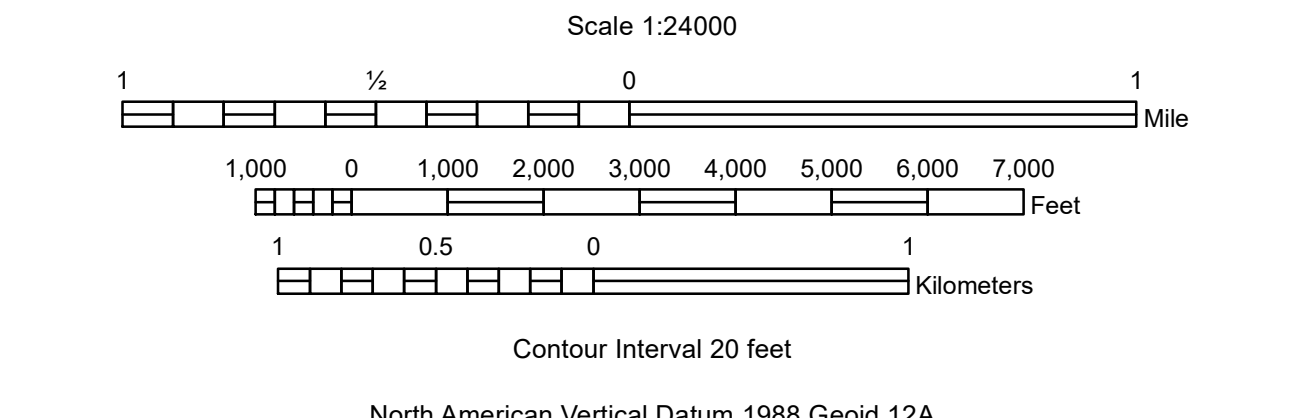


Base Map produced by the Mississippi Geological Survey
Coordinate System: NAD 1983 UTM Zone 15N
Projection: Transverse Mercator
Datum: North American 1983
Units: Meter
Declination: World Magnetic Model, December 31, 2019, estimated Magnetic North declination in 7.5-Minute Queens Hill Lake Quadrangle: (09°33'43.20"W, 32°26'06.00"N), center area is 1.29° west of True North ± 0.36". Annual rate of declination change is approximately 0.09" west per year.
Base Map Data sourced from <https://narr.mississippi.edu/>.
Contours are derived from LIDAR data.
Borehole data from Mississippi Office of Geology.



Mississippi Office of Geology
Open-File Report 340

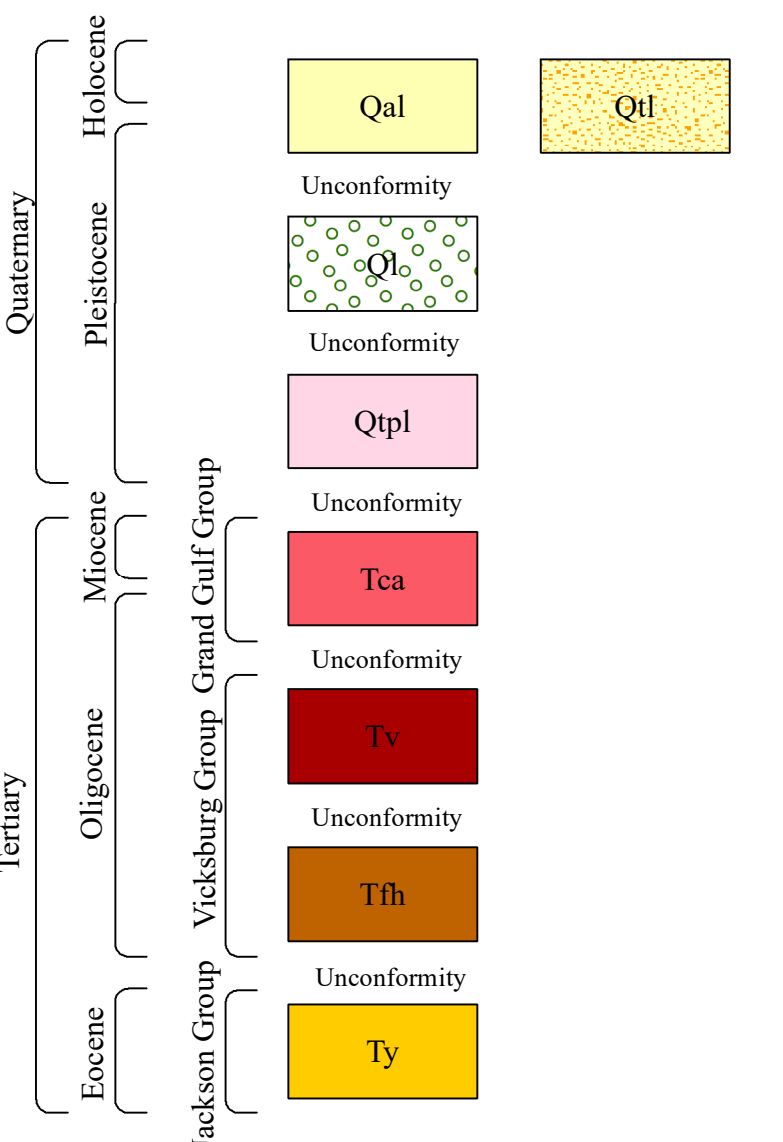
This geologic map was funded by the State of Mississippi and the United States Geological Survey, National Cooperative Geologic Mapping Program. Special thanks to the Benton family. Their cooperation was instrumental in the Survey's studies of the geology of the Queens Hill Lake area.

**GEOLOGIC MAP of the QUEENS HILL LAKE
7.5-MINUTE QUADRANGLE**
Hinds and Warren Counties, Mississippi
2024

Geology by
Jonathan R. Leard, RPG, Timothy J. Palmer, RPG, James E. Starnes, RPG, and Bailee M. Ozbirn



Correlation of Map Units

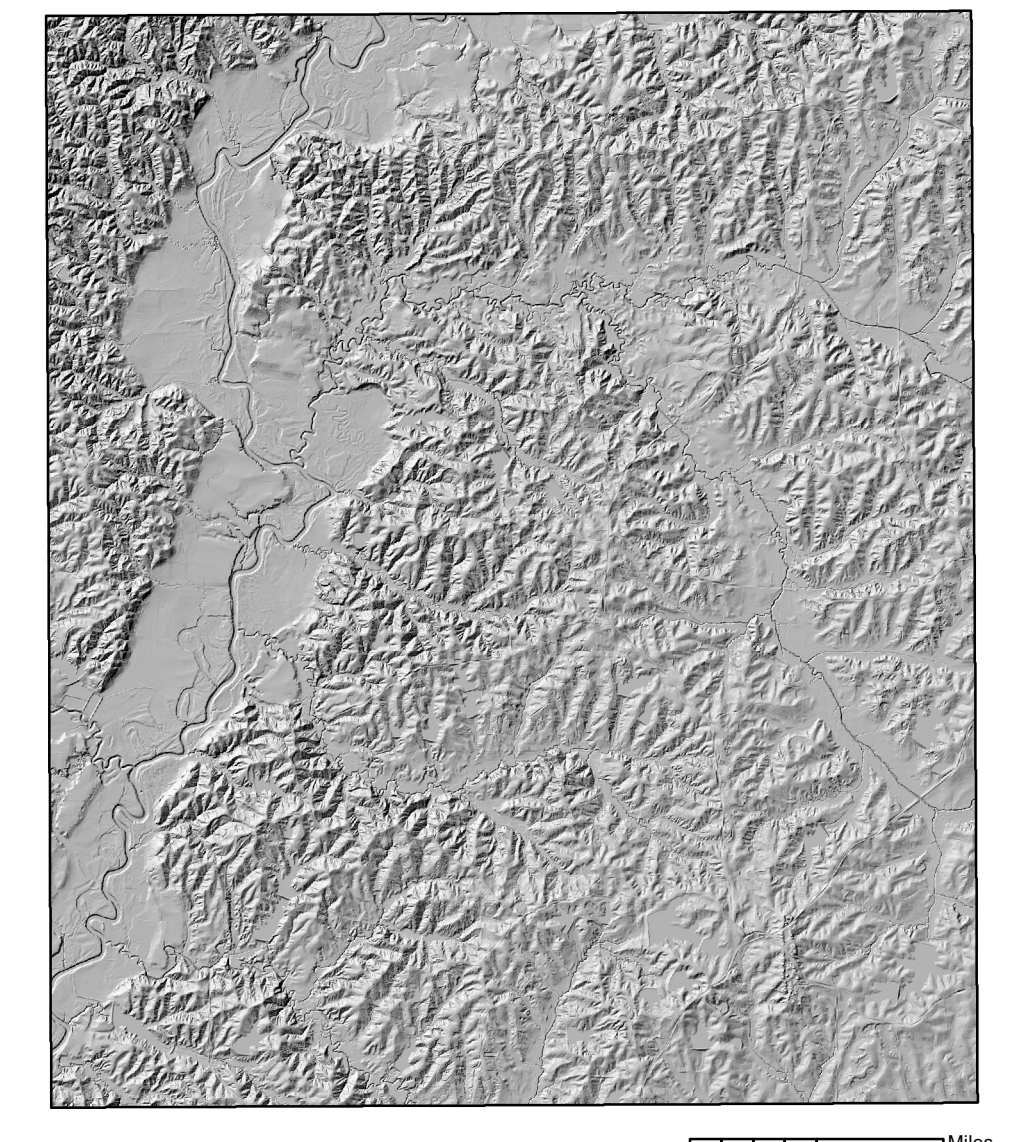


Descriptions of Map Units

- Qal** **Alluvium (Holocene to Pleistocene)**
Sand, yellow- to brownish-white in color, fine- to coarse-grained, subrounded to rounded, predominantly quartzose, locally graveliferous containing aggregate derived from the Pre-loess Terrace deposits, silty to clayey; humus lenses common; floodplain deposits are heavily loess-derived. Silicified wood common. Tributaries have narrow alluvial valleys and are deeply incised through the loess terrain.
- Qst** **Stream Terrace (Holocene to Pleistocene)**
Stream terrace deposits dominantly associated with the Big Black River; Sand, yellow- to brownish-white in color, fine- to coarse-grained, subrounded to rounded, predominantly quartzose, locally graveliferous containing aggregate derived from the Pre-loess Terrace deposits, silty to clayey; humus lenses common; floodplain deposits are heavily loess-derived. Silicified wood common. These terraces are known to contain important pre-historic archeological deposits.
- Qlo** **Loess (Pleistocene)**
Silt, buff to tan, pale yellow, red, grey to grey-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 (caliche, loess dolls). Loess can be locally and sparingly fossiliferous, commonly containing tests or stemkerns 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 precipitate from unconfined groundwater. There are two levels of terrace with bases occurring at approximately 300 and 220 ft MSL.
- Tca** **Grand Gulf Group**
Catahoula Formation (Oligocene)
Deltaic sands, silts, and clays; Sand, grey, pale yellow to white, fine- to coarse-grained, cross-bedded to massive, predominantly quartzose with lesser amounts of chert, metaquartzite, mica, and heavy minerals, slightly glauconitic in places with rare thin-bedded pea gravels. Gravelly, black chert and milky quartz, highly polished, immature, subangular to well rounded; Clay, green, grey, brown, kaolinitic, weathers white to brown exhibiting a "popcorn" appearance, silty to sandy, lignite common in basal clays. Typically indurates to opaline-cemented sandstones and rarer orthoquartzites where exposed, silicified wood and fossil *Palmoxylon* common. Ironstone common where sands overlie clays. The Catahoula Formation unconformably overlies the Bucatuna Formation. Total thickness is not represented on this map.
- Tv** **Vicksburg Group**
Vicksburg Limestone Undifferentiated (Oligocene)
Includes in descending order: the Bucatuna Formation, Byram Formation, Glendon Limestone, Marianna Limestone, and Mint Spring Formation. The Bucatuna is predominantly dark brown carbonaceous clay with thinly interbedded fine sands. It contains sparse estuarine mollusks towards its base and carbonized palaeobotanical fossil remains are common throughout. The Glendon Limestone is white to grey, commonly indurated to semi-crystalline biohermal limestone, either massive or with alternating ledges separated by thinly-bedded glauconitic marl. The Glendon Limestone commonly contains solution cavities at or near outcrop. Larger cavities usually form at the contact with the underlying Marianna Limestone. The Marianna Limestone is white to pale-yellow, soft to indurated, glauconitic marl, containing an admixture of fine-grained sands and clays in places. There is an abundance of the large Foraminifera *Lepidocyclina manelli* in the Marianna Limestone and *Lepidocyclina supra* in the Glendon Limestone and the echinoid *Clypeaster rogersi*. Mint Spring Formation is a fossiliferous, fine-grained quartz marly sand containing the cassidulid echinoid *Rhyncholampus gouldii*. The Vicksburg Limestone unconformably overlies the Forest Hill Formation. Thickness is approximately 150 feet.
- Th** **Forest Hill Formation (Oligocene)**
Deltaic sands, silts, and clays. Sand, fine-grained, silty, quartzose; Clay, carbonaceous, laminated, lignite and silicified wood common, including *Palmoxylon*. Lignitic with palaeobotanical fossil remains common along fissile partings in clays. The Forest Hill Formation unconformably overlies the Yazoo Formation. Total thickness is approximately 100 feet. A channel sand is locally incised into the Yazoo Formation demonstrated in H-0001.
- Y** **Yazoo Formation (Eocene)**
Locally referred to as the Yazoo Clay. Clay, bluish-green to bluish grey, weathers yellowish brown to tan, montmorillonitic, calcareous, silty, locally fossiliferous, locally contains framboidal pyrite. The fossil oyster *Pycnodonte trigonalis* are common throughout along with fossil vertebrate remains of Archaeocete whales, sharks and fish.

Cross Section Units Not Exposed at the Surface

Jackson Group
Yazoo Formation (Eocene)



LIDAR derived Bare Earth Hillshade
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.

Field Photographs



An outcrop of eolian Pleistocene loess unconformably overlying fluvial sand and gravels of an eroded Pleistocene Pre-loess Terrace Deposit photographed on March 16, 2023, in the Hammert Gravel Company, Inc. Gravel Pit P13-006 near Rawhide in Section 8, Township 7 North, Range 4 West.



A glacially ice-rafted, angular, Paleozoic chert boulder clast collected from a Pre-loess Terrace Deposit photographed on December 16, 2019, in Hammert Gravel Company, Inc. Rawhide Gravel Pit P13-006 in Section 8, Township 7 North, Range 4 West.



Pre-loess Terrace Deposit gravels exposed in the highwall of an abandoned gravel pit photographed on February 25, 2024, in Section 5, Township 6 North, Range 3 West.



A glacially faceted and polished chert gravel clast exhibiting striae collected from Pleistocene gravels of a Pre-loess Terrace Deposit exposed at the Hammert Gravel Company, Inc. Gravel Pit P13-006 near Rawhide in Section 8, Township 7 North, Range 4 West.



Gravel clast of Missouri Lacey Agate collected from Pleistocene gravels of a Pre-loess Terrace Deposit from the Hammert Gravel Company, Inc. Gravel Pit P13-006 near Rawhide in Section 8, Township 7 North, Range 4 West.



Gravel clast of Proterozoic banded Sioux Quartzite collected from Pleistocene gravels of a Pre-loess Terrace Deposit photographed on December 4, 2019, from the Hammert Gravel Company, Inc. Gravel Pit P13-006 near Rawhide in Section 8, Township 7 North, Range 4 West.



Gravel clast of Paleozoic chert containing a spirifer brachiopod collected from Pleistocene gravels of a Pre-loess Terrace Deposit photographed on April 8, 2021, from the Hammert Gravel Company, Inc. Gravel Pit P13-006 near Rawhide in Section 8, Township 7 North, Range 4 West.



An outcrop of Upper Oligocene Glendon Limestone exposed along the active channel of a tributary of Halls Creek photographed on September 6, 2023, in Section 31, Township 7 North, Range 3 West.



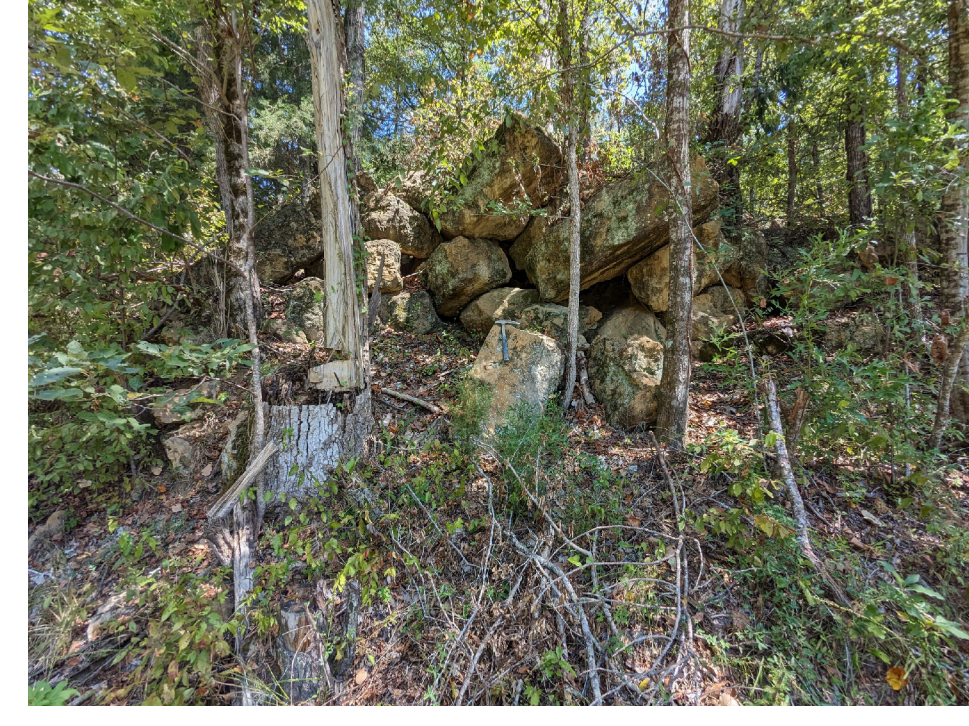
An outcrop of Upper Oligocene Glendon Limestone exposed along the active channel of a tributary of Halls Creek photographed on September 6, 2023, in Section 31, Township 7 North, Range 3 West.



Invertebrate fossils of *Pecten byramensis* preserved in Upper Oligocene Glendon Limestone exposed along the active channel of a tributary of Halls Creek photographed on September 6, 2023, in Section 31, Township 7 North, Range 3 West.



An outcrop of Upper Oligocene Glendon Limestone exposed along the active channel of a tributary of the Big Black River photographed on August 30, 2023, in Section 23, Township 7 North, Range 4 West.



An outcrop of Upper Oligocene Glendon Limestone exposed in an abandoned quarry at MGS-104 photographed on August 30, 2023, in Section 23, Township 7 North, Range 4 West.

Structural Cross-Section of the Queens Hill Lake 7.5-Minute Geologic Quadrangle

