



MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

OFFICE OF GEOLOGY  
OPEN-FILE REPORT 197

**GEOLOGIC MAP**  
of the  
**ESKRIDGE QUADRANGLE**

Montgomery County,  
Mississippi



Geology by David E. Thompson, RPG

2005

**DESCRIPTION OF MAP UNITS**

Geologic Unit	Description
<b>QUATERNARY</b>	
<b>HOLOCENE</b>	
<b>ALLUVIUM</b> (Qal)	Sand, flood plain sands and silts.
<b>PLEISTOCENE</b>	
<b>LOESS</b> (L)	Silt, buff to tan, pale yellow, red, or gray, sandy to clayey, quartzose, feldspathic. Unweathered loess is typically calcareous with dolomite and calcite; however, loess in this quadrangle is highly weathered, leached/mineralized, very clayey, and has been referred to as a brown or yellow loam. Loess is an eolian deposit derived from glacial outwash. Loess deposits blanket the pre-loess topography of the quadrangle area, with greater quantities developed along ridge crests than in valleys, creating local variation in thickness. The thickness in the quadrangle is estimated at 2 to 7 feet; loess is discontinuous and the average thickness is less than 5 feet. In places, weathered loess contains secondary deposits of small calcareous concretions (caliche, loess dolls).
<b>TERTIARY</b>	
<b>EOCENE</b>	
<b>CLAIBORNE GROUP</b>	
<b>KOSCIUSKO FORMATION</b> (Tk)	Sand, gray to light olive gray, weathers reddish orange to pale yellowish brown, very fine- to very coarse-grained, quartzose, micaceous; interbedded to interlaminated with silt and clay, light olive gray to brownish gray, carbonaceous to lignitic; especially argillaceous in upper third of the formation. Locally, the basal Kosciusko contains layers of quartzitic, siliceous siltstone and sandstone as thick as 5 feet, often occurring as large boulders along hill tops and slopes. Unconformity at base. The thickness is estimated to be 300 feet; however, only the lower 100 feet or so are exposed along the western portion of the quadrangle. Constitutes the Sparta Aquifer.
<b>WINONA and ZILPHA FORMATIONS</b> (Twn-Tz)	Zilpha - Clay, gray to brownish black, carbonaceous to lignitic, weathers light gray to reddish pink to white, massive and homogeneous or interbedded to interlaminated with silt and sand, gray to light olive gray, quartzose, micaceous, carbonaceous, locally glauconitic; concretionary siderite and limonite; near surface exposures may exhibit jointing with selenite or limonite infilling. The thickness is variable from a few feet to 60 feet. Winona - Sand, gray to yellowish green, weathers very light gray to reddish orange or dark red, fine- to coarse-grained, quartzose, micaceous, typically glauconitic to very glauconitic, carbonaceous, silty, locally fossiliferous with thin marine shell beds and prints. Surface exposures commonly weather to distinctive contorted, concretionary, limonitic sandstone and sandy ironstone; concretionary siderite, especially near top. Approximately 60 feet thick. The total thickness of the Zilpha/Winona interval is approximately 120 feet; however, the unit thins to 30 feet or so locally due to apparent overlap by Kosciusko sand.
<b>TALLAHATTA FORMATIONS</b> (Tbc)	Basic City Shale Member Sand, gray to very light gray, weathers pale yellowish orange to reddish orange, very fine- to medium-grained, unconsolidated, massive to cross-bedded, quartzose, micaceous, carbonaceous, pyritic, also greenish yellow to buff, fine-grained, semi-consolidated, siliceous, glauconitic, and silty; interbedded to interlaminated with clay, silt, claystone, and quartzitic siltstone and sandstone, olive gray to brownish gray, weathers yellowish gray to very light gray or white, carbonaceous with leaf and plant impressions, fucoid structures are common, near surface exposures may exhibit jointing with limonite infilling; claystones typically weather to lightweight and brittle rock with a subconchoidal fracture. Unconsolidated sands in the upper 30 to 60 feet are equivalent to the Neshoba Sand interval. The total thickness is approximately 220 feet; however, the unit thins to as little as 110 feet in the eastern area of the quadrangle due to apparent overlap of marine Winona lithologies.
<b>MERIDIAN SAND</b> (Tmr)	Sand, gray to very light gray, weathers yellowish gray to reddish orange, very fine- to very coarse-grained, typically fining upward, quartzose, micaceous, locally carbonaceous or slightly glauconitic, pyritic, interbedded to interlaminated with silt, siltstone, and clay, dark gray to white, carbonaceous; the upper beds are typically silty or argillaceous. Locally, the basal portion of the Meridian Sand may be predominantly argillaceous with typical Tallahatta siltstone lithologies overlying sand and clay of the Hatchetigbee Formation. This scenario lead previous investigators to omit the Meridian Sand completely or to incorrectly assign the Meridian Sand to the underlying Hatchetigbee Formation. The thickness is approximately 100 feet. Unconformity at base. The Meridian Sand constitutes the upper portion of the Meridian/Upper Wilcox Aquifer.
<b>HATCHETIGBEE FORMATION</b> (Th)	Sand, gray to light gray, weathers reddish orange to pale yellowish orange, very fine- to very coarse-grained, quartzose, micaceous, pyritic, clay clast conglomerate, especially sandy and coarse-grained at base; interbedded to interlaminated with clay, gray to brownish gray, weathers very light gray to white, silty, carbonaceous to lignitic, especially argillaceous in the upper beds of the formation; lignite. The basal 50 feet or so represent a non-marine equivalent to the fossiliferous, marine, Basho Formation of east-central Mississippi, mark the Paleocene/Eocene unconformity, and consist of sand, gray to light gray, weathers reddish orange to pale yellowish orange, very fine- to very coarse-grained, quartzose, micaceous, carbonaceous, slightly pyritic, clay clast conglomerate. The thickness is approximately 220 feet; however, only the upper 35 feet or so are exposed at lower elevations associated with streams along the northeastern edge of the quadrangle. The Hatchetigbee Formation constitutes the basal portion of the Meridian/Upper Wilcox Aquifer.

Geology field checked in 2004 using the Provisional Edition 1983, U.S. Geological Survey 7.5-minute topographic quadrangle, 1927 North American datum, contour interval 20 feet. Universal Transverse Mercator projection, 1983 North American datum, GRS80 spheroid, 1000-meter Universal Transverse Mercator grid ticks, zone 16; 1983 datum shown in red; 1927 datum shown in blue. January 2005, magnetic north declination in quadrangle center is 0°11' west of true north.

Sources: Road features, USGS Digital Line Graph data, 1:100,000 scale. Water features, USGS National Hydrography Dataset, 1:24,000 scale. Public Land Survey System and contours, Mississippi Automated Resource Information System (MARIS), 1:24,000 scale. Declination, National Oceanic and Atmospheric Administration (NOAA).

Geographic Information System by Daniel W. Morse, MDEQ does not warrant the accuracy or completeness of the source data. Geologic maps are only a guide to current understanding and do not eliminate the need for detailed investigations of specific sites for specific purposes.

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D - 1 Drill-hole locality and identification number

**Structural Cross-Section of the Eskridge 7.5-Minute Geologic Quadrangle**

