MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

OFFICE OF GEOLOGY

OPEN-FILE REPORT 225

GEOLOGIC MAP

of the

GRAVEL HILL QUADRANGLE

Carroll and Leflore Counties, Mississippi

Geology by David E. Thompson, RPG

2009

DESCRIPTION OF MAP UNITS

HOLOCENE

ALLUVIUM

Qal — Sand, flood plain sands, silts, and gravels.

ALLUVIAL FANS

Qaf — Silts, sands, and gravels. Fan-shaped deposits of water-transported material, derived largely from Bluff sediments (Loess and Pre-Loess Terrace Deposits). Typically develop at the base of topographic features where there is a prominent break in slope. Coarser-grained sediments tend to predominate closer to the bluff-line mouth, while finer-grained silts tend to be more prevalent along fan edges. Maximum fan thickness is near the bluff-line mouth, along the crest, and is estimated at 30 to 50 feet in some instances. Thickness typically decreases away from the bluff-line mouth, toward the outer edges.

QUATERNARY — PLEISTOCENE

LOESS

Silt, buff to tan, pale yellow, red, or gray, sandy to clayey, quartzose, feldspathic. Unweathered loess is typically calcareous with dolomite and calcite, and is present in thicker accumulations near the bluff-line. Thinner accumulations of loess, eastward of the bluff-line tend to be highly weathered, leached/noncalcareous, very clayey, and have 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 10 to 60 feet. In places, weathered loess contains secondary deposits of small calcareous concretions (caliche, loess dolls).

PRE- LOESS TERRACE DEPOSITS

Qt — Sand, dark red, reddish orange, pink, bright yellowish brown, brown, and occasionally white, fine- to very coarse-grained, predominantly quartzose, locally micaceous, poorly sorted and massive to well sorted and cross-bedded; typically gravelliferous with quartz and chert pebbles, especially at base. Commonly exhibits clay clast conglomerate with purplish red to white, kaolinitic, rip-up clasts. Locally interbedded with clay, light gray to purplish red to white, kaolinitic, plastic. Locally contains irregular layers of hematitic to limonitic sandstone. Unconformity at base, with an irregular, undulating surface. Roughly corresponds to the Lafayette Formation, Brown (1907); the Citronelle Formation, Priddy (1942); the Bentley Terrace, Fisk et al. (1949); and the Upland Complex, Saucier (1994). The thickness in the quadrangle is estimated at a few feet up to 100 feet.

TERTIARY — EOCENE — CLAIBORNE GROUP

KOSCIUSKO FORMATION

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 upper half or so is exposed in the quadrangle. Constitutes the Sparta Aquifer.

H - 2 — Drill-hole locality and identification number

GEOLOGIC MAP

GRAVEL HILL QUADRANGLE

Carroll and Leflore Counties, Mississippi

SCALE 1:24,000

1 0.5 0 1 Mile

1,000 0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 Feet

1 0.5 0 1 Kilometer

Geology field checked in 2009 using the 1982, U.S. Geological Survey 7.5-minute topographic quadrangle, 1927 North American datum, contour interval 5 and 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. January 2009, magnetic north declination in quadrangle center is 0°11' west of true north.

Sources: The base map is derived from a Digital Raster Graphic of the USGS topographic quadrangle map. 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.

This map was produced by the Mississippi Office of Geology in cooperation with the United States Geological Survey, National Geologic Mapping Program, under STATEMAP grant #08HQAG0101.

Structural Cross-Section of the Gravel Hill 7.5-Minute Geologic Quadrangle