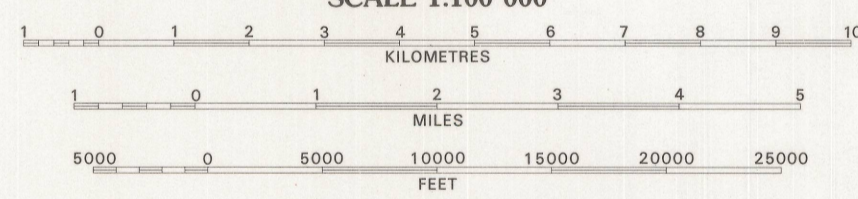


Edited by the Geological Survey

Compiled in 1976 from USGS 1:24 000-scale topographic maps dated 1946-1966  
Projection and 10 000-metre grid ticks, zone 16: Universal Transverse Mercator  
25 000-foot grid ticks based on Tennessee coordinate system 1927 North American datum

SCALE 1:100 000



This map complies with national map accuracy standards

MAURY CO., TENN.  
N3524.5-W8646.5/27 x 35  
1966

EXPLANATION

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Alluvial Deposits

Major deposits, occurring within the flood plain of Duck River and larger tributaries, consist of unconsolidated and unsorted clay, silt, and gravel. Alluvial deposits above the levels of these flood plains, at elevations ranging from 600 to 750 feet, consist of poorly sorted, waterworn chert cobbles, gravel, and sand, with some silt and clay. Thickness is highly variable, up to 60 feet.  
Engineering properties.—Easily excavated, unconsolidated materials. Commonly water saturated. Locally has fragipan with saturated zone above it. Sandy, gravelly material has high load-bearing capacity. Capacity lower where clay-silt content is higher. Makes excellent construction gravel.

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Warsaw Limestone

No fresh exposures are known in the county; weathered Warsaw is a rubble of blocky, porous chert in yellowish- or reddish-brown sandy soil. Present only in southwestern part of county. As much as 40 feet preserved.  
Engineering properties.—Easily excavated, no blasting required. Rapidly drained. Moderately good load-bearing capacity.

Fort Payne Formation

Three facies are present within this formation. They are gradational laterally and vertically.  
Upper cherty facies is dense to porous, thin- to medium-bedded chert interbedded with siltstone, with shale partings. Thickness is 120 to 200 feet.  
Middle siliceous facies is siliceous with various concentrations of calcite and dolomite, very fine- to medium-grained, thin- to medium-bedded, with scattered thin beds of chert. Thickness is 20 to 100 feet.  
Lower shaly facies is shale with thin beds of siltstone, with local crinoidal limestone lenses. Other minor limestone zones occur within zones of bedded chert and siliceous. Thickness is 0 to 75 feet.  
At base of the formation is a greenish-gray shale or mudstone 1 to 4 feet thick containing phosphatic nodules (Maury Shale).  
Fresh exposures of the Fort Payne are rare, and in most places throughout the county it is weathered to a rubble of chert, shaly flakes, and siliceous residue. Forms high hills, ridges and principal upland areas.  
The maximum thickness of the formation is about 280 feet. Where one facies is thin, another is thick, so that neither the composite maximum nor the composite minimum is present at any one locality.  
Engineering properties.—Where deeply weathered, it is easy to excavate. Relict beds can be ripped or bulldozed with no blasting required. More massive, unweathered zones require blasting. Fragmental chert in clay-textured matrix ("scraggy" chert) makes excellent road base with high load-bearing capacity. Jointed, but with little or no solution widening or solution cavities. Water moves rapidly vertically and laterally through weathered material. Shows extremely deep weathering (up to 100 feet). Jointed blocks of lower Fort Payne are locally involved in landslides where joints parallel axis of slide movement (see discussion of unstable soils on accompanying map).

Chattanooga Shale

Consists of carbonaceous, grayish-black, fissile to laminated shale with petroliferous odor. Contains pyrite; is slightly radioactive (contains traces of uranium). At base, comprising entire formation in extreme southwest, is fine- to medium-grained sandstone about 1 foot thick. Formation thickness is up to 10 feet.  
Engineering properties.—Easy excavation, highly jointed, but no solution openings. Forms steep slopes with rubby clay soil having low load-bearing capacity. Carbonaceous shale can ignite from lightning strikes or fires and burn along outcrop for long periods of time.

Pre-Chattanooga and Post Stones River Formations, Undivided

This unit includes the following Ordovician formations: Sequatchie Formation, Leipers Formation, Catheys Formation, Bigby-Cannon Limestone, and Hermitage Formation.  
The following Silurian formations are included in this unit due to their limited extent, thinness, and lack of exposures: Dixon Formation, Lego Limestone, Waldron Shale, Laurel Limestone, Osgood Formation (all Wayne Group) and Brassfield Limestone. These formations are present only on Nodgrass Hill (south of Columbia), in the northwest part of the county, principally in the upper reaches of Leipers Creek and Snow Creek valleys, and on hills west of Cross Bridges and Williamsport.

Wayne Group

Dixon Formation is thick-bedded calcareous mudstone. Thickness is 0 to 5 feet.  
Lego Limestone is fine- to medium-grained, medium and even-bedded. Thickness is 0 to 25 feet.  
Waldron Shale is calcareous shale with thin layers of limestone. Thickness is 0 to 3 feet.  
Laurel Limestone is fine- to medium-grained, medium and even-bedded. Thickness is 0 to 25 feet.  
Osgood Formation is argillaceous limestone and calcareous shale. Thickness is 0 to 12 feet.  
Engineering properties.—Moderately difficult to excavate (Osgood and Waldron are easier to excavate). Solution cavities are not a major problem. Distinct bedrock-residuum interface occurs in Laurel and Lego; less distinct in Osgood, Waldron, Dixon. Forms clayey residuum.

Brassfield Limestone

Consists of very fine- to medium-grained, thin and even-bedded cherty limestone. Thickness is 0 to 70 feet.  
Engineering properties.—Moderately difficult to excavate. Solution cavities are not a major problem.

Sequatchie Formation

Consists of calcareous and sandy shale with interbedded argillaceous limestone. Thickness is 0 to 8 feet.  
Fervale limestone facies is coarse- to very coarse-grained, thin- to medium-bedded, and irregularly bedded. Thickness is 0 to 25 feet.  
Sequatchie Formation is restricted to northwest part of the county.  
Engineering properties.—Moderately difficult to excavate. Solution features are minor. Forms uneven clay residuum.

Leipers and Catheys Formations

These formations are described together because of their lithologic similarity: shaly, argillaceous limestone and medium- to very coarse-grained, thin- to medium-bedded phosphatic limestone. Unit is progressively more phosphatic westward. Weathers to a phosphatic residuum. Basal part of formation is typically more shaly.  
Engineering properties.—Excavation difficulty is moderate, except in more massive beds. Thicker-bedded zones have irregular bedrock-residuum interface. Thin-bedded, shaly zones form thin, clayey residuum with moderate shrink-swell potential. Soil is stable, but poorly drained.

Bigby-Cannon Limestone

To the east and northeast this formation consists of three facies—the Cannon limestone, Dove-colored limestone, and Bigby limestone. These replace each other laterally and vertically. To the west and southwest the entire formation consists of the Bigby limestone.  
Cannon limestone facies is dense to medium-grained, thin- to medium-bedded, and evenly bedded. Interbedded with Dove-colored facies. Composite thickness is 0 to 20 feet; thicker eastward.  
Dove-colored limestone facies is very dense, medium- and even-bedded, brittle; weathers to a characteristic light-gray surface. Thickness is 0 to 30 feet; thicker eastward. Cannon and Dove facies are exposed best in Carters Creek quadrangle.  
Bigby limestone facies is coarse-grained, medium-bedded, crossbedded phosphatic limestone, weathers to phosphatic residuum. Grades downward into Hermitage Formation. Thickness ranges from 20 to 110 feet. Thickest in Sandy Hook quadrangle.  
Engineering properties.—Cannon-Dove facies is moderately difficult to excavate. Forms clayey residuum. Bigby facies forms deep cutters (up to 40 feet) with intervening pinnacles. Cutters are widened joints; have distinct linear trends. Very difficult to excavate. Residuum is clayey and phosphatic. Moderately well to poorly drained.

Hermitage Formation

Upper part is gradational with Bigby limestone facies, with phosphatic limestone layers. Most of upper part is fossiliferous limestone with disseminated silt and shale partings. Thickness is 10 to 30 feet.  
Most of formation is sandy, argillaceous, very fine- to medium-grained, laminated to thin-bedded limestone with thin shale partings. Thickness is 30 to 80 feet.  
Thin basal member (Curdsville Limestone) is medium-grained, thin-bedded, slightly phosphatic. Thickness is 0 to 5 feet.  
Engineering properties.—Moderately easy to excavate; forms sandy soil; well-drained. Relict beds in residuum are easily ripped. Interface between unweathered rock and weathered material is indistinct.

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Stones River Group

The upper three formations of the Stones River Group are exposed in Maury County. These are the Carters Limestone, Lebanon Limestone, and Ridley Limestone.

Carters Limestone

Upper member is very fine-grained to dense, thin-bedded limestone with thin shale partings. Thickness is up to 5 feet. Present only in eastern part of county.  
Lower member is very fine-grained to dense, medium- to thick-bedded limestone. Thickness ranges from 40 to 80 feet.  
Members are separated by a bed of bentonite (clay) approximately 6 inches thick; rarely seen on outcrop, but easily seen on geophysical well logs.  
Carters forms moderately sloping hills in eastern one-third of county; and is present in valley floors in western two-thirds, being exposed as far west as Hampshire.  
Engineering properties.—Upper member has moderate excavation difficulty. Lower member is difficult to excavate. Formation, especially lower member, has distinct but uneven bedrock-residuum interface. Overburden is generally thin, clayey. Jointing is pervasive, with solution cavities common. Sinkholes are numerous.

Lebanon Limestone

Consists of very fine-grained to dense limestone, thin-bedded, with thin shale partings. Thickness is about 90 feet. Forms low-rolling to low-hilly terrain.  
Engineering properties.—Moderate to difficult to excavate. Many areas of Lebanon outcrop have no soil cover. Where present, residuum is extremely thin and clayey. Characterized by numerous sinkholes. Highly jointed.

Ridley Limestone

Consists of very fine-grained to dense limestone, medium- to thick-bedded. Minor bands of chert locally. Thickness is about 100 feet. Forms low-rolling to low-hilly terrain.  
Engineering properties.—Difficult to excavate with thin overburden over moderately pinnacled, thick beds. Jointing is pervasive. Many sinkholes, solution cavities present. Forms thin, clayey, poorly-drained residuum with distinct bedrock-residuum interface.

Data Sources

Include published geologic 7.5 minute quadrangle maps, Tennessee Division of Geology (see Index Map):

|                   |                |              |
|-------------------|----------------|--------------|
| Campbells Station | Lynnville      | Spring Hill  |
| Carters Creek     | Mount Joy      | Summertown   |
| Columbia          | Mount Pleasant | Theta        |
| Glendale          | Primm Springs  | Verona       |
| Godwin            | Rally Hill     | Williamsport |
| Greenfield Bend   | Sandy Hook     |              |

Fault, U on upthrown side, D on downthrown side  
Contact

Prepared in cooperation with U.S. Geological Survey

GEOLOGIC MAP

Compiled by  
Robert A. Miller  
1983