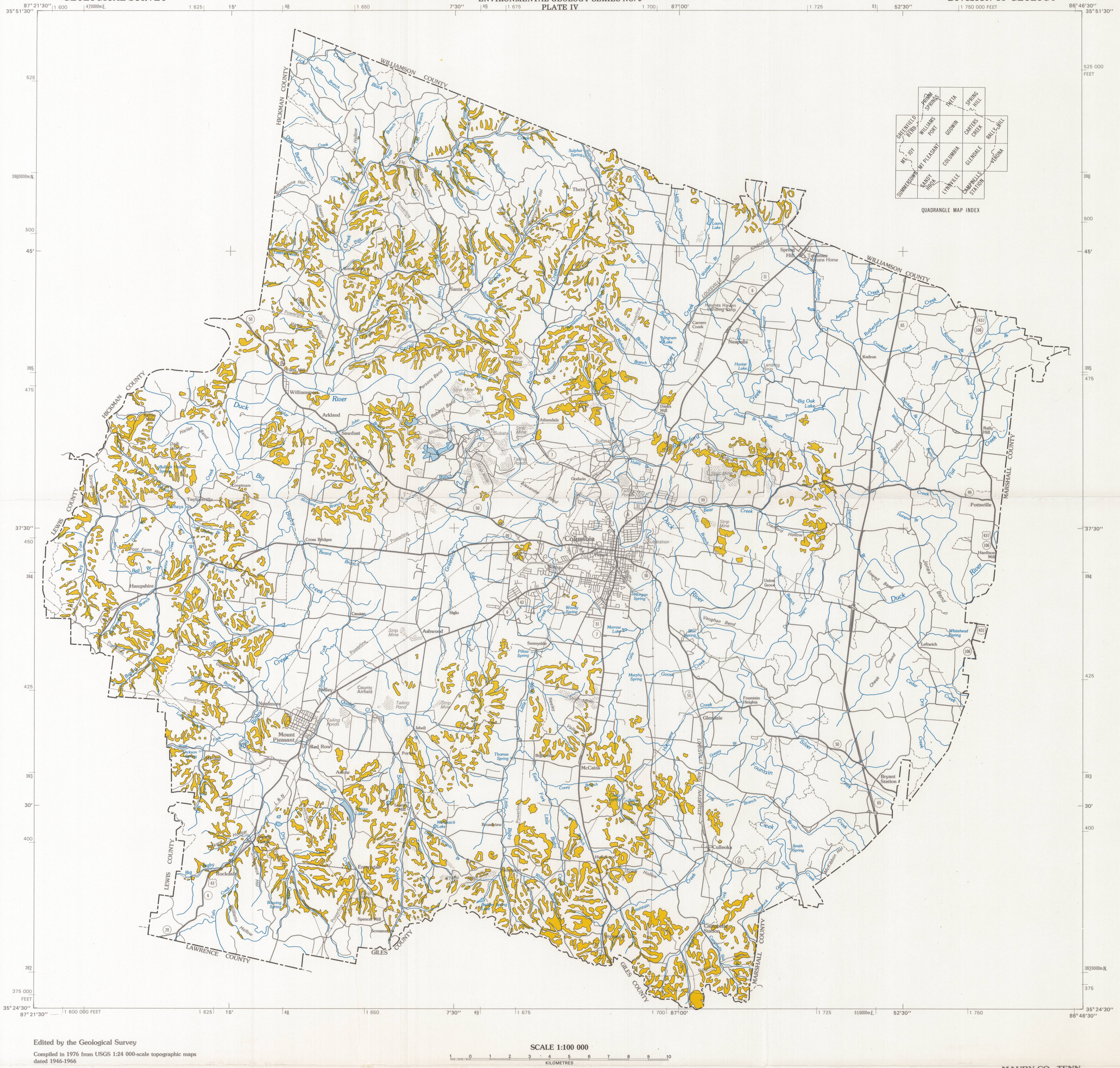
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

ENVIRONMENTAL GEOLOGY ATLAS OF MAURY COUNTY, TENNESSEE

ENVIRONMENTAL GEOLOGY SERIES NO. 9
PLATE IV

STATE OF TENNESSEE
DEPARTMENT OF CONSERVATION
DIVISION OF GEOLOGY



QUADRANGLE MAP INDEX

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

1 0 1 2 3 4 5 6 7 8 9 10 KILOMETRES
1 0 1 2 3 4 5 MILES
5000 0 5000 10000 15000 20000 25000 FEET

NATIONAL GEODETIC VERTICAL DATUM OF 1929

This map complies with national map accuracy standards

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

EXPLANATION

Colluvial soils developed on the higher hills and ridges within the county are the most prone to potentially hazardous slope failure. This material represents wastage of retreating hill slopes, and forms wedges and collars at and below the base of the Chattanooga Shale. It is derived principally from weathering and erosion of the Fort Payne Formation (*Mu on* geologic map). These soils are called Dellrose Series in the U.S. Department of Agriculture classification.

Most of the material comprising the colluvium is silt to clay sized, ranging from less than 1/256 mm (clay) to 1/16 mm in diameter (silt). Within this fine matrix are larger fragments ranging up to 6 inches across. These larger fragments normally comprise less than 20 percent of the total volume of the material, with silt comprising about 50-60 percent and clay about 30 percent. Finer material is more concentrated near the base. The following table shows the size distribution at various depths in a representative Dellrose sample, with load-bearing capabilities also shown.

TABLE 1. PARTICLE SIZE DISTRIBUTION IN A REPRESENTATIVE SAMPLE OF COLLUVIUM (DELLROSE SOIL TYPE)

	Percentage Passing			Classification	
Depth from Surface	No. 4 sieve (4.7mm)	No. 10 sieve (2mm)	No. 200 sieve (0.074mm)	AASHO	Unified
0-14''	50-85	40-80	30-70	A-2, A-4	GM, ML, CL
14''-60''	60-90	55-85	45-75	A-4, A-6	GC, CL
60''-80''	85-100	80-95	75-90	A-7	CH

Modified from: U.S. Dept. of Agriculture, Soil Conservation Service, Soil Survey, Williamson Co., Tennessee: Series 1961, No. 5, Table 6, p. 84-85.

Thickness of the Dellrose is very irregular, but is locally as much as 25 feet. Slopes range to greater than 50 percent, but are commonly in the 20 percent to 50 percent range.

Landslides in this material are mostly translatory (planar) or shallow rotational slump, with some earthflow in the lower (toe) zone. Slides have exceeded 250 feet in length and width, leaving scarps as high as 24 feet. Although no documentation of property damage in Maury County is available, considerable losses in urban areas elsewhere in Middle Tennessee have occurred.

Movement is initiated by slope alteration, either by steepening of the entire slope, notching of the material, or removal of the toe. This alteration creates a slope greater than the critical angle at which the material will remain stable when wet or when loaded. During periods of heavy rain, water moves downward through the material, encountering the underlying Mimosa clay soil developed beneath the Dellrose in clayey limestone. The water backs up into the colluvium, increasing pore pressure and destroying cohesion. The material then fails suddenly, reestablishing the former natural angle.

Other soils and weathered rock zones in the county can also fail, where deep enough and where other conditions favorable to slope failure occur. They include deeper soil zones developed over the Bigby-Cannon Limestone (Maury Series) and the Hermitage Formation (Stiversville Series). Although these soil units are not mapped here, detailed soil maps of Maury County are available in the Soil Survey of Maury County, U.S. Department of Agriculture, Soil Conservation Service. These maps include engineering properties as well as agricultural data.

Data Sources

Springer, M.E., and Elder, J.A., 1980, Soils of Tennessee: University of Tennessee Agricultural Experiment Station and U.S. Department of Agriculture, Soil Conservation Service, Bulletin 596.

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

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

U.S. Department of Agriculture, Soil Conservation Service, 1959, Soil Survey of Maury County, Tennessee.

Prepared in cooperation with U.S. Geological Survey

UNSTABLE MATERIALS MAP

Compiled by
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1983