

Figure 1. STRATIGRAPHIC SECTION A-A'. Section A-A' extends from Lawrence County, Alabama, across west-central Tennessee to Trigg County, Kentucky.

Figure 2. STRATIGRAPHIC SECTION B-B'. Section B-B' extends from Lawrence County, Alabama, across the Tennessee River to Trigg County, Kentucky.

Figure 3. STRATIGRAPHIC SECTION C-C'. Section C-C' extends from Lawrence County, Alabama, to Lincoln County, Kentucky.

Figure 4. STRATIGRAPHIC SECTION D-D'. Section D-D' extends from Lawrence County, Alabama, to Lincoln County, Kentucky.

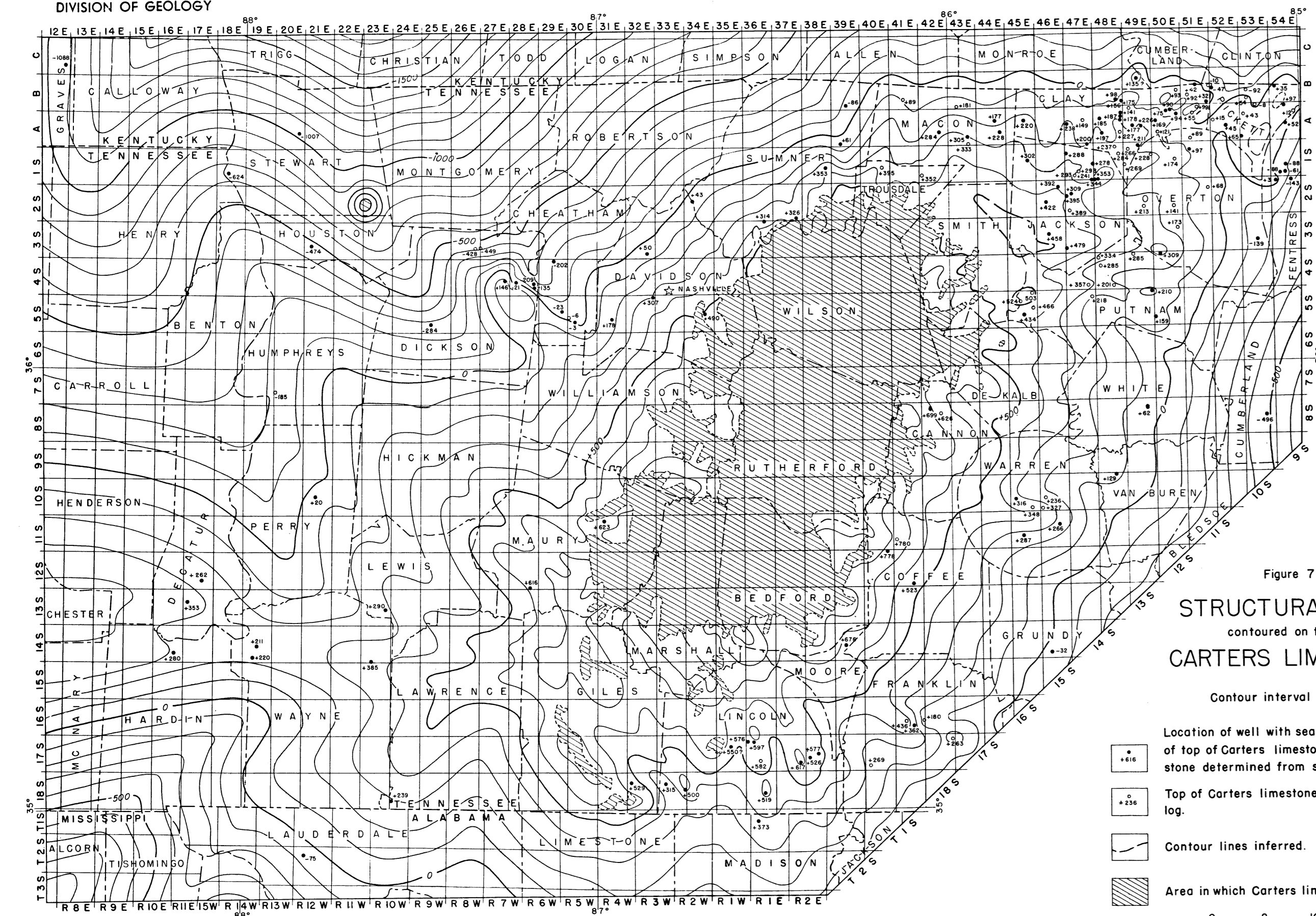


Figure 7 STRUCTURAL MAP contoured on top of CARTERS LIMESTONE

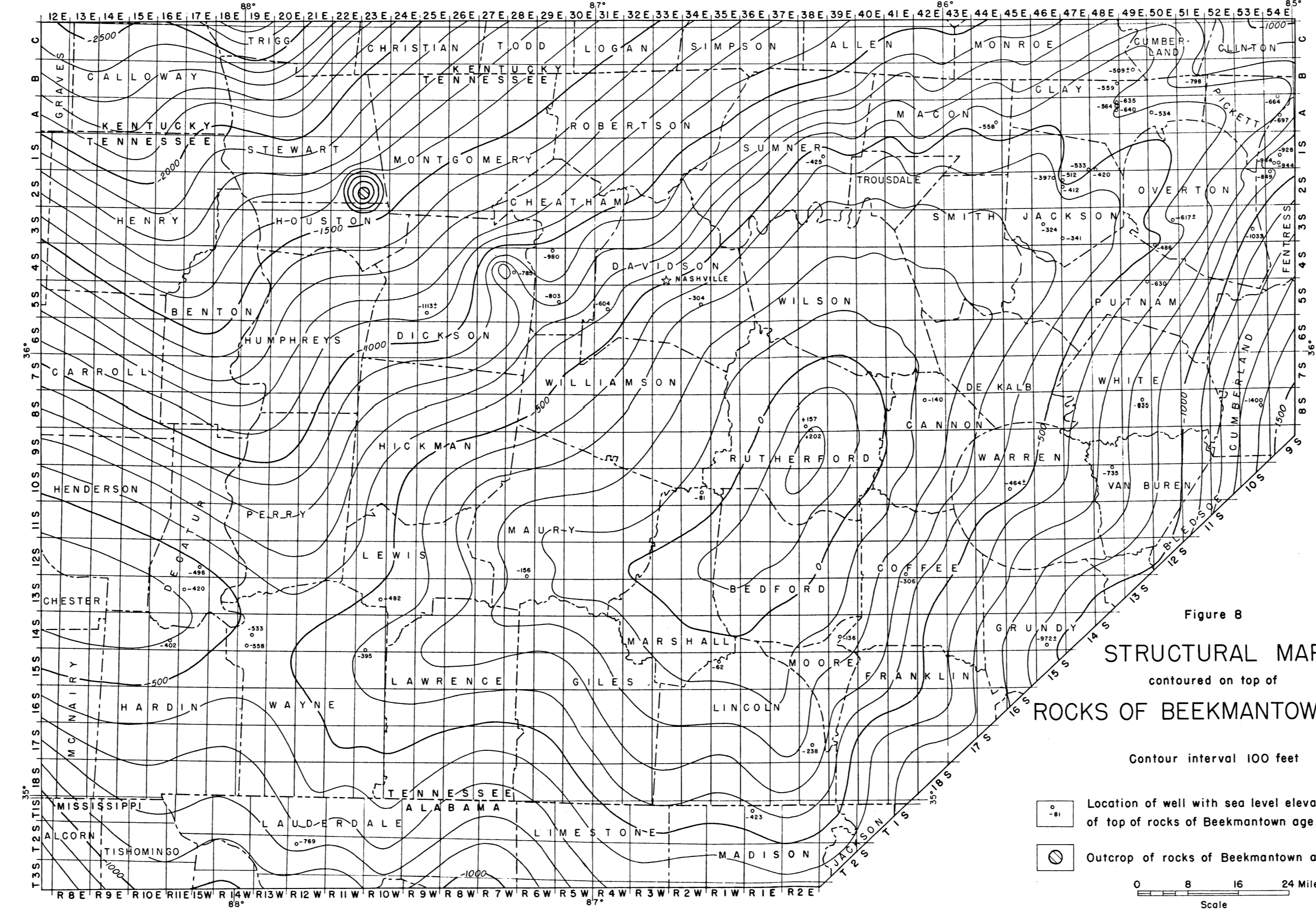


Figure 8 STRUCTURAL MAP contoured on top of ROCKS OF BEEKMANTOWN AGE

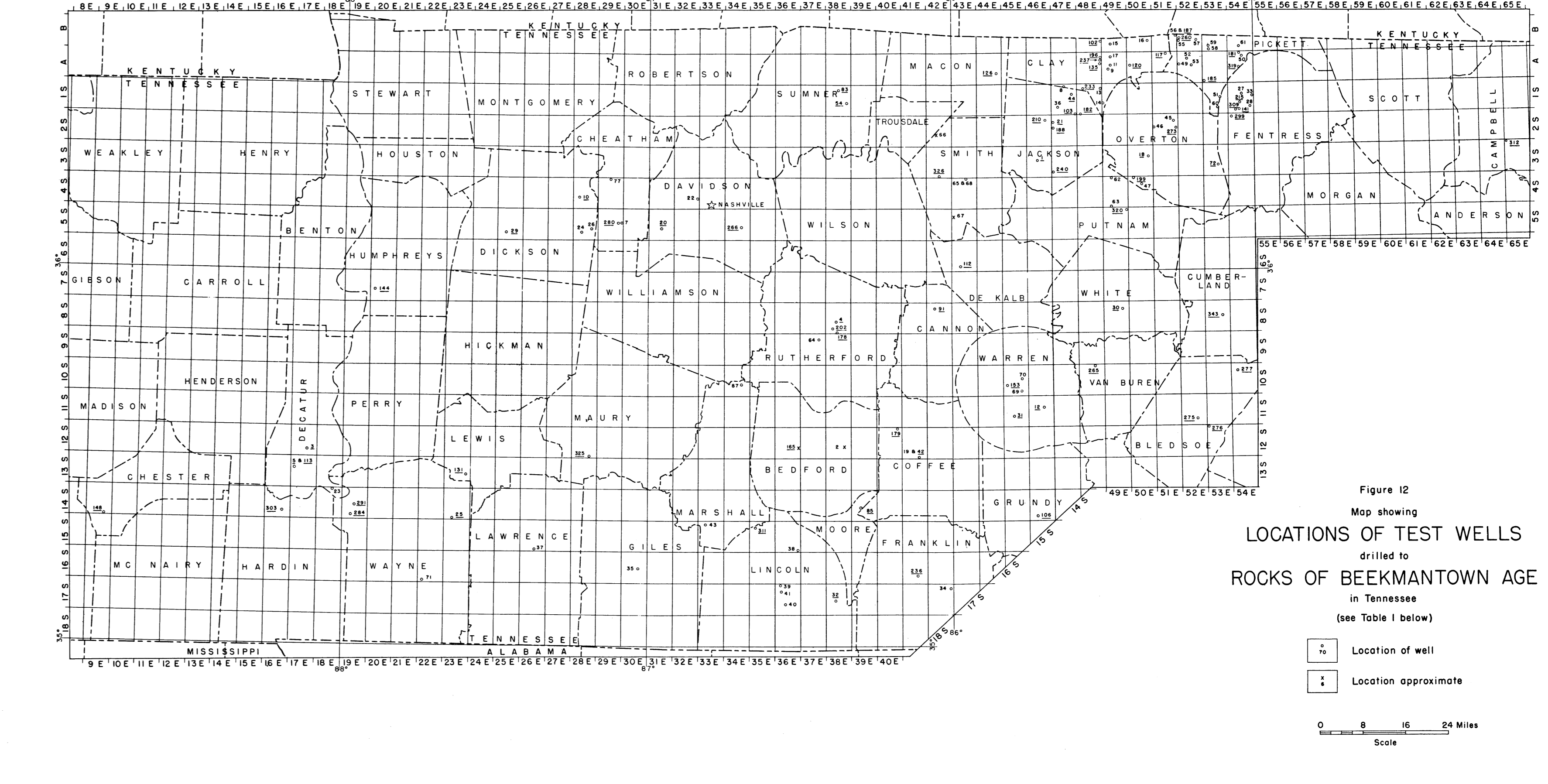


Figure 12 Map showing LOCATIONS OF TEST WELLS drilled to ROCKS OF BEEKMANTOWN AGE

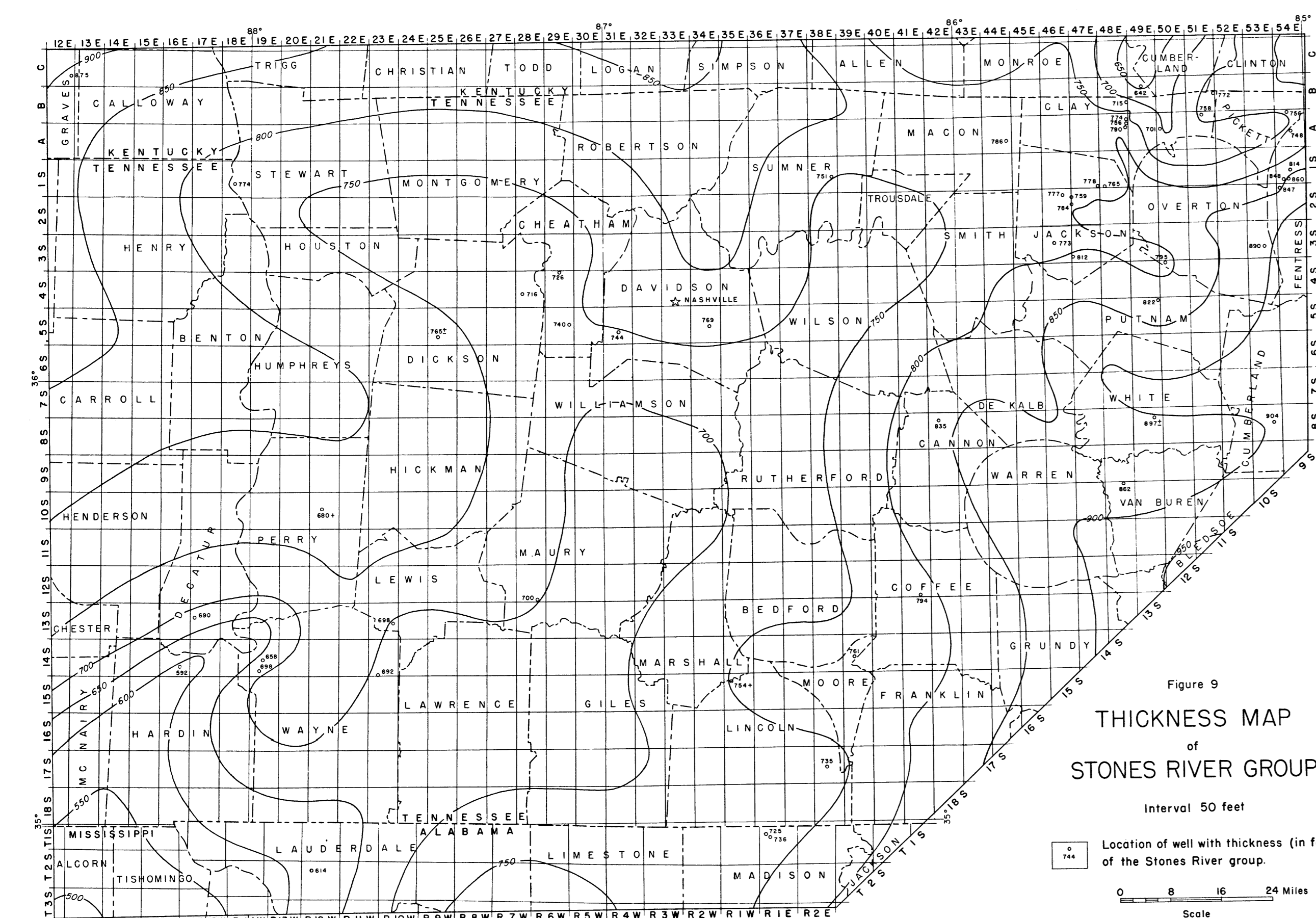


Figure 9 THICKNESS MAP of STONES RIVER GROUP

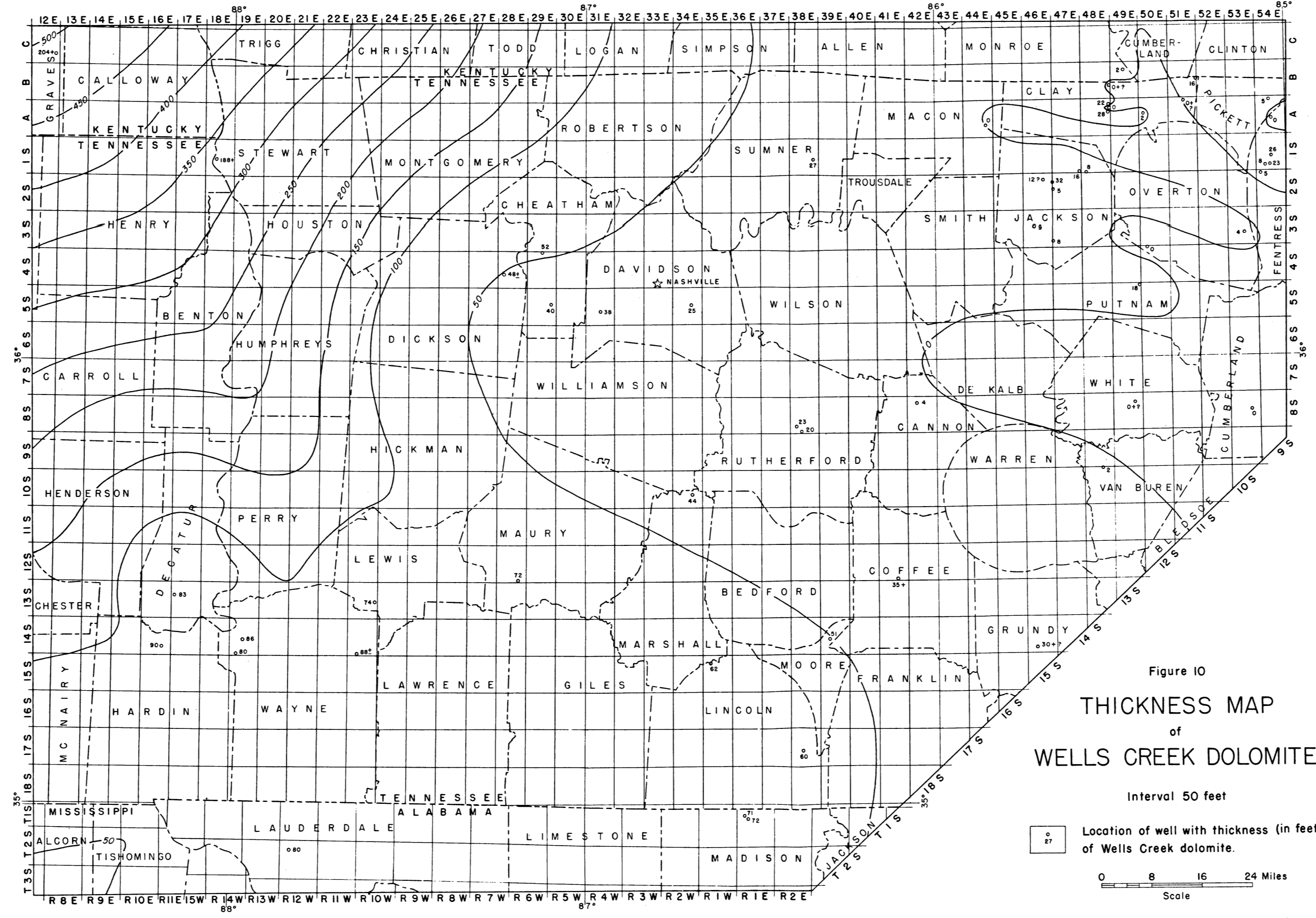


Figure 10 THICKNESS MAP of WELLS CREEK DOLOMITE

TABLE I. SUMMARY OF DATA ON TEST WELLS DRILLED INTO ROCKS OF BEEKMANTOWN AGE IN TENNESSEE

Table with multiple columns: County, No. on Map, Company, Name, Well No., Location (Carters Coordinates), Date, True Depth (feet), Top of Carters (feet), Top of Beekmantown (feet), Production (Barrels per Day), Oil (feet), Gas (feet), Water (feet). The table lists data for numerous wells across various Tennessee counties.

DISCUSSIONS OF STRUCTURE AND THICKNESS MAPS

Figure 7—Structural Contour Map on Top of the Carters Limestone

About 200 subsurface points were used in the preparation of the structural map on top of the Carters Limestone. Half of these points are from descriptions of well cuttings. The remainder from interpretations of driller logs. A general metamorphic shale ("Pencil cave") occurs in the Carters Limestone at or within 6 feet of the top and is consistently logged by the driller in the eastern one-third of this area. Tests located in the area in which the "Pencil cave" is present account for most of the driller's logs used. Several hundred surface elevations on top of the Carters were used to establish structural control in the areas in which the top of the Carters is exposed. The hachured pattern represents the areas in which the top of the Carters has been removed by erosion or remains only in scattered outcrops.

The following description of the structure of Central Tennessee is essentially that of Wilson** however, the elevations and dips involved in his description have been changed to conform with the larger area covered by the accompanying map.

The crest of the post-Carters Nashville dome is located in the south-central part of Rutherford, northwestern part of Bedford and the east-central part of Marshall counties. From this area the axis trends northeast through Rutherford, Wilson, Smith, Jackson, and the eastern part of Clay counties, where it is about 100 feet above sea-level. West-southwest from the crest the top of the Carters Limestone is highest structurally through Maury, Lewis, and Wayne counties.

Eastward from the crest the Carters Limestone dips to 500 feet below sea-level within the area contoured at a rate of about 25 feet per mile. Northwest of the crest this rate of dip is as low as 1400 feet below sea-level in Stewart and Montgomery counties. The Wells Creek up-

Figure 8—Structural Contour Map on Top of the Rocks of Beekmantown Age

All control points shown on this map were determined from the examination of well cuttings. In the northwest part of the map, where control is lacking, the thickness map of the Stones River-Wells Creek interval, in combination with the structural map of the top of the Carters Limestone, was considered in determining the course of the contour lines on the top of the rocks of Beekmantown age. In general, the contours of this map conform with those of the structure map on the top of the Carters Limestone, except that the rate of dip to the northwest is somewhat greater. This greater dip is due largely to the wedging character of the intervening Wells Creek dolomite. The thickness of the Stones River group remaining relatively constant. As on the structure map of the top of the Carters Limestone, the Wells Creek uplift is shown diagrammatically with 500-foot contour lines.

The area in which the Stones River group is thinnest roughly parallels the structural axis of the present day Nashville dome from which there is a gradual thickening of about 5 feet per mile to the northwest and southeast. The thinning of the section in Clay and Pickett counties,

is due to a decrease in thickness of the lower member of the Murfreesboro limestone. In Maury, Lewis, Wayne, and Decatur counties the greater part of the thinning takes place in the Carters Limestone.

The eastward thinning of these rocks indicates the presence of an area of low relief in east-central Tennessee during much of Wells Creek time.

Figure 9—Thickness Map of the Combined Stones River Group and Wells Creek Dolomite

This thickness map is presented for use in estimating the thickness of rocks that would be encountered by the drill between the top of the Carters Limestone and the top of the rocks of Beekmantown age rather than for its geological value. Gradual thickening of the Wells Creek dolomite toward the northwest and slight thinning of the Stones River group over the present-day Nashville dome produces a northward-trending area in which there is very little change in thickness of the interval from the top of the Carters Limestone to the top of the rocks of Beekmantown age. These same conditions produce a rapid thickening to the northwest and a relatively gentle rate of thickening to the southeast.

In Clay and Pickett counties, where the Stones River section is thinnest, the decrease in thickness is due to thinning of the lower member of the Murfreesboro limestone and also of the Wells Creek dolomite. The thinning through Maury, Lewis, and Decatur counties is due largely to a decrease in thickness of the Carters Limestone.

SUBSURFACE STRATIGRAPHY AND STRUCTURE OF THE PRE-TRENTON OROVICIAN AND UPPER CAMBRIAN ROCKS IN CENTRAL TENNESSEE

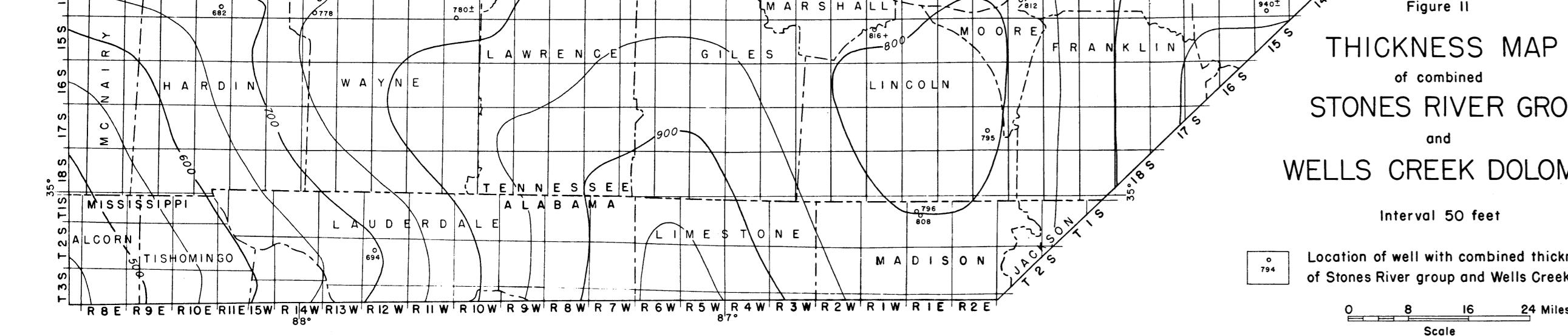


Figure 11 THICKNESS MAP of STONES RIVER GROUP and WELLS CREEK DOLOMITE

** On high (C) section.