

PRELIMINARY SURFICIAL GEOLOGY OF THE LINCOLN COUNTY PORTION OF THE JUNIATA AND BROOKVILLE SW QUADRANGLES, KANSAS

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2016

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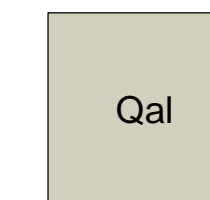
These descriptions are a compilation of several sources, including field notes and measured sections, Kansas Department of Transportation geological reports and profiles, and lithologic descriptions in Berry (1952), Bayne et al. (1971), and Arbogast and Johnson (1996).

GEOLOGIC UNITS

CENOZOIC

Quaternary System Pleistocene-Holocene

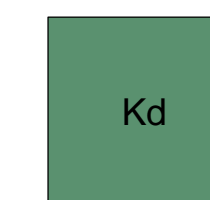
Alluvium and Terrace Valley Fill—Alluvium and terrace valley fill are found along the Saline River and its tributaries. Floodplain deposits contain mostly silt and clay with some sand. The thickness of the alluvium ranges up to 60 ft (18 m) in the Saline River valley and 20 ft (6 m) in other major tributaries in the county (Berry, 1952).



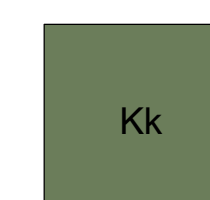
MESOZOIC

Cretaceous System – Lower Cretaceous Series

Dakota Formation—The Dakota Formation is composed of two members: the lower Terra Cotta Clay Member and the upper Janssen Clay Member. The Dakota is composed of varicolored clay, calcstone, and shale with irregular and sometimes massive lenses of siltstone and sandstone. The mudrocks are red-mottled pale-gray, tan to brown clay and silt. The interbedded sandstone lenses are fine to medium grained, very light gray to orange-tan to dark red-brown, and commonly poorly cemented. Concretions and thick layers of hard, gray, calcite-cemented sandstone (locally referred to as "Lincoln quartzite") are found in Lincoln County in small, isolated areas, but extensive deposits near Lincoln, Kansas are mined for aggregate. The Dakota often contains lignite and carbonaceous fragments, and small concretions and thin beds of limonite, siderite, and hematite occur as scattered fragments on eroded mudrock surfaces. The Dakota Formation ranges from about 140 ft (43 m) thick in eastern Lincoln County to about 200 ft (61 m) in the western part (Berry, 1952) and is an important source of water in Lincoln County and elsewhere in Kansas. In Lincoln County, the Dakota is exposed in much of central and southeastern parts of the county in areas adjacent to the Saline River and its tributaries.



Kiowa Formation—The upper part of the Kiowa Formation is present at the surface only in the extreme southeast corner of Lincoln County, where gray to dark gray shale and siltstone and fine-grained orange-tan sandstones outcrop near the boundaries with Ellsworth and Saline counties.



REFERENCES

- Arbogast, A. F., and Johnson, W. C., 1996, Surficial Geology and Stratigraphy of Russell County, Kansas: Kansas Geological Survey, Technical Series 7, 45 p.
- Bayne, C. K., Franks, P. C., and Ives, W. J., Jr., 1971, Geology and ground-water resources of Ellsworth County, central Kansas: Kansas Geological Survey, Bulletin 201, 84 p.
- Berry, D. W., 1952, Geology and ground-water resources of Lincoln County, Kansas: State Geological Survey of Kansas, Bulletin 95, 96 p.

EXPLANATION

Boundaries and Locations

- County line
- Township range line
- Section line

Transportation

- Interstate and U.S. highway
- Local road
- Railroad
- Airport runway

Hydrology and Topography

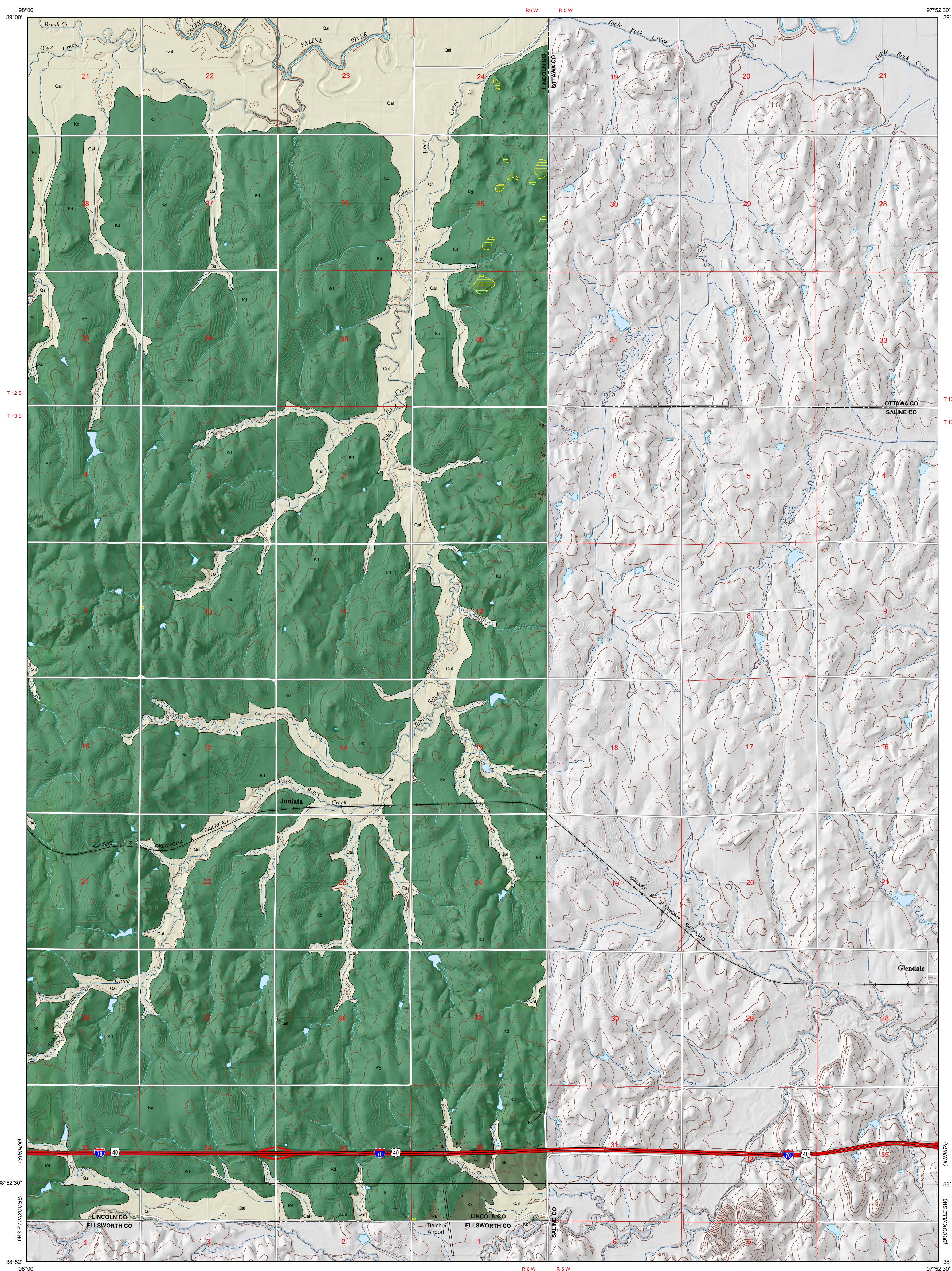
- Perennial stream
- Intermittent stream
- Water body
- Elevation contour (100-foot interval)
- Elevation contour (20-foot interval)
- Depression contour (100-foot interval)

Geologic Unit Boundaries

- Observed contact
- Concealed contact

Geologic Features

- Calcite-cemented concretions



Elevation contours are presented for general reference. Used in the U.S. Geological Survey's current US Topo 1:24,000-scale topographic map series, they were generated from hydrographically-improved 1/3 arc-second National Elevation Dataset (NED) data, and smoothed during processing for use at 1:24,000 scale. In some places the contours may be more generalized than the base data used for compilation of geologic outcrop patterns. Outcrop patterns on the map will typically reflect topographic variation more accurately than the associated contour lines. Repeated fluctuation of an outcrop line across a contour line should be interpreted as an indication that the mapped rock unit is maintaining a relatively constant elevation along a generalized contour.

1-m LiDAR hillshades and 1-m 2010 and 2012 U.S. Department of Agriculture – Farm Services Agency (USDA-FSA) National Agriculture Imagery Program (NAIP) digital imagery were used as references in the digital mapping. USGS 7.5-min 1:24,000-scale topographic maps, USDA Natural Resources Conservation Service (NRCS) soil surveys, and other geologic maps and bulletins were used to supplement the mapping. Roads and highways are shown on the base map as represented by data from the Kansas Department of Transportation (KDOT), U.S. Census Bureau, and other sources. U.S. Department of Agriculture – Farm Services Agency (USDA-FSA) National Agriculture Imagery Program (NAIP) imagery also was used to check road locations.

Shaded relief is based on 1-meter hydroflattened bare-earth DEMs from the State of Kansas LiDAR Database. The DEM images, in ERDAS IMAGINE format, were mosaicked into a single output DEM, downsampled to 2-meter resolution, and reprojected to decimal degrees. The output DEM was then converted to a hillshade, a multidirectional shaded-relief image using angles of illumination from 0°, 225°, 270°, and 315° azimuths, each 45° above the horizon, with a 4x vertical exaggeration.

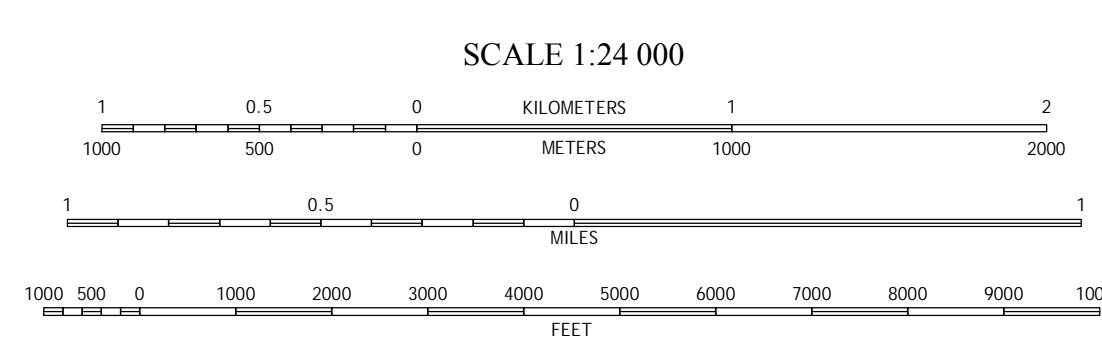
This geologic map was funded in part by the USGS National Cooperative Geologic Mapping Program, award number G15AC00225 (FY2015).

This map was produced using the ArcGIS system developed by Esri (Environmental Systems Research Institute, Inc.).

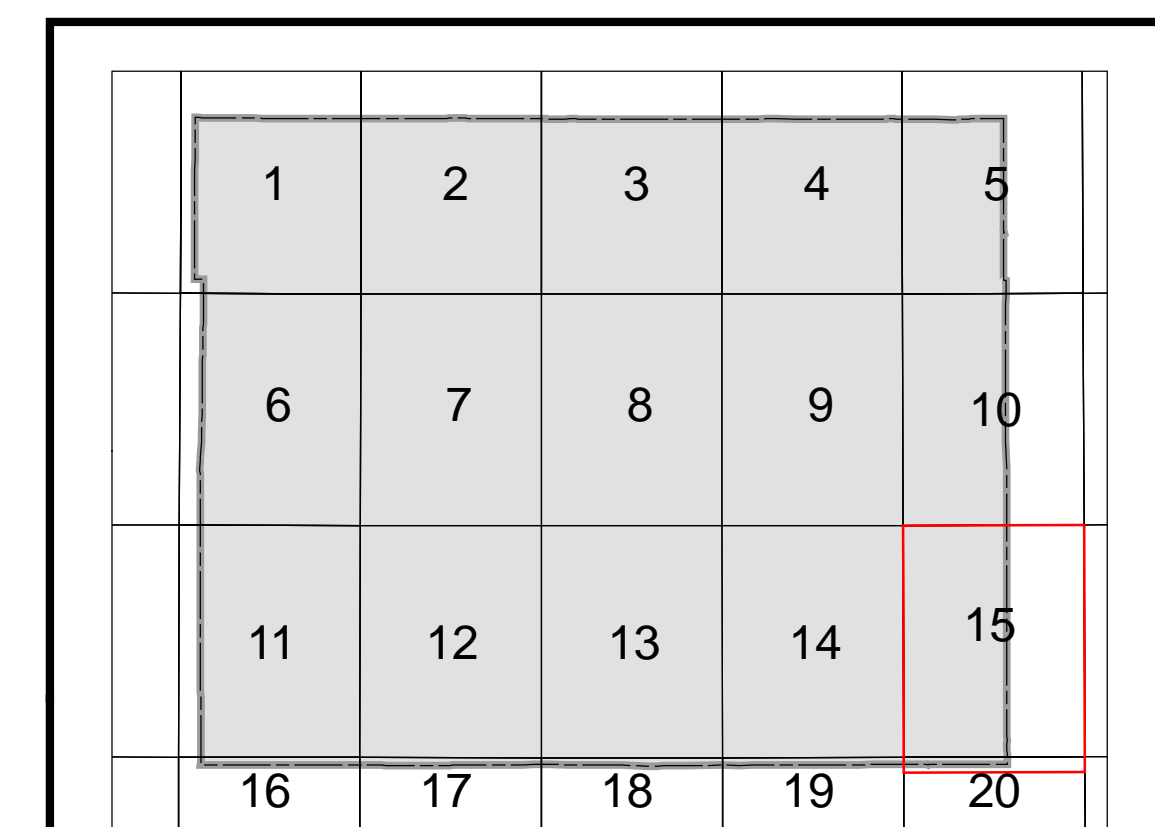
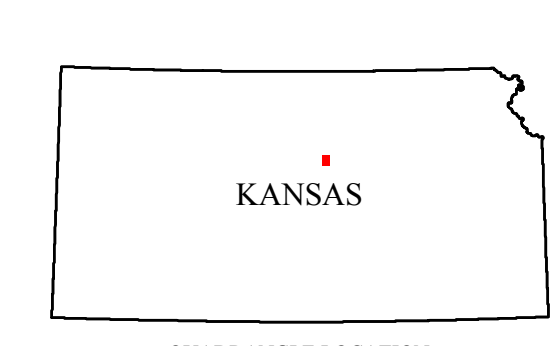
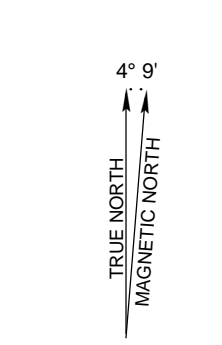
This map is a preliminary product and has had less scientific and cartographic review than the Kansas Geological Survey's M-series geologic maps. KGS does not guarantee this map to be free from errors or inaccuracies and disclaims any responsibility or liability for interpretations made from the map or decisions based thereon.

SUGGESTED REFERENCE TO THE MAP

Sawin, R. S., 2016, Preliminary surficial geology of the Lincoln County portion of the Juniata and Brookville SW quadrangles, Kansas: Kansas Geological Survey, Open-File Report 2016-5, scale 1:24,000, unpublished.



UNIVERSAL TRANSVERSE MERCATOR PROJECTION, ZONE 14
NORTH AMERICAN DATUM OF 1983



- LINCOLN COUNTY QUADRANGLES**
- | | |
|----------------|------------------|
| 1 Hunter | 11 Wilson NW |
| 2 Ash Grove | 12 Wilson NE |
| 3 Lincoln NW | 13 Westfall NW |
| 4 Barnard | 14 Westfall |
| 5 Ada | 15 Juniata |
| 6 Sylvan Grove | 16 Wilson |
| 7 Vesper | 17 Black Wolf |
| 8 Lincoln | 18 Westfall SW |
| 9 Shady Bend | 19 Westfall SE |
| 10 Tescott | 20 Brookville SW |