PRELIMINARY SURFICIAL GEOLOGY OF THE SEDGWICK COUNTY PORTION OF THE WHITEWATER QUADRANGLE, KANSAS

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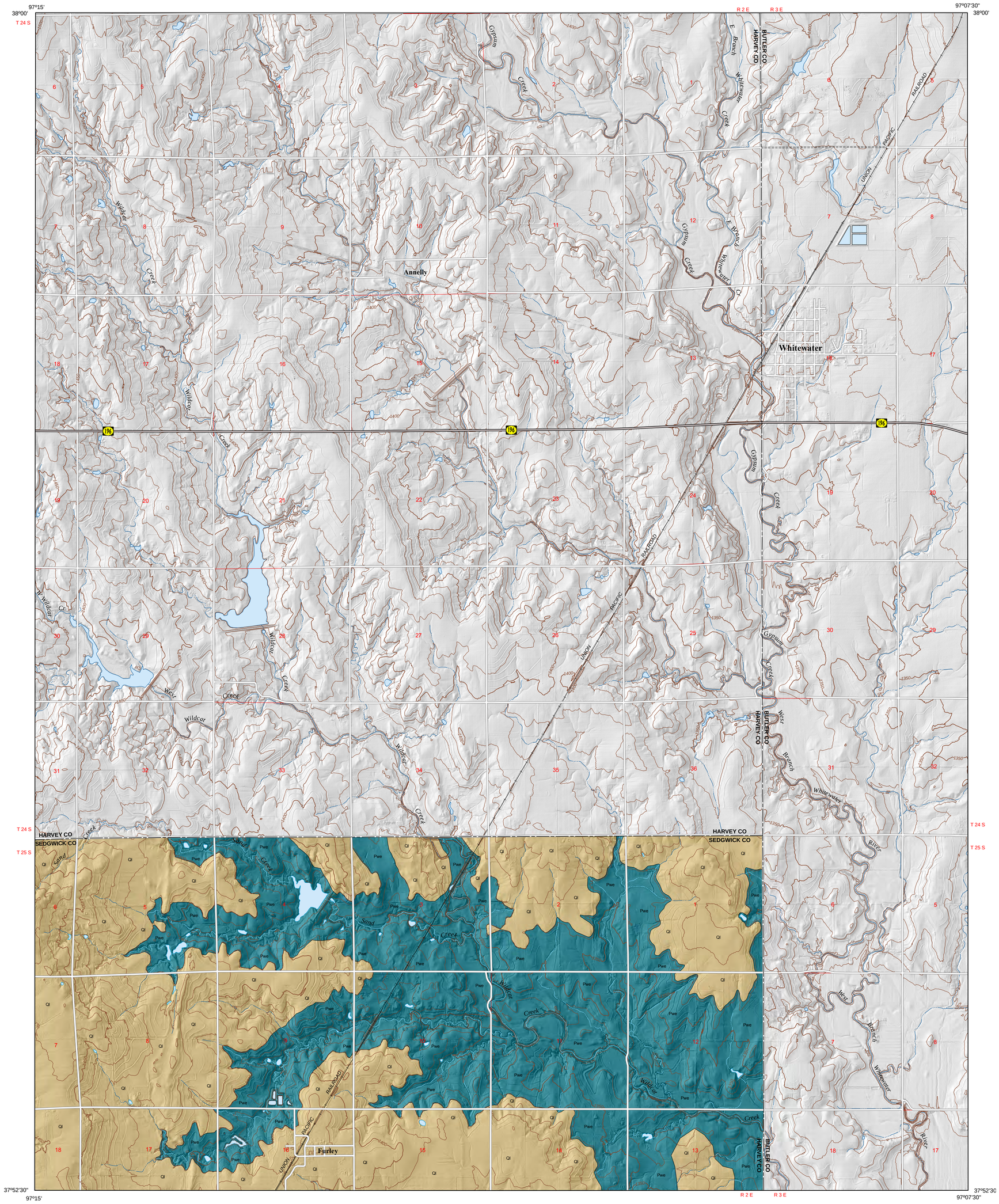

GEOLOGIC UNITS

CENOZOIC

Quaternary System
Pleistocene–Holocene

Qls — Wind-blown loess deposits in Sedgwick County are tan to pink-tan calcareous silt with zones of caliche and fine sand (Bevans, 1989). The loess ranges from Pleistocene to Holocene in age. Loess covers many of the upland surfaces in Sedgwick County (Welch and Hale, 1987) and rests unconformably on the Permian Wellington Formation and stratigraphically below thick (>5ft) soils.

PALEOZOIC

Wellington Formation — The Wellington Formation in Sedgwick County is predominantly soft, calcareous, gray and blue-gray shale with thin beds of gypsum, argillaceous limestone, and minor siltstone (Ver Wiebe, 1937). In northeastern Sedgwick County, minor beds of gypsum crop out where the Wellington is exposed along streams or lakes. The thick Hutchinson Salt Member, present in western Sedgwick County (Bass, 1929), is missing in the eastern portion of the county due to dissolution (Schumaker, 1966). Thin beds of the Carlton Limestone Member, a lenticular, dolomitic limestone with fossil insects, crops out in the eastern portion of the mapping area (Williams and Lohman, 1949). The uppermost member of the Wellington, the Milan limestone, is not present in central Kansas. The contact between the Wellington Formation and overlying Ninnescah Shale is placed where the shale changes color from gray to brick red (Zeller, 1968). The Wellington Formation in the western Kansas subsurface can be up to 700 feet thick, but in south-central Kansas, the exposed formation is 150 to 200 feet thick (Williams and Lohman, 1949). Outcrops of Wellington closely follow drainage system patterns where streams have cut through loess deposits to expose the underlying bedrock. In non-drainage areas, the Wellington is overlain by either Quaternary alluvium deposits or Pleistocene loess.

CITED REFERENCES

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EXPLANATION

Boundaries and Locations
- County boundary
- Township/range line
- Section line

Transportation
- 196 State highway
- Local road
- Unimproved road

Hydrology and Topography
- Perennial stream
- Intermittent stream
- Water body
- Water body (manmade shoreline)
- 1400 Elevation contour (50-foot interval)
- Elevation contour (10-foot interval)
- 1400 Depression contour (50-foot interval)
- Depression contour (10-foot interval)

Geologic Unit Boundaries
- Observed contact

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.

USGS National Elevation Dataset 1/3 arc-second 15 x 15 minute hillshade grids and 1-meter 2009 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-minute 1:24,000-scale topographic maps, USDA–Natural Resources Conservation Service (NRCS) Web Soil Survey Geographic Database (SSURGO), 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 City of Wichita-Sedgwick County LiDAR project. The original 1-meter DEM images, in ERDAS IMAGINE format, State Plane Kansas-South projection, North American Datum of 1983 (NAD 83), were resampled to 3-meter resolution, mosaicked into a single output DEM, which was reprojected to Universal Transverse Mercator (UTM) Zone 14. 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 G16AC00195 (FY2016).

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.

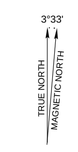
SUGGESTED REFERENCE TO THE MAP

Parcell, W. C., Dinkel, G. L., Post, S. D., and Dunham, J. W., 2017, Preliminary surficial geology of the Sedgwick County portion of the Whitewater quadrangle, Kansas: Kansas Geological Survey, Open-File Report 2017-29, scale 1:24,000, unpublished.

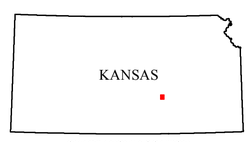
SCALE 1:24 000

1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 500 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

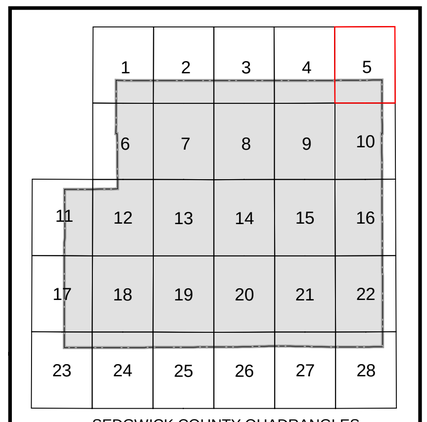
UNIVERSAL TRANSVERSE MERCATOR PROJECTION, ZONE 14
NORTH AMERICAN DATUM OF 1983



APPROXIMATE MEAN
DECLINATION, 2017



QUADRANGLE LOCATION



SEDGWICK COUNTY QUADRANGLES

1	Patterson	15	Wichita East
2	Bentley	16	Andover
3	Sedgwick	17	Cheney SE
4	Sedgwick NE	18	Lake Afton
5	Whitewater	19	Clearwater
6	Mount Hope	20	Bayneville
7	Colwich	21	Derby
8	Maize	22	Rose Hill
9	Valley Center	23	Norwich
10	Greenwich	24	Conway Springs
11	Cheney	25	Millerton
12	Garden Plain	26	Zyba
13	Goddard	27	Belle Plaine
14	Wichita West	28	Mulvane