

SURFICIAL GEOLOGIC MAP OF THE KEYSTONE SOUTH 7.5' QUADRANGLE, BENTON COUNTY, IOWA



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INTRODUCTION

The Keystone South Quadrangle is located in central Iowa on the boundary of the Iowan Erosion Surface and Southern Iowa Drift Plain landform regions. The map area on the Iowan Erosion Surface is dominated by dissected till plains with unnamed reworked periglacial sediments and elongated loess-covered uplands called paha. The Southern Iowa Drift Plain is characterized by thick loess and is found over a clayey Farmdale/Sangamon Geosol formed in till. Stratigraphically, this area contains Wisconsinan colian and/or colluvial sediments over Pre-Illinoian age glacial till overlying Paleozoic carbonates and shales. The thickness of Quaternary deposits in the Keystone South Quadrangle is generally over 60 m (200 ft).

New data collected for this mapping project included 22 drill cores including four drilling transects. New subsurface information was derived from the analysis of 59 water well records. Additional information about the surficial mapping units and stratigraphy may be found in the Summary Map Report of the Keystone South Quadrangle.

LEGEND

CENOZOIC

QUATERNARY SYSTEM

HUDSON EPISODE

- Qal** - Alluvium (DeForest Formation - Undifferentiated) Variable thickness of less than 1 to 5 m (3-16 ft) of very dark gray to brown, noncalcareous or calcareous, stratified silty clay loam, clay loam, loam to sandy loam alluvium and colluvium in stream valleys, on hill slopes, and in closed depressions. May overlie Wolf Creek or Alburnett formation glacial tills, Peoria Formation loess or colian sand, or Wisconsinan sand and gravel. Associated with low-relief modern floodplains, closed depressions, modern drainageways, or toeslope positions on the landscape. Seasonal high water table and potential for frequent flooding.
- Qaf** - Alluvial fan (DeForest Formation - Corrington Mbr.) Variable thickness of 2 to 5 m (7-16 ft) of dark brown to yellowish brown, noncalcareous, silt loam to loam with interbedded lenses of fine sand and silts. A pebble lag is commonly found at or near the fan surface. Overlies sand and gravel of the Noah Creek Formation along Prairie and Buckeye creeks. Shallow angled fans occur at the base of low order drainages and colluvial slopes along these drainages.

WISCONSIN EPISODE

- Qnw2** - Sand and Gravel (Noah Creek Formation) Generally 2 to 10 m (6-33 ft) of yellowish brown to gray, poorly to well-sorted, massive to well-stratified, coarse to fine feldspathic quartz sand, pebbly sand and gravel with few intervening layers of silty clay. A thin mantle of loess, reworked loess, or fine-grained alluvium may be present. This unit includes silty colluvial deposits derived from the adjacent map units and also encompasses "pre-Drift Member" deposits that accumulated in low-relief stream valleys during the Wisconsin and Hudson episodes. Seasonal high water table and some potential for flooding.
- Qps1** - Loess and Intercalated Eolian Sand (Peoria Formation - silt and/or sand facies) Generally 2 to 5 m (7-16 ft) of yellowish brown to gray, massive, fractured, noncalcareous grading downward to calcareous, silt loam and intercalated fine to medium, well-sorted sand. Sand is most abundant in the lower part of the colian package. Overlies massive, fractured, loamy glacial till of the Wolf Creek or Alburnett formations with or without the intervening clayey Farmdale/Sangamon Geosol.
- Qps1b** - Thick Loess and Intercalated Eolian Sand (Peoria Formation - silt and/or sand facies) Generally 5 to 15 m (16-49 ft) of yellowish brown to gray, massive, noncalcareous grading downward to calcareous silt loam and intercalated fine to medium, well-sorted sand. Minimum thickness of 5 m (16 ft) on uplands. Maximum thickness of 2 to 7 m (6-23 ft) of loess occurs on adjacent slopes. Overlies massive, fractured, loamy glacial till of the Wolf Creek or Alburnett formations with or without the intervening clayey Farmdale/Sangamon Geosol.
- Qps3** - Loess Shallow to Loamy and Sandy Sediment (Peoria Formation - silt and/or sand facies) Generally 2 - 3 m (7 - 10 ft) of yellowish brown, massive, noncalcareous silt loam and intercalated fine to medium, well sorted, feldspathic quartz sand. Sand, if present, occurs in the lower part of unit. Overlies 0.5 to 1.5 m (2 - 5 ft) of pebbly loam erosion surface sediment which, in turn, overlies eroded, massive, fractured, firm, loamy glacial till of the Wolf Creek or Alburnett formations. Seasonally high water table may occur in this map unit.

PRE-ILLINOIS EPISODE

- Qwa3** - Glacial Till (Wolf Creek or Alburnett formations) - Generally 60 m (200 ft) but can be more than 91 m (300 ft) thick. This mapping unit consists of very dense, massive, fractured, clay loam glacial till of the Wolf Creek or Alburnett formations. Map unit includes some areas mantled with less than 2 m (7 ft) of Peoria Formation materials (loess and colian sand). This mapping unit can be overlain by unnamed erosion surface sediments, colluvium, outwash, loess, colian sand, or alluvium.

CORRELATION CHART

General Lithology	Mapping Unit		Episode	Series	System
Alluvium	Qal	Qaf	Hudson	Holocene	Quaternary
Loess	Qps3	Qps1, Qps1b	Wisconsin	Pleistocene	
Colluvium	Qnw2				
Erosion Surface Sediments	Qwa2		Pre-Illinois		
Glacial till	Qwa3				

MAP SYMBOLS

- GeoSam point
- new drill core
- unit contact
- cross-section
- water body
- river/stream

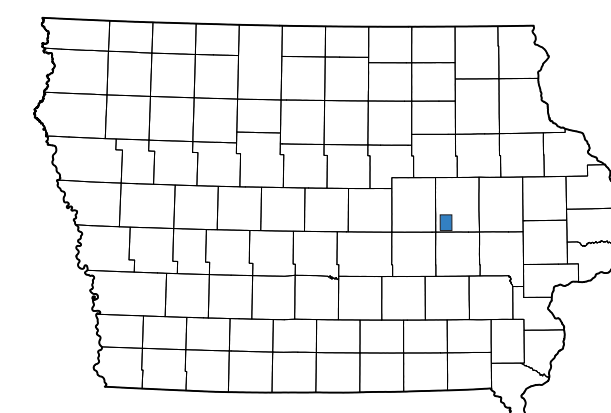
ROAD CLASSIFICATION

- U.S. Route
- State Route
- Local road

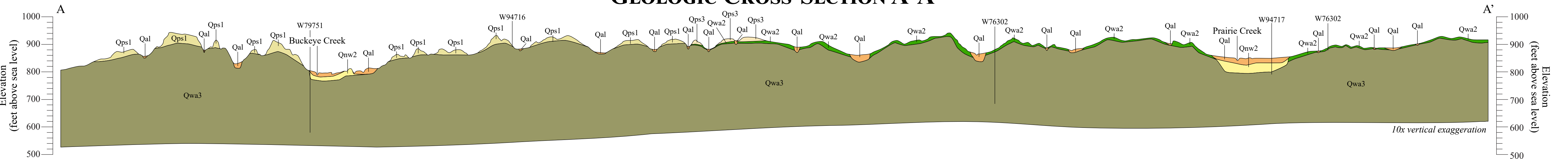
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ADJOINING QUADRANGLES		
1	2	3
4	5	
6	7	8



GEOLOGIC CROSS-SECTION A-A'

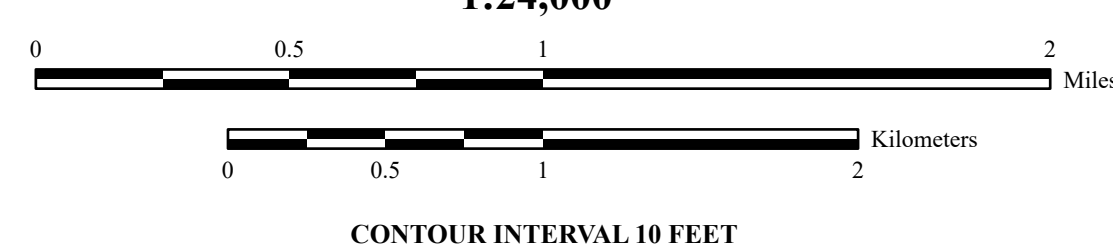


Base map from USGS Keystone South 7.5' Quadrangle map, published by the US Geological Survey in 2018. Land elevation contours (10' interval). Map projection and coordinate system based on Universal Transverse Mercator (UTM) Zone 15N, datum NAD83.

The map and cross-section are based on interpretations of the best available information at the time of mapping. Map interpretations are not a substitute for detailed site-specific studies. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. Government.

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UTM GRID AND 2020 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET



CONTOUR INTERVAL 10 FEET