

SURFICIAL GEOLOGIC MAP OF THE ARGYLE 7.5' QUADRANGLE, LEE COUNTY, IOWA AND CLARK COUNTY, MISSOURI

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Open File Map: OFM-21-4



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INTRODUCTION

The Argyle Quadrangle is located in Lee County on the Southern Iowa drift plain landscape region. The map area is dominated by loess-mantled till plains in the uplands, and fine- to coarse-grained alluvial deposits within the Des Moines River, Sugar Creek and their tributaries. Glacial till is only exposed in drainages and steep sideslopes. The Quaternary stratigraphy of the region consists of 2 to 5 m (7-15 ft) of Peoria Formation loess over a well-developed Yarmouth-Sangamon paleosol formed in Pre-Illinoian till. The Illinoian moraine lies to the east of the Argyle Quadrangle. The thickness of Quaternary materials varies widely across the quadrangle generally ranging from 0 to 18 m (0-60 ft) and reaching a maximum thickness of 88 m (290 ft) in the southeastern part of the mapping area. Bedrock exposures are found along the Des Moines River and its tributaries in the southwest portion of the map. Mississippian and Pennsylvanian units comprise the bedrock surface. An accompanying map of the bedrock geology of the Argyle Quadrangle has been published concurrently with this map (Open File Map OFM-21-3; Clark et al., 2021).

New data collected for this mapping project included four drill cores, 22 passive seismic data points, and investigation of three outcrops and one abandoned quarry. Additional subsurface information was derived from the analysis of more than 200 water well records, 18 of which have cutting samples that were described as part of this mapping project. Additional information about the surficial mapping units and stratigraphy may be found in the Summary Map Report of the Argyle 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 to calcareous, stratified silty clay loam, clay loam, loam to sandy loam alluvium and colluvium in stream valleys, on hillslopes and in closed depressions. May overlie Pre-Illinoian formation glacial till, Peoria Formation loess or colluvium, or Noah Creek Formation sand and gravel. This unit may include local fan deposits in smaller drainages. Associated with low-relief modern floodplain, closed depressions, modern drainageways or toeslope positions on the landscape. Seasonal high water table and potential for frequent flooding.
 - Qalb** - **Alluvium Shallow to Bedrock** (DeForest Formation - Undifferentiated) Variable thickness of less than 1 to 5 m (3-16 ft) of very dark gray to brown, noncalcareous to calcareous, stratified silty clay loam, clay loam, loam to sandy loam alluvium and colluvium in stream valleys, on hillslopes and in closed depressions. May overlie the Noah Creek Formation, Mississippian or Pennsylvanian bedrock. Bedrock surface is within 5 m (16 ft) of the land surface. Associated with low-relief modern floodplain, closed depressions, modern drainageways or toeslope positions on the landscape. Seasonal high water table and potential for frequent flooding.
 - Qallt** - **Low Terrace** (DeForest Formation - Camp Creek and Roberts Creek members) Variable thickness of less than 1 to 5 m (3-16 ft) of very dark gray to brown, noncalcareous, stratified silty clay loam, loam, or clay loam, associated with the modern channel belts of Sugar and Painter creeks and the Des Moines River. Overlies Noah Creek Formation sand and gravel. Occupies the lowest position on the floodplain (i.e. modern channel belts). Seasonal high water table and frequent flooding potential.
 - Qali-ht** - **Intermediate-High Terrace** (DeForest Formation - Gunder Member) Variable thickness of less than 1 to 5 m (3-16 ft) of very dark gray to brown, noncalcareous, silty clay loam to loam alluvium or colluvium. Overlies Noah Creek Formation sand and gravel along Sugar and Painter creeks and the Des Moines River. Occupies terrace and valley margin positions 1 to 2 m (3-7 ft) above the modern floodplain. Two terrace levels are present in some areas. Seasonal high water table and low to moderate flooding potential.
- WISCONSIN EPISODE**
- Qaf** - **Alluvial Fan** (DeForest Formation - Corrington Member) Variable thickness of 2 to 5 m (7-16 ft) of dark brown to yellowish brown, noncalcareous, silty loam to loam with interbedded lenses of fine sand and silts. A pebble lag is commonly found at or near the fan surface. Overlies thick sand and gravel of the Noah Creek Formation along the Des Moines River as steep angled fans at the base of low order drainages and colluvial slopes.
 - Qnw** - **Sand and Gravel** (Noah Creek Formation) Generally 3 to 9 m (10-30 ft) of yellowish brown to gray, poorly to well sorted, massive to well stratified, coarse to fine feldspathic quartz sand, loam, or silt loam alluvium (Late Phase High Terrace) or may overlie a Farmdale Geosol developed in Pisgah Silt which in turn overlies a well-exposed Sangamon Geosol developed in poorly to moderately well sorted, moderately to well stratified, coarse to fine sand, loam, or silt loam alluvium (Early Phase High Terrace).
 - Qpt** - **Loess Mantled Terrace** (Peoria Formation - silt and/or sand facies) Generally 2 to 7 m (7-23 ft) of yellowish brown to gray, massive, jointed, calcareous or noncalcareous, silt loam and intercalated fine to medium, well sorted, sand. May grade downward to poorly to moderately well sorted, moderately to well stratified, coarse to fine feldspathic quartz sand, loam, or silt loam alluvium (Late Phase High Terrace) or may overlie a Farmdale Geosol developed in Pisgah Silt which in turn overlies a well-exposed Sangamon Geosol developed in poorly to moderately well sorted, moderately to well stratified, coarse to fine sand, loam, or silt loam alluvium (Early Phase High Terrace).
 - Qps** - **Loess** (Peoria Formation - silt facies) Generally 2 to 5 m (7-15 ft) of yellowish to grayish brown, massive, jointed calcareous or noncalcareous silt loam to silty clay loam. May overlie a grayish brown to olive gray silty clay loam to silty clay (Pisgah Formation-eroded Farmdale Geosol) which is less than 1.5 m (5 ft) thick. The Pisgah Formation is in the same stratigraphic position as the Rosanna Silt which is mapped in Illinois. The Farmdale Geosol may be welded to an older Sangamon Geosol developed in loamy glacial till of the Wolf Creek or Alburnett formations. This mapping unit encompasses upland divides, ridgetops and convex sideslopes. Well to somewhat poorly drained landscape.

PRE-ILLINOIS EPISODE

- Qwa3** - **Till** (Wolf Creek or Alburnett formations) Generally 10 to 18 m (33-60 ft) of very dense, massive, fractured, loamy glacial till of the Wolf Creek or Alburnett formations with or without a thin loess mantle (Peoria Formation- less than 2 m) and intervening clayey Farmdale/Sangamon Geosol. A thin (1-2 meter) colluvial package may be present on slopes along Sugar Creek. This mapping unit encompasses narrowly dissected interfluves and side slopes, and side valley slopes. Drainage is variable from well drained to poorly drained.

OTHER MAPPING UNITS

- Qbr** - **Loamy Sediments Shallow to Dolostone, Limestone, Shale, and Sandstone** (DeForest, Noah Creek, Peoria, Wolf Creek, or Alburnett formations) Generally 1 to 2 m (3-7 ft) of yellowish brown to gray, massive to weakly stratified, well to poorly sorted loamy, sandy and silty sediments that overlie the Pennsylvanian or Mississippian bedrock surface. All areas of bedrock outcrop or shallow to bedrock soils are shown in red on the map, regardless of the bedrock mapping unit. Bedrock units are shown on the cross-section and may be identified on the bedrock map of the Argyle Quadrangle, see OFM-21-3.
- Qpq** - **Pits and Quarries** - Sand and gravel pits and rock quarries. Extent mapped as shown on the county soil survey and as identified on aerial imagery.

CORRELATION CHART

General Lithology	Shallow Bedrock	Valley	Upland	Episode	Series	Stage
Alluvium	Qalb	Qallt Qali-ht Qaf	Qal	Hudson	Holocene	Quaternary
Loess		Qpt	Qps			
Outwash	Qbr	Qnw*				
Glacial Till		Qwa3				Pre-Illinoian
Bedrock		Pcl*				Pennsylvanian
		Mpsl*				Mississippian
		Mws*				
		Mkco*				
		Mb*				
		Mk*				Devonian
	Der*					
	Dss*					
		Dgc*				

*Units only shown on the Cross-Section

MAP SYMBOLS

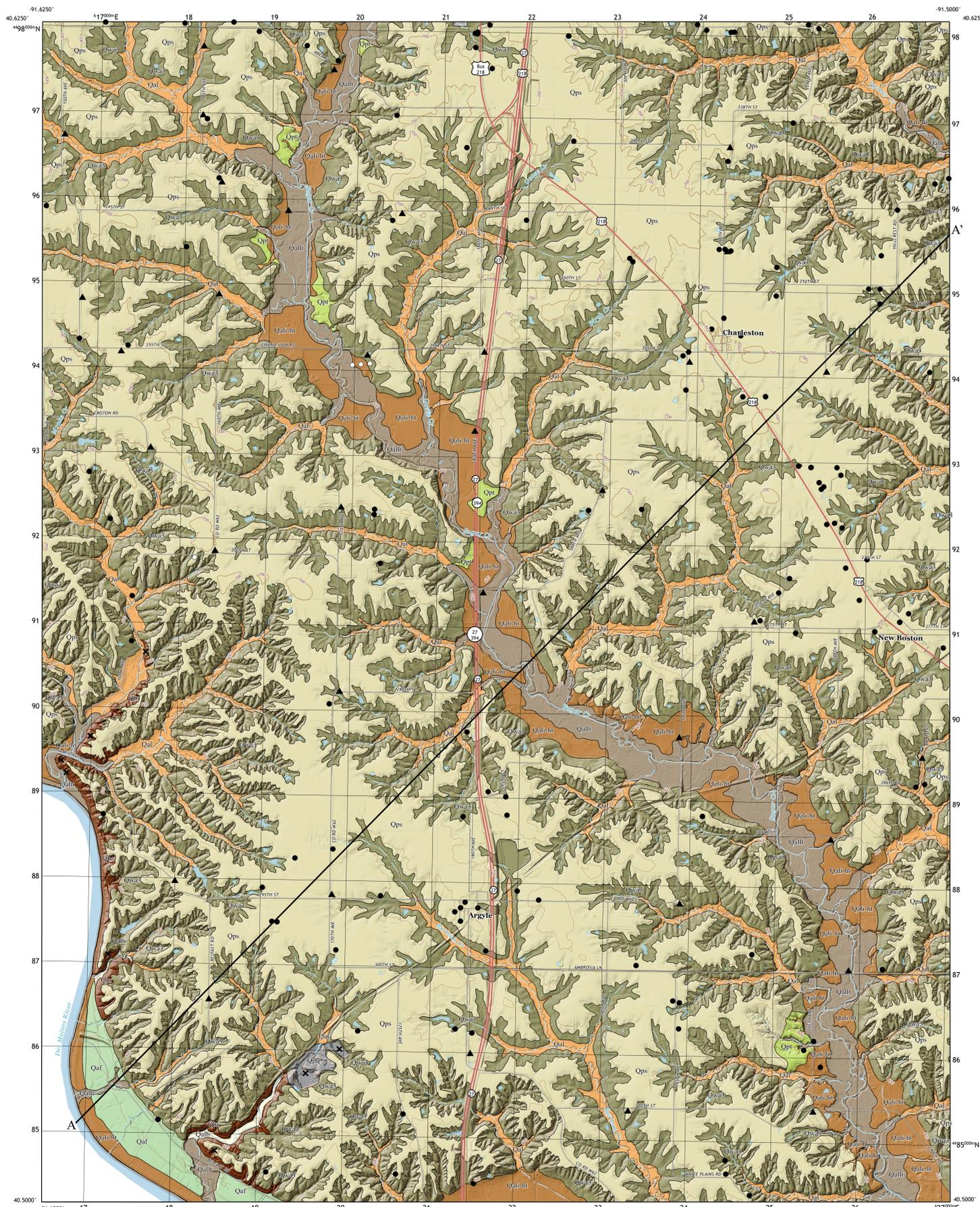
- bedrock outcrop
- GeoSam point
- new drill core
- geophysics collection point
- unit contact
- cross-section
- water body
- river/stream

ROAD CLASSIFICATION

- U.S. Route
- State Route
- Local Road

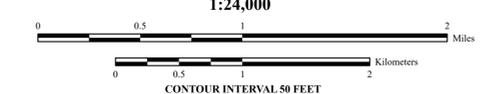
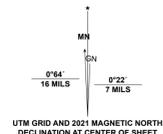
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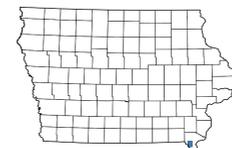


Base map from U.S. Geological Survey (USGS) Argyle 7.5' Quadrangle map published by the USGS in 2018. Map projection and coordinate system based on Universal Transverse Mercator (UTM) Zone 15N, datum NAD83. The map and cross-section are based on interpretations of the best available information at the 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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ADJOINING QUADRANGLES		
1	2	3
4	5	
6	7	8



GEOLOGIC CROSS-SECTION A-A'

