

Surficial Geology of the Shell Rock (Iowa)

7.5' Quadrangle

SURFICIAL GEOLOGY OF THE SHELL ROCK 7.5' QUADRANGLE, BUTLER, BLACK HAWK AND BREMER COUNTIES, IOWA

Iowa Geological Survey
Open File Map OFM-09-05
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prepared by

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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, massive to 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 Noah Creek Formation, Wolf Creek or Albion Formations or fractured Devonian carbonate bedrock. Associated with low-relief modern floodplain, closed depressions, modern drainage patterns, modern drainageways or topographic 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 hill slopes and in closed depressions. May overlie Noah Creek Formation or Devonian carbonate bedrock. Bedrock surface is within 5 m (16 ft) of the land surface. Associated with low-relief modern floodplain, closed depressions, modern drainageways or topographic positions on the landscape. Seasonal high water table and potential for frequent flooding.
- Qallt** - Alluvium Low Terrace (DeForest Formation-Camp Creek Mbr. and Roberts Creek Mbr.) 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 belt of the Shell Rock and West Fork Cedar river valleys. Overlies the Noah Creek Formation. Occupies lowest position on the floodplain, in modern channel belts. Seasonal high water table and frequent flooding potential.
- Qallht** - Intermediate-High Terrace (DeForest Formation-Gander Mbr.) 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 that overlies the Noah Creek Formation. Occupies terrace and valley margin positions 1 to 2 m (3-7 ft) above the modern floodplain. May be mantled with 2 to 3 m (7-10 ft) of fine to medium, well sorted medium to fine sand derived from wind reworking of the alluvium. Seasonal high water table and low to moderate flooding potential.

HUDSON and WISCONSIN EPISODE

- Qnw2** - Sand and Gravel (Noah Creek Formation) Generally 2 to 8 m (6-26 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 (Qal) may be present. This unit includes silty alluvial deposits derived from the adjacent map units. In places this unit is mantled with 1 to 3 m (3-10 ft) of fine to medium, well sorted medium to fine sand derived from wind reworking of the alluvium. This unit encompasses deposits that accumulated in low-relief stream valleys during the Wisconsin Episode and Hudson Episode. Seasonal high water table and some potential for flooding.

WISCONSIN EPISODE

- Qnw** - Sand and Gravel (Noah Creek Formation) - 3 m (10 ft) to more than 23 m (75 ft) of yellowish brown to gray, poorly to well sorted, massive to well stratified, coarse to fine feldspathic quartz sand, pebbly sand and gravel. In places mantled with 1 to 3 m (3-10 ft) of fine to medium, well sorted sand derived from wind reworking of the alluvium. This unit encompasses deposits that accumulated in stream valleys during the Wisconsin Episode.
- Qnw3** - Sand and Gravel Shallow to Bedrock (Noah Creek Formations) - 1 to 3 m (3-10 ft) of yellowish brown to gray, poorly to well sorted, massive to well stratified, coarse to fine feldspathic quartz sand, pebbly sand and gravel. May be overlain by up to 2 m (7 ft) of silty alluvial material. In places mantled with fine to medium well-sorted feldspathic quartz sand derived from wind reworking of the alluvium. Fractured carbonate bedrock is less than 5 m (16 ft) below the land surface. The unit encompasses deposits that accumulated in river and stream valleys during the late Wisconsin as well as excellent Pre-Illinois Episode deposits of the Wolf Creek and Albion Formations.

- Qwa2** - Loamy and Sandy Sediment Shallow to Glacial Till (Unnamed erosion surface sediment) Generally 1 to 7 m (3-23 ft) of yellowish brown to gray, massive to weakly stratified, well to poorly sorted loamy, sandy and silty erosion surface sediment. Map unit includes some areas mantled with less than 2 m (7 ft) of Peoria Formation materials (loess and colluvium). Overlies massive, fractured, firm glacial till of the Wolf Creek and Albion Formations. Seasonal high water table may occur in this map unit.
- Qwa5** - Loamy and Sandy Sediment Shallow to Rock (Unnamed erosion surface sediment) Generally 1 to 6 m (3-19 ft) of yellowish brown to gray, massive to weakly stratified, well to poorly sorted loamy, sandy and silty erosion surface sediment. Map unit includes some areas mantled with less than 3 m (10 ft) of Peoria Formation sand and silt (colluvium). Colluvium may be directly on top of bedrock in isolated areas. Overlies fractured Devonian carbonate rocks. Seasonal high water table may occur in this map unit.

PRE-ILLINOIS EPISODE

- Qwa3** - Till (Wolf Creek or Albion Formations) Generally 3 to 76 m (10-250 ft) of very dense, massive, fractured, loamy glacial till of the Wolf Creek or Albion Formations with or without a thin loess mantle (Peoria Formation—less than 2 meters) or this loamy sediment mantle (unnamed erosion surface sediment) may overlie intervening clayey Farmdale-Sargason Geosol. This mapping unit can be buried by unnamed erosion surface sediment, loess or alluvium and is shown only in the cross-section.

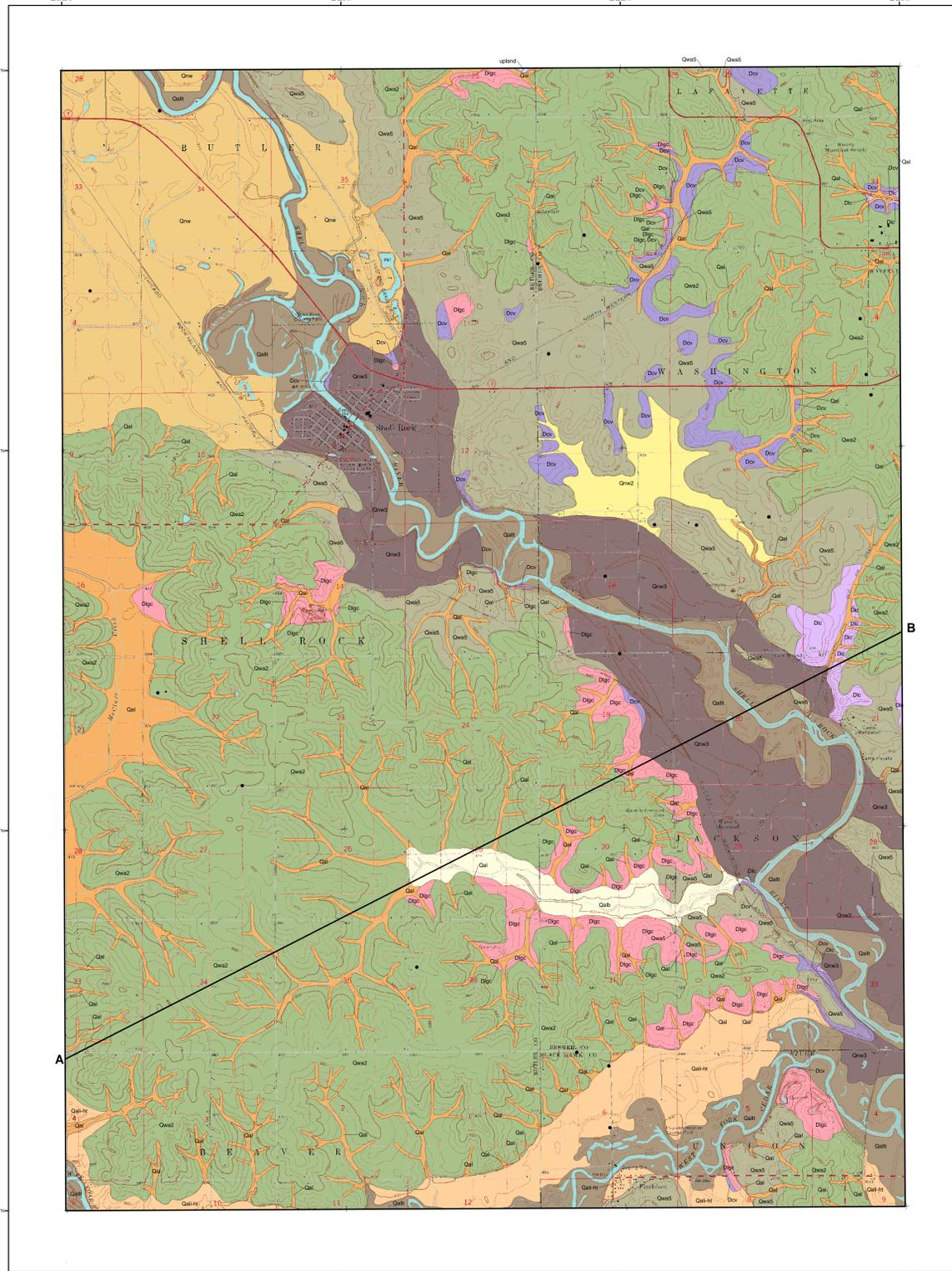
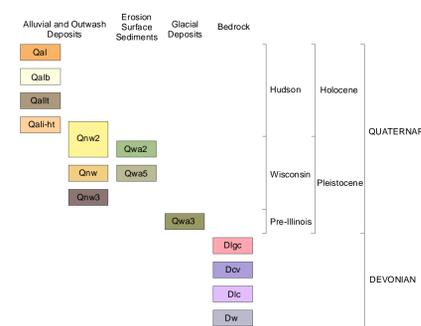
PALEOZOIC

DEVONIAN SYSTEM

- Dlqc** - Dolomite, Limestone, and Shale (Liberty City Formation) Middle to Upper Devonian. Maximum thickness of this map unit is up to 30 m (97 ft), consisting of, in ascending order, Osage Springs Member which is dominated by dolomite and dolomitic limestone, in part argillaceous and fossiliferous; Thunder Woman Shale Member which is characterized by gray shale, slightly dolomitic and silty; and partial Eldred Member which is characterized by interbeds of laminated lithographic and sublithographic limestone and dolomitic limestone with scattered abundant brachiopods and/or stromatopora.
- Dcv** - Limestone and Dolomite (Coralville Formation) Middle Devonian. Thickness of this formation varies between 10 and 18 m (35-60 ft), and is dominated by limestone, dolomitic limestone, and dolomite, in part laminated and argillaceous; brachiopods and corals are usually abundant in the limestone facies.
- Dic** - Dolomite and Limestone (Little Cedar Formation) Middle Devonian. The thickness of this formation ranges from 27 to 36 m (90-120 ft) in this area. It is dominated by slightly argillaceous to argillaceous dolomite and dolomitic limestone, usually wavy and partially laminated and/or cherty. This unit is commonly fossiliferous and brachiopods are especially abundant in lower portion.
- Dw** - Dolomite, Limestone, Shale, and minor Sandstone (Wappapungo Group) Middle Devonian. This map unit usually contains the Piceon Ridge Formation only, with a total thickness that varies between 9 and 14 m (30-45 ft) in the mapping area. It is dominated by shaly, laminated or brecciated, unfossiliferous limestone and dolomite that is sometimes sandy at its base. This unit is shown only in the cross-section.

Drill Holes

Correlation of Map Units



Base map from USGS Shell Rock 7.5' Digital Raster Graphic (IGS GIS file DRGH04.TIF) which was scanned from the Shell Rock 7.5' Topographic Quadrangle map, published by US Geological Survey in 1971. Topographic contours and land features based on 1967 aerial photography, field checked in 1971. Land elevation contours (10' interval).

Iowa Geological Survey digital cartographic file ShellRockQuad_surfaci090.mxd, version 01/15/09 (ArcGIS 9.2) Map projection and coordinate system based on Universal Transverse Mercator (UTM) Zone 15, 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.

GEOLOGIC CROSS-SECTION A-B

