

Surficial Geology of the Ridgeway (Iowa) 7.5' Quadrangle

LEGEND

CENOZOIC

QUATERNARY SYSTEM

HUDSON EPISODE

Qal - **Alluvium** (De Forest Formation—Undifferentiated) One to four meters (3 – 13 ft) of massive to weakly stratified, grayish brown to brown loam, silt loam, clay loam, or loamy sand overlying less than three meters (10 ft) of poorly to moderately well sorted, massive to moderately well stratified, coarse to fine feldspathic quartz sand, pebbly sand, and gravel and more than three meters (10 ft) of pre-Wisconsin or late Wisconsin Noah Creek Formation sand and gravel. Also includes colluvium derived from adjacent map units in stream valleys, on hillslopes, and in closed depressions. Seasonal high water table occurs in this map unit.

HUDSON AND WISCONSIN EPISODE

Qnw2 - **Sand and Gravel** (Noah Creek Formation) Two to eighteen meters (6.5-59 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. Along many valleys a thin mantle of loess, reworked loess, or fine-grained alluvium (Qal) may be present. This unit includes silty colluvial deposits derived from the adjacent map units. In places this unit is mantled with one to three meters 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

Qps - **Loess** (Peoria Formation—silt facies) Generally 2 m to 8 m (6 – 27 ft) of yellowish to grayish brown, massive, jointed noncalcareous grading downward to calcareous silt loam to silty clay loam. May be loamy near the boundary with the erosion surface. Overlies massive, fractured, loamy glacial till of the Pre-Illinoian Wolf Creek or Alburnett formations with or without intervening clayey Farmdale-Sangamon Geosol. In most areas the Pre-Illinoian till is 1 m to 5 m (3 – 16 ft) thick, but may be up to 8 m (27 ft) thick locally. This mapping unit encompasses upland divides, ridge-tops and convex-side slopes. Well to somewhat poorly drained landscape.

Qpsr - **Loess over bedrock** (Peoria Formation—silt facies) Generally 2 to 8 m (6 – 27 ft) of yellowish to grayish brown, massive, jointed noncalcareous grading downward to calcareous silt loam to silty clay loam. Overlies bedrock units or colluvium. This mapping unit encompasses upland divides, ridge-tops and convex-side slopes. Well to somewhat poorly drained landscape.

Qwa2 - **Loamy and Sandy Sediment Shallow to Glacial Till** (sediment associated with erosion surface) One to three meters (3 – 10 ft) of yellowish brown to gray, massive to weakly stratified, well to poorly sorted loam, sandy and silty erosion surface sediment. Map unit includes some areas mantled with less than two meters (6.5 ft) of Peoria Formation—silt (loess) or clay. Overlies massive, fractured, firm glacial till of the Wolf Creek and/or Alburnett formations. Seasonally high water table may occur in this map unit.

PALEOZOIC

DEVONIAN SYSTEM

Dw - **Dolomite, Limestone, Shale, and minor Sandstone** (Waspisnic Group) Middle Devonian deposits include the Spillville Formation, up to 19 m (60 ft), overlain by the Pincon Ridge Formation, up to 2 m (6 ft), for a maximum total thickness up to 21 m (68 ft). The Spillville Formation is dominated by medium to thick bedded dolomite, with scattered to abundant fossil molds, and vugs commonly filled with calcite crystals; basal portion is sandy or silty, a distinctive stratigraphic limestone facies occurs locally in the upper part. The Spillville is quarried for local aggregate and also hosts numerous small springs. The Pincon Ridge Formation is dominated by shaly, laminated or brecciated, unfossiliferous limestone and dolomite.

ORDOVICIAN SYSTEM

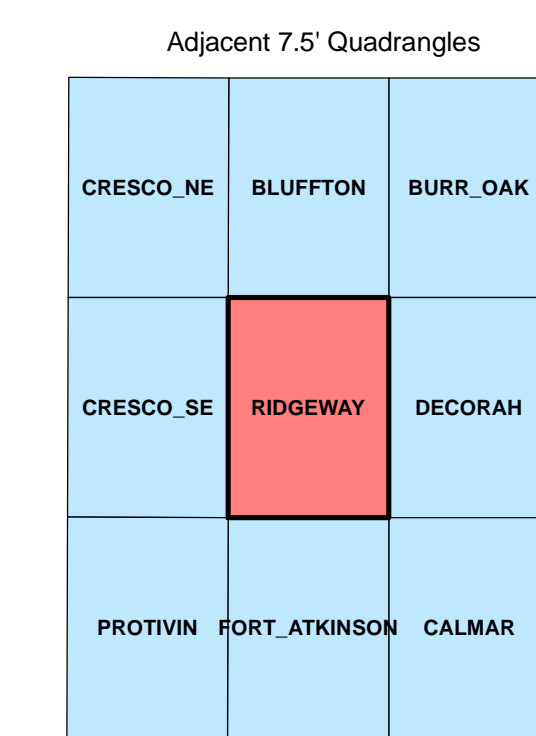
Om - **Shale, Limestone, and Dolomite** (Maquoketa Formation) A nonresistant slope-forming unit of up to 40 m (131 ft) of interbedded argillaceous limestone, dolostone and gray and brown shale. Fragmentary trilobite and graptolite fossils are common in the basal Elgin Limestone Member, and chert nodules are notable in the middle Fort Atkinson Member. It forms an upper confining unit that bounds a karst system in underlying Dubuque, Wise Lake and Dunleith formations of the Galena Group, and may host sinkholes in its lower portion.

Owd - **Limestone and minor Shale** (Wise Lake Formation and overlying Dubuque Formation, both of the Galena Group) A prominent ledge and cliff-forming unit of up to 31 m (102 ft) of limestone with thin interbedded gray shale beds in the upper 6 m. This map unit is the upper of two successive major cavern and karst-forming bedrock units in the area. The Wise Lake Formation consists of 21 m (67 ft) of medium to thick-bedded, relatively chert-free limestone, portions of which exhibit a distinctive bioturbated fabric; it serves as a source of concrete aggregate. The Dubuque Formation consists of 10 m (34 ft) of crinoidal limestone and thin interbedded shale. Sinkholes are common to abundant within this map unit.

Od - **Limestone** (Dunleith Formation of the Galena Group) A prominent ledge and cliff-forming unit of up to 42 m (137 ft) of limestone with minor thin interbedded shale. This is the lower of two successive major cavern and karst-forming bedrock units in the area. The formation consists of fossiliferous limestone and argillaceous limestone with common chert nodules; it is commonly quarried for aggregate. Major springs occur near its base and sinkholes and karst features are common.

Oppg - **Shale, Limestone, and Dolomite** (Decorah, and underlying Platteville, and Glenwood formations) A nonresistant slope-forming unit of green-grey shales, dense limestones, argillaceous limestones, and dolostone with average thickness of 26 m to 27 m (85 – 90 ft). Along steep valley wall slopes large detached slump-blocks of overlying Dunleith Formation limestones often rest on the upper surface of this unit. The unit forms a regional confining unit that serves as the basal boundary of the karst system in the overlying Dunleith, Wise Lake and Dubuque formations of the Galena Group. The upper division, the Decorah Formation, consists of 12 m to 14 m (39 – 46 ft) of interbedded fossiliferous green-grey shale and limestone. The middle division, the Platteville Formation, consists of 7.5 m (25 ft) of limestone, argillaceous limestone, and dolostone; it serves as a source of quarried aggregate. The lower division, the Glenwood Formation, consists of 2 m to 3 m (7 – 9 ft) of green-grey shale with minor siltstone to fine sandstone. This map unit, especially the upper and lower subdivisions (Decorah and Glenwood formations), is rarely exposed and is commonly mantled by 0 m to 2 m (0 – 6 ft) of Quaternary age colluvium.

- Drill Holes
- D Outcrops



Base map from USGS Ridgeway 7.5' Digital Raster Graphic (IGS GIS file DRGC38.TIF) which was scanned from the Ridgeway 7.5' Topographic Quadrangle map, published by US Geological Survey in 1981. Topographic contours and land features based on 1975 aerial photography, field checked in 1977. Land elevation contours (20' interval) based on NGVD 1929.

Iowa Geological Survey digital cartographic file ridgeway@iagsd_surficial.mxd, version 8/29/08 (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 MAPPING OF THE UPPER IOWA RIVER WATERSHED: PHASE 4: Ridgeway 7.5' Quadrangle

Iowa Geological Survey
Open File Map 08-04
August 2008

prepared by

Stephanie Tassier-Surine, Robert McKay, Huaibao Liu, and James D. Gigliero

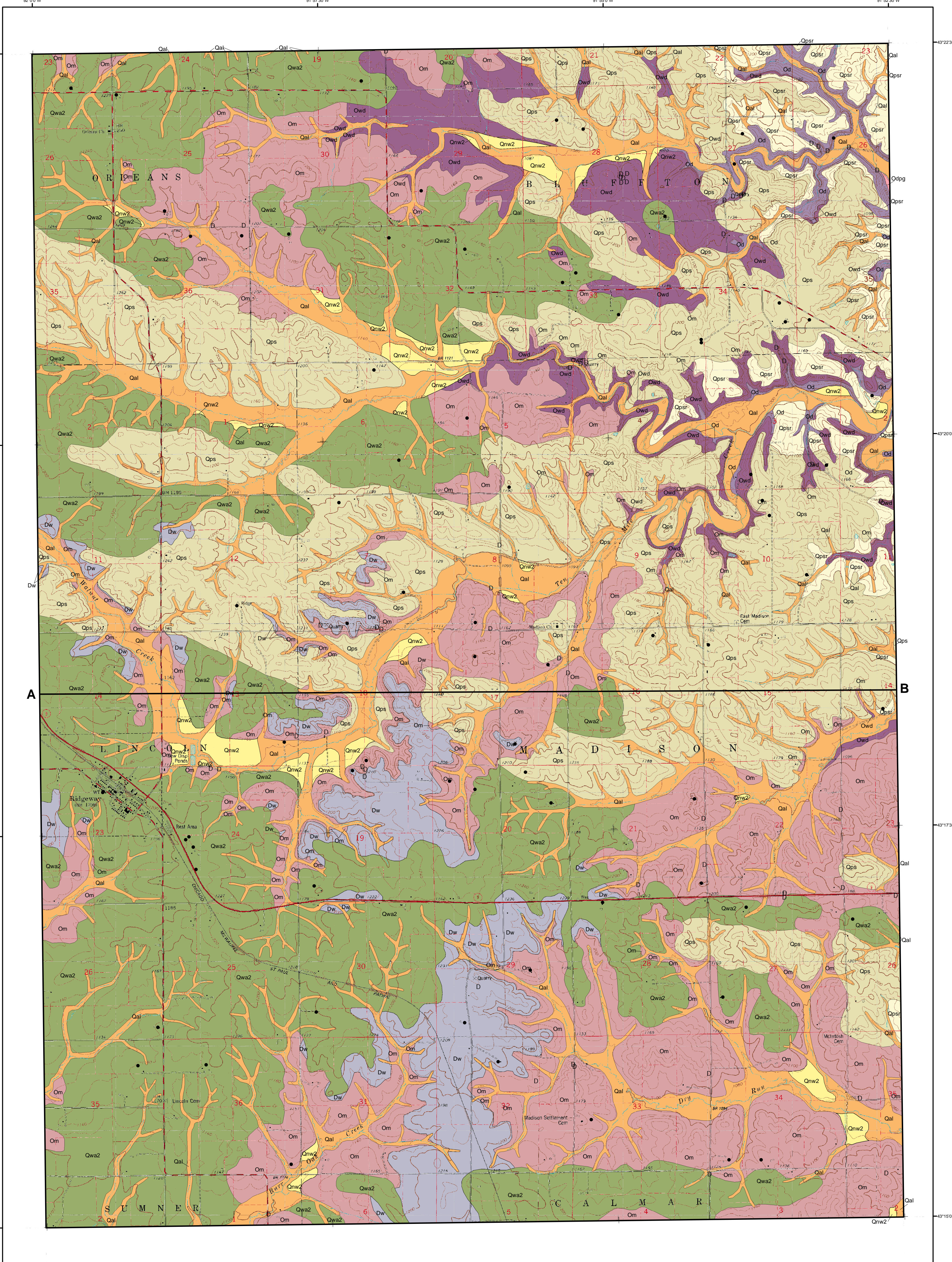
Iowa Geological Survey, Iowa City, Iowa

Iowa Department of Natural Resources, Richard A. Leopold, Director
Iowa Geological Survey, Robert D. Liben, State Geologist

Supported in part by the U.S. Geological Survey
Cooperative Agreement Number 07HQ00087
National Cooperative Geologic Mapping Program (STATEMAP)

ACKNOWLEDGMENTS

We thank the staff of the Northeast Iowa RC & D for their efforts in helping to initiate this mapping project and for supporting our work in the Upper Iowa River watershed. New subsurface geologic data was generated by the University of Iowa students: Thomas Marshall and Kelly Wilhelm who produced descriptive logs of water well drill samples. Luther College in Decorah actively participated in the project through subcontract 07-7380-01 for field mapping support. Luther College students Gabriel Demuth and Carl Haasstead were participants in field and office work in support of the mapping effort. Brigitte Meade of Luther College was instrumental in accurately locating and elevating water wells in the map area. Drilling in selected sites was provided under contract by Aquadiff, Inc. of Swisher, Iowa. Special thanks to Joel and Patsy Kruse who graciously allowed access to their land for drilling. Deborah Quade, Iowa Geological Survey (IGS) lent support with Quaternary field and office expertise; Robert Rowden (IGS) participated in part of the field work; Amy Sabin (IGS) prepared well samples for stratigraphic logging; Brian Witzke (IGS) provided subsurface information concerning the Ordovician and Devonian stratigraphy of the area; and Andy Ansell and Chris Kahle (IGS) provided GIS mapping technical help. Assistance obtaining drilling records and geologic information was provided by Dave Stanley and staff at Bear Creek Archaeology.



GEOLOGIC CROSS-SECTION A-B

