

	dark gray to brown, noncalcareous, stratified silty clay loam to loam that overlies Noah Creek Formation. Occupies low terrace position above the modern floodplain in the Cedar and Wapsipinicon river valleys. Seasonal high water table and frequent flooding potential
ali-ht	Qali-ht - Intermediate-High Terrace (DeForest Formation-Roberts Creek Mbr. and Gunder Mbr.). Variable thickness of less than 1 to 5 meters (2 to 16 feet) of very dark gray to brown, noncalcareous, silty clay loam to loam alluvium or colluvium that overlies Noah Creek Formation. Occupies terrace and valley margin position 1 to 2 meters (6.6 to 10 feet) above the modern floodplain in the Cedar and Wapsipinicon river valleys.
Qalht	Qalht - High Terrace (DeForest Formation-Gunder and Corrington Mbrs.) Variable thickness of less than 1 to 7 meters (3 to 22.5 feet) of very dark gray to brown, noncalcareous, silty clay loam, loam alluvium or colluvium. Overlies Noah Creek Formation. Occupies terrace and valley margin position 2 to 3 meters (6.6 to 10 feet) above the modern floodplain in the Cedar and Wapsipinicon river valleys. Seasonal high water table and rare flooding potential.
	HUDSON AND WISCONSIN EPISODE
Qe	Qe - Sand Dunes and Sand Sheets (Peoria Formation-sand facies) Generally less than six meters (20 feet) of yellowish brown, massive, calcareous loamy sand to fine sand. It may overlie yellowish-brown sand and gravel (Noah Creek Formation), or reworked unnamed loamy sediments associated with the Iowan Erosion Surface and/or it may overlie yellowish to grayish brown, often calcareous and fractured clay loam to loam diamicton (Wolf Creek and Alburnett formations)
<mark>)nw2</mark>	Qnw2 – Sand and Gravel (Noah Creek Formation) Two to eighteen meters (6.6 to 60 feet) 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 Pioneer, Sugar and Walnut Creek valleys a thin mantle of loess, reworked loess, fine-grained alluvium (Qal2) 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 (3 to 10 feet) 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	Qnw- Sand and Gravel (Noah Creek Formation) More than ten meters (32 feet) 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 one to three meters (3 to 10 feet) 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.
Qptlp	Qptlp - Late Phase High Terrace (LPHT) (Peoria Formation-silt and/or sand facies) Generally two to eight meters (6 to 26 feet) of yellowish brown to gray, massive, jointed, calcareous or noncalcareous, silt loam and intercalated fine to medium, well sorted, sand. Grades downward to poorly to moderately well sorted, moderately to well stratified, coarse to fine feldspathic quartz sand, loam, or silt loam alluvium.
ptep	Qptep – Early Phase High Terrace (EPHT) (Peoria Formation-silt and/or sand facies) Generally two to twelve meters (6 to 39 feet) of yellowish brown to gray, massive, jointed, calcareous or noncalcareous, silt loam and intercalated fine to medium, well sorted, sand. The Peoria deposits overlie a Farmdale Geosol developed in Roxanna Silt which in turn overlies a well-expressed Sangamon Geosol developed in poorly to moderately well sorted, moderately to well stratified, coarse to fine sand, loam, or silt loam alluvium of Pre-Wisconsin age.
Qpt	Qpt – Loess Mantled Terrace (Peoria Formation-silt and/or sand facies) Generally two to five meters (6 to 16 feet) of yellowish brown to gray, massive, jointed, calcareous or noncalcareous, silt loam and intercalated fine to medium, well sorted, sand. Grades downward to poorly to moderately well sorted, moderately to well stratified, coarse to fine feldspathic quartz sand, loam, or silt loam alluvium. Undifferentiated terrace unit mapped in smaller valleys encompassing Qptlp and Qptep terrace units.
Qps	Qps – Loess (Peoria Formation—silt facies) Generally 2 to 8 m (6 to 25 ft) of yellowish to grayish brown, massive, jointed calcareous or noncalcareous silt loam to silty clay loam. Overlies 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 Farmdale Geosol appears to have been disturbed by periglacial action and was 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.
2ps1	Qps1 - Loess and Intercalated Eolian Sand (Peoria Formation-silt facies) Two to ten meters (6.6 to 33 feet) 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 lower part of the eolian package. Overlies massive, fractured, loamy glacial till of the Wolf Creek or Alburnett formations with or without intervening clayey Farmdale/Sangamon Geosol.
<mark>ps1b</mark>	Qps1b - Thick Loess and Intercalated Eolian Sand (Peoria Formation-silt facies) Generally five to fifteen meters (16 to 49 feet) of yellowish brown to gray, massive, noncalcareous grading downward to calcareous silt loam and intercalated fine to medium, well sorted, sand. Minimum thickness of five meters on uplands. Maximum thickness of two to seven meters of loess occurs on adjacent slopes. Overlies massive, fractured, loamy glacial till of the Wolf Creek or Alburnett formations with or without intervening clayey Farmdale /Sangamon Geosol.
Qps2	Qps2 - Eolian Sand and Intercalated Silt (Peoria Formation—sand facies) Generally five to fifteen meters (16 to 49 feet) of yellowish brown to gray, moderately to well stratified noncalcareous or calcareous, fine to medium, well sorted, eolian sand. May contain interbeds of yellowish brown to gray, massive, silt loam loess. Overlies eroded, massive, fractured, loamy glacial till of the Wolf Creek or Alburnett formations or fractured Silurian-age carbonate bedrock.
2ps5	Qps5 - Loess and Intercalated Eolian Sand (Peoria Formation-silt facies) Two to ten meters (6.6 to 33 feet) of yellowish brown to gray, massive, fractured, noncalcareous grading downward to calcareous silt loam and intercalated fine to medium, well sorted, sand and a basal eolian (3 to 13 feet) thick sand sheet. Overlies a thin massive to weakly stratified, well to poorly sorted loamy, sandy and silty erosion surface sediment (unnamed erosion surface sediment). and or massive, fractured, loamy glacial till of the Wolf Creek or Alburnett formations with or without intervening clayey Farmdale/Sangamon Geosol.
Qwa2	Qwa2 - Loamy and Sandy Sediment Shallow to Glacial Till (Unnamed erosion surface sediment) Generally one to six meters (3 to 19 feet) 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 two meters of Peoria Silt (loess). Overlies massive, fractured, firm glacial till of the Wolf Creek and Alburnett formations. Seasonally high water table may occur in this map unit.
	PRE-ILLINOIS EPISODE
Qwa3	Qwa3 – Till (Wolf Creek or Alburnett formations) Generally three to fifty-five meters (10 to 180 feet) of very dense, massive, fractured, loamy glacial till of the Wolf Creek or Alburnett Formations with or without a loess/eolian sand mantle (Peoria Formation) or thin loamy sediment mantle (unamed erosion surface sediment) may overlie intervening clayey Farmdale/ Sangamon Geosol. This mapping unit can be buried by unnamed erosion surface sediments, loess or alluvium.
	Other Mapping Units
Qpq	Qpq - Pits and Quarries Sand and gravel pits and rock quarries. Extent mapped as shown in county soil surveys.
Qf	Qf – Fill Areas of major land filling. Fill associated with railroad grades, highway grades, and land leveling. Variable in texture. Extent mapped as shown in county soil surveys.
	Bedrock – All areas of bedrock outcrop regardless of unit shown in red on map, without any labels. Bedrock units are shown on cross-sections with the following descriptions:
	PALEOZIC
D	DEVONIAN SYSTEM Dc - Limestone and dolomite (Cedar Valley Group). This group includes the Little Cedar, Coralville, and Lithograph City formations. Middle to Upper Devonian (upper
DC	 Givetian-lower Frasnian). Maximum thickness 36 meters (120 feet). Primary lithologies: limestone and dolomite, fossiliferous, part argillaceous. Secondary lithologies: nodular chert; shale, dolomitic. Dw - Dolomite (Wapsipinicon Group). This group includes the Otis and Pinicon Ridge formations. Middle Devonian (upper Eifelian-lower Givetian). Maximum thickness 18-34
Dw	meters (60-110 feet). Primary lithology Otis Fm.: dolomite, part vuggy. Primary lithologies Pinicon Ridge Fm.: dolomite, laminated to argillaceous; limestone, dense, sublithographic, partly to wholly brecciated. Secondary lithologies: shale, dolomitic to sandy. Minor: chert and chalcedony; sandstone.
	SILURIAN SYSTEM
Sg	Sg - Dolomite (Gower Formation). This formation includes the Anamosa and Brady members. Silurian (Wenlock-Ludlow). Maximum thickness 40 meters (130 feet). Primary lithologies: dolomite, prominently laminated in part (Anamosa Mbr.); dolomite, fossiliferous to vuggy, carbonate mound facies (Brady Mbr.). Minor: nodular chert; intraclastic dolomite.
Ss	Ss - Dolomite (Scotch Grove Formation). This formation includes the Welton, Buck Creek Quarry, Waubeek, Palisades-Kepler, and Johns Creek Quarry members. Lower Silurian (upper Llandovery-Wenlock). Maximum thickness generally <49 meters (160 feet); locally to 75 meters (250 feet) where upper strata are developed as large carbonate mounds (Palisades-Kepler Mbr.). Primary lithologies: dolomite, fossil-moldic to vuggy, part very crinoidal; dolomite, cherty to very cherty, dense. Secondary lithologies: dolomite, mounded facies (dipping strata), part very fossiliferous to vuggy. Minor: dolomite, slightly argillaceous; quartz druse, chalcedony.
Sh	Sh - Dolomite (Hopkinton and Blanding Formations). Lower Silurian (Llandovery). Maximum thickness 30 meters (100 feet). Primary lithologies: dolomite, fossil-moldic to vuggy, non-cherty to very cherty. Secondary lithologies: chert, nodular to bedded (Blanding, lower Hopkinton). Interval not found in outcrop in Cedar County; unconformably overlies Upper Ordovician Maquoketa Shale.
	ORDOVICIAN SYSTEM
Om	Om – Shale (Maquoketa Formation). Upper Ordovician (Richmondian). Known thickness in Cedar County 67 meters (220 feet). Primary lithology: shale, green-gray to brown gray. Secondary lithology: dolomite. Unit does not form the bedrock surface anywhere in Cedar County (shown on cross sections only).
•	Drill Holes
	Base map from Iowa DNR NRGIS Library (Cedar County GIS files) derived from USGS 1:100,000 scale DLGs,
	Iowa Geological Survey digital cartographic file CedarCo_Bedrock08.mxd , version 8/28/08 (ArcGIS 9.2).
	Map and cross-sections are based on interpretations of the best available information at the time of mapping.

can be permanently covered by water. High water table.

map units. Seasonally high water tables occur in this map unit.

and potential for frequent flooding.

LEGEND

CENOZOIC

QUATERNARY SYSYTEM

HUDSON EPISODE

Qo – Depressions and Fens (DeForest Formation-Woden Mbr.) Generally 2.5 to 6 meters (8 to 16.5 feet) of black to very dark gray, calcareous, muck, peat and silty clay loam colluvium and organic sediments in drained and undrained closed and semi-closed depressions. Overlies Noah Creek Fm. sand and gravel in larger stream valleys or may be associated with seeps and springs along valley walls. Usually, associated with stream valley side slopes and areas of exhumed inter-till gravels. Supports wetland vegetation and

Qal - Alluvium (DeForest Formation-Undifferentiated) One to four meters (3 to 13 feet) of massive to weakly stratified, grayish brown to brown loam, silt loam, clay loam, or loamy sand overlying less than three meters (10 feet) 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 of pre-Wisconsin or Wisconsin Noah Creek Formation sand and gravel. Unit also includes colluvial deposits derived from adjacent

Qal2 - Stream Valley Thick Alluvium (DeForest Formation-Undifferentiated) Variable thickness of 2 to 6 meters (6.6 to 20 feet) of very dark gray to brown, noncalcareous, massive to stratified silty clay loam, loam, sandy loam alluvium and colluvium associated with Pioneer and Walnut Creek stream valleys. Alluvium overlies an unusually thick, from 6 to 18 m (20 to 60 ft) sequence of medium sand to pebbly sand outwash of the Noah Creek Formation. Occupies low-relief modern floodplain. Seasonal high water table

Qallt - Low Terrace/Modern Channel Belt (DeForest Formation-Camp Creek Mbr. and Roberts Creek Mbr.) Variable thickness of less than one to 5 meters (3 to 16 feet) of very dark gray to brown, noncalcareous, stratified silty clay loam, loam, or clay loam, associated with the Holocene channel belt of the Cedar and Wapsipinicon river valleys. Overlies Noah Creek Formation sand and gravel. Ox-bow lakes and meander scars are common features associated with this terrace level. Post settlement alluvium thickness varies from 1.5 feet in higher areas to 6 feet along the river course and in lower lying areas. Seasonal high water table and frequent flooding potential.

Oalit - Intermediate Terrace (DeForest Formation-Camp Creek Mbr., Roberts Creek Mbr. and Gunder Mbr.). Variable thickness of less than 1 to 5 meters (2 to 16 feet) of very hat overlies Noah Creek Formation. Occupies low terrace position above the modern floodplain in the Cedar t flooding potential Creek Mbr. and Gunder Mbr.). Variable thickness of less than 1 to 5 meters (2 to 16 feet) of very dark gray

SON AND WISCONSIN EPISODE

WISCONSIN EPISODE

PRE-ILLINOIS EPISODE

Other Mapping Units

PALEOZIC

DEVONIAN SYSTEM

ORDOVICIAN SYSTEM

r County GIS files) derived from USGS 1:100,000 scale DLGs, SER line files and IGS PLSS files. e CedarCo Bedrock08.mxd , version 8/28/08 (ArcGIS 9.2). Jniversal Transverse Mercator (UTM) Zone 15, datum NAD83. ations of the best available information at the time of mapping. Map interpretations are not a substitute for detailed site specific studies.

Iowa Geological Survey **Open File Map OFM-08-8**

information from past investigations in Cedar County.

¹Iowa Department of Natural Resources, Iowa Geological Survey 109 Trowbridge Hall, Iowa City, IA 52242-1319 ²University of Iowa, Department of Geoscience 121 Trowbridge Hall, Iowa City, IA 52242-1319



1:180,000



