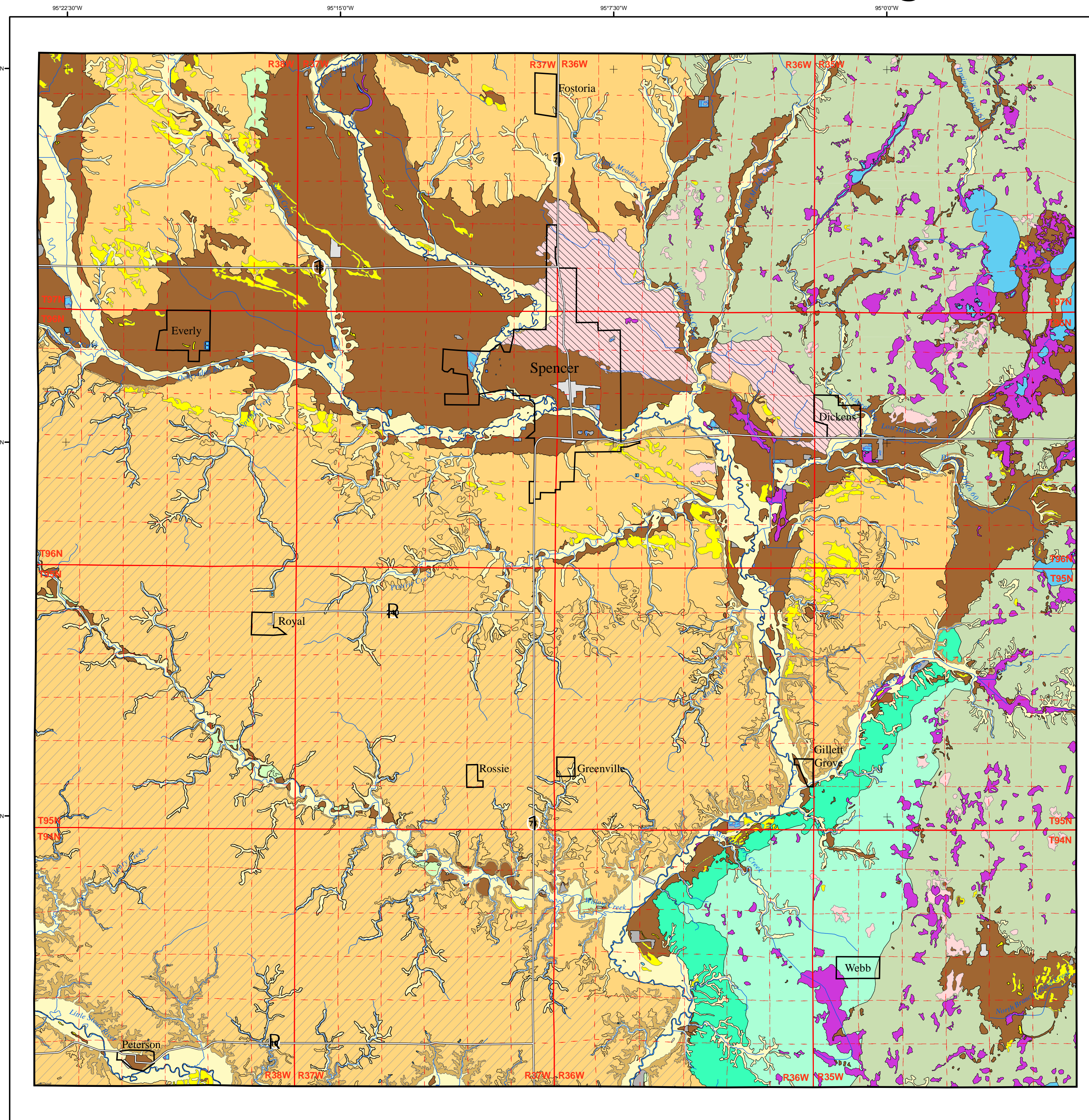
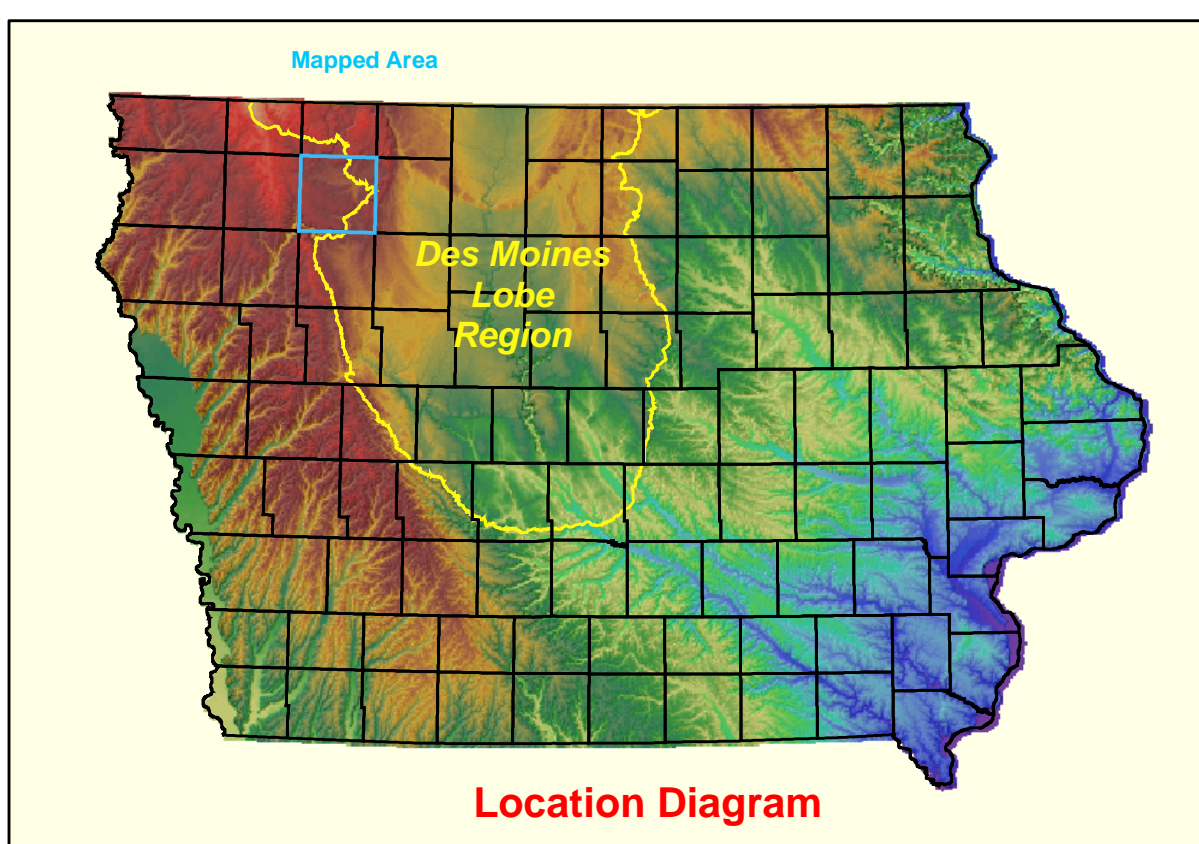


# Surficial Geologic Materials of Clay County, Iowa



**SURFICIAL GEOLOGIC MATERIALS OF THE DES MOINES LOBE OF IOWA**  
 Phase 7: Clay County  
 Iowa Geological Survey Open File Map 95-42, July 2005  
 Prepared by Deborah J. Quade<sup>1</sup>, James D. Gifferson<sup>1</sup>, and E. Arthur Bettis III<sup>2</sup>  
 Iowa Geological Survey, Robert D. Livers, State Geologist  
 Iowa Department of Natural Resources, Jeffrey R. Vosh, Director  
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<sup>1</sup>Iowa Department of Natural Resources, Iowa Geological Survey  
 900 Lehigh Road, Des Moines, IA 50319-0199  
<sup>2</sup>Department of Geoscience, The University of Iowa, 132 Engineering Hall, Iowa City, IA 52242



**LEGEND**  
 Description of Map Units

<p><b>Hudson Episode</b></p> <p><b>Qd - Depressions</b> (DeForest Formation-Wodes Mbr.) Generally 2.5 to 6 meters 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 gray, calcareous, massive, dense loam diamictite (Dows Fin.-Alden Mbr.) or Noah Creek Fin. sand and gravel. Associated with low relief features that occupy depressions and low spots on the landscape. Supports wetland vegetation and can be permanently covered by water. High water table.</p> <p><b>Qd - Alluvium</b> (DeForest Formation-Undifferentiated) Variable thickness (&lt;1 to 5 meters) of very dark gray to brown, micaceous to calcareous, stratified silt loam, clay loam, loam to sandy loam alluvium and colluvium in stream valleys, on hill slopes and in closed depressions. May overlie Dows Formation (Morgan or Alden Mbr.), or Noah Creek Formation. Off the Des Moines Lobe this unit overlies Sheldon Creek Formation diamictite. Associated with low-relief modern floodplains, closed depressions, modern drainageways or backstep positions on the landscape. Seasonal high water table and potential for frequent flooding.</p> <p><b>Wisconsin Episode</b></p> <p><b>Qs - Sand Dunes and Sand Sheets</b> (Pocahontas Formation-sand facies) Generally less than 3 meters of yellowish brown, massive, calcareous loamy sand to fine sand. It may overlie yellowish-brown coarse-grained sand and gravel (Noah Creek Fin.), or it may overlie yellowish to grayish brown, usually calcareous, stratified loam to silt loam to sandy loam diamictite (Dows Fin.-Morgan Mbr.). Usually restricted to a narrow belt along major river valley bottoms or adjacent uplands on the Des Moines Lobe. Off the Des Moines Lobe this unit is not restricted to dunes along valley areas and may occur as sand stringers overlying unamused erosion surface loamy sediments.</p> <p><b>Qp - Till plain</b> (Dows Formation-Morgan Mbr.) Less than 8 meters of yellowish brown, often calcareous and fractured, stratified loam to silt loam to sandy loam diamictite textures can be quite variable. Overlies gray, calcareous, massive, dense loam diamictite (Dows Fin.-Alden Mbr.). Low to moderate relief (1 to 8 meters), undulating plains with irregular surface patterns. Seasonal high water table.</p> <p><b>Qp - Ice - Till ridge</b> (Dows Formation-Morgan Mbr.) Generally 3 to 5 meters of yellowish to grayish brown, usually calcareous and fractured, stratified loam to silt loam, stratified sands and gravels to sandy loam diamictite textures can be quite variable. Overlies gray, calcareous, massive, dense loam diamictite (Dows Fin.-Alden Mbr.). The Alden Mbr. in this mapping unit rarely extends to slopes greater than 12 to 15 meters, and overlies the Sheldon Creek Formation diamictite. At the DMI margin, this landform may be mantled with a thin layer of Pocahontas Formation silt. Low to moderate relief, hummocky landform features exceed 2 to 5 meters of local relief. This landform is associated with the Bemis Meane. The surface pattern is irregularly shaped patterns. Seasonal high water table.</p> <p><b>Qp - base - Till ridge</b> (Dows Formation-Morgan Mbr.) Generally 7 to 10 meters of yellowish to grayish brown, usually calcareous and fractured, stratified loam to silt loam, stratified sands and gravels to sandy loam diamictite textures can be quite variable. Overlies gray, calcareous, massive, dense loam diamictite (Dows Fin.-Alden Mbr.). The Alden Mbr. in this mapping unit can extend to depths in excess of 15 meters, and overlies the Sheldon Creek Formation diamictite. Low to high relief, hummocky landform features exceed 3 to 10 meters of local relief. In places, older and some features and ice-walled lakes may be present. This landform is associated with the Bemis Altonen Meane Complex. The surface pattern is irregularly shaped and some rounded irregularly shaped patterns. Seasonal high water table.</p>	<p><b>Qc - Valley train outwash</b> (Noah Creek Formation) Generally 8 to 15 meters of dark gray, dark grayish brown, dark brown to dark yellowish brown medium to coarse sand, gravels used to pebbly gravel. Overlies gray, calcareous, massive, dense loam diamictite (Dows Fin.-Alden Mbr.) in valley positions, it is at the land surface of older terraces. On the modern floodplains it is buried by DeForest Fin. alluvium. Low-relief landform expressed as broad terraces; long, narrow longitudinal terraces or composite-shaped point terraces. Terraces associated with the major valleys are bedrock or a gray, calcareous, massive, dense loam diamictite (Dows Fin.-Alden Mbr.). <b>Qcw</b> - In areas of the country, beyond the excess of the Des Moines Lobe landform this unit is bedrock or Wisconsin-age Sheldon Creek Fin. diamictite. This unit encompasses deposits that accumulated in stream valleys during the Wisconsin Episode. No flooding potential.</p> <p><b>Qdpl - Lake plain</b> (Dows Formation-Lake Mills Mbr.) Generally less than 10 m of dark grayish brown, massive, calcareous silty clay loam, or silt loam and fine sand (phyllites common); often overlying a thin basal increment of sand and gravel (&lt;1 m). Overlies yellowish to grayish brown usually calcareous, stratified loam to silt loam to sandy loam diamictite; textures can be quite variable (Sheldon Creek Fin. diamictite). This feature is recognized as Glacial Lake Spencer and has a significantly thicker sequence of lake sediments than other former glacial lakes found on or adjacent to the Des Moines Lobe (DMI). It is theorized this lake formed in advancing DMI, to dammed the flow from the Okoboyan River. Low relief broad plain with less than 3 m of local relief. Seasonal high water table.</p> <p><b>Qdpl - Lake Sediment small-scale landform features</b> (Dows Formation-Lake Mills Mbr.) Generally less than 3 meters of dark grayish brown, massive, calcareous silty clay loam, silt loam overlying a thin (&lt;1 meter) basal increment of sand and gravel. Unit overlies yellowish to grayish brown calcareous, stratified loam to silt loam to sandy loam diamictite; textures can be quite variable (Dows Fin.-Morgan Mbr.) or it may overlie a gray, calcareous, massive, dense loam diamictite (Dows Fin.-Alden Mbr.). Small glacial lake beds associated with very low relief till plain with meandering linked-depression systems. High water table.</p> <p><b>Qs2 - Loamy Sediments Shallow to Glacial Till</b> (Unamused erosion surface sediment) One to three meters of yellowish brown to gray, massive to weakly stratified, well to poorly sorted loamy, sandy and silty erosion surface sediment. Hatched pattern indicates areas high on the landscape that are mantled with less than one meter of Pocahontas Formation till or sand facies. Overlies massive, fractured, slightly firm glacial till of the Sheldon Creek Formation.</p> <p><b>Qs - Glacial Till</b> (Sheldon Creek Formation sand/til) Generally 30 to 40 meters of a yellowish brown to gray, calcareous fractured to massive clay loam; at depth this unit can be variably sorted and contain significant sand and gravel bodies. It is not uncommon to see Pierre Shale clasts in core samples. This unit overlies the Pierre Shale. In Clay County, this unit emerges along steep slopes adjacent to the Little Sioux River valley and steep slopes along other major tributaries flowing into the Little Sioux River of the Des Moines Lobe landform.</p> <p><b>Qf - Fill</b> Areas of major land filling. Fill associated with cultural grades, highway grades and land leveling. Variable in texture ranging from loamy to sandy to concrete rubble. Extent mapped as shown in county soil surveys.</p> <p><b>Qp - Pit and Quarries</b> Sand and gravel pits and rock quarries. Extent mapped as shown in county soil surveys.</p> <p><b>Water Features</b></p> <p><b>Drill Sites</b></p>
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