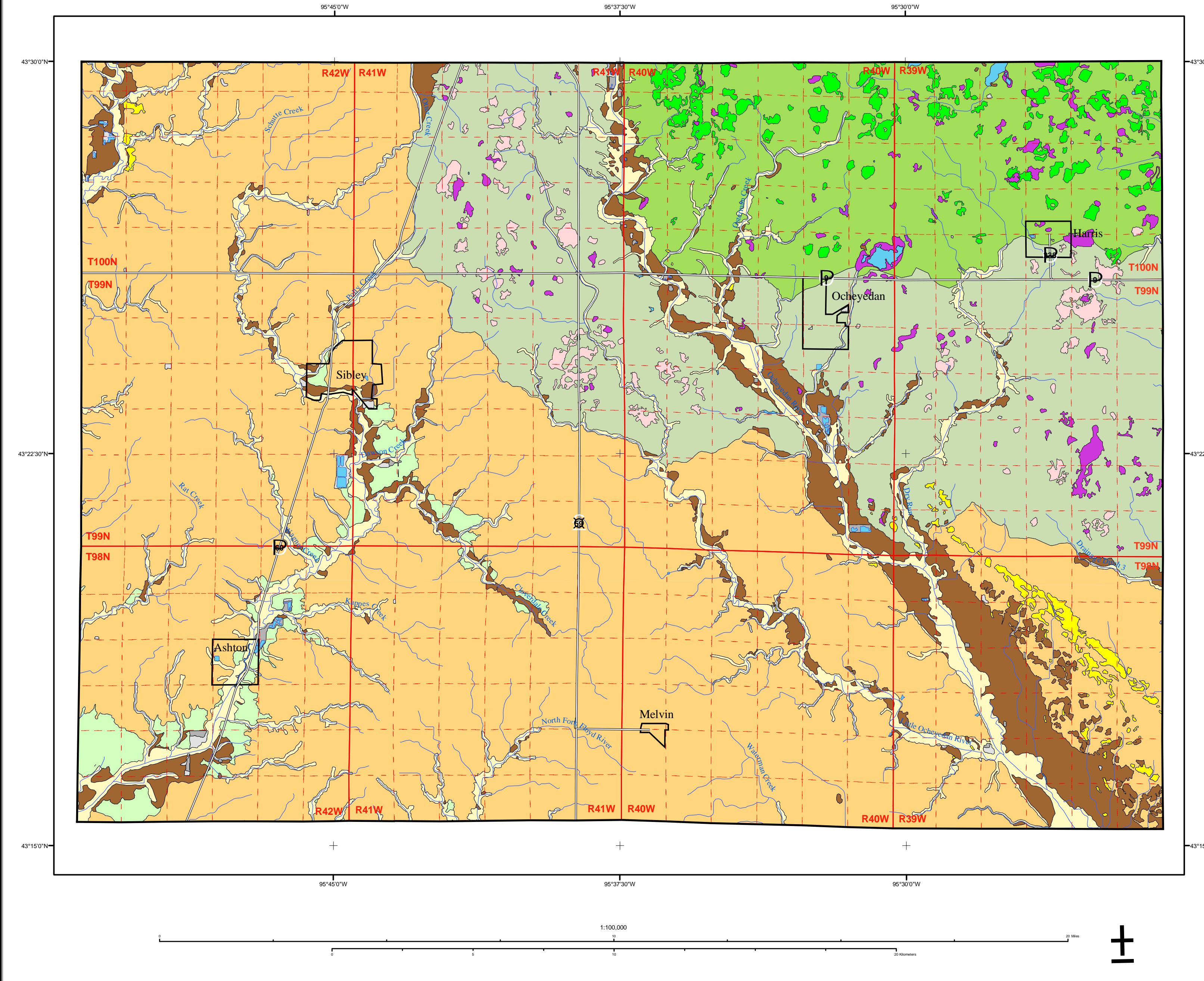


Surficial Geologic Materials of Osceola County, Iowa


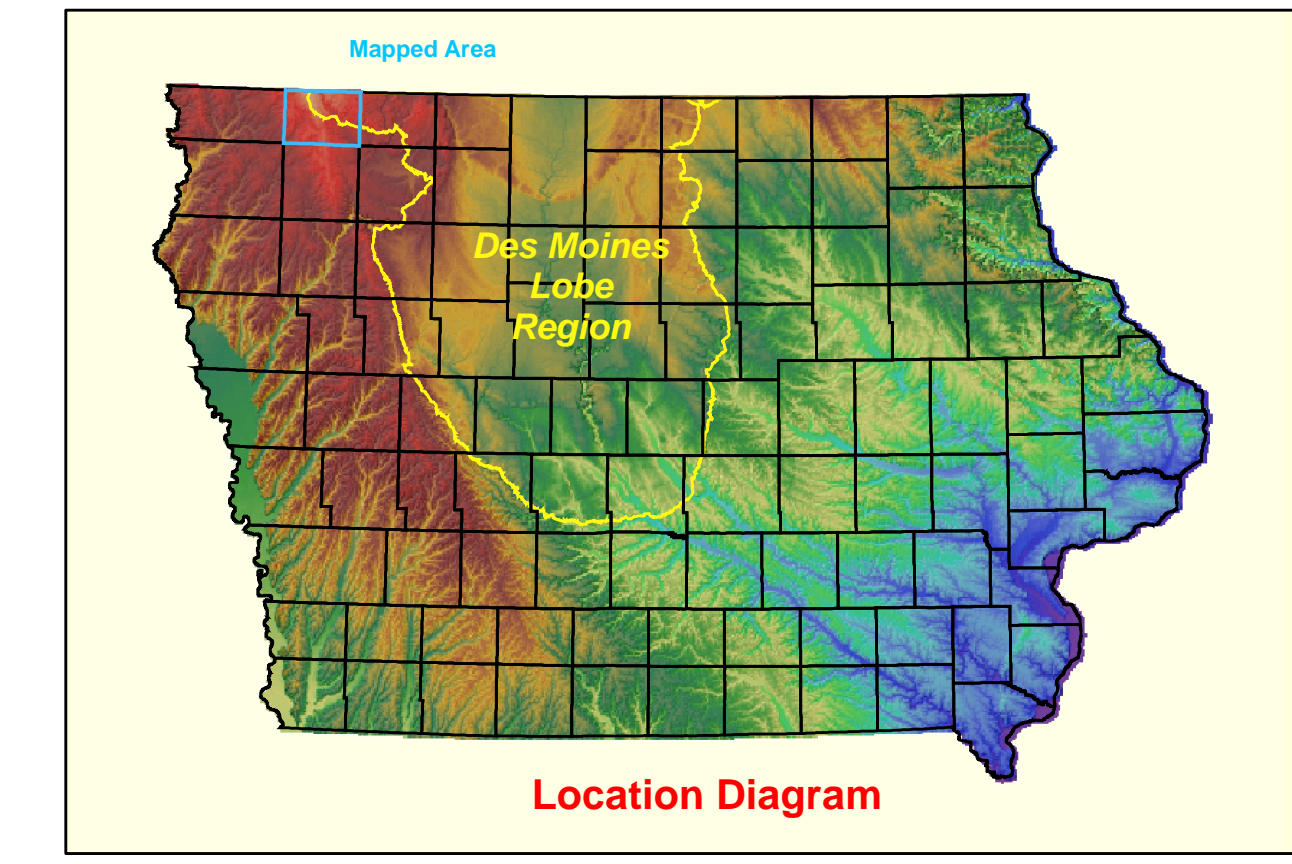


SURFICIAL GEOLOGIC MATERIALS OF THE DES MOINES LOBE OF IOWA
 Phase 7: Osceola County
 Iowa Geological Survey Open File Map 05-43, July 2005

Prepared by Deborah J. Quade¹, James D. Gagliardi², and E. Arthur Bettis III³
¹Iowa Geological Survey, Robert D. Libes, State Geologist
²Iowa Department of Natural Resources, Jeffrey R. York, Director
³Supported by the U.S. Geological Survey, Cooperative Agreement Number 04HQAG0007
 National Cooperative Geologic Mapping Program (STATEMAP)

ACKNOWLEDGMENTS: Recognized for contribution to map's production: Andrew B. Auld, Pete Kollbach, Heather Burek, Katie Hunsman, Mary Pat Helms, and Lisa Hale. Drilling was provided under contract with Aqueduct of Iowa City, Iowa, a special thanks to Diane Edberg, Jay Hojny and drilling crew members who worked at times in challenging drilling conditions. Assistance in describing sediment cores was provided by the Natural Resources Conservation Service, Storm Lake Office staff scientists, Matt Mudge and Julie McLoughlin. A special thanks to the following individuals who graciously allowed access to their land for drilling: Dick Boring, Meritt Boring, Allen Biondigo, David Dapkin, Robert Coffey, Joan Hartman, Bob McClain, Benny Nelson, Don Nelson, Dennis Peterson, Russ Peterson, Glen Reicher, Merit Roberts, Ted Schultz, Wab Street, Shirley Swanson, Kurt Theisen, Alvin VanWyck, Steven Wassum, Don Wilson and Don Zverbergen. We would like to thank the Iowa Department of Natural Resources for allowing access on public lands for drilling.

¹Iowa Department of Natural Resources, Iowa Geological Survey
 100 Dowling Hall, Iowa City, IA 52242-1019
²Department of Geosciences, The University of Iowa, 121 Dowling Hall, Iowa City, IA 52242

LEGEND
 Description of Map Units

<p>Hudson Episode</p> <p>Qd - Depressions (DeForest Formation-Wooden 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 diamicton (Dows Fin-Alden Mbr.) or Noah Creek Fin. sand and gravel. Associated with low relief features that occupy depressions and low swags on the landscape. Supports wetland vegetation and can be permanently covered by water. High water table.</p> <p>Qd1 - Alluvium (DeForest Formation-Undifferentiated) Variable thickness (<1 to 5 meters) of very dark gray to brown, micaceous 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 Dows Formation (Morgan or Alden Mbr.) or Noah Creek Formation. Off the Des Moines Lobe (DML) this unit overlies Sheldon Creek Formation diamicton. Associated with low-relief features, closed depressions, modern drainageways or noslope positions on the landscape. Seasonal high water table and potential for frequent flooding.</p> <p>Qs - Sand Dunes and Sand Sheets (Poria 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 diamicton (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 stragglers overlying unmined erosion surface loamy sediments.</p> <p>Qt - Tilted Till Ridge (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 diamicton; textures can be quite variable. Overlies gray, calcareous, massive, dense loam diamicton (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 diamicton. Low to high relief hummocky landform features exceed 3 to 10 meters of local relief. In places, esker and kame features and ice-walled lakes may be present. This landform is associated with the Bennett-Moran-Moraine Complex. The surface pattern is irregularly shaped and some rounded irregularly shaped patterns. Seasonal high water table.</p> <p>Qt - Tilted Till Ridge (Dows Formation-Morgan Mbr. or Pika Kosh Mbr. or Lake Mills Mbr.) Generally 9 to 15 meters of yellowish to grayish brown, usually calcareous and fractured, stratified loam to silt loam; stratified sands and gravels to sandy loam diamicton; textures can be quite variable. Overlies gray, calcareous, massive, dense loam diamicton (Dows Fin-Alden Mbr.). The Alden Mbr. in this mapping unit can extend to depths in excess of 20 meters. This sediment package overlies the Sheldon Creek Formation diamicton. Moderate to high relief hummocky landform features exceed 3 to 10 meters of local relief. This landform is characterized by moderate to high relief hummocks, esker and kame features and ice-walled lakes, and is associated with the Bennett-Moran-Moraine Complex. The surface pattern is primarily rounded circular to rounded irregularly shaped patterns. Seasonal high water table.</p>	<p>Qv - Valley train outwash (Noah Creek Formation) Generally 8 to 15 meters of dark gray, dark grayish brown, dark brown to dark yellowish brown medium to coarse sand, gravelly sand to pebbly gravel. Overlies gray, calcareous, massive, dense loam diamicton (Dows Fin-Alden Mbr.). In valley positions, it is at the land surface of older terraces. On the modern floodplain it is buried by DeForest Fin. alluvium. Low-relief landforms expressed as broad terraces, long, narrow longitudinal terraces or cusped-shaped point terraces. Terraces associated with the major valleys are bounded on a gray, calcareous, massive, dense loam diamicton (Dows Fin-Alden Mbr.). Qvw - In areas of the county, beyond the extent of the Des Moines Lobe landform this unit is buried on Wisconsin-age Sheldon Creek Fin. diamicton. This unit encompasses deposits that accumulated in stream valleys during the Wisconsin Episode. No flooding potential.</p> <p>Qvl - Collapsed lake sediments-hummocky isolated ice-walled lake plateau-flat-topped hummocks (Dows Formation-Lake Mills Mbr./Morgan Mbr.) Generally less than 3 m of dark grayish brown, massive, calcareous silty clay loam, to silt loam overlying a thin basal increment of sand and gravel (<1 m). It overlies yellowish to grayish brown usually calcareous, stratified loam to silt loam to sandy loam diamicton; textures can be quite variable (Dows Fin.-Morgan Mbr.). Isolated ice-walled lake plains comprise a portion of this landform area. Other hummocks consist of less than 4 m of yellowish to grayish brown usually calcareous, stratified loam to silt loam to sandy loam diamicton (Dows Fin.-Morgan Mbr.). Overlies a gray, calcareous, massive, dense loam diamicton (Dows Fin.-Alden Mbr.). Moderate to high relief hummocky landform area with 1 to 10 m of local relief. These features are commonly associated with the Bennett-Moran-Moraine Complex.</p> <p>Qvl - Lake Sediment small-scale landform features (Dows Formation-Lake Mills Mbr.) Generally less than 3 meters of dark grayish brown, massive, calcareous silty clay loam, silt loam overlying a thin (<1 meter) basal increment of sand and gravel. Unit overlies yellowish to grayish brown calcareous, stratified loam to silt loam to sandy loam diamicton; textures can be quite variable (Dows Fin.-Morgan Mbr.) or it may overlie a gray, calcareous, massive, dense loam diamicton (Dows Fin.-Alden Mbr.). Small former glacial lake beds associated with very low relief fill plains with restriction linked-depression systems. High water table.</p> <p>Qw - Loamy Sediments Shallow to Glacial Till (Unmined 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. May include some areas high on the landscape that are underlain with less than one meter of Poria Formation (silt or sand facies). Overlies massive, fractured, slightly firm glacial till of the Sheldon Creek Formation.</p> <p>Qf - Fill Areas of major land filling. Fill associated with railroad 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>Qp - Pits and Quarries Sand and gravel pits and rock quarries. Extent mapped as shown in county soil surveys.</p> <p>Water Features</p> <p>Drill Sites</p>
---	--