

January 15, 2013

Illinois Pollution Control Board  
Clerk's Office  
James R. Thompson Center, Suite 11-500  
100 West Randolph Street  
Chicago, IL 60601

RECEIVED  
CLERK'S OFFICE  
JAN 16 2013  
STATE OF ILLINOIS  
Pollution Control Board

RE: Docket R-2012-23, In the Matter of: Concentrated Animal Feeding Operations (CAFOs): Proposed Amendments to 35 Ill. Adm. Code Parts 501, 502, and 504

Dear Members of the Board:

Maurer-Stutz, Inc. is consulting engineering and surveying firm headquartered in Peoria, Illinois. We have a multi-discipline staff including specialists in Agriculture, Civil, Environmental, Professional Land Surveying, Structural, Transportation, Water and Wastewater engineering. Brief resumes for James L. Evans, PE and Terry L. Feldmann, PE, two of our agricultural engineers, are attached for reference. Our agricultural staff specializes in consulting on livestock and poultry facilities. We are NRCS certified technical service providers and work extensively with the NRCS Environmental Quality Incentives Program (EQIP). We have developed over 100 Comprehensive Nutrient Management Plans (CNMPs). Although we provide planning, design and construction phase engineering services for new livestock facilities, our most common services involve existing livestock producers and facilities where we help them properly expand operations and/or maintain compliance through establishing best management practices and updating nutrient management plans. We design livestock facilities including manure management systems and have developed hundreds of construction plans pursuant to the Livestock Management Facilities Act regulations. As such, we believe that our comments and questions should help establish a more clear set of regulations that equitably balance protection of our state's environment, economy and livestock industry.

Generally, we believe that IEPA has proposed a good rule. While we have not reviewed all comments and testimony in this matter due to the amount of time required, we do want to note that we support and agree with the comments made by Ted Funk, PE and David Trainor, PE, PG. With that said, we believe that there are additional comments and questions worthwhile adding and these follow. We first propose that it is worthwhile to comment related to the testimony of Samuel V. Panno, Dekalb hearing. Mr. Panno appears to recommend prohibitions of livestock facilities and application of livestock waste over broad areas of Illinois. His recommendations are extreme and lacks sufficient basis given the economic impact of his recommendations. Livestock is and has been produced in the driftless areas of Illinois and other states where there is less than 25 feet of unconsolidated material and less than 50 feet over carbonate (potentially karst) bedrock for many years without widespread problems. Panno suggests as a basis to use his revised version of Illinois Map-8, 1997 Weibel and Panno (1997) attached to his prefiled testimony as Figure 1. It appears that he enlarged the shaded karst regions of this map in Northwest Illinois and changed the term to "karst areas" rather than the original map "karst regions".

We believe that prohibiting land application and livestock facilities in broad areas is not warranted, especially by Panno's recommendations and maps. To illustrate with maps as an example, a significant part of Jo Daviess County has sufficiently impermeable shale bedrock above the carbonate (potentially

karst) bedrock. Further, there are other areas with a thin maybe less than 10 feet thick layer of carbonate (Sulurian) over the impermeable Maquoketa shale which acts as an aquitard to protect the carbonate aquifer below. Spreading in areas where protected by shale bedrock or in the Eastern part of the County where there is Glacial Till (Diamicton-og-Ogle Member of Glassford Formation) is relatively safe to ground water (see attached ISGS Surficial Geology Map Open File Series OFS 2000-8b). Use of Panno's Figure 1 or his recommendation of thickness of unconsolidated materials would prohibit CAFOS and land application of manure in all of Jo Daviess County even though there are numerous areas of sufficient aquitards providing protection.

An appropriate tool as commonly used in development of CNMPs by many technical services providers (TSPs) is the USDA's Web Soil Survey which gives information on soil type, water table, etc. to a depth of 72 to 80 inches below the surface including where present depth to bedrock. We use this tool in our risk assessments to help determine which management practices are needed for a particular field or facility. Panno also discusses soil macropores and related potential contamination of karst aquifers. While macropores do increase risks to shallow aquifers, there are practices to sufficiently offset these risks such as tillage and incorporation of manure which destroys or otherwise interrupts macropores. We do believe that the provisions section 502.620 h) i) and j) provide a reasonable balance to protecting ground and surface water. Understand that an owner, operator and their nutrient management plan developer can always follow a plan that is more protective than contained in these provisions if they believe in their judgment that it is necessary to protect the environment.

We suggest that Section 501.404 b) 3) would read better/clearer if the first part of the second sentence read as ~~A cover and pad~~ A temporary stack should be covered or other control must be provided ....

We suggest that Sections 502.104 b) and 502.106 b) 1) would read better/clearer if the first part of the sentence read as Pollutants are discharged from the production area into waters ....

Regarding section 502.201 a) 12) and 13), can you define stormwater pollution prevention plan and spill control and prevention plan with regard to these regulations?

Regarding section 502.320 w) 8), can weather forecast records from any of the nearest available reporting station be used? What are the requirements for forecasts? TV? Radio? Public Internet source? Maybe this section should be referenced to 502.620 d)?

Regarding section 502.320w) 7), it is difficult in many cases to document the location and acreage of each site used by off-site recipients when the manure is transferred to a third party. When manure is brokered or otherwise sold and the recipient transfers the manure and it is out of the control of the owner and operator after it leaves the production area, specific documentation may not be available or attainable. Federal regulations at 40 CFR 122.42 e) 2, 3, OR 4(iii) do not require details about the off-site location or acreage. We suggest that the sentence end after the word "tons."

Comments related to NPDES Permits, Annual Report (section 502.325): To date we have not seen a form from IEPA on which to provide the data required for the annual report. Would it be possible to require the agency to provide a form that may be used to submit this data? We realize that some of the data would simply be attachments of manure or soil tests and related nutrient management calculations

but much of the data submittal could be simplified and more uniform by utilization of an annual report form.

Is Section 502.505 h) related to land application areas not under the control of the owner or operator? If so, there may be simply an agreement that a third party receives the livestock waste. The agreement may be with a tenant or operator of the land and not with the landowner. A tenant is typically responsible to have the agreement with the landowner. What is the need for this provision as we do not understand the purpose or justification? It does not seem to be required by Federal regulations. Land application areas not under the control of the CAFO owner or operator may not be part of the Nutrient Management Plan. Third party transfers can be an annual, multi-year agreement or may only be once or twice every five years.

Section 502.515 d) 3) replace the word ~~amount~~ with rate per acre.

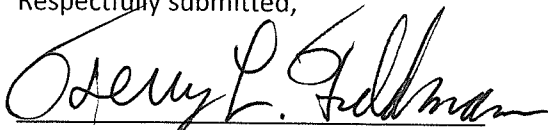
Section 502.515 e) 1) we believe that nutrient management plans can be developed and implemented based on common management units with respect to the nutrients per acre where multiple fields would have the same rate per acre of nutrients if the crop rotation and soil tests are essentially the same. After determining and listing which fields share rotations and similar soil test, the fields can be grouped into management units. This will make plans much easier for owners/operators to understand and implement. We ask if this can be allowed rather than on a field specific basis. Note that risks assessments would still be completed on a field specific basis.

Section 502.620 k) proposes to reduce the application rate where the depth to seasonal high water table is less than 2 feet. What is the purpose of this provision? This provision seems appropriate for sandy or otherwise high porosity soils. However, there are many soils with a dense clay layer, a clayey glacial till (diamicton) or other relatively impermeable soil layer causes a perched seasonal high water table as opposed to an apparent water table which may be connected to resource water or aquifer. Depending on the soil conditions at the time of application, the rate of application need only be limited by what the soil can absorb or infiltrate. A perched water table is common in Illinois and generally indicates that there is a soil layer providing protection to ground water as it preventing/restricting vertical flow.

We believe that it is important to protect the environment, especially the waters of our while having a reasonable balance in regulating our state's livestock industry. While this rulemaking is not an easy task, we encourage you to carefully consider additional regulations so that we maintain less confusion and more consistency with our regulations, particularly the Environmental Protection Act and the Livestock Management Facilities Act regulations.

Thank you for your efforts and consideration of our comments in this rulemaking.

Respectfully submitted,



By: Terry L. Feldmann, PE

James L. Evans, PE

Attachments: Resumes, ISGS Surficial Geology Map Open File Series OFS 2000-8b

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## PROFILE

Terry has extensive experience in a variety of agricultural systems and projects including livestock housing and waste systems, ponds/lakes/dams, soils and geotechnical investigations, Nutrient Management Plans and energy efficiency. Mr. Feldmann is an author and popular speaker on topics of livestock housing, waste treatment and storage systems, livestock ventilation and heating systems, odor control and designing for energy efficiency. Terry joined Maurer-Stutz, Inc. (MSI) in 2004 when Maurer-Stutz acquired Feldmann & Associates and has been actively growing and managing MSI agricultural services.

## LICENSE/REGISTRATION

Professional Engineer - Illinois (1998)  
Professional Engineer - Indiana (2003)  
Professional Engineer - Arkansas (2006)  
Professional Engineer - Wisconsin (2010)

## EDUCATION

University of Illinois, Urbana-Champaign  
B.S., Agricultural Engineering (1992)  
Structures and Environment Specialization

## ADDITIONAL CERTIFICATIONS

Certified Technical Service Provider  
(USDA-NRCS)  
Arkansas Natural Resources Commission,  
Certified Nutrient Management Planner  
Illinois Department of Agriculture,  
Certified Livestock Manager

## PROFESSIONAL AFFILIATIONS

American Society of Agricultural and  
Biological Engineers (ASABE)  
ASABE Professional Engineering Institute  
Order of the Engineer  
National Society of Professional Engineers  
Illinois Society of Professional Engineers  
Illinois Pork Producers Association  
Illinois & Woodford County Farm Bureau

## RELATED PROJECT EXPERIENCE

### *New Dairy Facility Planning, Design and Permitting, Tradition Dairy, Jo Daviess County, Illinois*

Senior project manager for planning, design and permitting and construction phases for a new 5000 head dairy farm. Project included a heated, plug flow digester system in a concrete tank with rigid cover, CHP gas use, solids separation and clay-lined, earth effluent-storage ponds. Planned and designed new barns, waste storage, and site layout for entire farm. Conducted project public hearing with client and Illinois Department of Agriculture. Managed design and survey staff on-site topography survey, soil borings and rock coring, site investigation, access road/entrance/stream crossing, grading plan, design of waste handling/treatment/storage components, storm water pollution prevention plan, nutrient management plan and construction layout and observation.

### *Multiple Dairy Farm Improvements, Elmwood Farms, LLC (F/K/A Inwood Dairy, New Horizons Dairy and Hill Crest Dairy), Elmwood, Illinois*

Project manager for feasibility study, planning, design and permitting and construction phases of dairy farm improvements including feasibility study for anaerobic digestion with biogas cogeneration of electricity and heat recovery for use at the farm and sale of excess power. Evaluated three alternatives including heated, complete mix and plug flow digester systems in concrete tanks with flexible covers and a covered, ambient temperature lagoon system with biogas recovery. Retained and co-authored digester feasibility study report with Mark Moser, RCM digesters. Conducted and managed on-site topography survey, soils/site investigation and soil testing plan. Designed and developed plans and project specifications for concrete waste handling/treatment/storage components (reception tank, digester tank and solids stack bunker), site grading, waste transfer systems (gravity sewers and pump/force-mains) and ancillary components.

### *Planning, Design and Permitting for a Swine Facility Digester, APEX Pork, Knox County, Illinois*

Project manager and lead engineer for planning, design and permitting of a heated, complete mix system with an earthen-clay lined digester with flexible cover. Conducted on-site topography survey and developed grading plan. Developed plan for and coordinated soil boring and testing investigation. Coordinated design with RCM Digesters to meet specific

**PROFILE**

Jim has extensive experience in planning and conducting studies for federal project measures, comprehensive nutrient management plans and manure and wastewater handling, storage and treatment measures, including anaerobic digesters.

With the Natural Resources Conservation Service (NRCS) he gained experience performing inventories, evaluating data and working with stakeholders to develop Environmental Impact Statements for PL-566 Watersheds.

With Maurer Stutz, Jim has designed or participated in the design of a wide variety of conservation practices, earth dams, animal waste management facilities and oil and chemical containment facilities. He has also served as a consultant to the Council for Sustainable Biomass Production.

Jim retired as the NRCS State Conservation Engineer in Illinois after a 35 year career with that agency. Jim joined Maurer-Stutz in 2007.

**LICENSES/REGISTRATION**

Professional Engineer - Missouri, 1980

Professional Engineer - Illinois, 1999

**EDUCATION**

University of Missouri, Columbia,

B.S., Agricultural Engineering

University of Missouri, Graduate Studies,

Agricultural Waste Management

Utah State University, Graduate Studies,

Soil Mechanics

**PROFESSIONAL AFFILIATIONS**

American Society of Biological and  
Agricultural Engineers

Illinois Land Improvement Contractors  
Association

Champaign-Urbana Hydraulic Engineers

**RELATED PROJECT EXPERIENCE**

*Illinois Urban Manual Development, Champaign, Illinois*  
Co-authored original Illinois Urban Manual in 1995 while the Assistant State Conservation Engineer for USDA-NRCS, Illinois. As State Conservation Engineer, reviewed all engineering practices edited or added to that document.

*Middle Fabius River Watershed Environmental Impact Statement, PL566 Small Watershed Protection Program*  
Supervised engineers and technicians performing surveys and gathering inventory information for the State Planning Staff. Assisted in evaluation of alternatives and participated in public meetings and reviews of draft Environmental Impact Statement (EIS), developed in compliance with federal Principles and Guidelines.

*Comprehensive Nutrient Management Planning in Illinois*  
Developed the first Statement of Work for CNMP's in Illinois. Provided training to NRCS and partners in development of CNMP's. Have developed or participated in the development of more than 30 CNMP's for producers in Illinois. All CNMP's have been approved by NRCS and some are documents supporting applications for NPDES permits.

*Bark River Study, Village of Merton, Wisconsin*  
Supervised surveys, performed hydrologic and hydraulic calculations, assisted hydrologist in unsteady state model development of potential breach of Rolling Mill Dam. Provided recommendations for measures to include in the emergency action plan required by the Wisconsin DNR.

*Northwest Illinois Manure Management Study*  
Led a team of NRCS engineers and technicians working with the Illinois Environmental Protection Agency and Soil and Water Conservation Districts to recommend and develop low cost manure management systems to address environmental concerns associated with small animal production facilities in five Northwestern Illinois Counties.

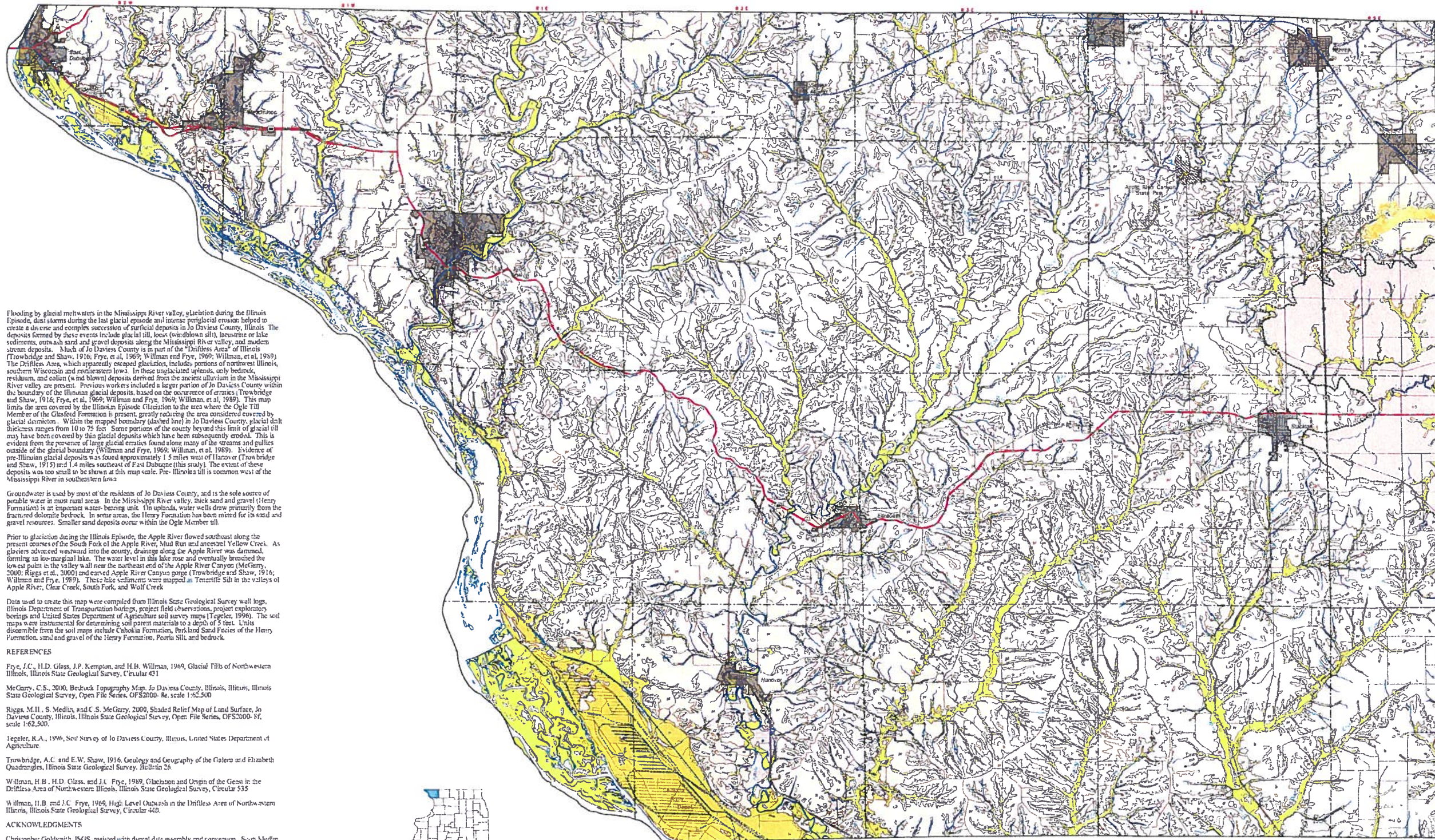
*Consultant to The Council for Sustainable Biomass Production*

Served as special consultant to the Council for Sustainable Biomass Production. Provided input to draft standard for Sustainable Biomass Production, including readily available tools for evaluating and planning conversion of crop land acres to biomass production and to document compliance with the standard. Recommended standard language that made it more practical and enforceable.



# SURFICIAL GEOLOGY MAP, JO DAVIESS COUNTY, ILLINOIS

Matthew H. Riggs



## SURFICIAL SEDIMENTS

- HUDSON EPISODE**  
 (postglacial, younger than 12,000 years old)
- Cahokia Formation**  
 Silt, clay, and sand; stratified; occurs in modern creek valleys and river channels and is 5-25 feet thick. Includes significant amounts of redeposited loess. Overlies thick sand and gravel (Henry Formation) in the floodplain and backwater channels of the broad Mississippi River valley.
  - Henry Formation**  
 Sand and gravel, stratified, up to 200 feet thick in the Mississippi River valley. Can include up to 50 feet of surficial dune sand.
  - Parkland Sand Facies**  
 Sand, well sorted, stratified, approximately 5-30 feet thick; occurs as sheet sand or dune sand. Mapped on uplands and in some regions of the Mississippi River valley overlying the Henry Formation.
  - Faulty Formation**  
 Silt and clay, laminated; occurs as slackwater lake deposits along the Menominee River, Little Menominee River, Sinsinawa River, Galena River, Rush Creek, and Apple River in western Jo Daviess County.
  - Peoria and Rosana Silts**  
 Silt (loess). Mapped only where > 5 feet thick and where glacial till is absent. Each of carbonates from typically 4-12 feet below the land surface. Loess covers most of the county, and gradually decreases in thickness from 25 feet in western areas to 15-20 feet in central areas, to 5 to 10 feet in northeastern areas on unemerged uplands. Peoria Silt composes most of the unit, with the underlying Rosana Silt < 5 feet thick. Loveland Silt (Illinois Episode loess and colluvium), containing the Sangamon Geosol, may be present beneath Wisconsin Episode loess in unglaciated areas.
  - SANGAMON EPISODE**  
 (approximately 130,000 - 55,000 years old)  
 Nondeposition, erosion or weathering of underlying units (formation of Sangamon Geosol)
  - ILLINOIS EPISODE**  
 (approximately 200,000 - 130,000 years old)
  - Teneriffe Silt**  
 Silt and clay, massive or laminated, along Apple River and South Fork Mud Run in eastern Jo Daviess County north of the Illinois Episode glacial margin. These lacustrine sediments were deposited in slackwater lakes in valleys dammed by glacial ice or outwash.
  - Ogle Member of Glasford Formation [5 - 50 feet thick]**  
 Diamictite, yellow-brown to grey; varies in texture from sandy loam, loam, silt loam, and silty clay; includes lenses of interbedded sand and gravel; the Sangamon Geosol occurs in the upper 5-7 feet. This unit is overlain by 5-10 feet of Wisconsin Episode loess and is typically underlain by 0-15 feet of residuum or sorted Quaternary drift above bedrock.
  - ORDOVICIAN AND SILURIAN BEDROCK**  
 Bedrock (at surface or below < 3 feet of loess, colluvium, diamictite or residuum)  
 Dolomite and shale of the Galena and Plattville Groups (dolomite), Maquoketa Group (Ordovician shale), and unindivided Silurian dolomites. The residuum on dolomite is a red clay, 0-4 feet thick, formed by chemical alteration of bedrock; it is sometimes underlain by 1 foot of dolomite sand.

- Disturbed Land
- Water
- Municipality
- State Park
- US Highway
- State Highway
- Other Roads
- Railroad
- Streams
- Extent of Till Deposits

Flooding by glacial meltwaters in the Mississippi River valley, glaciation during the Illinois Episode, dust storms during the last glacial episode and intense periglacial erosion helped to create a diverse and complex succession of surficial deposits in Jo Daviess County, Illinois. The deposits formed by these events include glacial till, loess (windblown silt), lacustrine or lake sediments, outwash sand and gravel deposits along the Mississippi River valley, and modern stream deposits. Much of Jo Daviess County is in part of the "Driftless Area" of Illinois (Trowbridge and Shaw, 1916; Frye, et al., 1969; Willman and Frye, 1969; Willman, et al., 1989). The Driftless Area, which apparently escaped glaciation, includes portions of northwest Illinois, southern Wisconsin and northeastern Iowa. In these unglaciated uplands, only bedrock, residuum, and colluvium (wind-blown) deposits derived from the ancient alluvium in the Mississippi River valley are present. Previous workers included a larger portion of Jo Daviess County within the boundary of the Illinoian glacial deposits, based on the occurrence of erratics (Trowbridge and Shaw, 1916; Frye, et al., 1969; Willman and Frye, 1969; Willman, et al., 1989). This map limits the area covered by the Illinoian Episode (glaciation) to the area where the Ogle Till Member of the Glasford Formation is present, greatly reducing the area considered covered by glacial diamictite. Within the mapped boundary (dashed line) in Jo Daviess County, glacial drift thickness ranges from 10 to 75 feet. Some portions of the county beyond this limit of glacial till may have been covered by thin glacial deposits which have been subsequently eroded. This is evident from the presence of large glacial erratics found along many of the streams and gullies outside of the glacial boundary (Willman and Frye, 1969; Willman, et al., 1989). Evidence of pre-Illinoian glacial deposits was found approximately 1.5 miles west of Hazelton (Trowbridge and Shaw, 1916) and 1.4 miles southeast of East Dubuque (this study). The extent of these deposits was too small to be shown at this map scale. Pre-Illinoian till is common west of the Mississippi River in southeastern Iowa.

Groundwater is used by most of the residents of Jo Daviess County, and is the sole source of potable water in most rural areas. In the Mississippi River valley, thick sand and gravel (Henry Formation) is an important water-bearing unit. On uplands, water wells draw primarily from the fractured dolomite bedrock. In some areas, the Henry Formation has been mined for its sand and gravel resources. Smaller sand deposits occur within the Ogle Member till.

Prior to glaciation during the Illinois Episode, the Apple River flowed southeast along the present courses of the South Fork of the Apple River, Mud Run and ancestral Yellow Creek. As glaciers advanced westward into the county, drainage along the Apple River was dammed, forming an ice-marginal lake. The water level in this lake rose and eventually breached the low east point in the valley wall near the northeast end of the Apple River Canyon (McGarry, 2000; Riggs et al., 2000) and carved Apple River Canyon gorge (Trowbridge and Shaw, 1916; Willman and Frye, 1969). These lake sediments were mapped as Teneriffe Silt in the valleys of Apple River, Clear Creek, South Fork, and Wolf Creek.

Data used to create this map were compiled from Illinois State Geological Survey well logs, Illinois Department of Transportation borings, project field observations, project exploratory borings and United States Department of Agriculture soil survey maps (Tegeler, 1996). The soil maps were instrumental for determining soil parent materials to a depth of 5 feet. Units discernible from the soil maps include Cahokia Formation, Parkland Sand Facies of the Henry Formation, sand and gravel of the Henry Formation, Peoria Silt, and bedrock.

### REFERENCES

Frye, J.C., H.D. Glass, J.P. Kempton, and H.B. Willman, 1969, Glacial Till of Northwestern Illinois, Illinois State Geological Survey, Circular 421.

McGarry, C.S., 2000, Bedrock Topography Map, Jo Daviess County, Illinois, Illinois State Geological Survey, Open File Series, OFS2000-8a, scale 1:62,500.

Riggs, M.H., S. Medlin, and C.S. McGarry, 2000, Shaded Relief Map of Land Surface, Jo Daviess County, Illinois, Illinois State Geological Survey, Open File Series, OFS2000-8f, scale 1:62,500.

Tegeler, R.A., 1996, Soil Survey of Jo Daviess County, Illinois, United States Department of Agriculture.

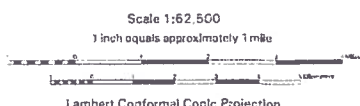
Trowbridge, A.C. and E.W. Shaw, 1916, Geology and Geography of the Galena and Elizabeth Quadrangles, Illinois State Geological Survey, Bulletin 26.

Willman, H.B., H.D. Glass, and J.L. Frye, 1969, Glaciation and Origin of the Geosol in the Driftless Area of Northwestern Illinois, Illinois State Geological Survey, Circular 535.

Willman, H.B. and J.C. Frye, 1969, High Level Outwash in the Driftless Area of Northwestern Illinois, Illinois State Geological Survey, Circular 440.

### ACKNOWLEDGMENTS

Christopher Goldsmith, ISGS, assisted with digital data assembly and conversion. Scott Medlin, Eastern Illinois University and Chris Iaring, Jo Daviess Soil and Water Conservation District, assisted with field work and drilling.



This map was prepared by the Illinois State Geological Survey, in cooperation with the Illinois Department of Commerce and Community Affairs and the Jo Daviess County Board. It is part of a suite of maps created to assist local government in addressing geologic questions concerning suitable sites for land fill development. Maps produced for this study are intended for regional land use planning purposes. More detailed mapping is needed for site-specific considerations. This map has been reviewed for scientific accuracy and edited to meet the quality standards of maps in the ISGS Map Series.

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