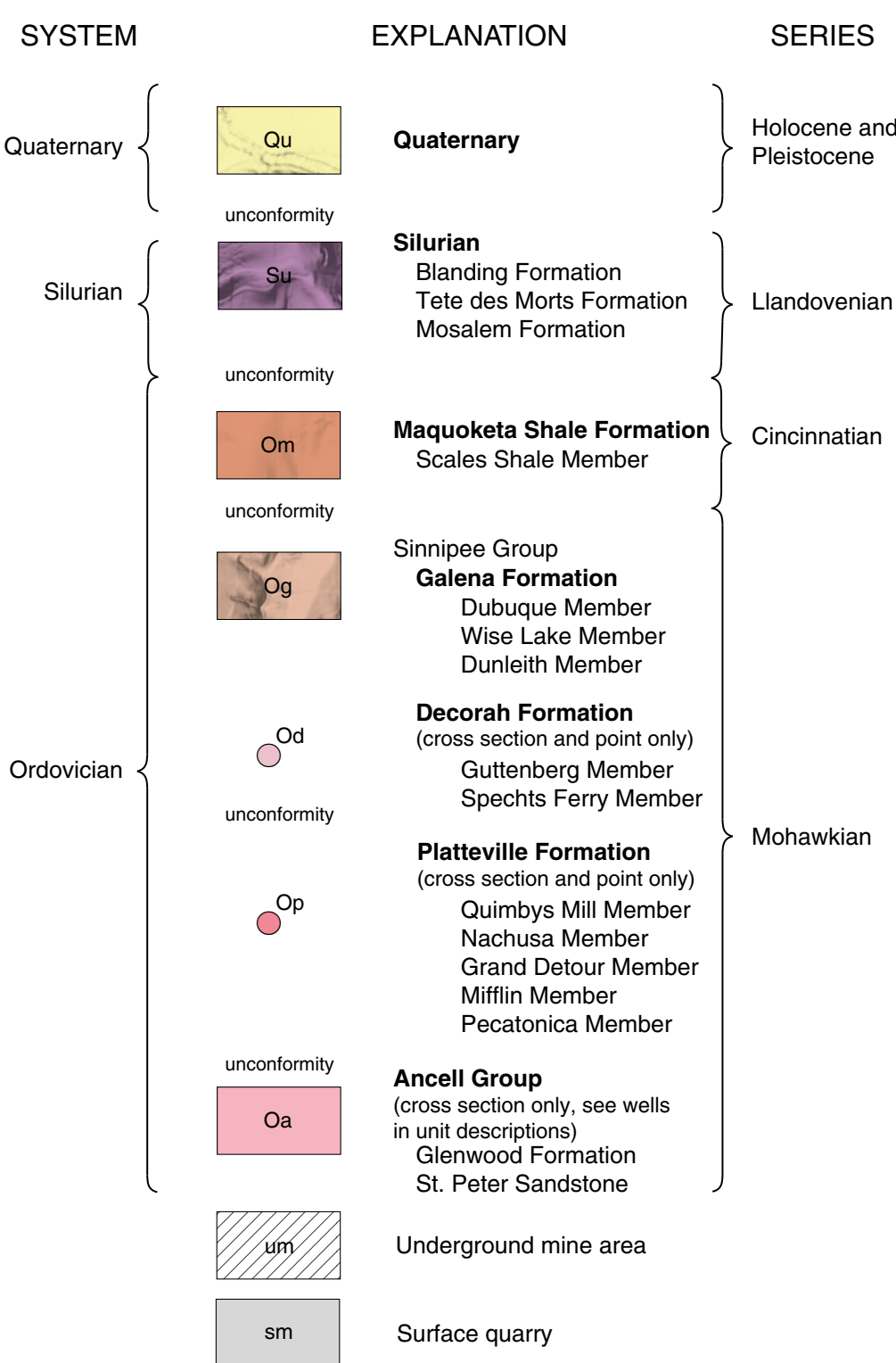


Prairie Research Institute
ILLINOIS STATE GEOLOGICAL SURVEY

STATEMAP Galena-BG










Drill Holes






- Confidential well
- Water well
- Mineral boring
- Stratigraphic boring

S ¹²⁵ Labels indicate samples (S) and core (C).
Numeric label indicates total depth of boring in feet.

Point Symbols

- | | |
|---|---|
| 40 | Strike and dip of bedding; number indicates degree of dip |
|  | Inclined joint, number indicates degree of dip |
|  | Quarry, active |
|  | Quarry, abandoned |
|  | Fossil locality |
| • | Bedrock outcrop |
|  | Natural Spring |
|  | Sinkhole locality |
|  | Other karst locality |

Line Symbols

- | | |
|---|----------------------|
|  | Contact, accurate |
| | Contact, approximate |
|  | Contact, inferred |
|  | Contact, concealed |
|  | Syncline, accurate |
|  | Syncline, inferred |

A—A

Note: Well and boring records are on file at the ISGS Geological Records Unit and are available online from the ISGS Web site.

Mine and karst data from the Jo Daviess County, IL Karst Feature Database (U.S. Fish and Wildlife Service et al. 2021).

Synclines modified from McGarry 2000, Bradbury 1959, and Willman and Reynolds 1947.

Base map compiled by Illinois State Geological Survey from digital data (2021 US Topo) provided by the United States Geological Survey. Shaded relief and contours derived from lidar elevation data from the Jo Daviess County (2020) and Mississippi River North collections available through ILHMP.

North American Datum of 1983 (NAD 83)
Projection: Transverse Mercator
1,000-meter ticks: Universal Transverse Mercator grid system, zone 15

Recommended citation:
Delpomdor, F.R.A., 2022, Bedrock geology of Galena Quadrangle, Jo Daviess County, Illinois: Illinois State Geological Survey, USGS-STATEMAP contract report, STATEMAP Galena-BG, 2 sheets, 1:24,000, report, 9 p.

SCALE 1:24,000

1 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

0.5 0 1 KILOMETER

BASE MAP CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1988




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1	2	3	ADJOINING QUADRANGLES 1 Kieler 2 Cuba City 3 New Diggings 4 Menominee 5 Scales Mound West 6 La Motte 7 Bellevue 8 Hanover
4		5	
6	7	8	

APPROXIMATE MEAN

ROAD CLASSIFICATION

- | | |
|-------------|---|
| U.S. Route |  |
| State Route |  |
| Local road |  |

SYSTEM	SERIES (and Comment)	GROUP	FORMATION	MEMBER	GRAPHIC COLUMN	THICKNESS (FEET)	UNIT
QUATERNARY	HOLOCENE AND PLEISTOCENE		Surficial deposits			3–140	A
SILURIAN	LANDOVENIAN		Blanding			30–50	B
			Tete des Morts			15–20	C
			Mosalem			70–80	D
ORDOVICIAN	CINCINNATIAN		Maquoketa	Scales		110–125	E
	MOHAWKIAN	Sinnipee					
				Dubuque		36–45	F
				Wise Lake		75	
				Dunleith		107–126	
			Decorah	Guttenberg		2–16	G
				Spechts Ferry		0–7	
				Quimby's Mill		3–18	
				Nachusa		0–15	H
				Grand Detour		5–15	
				Millfin		10–20	
				Pecatonica		20	I
			Glenwood			5	
		Anceill		St. Peter		300–385	J

Lithology	Paleontology	Pb-Zn Ore
Sand	Brachiopods	Crevice
Cross-bedded sand	Gastropods	Flat
Clay	Crinoids	Pitch
Loess	Mollusks	Disseminated Ore
Pebble and cobble	Bryozoans	Breccia
Sandstone	Corals	
Dolomite	Cephalopods	
Cherty dolomite	Belemnites	
Sandy dolomite	Algae (Receptaculites)	
Argillaceous dolomite	Fossil traces	
Limestone		
Cherty limestone		
Argillaceous limestone		
Shale		
Dolomitic shale		
Phosphorite		

Qu	Quaternary
Su	Silurian undifferentiated
Om	Maquoketa Shale
Og	Galena Formation
Od	Decorah Formation
Op	Platteville Formation
Oa	Anceill Group

Well Boring

Horizontal scale: 1 inch = 2,000 feet
Vertical scale: 1 inch = 250 feet
Vertical exaggeration: 8×
Well labels indicate short USGS API number and (total depth in feet).

A Quaternary Surficial Deposits Silt, clay, sand, gravel, loess. Silt, clay and sand occur in a few modern creek valleys and largely in the Sinsinawa and Galena River channels. Sand and gravels occur in the floodplain and backwater channels of the broad Mississippi River valley. Loess covers most of the quadrangle, in which 15-20 feet in thickness rests on uneroded uplands (Fehrenbacher et al. 1986; Riggs 2000). The contact with the underlying units is unconformable.

B Blanding Formation Dolostone. The formation consists largely of 3 feet thick brownish to pinkish gray, thin bedded (1/4 to 6 inches thick), fine-grained, slightly argillaceous, cherty, dolostone at the base grading upward to brownish to pinkish gray, thick bedded (1-4 feet thick), fine-grained, pure, vesicular, dolostone at the top. A few white scattered chert nodules are locally visible at the top. Silicified tabulate and rugose corals and *Stricklandinia* are common (Savage, 1926). The Blanding Formation and its contact with the underlying Tete des Morts Formation are exposed in a cliff near the top of the Horseshoe Mound 1.5 miles east of the City of Galena (Point 121, SE¼NE¼ sec. 21, T28N, R1E, GPS coordinate 42.407919°N, 090.400664°W), in which the base is visible.

C Tete des Morts Formation Dolostone. The Tete des Morts Formation is largely gray to greenish gray, thin bedded (1-1½ feet thick), pure, fine- to medium-grained, vesicular, massive, dolostone. Ripples and low angle cross-bedded are common in the upper part. Fossils, particularly *Pentamerus* and *Favosites*, are abundant. The formation generally contains scattered white chert nodules which occur locally in the lower part, while a persistent band of white chert nodules and lenses are locally in a thin, slightly argillaceous beds in the upper part. Glauconite is common in the upper part. The Tete des Morts Formation is the prominent cliff-forming unit at or near the top of the Horseshoe and Dygerts mounds and the Pilot Knob in the quadrangle. Its best exposures in the Galena area are visible in a few cliffs northwest Horseshoe Mound 1.5 miles east of the City of Galena (Point G096, SE¼NE¼ sec. 21, T28N, R1E, GPS coordinate 42.408661°N, 090.399923°W; point G099, NW¼SW¼ sec. 22, T28N, R1E, GPS coordinate 42.440898°N, 090.399003°W; Figures 2a and b).

D Mosalem Formation Dolostone. The formation consists largely of gray yellow-brown weathering, thin bedded, very argillaceous, medium to dark gray dolostone interlayered by thin dolomitic shale at the base (Figures 2e and f) grading upward to 1-12 inches thick bedded, gray, tan to yellow-brown weathering, moderately argillaceous, fine-grained, dense, locally vuggy and vesicular, laminated, dolostone (Figures 2c-d) and ½ to ½ inches thick tan to yellow-brown dolomitic shale at the top. The upper part of this formation contains 3/4 feet thick white chert nodules (1-1½ inches on diameter) and lenses (1-4 inches in length). Brachiopod, echinoderm, and rare *Favosites* are visible in the upper Mosalem Formation (Figure 2d). Only the latest 15 feet of the upper Mosalem Formation is exposed in northwest Horseshoe Mound 1.5 miles east of the city of Galena (Point G094, SE¼NE¼ sec. 21, T28N, R1E, GPS coordinate 42.408193°N, 090.401520°W (Figure 2f); point G095, SE¼NE¼ sec. 21, T28N, R1E, GPS coordinate 42.407920°N, 090.401304°W; Figure 2b). The typical exposures are seen in the Mississippi River bluffs 6 miles south of the City of Galena (SE¼SW¼SE sec. 21, T27N, R1E). The Formation is conformable with the underlying late Ordovician Scales Shale of the Maquoketa Group.

E Maquoketa Shale Shale. The formation is the formerly named "lower shale" unit of the Maquoketa Shale Group in northwestern Illinois. The formation only includes the Scales Shale Member that contains the Clermont Shale (top) and Elgin Shale (base), in which only the Elgin Shale occurs in the Galena Quadrangle. The Elgin Shale consists largely of dark gray to dark brown, partly silty, locally thinly laminated, shale (Figures 3a-c). This unit contains a few beds of whitish fine-grained limestone, and a dark brown silty shale at the base. A depauperate bed, 20 feet above the base, is characterized by 6 inches thick tan medium-grained limestone with distinctive pyritic and phosphate granules (phosphorite), "Depauperate" fossils, mostly a coquina of mollusks, but trilobite *Isotelus iowensis* and graptolite *Diplograptus Peosta* are common (Figure 3b). In the Galena area, the Elgin Shale is only encountered in a few borings (Einsweiler#1 stratigraphic well, API no. 120852629600, sec. 25, T29N, R1W, GPS coordinate 42.475491°N, 090.432894°W; Hasken water well, API no. 120850041000, sec. 34, T29N, R1W, GPS coordinate 42.468362°N, 090.468124°W; Galena City Well no. 5, API no. 120850000300, sec. 13, T28N, R1W, GPS coordinate 42.407920°N, 090.401304°W; Figure 2b). The Maquoketa Shale is conformable with the underlying Galena Formation.

F Galena Formation Dolostone. The Galena Formation includes the Dubuque Member (top, 36-45 feet thick), the Wise Lake Member (62-75 feet thick), and the Dunleith Member (base, 107-132 feet thick). Up to 211 feet of this formation is encountered in the Einsweiler#1 stratigraphic well, in which each members and beds are well identified (Figures 3c-p). The Dubuque Member is gray to grayish tan, fine-grained, thin bedded (1/4 to 1½ feet thick), dolostone and ½ to ½ inches thick red-brown shale partings, which grade upward to fine-grained, argillaceous, dense, dolostone interlayered with thin red-brown thick dolomitic shale (Figures 3c-d). Calcite-filled vugs are common near the top. Brachiopods (*Dalmanella*, *Sowerbyella* and *Pseudolingula*) are common in the lower part. The Dubuque Member is gradational with the underlying Wise Lake Member. Outcrops are restricted to two exposures along Interstate 20 respectively 4 miles NW (Point G159, NW¼NE¼ sec. 4, T28N, R1W, GPS coordinate 42.458765°N, 090.499048°W; Figure 2g) and 3 miles SE (Point G005, NE¼SW¼ sec. 26, T28N, R1E, GPS coordinate 42.389533°N, 090.377315°W) of the City of Galena, in which the contact with the Wise Lake Member is visible. The underlying Wise Lake Member is divided into two beds – the pure dolostone of the Stewartville Bed (27 feet; top) and the thinner bedded and less pure dolostone of the Sinsinawa Bed (34 feet; base). The Stewartville Bed is largely gray to light buff-yellow gray, medium- to coarse-grained, thick bedded (2 to 5 feet thick), pure, non-cherty, dolostone, in which the bedding becomes thinner

(1½ to 1 feet thick) and more argillaceous upward as a gradual transition to the overlying Dubuque Member (Figures 3d-e). Fossils are abundant and they include brachiopod *Lingula*, *Dalmanella*, *Platystrophia*, *Orthis*, *Clitambonites*, cephalopods *Orthoceras* and *Triptoceras*, and trilobite *Illaenus*. *Receptaculites Oweni* is abundant and constitute the upper *Receptaculites* Zone (Figure 2h). The Sinsinawa Bed consists of gray to light buff-yellow gray, medium- to coarse-grained, thick bedded (3-5 feet thick), tabular, massive, mostly non-fossiliferous but rare brachiopods and cephalopods locally occur, non-cherty, vuggy dolostone (Figures 3e and f). A few slightly wavy, dense, argillaceous beds are common. A 1- to 2-inch-thick bentonite layer is present locally near the base (Willman and Kolata 1978). The best exposure of the Wise Lake Member is located in a roadcut along Interstate 20 on the east side of the Galena River at the City of Galena (Point G001; SW¼SE¼ sec. 20, T28N, R1E, GPS coordinate 42.409862°N, 090.425203°W), and in Galena River bluffs in the vicinity of the City of Galena. The contact with the underlying Dunleith Member is gradational and marked by a transition zone within the Dunleith Member that consists of argillaceous cherty dolostone grading upward to pure non-cherty dolostone (Figures 2i and 3e). This contact is well exposed in the Virtue quarry (Point G002; SW¼NW¼ sec. 24, T28N, R1W, GPS coordinate 42.409093°N, 090.444483°W) and Schoenhard pit (Point G046; NE¼NW¼ sec. 15, T28N, R1E, GPS coordinate 42.423215°N, 090.392987°W). The Dunleith Member consists largely of light gray in fresh exposures, weathers to light buff or yellowish gray; slightly argillaceous at the base grading upward to more pure, vuggy, dolostone (Figures 3e-p). Throughout the region in the area, several distinct beds have been formerly names "Blue" for the Buckhorn Bed (8.2 feet; Figures 3o-p), basal unit of the Dunleith Member, "Gray" for the St. James Bed (19.3 feet; Figures 3n-o), and "Drab" for the Fairplay (16.8 feet; Figures 3j-k), Mortimer (13 feet; Figures 3j-l), Rivoli (19.5 feet; Figures 3h-i), Sherwood (12.2 feet; Figures 3g-h), Wall (8.2 feet; Figures 3f-g), and Wyota (20.3 feet; Figures 3e-f) beds. The Beecher (5 feet; Figures 3m-n) and Eagle Point (9.6 feet; Figures 3l-m) beds have been unnamed. The Buckhorn and St. James beds are not exposed in the quadrangle, but both units are identified widely in a few nine borings and the Einsweiler#1 stratigraphic well in the Galena area. The "Drab" rocks are largely exposed in the quadrangle, which the upper part of the Dunleith Member outcrops in the Mississippi River bluffs 3 miles SE of the City of Galena (Point G151, SW¼ SW¼ sec. 36, T28N, R1W, GPS coordinate 42.458765°N, 090.499048°W; Point G161, cen. sec. 21, T28N, R1W, GPS coordinate 42.408337°N, 090.494133°W; Point G179, NE¼SW¼ sec. 35, T28N, R1W, GPS coordinate 42.382529°N, 090.455182°W), a few roadcuts (Point G004, NE¼SW¼ sec. 26, T28N, R1E, GPS coordinate 42.386529°N, 090.375126°W; Point G029, SW¼NW¼ sec. 3, T28N, R1E, GPS coordinate 42.448915°N, 090.402457°W; Point G089, NW¼SW¼ sec. 22, T28N, R1W, GPS coordinate 42.411606°N, 090.484794°W) and quarries (Virtue, Schoenhard, Ehrler; NE¼NW¼ sec. 15, T28N, R1E, GPS coordinate 42.426844°N, 090.389599°W). These rocks consist of alternating argillaceous and pure beds. The argillaceous beds are fine- to medium-grained, dense, thin to medium bedded (½ to 1½ feet thick), slightly wavy and nodular, and often associated with white chert nodules (1 to 4 inches in diameter), lenses (5 to 20 inches in length), and thin beds (a few feet in length). The pure beds are generally coarse-grained, thick bedded (1½ up to 12 feet thick), tabular, massive, and non-cherty. Fossils are locally abundant and consist of molds and casts within the beds and dolomitized shelly fossils. *Trepastrea* bryozoans are particularly abundant in the lower part of the formation. Other common fossils include the brachiopods *Rafinesquina*, *Dalmanella*, and *Sowerbyella*, which are particularly well exposed along the East Fork Galena River 3.5 miles NW of the City of Galena (Point G026; NE¼SE¼ sec. 20, T28N, R1E, GPS coordinate 42.452637°N, 090.378944°W). *Receptaculites Oweni* is abundant in the Fairplay and Rivoli-Sherwood Beds that constitute the Lower and Middle *Receptaculites* Zones respectively. The Buckhorn Bed consists of blue-gray, medium- to coarse-grained, argillaceous to slightly sandy, dolostone and thin green shale partings, while the St. James Bed is gray to light tan, pure, medium-bedded, vuggy dolostone and thin green shale partings. Both beds contain black speckles. Fossils *Dalmanella* and *Prasopora* are common. *Thalassinoides* trace fossil is abundant in the upper Dunleith Member (Point G089, NW¼SW¼ sec. 22, T28N, R1W, GPS coordinate 42.411606°N, 090.484794°W). Very thin layers of bentonites can be identified in the Buckhorn Bed. The contact with the underlying Decorah Formation is sharp as observed in the Einsweiler#1 stratigraphic well and a few outcrops in Jo Daviess County (Willman and Buschbach 1975). Most of zinc ores (sphalerite), mainly flat-and-pitch-type deposited, are found in many places in the "Drab," "Gray," and "Blue" rocks of the Dunleith Member, while the lead ores (galena) are found principally in the crevice-type deposits in the top half of the Dunleith Member ("Drab") and the overlying Wise Lake Member ("Buff"). Disseminated ore deposits are widely distributed in the Galena area. A breccia containing amorphous black oxides of manganese ("wad") is visible 1.0 miles SSW of the city of Galena (Point G133; NE¼NW¼ sec. 25, T28N, R1W, GPS coordinate 42.401127°N, 090.437022°W). The Galena Formation, the Decorah Formation and the Platteville Formation are assigned to the Sinnipee Group.

G Decorah Formation Limestone, shale. In the region area, the Decorah Formation consists of two members – the Guttenberg Member (top, 2-16 feet thick) and the Spechts Ferry Member (base, 0-7 feet thick). The Guttenberg Member, formerly named "Oil rock" by miners and geologists throughout the region in the area, comprises the Glenhaven (10.2 feet; Figures 3p-q) and Garnaville (2.5 feet; Figures 3q-r) beds. The Glenhaven Bed consists largely of brown to buffish, fine-grained to medium crystalline, thin-bedded, dense, limestone with less than ¼ inch beds of dark brown-red, platy, carbonaceous shale (Oil rock). White to medium gray chert nodules are present near the top. Brachiopod (*Rafinesquina*, *Dalmanella* and *Sowerbyella*), molluscan, a few bryozoan and trilobite, fauna are abundant and diverse. A bentonite bed up to 1 inch thick is locally present at the base (Willman and Buschbach 1975). The Garnaville Bed is characterized by gray-tan, medium-bedded, argillaceous limestone with thin gray-brown shale partings. A 5 inches thick zone containing

dark phosphate granules occurs at the base (Figure 3r). The Guttenberg Member is only exposed along the Sinsinawa River at the intersection with the Interstate 40 4.5 miles NW of the City of Galena (NE¼SE¼SE¼ sec. 4, T28N, R1W). In the region area, the limestone of the Guttenberg Member forms a gradational transition zone with the overlying Galena Formation. Throughout the region in the area, the Spechts Ferry Member has been formerly named "Clay bed" by miners and geologists, consists largely of olive, brown, bluish green, yellowish green, dense, massive, pyritic, slightly calcareous, shale (Figures 3r-s). Near the base, a ½-inch-thick white, orange brown when weathering, bentonite is identified. Fossils are not abundant, but coquina of *Plonodema* and *Lingula* are particularly common at the base. The Spechts Ferry Member thins out with the overlying Guttenberg Member or is locally missing. The Spechts Ferry Member is visible in a small exposure along the Galena River 4 miles NNE of the City of Galena (Point G232, cen. 34, T29N, R1E, GPS coordinate 42.467415°N, 90.392718°W). The contact is unconformable with the underlying Platteville Formation. Disseminated sphalerite is found in the outcrops in the "Oil rock" (Guttenberg Member), and the "Clay bed" (Spechts Ferry Member).

H Platteville Formation Limestone, dolomitic limestone, dolostone. The Platteville Formation is only encountered at one outcrop area NE of the City of Galena (Point G233; SW¼SE¼, sec. 34, T29N, R1E; GPS coordinate 42.461557°N, 90.390508°W) and in a few borings in the Galena River just east of the City of Galena (City of Galena no.2 water well, API no. 120850034600, sec. 24, T28N, R1W, GPS coordinate 42.411380°N, 090.429607°W; City of Galena no.4 water well, API no. 120850029800, sec. 20, T28N, R1E, GPS coordinate 42.413543°N, 090.425816°W; City of Galena no.6 water well, API no. 120852261000, sec. 24, T28N, R1W, GPS coordinate 42.412078°N, 090.439924°W; Interstate Light & Power Co. water well, API no. 120850034900, sec. 24, T28N, R1W, GPS coordinate 42.405981°N, 090.432227°W), in which the formation varies between 33 and 88 feet thick. Five members have been identified in well records in this area that includes the Quimby Mill Member (top, 3-18 feet thick), Nachusa Member (0-15 feet thick), Grand Detour Member (5-15 feet thick), the Millfin Member (10-20 feet thick), and the Pecatonica Member (base, 20 feet thick). The Quimby Mill Member, formerly named "Glass rock" by miners and geologists throughout the region in the area, consists of dark to dark brown, fine-grained, pure to slightly dolomitic, dense, massive, non-fossiliferous, limestone which breaks with conchoidal fracture (Figure 3s). The base is gradational with the underlying Nachusa Member. The Nachusa Member is generally absent in the Mississippi Valley area, but a boring 1.2 miles NW of the City of Galena (City of Galena no.5 water well, API no. 120850000300, sec. 13, T28N, R1W, GPS coordinate 42.428999°N, 090.43031°W) has encountered 15 feet. It consists largely of fine-grained, slightly argillaceous to pure, locally cherty, vuggy dolostone which resembles to dolostone of the Galena Formation. The Nachusa Member has a gradational contact with the underlying Grand Detour Member. Both Grand Detour and Millfin members have been formerly named "Trenton" by miners and geologists throughout the region in the area. The Grand Detour Member is dominantly gray, to light buff-yellow gray, fine- to medium-grained, slightly argillaceous to pure, locally cherty, dolomitic limestone with thin green-gray to dark brown shale partings. The fauna is abundant and includes brachiopods, crinoids, gastropods, tabulate and rugose corals *Foerstophyllum* and *Streptelasma*, cephalopods, trilobites and lithistid sponges (Worthen 1873; Kolata 2015). The contact with the Millfin Member is not observed, but it is generally conformable (Willman and Buschbach 1975). The Millfin Member consists of gray to light yellow buff, very fine- to fine-grained, predominantly argillaceous, limestone with thin greenish gray shale partings. The member is very fossiliferous and contains an abundant and varied brachiopod, molluscan and bryozoan fauna (Kolata 2015). The contact with the Pecatonica Member is not observed. However, Willman and Buschbach (1975) have been indicated a sharp contact. In the region area, the Pecatonica Member has been formerly named "Lower Buff" by miners and geologists. It is largely composed of light gray to brownish-gray, medium- to very coarse-grained, slightly argillaceous to pure, vuggy, silty and sandy near the base, dolostone and rare thin gray dolomitic and platy brownish-gray shale partings. Phosphate nodules are abundant near the base. Fossils are not abundant, but a few beds contain brachiopods, bryozoans, and echinoderms. The contact with the underlying Glenwood Formation or St. Peter Sandstone is locally eroded or unconformable or marked by a hardground surface (Willman and Buschbach 1975).

I Glenwood Formation Shale. The Glenwood Formation is only exposed in wells in the quadrangle, which the thickness of this formation is 5 feet. In the region area, it consists largely of olive, dark gray to grayish-brown, pyritic, partly silty and sandy, friable, and thinly laminated shale that has been correlated with type Glenwood Shale in Iowa (Agnew 1955) and the Harmony Hill Shale, youngest member of the Glenwood Formation in Illinois (Willman and Buschbach 1975). The base is marked by an abrupt change to clean, white, sandstone. The Glenwood Formation and St. Peter Sandstone are assigned to the Anceill Group.

J St. Peter Sandstone Sandstone. The St. Peter Sandstone is only encountered in borings along the Mississippi River plain 2.7 miles SW of the City of Galena (Shanley no.1 water well, API no. 120850061300, sec. 27, T28N, R1W, GPS coordinate 42.389740°N, 090.467912°W), and in the Galena River just east of the City of Galena (City of Galena no.2, no.4, no.6 water wells, Interstate Light & Power Co. water well, API no. 120850034600, sec. 24, T28N, R1W, GPS coordinate 42.389740°N, 090.467912°W), and in the Galena River just east of the City of Galena (City of Galena no.2, no.4, no.6 water wells, Interstate Light & Power Co. water well, API no. 120850034600, sec. 24, T28N, R1W, GPS coordinate 42.389740°N, 090.467912°W). The formation varies between 300 to 395 feet thick. It consists of light gray, gray, silty, locally yellow-brown when iron-cemented, very fine- to coarse-grained, well-rounded, frosted, sorted, friable, pure quartz sandstone. The St. Peter Sandstone is largely unfossiliferous, but rare *Skolithos*-type worm and a few scolecodonts have been observed (Kolata 2015). The contact with the underlying units is unconformable (Willman and Buschbach 1975).

