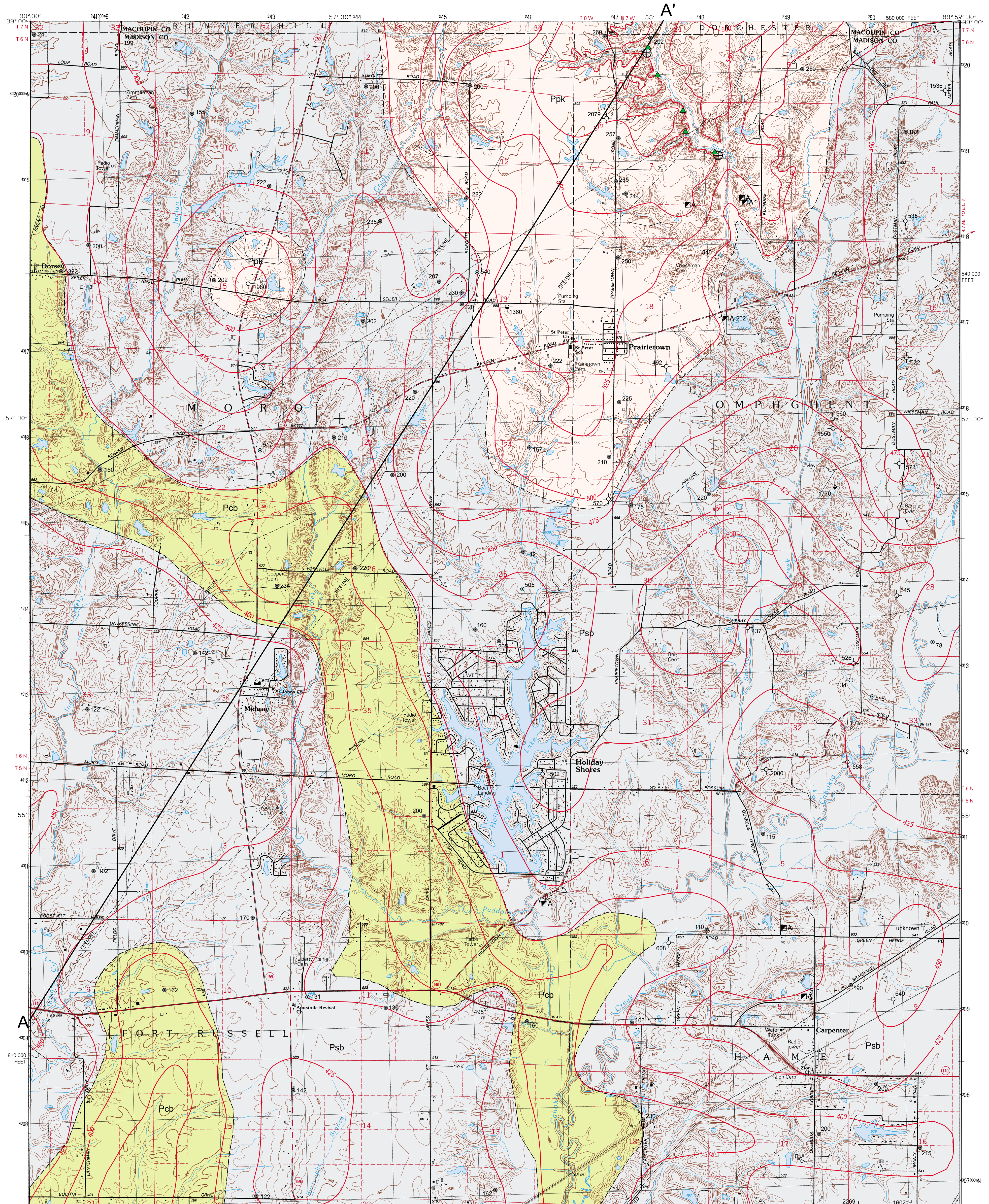
Department of Natural Resources
ILLINOIS STATE GEOLOGICAL SURVEY
William W. Shilts, Chief

Bedrock Geology of Prairietown Quadrangle
Madison and Macoupin Counties, Illinois

Illinois Preliminary Geologic Map
IPGM Prairietown-BG

F. Brett Denny
2004



Pennsylvanian	Ppk	Patoka Formation	Missourian
	Psb	Shelburn Formation	Desmoinesian
	Pcb	Carbondale Formation	
		Cross section only :	
	Pt	Tradewater Formation	Atokan
		Unconformity	
Mississippian	Mcu	Chesterian Undifferentiated	Chesterian
	Mvu	Valmeyeran Undifferentiated	Valmeyeran

Line symbols: dashed where inferred

- Contact
- 475 Bedrock topography (elevation in feet)
- A —— A' Line of cross section
- Horizontal bedding
- 78 Water well (depth in feet)
- 182 Coal test (depth in feet)
- 573 Oil test, dry hole (depth in feet)
- 1770 Oil test, show of oil (depth in feet)
- A Mine shaft, abandoned
- Outcrop

Base map compiled by Illinois State Geological Survey from digital data provided by the United States Geological Survey. Topography compiled from imagery dated 1986. Field checked 1968. Map edited 1990.

North American Datum of 1983 (NAD 83)
Projection: Transverse Mercator
10,000-foot ticks: Illinois State Plane Coordinate system, west zone (Transverse Mercator)
1,000-meter ticks: Universal Transverse Mercator grid system, zone 16

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SCALE 1:24 000

BASE MAP CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

Released by the authority of the State of Illinois: 2004

Geology based on fieldwork by F.B. Denny, 2003.

Digital cartography by F.B. Denny, J. Domier and J. McLeod, Illinois State Geological Survey.

This Illinois Preliminary Geologic Map (IPGM) is a lightly edited product, subject to less scientific and cartographic review than our Illinois Geological Quadrangle (IGQ) series. It will not necessarily correspond to the format of IGQ series maps, or to those of other IPGM series maps. Whether or when this map will be upgraded depends on the resources and priorities of the ISGS.

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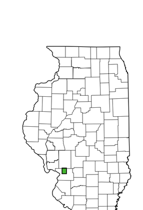


1	2	3
4		5
6	7	8

ADJOINING QUADRANGLES
1 Shipman
2 Bunker Hill
3 Gillespie South
4 Bethalto
5 Worden
6 Wood River
7 Edwardsville
8 Marine

APPROXIMATE MEAN DECLINATION, 2004

ROAD CLASSIFICATION
Primary highway, hard surface
Secondary highway, hard surface
Light-duty road, hard or improved surface
Unimproved road
Interstate Route
U.S. Route
State Route

Introduction

Bedrock Geology of Prairietown Quadrangle was prepared as part of a statewide 1:24,000-scale geologic mapping program by the Illinois State Geological Survey (ISGS). This geologic map was funded in part through a contract with the United States Geological Survey. Bedrock geologic maps may aid in the exploration for economic minerals including coal, petroleum, and natural gas and may facilitate regional planning by locating groundwater resources and aggregate materials for infrastructure support.

Several data sources have been used to construct this map. Well records from files of the ISGS were the primary source. Most data locations are shown on the map sheet, but locations from several confidential records used to construct the geologic and structural contour maps are not shown. In addition, bedrock outcrops were observed along the east side of Sherry Creek (Secs. 6 and 7, T6N, R7W).

Bedrock topographic surface contours at 25-foot intervals were generated and overlain on the geologic map. Unconsolidated or surficial material thickness may be estimated by subtracting bedrock elevations from surface elevations on the topographic base map.

Economic Geology

Coal
The primary economic coal is the Herrin Coal, located near the top of the Carbondale Formation. The Herrin averages 5 feet in thickness, but is eroded or not deposited in a few locations (see inset map of Herrin structure on top of the Herrin Coal).

ISGS records indicate six abandoned coal mine shafts in the quadrangle. These mines operated during the 1800s through the early to middle 1900s. Henry Voge operated a shaft mine from 1897-1898 in the Herrin #6 Coal (Sec. 8, T6N, R7W). This mine was later operated by the Mt. Olive and Staunton Coal Company from 1898-1900, the Staunton Coal Company from 1900-1905, and again by the Mt. Olive and Staunton Coal Company from 1905-1926. Another abandoned mine shaft is reported very close to the Mt. Olive and Staunton Mine (Sec. 8, T6N, R7W). This shaft was sunk in 1900 by the Mitchell Brothers until 1904. It operated under the direction of Theo Schuler from 1904-1912, Hardin and Stregmier from 1912-1913, E.E. Stregmier from 1913-1917, John Kowalzik from 1917-1931, and the Klondike Coal Company from 1931-1941. The Prairietown Coal Company (Sec. 18, T6N, R7W) operated from 1937 through 1945 and mined the Herrin # 6 Coal. F.C. Bach operated a shaft mine (Sec. 5, T5N, R7W) recovering the Herrin #6 Coal, but no information concerning the years of operation is available. John Glasmeyer operated a shaft mine (Sec. 8, T5N, R7W) about 1 mile south of the F.C. Bach Mine. The only information concerning the years of operation of the Glasmeyer Mine is that it operated before 1922. An abandoned mine (Sec. 1, T5N, R8W) was also operated before 1922. All mines were probably small and provided a source of fuel for local uses only (as depicted on the mined out areas in the 1:500,000 scale inset map of Petroleum and Coal Resources).

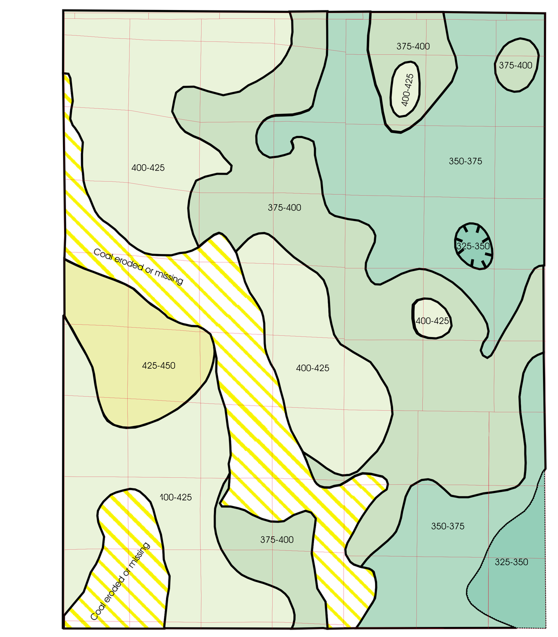
The regional dip of the Carbondale Formation is generally easterly. The Herrin Coal in the western portion of the quadrangle near Midway is approximately 100 feet below the surface and over 200 feet below the surface along the eastern edge of the quadrangle. Quaternary overburden is present throughout the quadrangle, but is thin in the north-central portion (Grimley and Phillips, in prep; see NE end of cross section). Coal may be present within 100 feet of the surface in an area along the southwestern corner.

Oil
Several oil tests were drilled in the quadrangle. All wells were dry holes, although two (Sec. 20, T6N, R7W, and Sec. 13, T6N, R8W) had shows of oil. The majority were abandoned at the top of the Valmeyeran below the Aux Vases. Several wells, including the two with shows of oil, were drilled through the Devonian and into Silurian formations. Oil is produced from several areas in the surrounding quadrangles (see inset map) and undiscovered accumulations of oil may be present in the Prairietown Quadrangle. The structural contours of the Herrin Coal may define targets for exploration wells.

Structural Geology

Structural contours on the top of the Herrin # 6 Coal indicate regional dip of the Paleozoic bedrock is to the east at approximately 25 feet per mile, or a dip of less than 1 degree. No major faults have been located offsetting any bedrock units in the immediate area.

Top of Herrin Coal Structure



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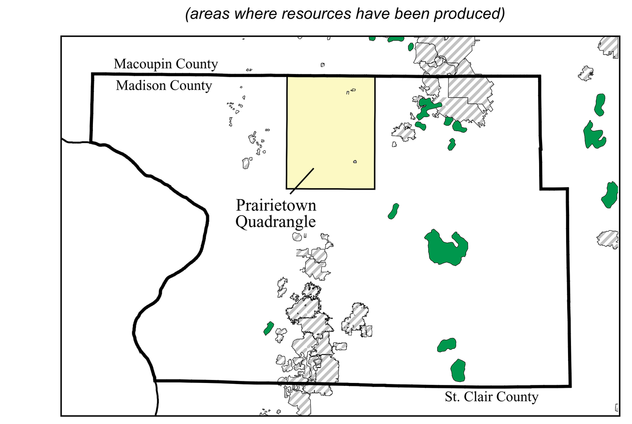
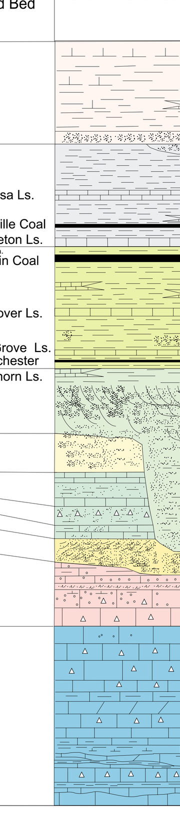
Petroleum and Coal Resources of Madison County
(areas where resources have been produced)



1:500,000

Oil and gas fields
Coal mines (mined-out areas)

SYSTEM	SERIES	FORMATION	MEMBER and Bed	GRAPHIC COLUMN	THICKNESS (feet)	DESCRIPTION UNIT
Pennsylvanian	Missourian	Patoka			0-80	A
	Desmoinesian	Shelburn	Piasa Ls.; Danville Coal; Brereton Ls.; Herrin Coal		100-150	B
		Carbondale	Hanover Ls.; Oak Grove Ls.; Colchester; Seahorn Ls.		130-150	C
		Tradewater			35-120	D
Mississippian	Chesterian	Cypress			0-25	E
		Paint Creek			0-45	F
		Yankeetown			0-25	G
		Renault			0-20	H
		Aux Vases			45-75	I
		St. Genevieve Limestone			60-80	J
	Valmeyeran	St. Louis Limestone			200-250	K

A. **Patoka Formation**: (claystone, shale, siltstone, sandstone, and limestone); *claystone* medium to dark gray, with greenish-gray siltstones in upper part, calcareous in places with marine invertebrates; where associated with limestone, black *shale* with marine bivalves; *siltstone* green to gray, laminated to massively bedded; *sandstone* medium grained, light gray, with occasional channel development; *limestone* dark gray, lenticular very argillaceous, containing marine fossils

B. **Shelburn Formation**: (claystone, shale, siltstone, limestone, sandstone, and coal); *claystone* light to medium to dark gray, variegated in places red and green where associated with Piasa Limestone; black *shale* above Danville Coal; *siltstone* gray to gray-green, laminated to thick bedded, commonly micaceous; *limestone* light gray to dark gray, argillaceous, with crinoids and brachiopods, dominantly lime mudstone with fossil wackestone; fusulinids common in lower part of Piasa Limestone, with thin red shale just above (marker bed in drill cutttings and on wireline logs); *sandstone* rare, light gray to tan, medium grained, micaceous, quartz arenite; *coal* thin and discontinuous, bituminous and commonly overlain by thin, black shale, red and green claystones and a limestone

C. **Carbondale Formation**: (shale, claystone, sandstone, limestone, and coal); *shale* and *claystone*, light gray to black; Anna Shale marine black shale above Herrin Coal; *claystones* light gray to white with carbonized root remains below coals; *sandstone* sporadic, gray, medium grained, thick bedded quartz arenites; Hanover Limestone dark to medium gray, nodular, two to three feet thick, a persistent bed of argillaceous limestone brecciated and containing primarily brachiopods; Oak Grove Limestone lithologically distinct sequence of thin lime-mudstones interbedded with thin dark gray and black shales; Herrin and Colchester Coals both bright banded; Herrin Coal near top contains a bluish gray argillaceous layer near base ("blue band"); Colchester Coal near base of Carbondale, thinner than Herrin; basal Brereton Limestone character unknown in mapped area

D. **Tradewater Formation**: (sandstone, siltstone, shale and conglomerate); *sandstone* mostly micaceous quartz arenites with some clay or altered feldspar sublitharenites, grain size fine to coarse with cross bedding in places; *siltstones* gray to tan, abundant mica, laminated to thick bedded; *shales* light to dark gray with carbonaceous debris, typically interbedded with siltstone; *conglomerate* rare, comprised of chert gravel and pebbles with coarse grained to medium grained sand; fossil plant debris is also found within conglomerate that mainly occur at or near base of unit

E. **Cypress Sandstone** (sandstone and shale); *sandstone* white to light gray, fine grained, well sorted quartz arenite with occasional sucrosic texture; *shale* only as clay drapes in laminated sheets near upper formation

F. **Paint Creek Formation** (claystone, limestone, and sandstone); *claystone* variegated, red and green to light gray, soft, locally with marine fossils such as crinoid and blastoid calyces and ossicles, productid brachiopods, rugose corals, and fenestrate bryozoans; *limestone* medium gray to dark gray, fossiliferous packstone and wackestone with shale interbeds containing fine grained quartz sand stringers; upper limestone with occasional pink chert-replaced crinoidal material; basal limestone predominantly dark greenish gray, with some red, green, and brownish shales

G. **Yankeetown Sandstone** (sandstone, shale, and chert); *sandstone* very fine grained, quartz-rich, white, red, and gray green, in places silicified and preserved as chert, with stacked ripple bedded chert structures containing very fine angular quartz sand; *claystone*, typically red, at top of unit, but can be variegated with greens and grays; grades into underlying limestone

H. **Renault Limestone** (limestone, sandy limestone, and limestone conglomerate); *limestone* light to medium gray, with oolites, fossils and diagnostic red echinoderm fragments; quartz *sandstone* within this limestone, and in places carbonate conglomerates at base

I. **Aux Vases Sandstone**: (sandstone and shale); *sandstone* clean, white, well sorted, quartz arenite with crossbedding and current ripples; green *shale* and green clay drapes near upper part of unit; lower part of sand calcareous, locally unconformable contact with underlying unit

J. **Ste. Genevieve Limestone**; (limestone and sandstone); *limestone* white, with abundant oolites and echinoderm fragments, oolitic crossbedded grainstones or oosparites in upper part of formation; *sandstone,* light greenish gray, bioturbated, approximately seven feet thick, very fine grained with calcareous cement, near upper part of unit; lower formation predominantly crinoidal packstones with tightly packed coated grains and thin greenish shale laminae, common stylolites, scattered chert nodules and greenish oncolites

K. **St. Louis Limestone**; (limestone, chert, dolostone); *limestone* dominated by lime-mudstones, dark gray to light gray, with conchoidal fracture; stylolites common; some fossil wackestone and packstone beds; unit thin bedded, white to dark gray *chert* nodules and stringers common; yellowish *dolostone* and breccia in middle part of formation; colonial coral *Acrocyathus* common near lower part of unit

Line of Cross Section A-A'
Looking Northwest

Oil tests within 1000 feet of line of cross section A-A'