Prepared in cooperation with the U.S. Geological Survey,
Dallas L. Peck, Director, under the Cooperative
Geologic Mapping Program (COGEOMAP)

Illinois Department of Energy and Natural Resources
ILLINOIS STATE GEOLOGICAL SURVEY
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Geologic Map of the
EDDYVILLE QUADRANGLE, ILLINOIS
IGQ-5

SYSTEM	SERIES (Appalachian)	SERIES (Mississippian)	INDIANA Fms. (Shaver et al.,1986)	KENTUCKY Fms. (Williams et al.,1982)	THIS REPORT	MEMBERS AND BEDS	GRAPHIC COLUMN	THICKNESS OF COAL (in.)	THICKNESS (ft)	DESCRIPTION UNIT	DESCRIPTION
QUAT-ERNARY						Talus, alluvium, lacustrine beds, loess			0-50	A	**A** Loess - silt, yellow-brown, compact, clayey; on uplands. Not Mapped. Alluvium - Clay, silt, sand, gravel, and boulders, in stream valleys. Lacustrine beds - Clay, blue-gray to brown; silt and sand, in northern-most part of quadrangle. Talus - Rocks and boulders below high cliffs.
PENNSYLVANIAN	Middle	Desmoinesian	Petersburg	Carbondale	Carbondale	Houchin Creek Coal Member		18-30	225 (max.)	B	**B** Sandstone, light gray to brown, very fine to medium, micaceous, feldspathic, argillaceous, carbonaceous, thin to thick-bedded siltstone, light to dark gray, generally thinly laminated. Shale, medium to dark gray, smooth to silty, thinly laminated, micaceous, carbonaceous, plant fossils. Coal, bituminous, bright-banded, blocky fracture, pyritic, in regionally traceable seams. Black, hard, fissile, pyritic shale overlies Houchin Creek, Colchester and Davis Coals. Rooted underclay common beneath all coals.
						Survant Coal Member		36			
						Colchester Coal Member		0-6			
						Dekoven Coal Member		33-40			
						Davis Coal Member		48-56			
			Linton			sub-Davis sandstone			25-50	C	**C** Sandstone, light gray, weathers brown, fine to medium, micaceous, coal and clay clasts; sharp basal contact.
						Carrier Mills Shale Member		trace	45-90	D	**D** Carrier Mills Shale, black, hard and fissile; coal trace at base, underclay; soft gray shale. Stonefort Limestone, gray, fine, dense, shaly, nodular, fossiliferous. Shale gray to black, smooth, thinly laminated; siltstone and fine-grained shaly sandstone, coal, underclay.
						Stonefort Limestone Member		9-14			
						Wise Ridge Coal Bed		8-12			
						Mt. Rorah Coal Member					
						golden sandstone			50-110	235-360	**E** Shale, siltstone and thin-bedded sandstone at top; poorly exposed. Golden sandstone weathers yellow-orange to dark brown, fine to coarse, small quartz granules, much mica, shale and coal clasts, thick-bedded, crossbedded, iron-rich. Mitchellsville Limestone, gray, fine, dense, nodular, shaly partings, abundant chert; distinctive yellow chert residuum. Claystone: gray shale with abundant plant fossils; Delwood Coal typically has shale 3" or thicker near middle of seam.
						Mitchellsville Limestone Bed		trace			
						Delwood Coal Bed		24-48			
						Oldtown Coal Bed		0-4	20-80	F	**F** Poorly exposed interval of gray shale, siltstone, and fine to very fine thin-bedded shaly sandstone with Old Town Coal and possibly younger local coal. Plant fossils.
								0-28			
						Murray Bluff Sandstone Member			80-115	G	**G** Sandstone, light gray, weathers brown with Liesegang bands; fine to coarse, occasional quartz granules; slightly micaceous, shale clasts, thick-bedded to massive; crossbedding common; forms cliffs and ledges. Grades upward into and interfingers with gray silty shale, siltstone, and thin-bedded shaly fine-grained sandstone.
						olive shale			10-55	H	**H** Shale, medium to dark gray, silty; siltstone, light to dark gray, thinly laminated; sandstone, light gray, very fine, shaly, thinly laminated, ripple marks, trace fossils. One exposure of thin-bedded calcareous sandstone to sandy limestone with crinoid and shell debris.
						middle Abbott sandstone lentils			90-135	350-450	**I** Sandstone, light gray, weathers yellow to dark brown, abundant Liesegang bands; upper part typically medium to coarse, with quartz granules, crossbedded to massive; downward very fine to fine, fairly clean quartz sandstone in thin to thick tabular beds; grades laterally to poorly exposed gray silty shale and siltstone; local gannisters, possible coal horizons, trace fossils at several horizons.
						lower tongue of olive shale		0-16	40-120	J	**J** Shale, gray to black, smooth to silty, thinly laminated, abundant plant fossils, local coal, underclay and gannister. Also siltstone and very fine sandstone, thin to medium-bedded, generally poor exposure.
						lower Abbott sandstone lentils			0-90	K	**K** Sandstone, white to light gray, weathers gray, fine, with rare quartz granules; clean quartz sand, well sorted, massive, forms cliffs. Also very fine light gray ripple-bedded to planar-bedded sandstone with siltstone and gray silty shale interbedded.
						basal Abbott shale and sandstone		0-4	50-110	L	**L** Sandstone, white to light gray, very fine to fine, clean quartz, thin-bedded, locally thick-bedded; siltstone, and silty shale, medium to dark gray; coarsening-upward sequences capped by gannister or underclay with thin local coals.
						Reynoldsburg Coal Bed		0-4			
						Pounds Sandstone Member		0-110		M	**M** Sandstone, white to light gray, weathers light gray, fine to very coarse, quartz granules and small pebbles common; nearly pure quartz sand, massive to thickly bedded, planar and trough crossbedding. Forms prominent cliffs and ledges.
						marine zone Drury Member Gentry Coal Bed		0-247	35-100	200-405	**N** Shale, medium to dark gray, silty, well-laminated; siltstone, light gray; sandstone, light gray, very fine, quartzitic, thinly bedded, ripple marks. Shale with plant fossils above Gentry Coal. Marine zone, exposed along Bear Branch: Shale, dark gray to black, calcareous, thinly laminated; thin bands and nodules of limestone; goniatites, brachiopods.
						Battery Rock Sandstone Member			30-100+	O	**O** Sandstone, white to light gray, fine to very coarse, quartz pebbles up to 1 inch abundant; conglomerate lenses, nearly pure quartz, thick-bedded to massive, trough and planar crossbedding; forms prominent cliffs and ledges.
						Wayside Member			20-115	P	**P** Highly variable lenticular clastic sequence. Cliff-forming sandstone up to 120 ft., light gray, weathers dark gray, very fine to fine, few quartz pebbles; local basal conglomerate of shale, chert and limestone. Sandstone, white to light gray, very fine, pure quartz, thin to medium planar bedding, ripples and load casts. Siltstone and gray silty shale; a little black carbonaceous shale. Basal contact uncomformable.
						Grove Church Member			0-507	Q	**Q** Shale, greenish gray, mottled, thinly laminated, soft, noncalcareous.
						Goreville Limestone Member			0-35	R	**R** Limestone, medium gray, weathers light gray, micritic to fine, siliceous beds, chert nodules, few visible fossils.
						Kinkaid Limestone — Cave Hill Member			35-90	70-160	**S** Shale, medium to dark gray and greenish-gray, smooth to silty, some calcareous; siltstone, greenish-gray, calcareous; claystone, red to green; limestone, gray to yellow-brown, generally fine to micritic, argillaceous, dolomitic, abundant marine fauna.
						Negli Creek Limestone Member			28-35	T	**T** Limestone, medium to dark gray, weathers rough-textured light gray; micritic to coarse, shaly partings, nodular bedding, chert nodules common; abundant crinoids, brachiopods, bryozoans, rugose corals, gastropods.
						Degonia Formation			30-45	U	**U** Siltstone to very fine sandstone, blue-green to olive, shaly, thinly bedded, ripples, load casts; red and green claystone near top, gray shale; bedded chert at base.
						Clore Formation			100 total, 30 exposed.	V	**V** Shale, greenish-gray to dark gray, smooth, platy, calcareous thin beds of limestone, dark gray, micritic to fine, dense, fossiliferous; siltstone to very fine sandstone, fine, thin- to thick-bedded.

STRUCTURAL GEOLOGY

The Eddyville Quadrangle lies along the southern margin of the Illinois Basin; sedimentary strata dip regionally slightly west of north at 1 to 3 degrees. This pattern is strongly modified by six named structures shown on the geologic map. From north to south, these are the New Burnside Anticline, the Battle Ford Syncline, the McCormick Anticline, the Bay Creek Syncline, the Shawneetown Fault Zone, and the Lusk Creek Fault Zone.

The New Burnside Anticline, near the northern edge of the quadrangle, has a slightly sinuous axis trending east-west. It is a narrow, asymetrical fold. The northern limb is generally steeper, with dips of 15° to 30°, compared to 5° to 15° on the south flank. The crest is gentle in some places, but in other places it is a sharp hinge. Parallel subordinate anticlines, synclines and monoclines are present. Numerous faults also have been mapped. Some strike parallel with fold axes and tend to pass laterally into sharp flexures. Other faults, mainly north of the anticlinal axis, strike east-northeast. All exposed faults are high-angle normal. Total structural relief on the New Burnside Anticline is 250 to 400 feet. The anticline terminates abruptly on the east side of Blackman Creek, but faulting continues farther east.

The Battle Ford Syncline, named herein for Battle Ford Creek, is 1/2 to 1 mile south of and parallel with the New Burnside Anticline, and is roughly 8,000 feet wide. The syncline has a gently dipping south flank, a broad trough, and a moderately dipping north flank. The eastern end of the Battle Ford Syncline is abruptly closed off in the vicinity of Blackman Creek. A northeast-trending fault crosses the syncline near its eastern end.

The McCormick Anticline follows a gently curving course westward from Section 1, T.11S., R.6E. to Section 11, T.11S., R.5E. This fold is similar in geometry to the New Burnside Anticline, but the McCormick has greater relief. A vertical relief of 650 feet within a distance of 2000 feet occurs at the western edge of the quadrangle. Both fold axes and faults along the McCormick Anticline tend to form a right-stepping en echelon pattern. So far as is known, surface faults are high-angle normal; however, a seismic profile indicates thrust faulting at depth. The New Burnside and McCormick Anticlines are interpreted on the cross-section as thin-skinned folds associated with thrust faults that ramp upward from a decollement (probably in pre-Mississippian rocks). Normal faulting along these anticlines is believed to be the product of a later episode of deformation.

The Bay Creek Syncline, named herein for Bay Creek, is about 7,000 to 10,000 feet south of the crest of the McCormick Anticline. The synclinal axis curves from west-northwest to southwest. Like the Battle Ford Syncline, the Bay Creek Syncline is broad and gentle. The Bay Creek Syncline is gradually closed off near the east edge of the map, as it approaches the Shawneetown Fault Zone.

Only a small segment of the Shawneetown Fault Zone lies within the Eddyville Quadrangle. Two faults have been mapped, forming a narrow graben that strikes slightly east of north in Sections 24 and 25, T.11S., R.6E. The Shawneetown Fault Zone is part of the Rough Creek-Shawneetown Fault System, which extends 115 miles across southeastern Illinois and western Kentucky.

The Lusk Creek Fault Zone crosses the southeastern corner of the Eddyville Quadrangle and intersects the southern end of the Shawneetown Fault Zone. The Lusk Creek consists of northeast-trending parallel faults in a zone 600 to 1400 feet wide. The faults dip steeply southeast and include both normal and reverse dip-slip faults. The net displacement is down to the southeast; the downthrown block is known as the Dixon Springs Graben. Within the Lusk Creek Fault Zone are narrow slices of rock older than those found on either side of the zone. The geometry of the fault zone indicates two episodes of post-Pennsylvanian movement: The first reverse with the southeast side upthrown, the second normal with the southeast side downdropped (Nelson, 1986). Seismic profiles reveal that the Lusk Creek Fault Zone is a major crustal feature. Along with the Rough Creek-Shawneetown Fault System, the Lusk Creek formed the northwestern margin of a major graben in the late Proterozoic to early Cambrian time.

ECONOMIC GEOLOGY

Unsuccessful exploration for oil and gas, and limited exploitation of coal, fluorspar, and related minerals have taken place in the Eddyville Quadrangle.

The Illinois State Geological Survey has records of nine petroleum test holes in the quadrangle. All were dry holes, and no significant shows of oil or gas were reported. Most wells were targeted for Mississippian strata on the McCormick and New Burnside Anticlines. The Texas Pacific #1 Mary Streich hole, Section 2, T.11S., R.6E., holds the current depth record for Illinois at 14,942 feet. This well bottomed in Cambrian sandstone. The Texas Pacific #1 Wells et al. hole finished drilling at 6,200 feet in Silurian strata. The other seven wells had total depths of 1,500 to 2,300 feet and finished in Mississippian strata.

Surface mining of the Davis and Dekoven Coals took place in the early 1970's at the Brown Brothers Excavating No. 1 Mine, NE 1/4 Section 30, T.10S., R.6E. These coals were, respectively, about 4 feet and 3.5 feet thick. A small area of unmined Davis and Dekoven coal remains northwest of the Brown Brothers mine. The Delwood Coal Bed occurs in a triangular structural basin northeast of Delwood village, and in part of Sections 27 and 28, T.10S., R.6E., at the north edge of the quadrangle. Boreholes and surface exposures show this coal to vary from 2 to 3.5 feet thick, commonly containing a 2- to 4-inch clay parting near the middle. All this coal is believed to exist at depths less than 100 feet. Only small-scale mining of this coal for local use, in small drift mines, has taken place.

A drift mine that operated about 1915 lies at the west edge of the map in Section 2, T.11S., R.5E. The Oldtown Coal Bed in the lower part of the Spoon Formation was mined, and reportedly was 3.5 feet thick at this mine. This coal is not known to occur elsewhere in the Eddyville Quadrangle. Other lenticular coals in the Abbott and Caseyville Formations have been dug for local use; but are not known to exceed 2 feet thick.

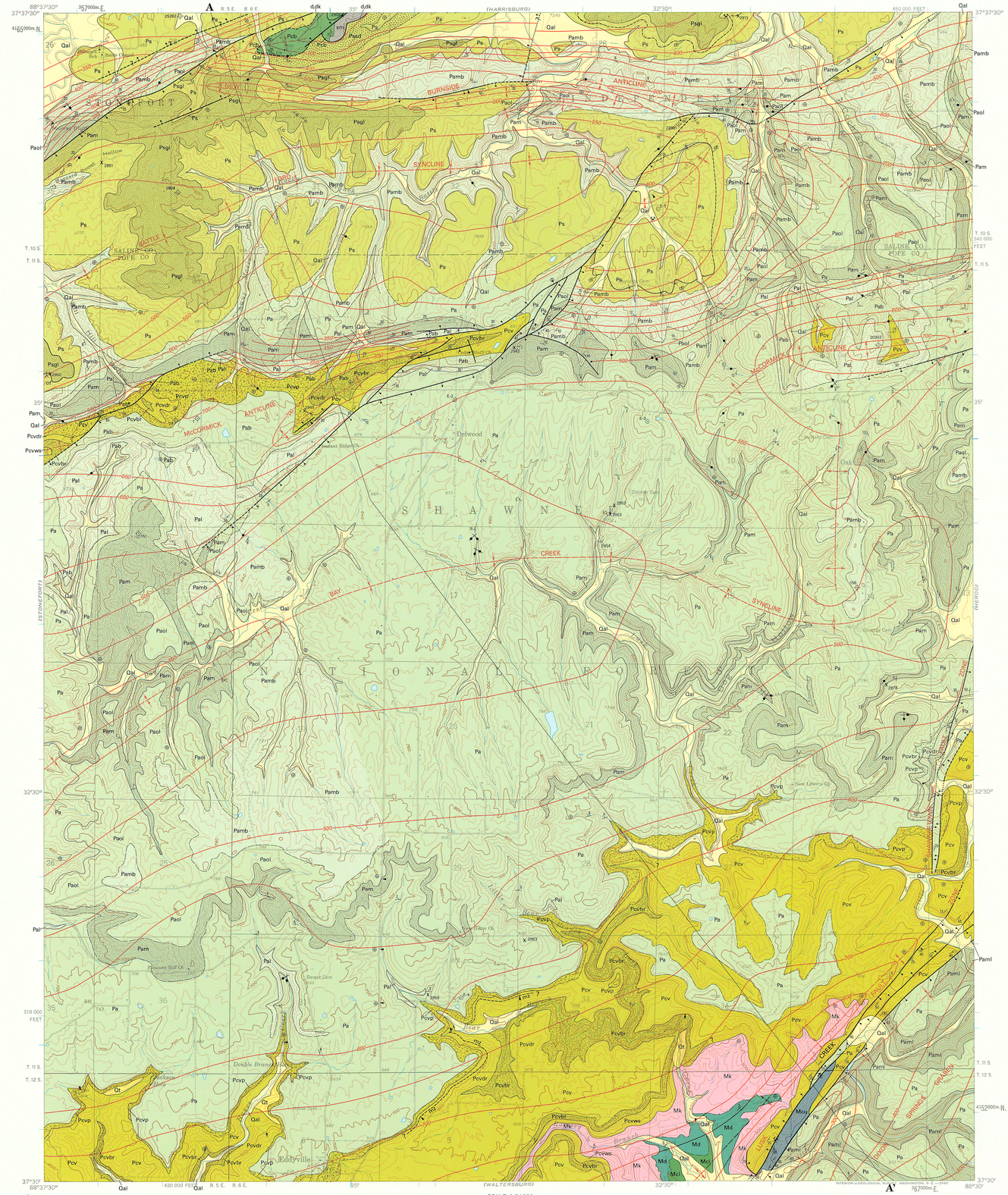
Fluorspar and accessory minerals were mined during the 1940's at the Lost 40 Mine, a shallow shaft mine in the E 1/2 Section 3, T.12S., R.6E. The ore deposits occurred in veins along the Lusk Creek Fault Zone (Weller et al., 1952; Klasner, 1982). Prospect pits and slight mineralization were observed elsewhere along the fault zone. Additional resources may exist at greater depth along the Lusk Creek Fault Zone.

REFERENCES CITED

Klasner, John S., 1982, Geologic map of the Lusk Creek roadless area, Pope County, Illinois: U.S. Geol. Survey, Misc. Field Studies Map MF-1405-A.

Nelson, W. John, 1986, Structural history of Lusk Creek Fault Zone (abstract): Geol. Society of America, North-Central Section, Abstracts with Programs, vol. 18, no. 4, p. 317.

Weller, J. Marvin, Robert M. Grogan, and Frank E. Tippie, 1952, Geology of the fluorspar deposits of Illinois: Illinois State Geol. Survey, Bulletin 76, 147 p.



SCALE 1:24 000

1 0 1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 .5 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

Base from U.S. Geological Survey, 1961. 10,000-foot grid based on Illinois coordinate system, east zone

APPROXIMATE MEAN DECLINATION, 1961

Cartography by Northern Illinois University, Department of Geography, Laboratory for Cartography and Spatial Analysis: Leonard A. Walther.
Supplemental drafting by: Mary T. Constantine, Illinois State Geological Survey

EXPLANATION

- Pleistocene and Holocene — QUATERNARY
  - Qt — **Talus and colluvium**
  - Qal — **Alluvial deposits; may be underlain by lacustrine deposit.**
- PENNSYLVANIAN
  - Desmoinesian
    - Pcb — hc, **Houchin Creek Coal Member**; d,dk, **Davis and Dekoven Coal Members, Davis at base, Dekoven about 30ft higher**
    - Ps — Pssd, ***sub-Davis sandstone***; Psgl, ***golden sandstone***; dl, ***Delwood Coal Bed***; ot, ***Oldtown Coal Bed***
  - Abaxian
    - Pa — Pamb, ***Murray Bluff Sandstone Member***; Paol, ***olive shale***; Pam, ***middle Abbott sandstone***; Paml, ***middle and lower Abbott sandstone, in Dixon Springs Graben***; Pal, ***lower Abbott sandstone***; Pab, ***basal Abbott shale and sandstone***
  - Morrowan
    - Pcv — Pcvp, ***Pounds Sandstone Member***; Pcvdr, ***Drury Member***; mz, ***marine zone***; Pcvbr, ***Battery Rock Sandstone Member***; Pcvws, ***Wayside Member***
- MISSISSIPPIAN
  - Chesterian
    - Mk — **Kinkaid Limestone**
    - Md — **Degonia Formation**
    - Mcl — **Clore Formation**
    - Mcu — **Chesterian undifferentiated (in Lusk Creek Fault Zone)**
  - Valmeyeran
    - Mvu — **Valmeyeran undifferentiated (cross section only)**

LINE SYMBOLS: Dashed where inferred; dotted where concealed

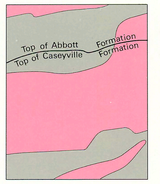
- **Contact**
- **Coal bed**
- **Fault: bar and ball on downthrown side**
- **Anticline**
- **Syncline**
- **Line of cross section**
- **Structure contour (see index map below)**

SYMBOLS

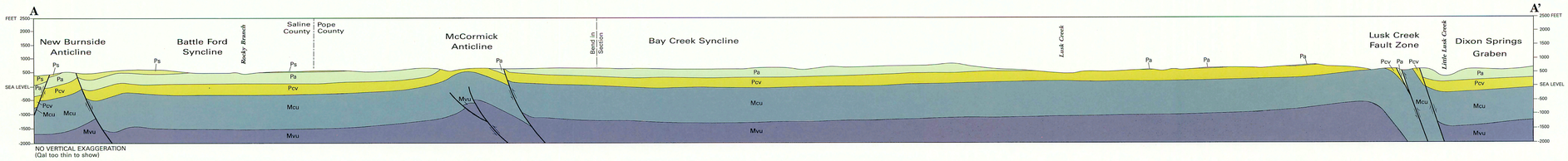
- **Strike and dip of bedding (representative sample). Number indicates degree of dip**
- **Horizontal bedding**
- **Vertical joints**
- **Joints, direction of dip indicated**
- **Abandoned mine shaft, small surface mine or prospect pit**
- **Abandoned coal adit or drift mine**
- 2804 x — **Coal exposure with ISGS coal maceration and palynological analysis number**
- **Outcrop of special note, shown where contact, map unit, or fault was well exposed at time of mapping**
- sm — **Surface-mined area**

DRILL HOLES FROM WHICH SUBSURFACE DATA WERE OBTAINED

- E-4 — **ISGS cored test hole**
- 20302 — **Oil test hole, with ISGS county number**



Index map showing different horizons used for structure contours. Contour interval 50 feet. Contours omitted in structurally complex areas and where control absent. Pink indicates areas where control is less accurate.



GEOLOGIC MAP OF THE EDDYVILLE QUADRANGLE, ILLINOIS

W. John Nelson and D. K. Lumm

1990