U.S. DEPARTMENT OF THE INTERIOR
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MAP SHOWING SELECTED WELLS AND GEOPHYSICAL SURVEY AND MODELING LINES IN THE VICINITY OF THE LOWER WABASH VALLEY, ILLINOIS, INDIANA, AND KENTUCKY

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INTRODUCTION

This is the third in a series of seismotectonic maps of the seismically active lower Wabash Valley area, which includes southeastern Illinois, southwestern Indiana, and most of western Kentucky (table 1). Seismotectonic maps show some of the geological and geophysical information needed to assess seismic hazard (Hadley and Devine, 1974; Pavoni, 1985). The first map in the series (Rhea and Wheeler, 1996) summarizes the geological and seismological setting of the map area, relates the map series to previous work, and describes construction of the base map used for all maps in the series.

SELECTED WELLS

We selected wells according to criteria that assist us in characterizing structures at hypocentral depths. Damaging earthquakes east of the Rocky Mountains have occurred at a median depth of 10 km, with half the depths between 8 and 13 km, and all occurred in the metamorphic and igneous basement (Wheeler and Johnston, 1992). The more abundant, smaller earthquakes that were located by eight local seismograph networks are also concentrated at similar depths—the eight depth histograms of smaller earthquakes have peaks at different depths in the different locales, but the peak depths cluster around 10 km (Wheeler and Johnston, 1992). Long faults with steep dips and large slips are the most likely to penetrate to hypocentral depths. The largest faults in the map area have dominantly normal or normal-oblique separations, and are associated with the east-trending Rough Creek graben in western Kentucky. The graben is not labeled on this map to minimize clutter, but it is mostly bounded by the Pennyrile and Rough Creek fault systems and the Lusk Creek and Shawneetown fault zones (Nelson, 1991). At its west end, the graben merges with the northeast-trending Reelfoot rift (for example, Nelson, 1991), whose fault system is partly exposed as the Fluorspar Area Fault Complex and disappears southwestward under strata of the Mississippi embayment. We show the approximate boundary of the embayment because it is the southwestern limit of most exposed, mapped faults.

We show locations of 32 wells (tables 2–4) that provided information about depths to basement, the rifting history of the Rough Creek graben and Reelfoot rift, coeval rifting elsewhere in the map area, or the modern stress field in which earthquakes occur. We chose wells that met any of four criteria.

First, we chose wells that reached basement because they provide unambiguous constraints on depth to basement.

Second, we chose wells that penetrated into Cambrian clastic rocks that underlie a thick, regionally extensive sequence of Cambrian and Ordovician carbonate strata, even if the wells did not reach basement. The main episode of faulting that formed the Rough Creek graben and Reelfoot rift occurred during deposition of the clastic strata (for example, Kolata and Nelson, 1991), so the properties of the strata could shed light on the early development and paleogeography of the graben and rift. Thus, we chose wells that penetrated the Upper Cambrian Mt. Simon Sandstone and correlative or older clastic units. The overlying Upper Cambrian Eau Claire Formation is limestone throughout much of the map area in southern Illinois (Sargent, 1989). However, within the deep Rough Creek graben in western Kentucky, at least some of the Eau Claire is shale (Schwalb, 1982; Hester, 1988a; footnote 5 of table 2), and few wells penetrate beneath the Eau Claire. For these reasons we also included wells in Kentucky that penetrated only into the Eau Claire. There were only two such wells, the Exxon/Duncan and Stephens wells, and each would also have been selected on the basis of other criteria (table 2).

Third, we chose wells that penetrated igneous rock other than basement. Mafic or ultramafic and especially alkaline igneous rocks are associated with many continental rifts worldwide, so the compositions and ages of any igneous rocks could help to illuminate the rifting history of the map area.

Fourth, we chose wells that we or other specialists thought had provided any other information that could constrain basement structure, rifting history, or the modern stress field. The largest group of wells chosen with this criterion consists of comparatively shallow wells in which the orientation of the greatest horizontal compressive stress could be determined by analysis of dipmeter logs. The resulting stress orientations are shown on the first map in this series (Rhea and Wheeler, 1996). Other wells provide stratigraphic and depth calibration for geophysical profiles that image or constrain modeling of basement structure. The Shell/Lewis well was chosen because it documents reverse slip on a fault along the southern edge of the Rough Creek graben; perhaps this slip is of comparable age to the documented reverse reactivation of the northern border-fault zone of the graben (Nelson, 1991). We decided not to select the deep wells that have been used to compile detailed stratigraphic cross sections of the Illinois basin (Treworgy and Whitaker, 1992), in which the map area lies, unless the wells also meet one of the criteria listed above.

The difficulties encountered by Wheeler and Sargent in selecting these wells and verifying their identifications leads us to conclude that latitude and longitude alone, or section, township, and range alone, are insufficient to locate and identify a well reliably in this map area and perhaps generally (see footnotes 2, 4, and 7 of table 4). Accordingly, tables 2–4 give six kinds of location or identification information to assist retrieval of additional information about a well. Table 2 contains lists of latitude, longitude, and the labels that appear on the map next to each well location. The map labels are commonly used informal identifiers, often the name of the farm owner on whose property the well was drilled. Table 3 lists the full well names. Table 4 provides three other ways of identifying a well. The state identification number is the most effective key to locating a well in the digital files of the state geological surveys. The section, township, and range location is the best link to land ownership, and many published reports provide no other location information. The county name and the various components of the full name are useful as checks on more specific location data.

GEOPHYSICAL SURVEY AND MODELING LINES

Tables 5 and 6 summarize 66 profile lines that fall entirely or partly within the map area, and along which seismic reflection profiles were interpreted or geophysical models were calculated. Our purpose is to show the geographic distribution of available geophysical cross-sectional interpretations that can constrain subsurface structure. Because our focus is on large structures that might penetrate to hypocentral depths, we excluded shallow geophysical surveys aimed at determining thicknesses of stream alluvium, characterizing sites for the development of landfills or other engineering applications, or mapping coal seams and their roof rocks in advance of mining.

We show only lines for which results are or soon will be published or otherwise publicly available, including lines from theses and dissertations. We ignore most of the many proprietary seismic reflection interpretations in the petroleum-prospective map area, although we show the approximate locations of some industry lines for which partial interpretations have been published, even if the data themselves remain proprietary. However, we do not show a few industry lines for which partial interpretations are being published (Drahovzal, 1997; McBride and others, 1997; Potter and others, 1997), because we were unable to obtain permission to show them on our relatively detailed base map. Several lines or sets of lines extend beyond the boundaries of the map area. The digital database from which this map was made contains some of the extensions. Also, some references cited in table 6 show the locations of several lines, but include interpretations or models of only some of the lines. We show only those lines for which interpretations or models are available.

The methods used to locate 22 of the lines require explanation. First, the location of seismic reflection survey P-2 is publicly available only as a circle on a small-scale index map (Heigold and Kolata, 1993). Table 5 lists the scales of this and similar maps from which we digitized line locations, as aids in assessing the accuracy of the digitized locations. We inferred the minimum length of line P-2 and its orientation from a published interpretation of the line or part of it. We represent P-2 as a line of the inferred length and orientation that is centered on the circle. Second, the theses by Lumm (1988) and Whipple (1989) contain locations of gravity stations, from measurements at which 12 gravity models were calculated. The stations were distributed along winding roads, whereas the models were calculated along straight lines into which the station locations were projected; therefore, we show the estimated locations of the straight modeling lines. Line locations were deduced from descriptions of end points, lengths, and azimuths in Lumm (1988) and Whipple (1989), plotted on their page-size index maps, and digitized. Third, figure 2 of Sexton and others (1986) shows that gravity modeling line G-CCC' begins at the Cisne well (table 2) and extends 130 km south-southeast along an azimuth of 114°. Fourth, the eight seismic refraction modeling lines B1–B8 were also located by estimating their lengths, azimuths, and starting points. Baldwin (1980) stated line lengths, and we measured azimuths from his page-size index map. Baldwin (1980) also gave names and approximate locations of the coal strip mines whose blasts were used as refraction sources; we presumed that the modeling lines started at the mines. His index map shows mine locations. On the index map we measured distances from each mine to two or three known points, used these data to triangulate the shot point locations on 1:100,000-scale topographic maps, and verified the triangulated locations against the sites of strip mines as shown on 1:24,000-scale topographic maps.

GLOBAL POSITIONING SYSTEM (GPS) MONUMENTS

Several GPS networks with various monument spacings are being used to monitor deformation in parts or all of the upper Mississippi embayment. Wheeler and Rhea (1994) show the locations of GPS monuments that are mostly southwest of the lower Wabash Valley map area and that belong to four networks. One network is regional, spanning approximately 400 km, mostly west and south of the map area (S. Stein, written commun., 1993). We show locations of the two stations of the regional network that are in our map area, in western Kentucky.

FAULTS

The map shows traces of mapped faults to aid readers in selecting lines or wells near faults of interest. We show only a few of the main fault names to minimize clutter. The fault traces were compiled and digitized by others from the maps of Noger (1988), Frankie and others (1994), and Nelson (1995). We combined the three sets of digitized traces and show them with a minimum of editing, following procedures described in map D of this folio (table 1).

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Table 1. *Maps in the seismotectonic folio of the lower Wabash Valley and vicinity*

Map	Theme: features shown	Reference
I-2583-A	Seismicity: earthquake epicenters, areas most intensely shaken, focal mechanisms, seismograph and accelerograph locations, and locations of prehistoric earthquake-induced liquefaction.	Rhea and Wheeler (1996)
I-2583-B	Modified Mercalli intensities.	Rhea and others (1996)
I-2583-C	Geophysical survey and modeling lines, wells, and global positioning system monuments.	this map
I-2583-D	Faults, basement structure, igneous rocks, and geophysical and neotectonic features.	Wheeler and others (unpub. compilation)

In addition, two other maps of surficial and cultural information are planned for this folio. The publisher will be the Illinois Basin Consortium, which consists of the Illinois State, Indiana, and Kentucky Geological Surveys.

Table 2. *Selected wells shown on this map*

Map label[1]	lat N., long W.	Selection reasons[2]	References documenting selection reasons
Anonymous1[3]	38°19'12", 87°27'36"	S	Plumb and Cox (1987)
Anonymous2[3]	37°19'12", 87°30'00"	S	Plumb and Cox (1987)
Arco / Lewis	38°45'00", 87°46'25"	C	Buschbach and Kolata (1991)
Barrie	38°55'08", 87°49'29"	S	Dart (1985), Ellis (1994)
Bell	37°35'13", 87°32'57"	B I P	Hester (1988b,c), Bertagne and Leising (1991), Buschbach and Kolata (1991), Drahovzal (1997)
Brown	37°42'37", 87°31'52"	S	Dart (1985), Ellis (1994)
Carneal	38°29'46", 88°39'13"[4]	S	Dart (1985), Ellis (1994)
Cisne	38°28'08", 88°24'24"	B P	Baldwin (1980), Schwalb (1982), Sexton and others (1986), Pratt and others (1989), Buschbach and Kolata (1991), Heigold and Oltz (1991), René and Stanonis (1995), Bear and others (1997)
Cuppy	38°01'35", 88°28'40"	B P	Baldwin (1980), Schwalb (1982), Sexton and others (1986), Buschbach and Kolata (1991), Potter and others (1994, 1997), René and Stanonis (1995), Bear and others (1997), McBride and others (1997)
Dyhrkopp	37°40'55", 88°13'19"	B	J.A. Drahovzal (oral commun., 1995)
Emerson	38°15'59", 87°42'56"[4]	S	Dart (1985), Ellis (1994)
Exxon / Duncan	37°34'48", 87°44'33"	C I[5] P	Schwalb (1982), Hester (1988c), Bertagne and Leising (1991), Buschbach and Kolata (1991), Potter and others (1994), René and Stanonis (1995)
Farley	37°20'28", 88°51'47"	C	Schwalb (1982), Buschbach and Kolata (1991)
Gould	38°39'03", 87°42'48"[4]	S	Dart (1985), Ellis (1994)
Hamp	37°31'56", 88°22'20"	P	Potter and others (1994)
Henderson	38°41'03", 88°21'22"[4]	S	Dart (1985), Ellis (1994)
Marathon / Lewis	38°45'13", 87°46'09"[4]	S	Dart (1985), Ellis (1994)
M. W. C. / Duncan	37°42'06", 87°31'23"	S	Dart (1985), Ellis (1994)

Table 2. continued

Old Ben	38°00'21", 88°56'56"	S	Dart (1985), Ellis (1994)
Ramsey	37°30'23", 87°40'52"	S	Dart (1985), Ellis (1994)
Rice	37°59'56", 88°56'46"	S	Dart (1985), Ellis (1994)
Rister	37°51'35", 88°20'00"	I	Bikerman and others (1982), Lewis (1982), Sparlin and Lewis (1994)
Roser	38°08'02", 88°15'12"[4]	S	Dart (1985), Ellis (1994)
Shell / Lewis	37°08'36", 87°12'51"	O[6]	M. C. Noger (oral commun., 1996), B. C. Nuttall (written commun., 1996)
Shipman	38°54'39", 87°48'41"	S	Dart (1985), Ellis (1994)
Simpson	38°15'42", 88°20'27"[4]	S	Dart (1985), Ellis (1994)
Stephens	37°13'35", 87°56'12"	C P	Buschbach and Kolata (1991), Potter and others (1994, 1995, 1997)
Streich	37°35'22", 88°30'46"	C P	Schwalb (1982), Buschbach and Kolata (1991), Potter and others (1994, 1995, 1997), René and Stanonis (1995)
Turner	37°30'57", 87°05'17"	B	Goetz and others (1992), B. C. Nuttall (written commun., 1996)
Walters	37°42'25", 88°14'31"	P	Potter and others (1994)
Webber	37°51'14", 88°35'27"	P	Potter and others (1994)
Young	38°17'20", 87°48'26"[4]	S	Dart (1985), Ellis (1994)

[1]Full names and other identifying information are in tables 3 and 4.
[2]Reasons for selecting well (see text). B, well reached basement; C, well reached clastic rocks beneath Cambrian and Ordovician carbonate rocks; I, well penetrated igneous rocks other than basement, usually a sill; O, data from well provide other constraint on basement structure; P, well data used to calibrate geophysical profile; S, stress orientation calculated from well bore breakouts.
[3]See note on this well in table 4.
[4]Latitude and longitude calculated at center of section listed in table 4.
[5]A sample log by Howard Schwalb is on file with the Kentucky Geological Survey. The log describes a Cambrian (Schwalb, 1982) shale containing "trace greenish rubbly dolomite with large brown biotite flakes, trace bentonitic material 14580-14640." We interpret this note to refer to an ash fall, not an intrusion.
[6]A log on file with the Kentucky Geological Survey shows a repeated section of Upper Mississippian rocks, which the interpreter attributed to a large reverse fault.

Table 3. *Well names*

Map label	Full name
Anonymous1	Well could not be identified in files of state geological survey
Anonymous2	Well could not be identified in files of state geological survey
Arco / Lewis	Atlantic Richfield Co. / J. B. Lewis No. 77
Barrie	Marathon Oil Co. / Effie Barrie No. 1
Bell	Exxon Minerals Co., U. S. A. / Jimmy Bell No. 1
Brown	M. W. C. Oil Co. / James Brown No. 1
Carneal	H. B. and Y. Associates / Bessie Carneal Estate No. 1
Cisne	Union Oil Co. of California / Cisne Community No. 1
Cuppy	Texaco, Inc. / E. Cuppy No. 1
Dyhrkopp	Conoco, Inc. / Einar Dyhrkopp No. 1
Emerson	Sandy Ridge Oil Co., Inc. / Emerson et al. No. 1
Exxon / Duncan	Exxon Minerals Co., U.S.A. / Choice Duncan No. 1
Farley	Texas Pacific Oil Co. / B. Farley et al. No. 1
Gould	Marathon Oil Co. / W. A. Gould No. WI-2
Hamp	St. Joseph Lead Co. / Henry Hamp, Jr. No. 1
Henderson	TRW Systems - K. Leon Hagen / Henderson No. 2
Marathon / Lewis	Marathon Oil Co. / J. B. Lewis No. 79
M. W. C. / Duncan	M. W. C. Oil Co. / Duncan No. 1
Old Ben	Great Plains Resources, Inc. / Old Ben No. 2-F
Ramsey	M. W. C. Oil Co. / Ramsey No. 1
Rice	Great Plains Resources, Inc. / Tuck Rice No. 8F
Rister	Carter Oil Co. / Luther Rister et ux. No. 1
Roser	C. E. Brehm Drilling and Production Co. / Roser No. A-1
Shell / Lewis	Shell Oil Co. / H. Lewis No. 1
Shipman	Marathon Oil Co. / E. G. Shipman No. 1
Simpson	Gruy Federal, Inc. (Department of Energy) / Simpson No. 1
Stephens	Sun Oil Co. / W. W. Stephens and M. Lillie No. 1
Streich	Texas Pacific Oil Co. / Mary L. Streich Community No. 1
Turner	Conoco, Inc. / Mark Turner No. 1
Walters	Texaco, Inc. / J. M. Walters No. 1
Webber	Ashland Oil Co. / Webber Unit No. 1
Young	Sandy Ridge Oil Co., Inc. / Charles Young No. 1

Table 4. *Other well identifiers*
[Leaders (--), no data]

Map label	State ID[1]	County, State	Sec.	Twp.	Rg.
Anonymous1	--[2]	Gibson, Ind.	6	3S.	9W.[3]
Anonymous2	--[4]	Hopkins, Ky.	5	J	25[3,5]
Arco / Lewis	1210107425	Lawrence, Ill.	29	4N.	12W.
Barrie	1203330213	Crawford, Ill.	35	6N.	13W.
Bell	1623329845	Webster, Ky.	23	N	24[5]
Brown	1610155787	Henderson, Ky.	12	O	24[5]
Carneal	1219129799	Wayne, Ill.	28	1N.	5E.
Cisne	1219107731	Wayne, Ill.	3	1S.	7E.
Cuppy	1206503450	Hamilton, Ill.	6	6S.	7E.
Dyhrkopp	1205924894	Gallatin, Ill.	4	10S.	9E.[3]
Emerson	39398	Gibson, Ind.	11	3S.	12W.
Exxon / Duncan	1623331562	Webster, Ky.	5	M	22[5]
Farley	1208720285	Johnson, Ill.	34	13S.	3E.
Gould	1210128374	Lawrence, Ill.	35	3N.	12W.
Hamp	1206900044	Hardin, Ill.	30	11S.	8E.
Henderson	1202525847	Clay, Ill.	19	3N.	8E.
Marathon / Lewis	1210128110	Lawrence, Ill.	29	4N.	12W.
M. W. C. / Duncan	1610154786	Henderson, Ky.	12	O	24[5]
Old Ben	1205523130	Franklin, Ill.	14	6S.	2E.
Ramsey	1623355185	Webster, Ky.	21	M	22[5]
Rice	1205523286	Franklin, Ill.	13	6S.	2E.
Rister	1205900150	Gallatin, Ill.	4	8S.	8E.
Roser	1219329151	White, Ill.	31	4S.	9E.
Shell / Lewis	--[6]	Muhlenberg, Ky.	8	H	28[5]
Shipman	1203330172	Crawford, Ill.	36	6N.	13W.
Simpson	--[7]	Wayne, Ill.	17	3S.	8E.
Stephens	1603343200	Caldwell, Ky.	9	I	19[5]
Streich	1215120302	Pope, Ill.	2	11S.	6E.
Turner	1614983637	McLean, Ky.	21	M	29[3,5]
Walters	1205903316	Gallatin, Ill.	29	9S.	9E.
Webber	1216525508	Saline, Ill.	6	8S.	6E.
Young	40686	Gibson, Ind.	1	3S.	13W.

[1]Illinois and Kentucky assign wells ten-digit identification numbers when reporting them to the American Petroleum Institute (API). Indiana uses the five-digit state permit number.

[2]The reference cited in table 2 locates this well in a county that is inconsistent with the given latitude and longitude. We were unable to contact the senior author of the cited reference, nor could the well be identified from the files of the Indiana Geological Survey.

[3]Calculated from latitude and longitude given in table 2.

[4]This well could not be identified from files of the Kentucky Geological Survey.

[5]Carter coordinates, which Kentucky uses instead of the Public Land Survey (PLS) grid. Carter coordinates form a nested grid similar to the PLS grid.

[6]This well has not been assigned an API number (B.C. Nuttall, oral commun., 1996). Its record number is 2029464 and its permit number is 6617WF in files of the Kentucky Geological Survey.

[7]This well could not be found in files of the Illinois State Geological Survey. However, the same section contains Gordon Jenkins / Simpson No. 1, API no. 1219129436. Perhaps the two are the same well. We could not find the dipmeter log to test this suggestion.

Table 5. Geophysical survey and modeling lines

Name[1]	D[2]	Length (km)[3]	Original scale[4]
Seismic reflection surveys			
"Webster Co."	b	81	1:1,000,000
"Union Co."	b	63	"
"Pope Co."	b	67	"
"Muhlenberg Co."	b	97	"
"Hicks dome"	b	83	1:1,667,000
COCORP IL-1, IN-1	u	289*	1 m
P-2	b	6	1:3,731,000
Hamilton Co.	u	28	1:160,000
Grayville	u	19	"
New Harmony	u	22	"
"Posey - White Co. N"	b	12	1:643,000
"Posey - White Co. S"	b	17	"
"Gallatin Co."	u	23	"
AD[5]	b	404*	1:750,000
DG[5]	b	83	"
EF[5]	b	194*	"
FH[5]	b	70	"
IH[5]	b	39	"
KJ[5]	b	43	"
"RS1"	b	8	1:95,000
"RS2"	b	4	"
"RS3"	b	2	"
"HO5"	b	58*	1:3,636,000
"HO6"	b	45	"
"HO8"	b	30*	"
"HO9"	b	18	"

Table 5. continued

Barnes Creek	s	2	0.001° (~ 100 m)
Seismic refraction modeling lines			
"B1"	M	110*	1:3,636,000
"B2"	M	150*	"
"B3"	b	70*	"
"B4"	M	172*	"
"B5"	b	33	"
"B6"	M	54	"
"B7"	M	55*	"
"B8"	b	18	"
"HLB"	br	3	1:60,000
"HLD"	br	3	"
Gravity modeling lines			
"G-SKAA' "	u	150	1:1,306,000
G-Kelly	u	17	1:377,000
G-Crofton	u	16	"
G-Pleasant Green Hill	u	18	"
G-Sinking Fork	u	22	"
G-Cerulean	u	12	"
G-Wallonia	u	18	"
G-Cadiz North	u	27	"
G-Cadiz South	u	24	"
G-LBL	u	68*	1:538,000
G-Newstead	u	25	"
G-Murray	u	88*	"
G-Hamlin	u	29*	"
"G-CAA' "	u	105	0.01° (~ 1 km)
"G-CBB' "	u	105	"
"G-CCC' "	u	130	0.5 km

Table 5. continued

Aeromagnetic modeling line			
"M-SLAA' "	s	8	1:125,000
Gravity and aeromagnetic modeling lines			
"GM-PAA' "	u	300*	1:3,464,000
"GM-PBB' "	u	300*	"
"GM-PCC' "	u	300*	"
GM-WW'	M	331*	0.1° (~ 10 km)
GM-WZ	u	139*	0.0001° (~ 10 m)
GM-WW'A	u	144*	"
GM-YY'	u	86	"
Magnetotelluric surveys			
H	u	174*	0.00001° (~ 1 m)
I	u	176*	"
J	u	73	"
K	u	118	"

[1]Quotation marks indicate an informal name assigned here as a map label. Other names were assigned by authors cited in table 6. We added prefixes to distinguish different types of potential-field models: G for gravity, M for aeromagnetic, and GM for both.

[2]Stratigraphic or crustal level to which the profile interpretation or model constrains structure: br, top of bedrock; s, within sedimentary cover sequence; b, top of metamorphic and igneous basement; u, some depth within upper crust; M, Moho.

[3]Length of survey or model. Asterisk indicates that survey or model extended outside map area. Some stated lengths may differ slightly from those shown on the map because of inaccuracies in digitizing from small-scale original maps.

[4]Scale of original map from which location was measured or digitized, included as an aid in judging the accuracy of locations shown here. A map scale of 1:300,000 or smaller indicates that locations had to be digitized from an index map of the given scale, either because more accurate locations are proprietary or because locations were not tabulated in the thesis or dissertation that documents the modeling. If location was obtained in digital or written form as latitudes and longitudes, the entry shows the accuracy implied by the number of significant digits that we were given.

[5]These data were not processed as profiles. Instead, single fold data were processed separately for each shot point, and interpretations from selected shot points were drafted together as a cross section.

Table 6. References for geophysical surveys and modeling lines

Name[1]	References[2]
Seismic reflection surveys	
"Webster Co."	Hester (1988c), Sexton (1988), Bertagne and Leising (1991)*
"Union Co."	Bertagne and Leising (1991)
"Pope Co."	"
"Muhlenberg Co."	"
"Hicks dome"	Goldhaber and others (1992), Potter and Drahovzal (1994), Potter and others (1994, 1995*)
COCORP IL-1, IN-1	Sexton (1988), Pratt and others (1989, 1990, 1992), Nelson (1990), Heigold and Kolata (1993), Bear and others (1997); locations downloaded from Cornell University
P-2	Heigold and Kolata (1993)
Hamilton Co.	Sexton and others (1986)*, Sexton (1988), Pratt and others (1990), Nelson (1990), Bear and others (1997)
Grayville	"
New Harmony	"
"Posey - White Co. N"	Bear and others (1997)
"Posey - White Co. S"	"
"Gallatin Co."	"
AD	Rudman (1960, 1963*)
DG, EF, FH, IH, KJ	Rudman (1963)
"RS1" - "RS3"	René and Stanonis (1995)
"HO5" - "HO6"	Heigold and Oltz (1991)
"HO8" - "HO9"	"
Barnes Creek	Sexton and others (1996), J.L. Sexton (written communs., 1995*, 1996)
Seismic refraction modeling lines	
"B1" - "B8"	Baldwin (1980)*, Baldwin and others (1980)
"HLB", "HLD"	Heigold and Larson (1994)
Gravity modeling lines	
"G-SKAA' "	Soderberg and Keller (1981), G.R. Keller (written commun., 1995)*

Table 6. continued

G-Kelly	Lumm (1988)*, Lumm and Stearns (1989), Lumm and others (1989, 1991)
G-Crofton	"
G-Pleasant Green Hill	"
G-Sinking Fork	"
G-Cerulean	"
G-Wallonia	"
G-Cadiz North	"
G-Cadiz South	"
G-LBL	Whipple (1989)*, Lumm and others (1989, 1991)
G-Newstead	"
G-Murray	"
G-Hamlin	"
"G-CAA' ", "G-CBB' "	Campbell (1983)
"G-CCC' "	Campbell (1983), Sexton and others (1986)*
Aeromagnetic modeling line	
"M-SLAA' "	Sparlin and Lewis (1994)
Gravity and aeromagnetic modeling lines	
"GM-PAA' "	Peregrine (1982)
"GM-PBB' "	"
"GM-PCC' "	"
GM-WW'	Hildenbrand (1985)
GM-WZ	Hildenbrand and Hendricks (1995)
GM-WW'A	Hildenbrand and others (1996)
GM-YY'	"
Magnetotelluric surveys	
H - K	W.D. Stanley (written communs., 1995)*, Stanley and Rodriguez (1996)

[1]Quotation marks indicate an informal name assigned here as a map label. Other names were assigned by authors cited in this table. We added prefixes to distinguish different types of potential-field models: G for gravity, M for aeromagnetic, and GM for both.

[2]If more than one reference is cited, asterisk identifies reference from which location was obtained.