DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE DEPARTMENT OF ENERGY
INTERAGENCY AGREEMENT # EX-76-C-01-2287

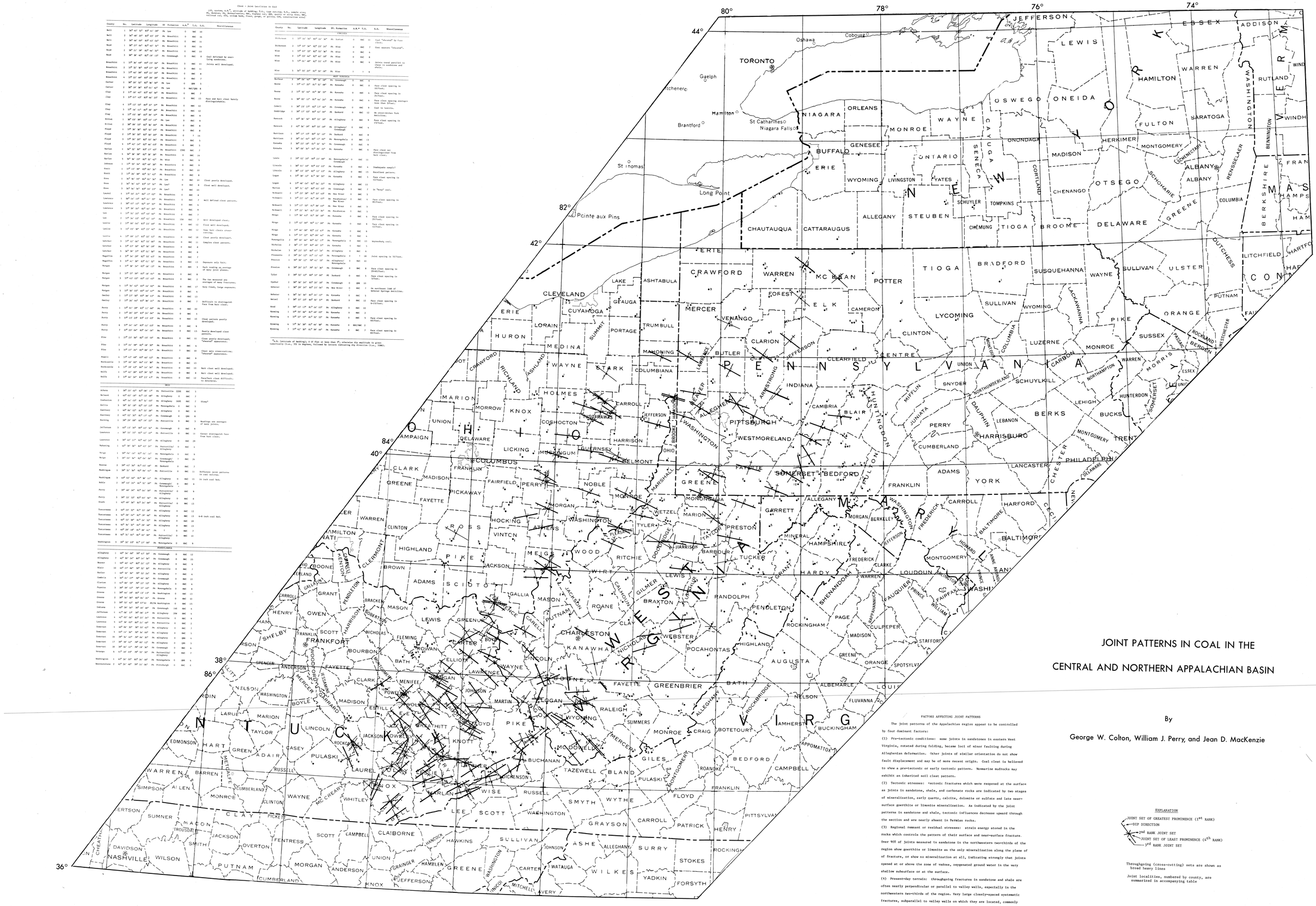
OPEN-FILE REPORT 81-837
SHEET 3 OF 4

Clear - Joint Localities in Coal

(JT, system; A.R.,* attitude of bedding; T.R., time rankings; S.R., sample size; PA, Permian; PN, Pennsylvanian; MV, Highway cut; QRR, quarry or strip mine; RRC, railroad cut; SRC, stream bank, floor, gorge, or gullies; CON, construction site)

County	No.	Latitude	Longitude	Jt. Formation	A.R.*	T.R.	S.R.	Miscellaneous
Hall	1	39° 40' 52"	83° 41' 08"	PA Lee	0	SRC	10	
Hall	2	39° 48' 20"	83° 43' 25"	PA Breathitt	0	SRC	16	
Hall	3	39° 46' 40"	83° 41' 16"	PA Breathitt	0	SRC	11	
Hoyd	1	38° 27' 06"	82° 45' 34"	PA Breathitt	0	SRC	14	
Hoyd	2	38° 21' 38"	82° 46' 52"	PA Breathitt	0	SRC	10	
Hoyd	3	38° 38' 40"	82° 49' 15"	PA Conemaugh	0	SRC	6	Coal deformed by overlying sandstone.
Breathitt	1	37° 36' 49"	83° 23' 06"	PA Breathitt	0	SRC	11	Joints well developed.
Breathitt	2	37° 31' 36"	83° 21' 32"	PA Breathitt	0	SRC	11	
Breathitt	3	37° 42' 32"	83° 21' 30"	PA Breathitt	0	SRC	8	
Breathitt	4	37° 22' 48"	83° 20' 29"	PA Breathitt	0	SRC	7	
Carter	1	38° 20' 32"	82° 58' 50"	PA Lee	0	QRR	5	
Carter	2	38° 19' 32"	83° 01' 42"	PA Lee	0	SRC/QRR	8	
Clay	1	37° 18' 40"	83° 40' 50"	PA Breathitt	0	SRC	7	
Clay	3	37° 07' 43"	83° 48' 23"	PA Breathitt	0	SRC	15	Face and butt cleat barely distinguishable.
Clay	4	37° 17' 33"	83° 37' 13"	PA Breathitt	0	SRC	12	
Clay	5	37° 16' 17"	83° 38' 34"	PA Breathitt	0	SRC	12	
Clay	6	37° 05' 38"	83° 38' 53"	PA Breathitt	0	SRC	9	
Elliot	1	38° 12' 38"	83° 11' 13"	PA Lee	0	SRC	9	
Elliot	2	38° 08' 10"	83° 16' 04"	PA Breathitt	0	SRC	8	
Floyd	1	37° 28' 36"	82° 51' 12"	PA Breathitt	0	SRC	8	
Floyd	2	37° 30' 30"	82° 50' 20"	PA Breathitt	0	?	14	
Floyd	3	37° 30' 20"	82° 50' 20"	PA Breathitt	0	?	5	
Floyd	4	37° 42' 14"	82° 46' 43"	PA Breathitt	0	SRC	5	
Harlan	1	36° 52' 30"	83° 17' 12"	PA Breathitt	ZERO	SRC	7	
Harlan	4	36° 56' 38"	83° 16' 38"	PA Breathitt	0	SRC	14	
Harlan	5	36° 56' 23"	83° 16' 42"	PA Vice	0	SRC	9	
Johnson	1	37° 50' 36"	82° 48' 38"	PA Breathitt	0	SRC	9	
Knott	1	37° 13' 20"	83° 00' 36"	PA Breathitt	0	SRC	10	
Knott	2	37° 26' 38"	82° 51' 12"	PA Breathitt	0	SRC	8	
Knox	1	36° 54' 37"	83° 41' 34"	PA Lee	0	SRC	10	Cleat poorly developed.
Knox	2	36° 54' 44"	83° 13' 16"	PA Lee?	0	SRC	8	Cleat well developed.
Knox	3	36° 54' 38"	83° 15' 13"	PA Lee?	0	SRC	10	
Laurel	1	37° 10' 21"	84° 11' 12"	PA Breathitt	0	SRC	8	
Lawrence	1	38° 16' 17"	82° 41' 33"	PA Breathitt	0	SRC	7	Well defined cleat pattern.
Lawrence	2	38° 07' 13"	82° 37' 32"	PA Breathitt	0	SRC	6	
Lawrence	3	37° 58' 26"	82° 42' 22"	PA Breathitt	0	SRC	9	
Lee	1	37° 31' 23"	83° 43' 46"	PA Breathitt	0	SRC	7	
Lee	2	37° 34' 23"	83° 42' 12"	PA Breathitt	15W	SRC	2	Well developed cleat.
Leslie	2	37° 08' 24"	83° 18' 48"	PA Breathitt	0	SRC	12	Cleat well developed.
Leslie	3	37° 15' 30"	83° 07' 33"	PA Breathitt	0	SRC	12	Some butt cleats cross-cutting.
Leslie	4	37° 09' 21"	83° 22' 12"	PA Breathitt	0	SRC	16	Cleat poorly developed.
Letcher	3	37° 12' 36"	82° 53' 06"	PA Breathitt	0	SRC	11	Complex cleat pattern.
Letcher	4	37° 07' 30"	82° 58' 18"	PA Breathitt	0	SRC	8	
Letcher	5	36° 56' 37"	83° 03' 51"	PA Breathitt	0	SRC	8	
Magoffin	2	37° 50' 20"	83° 03' 43"	PA Breathitt	0	SRC	2	
Magoffin	3	37° 41' 30"	83° 01' 51"	PA Breathitt	0	SRC	12	Exposure only fair.
Morgan	1	37° 56' 18"	83° 16' 15"	PA Breathitt	0	SRC	3	Each reading an average of many joint planes.
Morgan	2	37° 57' 50"	83° 16' 01"	PA Breathitt	0	SRC	8	
Morgan	3	37° 43' 23"	83° 13' 47"	PA Breathitt	0	SRC	2	The few measured are averages of many fractures.
Morgan	4	37° 54' 43"	83° 16' 03"	PA Breathitt	0	SRC	17	Very fresh, large exposure.
Morgan	5	37° 50' 03"	83° 10' 47"	PA Breathitt	0	SRC	4	
Owsley	1	37° 17' 50"	83° 38' 39"	PA Breathitt	0	SRC	13	
Owsley	2	37° 26' 47"	83° 38' 20"	PA Breathitt	0	SRC	8	Difficult to distinguish face from butt cleat.
Perry	1	37° 01' 28"	83° 17' 00"	PA Breathitt	0	SRC	22	
Perry	2	37° 00' 20"	83° 16' 06"	PA Breathitt	0	SRC	5	
Perry	3	37° 11' 23"	83° 13' 23"	PA Breathitt	0	SRC	10	Cleat pattern poorly developed.
Perry	4	37° 14' 16"	83° 11' 23"	PA Breathitt	0	SRC	9	
Perry	7	37° 21' 26"	83° 14' 40"	PA Breathitt	0	SRC	5	Poorly developed cleat pattern.
Pike	1	37° 17' 36"	82° 15' 37"	PA Breathitt	0	SRC	11	Cleat poorly developed; "sheared" appearance.
Pike	2	37° 21' 32"	82° 18' 30"	PA Breathitt	0	SRC	6	
Pike	3	37° 21' 24"	82° 08' 21"	PA Breathitt	5	SRC	10	Cleat sets cross-cutting; "sheared" appearance.
Powell	4	37° 47' 48"	83° 42' 12"	PA Breathitt	0	SRC	9	
Rockcastle	1	37° 10' 30"	84° 11' 30"	PA Breathitt	0	SRC	13	
Rockcastle	4	37° 18' 12"	84° 14' 36"	PA Breathitt	0	SRC	10	Butt cleat well developed.
Wolfe	1	37° 42' 28"	83° 38' 52"	PA Breathitt	0	SRC	8	Butt cleat well developed.
Wolfe	2	37° 44' 36"	83° 13' 12"	PA Breathitt	0	SRC	12	Face/butt cleat difficult. to determine.
OHIO								
Athens	1	39° 23' 02"	82° 08' 17"	PA Pottsville ZERO	SRC	5		
Belmont	1	40° 01' 18"	81° 13' 48"	PA Allegheny 0	SRC	7		
Coshocton	2	40° 12' 12"	81° 52' 24"	PA Allegheny 5SE	SRC	7	Slump?	
Gallia	3	38° 50' 18"	82° 10' 12"	PA Monongahela 0	SRC	5		
Guernsey	1	40° 06' 12"	81° 31' 30"	PA Allegheny 0	SRC	8		
Guernsey	2	40° 12' 30"	81° 21' 24"	PA Conemaugh 0	QRR	9		
Hocking	1	39° 29' 06"	82° 19' 12"	PA Pottsville 0	SRC	5	Readings are averages of many joints.	
Jefferson	3	40° 17' 30"	80° 43' 12"	PA Conemaugh 0	SRC	6		
Lawrence	-	38° 31' 33"	82° 42' 12"	PA Pottsville 0	SRC	11	Cleavat distinguish face from butt cleat.	
Lawrence	5	38° 42' 12"	82° 42' 12"	PA Allegheny 0	SRC	29		
Meigs	1	40° 08' 36"	82° 07' 12"	PA Pottsville/ Allegheny 0	SRC	4		
Perry	1	39° 46' 12"	82° 21' 12"	PA Monongahela 0	SRC	9		
Perry	3	39° 33' 12"	82° 02' 36"	PA Conemaugh/ Monongahela 7	SRC	26		
Monroe	2	39° 43' 36"	81° 03' 48"	PS Dunkard 0	SRC	7		
Muskingum	1	39° 51' 36"	82° 06' 12"	PA Pottsville 0	SRC	11	Different joint patterns in coal outcrop.	
Muskingum	3	40° 02' 48"	81° 38' 12"	PA Allegheny 0	SRC	15	16 inch coal bed.	
Noble	2	39° 43' 24"	81° 31' 18"	PA Conemaugh/ Monongahela -	SRC	8		
Perry	3	39° 48' 36"	82° 02' 30"	PA Pottsville/ Allegheny 0	SRC	9		
Perry	3	39° 33' 33"	82° 02' 36"	PA Allegheny 0	SRC	8		
Stark	1	40° 49' 36"	81° 26' 00"	PA Pottsville/ Allegheny 0	SRC	13		
Tuscarawas	2	40° 23' 33"	81° 33' 18"	PA Allegheny 0	SRC	12		
Tuscarawas	4	40° 20' 24"	81° 18' 42"	PA Allegheny 0	SRC	13		
Tuscarawas	5	40° 33' 30"	81° 24' 12"	PA Allegheny 0	SRC	18		
Tuscarawas	6	40° 36' 30"	81° 26' 48"	PA Allegheny 0	SRC	13		
Tuscarawas	7	40° 28' 18"	81° 37' 42"	PA ? 0	SRC	2		
Tuscarawas	8	40° 31' 00"	81° 10' 00"	PA Pottsville/ Allegheny 0	SRC	10		
Washington	5	39° 30' 03"	81° 17' 00"	PA Monongahela 0	SRC	9		
PENNSYLVANIA								
Allegheny	1	40° 34' 00"	79° 57' 30"	PA Conemaugh 0	SRC	12		
Allegheny	7	40° 30' 24"	80° 01' 36"	PA Conemaugh 0	SRC	21		
Beaver	1	40° 40' 42"	80° 21' 12"	PA Allegheny 0	SRC	9		
Blair	11	40° 27' 36"	78° 32' 30"	PA Pottsville 0	SRC	9		
Butler	1	40° 52' 36"	79° 55' 24"	PA Allegheny 7	SRC	6		
Cambria	4	40° 21' 27"	78° 48' 36"	PA Conemaugh 0	SRC	10		
Clarion	1	41° 00' 33"	79° 17' 12"	PA Allegheny 0	SRC	8		
Fayette	3	39° 38' 12"	79° 17' 45"	PA Monongahela 0	SRC	8		
Greene	1	39° 54' 18"	80° 19' 12"	PA Washington 0	SRC	13		
Greene	3	39° 51' 36"	80° 01' 24"	PA Greene 0	SRC	10		
Greene	3	39° 53' 42"	80° 07'42	PS/PA Washington 0	SRC	15		
Indiana	1	40° 39' 36"	79° 08' 48"	PA Conemaugh 15E	SRC	9		
Jefferson	1	41° 06' 12"	78° 58' 12"	PA Allegheny 20W	SRC	9		
Lawrence	4	41° 00' 36"	80° 21' 24"	PA Pottsville 0	SRC	9		
Lawrence	5	40° 58' 30"	80° 21' 42"	PA Pottsville 0	SRC	2		
Somerset	1	40° 06' 30"	78° 51' 42"	PA Allegheny 0	SRC	5		
Somerset	5	40° 11' 36"	79° 36' 36"	PA Allegheny 0	SRC	5		
Somerset	16	39° 56' 42"	79° 36' 36"	PA Allegheny 0	QRR	5		
Somerset	17	39° 38' 42"	79° 00' 12"	PA Allegheny 0	QRR	5		
Somerset	18	39° 44' 12"	79° 18' 36"	PA Conemaugh 0	SRC	9		
Venango	4	41° 18' 12"	79° 51' 12"	PA Pottsville/ Allegheny 0	SRC	9		
Washington	1	40° 24' 00"	80° 08' 18"	PA Monongahela 0	QRR	6		
Westmoreland	2	40° 24' 48"	79° 31' 36"	PA Pittsburgh 0	SRC	6		
WEST VIRGINIA								
Dickenson	1	37° 14' 34"	82° 14' 36"	PS Norton 0	SRC	11	Coal "sheared" by face cleat.	
Dickenson	2	37° 12' 34"	82° 12' 24"	PA Vice 0	SRC	7	Coal appears "sheared".	
Wise	1	37° 03' 33"	82° 33' 36"	PA Vice 0	SRC	6		
Wise	2	37° 03' 00"	82° 42' 18"	PA Vice 0	SRC	6		
Wise	3	37° 01' 48"	82° 31' 12"	PA Vice 0	SRC	6	Joints trend parallel in those in sandstone and shale.	
Wise	5	36° 55' 20"	82° 30' 18"	PA Vice 1	?	9		
WEST VIRGINIA								
Ralford	1	38° 35' 30"	78° 36' 12"	PA Conemaugh 0	SRC	8		
Boone	1	37° 17' 20"	81° 51' 00"	PA Kanawha 0	SRC	8	Face cleat spacing is 15/foot.	
Boone	2	37° 32' 16"	81° 38' 55"	PA Kanawha 0	SRC	6	Face cleat spacing is 15/foot.	
Boone	4	38° 00' 17"	81° 46' 24"	PA Kanawha 0	SRC	4	Face cleat spacing averages less than 5/foot.	
Cabell	1	38° 23' 23"	82° 17' 46"	PS Conemaugh 0	SRC	9	Coal is lenticle.	
Doddridge	1	39° 17' 33"	80° 42' 00"	PS Dunkard 0	SRC	12	On crest-of-the-Fork Anticline.	
Hancock	1	40° 36' 36"	80° 33' 18"	PA Allegheny 0	SRC	9	Face cleat spacing is 15/foot.	
Hancock	2	40° 36' 18"	80° 33' 18"	PS Allegheny/ Conemaugh 0	SRC	4		
Harrison	1	39° 17' 15"	80° 32' 12"	PS Dunkard 0	SRC	8		
Harrison	2	39° 16' 44"	80° 17' 02"	PS Monongahela 0	SRC	13		
Kanawha	2	38° 27' 18"	81° 16' 36"	PA Conemaugh 0	SRC	6		
Kanawha	3	38° 18' 36"	81° 26' 12"	PA Kanawha 7	SRC	6	Face cleat not distinguished from butt cleat.	
Lewis	1	39° 02' 20"	80° 22' 08"	PS Monongahela/ Conemaugh 0	SRC	11		
Lincoln	1	38° 01' 10"	82° 02' 12"	PA Kanawha 0	SRC	4	Inadequate sample?	
Lincoln	2	38° 13' 20"	82° 12' 12"	PA Allegheny 0	SRC	15	Excellent pattern.	
Logan	4	37° 38' 12"	81° 36' 30"	PA Kanawha 0	SRC	5	Face cleat spacing is 12/foot.	
Logan	6	37° 48' 24"	81° 36' 22"	PA Allegheny 0	SRC	11		
Marion	1	39° 31' 02"	80° 03' 22"	PA Conemaugh 0	SRC	7	In "Bony" coal.	
McDowell	1	37° 15' 28"	81° 43' 12"	PA New River 0	SRC	5		
McDowell	1	37° 11' 15"	81° 26' 03"	PA Pocahontas/ New River 0	SRC	6	Face cleat spacing is 20/foot.	
McDowell	3	37° 17' 12"	81° 36' 45"	PA New River 0	SRC	5		
McDowell	4	37° 21' 30"	81° 12' 36"	PA Pocahontas 0	SRC	5		
Mingo	1	37° 36' 42"	81° 57' 18"	PA Kanawha 0	SRC	5	Face cleat spacing is 20/foot.	
Mingo	2	37° 42' 00"	82° 11' 00"	PA Kanawha 0	SRC	5	Face cleat spacing is 12/foot.	
Mingo	3	37° 44' 00"	82° 11' 47"	PA Kanawha 0	SRC	8		
Mingo	4	37° 37' 12"	82° 06' 46"	PA Kanawha 0	SRC	4		
Monongalia	2	39° 42' 40"	80° 12' 12"	PA Monongahela 0	SRC	13	Waynesburg coal.	
Nicholas	2	38° 17' 33"	80° 45' 00"	PA Kanawha 0	SRC	5		
Pleasants	2	39° 24' 12"	81° 17' 12"	PA Allegheny 0	SRC	6		
Preston	1	39° 39' 12"	79° 41' 12"	PA Allegheny/ Monongahela 7	SRC	10	Joint spacing is 15/foot.	
Preston	4	39° 25' 21"	79° 31' 36"	PA Conemaugh 0	SRC	6	Face cleat spacing is 20-40/foot.	
Tyler	2	39° 33' 12"	80° 57' 00"	PS Dunkard 0	SRC	5	Face cleat spacing is 12/foot.	
Upshur	2	38° 50' 24"	80° 20' 18"	PA Conemaugh 0	QRR	10		
Webster	1	38° 29' 24"	80° 21' 06"	PA New River 0	SRC	2	On northeast limb of Webster Springs anticline.	
Webster	4	38° 34' 36"	80° 24' 12"	PA Kanawha 0	SRC	5		
Wetzel	1	39° 37' 27"	80° 32' 27"	PS Dunkard 0	SRC	10	Face cleat spacing is 6-15/foot.	
Wood	3	39° 15' 12"	81° 34' 03"	PA Allegheny 0	SRC	10		
Wyoming	1	37° 35' 48"	81° 40' 03"	PA Kanawha 0	SRC	2		
Wyoming	4	37° 37' 27"	81° 32' 33"	PA Kanawha 0	SRC	5	Face cleat spacing is 60/foot.	
Wyoming	6	37° 36' 00"	81° 40' 00"	PA Kanawha 0	SRC/SRC 2			
Wyoming	7	37° 41' 00"	81° 38' 18"	PA Kanawha 0	SRC	2	Face cleat spacing is 40/foot.	

*A.R. (attitude of bedding): 0 if flat or less than 5°, otherwise dip amplitude in given numerically (i.e., 70 in degrees, followed by letters indicating dip direction (i.e., 70NE).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Niagara Falls
Oshawa
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Guelph
Kitchener
St Thomas
Long Point
Pointe aux Pins
NIAGARA
ORLEANS
MONROE
WAYNE
OSWEGO
ONEIDA
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CHAUTAUQUA
CATTARAUGUS
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BRADFORD
SUSQUEHANNA
WAYNE
SULLIVAN
ULSTER
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LITCHFIELD
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CRAWFORD
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CAMERON
LYCOMING
CLINTON
SULLIVAN
WYOMING
LACKAWANNA
PIKE
ORANGE
PUTNAM
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BUCKS
MONTGOMERY
TRENTON
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SCHUYLKILL
SNYDER
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PERRY
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HARFORD
BALTIMORE
BALTIMORE
HOWARD
ANNE ARUNDEL
PRINCE GEORGES
MONTGOMERY
FREDERICK
WASHINGTON
ALLEGANY
GARRETT
MORGAN
BERKELEY
JEFFERSON
CLARKE
LOUDOUN
FAIRFAX
PRINCE WILLIAM
FAUQUIER
STAFFORD
SPOTSYLVANIA
CULPEPER
RAPPAHANNOCK
WARREN
SHENANDOAH
FREDERICK
HARDY
MINERAL
HAMPSHIRE
MORGAN
PRESTON
TUCKER
BARBOUR
TAYLOR
HARRISON
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ALBEMARLE
NELSON
FLUVANNA
LOUISA
BATH
ROCKBRIDGE
ALLEGHANY
GREENBRIER
POCAHONTAS
FAYETTE
RALEIGH
SUMMERS
MONROE
CRAIG
BOTETOURT
AMHERST
BUCKINGHAM
APPOMATTOX
BEDFORD
CAMPBELL
ROANOKE
FRANKLIN
PULASKI
GILES
MERCER
MCDOWELL
WYOMING
PIKE
BUCHANAN
TAZEWELL
BLAND
WYTHE
SMYTH
GRAYSON
CARROLL
PATRICK
HENRY
FLOYD
PITTSYLVANIA
WASHINGTON
RUSSELL
WISE
DICKENSON
LEE
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SURRY
STOKES
ROCKINGHAM
WILKES
YADKIN
FORSYTH
WATAUGA
CARTER
MITCHELL
AVERY
JOHNSON
SULLIVAN
HAWKINS
HANCOCK
GRAINGER
HAMBLEN
GREENE
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JEFFERSON
KNOX
ANDERSON
MORGAN
PUTNAM
CUMBERLAND
OVERTON
FENTRESS
JACKSON
CLAIBORNE
CAMPBELL
SCOTT
SMITH
WILSON
DAVIDSON
NASHVILLE
SUMNER
MACON
TROUSDALE
CLAY
PICKETT
WAYNE
WHITLEY
MC CREARY
CLINTON
MONROE
ALLEN
SIMPSON
WARREN
BARREN
METCALFE
RUSSELL
LAUREL
KNOX
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ADAIR
GREEN
TAYLOR
MARION
LINCOLN
EDMONSON
HART
LARUE
NELSON
BOYLE
MERCER
WASHINGTON
MARION
SPENCER
ANDERSON
FRANKFORT
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HENRY
CARROLL
GALLATIN
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MARTIN
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KNOTT
LETCHER
HARLAN
BELL
JACKSON
OWSLEY
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WOLFE
MENIFEE
POWELL
ESTILL
CLARK
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