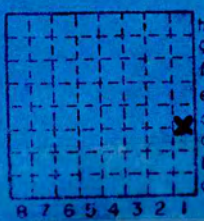
Workings extend into Sangamon and Montgomery Counties.

HERRIN

PEABODY COAL CO.
MINE # 10

County No. 238
Mine Index No. 693 S-8



[redacted] COUNTY

(Sheets) COAL PRODUCTION (Sheet)

Period Mo.	Day	Year	Mo.	Day	Year	Tons
					1951	144 059
					1952	829 006
					1953	2 357 609
					1954	2 645 923
					1955	3 628 121
					1956	3 427 355
					1957	3 677 757
					1958	2 902 215
					1959	3 764 147
					1960	4 117 552
					1961	4 587 309
					1962	5 266 166
PEABODY COAL CO.					1963	5 351 930
MINE NO. 10					1964	5 451 697
					1965	5 409 196
					1966	5 635 573
				*	1967	5 700 014
					1968	5 329 521
					1969	5 415 880
					1970	4 899 783
					1971	4 078 815
* U.S. Record Annual					1972	4 693 399
Production for Under-					1973	4 147 074
ground Coal Mine					1974	4 131 904

SUMMARIES

No.	1951	to	1958	No.	19	611 595
	1958		1971		85	119 628

Railroad, Wagon, Strip, Idle, Abandoned

IDENTIFICATION

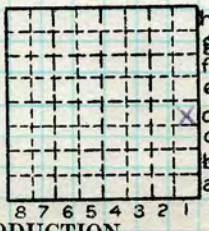
County No. 238

Coal No. □

Coal Report No. S-8

Quad.

County Christian



Sec. 10

T. 13 N. S.

R. 4 E. W.

Index No.

COAL MINE—PRODUCTION

ILLINOIS GEOLOGICAL SURVEY, URBANA

(2732—2M—7-41)

(Sheets) COAL PRODUCTION (Sheet)

Period Mo.	Day	Year	Mo.	Day	Year	Tons		
					1975	4	102	982
					1976	3	278	065
					1977	2	807	593
					1978	2	096	287
					1979	2	898	245
					1980	2	887	503
					1981	1	848	646
					1982	2	921	365
					1983	3	197	600
					1984	3	009	648
					1985	2	516	238
					1986	2	733	528
					1987	2	159	510
					1988	1	888	895
					1989	2	049	364
					1990			

101,690,000

um. 115,657,693

PEABODY COAL CO.
MINE NO. 10

SUMMARIES

No. to No.

Railroad, Wagon, Strip, Idle, Abandoned

IDENTIFICATION

County No. 238 Coal No.

Coal Report No. S-8 ☐

Quad.

County Christian

Sec. 10

T. 13 N.
S.

R. 4 E.
W.

Index No.

COAL MINE—PRODUCTION
ILLINOIS GEOLOGICAL SURVEY, URBANA

(2732—2M—7-41)

John C. Moore Corporation, Rochester, N. Y. Binder and holes in leaves Patented.
Form 180
2845

Co. No. County Sec. T. R. T.&R.

Company Peabody C.C. No. Farm Mine No. 10 No.

Elev. of by Total depth · Year drld 9/'d '51

For M Method N+L Result S Type log Core desc.

Stripped Analysis Confd. Publ.

Location

Core logged by

Remarks: Coal Rpt. # S-8; M.I. # 693

KEY BEDS

Code	Name	Depth	Thk.	Elev.	
	6	357	7'		
	6	340	7'2"		Table 13 1958 Coal Rept.

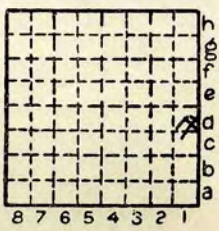
10 & 11 - 13N - 4W

Compiled by MHP 9/57

Correlations by basis

Date Quad.

County Christian Co. No. 238



Sec. 10 D1

T. 13 N.

R. 4 W.

(41289—5M—8-56) 2

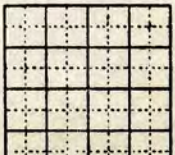
(22844—50M—9-55) 2

ILLINOIS GEOLOGICAL SURVEY, URBANA

CONFIDENTIAL Strata	Thickness	Top	Bottom
Note: See following Peabody drill hole logs which are fairly close to this location C(hr)C 132 S(an)C 35			
Shale - Dark gray.			
No. 6 Coal	7'3¼"		
Inches: 0-¼ - Coal - Bright ¼-½ - Shale - Dark gray ½-6 - Coal - Normally bright banded 6-6 1/16 - Shale parting 6 1/16-11 - Coal - normally bright banded, vitrain bands up to ½" thick. 11-11 1/8 - Pyrite band 11 1/8-16¼ - Coal - Normally bright banded 16¼-16 3/8 - Shale banded 16 3/8-20½ - Coal - Normally bright banded 20½-20 9/16 - Fusain banded 20 9/16-25¼ - Coal - Normally bright banded with vitrain up to ½". 25¼-25 3/8 - Pyrite band 25 3/8-27 3/4 - Coal - Normally bright banded 27 3/4-28¼ - Pyrite nod (Excluded) 28¼-30½ - Coal - Normally bright banded 30½-31 - Pyrite nod (Excluded) 31-39 - Coal - Normally bright banded with vitrain bands up to 1" 39-39¼ - Pyrite band 39¼-55 5/8 - Coal - Normally bright banded			

Chem Analysis # C-10291

COMPANY Peabody Coal Co.
FARM Mine No. 10 NO. Face
DATE DRILLED 1/22/58 COUNTY NO. Channel
AUTHORITY Harrison-Reinertsen No. 1
ELEVATION
LOCATION C entry 3rd W Main entry (Belt entry)
COUNTY CHRISTIAN Slope-10d1-13N-4W



CONFIDENTIAL Strata	Thickness	Top	Bottom
55 5/8-55 3/4 - Pyrite band			
55 3/4-65¼ - Coal - Normally bright banded			
65¼-66¼ - Shale band - gry, fairly soft (Excluded) BB? 2" vp			
66¼-84½ - Coal - Normally bright banded			
84½-84 5/8 - Fusain band			
84 5/8-87 3/4 - Coal - Normally bright banded			
Bottom			

87 3/4" = 7' 3 3/4" = 2.23 m

COUNTY CHRISTIAN County No. Face Channel No. 1 1-13N-4W

(22844—50M—9-55) 2

ILLINOIS GEOLOGICAL SURVEY, URBANA

CONFIDENTIAL — Strata	Thickness	Top	Bottom

Note: See Peabody drill hole C(hr)C 259 which is fairly close to this sample locality.

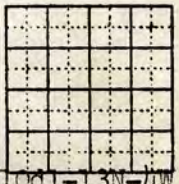
No. 6 Coal — 7'9 3/4"

0-12 3/4 - Coal, bright banded, mostly clarain with a few stringers vitrain 1/8" thick.
12 3/4-13 - Pyrite band.
13-16 1/8 - Coal, normally bright banded.
16 1/8-16¼ - Pyrite band.
16¼-21¼ - Coal, normally bright banded with vitrain bands up to 3/4" thick.
21¼-21 3/4 - Shale lens.
21 3/4-21 13/16 - Pyrite band.
21 13/16-24 3/4 - Coal, normally bright banded.
24 3/4-24 7/8 - Pyrite band.
24 7/8-32 - Coal, normally bright banded.
32-33½ - Shale band (Excluded).
33½-39 - Coal, normally bright banded.
39-39 1/16 - Pyrite band.
39 1/16-45 - Coal, normally bright banded.
45-45 3/4 - Shale band (Excluded).
45 3/4-61 1/8 - Coal, normally bright banded.
61 1/8-61¼ - Pyrite cone.
61¼-64½ - Coal, normally bright banded.
64½-64 9/16 - Pyrite band.
64 9/16-69 - Coal, normally bright banded.
69-69 1/16 - Pyrite.
69 1/16-69 1/8 - Vitrain band.

chem. Analysis # C-10292

COMPANY Peabody Coal Co.
FARM Mine No. 10
DATE DRILLED January 22, 1958
AUTHORITY Harrison-Reinertsen
ELEVATION
LOCATION Cross cut between A and B entries Slope-10d1-13N-4W
COUNTY CHRISTIAN 3rd Main E(Apx 11th N territory

NO. Face
COUNTY NO. Channel No. 2



CONFIDENTIAL Strata	Thickness	Top	Bottom
69 1/8-69 3/16 - Pyrite band.			
69 3/16-69½ - Coal, normally bright banded.			
69½-70¼ - Shale band (Blue Band) (Excluded)		— 23 4P	
70¼-87 - Coal, normally bright banded.			
87-87¼ - Fusain band partially pyritized.			
87¼-93 3/4 - Coal, normally bright banded.			

$93\frac{3}{4}'' = 7' 9\frac{3}{4}'' = 2.38\ m$

Chem Analysis # C-10292

COUNTY CHRISTIAN County No. Face Channel No. 2 1-13N-4W

(22844—50M—9-55) 2

ILLINOIS GEOLOGICAL SURVEY, URBANA

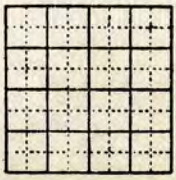
CONFIDENTIAL Strata	Thickness	Top	Bottom
Note: See Peabody drill hole C(hr)C 190, which is fairly close to this sample locality.			
No. 6 Coal	7'4"		
0-7 15/16 - Coal, normally bright banded relitively high percentage of bitrain in bands up to 1".			
7 15/16-8 - Pyrite band.			
8-11 1/8 - Coal, normally bright banded.			
11 1/8- 11¼ - Pyritic clay band.			
11¼-14 5/8 - Coal - normally bright banded.			
14 5/8-14 3/4 - Pyrite band.			
14 3/4-15 7/8 - Coal, normally bright banded.			
15 7/8-16 - Mineralized fussain band.			
16-19½ - Coal, normally bright banded.			
19½-20 - Shale band (Excluded).			
20-27½ - Coal, normally bright banded.			
27½-28 - Shale, band (Excluded).			
28-33 3/4 - Coal, normally bright banded.			
33 3/4-34 - Shale band (Excluded)			
34-36 7/8 - Coal, normally bright banded.			
36 7/8-37 - Fusain band.			
37-55 - Coal			
55-55 5/8 - Shale and pyrite band (Excluded)			
55 5/8-63¼ - Coal, normally bright banded.			
63¼-64 - Shale band (Excluded)			
64-72 - Coal, normally bright banded.			
72-72 1/16 - Shale band.			
72 1/16-88 - Coal			

88" = 7'4" = 2.24 m

Chem. Analysis # C-10293

COMPANY Peabody Coal Co.
FARM Mine No. 10
DATE DRILLED 1/22/58
AUTHORITY Harrison-Reinertsen
ELEVATION
LOCATION No. 1 Gobroom off 1st S Main S entry
COUNTY CHRISTIAN

NO. Face
COUNTY NO. Channel No. 3



Slope-10d1-13N-4W

Peabody Coal Co., #10 Mine, sampled by JAS & MEH 12/5/63, Sample #1, at 2nd intersection N., W. rib 4th Main N., 20' outby center line of W. belt entry. 750' from W. line, 250' from S. line, NW¼, Sec. 2, T.13N., R.4W., Christian County - 6'±

Sample 1-A - 3'0" (top half) Underclay, gray greenish cast, Stigmarian, relatively hard, reportedly "cut hard" while cutting underpass. Occasional coaly streaks, occasional pyritic nodules 1"± across, one calcite filled fracture noted, clay noncalcareous.

Sample 1-B - 3'0" (bottom half) Underclay, similar to above -- non-calcareous to base.

Sample 1-C - 0'2"± - Underclay, similar to above but calcareous, no lime nodules noted, base concealed below floor.

Sample #2, at 2nd intersection M. North, 4th Main N., W. rib, at rib of W. tract entry (Location is very near Sample #1)

Sample #2 - Underclay similar to Sample #1. Reported by machine operator to be much softer than same clay 30'N. Only top 30" of clay included in Sample #2 (gets slightly harder toward base)

12-5-63

Sample #3, at 1st intersection N., 4th Main N., 30' in by First East Belt entry, (Belt is middle entry of 5). St. N. Crossover. 600' from N. line, 850' from W. line, Sec. 11, T.13N., R.4W., Christian County.

Underclay - Sample 3-A - light to green shale, gray, slightly darker in upper 3", relatively firm, stigmarian, few pyrite nodules, occasional coal streak, noncalcareous	3'0"
Clay shale - Sample 3-B - greenish gray, noncalcareous, some faint possible bedding in part, has somewhat brecciated appearance in bottom 2', clay is appreciably weathered	3'0"
Shale, gray, moderately well laminated, calcareous, about 2" observed - Base concealed (floor of mine)	0'2"

12-5-1963

Sample #4, W. rib 4th Main S. in by 5th East Belt Entry. 1500' from S. line, 700' from W. line, Sec. 26, T.13N., R.4W., Christian County.

Roof - limestone, not examined, shale, gray, could not be examined	0'4"
Coal (Herrin No. 6), with a 1" carbonaceous "Blue-Band" 21" from Base	6'11"
Sample 4-A - Underclay, dark gray, carbonaceous	0'2"
Underclay, gray to light gray, Stigmaria, slightly silty, noncalcareous	3'4"
Limestone, light gray, argillaceous, possibly dolomitic, thickness slightly variable where measured, mine manager reports that this unit is highly variable, pinching completely out locally	1'4"
Sample 4-B Clay shale, gray to light gray, slip fractured calcareous, appears to contain numerous small white granules	1'6"
Sample 4-C - Clay shale, gray, slicks, rather uniform, base concealed, floor	1'4"

12-5-1963

Sample #5, 4th Main South, East Rib, 15' in by 3rd east belt entry. 1600' from N. line, 800' from W. line, Sec. 23, T. 13 N., R. 4 W., Christian County.

Coal (Herrin No. 6) Thickness not measured

Sample 5-A - Underclay, gray, stigmarian, weathered, noncalcareous	1'8"
Sample 5-B - Clay shale, gray, slight greenish cast, carbonaceous, calcareous, becoming more calcareous downward	2'6"
Sample 5-C - Underclay, gray, slip fractured, Stigmarian, very slightly calcareous in part, one disc-shaped chert nodule 1/8" thick seen	1'9"
Shale, gray, fair to well laminated. Base concealed (Floor)	3'+

12-5-1963

4th Main South, East Rib, about 15' in, 4th East Belt Entry. 100' from S. line, 750' from N. line, Sec. 23, T. 13 N., R. 4 W., Christian County

Coal (Herrin No. 6), thickness not measured

Underclay, greenish gray, (dark gray in top 2"), stigmarian, carbonaceous 1'0"

Limestone, gray, argillaceous, variable in thickness, but appears to be a continuous bed, base & top noticeably undulating 1'0"--1'3"

Clay shale, gray, calcareous, with occasional calcareous nodule, occasional limey nodule up to 3" across 2' from top 3'2"

Clay shale, gray to light gray, brownish cast, slightly silty, base concealed, Floor 1'+

12-5-1963

On 1st E. Track Entry at 1st N. Belt Entry.
Underclay is 2'+ (Base Concealed) noncalcareous

On 1st E. Track Entry at 2nd N. Belt Entry.
Underclay is 2'+ (Base Concealed) noncalcareous

On 1st E. Track Entry at 3rd. N. Belt Entry.
Underclay is 2'+ (Base Concealed) noncalcareous

On 1st E. Track Entry at 4th N. Belt Entry.
Underclay 2'6" exposed seems harder (lower 2" has brecciated appearance and is very hard)

1st E. Track Entry at 6th N. Belt Entry.
Underclay 2'6" exposed lower part seems harder like at 4th N. Belt Entry.

5th West off Main S., N. Rib Track or "B" Entry at Belt Entry 1st North Entry.
Underclay about 2', noncalcareous

As above but 2nd North.
Underclay about 2', relatively hard, silty, stigmarian, gray, not so silty on upper foot (more normal underclay)

12-5-1963
Peabody C.C.
Mine 10
visited by
JAS & MEH

Peabody Mine 10 - observed by M. E. Hopkins and R. P. Agaste on December 4, 1967 - Sample 1 - 1050'S., 630'W., center of Sec. 17-13N-4W - Sangamon County

Roof - sandstone, total thickness not observed	3'+
Coal - detail of Coal No. 6	53"
Coal - normally bright banded, rather thin banded, occasional Kaolinite facing, 1/8" soft fusain band 2" from bottom	0-13"
Shale - medium gray, thickens to 1" in short distance laterally, excluded from sample	13-13 3/8"
Coal - normally bright banded, some Kaolinite facing	13 3/8-21½"
Fusain, soft, non-mineralized	21½-22"
Coal - normally bright banded, occasional Kaolinite facing	22-27"
Pyrite band, excluded	27-27½"
Coal - normally bright banded	27½-29"
Coal - several thin pyrite bands	29-29½"
Coal - normally bright banded, occasional Kaolinite on fractured surfaces	29½-36¼"
Shale - (Blue Band), medium gray, excluded from sample	36¼-36 5/8"
Coal - normally bright banded, Kaolinite on vertical faces, some pyrite near top	36 5/8"-53"
Bottom is hard, light gray silty underclay	

53" = 4' 5" = 1.35 m

"C14838" - chemical analysis of composite face channel samples

General observations on visit to Peabody Coal Co. Mine No. 10, on December 4, 1967 - M. E. Hopkins

At this time seven entries are being driven northward through a channel sandstone area in the NE SW sec. 17-13N-4W, Sangamon County. The sandstone does not completely replace the coal but apparently the upper portion of the coal has been eroded and now only 4 to 5 feet of coal remain immediately under sandstone roof which is water-bearing, consequently the mine is fairly wet in this area. A roof fall was examined in this area and above about 15 feet of sandstone an upper coal was seen and pieces were picked up from the fall. This is the upper coal found in three drill holes (Peabody's SC-99, SC-102, and SC-103), drilled to pin-point the sandstone channel (or "fault"). In the mine, the base of the sandstone can be seen coming down rather sharply into the coal, there were local undulations of a foot or so at the base. Also lenses of coal and some shaly material appear to be included in the sandstone. This channel trends NE-SW and has been encountered in the mining to the northeast. The trend is rather straight and it was encountered where projected from the northeast.

At this time the entries are about half-way through the channel zone, but they are far enough to determine that the upper coal is apparently not a split of No. 6 but is a younger coal, probably No. 7, which is much thicker here, perhaps because it was deposited in a partially-filled channel, i.e. the Anvil Rock Sandstone did not completely fill the erosional channel, and a low place existed where the thicker coal accumulated.

(tipple located in sec. 10-13N-4W, Christian Co.)

Peabody Mine 10 - observed by M. E. Hopkins and R. P. Agaste on December 4, 1967 - Sample 2 - 600'S., 1000'W., center of Sec. 4-13N-4W - Sangamon County

Limestone - only base observed	
Shale - 3" gray, calcareous, fossiliferous, thin, coaly partings in bottom 1", tinly laminated	
Detail of Coal No. 6	7'5"
Coal - normally bright banded, pyrite and Kaolinite, some calcite on vertical faces, a discontinuous thin pyrite band at 7"	0-12"
Pyrite - excluded	12-12 3/8"
Coal - normally bright banded, Kaolinite on vertical faces	12 3/8-17"
Fusain - non-mineralized, some pyrite about 1' from sample (laterally)	17-17¼"
Coal - normally bright banded, Kaolinite on vertical fractures	17¼-29"
Pyrite - excluded	29-29½"
Shale - thickens laterally to 1", excluded	29½-29 3/4"
Coal - normally bright banded, Kaolinite on vertical fractures	29 3/4-35"
Fusain - interbedded with pyrite	35-35½"
Coal - normally bright banded, Kaolinite, some calcite on vertical faces	35½-39"
Bony coal and shale interbedded, excluded	39-39½"
Coal - normally bright banded, calcite and Kaolinite on vertical faces, occasional thin pyrite band	39½-57½"
Pyrite band	57½-57 3/4"
Coal - normally bright banded, pyrite and calcite, some Kaolinite on vertical fractures	57 3/4-65 3/4"
Shale - blue band, carbonaceous, excluded	65 3/4-67"
Coal - normally bright banded, occasional thin pyrite band	67-89"
Actual bottom not seen	

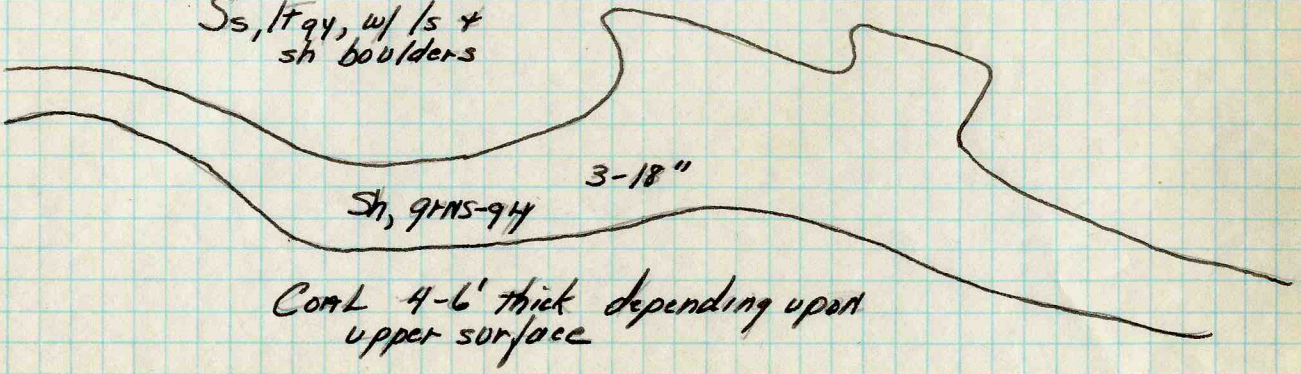
89" = 7'5" = 2.26 m

Peabody Mine 10 - observed by M. E. Hopkins and R. P. Agaste en December 4, 1967 - Sample 3 - 2000'N., 2200'W., center of Sec. 4-13N-4W - Sangamon County

Limestone - thickness not observed	
Shale - calcareous, gray, thinly bedded with coal in bottom 2"	
Coal No. 6	7'2"
Coal - normally bright banded, Kaolinite and calcite on vertical fractures	0-15½"
Pyrite band with some bony coal	15½-15 5/8"
Coal - normally bright banded, Kaolinite and pyrite on vertical fractures, ¼" bony band in the middle, occasional thin pyrite bands	15 5/8-36 5/8"
Pyrite band 1", excluded from sample	36 5/8-37 5/8"
Coal - normally bright banded, sparce Kaolinite on vertical fractures	37 5/8-47 5/8"
Fusain - calcareous	47 5/8-48 5/8"
Coal - normally bright banded	48 5/8-54 5/8"
Pyrite - excluded	54 5/8-55"
Coal - normally bright banded, sparce calcite on fracture faces	55-63"
Shale - (Blue Band), thickens laterally to 1", excluded	63-63¼"
Coal - normally bright banded, Kaolinite, some pyrite on vertical fracture faces	63¼-77 3/4"
Pyrite - with some interlaminated shale, excluded	77 3/4-78 3/4"
Coal - normally bright banded	78 3/4-81¼"
Pyrite - some shale, excluded	81¼-82 3/4"
Coal - normally bright banded	82 3/4-86"
Bottom is light gray, silty underclay	

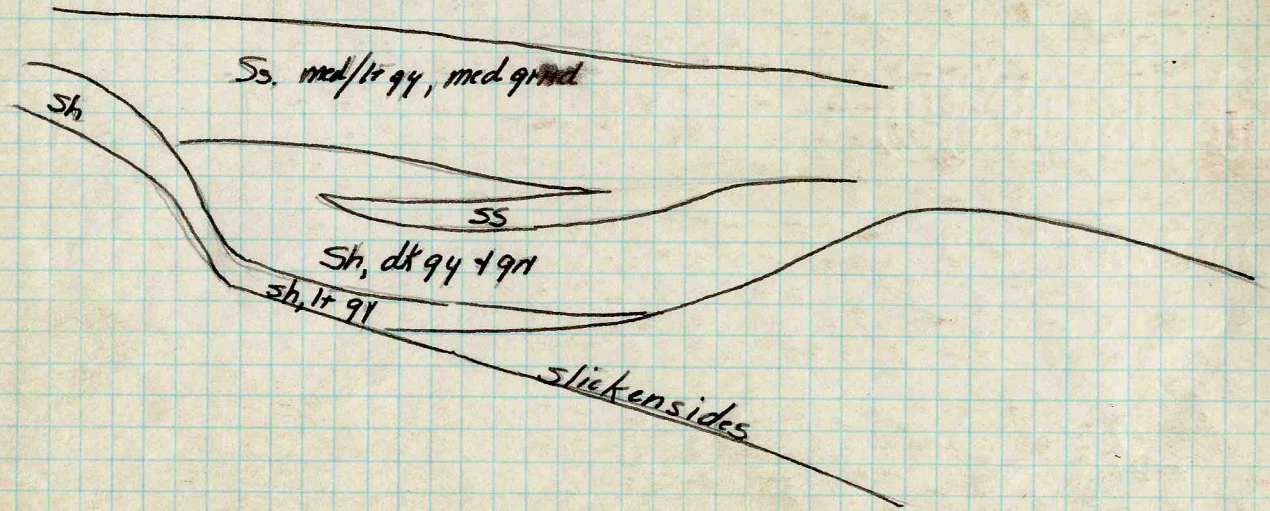
Peabody Mine # 10

Is-D



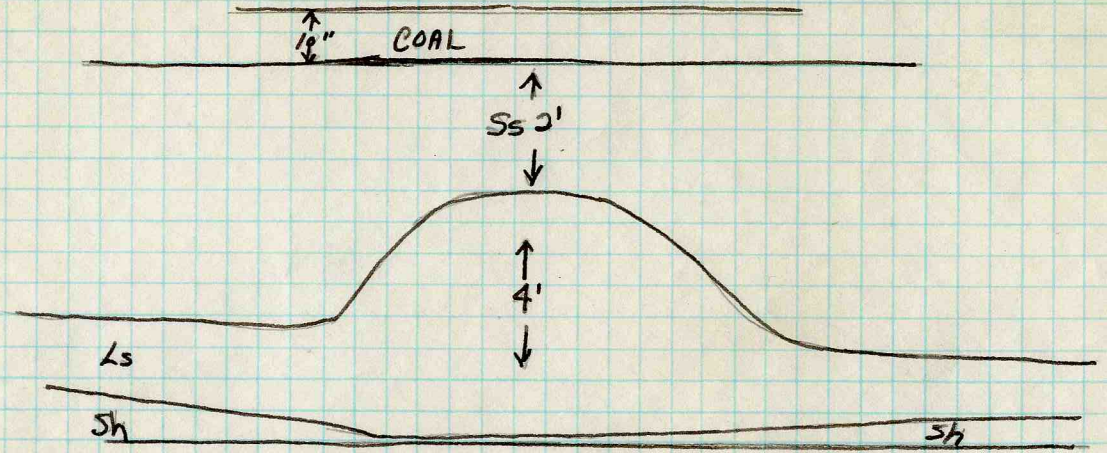
Peabody Mine #16

5th E



ROOM 6 S IN W

PEABODY MINE #10 - CHRISTIAN CO.



CoAL

Location 1: Peabody Mine No. 10, at Intersection of 17 south with belt entry 5th west, 800' west of center of section, 1150' south of center of section, SW¼ NE¼ SW¼, Section 29, T. 13 N., R. 4 W., Sangamon County - W. A. White and M. E. Hopkins, February 5, 1968

Coal	
Claystone - gray, grades into siltstone	10"
Siltstone - gray	14"
Siltstone - gray	4"
Total	28"

Location 2: Peabody No. 10 Mine, between 5th and 6th south on 5th west, 1100' south of center of section, 1900' west of center of section, SE¼ NW¼ SW¼, Section 27, T. 13 N., R. 4 W., Christian County - M. E. Hopkins and W. A. White, February 5, 1968

Coal (No. 6)	
Underclay - gray, yellow stained, soft	3"
Siltstone - gray, yellow stained, rudimentary layering, appears as one homogenous layer with spheroidal weathering, harder than unit above	12"
Claystone - gray, bedly stained with yellow iron sulfate salts, not as solid as unit below, weak	3"
Siltstone - gray with yellow staining, more or less laminated	13"
Sandstone - light gray, very fine grained, horizontally and thinly laminated	21"
Claystone - gray, silty with melanterite	17"
Total	69"

Location 3: Peabody No. 10 Mine, 17th north track entry at 10th west belt crossover, 650' west of center of section, 2000' north of center of section, NW¼ NE¼ NW¼, Section 20, T. 13 N., R. 4 W., Sangamon County - M. E. Hopkins and W. A. White, February 5, 1968

Coal (No. 6)		
Claystone - gray, softer than underlying siltstone, rootlets		5"
Siltstone - gray, hard, non-laminated, few rootlets		15"
	Total	20"

Location 4: Peabody No. 10 Mine, on 17th north belt entry at 10th east at 3rd belt drive, 625' west of center of section, 2300' north of center of section, NE¼ NE¼ NW¼, Section 20, T. 13 N., R. 4 W., Sangamon County - M. E. Hopkins and W. A. White, February 5, 1968

Coal (No. 6)	
Claystone - dark gray, fairly hard	4"
Claystone - greenish gray, silty	10"
Siltstone - greenish gray, fairly hard	17"
Claystone - darker gray and softer than overlying siltstone	1"
Limestone - light brown (tan), no fossils seen, some pieces seem to have angular rock fragments	20"
Claystone - greenish gray, fairly soft, slickensides	14"
Total	66"

Location 5: Peabody No. 10 Mine, 17th north belt entry at belt crossover at 12th east, 1400' south of center of section, 600' west of center of section, NW¼ SE¼ SW¼, Section 17, T. 13 N., R. 4 W., Sangamon County - M. E. Hopkins and W. A. White, February 5, 1968

Coal (No. 6)	
Claystone - dark gray, harder than underlying unit, rootlets	5"
Claystone - light gray, rootlets	24"
Siltstone - light gray, micaceous, mostly non-bedded	30"
Total	59"

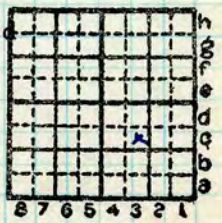
Location 6: Peabody No. 10 Mine, 17th north track entry (east) at 12th west belt entry, 1800' south of center of section, 600' west of center of section, NE¼ SE¼ SW¼, Section 17, T. 13 N., R. 4 W., Sangamon County - M. E. Hopkins and W. A. White, February 5, 1968

Coal (No. 6)	
Claystone - gray, softer than underlying claystone, irregular pyrite nodules up to 1" in diameter, slickensides	18"
Claystone - gray, hard, silty	7"
Claystone - gray, not as hard as overlying unit	5"
Total	30"
Bottom of hole dug to an indurated, hard layer of calcareous siltstone	

Illinois State Geological Survey

Peabody Coal Co., Mine 10
F-C Sample taken near drill hole (60' W of)
835'E, 965'S of Center of Sec. 19, 13N - 4W

Thickness		
	4 cans column bulk sample also taken	
	Description of No. 6 Coal - total thickness	
	Roof shale - dark gray, lower 1" contains coaly streaks.	
0.40	0 - 0.40	Coal, normally bright banded (some times left as top coal).
0.40	0.40 - 0.80	Coal, finely laminated with several fusain partings.
0.08	0.80 - 0.88	Coal, dull banded
.23	0.88 - 1.11	Coal, bright banded.
.47	1.11 - 1.58	Coal, normally bright banded.
.04	1.58 - 1.62	Shale, highly carbonaceous with pyritized lenses (EXCLUDED).
.41	1.62 - 2.03	Coal, normally bright banded.
.02	2.03 - 2.05	Coal, shaly, partly pyritized.
.2	2.05 - 2.11	Coal, finely laminated.
.04	2.11 - 2.15	Shale, gray, soft with pyritized lenses (EXCLUDED).
.48	2.15 - 2.63	Coal, finely laminated, relatively dull.
.02	2.63 - 2.65	Shale, highly carbonaceous with pyritized lenses, lenticular.
.35	2.65 - 3.00	Coal, finely lmainated, several fusain partings.
.82	3.00 - 3.02	Fusain, soft, lenticular.
1.4	3.02 - 4.43	Coal, normally bright banded, lower part relatively dull, finely laminate
.04	4.43 - 4.47	Pyrite, lenticular with some shale (EXCLUDED).
.60	4.47 - 5.07	Coal, finely laminated relatively dull.



By M. E. Hopkins
H. H. Damberger Date 12/12/70

Quadrangle

County SANGAMON Sec. 19 T 13N R 4W

A-entry off 18th North off of 5th main West-co 395' from C-Buggy entry - 6th East 18th North.

.09	5.07 - 5.16	Shale, dark gray, soft with many thick pyritic lenses up to .10 thick (EXCLUDED).
1.15	5.16 - 6.31	Coal, finely laminated, relatively dull.
.03	6.31 - 6.34	Coal, finely laminated, highly pyritized.
.19	6.34 - 6.53	Coal, very bony with many shaly streaks, much finely disseminated pyrite, hard.
.80	6.53 - 7.33	Coal, normally bright banded, lower half somewhat duller, probably higher in ash, several pyritzed fusain partings.

Floor is seatrock - claystone, gray with irregular plant fragments, somewhat silty.

Total thickness of coal: 7.33' = 88" = 2.24m

Peabody #10

Cleats normally developed, faces, with relatively little calcite, cleat direction at: main direction at 155°, 157°, 142°, 131°, 144°, 120°, 128°, 126°, 163°, 128°, 160°

also good set at: 66°, 67°, 65°, 46°, 35°, 59°, 75°

other at: 130

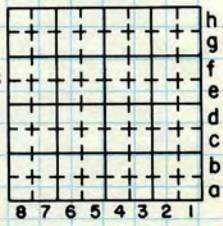
Sangamon Co. - Peabody #10
C3 - Sec. 19 - 13N - 4W

ILLINOIS GEOLOGICAL SURVEY, URBANA

Peabody Coal Company, Mine No. 10
Face channel sample: 18th N off 5th Main W

Shale - Gray, flakey, some plant impressions, relatively soft, contains a few stringers of coal.
Coal Herrin (No. 6) - Detail description below.

0'-1.04'	Coal - Finely laminated, relatively dull.
1.04'-1.11'	Coal - Dull, pyrite lenticles up to .02 thick near bottom, shaly streaks.
1.11'-1.46'	Coal - Finely laminated. Fusain lenses expecially near bottom up to .01 thick.
1.46'-1.48'	Shale - Soft, brownish gray.
1.48'-2.40'	Coal - Normally bright banded. Several fusain bands especially in upper ½ up to .02 thick.
2.40'-2.44'	Shale - Soft, brownish gray (excluded).
2.44'-2.58'	Bone coal.
2.58'-2.68'	Coal - Finely laminated, some shaly streaks.
2.68'-2.70'	Shale - Carbonaceous, dark gray, soft.
2.70'-2.77'	Coal - Finely laminated, normally bright.
2.77'-2.78'	Shale - Carbonaceous with many pyrite lenticles.
2.78'-2.92'	Coal - Fine laminated, relatively dull.
2.92'-2.94'	Shale - With pyrite lenses, carbonaceous dark gray.



By HHD and GJA Date 9/27/71

Quadrangle

County Sangamon Sec. 19 T. 13N. R. 4W.

660'E, 150'S of center

2.94'-3.21'	Coal - Normally bright banded.
3.21'-3.29'	Coal - Dull, bony with pyrite lenses.
3.29'-3.40'	Coal - Normally bright banded.
3.40'-3.50'	Coal - Bony with pyrite streaks especially near top.
3.50'-5.00'	Coal - Finely laminated.
5.00'-5.01'	Pyrite - Lenticular.
5.01'-5.66'	Coal - Finely laminated, relatively dull, several fusain lenses up to .05 thick.
5.66'-5.73'	Shale - Gray with pyrite lenses irregularly laminated (Blue band?) excluded.
5.73'-7.55'	Coal - Normally bright banded with several fusain lenses up to .04 thick mostly hard fusain and in part pyritized. Also several thin pyrite lenticles. Few shaly laminations in upper 1/3.
7.55'-7.80'	Coal - Bony, in part pyritized. Especially near top. Mostly dark with some bright coal lenses. Very hard.
7.80'-8.00'	Coal - Bright, crushed, bedding not well developed. Mineralized coal parts near bottom.

Seatrock-Claystone - Medium gray, soft, rootlets sharp contact with coal. .30 exposed.

PEABODY COAL CO. MINE # 10, PAWNEE, CHRISTIAN COUNTY, ILLINOIS

Visit by Heinz Damberger and H.-F. Krausse, 7/2/74; a reconnaissance visit for the Herrin (No. 6) Coal Roof Study.

Original handwritten notes by H.-F. Krausse are included. Damberger's notes, if he made any, are lost. Photos taken on this visit are included, with captions from Heinz Damberger. Original captions are lost.

The Herrin (No. 6) Coal Roof Study was a contract financed and sponsored by the U.S. Bureau of Mines. All mines in the state in the Herrin (No. 6) Coal were visited to determine general roof conditions and select areas for more intensive study. This was the only visit to Peabody # 10 for the roof study.

Black shale above coal, the Anna Shale Member, showing well-developed joints. Prominent joints run about 100° and are spaced 6-10" apart; subsidiary joints trend about 045°. This place was mined in 1965 (nine years prior to visit).

Note how all of shale has fallen, exposing limestone "caprock" with dangling roof bolts.

Location: #4 Entry, 500 ft. NW of air shaft off 5th West heading into air shaft. Return air. Looking S 60°E.

SC 27-13n-4w
or NE 34-13n-4w

mn_02_001.tif

Prominent jointing in black shale roof. Trend of joints about 100 . Minor slabbing of roof along joints between header boards.

Location: # 3 Entry, about 750' from shaft. Looking NW.

Mn-02-002.tif

Anna Shale, about 1.5' thick, with 0.5' heavily burrowed zone near top. Shale with burrows is weak. Location: About 850' from shaft, looking NNE.

MN-02-003tif

Roof fall exposing the following rock sequence:

TOP

2' Mottled shale

1.5' Light gray or tan nodular limestone

2' Thin-bedded sandstone

1.5' Brereton Limestone

3-4' Anna Shale

7' plus Herrin (No. 6) Coal

Location: About 1000' from shaft looking north.

mn-02-004.tif

Roof fall exposing about 3 ft. of thin-bedded sandstone (probably Anvil Rock) with numerous shale interlaminations. Bedding thickness ranges from $\frac{1}{4}$-$\frac{1}{2}$". Below is about 2.5' of Anna Shale.
Location: 450' from shaft, looking SW.

prob nw nw 35-13n-4w

MN_02_005.tif

Another view of fall in previous photo showing typical failure pattern in thin-bedded sandstone. Below sandstone is 6-18" of limestone with large oval concretions, and about 2' of Anna Shale. (Damberger calls the limestone Brereton, but the large oval concretions are typical of the Conant Limestone in this region. The sandstone in probably the Anvil Rock Sandstone).

prob nw nw 35-13n-4w

MA_02_006.tif

Brereton Limestone "boss" protruding down into coal, and displacing Anna Shale, which varies up to a foot thick in this area.

Location: 6th Entry of 5½ West, west at top of "hill."

prob nw 34-13n-4w

Mn-02-007.tif

A remarkable feature at Peabody # 10 is the "hill" at the 5½ West, which is actually a steep dip or syncline in the coal. The coal thickens from about 7 to more than 13 feet at the bottom of the syncline.

This is a view of a fall at the bottom of the syncline. The fall is 35 feet high, exposing the Piasa Limestone.

Location: #5 Entry in 5½ West.

See notes 2-3-1981
NE SW 27-13N-4W

MN-02-008.tif

T

Massive cribbing in the 35-foot-high roof fall at the bottom of the syncline, where the coal is up to 13 feet thick.

Mn_02_009.tif

SW 27-13n-4w

Another view of same fall.

mn_oz_010.tif

SW 27-13n-4w
or NW 34-13n-4w

Large fall exposing about 6 ft. of dark gray silty shale overlain by 10 ft. of sandstone. Camera appears to have been tilted at a 45-degree angle.

Location: 6th Entry just south of previous photos.

Mn_02_011.tif

SW 27-13N-4W

T

Cribbing in roof fall.

Location: 5th Entry, 1st Main South off 5½ West, 1500' S of 1st E turn.

Mn_02_012.tif

? ne 35-13n-4w

T

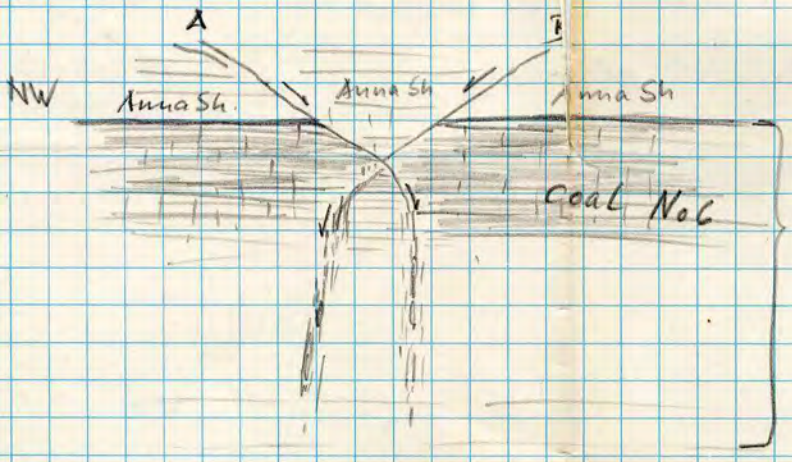
Small fall along slip trending about 100 in black shale, which is about 5 ft. thick here.
Location: #5 Entry, S 1600' from 1st E.

NE 35-13N-4W

M1_0220D.tif

H.-T. KRAUSSE — DEADBODY # 10 — 07/02/74

1st slip measured



slips A	kls	30/34 SE	pitch of Stria ± 90°
	kls	32/36 SE	
	kls	33/32 SE	
	sls	35/65 SE	
	sls	32/47 SE	
	sls	38/70 SE	
slips B	kls	40/35 NW	pitch of Stria ± 90°
	kls	39/32 NW	
	kls	42/36 NW	
	sls	37/76 NW	
	sls	38/53 NW	
	sls	36/61 NW	

A throws B 1-2 inches
within the cleats mac normal toss enrichment of Pyrit

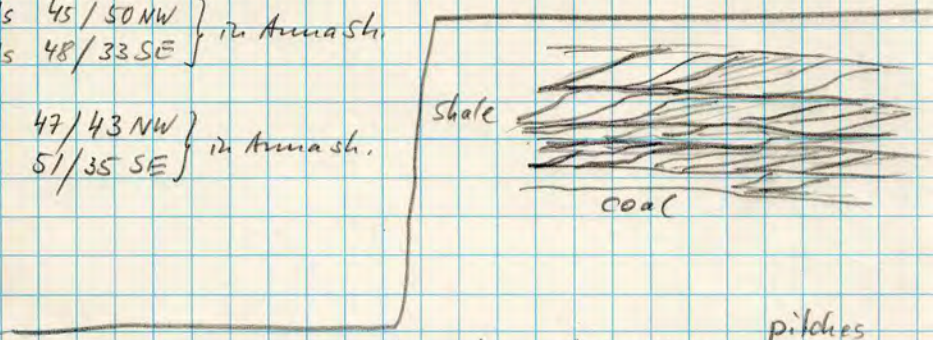
frequent cleats in coal slr

140/80 NE	56/82 SE	10/79 SE
138/78 NE	61/84 SE	8/81 SE
148/82 NE	53/72 SE	
143/77 NE	58/80 SE	
146/81 NE	62/81 SE	

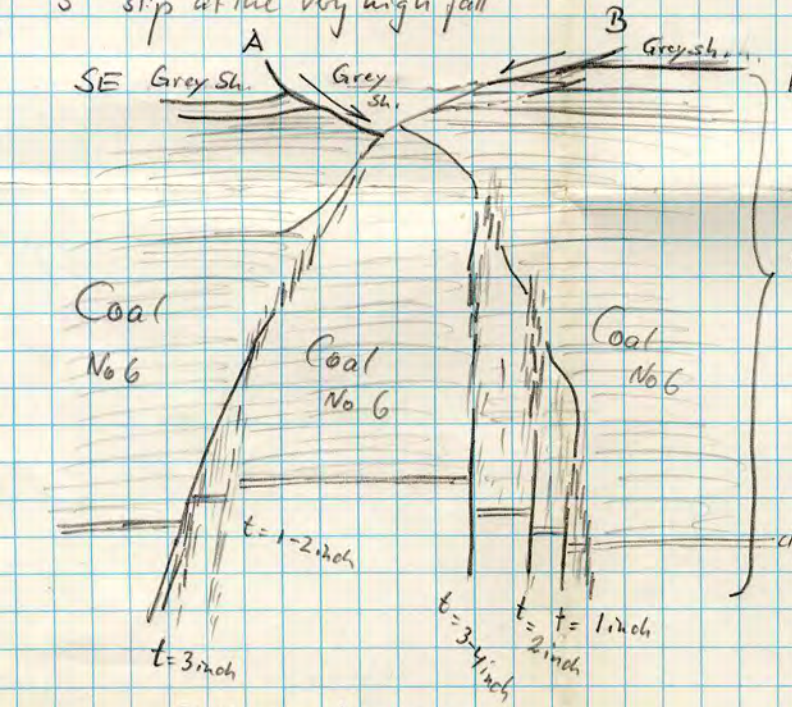
2nd slip measured B = 46° kls 45/50 NW } in Anna sh.
kls 48/33 SE }

3rd B = 48° kls 47/43 NW } in Anna sh.
kls 51/35 SE }

4th B = 148° - 151°



5th slip at the "very high fall"

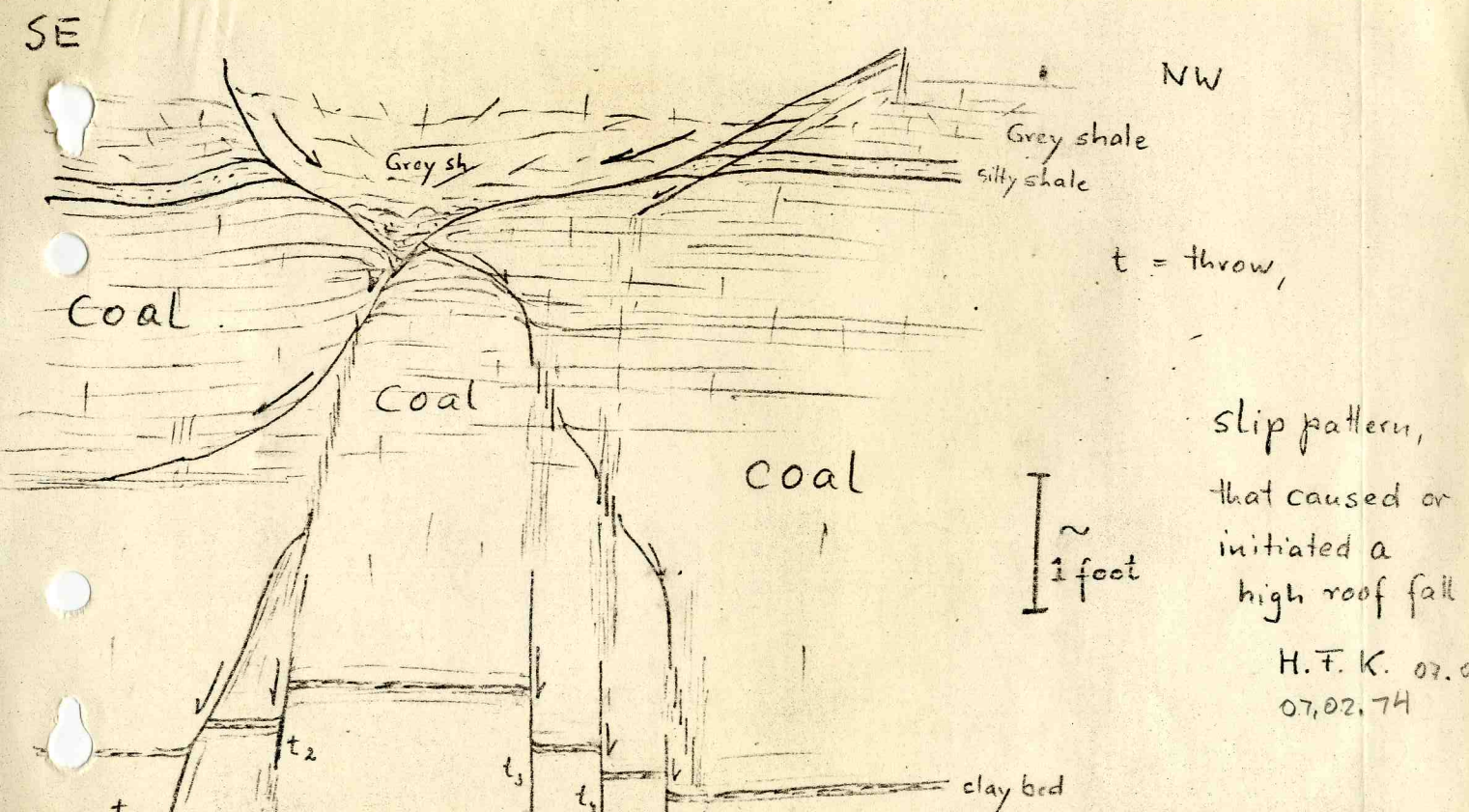


B throws A: 2-3 inch

slips A	kls	60/17 NW	pitches of Stria ± 90°
	kls	58/20 NW	
	kls	59/16 NW	
	sls	68/45 NW	
	sls	66/61 NW	
	sls	71/72 NW	
slips B	kls	52/41 SE	
	kls	54/38 SE	
	kls	49/46 SE	
	kls	50/43 SE	
	sls	70/65 SE	
	sls	67/49 SE	
	sls	64/69 SE	

frequent cleats in coal

slr 150/79 NE	61/83 SE	
148/82 NE	63/78 SE	
140/77 NE	58/81 SE	


SE
NW
Grey sh
Grey shale
Silty shale
Coal
Coal
Coal
t = throw,
slip pattern,
that caused or
initiated a
high roof fall
~
1 foot
H.T.K. 07.0
07.02.74
t_2
t_3
t_4
clay bed

Peabody # 10 Mine. June 30, 1978

Christain County

Visited mine with visitors from Poland.

Peabody Officals

Charley Bollier
Babe Drea-Mine Superintendent North Side

Polish Visitors

Dr. Bronislaw Skinderowicz, Deputy Director
Research Centre for Coal Deposit
Conservation and Environment Protection

Mr. Bogdan Staszewski

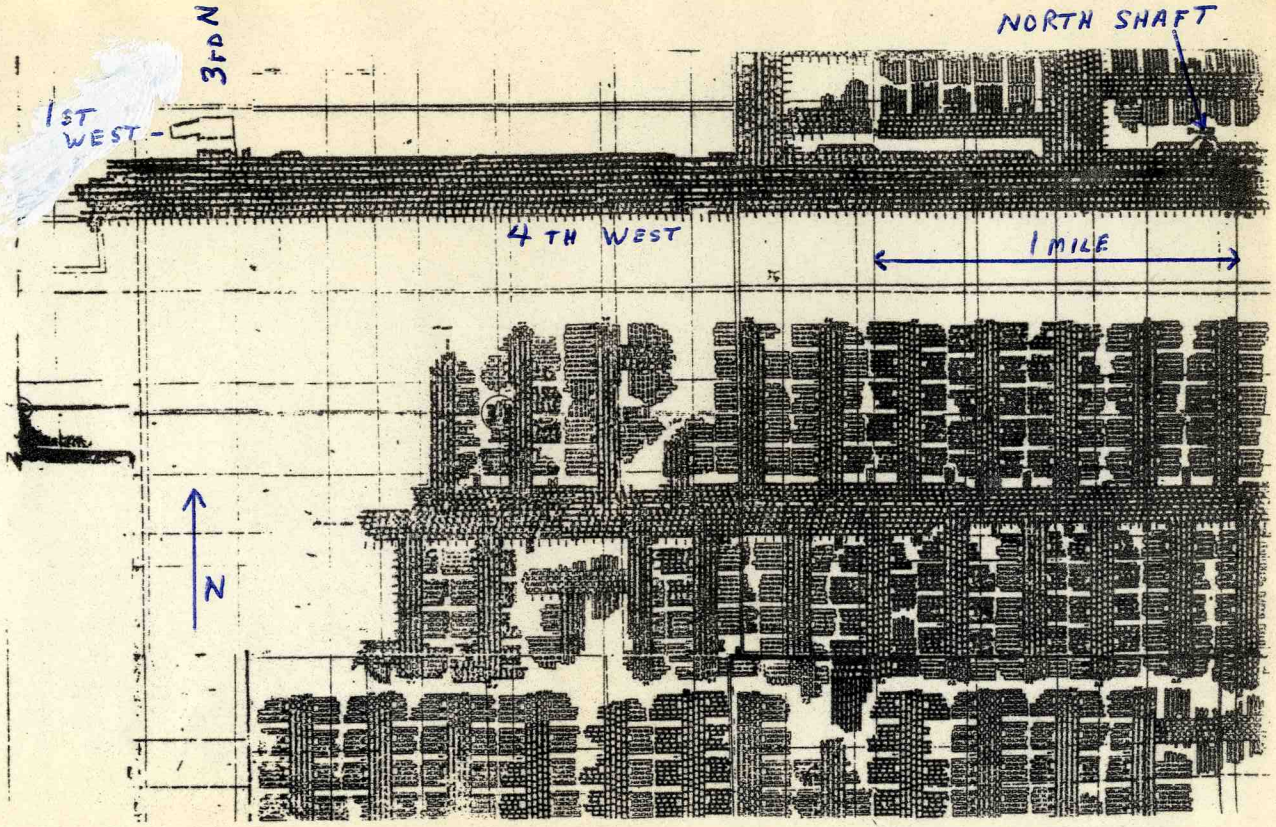
Both from the Central Mining Institute
Katowice, Poland.

Bill Eichfeld - Dept. of Energy, Carbondale

Steve Hunt - I.S.G.S.
Bob Bauer - I.S.G.S.

Visited 1st West off the 3rd North off the 4th West, this is located about 2.9 miles west of the North man and materials shaft. See supplemental map.

CC - North man & material shaft is SE SE SE 27-14n-4w


3RD N
1ST WEST
NORTH SHAFT
4TH WEST
1 MILE
N

Had no map of area so all observations are generalized for this small area.

Roof fall exposing 6.3 feet of black shale roof. Fell out up to limestone. The black shale (Anna Shale) changes in thickness very rapidly.

Fracture pattern (joint set) in Black Anna Shale member is N 65° E and very persistant, with spacings of .5 to 1 foot.

Coal thickness under the limestone roof is only 6.5 feet thick.

Coal thickness under the Black Anna shale roof is 7.5 feet thick, with the Blue Band 2.2 feet from the bottom of the seam.

Major slips in the 1st west off the 3rd North off 4th West trend N 20° E and form coffin covers. Charley Bollier said that this direction was common.

In this part of the mine only saw black Anna shale and Brereton limestone roof, with the black shale thickness changing rapidly.

For each 20 feet of roof bolting a test hole is driven upwards to try and find the limestone. Each of these holes is indicated by a roof bolt plate turned upside down. Where no limestone is encountered three piece sets of timber props with 16 pound rail across the props is used in addition to roof bolts.

Office Meeting at Peabody Mine No. 10
with Charles Bollier

Steve Hunt, H.-F. Krausse, John Nelson, and C.-D. Reuther, Sept. 11, 1978. Notes by J.N.

Purpose of meeting was to work out in-mine mapping program to be conducted by the Survey. The matter of ground subsidence caused by mining was also discussed.

Bollier noted that Peabody customarily pays farmers for damage caused by subsidence, even though the company is not legally required to do so. Out of some 200 cases of subsidence, he estimated 90% had been settled with the farmers.

Peabody No. 10 is a room-and-pillar mine. There is no second mining. The miners try to leave 2-3" of top coal. Above this (according to Bollier) may be gray shale, black "slate", or "clod".

The company has tried using split sets instead of conventional roof bolts. In one of the sections with split sets, roof control was very difficult and much water was encountered. Falls 10-15 feet high were common, mainly at intersections.

Bollier reported that the coal on the north side of the mine is much harder to cut than the coal on the south side, but the fireclay to the north is softer than that to the south. The roof strata are fairly uniform (regionally) throughout the mine.

A squeeze occured in rooms west off the 1st Main North and in an area east of the north shaft, suggesting a line of weakness trending NW-SE.

We decided to begin mapping in the junction area of the Main West and the 2nd Main North, where bad top and water problems are associated with what seems to be a sandstone-filled channel running north-south. Maps were obtained of the area, and other arrangements made to begin the study.

This mapping was delayed until August, 1982.

Peabody Coal Company Mine No. 10 Christian Co.
April 30, 1980
Notes by Steve Danner on visit with Phil Bowden.
Accompanied by Jim Fasser, mine safety instr.

Purpose of visit was to collect channel samples and observe general geologic conditions. Due to the large areal extent of the mine (approx. 10 miles from notth to south faces), we were limited to sampling the northeast faces. The mine now has north and south man shafts to cut down on travel time. The coal still travels by belt to the main bottom. Part of the main beltway was still closed down from a fire (of unknown origin) back in Jan. '80.
Peabody is now employing roof trusses in an effort to increase long range roof control. The trusses are installed every four feet in combination with conventional roof bolting sequences. The trusses extend 11' up into each rib.

Channel Sample Location #1: #2 entry of first North off 4th East. NE¼ SE¼ SE¼ NW¼ Sec 26, T.14N, R4W or 2020' from north line and 2580' from west line of section.

Roof- Shale: med gray, hard, mod.well bedded, breaks into large irregular plates, some patches of pyrite as well as, large pyritic fossils (i.e. Cephalopods); sharp contact with coal usually marked by lamina of pyrite. Roof is generally flat and smooth at this site.
0.51' Coal: N.B.B., black, hard, approx. 30% vitrain; small quantity of calcite on cleats and in fractures.
0.01' Pyrite: very hard, continuous.
1.79' Coal: similar to above, N.B.B., more calcite on cleats and on banding planes.

0.04'	Shale: med gray, moderately soft, contains coaly streaks, small quant. of disseminated pyrite, moderately sharp contact with coal, continuous; (excluded from sample).
0.66'	Coal: N.B.B., similar to above.
0.11'	Shale: light gray, very hard, thinly laminated, carbonaceous, heavily pyritized, thin streaks of pure pyrite; gradational contact at base. (excluded from sample)
2.07'	Coal: N.B.B., black, hard, less vitrain than above units; also, more pyrite on banding planes.
0.08'	Shale: med gray, mod hard, some disseminated pyrite as well as, pyritic streaks; gradational contact with coal. (Blue Band) (excluded from sample)
1.96'	Coal: N.B.B., sim. to above, more calcite and less pyrite, less vitrain.
Floor	Claystone: light to med gray, soft, smooth, carbonaceous, slickensided, gradational contact with coal.

Total thickness of seam is 7.23 feet.

Channel Sample Location #2: #6 entry of 1st North off 4th East. NW¼ SW¼ NE¼ Sec 26, T.14N, R.4W, or 1740' from north line and 2440' from east line of section.

Roof	Shale: med to dark gray, hard, fissile, slightly silty; pyritic at base; moderately sharp contact with coal.
0.66'	Coal: N.B.B., black, hard, vitrain rich; calcite on cleats and in vertical fractures; moderately thin banding.
0.01	Fusain: soft, no pyrite.
0.68	Coal: N.B.B., similar to above, w/ thin pyritic lenses; vitrain rich.
0.01	Shale: med gray, moderately soft, fissile, friable, some disseminated pyrite; discontinuous.

0.21'	Coal: N.B.B., similar to above.
0.02'	Fusain: moderately soft, friable, discontinuous.
0.54'	Coal: N.B.B., similar to above; several calcite laminations on banding planes; some calcite in thin vertical fractures;
0.03'	Shale: med gray, thinly banded, soft, friable, contains coaly streaks, fairly continuous.
0.75'	Coal: N.B.B., similar to above.
0.04'	Shale: med gray, moderately soft, discontinuous. (excluded from sample)
0.79'	Coal: N.B.B., similar to above; less calcite.
0.02'	Fusain: soft, friable, thinly laminated; discontinuous.
0.29'	Coal: N.B.B., similar to above.
0.01'	Pyrite: hard, laminated with thin shaley partings; discontinuous.
0.66'	Coal: N.B.B., contains many thin shale laminations; shale is concentrated in top half of this unit, lower half is relatively clean; much calcite on cleats and in vertical fractures.
0.07'	Shale: med gray, moderately soft, smooth, contains a few thin coaly streaks. (excluded from sample) (Blue Band)
0.71'	Coal: N.B.B., black, hard, vitrain-rich, much calcite on cleats and in vertical fractures; some thin pyrite laminations.
0.10'	Shale: moderately hard, light gray, very pyritic, laminar bedding, somewhat fissile, sharp contact with coal. (excluded from sample)
1.00'	Coal: N.B.B., similar to above, with less vitrain and more fusain; moderately sharp contact with underclay.
Floor	Claystone: med gray, soft, slickensided, slightly silty, carbonaceous debris.

Total thickness of seam is 6.60 feet.

John C. Moore Corporation, Rochester, N.Y. 14604
MOORE'S MODERN METHODS
FORM 180 W

Channel Sample Location #3: #7 entry of 1st North off 4th East. NW¼ SW¼ NE¼ Sec 36, T.14N, R.4W, or 1620' from north line and 2350' from west line of section.

	Roof	Shale: med gray, moderately soft, laminar bedding, smooth, pyrite band at base; contains several pyritized coal balls; numerous intersecting vertical fractures with calcite fillings; several clay dikes less than 0.1' wide; also numerous poorly developed marcasite dollars; irregular gradational contact with coal.
	1.21'	Coal: N.B.B., black, hard, poor cleat development, vitrain-rich; contains several bands of pyritized fusain; numerous calcite-filled vertical fractures and goatbeards; some calcite in cleats.
1.22	0.01'	Pyrite: hard, contains coaly streaks, discontinuous.
1.99	0.77'	Coal: N.B.B., similar to above; pyrite and calcite in vertical fractures, pyrite on cleat surfaces;
2.05	0.06'	Shale: med gray, moderately soft, laminated, smooth; lenticular, contains a few coal stringers; discontinuous. (excluded from sample)
2.45	0.40'	Coal: N.B.B, similar to above.
2.47	0.02'	Pyrite: intermittently continuous.
3.03	0.66'	Coal: N.B.B., similar to above: contains thin shaley partings and pyrite streaks.
3.11	0.08'	Fusain: hard, pyritic, lenticular.
4.60	1.49'	Coal: N.B.B., similar to above: less calcite and pyrite.
4.70	0.10'	Shale:(Blue Band) med gray, moderately soft, slightly silty, pyrite lamina at top and sharp contact with coal at base. (excluded from sample)
5.43	0.73'	Coal: N.B.B., similar to above.
5.47	0.04	Pyrite and Shale: dark brown, moderately hard, coaly streaks, lenticular.

1.11'	Coal; N.B.B., similar to above; lenses of pyrite and shale with pyrite laminations around edges;
6.58	
Floor	Claystone: med gray, soft, smooth; carbonaceous debris, slickensided.

We were informed that the coal and underclay changed markedly from the north side of the mine to the south side. On the north side of the mine the coal is exceptionally hard and relatively clean of impurities, while the underclay is rather soft. On the south side the coal is softer and contains more impurities, while the underclay is much harder. Since time did not allow us to visit the south side, we were unable to verify this information.

Peabody Coal Co. Mine No.10 Montgomery County
June 17,1980

Notes by Steve Danner; accompanied by Phil Bowden, a U. of I. grad student, Suzanne Russell and Jennifer Thompson, both grad students at Penn State Univ., and Jim Fassero, safety instructor at No.10.

Purpose of visit was to collect face channel, column, and bench samples of the Herrin (No.6) coal. Sampling conditions were somewhat less than ideal in that the roof rock was covered by 4 to 6" of top coal and we were working in a room that soon had to be evacuated so that the continuous miner could resume operations there.

Sample Site #1: Room 8 on AB side of 3rd North panel off 4th West off 1st South off 6th Main West off Main South, or NW¼ NW¼ SW¼ Sec 5, T.12N, R.4W. (Bench smpls # C21110 - C21115)

Roof Shale: med to dark gray, finely laminated, smooth; breaks in angular, sharp-edged blocks; pyrite streaks near base; mod sharp contact with coal.

1.40' Coal: N.B.B, black, hard, cleat mod well-developed; vitrain bands up to .016' thick; attrital coal is mod bright to bright and rather thin banded; calcite and kaolinite on cleats, some cleat pyrite in lower third of unit.

1.43 0.03' Fusain and shale: med to dark gray, mod soft, variable thickness, lenticular, fairly continuous. (excluded from sample)

2.23 0.80' Coal: N.B.B., similar to above, pyrite on cleat surfaces.

2.34 0.08 Shale: dark brownish-gray, hard, smooth, laminated; pyritized laterally in lenses and nodules; vitrain stringers at top and bottom contacts. (excluded from sample)

2.47 0.13' Coal: N.B.B., similar to above, mod cleat development, less vitrain and more of the dull attrital coal than above.

3.45 0.98' Coal: N.B.B., vitrain less than 0.02' thick; attrital generally thin banded and fine grained; mod cleat development; calcite, kaolinite, and pyrite on cleats; contains pyrite, shale, and pyritized shale lenses; also several distinct fusain bands.

3.49 0.04' Shale: med gray, hard, smooth, pyritzed in places; laterally continuous. (excluded from sample)

4.80 1.31' Coal: S.B.B., poorly developed cleat; vitrain bands less than 0.01' thick; attrital is generally thin banded and fine-grained, with a mod dull to dull luster; calcite and kaolinite on cleats.

5.50 0.70' Coal: N.B.B., mod cleat development; vitrain similar to above; attrital coal is mid-lusterous; calcite, kaolinite, and pyrite on cleat; contains a large fusain lense up to 0.20' thick, grades laterally into a pyritic zone of same thickness; this zone contains a vitrain band approx 0.04' thick.

5.60 0.10' Shale: med gray, hard, smooth, partially pyritzed; splits laterally with lower layer slickensided. (Blue Band) (excluded from sample)

7.22 1.62' Coal: N.B.B., black, hard, mod cleat development; vitrain bands up to 0.01' thick; attrital coal is midlusterous and fine-grained; some calcite and kaolinite and a little pyrite on cleats; several distinct fusain bands.

7.39 0.17' Coal: very shaley (bone coal).

7.69 0.30' Coal: N.B.B., similar to 1.62' unit; vitrain bands up to 0.04' thick; much fusain.

Floor Claystone: med gray, mod soft, smooth, carbonaceous streaks near top, some slickensides.

John C. Moore Corporation, Rochester, N.Y. 14604
FORM 180 W

Peabody Coal Co. No.10 Mine Christian County
June 18, 1980

Notes by Steve Danner; accompanied by Phil Bowden, a U. of I. grad student, Suzanne Russell and Jennifer Thompson, both grad students at Penn State Univ., and Jim Fassero, safety instructor at No.10.

Purpose of this visit was to collect face channel, column, and bench samples of the Herrin (No.6) coal. Sampling conditions were ideal for an underground mine.

Sample Site #2: #1 gob room between 6th and 7th East off 1st North off 4th East off Main North, or NW¼ SW¼ SE¼ Sec 23, T.14N, R.4W.

Roof Shale: (Anna) grayish-black to black, hard, dense, very finely laminated; numerous pyrite nodules as well as some large pyrite crystals; also several finely detailed pyritic fossils; breaks in large, irregular, sharp-edged slabs along slate-like bedding planes; numerous slips; lower 0.04' containes numerous pyrite and vitrain streaks, as well as occasional coal stringers; mod sharp contact.

0.79' Coal: N.B.B., black, hard; mod well-developed cleat, calcite and pyrite on cleats, cleat calcite is finely crystalline; upper 0.12' and lower 0.14' of unit is relatively rich in vitrain; rest of unit is approx 20% vitrain and very thinly banded; attrital coal is generally mod dull, however, several 0.05' bands are mod bright.

0.01' Pyrite: hard and lenticular; continues laterally as a lamina of fusain.

0.80

0.98' Coal: N.B.B., similar to above; banding indistinct, more vitrain than above, vitrain bands up to 0.05' thick; attrital coal is very fine grained and mod bright; contains several laminae and lenses of fusain; less pyrite than above.

1.78

0.03' Fusain: mod hard, fairly continuous; contains several vitrain stringers and pyrite lenses.

1.81

2.35 0.54' Coal: N.B.B., similar to above.

0.05' Shale: med gray, soft; some parts are heavily pyritized and hard; contains irregular pyrite bands and some vitrain streaks; lowest 0.01' is mostly bone coal. (excluded from sample)

2.40

2.68 0.28' Coal: N.B.B., similar to above; top 1/3 is rather shaley.

2.71 0.03' Shale: goldish-gray, hard, very pyritic, contains vitrain streaks.

4.31 1.60' Coal: N.B.B., similar to above; cleat mod well developed; mean vitrain thickness of 0.01' with a maximum of 0.12'; attrital is mod dull to midlusterous, finely laminated and fine grained; some calcite on cleats and in vertical fractures.

4.34 0.03' Pyrite: hard, lenticular, fairly continuous.

0.65' Coal: N.B.B., similar to above; mod cleat development; contains several layers of shale laminae.

4.99

5.05 0.06' Shale: (Blue Band) med to dark gray, hard and smooth; contains vitrain stringers and pyrite streaks. (excluded from sample)

5.58

5.59 0.53' Coal: N.B.B., similar to above.

0.01' Pyrite: hard and discontinuous.

6.93 1.34' Coal: N.B.B., similar to above; approx 40% vitrain; attrital coal is midlusterous and fine grained; calcite on cleat; several fusain lenses up to 0.03' thick near base of unit.

Floor Claystone: med gray and mottled, mod soft, irregular contact with coal; some pyritic globules and coaly streaks; no slickensides; possibly calcareous.
Total thickness: 6.93'

Random Notes: Due to the logistics of underground rail travel and our tight time schedule, we were unable to do any real sight-seeing on the north side of Peabody 10. We were able to see one sizable fall in the second entry west of the tracked entry of 1st North off 4th East off Main North. The fall is located just north of the 6th or 7th West entries off 1st North. The fall extends from the middle of one intersection on up the entry for 120 to 150 feet. Approx 15' of top came down, exposing what appears to be 12 to 14' of Anna Shale and approx 1 to 2' of Brereton Limestone. The shale is black, hard, fissile, and contains numerous phosphatic bands and nodules near top. It fell in large, irregular, sharp-edged blocks, completely filling the entry. Apparently the roof bolts did not penetrate the limestone and the roof trusses could not bear the load. Several of the miners told us that the roof trusses were only effective when anchored in competent rock (the limestone). No jointing was noted in the vicinity of the fall. According to the miners, this was an unusually large fall for this section of the mine.

PEABODY COAL COMPANY MINE NO. 10 CHRISTIAN COUNTY

February 3, 1981

Notes of visit by John Nelson, accompanied by Steve Danner.

M.E. Hopkins, now a geologist with Peabody, invited us on this visit. Also joining us on the tour were:

John Acker, Geologist with seismic crew
Garry Garrison, Head of engineering at Mine # 10
Larry Kumamoto, Geophysicist
Joe German

Purpose of the visit was to examine the feature known as the "hill", actually a valley or trough in the coal. Peabody is concerned about mining through this feature again.

The only exposures currently accessible are in the 5½ Main West Entries off the Main South, in the NE¼ NW¼ of Section 34, T. 13N- R. 4W, Sangamon County. Christian Co. The "hill" apparently is a linear feature trending roughly north and south. It was crossed in the 5th Main West in the NE¼ SW¼ of Section 27, but these entries now are sealed. Disruptions to mining patterns in panels suggest that the feature continues farther north, at least as far as the SE¼ NW¼ of Sect. 27. The company now is contemplating mining in the southern part of Sect. 34 and is concerned about possible disruptions to mining from the southward continuation of the structure.

We went underground at the south portal and rode the main line of the 5½ Main West to the "hill" area. The track is in the northernmost of six entries in the 5½ Main West. I do not know how Peabody numbers their entries, so in the notes that follow I am numbering them from north to south; the track entry is Entry 1.

We made a brief stop somewhere along the track to switch out and let supply trips pass. While waiting we had a chance to look at the roof. The roof here is limestone with 0.1 to 0.5 ft of "clod" at the base. As usual, limestone makes very solid roof but the

"clod" spalls from between the header boards. The base of the limestone contains occasional small rounded nodules. Occasional fractures, probably joints, also occur in the base of the limestone; they trend approx. N 70 E. The coal seam is nearly level, with minor undulations. No faults, clay dikes, or other disturbances were noted.

We first tranversed the "hill" along the track entry (Entry 1). Heavy rock dust, debris along the ribs and extensive timbering hinder our view of geologic features. The entry has been graded and does not follow the contours of the coal where the coal dips steeply. I could not get a proper impression of the profile here. The grades in the entry, however, did not seem to be severe and I did not observe any significant offsets or dips greater than 10-15 degrees in the coal itself.

The immediate roof, as seen in scattered exposures, is black, fissile Anna Shale with two well-developed sets of vertical joints. These trend about N 75 E and N 35 W respectively. The shale appears to thicken into the trough. It is 1 to 2 ft. thick on the west flank and 4 to 5 ft thick near the low point of the trough. The rock above appears to be limestone. Just east of the low point of the trough, large heavily pyritized coal balls were seen near the top of the coal on the east rib. The main roof appears to be stable, but is heavily supported with cribs, timbers, and rail bars.

Conditions for observation in Entries 2 and 3 (Entry 3 is belt entry) were as poor as those in Entry 1. One good exposure of strata above the coal was found in a roof fall on the north side of Entry 3 near the low point of the trough. The immediate roof probably is Energy Shale. It is a poorly-bedded shale or mudstone, medium-dark to dark gray, weathering light yellowish to brownish, weak, smooth, poorly laminated, pyritic, and containing Pecten. Numerous inclined

shear fractures are present. The Energy Shale is 8 to 10 feet thick and is overlain by yellowish-weathering, slabby siltstone or sandstone. The upper part of the fall was not accessible for study.

Entry 4 is largely free of rock dust so the roof is well exposed where not hidden by top coal. There is still much debris along the ribs, so the lower part of the coal is buried and we cannot measure its thickness. Similar conditions are found in Entries 5 and 6.

In Entry 4 we traversed the trough from west to east, starting due south of the switch on the track. At the start of the traverse the coal is directly overlain by limestone and is nearly level. Eastward the coal begins to dip gently downward and the Anna Shale appears beneath the limestone. The black, fissile shale gradually thickens eastward as the coal drops. The gentle dip continues for 200 to 300 feet, then the inclination increases sharply into the real trough. Near the "hinge" or break in dip the Anna Shale is 3 to 4 ft thick and it, as well as the upper layers of coal, are offset by several inclined clay-dike faults with thin clay filling. Also noted was a large limestone "boss" protruding almost to the top of the coal.

On the steeply dipping west flank of the trough the strata above the coal are largely hidden by top coal. I did not measure the dip of the coal but guess it to be about 15 degrees at the most. The coal is definitely thickening toward the bottom of the trough and at the bottom it is said to be 10 to 11 ft thick (compared with 6 to 7 ft normally). The upper layers of the coal appear to contain more partings of shale and fusain than usual.

The coal levels out at the bottom of the trough, and here a very large roof fall has occured. A crew is engaged in building an arch and cribbing the fall. Due to loose and fallen debris, direct examination of the roof strata was not safe. The following is an estimated section:

Top of Fall- Dark gray to black shale (?), barely exposed.

8-10' Sandstone, medium-light gray, thickly bedded to massive, appears to have sharp and possibly erosional lower contact. Fallen pieces are micaceous, finely carbonaceous, fine to medium-grained, porous, and slightly friable. Also found are pieces of finely laminated siltstone or silty shale; these were not observed in place

3' (?) Limestone, medium-dark gray, fine-grained, fairly massive except for a few discontinuous shaly partings. Difficult to trace its thickness because it is largely coated with rock dust.

4-5' Shale (Anna), black, hard, fissile, contains large lenses of limestone, with septarian fractures, near base.

Top of Coal.

The coal at the bottom of the trough is fairly level for a distance of 150 to 200 ft. The eastern flank of the trough in Entry 4 is blocked by large roof falls.

Near the eastern edge of the low point in the trough in Entry 6 is a series of huge roof falls that extend through the crosscut northward into Entry 5. These falls apparently are the ones photographed by Heinz Damberger on his visit of 7/2/74.

The fall in Entry 6 is cribbed so extensively that almost nothing is visible in it. M.E. Hopkins climbed up on the cribbing and gave the following estimated section:

Upper part of fall not clearly visible.

4-5' Claystone, mottled greenish, gray and brown. Varigated; soft and weak, slickensided.

3-5' Limestone (Bankston Fork), yellow-brown.

1" Shale , black and carbonaceous, or impure coal

2' Shale or siltstone

4' Sandstone, faintly bedded to massive

1' Shale, olive gray, thinly laminated, contains concretions.
3½' Shale, dark gray; Anna ?
Top of coal.

About 100 ft west of the fall the top coal has fallen away to expose a very dark gray shale with brownish fossil fragments. This shale is very flaky. It resembles shale I have seen elsewhere transitional between Anna Shale and Energy Shale.

In Entry 5 the fall was accessible (in crosscut north of intersection) and the following section was measured:

Top of fall- Base of main bench of Bankston Fork Limestone. This may be broken above the cribbing in the center of the intersection.
0.5' Shale or mudstone, dark gray and yellowish-green strongly mottled, very soft.
0.5' Limestone (lower bench of Bankston Fork), yellowish-brown, fine-grained, nodular, very argillaceous. Thickness varies slightly. Contact irregular.
1.5' Shale, dark gray with light greenish mottling, poorly bedded, soft, unevenly laminated. Sharp contact:
3.7' (varies) Sandstone (Anvil Rock), light gray, fine-grained porous, friable, thick-bedded to massive, contains discontinuous streaks of dark gray shale and also, in lower part, small dark fragments or inclusions. Sharp and even contact.
1.6' Siltstone, light gray, very thinly laminated, with numerous interlams of medium gray silty shale. Fairly sharp, slightly uneven contact:
0.6' Shale, gray to brown, mottled, silty, crumbly and flaky, contains uneven, lenticular banding, finely carbonaceous. Lenses or concretions of dark gray fine-grained fractured limestone near top of unit. Sharp contact:

1.5' Shale (transitional Anna), grayish-black, hard, poorly bedded, not fissile, but evenly laminated; contains very fine fossil fragments and numerous thin stringers of vitrain. Occasional small concretions of limestone. Very gradual change to:

5.0' Shale (Energy), dark gray, becoming lighter downward, poorly bedded, moderately hard, smooth to finely silty, contains occasional thin streaks of coal and very finely disseminated carbonaceous debris. Large brownish concretions of siderite (?) near base.

Coal, not examined, mostly buried by debris.

The profile of the western side of the trough in Entry 6 is similar to that is Entry 4. The Anna Shale thins as the coal rises. Near the hinge point between the steep and gentle dip, again large limestone "bosses and small clay-dike faults are present. Near the base of the trough some extremely coaly black shale with abundant fusian forms the immediate roof; transitional Anna-Energy Shale.

Notes from discussions and examining maps after our underground tour.

Channels- Peabody No. 10 contains several prominent channels filled with Anvil Rock Sandstone; many of these are quite obvious on the mine map from disruptions to the mining pattern. Most are filled with medium-grained, water-bearing sandstone. In some the coal is completely cut out, in others only the upper layers were eroded. According to Hopkins the cut-outs are quite sharp and abrupt but the contacts undulate. Where the sandstone lies close to or directly on the coal, water flowing into mine workings causes serious problems. Most channels are 200 to 400 ft wide and the flanking zones of wet conditions and/or unstable roof are wider.

Fault- Mining at the face of the 3rd Main East off the Main North was halted at a large normal fault. Unfortunately, the area has been sealed so the fault can no longer be seen. The fault trends about N 30 W and has the northeast side downthrown at least 7 ft. According to Bob Danko, superintendent of the mine, the fault had a steeply inclined surface. No one recalls any minor or subsidiary faults associated with the large one. The face of the 3rd Main East is in the SE¼ NW¼ SE¼ of Section 31, T. 14N- R. 3W.

Peabody has done extensive drilling and also has run two seismic lines to locate the northward continuation of the fault, which must be crossed in future mining. One of the seismic profiles which I saw clearly indicates a normal fault with about 15 ft of throw. Some of the sets of drill holes also confirm the existence of a fault with the east side downthrown, but in other sets the coal shows no marked change in elevation even where seismic profiles show a fault. The possibility of two or more faults, possibly forming grabens, was discussed. The drilling and seismic work indicate that the fault continues at least two miles north-northwest from the point where it was met in the mine. Furthermore, the map of the abandoned Peabody No. 8 Mine clearly shows the fault continuing at least as far as the NW¼ SE¼ NE¼ of Section 17, T. 13N- R. 3W. The fault thus has an overall length of at least 6 miles. At one point in Mine No. 8 the fault shows a slight "en echelon" offset.

The linearity and continuity of the fault, the reported high angle of dip, and the "en echelon" offset all suggest that the fault is of tectonic origin. It has similar trend and displacement to faults observed in Crown I and Crown II Mines and in the old Virden Mine, Macoupin County.

The seismic line that showed the fault also bore evidence of two channels possibly cutting out the coal. Peabody intends to use both seismic methods and drilling to locate the continuation of the "hill", as well as channels.

MY INTERPRETATION OF THE "HILL"

An idealized cross-section of the "hill", based on my observations, is on the next page.

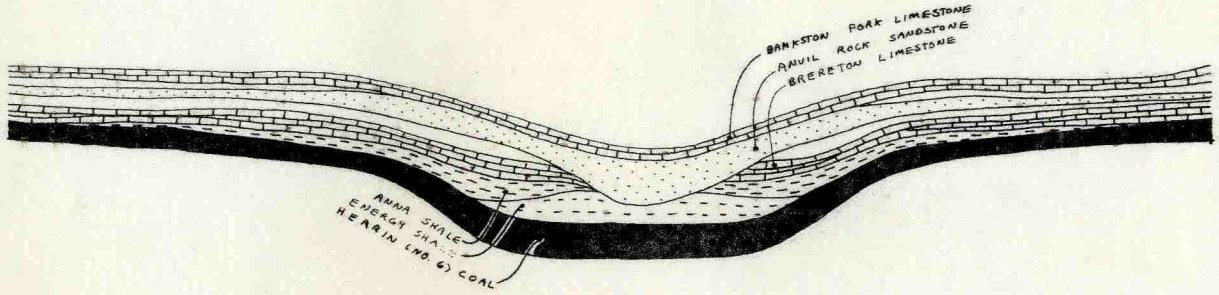
I am convinced that the trough, with its abnormally thickened coal, represents an original sag in the coal swamp and that the sag was maintained as the plant material accumulated. The trough persisted after peat formation as well, and became a locus for deposition of Energy Shale (apparently unusual for this area) and for thickened Anna Shale. The adjacent areas to the trough remained high and did not receive these sediments. A trough still existed during Anvil Rock time as well, and a channel followed the trough. The Brereton Limestone, and in places the Anna Shale and upper layers of the Energy Shale, were eroded in the channel.

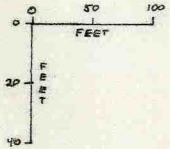
The most likely cause of the original trough is differential compaction of sediments beneath the coal. Unfortunately we have no information on what type of strata underlie the coal beneath the trough. The linear form of the trough strongly suggests that it directly overlies a channel. This channel must have been filled with sediments that compacted more than the surrounding sediments. It may have been filled with mud, and perhaps included a thick deposit of peat. I would not be surprised if drilling below the No. 6 Coal disclosed the presence of another thick channel-fill coal.

If this theory is correct, we can expect the "hill" to continue southward and follow a linear trend, and quite likely it will increase in magnitude. The most important implication for mining is that the channel of Anvil Rock Sandstone which here has eroded only rocks above the No. 6 Coal, may have eroded the coal itself farther south. The feature seems to be larger toward the south, that is, the source of the channels was to the north of the 5½ Main West.

IDEALIZED CROSS-SECTION OF THE "HILL"
IN THE 5½ WEST MAINS OFF THE
MAIN EAST, PEABODY COAL CO.
MINE NO. 10, CHRISTIAN
COUNTY, ILLINOIS.

WEST EAST





BY JOHN NELSON 2/4/81

Peabody Coal Co. Mine No. 10 Christian County
2/3/81

Notes by Steve Danner; accompanied by John Nelson of ISGS. We were escorted by Gary Garrison, Area Engineer for Peabody, and M.E. Hopkins, John Acker, Larry Kumamoto, and Joe German, all geologists or geophysicists from Peabody's St. Louis office. Purpose of visit was to visit an area of the mine known as the "hill". The "hill" turned out to be a north-south trending trough in the 5½ West Mains off Main South.

Location: NE¼ NW¼ Sec 34, T13N, R4W, Christian County.

As mentioned before, the "hill" is really a north-south linear depression in the coal and overlying strata. This valley is roughly 450-500 feet across in the 5½ West Mains. Judging from the pattern of the mined out panels to the north, this synclinal feature may extend for 2000-4000 feet in a northerly or northwesterly direction. Its southern extent is unknown; further drilling will be necessary to determine this.

The typical roof in this part of the mine is 0.5-5.0' of black Anna Shale overlain by Brereton Limestone. The base of the limestone was exposed in many areas along the track entry in 5½ West. This set of mains has been mined out for more than 10 years, hence much of the thin shale has fallen up to the limestone. In the vicinity of the "hill" the Brereton Ls appears to be a good caprock.

Our initial view of the syncline was somewhat restricted because we were on the track entry, which was heavily rock dusted contained much debris along the ribs. Also, this entry was not mined to the bottom of the trough because the tracked vehicles could not make such a grade. As a result, the rails at the bottom lie just above the top of the

coal.

The beds on the flanks of the syncline dipped to the center at 15-20 degrees, with a noticable thickening of the black shale near the bottom. The black shale in the vicinity of the trough displaid two well-developed sets of joints trending N20W and N70E.

There was one curious exposure of weathered shale superjacent to the coal near the bottom of the valley. It was out of reach, but had the same sulfurish-yellow weathering that the gray Energy Shale exhibits elsewhere. It appears that this was the outer edge of a large pod, or lense, of Energy Shale.

3rd Entry, 5½West Mains (belt entry): Traverse across the syncline again. Much rock dust and timbering, poor visibility. Nelson finds a small fall that exposes what appears to be Energy Shale overlain by sandstone.

4th Entry, 5½ West Mains:
In this entry, the syncline has caused considerable trouble. The roof has fallen several times and has formed a large "room" that extends back into the pillars on either side. The roof domes out about 30 feet above the floor. The stratigraphic section between the floor and the roof consists of 11+' of Herrin (No.6) Coal, 4-5' of dark shale (Anna or Anna and Energy), 4' of brownish limestone (Brereton), 6-8' of sandstone (Anvil Rock?), and then, what appears to be several feet of dark, mottled shale.

The roof in this area was severely weakened by the water-bearing sandstone. After the sandstone and underlying strata had fallen, the over lying shale began to slake. At present, a maintenance crew is replacing a set of I-beam arches

that were crushed when a large block of the sandstone fell. The arches are roughly 7' high and 8' across at the base. This area will probably be heavily cribbed to prevent future damage to the arches.

6th Entry, 5½ West Mains:
Once again the roof has failed over the syncline. This fall extends for 2-3 breaks to the east and crosses the pillar line into the 5th Entry. Our view is restricted by the cribbing on both sides and above the entry. The 20-30' high overhead cribs are set on rails and I-beams that span the entry.

M.E. Hopkins scaled the cribs to get a good view of the rock above the coal. His description is in John Nelson's notes.

5th Entry, 5½ West Mains:
Continuation of fall in 6th entry; cribbing on both sides and above. Entry is spanned by rails and I-beams. We were able to climb by the cribs and up the talus slope to the walls of the fall area. John Nelson measured and described the section above the coal; see his notes for details.

An interesting feature of the dark shale overlying the coal is that it appears to represent a transition facies between the Energy and Anna Shales. The lowest 6.8' of this 7.8-8.2' unit consists of dark gray shale with a brownish cast. It is rather smooth and finely laminated, and breaks with a sharp, jagged fracture. Laminae of bright coal are prevelent in the upper half. This shale is hard and shows little fissilty.

The upper 1+' of the unit is the typical black Anna Shale; hard, smooth, finely laminated, sharp brittle fracture. It too contains coaly laminae. The transition from the lower to upper parts of the unit is so gradational as to be barely perceptable.

This "transitional facies" is very similar to that encountered in other mines working in the No.6 Coal. At the Calefy Mine in Vermilion County, there were several large roof falls where 10+' of this transitional shale was exposed. In most cases the shale fell from the base of the limestone.

On the west shoulder of the syncline, the immediate roof shale thins to less than 1.0' and appears to be typical Anna Shale. The shale has fallen in the entry, exposing the base of the Brereton Ls. Several bosses extend down from the base of the ls, one of which probably bottomed out in the coal. Several small clay dikes can be seen in the coal in the ribs on both sides of the entry. The separation is minimal along the dikes, with very little clay filling. These aren't real common in this mine.

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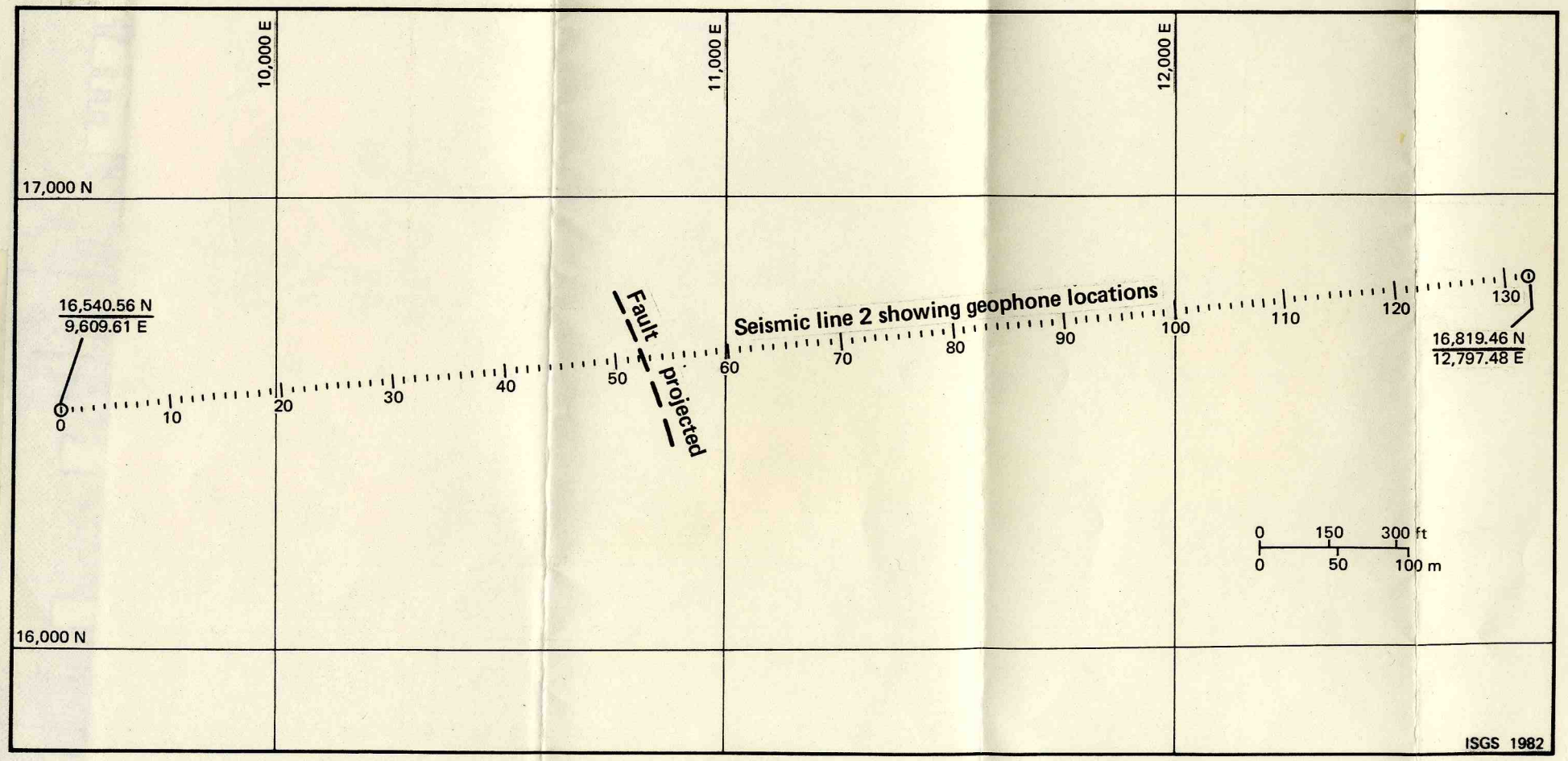

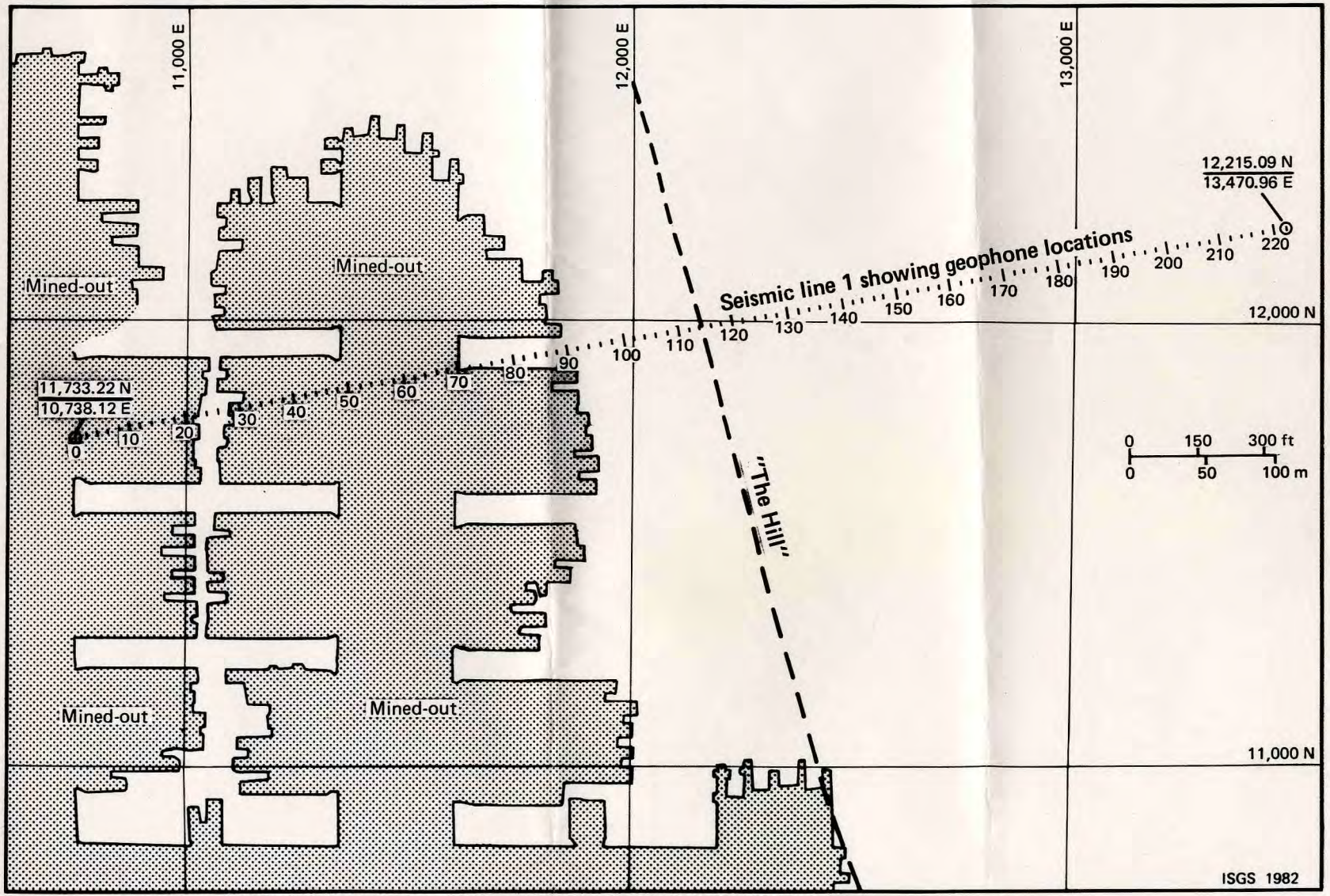
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Seismic line 1 showing geophone locations
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"The Hill"
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Mined-out
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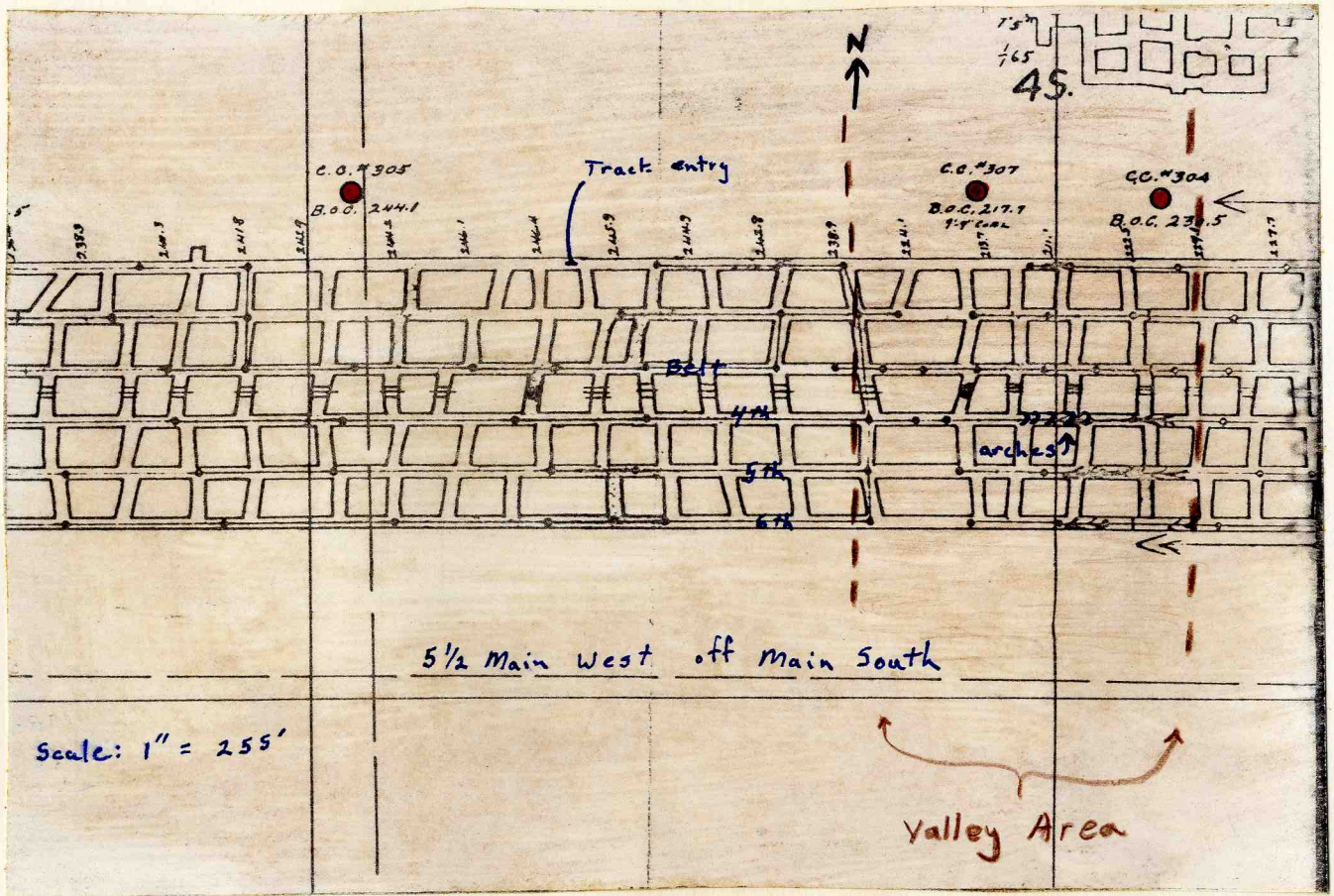
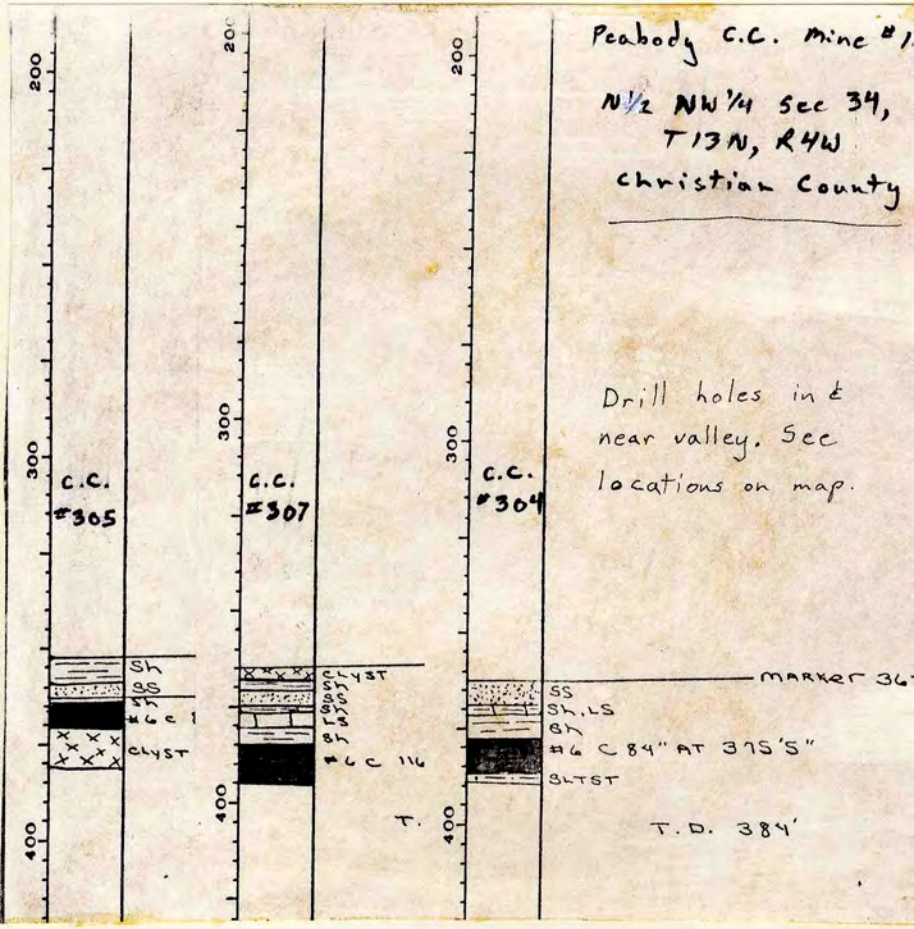
ISGS 1982



Peabody C.C. Mine #1

N½ NW¼ Sec 34,
T 13 N, R 4 W
Christian County

Drill holes in & near valley. See locations on map.



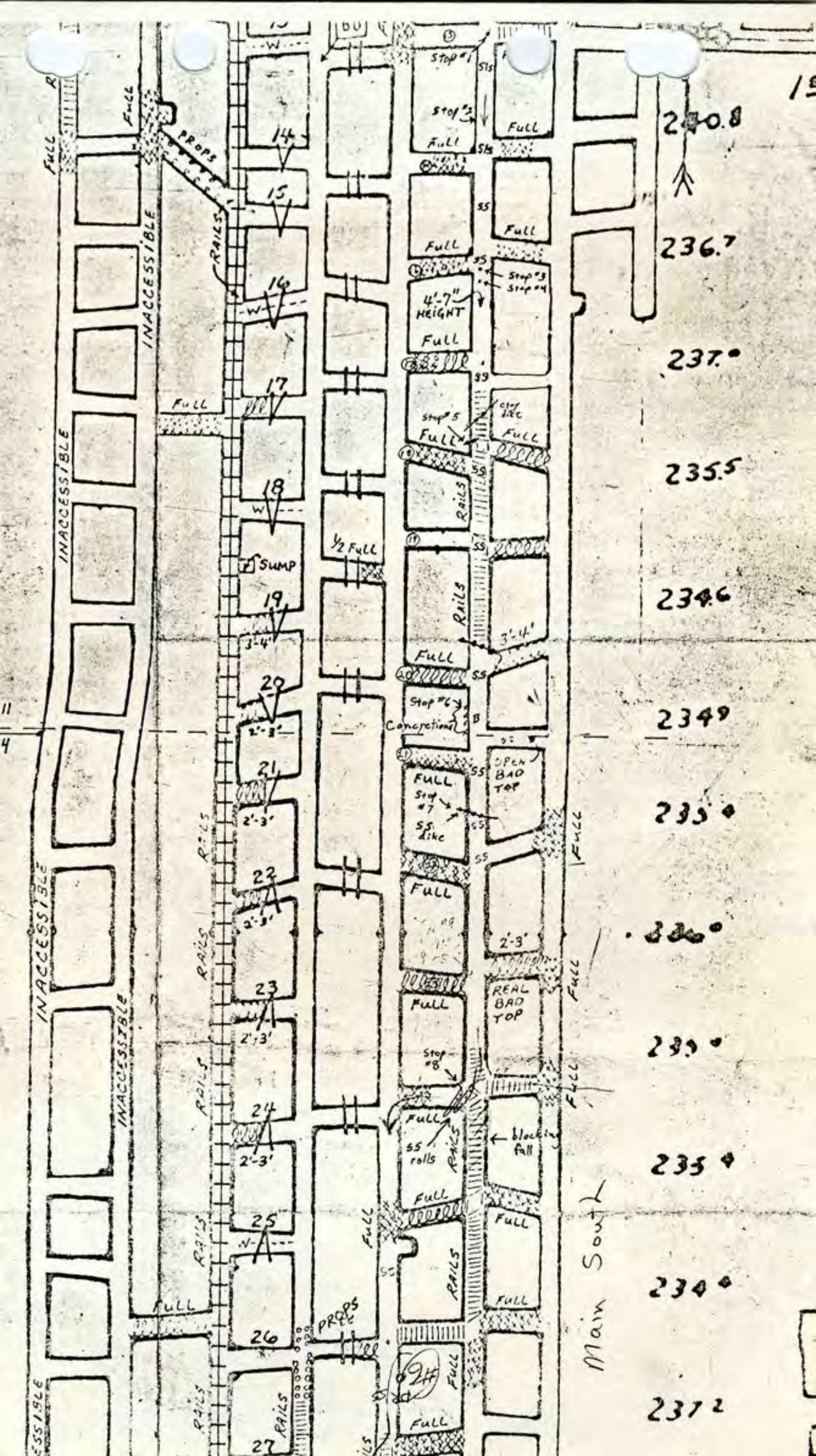
Peabody Coal Co. Christian County
Mine No. 10 8/11/82

Notes by Steve Danner. Accompanied on visit by John Nelson and Don Lumm from the ISGS and by Greg Pinto, a Peabody engineer. The purpose of this visit was to collect information on some of the sandstone channels that have been encountered in this mine. We picked the sites we wanted to visit from the company mine map. Peabody #10 mines only the Herrin (No.6) Coal. All of the coal goes to Commonwealth Edison's Kincaid Power Plant.

Day 1... We visit a channel site on the 4th Main West, just west of the junction with 2nd Main North (SE corner Sec 28, NE corner Sec 33, T. 14 N., R.4W., Sangamon County). The presence of the channel apparently caused some water and roof stability problems during the development of the 4th Main West. This is indicated by several unusually long pillars.

While the sandstone channel occupies part of the immediate roof through here, it doesn't appear to cut down into the coal. At one location in the first entry south of the belt there is only 0.1' of limestone between the sandstone and the coal. At three other exposures of the ss, it overlies one to three feet of black shale.

The channel seems to trend NNE-SSW through here. It is also encountered about 1000' feet north of here in the 2nd Main North entries. It has produced at least a moderate amount of water in the Main West entries as evidenced by the badly deteriorated roof in many places. The roof and ribs have rashed so badly that it is almost impossible to find a place to measure the seam thickness without digging out a foot or two of rubble first. I did just that at Stop #1.



INACCESSIBLE
FULL
PROPS
RAILS
14
15
16
17
18
19
20
21
22
23
24
25
26
27
SUMP
1/2 FULL
Stop #1
Stop #2
Stop #3
Stop #4
4'-7" HEIGHT
Stop #5
Stop #6
Concretions
Stop #7
SS dike
Stop #8
SS rolls
blocking fall
OPEN BAD TOP
REAL BAD TOP
3'-4'
2'-3'
Main South
236.7
237.0
235.5
234.6
234.9
234.0
237.2

Stop #1: Skeleton description of No. 6 Coal at a location 720' west of the junction of Sections 27, 28, 33, and 34. (See map)

Roof: Limestone (Brereton): med gray, hard, dense, knobby basal contact.

1.50'	Coal: NBB
0.05'	Fusain: pyritized
0.83'	Coal: NBB
0.09'	Shale: dark gray
0.78'	Coal: NBB with four thin fusain and shale partings.
0.05'	Shale: dark gray
1.15'	Coal: NBB
0.02'	Shale: pyritized
0.64'	Coal: NBB
0.08'	Shale (Blue Band): medium gray, mid-hardness fairly continuous.
1.15'	Coal: NBB
???	Covered interval, probably less than one foot.

Total thickness: 6.34+'

Stop #2: Sandstone channel exposure.....
The channel is exposed by a small fall in the black shale. About 3.2' of black shale is visible below the ss. Only the lower 0.5' of the ss is exposed. This area is heavily timbered with numerous 3 piece sets (rail cross-bars).

The black Anna shale is hard, brittle, well-bedded, and has a slabby fracture. In many places it has a white filmy coating from weathering (oxidation). There are also many light green and white crystal growths (gypsum??). The shale surrounding the fall is fractured and jointed, and is sagging badly. Were it not for the many rails supporting it, most of the shale would have fallen by now. The joints trend almost exactly N-S.

The sandstone is light gray, fine-grained, very micaceous, mid-hardness, with indistinct bedding and occasional carbonaceous pathches. Weathered surfaces are various shades of yellow, gold, and brown. The sandstone must be moderately competent because only a few small pieces have fallen. It is somewhat porous and permeable because it readily soaks up the 10% HCl solution I applied. It is however non-calcareous.

Stop #3: Location - intake entries of 2nd Main North, about 600-1100 feet north of the 4th Main West. Roof conditions are similar to those in the 4th Main West, with the addition of some patches of gray shale underlying the black shale. Through this area the gray shale ranges from 0-2' thick, while the black shale ranges up to 3' thick. The limestone above the black shale seems to be intermittent through here, possibly due to erosion by the channel. In some of the falls the limestone can be seen capping the shale, in others the limestone is missing and the sandstone rests directly on the black shale.

One feature that seems somewhat unusual is the localization of the severely slip-riddled roof. Small areas of the shale are heavey with slips and slickensides, while adjacent areas show relatively few of these features. This may be due to differential loading of the superjacent sandstone. There may be sandstone bosses or scour and fill structures directly overlying the fracture zones. Just speculation.

Day #2 - We visit a channel site about 1200 feet south of the slope in the Main South. We will map the roof in the 2nd and 1st return entries

from the 1st Main East on south for about 1800'. This area was mined out about 30 years ago so the return entries are not in very good shape. Both roof and rails have fallen in many places. As a result of these conditions, we will have to use the 2nd return for about 900' and then cut over to the 1st return for the remainder of the mapping. Originally the roof was supported with three piece sets, timber leg and rail cross-bar. Most of the rails are severely rusted and look like they could be broken by one good blow with a sledge hammer. In some places so much roof has fallen that there is several feet between the rails and the present roof. In other places the rails have fallen also. All in all, not even a nice place to visit.

We leave the track and enter the returns at cross-cut #12. At this time we are in the SW¼, SW¼, SW¼ Sec 11, T13N, R4W (Christian County), and will be heading south into the NW¼, NW¼, NW¼ Sec 14.

Stop #1: The roof at this location is a very thinly laminated shale and siltstone. Since it has been weathering for over 30 years it is very fissile and friable. Luckily however, there are a few fresh surfaces where the roof has fallen recently. On a fresh surface the rock is a medium reddish-brown color, somewhat mottled in appearance. The laminar nature of the rock is much more apparent on the weathered surfaces where the laminations alternate between very light brown and gray, or between light gray and a dark grayish-brown. Fine carbonaceous debris and much mica are visible on the bedding surfaces. Much of the rock appears to be dusted with sulfur, the result of oxidation of the exposed surfaces. The fresher exposures belie the rocks laminar nature; it appears medium bedded

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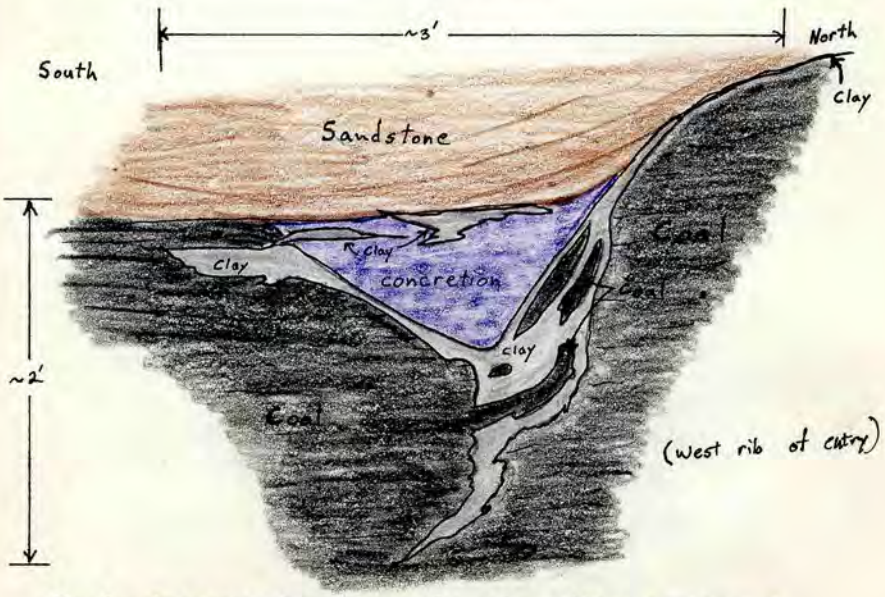
Stop #2: Location - 2nd return entry between cross-cuts 13 and 14. We have just passed under the contact between the aforementioned siltstone and the sandstone channel. The channel has cut down into the coal from a few inches to almost 2'. The coal shows little deformation below the channel. There is just a slight bending of the coal banding in the first couple inches below the contact.

The sandstone is light to medium gray with fine, white, horizontal streaks. It is thin, but poorly bedded, fine-grained, and very micaceous. There is little or no carbonaceous debris in evidence at this site. On the weathered surfaces the sandstone is usually some shade of gold or brown .

Stop #3: Crosscut #16 in 2nd return entry. We have been under the sandstone roof since the last stop. Here it appears massive and fine to medium grained. Some parts of the base of this channel are broad and nearly flat or very gently curving. In other places there are trough-like scour-and-fill structures up to 2' deep. At this stop the contact between the SS and the coal is gently undulating. The scour-and-fill structures are elongated to the NW and SE, with the long axis trending diagonally across the entry. Also, the occasional carbonaceous lamina and partings found near the base of the SS tend to dip gently to the NW.

Stop #4: (see Nelson's notes)

Stop #5: Clay dikes in coal. We have come across a couple of clay dikes in the coal, immediately below the SS roof. Nelson is sketching the first one and I am sketching the second (see next page).

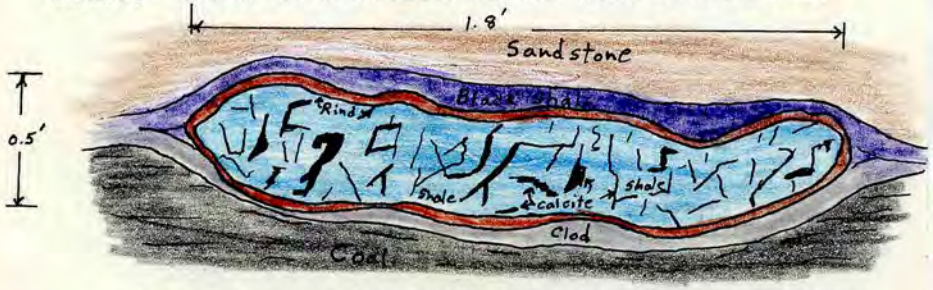


It is interesting that the clay dike occurs at the same location as the concretion. I don't know whether this is just a coincidence or whether there is some sort of relationship here. It should be noted that the dike does not penetrate the SS at this stop, but does follow the SS/coal contact for several feet to the north, as though it had squeezed in between the coal and the SS. It may be that we are only seeing a lateral extension of the dike and that the main body of the dike does in fact penetrate the SS somewhere in the immediate vicinity.

A little farther down the entry we come across a coal stringer in the SS (see sketch below).

There are several other small stringers or rider coals in the vicinity. They are all near the bottom of the SS and all tend to bow down in the middle.

Stop #6: Location; 5-30' north of the North Line of Sec. 14; 2nd return between cross-cuts 20 and 21. There is an intermittently continuous band of septarian concretions between the coal and the sandstone. The concretions consist of small blocks of dark gray to black shale in a matrix of white calcite. These are surrounded by a dark gray and brown rind of shale. These concretions are separated from the coal below by a 0.3-0.4' layer of light gray clod, and from the sandstone above by a 0.3' layer of black (Anna)' shale. Below is a sketch of one such concretion.



A couple pillars south of Stop #6 we encounter a lenticular mass of dark gray limestone, perhaps a remnant of the Brereton Limestone. It has a maximum thickness of about 2.5' and can be seen only in the east rib. The limestone is very dense and finely crystalline. There are numerous small, round , white "dots" near the bottom of the unit, possibly fossil fragments.

Stop #7: Sandstone dike in coal. Along this stretch of the entry there are several SS dikes cutting down through the coal. The thickest one

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contains about 3" of sandstone, is nearly vertical, and cuts down about 1.5' into the coal. The sand in the dike is quite similar to that in the roof. The coal surrounding the dike appears to be cleanly fractured with little or no deformation or bending of the coal bands. The sides of the dike have near horizontal fluting, as though the sand was injected laterally, rather than vertical injection or settling. The upper part of the dike however, is rather uniformly laminated with no deformation of bedding, which would preclude any injection mechanism. The weathered surfaces of the SS dike are very iron-stained and have a light coating of yellow, sulfurish powder. It should be noted that some of the smaller dikes are very pyritzed.

Stop #8: Cross-cut #24 and 2nd return entry. If you read the notes closely you will remember that I mentioned that the scour and fill structures trend NW-SE. Almost all of them that we have seen in this entry have that general trend; that is until now. At this intersection we encounter SS rolls trending NE-SW, almost normal to the trend elsewhere. These rolls may be the remnants of a meander or a tributary of the main channel.

Due to a blocking fall in this entry we have to move over to #1 return entry to continue our southerly heading. In this entry we en counter a good bit of limestone (Brereton) and eventually the black shale roof with a limestone caprock. See Nelson's notes for the journey down the 1st return.

Additional notes:

1) Clay dikes - While the first few clay dikes we encountered did not penetrate the overlying sandstone, we did later find clay dikes

that did propagate up through the sandstone, at least the basal unit. Several could be followed across the entry without much trouble. Usually the lower few inches of the dike would flake out leaving an inverted trough across the base of the SS. How far up into the SS these dikes extended we cannot tell, but I suspect that they pass completely through. If they didn't, we would be hard put to find a source for the clay fill material. As for the dikes that we saw that did not appear to penetrate the SS, they were probably lateral extensions of a dike somewhere in the pillar that did extend down through the SS.

2) It seems that the main channel through here flowed in a north-westerly direction. The few places that indicate a different direction probably represent meanders or tributaries of the main channel. It will take more mapping to determine the true nature of this channel.

SKD
8/12/82

Peabody Coal Co. - Mine No. 10. Notes by John Nelson with Steve Danner and D. K. Lumm. August 11, 1982

Gary Garrison
Greg Pinto (guide)
Dave Gray, Superintendent

Mapping area near junction of 4th Main West and 2nd North, where there is a sandstone-filled channel in the roof. The channel does not cut out the coal, but it made very wet mining.

Numbers refer to locations on field map.

(1) Begin mapping 2nd entry north of track in 4th Main West, west of "channel" area. Here is a small apparently linear roll-like feature at the top of the coal; in cross-section it appears as an irregular lens of black, very coaly shale roughly 2 feet wide. Slickensides in the "clod" mark its NW-SE trend across the entry. On the south rib, just east of the structure, a few inches of black coaly shale with numerous phosphatic lenses occur between the coal and the "clod." This is probably a non-fissile variety of Anna Shale. Slightly farther east this shale becomes thicker, true fissile Anna Shale.

(2) Roof fall exposes base of Anvil Rock Sandstone lying unconformably on about 3 feet of Anna Shale. The sandstone is light gray (when fresh), fine-grained, micaceous, poorly cemented, and irregularly bedded; it contains dark shaly streaks near the base. Locally lenses of limestone - erosional remnants - appear at the base of the sandstone.

The fall is heavily timbered and the roof bad, so not much can be seen in it. 30 feet to the south, in the center of the intersection, the Anna Shale is pinching out and is overlain by very knobby limestone; the sandstone is not visible.

The situation appears to be similar to that at Crown II Mine, where the sandstone occupies long, linear channels that are only locally exposed where roof falls show the erosional contact of the sandstone with the Anna Shale and Brereton Limestone. The sandstone does not come down to the top of the coal here.

(3) This area is still wet, with a little water dripping in places. Many of the roof bolts have popped out apparently because they or their anchors rusted out. The immediate roof is limestone, commonly with a very knobby lower layer that slabs away to expose a smooth, undulating surface above. No sandstone observed. The coal-limestone contact is quite irregular, with numerous broad, low "bosses" below which the coal is deformed.

(4) Continuation of narrow, low black shale "roll" as at Stop 1. This feature runs parallel with the boundary of the Anna Shale and lies 10 to 20 feet beyond that boundary.

(5) On return-air entry (3rd entry from south) a large boss-like protrusion of sandstone depresses the coal. The sandstone body, which is solidly attached to the roof, extends about halfway across the entry, is about 9 feet wide at the north rib, and presses 2 to 3 feet down into the coal. The surrounding roof appears to

be limestone with thin "clod," but this is difficult to determine due to heavy coatings of mud and oxides, along with bad roof conditions that discourage prying. The sandstone is light gray, fine-grained and very hard. The lower surface is coated with mud and crushed shale; lenses of pyritic limestone adhere to it, and in one place coarsely crystalline calcite is present.

This does not appear to be an erosional feature, but rather a load structure of some kind.

East of this Anna Shale comes in as immediate roof; but in places there seems to be dark fine-grained sandstone directly on the coal. Conditions are very poor for detailed study, 50 feet east of the sandstone "boss" a large fall blocks further progress. The fall shows 3 to 4 feet of Anna Shale fallen away from smooth-bottomed limestone or possibly sandstone.

(6) In a large roof fall on the entry east of the track entry in the 2nd North, about 15 crosscuts in by the 4th Main West, the following section is exposed:

TOP

1½' Sandstone (Anvil Rock) - Medium gray, fine-grained, well-sorted, very hard, thickly and irregularly bedded. Highly irregular, lumpy lower contact.

1' Shale (Anna) - Black, smooth, thinly laminated, crumbly; in places shot full of sandstone veinlets that appear to have been injected along bedding planes. Indistinct contact:

2' Shale (Energy) - Dark gray, weathers yellow and orange, smooth to finely silty, lacks lamination, lower portion almost a massive mudstone. Fusain and plant debris common. Pyrite crystals at base in places.

Coal (not described).

Slight water seepage from the roof in this area.

Energy Shale persists over a fairly broad area - not easy to map the boundaries. This section is nearly identical to a common section at Crown II Mine.

CONCLUSIONS

Mining problems in this area apparently were caused by water seepage from the porous Anvil Rock Sandstone, which lies only a short distance above the coal. A few areas are still dripping five years after the area was mined; several people from Peabody told us this part of the mine was extremely wet at first. It is possible that unstable roof also hindered mining here. Certainly there are many falls, especially in the return-air entries (south of the belt) which now are practically impassable. We did not take much time to examine the falls, but most we looked at appeared to involve failure of the Anna Shale (or, locally, the Energy Shale only). The Brereton Limestone makes stable roof as does the Anvil Rock Sandstone, which is fine-grained, fairly massive, and well-cemented where we saw it.

The geology of this area is nearly identical to that in the North Panels at Freeman United's Crown II Mine, where Phil DeMaris and I have done detailed mapping. Conditions for mapping, however, are not as good here as at Crown II. The return-air entries are practically inaccessable except for the "escapeway", much of which runs under severely sagging unsupported roof. The intake-air entries north of the track are open and provide good exposure but there is little of interest to see. The belt and track entries, as usual, are heavily rock-dusted and the belt entry has very little room for walking. In the 2nd North the mapping, conditions, as we saw them, are similar to those in the 4th West. There are many other areas in Peabody No. 10 which would be more rewarding to study than this area.

John C. Moore Corporation, Rochester, N.Y. 14604
FORM 180 W

Peabody Coal Company - Mine No. 10. Notes by John Nelson on visit with Steve Danner and D. K. Lumm, accompanied by Greg Pinto of Peabody.

Reconnaisance mapping of sandstone roof area in Main South immediately south of main slope. Field map and geologic profile included.

Only three entries are accessible in this, the oldest part of the mine, excavated 30 years ago. The accessible entries are the belt, the track, and the return-air escapeway. We walked the latter. This entry is in bad shape despite almost continuous cribbing and rail bars. Nearly all crosscuts are choked with gob and fallen debris and are impossible and/or unsafe to enter. Along the escapeway the coal is largely buried under fallen debris, so we cannot (without extensive digging) determine its thickness. There are numerous discrepancies between our map and the actual layout of pillars, so some locations, especially to the south, may be inaccurate.

(1) Return-air escapeway in Main South at Crosscut 13. This is one of the oldest parts of the mine and the roof is extremely deteriorated; the escapeway maintained by continuous cribbing and rail-bars. The channel-fill deposits lie directly upon the coal. The roof consists mainly of a yellow-weathering very thinly laminated silty shale - appears to consist of alternating beds of siltstone and shale. This rock crumbles and is almost impossible to support. In places there is a basal lenticular well-cemented sandstone a few inches to a foot thick. The contact to the coal definitely is irregular and in places

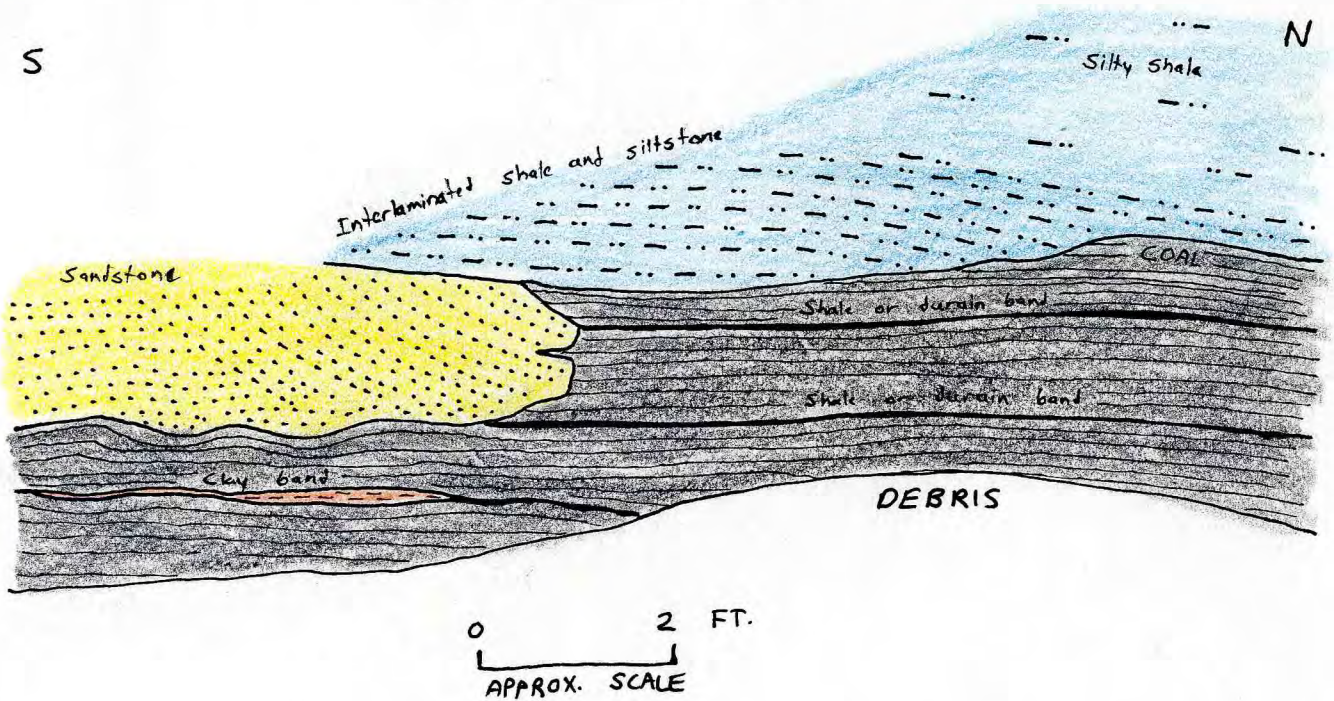
it is clear that some of the coal (peat) was eroded, as the silty shale or sandstone truncates the bedding of the coal. Small "riders" of coal frequently splay off the top of the seam into the shale/sandstone.

(2) Crosscut 14 on return-air escapeway - Very definite erosion of coal seen along the west rib - see sketch. Approximately 1.5 feet of coal has been eroded beneath cross-bedded sandstone (to the south) and silty shale (to the north). The silty shale grades upward to a less silty thickly bedded shale.

(3) Massive sandstone forms the immediate roof here. The sandstone is medium gray (salt-and-pepper), fine-grained, well sorted and well-cemented. It forms a solid and stable roof. The lower surface is smooth and flat to hummocky. A small sandstone dike, about ½ inch wide and a foot or so long, inclined about 40^{o}, penetrates the coal on the west rib.

(4) Channel axis, filled with sandstone as at Stop 3. Between 1½ and 2 feet more coal eroded here than at Stop 3. The channel trends approximately NW-SE and is 20 to 25 feet wide. The margins are rather abrupt, especially on the east rib at the northeast side of the channel where the coal is cut off at a steep angle. The map shows only 4'7" of coal here; I could not confirm this because the bottom of the coal is buried in debris, but in one place I measured 3.2' of coal above 0.1' clay parting that may be the "blue band."

STOP 2. WEST RIB OF
3rd ENTRY FROM EAST.



The bottom of the sandstone body has many rounded flute-like ridges trending NW-SE. On the northeast side of the channel near the roof is a zone of apparently cross-bedded sandstone, with coarse carbonaceous debris on the cross-bed surfaces. The crossbeds dip toward the northwest suggesting that the channel flowed that way.

South of the channel the coal is overlain by sandstone similar to that at Stop 3, with abundant coalified bark and stems at the base.

(5) Clay dike in coal beneath sandstone roof. The dike is about 0.4' wide, steeply inclined toward the north-northwest, and has a nearly horizontal "sill" or offshoot to the north. The filling consists mainly of soft sticky smooth clay, but there is also a large amount of a hard very fine-grained rock, non-calcareous, weathering brown, gray inside. There is no sand or silt in the dike. The coal adjacent to the dike shows typical false drag and definitely has been displaced. There are no bands in the coal that can be positively matched on opposite sides of the dike to determine the amount of offset; however, the amount of false drag indicates about a foot, or maybe a little less. The sandstone above the main dike drops about 0.2' on the northwest side of the dike, but there are no fissures, slips or clay veins in the sandstone. This indicates that the intrusion of the clay and the offsetting of the coal occurred before the coal was eroded and the Anvil Rock Sandstone deposited. However, the "feeder sill" to the north with its brown rock does project up

into the roof and there are slickensides lined with clay in the sandstone. The slickensides and brown rock can be traced diagonally across the entry to the northeast and in the crosscut to the northeast the continuation of the dike is seen. This suggests that the brown rock was intruded or deposited after the Anvil Rock Sandstone was deposited.

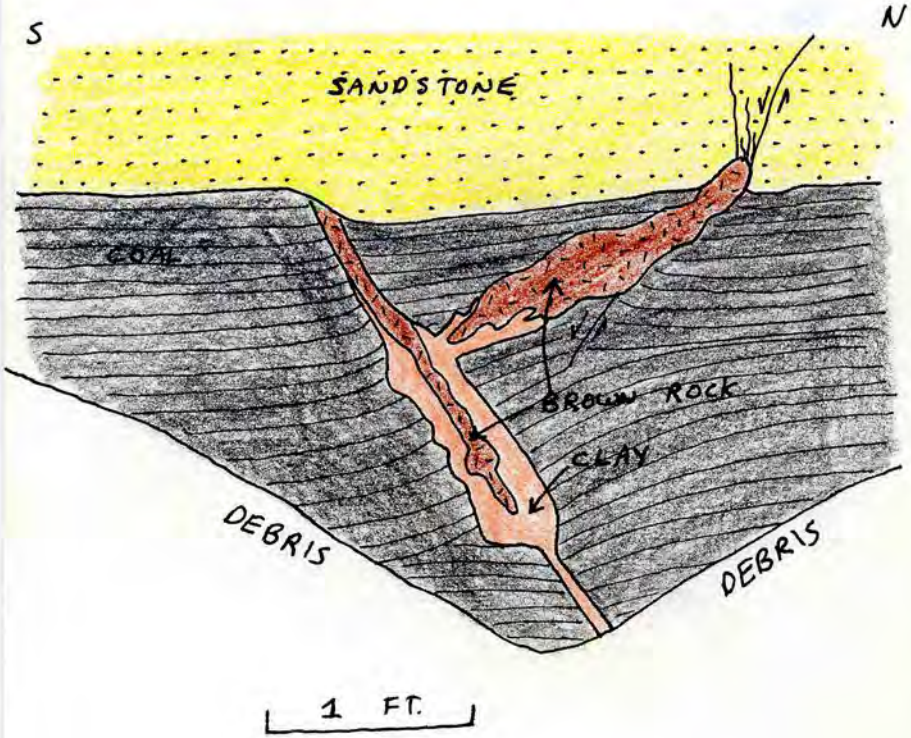
Sketch (over) shows the relationships.

See, however, Steve Danner's observations on other dikes which lead to different conclusions. Reexamination suggests that both the clay and the brown rock were intruded or deposited after the sandstone was in place. The clay may have come in from the feeder sill to the right - it definitely did not come in along the main dike to the left. Another possibility is that the clay came up from below the coal.

(6) Large clay dike crossing the entry east to west. The dike is very irregular in outline and roughly vertical. The clay is gray, soft and sticky, full of coal fragments. In this case the dike very definitely penetrates the sandstone - most of the clay has fallen out leaving an inverted trough in the roof. Clay extends upward at least a foot into the sandstone. A few lenses of the brown rock are present. This dike must have formed after the sandstone was deposited.

(7) Lower surface of sandstone extremely lumpy and "bossy," with several linear rolls of sandstone extending SW or WSW. The rolls are 2 to 5 feet wide and about 2 feet deep. The coal is pushed down beneath them and pushed up between them.

STOP 5 - SKETCH OF CLAY DIKE SHOWING RELATIONSHIP TO ROOF



Between the rolls are apparent erosional remnants of pre-Anvil Rock strata: extremely soft crumpled dark gray to black shale with large septarian concretions. The concretions are of dark gray-brown extremely hard, very fine-grained rock (not limestone) and are shot full of orange to white calcite fracture-fillings.

This may be eroded concretionary Anna Shale.

Impressions of large stems and pieces of bark continue to be common at the base of the sandstone.

(8) Excellent view of sandstone overlying truncated edge of the Brereton Limestone. The limestone has fallen giving an excellent cross-sectional view along the east rib. The limestone overlies a thin basal "clod." The lower half foot or so of the limestone is nodular with partings of dark fossiliferous shale between the nodules. Above that the limestone is massive, dense, fine-grained with scattered brachiopods and crinoid fragments, and contains calcite-filled vertical fractures. The upper surface of the limestone is smooth and even. This is overlain by a few inches of soft crumbly dark gray noncalcareous shale or claystone. Sandstone tops this with a highly irregular contact: many lumpy protrusions of sandstone into the shale. The sandstone is light gray with darker irregular discontinuous laminae; fragments of fusain and coal, possibly also shale, are present.

The dark shale is present right to the eroded edge of the limestone. Beyond this edge are occasional lenses of limestone(?) surrounded by similar shale.

Note that the limestone, except for the basal "clod" does not react with acid (fossil fragments and calcite in fractures do react). The limestone may have been dolomitized or silicified.

(9) Southward the limestone again gives way to sandstone; the contact here, as at Stop 8, trends NE-SW. Just beyond the edge of the limestone on the west rib a mass of sandstone roughly 15 feet across completely displaces the coal. (Coal may be present below floor level, but we cannot see it.) The coal at the edge of this mass is sharply truncated and the bedding turns downward at 45° or greater. In places along the edge there is soft dark shale, shot full of sandstone dikes, between the sandstone and the coal.

(10) Large roof fall in entry east of belt near crosscut. The following section is exposed:

2'+ Sandstone - Medium-light gray, fine grained, massive, well cemented, sharp and slightly uneven contact:

1.5' Siltstone - Light gray, with thin streaks and laminae of medium-dark gray shale; grades downward to firm, silty medium-dark gray shale with lenses and laminae of siltstone. Numerous large oval lenses of medium-dark gray to brown very fine-grained limestone some up to 2 feet long and 0.6' thick. Many have septarian fractures filled with white to brown calcite. Grades into:

1.5' Shale - Medium-dark gray, hard, silty, well bedded, lacks silty laminae.

Top of Coal. Coal covered except at top. Top of seam about 9 feet above floor of entry.

The entire sequence in the fall overlaps the Brereton Limestone and thin Anna Shale at the north edge of the fall.

(11) Not on map - located in Crosscut 11 between No. 2 and No. 3 Returns. Place has been cut down and cribbed. The following section is exposed.

Top of Fall:

3-4' Claystone and/or bony "rash" - Finely crumbled, entirely inaccessible, seen only through gaps in cribbing. Floor is covered with a dark crumbled mass of dark gray shale with yellowish weathered pyrite and gypsum crystals.

1'? Shale - Dark gray, looks carbonaceous and brittle, possibly bone coal - seen through gaps in cribbing.

1' Coal - Upper part very shaly, thinly bedded and crumbled; lower half bright banded and blocky. Seen through cribs.

2' Siltstone - Light gray to light brown, micaceous; thinly and irregularly interlaminated with shale, dark gray-brown, micaceous; coal stringers present; carbonaceous with probable Stigmaria. Sharp wavy contact:

2.8' Shale - Medium-dark gray, upper part fairly firm and massive, pyritic throughout; downward becomes weaker and more thinly laminated; last 0.7 foot or so interlaminated with light gray siltstone. Occasional pyrite concretions near top of unit. Sharp even contact:

Herrin Coal - Not described.

(12) Outside entry at Crosscut 12 - Cribbed fall at intersection exposes very nearly the same section as at Stop 11; the upper coal seam above the cribbing, higher units not exposed. About 3 feet thinly laminated siltstone below the upper coal; sharp contact to 4 feet shale with silty laminae in basal foot.

(13) Fall one crosscut (Crosscut 11) north of Stop 12 exposes:

Base of upper coal, not accessible.

2' Claystone - Carbonaceous, yellowish-brown to gray, very soft.

2.5' Sandstone - With many shaly laminae. Laminae of bone coal at top. Sharp wavy contact.

4' Shale - With siltstone at base, as before.

Herrin Coal.

(14) Fall one more crosscut north (Crosscut 10). Brereton Limestone forms immediate roof to north of intersection; to south it is eroded and replaced by thick lenticular beds of sandstone. At the south edge of the fall the sandstone is about 3 feet thick and overlain by about 5 feet of shale and laminated siltstone/shale. Access very difficult. Upper coal not visible.

CONCLUSIONS AND INTERPRETATION

This is an excellent place to study channel phenomena; however, actual mapping is precluded by the lack of access to most of the entries. Furthermore, all of the adjacent exposures of this particular channel lie in sealed-off abandoned workings.

The geologic cross-section shows quite a variety of facies and features. Note that the cross-section does not include either the northern or the southern edge of the channel area. We did not have time to trace out the full extent of the sandstone roof area.

Peat obviously was eroded in the areas that have sandstone roof. Erosional truncation of bedding is most obvious at Stops 2 and 4 but can be seen on a small scale in many other places. Erosion of the normal roof sequence of the Herrin Coal also is nicely displayed at Stops 8, 14, and elsewhere. Thus it is apparent that sandstone roof occupies the active bed of an ancient watercourse.

The large septarian concretions, shown near Stop 7 on the profile, were first thought to be siliceous but actually appear to be dolomitic. We brought a large example back to the office. The groundmass is grayish-black, very fine-grained, dense and hard, and totally lacks fossils. Fresh surfaces react sparingly or not at all to weak acid but scratched or crushed rock fizzes strongly; the rock will not scratch glass. The septarian fractures are filled with coarse white calcite. The entire conretion has a hard dark brown rim about ½ inch thick. The concretion measures 17 X 6" and one end is missing. There is coal clinging to the lower surface and soft, smooth black shale clinging to the upper surface of the concretion.

I have little doubt that these concretions formed in the Anna Shale before the shale was eroded. When the stream washed through the area most of the Anna Shale was still a fairly soft mud and so it was swept away by the current. The concretions, however, were already hard and very heavy so they simply remained on the bottom of the stream. A thin layer or film of Anna Shale, possibly transported and redeposited by the stream, is the black soft shale found commonly with these septarian concretions.

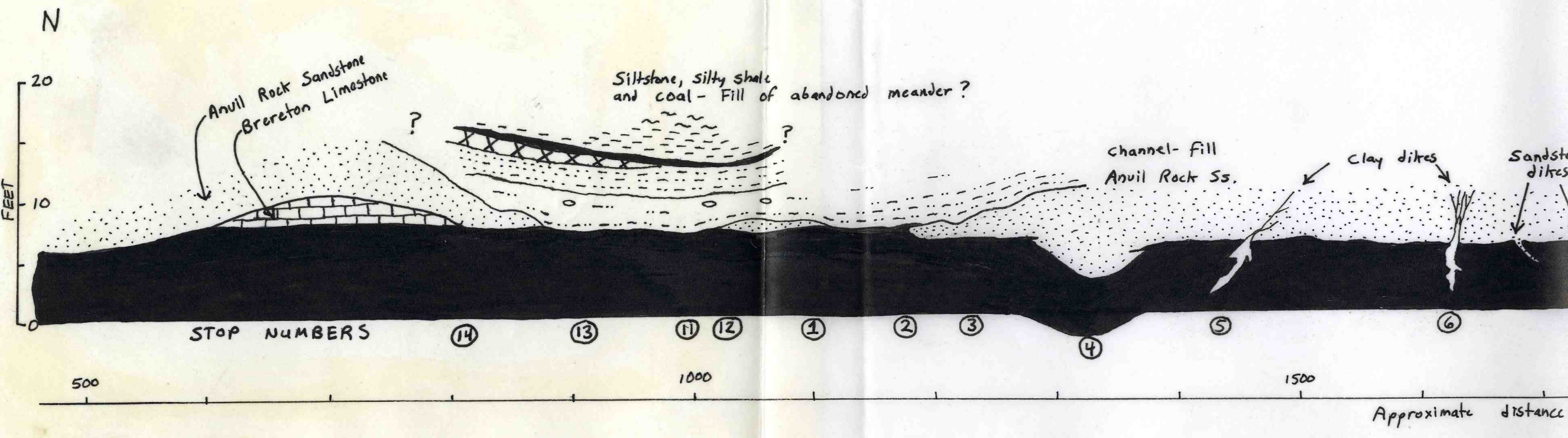
We noted that not only the concretions (ordinarily calcareous) but also the Brereton Limestone adjacent to the edges of the channel tend to be dolomitic. This suggests that the Anvil Rock channels carried a lot of dissolved magnesium that dolomitized limestone.

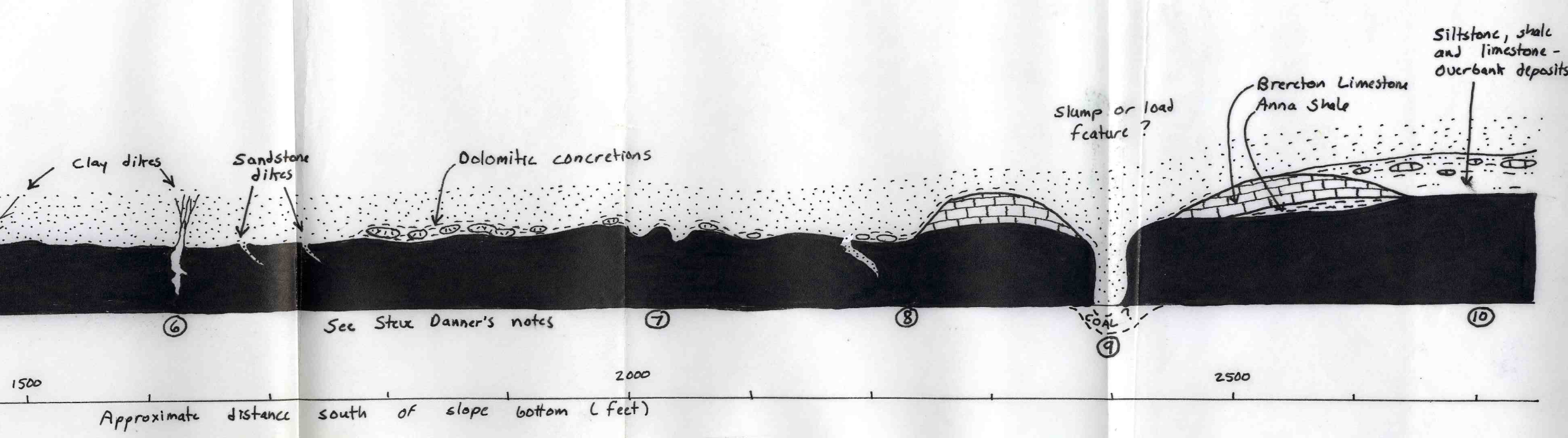
The exposure at Stop 5 was enigmatic, but the one at Stop 6 left no doubt that the clay dikes formed after the Anvil Rock Sandstone was already in place. The sandstone dikes obviously formed during or after deposition of the sand. Why some dikes contain clay, and others sand, I cannot explain. I should mention that we saw a nice clay dike not far from the slope bottom under limestone roof. I cannot say where the clay came from although I presume it came from above the Anvil Rock Sandstone. Incidentally, the "brown rock" found in some of the clay dikes seems to be dolomite.

Sandstone probably represents the filling of active channels. The siltstone, shale, claystone, and coal at Stops 11, 12, and 13 may represent the filling of an abandoned channel analogous to a bayou or oxbow lake. Coal could reflect the final stage of succession when the channel was completely silted up and vegetation became established on top of the mud and silt. This type of sequence, with a coal, is rather common in Peabody's drill cores around the mine and also has been seen at other mines in the area. It is unfortunate that there were not better exposures here.

The rock sequence at Stop 10 is quite unusual - I have never seen anything like it in a mine before. A basal dark gray silty shale coarsens upward to a siltstone with shale laminae; limestone concretions are abundant in the upper part of the unit. The siltstone is sharply and irregularly overlain by sandstone. A look at the profile suggests that the silstone/shale/limestone may be an overbank deposit of the Anvil Rock channel. Notice that there is a wide barrier, or bank if you will, of Brereton Limestone between the siltstone/shale/limestone and the main sandstone-filled channel. Thus while the stream was actively flowing at Stops 7, 8, and 9, Stop 10 was protected behind the banks and received only occasional influxes of sediment during floods. There was plenty of lime in the water from the Brereton Limestone and this precipitated out of the sediment later to form limestone concretions. Eventually the channel aggraded and then migrated laterally to scour the top off the overbank deposits and lay sandstone in their place.

The mine map shows a rather complicated pattern of channels in this area - at least the map shows linear unmined areas strongly suggestive of channels. The largest channel trends southeastward from our study area. It appeass to curve around toward the southwest on the west side of the Main South, and it may split into two branches. Another possible channel may run northeasterly away from our area. Maybe two or more streams that existed at different times have their deposits superimposed here.


N
20
10
0
FEET
Anvil Rock Sandstone
Brereton Limestone
?
Siltstone, silty shale
and coal - Fill of abandoned meander ?
?
channel- fill
Anvil Rock Ss.
Clay dikes
Sandst
dikes
STOP NUMBERS
14
13
11
12
1
2
3
4
5
6
500
1000
1500
Approximate distance


Clay dikes
Sandstone dikes
Dolomitic concretions
Slump or load feature ?
Brereton Limestone
Anna Shale
Siltstone, shale and limestone - Overbank deposits
6
See Steve Danner's notes
7
8
COAL ?
9
10
1500
2000
2500
Approximate distance south of slope bottom (feet)

John C. Moore Corporation, Rochester, N.Y. 14604
MOORE'S MODERN METHODS
FORM 180 W

Visit to Peabody C.C. Mine No. 10, Christian County, Illinois. Wednesday, August 11, 1982. Weather: Partly Cloudy, 55-75°F. Notes by D. K. Lumm, ISGS. Partners: W. J. Nelson, S. K. Danner, ISGS. Guide: Greg Pinto, Mining Engineer, Peabody C.C.

Purpose of visit is to examine and map sandstone channels which have eroded or partly eroded the Herrin (No. 6) Coal. W. J. Nelson is attempting to map the channels and their boundaries with drill hole data. Our visit should facilitate the mapping of the channels where data is sparse, to note the relations of the various channels, and to observe sedimentological conditions and hypothesize on the environments of deposition.

This is the first day of a scheduled two-day visit. Today we will concentrate our work in the 4th Main West and in the 2nd Main North off the 4th Main West. Peabody has provided us with 1" = 100' maps of these workings. Locations referred to in notes are represented on such a map provided herein.

Mr. Greg Pinto, Mining Engineer, Peabody Coal Co., will be our guide for this visit.

Additional Notes:

Peabody intends to mine the Springfield (No. 5) Coal where it becomes thicker to the north and where the Herrin (No. 6) Coal becomes thinner than 6 feet. The interval between the two seams in the northernmost workings is about 25 feet.

The mine has the capacity to operate 12 units but is currently operating 5 units. 2 units on the north side employ conventional methods.

Unofficial total production through 1980 is a whopping 115,697,693 tons! The 100,000,000th ton was mined on 4-5-74 at 9:28:47 a.m.

In-Mine Visit

Stop 1. Location: Near center of south facing rib 2 entrys N or E-W track and between 13th and 14th intersection W of N-S track, 4th Main West; 40' SL, 910' EL, 28-14N-4W.

A persistent shale band 1" thick occurs approximately 2.0-2.5' from the top of the coal seam. The shale is dark gray and silty.

"Clod" or calcareous shale 0.1-0.5' thick occurs as a transitional unit above the coal and below the Brereton Limestone. I believe that this unit is associated with swamp facies.

The Brereton Limestone is very nodular. I cannot determine its thickness.

Stop 2. Location: Near northern corner of west facing rib 1 3/4 entrys N of E-W track and 12 intersections W of N-S track, 4th Main West; 0'SL, 640'EL, 28-14N-4W.

The roof consists of "clod" interfingering with the No. 6 Coal at the base of the roof. The Brereton Limestone is the principal roof type.

The following is a measured section of the Herrin (No. 6) Coal:

	Thick.	Bed	Description
	0.43'	coal	bright banded, thinly laminated vitrain and clarain; some vitrain laminae up to 0.02' thick; white to brownish calcite abundant on cleat.
0.44	0.01'	fusain	locally with bluish sulfate.
1.20	0.76'	coal	bright banded as above.
(1.23)	0.03'	shale	dark gray, crumbly, interlaminated with fusain and a little pyrite.
2.06	0.83'	coal	bright banded as above, with yellowish oxidized pyrite.
2.09	0-0.03'	shale	olive gray, firm, carbonaceous, pinches out laterally.
2.78	0.69'	coal	bright banded as above.
2.83	0.05'	shale	brown to black, firm, carbonaceous, pyritic, varies in thickness.
4.02	1.15'	coal	bright banded as above.

Thick.	Bed	Description
0.01'	shale	black with crumbly sulfates.
0.74'	coal	bright banded as above, many laminae of fusain in upper part.
0.10'	claystone	"blue band," olive gray with dark mottling, stringers of coal common, pinches out locally.
2.08'	coal	bright banded, many laminae of durain in upper 0.6'.
?	underclay	olive gray, soft.

END SECTION

6.91' = total thickness

Stop 3. Location: Near center of S facing rib, 2 entries N of E-W track and 10½ intersections W of N-S track, 4th Main West; 40'SL, 610'EL, 28-14N-4W.

Lenses of black shale 0-0.6' thick occur and contain thin coal laminae. The shale is quite hard, very thinly laminated to nonbedded but is not brittle; this is not the Anna Shale as such but stratigraphically conforms with the underlying No. 6 Coal and the overlying limestone.

Stop 4. Location: Roof of 9th N-S crosscut W of N-S track and between 2nd and 3rd entries N of E-W track, 4th Main West; 50'SL, 450'EL, 28-14N-4W.

Heavily timbered and cribbed crosscut where roof has fallen has revealed the presence of the following strata overlying the No. 6 Coal:

0.05' shale - dark brown, hard, calcareous, similar to a "bastard" limestone.

3.5' (approx.) shale (Anna) - black, brittle, fissile, carbonaceous.

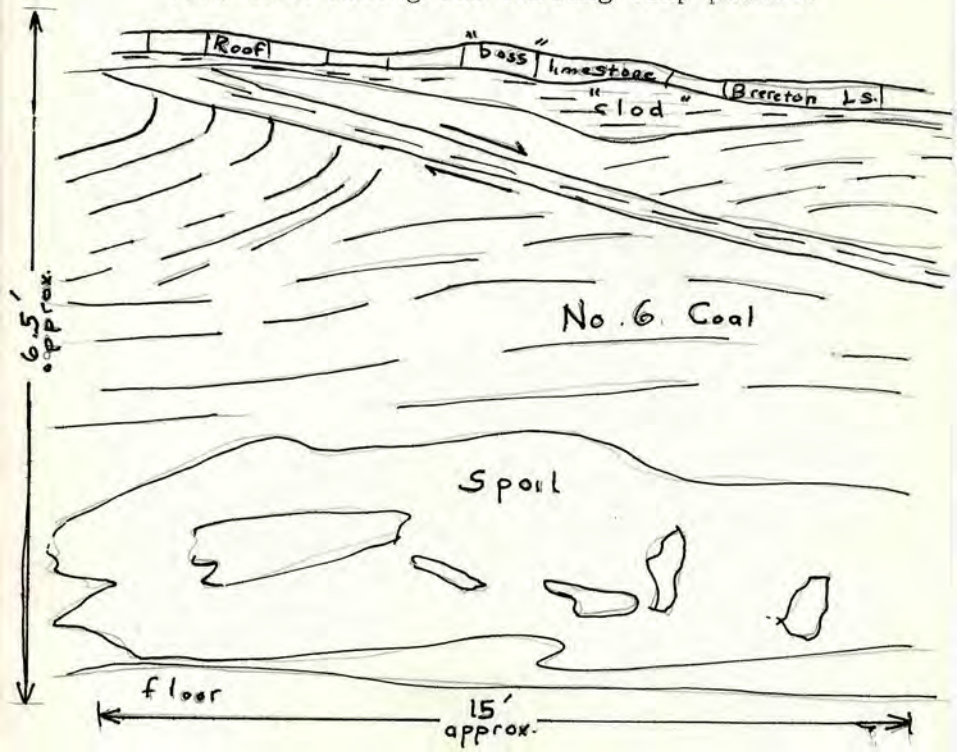
0-0.4' limestone (Brereton) - very nodular or knobby, discontinuous.

0.3-? sandstone (Anvil Rock) - medium gray, fine to medium grained, well cemented, medium bedded, micaceous, quartzose, some ferruginous laminae.

Stop 5. Location: Near W corner of N facing rib 2 entries N of E-W track and 8 3/4 intersections W of N-S track; 10'SL, 390'EL, 28-14N-4W

A few slip planes occur along bedding planes in the upper 2.0' of the No. 6 Coal; some of the beds show a minor amount of displacement. The roof strata do not display any signs of disturbance; the underclay and lower 3.0-4.0' of the coal seam could not be observed due to slumping.

View of N facing rib showing slip planes:



Stop 6. Location: Roof of 2nd entry S of E-W track and 7¼ intersections W of N-S belt, 4th Main West; 270'NL, 340'EL, 33-14N-4W.

Roof fall has exposed the Anvil Rock Sandstone. The sandstone is fine to medium grained, wavy bedded, slight forset bedding, micaceous. At least 3' of sandstone is exposed, which overlies approximately 2.0-2.5' of Anna Shale. The Brereton Limestone is not present and assumed to have been eroded; it is present, however, beyond the immediate roof fall area to the W and beyond the 1st intersection to the E.

Stop 7. Location: Near SE corner of E facing rib 1 entry E of N-S track and 14¼ intersections N of E-W track, 2nd Main North; 950'SL, 360'WL, 27-14N-4W.

Roof fall has exposed the following strata over the No. 6 Coal:

2.0' shale (Energy) - dark gray, silty, carbonaceous, thinly laminated, appears massive.

1.5-2.0' shale (Anna) - dark gray to black, fissile, brittle, carbonaceous, contains numerous partings on laminae of medium gray silty shale or siltstone.

+2.0' sandstone (Anvil Rock) - medium gray, fine to medium grained, wavy trough cross bedding, micaceous, ferruginous.

A sample of siltstone within the Anvil Rock Sandstone was taken.

END OF VISIT

Visit to Peabody C.C. Mine No. 10, Christian County, Illinois. Thursday, August 12, 1982. Weather: Partly Cloudy, 60-80°F. Notes by D. K. Lumm, ISGS. Partners: W. J. Nelson, S. K. Danner, ISGS. Guide: Greg Pinto, Mining Engineer, Peabody C.C.

This is the second day of a scheduled two-day visit. For the description of the purpose see notes of 8-11-82. Today we will concentrate our work in the Main North entries south of the slope portal. Peabody has provided us with 1" = 100' maps of these workings. Locations referred to in notes are represented on such a map provided herein.

Mr. Greg Pinto, Mining Engineer, Peabody Coal Co., will be our guide again.

In-Mine Visit

We made a brief visit to the central hopper, a 1300-1400 ton storage vessel where all mined coal is transported before it is sent by conveyor belt to the surface via the Central Slope.

Stop 1. Location: Roof of intersection of Crosscut #13 and 2nd entry E of N-S track, Main North; 600'SL, 950'WL, 11-13N-4W.

A very thinly laminated silty shale forms the immediate roof here. Labeled as "fall" on the 1" = 100' map, much of the fallen debris has been piled to the sides of the ribs and an unobstructed path remains. The shale is brownish gray to tan, micaceous, very brittle, crumbly; it may represent a splay deposit of overbank deposition.

Medium bedded siltstone approximately 1.0' thick is present in areas of roof falls. Sandstone is not present here but was present in track entry on the hike into this location.

Stop 2. Location: Roof of 3rd entry E of N-S track and 2½ crosscuts S of Crosscut #13, Main North; 370'SL, 1030'WL, 11-13N-4W

The roof is composed of sandstone here. The clasts are light brownish gray, fine grained, well sorted, and moderately indurated; it contains thin beds having parting lineation.

There are several localities where the coal has been partly eroded where a sharp wavy contact between the coal and sandstone exists. The sandstone appears to be wavy bedded and massive, containing thin coal stringers or carbonaceous shale partings; in other localities, however, it is thinly bedded and alternates with a thinly bedded gray shale, producing a varied appearance.

Stop 3. Location: Roof of 3rd entry E of N-S track and 4½ crosscuts S of Crosscut #13, Main North; 200'SL, 1020'WL, 11-13N-4W

Massive sandstone forms the immediate roof here. The clasts are medium gray, medium grained, well cemented, moderately well sorted, moderately well indurated; the rock is micaceous and contains cross bedding.

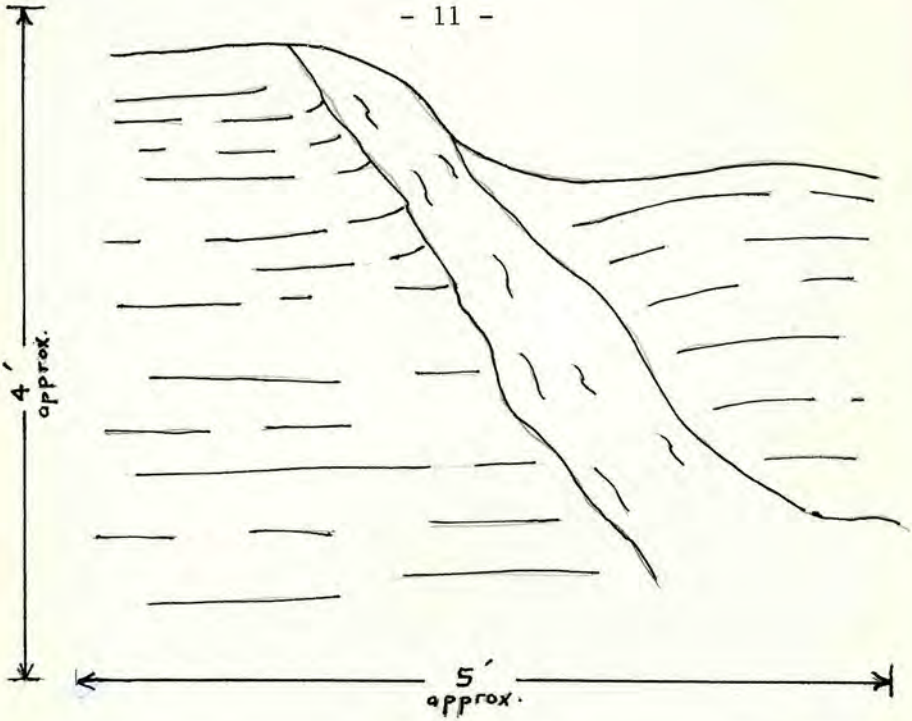
I am unable to determine the paleocurrent direction from the cross bedding and other sedimentary structures. There are several log or tree like casts present on the immediate roof which have no preferred or dominant orientation.

Stop 4. Location: Near N end of E facing rib in 3rd entry E of N-S track and 5¼ crosscuts S of Crosscut #13, Main North; 150'SL, 1020'WL, 11-13N-4W

This location is the same as that described in Stop 5 by Nelson. A clay dike is present in the E facing rib about 15-20' S of 3-way intersection. The dike varies from 3-5" in width and consists of clay, medium gray, soft, smooth, with carbonaceous inclusions but is noncalcareous. There is approximately 6-12" of normal offset where the dike has intruded the coal; evidence for this is a yellowish oxidized pyrite band which possibly may be traced or appear to be offset across the clay band; in addition, the sandstone has filled in or was deposited in the void adjacent to the hanging wall. False drag is also present. See sketch below.

A question of considerable intrigue is whether the dike is younger, older, or the same age as the Anvil Rock Sandstone, of which the roof is composed. No fractures, offset, or slickensides are present on the sandstone, while the coal seam shows 6-12" of offset. On this basis the sandstone is presumed to postdate the clay dike.

The dating relationship becomes confusing.



Stop 5. Location: E facing rib of 3rd entry E of N-S track entry between 6th and 7th crosscuts S of Crosscut #13, Main North; 0-20'SL, 1020'WL, 11-13N-4W

The Anna Shale has a zone of septarian nodules developed in the lower 1.0'. These are believed to have formed by removal of the soft muds by fluvial activity leaving the already hard concretions as a lag deposit, the irregular network of internal polygonal joints and fractures is filled by secondary calcite and the matrix is dolomitic. Samples were taken by Danner. See his notes.

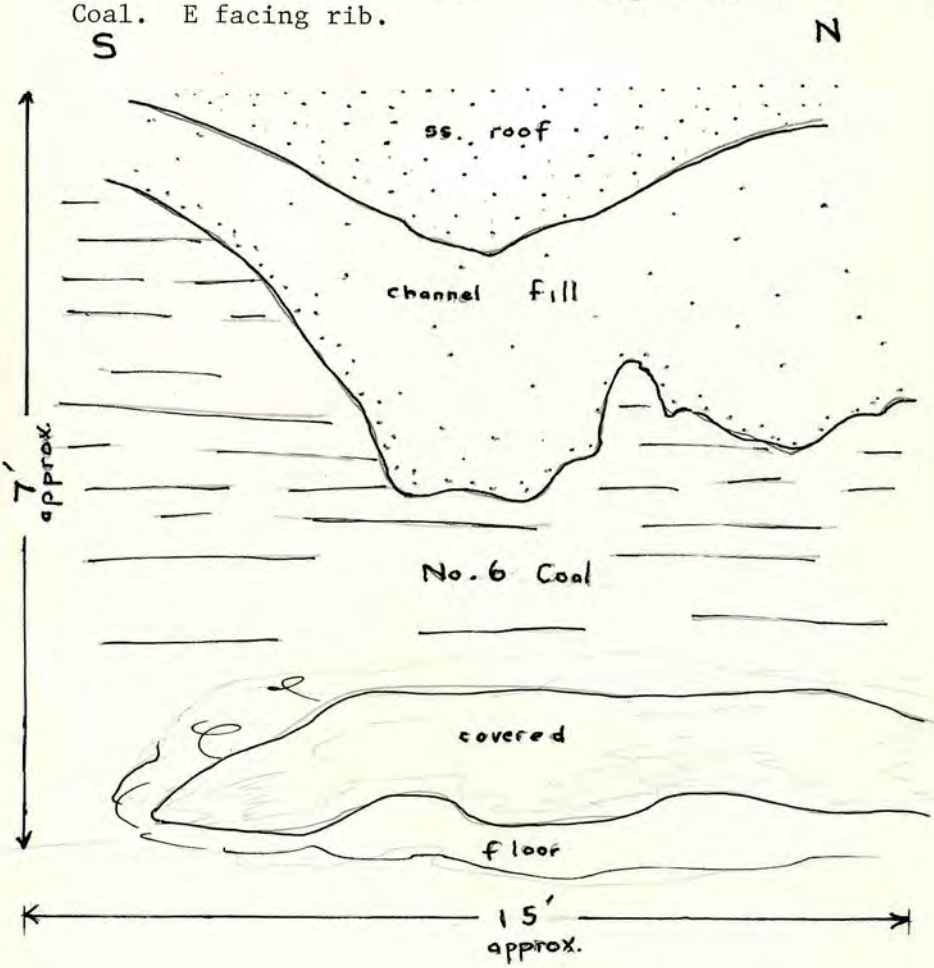
Stop 6. Location: Roof of 10th intersection S of Crosscut #13, 3rd entry E of N-S track, Main North; 300'NL, 1030'WL, 14-13N-4W

At this location the roof consists of massive sandstone having numerous "bosses," some of which may be nearly 3' in diameter. They appear to have been concentrated in linear trends; one grouping trends N 25 E. This trend contradicts NW trends measured by Danner further north of here. I cannot determine as yet whether the conflicting trends represent a meander bend or if two channels are present. Nelson and Danner are inclined to support the latter; see their notes.

Stop 7. Location: Near N corner of E facing rib, 2nd entry E of N-S track; 14¼ crosscuts S of Crosscut #13, Main North; 730'NL, 960'WL, 14-13N-4W

A narrowly incised sandstone channel has eroded 3.0-3.5' of the No. 6 Coal. The erosional surface is irregular and locally contains soft gray clay. The channel fill does not penetrate the underclay.

Sketch of local channel filling in No. 6 Coal. E facing rib.



Stop 8. Location: E facing rib in 2nd entry E of N-S track, between 17th and 18th crosscut S of Crosscut #13, Main North; 1020'NL, 960'WL, 14-13N-4W

The Anna Shale is locally developed here and is a lenticular shaped deposit in this pillar and the one to the north. It becomes nearly 10" thick before pinching out at the S end of the pillar. Sample taken.

A dark gray silty shale immediately overlies the No. 6 Coal S of where the Anna Shale pinches out. Nelson believes this unit to belong to the Lawson Shale/Anvil Rock facies, as it is seen to overlie a thin edge of the Brereton Limestone further S.

END OF VISIT

Summary of In-Mine Visit

Purpose of visit is to examine and map sandstone channels which have eroded or partly eroded the Herrin (No. 6) Coal. First day of two-day visit was spent in 4th Main West and 2nd Main North off 4th Main West. "Clod" and Energy Shale lenses occur locally. Sandstone probably of the Anvil Rock sheet facies occurs above these units and the Anna Shale and Brereton Limestone but could only be detected in roof fall areas. Sandstone channel fill sediments are not found to overlie or erode the coal in any localities. Second day was spent in Main North in workings south of the Central Slope. Channel fill sediments locally erode the upper part of the coal seam. Numerous facies changes are present in the roof.

Energy Shale, Anna Shale, Brereton Limestone, Lawson Shale, Anvil Rock sheet and channel facies all occur locally as the immediate roof type. Facies changes are gradual to abrupt. Variations in the paleocurrent trends vary from N 25 E to NW. The field observations lead us to believe that the channel was a meandering type. Additional mapping is necessary to map the channel axis and to determine its relationship to other areas yet to be mapped where "washouts" or channels have been reported.

PEABODY COAL COMPANY MINE NO. 10 CHRISTIAN COUNTY
February 21, 1983. Notes by John Nelson, accompanied by Steve Danner, Don Lumm and Cheri Chenoweth from the Survey, also John Ewell and Edward "Babe" Drea from Peabody.

Visit to face of 3rd West off 2nd North off 4th Main West to examine cause of unstable roof and water influx that has forced a halt to mining activities.

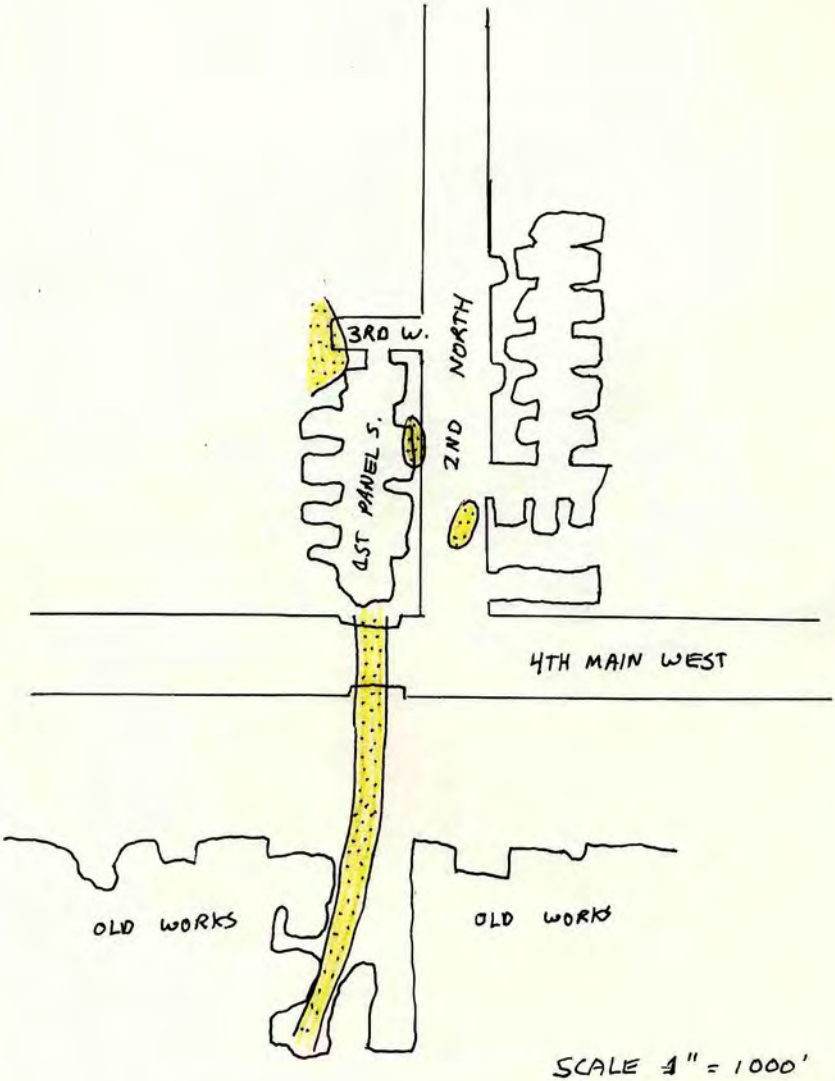
We went down the north portal. While standing near the shop waiting for our ride, we noticed a number of coal balls in the top coal that forms the roof of the entry. The coal balls are shaped like a discus and are a foot or slightly larger in diameter. They are composed of brownish calcite. The rock overlying the coal is not exposed, and the coal on the ribs is coated with sealant, hindering further study.

In the 3rd West off the 2nd North, we saw the first evidence of trouble about 300 feet outby the face on the travel entry. Roof falls expose light gray, fine-grained sandstone overlying 3 to 4 feet of Anna Shale. The contact is sharp and irregular.

Close to the face of the left-hand entry sandstone is almost directly on top of the coal, with only a thin layer of soft, deformed shale between coal and sandstone. The sandstone has a very "rolly" lower surfaces with large rounded hummocky bulges as much as 10 feet across. Locally pebbles or angular clasts of shale are seen at the base of the sandstone. Sandstone dikes and sand-filled fractures are common; fractures trend dominantly northwest but several other directions are seen. The sand penetrate the shale and locally a short distance into the coal. As far as I can tell no coal has been eroded: the bulges of sandstone probably are load or slump features.

The sandstone is light gray, fine-grained, very argillaceous, very micaceous, and massive to faintly laminated. It is porous and bears plenty of water.

John C. Moore Corporation, Rochester, N.Y. 14604
FORM 180 W



SKETCH MAP SHOWING AREAS OF SANDSTONE ROOF

The shale beneath the sandstone is very dark gray to black and thinly laminated but not fissile. Near the base are many flattened nodules of crystalline pyrite. Below this is a transitional layer of hard, lustrous, low-density canneloid coal, up to 4 inches thick, grading at the base to normal banded coal. I believe the shale most likely is Energy Shale, but another possibliity is that is represents an earlier stage of channel-filling than the sandstone. It weathers yellowish rather than bluish, and lacks concretuons, phosphatic lenses and other features diagnostic of Anna Shale.

At the northern faces of the 3rd West less sandstone is exposed but the workings are still very wet. The top of the entry is in top coal or black shale.

The coal is about 7 feet thick at one of the few places where the entire thickness can be measured. In most spots the bottom of the seam is under water or mud. The "blue band" is about an inch thick and 2 feet above the underclay. Above the "blue band" are several additional partings of pyrite and dark shale, none of which appear to be continuous.

On the northernmost entry, about 4 crosscuts outby the face, is a large roof fall exposing 6 feet of very dark gray shale overlain by sandstone. The shale appears as before, with pyritc lenses and about 3 inches of canneloid coal at the base. The sandstone is medium gray and very fine-grained, almost siltstone; it is interbedded with dark gray siltstone and silty shale. The laminations are parallel and regular, or nearly so. Bedding planes are coated with coarse mica and carbonaceous flakes.

Many clay-lined, slickensided compactional faults penetrate the dark shale below the sandstone.

At the northwest corner of the face of Room 1 West of the 1st South Panel off the 3rd West is a dripping wet intrusion of sandstone (?). We could not examine it directly because the roof is not supported. In the remainder of the room the coal is overlain by

knobby nodular limestone with thin basal "clod". The roof at the face of Room 2 West is thin Anna Shale (definite) overlain by nodular limestone. The roof is wet, but no sandstone is exposed. A planar slip trending N 35 W crosses the room near the face. Apparently these two rooms were mined up to the edge of the channel.

In summary, we are dealing with a small channel of Anvil Rock Sandstone. Available exposures do not tell us much about the extent or trend of the channel. In the area that has been mined, the roof strata but not the coal have been eroded. It is possible that coal is eroded west of the face of the 3rd West. The situation appears similar to what we observed about a year ago in the 4th Main West immediately south of the 1st Pnael South off the 3rd West, and also in places along the 2nd North.

According to Babe, Peabody plan® to pull out of the 3rd West (recovery operations already are underway). Later they will approach the channel area from the west, and then will learn the extent of the erosion. Peabody does not own the coal north of the 3rd West.

February 22, 1983. Mapping Main North Entries between Crosscuts 95 and 117. Anvil Rock channel. Refer to field map (included)

1.) Timbered roof fall in Crosscut 106 on west side of track entry. Coal and carbonaceous shale in channel fill are exposed. The top of the fall is in coal and the exposed coal is at least 4 feet thick. The upper portion is bright-banded and blocky, with well-developed cleat having calcite facings. Several thin partings of black or dark gray brittle shale are present. Downward the coal becomes shalier and more thinly laminated, grading into shale. The shale, about 4 feet thick, is dark gray, very brittle and flaky, thinly laminated, and highly carbonaceous; it contains laminae of bony

coal. Below this is the Herrin Coal. There is no evidence of erosion in the Herrin Coal.

The entries west of the track here have been sealed in the aftermath of a gob fire. According to John and Babe, the area behind the seals was cleaned out and re-bolted before sealing. Much of it fell to a height of 25 feet above the Herrin Coal. The "rider" seam caught fire. I would speculate that the enormous quantity of fallen "rider" coal and carbonaceous shale, in the gob, caught fire by spontaneous combustion. Along the track entry the roof is so thoroughly cribbed that very little can be seen of the roof strata.

2.) Sandstone directly overlies coal along track entry from Crosscut 102 to 105. The sandstone is loaded with coal fragments, coal stringers, and large coalified tree stems. The sandstone is fine-grained, light brownish gray, specked, micaceous, and appears weakly cemented. Again very few details can be seen, because of cribbing, dust and fallen debris.

3.) Large unbolted roof fall on westernmost entry at Crosscut 100, south of sealed area. Southeastern margin of channel shown as sandstone overlies Brereton Limestone with angular contact. The limestone is in nodular beds 4 to 6 inches thick. The sandstone is very coaly and appears to be irregularly interbedded with shale, but cannot examone it directly in place.

4.) Fall along west rib of track entry just north of Crosscut 100 provides good view of channel-fill shales. More exposures to south. This is southwest of the main channel. The shale is medium to medium-dark gray, firm and silty, rather poorly laminated, and contains numerous bands and lenses of siderite. It is very carbonaceous, containing abundant well-preserved plant compressions. Near the base are thin laminae and lenses

of light gray sandstone. Some portions of the shale are more carbonaceous, and very flaky and soft.

Still farther south, intermittent falls expose irregular lenses of sandstone, up to about 3 feet thick, overlying the Herrin Coal. Above the sandstone is shale, as above. The sandstone contains many stringers of coal, and is light to medium gray, fine-grained, very feldspathic, finely micaceous, and porous.

I would interpret these rocks as basal channel-fill sands, scoured into the peat, and overlain by overbank deposits. The shales are similar lithologically to the thick Energy Shale seen adjacent to the Walshville Channel: the main difference being that these shales contain much more coaly debris than typical Energy Shale. These deposits are equivalent to the Anvil Rock Sandstone, however, and not to the older Energy Shale.

5.) East of the belt entry there was another gob fire between Crosscuts 108 and 111. After Peabody extinguished the fire, they went in and cleaned out all th falls, grading the entries up over the gob and re-bolting the roof. Thus we now have a large area where we have direct access to strata as high as 25 feet above the Herrin Coal. These falls provide us with unequalled exposures, practically a continuous cross-section through the channel.

In the 3rd entry from the east, between Crosscuts 109 and 110, the following section was measured:

TOP OF FALL - Limestone ??

3' Rock, not directly accessible, gray, hard, massive, probably limestone or firm mudstone (see Note 6).

3.7' Shale, very dark gray to black, locally lighter gray and mottled, smooth, well-bedded to fissile except where mottled, contains phosphatic lenses; overall very similar lithologically to Anna Shale.

1' Limestone (Bankston Fork ?), medium brownish-gray, very argillaceous, zones grading to calcareous shale, contains broken fossils (none recognized), also large oval concretions of dark gray,

fine-grained dense limestone. Unit varies from a few inches to about 2 feet thick.

3.1' Coal, bright-banded, blocky, well-developed cleat with calcite facings, contains several thin layers or partings of firm black shale, none of these over 0.1' thick.

0.3' Claystone, medium to dark gray, rather firm, very carbonaceous, many coaly streaks. Fairly continuous bed, at least in this entry.

1.6' Coal, bright banded, blocky as above, but contains more numerous and thicker layers of dark shale than the upper coal.

0.5' Mudstone, medium gray, moderately firm, silty, pyritic, contains stringers of bright coal, resembles an underclay.

0.9' Shale, black, hard, thinly laminated, extremely coaly, interbedded with bony coal and laminae of bright coal, also numerous lenses of siderite. Grades into:

1.5-3.3' Shale, dark gray, firm, well laminated, siderite, numerous nodules of brownish siderite and calcite and numerous laminae of coal. Sharp, angular contact. Unit thickens southward.

3.5-4.9' Shale, medium gray, firm and silty, poorly bedded, weathers yellow, resembles Energy Shale; contains abundant split and contorted stringers of coal. Eroded at base of overlying dark shale, thickens northward.

0-1.5' Limestone (Brereton), brownish-gray, fine-grained, nodular, dolomitc (slow fizz); eroded to south, exposed only at northerm edge of fall

HERRIN COAL (Not described)

I believe the light gray shale above the Brereton probably is an overbank deposit. The silt content, lack of well-defined lamination, and especially the abundance of coal stringers suggest fairly rapid deposition.

This light shale is marginal to, and laterally equivalent to, the sandstone which fills channels eroded into the Herrin Peat.

The overlying dark gray coaly shale represents a later stage of deposition within the channel. First some of the overbank deposits were eroded. The fine grain and parallel laminations of the dark shale indicate slower deposition from slowly moving or quiet water Most likely this shale was laid down after the channel was abandoned, as mud and plant debris were periodically swept into the abandoned channel.

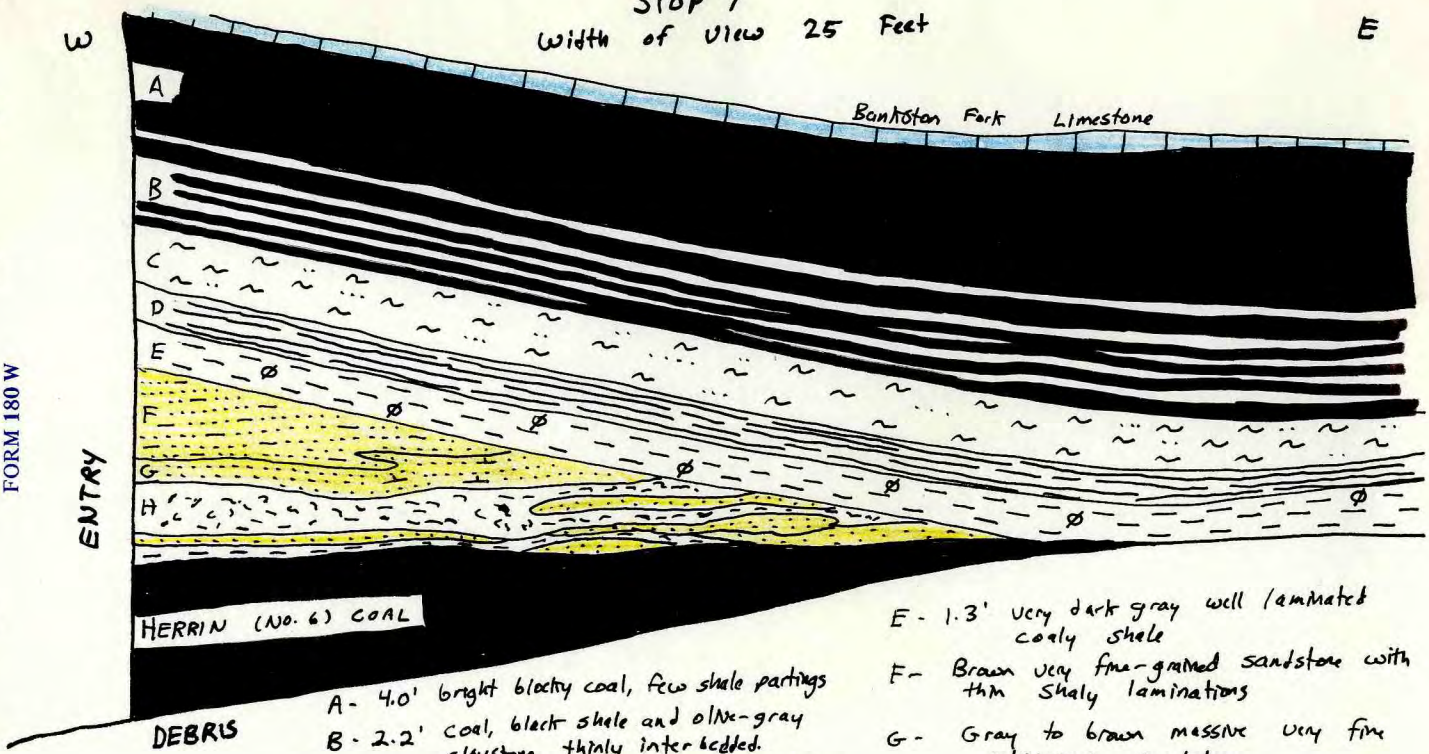
The overlying coal represents the final stages of channel abandonment: the normal succession of vegetation encroaching on the waterway, dominantly "in situ" growth of plants. Claystone and shale partings probably were laid down during floods, which became less frequent through time. The growth of plants and accumulation of peat finally ended when sea level rose, and the Bankston Fork Limestone was laid down.

6.) 2nd entry from east, south of Crosscut 109. Excellent view of sandstone-filled channel eroded into Herrin Coal. The sandstone is brownish, fine-grained, iron-cemented and contains very abundant clasts and stringers of coal, and coalified logs, etc. as a basal lag deposit. Overlying the coal is dark gray laminated shale, with thin lenses of sandstone near the base; this is succeeded by the thick coal, as at Stop 5.

In Crosscut 109 where the gob was stored the upper strata can be reached. The very top of the fall is the roughly flat base of a solid layer, probably Piasa Limestone. Below this is 2 to 3 feet of firm, mottled greenish-gray silty mudstone with what appear to be synaresis cracks. This grades downward into very dark gray shale, as at Stop 5. The remainder of the section is similar to that at Stop 5.

STOP 7

Width of View 25 Feet



A - 4.0' bright blocky coal, few shale partings

B - 2.2' coal, black shale and olive-gray claystone, thinly interbedded.

C - 1.5-2.2' Medium gray silty mudstone, rooted like underclay.

D - 1.1 - 1.5' coal and dark gray shale thinly interbedded.

E - 1.3' very dark gray well laminated coaly shale

F - Brown very fine-grained sandstone with thin shaly laminations

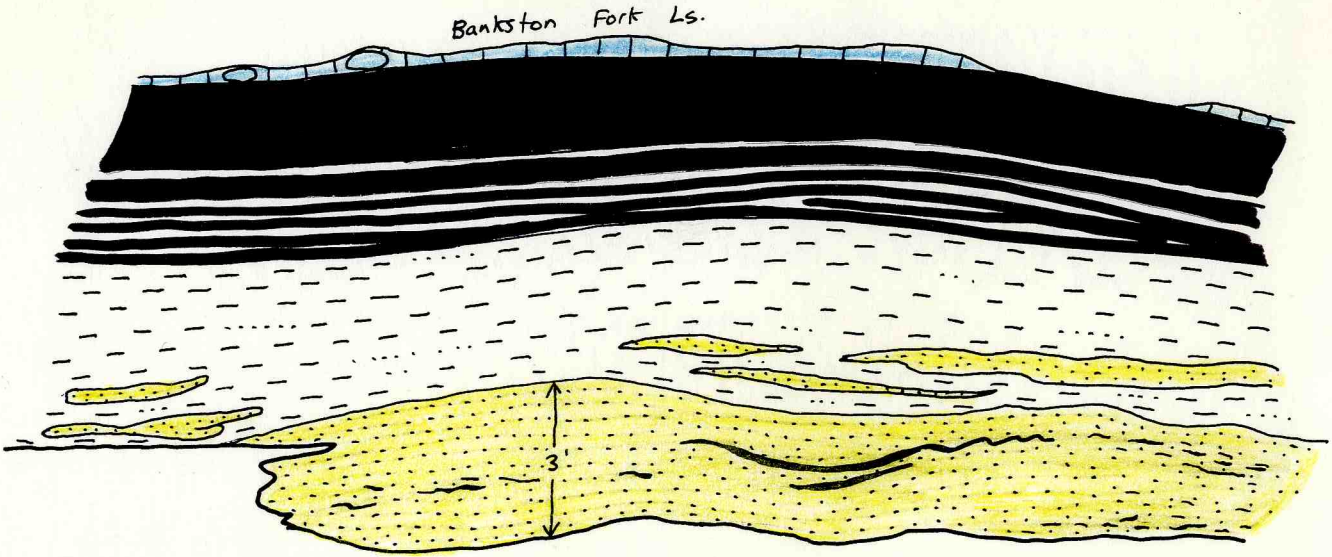
G - Gray to brown massive very fine calcareous sandstone

H - Shale-pebble conglomerate (shale silty, med. dk gray, sandstone light gray, fine-grained)

N

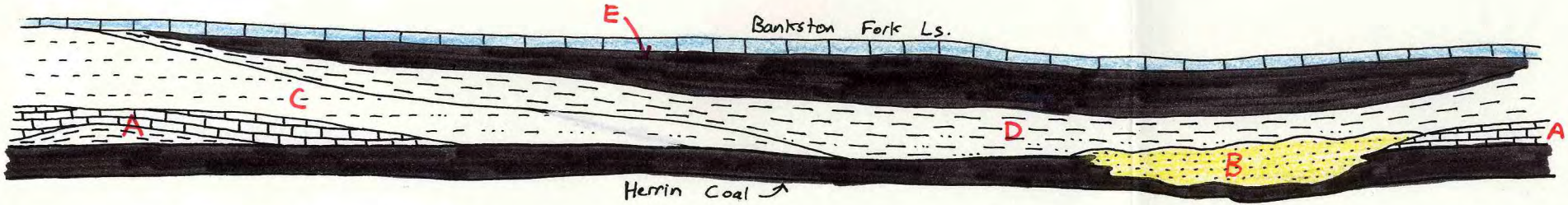
STOP 6

S



Width of View About 20 Ft.

Schematic Cross-Section of Channel



A - Anna Shale, Brereton Limestone

B - Sandstone filling channel axis eroded into peat

C - Light gray silty shale; overbank sediments

D - Dark gray shale (sandstone lenses near base) recording abandonment of channel

E - Coal accumulated as "in situ" peat in abandoned channel.

7.) North rib of Crosscut 110 between easternmost entry and next entry to west. Overlying the Herrin Coal is a wedge-shaped body of interbedded sandstone, siltstone, shale, and shale-pebble conglomerate. It appears that little, if any, coal was eroded before these sedimenst were deposited. The top of the clastic wedge is truncated by erosion so that it pinches out eastward, as shown in sketch. Above this erosional surface is dark gray shale, then coal, as at Stop 5.

The clastic wedge looks like marginal overbank sed iment and probably is equivalent to the basal light gray shale at Stop 5.

February 23, 1983. Main North Entries between Crosscuts 48 and 69. Another Anvil Rock channel.

1.) Track entry at Crosscut 58: southeastern margin of channel. Southeast of channel Herrin Coal is directly overlain by nodular Brereton Limestone, with Anna Shale present in places. The margin of the channel is abrupt and strikes roughly N 70 E. The limestone and upper layers of the coal are sharply truncated beneath the sandstone that fills the channel. The coal also is slumped into the channel and broken by several clastic dikes filled with clay and sand. Not many details can be seen because of thick rock dust and debris along ribs.

Similar exposures seen on belt entry, and on entry west of track. Not much of the channel is still accessible; most of the entry west of the track has fallen in or is filled with gob.

2.) Easternmost entry at Crosscut 58 - southern margin of channel clearly visible in roof fall (unbolted). Structure much as at Stop 1 except that here the channel's edge trends about N 70 W. 2 to 3 feet of the coal is missing in the channel. The bottom of

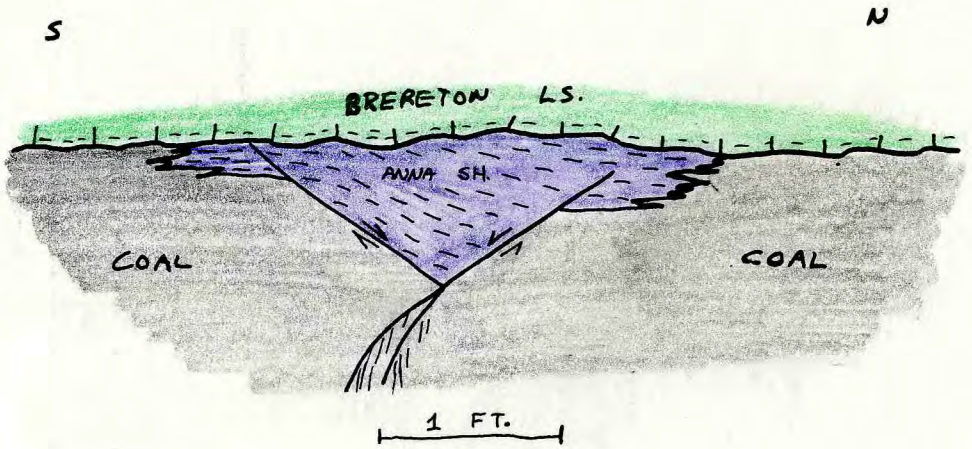
the sandstone is very rolly. The sandstone varies from massive to faintly laminated; it is feldspathic and very micaceous.

3.) Eastern entry near Crosscut 60: sandstone overlies erosional remanants of Anna Shale in roof. Shale and concretions in it have oxidized appearance. The shale and the top of the coal roll or undulate and are offset by numerous small slips. Normally where coal is overlain by Anna Shale, the coal and shale have horizontal and undeformed bedding. I believe the undulations are the result of sandstone unevenly loading upon the still spongy, waterlogged peat (Something like a waterbed!) Many sandstone dikes cut the Anna Shale; they are highly contorted, reflecting compaction of the sediments after the sand was injected.

In intersection to north is a very large roof fall giving excellent view of sandstone overlying 3 to 4 feet of Anna Shale. The shale and coal here are not undulating or affected by slips and clastic dikes. The lower portion of the sandstone is mostly fine-grained; upward it becomes very fine-grained and is irregularly interbedded with silty shale and siltstone. Some portions of interbedded shale and siltstone show micro-cross-lamination or possibly ripple or flaser bedding. The fall exposes about 10 feet of clastics above the Anna Shale. No sign of the "rider" coal or dark shales seen in the channel we looked at yesterday.

4.) On entry next to easternmost, about Crosscut 67. A small, linear channel-like feature filled with Anna Shale crosses the entry and the adjacent crosscut on a heading of roughly N 60 W. As seen on the west rib of the entry (see sketch), this feature is about 2½ feet wide and 1 foot high. It is sharply overlain by knobby-based Brereton Limestone, which lies directly on the coal on both sides of the "washout". In the center of the "washout" the Anna Shale is dropped down and tilted gently in a graben, formed by two slips.

STOP 4



Along both margins, the Anna Shale interfingers with the coal.

I see in this feature evidence of erosion both before and after deposition of the Anna Shale. I suppose that as the peat was being submerged, some small current of water (a tidal channel ?) scoured a little pathway into the top of the peat. This channel-way, and the surrounding peat, subsequently were covered with Anna Shale. The slips formed and shale was pushed down through differential compaction. Then came a second stage of erosion, stripping away all of the Anna Shale except that lying in the depressions and thus protected. Brereton Limestone finally was laid over all.

I wonder whether the lenticular distribution of Anna Shale throughout central Illinois might reflect erosion of a "blanket" deposit of black mud, rather than discontinuous deposition of the black mud in isolated basins.

John C. Moore Corporation, Rochester, N.Y. 14604
FORM 180 W

PEABODY COAL CO. MINE NO. 10 CHRISTIAN COUNTY
2/21/83 Notes by Steve Danner. Accompanied by John Nelson, Don Lumm, and Cheri Chenoweth from the I.S.G.S., and John Ewell and Babe Drea from Peabody.

On our first day at the mine Babe wanted to show us a troublesome area in the 3rd West off the 2nd North off the 4th Main West on the north side of the mine. The third West is a set of five entries that extend about 1400 feet west from the 2nd North. The entries are just south of and parallel to the southern boundry of a large block of coal that Peabody was unable to buy the rights to. Peabody engineers had hoped to drive the 3rd West along this boundry until they were past the exception. The panel entries were to be driven south off the 3rd West, stopping just short of the 4th Main West. Unfortunately, things did not work out as planned. About 1200 feet inby the 3rd West the miners encountered water problems in the roof. By the time they had advanced another 200 feet there was so much water that they were having to build bridges to move the equipment from face to face. The underclay had become a quagmire. Finally, about one month ago, they pulled out of this area. From what Babe Drea, the mine manager, says, this area will soon be sealed off. They will probably pick up the remaining coal by approaching from the west or the south.

As we hiked down the track entry of the 3rd West we encountered our first roof fall about 400 feet outby the face. The fall exposed 3 to 4 feet of black Anna Shale overlain by a light-gray sandstone. The contact was sharp, but

undulating. We continued on to the faces.

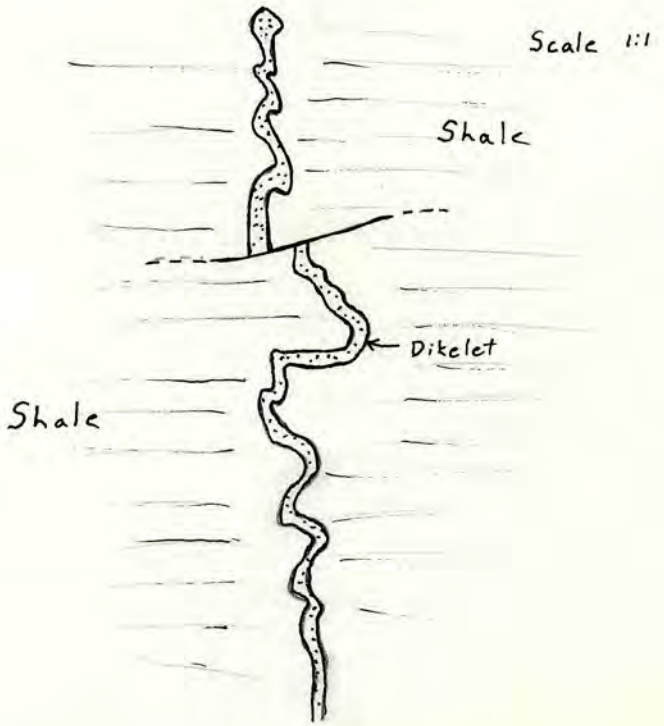
At the face of the southern-most entry of the 3rd West we began to get an idea of how troublesome the sandstone could be. Here the sandstone lay almost directly on top of the coal, and in some places displaced as much as 3 to 3.5 feet of coal. Near the corner of one pillar we could see a cross-section of a sandstone boss that protruded about 3 feet into the coal. The banding of the coal immediately adjacent to this boss showed little or no deformation. It appears this particular sandstone body was the result of erosion and deposition, rather than loading and differential compaction. A thin rind of clay separated the sandstone from the coal.

In the first crosscut outby the faces the SS was separated from the coal by a bed of shale up to a foot thick. This shale was dark-gray with a brownish cast, thinly laminated, and had a blocky fracture. In appearance it resembled Energy Shale more than it did Anna Shale. It weathered to a yellowish sulfur color, rather than the silver-blue weathering so characteristic of the Anna. While it lacked the concretions and phosphate-calcite streaks typical of the Anna, it did have some thin brownish-orange streaks like those we have seen in the Energy Shale at other mines. Someone mentioned that this unit may represent an early channel filling, but I have my doubts. From what we have seen so far the contact between the SS and the underlying units is usually rolling and irregular. The contact between this shale and the coal is fairly level and uniform, not at all like the typical channel fill contacts.

Perhaps a short description of the SS itself might be in order. The sandstone is light-gray in color, fine-grained, micaceous, somewhat argillaceous, and massive. It consists mostly of subrounded quartz

grains moderately well-cemented with a non-calcareous cement. It is hard and moderately porous. The chewed up miner bits attest to its hardness, and the wet conditions verify its porosity.

Along the rib in the crosscut I encountered a small SS dike in the shale below the main SS body. While SS dikes and dikelets are not unusual in themselves, this one caught my eye because of its contorted nature. See sketch below. Apparently sand had filled in a small fracture in the shale during the early stages of compaction. By the time the shale was fully compacted, the vertical fracture and its SS filling had become quite contorted, and had been offset by a sub-horizontal slip in the shale.



The northernmost entries of the 3rd West were extremely wet. One entry had over a foot of water standing in it. At one of the faces we saw where the water had literally flowed from the roof. The face of the coal was stained orange from all the water that had flowed down it. While the roof did not look as bad in these entries, the floor was a quagmire because of all the water. The SS channel was higher up in the roof here than in the southern entries.

Babe took us to a roof fall in the northernmost entry where 5 to 6 feet of dark gray shale had fallen, exposing the base of the SS channel. This shale strongly resembles the Energy Shale we have seen at other mines. One of the interesting features of the coal in this part of the mine is a 3 to 4 inch thick band of canneloid coal at the top of the seam. The coals overall dull luster is only interrupted by occasional thin lamina of vitrain. I have been informed by Dick Harvey that this canneloid band was formed from algae. It is low in sulfur, as evidenced by the distinct lack of pyrite, but has a high ash content (17%).

Another interesting feature in this part of the mine is a thin band of well developed pyrite crystals along the shale-coal contact. This band appears intermittently continuous near the faces of the 3rd West. In some locations the crystals are more deformed than in others. Most of the crystals are less than 1/4 inch in diameter.

Before leaving the 3rd West, Babe showed us where the miners ran into an extremely hard parting in the coal. Since the entry was flooded where this parting was exposed, we had to view it from about 30 feet away. The miners called the parting "flintrock" because of its extreme hardness. It rapidly wore down the hardest carbide bits that they could get for the continuous miner. The part-

ing was about 3 inches thick and located about one foot above the bottom of the seam. From what we could see, the parting ran along the lowest bench for 30 or 40 feet, then abruptly cut up through the seam at an angle of about 30 degrees from horizontal. Near the top of the seam it leveled off and continued horizontally into the face of the entry. The contact between the coal and the parting was very sharp and even. The coal was about 7 feet thick at this location. The most striking feature of this structure was its uniformity. It was very planar in nature and maintained a uniform thickness for as far as we could see.

Babe gave us a sample of the parting that one of the miners had collected when they first ran into it. The sample is very dense and fine-grained, and resembles a quartzite in appearance. Under a microscope the rock appears to consist mostly of angular shards of quartz in a calcite cement. The acid test showed it to be highly calcareous. At present we are making acetate peels and thin sections from the sample we received.

In several locations in the 3rd West I noticed numerous hairline fractures in the roof. Most of these had a similar strike of N50E. This is somewhat unusual in that most of the jointing that I have seen in the roof of this mine consisted of two joint sets nearly perpendicular to each other. The jointing may not develop as readily in the Energy Shale as in the Anna. The hairline fractures may be traces of the primary joint set.

2/22/83 - Mapping channel area in Main North Entries between crosscuts 95 and 115.

Note 1.) Roof fall in crosscut #106 on west side of track entry. The fall shows that the Herrin

Coal is conformably overlain by 4 feet of dark gray shale, which in turn is overlain by 4 feet of bright-banded coal. The shale is thinly laminated and very fissile, rather weak and unstable; several sags and slumps are evident within the shale. The shale rapidly grades into the overlying coal. Above the gradational zone the coal is thin bedded with well-developed cleat. It contains a few shaly lamina and a fair amount of calcite. The latter is prominent on the cleat faces.

The numerous three-piece sets and extensive timbering in this area indicate that the immediate roof is more than moderately weak. The dark-gray shale and roof coal are among the weakest roof units that I have seen to date in this mine.

The entries to the west have been sealed off as a result of a fire in that area in 1981. After the fire was extinquished the miners were faced with a tremendous clean-up chore. Much of the roof had fallen in those entries, in some places as high as 25 feet above the Herrin Coal. After all the fallen rock was removed, the roof and ribs were rebolted and the area was again sealed off.

Note 2.) Sandstone exposure in roof of crosscut #104, just east of track entry. The roof between here and crosscut #106 has been a very carbonaceous sandstone. The SS is light golden-brown to brownish-gray, fine-grained, very porous and permeable, and micaceous. The most distinctive feature of this SS is the great abundance of coal fragments, stringers, and lamina. Most of the coal appears dull and bony, however there are some bright coal chips and stringers. The coal stringers and lamina are generally short (less than 1 inch in length), undulating and overlapping. This SS also contains some blobs or balls of claystone. The coal - sandstone contact appears rolly and hummocky.

Note 3.) Large fire/fall area east of belt entry between crosscuts #107 and 111. The fire occured about 2 years ago and resulted in some very high roof falls. After the fire was extinguished and the area ventilated, Peabody personnel were brought in to clean up the falls and rebolt the roof. The entries were graded so that the floor is about level with the top of the Herrin Coal. The bolted ribs in the fall area expose up to 25 feet of the roof strata, offering us an unusually good view of the sandstone channel and overlying bedrock.

The following rock descriptions were made at two different locations in the fall area of the first entry east of the belt entry. I had to estimate the thicknesses of the upper units because they were to high to reach with the rule.

Measured section (in crosscut on east side of fall area, north rib.);

- 6+' Claystone: medium bluish-gray, some mottling, numerous slickensides.
- 2.5' Shale: blue-gray, hard, dense, laminar bedding.
- 1.0' Limestone: brownish-gray, nodular.
- 6.7' Coal: bright-banded, black, blocky with well-developed cleat; calcite and/or kaolinite on cleat faces; many dark shale partings, most less than ½ inch thick.
- 2.1' Shale: medium brownish-gray, smooth, well-bedded, fissile, contains coaly stringers and other carbonaceous materials.
- 6.0' Herrin Coal: all but the upper few inches of the seam was covered by gob and talus.

Measured section (near southwest corner of fall area):

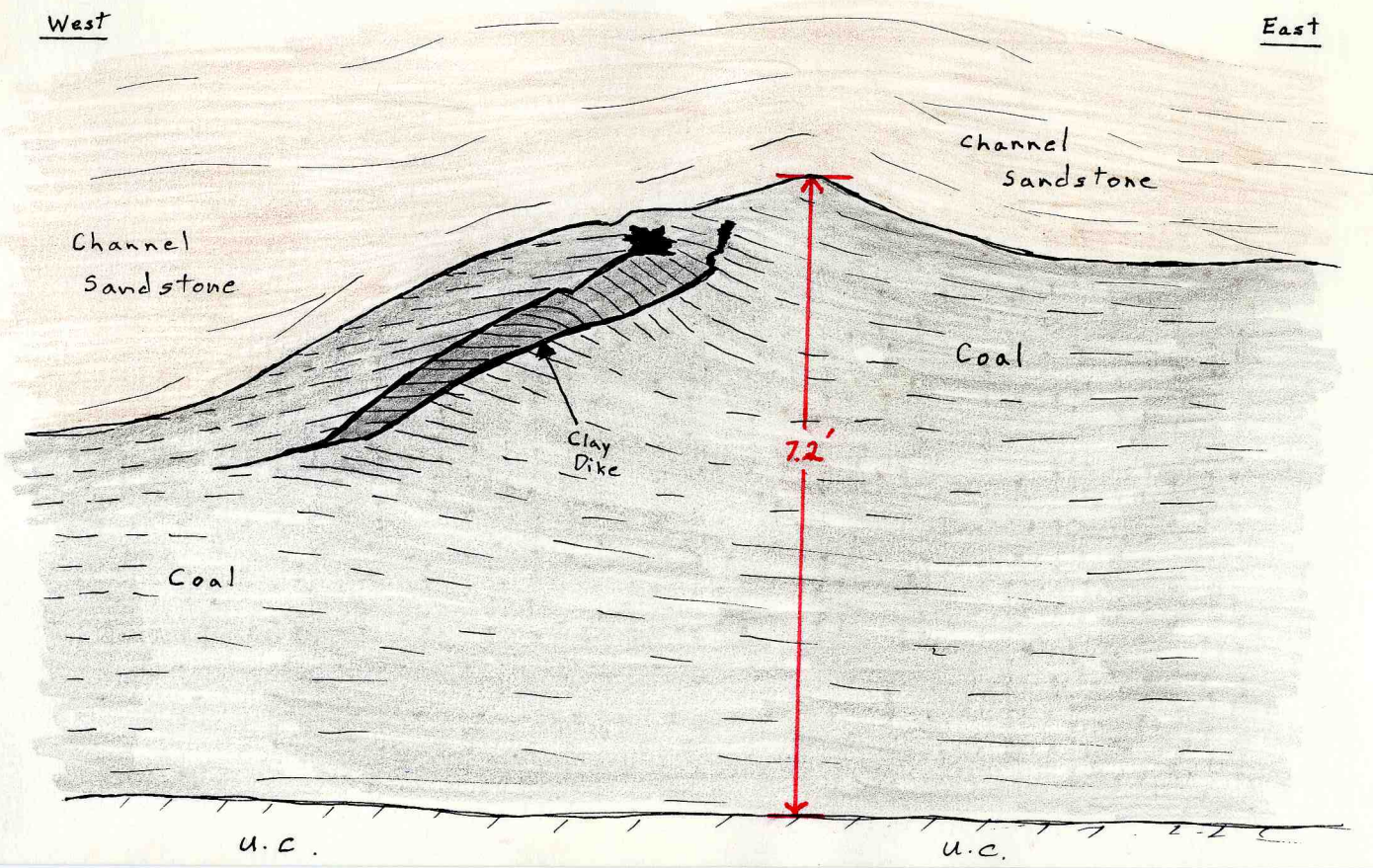
- 3.0' Shale: blue-gray, well-beded, firm.
- 2.0' Shale: black, hard, smooth, platy, well-bedded, contains calcite and siderite lenses.

2.0' Shale: dark gray, smooth, hard, well-bedded.
1.0' Limestone: brownish-gray, hard, fine-grained, nodular, argillaceous, and not very competent.
2.0' Coal: black, thin-bedded, bright-banded, moderately well-developed cleat; calcite on cleat faces; blocky.
0.35' Shale: dark gray, carbonaceous with thin coal stringers, firm.
1.45' Coal: bright banded, similar to upper bench; contains several thin shale partings.
0.35' Shale: medium gray, firm, weathers to a sulfur yellow color.
1.70' Coal & Shale: interbedded coal and dark gray shale; coal bright-banded in part and bony in part.
0.40' Shale: medium gray, firm, numerous coal stringers; weathers to a sulfurish yellow color.
0.80' Coal and shale: interbedded laminations of coal and shale.
0.80' Shale: dark gray, firm, carbonaceous.
0.60' Sandstone: light gray, fine-grained, micaceous, hard, well cemented.
0.50' Shale: brownish-gray, firm, well-bedded, carbonaceous, fissile.
--- Herrin Coal: most of the coal is covered by the gob, unable to get a measurement, but it is about 6 ft thick in this area.

2/23/83 - Mapping channel area in Main North Entries between crosscuts 54 and 68.

Note 5.) Clay dikes and fault in crosscut #58, just east of track entry. (see sketch on next page). At this site two clay dikes cut diagonally across the upper half of the Herrin Coal seam. The upper part of the seam has been severely eroded locally and shows signs of deformation. The faults, or

Note: 5 : North Rib, X-cut # 58, North Mains

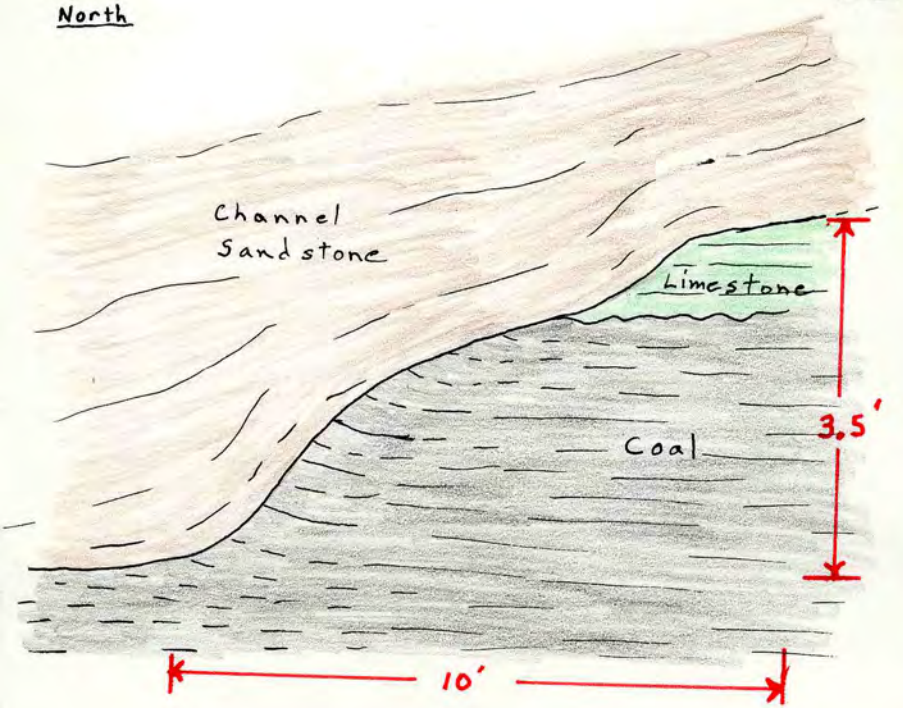


fractures, that evolved into the clay dikes are probably the result of differential compaction. The wedge of coal between the two dikes has a couple of interesting features. First the inclination of the banding of the coal varies within the wedge itself. The banding in the upper third of the wedge dips to the east and aligns closely with the banding east of the dikes. The banding in the lower 2/3 of the wedge dips ever so gently to the west, but does not align with the banding east or west of the wedge. Another unusual feature of this anomoly is the way the clay dikes merge and then terminate parallel to the banding (bedding). The source of the clay that fills the dikes is open to speculation. The upper ends of the dikes terminate several inches short of the sandstone roof and there is no evidence of sand in the clay. Perhaps the fractures propagate up through the sandstone somewhere within the pillar. Since this site is near the edge of the channel, the sandstone is probably rather thin here.

Note 6.) Edge of channel near the intersection of crosscut #59 and the first entry east of the belt entry. At this site the Brereton Limestone, which forms the immediate roof for several hundred feet south of here, abruptly feathers out against the sandstone channel. The sandstone has not only cut out the limestone, but also the upper 3 to3.5 feet of the coal seam. The erosional contact is very sharp and distinct. About 2.5 to 3 feet of coal remain below the sandstone. There is relatively little deformation of the coal lamina beneath the channel. The sandstone is a light to medium brownish-gray, very fine-grained quartz arenite; hard, dense, non-calcareous, moderately porous and permeable; shows numerous coaly streaks near base. The contact with the coal is very rolly.

There are numerous sandstone bosses under the main body of the channel. These protrude down into the coal another 1 to 1.5 feet. While the contact between the bosses and the coal is predominantly erosional, there are signs of some soft sediment deformation and loading. There are several places where the coal has faulted to adjust to the loading.

North South



Note 6: East rib of first entry east of belt, just north of X-cut #59.

John C. Moore Corporation, Rochester, N.Y. 14604
FORM 180 W

Visit to Peabody #10 Mine
Herrin (No. 6) Coal; underground; shaft; continuous
North Portal SE SE SE Sec. 27, T. 14 N., R. 4 W.,
Christian Co., IL
Feb. 21-23, 1983 (3 day visit)
Notes by D.K. Lumm
Partners: W.J. Nelson, S.K. Danner, C. Chenoweth
Guide: John Ewell, Mining Engineer, Peabody C.C.
Purpose: To examine, describe, and map sandstone channels.

Mon., Feb. 21, 1983

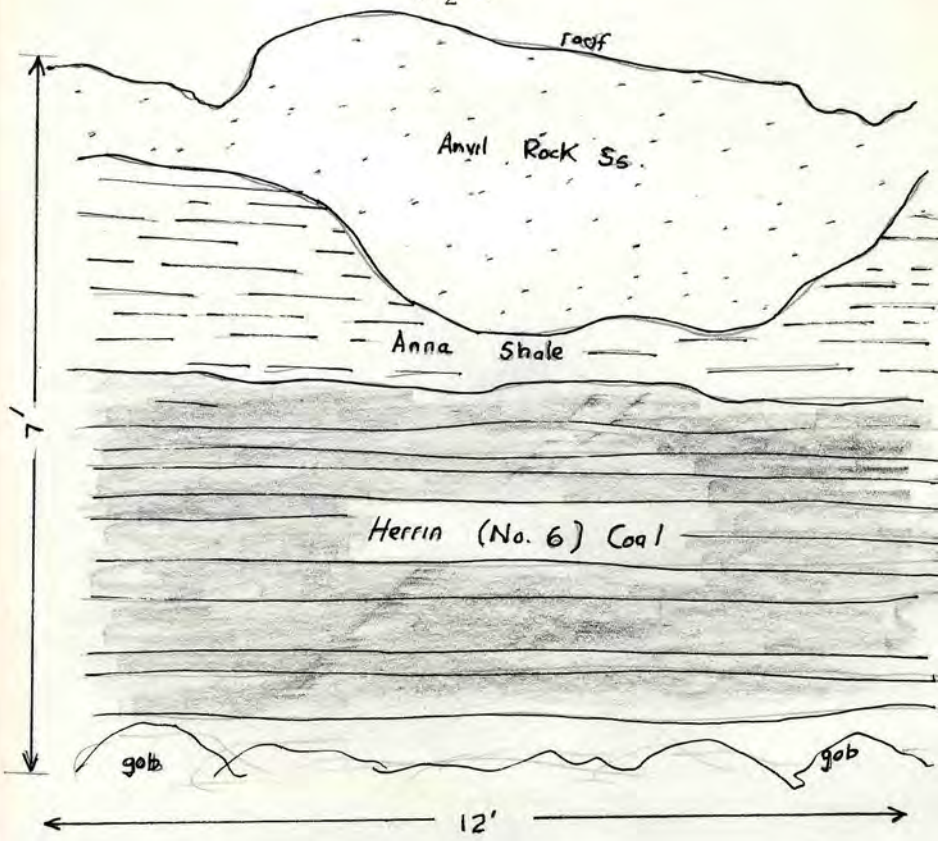
Today we will examine the 3rd W and 2nd W off of the 2nd Main North, Sec. 28, 14 N., 4 W., Sangamon Co.

Stop 1. South facing rib of entry located 1 entry S of track entry, 17 crosscuts west of section line, 2370' S.L., 1370' E.L., NE NW SE Sec. 28, 14 N., 4 W.

Medium to coarse-grained sandstone has an erosional contact with the underlying Anna Shale. No coal has been eroded. Load casts and other sedimentary structures have been compressed and differentially compacted by the sandstone. Localized squeezing of the coal took place in the upper portion of the seam. See sketch next page.

Mining has been discontinued in these westward heading entries. The channel has created unstable roof conditions and water has seeped in along unseen fractures to submerge some of the floor area. According to Mr. Ed "Babe" Drea, Assistant Superintendant, the reserves in this area will be rescued by advancing some entries from the south or west.

It is not possible to determine the width or regional trend of the channel from these entries.



View of sandstone facies and erosional contact with the Anna Shale. South facing rib located 1 entry S of track entry 17 crosscuts west of section line, Sec. 28, 14 N., 4 W.

We visited the northern most set of entries off of the 1st South which were driven to the west. Unstable roof conditions were found near the western stubs of these entries. The same conditions were found to occur at the eastern stubs of the 3rd West off of the 1st South. Sandstone was found to overlie Brereton Limestone at the former location and the Anna Shale was completely eroded by the sandstone at the stub faces of the later locations.

Tue., Feb 22, 1983

Today we will examine the roof strata of the Main North between Crosscuts 95 and 110, NE NW NW Sec. 2, 13 N., 4 W., Christian Co. The Main North has 8 entries which head due N-S.

Stop 1 Roof of Crosscut 106, immediately west of track entry, 1060' N.L., 300' W.L., SW SW NW Sec. 2, 13 N., 4 W.

A good exposure of strata overlying the Herrin Coal can be seen where the roof has fallen. Overlying the Herrin Coal are:

4' shale, grey to dark grey, very poorly bedded, flakey, non calcareous, non fossiliferous, thin carbonaceous laminae

2' coal, irregularly bedded or interlaminated with grey non fossiliferous shale, coal is N.B.B. with bands up to 0.3' thick consist of vitrain, durain, and fusain. This is a "rider" coal which probably originated from deposition of peat in an abandoned channel, which was at times covered by overbank deposits of clay during flood stage.

The sandstone immediately overlies the coal between Crosscuts 103 and 106 along the track entry and between 107 and 109 along the N-S entry located 2 entrys east of the belt entry. To generalize the channel in its areal extent, it trends about N 30-40 E and varies in thickness from 300'-350' in the SW to about 200'-250' in the NE. The Herrin Coal is overlain by various strata in different areas in this part of the Main North. Anna

Shale, Brereton Limestone, and Anvil Rock Sandstone locally overlie the Herrin Coal.

Stop 3 Crosscut 110 at staggered 4-way intersection 4 entries east of track, Main North, 400' N.L., 1110' W.L., NE NW NW Sec. 2, 13 N., 4 W.

A thick section of roof, perhaps 25', has fallen and was removed from the area, leaving a void to study the strata. Most of the exposed section is out of reach for detailed study but a generalized description is given here. From top to base, the strata are:

sandstone; not examined, forms roof, displays course grove marks from the continuous miner, probably medium to coarse-grained and poorly sorted.

8-10' shale; not examined, dark grey, bedding indistinct to irregular.

3'-4' shale; not examined, light grey, probably thinly bedded.

2.5' coal ("rider"); not examined, N.B.B., interlaminated with numerous clay-shale partings

4' shale; grey, silty, with coaly streaks or thin lenses of N.B.B. coal 0.01'-0.15' thick, irregularly bedded, contains sideritic and calcareous concretions.

0-0.4' limestone; hard, dense, argillaceous, fine-grained, some fossil fragments.

7.3' coal (Herrin No. 6); N.B.B.

underclay not exposed

End Section.

Wed., Feb 23, 1983

Today we will examine the roof strata of the Main North between crosscuts 55 and 70, W/2 SW/4 Sec. 2, 13 N., 4 W. The Main North has 8 N-S entries north of Crosscut 62 but narrows to 6 entries south of Crosscut 62.

The sandstone immediately overlies the Herrin Coal roughly between crosscuts 58 and 60 for a distance of 400'-500'. The change or transition from Anna Shale and Brereton Limestone to Anvil Rock Sandstone is erosional and quite abrupt on the south near Crosscut 58, especially between the track and the belt entries. About 2'-3' of Herrin Coal is locally eroded. The transition is not as abrupt to the north near Crosscut 60. The channel trends approximately E-W near Crosscut 60 but the contact between the sandstone roof former and shale or limestone roof former bends SW near Crosscut 58. The "rider" coal and other channel lithologies were not seen because of the lack of roof falls (only 1 fall had an exposure greater than 10' high).

Summary of 3-day visit.

Purpose of visit was to examine, describe, and map sandstone channels and their associated facies. These facies have been documented by Peabody drilling tests SC-99, 100, 101, 102, and 103 and have been described by other Survey geologists during previous visits. We found that the Anvil Rock Sandstone rests or lies directly on the Herrin Coal, in some areas eroding as much as 2'-3' of this coal but in other places the sandstone partially erodes the Anna Shale and or the Brereton Limestone. I believe that the channels interconnect and form a braided network but whose regional trend cannot be determined at this date. It is also unknown whether the channels are all the same age. Composite mapping by Nelson suggests that they are not the same age (see his notes).

Peabody Coal Co. - Mine No. 10
August 28, 1984. Notes by John Nelson

Visit with Heinz Damberger from I.S.G.S., and Frank Chase, Eric Bauer and Dave Ingram from U.S. Bureau of Mines; Gary Garrison and M.E. Hopkins from Peabody.

According to Gary Garrison, the fault at the northeast corner of the property was found by drilling to have up to 40 feet of throw. It strikes about N. 20° W. and has the east side downthrown.

A new set of entries is being driven across the so-called "hill" about 1/2 mile south of 5½ W. According to Hopkins, the feature is much less pronounced than it was in the 5½ W.

We visited the area where gob fires occurred, and where channel-fill sequence is well exposed, on Main North Entries about 100 crosscuts north of the main slope. Exposures are still good, although coated with rock dust.

Photos

1. Sandstone dike

2. Sandstone dike

3. Small fault in sandstone. Sandstone is thicker on downthrown side, indicating fault developed as sand was being deposited.

4. Same fault, different camera angle.

5. Channel-fill deposits:

   (A) Coal and shale interbedded

(B) Dark shale with sandstone lenses

(C) Conglomeratic sandstone

(D) Herrin Coal

6. Closeup of conglomeratic sandstone

7. Closeup of interlaminated coal/shale.

8. Small washout filled with conglomeratic sandstone.

A very interesting exposure on the easternmost entry between crosscuts 110 and 112 (see sketch). At the north end the Brereton Limestone is truncated beneath channel-fill sediments. It is overlain by massive sandstone that pinches out to the south. Above this is silty shale or siltstone, with lenses of sandstone, dipping 5-10^{o} southward. To the south the interbedded coal/shale comes down, thickening to the south and dropping from 10 feet to 2-3 feet above the Herrin Coal.

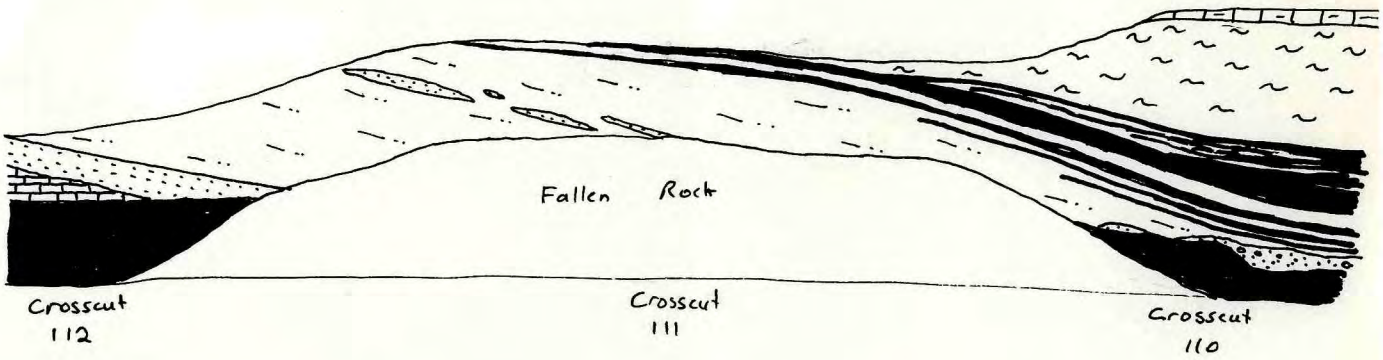
The area is worthy of further study.

We also toured the channel area in the return escapeway of the Main South, just south of the main slope bottom. No new observations of interest were made, and no photos taken.

N

width of view roughly 200 feet

S



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MOORE'S MODERN METHODS
FORM 180 W

Peabody Coal Company - Mine No. 10 - Photo 1- Sandstone dike in Herrin Coal.

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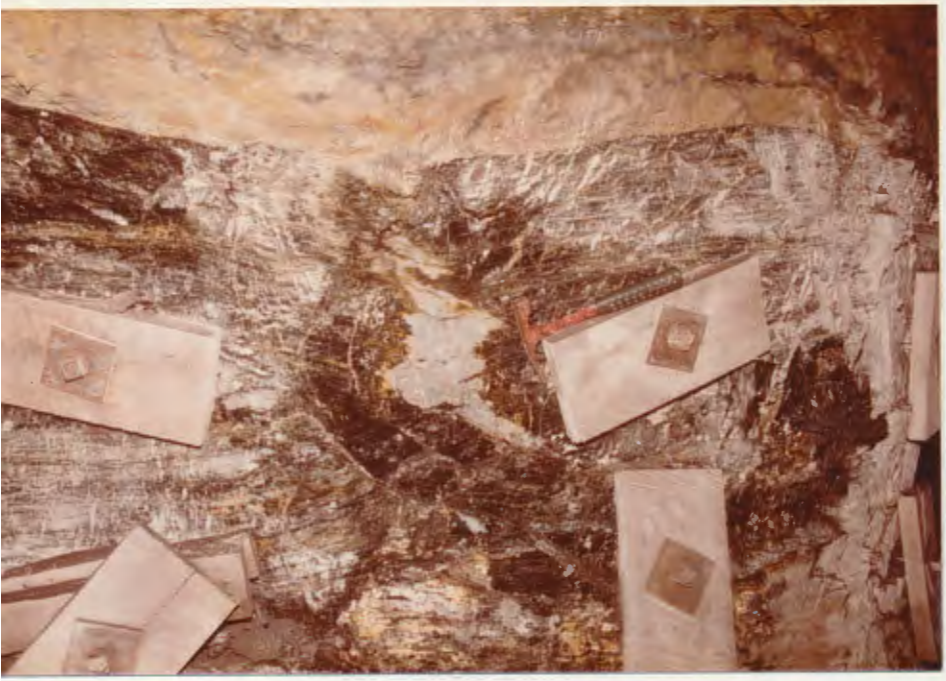

Photo 2

Photo 3

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Photo 4

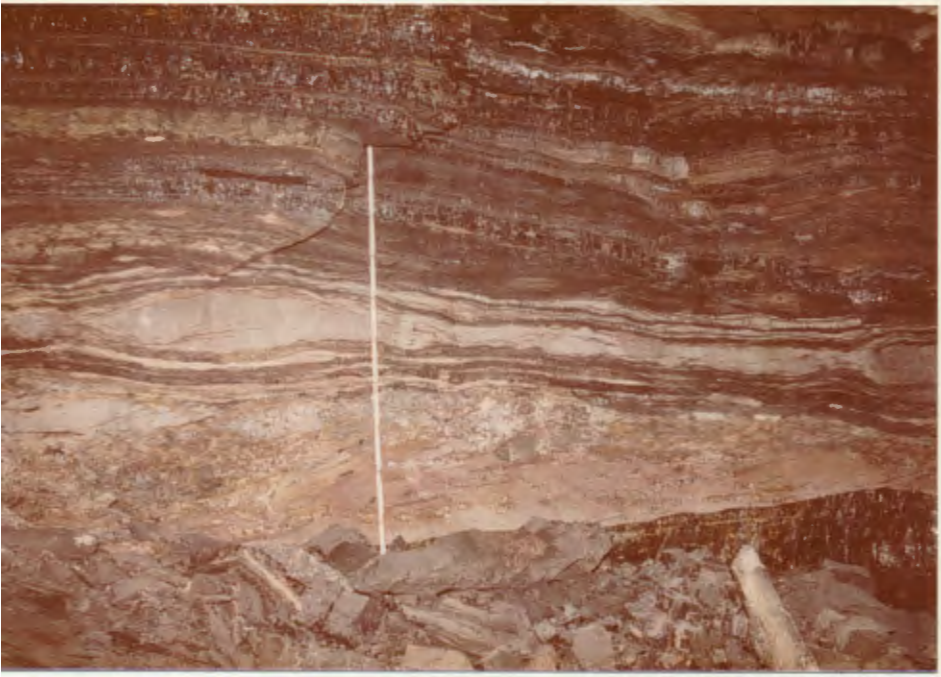
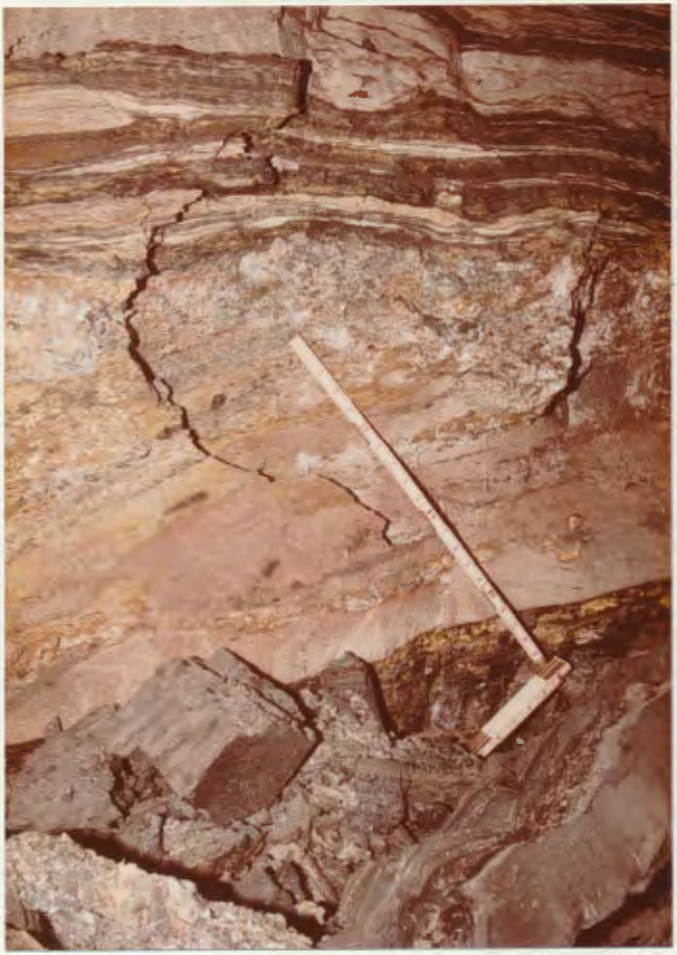


Photo 5. Channel-fill deposits.

Photo 6



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MOORE'S MODERN METHODS
FORM 180 W

Photo 8

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Peabody Coal Co. - Mine No. 20
John Nelson - October 16 and 17, 1984.

Mapping Main North Entries between crosscuts 95 and 115. John Wyatt, surveyor from Peabody, accompanies me.

Traverse of easternmost entry, north to south, on ease side of entry.

A) Crosscut 113 (SE corner of intersection)

Brereton Limestone, dark gray, nodular, shaly zone at base, irregular contact:

2.25'	Coal
0.10	Shale, black; mineralized fusain
0.80	Coal
0.10	Shale, dark gray, hard, pyritic
1.90	Coal
0.10	Shale, dark gray, hard, pyritic
1.30	Coal
Bottom	Coal

B) Between crosscuts 112 and 113

2.0'	Sandstone, orange-gray, fine-grained, very hard, noncalcareous; abundant pebbles of gray to black shale and coal, coalified logs, etc.; irregular partings soft dark gray shale.
1.6	Coal
0.03'	Shale, black, hard; with sulphates
0.55'	Coal
0.07'	Shale, dark gray-brown, pyritic
0.80	Coal
0.05'	Shale, dark gray, discontinuous
1.6	Coal
Covered	

C) South edge crosscut 112, and south into area ramped onto gob:

Top at sandstone layer traceable to south.

7.5 Siltstone, medium gray, firm, very micaceous, poorly laminated; discontinuous laminae of light gray very fine sandstone in upper part, occasional stringer of coal near top; grades downward to silty mudstone without sandy laminae. Sharp contact.

1.0 Sandstone, medium brown, very fine-grained, very well cemented, single bed; no shale or coal pebbles; thins to south (covered by gob)

1.5 Coal

Covered

D) Top of ramp, approx. opposite north side of crosscut 111.

0.4 Shale, dark gray, mottled, very carbonaceous, brittle, thinly laminated. Probably coal above.

1.0 Coal and shale, as above, interbedded; mostly dull shaly coal; 0.3' clean coal at base.

2.9 Shale, dark gray, silty, hard, poorly laminated near top coal stringers, fusain, possible rootlets; near base very thin laminae of vitrain.

3.0 Siltstone, with sandstone interbeds; as at top of Section C. Base of Section D approx. top of Section C.

Covered.

The coal dips to the SSE.

E) About 40 ft. to south, where ramp drops down to south:

3.5' Mudstone, light to dark gray mottled; looks like synarests cracks; faintly laminated, gritty, pyritic (?) veinlets, very crumbly, weak.
0.9' Coal, very impure, interbedded with very dark gray mudstone or shale. Pyritic.
1.8' Coal, clean; calcite on cleat. Drops to south.
0.3' Claystone, medium gray, mottled greenish, slightly gritty, very weak. No obvious rootlets.
1.8' Coal and shale, interbedded; coal thin laminae to 0.3' thick clean to dirty; shale very dark gray, pyritic.
2.0' Shale, medium to dark gray, poorly laminated; highly carbonaceous, many laminae impure coal.
Covered. Base of this section approximately same elevation as base of Section D.

F) Opposite north side of crosscut 110, at north edge of sandstone lens.

Top: Greenish-gray mottled flat surface, possibly base of limestone.
12'est. Mudstone, medium to dark gray, mottled and streaked, synarisis cracks?; coaly fragments observed in fallen pieces.
7.8' Coal and shale, interbedded. Mostly inaccessible, but generally as at Section E. Lower 1.8 ft. mudstone and impure coal interbedded. Lower contact poorly defined.
1.1 Shale, very dark gray, thinly laminated, silty; very carbonaceous, coaly laminae, lenses of brownish very fine sandstone. Irregular contact, probably erosional, to Herrin Coal.

2.25' Herrin Coal, clean.
0.10 Shale, medium gray, hard
0.85' Coal
0.10 Shale, very dark gray, with pyrite lenses, varies in thickness, discontinuous
1.0' Coal
Covered.

Section F is north edge of a lens of sandstone 50 to 60 ft. wide along the east rib, about 4 ft. thick at the most; its top nearly horizontal, base very uneven, definite erosion of top layer of Herrin Coal. Sandstone brownish-gray, very fine to fine-grained, with many pebbles of coal and shale, upper part has many undulatory laminae of soft black shale. As mapped yesterday, this sandstone body trends NE-SW. The south edge of another such lens seen just north of Section F, mostly buried by the gob ramp.

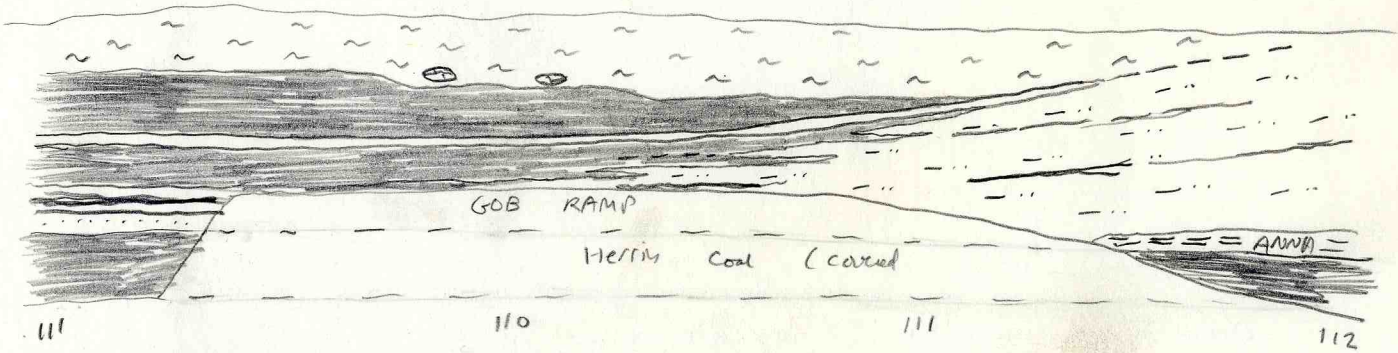
G) Opposite north side of crosscut 109:

Top: Greenish-gray limestone?
10'est Mudstone (?) inaccessible, coated with rock dust.
7.5' Coal and shale, interbedded; mostly inaccessible, much rock dust.
1.0 Sandstone and siltstone, interlaminated; sandstone light gray, very fine, lenticular laminae locally contorted, siltstone very dark gray, weathers brown; thin coal streaks.
1.0 Shale and coal, interlaminated; shale nearly black, thinly laminated, sandy laminae; coal impure.
1.55' Herrin Coal, clean.
0.05 Shale, olive-gray
0.8 Coal, with many shale partings.
0.1 Shale, medium-dark gray

H

N

S



2.0 Coal, with a few fusain laminae
0.1 Shale (Blue Band?) medium-dark gray, coal stringers. Thickens in one place to 0.30'.
2.0' Coal; believe almost to underclay.

On opposite rib and in crosscut, small lenses of conglomeratic sandstone scoured into top of Herrin Coal (photographed on previous visit).

H) Ramped up on gob, above the top of the Herrin Coal, from crosscut 109 to 111. The channel-fill coal rapidly thins to the south, as shown in sketch (over). There is a persistent greenish claystone in the middle of the coal sequence, about 0.3 to 0.4 feet thick. Probably this claystone was also present at Section E. The coal above the claystone is over 3 feet thick at the north edge of the ramp, and thins southward; being eroded at the base of the mottled mudstone, as the upper layers of coal rise to the south. The coal layers below the claystone finger laterally into siltstone, the lower layers being lost first.

I) Section opposite crosscut 107:

5'est. Mudstone, gray, mottled, synarisis cracks, etc. Nearbase silty, almost a shale; poorly laminated; small sideritic nodules, occasional septarian concretion of dark gray limestone.
~0.2' Coal, very impure. Rises to southeast.
7' Mudstone, medium to dark gray, firm, silty; lower portion becomes faintly laminated and siltier. Thin impure coal stringer or laminae fade out to southeast.
10-12' Siltstone, medium-dark gray, hard, poorly laminated for the most part, very micaceous, becomes shaly downward. Occasional coal laminae. Lenses of sandstone, and laminae and beds of sandstone, locally more than a foot thick, occur throughout.

Covered. To south, siltstone overlies Anna Shale.

J) Section opposite crosscut 106:

8'est. Siltstone, medium gray, as above; mostly inaccessible and covered with rock dust.
1.8'max. Sandstone, light gray, weathers orange-brown, mostly fine-grained; locally pebbles of shale and coal, coalified logs. Generally a single massive bed; a few shaly partings. Lenticular; pinches out to north.
0-1.5' Brereton Limestone, dark gray, nodular bedding. Eroded to north.
0.3' "Clod", light gray flaky shale
0.4' Shale, dark gray, with yellow streaks and tubules, probably burrows. Poorly laminated.
0.3' Shale, black, poorly laminated, with abundant phosphatic lenses.
3.6' Anna Shale, black, fissile. Progressively eroded to north.
1.7' Herrin Coal, clean.
0.05' Shale, dark gray
0.55' Coal
0.10' Shale, dark gray
0.50 Coal
Covered.

Profile in 2nd entry from east.

K) Crosscut 111, northwest corner of intersection:

Brereton Limestone
2.85 Herrin Coal; several durain bands.
0.05' Shale, dark gray; sulphates.
0.65' Coal

0-0.1' Fusain, mineralized; lenticular
1.1' Coal
0.15' Shale, (Blue Band) medium to dark gray
2.0' Coal
Underclay

L) Northeast corner of intersection, Crosscut 110.

Coal at top of entry; drops in elevation to south.

12'est Siltstone and silty shale, medium gray. Largely inaccessible. Numerous lenses and laminae of sandstone in lower 3-4 ft.; contact to coal sharp, and undulates gently.
2.7' Herrin Coal. Fusain lenses 1.9' from top.
0.15' Shale, black, and/or durain, with irregular vitrain laminae.
0.80' Coal
0.02' Shale, dark gray
1.05' Coal
0.15' Shale (Blue band)
2.0' Coal
Underclay.

M) South rib crosscut 110, about 10' east of 2nd entry

10'est Mudstone, gray, mottled; inaccessible
4.1' Coal, bright banded. A few thin shale bands. Mostly inaccessible.
0.25' Claystone, light gray, firm. Very persistent unit.
1.9' Coal, alternating bands bright coal, shaly coal and gray to black coaly shale.

1.5' Siltstone, medium-dark gray, hard, nearly massive; faint slightly irregular laminations. Rare streaks of coal.
0.4' Coal, bright in middle, thinly laminated shaly at top and bottom.
2.3' Shale, very dark gray, firm, silty, thinly laminated, many vitrain laminae, coalified plant debris, sideritic bands and nodules throughout.
Herrin Coal, covered by gob.

N) Crosscut 109, northwest corner of intersection.

Strata above coal much as at Section M; inaccessible, not described.

1.9 Coal
0.05' Shale, dark gray
0.8 Coal
0.1 Shale, dark gray
1.25 Coal
0.05 Shale, black, and/or durain
0.65 Coal
0.15 Shale (blue band) with coal laminae
1.85 Coal
Underclay.

O) West rib, just north of crosscut 109.

Coal at top of entry, about 1 ft. exposed.

0.3' Claystone, marker bed.
2.0' Coal, with thin shale bands.
3.5' Siltstone, medium to dark gray, well laminated, micaceous; thin laminae and lenses of sandstone, rare septarian limestone concretions. Sharp undulating contact:
2.5' (varies) Sandstone, locally conglomeratic with pebbles stringers and bands of coal and gray to black

shale. Lower contact clearly erosional; coal removed in scoured depressions.
0.9-1.4' Coal, varies in thickness due to erosion. Bowed down under sandstone rolls.
0.05' Shale, olive gray to black
0.75' Coal
0.05' Shale, black and coaly; durain
1.9' Coal
0.1 Shale (blue band)
2.1 Coal
Underclay

P) In crosscut 107 about 15 ft. east of 2nd entry.

Top Greenish-gray limestone?
3'est Mudstone, gray, mottled
0.3'est Coal, or black shale. Horizontal
9' est Siltstone, dark gray; also silty shale or mudstone; laminae and thin lenses of sandstone; discontinuous bands of shaly coal; stringers of coal. Upper layer roughly horizontal, lower layers dip east or southeast.
0.3' Coal, impure, shaly, dips east or SE
6.0' Mudstone, medium gray, silty; faint irregular laminations, faint sideritic zones.
0-2.5' Sandstone, light gray, weathers brown poorly sorted, well cemented, abundant coal pebbles and stringers, coalified stems. Lenticular body thickens to NW.
0.5' Mudstone, medium gray, very soft, silty; coal streaks
0.8' Anna Shale, black; laminations disrupted, varies hard and smooth. Top eroded.
2.35' Coal
0.05' Shale

0.7 Coal
0.05' Shale, not continuous
1.7' Coal

Fault surface in coal, strikes N-S, dips about 45° east; does not penetrate roof but traces 20 ft. along rib. Lined with calcite. Blue band not located.

Q) Crosscut 106, about 10 ft. west of 2nd entry.

Brereton Limestone
2.0' Coal
0.05' Shale, black to brown
0.75' Coal, thin shaly partings
0.02' Shale, dark gray to black, not very continuous
1.85' Coal
0.10' Shale (blue band) dark gray
1.95' Coal
Underclay.

Traverse of 4th entry from east (entry east of belt)

R) Crosscut 110, NW corner of intersection:

Brereton Limestone
0.95' Coal
0.01' Shale parting
0.53' Coal
0.01' Shale parting
0.66' Coal
0.05' Shale, olive gray
0.78' Coal
0.05' Shale, pyrite lenses
1.85' Coal
0.10' Shale (blue band) disrupted
0.30 Coal

0.40 Fusain, mineralized lens
0.70 Coal
Underclay

Away from fusain lens, 2.0' coal below blue band.

S) Crosscut 109, west of entry; roof fall in crosscut, and exposures along entry:

Top: Mottled greenish-gray; base of limestone?
8' est Shale or mudstone, mottled greenish to olive at top, grading down to dark gray or black. Lower part appears laminated.
4'est Coal; upper part looks shaly.
0.3'est Claystone marker
2.0' Coal, looks shaly
0.5' Claystone, olive gray
1.0' Shale, black, well laminated; coaly laminae. Grades into:
2.0' Shale, dark gray, thinly laminated, very silty, micaceous, very coaly. Angular inclined contact:
1.7' Mudstone, medium gray, moderately firm, very silty, nearly massive; irregular coal stringers - weathers yellow and brown like Energy Shale. Thickens to west and north. In crosscut to NE, seen to overlie Brereton Limestone.
1.45' Coal
0.03' Black shale or durain
0.57' Coal
0.05' Shale, olive to black
0.70 Coal, thin shale partings
0.08' Shale, black, coaly
1.95 Coal
0.10 Shale (blue band)
2.08 Coal
Underclay

T) Crosscut 108. just east of entry, north rib:

Top	Limestone?
7'est	Mudstone or shale, as at S.
3.5'	Coal, appears shaley toward top
0.3-0.4'	Claystone marker, light-medium gray.
2.7'	Coal, with interbeds dark gray silty shale or siltstone
2.1'	Shale, dark gray to black (darkest at base) hard, well laminated, very silty, thin coaly streaks throughout, some zones approach a bone coal; thin laminae of white sandstone at base. On south rib, conglomerate lenses scoured into coal at base.
1.9	Coal
0.05'	Shale
0.75'	Coal
0.05'	Shale, black
1.9'	Coal
0.1	Shale (blue band)
0.2	Coal

Covered with gob to underclay.

U) Crosscut 107, NW corner of intersection:

Top of entry in coal, looks like claystone marker	
2' est.	Coal; with shaly partings.
3.5'	Mudstone or siltstone, medium gray, poorly laminated (not accessible)
3.5'	Sandstone, light gray, weathers brown, fine, well cemented; numerous irregular partings black shale, coaly fragments and stringers common. Uneven contact to coal.
1.7'	Coal
0.03'	Shale, olive
0.7'	Coal; durain or black shale partings
0.07'	Shale, dark gray to olive.

1.8' Coal
0.15' Shale, medium-dark gray, pyrite lenses (blue band)
2.0' Coal, partings of mineralized fusain
Underclay

V) West rib, just north of crosscut 105.

0.5'est Coal, to top of entry
0.3 est Claystone marker?
1'est Coal, looks shaly
5-6'est Mudstone, medium gray, darker toward the base (inaccessible) contact indistinct:
4-7' Siltstone, dark gray; sandstone lenses near base. Varies with variations in sandstone below.
1-5' Sandstone, as at Section U. Great variations; lenticular, shaly interbeds especially near top. Scoured contact to coal.
1.95 Coal
0.05' Shale, olive
0.70 Coal
0.05 Shale, dark gray to black
1.18' Coal
0.03' Shale, black; fusain bands
0.65' Coal
0.10' Shale (blue band) dark gray, olive lenses; many vitrain stringers
1.8 Coal, many fusain partings
Underclay

No good place south of channel to measure coal, because of deep gob.

W) Crosscut 106 on west side of track entry. Roof fall exposes strata, but cribbing prevents direct measurement:

3-4'	Coal, to top of fall. Thin interbeds of shale, but mostly bright coal.
0.3'	Claystone marker, medium gray
2'	Coal, with thin layers of dark shale
0.5'	Shale or siltstone, dark gray
0.6'	Coal, impure, especially at top and bottom.
2'	Shale, very dark gray, well-laminated; lenses and laminae of sandstone.
Herrin Coal.	

Additional note: a miner told us of encountering "black jack" in the coal face in the 15th East off the 1st South. The material is described as black shiny rock, very hard to cut, occurring in big lumps at all levels in the seam. Sounds like mineralized fusain lenses, but could be coal balls.

John C. Moore Corporation, Rochester, N.Y. 14604
FORM 180 W

Peabody Coal Company - Mine 10. November 5, 1986.
John Nelson with Phil DeMaris; John Ewell from Peabody.
See letter report #171

6th North off 6th Main East. Approx. NE¼ SE¼ NE¼, Section 35, T.13N., R.4W. We are here to observe a fracture that has been described as a limestone roll. (Fracture)

1.) Room 20, west side of panel

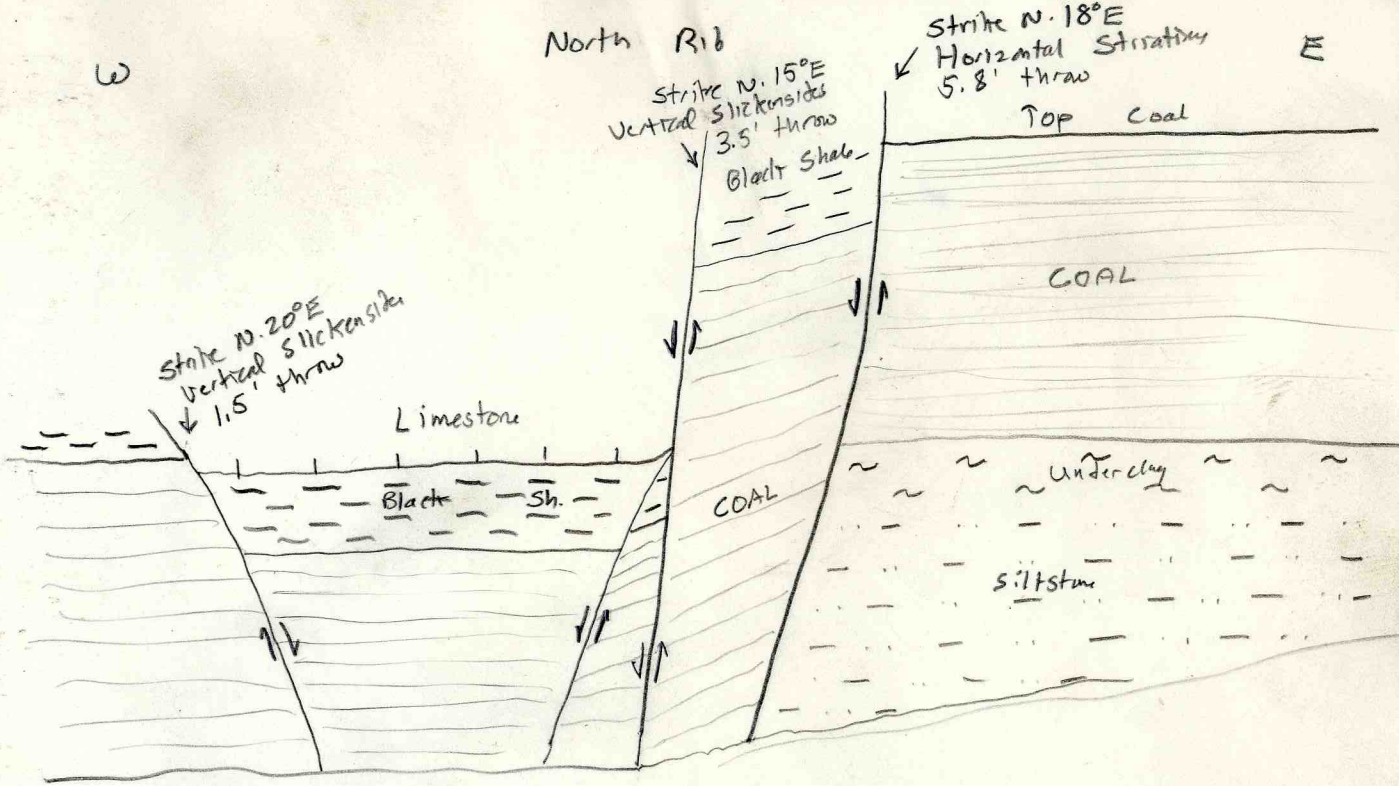
A fault is exposed; attitude N.20°E/80-90°W., the west side downthrown about 8.7 feet, displacing limestone against coal. The fault shows very little drag but there are narrow slices of tilted and sheared coal along the fault.

Very prominent horizontal grooves and slickensides are seen both on the overhanging brow of limestone and on the coal when it is faulted against the underlying strata. These consist of about 1 foot of greenish-gray firm claystone with abundant Stigmaria, overlying hard, massive greenish-gray siltstone. A few faint vertical striations are also present.

In the roof is a wide zone (3-4 ft. wide) of black rock broken into angular blocks, with crystalline white mineral (calcite?) filling the spaces and fractures.

The fault surface is exposed along the rib for about 30 ft. south of Room 20. It has horizontal slickensides throughout.

2.) Room 18, stubbed across fault zone. The fault has widened to a zone of three major faults and several smaller ones. The easternmost fault is largest (about 6 feet of throw) and has horizontal striations. The other faults are normal; dip-slip with vertical



striations. As before there is no noticeable drag, but the blocks between the two largest faults are tilted to the west.

About 20 feet east of the fault zone is an exposure of Anna Shale with joints trending N.60-65°W. and N.15°E; the latter set show crushing and may be small faults. The shale contains pyritized pelecypods resembling Mytilus, about 1-1¼" long.

Rooms 17 and 16 have not reached the fault.

3.) Room 15, barely mined into fault. The fault maintains a NNE heading and dips steeply west. The throw is at least 6 feet with limestone faulted against the coal. The fault plane is sharp and there is no drag. Both vertical and horizontal slickensides are present.

The immediate roof is a few inches of greenish-gray bioturbated calcareous shale, with coal stringers. The main roof is nodular-bedded limestone containing brachiopods and gastropods (poorly preserved).

4. Room 14. Oblique exposure of fault zone. There are a series of closely-spaced faults with overall throw down to the west. On the north rib the top of the coal can be seen west of the fault, downthrown about 5½ feet. Both vertical and horizontal striations are present.

5.) Room 13. The fault is nearly vertical and the throw is about 5 feet. Here the fault is a single sharp plant with practically no gouge, and no drag.

6.) Northernmost entry of 6th Main East, just east of sealed 5th North Panel. A series of small faults, striking slightly east of north and dipping steeply

to vertical; probably continuation of fault zone described above. Cumulative displacement down to west, 1.4 to 1.6 feet. Striations are both vertical and oblique, on one west-dipping normal fault the striations plunge about 60° north, suggesting a right-lateral component. There is no drag, very little gouge, and only slight tilting of blocks between faults. Some of the faults dip east, displacements a few inches. Largest fault down to west, 1.0 to 1.4 ft. throw.

This appears to be a tensional structure - no evidence of compression.

7. Crosscut just north of belt entry (2 entries south of last note). Fault zone can be traced to this point but throw has decreased to a few inches. A small clay dike, trending east-west and dipping 45° north, intersects the fault just north of the concrete stopping. The dike can be traced across the limestone roof; the clay weathers light yellow in contrast to the dark gray limestone. The dike is offset about 0.3' left-lateral and 0.2' vertical, down to west.

Another dike about 10 feet north of the first shows the same sense of offset.

8. 6th Main East, by seal of 2nd entry to 5th North Panel. Normal fault, N.20°E/55°SE, throw about 1.6 feet down to southeast, faint vertical striations, no drag, very little crushed coal and clay gouge.

Several faults with similar trend were observed between Notes 6 and 8.

This fault zone is becoming splintered as it dies out toward the south.

9.) 6th Main East, track and belt entries, Crosscut 14. Normal fault, strike approximately N.25°W/60°NW, throw about 1 foot down to SW. Not a very good exposure, due to heavy rock dust. Fault plane is nearly straight and planar, no drag, no gouge or clay noted.

This is several thousand feet west of the faults described above.

About 100 ft. west another fault with similar strike, dip, throw, and lack of drag. Three more faults within the next 100 feet, each about 1 foot throw down to SW; and several faults with a few inches of throw, all parallel and down to SW.

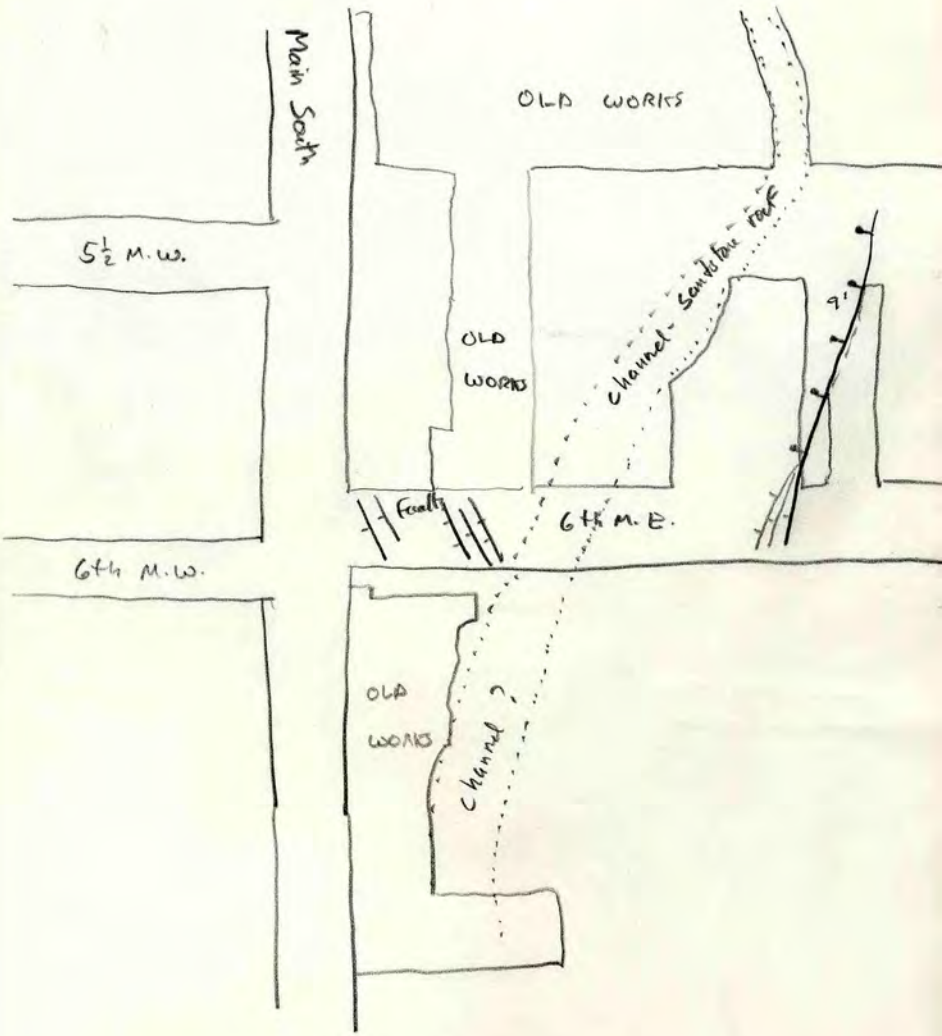
Several more faults, all with the same trend, were observed between Crosscut 8 and the Main South Entries.

These faults have the same trend as the large fault in the northeastern part of Peabody No. 10.

Thursday, November 6. "The hill"

A feature called "the hill" in the southeast part of Peabody No. 10 is actually a sharp, narrow valley in the coal. It trends approximately N-S across the 5th and 5½ Main West Entries, and is thought to reach the 6th Main West near 3rd and 4th North Panels, where it sharply turns northeast, crossing the Main South between the 5½ and 6th Main West.

1.) Possib le extension of "Hill" into Main South. A depression in the coal trends approximately east-west. The area is badly caved and largely inaccessible; rib rash and debris prevent us taking many measurements of coal thickness.



Crosscut 222, westernmost entry - coal overlain by Anna Shale, 1½ feet thick on south rib, overlain by a conglomerate, deeply weathered; clay, shale and coal clasts up to several inches, matrix claylike, does not appear to be sandstone - light yellowish-gray, crudely layered. Contact to Anna Shale is erosional. This is on south flank of trough.

2.) Outside entry, only 50 ft. south of last. Roof exposure, about 3 ft. of shale, medium-dark gray, finely silty, moderately laminated, contains Pectin, mytiloid pelecypods; large oxidized septarrian concretions near base. Conglomerate not visible.

On re-examination the shale below the conglomerate at Location 1 is not Anna, but is the same as the shale at Location 2. East of Loc. 1, the gray shale is observed to pinch out under normal-appearing Anna Shale.

3.) Crosscut 214, between westernmost entry and 2nd entry from west, Main South. Estimated section in roof fall:

(Top) 4'+ Mudstone (?) medium-light gray, no lamination, broken in large irregular chunks.

2' Conglomerate, as at Loc. 1; abundant coal fragments and coalified stems and bark, matrix dark gray sandy shale or siltstone, poorly laminated, abundant mica. Sharp uneven contact:

1' Limestone, brownish-gray, fine-grained, contains shell fragments, shaly partings.

2' Anna Shale, black, fissile, burrowed at top.

Top Herrin Coal

This is on northern flank of the depression.

The Herrin Coal is approximately 6 feet thick (cannot measure due to rib rash). It was measured 8.3 ft. thick near the bottom of the trough.

CONCLUSIONS ON MAIN SOUTH

The trough or depression in the coal here is similar to "the hill" in the 5½ Main West, in that the coal does appear to thicken toward the bottom of the trough. Neither the elevation change nor the thickness change is as pronounced as in the 5½ Main West. We cannot definitely relate changes in roof lithology to the trough. The Anna Shale tends to thicken toward the bottom, and the conglomeratic shale is present both in the trough and on its south flank. However, we cannot map the extent of the conglomerate, which is younger than the Brereton Limestone.

6th Main West

4.) Northernmost entry, crosscut between 2nd and 3rd North Panels. In vicinity of 2nd North the coal is horizontal, about 6-6½ feet thick, and overlain by limestone. West of 2nd North Panel the coal begins to dip an estimated 2-3° west or WNW. At crosscut the dip abruptly increases to about 7-8° west or NW, with limestone still as roof. Good exposures.

5.) Junction of 6th Main West with easternmost entry of 3rd Panel North. Coal dips 8-10° NW (estimated); coal is at least 9 feet thick; 6.5' from top of coal to "blue band", 3.2' below "blue band", measured. Anna Shale comes in as roof; edge of shale strikes NE-SW, approximately parallel with strike of coal. No faults observed.

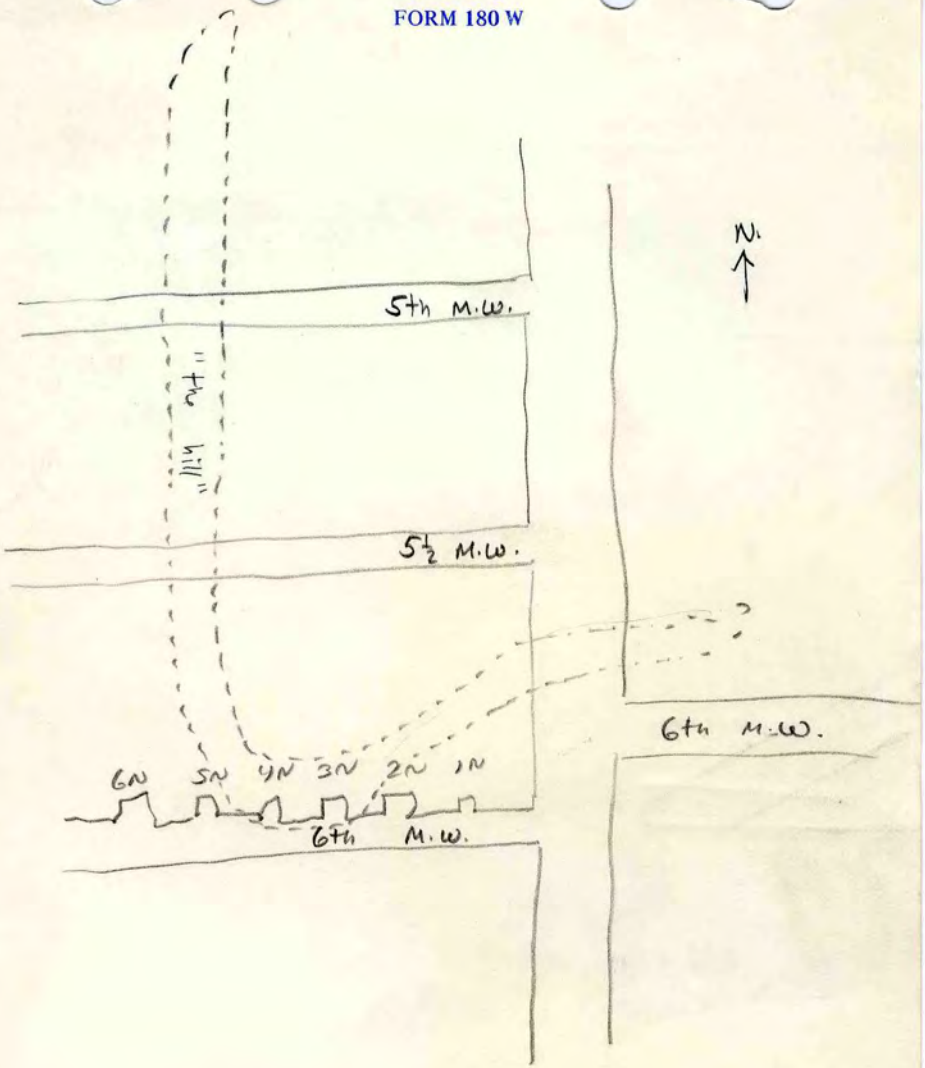
The bottom of the trough is about 100 ft. north of this point. The coal rises northward toward the face of the panel.

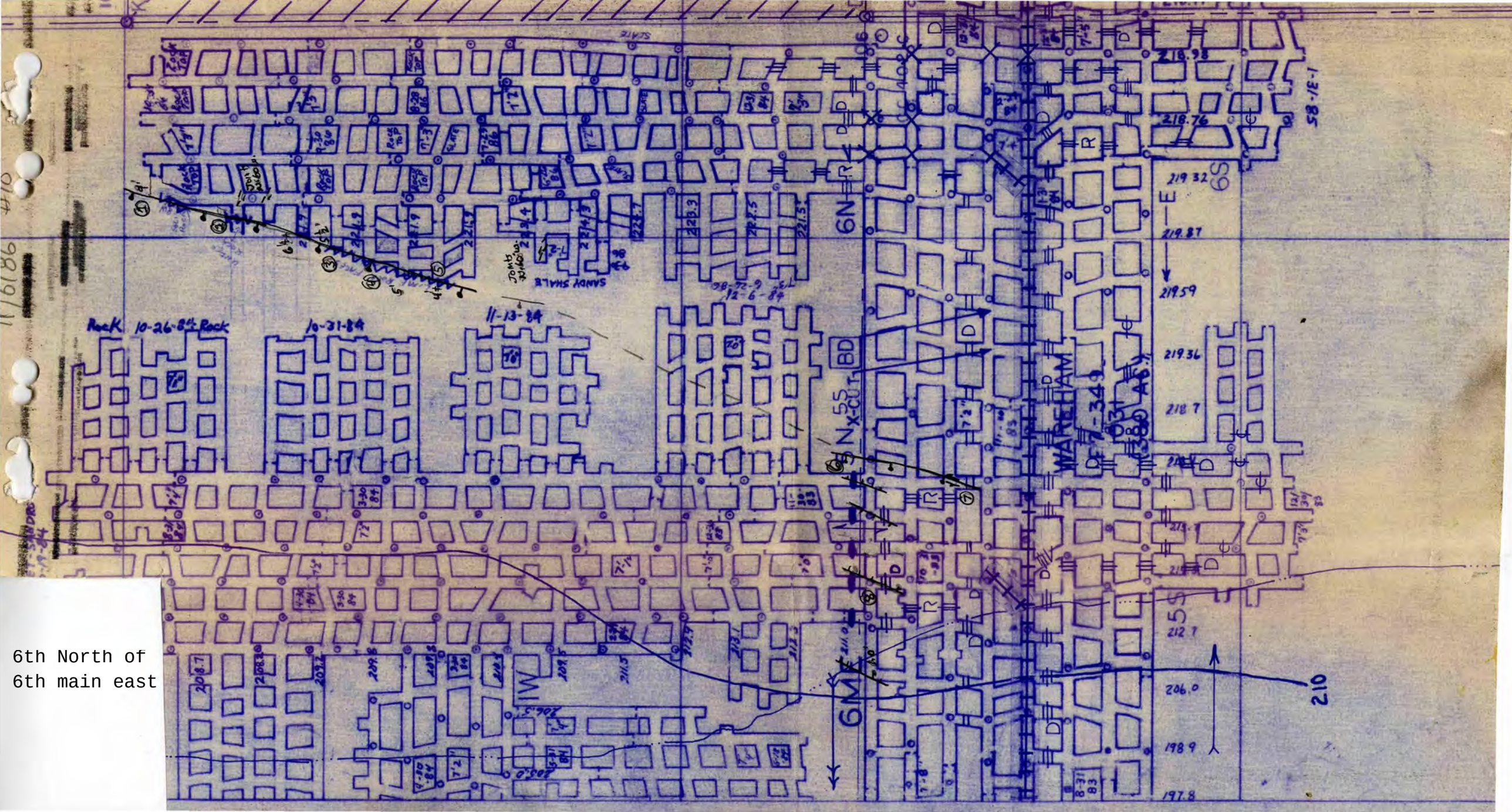
6.) Roof fall in 2nd entry from west in 3rd N. Panel. The entry is blocked and not accessible; view from side shows 4 to 6 feet of black Anna Shale, sharply overlain by light gray, fine-grained, shaly planar-bedded sandstone. No limestone is present. Shale appears to thicken southward, down-dip. Fall is on north flank of trough.

7.) Roof fall in westernmost entry of 3rd North. 6 to 8 feet of black Anna Shale overlain by smooth-surfaced light-gray-brown rock which is not broken - probably limestone. Near bottom of trough. Coal 8 ft. plus, bottom covered.

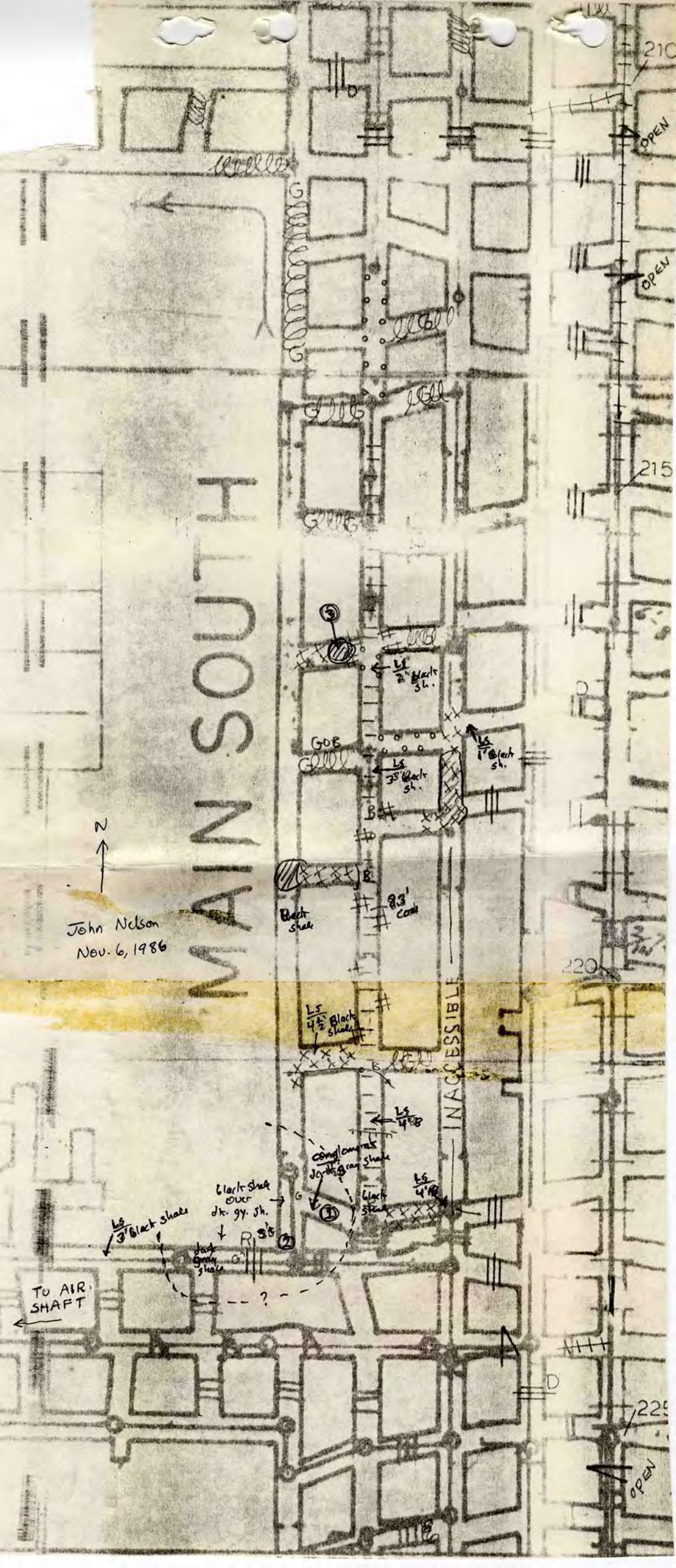
The Anna thins southward to less than 1 foot two cross-cuts (about 150 ft.) south.

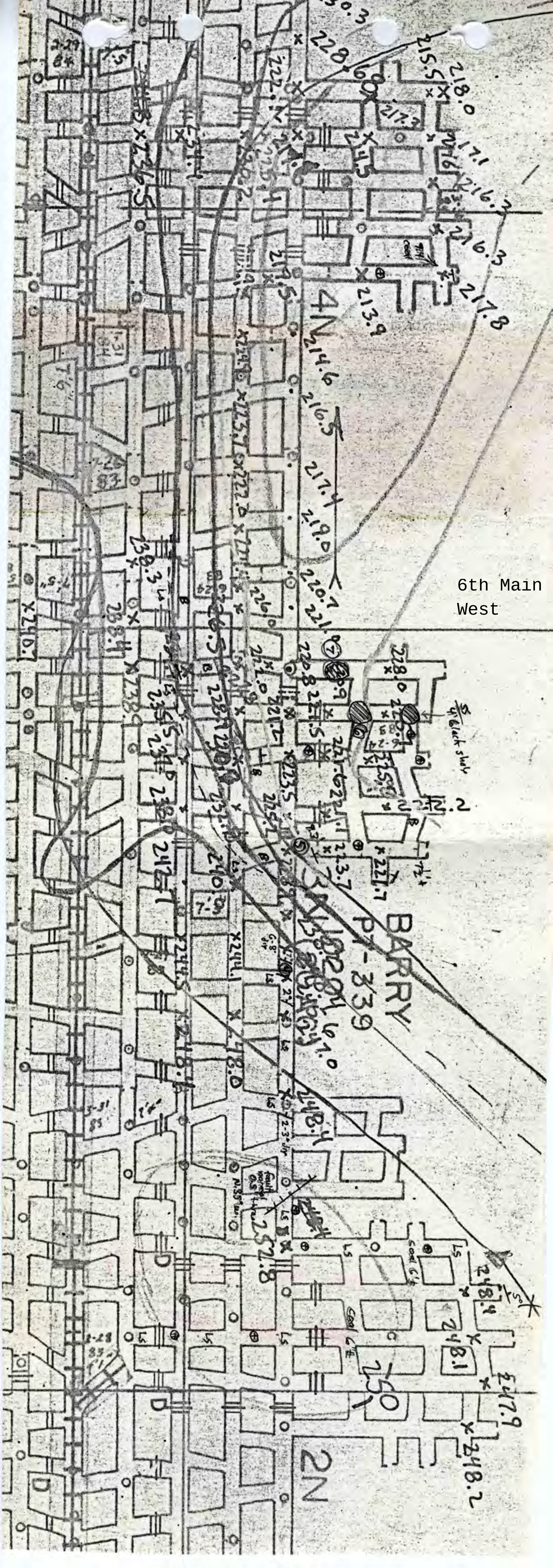
Between the 3rd and 4th North Panels, the northernmost entry of the 6th Main West follows the axis of the trough. The coal is over 9 feet thick with niether top nor bottom visible in most places. The coal rises sharply to the south, and levels out within about 200 feet, where it is overlain directly by limestone.


N.
5th M.W.
5½ M.W.
6th M.W.
6N
5N
4N
3N
2N
1N
6th M.W.



6th North of
6th main east


MAIN SOUTH
210
215
220
225
OPEN
OPEN
OPEN
INACCESSIBLE
N
John Nelson
Nov. 6, 1986
LS 2½' Black sh.
LS 1' Black sh.
LS 3½' Black sh.
GOB
Black shale
8.3' coal
LS 4½' Black shale
LS 4'8
Conglomerate sh.
Black shale over dk. gy. sh.
Black shale
LS 4'8
LS 3' Black shale
3'8
Dark Gray shale
TO AIR SHAFT
?


6th Main
West
4N
BARRY
PT-339
2N

Mine Notes - Peabody No. 10 - Christian County

Trip: Nov. 5-6, 1986, by Phil DeMaris and John Nelson with John Ewell, Mining Engineer for Peabody Coal

Coverage: Introduction
Faults in 6th N. Panel off 6th Main E.
Feature near M. South Airshaft 2
Feature in N. stubs off 6th Main W.
Conclusions
Samples: set P10-A-s (1-15)

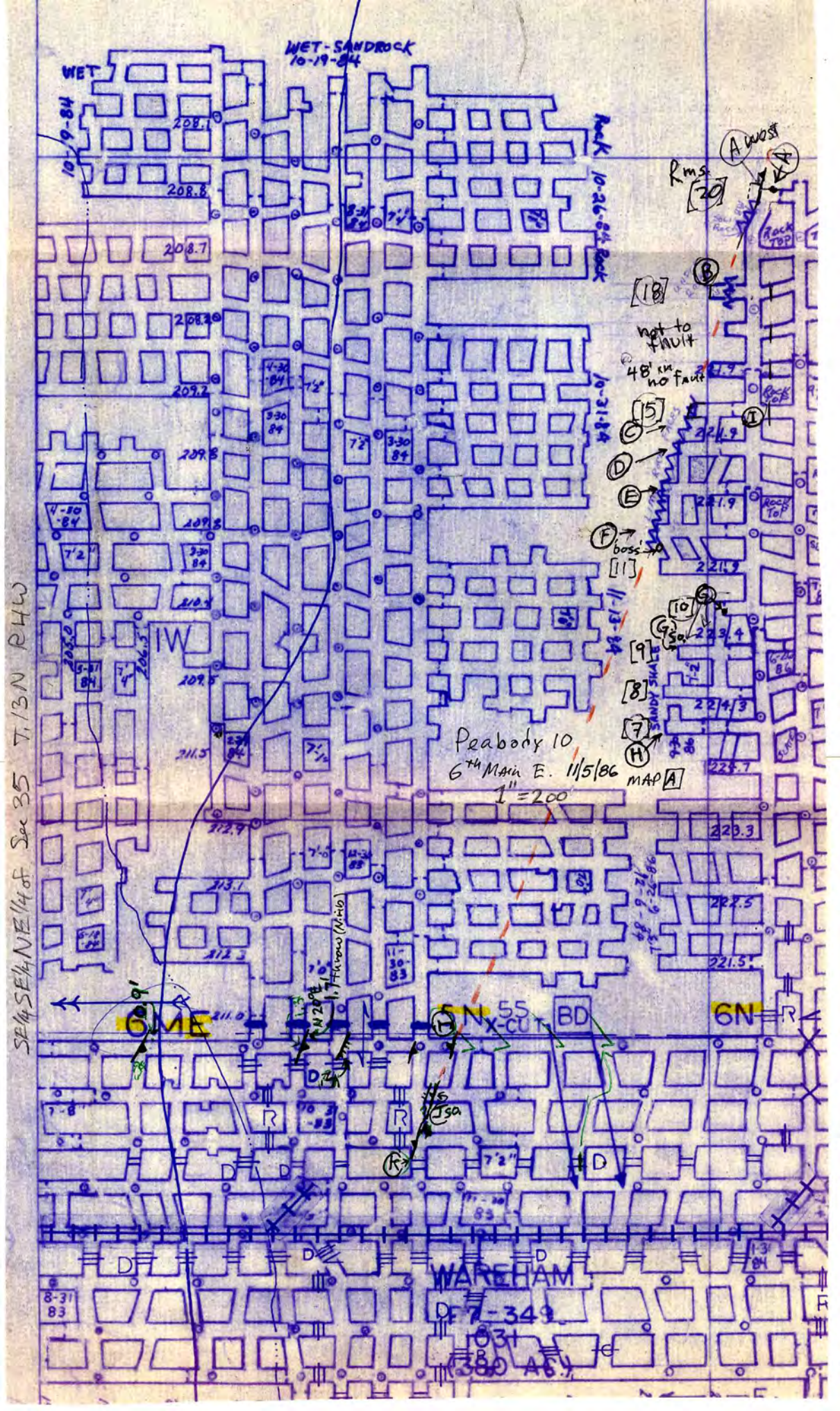
Introduction

This trip was arranged at Ewell's request to examine mining problems in the 6th N. where coal loss under limestone occurred. We wanted also to look at new exposures of the "hill", a meandering trough of thickened Herrin coal occurring in present-day topographically low areas on the south side of the mine. Nelson has reported on earlier exposures of feature in Circ. 530.

John Ewell briefed on conditions we might see. He said sandstone in the roof is common in areas we are visiting (by sandstone company people mean water bearing rock, not the lithology), but seeing notes of "sand rock" on the map does not mean it is immediate roof. John showed us some rock samples, including a carbonate coal ball found in the "gob", i.e. from anywhere in the mine.

Faults in 6th N. Panel off 6th Main E. (See Map A)

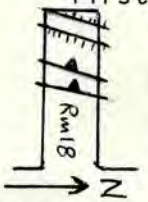
A. (N's 1.) We went to the 20th West room and could immediately identify the feature as a fault which is displacing more than the full thickness of the coal, down to the west. I measured the full seam thickness at 6.88' (82½ inches) and an addition throw of 1.83'


WET - SANDROCK
10-19-84
WET
10-19-84
ROCK
10-26-84 Rock
10-31-84
11-13-84
A most
Rms
[20]
[18]
not to fault
48' in no fault
[15]
[11]
[10]
[9]
[8]
[7]
SANDY SHALE
Peabody 10
6TH Main E. 11/5/86
1" = 200
MAP A
SE¼ SE¼ NE¼ of Sec 35 T.13N R4W
6ME
6N
55
X-CUT
BD
WAREHAM
DF 7-349
(380 A6)

(22 inches) which gives 8.7' on the fault. The fault plane is close to vertical, has only thin slivers of gouge. Just east of the fault on upthrown side (N. rib) is a 3.1' long fusain lens at mid-seam in Herrin, reaching a maximum thickness of 0.4' (not sampled).

A. West They have undercut the brow of Brereton Ls. to continue the room west. On the fault plane here Nelson confirms horizontal movement, and after cleaning up some more, feel that horizontal movement is dominant and probably primary. The vertical mullion is more common on gouge-to-coal contacts and thus seems to be secondary, and may even be produced solely by later minor readjustments of material along the fault. I sampled a small piece with chips of Brereton set in calcite (-A-1).

B. (N's 2) Room 18 is stubbed through the fault; first of a set of 4 faults is 24' West of corner with last entry, and is high-angled with a vertical throw of 5.8' (down to west) using coal thickness from A. A couple of feet west a second sub-parallel fault occurs, with a throw of about 2.25' on S. rib (using base of Brereton) and 3.5' on N. rib where John measured it (see his sketch). Two minor faults further West complete the set. Net throw on the first 2 faults is about 8', similar to the throw at A., where there was one main plane. Blue band sampled on upthrown side (-A-2).



B. So. Back around corner I sampled Anna with u/i bivalves and Orbiculoidea, from about 1' into unit (-A-3).

C. (N's 3.) Faults hit at end of 15th Room. Net throw on two faults is over 6'. The first of the two close-spaced high-angle faults has a throw of about 2½' - a splinter off this one found 2' east dies out to the south.

D. (N's 4.) Faults hit at end of 14th Room. Net throw on 2 high angle faults is 5½' on N. rib. Horizontal slickensides prominant on 2nd fault at N. rib. Roof is "rolly" Brereton, several feet thick.

E. (N's 5.) Faults hit at end of 13th Room. On N. rib two closely-spaced high-angle faults are down to the West 5¼' together.

F. Last in a set of exposures of large fault - only one high-angle plane seen with 4' throw (down to West), but could be more behind it. A limestone "boss" was seen just to the south which pushes top of coal down about one foot; no Anna Shale here and no more than a trace of clod. "Bosses" (Limestone) are called "horse backs" in this mine.

G. Room 10 does not extend near faults, but rooms down to the seventh were checked. Eight foot double lock bolts used here; thick Anna has multiple medium-angled slickensided compactional faults. Anna concretions are large; 1½' to 2' diameter.

G. South End of Room 9 has no faults. There is no "sandy shale" here as on mine map. Such comments other than "rock top" have little geologic reliability - rock top means only a competent unit is immediate roof, which usually would be limestone in this mine.

H. Fall which prompted comment discussed in Intro.
Sequence is: Herrin coal; 3' Anna shale, not fissile; less than 1' nodular Brereton; 3' min. siltstone, greenish gray, thinly laminated, slightly micaceous (-A-4). 8' bolts used here.

We walked back north on buggy entry (A ?) and saw 2 falls, which showed little to no Brereton Limestone above 3½ to 5' Anna Shale.

I. Coal description by Nelson

J. Following lunch we followed northernmost entry of East Mains to the west to track faults seen in the panel. Here the first fault is seen - one plane on S. rib and two close-spaced planes down to west on N. rib; on S. rib there is a 1.3' net throw and strike is around 0° to 10°E. of N. S. rib exposure shows both 45° and vertical mullion in fault plane; 45° mullion dips north.

J. South Fault shows horizontal movement in coal but little vertical throw: actually pair of parallel faults here.

K. Fault runs into pillar 3' from the stopping, displacing a well-placed clay dike at base of Brereton about 0.3' with left-lateral movement and 0.2' vert. movement down to W. John is thinking "Eureka!". As we tracked the plane back across the roof John saw a second clay dike similarily displaced.

We continued to follow the #1 entry west and found 4 or 5 more small faults all dipping EAST over the next 400', but with similar strike to the faults in the panel, i.e. around 15°E. of N. Nelson states that he believes the pattern is that of a normal fault system with local strike-slip over print. However, the strike-slip movement occurred only on the easternmost fault plane and not the others, so simultaneous origin cannot be ruled out. Further, if the main fault of a normal fault system was later reactivated by strike-slip movements, why do the horizontal movements still appear to be respectively proportional to the vertical throw on the fault plane at the same site?

We jogged south to meet the travelway and left the 6th M.E. on foot heading west. Between the 15th and 4th crosscut (750') we encountered at least 11 small, high-angle faults striking between 30°W. of N. and due North

with throws of up to 1½ feet. All faults but 1 or 2 dipped west. This is a much broader dispersion of a fault zone than I am familiar with; most Rend Lake fault systems are narrower and carry a higher percentage of net throw on 1 to 3 fault planes.

Feature near Main South Airshaft 2 (Day 2)

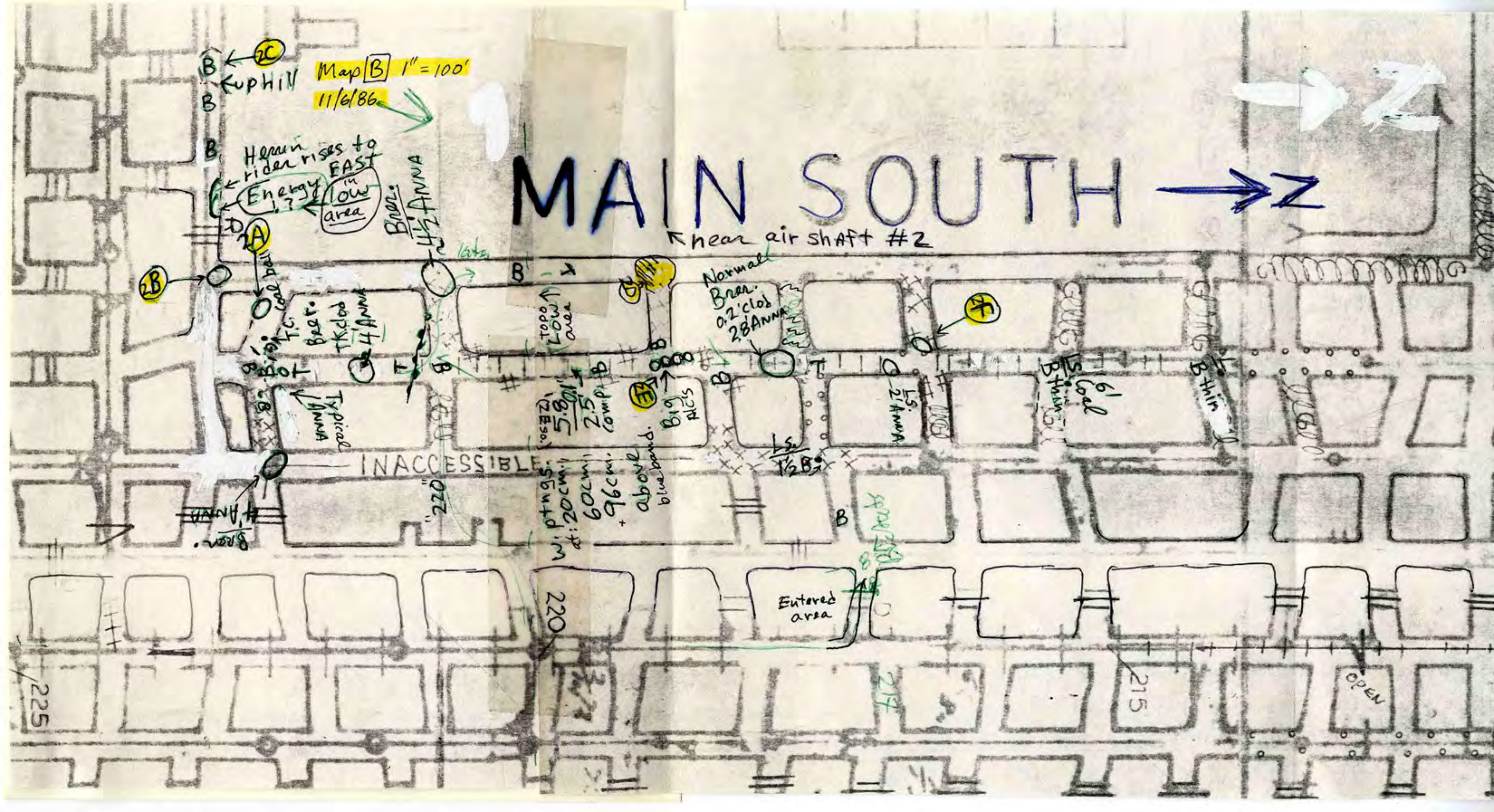
We plan to track the "hill", a curvilinear thickening of the Herrin Coal, which has unusual roof. I planned to get as many coal thicknesses as could be quickly done, which was less successful in old works where we started. (See Map B.)

2A. (N's 1) Roof fall with 1½' Anna (?) overlain by a pebble conglomerate containing large coalified plant parts (probably periderm strips and pieces 10 cm. and longer. Pebbles were very white and were sampled for XRD (-A-7).

2B. (N's 2) Thick medium gray shale with regular contact to Herrin here. We conferred and decided that this is very probably Energy Shale because of prominent pectins in the shale (marine facies as at Crown II) despite unusual carbonate concretions in unit found here. Nelson confirms shale at 2A. as same material; is lighter than typical Anna and has large plant material higher up in unit than is typical.

2C. True Anna Shale seen here in fall. Sequence is: 2½' Anna, some clod, Brereton at top. Top ½' Anna is bioturbated. We walked uphill to this site, so we returned east and then turned north.

2D. Large blocking fall with unknown stratigraphy, but pebble conglomerate blocks are on top of fall. Anna is probable immediate roof by remote evaluation.


MAIN SOUTH
N
near air shaft #2
Map B 1" = 100'
11/6/86
uphill
Hermin rider rises to EAST
Energy 1.?
in low area
coal bed
Normal Brar. 0.2' clod 2.8' ANNA
Topo Low area
Typical ANNA
INACCESSIBLE
Big rocks
above blue band
LS. 2' ANNA
6' Coal
B thin
Entered area
OPEN
215
217
220
225

2E. Brereton over Anna with large concretions. John sees fall through Brereton to unknown position nearby. Since Brereton is usually thin over thick Anna this doesn't help to map pebble lag position, which is likely a channel lag from an Anvil Rock Channel.

2E. South (Taken from Map B). Coal thickness measured at: 5.8' above blue band (0.1') and 2.5' below it; T = 8.4'. Major partings located @ 0.66', 1.97' and 3.15' above blue band.

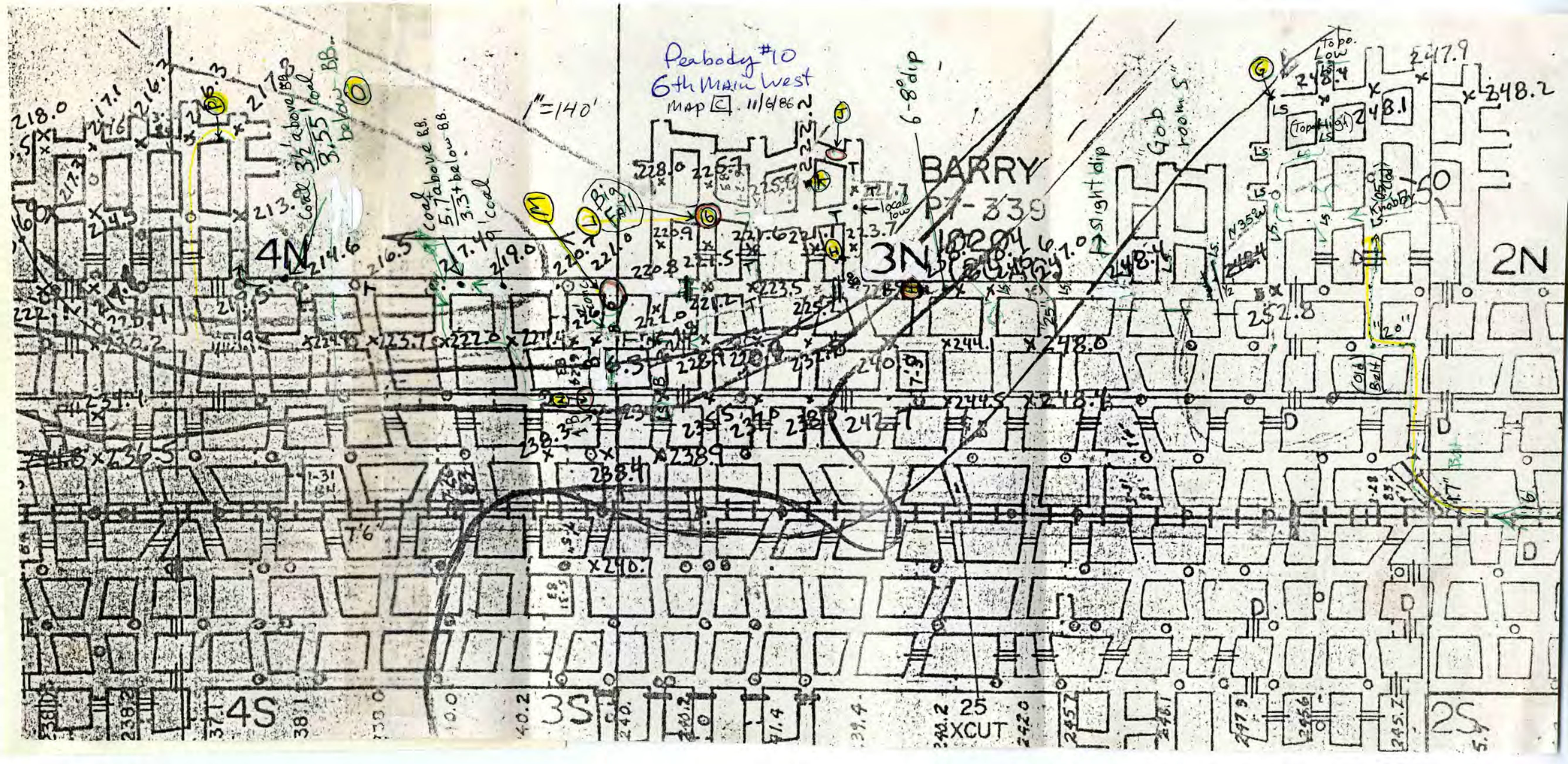
2F. (N.'s 3) Big fall with clear stratigraphy: 2' Anna overlain by 1' Brereton; 1½' coarse conglomerate with lots of large plant debris (similar to that at 2A., but smaller pebbles): light gray shale (?), micaceous; no sand but likely silty. Conglomerate with rafted peat sleets (coalified) and rounded inertinite clasts sampled (-A-9). Just to north sampled base of Brereton (-A-10) with brown crystals, probably caused by draining of water from above (iron charged?). Conglomerate here looks similar to that photographed by N. on an earlier trip; see notes from Aug 28, 1984).

Feature in N. stubs off 6th Main West

We moved to the Main West and went to the northernmost entry which crosses the base of the 2nd, 3rd and 4th N. panel stubs.

2G. On flank of normal coal just as slope toward trough begins a coal thickness was attempted. Coal thickness above the blue band is 5.5' and at least 1' below it. Roof is regular-based Brereton with 0.2' clod.

2H. (Near N's 4) Brereton roof continues as we go down topographically. Clod of Brereton varies 0.4-0.6' and locally has small crude pyritic cones. Irregular base of Brereton begins here; i.e. shallow rolling of base of Brereton occurs.



Peabody #10
6th Main West
Map C 11/6/86
1" = 140'
BARRY
4N
3N
2N
4S
3S
2S
25
XCUT
Big Fall
6-8° dip
slight dip
Gob rooms
Topo. Low
local low
Old Belt
Coal 3½' above BB 3.55' coal below BB
Coal 5.7' above BB 3.3' below BB 1' coal

2I. Just into stub full seam is exposed. Herrin is 6.60' above blue band (.10') and 3.20' below; T = 9.90'. Coal has thickened largely since 2H, i.e. over 150' laterally. Strong dip NNW here. Other 3 partings (seen extensively at Crown II) are prominant due to weathering, but there may be others in top 1/3 of seam which are continuous in the trough.

2J. Shallow fall near top of stub shows base of Anna very coaly (-A-11, for carbon). 2J is slightly uphill from lowest area seen.

2K. Entry graded through too steeply giving deep floor exposures, leaving top coal roof. 3.1' coal below blue band here. I sampled blue band (-A-12), top 0.3' underclay with 0.1' impure Herrin (-A-13), and underclay 1.3-1.5' below base of seam (-A-14).

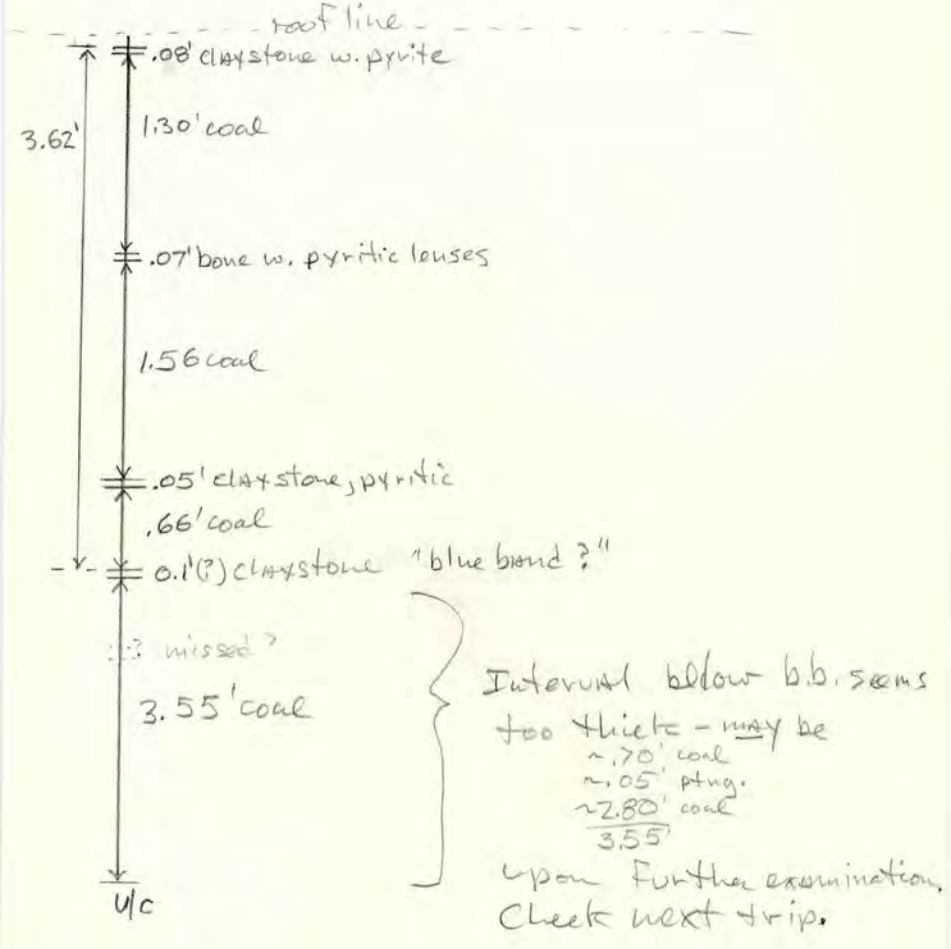
2L. (N's 6) Big fall shows very thick Anna overlain by siltstone, collected off gob. Off-white siltstone with greenish cast (-A-15); this is the "sandstone" N. reports.

2M. Fall with at least 6' of Anna Shale overlain by a buff-colored unit, probably Brereton. An enormous 4' diameter Anna concretion has fallen in crosscut, and it's not a "twin". Rough correlation of Anna concretion size and thickness of the unit is again suggested, as it was in O.B. 24 in the 70's.

2N. South of 3rd N. stub we examined Anna Shale behavior. Anna thins as we return "up hill". Here Anna Shale thins from 2.1' to 0.9' across a N-S fall exposure of 13', and matches the break in slope which is noticeable here as well. This means thickness of Anna deposition may well be more topographically sensitive than previously thought (compare with O.B. 24 findings!) and raises serious questions about how early and why Herrin peat compaction occurs.

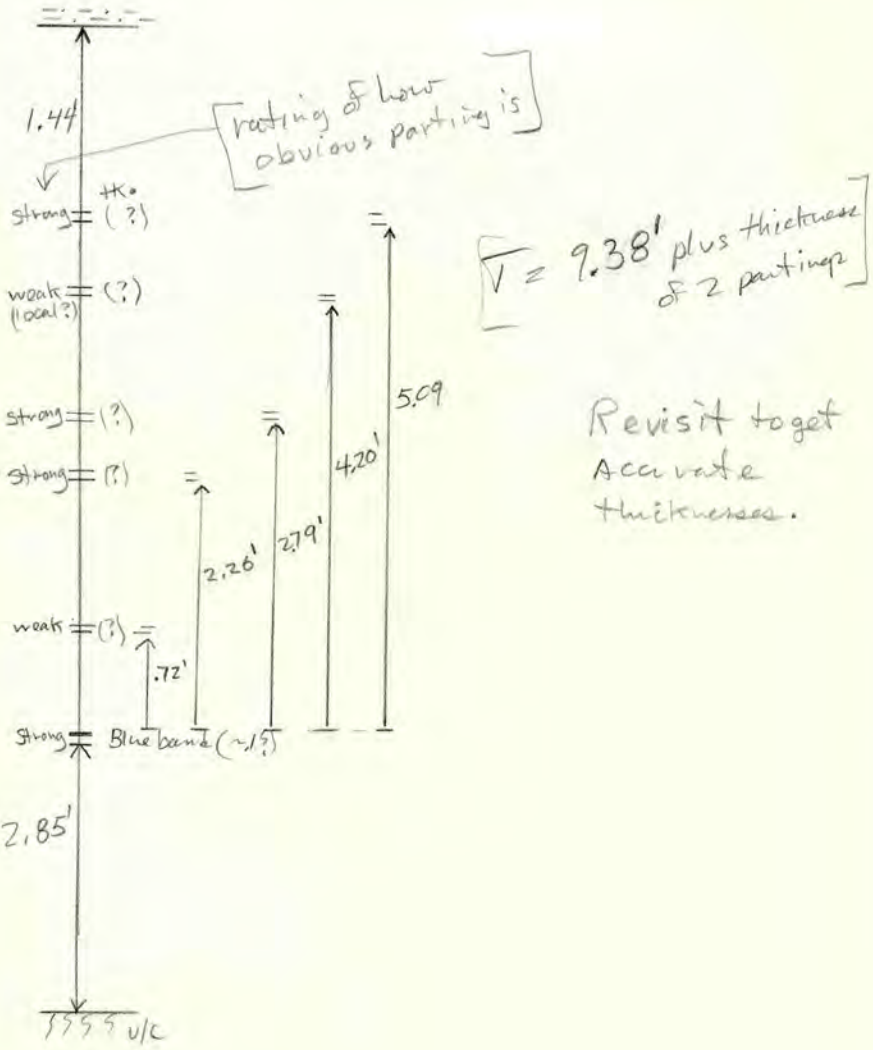
Peabody No. 10 -9- DeMaris

Letter
20. Nearly 7½ feet of coal here with rough Pick of blue band suspect when compared with 2P. exposure, i.e. this is probably "steel band" which runs 0.6-0.7' above blue band.



Peabody No. 10 -10- DeMaris

2P. John finds full exposure of coal and measures 9.41' of Herrin. I do hurried rough stratigraphy of partings. Roof is a gray claystone with slips - need better exposure. Hammer left in hurry to meet ride.



Conclusions

The trough feature called the "hill" has been grossly described in print but not studied for significance in deposition of Herrin Coal. Because fresh exposures are now available, John and I have decided to do a small scale project, with help from Debbie Willard (palynology) and Randy Hughes (XRD mineralogy), focusing on the 3rd N. stub area. We will examine the nature of the depression and how it was filled in with peat, focusing on the interval below the blue band but getting full seam thickness data where available.

Samples: P10-A-1 through -15

11/5

	Site	Description
P10-A-1	A west	Chips of Brereton fault gouge breccia
-A-2	B	Blueband of Herrin; 27 mm thick with bottom 7 mm bone coal. Sharp claystone/bone contact, gradational contact to NBB coal below. Block and bulk (XRD).
-A-3	B south	Anna Shale with u|i bivalves and Orbiculoidea; B = base; being examined by Joe Devera.
-A-4	H	Siltstone above Brereton Limestone; cream colored, slabby (XRD)
-A-5	I	Blueband of Herrin, 22 mm thick. (XRD)
-A-6	I	Underclay of Herrin Coal, top (XRD)
(Day 2) 11/6		
-A-7	2A	White clay pebbles from conglomerate over prob. Energy Shale (XRD)

Peabody No. 10 -12- DeMaris

	Site	Description
P10-A-8	2B	Energy Shale with pectins from paleo-low area (XRD)
-A-9	2F	Pebble conglomerate with plants where unconformably lying on Brereton
-A-10	2F	Iron-stained or recrystalization at base of Brereton Limestone (XRD)
-A-11	2J	Base of Anna, very carbonaceous (from bottom 0.1')
-A-12	2K	Blueband of Herrin; 23 mm, with gradational base, block and bulk (XRD)
-A-13	2K	Block covering about 2 cm of bottom of Herrin (impure) plus about 6 cm of top of underclay, silty. Top boundary with NBB Herrin is along a pyritic laminae. -13A is 2 cm. impure coal with vitrain streaks, cleated; fairly sharp boundary to -13B; silty claystone, moderately carbonaceous, showing some subvertical rootlet traces and one subhorizontal carbonaceous zone (XRD + palynol.)
-A-14	2K	Underclay 1.3'-1.5' below base of Herrin, from zone showing more carbonaceous traces (including rootlet traces) than above and below it. (XRD)
-A-15	2L	Siltstone, off-white with greenish cast; from top of fall.

John C. Moore Corporation, Rochester, N.Y. 14604
FORM 180 W

Peabody Coal Co. - Mine No. 10. February 19, 1987. Notes by John Nelson, visit with Debbie Willard (Univ. of IL., paleobotanist) and Phil DeMaris.

Purpose of visit is more detailed mapping of trough in coal, 6th West off Main South. Suites of samples will be collected from coal and floor strata.

A.) Intersection of entry 3 (from north) and entry no. 1 (westernmost) to 4th north panel. Strata horizontal on south flank of trough. Coal overlain by 1 to 1½ feet of Anna Shale with limestone above. Broad low "roll" in limestone, about 10 ft. wide, trends ESE; the coal and Anna Shale folded down beneath; small compactional faults and light gray clay injected into top of coal beneath the "roll".

B.) Intersection of entry 1 and entry 2 of 4th North Panel. Floor exposed - up to 3 ft. medium-dark gray to olive-gray hard silty mudstone or siltstone, nearly massive, coarse plant debris (roots?) faint contorted laminations in places; detrital texture- coarse sand-size fragments in argillaceous matrix.

Coal dips approximately 9° north on flank of trough. Roof not exposed.

C.) Intersection entry no. 1 of 6th West, and entry no. 3 of 4th Panel North. Intersection totally blocked by roof fall. It appears that the roof failed "en masse" as the fallen rocks are stacked rather than jumbled. Interior of fall barely visible from edge. To judge by fallen rock, there is 6-7 ft. of black shale above coal, overlain by light gray, micaceous argillaceous siltstone or extra-fine sandstone that contains abundant coarse plant debris - possible roots.

This is at bottom of trough.

D.) Just north of belt on crosscut 36 (= Entry No. 4 of 4th N. Panel) on west rib there is a zone of black siliceous nodules at the top of the coal. Nodules up to about a foot thick, internally shattered and shot through with veinlets of crystalline white quartz (?) and pyrite. In places a thin streak of coal overlaps nodules. Roof is Anna Shale, weak and mottled, a few inches to 1½ feet thick (much local variation); limestone above.

Coal adjacent to nodules appears normal although deformed around the nodules.

E.) Intersection entry no. 2 and crosscut 34. Roof is dark gray shale - not Anna Shale. Shale is firm, finely silty, faintly laminated, not fissile; abundant pyrite crystals near base, flattened septarian concretions (pyritic) up to 1 foot across, also near base. Fossils include Pectin, small bivalves like Carbonicola, and coaly plant fragments. Thickness 2 ft. plus.

F.) Crosscut 31 (?) between entries no. 2 and 3. Several inches of brittle, thinly laminated, shaly coal or interlaminated shale and coal at base of Anna Shale. Contact to bright coal below is sharp, contact to black fissile shale above is gradational. Much coarse coalified woody debris.

G.) Entry no. 3 at and near crosscut 34. Immediate roof is several inches to about 1 foot of very dark gray to black brittle shale that appears to be Anna, but it is not fissile; bedding is disturbed and shale very weak. It is overlain with sharp irregular contact by siltstone, medium-light gray, argillaceous, thin parallel to slightly uneven laminations. Many nodules or concretions of dark gray, dense, fine-grained pyritic limestone found in base of siltstone, or between siltstone and black shale.

G.) (Cont)

Roof slabbing badly, large falls impending despite thorough use of roof bolts and angled trusses.

H.) Intersection of entry no. 3 and crosscut 33 completely blocked by roof fall, 6 to 8 ft. above top of coal. Immediate roof at west edge of fall as of Note G. At east edge of fall there is about a foot of Anna Shale overlain by nodular, silty Brereton Limestone. Fallen rock is mostly siltstone, as of Note G; grades upward to greenish mottled silty mudstone; at the top a brown-weathering lenticular bed of silty limestone (?). Top of fall is more or less planar surface - it has not arched out.

Could be Anvil Rock overlain by Bankston Fork?

I.) Entry no. 3 between crosscuts 31 and 32. Roof consists of a few inches of Anna Shale overlain by nodular limestone. Shale and top few inches of coal shot through with "white top" veinlets of yellow-gray clay. Contacts are very irregular. Eastward the "white top" dies out, and the Anna Shale thickens and becomes fissile (as usual).

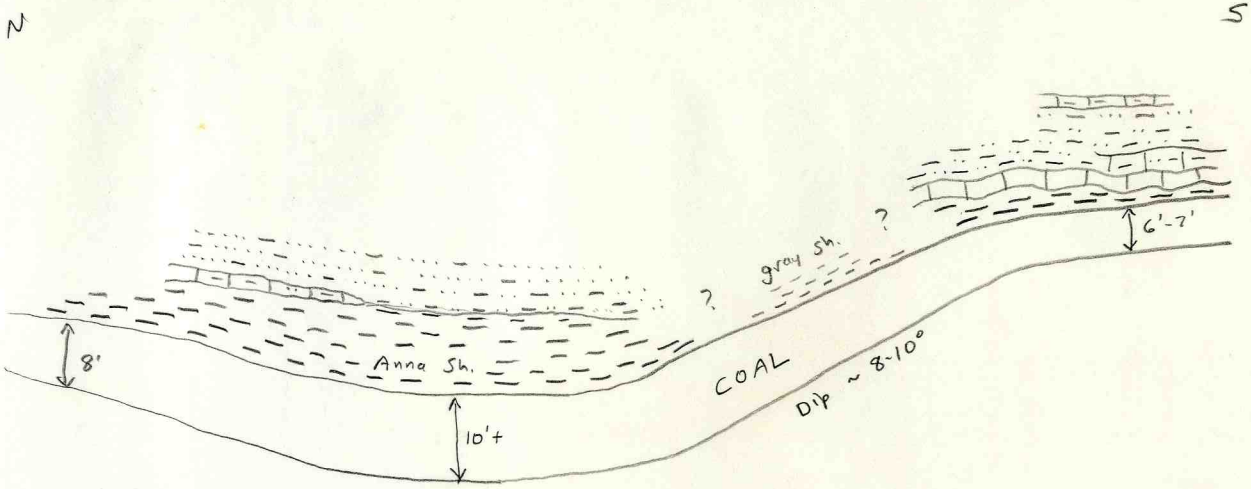
J.) In entry no. 2 of 3rd North Panel - one crosscut north of 6th Main West. Roof fall blocks intersection. Looking in from edge, appears to be about 6 ft. of Anna Shale, sharply overlain by light gray rock. Fallen slabs of siltstone, medium-light gray, shaly, finely laminated; also limestone, grayish-brown, fine-grained, thin lenticular slabs. 2 to 3 feet of this material fallen out, exposing darker rock at very top of fall.

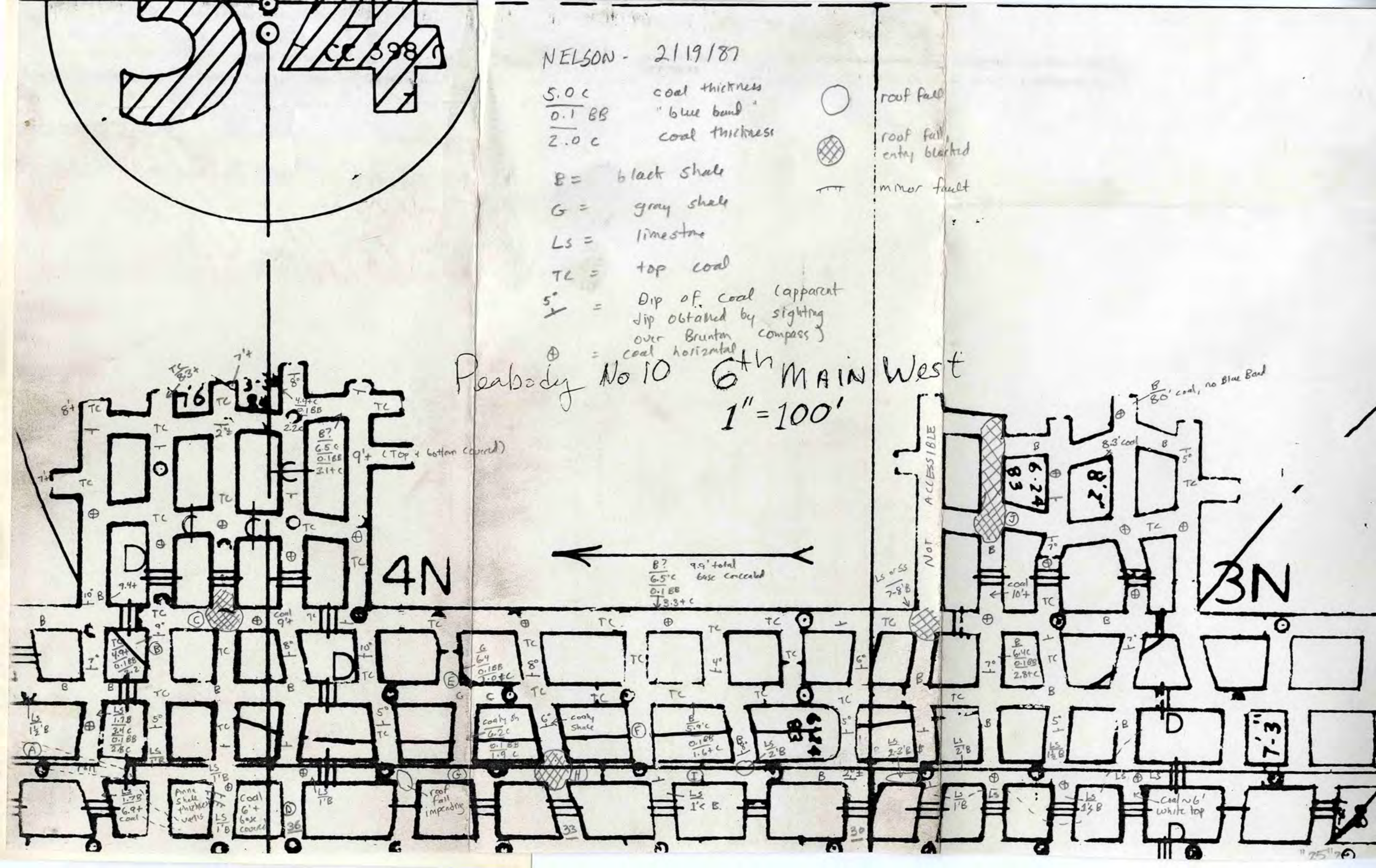
Next intersection to north also blocked by fall. Here (judging by stacked, fallen rock) several feet of Anna Shale overlain by about ½ foot of brownish-gray limestone; above this several feet of sandstone, light gray,

J.) (Cont)

very fine, shaly, micaceous, thinly laminated; thoroughly penetrated by fine rootlets or burrows - I believe they are rootlets, but no obvious Stigmaria.

Generalized cross-section





NELSON - 2/19/87
5.0 c — coal thickness
0.1 BB — "blue band"
2.0 c — coal thickness
B = black shale
G = gray shale
Ls = limestone
TC = top coal
5° = Dip of coal (apparent dip obtained by sighting over Brunton compass)
⊕ = coal horizontal
roof fall
roof fall, entry blocked
minor fault
Peabody No 10 6th MAIN West
1" = 100'
4N
3N
NOT ACCESSIBLE
9'+ (Top + bottom covered)
9.9' total base concealed
8.0' coal, no Blue Band
roof fall impending
Coal ~6' white top
7'-3"

John C. Moore Corporation, Rochester, N.Y. 14604
FORM 180 W

Mine Notes - Peabody C.C. No. 10 Mine - Christian Co.

Trip: February 19, 1987 by Phil DeMaris and John Nelson, with Debbie Willard (U. of I.) and John Ewell (Peabody Engineer)

Coverage: Introduction
Trough in Herrin at 3rd N.
Samples: Set B (1 to 8, complete)

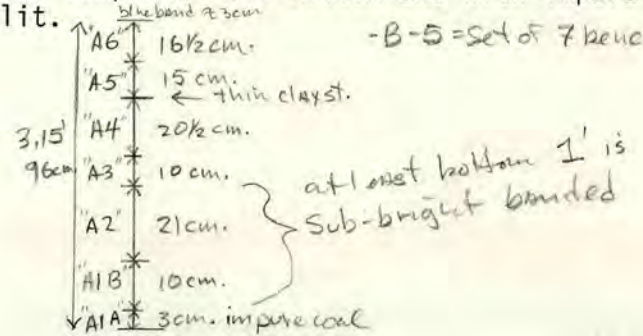
Introduction

John, Debbie and I agreed to do a small project on the depositional environment of the thick Herrin Coal in the trough compared to the more normal coal on the flanks of the feature. Randy Hughes will provide clay mineralogy support. Palynologic data generated by Debbie will go into her Ph.D. thesis. A manuscript suitable for publication is planned to be generated this year; tentative draft deadline is September 1.

Trough in Herrin Coal at 3rd N. off 6th Main West

Planned sample site area reached at 10:45 (see map). I had intended to get a mix of thickness/stratigraphy sites and sample sites, but base of ribs generally have 2½' of fallen coal against them, so only sample sites were dug out.

A. Site is on E. rib where someone took a thickness on the last trip, across the entry and about 20' N. of "2I" site from last trip. Below the blue band 6 benches were sampled: the bottom one with impure coal may be split.



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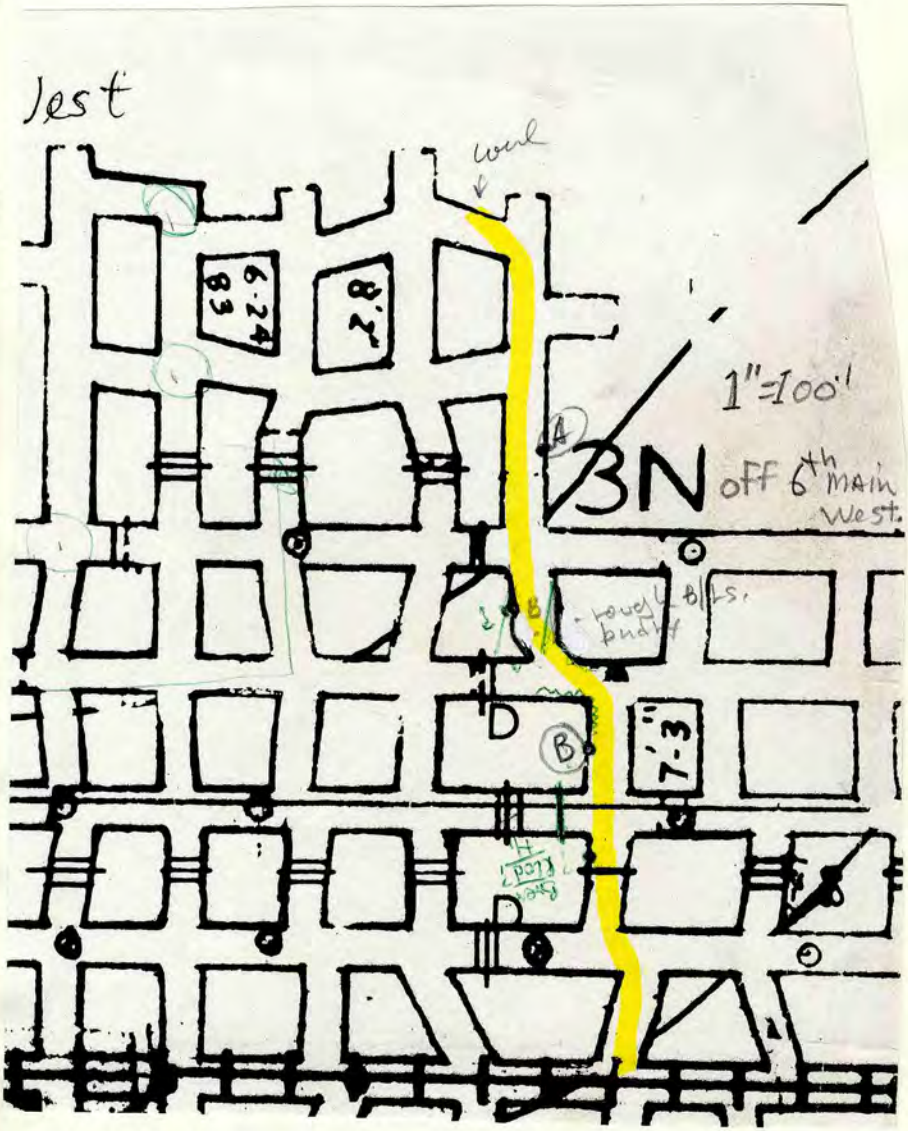
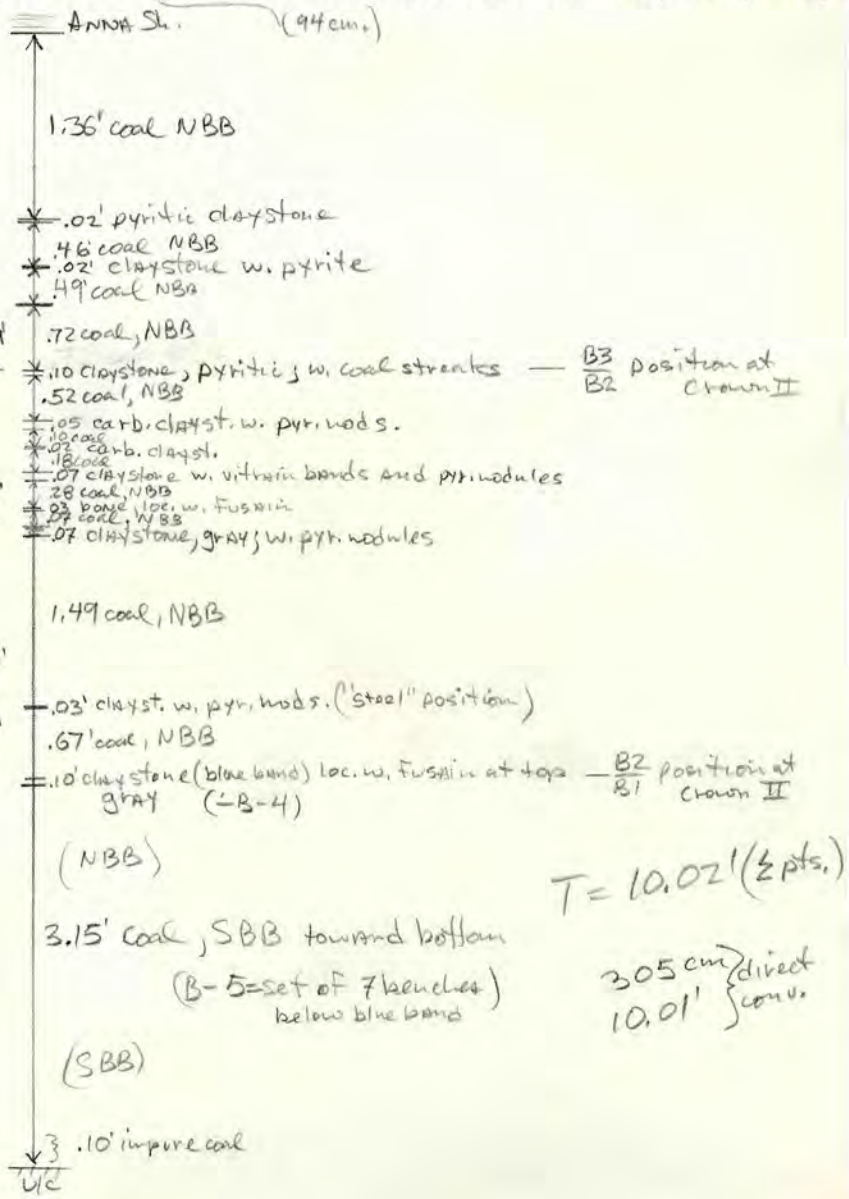
FORM 180 W

MAP A 2/19/87

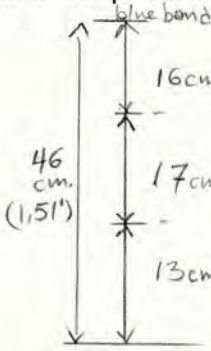


The full seam description (converted to decimal feet) follows. The coal thickness above top parting is derived in part from value above .10' claystone parting on W. rib, where Anna shale roof was sampled (-B-3).

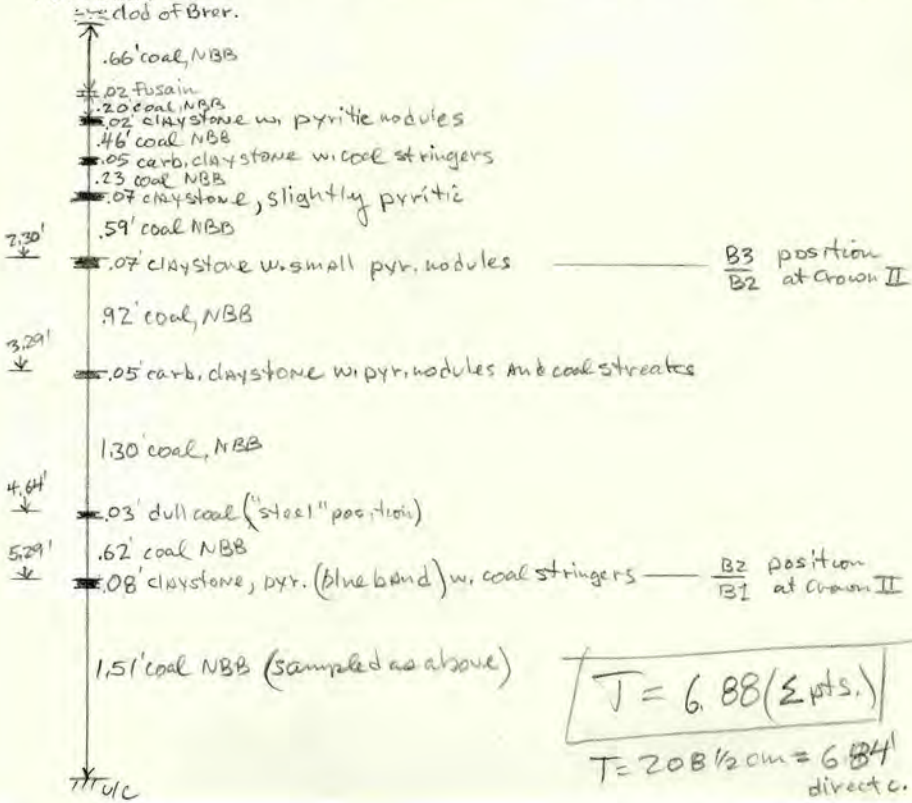


Peabody C.C. No. 10 Mine

B. Site was difficult to dig out because it was mined several years previous. It is about 160' South of A and is on the "rim" of the trough. Three benches were sampled below the blueband. (B-6) set of 3 benches



The full seam description (converted to decimal feet) follows.



J = 6.88 (Σ pts.)

T = 20 B 1/2 cm = 6.64' direct c.

Next we revisited the 2K site and sampled (-B-7) the banded coal above the impure coal sampled previously as -A-13. There is 3.1' coal here below blueband, a figure similar to that at A.

With John completing his mapping, we went to look at the highest nearby fall, his J. I sampled the light gray siltstone found above the Anna or Anna/Brereton sequence. We discussed his statement of burrowing or rooting; I saw no evidence of rooting in mine. Specimen I took (-B-8) is fine siltstone, very micaceous with faint brownish laminae: brown material also appears on what may be burrow traces or small scale sedimentary structures. Study of slices of specimen would clarify this. The siltstone is presumably part of the Anvil Rock Sandstone which may have reused segments of the trough in the Herrin reflected as lows on post-Brereton surfaces.

Samples: Set B, 1 through 8

	Site	
-B-1	-	Sandstone from channel (ARC ?) above Herrin in the 5½ Main where previously mapped by Nelson: grab sample from sandstone block fallen between arches. Sampled on way to A.
B-2	-	Anna shale from previous coal description site "2P" where roof over thick coal was uncertain: rather pyritic Anna from basal 0.1' of unit. Sampled prior to arrival at A.
B-3	Vic.A	Anna roof from near old "2I" site near new site A.
B-4	A	Blue band; oriented block (create bulk sample for XRD)

plus map

B-5	A	Coal samples below blue band (6 or 7 benches) for palynologic and petrographic analysis, numbered A1A, A1B, A2 to A6 stratigraphically, covering 96 cm.
B-6	B	Coal samples below blue band (3 benches) for palynologic and petrographic analysis, numbered B1 through B3 stratigraphically, covering 46 cm.
B-7	-	Revisit of 2K site to get normally bright banded coal above pyritic band: A is lower 6 cm.; B is top 9 cm to fusain band.
B-8	N.'s J	Finely banded siltstone (A.R.C.?) with some structure. Nelson's light gray unit.

Peabody 10

Ill. Energy & News-Letter 13/4 (Aug. '87)

Edison Contemplates Coal-Fired Power Plant

Commonwealth Edison Co. is promising the next power plant it builds will be coal-fired, as part of its commitment to using Illinois coal, spokeswoman Debbie Vestal said. Edison will continue operating its Kincaid power station, a major user of Illinois coal, into the next century. That plant, about 20 miles south of Springfield, is the sole customer of nearby Peabody Coal Co.'s Mine No. 10, the largest underground coal mine in Illinois, she said.

"For the first time Edison promises to keep using Illinois coal as one of our key sources," Vestal said. Edison is not yet announcing where that power station will be built, or when. The utility has 10 fossil-fuel plants. (Associated Press)

10/8/87
PJD

John C. Moore Corporation, Rochester, N.Y. 14604
FORM 180 W

p.1 of 8, plus map

Mine Notes - Peabody No. 10 - Christian County

Trip: May 9, 1989 by Phil DeMaris with Gary Garrison, Chief Engineer and Connie Letsky, PDC Geologist

Coverage: Introduction
Thick Coal in 1st W. off 1st N. off 6th W. Main
Samples: Set "C" (C-1 to -11)

Introduction

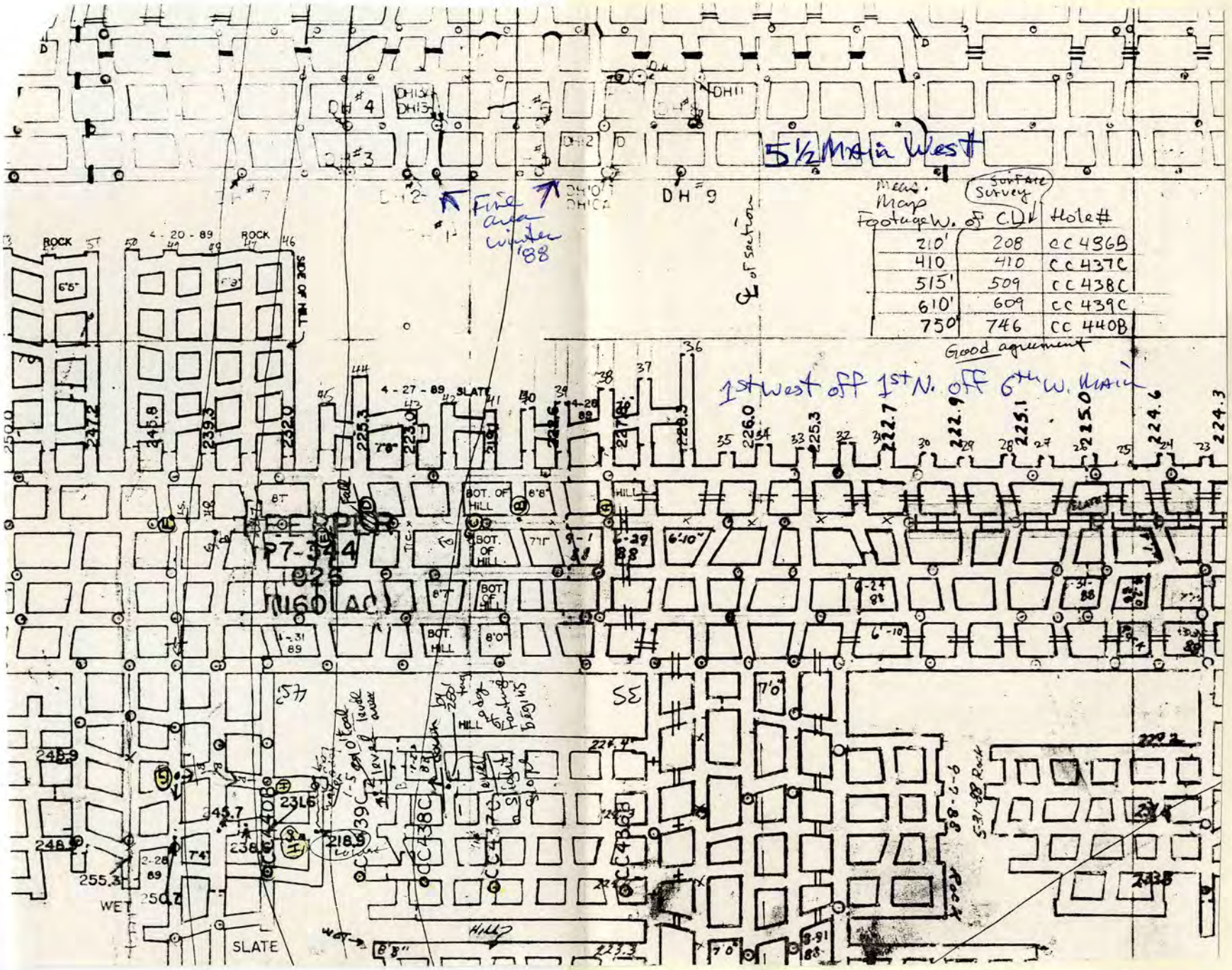
Purpose of visit was to visit paleo-channel with thickened Herrin Coal and get last samples for study underway with Debra Willard and John Nelson. We visited the 1st W. off 1st N. panel off 6th W. Main and subpanels driven S. off it. On the 1st W. we traveled on the "C" entry (travelway) to match up with the elevations of the floor recorded on the mine map. In panels the 5 entries are named (L to R) "A buggy, A, B(belt), C (travelway/track) and C buggy." We entered new Zenobia portal (which Gary designed and had constructed); coal is 382 feet deep there.

Thick Coal in 1st W. off 1st N. off 6th W. Main

We stopped near end of track around Rm. 28 position and walked west past unit 7 which was cutting rooms off the "C buggy" entry.

A. (See Map A) Station 20 (3791') at approximately #38 room position marks the edge of depressed area. Roof is 0.4' "clod" under Knobby Brereton. The "clod" is typical in the mine although the "clod"/ls. contact appears a little more gradation here than is typical in Crown II. Clod has lots of brachiopods, some bivalves and occasional cephalopods (general observation from all sites).

May 9, 89 Map A

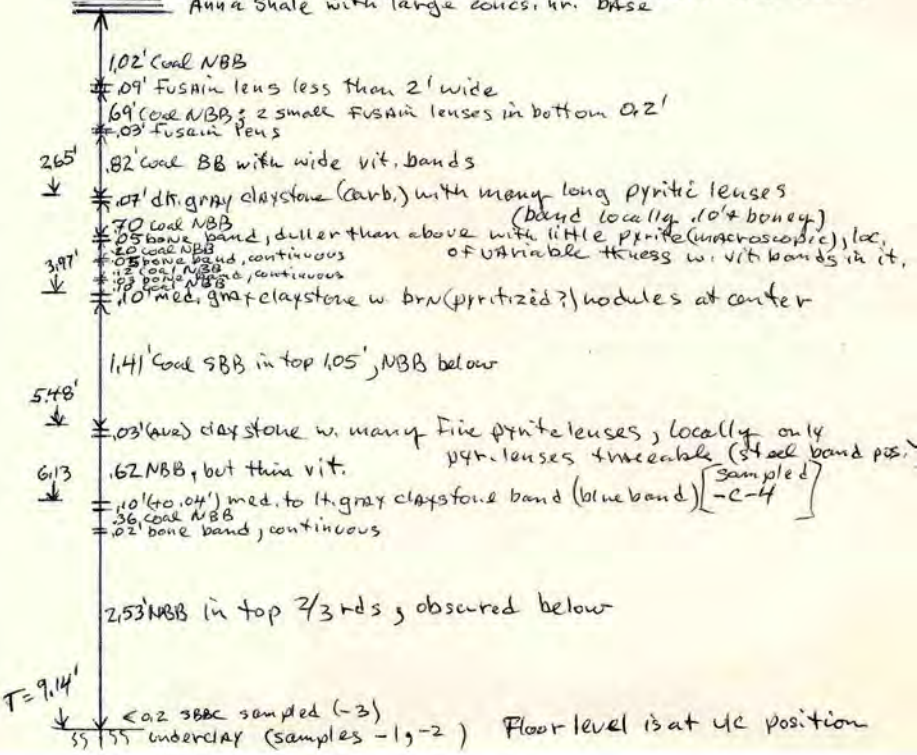

DH #4
DH #3
DH 2
DH 9
DH 11
5½ Main West
Fire area winter '88
Means Map Footage W. of C.D.H.
Surface Survey Hole#
210' 208 CC 436B
410 410 CC 437C
515' 509 CC 438C
610' 609 CC 439C
750' 746 CC 440B
Good agreement
1st West off 1st N. off 6th W. Main
4 - 20 - 89
4 - 27 - 89
ROCK
SLATE
BOT. OF HILL
WET
CC 440B
CC 439C
CC 438C
CC 437C
CC 436B

p. 2 of 8, plus map

Next intersection (approximately #39 room) has Anna roof, so lith. change occurred over about 60' (average centers for pillars is 80').

B. Approximately #40 room, Anna roof with large concretions (over 1 1/2' diameter, one seen is 1 1/2' x 2' oval). Coal is minimum of 9'; coal thickness below blue band is 2.85', below 0.07' thick "blue band" (medium gray claystone). Map shows 8' 8" just to east.

C. Intersection is just past "bottom" of low as on map; location between #41 and #42 rooms. Anna roof has lots of coaly debris including periderm or trunk segments to 0.4' long. Base of Anna shows circles defined by microfaults of 1 1/2' - 2' diameter under Anna concretions. Around corner to south pictures were taken by Connie and a coal thickness/description in moderate detail was done:



D. Bottom area rather level - walked ahead to fall at #44 room position on travelway. Fall shows 2 1/2' Anna with 4' bolts at top (5' Anna possible). Bolts on brow of Fall are 6' suggesting 4 1/2' - 5' Anna is likely. (Bolters bolt into minimum of 1' limestone)

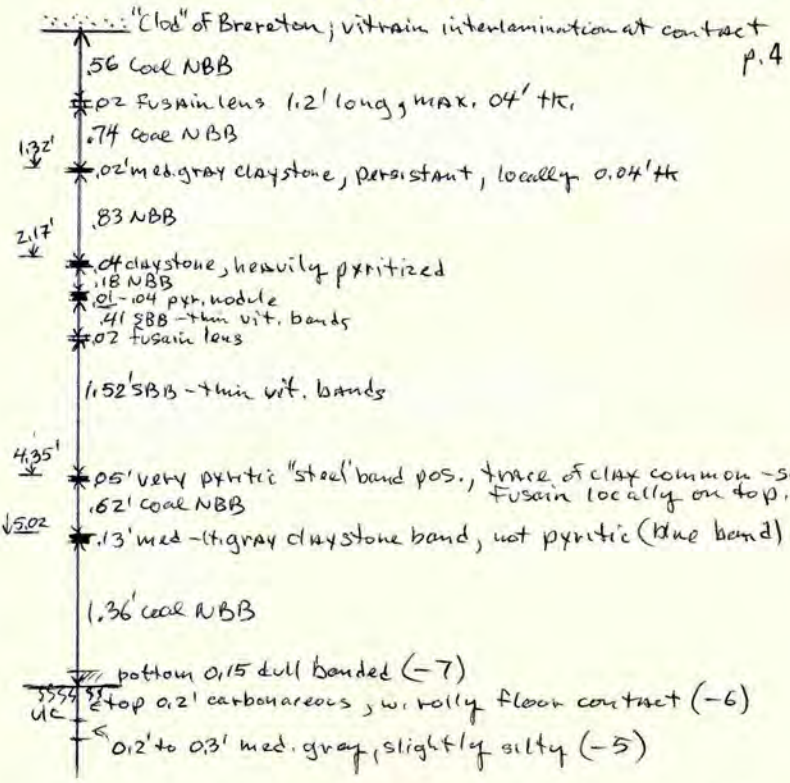
E. Light at intersection (4220' tag), just past #45 room position. Floor is at top-of-underclay level and area has Anna roof with 6' bolts. Coal thickness around corner to S. is 8.85'.

At Rm. #47 position still approximately 8' of Herrin.

At pillar corner just short of Rm. #48 position there was 1 1/4' Anna to gray claystone "clod"; tag says 4380'.

Over interval Rm. #47 to #48 on travelway the floor goes steeply up, perhaps 6'. On to halfway to position #49 room Brereton Ls. (with 0.3' clod) comes in as roof as steep slope continues.

F. Top of steep grade (Rm. #49 position) has limestone roof and "thin" coal. Gary says anything under 7' is thin in this mine. Top of underclay is carbonaceous, grading down to medium gray claystone (silty?) by 0.2' down.



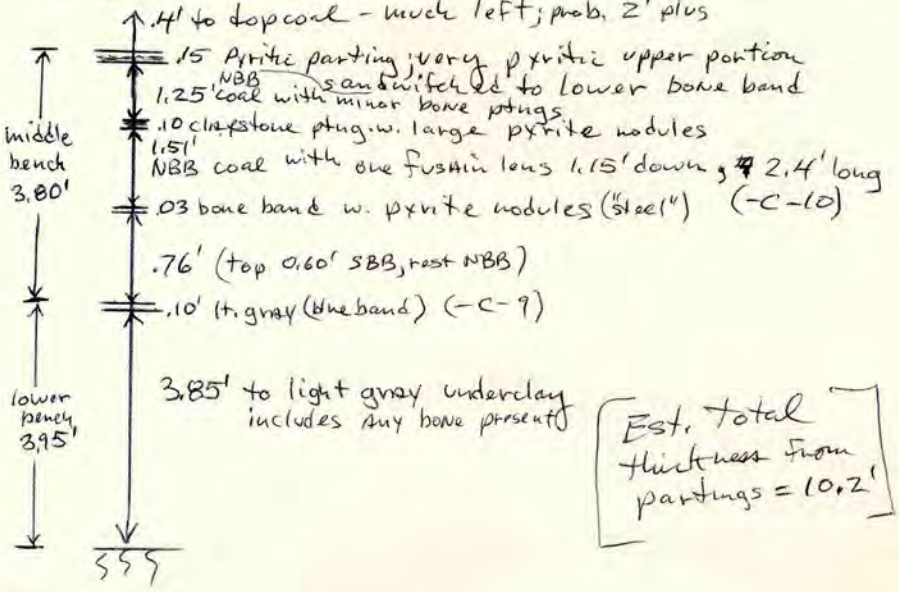
From #49 position looking west there is only a slight rise (see map elevations). We walked due S. and thus went down slightly in elevation because the rim crest "moved" slightly west by the door between "A" and "A buggy" entries into 4th south panel. We continued another 200' south to G. at near level.

G. Intersection is at top of steep decline to east. Seam levels just to the west, and perhaps also to south. Roof is still Brereton "clod." Elevation loss is probably 8' to next c/c east. Walking east, Anna roof comes in with only about 2' elevation change. Drop continues to E. totaling at least 28'.

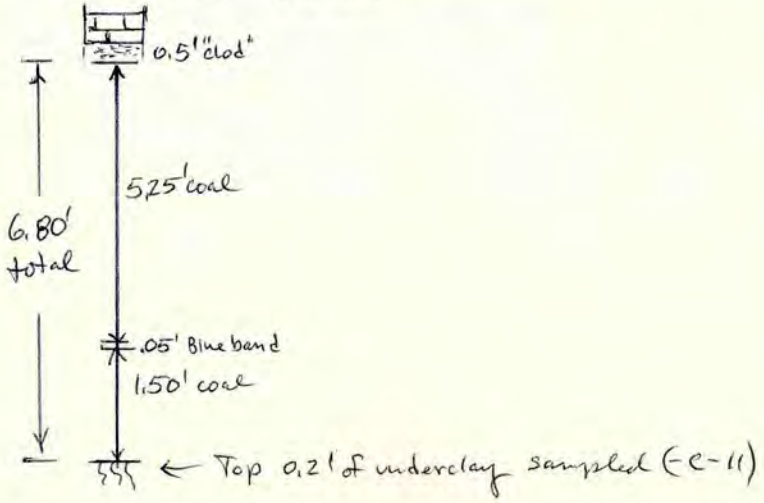
H. Gary exposes coaly underclay at gradational contact to underclay near bottom of channel. Coal

thickness here is 9.7', top 0.2 of coaly underclay samples (-C-8). (On examination this material is dull, weakly banded bone coal transitional to underclay; total thickness is probably 10.0' and true underclay was not sampled).

H. So. Site is lowest in the area, is now topographically only slightly lower than C. but has significantly more coal below the "blue band" than C. Top coal was left locally and we saw stigmaria root and rootlets in a claystone parting here where it was left as roof (.15 parting in diagram below). Also in the parting there appeared to be the lower part of a small (2' diam.) erect tree trunk ("kettle bottom") which became only slightly in-filled (perhaps 0.2' but not clear) before it collapsed over to a low angle. I did quick measurement of position and thickness of the 4 main middle bench partings and dug to get a lower bench (below blue band) thickness to light gray underclay (wet); contact not visible, so this includes any bone coal or very carbonaceous underclay.



I. We returned to travelway and walked east. Just west of turn into 1st N., N. of track across from lighted c/c with transformer I sampled top 0.2' of underclay. 1987 mining in area; hopefully unweathered enough for palynology. Site would be "control", representing normal flora before swamp peat accumulated. Took vehicle out to bottom around 2:30. Sketch:



5/12/89
plj:MineNotes

Samples: P10-C-1 through -11

notes by hand added after examining samples during processing, P30.

	Site	Description
-1	C.	Herrin underclay 0.2' - 0.3' below seam; medium dark to dark gray. (paly): v. finely carb. w. rare very small bright grains (mica?) and some lt. gray ½mm flecks.
-2	C.	Herrin underclay top 0.1', medium dark to dark gray, mottled. (paly and XRD): No silt; very finely carbonaceous.
-3	C.	Herrin Coal, bottom 0.2' SBB coal. (paly and pellet) very finely banded; only occas. 1 mm band seen.
-4	C.	Blue band, 0.10' thick, dark olive gray (block and carbon %). (R17551)
-5	F.	Herrin underclay 0.2' - 0.3' below seam; light-medium greenish gray with vitrinized root(?) traces. (paly and XRD); more granular texture than samples from site C. 5 mica flakes per cm² on bedding planes (to .2 mm)
-6	F.	Herrin underclay 0.0 to 0.2' below seam; top .04' very dark gray (carbonaceous); lower part variably carbonaceous and medium gray. (paly and XRD): similar to above; also micaceous, perhaps less so; with rooting struct.
-7	F.	Herrin Coal, bottom 0.15 ~~HBB~~. (paly, block and pellet) dull banded, finely banded.
-8	H.	Impure coal near underclay contact (0.2' thick). (paly and carbon %). heavier than coal - finely banded (R17552) especially thin vit streaks - fair clast dev.
-9	H. So.	Blue band, medium to dark gray. (black and XRD). Typical; .08'; more gradational to top than to bottom.

-10 H. So. Fusain from mid-seam lens. (pellet). Good purity — no vitrain seen in bag.

-11 I. Herrin underclay, top 0.2'. (paly and XRD) pale greenish gray with many carbonaceous rootlet films. Slightly micaceous and very friable. No leaflets seen.

8 palynology samples to Debra Willard 5/15 as part of planned paper.

written 5/9
5/12/89
plj:MineNotes

p 1 of 4
w. 2 maps

Mine Notes - Peabody No. 10 - Sangamon County

Trip: August 16, 1989 by Phil DeMaris, Debra Willard (U. of I.), escorted by Ed Mattey, Engineer

Coverage: Elevation data on maps
Visit to 6th Main West off S. Main
Visit to 6th N. of 6th Main West
Samples: Set D ;(-1 to -5)

Elevation data on maps

Part of purpose of visit is to clarify location of elevation values on map. These floor elev. values are plotted on the N. margin of the Mains for the 6th West and are spaced 100 feet apart. I asked if elevation data on 5 1/2 West map was correct and Ed indicated they were from before grading of the travelway.

The drill holes in the area were not seen at mine level, so there is no location check possible. Some drift is possible during drilling, so elevations should be close to expected but can vary. The drill holes are assumed to have sloughed in, and are never seen in the mine. Study area is actually in Christian Co.

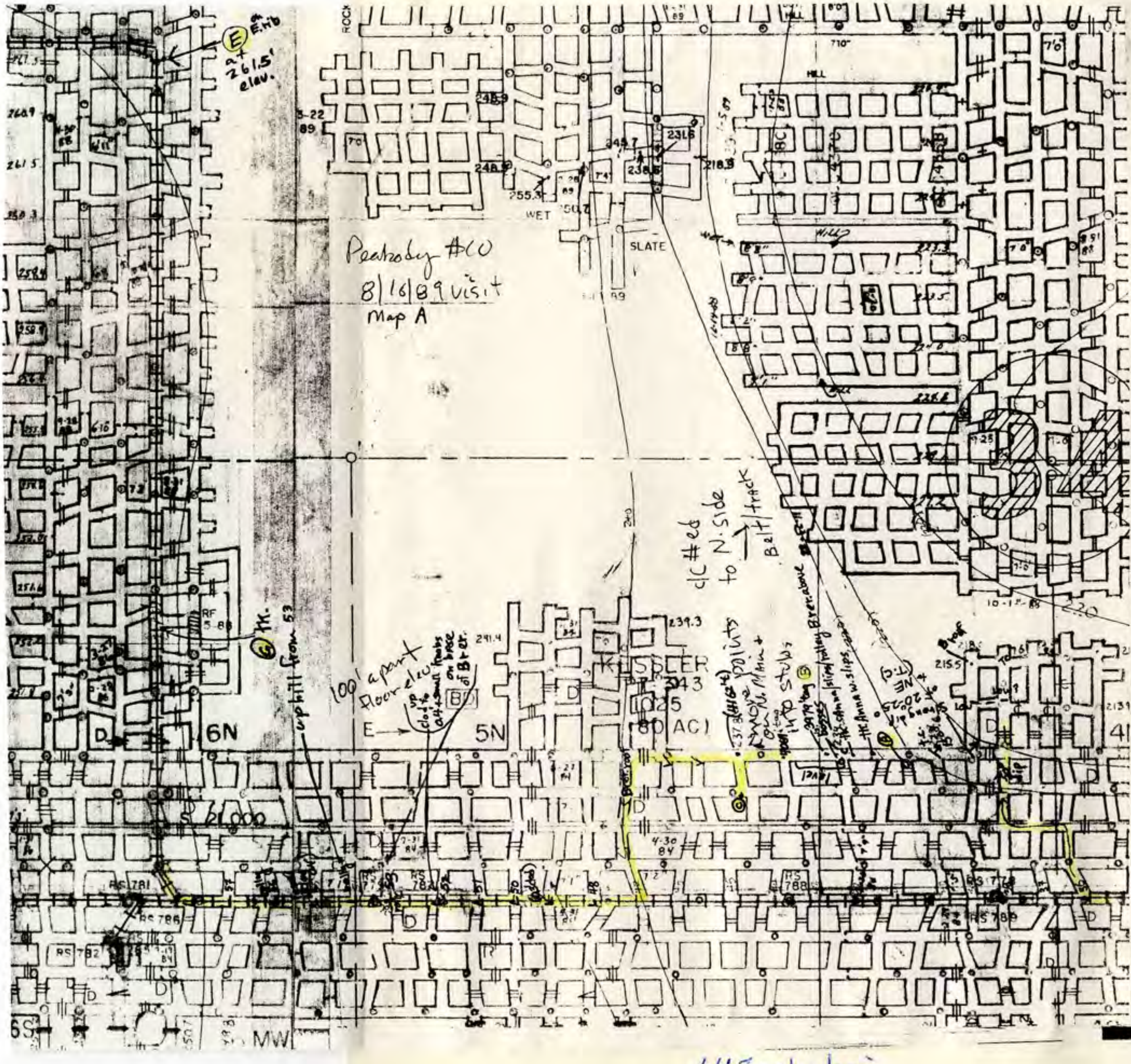
Visit to 6th Main West off S. Main (Map A)

We went in 36th cc to reach the 4th N. panel stub. I had hoped to get some full seam thicknesses matched to points of known elevation, but buildup at base of pillars is a problem. See map A for location of low points, roof lithologies and dip directions noted.

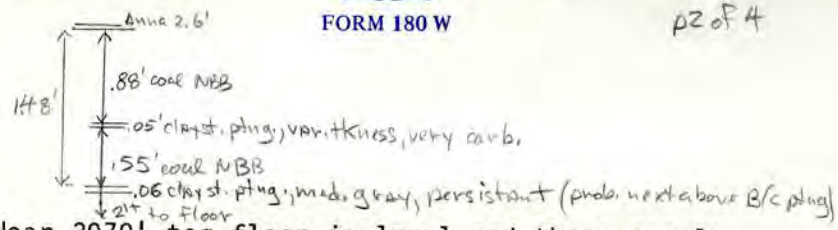
A. Found roof fall at a "shoulder" site (slight slope--10 degrees--to NE). Anna is 2.6' thick with Brereton above. Brereton base is rolly with 1 foot amplitude. Partial desc.:

FORM 180 W

Map A



.647 reduction



B. Near 3979' tag floor is level and there are 1s. bosses in c/c just to south. At 15 feet north of CL of crosscut there is 5.45' coal to Anna roof above blueband. This is probably near average for surrounding area, but see E. where this distance is 5.06'.

C. Seemingly away from channel, we have Brer. 1s roof. The distance from blueband to roof is 4.46', which may reflect the "rim" effect seen on last trip on the west side of the channel. Full seam thickness (dug out) is:

4.46' a.b. b.b.
.04' blueband
2.15' below b.b.

T = 6.65'

We returned to the track entry at 47th c/c and continued west on foot. We got a ride into the 6th N. and walked to the west end, where a south submain has just been abandoned.

D. First south submain off 1st west submain off 6th N. (map B) Development stopped 2-3 c/c in. A buggy exposures include a shallow fall one c/c outby the face showing Anna with large concretions (2-3' range--one meas. 2.6'). At the face there is a 2 1/2-foot fall showing 1.0' Anna with concretions, no Brer. with a greenish-gray highly slickensided claystone above that. At top of fall (1 1/2' up in claystone) there are vasular plant macrofossils. Silty claystone at base sampled (-D-1). Original roof of thick Anna/Brer. apparently removed by erosion.

The A entry (next west) has a small fall and a long fall extending several crosscuts to the west. The small fall shows 3' claystone above thin Anna with large concretions. Claystone is greenish gray and weak (-D-2). Thin siltstone(?) at base of prob. erosional sequence sampled (-D-3). Fall to west appears to have no Anna Shale over Herrin. They have pulled out of

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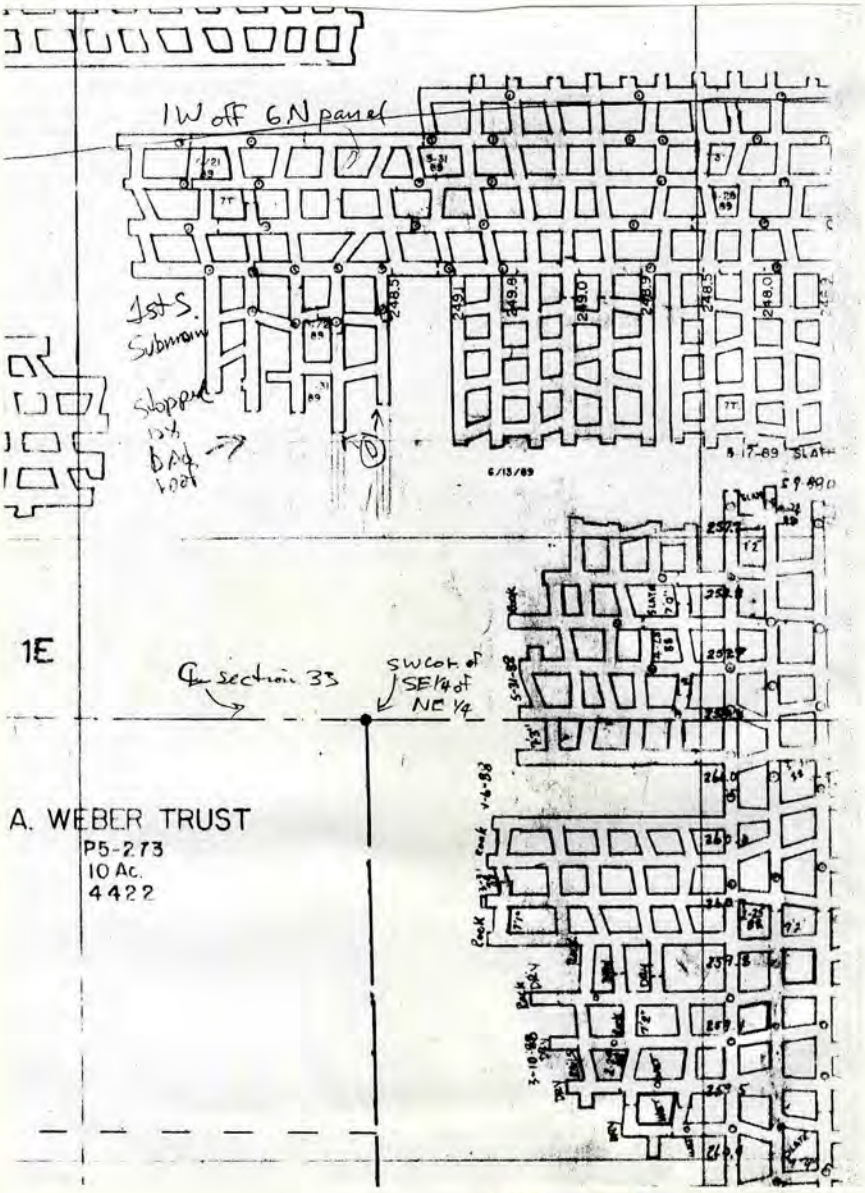
MOORE'S MODERN METHODS
FORM 180 W

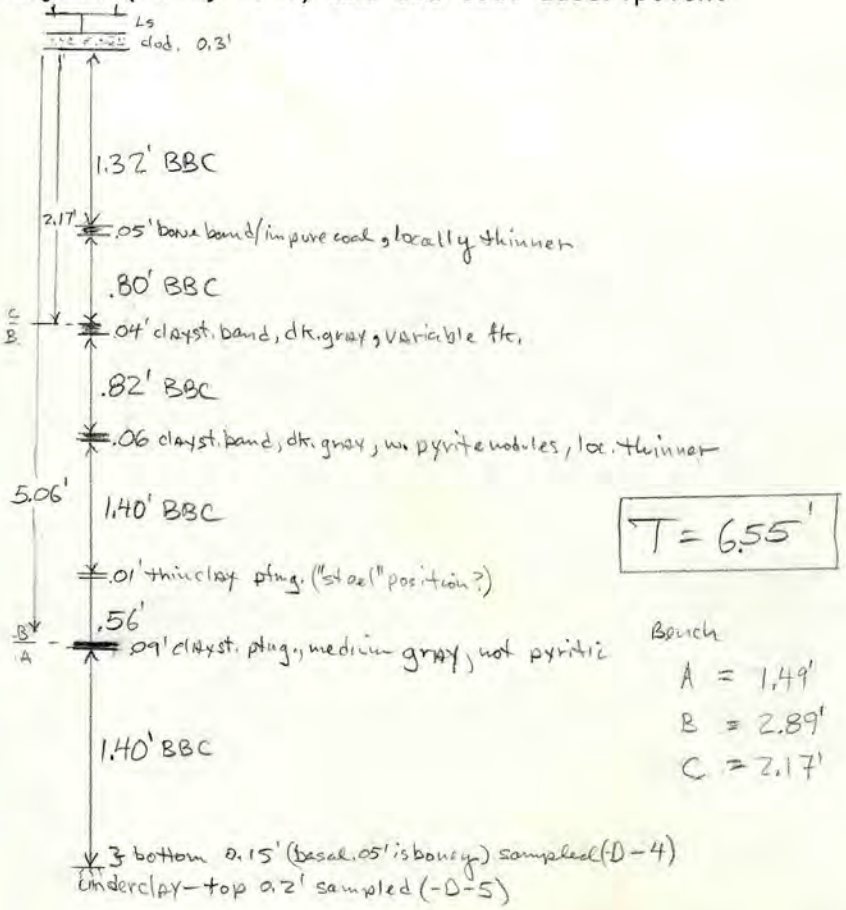
Map B



.647 reduction

area because of poor roof; they reported that siltstone lenses were in top of Herrin further west. Reportedly there was a fall on the belt entry 12' high max. and 60' long; no Anna Shale present and no limestone within bolting distance.

E. We returned to this area (map A) to get "control" samples to the west of the paleochannel. At turn of track and 261.5' elevation of seam bottom I took samples for analysis (-D-4, -D-5) and did coal description:



G. (F. skipped in error) On track 1080' south of E. and 252.0' elevation I took a seam measurement:

Anna roof

5.35' coal above B.B.
.09' b.b.
1.42' coal below B.B.
u/c

T = 6.86'

Samples: Set "D" (-1 to -5) 8/16/89

	Site	Desc.
-D-1	D	Silty claystone, sparcely micaceous
-D-2	D	Weak claystone, highly slickensided
-D-3	D	Siltstone below claystone
-D-4	E	Bottom 0.15' of Herrin Coal (petrog, + paly.)
-D-5	E	Top 0.2' of underclay (petrog. + palynology)

Peabody10

John C. Moore Corporation, Rochester, N.Y. 14604
FORM 180 W

1 of 8 plus 5 maps

Mine Notes - Peabody No. 10 - Christian County

Visit: Nov. 20-21, 1989 by Phil DeMaris, Kumar Chandra and Mark Phillips of SIU, accompanied by Gary Garrison, Ed Mattey and Dick Reisinger of Peabody Coal Co., and Steve Wilson and Connie Letsky of Peabody Development Co.

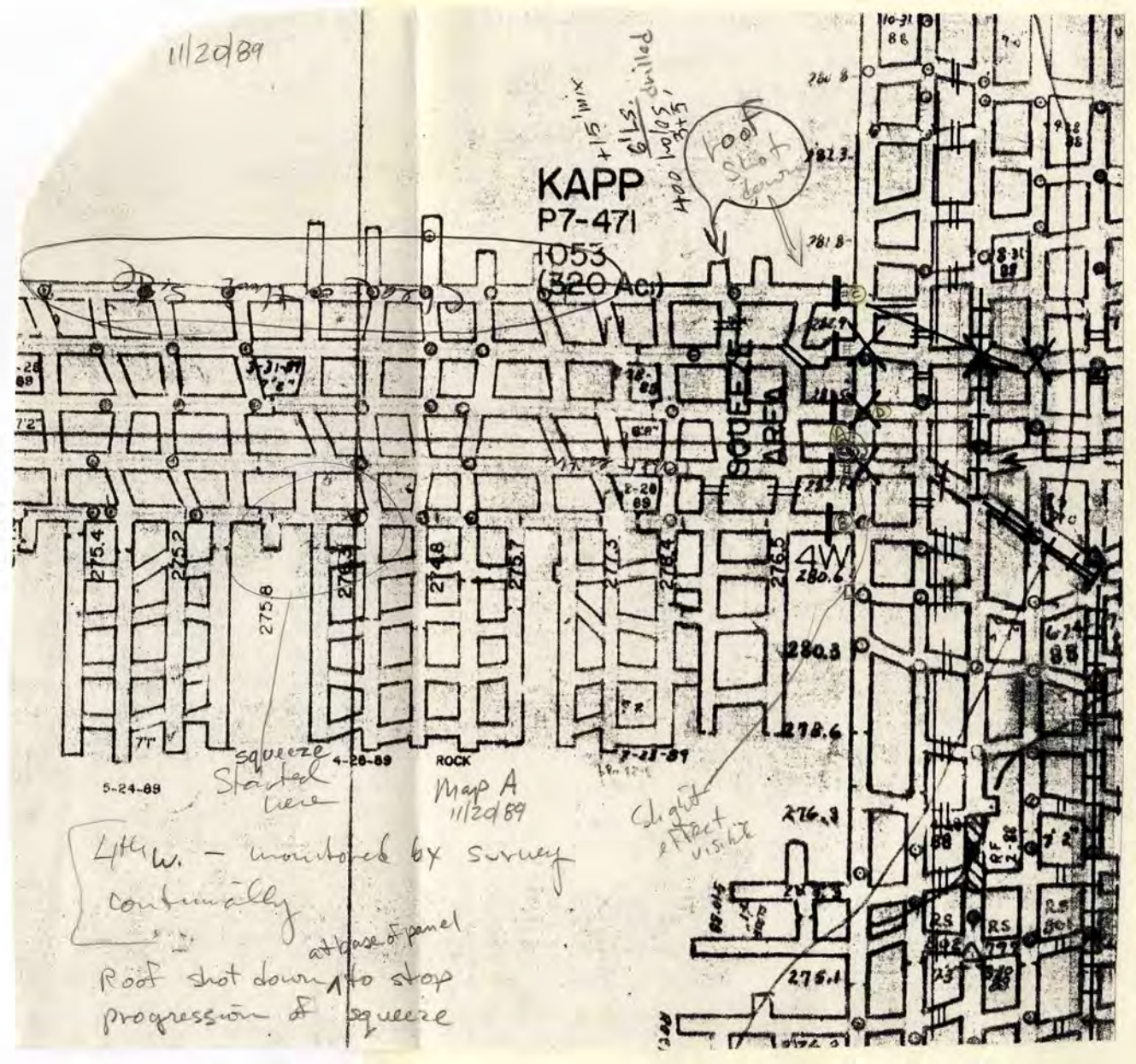
Coverage: Introduction
Squeeze area in 4 W (Sec. 25)
6th S. Channel area off 4 Main E.
Falls near Xenobia portal (day 2)
8th Main East
Faults in 6th N. off 6th Main E.
Samples: Set "D" continued (to -12)

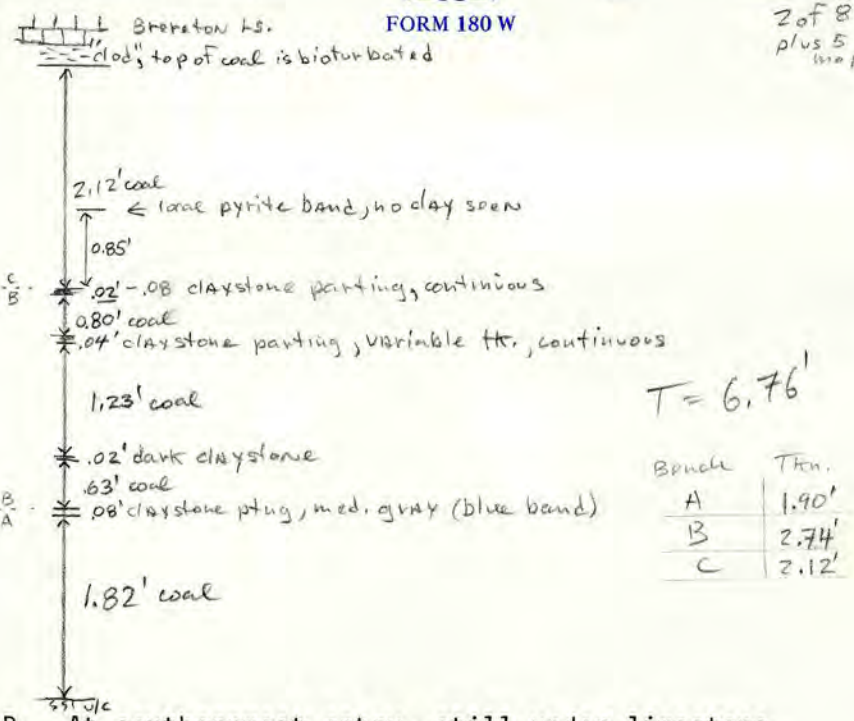
Introduction

This is the first mine visited for IMSRF-funded research for 1989-1990. Gary Garrison planned for us to visit 6 sites, and we were able to visit 5 of them over 2 days. On the first day we went to the North side; the South side was visited the second day via the Xenobia portal. We met Tony Ley, Superintendent, before we went underground.

Squeeze area in 4W (Sec. 25)

A. (Map A) We conferred on former travelway entry; all 5 entries are cribbed on the mains just ~~past~~ in front of the seals. Roof is 0.35' clod below slightly rolly limestone. Roof was excellent in unit--area may have been slightly overmined according to quote of Superintendent. I did a quick description here; coal was a little thicker out in the panel. (just over 7 foot - see map)


11/20/89
KAPP
P7-471
1053
(320 Ac.)
ROOF AREA
4W
280.6
280.3
278.6
276.3
276.1
275.4
275.2
275.8
276.3
274.8
275.7
276.4
275.5
5-24-89
4-26-89
ROCK
7-28-89
squeeze Started here
Map A
11/20/89
Slight effect visible
4th W. – monitored by survey continually
Roof shot down at base of panel to stop progression of squeeze



B. At southernmost entry, still under limestone roof (at "18"?), the pillar corner shows rashing but the coal is intact (no fusain zones seen).

C. At northernmost entry there is rolly limestone roof; 0.40' clod with coal in bottom 0.10'. Coal seam is solid--no fusain zones.

D. Undercast on belt (filled in) had 6' underclay dugout and no limestone was found. Soft floor and "true beam" roof apparently set stage for the squeeze here.

Information provided indicated squeeze started on south side or in south rooms--north entry was uneffected when area was abandoned. Squeeze progressed toward base of panel so the roof was shot down just beyond line of seals. Slight effect of squeeze on floor at A. is all that is seen.

6th S. Channel area off 4th E.

Beginning on the 2nd E. we examined exposures of an Anvil Rock Channel trending NE-SW above the Herrin Coal. At room 10 position on travelway we saw 2 1/2' plus of Anna Shale. SEE MAP B.

E. High fall has carb. shale/siltstone with Virden Coal above. No Brereton or Anna seen; appears to have been Energy Shale roof (trace left). Siltstone right above it is full of plant debris.

F. Continuation of fall further East; shows channel-fill sediments full of pteridosperm compressions directly on Herrin Coal.

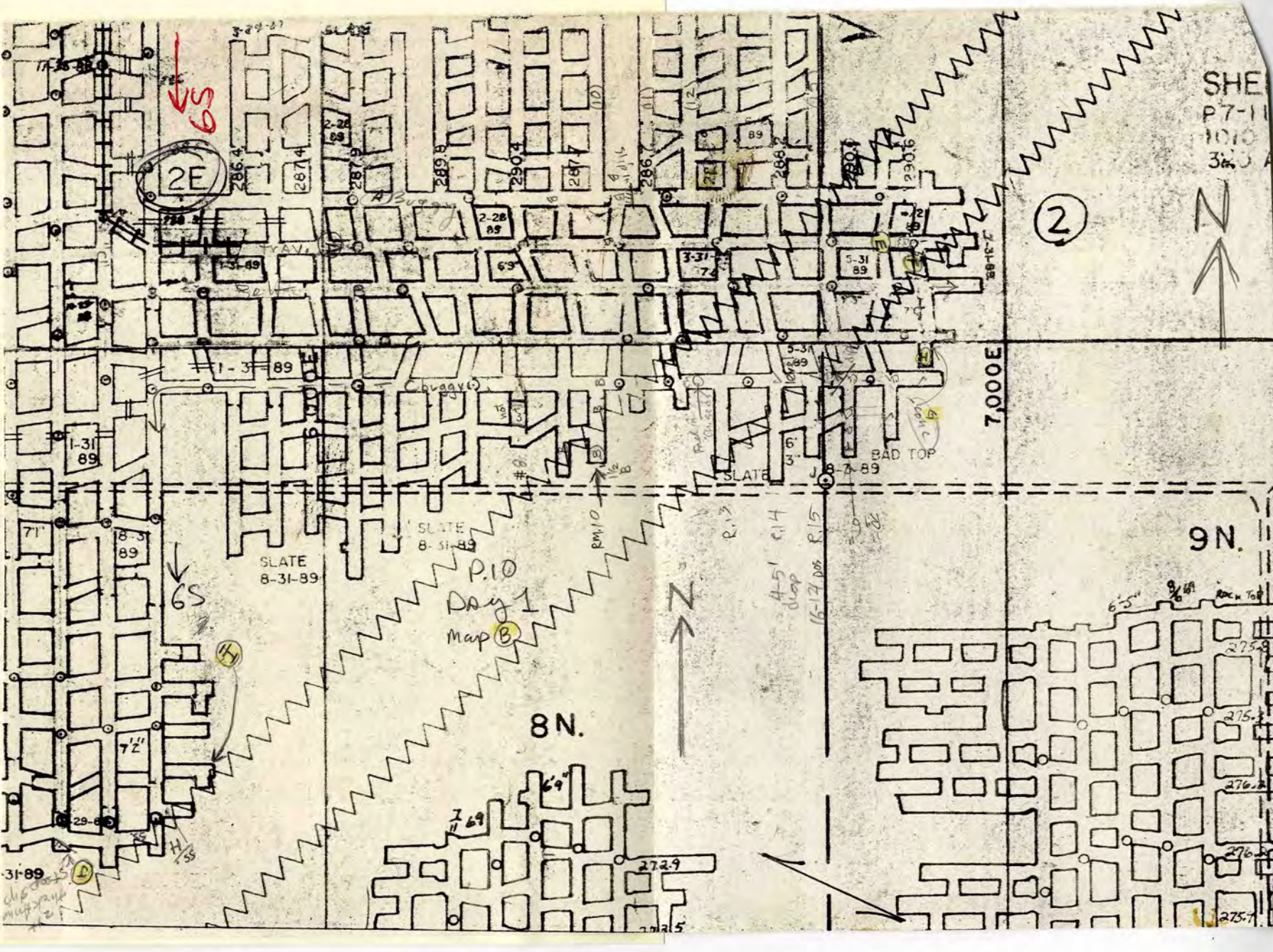
H. (G. skipped) Fall in uncompleted c/c shows 2' sandstone on Herrin Coal (Connie gets pictures) in a clear angular erosional contact. Above Ss. is a thin siltstone with the impure Virden Coal above it. Height of Virden Coal above Herrin varies here from 1 1/2' to 3'. I sampled siderite concretion from channel sediments on E. rib (-D-6) and base of impure coal toward the south (-D-7).

We left 2nd E. on "C Buggy" entry and turned south into 6th S.

I. In fourth E. room off easternmost entry in 6th S. fall shows clear channel exposure. Thick sandstone sits on Herrin Coal, with load structures present. Coal dips strongly to SE toward prob. center of channel. Remnant patch of Anna here is 1 1/2' thick and 10' long perpendicular to channel; length (with channel) is unknown.

J. Sandstone roof to Herrin seen twice on the way (see map B). Here there is thick (2' min.) Anna Shale with a high angle slip perpendicular to

Map (B)



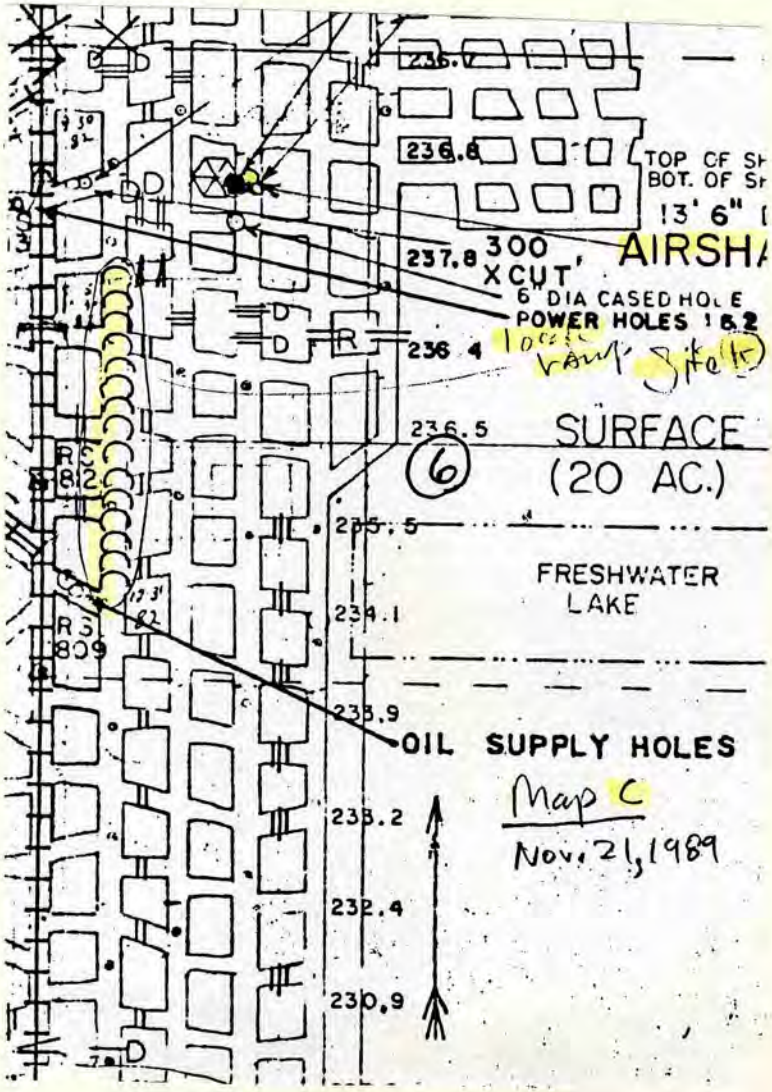
the channel. Anna concretion near the base were 1.6', 1.5' and 1.5' in diam., and they pushed down top coal. The slip is apparently unrelated to the Anvil Rock channel, because several other mid-angled slips in Anna Shale were seen as we walked out of the 6th S. (end day 1).

Falls near Xenobia portal

K. We started at Garrison's area 6 which is walking distance from the portal. This is a long fall (see map C) on the belt, part of which is ramped. Area was mined in Dec. '82, but did not fall until several years later. Peak of fall is over belt (not accessible); description is on belt entry on graded ramp.

est. 1 1/2'+ upper bench limestone
est. 2' claystone bench w. carb. material at top
est. 4-5' lower bench limestone (Bankston Fk.)
0.40' mottled claystone
0.35' tan limestone, weathered brown (Bk. Fk.?)
1.45' Kaolinite(?) blebs in top of 0.1' of claystone (-D-8), grayish band 0.15' to 0.2' below top (-D-9) balance of unit is weak claystone, and mottled (weathered?) at top where samples were taken.
3.40' finely laminated siltstone, med. gray, angil. In top 0.4', competent i.e. is not delaminating
0.35' dark claystone grading upward to:
(0.6') Brereton, nodular bedded; typical thickness but nodules are distinct and have vertical interior cracks
5.0' Anna Shale, only top 2' seen on belt entry.

Map C



John C. Moore Corporation, Rochester, N.Y. 14604
MOORE'S MODERN METHODS
FORM 180 W

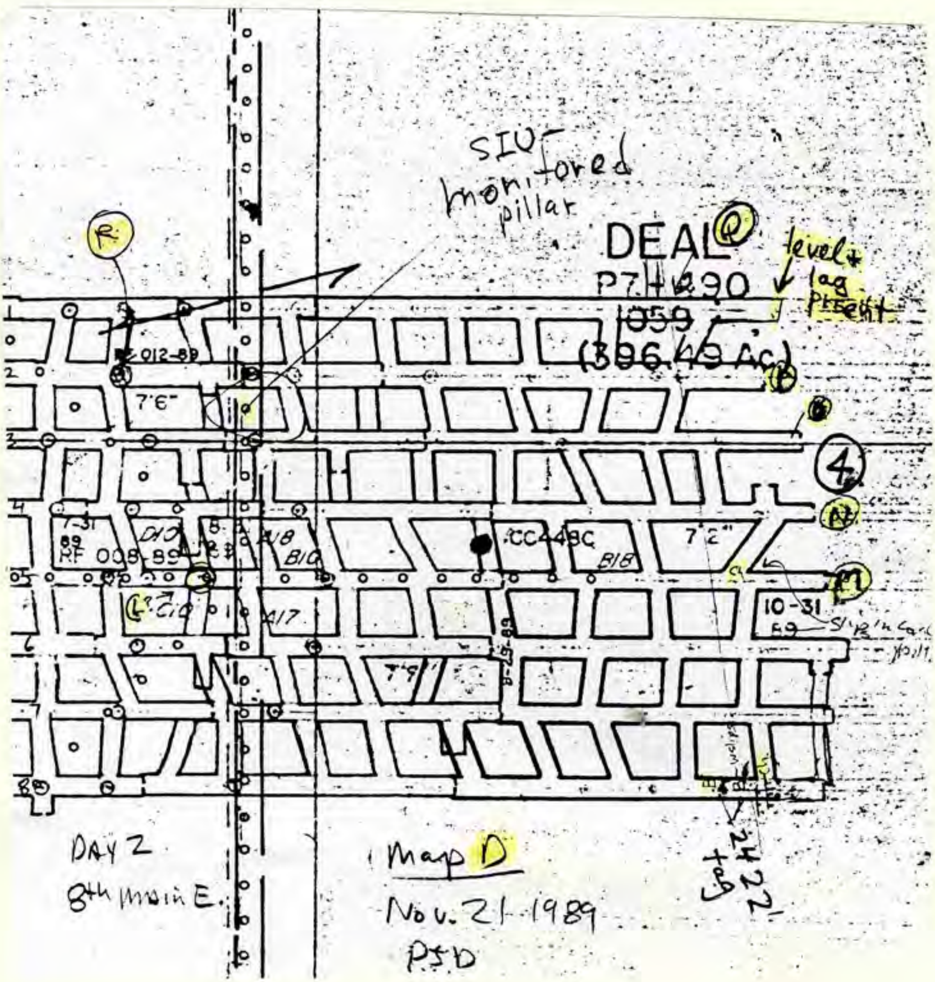
8th Main East

L. (See map D) Channel exposure on track entry; location uncertain but probably 7 1/2 c/c West of M. Limestone "bosses" on W. flank; sharp dip down to E. may mark edge of Anvil Rock channel. Fall shows channel-fill sediments with impure coal horizons in what appears to be shale. Eight foot bolt plates have failed here, not bolts; I believe this is due to weathering of the impure coal. Rough description:

est 4' shale(?) to top
est. 2 1/2' coal or carb. shale position
est. 2' silty shale (thin carb. laminated siltstone at base)

M. Face of travelway shows channel sediments as roof, appearing to cut about 90° to entries. Quick description done where thin"clod" remains as roof:

Map (D)



N. Face of belt entry, 3/4 way to next c/c. Channel lag deposit on Herrin Coal at face, appears sideritized. A clay dike in coal at face goes to the bottom of the seam, but is discontinuous below the blue band. Top normal (B/C) parting is present here: seam appears to be thiner here than just to west. 5.1' underclay seen here; no limestone nodules present. (Possible sample site?)

O. More sideritic channel lag at base of face exposure; material is being cut because of coal loss due to channel. Pyritic blue band (-D-10) collected for Latif Khan.

P. Next face north shows a large spheroid of remnant Brereton(?) in cross-section and crinoid columnals in a channel lag deposit on eroded Herrin. The "paleo-bowling ball" is 0.5' high and 0.65' horizontally and a chip was collected (-D-12). Brownish nodules in channel lag deposit were collected (-D-11).

Q. Face of northernmost entry (#1)--coal is level at face and channel lag is present. Variable erosion shows clearly here; Brereton Ls. is present over Anna on N. rib, but 8' away (S.?) channel lag is on Herrin.

R. Eight c/c back from face at P. we examined a fall on #2. We walked by SIU-monitored pillar on the way. We are 210' from arches. Same channel seen 600 feet E. is present in roof here. Desc.:

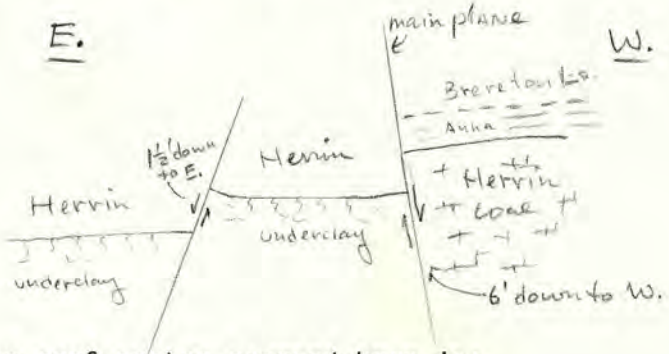
Limestone(?) (L.B. BK.FK.?)
ca. 1 1/2' dark jointed shale (Lw?)
thin light unit loc. persistent
(Kaolinite band as at K.?)
ca. 8' Claystone w. plant debris, espec. seen

in bottom 2 1/2'
0.8' Claystone, unfossilif.
0.2' Channel lag deposit
0.7' Anna Sh. w. erosional upper contact
- Herrin Coal

This is an interesting area, perhaps worthy of mapping in detail.

Faults in 6th N. panel off 6 M.E.

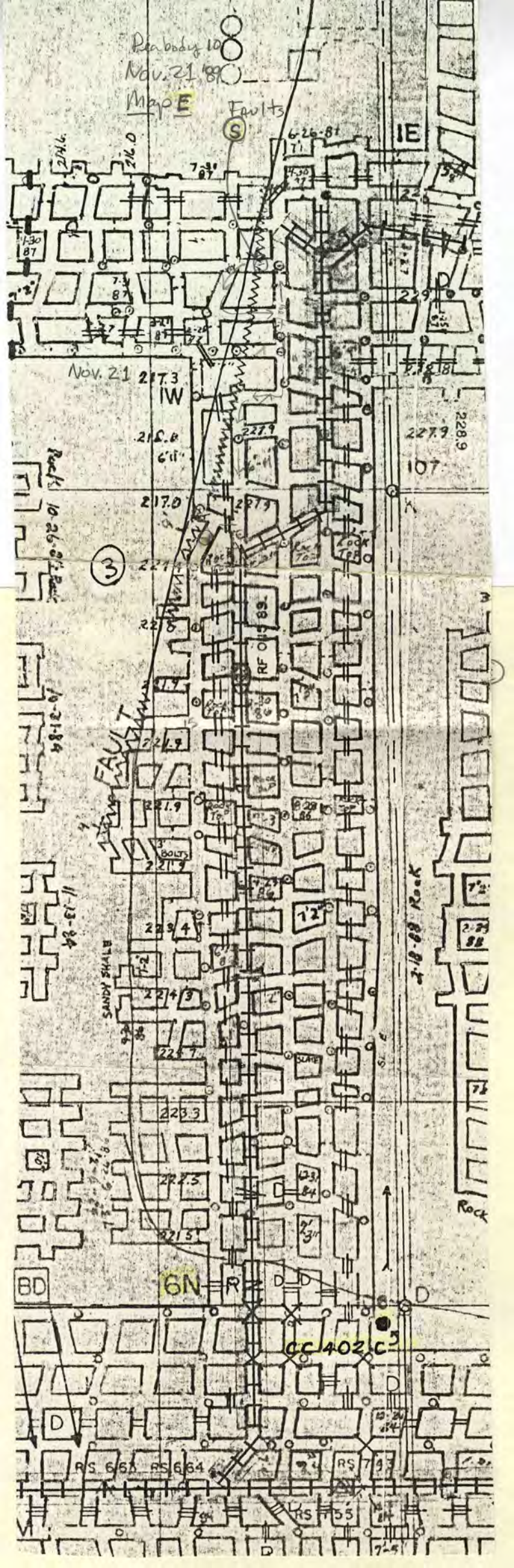
S. Set of normal faults seen previously by Nelson and I up to Rm. 18 in 1987; (See map E) this is Garrison's area 3. Facing south the exposure shows the main plane nearly vertical with a throw of 6' down to the west. Sketch:



The roof secton exposed here is:

Gray siltstone
4.7' Brereton Ls.
<1' Anna w. phos. bands
- Herrin Coal

Due to grading this would be a good underclay sample site.


Peabody 10
Nov. 21, 88
Map E
Faults
S
6-26-81
IE
Nov. 21
IW
227.9
228.9
107
FAULT
SANDY SHALE
Rock
6N
CC 402 C
RS 6/61
RS 6/64
RS 7/93
RS 55

T. We went S. toward travelway but jogged west to look at fault at about Rm. 20 position. Roof sequence shown here is:

2 1/2'+ siltstone, banded
1 1/2' dark shale
6 1/2' Brereton Ls.
(prob. Anna)

The fault plane generally has thick calcite along it, which some of us sampled.

Samples: Set "D" continued Nov. 20-21, 89

	Site	Desc.
-D-6	Heast	Siderite(?) concretion from Anvil Rock Channel
-D-~~7~~	H	Argil. upper coal (Virden) from A.R. Channel for palynology and carbon
-D-8	K	Kaolinite(?) blebs from claystone unit (Lawson?) -Day 2
-D-9	K	Golden gray claystone just below -D-8 (both for XRD)
-D-10	O	Pyritic blue band, bulk for L. Khan for California
-D-11	P	Brownish nodules in channel lag (sideritized?) XRD
-D-12	P	Chip off "paleo-bowling ball," probably remnant Brereton

mde:Peabody

p 1 of 6, plus 2 maps

ISGS Mine Notes - Peabody No. 10 - Christian Co.

Trip: May 8-9, 1990 by Phil DeMaris with Connie Letsky and Ed Mattey of Peabody

Coverage: Introduction
Channel exposures on S. Mains
8th E. Main Channel mapping
Samples Set D continued to -9.
E

Introduction

This is a co-operative effort with Peabody Dev. Co.'s Connie Letsky to map a transect across an area affected by an "Anvil Rock" channel or channels on the 8th E. Main. Similar channel exposures had just been hit in the Mains South, so that we visited area first.

Channel exposures on S. Main

We went first to face of the 5th entry which showed several clay dikes in Herrin, prob. A.R. Channel-related. Back a little from the face, we examined a roof fall on the 4th at 342 c/c. This fall shows 2½' Anna, probable remnant nodules of Brereton and relatively flat-bottomed channel sediments above. These are siltstone/sandstone, predominantly, and are sparsely to very micaceous judging from debris. Sandstone dike seen in Anna.

At the face of #3 there are lots of slip planes in roof with strong random component to distribution. Several clay dikes in coal seen, Brereton Ls. is still partly present over most of area. I met John Walker, face boss, in this area. Also saw quartz vein at "224" (?).

At 29,230′ c/c on #3 we saw horizontal clay dikes at mid-unit in Anna Shale. Herrin is 7.3′ here which Connie says is normal. Small vertical sandstone dikes seen locally in Anna.

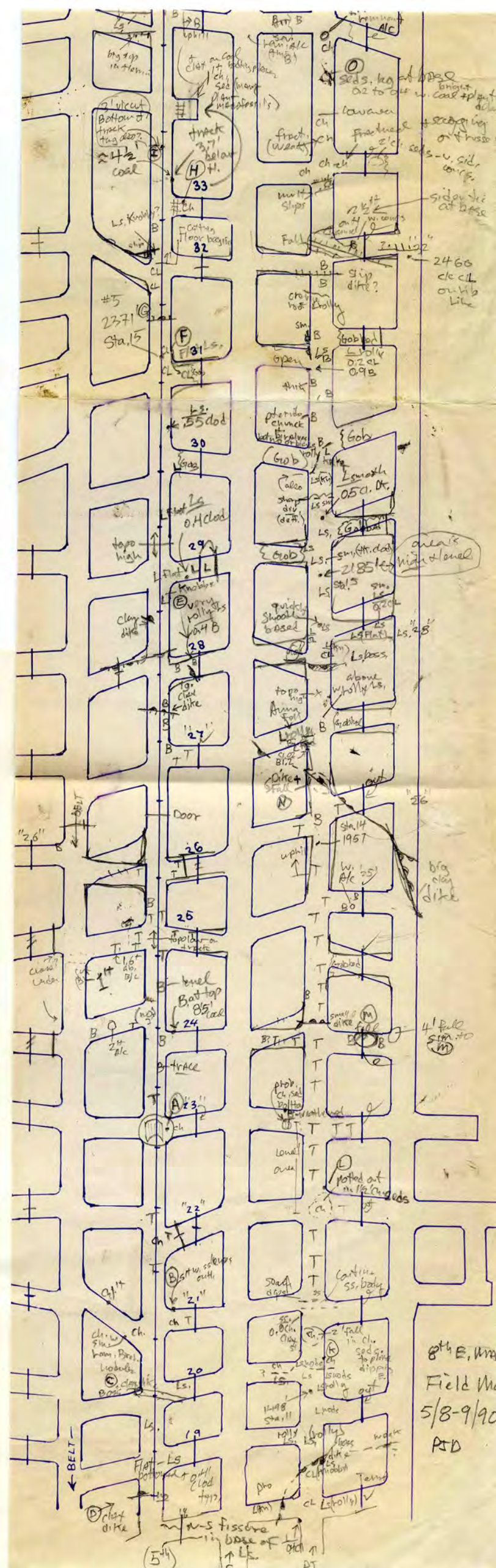
8th E. Main Channel Mapping

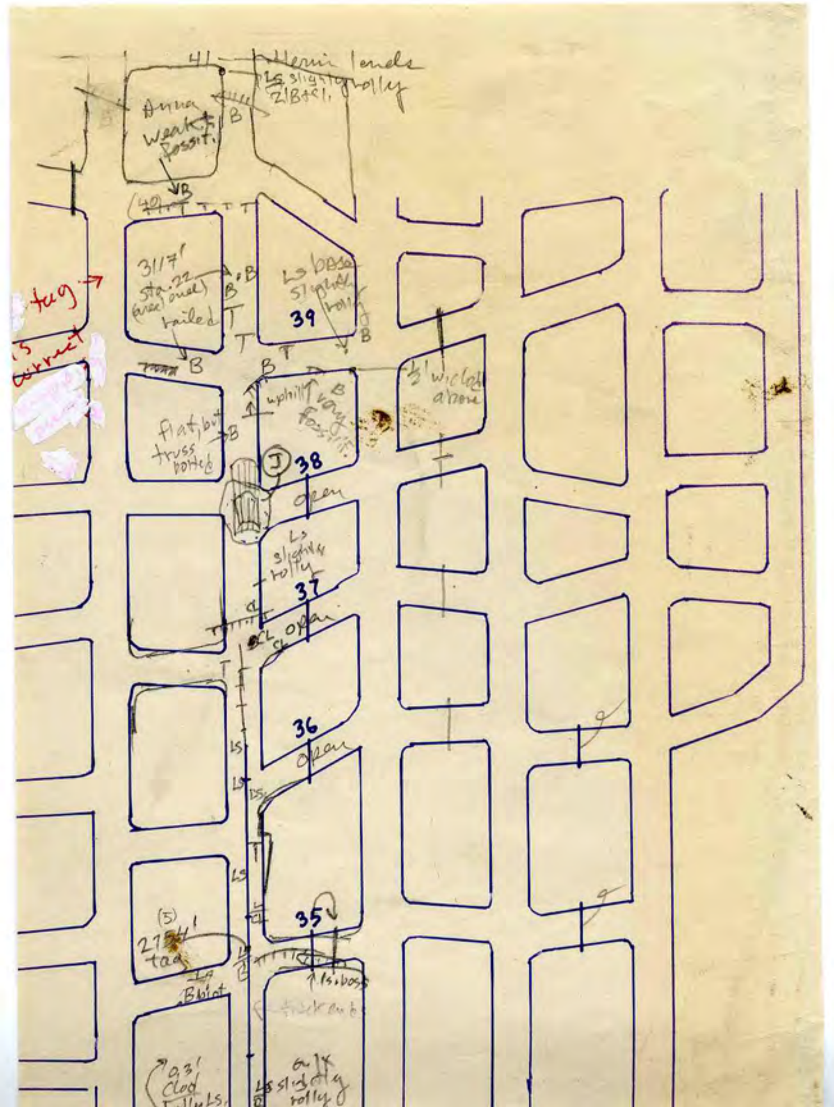
A. Arrived at 25 c/c at 10:40 and worked west to find edge of feature. Here at 23 c/c there is an arch built under a 7′ fall which gives clear exposure of channel sediments.

(top) flat-bottomed competent unit (Bk. FK.?)
5½′ dark clayst. coaly near base
1.2′ Virden Coal
0.7-1.0′ laminated channel siltstone
←(traces) Anna or Anna concretions
- Herrin Coal

B. One foot of siltstone exposed over thin sandstone atop Herrin Coal at 21 c/c. Lots of plant debris--most of bigger stuff is cf. pteridosperm petioles, in segments up to 3′ long.

C. Carb. claystone atop Herrin; best evidence that its is channel-fill is some rip-up of top of Herrin. Claystone is 0.6-0.8′ thick and contains a few ls. nodules. Above this is a siltstone with plant debris and ls. pebble lag. To the west, crossing travelway is a linear limestone "boss", trending into the crosscut (strike is only about 10° E. of due N.), with a clay dike below the "boss". 3′ bolts used in area. Brereton Ls. is continuous in roof, but base is irregular--some slip-faults present with minor throws [I interpret this as partial erosion of Brer. and slump of channel seds. (prob. ss.) to


8th E, Wm
Field Ma
5/8-9/90
PD


41
Anna
weak,
possit.
31/7'
failed
flat, but
truss
39
38
uphill
open
LS
slightly
rolly
37
36
35
tag

produce the linear "boss"--similar feature has been seen in Crown II.]

D. Clay dike on N. rib of entry and in roof, but lost by top of seam on S. rib. Probably related to channel over ls., as is N-S fissure in base of Brereton in next c/c to W.

E. At 28 c/c 0.4′ anna overlies Herrin, and very rolly-based Brereton overlies Anna. Examination of base of Brer. indicates that it thins into a shallow "pillow" forms from 1′ to 5′ across, but appears still to be continuous. Some clay dikes are related to these "pillows"--one clay dike extending to mid-seam was seen under one large pillow-shaped shallow "boss".

F. Just past c/c 31 nr. Sta. 15, there is thick "clod" over bioturbated Herrin Coal, and a gradational contact also to crystaline Brer., flat-bottomed. [Presence of "clod" here and it's absence or thinness in the clay dike areas suggests "clod" is source of at least some of clay dike material.]

G. Impressive low-angle slip in top coal under relatively flat Brer. roof. There is some gray clay on short segments only of the fault within the coal seam. We dubbed this "Ed's Fault"--it displaces the floor on the north rib nearly 1/2′. Site deserves future study.

H. In area of substantial Herrin peat erosion (travelway cut into floor several feet) channel sediments were described behind crib at 32½ c/c. Here is:

1.8′+ med. gr. clayst., sideritic, no lg. plant debris, low angle slips present

0.3′ med. gr. clayst. with siltstone lenses
0.1′ laminated siltstone
- Herrin (eros. contact)

Connie noted that such a sequence would all be coded "Anvil Rock" in computerized d.h. records. The elevations taken by company are measured at floor level and here would be 3′ below base of coal.

I. Tree trunk compression in roof is over 6 feet long, oriented N-S, in channel-fill sediments. Dust obscures details but it is within predominantly sandstone with lots of smaller plant debris. Comparing H. and I., the lateral variability of sediments is impressive and deserves study. (End day 1)

J. (We started with unproductive visit to 5½ W thick coal areas which were too rashed and weathered to gather good data at). Fall about 15′ high at 38 c/c is arched through full intersection. Section seen:

(domes out) Prob. coal at top, unkn. tk.
10′+ ←(est.) med. gray weak silty claystone with 4-6′ long vertical slip planes
0.5′ Coaly debris dominating lag deposits, sideritized (prob. channel plants)

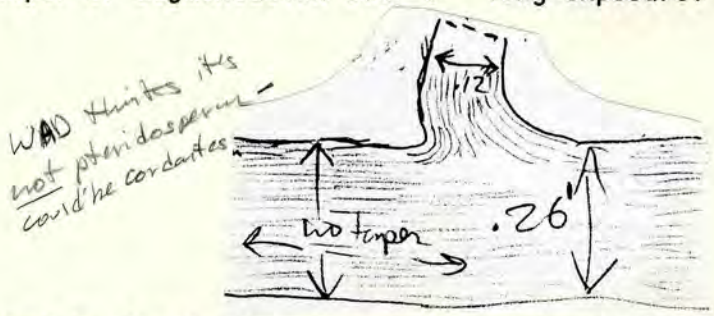
1.0′ Clastic dominated lag deposits with local coal or sideritized plant debris (-D -6)
2.3′ Anna, below eros. contact
- Herrin Coal

We stopped at 41 c/c, believing we were out from under the channel. We returned to 18 c/c and

p5 of 6, plus 2 maps

split up (Connie on 6th entry, Phil on the 7th entry) and began mapping after lunch.

K. Just beyond edge of eroded Brereton roof examined plant compressions in channel sediments. I sketched probable pteridosperm stem with branch. Stem is 0.26′ across and branch is 0.12′ across; stem is finely veined and has no taper or segmentation over 1′+ long exposure:



Just to the N. the channel sediments are full of plant compressions. A linear, roughly N-S, sandstone body crosses entry at c/c 21.

L. Collected a top coal coal ball showing the late-stage spheroidal type of mineralization (-D -7) where channel-fill sediments with plant compressions are immediate roof. Minor floor heave seen in area.

M. 3′ of Anna Shale (4′ through fat conc.) below relatively level channel sediment contact; ch. seds. are very full of plant debris. The thick shale-dominated sequence has developed several major slip-faults, creating a 4′ fall.

N. Fall related to a clay dike in roof and coal. Fall shows 1½′ Anna with at least 1/2′ claystone (not fossiliferous) above it. I thought at the time this was channel material but there is

p.6 of 6, plus 2 maps

thin clod over thin Anna at the next corner east. Re-examine on future visit; could also be dike material.

O. Between c/c 33 and c/c 34 a small exposure of channel lag on Herrin. Lag is only 0.2-0.4' thick with some rip-up coal clasts. Lag deposit sampled (-D -8) is coarse with clay only as clasts and had "rod" which proved to be marine-animal spine (Joe Devera). Spines (including frags.) probably from Brer. source material before full lithification. The other sample is from a 10 cm. long shale clast which is now greenish-gray (-D -9); it will be x-rayed to identify clay minerals. Green color is probably from Ferrous Fe in clay lattice (Dewey Moore).

Samples: Set ~~D~~ E (-1 to -4) con't ~~(to -9)~~

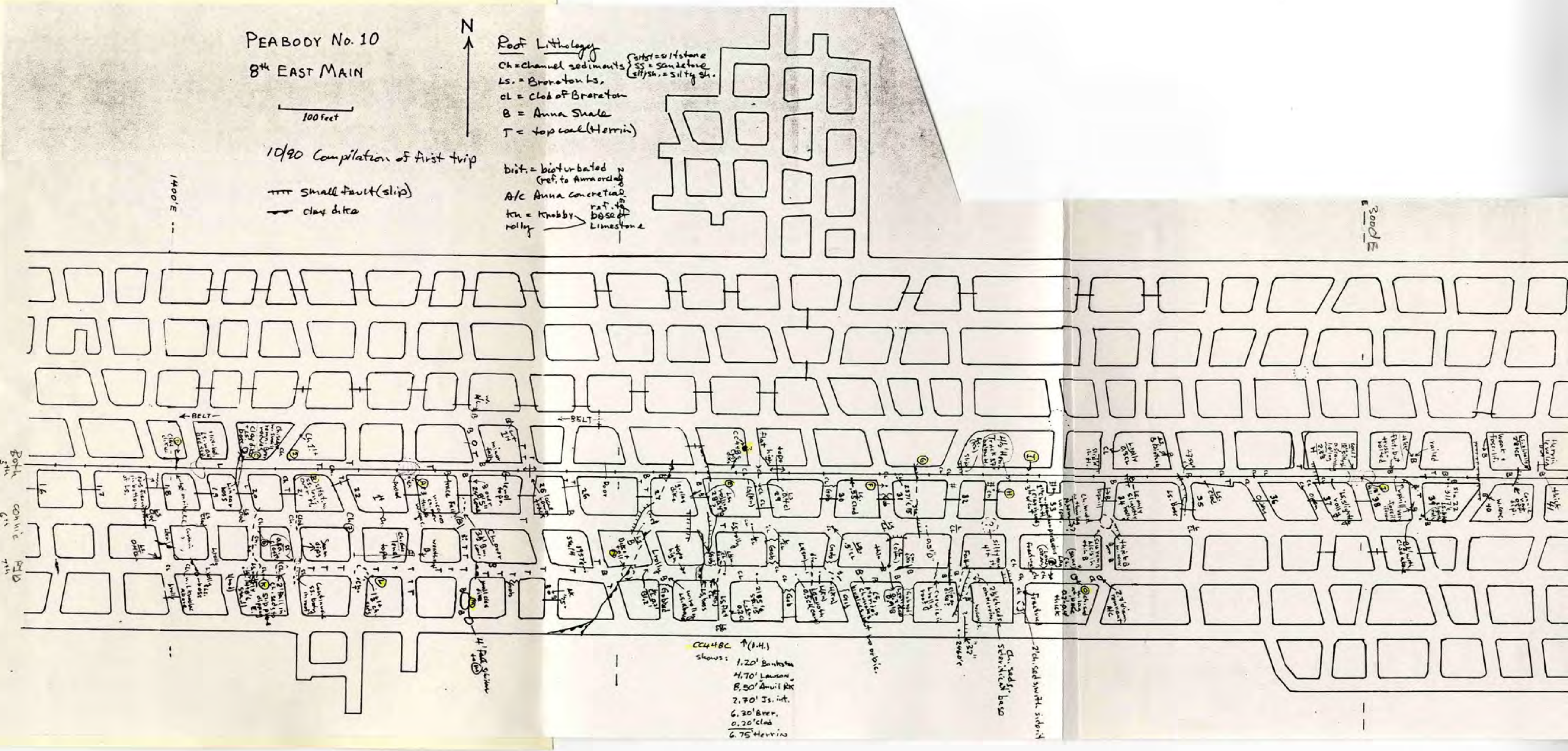
-D -6 (J) Channel lag; bulk sample. Size range mostly course sand to small pebbles (marble-sized)

-D -~~7~~ (L) Coal ball from top coal under channel showing late-stage spheroidal mineralization.

-D -8 (O) Channel lag deposit with long pyritized "rod" in matrix of coarse ss. and larger debris (some fossil fragments). Echinoderm spines (pyritized donut form) identified in sample.

-D -9 (O) Shale clast about 10 cm. long from channel lag. Now greenish gray, but may have been Anna Shale originally (for XRD).

Compilation map follows


observations
PEABODY No. 10
8th EAST MAIN
100 feet
N
Roof Lithology
Ch = channel sediments
LS. = Brereton Ls,
cL = Clod of Brereton
B = Anna Shale
T = top coal (Herrin)
sltst = siltstone
SS = sandstone
sltysh. = silty sh.
10/90 Compilation of first trip
small fault (slip)
clay dike
biot. = bioturbated (ref. to Anna orcl.)
A/c Anna concretion
kn = knobby rolly
ref. to base of Limestone
1400'E
2000'E
3000'E
← BELT
CC448C (D.H.)
shows: 1.20' Bankston
4.70' Lawson
8.50' Anvil Rk
2.70' Js. int.
6.30' Brer.
0.20' clod
6.75' Herrin
ch. seds, sideritical base
2' ch. seds with siderit
4' Fall Skidan
Both 5th
Connie 6th
7th

MOORE'S MODERN METHODS

Mine originally operated by: (1)

Date 1951

PEABODY COAL CO. PAWNEE, ILL.

Original name or number: #10

Illinois Coal Report 1951 p. 42

LATER OPERATORS

Date	Operator	Name or No.
2		

Tuesday, March 29, 1988

Farm-business news in

Illinois coal mine laying off 148

PAWNEE (AP) — About 148 employees of Peabody Coal Mine No. 10 will be out of work Thursday, according to company officials. The mine, near Pawnee, is laying off the employees as part of a cost-cutting measure, spokeswoman Barbara Behrens said Monday.

The layoffs, which will go into effect at midnight Wednesday, will trim the number of workers from 836 to 688, Behrens said in a prepared statement.

Both non-union and union employees, members of United Mine Workers Local 9819, are involved. Local President Bill Lahr declined comment on the layoffs.

*Also owners #See ownership sheet

Shaft? 1954 coal rept p. 73

Railroad, Wagon, Strip, Idle, Abandoned Slope

IDENTIFICATION

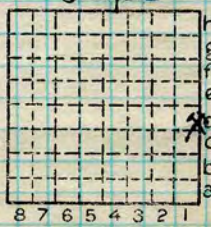
County No. 238 Coal No. 6

Coal Report No. 5-8

357' to 71'

Quad.

County CHRISTIAN



Sec. 10

T. 13 N. S.

R. 4 E. W.

Index No.

COAL MINE OPERATOR

(68020—1500—11-38) 2

Herald & Review

Tuesday, July 28, 1992 ★★ Decatur, Illinois

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Our 120th Year ~ Issue 210 ~ Two sections

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Obituaries	A6
Puzzles	B9,10
Television	B6

Mine vote shows uncertain future

■ Many Peabody miners favor giving up work rules but balk at surrendering vacation days.

By JIM GETZ
H&R Taylorville Bureau Chief

BULPITT — In the town hall of this tiny community built on Peabody Mine No. 10's past, votes were counted Monday night on the mine's future.

The tally reflected an uncertain future for the 450 miners and management employees at No. 10.

About 78 percent of the 352 members of United Mine Workers of America Local 9819 who cast ballots voted in favor of giving up local work rules gained over the past 41 years.

But the union local's recording secretary, Jody Hogge, doubted miners were going to accept pay in lieu of their graduated vacation days. That's because, in a separate vote, the vast majority of union members did not turn in signed sheets surrendering those days.

Peabody Holding Co. Inc. President Sam Schifflet said Monday after the vote that large marjorities favoring each issue were needed so that Mine No. 10 could gain a contract to supply Commonwealth Edison's Kincaid power station from January 1993 through September 1994.

Local 9819 President Chuck Clark said he believed a tally on the vacation issue would not be available until Wednesday.

Miners begin accruing graduated vacation days at one per year after six years of service until they reach a maximum of 13 days. Those days are in addition to two weeks of regular vacation.

If the vacation issue fails, Schifflet said, "I'll be disappointed. I think there's men there that want to work."

"The graduated vacation days exist at other mines," Schifflet continued, "but this is an old mine that has different costs to maintain it, as opposed to a newer mine."

Schifflet said Peabody must invest about $4 million in equipment just to keep the mine running 21 months past Dec. 31 of this year.

Clark and Hogge said the shift toward the concessions — miners rejected the same list 2-to-1 on July 6 — was due in large part to a visit last week by Com Ed vice president George Rifakes.

"Mr. Rifakes came right out and told them he didn't know what the concessions were and didn't care," Hogge recalled. "All he said was, he told Peabody what price they needed and if they could match it, they'd get the contract. He also said (Com Ed) would stop taking coal after 21 months."

New Gazette 8/30/1992

Peabody still offering cash for vacation days

SPRINGFIELD (AP) — The Peabody Mine Co. is still open to signing up workers willing to forgo vacation days for cash in order to ensure a coal mine in central Illinois remains open, a company spokesman says.

"We've tried to be very patient and very accommodating," said Ron Greenfield, a vice president for the St. Louis, Mo.-based coal company.

"Our point is to keep open the mine."

Earlier this month, workers rejected the vacation-related concessions Peabody sought to lower costs at Mine No. 10 near Taylorville, about 30 miles south of Springfield.

Peabody said it needed unanimous approval on that issue so it could remain competitive enough to get Chicago-based Commonwealth Edison Co. to renew the contract for supplying coal to its nearby Kincaid power plant.

Only 62 percent of the more than 400 United Mine Workers members agreed to give up extra vacation days and take cash instead.

Miners already had agreed to concessions on work rules designed to help win a 21-month contract extension from Edison after its contract expires Dec. 31.

A union official said last week the company should not count on more workers surrendering vacation days for money.

"People have gotten in their mind they're playing games. They're just not buying it," said Jody Hoge, recording secretary for UMW Local 9819.

"When you've got 400 people, you're not going to get 100 percent on anything."

Meantime, contract talks are proceeding between Peabody and Edison.

"We're still trying to explore all possible ways with Commonwealth Edison to see if something can be done to keep Mine No. 10 open," Greenfield said.

"If they can get the price down sufficiently, we'll renew the contract through 1994," Edison spokesman John Hogan said. "I think we'll be coming to a conclusion in pretty quick order."

Spokesmen for the coal company and the giant utility would not discuss the talks in detail.

In Taylorville, where there is fear that the mine's closing would hurt the economy, officials say there are so many rumors it's hard to predict the mine's fate.

John C. Moore Corporation, Rochester, N.Y. 14604
MOORE'S MODERN METHODS
FORM 180 W

SAMPLE HISTORY

Plant sampled: **Peabody No. 10** Date: **November 5, 1992**

Company: **Peabody Coal Co.** Sample ID: **Pby-10**
POB 1990 **C32783**
Henderson, KY 42420-1990
Ken Luckhurst, Manager of Preparation
Company representative: **Ezra Smith, Dir. Preparation 502-831-6377**
At the mine: **Ron Dalstream,Prep Lab Chemist**
217-625-2611 x 216

Mine (source of sample): **No 10 Mine** Collected by: **RDH & RRR**

Seam identification: **Herrin** Time of closure: **3:45pm**

Mining period represented (dates): **Approx Oct 20 -30, 1992**
Panel(s) & location(s) in mine: **Six different units are operating**
Mine locations (descriptive):
Approximately 30,000 ft south of prep. plant
¼ or footage section twp rge
10 & 11 12N-4W Christian Co
Type of Preparation Plant:
McNally, 1953 version: 3 Jeffery water jigs; course (+ 1 in.) circuit. A fine circuit (3 cyclones, water wash) and 3 sets of driers were installed in 1976. Plant yields 75% recovery.

Sampling point: # increments: **4**
Belt (describe position in plant)
Manually sampled off moving belt.
Train Truck
Company's sampling device (yes / no) : **NO**
Type:
Other (describe)
Company worker sampled in the same way they normally sample. Each incriment was:
2 - buckets (2 gal) of their 1x0 belt, took 1/4 after 2 riffles (about 16 lbs).
1 - bucket (2 gal) of 1x4 (taken with a shovel from a 4 ft wide belt carrying 1x8 in coal); took 1/4 after 2 riffles (~ 6 lbs)
1 - bucket (2 gal)of 4x8 blocks (selected by sampler with a shovel from the same 1x4 belt); took 1/4 after 2 riffles (~1.5 lbs).

Procedures (describe other aspects):

The company mixes these separate subsamples to arrive at a composite for the output of the plant:

70 % 1x0
25 % 1x4
5 % 4x8

Our sample was composited in the same proportions.

(36941—50M—2-67)27-o

FIELD NOTES

Illinois State Geological Survey

eHling for Peab. #10 Mine / Coal wk 10/19/92

ernment that it paid $21.17/t delivered for test coals from Peabody's Rochelle mine in June.

PEABODY, COMMONWEALTH AGREE; MINE 10 STILL TO SUPPLY KINCAID

Peabody Coal announced Oct. 15 that it had signed a new 19-month contract with Commonwealth Edison's to continue supplies of high-sulfur coal from its Mine No. 10 in Illinois to Edison's nearby Kincaid plant. The pact will follow Peabody's current expiring contract until the plant must switch fuels to meet 1995 sulfur emissions standards.

The agreement has been in some doubt for weeks because Peabody had to meet lower delivered cost targets under market price bidding Edison conducted for the mine-mouth plant. Edison had tested coals from Zeigler coal and coal field sources said Zeigler had entered a very low bid on the material.

To meet the price, Peabody had to make a number of changes at the mine and its United Mine Workers of America miners had to agree to a series of concessions on work rules and vacation time.

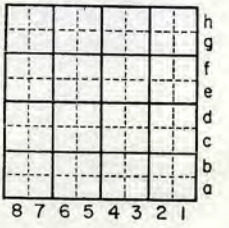
Peabody announced that the contract will cover 4.16 million tons through July 1994 with a monthly minimum of 185,000. Peabody Coal president Sam Shiflett said the company will look for new customers for the mine's high-sulfur product.

over

By_____ Date_____

Quadrangle_____

County_____ Sec._____ T_____ R_____



PEABODY TO CLOSE MINE 10; COMMONWEALTH EDISON READIES BID CALL

The Phase I casualty list grew in the Midwest last week as Peabody Coal Co. issued its expected WARN notice that it would close its Pawnee No. 10 mine about Aug. 5 and Commonwealth Edison said it soon will issue a wide-ranging solicitation for fuel to replace Mine 10's high-sulfur coal.

Despite expectations that CE would concentrate on Illinois mid-sulfur coals, spokesperson Gary Wald told *Coal Week* that the utility would not limit the upcoming solicitation. It will not be limited to Illinois coals, nor to coals with or without emissions credits. "The only option that won't be considered is that there just isn't sufficient time for scrubbers," he said. "We want the bids to be written as general as can be and to look at the best alternatives."

Peabody's contract to supply CE's Kincaid power plant with 7 lbs. SO2/mmBtu coal expires July 31. The mine has been on borrowed time since CE decided to scrap plans to install a scrubber at the plant. Only a special agreement with the United Mine Workers of America to cut costs at Mine 10 allowed it to remain in production under a stopgap 19-month contract with CE.

Kincaid is CE's only power plant that burns Illinois Basin coals. The remainder of its generation is from nuclear plants, fossil plants fired with Powder River Basin coal from Montana and Wyoming and peaking units.

However, Phase I will have a major effect on Kincaid. Figures compiled by *Coal Week* show that the plant's two units must trim sulfur dioxide emissions by 101,000 tons compared with 1990

CE first planned to install flue gas scrubbers at Kincaid, then decided on mid-sulufr Illinois coals and now has opted for wide-open supplies.

Coal Week, June 13, 1994

PEABODY SHUTTING MINE 10; TIME RAN OUT ON COMED DEAL

A company that wants to buy Peabody Coal Co.'s idled Pawnee No. 10 underground mine in Illinois came close to cementing a long-term deal with Commonwealth Edison, only to see it fall apart last week because of time constraints and other uncertainties.

The latest turn of events in Mine Ten Coal Co.'s dogged pursuit of Pawnee 10 left Peabody and the United Mine Workers of America pessimistic the mine will ever reopen. Peabody announced that the mine would close immediately.

Peabody had kept the mine in suspended status after production ceased at the end of July in hopes Mine 10 Coal Co. could negotiate a long-term coal supply agreement with ComEd.

Sources said Mine 10 Coal Co. was able to get ComEd tentatively to agree to buy 2.2 million t/y of Pawnee 10 coal for an undisclosed number of years. Sources previously told *Coal Week* that Mine Ten Coal Co. offered a five-year contract to ComEd with coal priced at $1.15/mmBtu. The company would wash the coal through "conventional means" and buy sulfur dioxide emission credits to address any lingering environmental concerns resulting from Phase I of the 1990 Clean Air Act Amendments,.

But the deal began to unravel after ComEd insisted on a more efficient coal washing system to reduce the sulfur content of the coal before Jan. 1, sources said. Mine Ten Coal Co. was hesitant to make such an investment without a guaranteed contract.

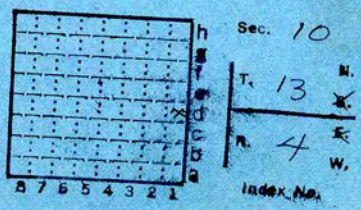
About two weeks ago, Peabody informed Mine 10 Coal Co. it could no longer afford to keep Pawnee 10 in suspended status at a reported expense of $70,000 a week."

Mine Ten Coal Co. spokesperson Steve McClure said his company "simply ran out of time." The logistics of making the necessary capital improvements at the mine, "in order to meet Commonwealth Edison's time constraints, ultimately prevented finalizing any such agreement," he said. McClure, however, maintained there remains a glimmer of hope that a deal can still be crafted in time to save Pawnee 10 .

See Non Active ~~Shipping~~ Book

Peabody Coal Co
MINE NO. 10

MINE INDEX # 693
County No 238



5-8

Peabody #10

Tom Herman - Super.
Chuck Crawford - Asst super
Jim Fagser - Safety Instructor

Location #1.
1st North off 4th E, #2 Entry

Roof: Shale - med gray; hard, ~~massive, poor bdd~~ mod bdd; flaggy; breaks in large plates, some pyrite; large pyritic fossils, Cephlapods large flat areas; Sharp contact w coal, usually marked by layer of pyrite

0.5' Coal, UBB, Hard, 1,#1 calcite on cleats + in fractures, Vitrainous, Black

30% Vitrain
Sharp contact w/ roof rock with a pyrite layer

.01' Pyrite, continous very hard

1.79 Coal, NBB, same as above
more calcite on cleats + bedding planes
Excluded 1

0.04 Shale, medium grey, moderately soft
coal streaks ~~[illegible]~~ little disseminated
pyrite, moderately sharp contact
with coal Continuous excluded

0.66 Coal, NBB same as above

0.11 Shale sharp contact
light grey, pyritized heavily
very hard carbonaceous, thin
streak of peripyrite thinly laminated
gradational contact at base excluded

2.07 Coal, NRB less vitrainous than above
more pyrite streak and on bedding plane

Excluded 1, 2

.08 Shale medium grey, moderately hard BB
pyrite disseminated and in streaks
gradational contact with coal

1.96 Coal, NBB, SAB, more calcite & less
pyrite, less vitrainous

Underclay - medium to light grey
SSB, carbonaceous, mod. smooth
fissile gradational contact

7.23 total

Location #2:

Roof: - med-dk gray; hard, fissile; slightly silty; pyritic at base; mod sharp contact;

0.66 Coal, NBB, very vitrainous
calcite on cleats + fractures
Black, hard, thin, moderate-thin banding
mod sharp contact w/ roof

0.01 Fusain, soft, non-pyritic

0.68 Coal, NBB, SAB, thin pyritic lenses
very vitrainous

0.01 Shale redish gray, moderately soft
fissile, friable, little disseminated
pyrite, discontinuous

.21 Coal, NBB, SAB

.02 Fusain, moderately soft, friable
discontinuous

.54 Coal, NBB SAB several laminae of calcite
on bedding plane
Little calcite in fracture fills

.03 Shale med gray, thinly bedded, soft
friable, 2 coaly streaks
mod. cont.

0.75 Coal, NBB, SAB,

0.04 Shale, med gray, mod. soft
mod. discontinuous EXCluded

0.79 Coal, NBB, SAB, less calcite

0.02 Fusain mod. soft, friable
thinly laminated

0.29 Coal, NBB, SAB

0.01 Pyrite, hard, laminated
shale, too??

0.66 Coal, NBB, contains numerous
thin shale laminae
lots of calcite on cleats, fractures
shale comes in top ½
grades into clean coal

0.07 Shale, med gray, smooth BB
few thin coaly streaks
EXCluded

0.71 Coal, NBB, Vitreous
much calcite cleat, fract
some thin pyrite

0.10 Shale moderately hard, light gray
EXCLUDED very pyritic + mudcracked
laminar bedding
sharp contacts with coal

1.00 Coal, NBB, SAB, less vitrainous
more fusain, moderately sharp contact
with Floor

Underclay, red gray, soft
slickensided, coaly, silty (slightly)

Total Thickness
6.6

Entry 7, location 3
Roof: Shale, med. gray, moderately soft
laminar bedding, smooth
pyrite at base,
contains pyritized coal balls
intersects calcite fracs
clay dikes <1 in. diameter
patches of pyrite ~ marcasite dollars

Total Thickness 6.67

1.21 Coal NBB, Vitrainous contains bands of pyritized fusain
numerous calcite fracs at goat, coal
some calcite on cleats
grades into roof

.01 Pyrite - discont
contain coal shards

.77 Coal, NBB SAB, conchoidal fractures
pyrite + calcite in frac. pyrite on cleat

✓ 0.06 Shale, med gray, mod. soft
laminar bedded, smooth
a few coal stringers, discont.
lenticular

0.40 Coal, NBB, SAB

0.02 Pyrite
inter cont.

0.66 Coal, NBB, contains shale parting
SAB, pyrite streaks

0.08 Fusain, hard, pyritic, lenticular

1.49 Coal, NBB, SAB
less calcite & pyrite

✓ 0.10 Shale, med gray, mod. soft
slightly silty, pyrite lamina at top
sharp contact at bottom
(BB excluded) BB

.73 Coal, NBB, SAB

✓ .04 Pyritic shale
mod. hard, coaly streaks
lenticular

1.11 Coal NBB SAB
lenses of shale & pyrite
shape of pyritic rings

Underclay - med. gray, soft, slickensided, cont.
smooth

North: Coal hard; clay soft; more impurities

South: Coal soft; clay hard; cleaner coal;

Peabody #10 6/18/80

Channel & Column Sample site 2, 3

Roof: Shale: (Anna) black or grayish-blk; hard, dense, very finely laminated, numerous pyritic nodules, some large pyrite xtals; some finely detailed pyritic fossils; numerous slips; breaks along slate like bedding planes; edges are sharp & irregular; breaks in large irregular slabs; lower 0.0' contains numerous vit. streaks & pyritic streaks; occasional stringers of coal; mod sharp contact

0.79 Coal, NBB, upper .12 and lower .14 of unit (sectured) vitrain-rich finely laminated, rest of unit <20% vitrain very thin banding
Attritus coal is generally med. dull
Several .05 bands med. bright
Cleat fairly well-developed
calcite-gyp on cleats
Clear calcite very crystalline

0.01 Pyrite, hard, thin lens, continues as a lamination of fusain

0.98 Coal, NBB, STA, more vitrain than above
Banding indistinct, due to laminar nature

vitrain bands up to 0.05 thick, however
Attritil coal - fine grained mod. bright
several laminations + lenses of fusain
less pyrite than above, calcite seams

0.03 Fusain, attrital, contains a few vitrain
stringers pyrite lens, Mod. hard
fairly cont.

0.54 Coal, NBB, STA

0.05 Pyrite + shale, soft to hard, cont.
part of shale pyritized + hard,
soft → med grey vitrain streaks, thin pyrite
very irregular thickness
lower .01 mostly bone coal

0.28 Coal, NBB, STA, top ⅓ contains
shale - shaly - bone

0.03 Pyritic shale, golden-grey, hard, cont.
contains vitrain streaks

1.60 Coal, NBB, STA, occasional
fusain bands, calcite → clear
clear, mod. well-developed, largest
vitrain 0.12 thick - average 0.01
Attrital - mod. dull to lustrous, finely laminated
fine-grained - numerous calcite fractures

fillings
0.03 Pyrite - hard lenticular, fairly cont.

0.65 Coal, NBB, STA, mod. clean dev. top contains several layers of shale lamination

0.06 (Blue band) Shale, med. to dark gray hard + smooth
vitrain stringers, pyrite streaks excluded from sample

0.53 Coal, NBB, STA

0.01 Pyrite, hard, discont.

1.34 Coal, NBB, STA, 40% vitrain
attrital, fine-grained, numerous calcite dept fillings
several fusain lenses, 0.03 thick
near base of unit, lower 0.1 intermittently

Underclay - med gray + mottled, mod. soft
irregular contact w coal
coaly streaks, no slickensides
some pyrite globs, possibly calcareous

Peabody 10 Channel 1 Borden

Sample at bottom bench 2 - pyrite

1.40 (sample 1)

1.0 (sample 2)

1.13 3

2.05 4

BP 7.63

2.05 5

6/17/80 Peabody 10 South side

~~in 5 West~~

Location
3rd N
4 W
1st S
Room 8 on AB side

Roof: uncertain; samples taken
contact looks sharp

feet

2.2 Clarain; bright clarain - top one-third; clear to poorly developed; calcite & kaolinite on cleats, pyrite on cleat - lower 1/3 numerous fusain lenses; shale lenses up to 3/10" thick (.0116) (at about 1.4' from top) within band up to .0116 feet thick

— shale parting up to .08' pyritized laterally in lenses and nodules, thin vit band top & bottom of parting

.04 durain

.06 dull clarain

.03 durain

.98 Clarain w/ pyrite & shale lenses, some shale lenses pyritized, pyrite, kaolinite, calcite on cleat, some fusain bands, vitrain bands varying up to .82 feet

.04 Shale parting, med grey, laterally continuous pyritized in places

1.06 Clarain; dull; thin vit bands up to .01' Calcite, Kaolinite on cleat; Cleat poorly developed; some fusain lenses; grades into unit below

.25 very dull clarain

.7 Clarain; better developed cleat; calcite, pyrite kaolinite on cleat; fusain particles near base; very few fusain lens up to .2 feet laterally pyritized band .2' thick w/ vit band at base of zone;

[redacted]

Feet

(vit. band about .04' thick)

0.1 Blue band, pyritic, laterally splits (SPLITS) laterally, thinner layers slickensided, med gray

1.62 clarain variable brightness, vit. bands up to .01'; calcite, kaolinite on cleat, a little pyrite; some fusain bands

(2.9')

.17 bone coal

.3 clarain; vit bands up to .04' thick; vit band at top. Clarain layer under, thick vit band - vit band varies laterally in thickness.

underclay - med gray, med hard,

7.46

Peabody 10

Joe Fassero

Location 6/18/80

1st North off 4th East Main North

#1 Gob room between 6th & 7th East

IL Geol. Survey has the complete mine map.

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Peabody No. 10 Mine 8-11-82

Guide: Greg Pinto - Surv asst.

P.M. Day #1

Mapping a potential channel area - 2nd North off Main West off Main North

Stop #1 (See map)

Coal & partings

1.0'

1.5 NBB
- 0.5' Pyr-fus
.825 NBB
- 0.09 sh.
.78 Fus & sh ptgs.
- .05' sh
1.15 NBB
0.02 Pyr sh
.64 NBB
- 0.08 BB
1.5+ NBB

2' covered

Note: Much of the area has a limestone immediate roof

6.34 x 1 total

Collector

Mine Co.

Coal: Survey No.

Index No.

X.—EXTRA SHEET NO.

INDEX

Stop #2: S.S. channel exposure.
Area is heavily timbered, I-beam 3 piece sets. Anna shale 23' thick, very weathered, sags greatly. Lowest S.S. of S.S exposed.

Anna is dark gray-black, slabby, hard & brittle, well bdd, weathers white w/ lt green & white crystal growths (gypsum.

S.S is fine-grained & very micaceous; light gray, weathers yellowish, some dark carbonaceous patches; bedding unsure; mid bed, slightly friable

Note jointing in Anna; trends almost N-S.

Collector
Mine Co.
X.—EXTRA SHEET NO.

Coal: Survey No.
Index No.

INDEX

8-12-82 Peabody No. 10

Note: We head south along the trend of the South Maine. Everything is shatereted. At x cut 12 we cut east into the 2nd return entry. Very windy. Many 3 piece sets with rail & bars.

Roof is a very thinly laminated shale siltstone. Very micaceous. Since this is an old part of the mine the roof is very fissile & friable, powders easily. Has weathered to a beige & gray-lamina, or lt gray & dk gry brown. Often yellowish oxidation.

Fresh surface has a mottled medium redish-brn color. Appears moderately competent, med. bld.

Operator Co. X | Index No. page | Collector

INDEX

Tends to slab off in long blocks, with shear, near vertical sides.

Stop #2 - between X cuts 13 & 14.

Channel has eroded away top of coal. Erosion varies from gradual (inches) to great (2')
The coal shows little deformation under the deep channel, a little bending of the banding

Stop #3 - X cut 16

More SS; for the last two breaks we have been under S.S. roof, appears massive & med grained, micaceous, some parts are flat based, others show shallow load casts 1-2'.

Occasionally carb. lamina can be seen near the bottom of the S.S.

Lower contact undulating gently

Operator
Co.
X

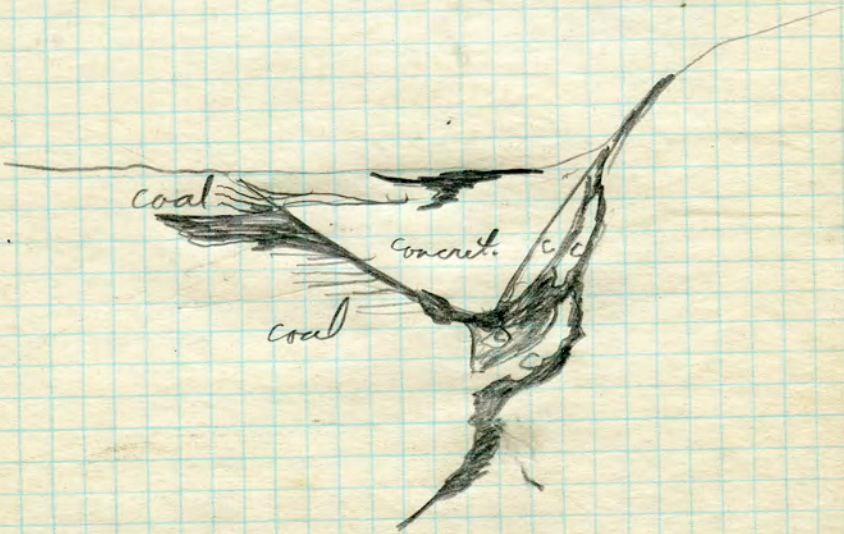
Index No.
page

Collector

INDEX

Note load casts tend to be elongated NW-SE, trending diagonal across entry. Also carb partings dip generally to NW

clay dike Stop 5



Operator
Co.
X

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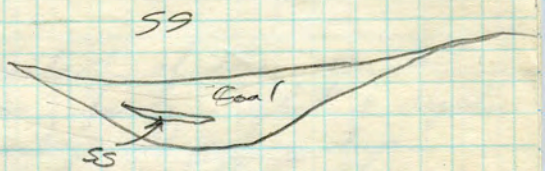

S S.

Note coal partings tend to bend or bow along bottom of S.S

Operator
Co.
X

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page

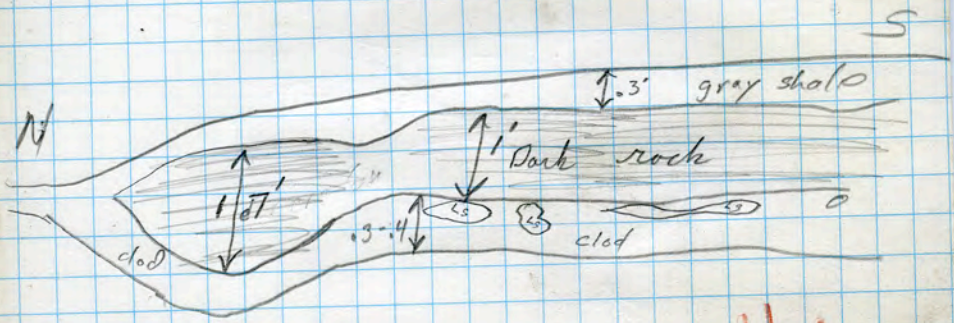
Collector

Note on roof in this area:

The basal contact of the sandstone varies between fairly flat & regular to very hummocky w/ many deep load casts (ss bosses). The bosses tend to come and go w/ no apparent rythm.

Note #6: Dark rocks.

Dark rock abruptly comes in between S.S & coal



Dark rock doesn't fizz
clod fizzes
S hold doesn't fizz, but very pervasively
Nodules fizz mildly

X.—

This rock is only in east rib, appears to be lenticular, 2.5' thick max. Many white fossil chips near base

No 7.

Several 1-2' deep load casts trending NE-SW; they cut diagonally completely across entry