A wider view of the same. Location; travelway (No. 3 entry) of 4th North Panel off Main West, several hundred feet south of Crown Fault.

Loc. 5, 4th North Panel off Main West (east rib of No. 1 entry). North branch of Crown Fault appears as a reverse fault, with Anna Shale on south (right) thrust up and over thin Brereton Limestone and Anvil Rock Sandstone on the north.

Fault at Location 4 (compare with sketch).

Fault at Location 4, differeent angle of view.

Fault at Location 5 (?) Fault cuts coal at a steep angle (shown by zone of dull, crushed coal) and abruptly flattens upon entering the roof strata. Overthrusting is evident on the gray mottled layer at the upper left corner of the photograph. Just right of the ruler a very small normal fault is visible.

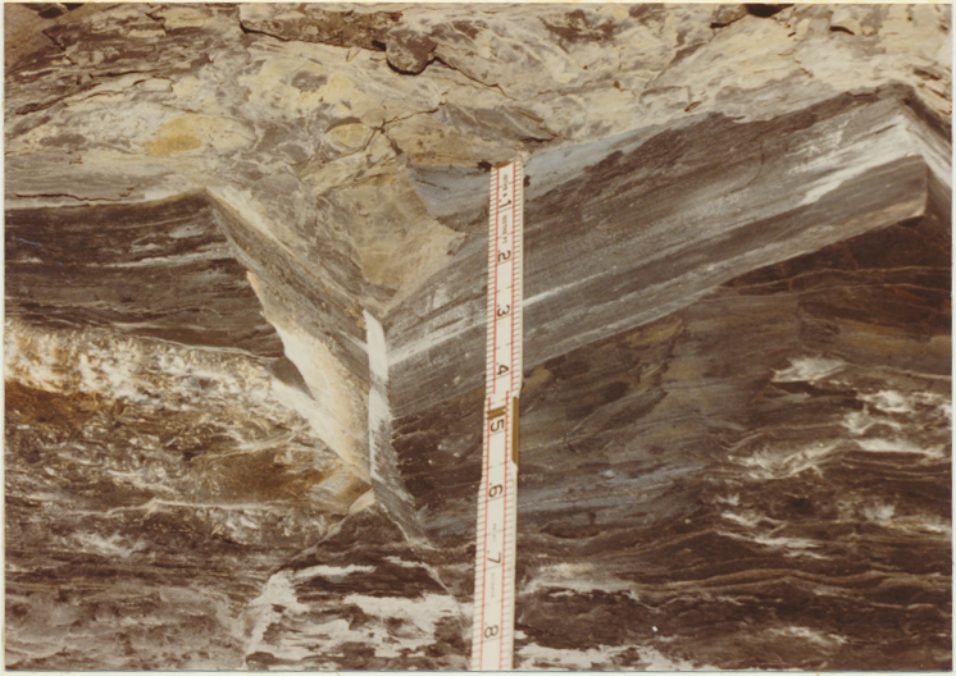
On the main fault note that a narrow vein of clay or crushed shale protrudes downward several inches into the top of the coal.

Location 3; open fractures in limestone roof.
Roof bolt roughly 1 inch in diameter, for scale.
5/8" x 7/8"

Open crevice in Brereton Limestone at Location 3. Note angular rock fragments within crevice, and absence of mineralization.

Another view of same.

Main West, southernmost entry, 2088' tag.
Irregular erosion of black, hard, well laminated Anna Shale beneath yellowish-gray, soft, poorly laminated shale and siltstone of Anvil Rock Mbr.
PJD holding hammer on Herrin/Anna contact; note erosional contact on Anna just above hammer.



Closer view of same.

MINE NOTES - Freeman Crown II - Macoupin Co.

Trip: October 15, 1987 by Phil DeMaris and John Nelson, escorted by Henry Shackleford, Freeman

Coverage: Introduction
Mapping of strike-slip fault on 4th N.W.
Search for faults on Main West
Samples Set "S" cont. (-S-4 and -S-5)

Introduction

Visit was made to see if the normal fault on the S. Mains ("Girard Fault" of Ledvina) crossed the W. Mains. We began on the eastern entries of the 4th N. Submain and then turned east on the intake entries of the W. Mains. W. Mains were advanced slightly within the last year but have not been worked recently. Mine is now working N. + S. only; 5 units total of which 3 run per shift (2 shifts per day).

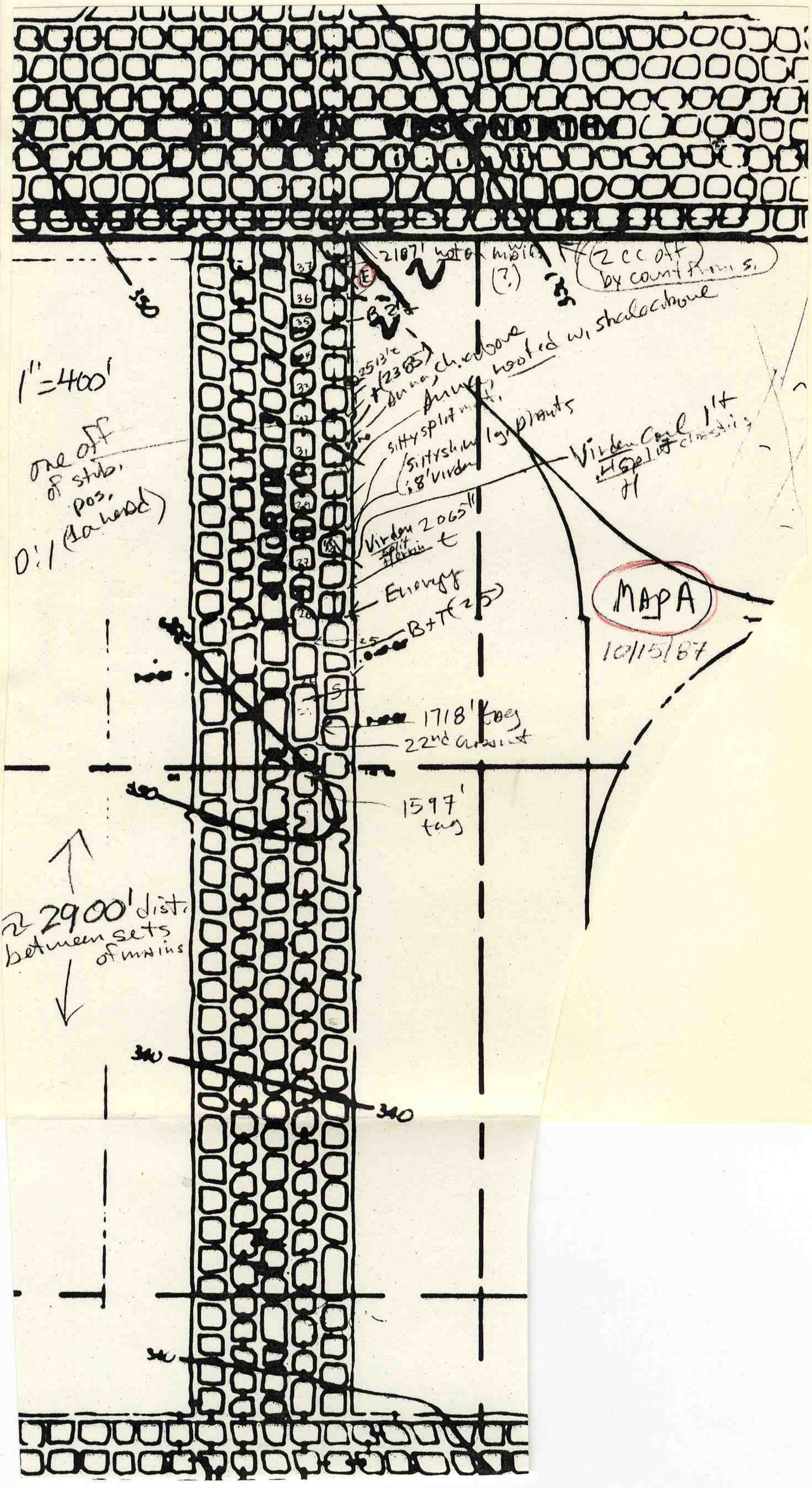
Mapping of strike-slip fault on 4th W.N. Submain

Going North a small normal fault trending NW/SE was encountered at the 14th crosscut on the second N. (see map A).

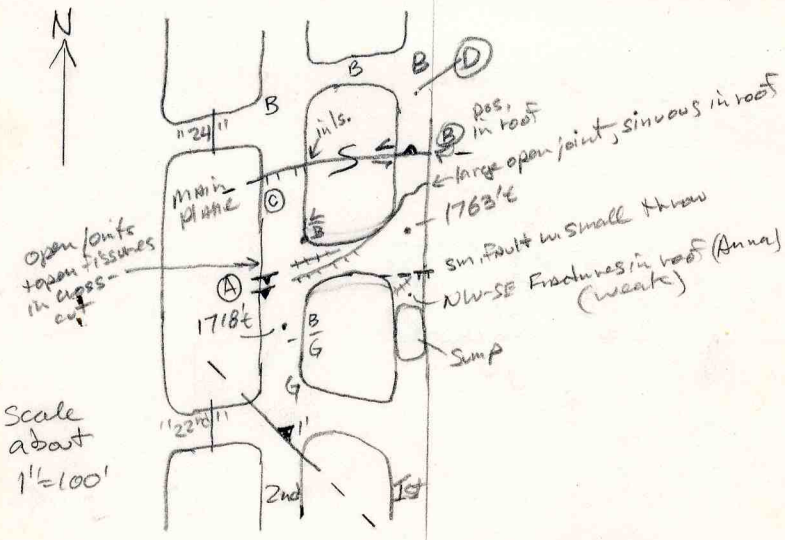
The area of the strike-slip fault falls between the 23rd and 24th crosscuts, and the area was checked for faults in some detail. Just south of this area John takes pictures of the edge of an Energy Shale lens just north of the 19th crosscut under Anna roof with Anvil Rock seds. above (See map A).

Main strike-slip fault plane turns nearly E-W here; see detail map below which partially adjusts for tags and different pillar shapes:

FORM 180 W



2187' water mains
(?)
2 cc off by count from s.
E
rooted w/ shale above
Virden Coal
Virden 2065'
Energy
1718' tag
22nd crosscut
1597' tag
MAP A
10/15/87
1" = 400'
2900' dist. between sets of mains
340



A. Around 1745' on 2nd N. a pair of small faults are found on the west rib, both down to the S. Northern fault has about 0.3' throw and contorted coal bedding, while the southern fault has 0.5' throw at top of Herrin. It may be a splinter off main strike-slip fault about 45' to north. Just to east Brereton roof has numerous open joints with a similar trend. (Nelson tracks fault in roof to here - site 1).

B. Anvil rock channel clastic sediments are here (north side) on top of 3½' of Anna Shale with a fairly planar contact. Main strike-slip fault plane runs E-W here (1st N.) and is near vertical. South of main plane there is 4' of Anna with Brereton limestone above. Lateral movement is clear, but is unmeasurable. Throw is down to N. about a foot (net) using top of coal. (Nelson's site 5).

C. Main fault plane strikes a little north of E-W leaving the long pillar (west rib) and has about

C. (Cont)

1/3 foot throw on top of Herrin. Anna is thicker on S. side of plane so at top of Anna the near-vertical fault appears to have a few inches of reverse movement. However, horizontal slickensides indicate main movement is lateral and slightly down to the south (Herrin datum). Channel sediments on both sides are predominantly silty shale with plant compressions. Fault plane is near vertical in Brereton, low angle and split in Anna. (Nelson's site 4 - observational conflicts were not resolved in field. Nelson may be right about minor reverse movement, but predominant movement is clearly lateral though difficult to quantify). Bulk sandstone from base of channel seds. over Anna Shale collected here for R. E. Hughes (-S-4).

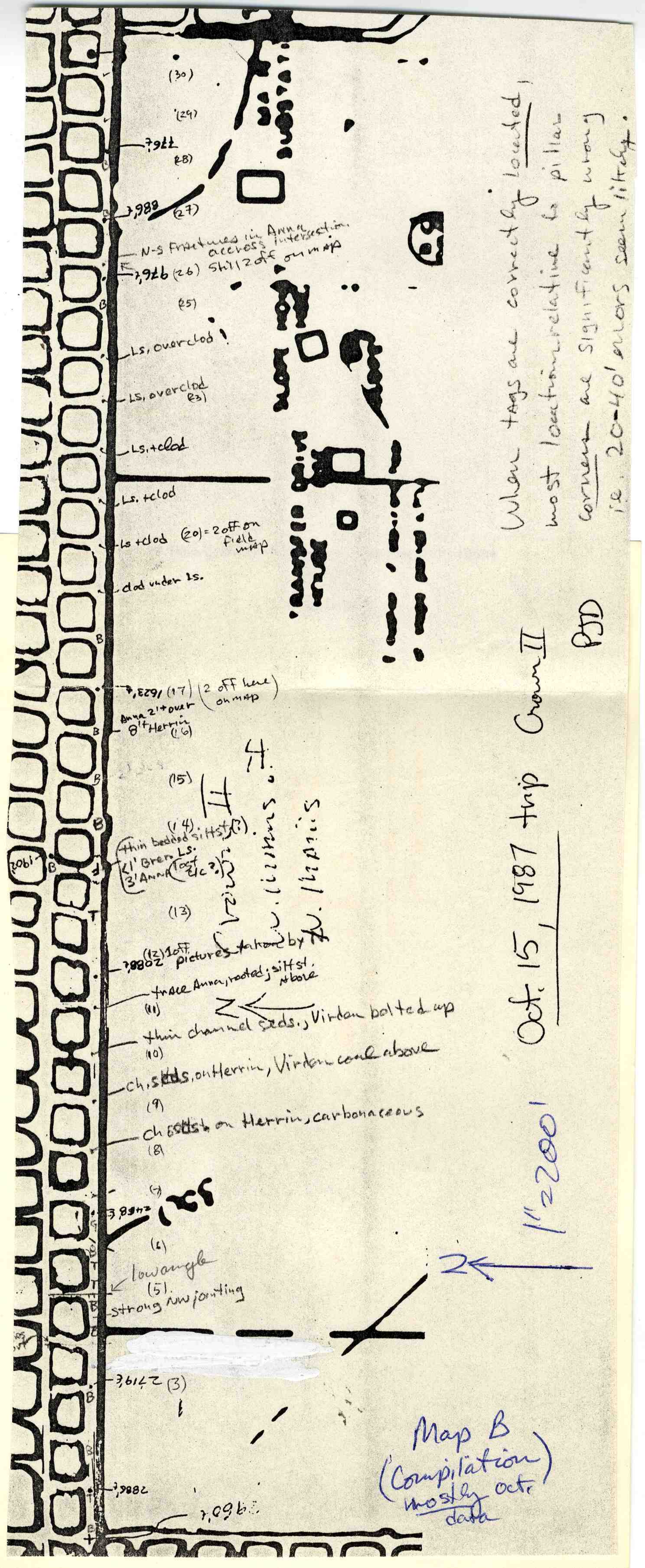
C. North Just to north crosscut checked for faults - Anna roof is level and without faults; base of limestone not seen.

D. North of main plane on 1st N. I checked again for fault-related fractures in the Anna, but found none. A couple of small sandstone dikes into top of Anna from Anvil Rock sediments were seen. Material in under 4 cm.-wide dikes was part sandstone, part silty shale with plant fossil fragments.

E. Near the north end of 4th N. submain a normal fault striking NNW-SSE crosses the 1st N. entry; throw is about 1½' down to E. on the East rib. Just to the north Energy Shale near base was sampled (-S-5).

Search for Faults on Main West

We continued east after encountering the 1st W. Main (southernmost entry of West Mains off N. Mains). Several mapping errors were made but corrected in part by later visit. See Map B, a compilation to base using tags, and including clarifications from next visit.


(30)
(29)
(28)
(27)
N-S Fractures in Anna accross intersection
(26) Sh 11/2 off on map
(25)
Ls, overclod
Ls, overclod
(23)
Ls, +clod
Ls. +clod
Ls +clod (20) = 2 off on field map
clod under Ls.
(17) (2 off here on map)
Anna 2'+ over 8'+ Herrin
(16)
(15)
(14)
thin bedded siltst (?)
1' Bren Ls.
3' Anna
(13)
(12) 1 off
pictures taken by
trace Anna, rooted; siltst. above
(11)
thin channel seds., Virden bolted up
(10)
Ch. seds. on Herrin, Virden coal above
(9)
Ch. ssdst on Herrin, carbonaceous
(8)
(7)
(6)
low angle
(5)
strong NW jointing
(3)
When tags are correctly located, most location relative to pillar corners are significantly wrong ie. 20-40' errors seem likely.
PJD
Oct. 15, 1987 trip Crown II
1"=200'
Map B (Compilation) mostly Oct. data

In vicinity of 12th c/c (2088' tag) Nelson took pictures of erosion of Anna Shale under Anvil Rock channel sediments.

In vicinity of 17th c/c (1623' tag) a goat beard and slight flexure of the top coal was seen, but Anna was normally joitned (at right angles) and no fault was present. After traveling as far east as possible we concluded that the "Girard fault" from the South Mains died out in the unmined pillar.

I feel the normal faults encountered on the 4th N.W. which strike NW-SE and NNW-SSE are likely part of this same system, but this would be a fairly wide zone. Pat Peterson (Freeman) has mapped a normal fault striking NW-SE further west on the W. Mains, crossing the travelway at the 68th c/c (1½' down to NE), which is only 8-10 crosscuts from the present end of the mains.

Samples: Set "S" con't

C2-S-4	Site C	Channel sandstone from bottom of Anvil Rock channel sediments (bulk sample mostly for R. E. Hughes)
C2-S-5	Site E	Energy Shale from near bottom of unit.

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

MINE NOTES-Freeman Crown II - Macoupin Co.

Trip: November 20, 1987 by P. DeMaris, Keith Hackley and Mike Summers, escorted by Henry Shackleford (Freeman CMC)

Coverage: Introduction
Collection of S-isotope samples for ~~ICDB~~ IBCSP bank
Samples: C2-S-6 (= IBCSP-7 = white bags = IBC-107)

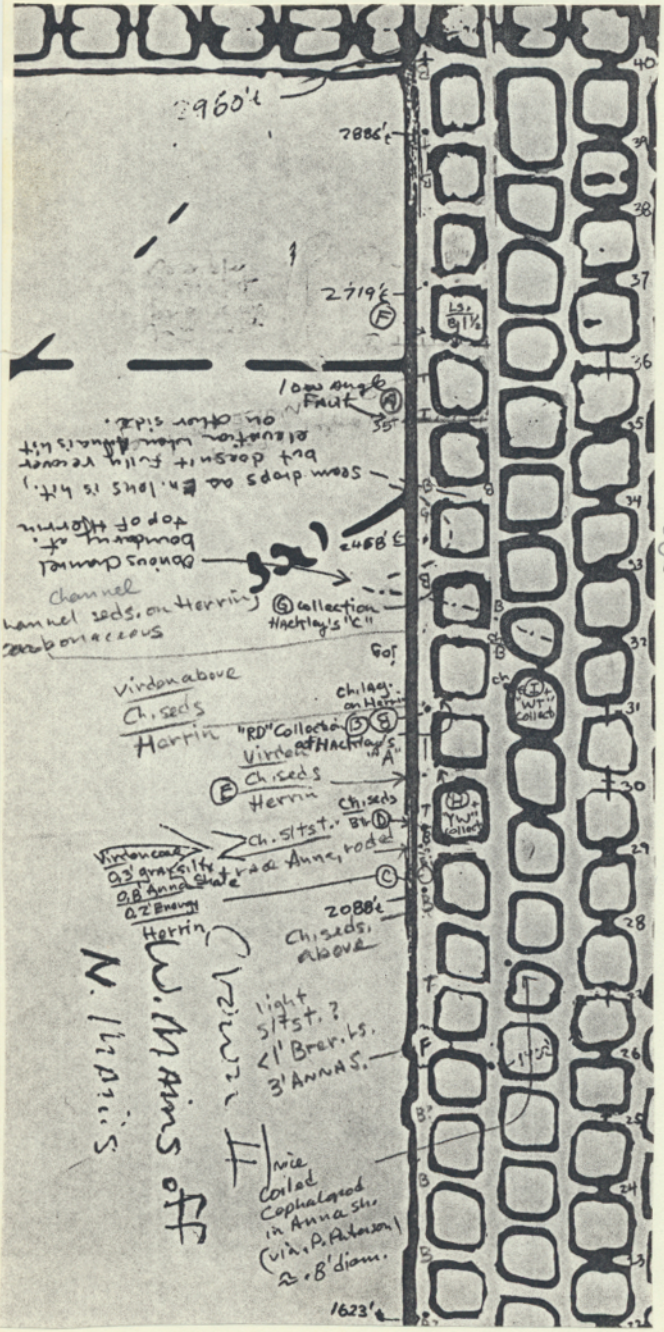
Introduction

Due to sealing of old works, collection of a large S-isotope sample for IBCSP at 9th North side (last visit) was blocked. However, since S-isotope analyses continue to bolster the association of these special characteristics with sites under post-Herrin time erosion of normal roof rocks, the hypothesis was used to select another likely site in Crown II. This site, on the West Mains off the North Mains, has good accessibility and will likely be available for resampling for the life of the mine. A reconnaissance through this area in October by D. showed a wide area with channel sediments directly on the top of the Herrin Coal. Although no samples for S-isotope analysis had been taken from the area, the research team thought chances were high for success here, and Carl Kruse allocated funds for subsample collection. Small drill core samples (normally used for initial screening) were to be taken under the Anvil Rock channel, near the edge of the channel (Herrin datum) and well away from the channel. Three large samples (150-200 lbs.) were to be taken at different sites under the channel and combined to produce a large sample for wide distribution, should the S-isotope results warrant it.

FORM 180 W

11/2d87

Compilation Map and sample site detail map



11/20/87 Freeman Crown II DeMaris

A. (See detail map and compilation)
Small low-angle fault in thick Anna (large cones). Low probability that it is due to compaction under channel - it runs N-S and dies out before the pillar due North. Placed at 35th cc which is probably right. "Out-of-channel" site planned to be west of A.

B. Fall near east pillar corner shows channel-fill sediments immediately on Herrin. A thin (0.3') micaceous coarse sandstone lag with small shale(?) clasts up to 4 mm sits on the Herrin, with 1½' silty shale above. Top of exposure shows Stigmaria roots and rootlets suggesting Virden coal horizon is close above. Basal lag sampled (-S-6).

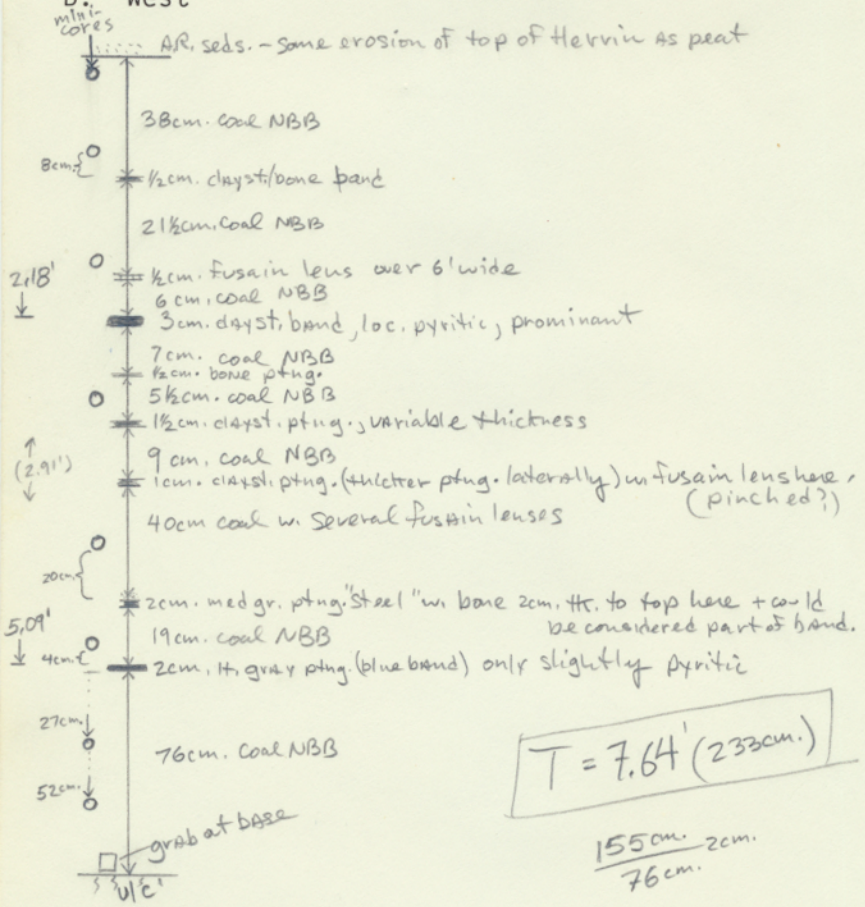
C. Fall exposure:
Virden coal, impure at base (0.1' seen)
0.3' gray silty shale (A.R. seds); eros. contact to:
0.8' Anna Shale, rooted by Stig. from Virden coal
0.2' Energy Shale (? edge of thin lens)
Herrin Coal

D. Shallow fall shows trace of Anna, rooted, with 0.4' channel-fill seds. above (top of Herrin also rooted). Sediments appear to be silty shale with lots of u/i plant fragments, Calamites (short sections) and significant weathering on Stigmaria roots and rootlets.

E. Channel sediments directly on Herrin. Sediments contain lots of plant fragments and Stigmaria coming down from above, again suggesting Virden coal horizon. All stoppings are out south of stopping line by travelway which we went through at 25 (and exited at 30).

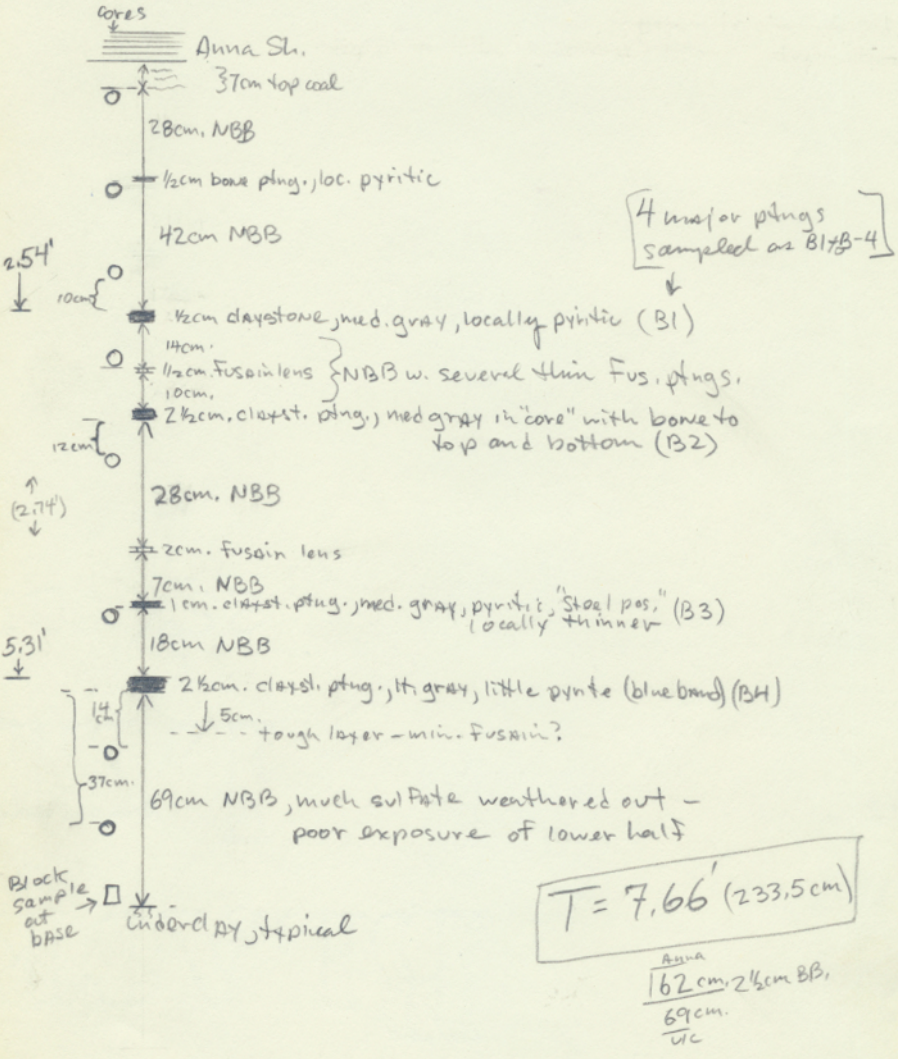
Freeman Crown II -3- DeMaris

B. West

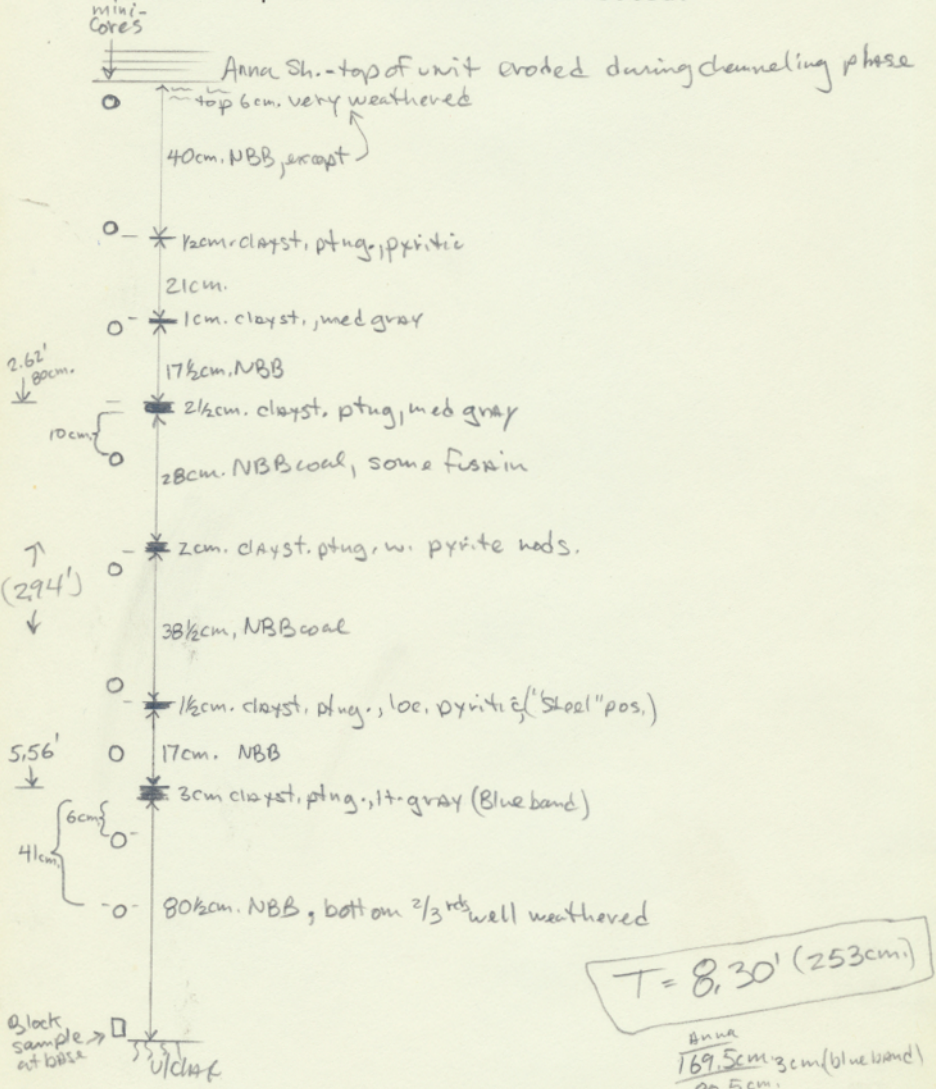


With channel margin known Keith was ready to take mini-core samples, and he began at the 31st crosscut on the pillar corner opposite B; Hackley "A" site (later "RD" collection also). Thicker (2'?) channel-fill is probable roof here. About 40' to the East the Virden Coal is seen to rise up to the West over about 1½' of clastics, so more seems likely here. 8 cores and a block sample at base were collected.

F. Hackley's "B" site is at the 36th c/c (marked "37" in error) on the western pillar corner, about 250' W. of the channel edge. 8 cores and blocks at base were collected and 4 main claystone bands were also sampled.



G. Hackley's "C" site is at 33rd crosscut just east of pillar corner. Site is just "outside" of channel boundary as mapped (Herrin datum). 9 cores and block sample of base were collected.



We had lunch and planned large sample collection. Henry moved the vehicle up to 30th crosscut door whre bags would be sent through.

We returned to B. west to collect the 200 lb. "RD" sample, in red-coded bags; also Hackley's "A" site.

H. Next we went to 30th crosscut to collect the 200 lb. "YW" sample in yellow-coded bags. White "31" was corrected to 30 with "0" in red.

I. Last we went to 2nd entry just north of 31st crosscut to collect the 200 lb. "WT" sample in unmarked bags. Roof sequence here is Herrin, 0.9' channel clastics, Virden Coal. Only base of Virden Coal was seen; it is flat and level and has u/i fern folliage tips and 1-3 cm. across angular fusain chunks across it.

This sample = IBCSP-7 And represents the bottom 1/4 of seamsall below the blue band.

Samples: C2-S-6 collected

C2-S-6 Site B Micaceous sandstone channel lag collected with traces of Herrin Coal.

(IBC-107)

T+R location for S-isotope bulk sample
1S SW1/4 SW1/4 SW1/4 Sec. 14, T. 12 N., R. 6 W.

1 of 4, plus maps

Mine Notes - Freeman Crown II - Macoupin County

Visit: April 4, 1989 by Phil DeMaris, Joe D. Miller (ISGS); Steve Marshak and Scott Wilkerson (U. of I.); escorted by Ken Fritzche (Safety Dept.).

Coverage: Introduction
4th N. (W) Submain Faulting
Summary

Introduction

Purpose of visit is to update mapping in 4th N. Submain where strike-slip fault intersects it, and to get some help in interpreting some unusual faulting patterns there. We were informed that a new E. Main off the North Mains would be started soon--this should be a good area for mapping as a study area for field trip.

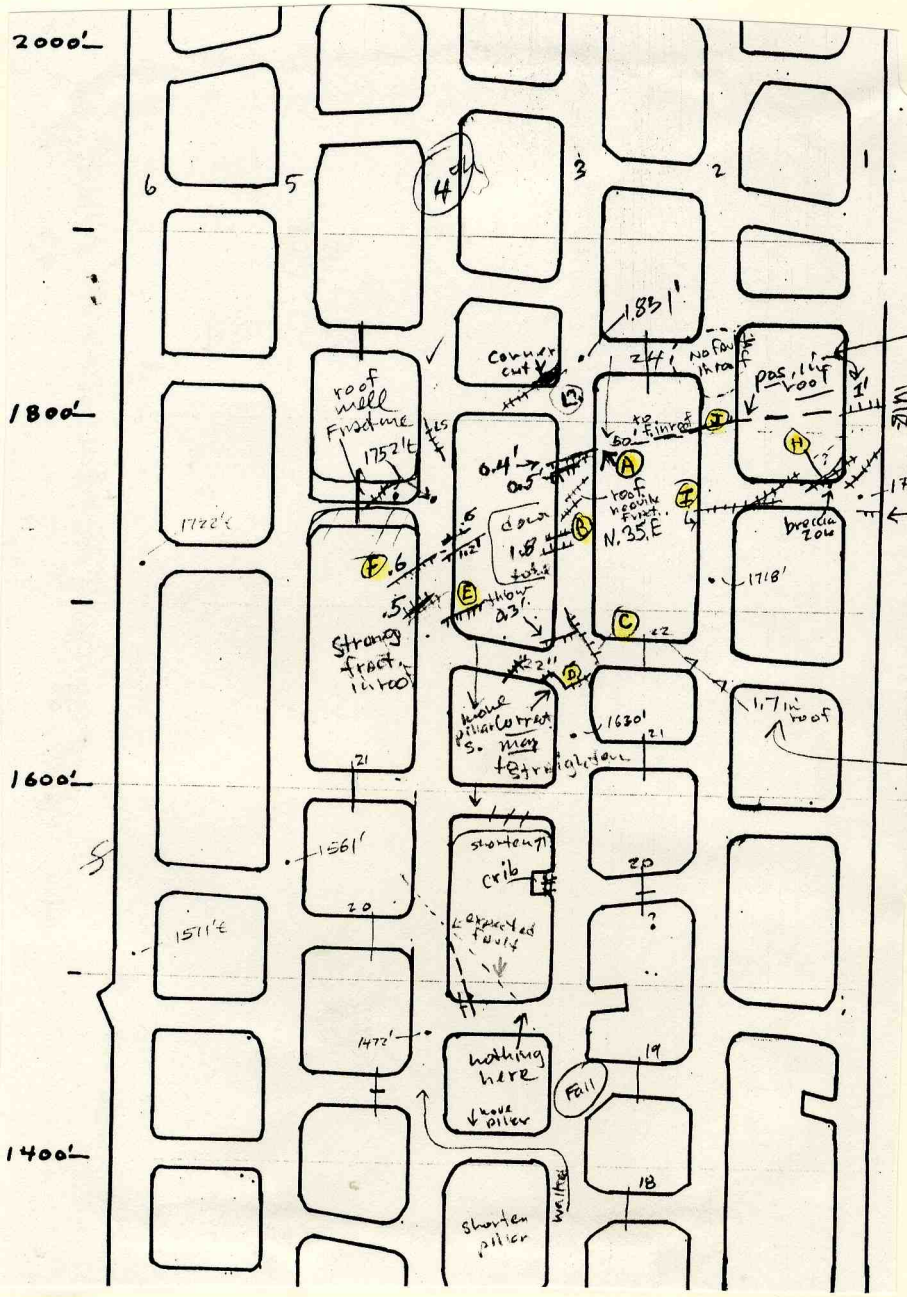
4th N. Submain faulting (See map A)

A. We began on the 3rd and 4th N. entries and moved to the northern-most fault. Throw here is 0.4' down to SSE, over several short steps; on W. rib there are two distinct planes separated by about 6 feet.

B. Just to the south on the 3rd a set of normal faults subparallel (about N. 75°E) to those at A. have a net throw of 1.8' down to N., forming a shallow graben. Fracturing in roof (ss. or ls.) is at N. 35°E, about 35-40° difference in strike.

C. Further south there is a normal fault down 0.4' to NE, striking roughly N. 40°W. Steve sees crosscutting of this fault near the pillar corner by an ENE trending fault.

Map A. 4/4/89



2 of 4, plus map

D. At intersection zone of brecciated ls. (open joints on close centers) in roof; strikes of indiv. planes are less coherant toward both pillars (is this an effect of vertical position in a brittle roof unit?). On long pillar corner mapped normal fault down to S.

E. Through 22nd c/c onto 4th N. On E. rib mapped normal fault between two Anna concretions at 60° dip, down to S.

F. Fault zone which appears to match feature at A. shows much brecciation of roof associated with it. This is Nelson's "shattered zone." On the E. rib this is a small horst, which is gone on W. rib. W. rib has single plane, down 0.6' to S. and another parallel plane about 20' S.

G. Moved to 1st N. (see prev. notes) to get correct position of fault; it is 10 paces (30') North of 1763' tag, so 1793' is rough fault position. Plane 1' throw down to N. at top of seam; plane in roof is 4' to 8' further N., so about 2/5th way up this pillar (correct on compilation). Roof sequence here is 4.0' Anna, 0.3' clod, Brer. nodules with siltstone above. Believed to be under A.R. channel, but this is close to a "normal" sequence, so edge of channel should be established. Open joints further S. do not intersect this plane, which Nelson considers a strike-slip fault. Marshak was shown pulverized coal, but no evidence remained of any horizontal movement.

H. This crosscut shows high density of open joints in roof (ss. or ls.--lith. uncertain); one exposure of breccia zone (more E-W than o.j.'s) showed linear fragments in claystone in a mini-horst only 0.8' wide--clearly suggesting horizontal movement. Miller (#2) mapped a through-going normal fault (down to S.) here, but I see the fault only on the west side, and throw is not determinable in roof. I think there are several

sub-parallel sets of joints in roof, but they usually don't run more than 20' before weakening.

I. Now on 2nd N. fault in roof lays over in Anna shale to south and connects up with the southernmost fault trending more E-W which pulverizes coal on W. rib. I think the two faults on rib join in roof.

J. Fault on 2nd N.--both sides of entry have small horsts in roof rocks. Facing east the exposures show different siltstone thicknesses on either side provoked some acceptance of horizontal movement. Small horst is compatible with thrusting with right-lateral displacement (up to North) and so Marshak was dubious about idea of left-lateral movement. Miller's #3 is here.

I checked on entry ribs to next c/c (both sides) and in roof for faults and found none.

Summary

Improvements to understanding of the faulting patterns here can be made when plotted on a corrected base. It appears that the zone of maximum fracture in the roof may be distinct from the faults on the north, this zone appears to be subparallel and 50-100' to the south, but there may be no through-going fault in the Herrin associated with it--the exposures may be too old to fully evaluate this as well.

Steve Marshak did not see clear evidence of strike-slip movement; but did see some evidence compatible with strike-slip movement. He noted that pulverized coal which John and I associate with the through-going plane (historically) means only brittle fracture of the coal has occurred.

When the corrected base is available checks should be made 100'+ N. of last obvious features for associated smaller faults and possible continuation of the NW-SE trending normal faults found to the south.

9/20/89

mde:MineNotes3

Mine Notes - Freeman Crown II - Macoupin Co.

Trip: May 23-24, 1989, by Phil DeMaris and Erik Kvale and Al Archer (Indiana Geological Survey) on 23rd, with Charles Heiple, Construction Manager, as guide

Coverage: Introduction
Sampling along N. Mains & panels
Fall at 2nd Main East
Fall on 4th Main at 8 c/c (day 2)
Mapping of 8th West Main
Quick stops off N. Mains
Samples: Set I (-T-1 to -16)

Introduction

Trip will cover examination of Energy Shale lenses for fine laminations (research interest of visitors) and sampling of Energy Shale and fusain lenses for analysis. On second day mapping of 8th W. Main is planned.

Dave Webb (Supt.) discussed plans for mine development. North-south development has been stressed recently and the south mains and 4th N. Submain will likely be sealed within a year, and the W. Mains could be sealed within a year. The north side out the mine has had generally good working conditions and long-term development will focus there. New 2nd E. Mains will lead N. development and 2nd W. Mains will lead NW development.

Sampling along N. Mains & panels

A. Fall at 42nd c/c on 6th N. travelway examined. Base of Energy sampled; Kvale/Archer's "S1" matches my -T-1.

B. Fall at 77th c/c on 6th N. shows: Energy Shale, trace Anna shale, nodular Brereton up to 0.8' thick and 3' of Anvil Rock siltstone(?), damp, at top of Fall. There is a trace of carbonaceous material on Brer./siltstone contact. Base of Energy sampled (-T-2).

Next we went to 3rd E. panel off N. Mains to see Falls at 43rd and 45th crosscuts.

C. At 43 c/c, #2 room Fall shows Anna, Brer. nodules only, siltstone, (finely laminated). Oriented sample of siltstone (-T-3).

C east. At 45 c/c large Fall, now cleaned up. Energy shale sampled, oriented and bulk (-T-4). Bulk sample is 0.1-0.2' above contact, above pyrite concentration. Erik gets two oriented block and oriented Energy/Anna contact. Energy is 2.9' thick; Brereton is nodular bedded (0.5' to 1.0') with siltstone above, 2 1/2' seen.

Next we went to 2nd W. Panel off Main N.

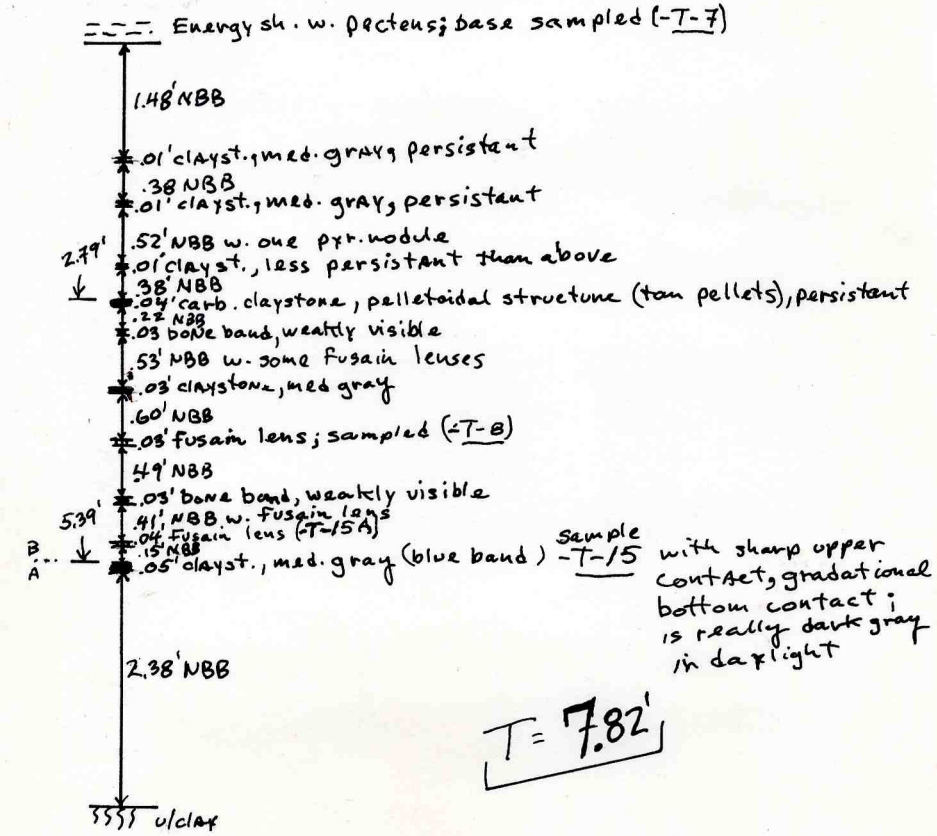
D. Went to face and discussed partings at rooms 2 and 3. At room 4 off #4 entry (intake) looked at Fall with 3 1/2' Energy Shale, with slickensides and many pectens. Bulk and pieces with pectens sampled (-T-5).

E. At #5 room, Energy has mid-angle slickensides causing falls--bolter says there is 0.25' separation in roof here. Sampled bulk (T-6A) and basal Energy with pyrite octahedra (T-6B).

Fall at 2nd Main E.

F. They have just cut 3-4 c/c east, and there is a high (28' Fall at the junction of the 12th N. at 103 c/c (belt entry). Block with blueband has collected later (-T-15) and fusain lens collected off of it (-T-15A). Description:

John[illegible], Moore Corporation, Rochester, N.Y. 14604
FORM 180 W



G. On the way out we stopped at Fall at 32 c/c on 6th N. I sampled base of Energy (-T-9). Laminated siltstone or fine ss. just above was sampled by Erik and Al; it shows westerly current direction. No Brereton Ls. seen. After checking map, this site is the only site close to a known Anvil Rock Channel, but it is still about 200' north. Further, the sequence here is not unusual for the "sheet facies" of Anvil Rock ss. However, no clear exposures of the channel edge relationship have been seen to date and expectations vary.

4 of 8 plus map

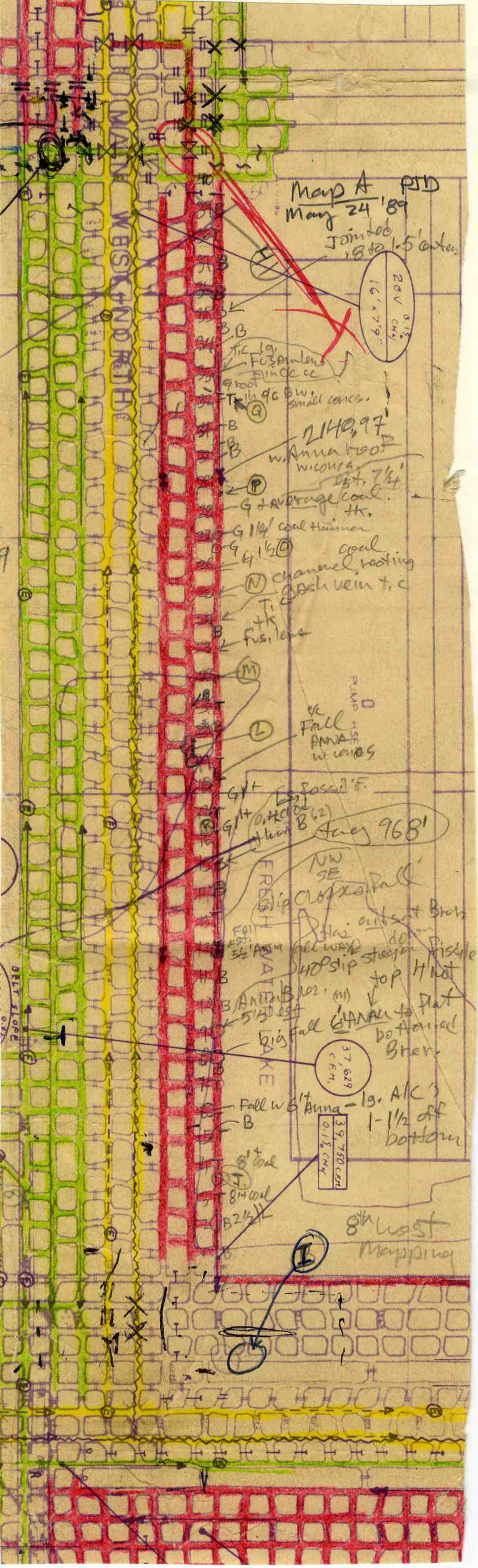
Fall on 4th Main at 8 c/c (day 2)

H. We went to the far end of the west Mains which stopped in wet conditions. In vicinity 78 c/c there is over 8 feet of coal with top coal and floor coal left as mined. I measured 3.4'+ coal below blueband (2.5' is typical). Area has Energy roof, so thinor missing Brereton has probably let in water from above. We returned to bottom area to map on foot.

I. On way to 8th West examined Fall on 4th N., prob. at 8th u/c. Desc.:

1'+	Prob. U. Bench Bankston Fork; competent unit which bridges a 20' span
1-2'	Gray, weak unit; poorly bedded
ca. 1'	light unit, prob. L. Bench Bankston Fork
4.3'	lt. gray siltstone, somewhat more competent than below, not typical Lawson Shale (A.R.ss.)
1.0'	lt. gray silty shale, finely banded, weak (A.R.ss.) conformable contact to
0.7 to 0.95'	Brereton, nodular bedded, with broad bumps showing on base
0.4'	"Clod" of Brereton
2.2'	Anna Shale, finely laminated, black
3.4'	Energy Shale, dark gray; scratches "gray"; Energy base sampled (-T-10)

J. Sump cut into floor at 3 1/2 c/c W. into tough black underclay limestone(?), similar to floor at west end of W. Mains. X-ray diffraction analysis (XRD) of sample C-2-T-11 from lip of sump gives following semi-quantitative results: 70-75% calcite, 5-10% Quartz, 12-18% Clays (including Illite and authigenic Kaolinite), 3-5% carbon and less than 5% pyrite/marcasite. A similar black limestone was found in gradational contact to the Herrin in the 8th S. panel. What these three sites have in common is thick Herrin coal below the blueband, indicating local

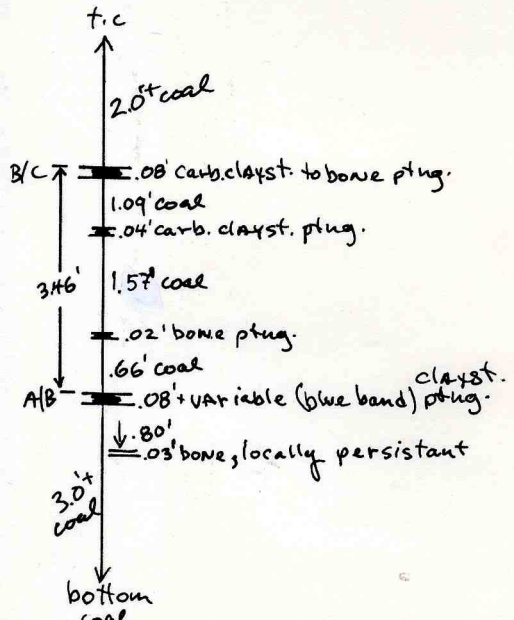

Map A PJD
May 24 '89
PUMP HSE
FRESH WATER LAKE
8th West Mapping
2140.97'
Fossil F.
big Fall
Fall w 6' Anna

topographic low. Working hypothesis for these areas is that they are ponds forming fresh water limestones synchronous with beginning of swamp development, younger than the nodular limestone a few feet below coal seam. Find a way to test this.

K. At c/c 16 well-weathered Energy Shale examined; it is yellow, and pyrite crystals are obvious. Energy appears medium gray, with rare vitrain streaks in bottom 0.6'; basal 0.2' sampled (-T-12).

L. Large Fall on 7th at 19th c/c shows 5.4' Anna to flat-bottomed Brereton. Fall continues W. to near the 20th c/c.

M. At c/c 22 we are again in thick Herrin area and top coal is holding up. On N. rib I do a partial desc. where 8 1/2' of coal is exposed. All four major partings are prominent, and middle bench is 3.46'. Get a full thickness locally. Desc.:



N. At 25th c/c Anna Shale roof with concretions 1 1/2-2' in dia. and stigmaria with rootlets coming down to base of Anna; this is evidence we are under the Anvil Rock Channel. Anna Shale is roof to the thick Herrin seen at last 3-4 crosscuts. In crosscut t.c. shows nice concentric fracture rings--possible photo and coal desc. site.

O. Energy Shale at 26th c/c shows high density of pectens, but well-weathered. Base of Energy sampled (-T-13).

P. Just short of 29th c/c, Fall shows Anna concretions bolted up, but they are surrounded in a medium gray shale with plant fossils; much weathering (sulfates) obscure relationships, but this site is certainly under the Anvil Rock channel.

Q. Just past 32nd c/c Energy wedge starts. I sampled base where Energy is 1' thick about 6' west of contact (-T-14). I mapped to 39th c/c before lunch.

Quick stops off N. Mains

R. We went to base of 2nd W. panel. In crosscut with tag 9656' on 4th Main N. I took a fusain lens sample 1.3' above the blueband (bench B.5 position) as -T-16.

F. Returning to yesterday's site in 2nd E. Mains, I decided site not ideal for benched coal samples, but got a nice block of the blueband (T-15) and later sampled fusain lens from top of block (-T-15A). See F. from day 1.

Samples: Set 'T")-T-1 to 16)

No.	Site	Desc.
-1	A	Base of Energy sh., med. gray; matches "S1" (carbon)

7 of 8 plus map

-2	B	Base of Energy sh, very dark gray (carbon)
-3	C	Anvil Rock silstone, finely laminated, oriented
-4	C. East	Energy Shale; oriented block and bulk .1 to .2' up (carbon)
-5	D	Energy Shale, dark gray; pectens and bulk (carbon)
-6A	E	Energy Shale, basal (carbon)
-6B	E	Energy Shale, basal w. pyrite octahedra
-7	F	Energy Shale, basal med. gray (carbon)
-8	F	Fusain from lens 0.03' thick (petrog.)
-9	G	Energy Shale, basal (carbon)
-10	I	Energy Shale, basal, med. to dark gray (carbon)
-11	J	Hard, dark underclay limestone (XRD, carbon)
-12	K	Energy Shale, basal 0.2', med. gray (carbon)
-13	O	Energy Shale, basal, dark gray (carbon)
-14	Q	Energy Shale, basal 0.2', dark gray (carbon)

8 of 8, plus map

-15	F	Blueband (.05') in block: med. gray top .02'; very dark gray (bone) bottom .03' (tk. varies across block)
-15A	F	Fusain lens .04' tk, 0.15' above blueband (petrog.)
-16	R	Fusain lens from mid-seam (petrog.).

9/20/89

nde:MineNotes2

Mine Notes: Freeman Crown II - Macoupin Co.

Trip: June 14-15, 1989 by Phil DeMaris
Anil Atri, Syed Haq (14th) and
Mark Phillips (15th) of SIU, escorted by
Tom Kell (Gen. Mine Manager) on 14th and
Charles Heiple (Const. Manager) on 15th

Coverage: Introduction with Webb's briefing
S. Mains Faults and Falls
4th E. Panel/S. Mains
3rd E. Panel/S. Mains
Quick visit of 4th N. Submain/W. Mains
S. Mains Fall at c/c 19 (end day 1)
N. Mains Fall at 36 1/2 and 47 1/2 c/c
2nd W. Panel/N. Mains
3rd E. Panel/N. Mains
2nd E. Main/N. Mains
Samples: Set "T" completed (to T-19)

Introduction

Atri briefed Dave Webb (Supt.) and Tom Kell on the goals of our ground stability study. This is the sixth and last mine visited for the first year of the IMSRP project.

Dave Webb reported that the first known subsidence over Crown II began last week over 2nd S. Main junction area, and indicated that this was sensitive information. He described the unusual mining conditions in that area. There was 7-8' of Herrin and 4-5' Anna; the top coal and Anna was cut on first pass because of unstable roof. Pillar stability was poor in the area and pillars punched into underclay up to 1' per year. Water from E-W strike slip fault may have contributed water which increased the problem.

Dave indicated that over 1-3 years after mining the height of all travelways goes down 1'. This was

true on mains and in panels. Atri indicated that this might be due to convergence and that actual subsidence of several inches might be occurring at the surface, based on work that Dr. Chugh has done. I cautioned that this height loss includes the bulking factor of fallen roof materials, addition of rock dust, and swelling of underclay as well as any roof sag and underclay heave.

Dave Webb briefed us on mine practice. This information included typical mining width and bolting information; 6' conventional bolts are used in good conditions, with 8' bolts used at intersection (7/8" bolts). In long life entries and problem areas tensioned rebar bolts with 3' of resin at bottom are used. Truss bolts are used in trouble areas on travelways and throughout the 2nd Main E., which will have a long lifetime.

Mining width and pillar size are:

16-18' wide on 74' centers on Mains
16-18' wide on 74 x 60' centers on panel entries to 19' wide on 60' x 60' centers in panel rooms

There are currently two production units on the south side of the mine (3rd E and 4th E Panels): due to broad roof and floor "rolls" making coal thinner and causing roof problems these areas are less productive than those in the north where the roof is more consistent. By 1990 coal production is planned to be exclusively from north of the shaft. With roof conditions as they are now they can safely make only 20' cuts in south, but 40' cuts in north under good roof w. remote control.

South Mains Faults & Falls

A. 6th S. exposures of normal fault have been cleaned up since last mapping. Normal fault exposed clearly--strike-slip fault must also cross here. In

entry to east the large fall was ramped and truss-bolted: it is now cribbed.

B. 39th c/c on 6th S. fall extends to around 30'; at base is an Energy lens. At 40th c/c in fall Anvil Rock sediment lie over Anna - may be due to deformation of limestone perhaps displaced toward 40 1/2 c/c. There are many low angle slips along the top of and into the top of the Anna Shale.

C. 50th c/c has fall with 5.0' Anna Shale. Original 6' bolts pulled out and fall was rebolted.

D. 84th c/c, west side shows Brereton "boss" down to top of Herrin level. Only Anna roof in area and it is 4' thick.

E. Put vehicle on charge at 116 c/c. Base of Brereton is rolly and Anna thickness changes from 1 1/3' to 2 1/2' over 15' laterally: the base of Brer. seems to vary more than Anna variability demands. Anna has slips and is hard to hold up.

F. 124/5 c/c area has 1/2' coal and 2 1/2' Anna rashed from around bolts completely. Probable truncation of coal bedding at top due to low-angle slips. There are alot of slips in the Anna (it is dry); the bottom of unit is not fissile and shows waviness of bedding.

G. Energy Shale lens (max. 2 1/2' seen) at 120/1 c/c type of sequence. I took Energy Shale samples: at 0.7' - 0.9' above Herrin (-T-17) and at 1.2' - 1.4 above Herrin (-T-18).

4th E. Panel/S. Mains

H. We parked on travelway at 1921' tag near power. One c/c inby (Rm. 30) shows 1.1' Anna Shale, 0.4' greenish "clod" with cemented Brereton Ls. above. Base of Brereton rolls broadly; it is not 3' thick judging from use of tension bolts here.

At Rm. 30 at belt position (belt head at 29) we saw at least 1' Brereton, unbanded, massive in appearance; base rolls broadly but appears continuous. There are multiple low-angle slickensided planes in Anna down 1' from ls. contact. Anna is locally 3' thick judging by bolts, but generally thinner.

3rd E. Panel/S. Main

I. At 48/9 c/c on travelway seam pinches down to 4'. Brer. has come down, partly displacing Anna and top of Herrin. There is a lot of greenish clay seen on the Herrin/Anna contact clearly injected laterally from 0.1' fissure in base of Brereton. Medium-angle fault in Herrin, apparently through whole seam. Underclay is normal but is elevated at least 1' below this feature which is like a broad "V" on base of Brereton. Anna is highly faulted; also has some light clay into top 1' of unit where it is 2' thick.

J. Room 48 on travelway (3037' tag nearby). I did quick coal desc. on NE corner, 30' west of I.

(next p.)

J. 3037' E. on tunnel wall

Anna Shale, over 1' ft., some "white top" on contact (see I.)

1.50' NBB, wide bands

.03' (var.) pyritic claystone band

.32' NBB, as above

.02' carbonaceous claystone

.61' NBB, fine banded in sections

2.48' ↓

.04' med. gray claystone, only slightly pyritic (B/C parting)

.28' SBB coal, some fusain

.03' dull coal band (bone?)

3.41' ↓

.58' NBB coal, locally finely banded

.06' claystone ptng., med. gray, pyritic

1.12' SBB coal, mostly fine banded, some fusain

.03' bone coal parting

.59' SBB coal

.05 (variable) claystone band, pyritic (blue band)

2.21' ↓

2.21' NBB, mostly finely banded

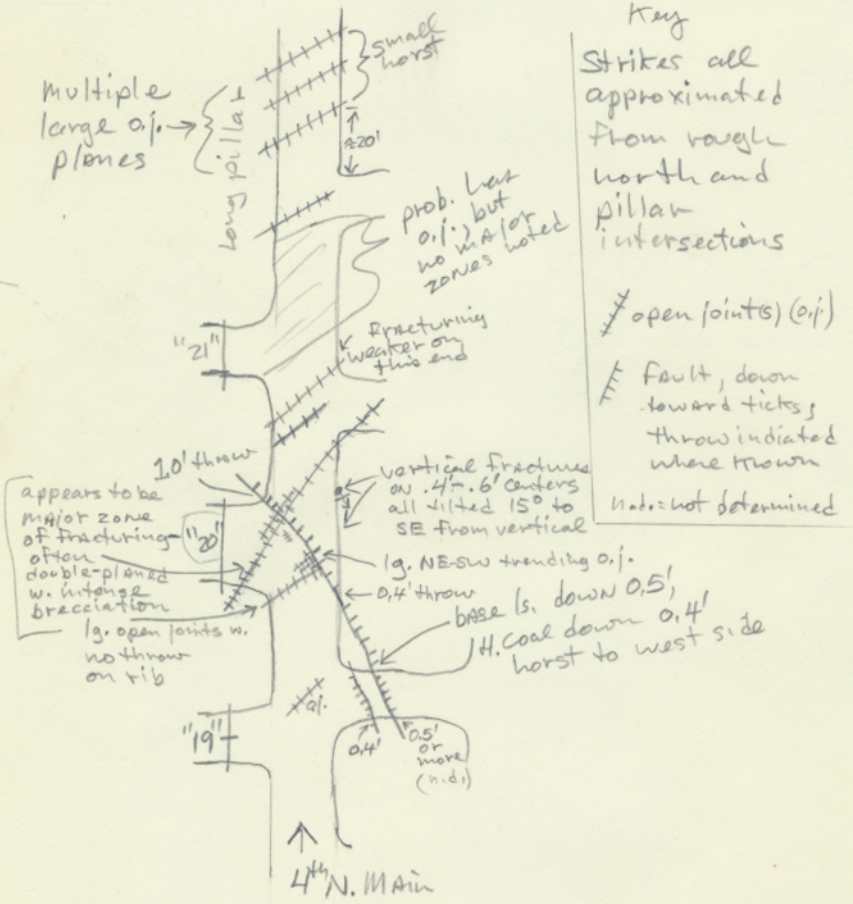
UC, tough, med. gray

T = 7.47'

5.21' / 2.21' / .05

Quick visit of 4th N. Submain/W. Main

K. Examined effect of strikeslip fault on Brereton. I mapped on 4th entry counting from the east.



South Mains; undercast at c/c 19

On way out examined undercast just off 7th Main S. Nice shot undercast under main belt about 5 1/2' deep with 1' soft underclay on top. Tom Kell compared the south side of the mine to the north side: the south generally has "soft bottoms" i.e. thicker undeclay but ls. in floor rolling up to bottom of seam locally (as at I.), while the north generally has "hard bottoms" i.e., thinner underclay above u/clay limestone, which is flat-topped and doesn't roll into coal bottoms. End of day 1 work.

N. Mains Falls at 36 1/2 and 47 1/2 c/c

We travel today with Chuck Heiple, Construction Manager. He mentioned that a "binder" is used on all roadways (mains, submains and travelway in panels) for dust control, most often in the winter to retain moisture. Material is a lignosulfonate & sugar mixture (black & sticky) mixed with water further and sprayed on roads. Heiple indicated that most roadways are sprayed with water once a day all year around. We walked by some c/c that formerly had 2' concrete pads (poured late 70's or early 80's) broken up by heave and were recently loaded out; others have not broken up, so this may be either a local or long-term problem.

L. Fall at 36 1/2 c/c; I decided that this might be on N. side of A.R. Channel which was mapped to both east and west, but is probably too far N after looking at map. Above normal roof is 3' silty shale (A.R. Ss?) and 2 1/2 of darker unit (Lawson?) which looks mottled. The "normal roof" is about 3' Energy, gradational contact to 1' Anna and scattered Brereton nodules.

M. On 8th N. at c/c 47 1/2 we examined cleaned-up fall which had excellent exposure and will remain open and ramped. Section:

	Prob. ls. at top of Fall (Upper Bench BK.FK.?)
2'	(variable) dark claystone, mottled, very weak greenish at top
1.0-1.5'	Brown nodular ls., cream colored and purer at top (L.B. BK.FK.?)
4.0'	Lt. gray ss. to siltstone; fine ss. with clay drapes in bottom 1 1/2'
1.0'	Finely laminated siltstone, weaker than above unit
0.1'	Claystone
1.2'	(variable) Brereton Ls.; Fairly massive, not nodular
0.1'	"Clod" of Brereton
2.7'	Anna Shale
	Herrin Coal

Area was cleaned up to improve ventilation for future development of 2nd Main West.

N. At 48 1/2 c/c near base of ramp, another desc.:

ca. 2'	dark claystone, very weak
0.4'	limestone, tan gray
5.5'	upper silty shale/siltstone (damp)
1.1'	laminated siltstone with one limey nodule up 0.3' above base (suggestive of Brer. erosion)
2.5'	Anna Sh., very coaly and weakly laminated in bottom 1 1/2', typical tan laminations in top 1'. Herrin Coal

By 49 c/c level entry: Anna base on North side of entry shows gradational contact to edge of Energy lens.

2nd W. Panel/N. Mains

O. We parked near 9656' tag (ca. 130 c/c) just out by seals which are under construction. Went in "D" or #4 entry (intake). 1st room had t.c. and stable pillars. 5th room (north) had Fall showing 2.8' Energy to top of Fall (See E. of May 23-2 visit).

Backtracked to 4th room to go north; at 3rd c/c position in 5th rm. saw 2-3' long coalified lycopod periderm debris in base of Energy (same lens as above). Pectins also occur at same stratig. position as lycopod material; Mark sampled pyritized pectins here (8" and a smaller slab).

P. 4th room, prob. 3rd. c/c north did quick Fall description.

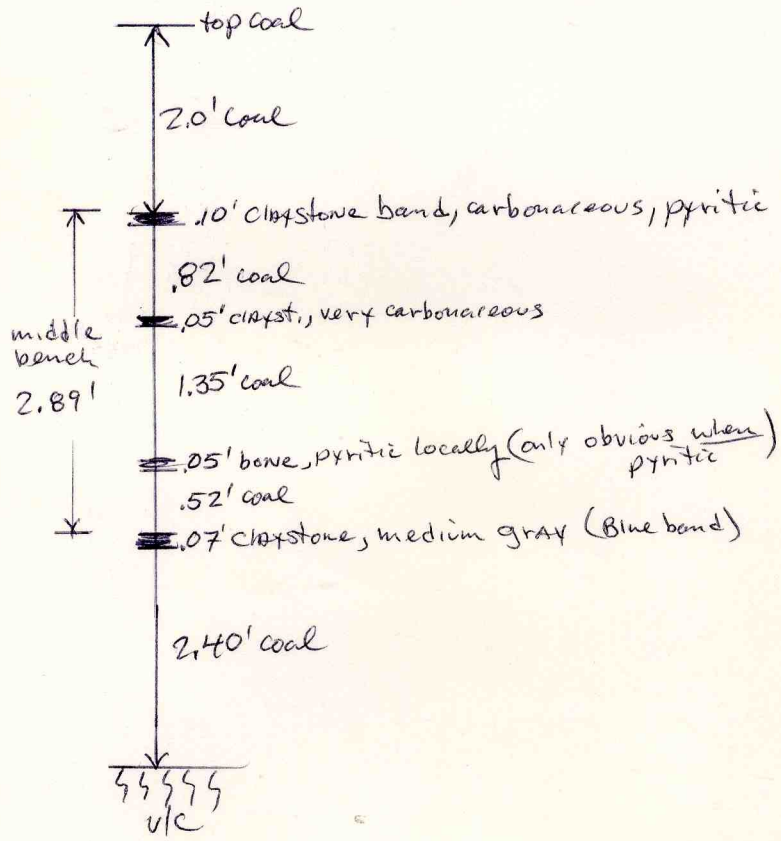
4'+	lt. gray siltstone (?) to top of Fall
1'	limestone(?) appears nodular
2 1/2'	Anna Sh. w. tan lenses at top
3'	Energy Sh. with long, steepening-downward slips

Back on "D" entry, rm. 7 shows Fall of 1 1/2' within Energy (same lens continues at least to 9th Rm.). Rm. 12 has top coal. Anna roof from Rm. 13 to 18; at 14th Orbiculoidia seen above and below lg. piece of vascular plant. At 17 1/2, Fall shows 3' of Anna, mottled at top. Rm. 19 has 1309' tag and top coal. At Rm. 20 to north there is 1 1/2' Fall within Anna with low-angle slickensides. Here there was a 0.5' long fusain lens on bottom of B/C parting which had no vitrain on claystone ptng. contact; appeared to have thin vitrain band to underlying coal.

3rd E. Panel/N. Mains

Q. We parked at 29 c/c on travelway. In 30th Rm. south there was top coal and fissile Anna. At 31 Anna; saw continuous miners working, but few exposures.

R. On Mains at main belt undercast at 137 c/c (or 138?) Atri examined underclay and underclay limestone. Also a good coal desc. site if a little more T.C. drops. I did a rough measurement on the N. outside of turn;



2nd E. Main

S. We started at rebolted Fall on 12th ⟵ N.; c/c 102 is travelway and 103 is belt, which is getting an arch. One can see several feet of Energy at base, probable Anna and thin or missing Brereton.

8 to 10 entries are to be driven east; they are in 5 c/c so far. These will be key set of mains for long term mine development - should be mapped. I collected pectin from Energy (-T-19) to photograph.

T. Travelway (102) and 4th c/c has a 14' x 14' Fall which is well truss-bolted and still wet. There is 3' Energy Shale with multiple slip planes, med.-to-low-angle; top coal is holding in crosscut.

Samples: Set "T" completed (to T-19)

-T-17 G Energy Shale, med. gray 0.7' - 0.9'above contact (carbon) (Sec. 26, 4300' NL, 1900' EL)

-T-18 G Energy Shale, med. gray 1.2' - 1.4' above contact (carbon) (Sec. 26, 4300' NL, 1900' EL)

-T-19 S Pectin impression from Energy Sh. (Sec. 11, 1830' EL, 2190' SL)

mde:FreemanNot

Mine Notes—Macoupin Co.— Freeman Crown II

Visit: August 15, 1989 by Phil DeMaris and Debra Willard (U. of I.) with Charles Heiple, Construction Manager, as guide

Coverage: Introduction
Falls on N. Mains
Fall in 2nd N.E. panel
2nd E. Mains
Samples: Set "U" begun

Introduction

Deb and I were briefed by Dave Webb (Supt.) on several falls which had recently been cleaned up and we visited these in the morning. Dave briefed us on plans for mining up to 2010. All coal will come out of the north mains, so additional roof support has been put in locally in belts and travelways.

Dave commented on problems with 3-way intersection. The mine was told to use 3-way intersections in the early 1980's, but they have had long term stability problems. A 37' stagger was compromise for manuverability but some of long diagonal 50' spans created eventually fell well after mining.

Falls on N. Mains

about 150' N. of mapped Anvil Rock channel.

A. Fall on belt at 30 1/2 crosscut. This fall is just south of fall seen on last visit, but is not an extension. New fall extends to Bankston Fork Upper Bench and is cribbed. A 30' brow between the two falls was cut down. At SW corner of intersection, desc. is:

(?) thick limestone - on travelway (bolt tests)
5 1/2 - 7' thick just to west (upper bench Bankston Fork)

ca. 2 1/2' dark gray claystone with green clay-filled synaresis cracks, weak

0.7-0.85' thin limestone (lower bench Bankston Fork) tan, fossiliferous (ribbed brachiopod frags seen)

0.3' tan hard cherty layer w. some carbonaceous material (part of Bankston Fork?)

4 1/2' Lawson shale; weak, dark gray and pyritic at base, lighter and slightly silty toward top; some greenish mottling at top; lies conformably on:

trace to 0.85' Anvil Rock sandstone, fine-grained ss. with some clay laminae; some ripples where thicker (channel origin likely); sharp wavey contact to:

0.9' Brereton Ls. cream colored, broadly nodular, weakly laminated in top half, gradational contact to:

0.6' Anna Shale, black, mottled at top; sharp contact to:

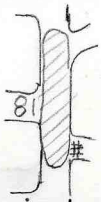
est. 2' Energy Shale, med. dk, gray, with pecten fossils Herrin Coal

B. Fall on travelway at 31-32 c4c has tested 5 1/2 - 7' Bankston Fork (upper bench) mentioned above, and Energy also at base. Energy here is 3 1/2'with 1/2' at top mottled by bioturbation; thin Anna above also bioturbated. Collected Energy Fossils and bulk sample (-U-1).

C. Fall on travelway at 81; c/c fell all at once; has been trimmed up some. Rock dusted so lithologies are guesstimated in part. Area was wet when mined; it was resin bolted and mostly railbarred originally.

top prob. Bankston Fork U Bench, 8-10' width exposed ca. 2 1/2' dark claystone w/greenish cast
ca. 1' Bankston Fork L Bench; forms 3-4' wide brows partially bridging top of fall
4 1/2' wet unit, no contact seen, prob. all Lawson Shale :(or thin siltstone or ss. with Lawson above possible)

missing or nodular Brereton Ls. (appears to be missing mostly)



3.2' Anna Shale, black, brittle

Fall in 2nd N.E. panel

D. 2nd E. panel, 5th room on belt entry; just cleaned (no dust) and belt not extended. Description at SW corner of fall:

0.6-1.' Tan limestone ;(caps edge of fall); BK.FK.
0.4' carbonaceous; pyritic, med. brown ls.?
3.3' Lawson shale, med. gray; laminated, not mottled at base, not silty
0.4'-0.7' Brereton nodules to 1' long sep. by weak gray claystone
1.1' Anna w. very thin tan laminae
1.3' Energy Shale w. pectens (sample -U-2) Herrin Coal

At center of fall, 20' x 30' area at top exposes probable upper bench of Bankstone Fork. There is about 2' of dark gray claystone with green synaeresis cracks (master cracks form irregular polygons 2' - 5' across) below the upper bench; 10' to 11' bolts would be needed to reach the thick

upper bench of the Bankston Fork ls. here. The missing Anvil Rock ss. (usually siltstone) was a surprise.

2nd East Mains (See Map A.)

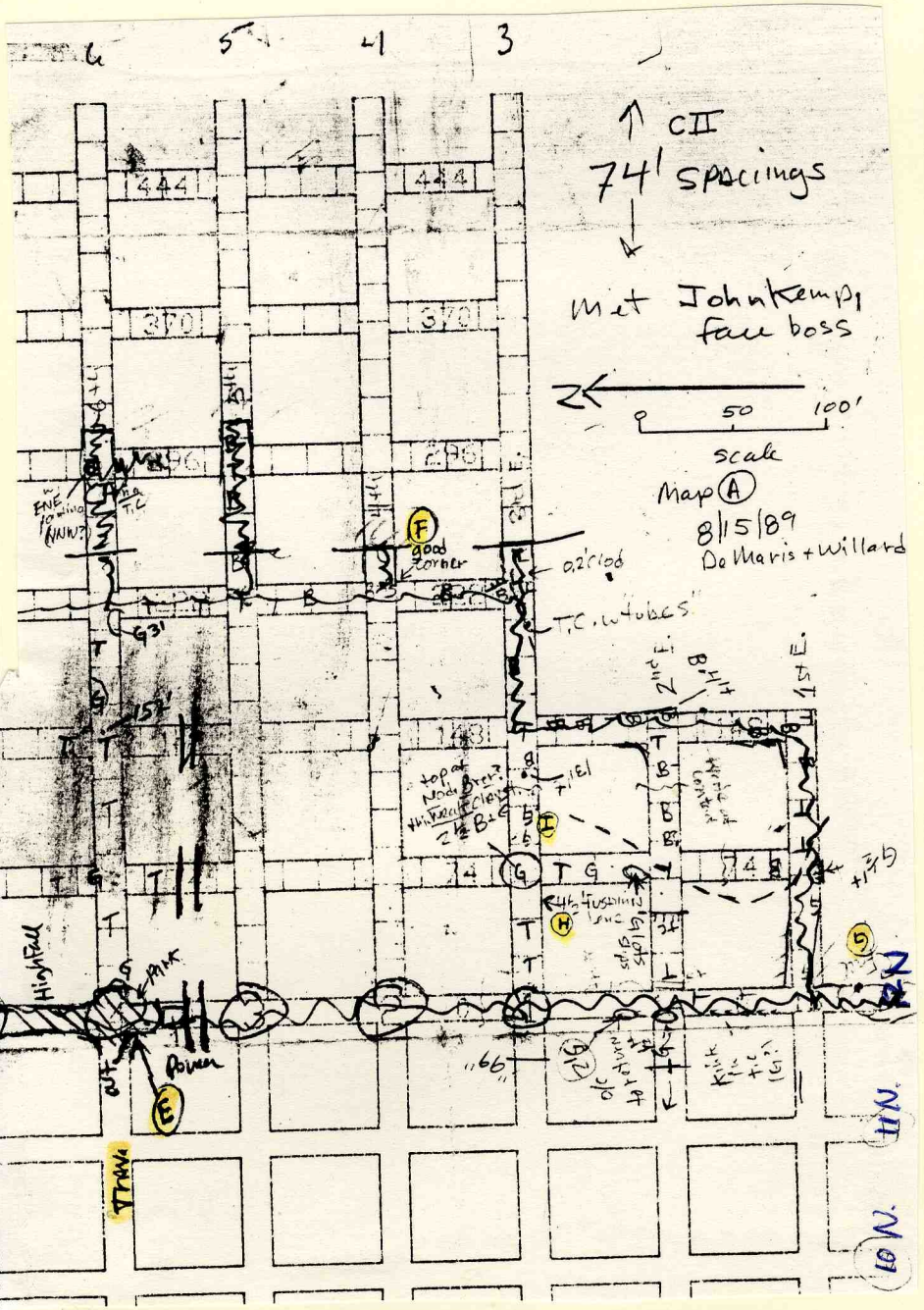
I plan to map the 2nd E. as it is cut this fall as an illustration for the 1990 GSA field trip guidebook. Today we examined parts of the 1st - 6th East and got a benched set of Herrin samples for palynologic study.

E. Intersection of 12th N. and 6th E. near end of long N-S fall. Immediate roof is Energy shale with gradational contact to about 1 foot of Anna; Anvil rock (silty shale) lies above it. There is no Brereton ls. here.

F. Sampling site for palynologic and petrographic samples. Debra Willard took set of benches of full seam: these were combined to reduce number(see Appendix A). Block samples of blueband (-U-3) and claystone ptng. "B/C" (-U-4) were provided to Dan Triplehorn (U. of Alaska).

(next)

Map A 8/15/89



F.

Anna Shale

BB Coal
1.52'

.02' pyritic ptng., discontinuous (base of 17)
.45' BB Coal, finer banded than above
.02' fusain lens, about 1" long, (used by Deb)
.45' SBB coal with smaller fusain
2.46'
.06 claystone ptng. (B/C) [block sampled - U-4]
.85' BBC, including .04' fusain lens at .54' down
.06 claystone ptng with pyrite

.64' SBB Coal
.01' fusain lens
.54' BBC

.03 very pyritic parting
.57' BBC, including .02' fusain band at .45' down
5.22'
.08 light over med. gray claystone ptng. (blueband) [block sampled - U-3]
.40 BBC
.01 fusain lens (used by Deb)

1.88 BBC, bottom 2/3 finely banded and pyritic

ΣT = 7.59'

5.22 / 2.29 .08

U/clay, lt./med. gray, friable (top 0.2 sampled as U-5)

Deb took 2 u/clay samples
0-.7' down + lower

G. Fall on 12th N. just south of 1st E. Main entry. Desc. about 20 feet from intersection shows:

Anvil Rock ss., weathered yellow, at top
0.8' Brereton nodule band
1.2' Anna Shale
3' Energy Shale

H. Nice fusain lens suitable for field trip viewing as "phyteral". Sample vitrain rim and fusain interior on next trip for petrography; vitrain rim thickness is useful to determine thickness of lycopod periderm on these trees before they fell over. This one has fusain 0.4' thick and is 4 1/2' long on bedding plane.

I. Thin Energy Shale with 0.08' wide bioturbation "tube" traces; usually seen in Anna so this is somewhat unusual.

Sample set "U" begun (to -U-5)

	Site	Desc.
-U-1	B	Energy shale with fossils, for specific identification and and bulk analyses
-U-2	D	Energy shale with fossils, for specific identification and bulk analysis
-U-3	F	Blueband (.08') in Herrin Coal; for clay min. and block to Triplehorn
-U-4	F	Claystone parting (.06') in Herrin Coal (B/C parting); clay min. and block to Triplehorn
-U-5	F	Top 0.2' of Herrin underclay; for clay min.

mde:MINEnotFre

Mine Notes - Freeman Crown II - Macoupin County

Trip: Sept. 12-13, 1989 by Phil DeMaris and Wayne Frankie, escorted by Charles Heiple and Henry Shackleford (PM of 13th) of Freeman C.M.C.

Coverage: Introduction
Fall at 52nd c/c on 3rd N. Main
Mapping in 2nd East Mains
Mapping in West Mains off N. Mains
Samples: -U-6 to -U-8

Introduction

Purpose of visit is to continue geologic mapping of 2nd E. Mains and "old" West Mains off the N. Mains and to introduce Wayne to underground mapping in Illinois. I am also looking for specific field trip sites and must collect another fusain sample to analyze for planned 1990 GSA field guidebook. Bob Perozzo donated a nice Lepidodendron compression in-filled with sandstone; it was found at 26th c/c on the 4th N. Main. It has weathered some--area was cut in early 80's--so I need to check if it needs treatment.

Dave Webb, (Supt.) requested that I hold a meeting around mid-October to brief himself, Tom Kell (Mine Manager) and Chuck Heiple (Construction Manager) on the summary of Crown II geology ongoing this fall. We agreed to set a date after my next trip in early October.

Fall at 52 c/c on 3rd Main N.

Area is being prepared for new development (2nd W. Mains off N.). Future belt will be at 51st and travelway at 52nd c/c.

A. High fall blocking future travelway at 52 c/c/3rd Main intersection. Between 3rd and 4th N. there is

a small boss on S. rib and some white top in Anna on N. rib. Roof is very coaly Anna--soot black with lots of fine vitrain shreds. Fall is circular and roughly 30' above top of Herrin. Area fell all at once (mined 11 yrs. ago); we observed a oxidized slip plane (5' long, steepening downward) in the Anvil Rock silty shale/siltstone which seems a likely causal factor. Fall is partly cleaned--should revisit when fully cleaned, since this is prob. highest accessible fall. Rough desc.:

ca. 2'+	lt. gray unit capping fall, wet
ca. 4'	coal or coal and very dark unit
ca. 6'	weak unit, wet
ca. 4'	more competent unit (U. Bench BK.Fk.?)
ca. 1'	claystone (benching BK.FK.?)
3-4'	probable Bankston Fork ls. (block of light gray cherty dolomitic limestone (Wayne) pulled from fall examined--which bench unknown)
ca. 6'	Anvil Rock unit, where examined is finely laminated light gray silty shale with open vertical jointing?, very weak
0.7'-1 1/2'	Brereton Ls., continuous, but broadly nodular
2.1'	Anna Shale; top half laminated and fissile, bottom half non-fissle, very high in dispersed and streaky carbon, and weaker than typical.

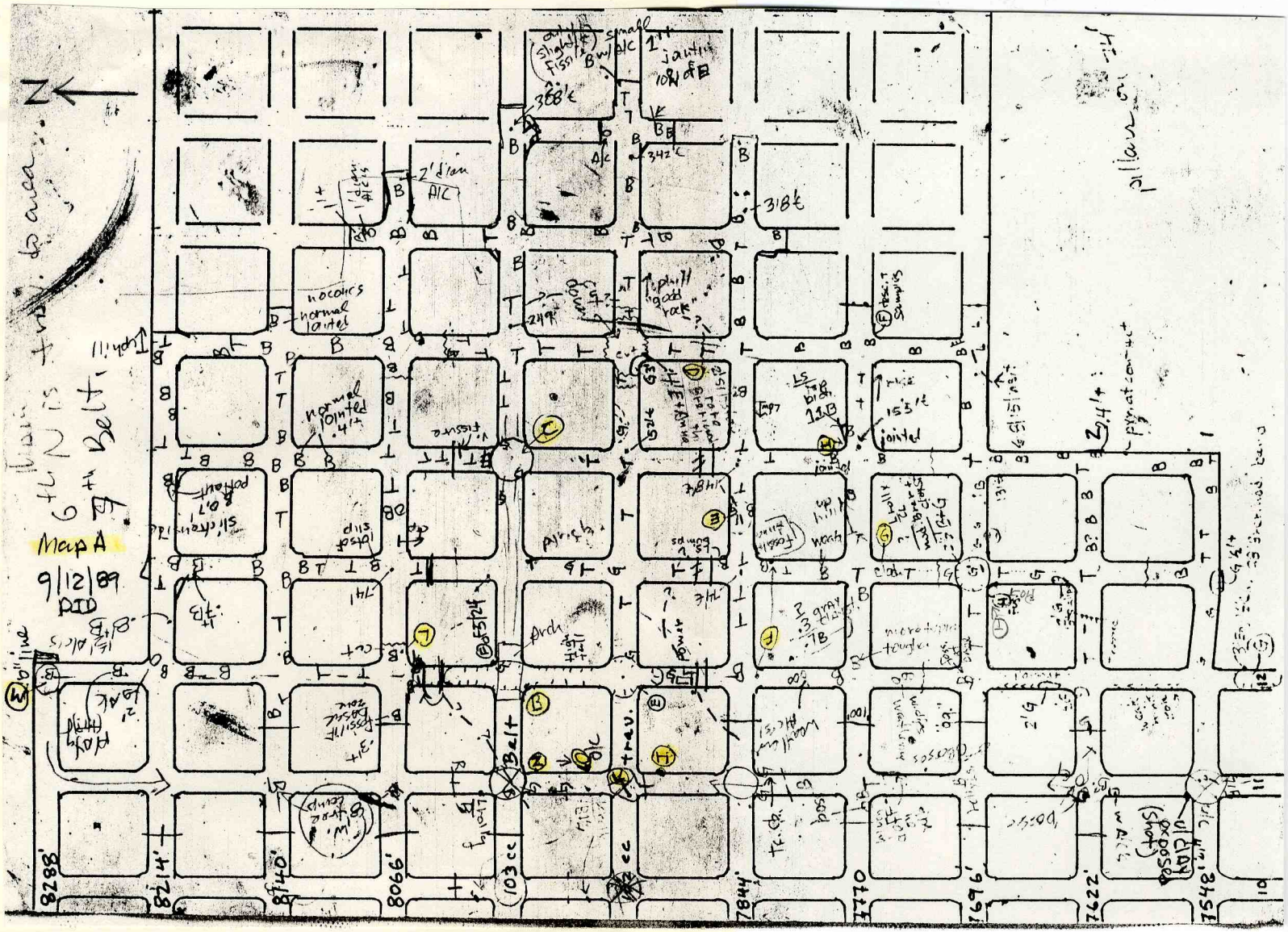
Mapping in 2nd E. Mains (Map A)

B. Fill has been put in over the arch protecting the belt here, giving a better view of the roof units:

2'+	limestone? - prob. top bench of Bankston Fk.
2.7'	dark claystone with green clay crack-filling; one nodule band (ls.?) in top foot
3.9'	Anvil Rock Ss.: argil. siltstone at base, ss. by 2' up trace of nodular Brereton

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

Map H
9/12-13



3 of 7 plus 2 maps

1/2' Anna Shale, gradational contact to:
3 1/2' Energy Shale

C. Fall on belt entry:

3'+ Anvil Rock ss.; lt. gray silty shale at base, coarsens upward nearby-nodules of Brereton, separated in claystone
1.2' Anna Shale
3.6' Energy Shale, pyritic at base

Six or eight-foot bolts used here: judging from B. the bolts are hitting the coarser part of the unit, which is probably stronger.

D. 3'+ siltstone, appears tougher upwards judging by mid-unit cutting marks (A.R.Ss.)
rare nodules of Brereton
1/2' Anna (estimated)
3 1/2' Energy (estimated)

2' above base of siltstone a horizontal Stigmaria is present. Segment is 3' long and appears 3-D at one end i.e. infilled in-situ. This appears unlikely to have been transported, so this supports fluvial/terrestrial origin for sheet facies of A.R.ss. common over Crown II.

E. Roof is 1.1' Anna Shale with 0.7-0.9' diameter A/C's which are weakly pyritized. Above it is either Brereton "clod" or silty claystone Energy on N. rib.; revisit later to clarify.

F. Unusual basal Anna--weak, non-fissile, very carbonaceous with fusain hunks to 3 cm. across, and strongly curved shells in bottom (unidentified, but prob. articulated brachs. or bivalues) which are not part of typical Orbiculoidea--dominate fauna.

G. Clod of Brereton as roof--ribbed brachs seen near top (prob. spirifer collected nearby by F.) and top of Herrin bioturbated. Base of Brereton is "rolly". (Frankie's #4)

H. Fissile + jointed base of Anna; jointing appears to occur with 1' of Anna thickness. Seam thickness is 7.40'.

3rd E, Main, 1 ℄

I. Revisit of old H. to collect large fusain lens material. 2 uncontaminated bags of fusain collected (-U-6): lens is at shoulder height and between two claystone partings. A small sample of the bright coal rim from the upper west side (-U-7) collected--some loose fusain contamination, but should have vitrain/fusain contacts. Sample will be cast coarse for photos.

J. Between two overcasts roof has fallen or was cut down. Desc.:

3'+	sandy? Anvil Rock ss.
1'	argillaceous Anvil Rock ss. (slightly darker and weaker) no limestone seen
1'	Anna Shale
3 1/2'	Energy Shale

K. On top of overcast we looked at upper roof units. Anvil Rock sediments are silty shale in bottom roof and argil. siltstone above with bioturbation and dewatering structures near base. Upper part of A.R. is bolted up. Top of Anna shows tan banding (phosphatic?) in upper portion: piece sampled for XRD check (-U-8). End of day 1.

Yes see samp

L. Cut exposure shows 1.4' Anna with wet rolly Brereton above--probably 1' thick or less judging by other exposures. Clay injection into top 0.4' of Anna here indicates some deformation nearby. Lower 0.18' Anna is shell-rich, weak facies. Is Anna facies

related to proximity of Energy Shale lens? Is oldest Anna facies reworked Energy with new fauna?

M. Typical thick Anna on north side of mains. Fall exposure at N. end of 12th N. shows:

Brereton, flat bottomed and jointed slightly W. of N.
0.4' "Clod" of Brer.
4.1' Anna shale with 1' a/c's near base (concs. not common); unit is fissile in bottom 2'.

N. At belt o/c on 11th N., besc. on SE pillar corner done. Contact mapped was estimated by using strike of tilt on base of Brer. caused by Energy lens. Return here to measure slope angle on Energy lens. Desc.:

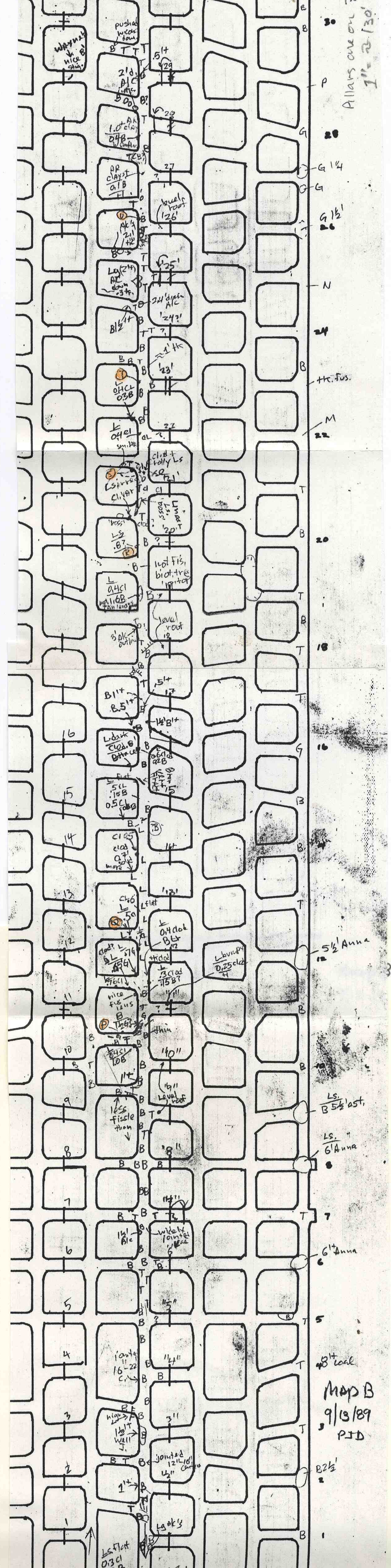
1/2' exposed of gray silty shale (A.R. sediments)
est. 0.7' Brer. Ls., thin, rolly base
0.4' clod of Brer., lt. gray
0.9' Anna shale w. gradational contact to
2.1' Energy Shale

O. Between overcasts Brereton becomes nodular-bedded on west side and is lost as limestone on the east side; only 0.4 claystone remains. By K. the limestone is lost on west side, on top of o/cast. Possible guidebook stop, but overcasts can't be crossed ~~at~~ bf all.

Mapping in West Mains off N. Mains

P. (See map B of 5th W. Main, S. side of Belt). Uncertain material below Anna here:

Brer. Ls.
.10' well indurated claystone
.50' weak claystone with bivalues or brachs at top
.37' Anna Shale, laminated at base, with tan lenses, some w. clumps at top


Allars are on
1" ≈ 130'
Map B
9/13/89
PJD

.35' Dark claystone w. lots of fossils (brachs.?) and pyrite clumps, vitrain traces
-- Herrin Coal

Tentatively mapped as thin Energy lens, but might be the odd facies of Anna, sometimes found at base. Compare with S., below.

Q. "Clod" has 1 1/2-2 cm gastropods, pectins and other valved shells 2-3 cm across. One coiled cephalopod 5 cm across seen. Where clod is thick locally the contact to crystalline Brer. seems gradational.

R. Between Herrin and Crystaline Brereton is 0.8'; only bottom 0.2' is clearly Anna (black w. tan/lenses)--balance looks like thick clod (0.6') which is unusual. contact loc. gradational due to Bioturb. RSO

S. Small patch of 1 1/2' Energy shale with no Anna and no real clod. Some bioturbation on Brer./Energy contact.

T. Anna thickens to .45' at mid-pillar and material added is at base: i.e. the tan band and blebs remain at top of unit. Material at base is laminated Anna 0.2' thick with rare thin tan laminae. (Unit continued to thicken to the north.)

U. Potout shows 0.8' Anna with Stigmaria root on Anna bedding and deeper rooting by 5-7 mm curvilinear roots alongside a 1 foot diam. concretion. This is first evidence of Anvil Rock channel seen today.

Just before leaving looked at rooting on Frankie's entry (4th West travelway) and collected stigmaria rootlets crossing Anna bedding in 1' x 2' block.

7 of 7
plus 2 maps

Samples Set "U" continued (-U-6 to -U-8)

	Site	Desc.
-U-6	I	Fusain from large lens between claystone partings; bulk for petrog. and other analyses
-U-7	I	Bright coal from rim of fusain lens for petrography
-U-8	K	Tan lenses in top of Anna Sh. for XRD. (XRD indicates these are a type of Fluorapatite)

Lepidodendron and Anna w. rootlets both donated to Teaching collection used by T.L.P.(U of I.) Dilcher should examine Lepidodendron for species.
[not determinable due to loss of detail, he says]

nde:MineNoteFr

Mine Notes - Freeman Crown II - Macoupin County

Visit: Oct. 3-4, 1989 by Phil DeMaris and Wayne Frankie, escorted by Dave Brown, Training Dept. (3rd) and Charles Heiple, Const. Manager (4th)

Coverage: Roof mapping on West Mains
Conclusions on Anna ident. and facies
Samples: Set "U" continued (-9)

Roof mapping on West Mains

We started out by finishing mapping of the travelway and belt (4th & 5th W) begun the previous trip (See map A). WTF PID (starting at 29 c/c)

A. Small pot out on travelway shows siltstone (ARC) lens over remnant Anna Sh. (0.3'-0.5'). Pics of Stigmaria just to E, at 29

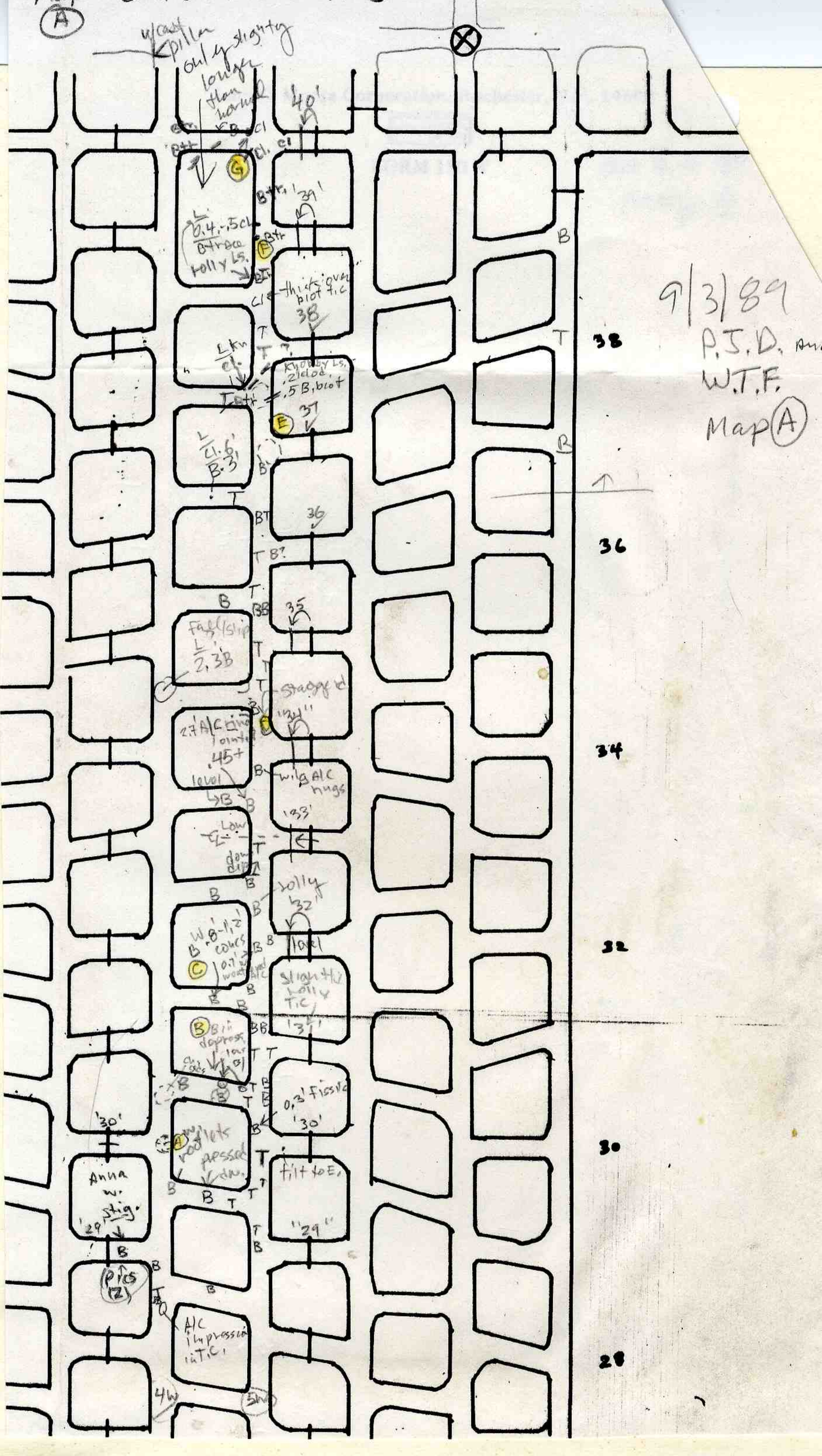
B. Judging from exposures on Travelway (Frankie's entry) there are siltstone lenses or channelets cut into Anna shale: these produce 2-3' wide shallow depressions in the top coal. Three of these depressions are seen.

C. Anna concretions are present but are not typical. There is much pyrite in Anna and top coal below them; the concretions themselves are weak and have lost the typical pyritic "rim".

D. Compactional ring faults under Anna concretions come down 0.8' into top coal and are up to 0.4' wider than the actual concretion.

E. Fall over belt shows: 1.2' Anna shale (top 0.6' very bioturbated), 0.5' clod, and Brereton, flat-bottomed and jointed at top. Just to north near Ls. roof contact, Knobby Brereton appears to be due to excessive bioturbation at base. Some of these

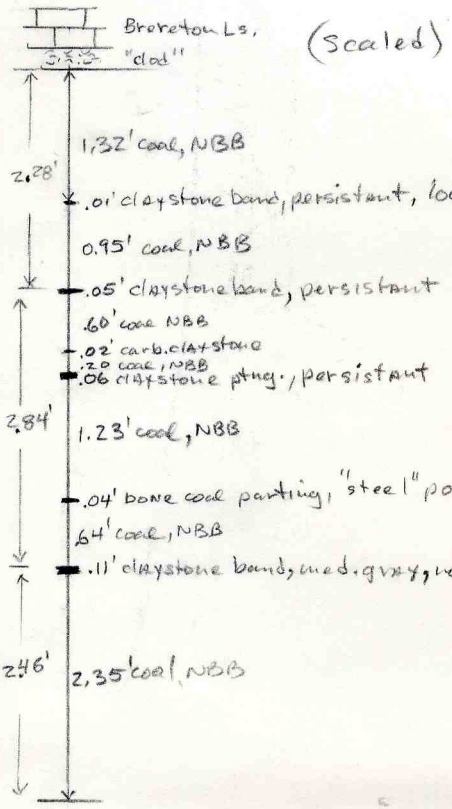
Map (A) Oct. 3 '89 PJD Mapping



sublinear knobs up to 1' long and 0.3' wide at top are present at base of Brer.

F. Trace of Anna (perhaps 0.2' max) and thick clod present. Clod is fossiliferous, and could be a sample site. Possible coiled cephalopod and other large flat shells on rolly base of limestone.

G. More accessible view of Brereton roof with good "tube" bioturbation traces, and bioturbation of the top of Herrin. Anna traces are patchy and suggest they remain due to variable bioturbation. Quick description on W. rib corner where there is clear bioturbation of top coal:



Bench	Thk.
C	2.28'
B	2.84'
A	2.46'
Total	7.58'

H. (See map B) Mapping 6th W. moving E. At crosscut 31 channel seds overlie Anna; at edge of fall there is a bolted 2.0' Anna concretion. Units in fall are: 2.2' Anna with phosphatic lenses at top, with erosional truncation fairly level and a linear piece of Brer. seen on contact; 0.4' (var.) off-white sandstone, and slightly micaceous claystone, weak and well weathered above.

I. At 28 c/c a small fall shows: 0.45' Anna shale with eroded top contact, 0.15' dirty siltstone lens with plant fragments, 0.8'+ gray claystone full of stigmaria and rootlets. Just to N. I see some siltstone injected or undercut 0.7' laterally along Anna bedding.

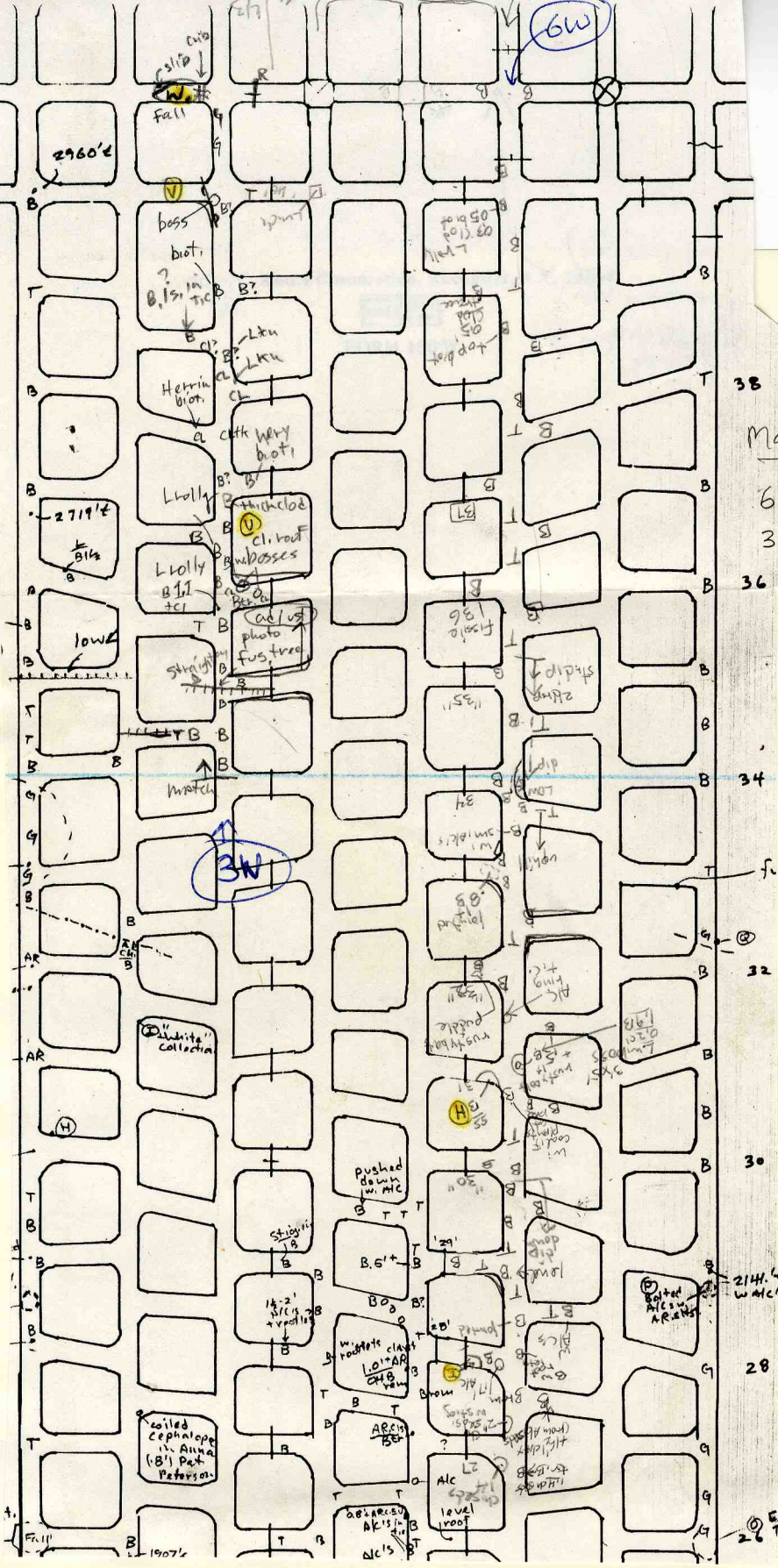
(start day 2, Chuck Heiple as guide)

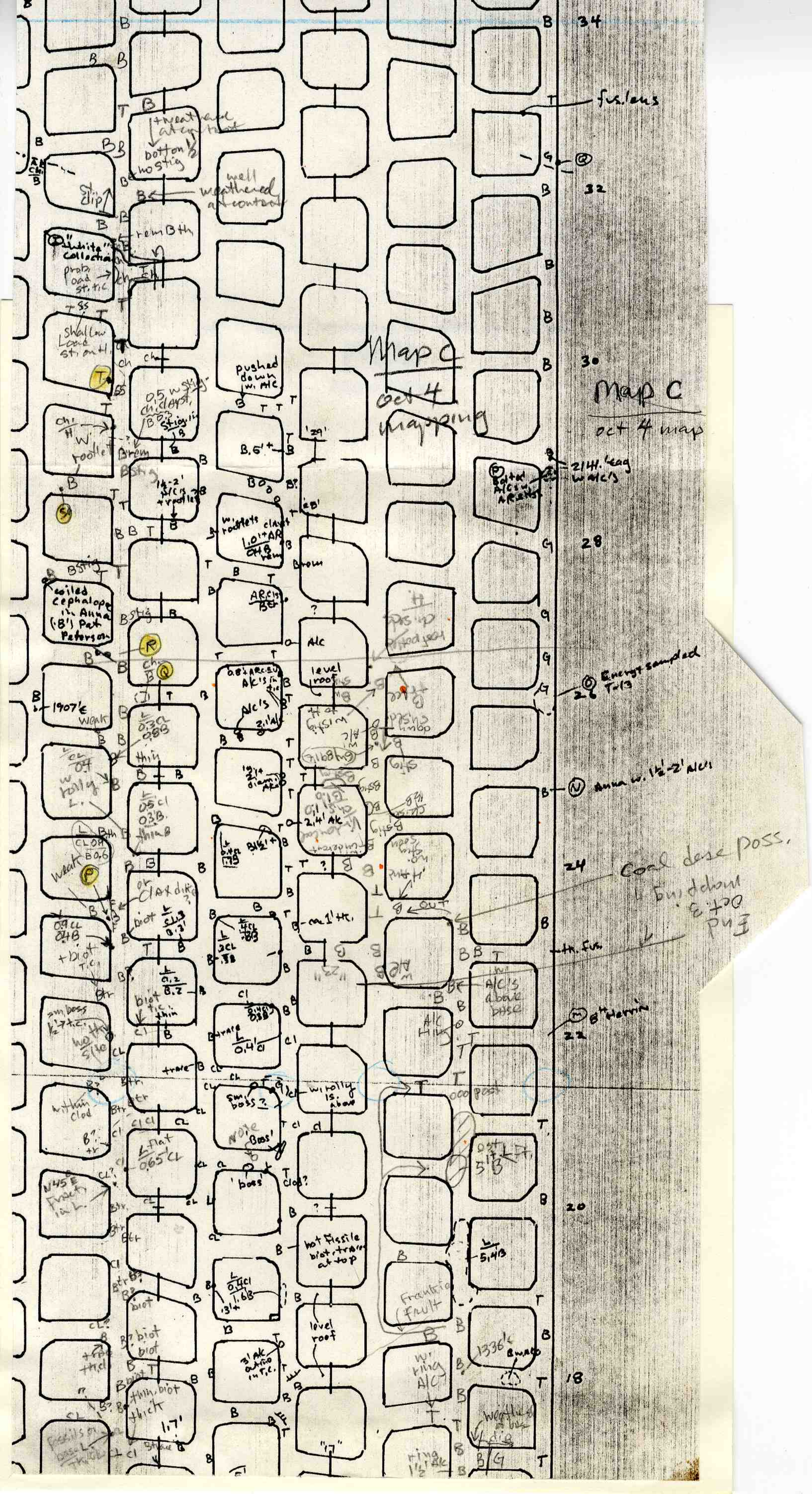
J. (See Map D, 7th West) Thick coal desc: site 5.73' coal above blueband--can dig out to get full thickness (over 8'). Five partings are sampleable--usual four plus C.4.

K. Very thick Anna (6' in 8W) with 1 1/2'-2' A/C's; the bottoms of the concretions are up 0.4' to 0.6' and shale jointing is continuous under them. Thus the presence of concretions is not obvious from below, except for a slight bowing of the base of the Anna shale. These concretions have typical pyritic radial rims and some are kidney-shaped or ovate.

L. Moderately thick Anna Shale (judging from 8W exposures) over fairly thick Herrin (5.48' above B.B.); could be dug out.

M. Slip in top coal--on the east it looks like a clay dike but the slip is probably secondary. Related feature is local carbonaceous claystone band down 0.15'-0.2' with no obvious fossils. Parting(?) runs 30 feet on pillar going west and occasionally compactional


6W
3W
2960'±
2719'±
low
fall
boss biot.
Hetrin biot.
Lholly
Lholly
Lholly
Lholly
thinclod
cli. out
bosses
adjust
photo
fus. trend
straight
match
"whitish" Collection
pushed down w. Alc
B. 6'+
coiled Cephalopod in Anna (8') Pat Peterson
Alc
level root
Bolted Arcs w. Ark's
38
36
34
32
30
28
26
Map B
6W - Oct. 3
3W - Oct 4


Map C
oct 4 mapping
Map C
oct 4 map
34
32
30
28
24
22
20
18
coiled cephalopod in Anna ('B') Pat Peterson
pushed down w. A/C
level roof
Energy sampled
Anna w. 1½-2' A/C's
Coal dese poss.
A/C's above base
hot fissile biot. + trace at top
level roof
weak
thin
'29'
'22'
1336'
1907'

fault displaces it; parting deserves further investigation.

N. Pictures of Anna pinchout in wide crosscut shot by Wayne Frankie.

O. Claystone in top coal below trace of Anna shale. Some fossils in claystone but it is badly weathered; due to bioturbation(?) or like M.?

P. (See map c, 3rd west) Very thick "clod" over Anna shale, bioturbated. Clod here is a weak, faintly bedded shale with lots of fossils (esp. gastropods), bioturbation traces, plus scattered small concretions. Desc.:

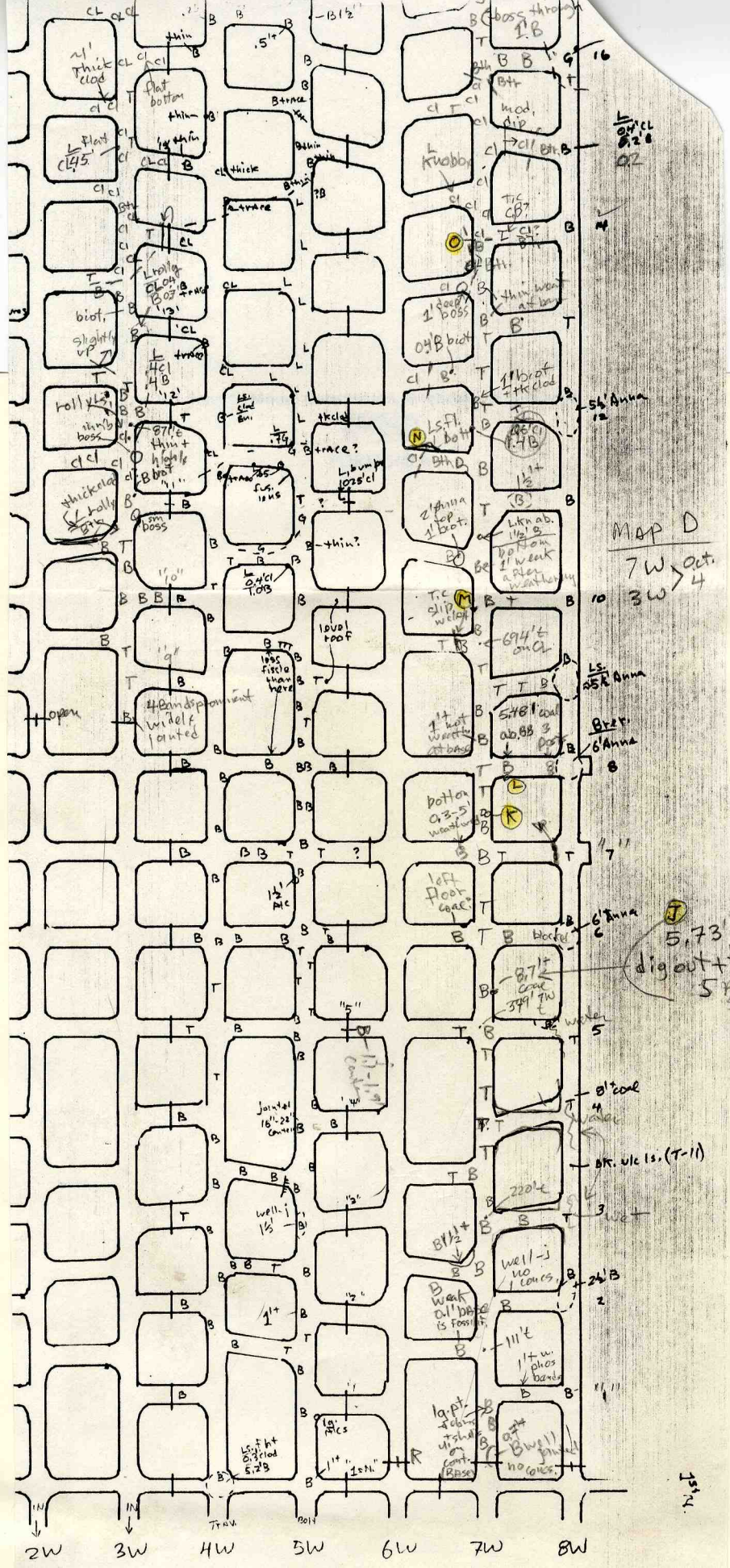
Ls., gradational contact to:
0.9' "clod"
0.6' Anna shale with phos. bands and blebs

Q. Weathered exposure of channel seds. on Anna. Bolt plate popped by weathering; ss. lens exposed runs roughly N-S. Desc.:

0.2'+ → impure siltstone, coarsely micaceous with plant chunks and probable rooting
0.1' sandstone lens, finely micaceous, w. plant fragments
1.1' Anna shale

R. Thin (ave. 1/2 cm) siltstone dike in base of Anna shale at N.40°E., about 8 degrees more north than jointing in Anna. Bolt plates are bent down in area just to west on 3rd.

S. Stigmaria 0.46' wide with 1.3' max. rootlet length (seen) and may be over 1 1/2' (Photographed). Wayne measured one at 0.40' wide with .55' rootlet length. Photographed root here shows rotated rootlets


MAP D
7W > Oct. 4
3W
dig out + Finish
5 plugs,
2W
3W
4W
5W
6W
7W
8W

45° or more from perpendicular or both sides (atypical from my observation and TLP's knowledge). Stigmaria showing rootlets attachments sampled (C2-U-9).

T. Channel sediments on Herrin; thin ss. lies on base of sediments, and there are shallow load or compactional structures down into top coal here and to north. Vertical rooting structure seen near a Calamites compression. Ch. seds. are 1.1' and mostly silty claystone with plant debris; highly rooted at top but no coal seen. If coal were here it probably would have weathered out.

(map B)

U. Bosses directly associated with thick clod--appear to be due to intense bioturbation of Anna--appear quickly over short lateral distance.

V. Nice "boss" with clay dike along one side. Clear clay injection into coal--possible field trip site.

W. Fall: unkn. unit at top
3 1/2' siltstone
1 1/2' Brereton
0.3' clod
0.5' Anna Shale
2.3' Energy Shale

Conclusions on Anna identification and facies

Previous work in mapping indicated that Brereton "clod" roof to thin Anna roof transitions were difficult to map due to post-depositional bioturbation of the Anna. Pragmatically, we had to map recognizable Anna Shale and accept that thin, bioturbated Anna was locally not recognized. However, Wayne and I both developed similar standards of judgement needed to produce a coherent map of the West Mains. We found that the phosphatic banding in the Anna lasted after the shale was lightened in color and the scratch test was unreliable.

We also found that the thin (< 1/2') more fossiliferous facies of the Anna shale found at the base of the unit on occasion in the past apparently only occurs when the Anna is thick (over 3'). Where seen on the West Mains it had lots of partially pyritized shells (only some are fragments) and has valved animals other than Orbiculoidea, including cf. Edmondia. This basal facies does not have much phos. banding and needs more study.

The typical Anna (which is the only facies over majority of the area) is generally fissile at the base and contains fine to blebby phosphate bands throughout; infaunal bioturbation is also common. The other area that seems to be more fossiliferous are areas around Energy Shale lenses. Such areas we saw were very weathered, so this needs to be examined in freshly mined areas.

Samples: Set "U" continued (-9)

U-9 Site S Stigmaria compression showing rootlet attachments with apparent taper of rootlet near attachment. (Cast to stabilize)

Mine Notes - Freeman C.M.C. Crown II
Macoupin County

Trip: October 17, 1989 by Phil DeMaris and Wayne Frankie, escorted by Tom Kell, Mine Manager

Coverage: Completion of W. Mains Mapping
Checks of Anvil Rock channel on 1st & 8th W.
Samples: Set "U" con't (-10 to -13)

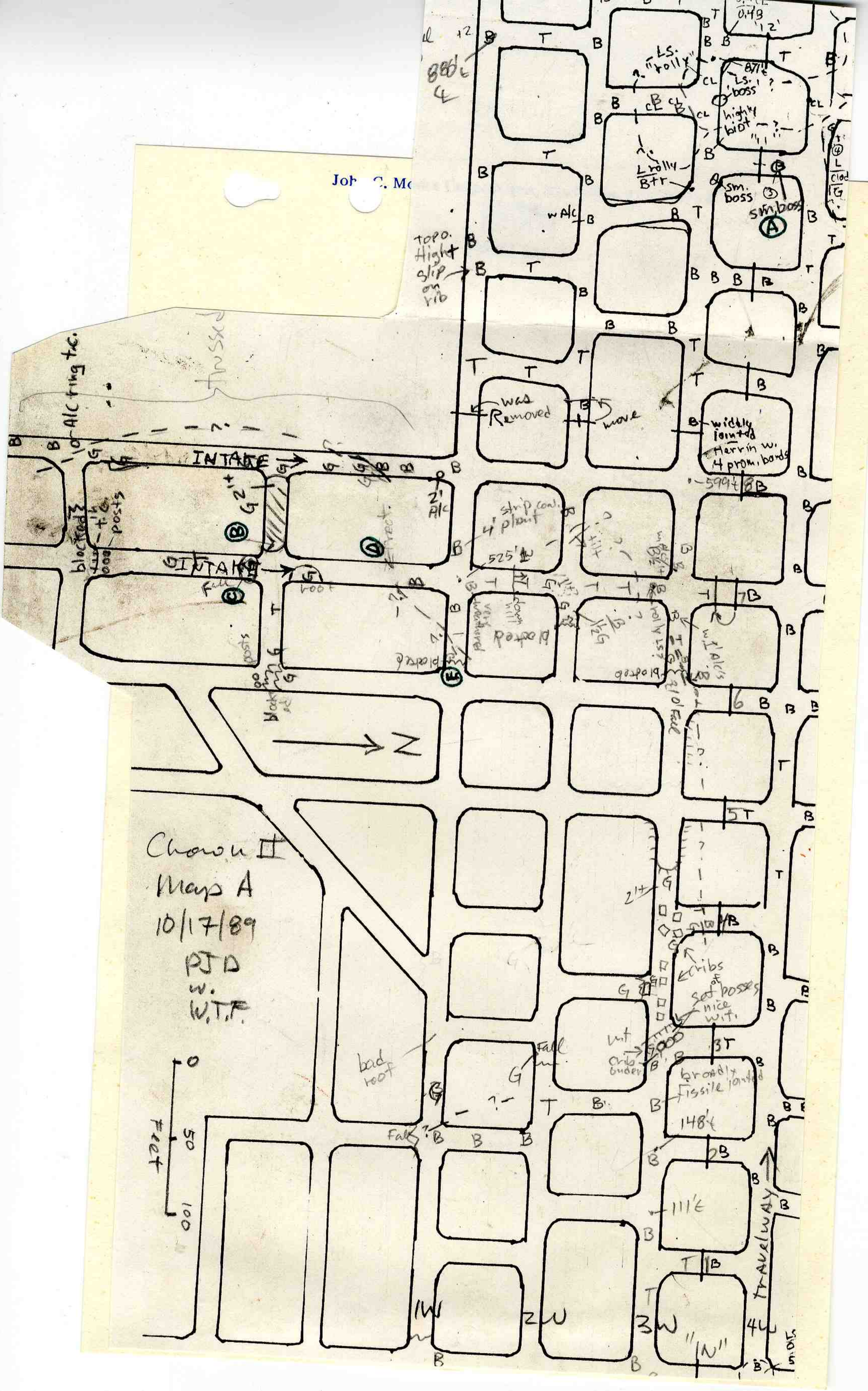
Completion of W. Mains Mapping

Wayne and I have just a little mapping yet to complete the W. Mains off N.M. from 0 c/c to 40 c/c, specifically the first eight crosscuts of 1st, 2nd and 3rd West entries. We thought this would go quickly, but accessibility difficulties slowed us down (Map A).

A. On travelway (4th W.) at 11th c/c door we looked at Frankie's site 3; small "boss" in Anna roof and lots of bioturbation tube traces in roof (photographs taken). The bottom of the "boss" appears to be composed of filled tube traces--no clay injection or clay dikes here, so a soft-sediment deformation mechanism is doubtful.

B. We went south a little off W. Mains to see if we could get E. of the 6th c/c, which has blocking falls. We could not, but did get into Energy roof area. Here we have:

1 1/2' prob. siltstone capping fall
1 1/4' Brer. Ls.
0.3' Clod of Brer.
2 1/2' Anna Shale with 1 1/2' diam. concs.
2 1/2' Energy Shale



Chavon II
Map A
10/17/89
PJD
w.
W.T.F.
INTAKE
INTAKE
Feet
0
50
100
TRAVELWAY
1W
2W
3W
4W
"N"
cribs of sat bosses
nice wit.
broadly jointed
fissile
148'±
111'±
599'±
525'±
widely jointed
Herrin w. 4 prom. bands
was Removed
move
strip coal
4' plant
topo. High + slip on rib
sm. boss
Ls. boss
highly biot
L rolly Btr
Ls. "rolly"
blocked
posts
bad roof
Fall
crib under
blocked

C. Around the corner another smaller fall was described on W. side. Going E. the Anna Shale thins, the Brereton Ls. nodules become sparce and the Energy probably thickens (not clear). Desc.:

Nodular Brereton Ls.
2' Anna Shale with concretions
2' Energy Shale, biot. at top

D. Possible ls. "boss" in rib; slips down to mid-seam seen dipping into pillar. Compatible with roof lithology change in this area. Coalified strip of unkn. plant (lyc.?) on bedding in Anna 4 feet long was seen nearby.

E. Blocking fall (ca. 8' high) at intersection just into Energy Shale roof area:

- tops out in gray siltstone (A.R. Ss. sheet facies) (obscured interval)
? Anna with prob. concretion near base
2 1/4' Energy Shale

Checks of Anvil Rock Channel on 1st and 8th W.

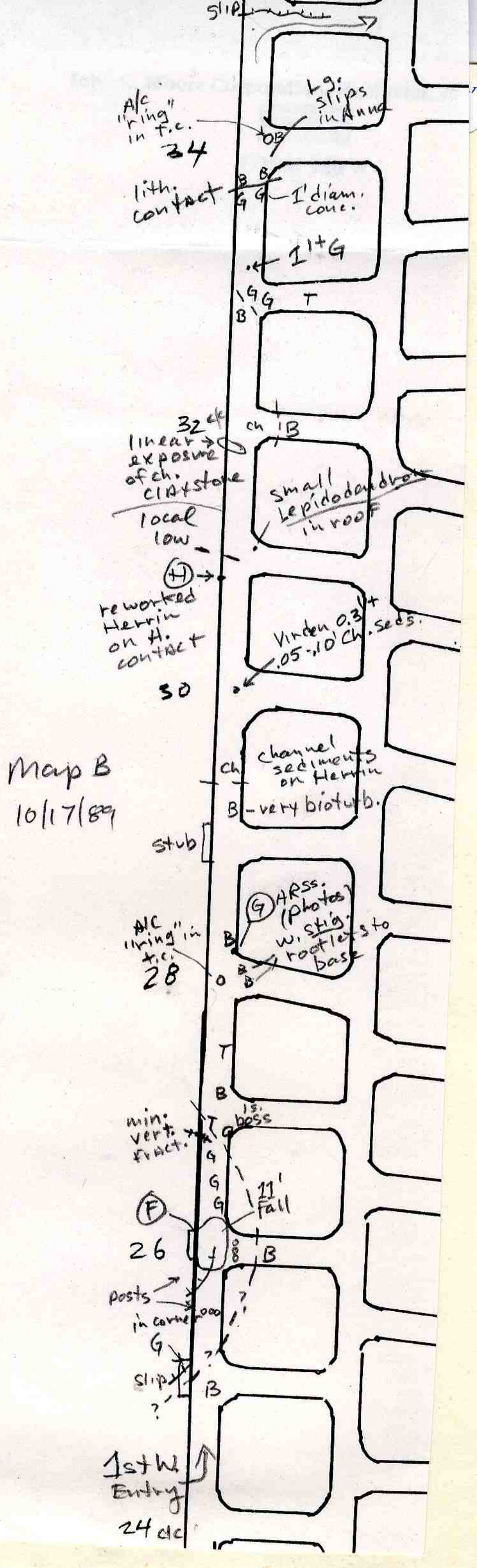
F. Fall on 1st W. (see Map B) near E. edge of channel at edge of Energy lens. Long compactional slip paralleling lithology contact, dipping away from center of lens, is present. Section exposed on W. side of fall:

1' dark claystone
5' lt. gray silty shale to (over) arg. siltstone
1 1/2' Anna, grad. contact to:
2 1/2' Energy Shale

The dark claystone (organic?) is in sharp apparently conformable contact to siltstone (A.R. Ss. sheet facies), and it is pyritic and mottled w.

. 14604

Map B


slip
A/c "ring" in t.c.
34
OB
Lg. slips in Anna
lith. contact
B
G
B
G
1' diam. conc.
1"+G
G
B
G
T
32
ch
B
linear exposure of ch. clAystone
small Lepidodendron in roof
local low
H
reworked Herrin on H. contact
Virden 0.3'+
.05-.10' Ch. seds.
30
Map B
10/17/89
Ch
channel sediments on Herrin
B - very bioturb.
stub
A/C "ring" in t.c.
28
G
ARss. (photos) w. stig. rootlets to base
B
B
B
T
B
ls. boss
min. vert. fract.
T
G
G
G
G
11' fall
F
26
B
posts in corner
G
slip
B
1st W. Entry
24

poss. rootlet impressions - no carbon films seen -U-10). This seems to be a normal sequence over an Energy Shale lens, and I would call the dark, mottled shale at the top "Lawson", except that this contradicts the current usage i.e. "Lawson below Anvil rock Ss." according to HHD. Any progession of this fall to the west might clarify what is happening at channel's edge. Channel siltstone might also be compared geochemically with sheet siltstone to see if they are similar (sample 5' unit at next opportunity).

G. Definite channel exposure (photographed by F.) at c/c 28 in 1 1/2 foot fall:

-tops out at organic-rich flat surface, 0.05' seen (base of Virden Coal?)
0.75' medium gray claystone (channel-fill); rooted, especially at the top
0.15' sandstone with organic debris, partially under-cutting part of Anna shale

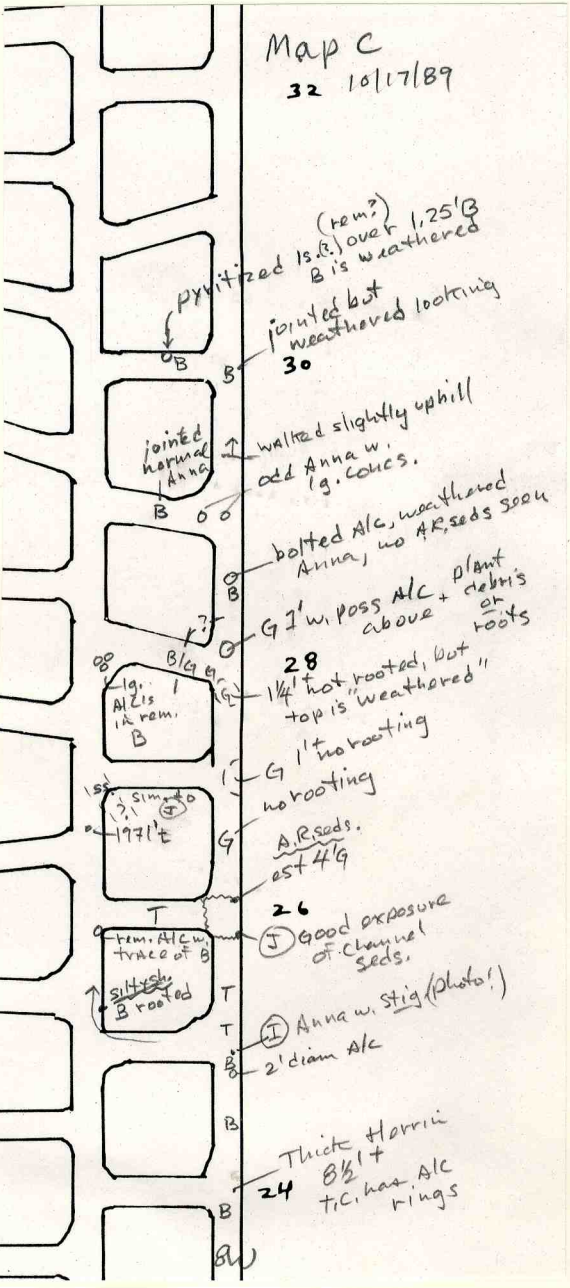
0.60' Anna Shale, under erosional contact
Herrin Coal

Stigmaria rootlets down to base of Anna seen just to the east.

H. Fall at c/c 31 shows channel-fill silty claystone over Herrin; thin deposit of reworked Herrin along contact sampled (-U-11). The channel-fill sediments are seen to thicken to the W. We continued to c/c 35, turned north, and had lunch on the travelway.

I. (See map C) We switched over to the 8th W., coming N. at c/c 42, walking E. to the 24th c/c and working North. Here at 25th c/c we first pick up Stigmaria to the base of the Anna Shale. Anna

Map C



concretions 1 1/2-2' generally, but one still in roof is ovate at 2 1/2' long. (Photos may have been taken here.) This exposure used as eastern edge of channel on this entry.

J. Fall with nice channel sediment exposures. Dese. at N.E. corner:

- light unit capping fall
thin; plant compression or coal?
0.4' carbonaceous claystone
2.2' silty shale w. vert. root traces; heavily rooted at top
0.8' Interlamin. silty shale/thin siltstone with root traces down into sandstone
0.4' widespread micaceous ss./siltstone (10' wide N-S) with interlaminated organic debris (-U-13)
0.8' Micaceous ss./siltst./clayst. in lateral facies w. plant debris
0.2' fine ss. lens over eros. contact (U-12)
1.1' Anna Sh. with 1' diam. conc.
1.8' Energy Shale; some bioturbation below Anna contact
Herrin Coal

No Brereton or poss. nodules seen above Anna; erosion of thin Brereton seems likely (compared with B. which is 525' south). A sandstone (similar to bottom foot here) seen at 7th W at 28th c/c suggests this sand body may be following the Thalweg (see compilation) rather than channel margins. This possible crossover appears to be going from inside of meander to inside of meander, rather than between outside positions as expected in a flood plain setting. Twenty feet west on other side of fall there was an estimated 4' Energy with channel-fill sediments above: lots of siltstone with plant debris in gob.

No channel seds. exposed on 8th to west, but indirect evidence of channel (mostly weathering of Anna) was seen up to 30th c/c, so tentative channel boundary would be placed some place west of 30th c/c on the 8th entry.

Samples: Set "U" con't. (U-10 to -13)

#	Site	Desc.
U-10	F	Med. gray claystone from top of fall above AR ss. sheet facies - "Lawson?". 2 bags for chem. + XRD.
U-11	H	Reworked Herrin atop normal Herrin under Anvil Rock Channel.
U-12	J	Basal A.R. Ss. cutting Anna; impure, massive, but thin.
U-13	J	Upper A.R. Ss. 1' above base of channel; laminated, rooted (chem.)

written 1/18/90

mde:FreeNotes

Mine Notes - Freeman C.M.C. Crown II, Macoupin Co.

Trip: December 1, 1989 by Phil DeMaris with Chuck Heiple, Construction Manager

Coverage: Introduction
2nd W. Submain off N.
2nd E. Main off N.
Samples: Set "U" completed (to -16)

Introduction

Following a short briefing of company personnel on geologic features previously mapped, I made a 3-hour visit underground. This was not enough time to update 2nd E. developments, but I got a good first look at 2nd W. Submain development.

2nd W. Submain off N. (see Map A)

New development to the NW will be done off the 2nd W. Submain. Six entries have been driven west, and belt drives for both North and South submains (6 entries) are under construction. We went to the active faces here which are having roof stability problems to be sure no faults have been hit.

A. South belt overcast (4th S) at c/c 50 (on N. Mains) in new development has been cut high. On N. side Energy Shale roof shows with lots of pectens, and several near vertical, curved slip planes show at base; one has 0.1' throw at top of Herrin. Cut sequence is 4.3' Energy and Anna Shales to gray siltstone (wet) at top. From top they drilled 8' and found no "rock" (limestone).

MOORE'S MODERN METHODS
FORM 180 W

Map A 12/1/89

B. Next crossout south is an overcast. Exposure of roof at SE pillar corner shows:

siltstone - bolted at 1' above base
no Brer. (few nodules locally)
0.8' (est.) Anna Shale
5 1/2' Energy Shale

C. Next c/c west on 5th S. (49th c/c on N. Mains) is a future o/c and has potted out about 3'. Sequence is:

greenish gray siltstone at top; Stigmaria
ca. 0.5' pyritic ls. nodule bed
0.4' clod, mottled
ca. 0.8' Anna, mottled at top
1.8' Energy Shale

A segment of siltstone-filled Stigmaria from base of siltstone was sampled for chemistry (-U-14): this is thought to be sheet facies Anvil Rock Ss., since we are 30 c/c N. of Anvil Rock channel in N. Mains. In-filled tree root suggests terrestrial environment for siltstone. Siltstone in root is micaceous. This surface was exposed and undoubtedly rooted, which explains why the "clod" is also mottled. Just to the W. there is a low- to med.-angle curved slickensided plane in Energy Shale.

D. Next c/c west (6th S.), also future o/c has top coal in intersection and Anna just to the south. Scratch test insufficient to distinguish Energy from Anna in fresh exposures. Six foot TR (tension rebar) bolts in use here--were called point anchor bolts in error previously.

FORM 180 W

E. Face of 5th S. (travelway) shows Energy Shale (very dark) 2' thick with big low-angle slickensides with Anna Shale w. concretion above. Brereton ls. was not seen.

F. Fall on belt entry shows 1 1/2-2' Energy Shale with Anna Shale above. Energy Shale shows multiple low angle slicken sides; its wetness suggests Brereton is not continuous above, but it was not seen. 6' TR bolts used.

G. Fall on 2nd S. shows 3' of Energy and Anna, no limestone or possible pyr. ls. nodules, topped by at least 1' weak greenish gray siltstone (sample -U-15).

H. We walked to north side developments to face of 7th N. (plus 115' roughly) where there is a fall between crosscuts. Fall shows 2' Energy and a minimum of 1/2' Anna. No limestone seen and materials are very wet. I sampled Energy Shale 0.4' to 0.8' up for chemistry (-U-16).

I. At face of 4th N. (belt) at 57 c/c fall shows 2' Energy Shale, 1/2' Anna and Brereton present but of variable thickness, estimated at 1 1/2'. Base of Brer. is brownish (prob. pyritic) and rolly.

J. Next crosscut east shows Energy being cut down (future overcast); coal bottoms are left and they are bolting siltstone. SW corner of intersection shows the following sequence: There is 3' Energy grading to Anna, with thin phosphatic laminae in top 0.4' (Anna). Energy becomes more carbonaceous upward in bottom 1' of Energy: there is a 20° slip through Energy Shale which has 0.25' throw at top of Herrin. One Brereton nodule (0.5' diam.) seen at roof line. Highest roof bolts are

FORM 180 W

Map B 12/1/89

being set at 1' into laminated gray siltstone, which is likely several feet thick.

2nd E. Main off N. Mains

K. (Map B) Followed Belt to future 9th c/c (666') where fall on east side was described. On NE corner, there is 4 feet of Energy and Anna with a gradational contact; estimate that only top 1' is Anna Shale. Brereton is present as continuous nodular band here, but is separate nodules over center of intersection. Fifteen feet to west the Energy Sh. is only 2' thick, but fall tops out within Anna Shale.

L. Mapped back down 3rd East to area previously examined. I took a quick set of coal thickness measures at 3 spots here to see if full seam and top bench thickness varied as expected. The top was thickest under Energy roof, but the top bench under Brereton roof was unexpectedly thick. This entry would be a good place to get a set of measures at crosscut spacings or closer to further clarify variations.

Samples: Set "U" completed (to -16)

-U-14 C Stigmaria root infilled with siltstone; base of (apparently) sheet facies of Anvil rock Ss., for chemistry

-U-15 G Anvil Rock Ss. "sheet facies," random sample for chemistry

-U-16 H Energy Shale 0.4' to 0.8' above base, for chemistry

mde:MINEfree

1 of 8, plus 2 maps

Mine Notes - Freeman Crown II - Macoupin County

Visit — March 21-22, 1990 by Phil DeMaris escorted by Chuck Heiple, Construction Manager

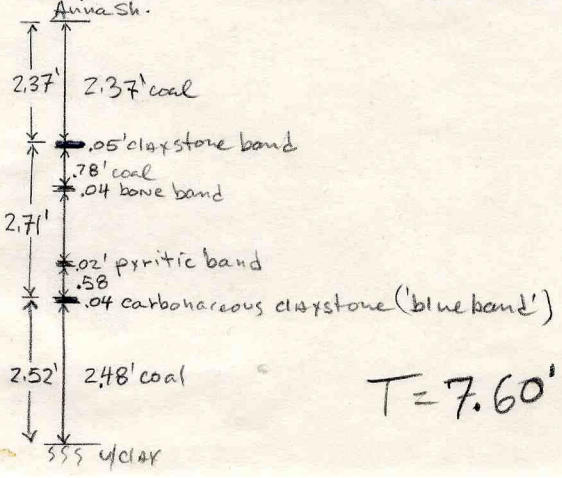
Coverage — Introduction
Mapping in 2nd Main East
Coal desc. from extreme south
Mapping in Bottom Area (Day 2)
Samples: Set "V" begun (V -1 to -5)

Introduction

I had a short initial planning meeting with Dave Webb and Chuck Heiple for the planned field trip. They are prepared for groups (supplying equipment) so I need only inform Webb when we have a firm "go" and number of visitors. A small group can go in one mantrip. Dave indicated work boots would be acceptable--steel-toed boots would not be required for such a short visit.

Mapping in 2nd Main East (See Map A)

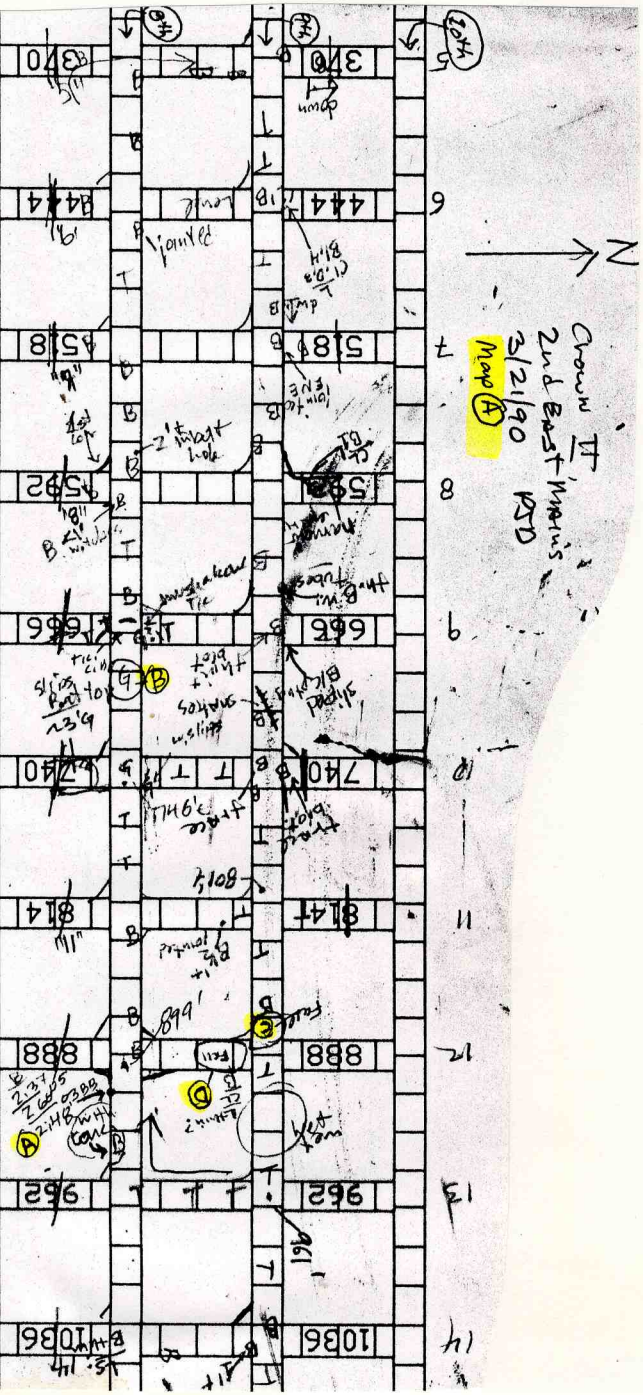
A. We went on to 8th and 9th entries to map between 5th and 14th crossouts before dusting. I did quick coal description here near 12th c/c on 8th E.:



FORM 180 W

Crown II
3/21-2/90

Map A



B. Fall to nodular ls., noted on previous trip:

(top) Brereton, lumpy to nodular, more so to east
0.8' Anna, mottled & weak
2' Energy, a little thinner to west

Base of Brereton is pyritic (golden-toned) on N. side over 0.3' clod suggesting it is thin, but can't tell by bolt type. All bolts rusted since area was mined 2 1/2 month ago. Brereton base is more rolly than nodular on N. side.

C. Fall near 12th c/c on 9th:

(top) Brereton, light colored & slickensided base
0.4' clod, med. gray white-topped with light clay
2.7' Anna, shot full of lt. gray clay lenses (w-t'ed)
- Herrin; top 0.4' (w-t'ed)

Clay in top of Herrin and bottom 0.4' of Anna is brownish gray (weathered pyrite?). On further examination clay may be sideritized. I sampled sideritic(?) brown clay veins in top of Herrin (-V -1) and gray clay just 0.2' above the brown material (-V -2).

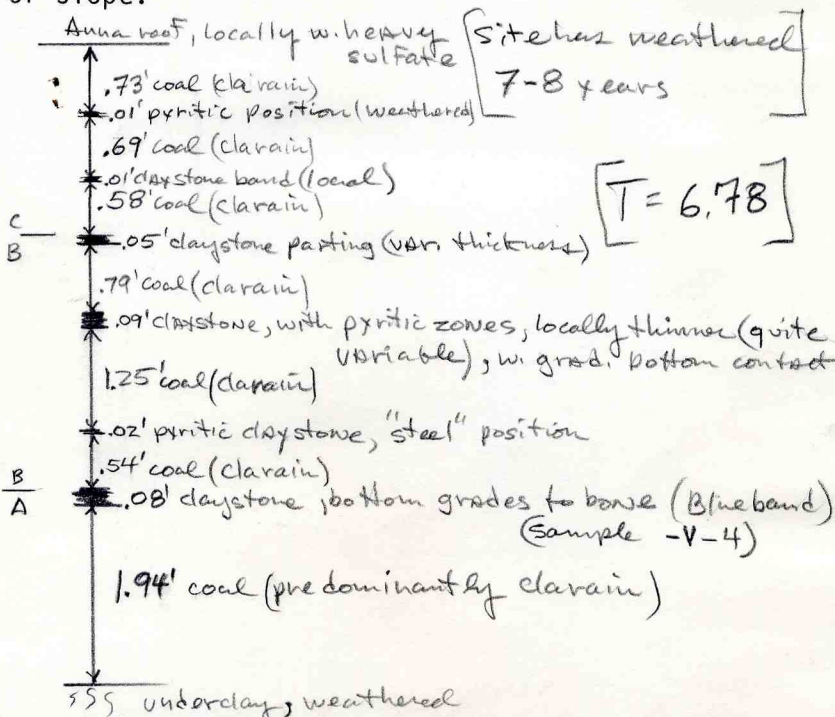
D. Just around the corner into 12th c/c another fall to the Brereton. The Brereton is either in a nodular bed (suggested by golden base) with siltstone above it, or Brereton is benched by horizon of very light gray clay--perhaps the later, since fall has not gone further up.

Coal description from extreme south

The south mains and panels had the reputation of having thinner coal and floor and roof rolls occuring at the

same point. Chuck indicates the coal got to 5 feet locally.

E. We went through the door at 130 c/c from the travelway to the 131 c/c on the 4th S. which has a continuous west rib. I did a quick description at the corner in NE quadrant of the intersection, at 10,365' S. of slope:



This area has weathered at least 7 years. In the crosscut we saw apparent coal loss under Anna roof areas over 4-5' horizontal distance. Anna thickness varied also, and this variation was due to low-angle slips. There is a lot of sulfate at and near the Anna/coal contact, and locally some interbedded clay in top coal, so deformation along low-angle slips appears

to have caused at least part of the coal thickness variation. The base of Brereton rolls broadly in this area, and the coal thickness variation is broadly associated with those highs and lows. White sulfate on base of Anna sampled (-V -3) for XRD. Also collected block with blue band (-V -4) for radiograph.

On the way out we visited the seals under construction at top of 4th N.W.; no notes, no samples.

Mapping in Bottom Area (Day 2)

F. (See map B_1) Examined a very weathered fall:

Brereton; base here, see below
2' Anna, typical, laminated
1 1/2' Anna(?) dark gray with small coaly debris and little lamination
Herrin Coal

It appears that the bottom 1' of the Brereton has failed over much of the center of the fall, but unit appears continuous over fall. Down 0.4' within Herrin is top of a long coal ball which is 0.8'-1.1' thick. Late mineralization is suggested by multiple long vitrain bands within it. A slip over the c.b. has produced some injection of claystone on coal bedding just above the c.b. Previous c.b.'s prob. collected just west of H.

The bottom 1 1/2' here was first identified as Energy, but it is darker and has more fine coaly debris than typical Energy. (Resolution of this site with thick Energy 30' to the N. is needed on next visit.)

G. Fall in crosscut due to weathering of lower facies of Anna. Original bolt plates have all popped off