FIELD NOTES Illinois State Geological Survey

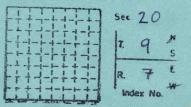
ARCIAR CC BIG Ridge MINE MINDER 1015
MNB Date 3/27/92

Quadrangle.

Arclar Company Big Ridge Mine

SPRINGFIELD

Drift mine in NW4 of SW4



Mine Index 1015
Southie Co.

GAllotin Co. Tek-Bar

Mine Announcement

Coal Jan, 89

New Illinois mine

Tek-Bar Industries is awaiting permit approval by the Illinois Department of Mines and Minerals to begin development of a new \$9 million to \$11 million slope mine just east of Harrisburg in southern IIlinois. According to the company's application on file with the department, Tek-Bar plans to mine the Springfield No. 5 seam, which has a depth of about 120 ft. Construction is scheduled to start in the spring, with completion in early August. The mine eventually will employ about 100 people and produce 500,000 to 600,000 tpy. The mine's reserve is lower in sulfur content than most Illinois coal. A department spokesman said two utilities interested in signing contracts with Tek-Bar requested a total of 15,000 tons of coal for test burns. The mine will be Tek-Bar's second in southern Illinois; it also operates an underground mine in Gallatin County that produces about 600,000 tpy of coal.

p.1 of 4 plus 1 map

ISGS Mine Notes - Arclar "Big Ridge" - Saline Co.

Trip: Dec. 4, 1990 by Heinz Damberger and

Phil DeMaris; Paul Chugh, Mark Phillips and Manoj Mishra of SIU-C, with Emory

Beard and Mark Schiff, Guides.

Coverage: Introduction

Fault at slope bottom Roof conditions on Mains

W. Mains/S. panels

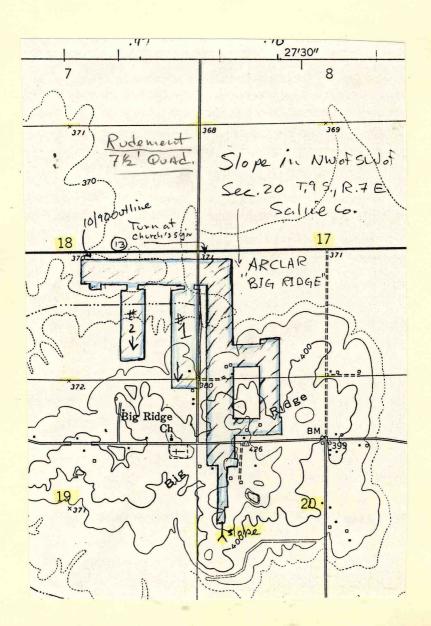
Samples Set A begun (to -4)

Introduction

This is the third trip for the third year of IMSRP-support research on mine ground stability. This is the third mine in the Springfield Coal visited. In addition to our guide we met Bob Hill, Supt. and Mark Blue, Engineer. Surprising's the mine is a year old and will produce in excess of 700,000 tons in 1990. Mine had significant production in 1989, which is not reflected in DMM 1989 production figures. Coal runs around 2% sulfur and customers to date are E.E.I. of Joplin and Vienna Correctional Facility (stoker coal). The slope is 300' long (2½% grade?) and big footings were needed in the strip mine gob that it starts in.

Pillar spacing is 70' x 70' CL on Mains and 50' x 50' CL in panels. Entry widths vary 17-21'. They cut 12-18" of the gray shale roof--this includes rare thin limestone (nodules?) and some coal. Maps show actual measured pillars (Schiff)--sights are done in every belt line c/c and in about half of the rest.

The company ran two mines until the summer of '90 when the Eagle Valley Mine was sold to Larry Findlay of "Green River".



Quick look at roof sequence shows black shale & local ls. at 8'-12' up and a coal consistently about 2' thick up around 53'-60' (Briar Hill?).

Fault at slope bottom

A. A fault zone with roughly 10' net throw was encountered near the bottom of the slope. I-beams stabilize the roof here; area is heavily rock-dusted. The fault zone is about 45' wide; perhaps there are two main plains, with some fracturing in between. The northern-most fault has over 4' of throw and is down to the north. At the arch, floor level is still about 10' above Springfield. Here there is a dark shale about 4' thick which is probably Turner Mine Shale (-A-1) although HHD suggests it is Dykersburg.

Roof conditions on Mains

- B. At 3-4 c/c in we see Dykersburg Shale over $55\frac{1}{2}$ " Springfield. I sampled med. gray shale 0.8' above Springfield (-A-2) Mark's site B. also.
- C. At turn to tempering rooms (E. of mains) we see this is a wet area. Weak "jack rock" mined here is seen at the base to be a zone of networked microfractures of random strike and low dips in the lots of sulfates on multiple slip planes. Reasons for lateral adjustments unclear. In vicinity I found upright tree stump in med. gray shale roof. It is outlined by continuous vitrain "rind", irregular to the outside which is 1.55' x 1.25' at 90° positions. A small turn-back due to plastic deformation is present on one side.

irreg. exterior

exterior vit.

We are near SIU-C study site: there were limestone nodules in the floor at 23" down according to Mark P.

- D. At Test 2 site (2550'N) I examined roof shale. I saw some coalified plant macro debris in bottom 1/2' of roof shale, and pea-sized nodules are also present. Shale is medium gray with brownish cast and contains some irregular micro discontinuities on close examination: Nodules sampled (-A-3) for XRD.
- E. At 43 c/c we saw very flat bedding plane 1.2' up; it shows only hairline E-W jointing except where small post-mining fractures intersect with it, producing some crumbling. Top contact of Springfield Coal is level.

W. Mains/S. panels

- F. 1st Panel South has a fall at 740' on entry 7 over full intersection. 3' bolts are seen pulled out at edge of fall. Fall reaches maximum of 8-10' at center. Some slickensides on mid-angle planes are seen on far side at 4-8' above coal top; they are not linear and appear local in extent.
- G. At 1330' on W. Main we examined highly slickensided material at edge of large fall. Material is a shale with local calcareous areas (tested); secondary calcite found on some but not all slickensided planes. Slickensided black shale sampled (-A-4). Irregular-shaped limestone nodules are in matrix of black shale with overprint of near-horizontal and sub-vertical slickensides. This appears to be same type of material seen at flanks of last fall (Site F.) A N.30°W trend is discussed by some of us.
- H. Mark's underclay site. I looked at roof and coal. Springfield Coal is 4.70' thick and 1.4' Dykersburg is cut here, and contains finger-like mini-concretions.
- I. Fall at 190 between 1 +2 and 3 + 4(?) caused by 2 high angle slips in roof seen to $4\frac{1}{2}$ high, which are somewhat curvilinear and strike N.30°E. Just to north



another slip-defined fall with many curvilinear slips in zone 1-2' up in roof; not related to jointing. I saw Lepidophyloides exposed up 1' in roof, not on a well-defined bedding plane.

J. Examined overcast briefly near same area; 3' Dykersburg cut. Separation planes were found at 8", 10" and 26" up. These planes appear to be developed on bedding planes due to slight lateral adjustment, but are not really slickensided.

As we traveled out of the mine I checked for any sign of compressional "kinks" or "cutters", but none were seen anywhere.

Samples: Set A begun (to -4)

- -A-1 (A) Black shale (Turner Mine?) from nr. slope bottom
- -A-2 (B) Dykersburg from 0.8' above Springfield Coal
- -A-3 (D) Pea-sized nodules from bottom of Dykersburg
- -A-4 (G) Slickensided black shale (Turner Mine?) from fall debris.

MN19





March 24, 1992

Mr. Heinz H. Damberger Secretary-Treasurer IL State Geological Survey 615 E. Peabody Drive Champaign, Illinois 61820

Dear Mr. Damberger:

Here is the write-up on the history of our company:

THE ARCLAR STORY

The Franks family obtained substantial land and coal reserves in 1983 and began development of the Arclar Mine in January of 1984 in the Eagle Valley of Gallatin County, Illinois.

The Arclar Mine produced approximately 400,000 tons per year of high sulfur Illinois No. 5 Seam coal and in 1989 the company was awarded the prestigious "Sentinals of Safety Award", for being the safest underground coal mine in the United States.

At the same time the Arclar Company acquired significant coal reserves of a lower sulfur content to begin development of the Big Ridge Mine. This property is located three miles east of Harrisburg, Illinois. In July of 1990 the Arclar Company sold the Arclar Mine to focus on producing lower sulfur coal at Big Ridge consistent with compliance strategies dictated by the "Clean Air Act".

The Big Ridge Mine Produced approximately 1,100,000 tons of clean coal in 1991 and intends to increase that figure in 1992. The Arclar Company and the Franks family mine coal with excellent production and the utmost emphasis on safety.

If you need any additional information please feel free to contact me at the address listed.

Calvin D. Quertermous General Superintendent

Big Ridge Mine

Sincerely

Coal Week, v. 21, no. 19, May 8, 1995

TVA REASSIGNS HIGH-SULFUR CONTRACT; ARCLAR TAKES OVER SO. ILL. MINING PACT

The Tennessee Valley Authority has approved the assignment of Arclar Co.'s Big Ridge mine in southern Illinois as the successor to Southern Illinois Mining Co. under the utility's T-1 contract for coal supplies into the Colbert station.

The reassignment was the subject of a US Bankruptcy Court order in Lexington KY two weeks ago under which TVA agreed to pay Southern Illinois Mining \$1,250,000 in settlement, but the company had to agree to assign the contract to a party designated by TVA.

A TVA spokesman said the reassignment ends over two years of bankruptcy litigation through which SIM had sought a reassignment as an alternative to the utility's effort to terminate the contract. The termination had been sought because SIM had shipped coal from unauthorized sources, the spokesman said. SIM sought bankruptcy protection one day before the contract termination was to take effect.

"Since that time, TVA resisted efforts by SIM to force TVA to agree to an assumption or reassignment of the contract on terms that were unfavorable to TVA. To close out the dispute and at the same time replace the SIM coal with a contract more favorable, TVA proposed the assignment of the contract to Arclar on terms acceptable to TVA," he said. Additional details regarding the contract and the reassignment terms were not available.

Four years ago (11-18-91 Coal Week), TVA reassigned its 13,500 t/w contract with Addwest Mining to supply Allen steam plant to Addington Resources' Southern Illinois Mining subsidiary, at a time when 2.5 million tons was left on the contract. At that time, Southern Illinois operated an underground mine in Williamson County IL. Subsequently (2-17-92 Coal Week), Addington signed an option agreement to sell SIM to Pittston. Later still (8-31-92 Coal Week) TVA made a spot coal award to Sugar Camp, the successor to SIM.

FORM 180 W

SAMPLE HISTORY

Plant sampled:

Big Ridge

Date: 11/9/92

Company:

Arclar Company

Sample ID: Big Ridge

POB 444, Harrisburg, IL 62946

C32772

Company representative: Dan Bailey, vp 618-252-0490

Emery Beard, Safety Engng

Ron Pickering, Engr (assisted us sample) Joe Pearson, Sales (qualtiy)

Mine (source of sample): Big Ridge

Collected by: RRR & RDH

Seam identification:

Springfield

Time of closure: 4:15pm, 11/9/92

Mining period represented (dates): 11/8/92

Panel(s) & location(s) in mine:
Mine locations (descriptive):
3 mi S of Rt 13, 3 mi E of Harrisburg

Two faces are being mined -386780N, 464000E and 390000N, 466500E

⅓ or footage

section twp rge 30

9S - 7E

Saline Cnty

Type of Preparation Plant:

Mechanical washing jigs

Sampling point:

Belt (describe position in plant)

increments: 17

Train

Truck X

Company's sampling device (yes / no) NO Type:

Other (describe)

Procedures (describe other aspects):

Manually with shovel around and up the stock pile. The front end loader was loading trucks immediately adjacent to where we were sampling.

Visit by W. John Nelson and Colin Treworgy to Arclar Company's Big Ridge Mine Main portal located on Big Ridge, 9S-7E-20, Saline County, Illinois July 1, 1993

Notes on mining operations and geology made by Colin Treworgy based on mine visit and conversations with Emery Beard, Mining Engineer for Arclar Co.

The Big Ridge Coal Mine is mining the Springfield Coal east of Harrisburg. This area is covered by the southeastern edge of the large Dykersburg Shale deposit found in the Harrisburg area. The mine property includes areas within and just outside the area mapped by Hopkins (Circular 419) as having 20 feet or more of Dykersburg Shale. The mine produces a clean coal product with a sulfur content of 1.3 percent. The company believes that their reserves directly north of their portal will have a similar sulfur content (most of this area has more than 20 feet of Dykersburg). Reserves to the east have a higher sulfur content and will not be mined until a market for higher sulfur coal develops.

The coal in the mine averages 54 inches thick and ranges in thickness from about 52 to 56 inches. Except for the regional dip to the north, the coal is generally flat lying with few irregularities. Normal and strike-slip faults of the Cottage Grove Fault System have been encountered in two areas of the mine (see notes by John Nelson). The roof throughout the mine is Dykersburg Shale and is reported to have very

little irregularity in appearance or behavior. The mine has excellent roof conditions. Only about a half-dozen roof falls have occurred in the four years of operation. All of these falls took place several months after the coal had been mined. Slaking of the roof shale can be a problem if precautionary steps are not followed. As has been done in other mines in this area. the air brought into the mine is circulated through a panel specifically developed as a tempering chamber. Also, the lower 6 to 10 inches of roof shale is routinely removed along with the coal. This lower layer of shale is dark grey to black and reportedly slakes badly and falls out around the roof bolts if left in place. I noticed a constant slabbing of roof material in an area of the mine we visited that had been mined 1 to 9 days earlier. However. the rock fragments were generally too small to cause serious harm. In addition to improving roof control, removal of some of the roof makes it easier to move around. When the mine was first started they routinely mined about 1 foot of the underclay to increase the height of entries. The miners soon found that this allowed water to seep into the mine from below and the practice was stopped. Conventional roof bolts (36" to 42") are used in the panel areas. Resin bolts (48") are used in the mains. Steel arches and heavy timbering were used to support the main entries where they pass through the fault zone located near the mine portal.

The southern part of the mine reserve is near the outcrop of the Springfield Coal. Roof problems have been encountered in areas near the crop where thick drift covers relatively thin bedrock (e.g. 50 feet bedrock, 100 feet drift). Though the mine is permitted to mine under as little as 50 feet of bedrock, through experience they have learned that more bedrock is desirable if not necessary. Where the bedrock is too thin the roof is "soft" and water seepage becomes a problem. Flooding of the mine is a potential concern. The main portal is located on a bedrock high on the southern end of the mine property. Most of the reserve block stretches north and west across flat, low-lying cropland that is subject to periodic flooding from the nearby Middle Fork of the Saline River. A major flood in 1937 (before the levees east of Harrisburg were constructed) forced the closure of some of the mines east of Harrisburg.

The mine operates two "super sections" and one regular section. A super section has two continuous miners, two roof bolters, and four shuttle cars. Three shuttle cars work with one miner while the other miner is moving and setting up. These sections produce 1600 to 2200 tons per shift. The regular section (one miner, one roof bolter, and two shuttle cars) produces 600 to 900 tons per shift and is used mainly to develop main entries.

Arclar Co. - Big Ridge Mine

Saline County, Illinois Notes by John Nelson with Colin Treworgy July 1, 1993 (see also notes by Treworgy)

> Dan Bailey, Vice President Emory Beard, Chief Engineer

Underground mine in Springfield Coal. Slope entrance is located 2000' SL, 500' WL, Section 20, T9S, R7E. Northernmost entries have recently encountered the Cottage Grove Fault System.

Another fault of small displacement was encountered near the slope bottom and at the faces of panels west of the slope. These panels are now sealed and inaccessible. The fault trend is about N70°W.

Main fault zone—1st North off 3rd East Located in NW1/4 SW1/4, Section 8, T9S, R7E. We were furnished with a map, but it is not up-to-date.

1) Easternmost place where the fault has been intersected. It is a remarkably clean break. The fault plane strikes N70°W and dips 83°N to vertical. Pronounced horizontal slickenslides are on the fault surface. The Springfield Coal is shattered within a few inches of the fault, and there is a thin layer of clay gouge. North of the fault is hard dark gray, nearly massive siltstone, the bedding of which appears to dip about 10° south. The coal south of the fault dips very gently (1-2°) south and does not show any fracturing

beyond the usual cleat. Details difficult to see because of rock dust.

Next entry to west stubbed into fault, which trends N65°W/90°. Horizontal slickenslides again are present. Toward the west rib the fault bifurcates, and a wedge of coal and underclay (?) is pushed upward into the roof. Again, the rock north of the fault is hard, dark gray siltstone.

Arclar's borehole data indicate that the strata are upthrown north of the fault.

3) Continuing west, the fault is exposed at the corner of an intersection. The roof has fallen out partially, giving a view unobscured by rock dust.

The fault zone is more complex here than before; a zone of highly sheared rock and coal several feet wide. A slice of coal is upthrown in the roof within the fault zone. North of the fault, bedding of laminated dark gray siltstone dips 20-30° SSW, the dip steepening toward the fault zone. No slickensides were found on the main fault, but on a minor parallel fault at the south edge of the zone, the slicks are nearly vertical.

4) Entry stubbed northward into fault. A 10-foot segment of the main fault surface is highly planar: N65°W/84°S, and bears horizontal slickensides. South of this place a narrow wedge of pulverized coal is dragged upward into the roof. Farther south in the roof shale are small fractures, planar and nearly parallel with the main fault. They dip

steeply north and have slicks vertical or nearly so, but negligible displacement.

- 5) Face of Entry 8 (a corner exposure). Exposure fairly clear of rock dust shows good evidence for both strike-slip and normal faulting, the normal displacement being down to the south.
 - Main fault strikes N70°W, dips 83-85° south and has horizontal slicks, but on the east rib thee is an overprint of near-vertical slicks and mullion indicating an episode of dip-slip. Also at the east rib is well-developed drag that implies downthrow of the southern block. Numerous parallel, planar high-angle normal faults are on both sides of the strike-slip fault. They have near-vertical slicks and displacements of a few inches (where observable). Some of these faults dip south, while others dip north.

As before, north of the main fault is dark gray siltstone, which becomes finer-grained and better laminated upward. The bedding dips SSW at 10° or less.

- 6) Heading has barely stubbed into a small normal fault south of the main fault. Trend N70°W/70°SW, throw about 2 feet down to SW, and straie are vertical or nearly so.
- 7) Next crosscut to west, exposure of a larger fault that may be a continuation of the one at Site 6. It is a normal fault with the north side upthrown a little more than the height of the entry; underclay

in the footwall is juxtaposed with coal in the hanging wall. The fault bifurcates in dip direction, isolating a lens-shaped slice of coal. See sketch (next page). The steeply dipping segment of the fault strikes N50°W.

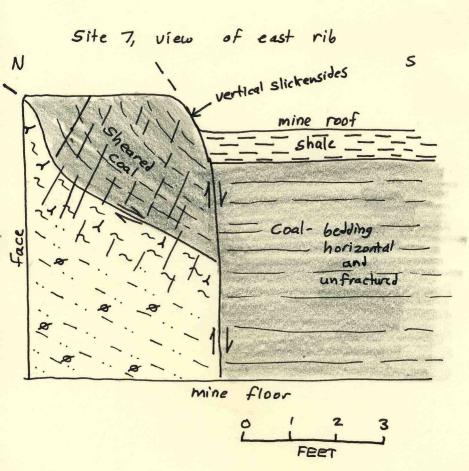
At corner of Entry 10, a normal fault is exposed—probably the same fault as at 6 and 7 but with larger displacement. Trend N65°W/65°SW, very sharp and planar, thin coal and clay gouge, barely any drag, vertical slickensides. Footwall is light greenish-gray siltstone, grading to claystone at top. Estimated

throw 8-10 feet.

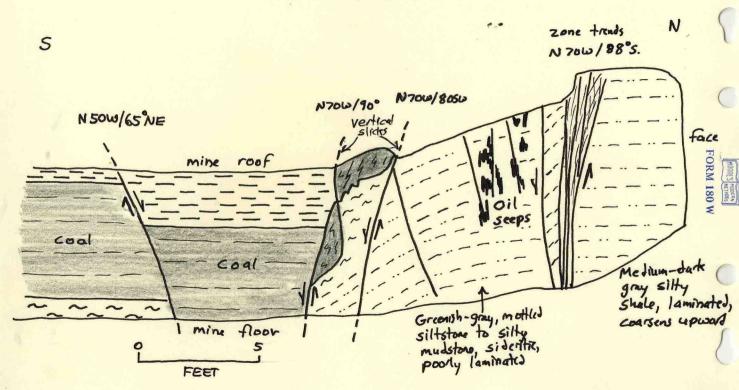
NW.

- 9) Next heading to west stubbed into normal fault, as at Site 8. Vertical slickenslides and a dragged-up slice of coal confirm the displacement being up to the northeast. About 10 feet south of the large normal fault, a small normal fault is present. It strikes N65°W and the throw increases toward the
- 10) North-trending heading has been driven through fault zone, giving the best overall view of both normal and strike-slip faults. (See sketch, next page.)

The fault nearest the face (northernmost) has horizontal mullion and slickensides with faint overprint of vertical slicks. Strong drag in a fault slice along this fault indicates displacement down to the south. All the other faults here are normal faults; slicks indicate pure dip-slip, or nearly so.



Site 10 - view of west rib



Note the oil seeps adjacent to the strike-slip fault. A small amount of gas and occasional drips of water are coming from the large normal fault.

Fault zone at slope bottom

- Southernmost fault about 100 feet north of slope bottom along main haulage road. Trend
 N60°W/65°NE, throw 8-10 feet down to north.
 Horizontal slickensides on fault plane. Coal is horizontal to south shale north of fault also.
 - horizontal to south, shale north of fault also horizontal. Turner Mine shale on north is faulted against top of coal. The gouge zone is only a few inches wide but shale is fractured several feet north of fault.
- 45 feet to north, a normal fault N70°W/55°NE, displaces the Turner Mine shale 4 or 5 feet down to the northeast. There is strong drag in the footwall. No slickensides observed, but this looks like a simple normal fault. View is partly obstructed by arches and cribbing.

North of this point the entry is graded down to regain the coal.

This appears to be the full extent of the fault zone, although some minor faults may be hidden by rock dust, etc. The belt entry was checked, but nothing is visible.

Summary and additional observations

The northern fault zone, in the 1st North, is the northern branch of the master fault of the Cottage Grove Fault System. Borehole data (examined after the mine visit) indicate a net displacement of about 100 feet down to the south.

The fault zone exposed in the mine consists of subparallel normal and strike-slip faults with throw down to the south. The largest fault bears horizontal slickensides, but drag folds are consistent with normal faulting. This fault may have undergone initial dip-slip displacements, followed by strike-slip displacement.

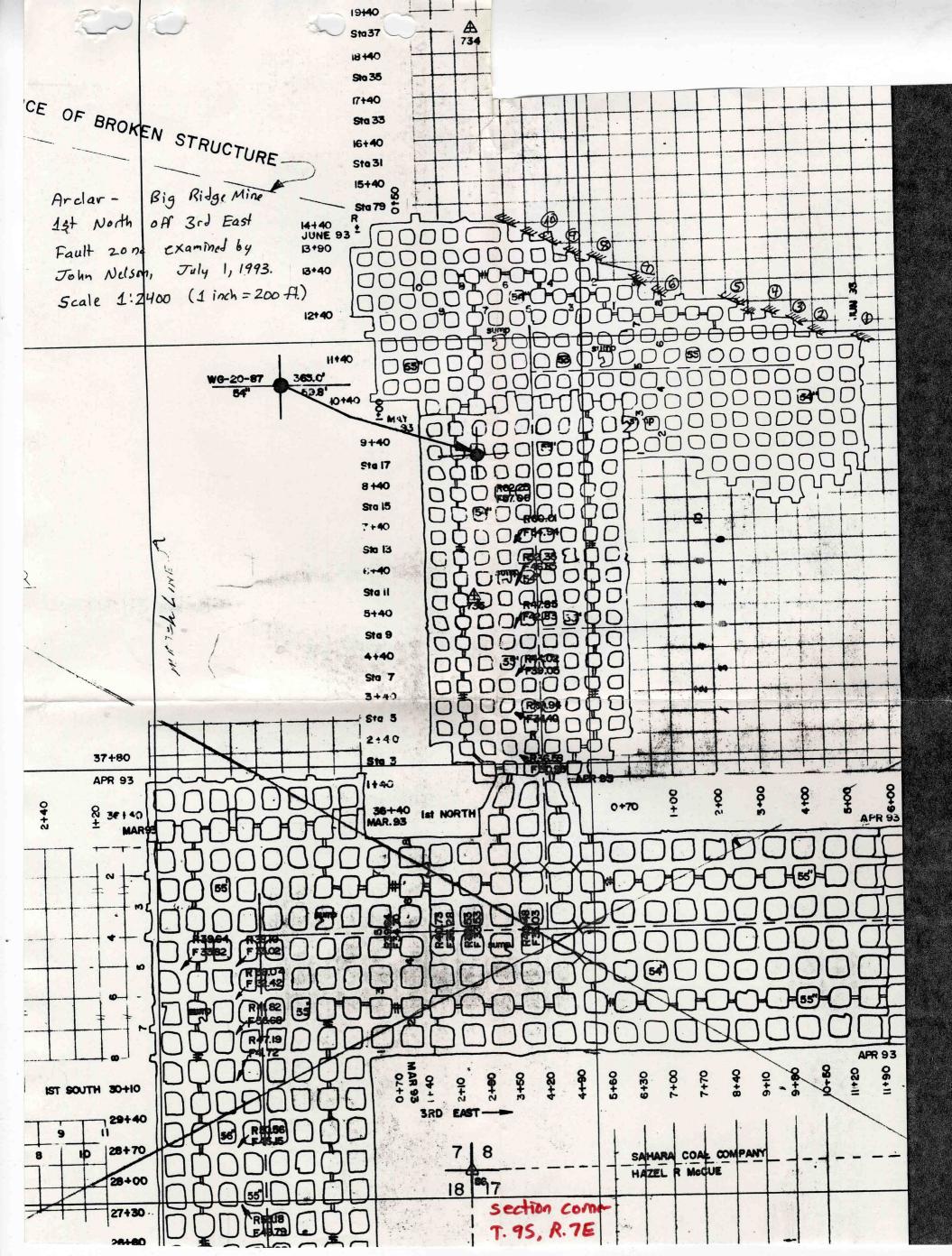
The strata north of the fault was not identified, and we do not know whether the entire fault zone has been crossed, or whether additional faults lie ahead.

The fault zone that crosses the slope bottom is a southern branch of the Cottage Grove master fault, and like the northern branch, it exhibits both normal dip-slip and strike-slip displacement. Thus it closely resembles the parallel northern branch, except that the southern branch has smaller displacement.

Arclar intends to mine across the northern fault, where nearly half of their coal reserves lie. They will not cross at the 1st North, but at some point to the east where (hopefully) the displacement is smaller. The company needs more borehole data to locate the best place to cross the fault. My own mapping suggests that throw decreases eastward in Section 8 and the western part of

Section 9, but in the eastern part of Section 9 the fault zone widens and becomes quite complex.

PAM:WJN\FLDNOTES.93\ARCLAR.165



1 division=3 in.]

ARCLAR SEALS IDLED SOUTHERN ILLINOIS MINE

Arclar Coal Co. in mid-March was in the process of sealing its Big Ridge No. 2 underground mine near Harrisburg, Ill., scene of a Feb. 1 explosion and subsequent fire.

David Whitcomb, assistant district manager at the federal Mine Safety and Health Administration Vincennes, Ind., office, told Coal Age the mine was expected to be sealed by early April. That means, he said, federal mine safety investigators will not know for certain what triggered the explosion in an abandoned shaft that had been sealed off. The mine was evacuated following the blast, although no one was injured.

Whitcomb added the mine fire was "about out."

Initially, the company did not indicate if it intended to reopen the idled mine or not. Water was pumped into the mine for days to reduce dangerously high levels of CO.

Arclar later told government officials it would not reopen Big Ridge No. 2. At the time of the explosion, the mine's reserves were almost depleted, and the company planned to shift production to its new Willow Lake mining complex about four miles east of Big Ridge No. 2.

The Willow Lake complex includes two underground mines and a surface operation.

Arclar officials could not be reached for comment about their decision to seal Big Ridge No. 2. However, the company has steadfastly refused to make any comments publicly since the explosion. CA

COAL AGE / April 2002

Collector.

Mine.

Index No.

Coal: Survey No.