

**Appendix E: Preliminary Geotechnical Assessment**

cc: S. Ross  
M. Pelfry  
S. Gutti

**MEMORANDUM**

**TO:** Keith Dotson  
Division of Planning

**BY:** Bart Asher, P.E., P.L.S.  
Geotechnical Branch Manager

**DATE:** December 17, 2013

**SUBJECT: Breathitt/Owsley County  
KY 30 Planning Study  
From KY 15 in Jackson to KY 11 in Booneville  
MARS # 8807407P  
Preliminary Geotechnical Assessment**

The Division of Planning is conducting a study for options for KY 30 between KY 15 in Jackson to KY 11 in Booneville which is in Breathitt and Owsley Counties. The study investigates a number of spot improvements on the existing route as well as a few areas where the route could be realigned. This abbreviated review will discuss some general geotechnical concerns with the area.

The study area is located in the Eastern Kentucky Coal Field Physiographic Region. The Kentucky Geological Survey web site states that:

*The Eastern Kentucky Coal Field is part of a larger physiographic region called the Cumberland Plateau (which extends from Pennsylvania to Alabama). The interior of the Eastern Kentucky Coal Field is dominated by forested hills and highly dissected by V-shaped valleys. In general, the elevations of the hills are highest in southeastern Kentucky.*

The approximate coordinates for the center of this site are: 37.469713 degrees North and -83.522833 degrees West. The site is located in the Booneville, Cowcreek, Canoe and Jackson Geologic Quadrangles.

Available geologic mapping indicates that the project is underlain by bedrock of the Breathitt and Lee Formations and alluvium deposits. The regional dip of the bedrock is in an easterly direction, although bedrock contours indicate that the bedrock strata is relatively flat. The Breathitt and Lee formations consists of shale, limestone, siltstone, sandstone, coal and clay. The sandstones can be friable and the shales can be highly weatherable. For estimation of right of way for rock cuts in this area it is typical to assume from a 1V:1H to 1.5V:1H for cut slopes. Some mapped faults are indicated a few miles from the project; however these faults are not likely to be a concern.

Numerous mines appear to be located throughout the study area. It appears that strip mining, auger mining and deep mining have taken place in the area. It is also likely that there are numerous locations where small scale "house coal" mining operations have taken place. There are numerous adits shown on the mapping for which no known mine maps exist. The extent of these mines is not known. In some areas mine maps are available for in-depth study of future alignments. We have included numerous mine maps for this vicinity in the appendix.

Additional mines not noted on the attached map will likely be encountered during design and construction. Deep mines encountered during construction likely will contain water. Mitigation of the mining areas may be required. It is likely that areas of uncompacted or loosely compacted mine spoil exist in the area. These areas can be problematic for road construction.

Mapping indicates that the primary seams mined in each quadrangle are:

### **Boonville Quadrangle**

Mined seams – Copland coal bed, Amburgy coal zone, Upper Elkhorn No. 3 coal zone & Jellico coal zone.

Shown on the study map are adits and strip mining in the Jellico coal zone. The identified deep mines in purple are in the Jellico also.

### **Cowcreek Quadrangle**

Mined Seams – Hazard coal zone, Haddix coal zone, Copland coal bed, Fire Clay rider coal bed, Amburgy coal zone, Upper Elkhorn No. 3 coal bed, Jellico coal zone & unnamed coal bed.

Shown on the study map are adits in the Upper Elkhorn No. 3 coal bed and strip mining in the Jellico and Copland.

### **Jackson Quadrangle**

Mined seams – Whitesburg coal bed, Grassy coal bed, Vires coal bed & Vancleve coal bed.

Shown on the study map are adits in the Whitesburg, Grassy and Vires. The identified deep mines are in the Vires (shown in blue) and Grassy (shown in tan).

### **Canoe Quadrangle**

Mined seams – Haddix coal zone, Fire Clay coal bed

There is nothing to identify on the map.

Foundations for bridges in this area would typically be founded on shallow foundations (spread footings on bedrock) or deep foundations (steel H-piles driven to bedrock or drilled shafts socketed into bedrock). Culverts and walls are typically supported on shallow (either yielding or non-yielding) foundations on soil or bedrock. Mined areas can be problematic for structure foundations.

Soil strata in this area tend to be relatively thin. The soils encountered in the area are generally suitable for embankment construction. Generally, embankments built from the native soils and durable bedrock can be constructed to a height of 60 feet with 2H:1V side slopes if the foundation is suitable and proper compaction methods are used. Building embankments with non-durable shales may require special methods to obtain acceptable long term results. Soil cuts over approximately 10 feet often require analyses to design proper side slopes. In no case should

**P-011-2013**  
**Breathitt/Owsley County**  
**KY 30 Planning Study**

soil cuts be steeper than 2H:1V. Suitable rock for embankment construction and rock roadbed is often readily available in this area of the state. Soils in the area are considered erodible.

There are likely numerous potentially unstable Talus areas in the study area. Existing KY 30 has numerous places where railroad rails are in use as a landslide abatement measure (holding up the downhill side of the road). Some of the existing slopes have shown movement in the past and it is likely that many of the existing soil slopes range from marginally stable to unstable.

California Bearing Ratio (CBR) values used in pavement design generally range from 2-4 for soils subgrades in the area and 9-11 for a 2 foot durable rock road bed. Chemical modification of soil subgrades are sometimes used in this area. Wet areas could require undercutting and replacement of soils.

Previously completed Geotechnical Investigations within the vicinity of the study area are:

<u>Report No.</u>	<u>Route</u>	<u>Structure Over</u>	<u>Report Type</u>	<u>Description</u>
L-023-1990	KY-30		Landslide	KY 30, BRIDGE OVER S. FORK KY RIVER AT BOONESVILLE @ MP 11.0-12.0
S-136-2002	KY-28		Roadway	KY 11 & KY 30: From Sta 3+50 to Sta 155+00
S-024-2000	KY-30	Buck Creek	Structure	3 Span @ Station 150+97.5
L-045-1990	KY-30		Structure	RCBC @ Sta. 29+23.68
S-034-2001	KY-30	Shoulderblade Creek	Structure	Double 12' x 6' RCBC over Shoulderblade Creek
S-034-1973	KY-30		Structure	4-span Double Bridge @ Station 1139+82.93
S-011-1979	KY-30	North Fork of Kentucky River	Structure	4-span Bridge on Ramp D @ Station 138+58.37 near ML Station 1150+00.00
R-022-1972	KY-30	Old Route 15	Structure	3-span Bridge @ Station 1153+96.98

The reports are located on the KYTC Geotechnical Branch Database which can be accessed through the KYTC Division of Structural Designs home page (Click on Geotech and Search KYTC Completed Projects).

Site specific Geotechnical investigations are critical in this region for design, particularly in areas where mining is suspected.

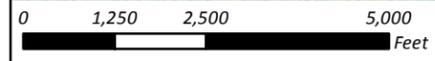
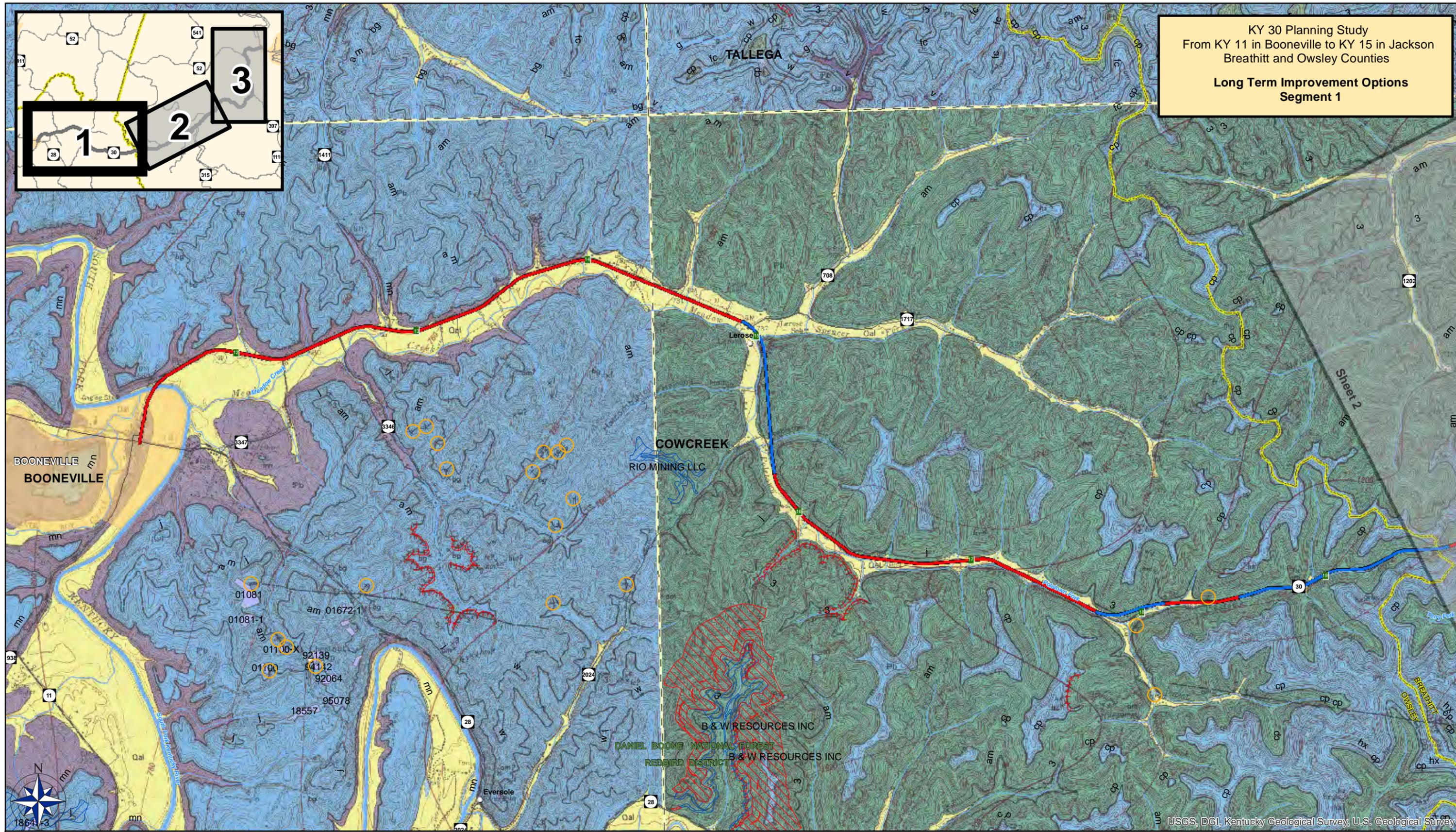
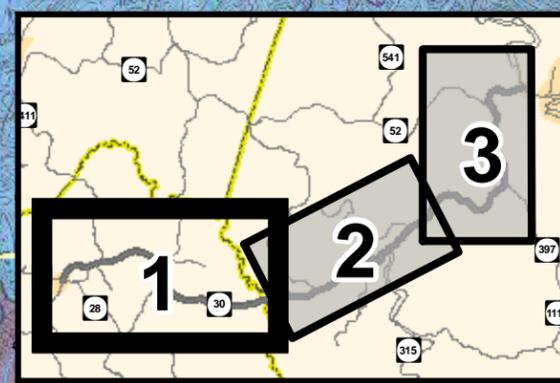
Please feel free to contact this office for additional information.

**Attachments:**  
**Site Map**  
**GQ Site Map**  
**Mine Maps**



KY 30 Planning Study  
 From KY 11 in Booneville to KY 15 in Jackson  
 Breathitt and Owsley Counties

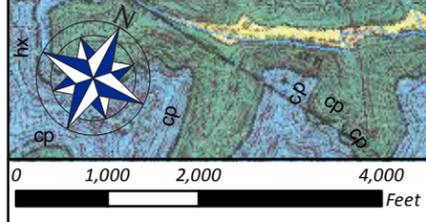
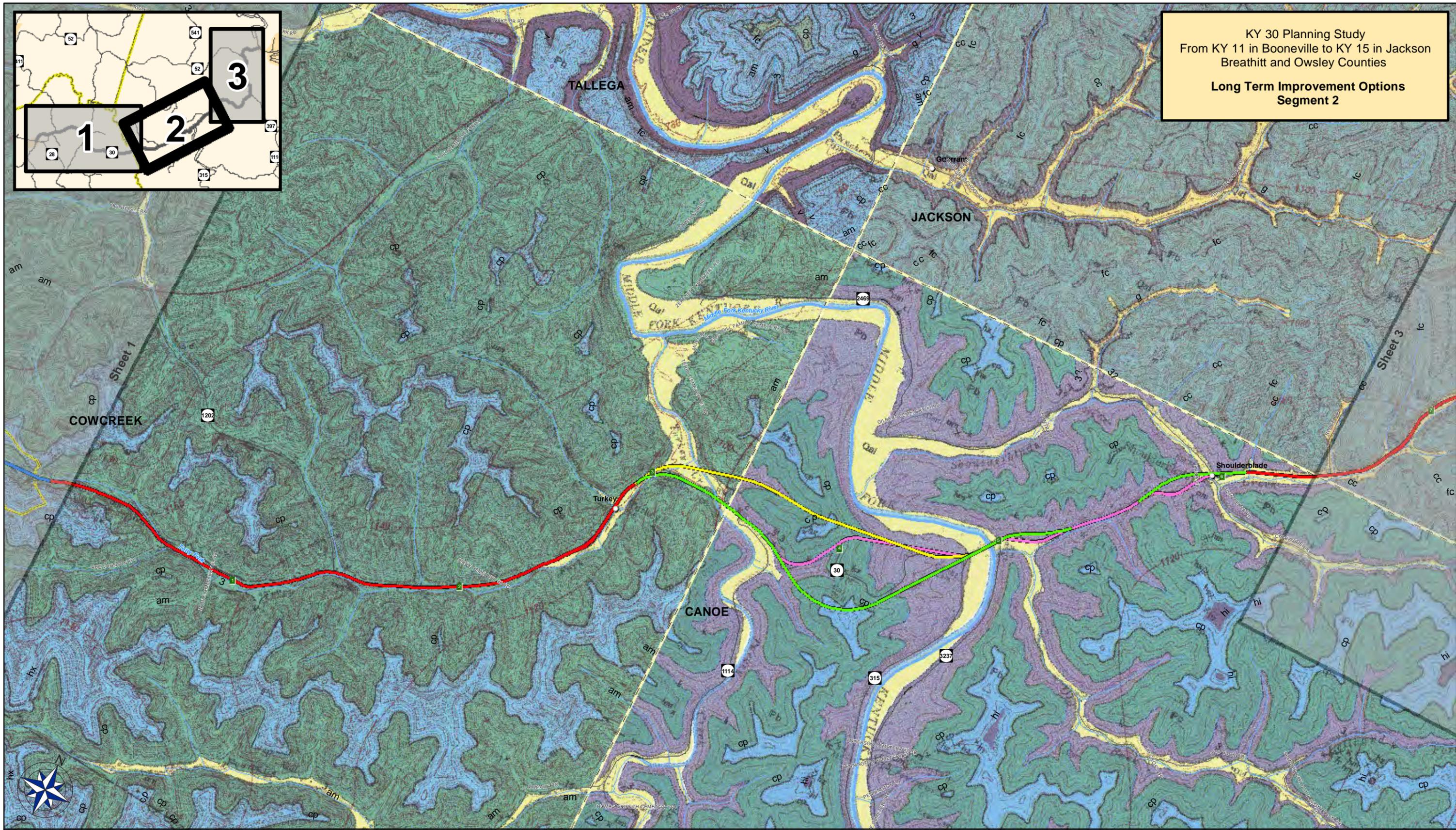
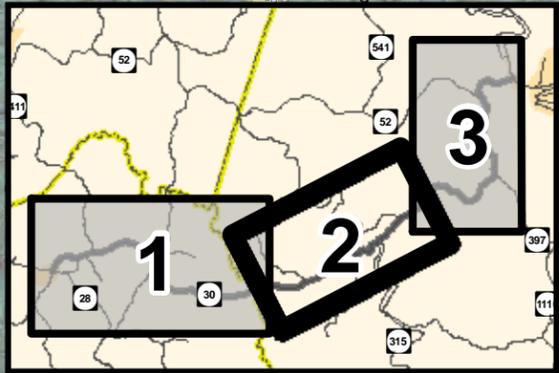
**Long Term Improvement Options  
 Segment 1**



— State Roads	— Local Roads	— Existing	— Widen Existing On Alignment (55 mph)	— Alternate Blue (55 mph)	— Alternate Green (55 mph)	— Alternate Yellow (55 mph)	— Alternate Orange (55 mph)	— Alternate Pink (45 mph)	+++ Contour Strip	Qal Alluvium	— Breathitt Formation	○ Adit Location	Known Mined Out Areas	— Jellico Coal Zone	<b>Active Permitted Mine Boundaries</b>
															<b>Mine Type</b>
															▨ Surface
															▨ Underground incl. Auger

USGS, DGI, Kentucky Geological Survey, U.S. Geological Survey

KY 30 Planning Study  
 From KY 11 in Booneville to KY 15 in Jackson  
 Breathitt and Owsley Counties  
**Long Term Improvement Options  
 Segment 2**

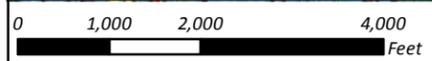
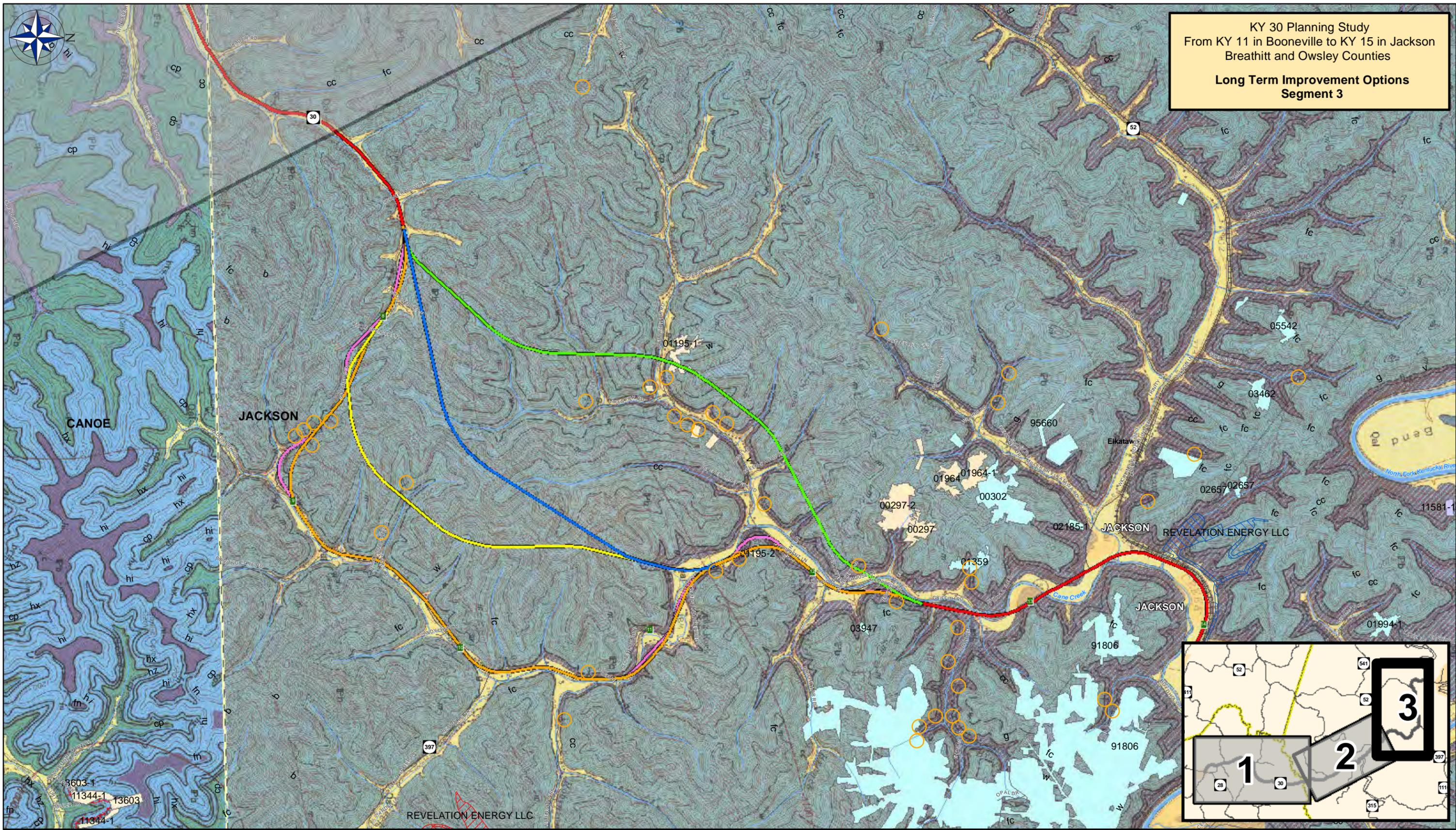


- |               |  |                             |                        |
|---------------|--|-----------------------------|------------------------|
| — State Roads | — Widen Existing On Alignment (55 mph) | — Alternate Yellow (55 mph) | Qal Alluvium           |
| — Local Roads | — Alternate Blue (55 mph)              | — Alternate Orange (55 mph) | Pb Breathitt Formation |
| — Existing    | — Alternate Green (55 mph)             | — Alternate Pink (45 mph)   |                        |



KY 30 Planning Study  
 From KY 11 in Booneville to KY 15 in Jackson  
 Breathitt and Owsley Counties

**Long Term Improvement Options  
 Segment 3**



- |  |                             |                        |                           |
|--|-----------------------------|------------------------|---------------------------|
| — State Roads                          | — Alternate Blue (55 mph)   | — Contour Strip        | Known Mined Out Areas     |
| — Local Roads                          | — Alternate Green (55 mph)  | Qal Alluvium           | Vires Coal Bed            |
| — Existing                             | — Alternate Yellow (55 mph) | Pb Breathitt Formation | Grassy Coal Bed           |
| — Widen Existing On Alignment (55 mph) | — Alternate Orange (55 mph) | Pl Lee Formation       |                           |
|  | — Alternate Pink (45 mph)   | ○ Adit Locations       | <b>Mine Type</b>          |
|  |                             |                        | ▨ Surface                 |
|  |                             |                        | ▨ Underground incl. Auger |



NOTE: Seam = Grassy (Eq. to Upper Elkhorn 2/3)  
Breathitt County - Jackson GQ.



KDMM NAD83 Lat = 37° 32' 42.7"  
APPROXIMATE Lng = 83° 25' 21.6"

SFN  
00297-2

SFN  
00297

Note -  
Property Lines & Outcrop and  
Part of mine workings made by others

MAP OF  
H.C. VIRES COAL CO  
MINE NO 3 NO 4 SEAM  
JACKSON BREATHITT CO KY  
SCALE 1"=100 DATE 12-10-58

State of Kentucky  
County of Knott /SCT  
I, A.G. Perkins, Engineer, certify that  
this map is correct to the best of my  
knowledge and that it complies with the  
the State Laws of the Department of Mines  
and Minerals of the State of Kentucky  
and covers the period ending 12  
10 1958  
witness my signature this the  
29 day of Dec 1958  
A.G. Perkins

State of Kentucky  
County of Knott /SCT  
Subscribed and sworn to before me  
this the 29 day of Dec 1958  
Roy Muller  
Clerk of Knott County Court

00302\_1958M\_19580404

00302

NOTE: Seam = Vires (Eq. to Lower Elkhorn)  
Breathitt County - Jackson GQ.

00302-2\_1958L\_19580404

00302-2

SCANNED



SFN  
00302-2

KDMM NAD83 Lat = 37° 32' 54.8"  
APPROXIMATE Lng = 83° 25' 32.5"

SFN  
00302

State of Kentucky  
County of Knott /SCT  
I, A.G. Perkins, Engineer, certify  
that this map is correct to the best  
of my knowledge and that it complies  
with the State Laws of the Department  
of Mines and Minerals of the State of  
Kentucky, and covers the period ending  
4-4-1958

Witness my signature this the  
1 day of April 1958  
*A.G. Perkins*

State of Kentucky  
County of Knott /SCT  
Subscribed and sworn to before me  
this the 1 day of April 1958  
*Roy Mullins*  
Clerk of Knott County Court

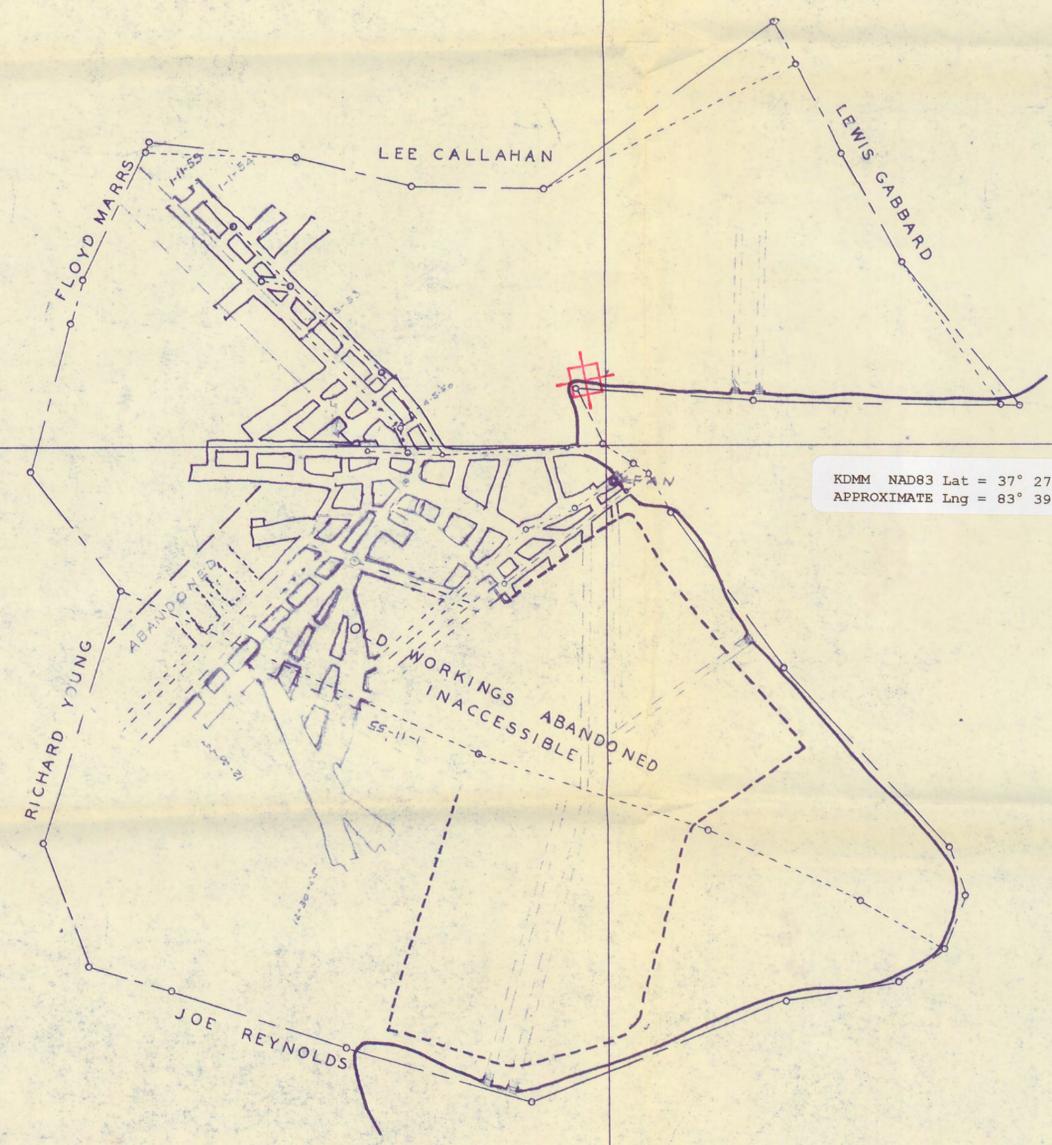
4-4-58  
d.g. Perkins

RECEIVED  
APR 10 1958  
DEPT. OF MINES AND MINERALS  
KENTUCKY

MAP  
WATTS COAL CO NO 5 MINE  
MILLER BRANCH OF CANE CRK.  
ELKATAWA, BREATHITT CO KENTUCKY  
SCALE 1" = 100' Date 4-4-58  
A.G. Perkins Reg. No. 1183 Hazard Ky

01081\_1956L\_19551230

01081



KDMM NAD83 Lat = 37° 27' 51.7"  
APPROXIMATE Lng = 83° 39' 52.4"

MAP  
OF  
JOE REYNOLDS COAL CO

BOONEVILLE, OWSLEY CO. KY.

H. S. ADKINS,  
MINING ENGINEER  
MANCHESTER, KY.

SCALE 1"=100'

APRIL 8, 1950

NOTE: Coal Seam = Jellico

EXTENDED - 1-1-54  
" 1-11-55  
" 12-30-55

I, the undersigned, hereby certify that this map is correct, shows to the best of my knowledge and belief all the information required by the mining laws of this state, and covers the period ending Dec 30 1955  
Adkins Engineer.

Acknowledged before me a Notary Public this 6th day of January 1956

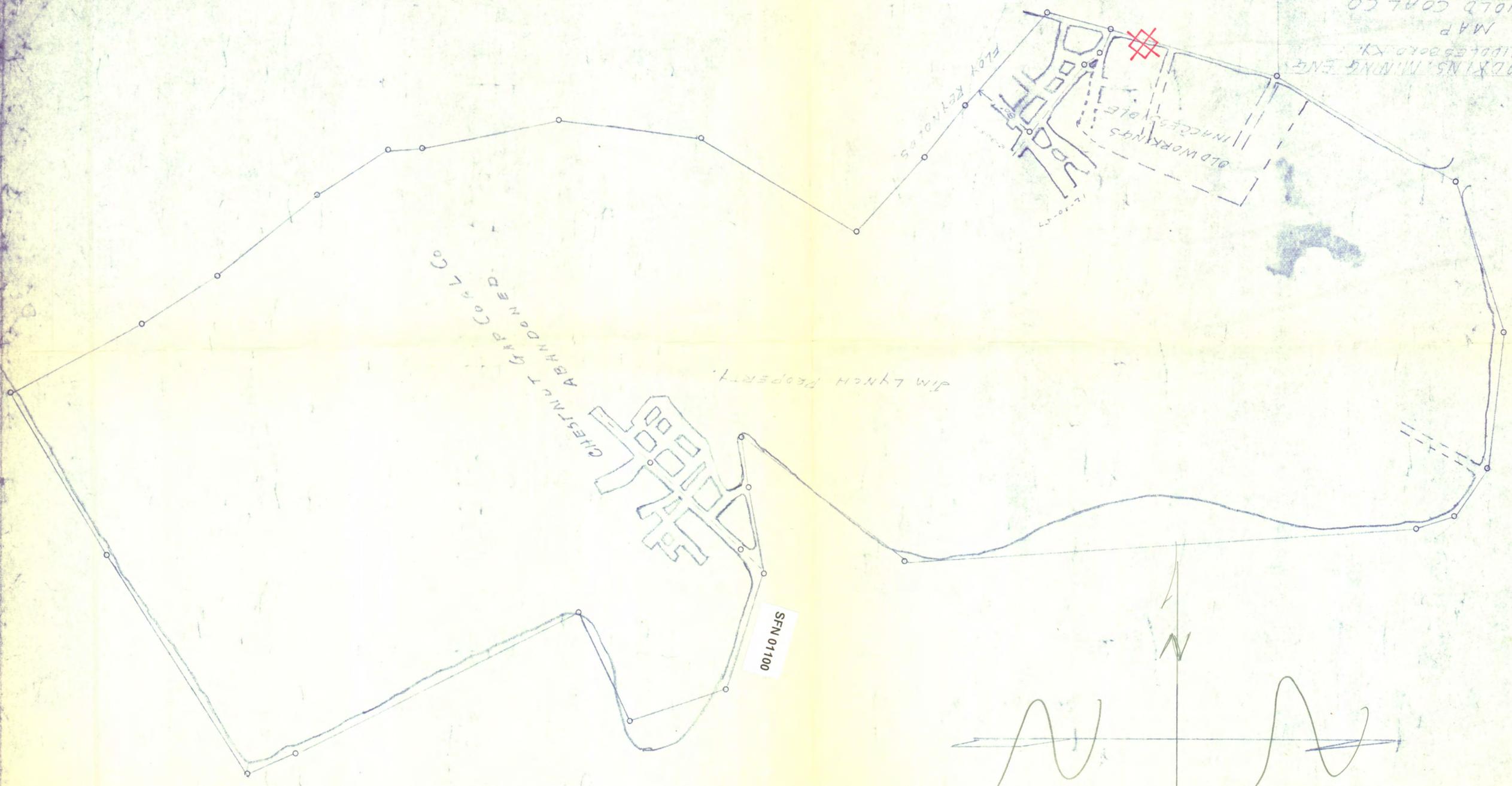
Martha C. Adams  
Notary Public  
Ky.  
My Com. exp. Apr. 7, 1958



H.S. ADAMS, MINING ENG.  
MIDDLEBORO, KY.  
MAP  
ARNOLD COAL CO.  
PEB WORTH, KY.  
LOCATED - CHESTNUT BRADSHAW CO.  
SCALE 1" = 100'  
DECS 19-7

KDMM NAD83 Lat = 37° 27' 34.8"  
APPROXIMATE Lng = 83° 39' 41.3"  
NOTE: Coal Seam = Jellico  
Owsley County - Booneville Quad

SFN 01100-X



SFN 01100

01100-X

01100-X\_1958L\_1957I231

I, the undersigned, hereby certify that this map is correct,  
shows to the best of my knowledge and belief all the infor-  
mation required by the mining laws of this state, and covers  
the period ending Apr 31-1957  
I, McHenry Fisher,  
acknowledged before me, a Notary Public,  
this 10th day of February, 1958.  
John St. Justice  
Beal Co. Eng.  
My Comm. exp. March 15, 1958

01195-1\_1955L\_19550311

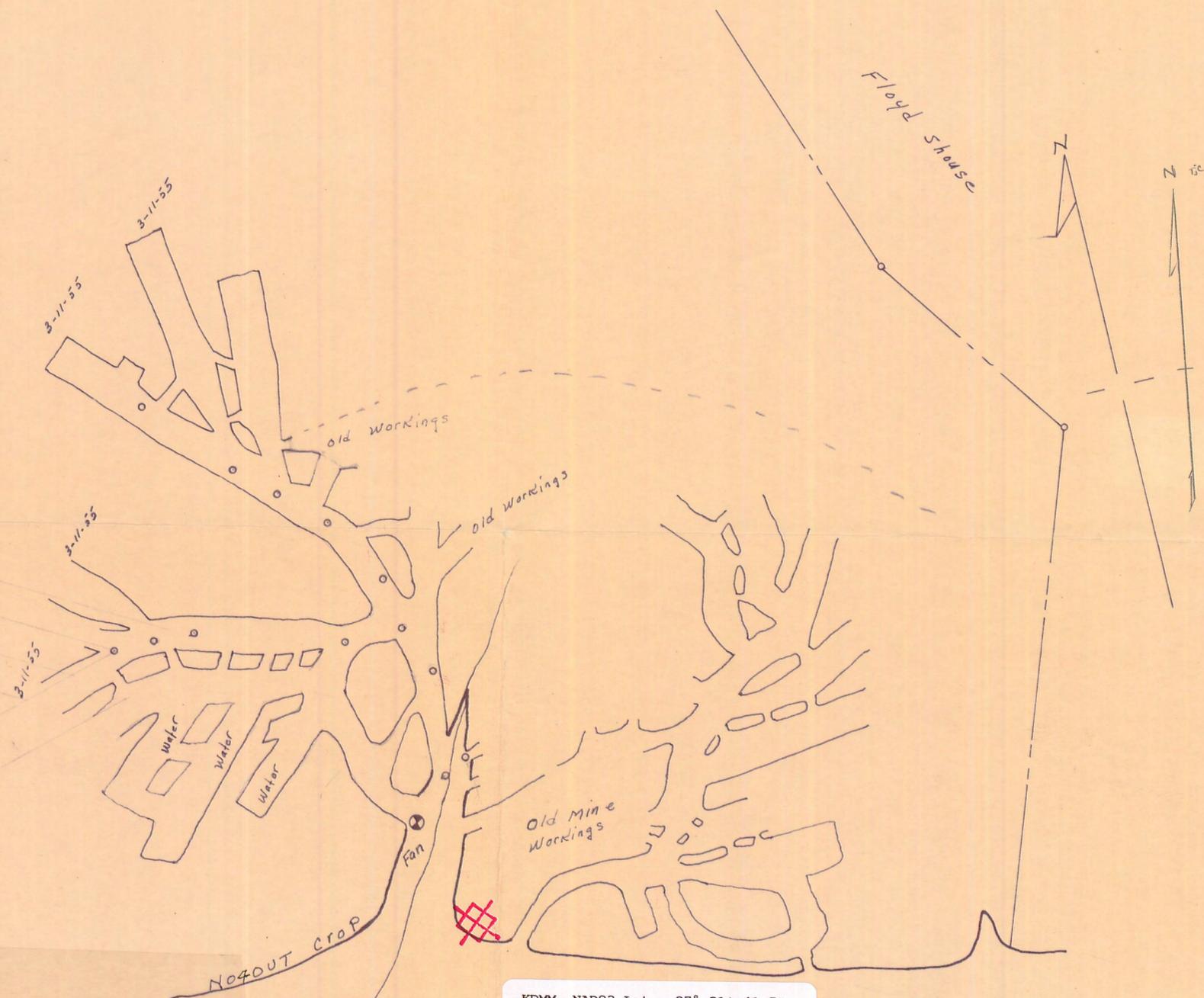
01195-1

NOTE: Seam = Grassy (Eq. to Upper Elkhorn 2/3)  
Breathitt County - Jackson GQ.

NOTE: Used Legend Date of 03-11-1955  
-Also shows as most recent works date

Granville Little

Granville Little



KDMM NAD83 Lat = 37° 31' 41.5"  
APPROXIMATE Lng = 83° 26' 06.7"

- Note -  
Property Lines out. crop  
And Part of mine workings  
made by others

MINE MAP OF  
GRANVILLE LITTLE MINE  
JACKSON, BREATHITT, CO. KY.  
SCALE 1" = 100 FT. DATE 3-11-55

"I, the undersigned, hereby certify that this map is correct, shows to the best of my knowledge and belief all the information required by the mining laws of this state, and covers the period ending December 31st 1954

Ralph Beathett, Engineer.

"Acknowledged before me, a NOTARY PUBLIC  
this 19th day of March 1955."

My Comm. Expires 10/18/54  
Seal

RECEIVED  
MAR 22 REC'D

DEPT. OF MINES AND MINERALS  
LEXINGTON, KENTUCKY

8155

1195.1

01195-2\_1960L\_19600317

01195-2

NOTE: Seam = Grassy (Eq. to Upper Elkhorn 2/3)  
Breathitt County - Jackson GQ.

I, the undersigned, hereby certify  
that this map is correct and shows to  
the best of knowledge and belief all  
the information required by the Mining  
Laws of this State, and covers the  
period ending 3-17-60

*H.G. Perkins*

Engineer

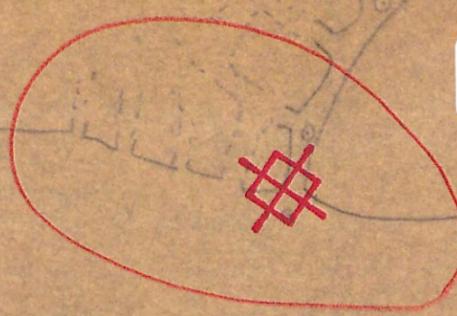
Subscribed and sworn to before me  
this the day of Feb 27 1960

*R. J. Muller*

Clerk of Knott County Court

Granville Little  
Mineral

old works  
revisited



KDMM NAD83 Lat = 37° 31' 58.4"  
APPROXIMATE Lng = 83° 25' 10.5"

File No  
1195.2

Raymond Spencer Coal Co. No 1  
Jackson Ky  
Located on Cain Creek  
Scale 1" = 100  
Date 3-17-60  
H.G. Perkins Reg. No 1183  
Hindman Ky

I, the undersigned, hereby certify that this map is correct, shows to the best of my knowledge and belief all the information required by the Mining Law of this state, and covers the period ending December 31 1954

Ralph Bartlett Engineer.

"Acknowledged before me, a Notary Public  
this 9th day of February 1955

W.H. Roll  
My Comm. Expires 10/18/58

KRS 352.470."

Yours very truly,

W.H. Roll

W. H. ROLL, Reg. No. 599  
Executive Assistant  
Chief, Department of Mines and Minerals  
Commonwealth of Kentucky

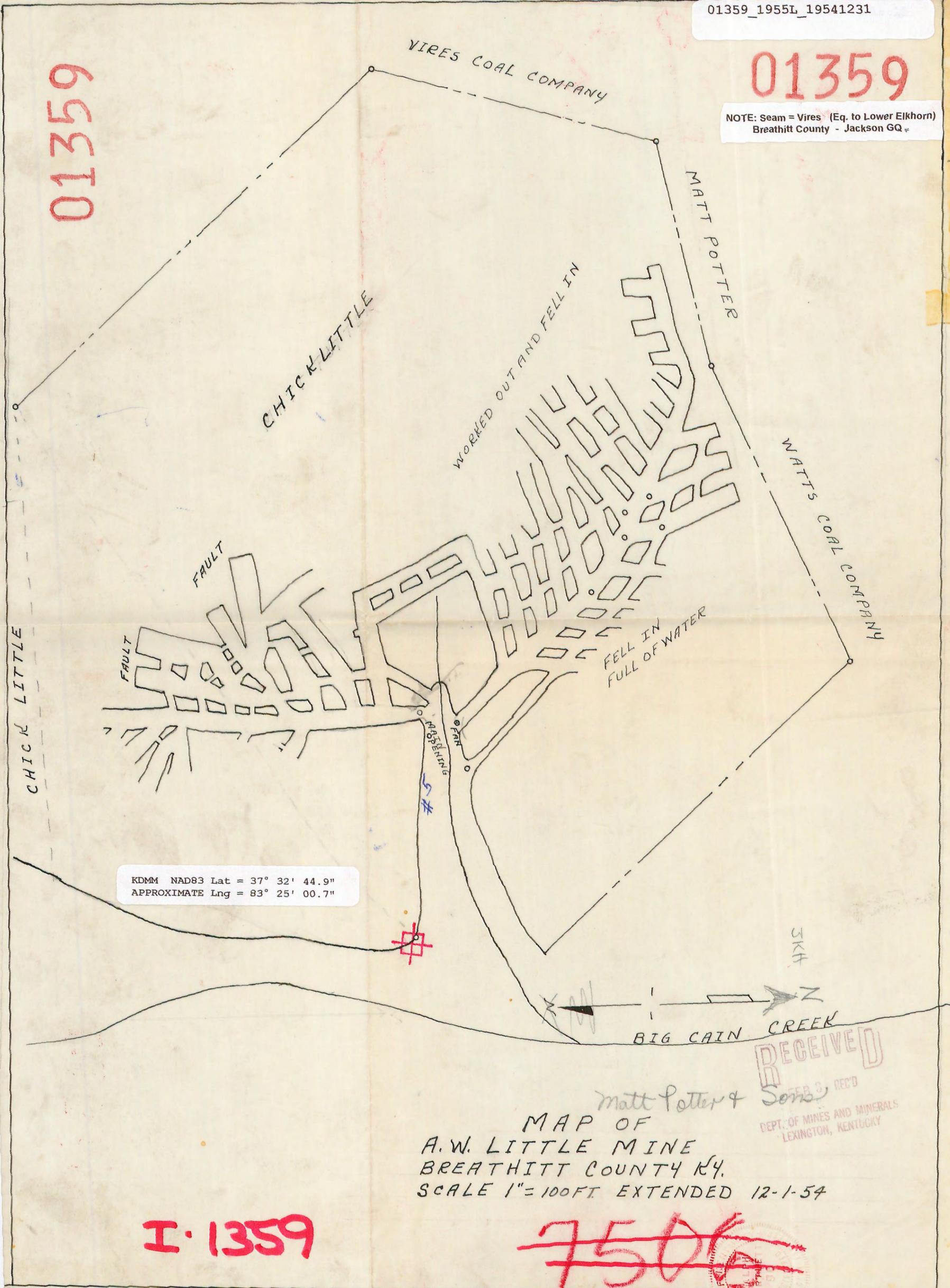
WHR:md

RECEIVED  
FEB 11 REC'D  
DEPT. OF MINES AND MINERALS  
LEXINGTON, KENTUCKY

01359\_1955L\_19541231

01359

NOTE: Seam = Vires (Eq. to Lower Elkhorn)  
Breathitt County - Jackson GQ.



KDMM NAD83 Lat = 37° 32' 44.9"  
APPROXIMATE Lng = 83° 25' 00.7"

Matt Potter & Sons  
MAP OF  
A.W. LITTLE MINE  
BREATHITT COUNTY KY.  
SCALE 1"=100FT EXTENDED 12-1-54

RECEIVED  
FEB 3 REC'D  
DEPT. OF MINES AND MINERALS  
LEXINGTON, KENTUCKY

01359

I. 1359

~~7506~~

01378\_1953L\_19521231

01378

"I, the undersigned, hereby certify that this map is correct, shows to the best of my knowledge and belief all the information required by the mining laws of this state, and covers the period ending

Dec. 31, 1952

*Willy Brewer*, Engineer

"Acknowledged before me, a Notary Public

, this 28

day of Jan 1953

*William Terry*

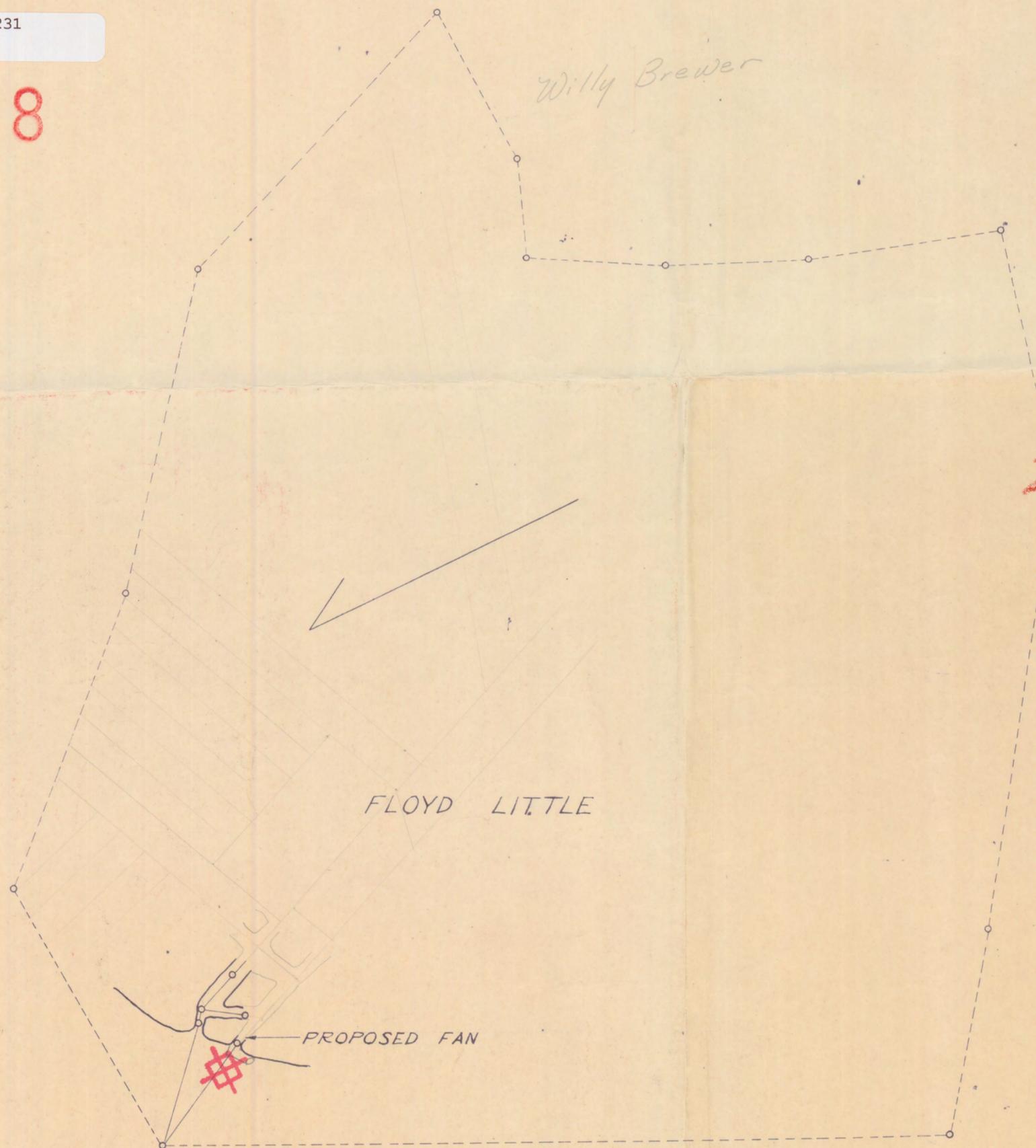
My Commission Expires January 8, 1957

SEAL

*John Couch*

*Willy Brewer*

*Richard Spencer*  
**#4976**



FLOYD LITTLE

PROPOSED FAN

Belcher Fork  
Creek & Road

0.75 Miles to Ky. #30 4.0 miles West of Jackson, Ky.

KDMM NAD83 Lat = 37° 31' 51.6"  
APPROXIMATE Lng = 83° 25' 43.3"

NOTE: Coal Seam = Grassy  
Breathitt County - Jackson Quad TAS

MINE MAP  
THE FLOYD LITTLE MINE  
BREATHITT COUNTY, KY.  
DEC. 22, 1952 SCALE 1"=100'

**#4976**

DEPT. OF MINES & METALS  
FEB 10 1953  
BREATHITT COUNTY, KY.

01672\_1957M\_19530129

01672

01672-1\_1957L\_19570102

01672-1

SFN 01672-1

KDMM NAD83 Lat = 37° 27' 45.0"  
APPROXIMATE Lng = 83° 39' 16.1"



SFN 01672



NOTE: Coal Seam = Jellico

SAM SMITH COAL CO.  
BOONEVILLE, OWSLEY CO., KY.  
H.S. ADKINS,  
MINING ENGINEER  
MANCHESTER, KY.  
SCALE 1"=100'     MARCH 25, 1950.

EXTENDED JAN 25 1953  
 "     JAN 1 - 1954  
 "     "     10 - 1954  
 "     DEC 30 - 1955  
 "     JAN 2 - 1957

I, the undersigned, hereby certify that this map is correct, shows to the best of my knowledge and belief all the information required by the mining laws of this state, and covers the period ending Jan 25 1957

Acknowledged before me, a Notary Public, this 9 day of January 1957.  
March 25, 1958  
Bill Co. Ro

01964\_1958L\_19580212

01964

01964-1\_1958M\_19580212

01964-1

NOTE: Seam = Grassy (Eq. to Upper Elkhorn No. 2)  
Breathitt County - Jackson GQ.

Watts Coal Co

Watts Coal Co

Eastin  
Campbell  
Hells

Extent of works  
unknown

Extent of Works  
unknown

Extent of Works  
on drawing

SFW  
1964

#1

#2  
SFN = 1964.1

KDMM NAD83 Lat = 37° 32' 47.7"  
APPROXIMATE Lng = 83° 25' 35.8"

State of Kentucky  
County of Knott /SCT  
I, A.G. Perkins, Engineer, certify  
that this map is correct to the best  
of my knowledge and that it complies  
with the State Laws of the Department  
of Mines and Minerals of the State of  
Kentucky, and cover the period ending  
Feb 12 1958

Witness my signature this the  
17 day of Feb 1958  
A.G. Perkins

State of Kentucky  
County of Knott/SCT  
Subscribed and sworn to before me  
this 17 day of Feb 1958  
Key Mullins  
Clerk of Knott County Court

Potter & Sons Coal Co  
Mine No 1

Located on Miller Branch Breathitt Co Ky

P.O. Elkatawa Ky

Scale 1"=100'

Extended 2-12-58

F.G. Perkins Reg. No 1183

Hindman Ky

Miller Branch

Outcrop Coal

01964\_1958L\_19580212

01964

01964-1\_1958M\_19580212

01964-1

NOTE: Seam = Grassy (Eq. to Upper Elkhorn No. 2)  
Breathitt County - Jackson GQ.

Watts Coal Co

Watts Coal Co

Bastin Heirs  
Campbell



Extent of Works unknown

Extent of Works unknown

Extent of Works unknown

#1

1964

#2  
SFN=1964.1

KDMM NAD83 Lat = 37° 32' 47.7"  
APPROXIMATE Lng = 83° 25' 35.8"

State of Kentucky  
County of Knott /SCT  
I, A.G. Perkins, Engineer, certify that this map is correct to the best of my knowledge and that it complies with the State Laws of the Department of Mines and Minerals of the State of Kentucky, and cover the period ending Feb 12 1958.

Witness my signature this the 17 day of Feb 1958  
A.G. Perkins

State of Kentucky  
County of Knott /SCT  
Subscribed and sworn to before me this 17 day of Feb 1958  
Ray Mullins  
Clerk of Knott County Court

Potter & Sons Coal Co  
Mine No 1

Located on Miller Branch Breathitt Co Ky

P.O. Elkatawa Ky

Scale 1"=100'

Extended 2-12-58

A.G. Perkins Reg. No 1183

Hindman Ky

Miller Branch

Outcrop Coal

02657-1\_1955L\_19541231

02657-1

02657\_1955L\_19541231

02657

NOTE: Seam = Vires (Eq. to Lower Elkhorn)  
Breathitt County - Jackson GQ.



RECEIVED  
 JAN 1 1955  
 DEPT. OF MINES AND METALLURGY  
 LEXINGTON, KENTUCKY

Cornettsville Coal Co.  
 NOTE: buildings and property  
 like survey of the building

MAP OF  
 BILL BRYANT MINE No 2  
 ELKHARTON, BREATHITT CO. KY.  
 SCALE 1" = 200 FT. DATE 1-12-55

State of Kentucky County of Perry  
 I the undersigned hereby certify that  
 this map is correct shows to the best of  
 my knowledge and belief all the information  
 required by the mining laws of this state  
 and covers the period ending December 31<sup>st</sup> 1954  
 Engineer *Ralph Beathitt*  
 Acknowledged before me a notary Public  
 This Day of *January 21<sup>st</sup>* 1955  
 my Commission expires the *16<sup>th</sup>* Day of *October* 1958  
 notary Public Perry County Kentucky

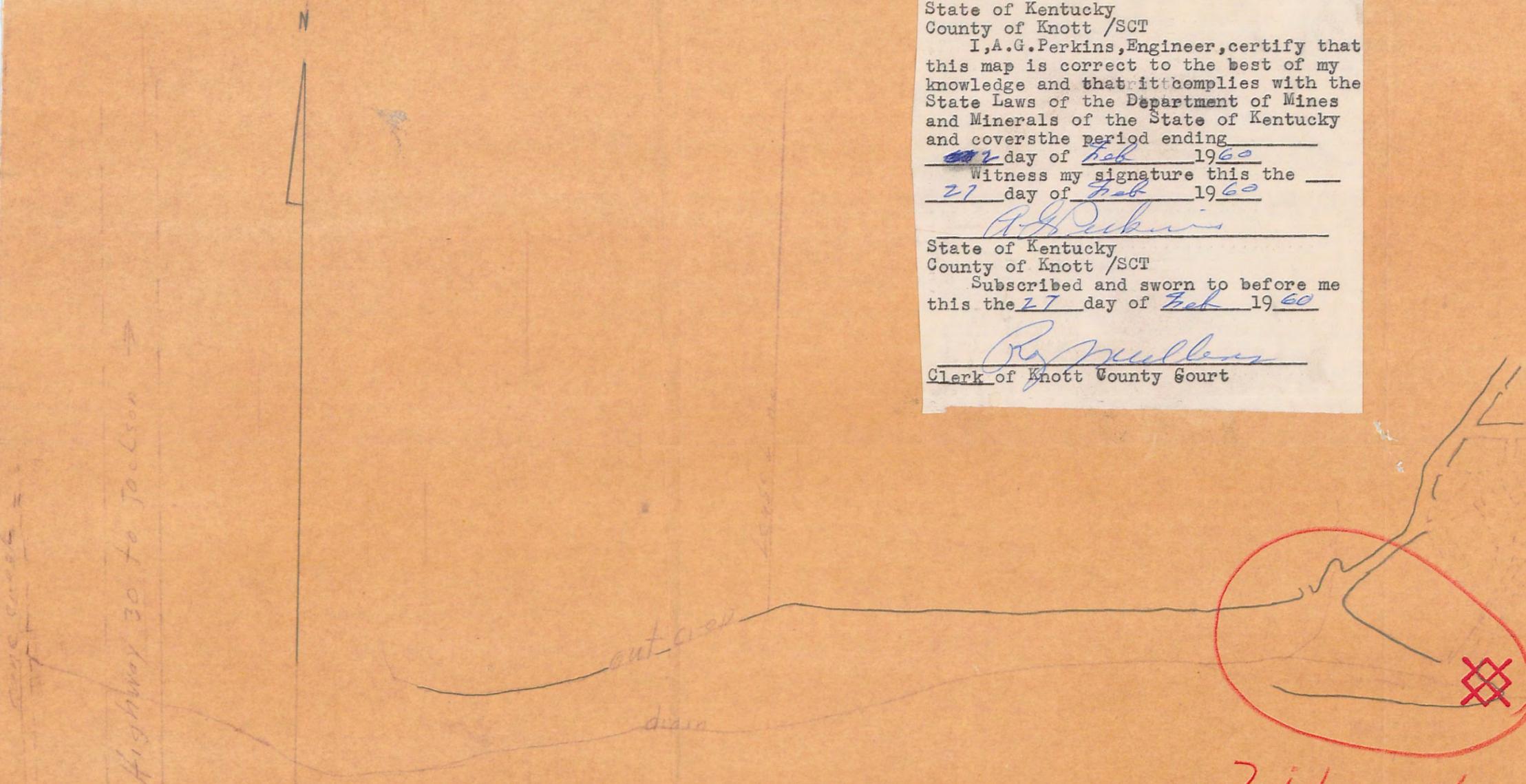
03947\_1960L\_19600202

03947

NOTE: Seam = Vires (Eq. to Lower Elkhorn)  
Breathitt County - Jackson GQ

Ridge Line NOT Run

State of Kentucky  
 County of Knott /SCT  
 I, A.G. Perkins, Engineer, certify that  
 this map is correct to the best of my  
 knowledge and that it complies with the  
 State Laws of the Department of Mines  
 and Minerals of the State of Kentucky  
 and cover the period ending \_\_\_\_\_  
 \_\_\_\_\_ day of Feb 1960  
 Witness my signature this the \_\_\_\_\_  
 27 day of Feb 1960  
 \_\_\_\_\_  
 State of Kentucky  
 County of Knott /SCT  
 Subscribed and sworn to before me  
 this the 27 day of Feb 1960  
 \_\_\_\_\_  
 Clerk of Knott County Court



KDMM NAD83 Lat = 37° 32' 22.2"  
APPROXIMATE Lng = 83° 24' 48.4"

File No 1195.2 (WRONG NUMBER)

Spencer & ~~Spencer~~'s Coal Co  
 Cane Creek Jackson Ky  
 Scale 1" = 100'  
 Date 2-1-60  
 H.G. Perkins Reg. No 1183  
 Hindman Ky

05243

NOTE: Seam = Hazard No. 4 (Fire Clay)  
Breathitt County - Jackson GQ

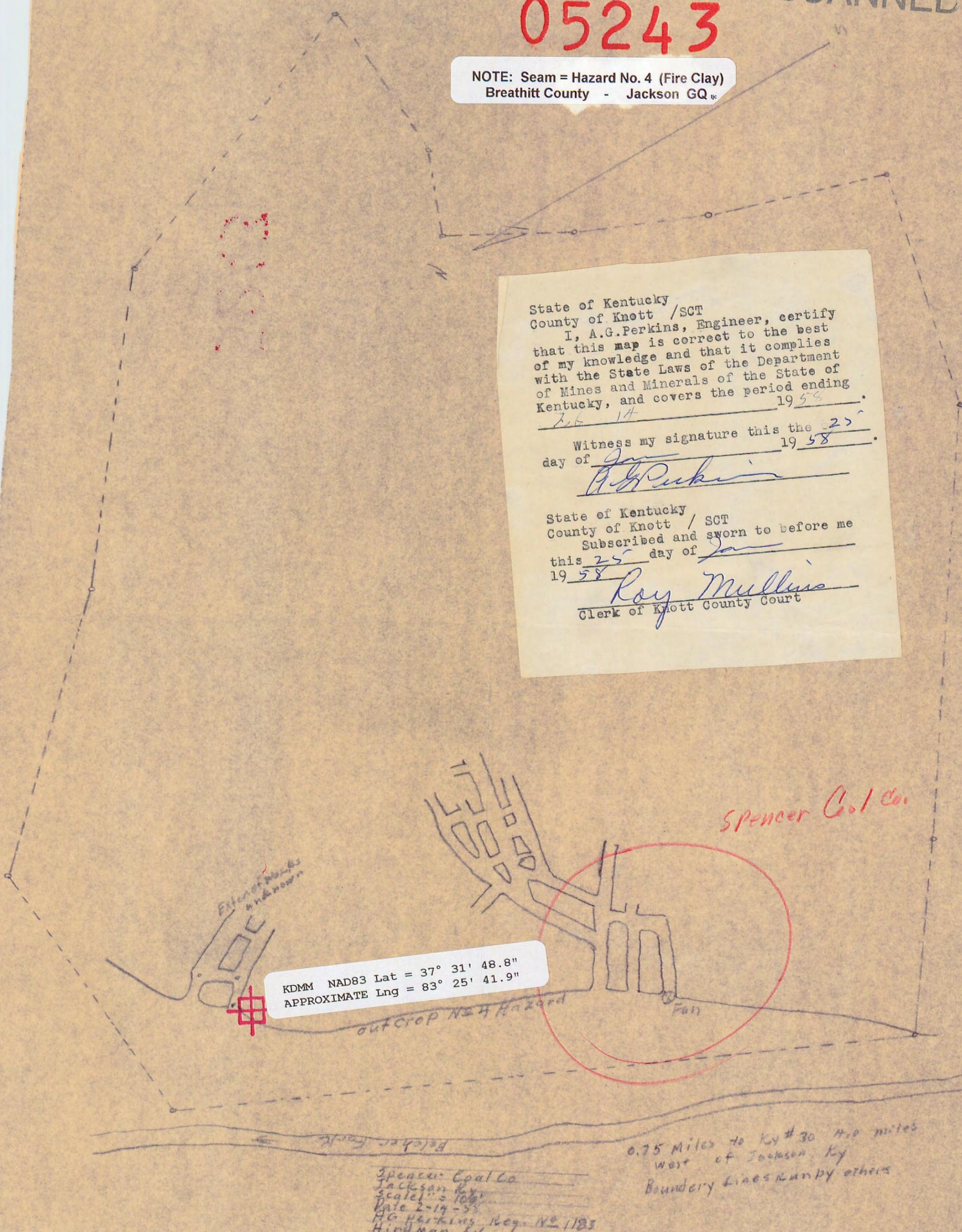
State of Kentucky  
County of Knott /SCT  
I, A.G. Perkins, Engineer, certify  
that this map is correct to the best  
of my knowledge and that it complies  
with the State Laws of the Department  
of Mines and Minerals of the State of  
Kentucky, and covers the period ending  
Feb 14 1958.

Witness my signature this the 25  
day of Jan 1958.

A.G. Perkins

State of Kentucky  
County of Knott / SCT  
Subscribed and sworn to before me  
this 25 day of Jan  
1958

Roy Mullins  
Clerk of Knott County Court



KDMM NAD83 Lat = 37° 31' 48.8"  
APPROXIMATE Lng = 83° 25' 41.9"

SPencer Coal Co.

outcrop N4H Hazard

Fan

Belcher Fork

Spencer Coal Co.  
Jackson Ky  
scale 1" = 100'  
Date 2-14-58  
A.G. Perkins Reg. No. 1183  
Hindman Ky

0.75 Miles to Ky #30 4.0 miles  
west of Jackson Ky  
Boundary lines & unby others



POTTER AND SHOUSE COAL CO.  
 MINE Nº 2      Nº 4 SEAM  
 LOCATED ON MILLER BRANCH  
 BREATHITT COUNTY 4 KENTUCKY  
 SCALE 1" = 100'      DATE 10-16-71

KENTUCKY MINE MAP CERTIFICATION

I, the undersigned, hereby certify that this map is correct, shown to the best of my knowledge and belief all the information required by the mining laws of this State, and across the period ending

10-16-71

*Ralph B. Bantitt*  
 Eng'g. No. 190

190

Notarized before me, a Notary Public, this 16th day of October, 1971, at Breathitt County, Kentucky.

*Ralph Bantitt*  
 State at Large of Kentucky  
 My Commission Expires 5-1-73

ENGINEER'S seal      NOTARY seal

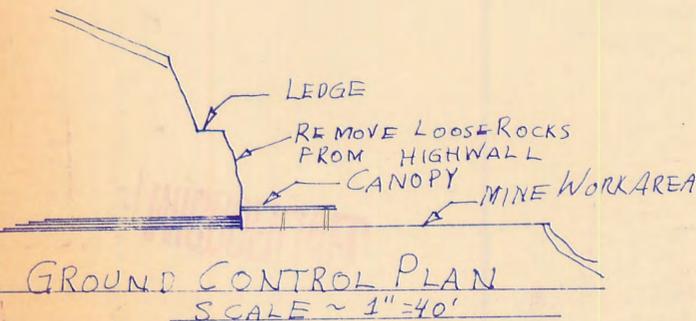
11630-5\_1978L\_19780417

11630-5



MINE LOCATION MAP & PLAN  
SCALE ~ 1" = 400'

MICROFILMED



KENTUCKY MINE MAP CERTIFICATION

I, the undersigned, hereby certify that this map is correct, shows to the best of my knowledge and belief all the information required by the mining laws of this State, and covers the period ending

April 17, 1978

Walter S. Hoskins ENGR.

Engr's. Reg. No. 7811

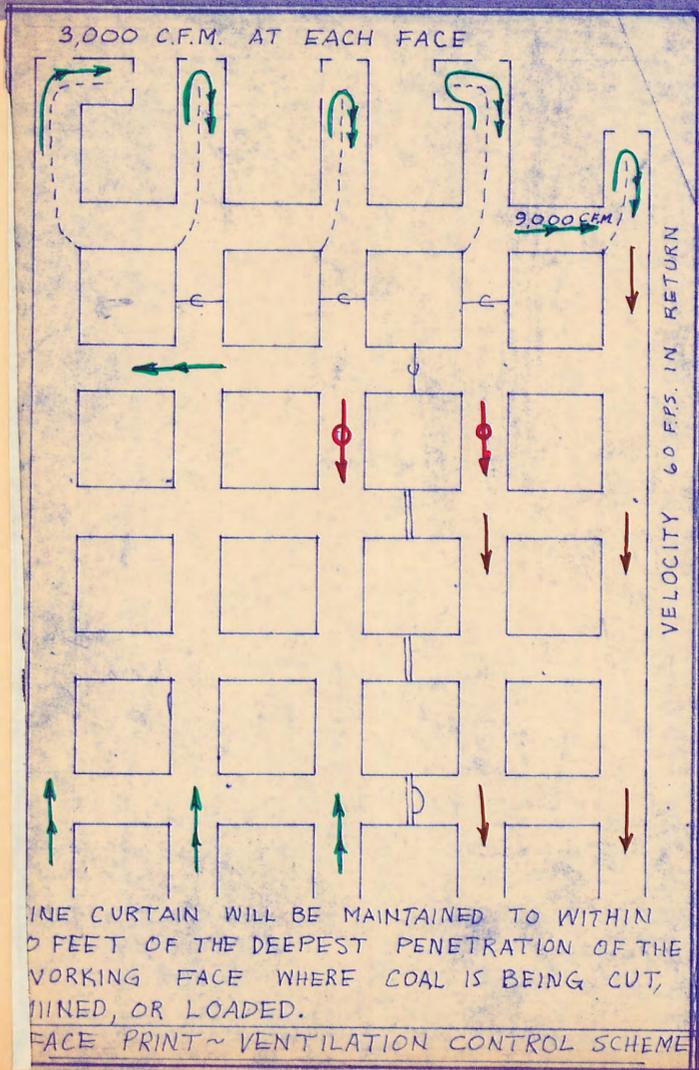
Acknowledged before me, a Notary Public this day of April 1978

Walter S. Hoskins London, Kentucky

MY COMMISSION EXPIRES AUG. 27, 1979

ENGINEER'S seal

NOTARY seal



~ LEGEND ~

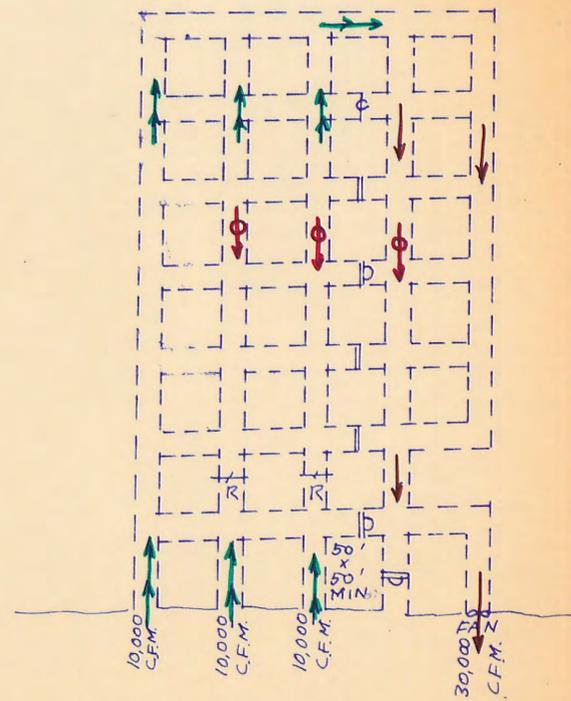
- PROPERTY LINE
- COAL CROP LINE
- 25' BARRIER PILLAR LINE
- RIDGE CREST LINE
- MINE ACCESS ROAD
- PUBLIC ROAD
- BENCH MARK
- OLD STRIP BENCH
- MINE LIMIT LINE
- INTAKE AIR
- RETURN AIR
- ESCAPEWAY
- PERMANENT STOPPINGS WITH CONCRETE BLOCK & MORTAR
- STOPPINGS W/DOOR
- AIR REGULATOR
- VENTILATION CURTAIN
- LINE CURTAIN
- VENTILATING FAN

MICROFILMED

~ DUST CONTROL ~

- ~FACE ~ VENTILATION AIR, WATERSPRAY
- ~HAUL ROADS - WATER AND/OR CALCIUM CHLORIDE
- ~FAN DATA ~
- ~NAME & SIZE - SHOP MADE - 48"
- ~8 BLADES, ADJUSTABLE
- ~MOTOR, POWER - 15HP, 46 AMP, 220V/A.C.
- ~SPEED - 1700 R.P.M. REVERSIBLE
- ~C.F.M. - 30,000 C.F.M.

ENGINEER  
WALTER S. HOSKINS, P.E.  
131 MAYHAN AVENUE  
LONDON, KENTUCKY 40741  
PHONE ~ 864-9771



MINE DEVELOPMENT PLAN  
SCALE ~ 1" = 100'

~ NOTES ~

- ~ PREVIOUS MINING W/IN 1000' SHOWN
- ~ CROSS CUTS TO BE COMPLETED PRIOR TO ABANDONING ENTRIES OR ROOMS.
- ~ DIP OF COAL NOT INDICATED - UNABLE TO DETERMINE UNTIL MINING COMMENCES.
- ~ NO OIL OR GAS WELLS W/IN 1000' OF PROJECTIONS
- ~ NEAREST R.R. - LEN - JACKSON, KY.
- ~ NO MINES ABOVE OR BELOW.
- ~ NO WATER POOLS ABOVE.
- ~ ONE YEAR PROJECTIONS SHOWN.
- ~ TWO YEAR MINE LIFE ANTICIPATED.
- ~ NO KNOWN DRILL OR CORE HOLES THRU SEAM.

~ BENCH MARK & BASE LINE DATA ~

- ~ B.M. "A" - NOTCH ON 16" MAPLE - EL. 1195'
- ~ "B" - NOTCH ON 20" ELM - EL. 1195'
- ~ "C" - NOTCH ON 16" POPLAR - EL. 1195'
- ~ "D" - NOTCH ON 18" BEECH - EL. 1185'
- ~ "E" - NOTCH ON 13" OAK - EL. 1200'
- ~ "F" - STAKE - EL. 1190'
- ~ "G" - STAKE - EL. 1190'
- A → B 520W 85'
- B → C 538E 264'
- C → D 580E 110'
- D → E 560W 175'
- E → F 580W 260'
- F → G 510W 314'

~ MINE DATA ~

- COUNTY ~ OWSLEY
- QUADRANGLE ~ COWCREEK, KY.
- LATITUDE ~ 37° 27' 20"
- LONGITUDE ~ 83° 35' 00"
- WATERSHED ~ SPLIT POPLAR FORK
- COMMUNITY ~ LEROSE
- MINERAL OWNER ~ HENRY COMBS
- COAL SEAM ~ No. 4 - EL. 1180'
- DATE OF MAP ~ Nov. 20, 1977
- REVISED ~ APRIL 15, 1978

TREE  
HARRY TOP COAL & EQUIPMENT, INC.  
606 SOUTH MAIN STREET  
CORBIN, KENTUCKY 40701  
MINE NO. 6

COMPANY NAME Hard Dollar Coal Inc. COUNTY Owsley & Breathitt  
 ADDRESS 3988 Forsythe Drive MAP SCALE 1" = 400'  
 Lexington, KY 40503 CONTOUR INTERVAL 20'  
 APPLICATION NUMBER 895-0033 LATITUDE 37° 27' 04"  
 QUADRANGLE Cow Creek LONGITUDE 83° 33' 03"  
 LOCATION IN DETAIL (NEAREST NEAMED STREAM/OR NEAREST IDENTIFIED PUBLIC INTERSECTION)  
 Left Fork of Cow Creek/Cow Creek Road and State Route 28.

17975

LEGEND		CONTOUR METHOD	
SLOPE (in Degrees)	→ 20°	SEAM/ELEVATION	Acres
DIVERSION DITCH	→ → →	Copeland/1150-1170	13.98
NON-EXISTENT BUILDING	⊠	Haddix/1180-1200	33.11
PROPERTY LINE SURFACE	— R —	Hazard #7/1330-1350	21.09
MINERAL FEE	— M —		
GEOLOGIC SAMPLE POINT	⊠		
TOPSOIL STORAGE AREA	⊠	Spoil Storage Areas	
WATER DISCHARGE MONITORING POINT	⊠ (KPPES)		
BACKGROUND SURFACE WATER MONITORING POINT	⊠	Hollow Fills	24.44
GROUND WATER MONITORING POINT	⊠		
UNDERGROUND MINE OPENING	—	Auger Mining	
UTILITY LINE (Indicate Type)	— G — W — O —	Slide Area	1.00
WELLS (Indicate Type)	⊙ ⊗ ⊕		
POWER LINE	—		
PERMIT BOUNDARY	x x x	SILT STRUCTURE(S)	
EXISTING PERMIT NO. 495-0117	⊠	EMBANKMENT	PROPOSED PERMITTED EXISTING
PREVIOUSLY MINE AREA	⊠	DUG-OUT	1.00 2.00
A.S. OF 12-1-84			
SHOW ALL DWELLING, CHURCHES, SCHOOLS, AND CEMETARIES WITHIN 1/2 MILE OF ANY PART OF THE MINING OPERATION.		ACCESS ROAD(S)	
AREA PROPOSED FOR MINING UNDER EXISTING PERMIT NO. 495-0117	⊠	PROPOSED PERMITTED EXISTING	
		WIDTH/LENGTH	96' / 2050' 1' / 96' / 1700' 8.27 7.87
		OTHER SURFACE DISTURBANCE(S)	
		Silt Pond Access Roads	20' / 1000' 0.80
		TOTAL ACRES PERMITTED 113.58	

**CERTIFICATION**

I, the undersigned, hereby certify that this map is correct, shows to the best of my knowledge and belief all the information required by the mining laws of this State and covers the period ending May 22, 1991.

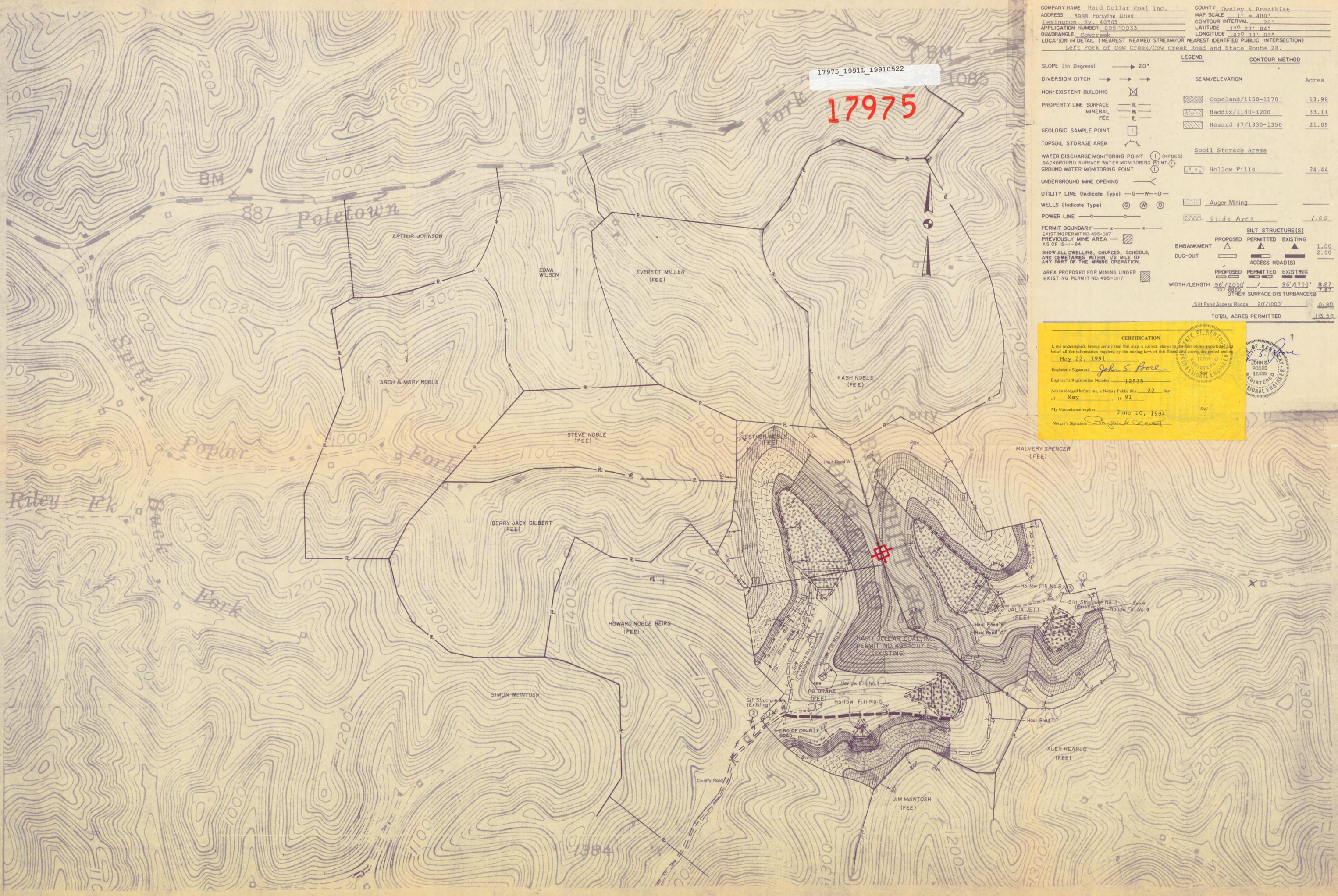
Engineer's Signature John S. Poore

Engineer's Registration Number 12535

Acknowledged before me, a Notary Public this 22 day of May, 1991.

My Commission expires June 10, 1994

Notary's Signature Angus R. Cooney



18136\_1994L\_19940507

18136

00003 CARRIER HAZARD 01/22/93  
 NEUBERRY MINING CO 1038  
 19136  
 BILL HAMMOND  
 542 SOUTH FORK BOONEVILLE  
 BEATTYVILLE, KY 41311 OUSLEY  
 ASTC  
 15-00000

REVISION # 4  
 COMPANY NAME Hard Dollar Coal, Inc. COUNTY Owsley & Breathitt  
 ADDRESS 3988 Foregate Drive MAP SCALE 1" = 400'  
 Lexington, KY 40503 CONTOUR INTERVAL 20'  
 APPLICATION NUMBER 895-0033 LATITUDE 37° 27' 04"  
 QUADRANGLE Cowcreek LONGITUDE 83° 33' 03"  
 LOCATION IN DETAIL (NEAREST NAMED STREAM/OR NEAREST IDENTIFIED PUBLIC INTERSECTION)  
 Left Fork of Cow Creek/Cow Creek Road and State Route 28

LEGEND

SLOPE (In Degrees) 20'

DIVERSION DITCH

NON-EXISTENT BUILDING

PROPERTY LINE SURFACE MINERAL FEE

GEOLOGIC SAMPLE POINT

TOPSOIL STORAGE AREA

WATER MONITORING POINTS

SURFACE WATER DISCHARGE (KPDES)

BACKGROUND SURFACE WATER

GROUNDWATER WATER

UNDERGROUND MINE OPENING

UTILITY LINES (Indicate Type)

POWER LINE

WELLS (Indicate Type)

PERMIT BOUNDARY

PERMIT 495-0117 (EXISTING)

EXPLOSIVES STORAGE AREA

CONTOUR/AREA METHODS

SEAM/ELEVATION	ORIGINAL AMEND.	#1 TOTAL ACRES	#2 TOTAL ACRES
Copeland/1150-1170	13.98	13.98	
Hobby/1180-1200	33.11	33.11	
Hazard/1330-1350	21.09	21.09	
Hazard #9 1470+	8.6	8.6	

SPOIL STORAGE AREAS

SEAM/ELEVATION	ORIGINAL AMEND.	#1 TOTAL ACRES	#2 TOTAL ACRES
Hollow Fills	24.44	24.44	
Slide Area	1.00	1.00	
Layout Areas	3.2	3.2	

SILT STRUCTURES

EM BANKMENT	PROPOSED	PERMITTED	EXISTING	ORIGINAL AMEND.	#1 TOTAL ACRES	#2 TOTAL ACRES
△	3.00	2.0	5.00			

ACCESS ROAD(S)

PROPOSED	PERMITTED	EXISTING	ORIGINAL AMEND.	#1 TOTAL ACRES	#2 TOTAL ACRES
96/2050	96/1700	8.27	8.27		
50/680	50/680	7.87	7.87		
50/1400		1.6	1.6		

OTHER SURFACE DISTURBANCES(S)

SILT POND ACCESS ROADS	PROPOSED	PERMITTED	EXISTING	ORIGINAL AMEND.	#1 TOTAL ACRES	#2 TOTAL ACRES
20/1000	0.80	0.80	0.80			
20/1200	0.6	0.6	0.6			

SHOW ALL DWELLING, CHURCHES, SCHOOLS, AND CEMETERIES WITHIN 1/2 MILE OF ANY PART OF THE MINING OPERATION.

TOTAL AREA PERMITTED (REVISION #3) 113.58 16.0 129.58  
 OFF PERMIT AREA (REVISION #4) 23.32  
 TOTAL AREA PERMITTED (REVISION #4) 129.99

ALL PROPERTY LINES AND BOUNDARIES ILLUSTRATED ON THIS DOCUMENT ARE SHOWN AS FURNISHED BY THE OPERATOR OR OBTAINED FROM OTHER SOURCES AND ARE NOT FROM AN ACTUAL SURVEY. NO CERTIFICATION IS MADE OR IMPLIED AS TO THE CORRECTNESS OR AUTHENTICITY OF ANY INFORMATION RELATIVE TO THE PROPERTY BOUNDARIES AS SHOWN.

I, John S. Poore 12535 5/7/94  
 hereby certify, in accordance with 405 KAR 7:040E, Section 10, that this document is correct as determined by accepted engineering practices and includes all information required of it by KRS Chapter 350 and KAR Title 405.



KDMM NAD83 Lat = 37° 26' 52.8"  
 APPROXIMATE Lng = 83° 32' 32.1"



18819-2\_2013L\_20121231

Kentucky Office of Mine Safety and Licensing  
Mine License Map

State File No: 18819-2 Map Scale: 1" = 400' Sheet No. 1 of 1  
Federal ID No.: 15-19617 Map Covers Period Ending: 12-31-2012  
Mine Entry Location: Latitude: 37°26'39.436" Longitude: 83°37'03.737"  
Entry Point Quadrangle: COW CREEK  
Nearest Named Stream: COW CREEK

KDMM Seam Name	Average Thickness	Average Elevation
AMBURGEY	30-34"	± 895

DSMRE Permit No(s):  
895-0200

# 18819-2

OFFICIAL USE ONLY - SFN STAMP

CARRIER BARBOURVILLE 3-19-13  
B & W RESOURCES, INC. 1301-S-035  
BINGHAM JOB # 13  
RICHARD LIPEROTE 18819-2  
300 LIPEROTE WAY COW CREEK  
LONDON, KY 40741 OWSLEY  
ASTC  
8-19-11 15-19617

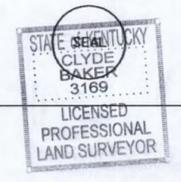
Map Georeferencing Information:  
Datum:  NAD27  NAD83  None (Local)

Mapping Projection:  
State Plane:  Single Zone  North Zone  South Zone  Other:  
UTM:  Zone 16  Zone 17  
Local System (Name):

Units:  Foot  Meter  
Control Network or Grid Accuracy Classification:  
 GPS Class C or Better (> 1 : 10,000)  AGPS (+/- 10 Meters)  
 SCN Class B or Better (> 1 : 5,000)  Digital Mapping 1 :  
 SCN Class C (< 1 : 5,000)  Kentucky DOQ  
 DGPS (+/- 1 Meter)  Kentucky KRG  
 WAAS (+/- 3 Meters)

- AMBURGEY PITS MINED 2011
- AMBURGEY PITS MINED 2012
- 2011 AUGER
- 2012 AUGER
- PERMIT BOUNDARY
- GEOLOGICAL SAMPLING POINT
- AMBURGEY and riders 2013 (AREA AVAILABLE)
- PROPOSED AUGER AREA
- PROPOSED AUGER AREA

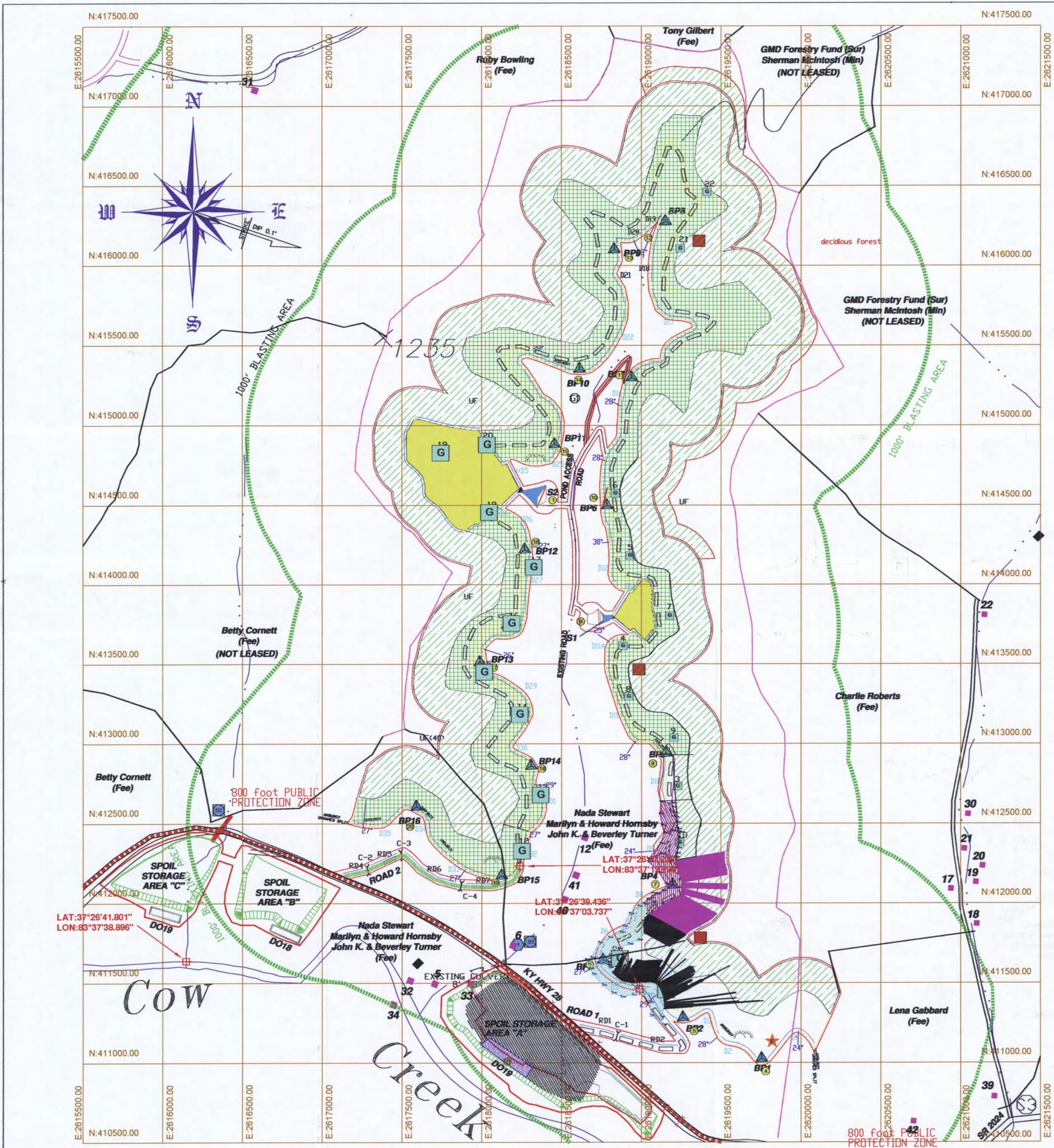
I, THE UNDERSIGNED HEREBY CERTIFY TO THE BEST OF MY KNOWLEDGE AND BELIEF THIS MAP IS CORRECT AND THAT ALL THE INFORMATION REQUIRED BY THE MINING LAWS OF THIS COMMONWEALTH IS SET OUT AND COVERED BY THE PERMIT ENGINEER. 8-31-2012  
PROFESSIONAL ENGINEER/SURVEYOR Clyde Baker LIC.# 3169  
ACKNOWLEDGED BEFORE ME, A NOTARY PUBLIC, THIS 22 DAY OF March, 2013  
MY COMMISSION EXPIRES: 12-31-2016  
NOTARY PUBLIC: Ray G. Caldwell



**B & W RESOURCES**  
300 LIPEROTE WAY  
LONDON, KY 40741

## BINGHAM No. 13 MINE LICENSE MAP

SCALE: 1" = 400' PERMIT: AS NOTED DATE: 3/14/2013  
FILE NAME: /SERVER/MINE LIC 2013 MINE LIC MAP 12-31-12.DWG



LAT: 37°26'41.801"  
LON: 83°37'38.896"

LAT: 37°26'39.436"  
LON: 83°37'03.737"

800 foot PUBLIC PROTECTION ZONE

91806\_1949M\_19490102\_s2cF2

91806

NOTE: Coal Seam = Vires  
Breathitt County - Jackson Quad  
Scale: 1"= 200'

COAL SEAM  
APPROXIMATE 220' 85' 23" 69.2'

From original map

This mine  
located in Breathitt Co.  
the top back side



91953\_1950L\_19500217

91953



KDMM NAD83 Lat = 37° 33' 05.6"  
APPROXIMATE Long = 83° 25' 37.2"

NOTE: Coal Seam = Vires  
Breathitt County - Jackson Quad

MAP  
OF  
WATTS COAL CO  
ELKATAWA, KENTUCKY.

H.S. ADKINS, MINING ENGINEER  
MANCHESTER, KENTUCKY  
SCALE 1"=100' AUGUST 19 1949



I, the undersigned, hereby certify that this map is correct, shows to the best of my knowledge and belief all the information required by the mining laws of this state, and covers the period ending February 11, 1950.

Acknowledged before me, a Notary Public,  
this 25th day of February, 1950.  
My Comm. expires Apr 11, 1950

H.S. Adkins Engineer.  
W.D. Duffell Notary Public  
W.D. Duffell Ky.

I, the undersigned, hereby certify that this map is correct, shows to the best of my knowledge and belief all the information required by the mining laws of this state, and covers the period ending March 15, 1950

H. S. Adkins Engineer.

Acknowledged before me, a Notary Public,  
this 18<sup>th</sup> day of March 1950.

Little S Lytle  
Notary Public

My commission expires Jan. 17, 1953

92139\_1950L\_19500315

92139



ED RILEY COAL CO  
CHESTNUT GAP, OWSLEY CO., KY.  
H. S. ADKINS,  
MINING ENGINEER  
MANCHESTER, KY.

SCALE 1"=100'    MARCH 16, 1950.

KDMM NAD83 Lat = 37° 27' 30.5"  
APPROXIMATE Lng = 83° 39' 30.9"



95012

"I, the undersigned, hereby certify that this map is correct, shows to the best of my knowledge and belief all the information required by the mining laws of this state, and covers the period ending Dec. 31 1952

*Wm. J. Perry*

Engineer

"Acknowledged before me, a Notary Public

, this 28

day of Jan 1953

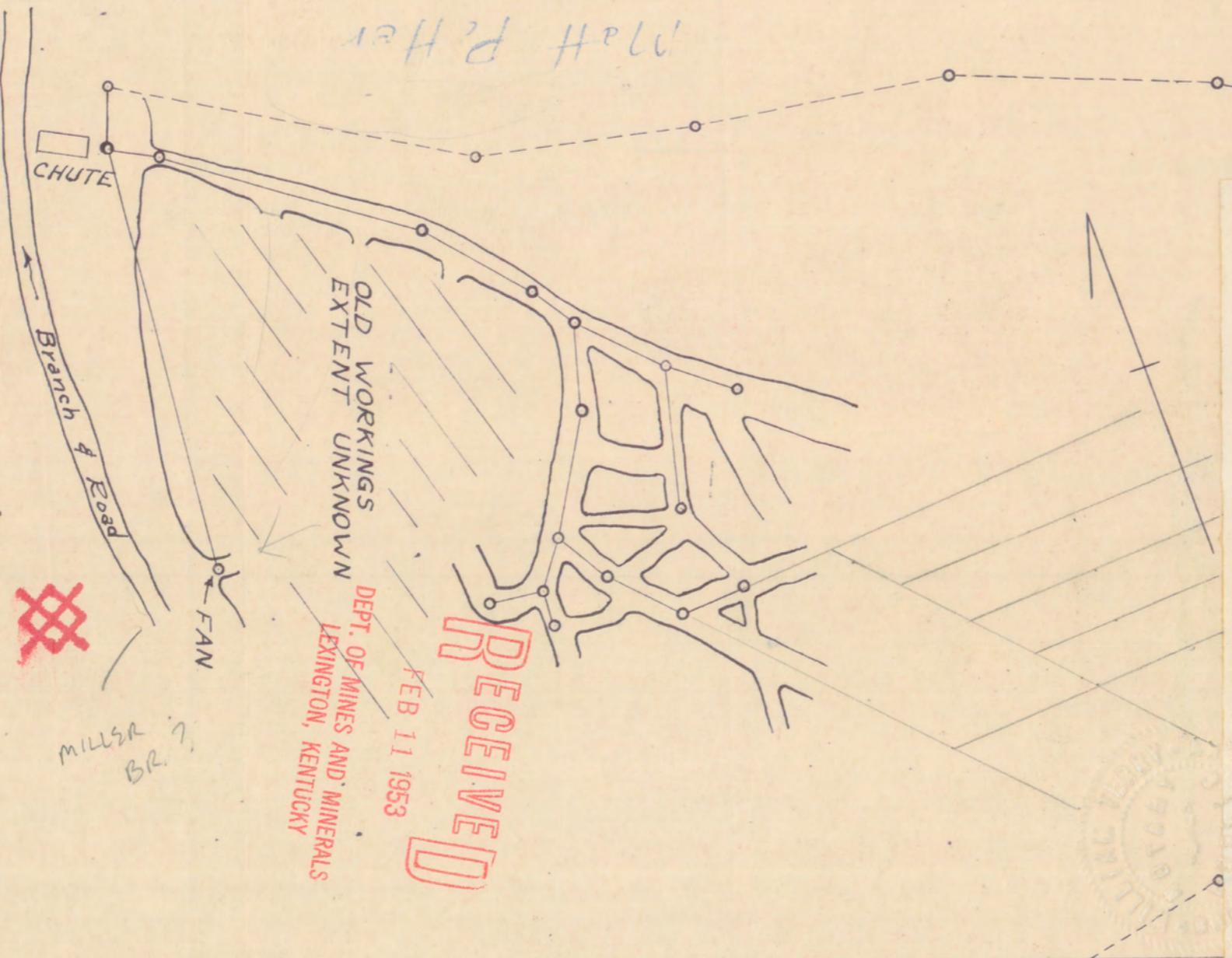
"

William Perry

My Commission Expires January 8, 1957

SEAL

*Math P. Her*



DEPT. OF MINES AND MINERALS  
LEXINGTON, KENTUCKY

FEB 11 1953

RECEIVED

*MILLER BR. ?*

1.0 Miles to Ky. #52 at Elkstow, Ky

KDMM NAD83 Lat =  
APPROXIMATE Lng =

37° 32' 57.8"  
83° 25' 33.5"

MINE MAP  
THE JOHN B. COUCH MINE  
BREATHITT COUNTY, KY.  
DEC. 26, 1952  
SCALE 1" = 100'

CK. VIRES SEAM JACKSON QUAD.

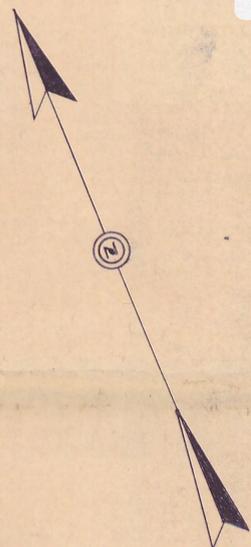


96121

NOTE: Seam = Vires (Eq. to Lower Elkhorn)  
Breathitt County - Jackson GQ.

RECEIVED  
JAN 30 1954

DEPT. OF MINES AND MINERALS  
LEXINGTON, KENTUCKY



Walter Deaton  
Mahala " (wf)  
J. Wise Deaton  
Gladys " (wf)

John Haney  
Liza " (wf)

P.J. M<sup>rs</sup> Alarnis  
Grace " (wf)

William Gabbard  
Elsie " (wf)

Alfred Gambill  
Rachael " (wf)

ELIAS MULLINS  
MAMIE " (wf)

I, the undersigned, hereby certify that this map is correct, shows to the best of my knowledge and belief all the information required by the mining laws of this state, and covers the period ending 1-6-54.

*E. Mullins*, Engineer

Sworn to and subscribed before me this 23<sup>rd</sup> day of January, 1954.  
Witness my hand and official seal.  
*William Jay*, Notary Public  
My Commission Expires January 8, 1957

KDMM NAD83 Lat = 37° 33' 30.3"  
APPROXIMATE Lng = 83° 25' 33.9"

ALL ROOMS BREAKS ON LEFT  
ARE BRATTICED & SEALED

WORKING EXTENT  
UNKNOWN

MINE PROPERTY  
OF  
CORNETTSTVILLE COAL CO.  
ELKATAWA, BREATHITT CO. KY.

DATED Jan. 6, 1954

RECEIVED  
JAN 30 1954  
DEPT. OF MINES AND MINERALS  
LEXINGTON, KENTUCKY

SCALE 1" = 200'

6121

6121

