

## **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

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

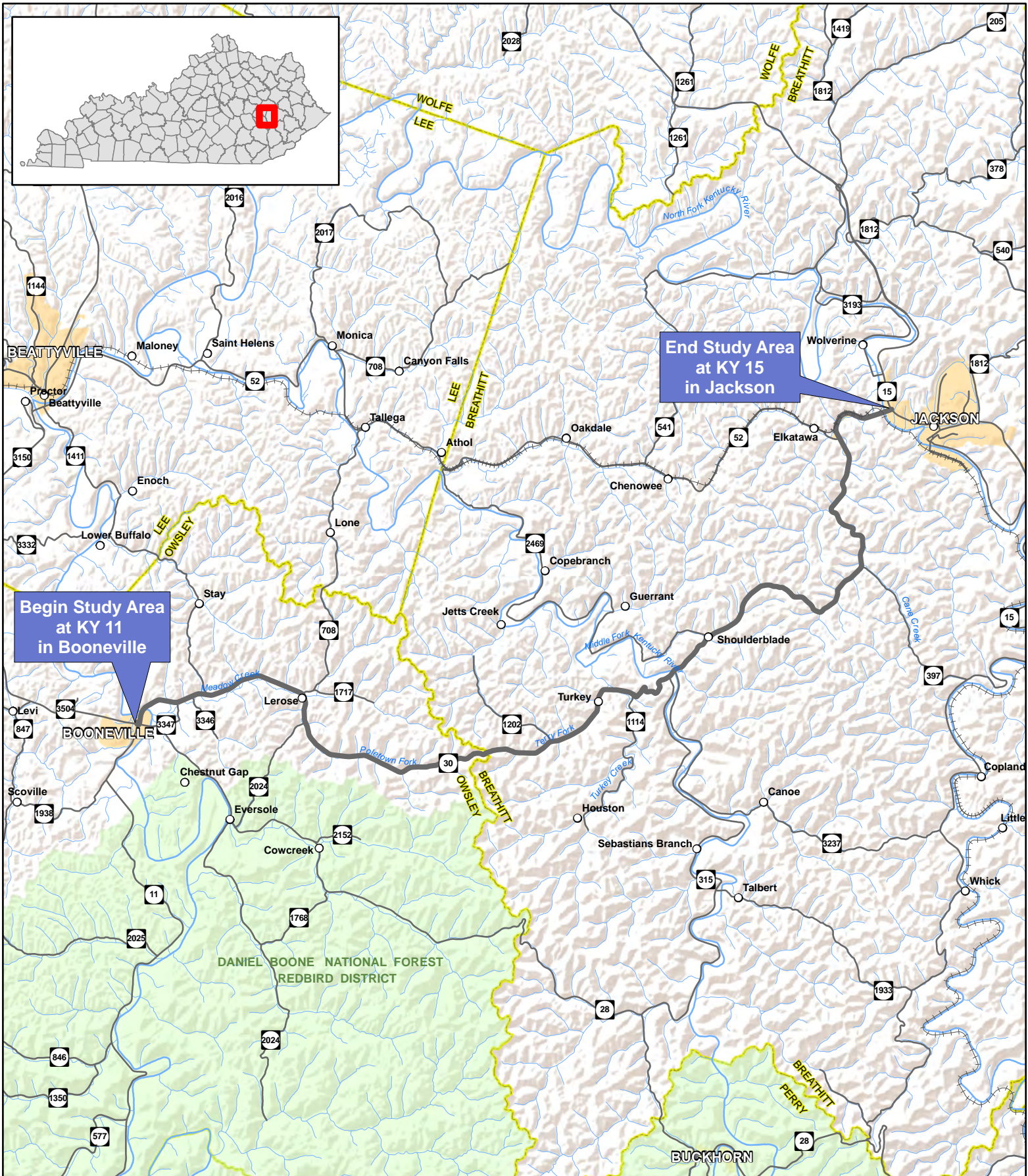
The reports are located on the KYTC Geotechnical Branch Database which can be accessed through the KYTC Division of Structural Designs home page (Click on Geotech and Search KYTC Completed Projects).

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**





**CDM  
Smith**



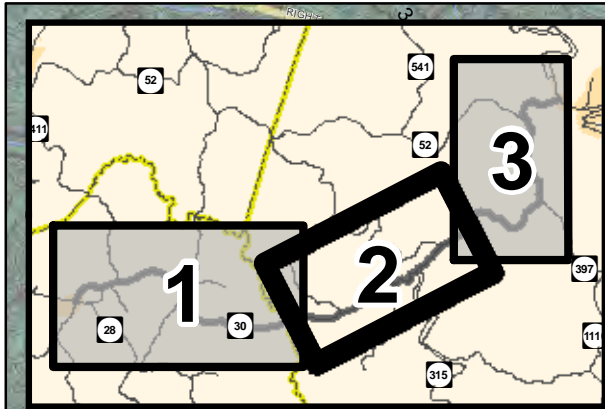
0 5,000 10,000 20,000  
Feet

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



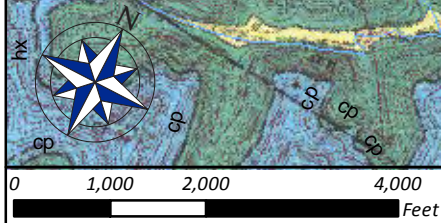
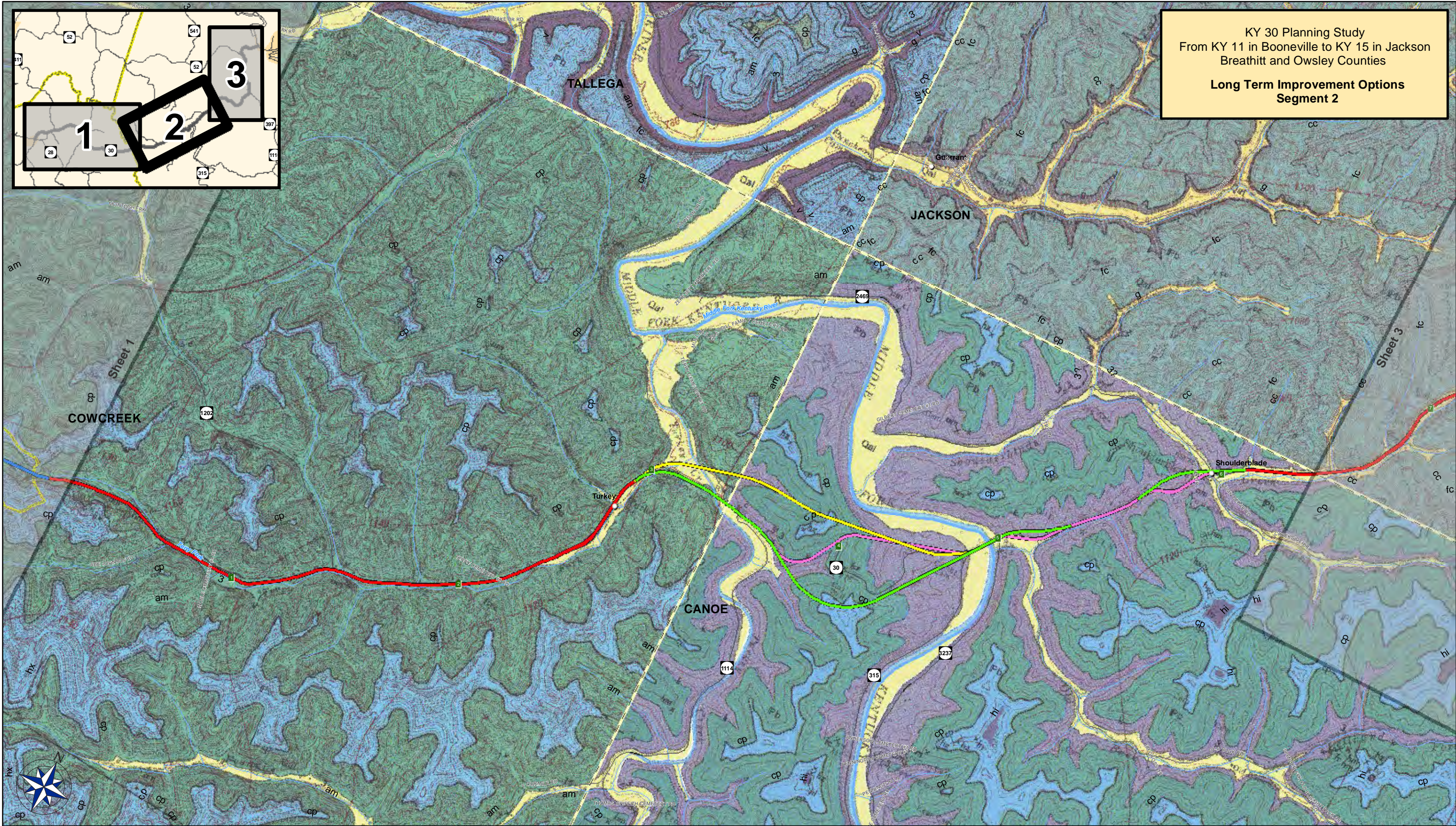






KY 30 Planning Study  
From KY 11 in Booneville to KY 15 in Jackson  
Breathitt and Owsley Counties

**Long Term Improvement Options  
Segment 2**



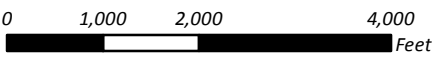
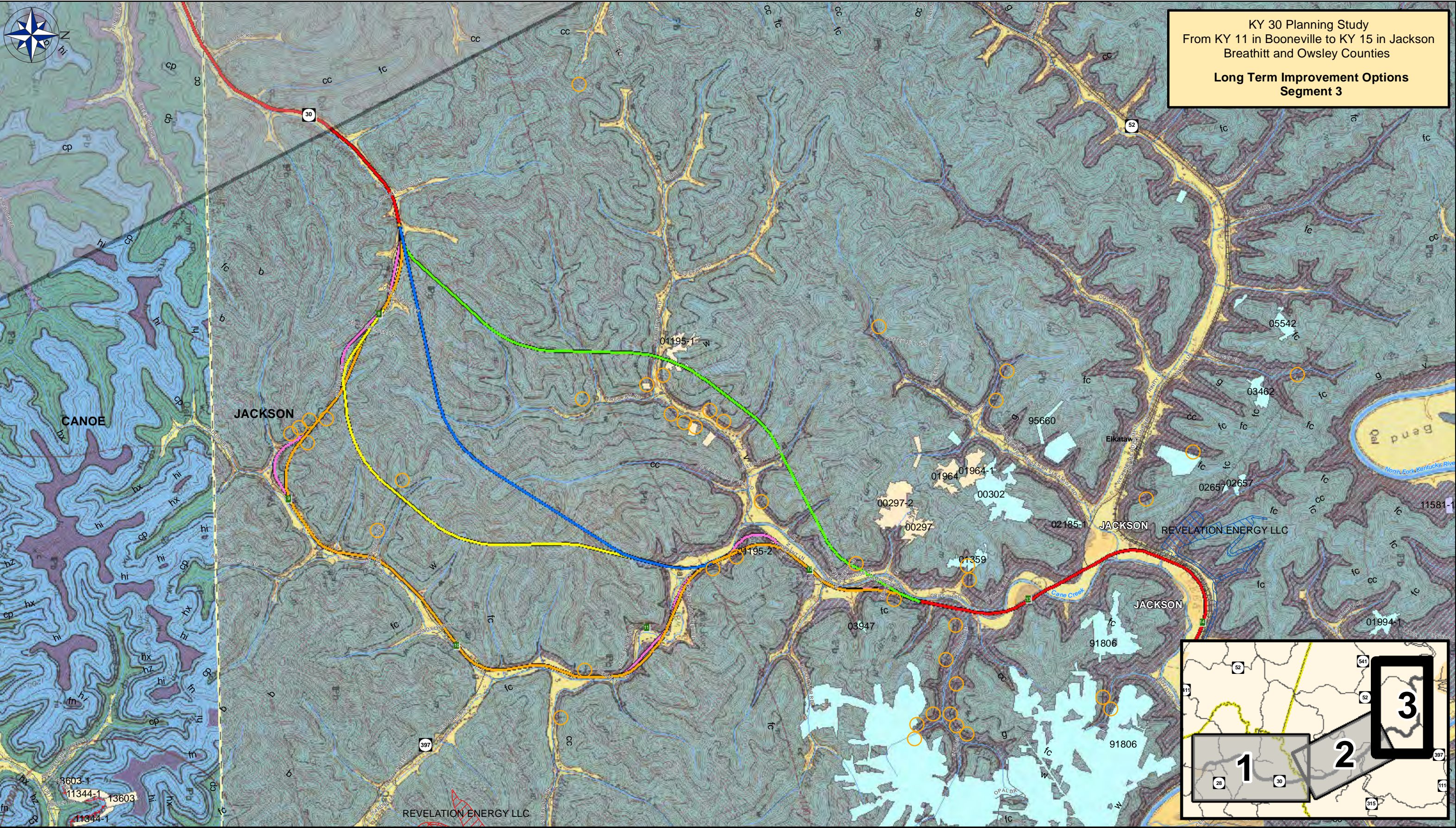
- |               |  |                             |                        |
|---------------|--|-----------------------------|------------------------|
| — State Roads | — Widen Existing On Alignment (55 mph) | — Alternate Yellow (55 mph) | Qal Alluvium           |
| — Local Roads | — Alternate Blue (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
- 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
- Alluvium
- Breathitt Formation
- Lee Formation
- Adit Locations

- Known Mined Out Areas
- Vires Coal Bed
- Grassy Coal Bed

- Active Permitted Mine Boundaries**
- Mine Type**
- Surface
  - Underground incl. Auger



00297\_1952L\_19520515

00297

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"

#4283

RECEIVED  
MAY 31 1952

DEPT. OF MINES AND MINERALS  
LEXINGTON, KENTUCKY

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 5-15-52.

W. B. Vires  
ENGINEER.

Acknowledged before me, a Notary Public, this the 19 day of May, 1952.

My commission expires 12/14/53.

Am. Raw  
Notary Public, Perry County,  
Kentucky.

H.C. Vires Coal Co.  
Jackson, Breathitt Co. Kentucky  
Scale 1"=100' Dated 5-15-52

#4283

Note -  
Property lines, outcrop and  
part of Mine Workings made by others



00297-2

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  
00297-2SFN  
00297

297.2

Note-  
Property Lines & Outcrop and  
Part of mine workings made by othersMAP 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  
*R. J. 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 /SOT  
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  
4-4-58 1958

Witness my signature this the  
1 day of April 1958

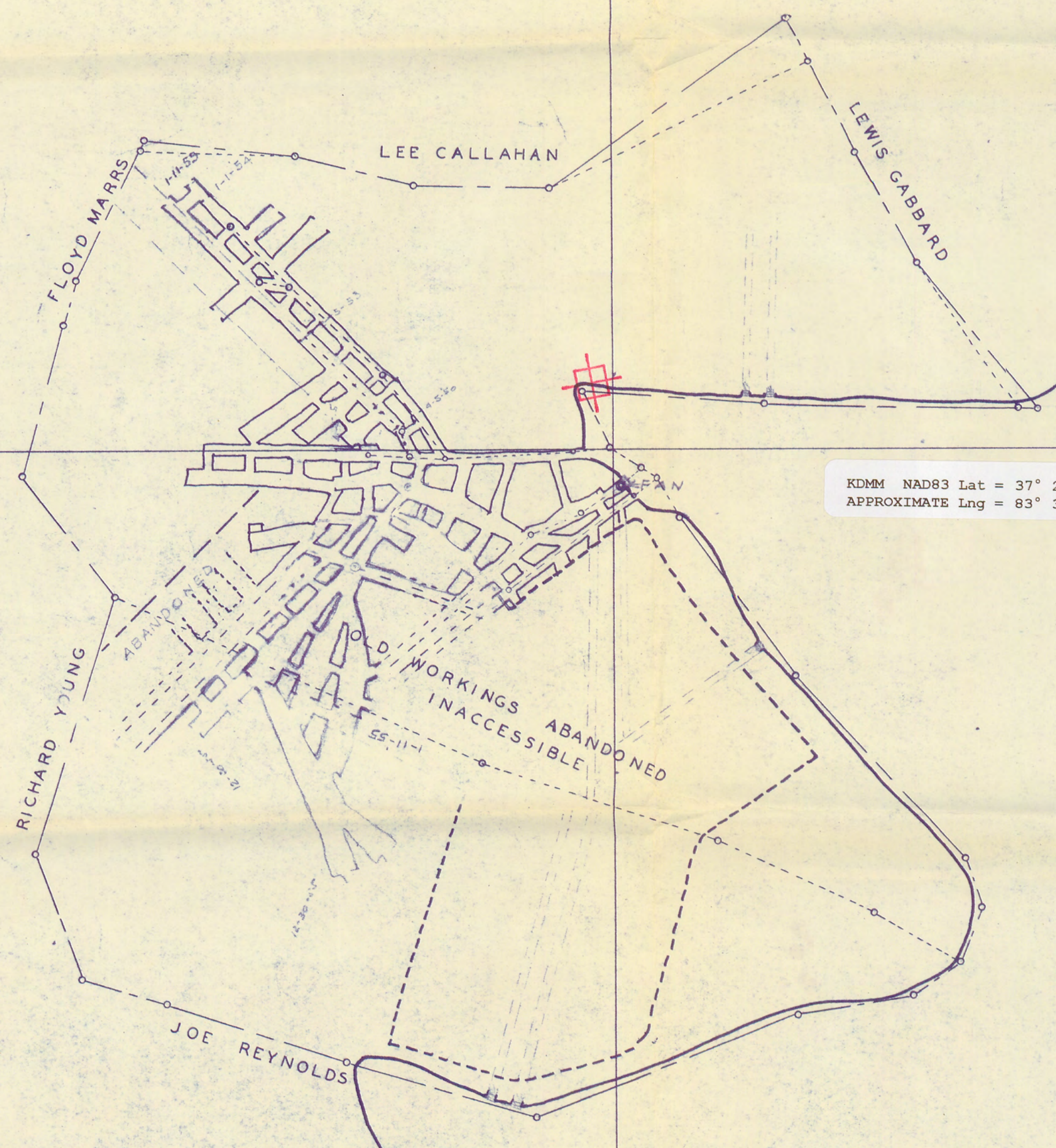
State of Kentucky  
County of Knott /SOT  
Subscribed and sworn to before me  
this the 1 day of April 1958  
Ray Mullins  
Clerk of Knott County Court

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  
AG Perkins Reg. No. 1183 Hindman, 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'

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

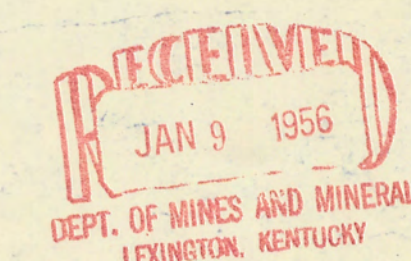
APRIL 8, 1950

NOTE: Coal Seam = Jellico

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 16th day of January 1956

Martha C. Hammett  
Notary Public  
My Comm. expires Apr. 7, 1958





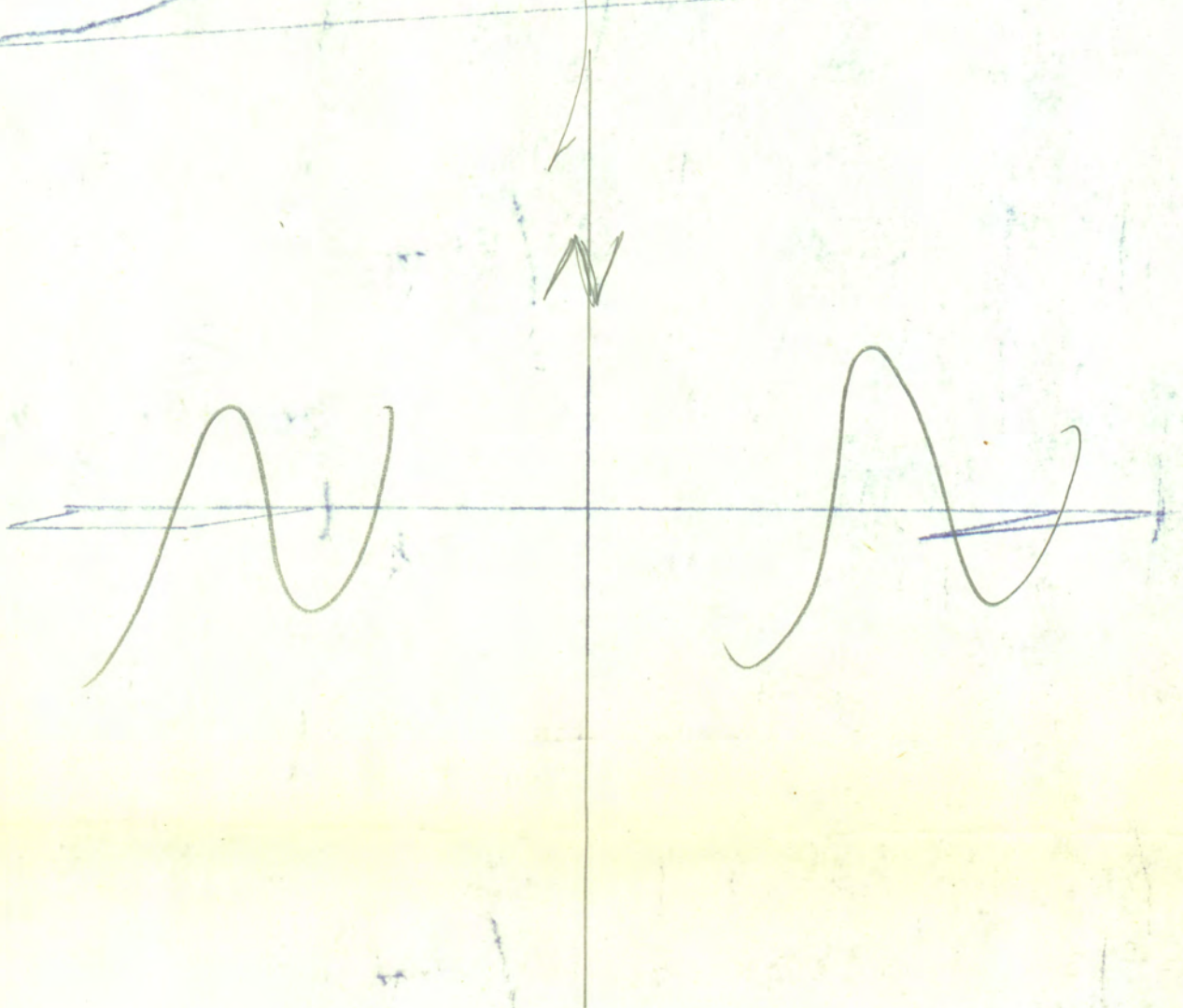
I, the undersigned, hereby certify that this map is correct, shows to the best of my knowledge and belief all the information required by the mining laws of this state, and covers the period ending Dec 31 - 1957

Acknowledged before me, a Notary Public, MacArthur Engineer, this 10th day of February, 1958.

My Comm. exp. March 15, 1958  
John St. Justice  
Bel Co. Eng.

01100-X

01100-X\_1958L\_19571231

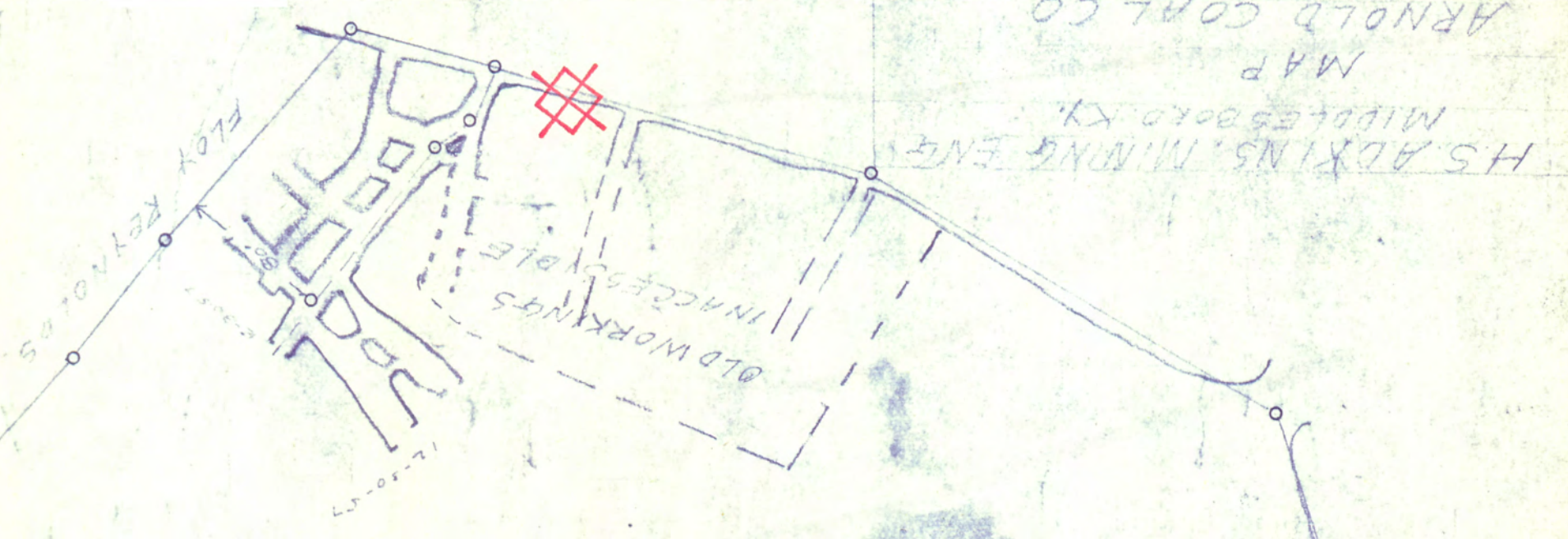


SFN 01100

CHESTNUT GAP COAL CO

JIM LYNCH PROPERTY.

SFN 01100-X



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

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



01195-1\_1955L\_19550311

01195-1

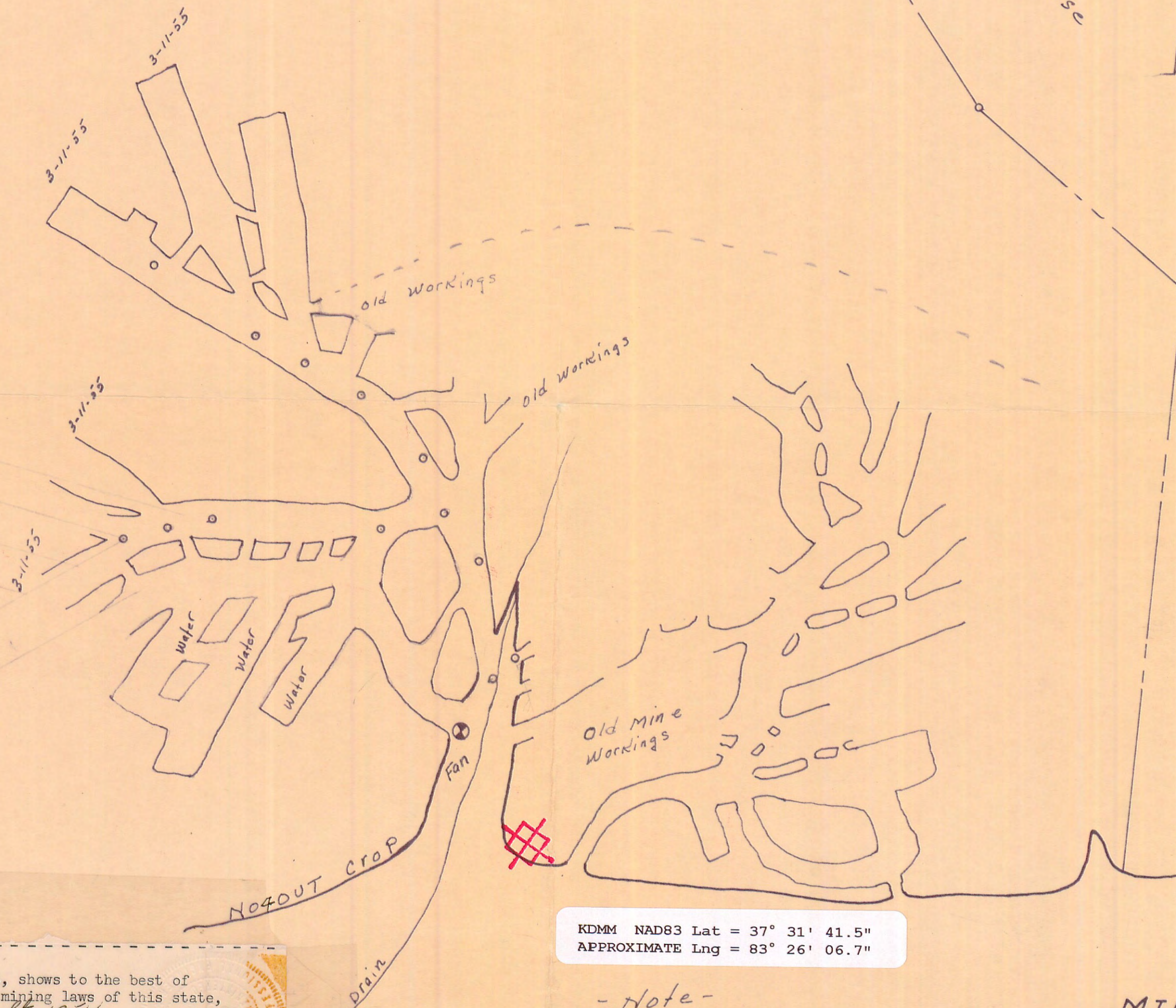
NOTE: Seam = Grassy (Eq. to Upper Elkhorn 2/3)  
Breathitt County - Jackson GQ.

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

Granville Little

Floyd Shouse

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 Baathett, 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

Grassy Little  
Mineral

old works  
not visited

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

G. W. Ham

KRS 352.470."

My term expires 10/18/58.

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

I. 1359

7506



01378\_1953L\_19521231

01378

Willy Brewer

"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 Comm. Expires January 8, 1957

SEAL

John Couch

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"

#4976



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



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 1955  
" JAN 1-1954  
" " 10-1953  
" 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 2nd 1957

H. S. Adkins Engineer

Acknowledged before me, a Notary Public, this 9 day of January 1957.

My Comm. exp. March 15, 1958 Stiles H. Justice Notary Public Bel Co. Ky.



01964\_1958L\_19580212

01964

01964-1\_1958M\_19580212

01964-1

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



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



01964\_1958L\_19580212

01964

01964-1\_1958M\_19580212

01964-1

NOTE: Seam = Grassy (Eq. to Upper Elkhorn No. 2)  
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 cover the period ending  
Feb 12 1958.

Witness my signature this the  
11 day of Feb 1958

A.G. Perkins

State of Kentucky  
County of Knott /SCT  
Subscribed and sworn to before me  
this 11 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  
A.G. Perkins Reg No 1183  
Hindman Ky



02657-1\_1955L\_19541231

02657-1

02657\_1955L\_19541231

02657

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



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 Bawdett*

Acknowledged before me a notary Public  
This Day of *January* 22<sup>nd</sup> 1955 *R. Bawdett*  
my Commission expires the 16<sup>th</sup> Day of *October* 1958  
notary Public Perry County Kentucky

MAP OF *100*  
BILL BRYANT MINE No 2  
ELKATHAWA, BREATHITT CO. KY.  
SCALE 1" = 200 FT. DATE 1-12-55



03947\_1960L\_19600202

03947

NOTE: Seam = Vires (Eq. to Lower Elkhorn)  
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

27 day of Feb 1960

Witness my signature this the  
27 day of Feb 1960

A.G. Perkins

State of Kentucky  
County of Knott /SCT

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

R. J. Mullens

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

N

Highway 30 to Jackson

Cane Creek

out-crop

ditch

Ridge Line NOT Run

submerged  
to water level



SCANNED

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  
19 58.

Witness my signature this the 25  
day of Jan 19 58.

State of Kentucky  
County of Knott / SCT

Subscribed and sworn to before me  
this 25 day of Jan  
19 58

Roy Mullins  
Clerk of Knott County Court

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

SPENCER COAL CO.

outcrop No 4 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 run by others



11002-1

NOTE: CLAMORGAN SEAM - FROM GQ 700



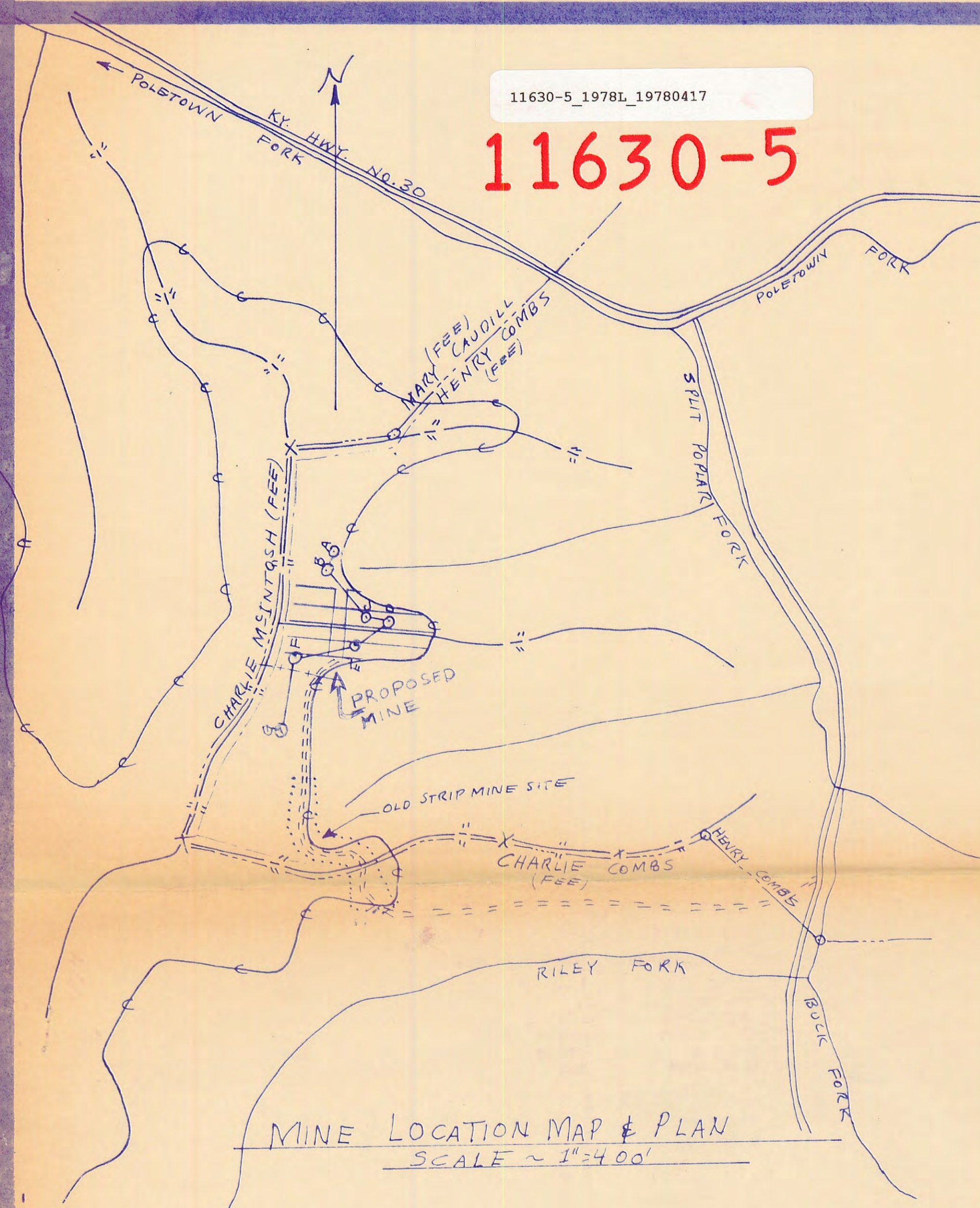
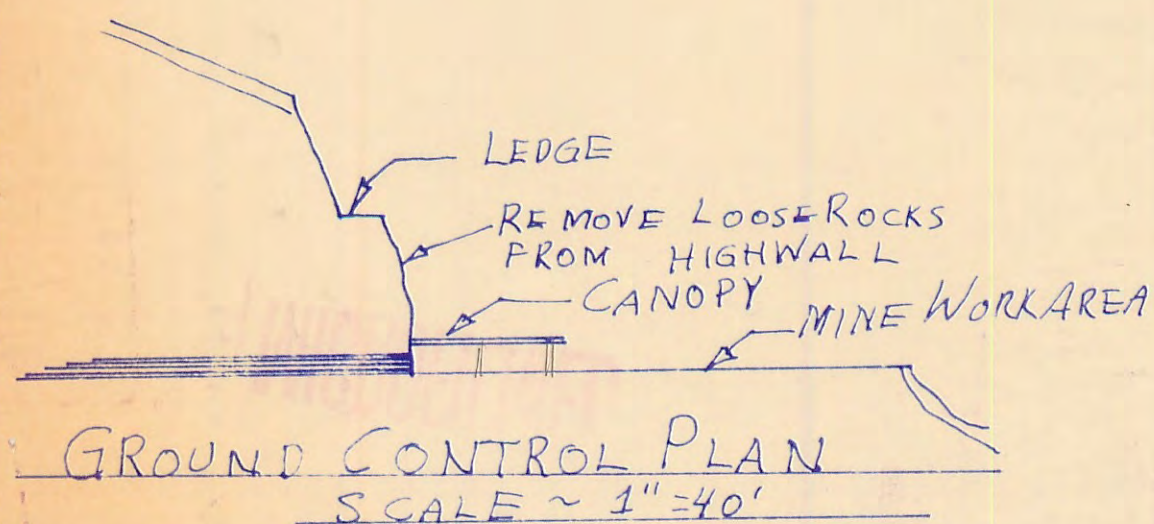
POTTER AND SHOUSE COAL CO.  
MINE No. 2 No. 4 SEAM  
LOCATED ON MILLER BRANCH  
BREATHITT COUNTY 4 KENTUCKY  
SCALE 1" = 100' DATE 10-16-71

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 given to the best of my knowledge.	Acknowledged before me, a Notary Public, this 16 day of Oct 1971 by <u>Ralph Bantitt</u> of <u>Breathitt</u> Kentucky.
<u>Ralph Bantitt</u> Eng'r, Reg. No. 190	<u>My Commission Expires</u> 5-1-73
ENGINEER'S seal	NOTARY seal



11630-5\_1978L\_19780417

11630-5

MINE LOCATION MAP & PLAN  
SCALE ~ 1" = 400'GROUND CONTROL PLAN  
SCALE ~ 1" = 40'

## 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 12, 1978

Walter S. Hoskins ENGR.

Engr's. Reg. No. 7811

Acknowledged before me, a Notary Public this

12th day of April, 1978

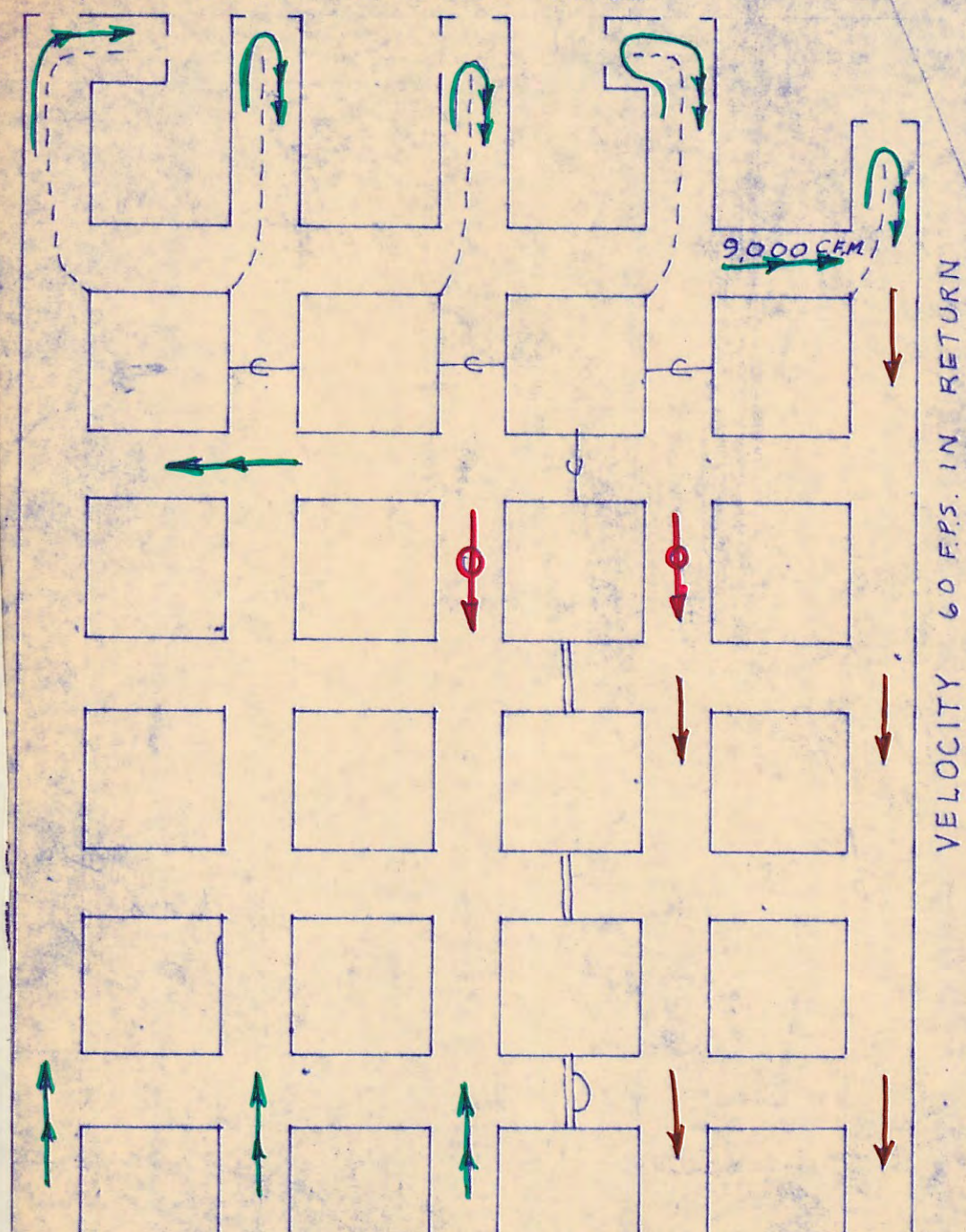
Walter S. Hoskins

London, Kentucky

MY COMMISSION EXPIRES AUG. 27, 1979

ENGINEER'S  
sealNOTARY  
seal

3,000 C.F.M. AT EACH FACE



INE CURTAIN WILL BE MAINTAINED TO WITHIN 10 FEET OF THE DEEPEST PENETRATION OF THE WORKING FACE WHERE COAL IS BEING CUT, MINED, OR LOADED.

FACE PRINT ~ VENTILATION CONTROL SCHEME

## ~ 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

~ DUST CONTROL ~

~ FACE ~ VENTILATION AIR, WATERSPRAY

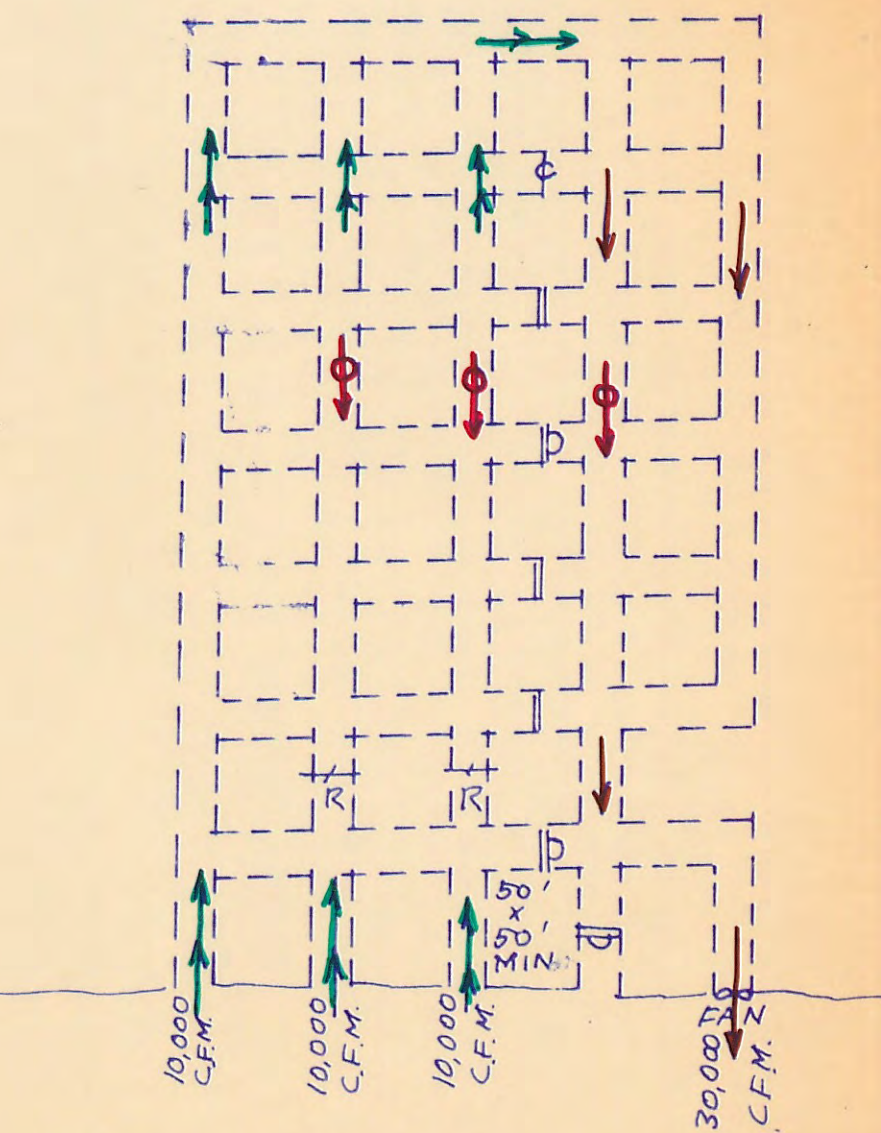
~ HAUL ROADS - WATER AND/OR CALCIUM CHLORIDE

~ FAN DATA ~

~ NAME & SIZE ~ SHOP MADE - 48"  
~ 8 BLADES, ADJUSTABLE  
~ MOTOR, POWER ~ 15 HP, 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. - L&N - 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 &amp; BASE LINE DATA ~

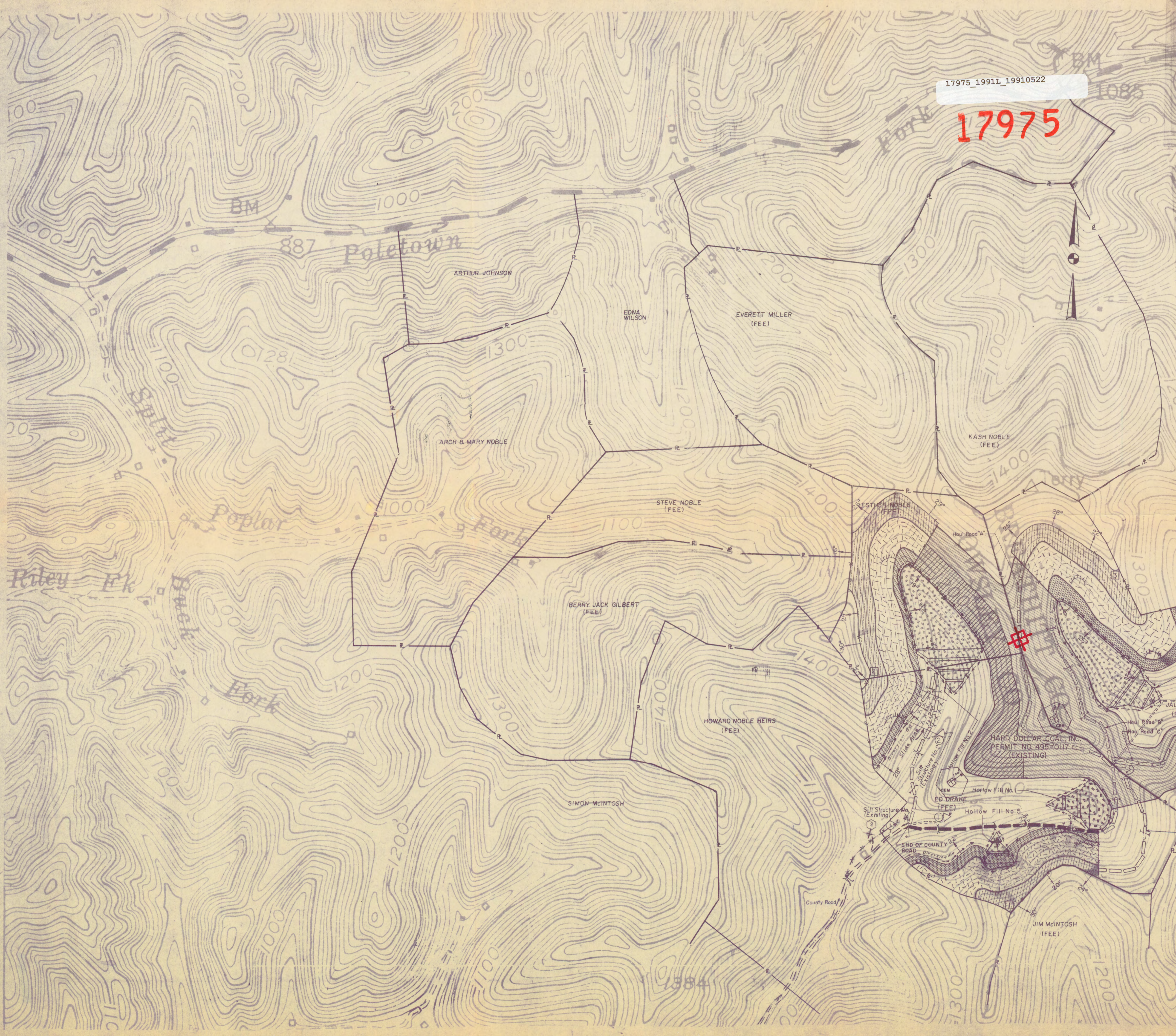
~ B.M. "A" - NOTCH ON 16" MAPLE - EL. 1195'  
~ "B" - NOTCH ON 20" ELM - EL. 1195'  
~ "C" - NOTCH ON 16" POPLAR - EL. 1195'  
~ "D" - NOTCH ON 18" BEECH - EL. 1185'  
~ "E" - NOTCH ON 13" OAK - EL. 1200'  
~ "F" - STAKE - EL. 1190'  
~ "G" - STAKE - EL. 1190'  
A → B S 20° W 85'  
B → C S 38° E 264'  
C → D S 80° E 110'  
D → E S 60° W 175'  
E → F S 80° W 260'  
F → G S 10° W 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.				
SLOPE (In Degrees)		→ 20°	LEGEND	CONTOUR METHOD
DIVERSION DITCH		→ → →	SEAM/ELEVATION	Acres
NON-EXISTENT BUILDING		☒		
PROPERTY LINE SURFACE		— R —	Copeland/1150-1170	13.98
MINERAL		— M —	Haddix/1180-1200	33.11
FEE		— F —	Hazard #7/1330-1350	21.09
GEOLOGIC SAMPLE POINT		I		
TOPSOIL STORAGE AREA		↻		
WATER DISCHARGE MONITORING POINT		① (KPDES)	Spoil Storage Areas	
BACKGROUND SURFACE WATER MONITORING POINT		①	Hollow Fills	24.44
GROUND WATER MONITORING POINT		①		
UNDERGROUND MINE OPENING		↘		
UTILITY LINE (Indicate Type)		— G — W — O —		
WELLS (Indicate Type)		⊙ ⊗ ⊕	Auger Mining	
POWER LINE		— ○ —	Slide Area	1.00
PERMIT BOUNDARY		x — x		
EXISTING PERMIT NO. 495-0117		☒	SILT STRUCTURE(S)	
PREVIOUSLY MINE AREA			EMBANKMENT	1.00
AS OF 12-1-84			DUG-OUT	2.00
SHOW ALL DWELLING, CHURCHES, SCHOOLS, AND CEMETARIES WITHIN 1/2 MILE OF ANY PART OF THE MINING OPERATION.			PROPOSED	1.00
AREA PROPOSED FOR MINING UNDER EXISTING PERMIT NO. 495-0117		☒	PERMITTED	8.27
			EXISTING	7.87
			ACCESS ROAD(S)	
			PROPOSED	96' 2050'
			PERMITTED	36' 6860'
			EXISTING	96' 1700'
			OTHER SURFACE DISTURBANCE(S)	8.27
			Silt Pond Access Roads	20' / 1000'
			TOTAL ACRES PERMITTED	113.5

**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 Angela R. O'Connell





18136

Riley Fk

MAY 11 1954



I, John S. Poore 12535 5/7/94  
Reg. No. Date  
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"







91806\_1949M\_19490102\_s2of2

91806

NOTE: Coal Seam = Vires  
Breathitt County - Jackson Quad

Scale: 1"= 200'

COAL SEAM  
BREATHITT COUNTY  
APPROXIMATE 1949  
83° 30' 45" E  
123° 00' 00" S

From original map

This mine  
located in Breathitt Co.  
the map book is





91953\_1950L\_19500217

91953



NOTE: Coal Seam = Vires  
Breathitt County - Jackson Quad 100

KDMN NAD83 Lat = 37° 33' 05.6"  
APPROXIMATE Lng = 83° 25' 37.2"

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  
property ending February 17, 1950

Acknowledged before me, a Notary Public,  
this 25th day of February, 1950.  
My Comm. expires Apr 11, 1950  
H.S. Adkins Engineer.  
Watts Coal Co  
Elk Katawa, 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

Chas. Jensen

Engineer

"Acknowledged before me, a Notary Public

, this 28

day of Jan 1953

"

William Derry

My Commission Expires January 8, 1957

SEAL

OK. VIRES SEAM JACKSON QUAD.

DEPT. OF MINES AND MINERALS  
LEXINGTON, KENTUCKY

FEB 11 1953

RECEIVED

OLD WORKINGS  
EXTENT UNKNOWN

FAN

MILLER BR. ?

CHUTE

Branch & Road

1.0 Miles to Ky. #52 at Elkatawa, 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'



95660\_1953L\_19530309

KDMM NAD83 Lat = 37° 33' 05.2"  
APPROXIMATE Lng = 83° 25' 37.8"

95660



Annual Report  
Annual Map  
JUN 25 1953  
Approved For Issue By

5660

James & Water, Breathitt  
WATTS MINE MAP COAL CO. COUNTY KY. FEB. 28, 1953 SCALE 1" = 100'

Elktonia, according to 153 FAR. - 60 MILLER BR.

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

"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, 1953, this 9 day of March, 1953"  
William D. Long, Engineer  
Acknowledged before me, a Notary Public  
My Commission Expires January 8, 1957  
SEAL



96121

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

RECEIVED  
JAN 30 1954

DEPT. OF MINES AND MINERALS  
LEXINGTON, KENTUCKY



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.

*[Signature]*, Engineer

Sworn to and subscribed before me this 13 day of January, 1954.  
Witness my hand and official seal.  
*William J. [Signature]*, Notary Public  
My Commission Expires January 8, 1957

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