

WALLER C. HARDY, JR. ET AL  
1-11-47-00834 3707.19 AC.  
(KAN. STATE FOR.)  
SURF

Fracture - issued 8-23-74  
Before 6/5/27   
New Location   
Drill Deeper   
Redrill   
Abandonment   
Partial Plug - issued 8-23-74

I, the undersigned, hereby certify that this map is correct to the best of my knowledge and belief and shows all the information required by Paragraph 5 of the Rules and Regulations of the Oil and Gas Section of the Mining Laws of West Virginia.  
The accuracy of this survey is within the limits and as prescribed in paragraph 5 by the Oil and Gas Division of the Department of Mines Regulations.  
PROVEN ELEVATION 4565 708

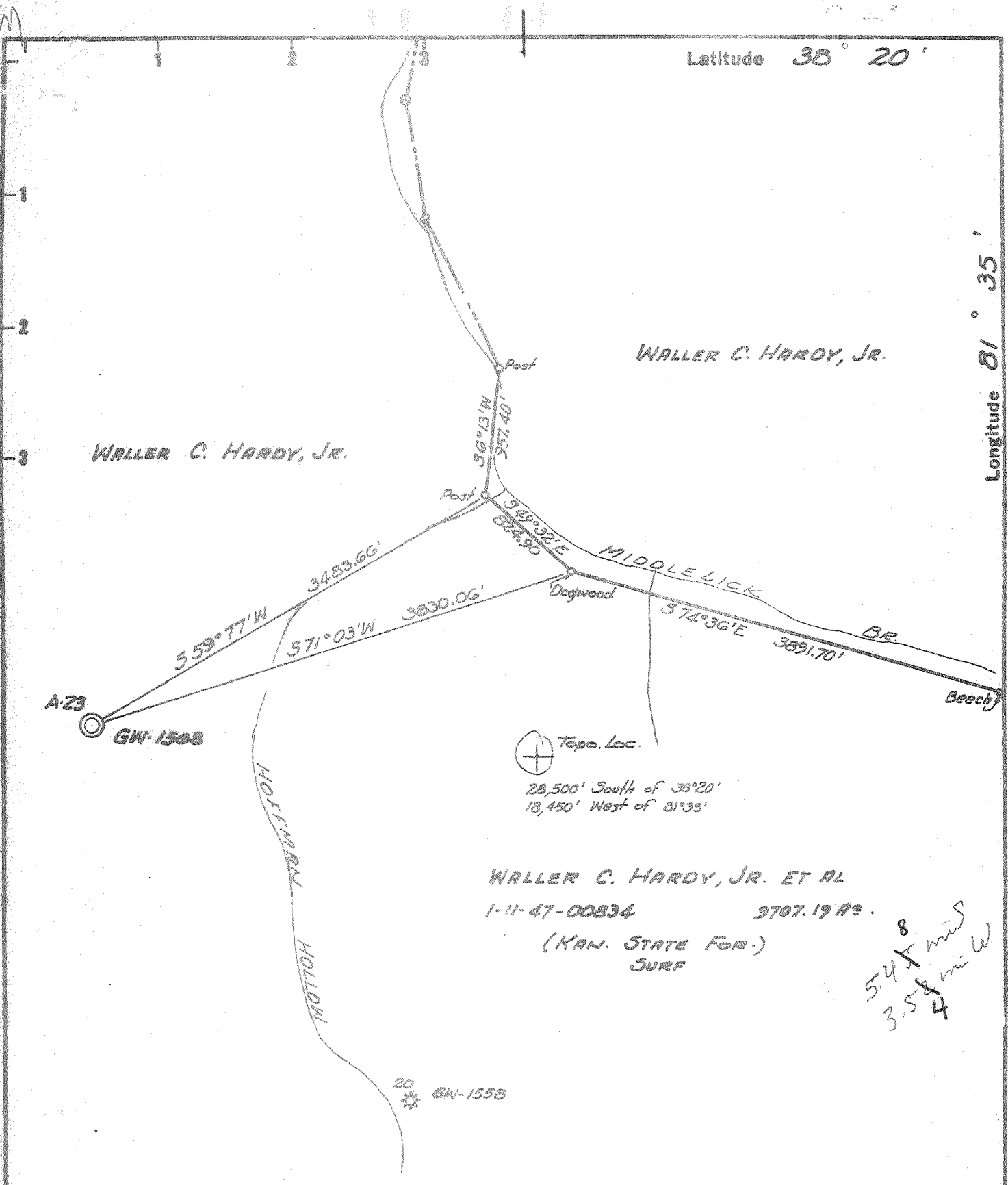
Company CITIES SERVICE OIL COMPANY  
Address BOX 873 CHARLESTON, W.VA.  
Farm WALLER C. HARDY, JR. ET AL  
Tract \_\_\_\_\_ Acres 3707.19 Lease No. 1-11-47-00834  
Well (Farm) No. A-23 Serial No. GW-1568  
Elevation (Spirit Level) 1424.87  
Quadrangle CHARLESTON SC  
County KANAWHA District LOUDON  
Engineer Wendell S. Moore  
Engineer's Registration No. 2113  
File No. \_\_\_\_\_ Drawing No. W-13-65  
Date 11 AUG. 66 Scale 1"=1000'

STATE OF WEST VIRGINIA  
DEPARTMENT OF MINES  
OIL AND GAS DIVISION  
CHARLESTON

WELL LOCATION MAP W  
FILE NO. KAN-2078-PP-FRM

+ Denotes location of well on United States Topographic Maps, scale 1 to 62,500 latitude and longitude lines being represented by border lines as shown.  
- Denotes one inch spaces on border line of original tracing.

47-038



WALLER C. HARDY, JR. ET AL  
 1-11-47-00834 3707.19 AC.  
 (KAN. STATE FOR.)  
 SURF

5.48 mi S  
 3.58 mi W  
 4

- Fracture
- Before 6/5/27
- New Location
- Drill Deeper
- Redrill
- Abandonment

I, the undersigned, hereby certify that this map is correct to the best of my knowledge and belief and shows all the information required by Paragraph 5 of the Rules and Regulations of the Oil and Gas Section of the Mining Laws of West Virginia.  
 The accuracy of this survey is within the limits and as prescribed in paragraph 5 by the Oil and Gas Division of the Department of Mines Regulations.  
 PROVEN ELEVATION 4365 "706"

Company CITIES SERVICE OIL COMPANY  
 Address BOX 879 CHARLESTON, W.VA.  
 Farm WALLER C. HARDY, JR. ET AL  
 Tract \_\_\_\_\_ Acres 3707.19 Lease No. 11-47-00834  
 Well (Farm) No. A-23 Serial No. GW-1508  
 Elevation (Spirit Level) 1424.87  
 Quadrangle CHARLESTON - SC  
 County KANAWHA District LOUDON  
 Engineer Wendell S. Moore  
 Engineer's Registration No. 2113  
 File No. \_\_\_\_\_ Drawing No. 11-13-65  
 Date 11 AUG. 66 Scale 1" = 1000'

STATE OF WEST VIRGINIA  
 DEPARTMENT OF MINES  
 OIL AND GAS DIVISION  
 CHARLESTON

WELL LOCATION MAP  
 FILE NO. KAN-2078

+ Denotes location of well on United States Topographic Maps, scale 1 to 62,500 latitude and longitude lines being represented by border lines as shown.  
 — Denotes one inch spaces on border line of original tracing.

6-6-305  
 Deep Well (newburg)



STATE OF WEST VIRGINIA  
DEPARTMENT OF MINES  
OIL AND GAS DIVISION / 8

Rotary   
Spudder   
Cable Tools   
Storage

Quadrangle Charleston

Permit No. Kan-2078

WELL RECORD

Oil or Gas Well Gas  
(KIND)

Company Cities Service Oil Company  
Address Box 873, Charleston, W. Va. 25323  
Farm W. C. Hardy, Jr., et al Acres 9707  
Location (waters) Hoffman Hollow  
Well No. "A" #23, GW-1568 Elev. 1424.87'  
District Loudon County Kanawha  
The surface of tract is owned in fee by Resources  
656 Capital Building Address Charleston, W. Va.  
Mineral rights are owned by W. C. Hardy, Jr., et al  
P. O. Box 350 Address Parkersburg, W. Va.

Casing and Tubing	Used in Drilling	Left in Well	Packers
Size			
16			Kind of Packer
3 7/8" 48#	27'	27'	none
10			Size of
9-5/8" 32.3#	2099'	2099'	Depth set
6 5/8"			
5 3/16"			
4 1/2" 11.6#	5925'	5925'	Perf. top
3			Perf. bottom
2 3/8" 4.7#	5872'	5872'	Perf. top
Liners Used			Perf. bottom

Drilling commenced 10-14-66  
Drilling completed 11-1-66

Date Shot not shot From                      To                       
With                     

Open Flow                      /10ths Water in                      Inch  
                     /10ths Merc. in                      Inch

Volume                      Cu. Ft.  
Rock Pressure                      lbs.                      hrs.

Oil                      bbls., 1st 24 hrs.  
WELL ACIDIZED (DETAILS) not acidized

WELL FRACTURED (DETAILS) See reverse side

Attach copy of cementing record.  
CASING CEMENTED                      SIZE                      No. Ft.                      Date                       
Amount of cement used (bags)                       
Name of Service Co. see reverse side  
COAL WAS ENCOUNTERED AT 260 FEET 60 INCHES  
                     FEET                      INCHES                      FEET                      INCHES  
                     FEET                      INCHES                      FEET                      INCHES

RESULT AFTER TREATMENT (Initial open Flow or bbls.) 603 MCF (Newberg)  
ROCK PRESSURE AFTER TREATMENT 6 days HOURS 1872#  
Fresh Water: 200' Feet Salt Water                      Feet  
Producing Sand Newberg Depth 5817-36' (per electric logs)

Formation	Color	Hard or Soft	Top	Bottom	Oil, Gas or Water	Depth	Remarks
Sand			0	260			
Coal			260	265	F. water	200'	
Grey Shale			265	295			
Sand and Shale			295	415			
Shale			415	440			
Sand and Shale			440	600			
Shale			600	1005			
Sandy Shale			1005	1270			
Sand - <u>Sand</u>			1270	1405			
Sandy Lime			1405	1480			
Sand and Shale streaks			1480	1670			
Sand - <u>Marion</u>			1670	1720			
Sandy Lime			1720	1760			
Lime - <u>Big Lime</u>			1760	2030			
Big Injun - <u>365</u>			2030	2050			
Shale - <u>Maxcady</u>			2050	2080			
Sand and Shale			2080	2445			
Sand - <u>Bear</u>			2445	2460			
Sand and Shale			2460	5046			
Onondaga Lime			5046	5145			
Shale and Lime			5145	5205			
Sandy Shale			5205	5655			
Shale			5655	5690			
Dolomite			5690	5824			
Newberg Sand			5824	5850			
Sandy Shale			5850	5890			

Deep well

Formation	Color	Hard or Soft	Top	Bottom	Oil, Gas or Water	Depth Found	Remarks
Total depth				5890'	Drillers' Meas.		
Plugged back depth				5884'	Schlumberger's Meas.		
				5880'			
Electric Logs show:							
Big Injun			2005	2038			
Oriskany			5136	5147			
Newberg			5817	5836			
<b>CASING RECORD</b>							
10-14-66	Set and cemented 13-3/8" 48# H-40 new casing at 27' with 14 sacks regular cement.						
10-20-66	Set and cemented 9-5/8" 32.3# H-40 new casing at 2,080' with 165 sacks regular cement with friction reducer and 2% Calcium Chloride. Centralizers at 2,048', 1,950', 1,853' and 1,756'. Gelled with lost circulation material pumped ahead of cement.						
11-2-66	Set and cemented 4-1/2" 11.6# J-55 A-Grade casing at 5,884' with 96 sacks Pozmix and 800 gallons Cement. Insert at 5,880'. Centralizers 5,854', 5,804', 5,711', 5,613', 5,515' and 5,415'. Baker Reciprocating scratchers on 12' centers 5881-5629'						
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10-20-66	Drillers' depth 2,080'. Ran Schlumberger Gamma Ray, Caliper, Density and Induction Logs. Schlumberger's T. D. 2,076'.						
11-1-66	Drillers' T. D. 5,890'. Ran Schlumberger Gamma Ray, Caliper, Density and Induction Logs. Schlumberger T. D. 5,884'						
11-14-66	Ran McCullough Correlation Gamma Ray, Collar Locator and Cement Bond Log. Loggers' T. D. 5,880'.						
11-15-66	Perforated Newberg Sand 5818-5820', 5823-5825' and 5828-5830' with 4 shots/foot for a total of 27 holes.						
11-17-66	<b>FRACTURED THE NEWBERG SAND</b>						
	Spotted 1,000 gallons regular 15% acid and 500 gallons MCA. Pumped into Newberg at 2,150#. Fraced Newberg down the annulus with 28,000# 20-40 sand in 26,000 gallons gelled water. Maximum treating pressure 5,400#. Average treating pressure 5,300#. Immediate S.I. pressure 3,900#. Average injection rate 10.1 bbls/minute. Used 791 barrels fluid during treatment.						
12-1-66	Final open flow 603 MCFD. 6 day shut in pressure tubing 1,868#-Annulus 1,872#.						

Date December 12, 1966

APPROVED Cities Service Oil Company, Owner

By Verlin Meier, Prod. Engr.  
(Title)



STATE OF WEST VIRGINIA  
DEPARTMENT OF MINES  
**Oil and Gas Division**  
**WELL RECORD**

Quadrangle Charleston  
Permit No. KAN-2078 -PP-FRAC.

Rotary \_\_\_\_\_ Oil \_\_\_\_\_  
Cable X Gas X  
Recycling \_\_\_\_\_ Comb. \_\_\_\_\_  
Water Flood \_\_\_\_\_ Storage \_\_\_\_\_  
Disposal \_\_\_\_\_ (Kind) \_\_\_\_\_

Company <u>Cities Service Oil Company</u> Address <u>Box 873, Charleston, W. Va. 25323</u> Farm <u>Waller C. Hardy, Jr. et al</u> Acres <u>9707.19</u> Location (waters) <u>Hoffman Hollow</u> Well No. <u>"A" #23, GW-1568</u> Elev. <u>1424.87</u> District <u>Loudon</u> County <u>Kanawha</u> The surface of tract is owned in fee by <u>Dept. of Natl. Resources, Charleston, W. Va. 25305</u> Address _____ Mineral rights are owned by <u>Waller C. Hardy, et al</u> Address <u>P O Box 350, Parkersburg, WVa.</u> Drilling Commenced <u>11-19-74</u> Drilling Completed <u>12-11-74</u> Initial open flow <u>T.S.T.M.</u> cu. ft. <u>0</u> bbls. Final production <u>267 M</u> cu. ft. per day <u>0</u> bbls. Well open <u>4</u> hrs. before test <u>350#</u> RP.	Casing and Tubing Size 20-16 Cond. 13-10" 13-3/8" 9 5/8 32.75# 8 5/8 7 5 1/2 4 1/2 11.6# 3 2 -3/8 4.7EUE Liners Used	Used in Drilling 27' 2099'    5925 2045	Left in Well 27' 2099'    1085' 2045	Cement fill up Cu. ft. (Sks.)  14 sx 165 sx w/2% Ca Cl  96 sx Pozmix
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Well treatment details: Attach copy of cementing record.  
Well plugged back from Newburg Sand to Big Injun . Spotted cement plugs @ 5872-5614', pulled 4-1/2" casing, cement plug 4780-4644, Set BP @ 2070', dumped 3 sx calseal on top BP to 2061' PBTD. Perforated 2006-8', 2010-19', 2021-24', and 2032'-37' w/1 shot -foot. Frac w/750 gal mud acid, 30,000# 20-40 sand and 28,550 gal. of gelled water

Coal was encountered at 260 Feet 60 Inches  
Fresh water 200 Feet Salt Water \_\_\_\_\_ Feet  
Producing Sand Big Injun Depth 2005-2038 elect log tops

Formation	Color	Hard or Soft	Top Feet	Bottom Feet	Oil, Gas or Water	* Remarks
Sand			0	260		
Coal			260	265	F. Water 200'	
Grey Shale			265	295		
Sand and Shale			295	415		
Shale			415	440		
Sand and Shale			440	600		
Shale			600	1005		
Sandy Shale			1005	1270		
Sand			1270	1405		
Sandy Lime			1405	1480		
Sand and Shale Streaks			1480	1670		
Sand			1670	1720		
Sandy Lime			1720	1760		
Lime			1760	2030		
<u>Big Injun</u>			2030	2050		
Shale			2050	2080	2061' PBTD	
					5884' T.D.	

RECEIVED  
JAN 13 1975

(over)

\* Indicates Electric Log tops in the remarks section.



STATE OF WEST VIRGINIA  
DEPARTMENT OF MINES

RECEIVED

AUG 23 1974

OIL & GAS DIVISION  
DEPT. OF MINES

Oil and Gas Division

OIL AND GAS WELL PERMIT APPLICATION

TO THE DEPARTMENT OF MINES,  
Charleston, W. Va.

DATE August 23, 1974

Surface Owner Dept. of Natural Resources

Company Cities Service Oil Company

Address Charleston, W. Va. 25305

Address Box 873, Charleston, W. Va. 25323

Mineral Owner W.C. Hardy, Jr., etal

Farm Waller C. Hardy, Jr. etal Acres 9707.19

Address P.O. Box 350, Parkersburg, W. Va.

Location (waters) Hoffman Hollow

Coal Owner Waller C. Hardy, Jr. etal & Charlotte

Well No. "A" #23, OM 1568 Elevation 1424.87

Address P.O. Box 350, Parkersburg, W. Va.

District Louden County Kanawha

Coal Operator Frank A. Hardy & Katherine

Quadrangle Charleston

Address Rupert Route, Lewisburg, W. Va.

THIS PERMIT MUST BE POSTED AT THE WELL SITE

All provisions being in accordance with Chapter 22, of the W. Va. Code, the location is hereby approved for fracturing. This permit shall expire if operations have not commenced by 12-23-74

INSPECTOR TO BE NOTIFIED  
Martin Nichols  
Clendenin, W.Va. FBI 548-1961  
25015

John S. [Signature]  
Deputy Director - Oil & Gas Division

GENTLEMEN:

The undersigned well operator is entitled to drill upon the above named farm or tract of land for oil and gas, having fee title thereto, (or as the case may be) under grant or lease dated April 22 1959 by Waller C. Hardy, etal made to Col. Carbon Co. (now Cities Service Oil Co.) and recorded on the \_\_\_\_\_ day of \_\_\_\_\_ 19\_\_\_\_, in \_\_\_\_\_ County, Book 147 Page 374

\_\_\_\_\_NEW WELL \_\_\_\_\_DRILL DEEPER \_\_\_\_\_REDRILL \_\_\_\_\_X \_\_\_\_\_FRACTURE OR STIMULATE \_\_\_\_\_OIL AND GAS WELL ORIGINALLY DRILLED BEFORE JUNE 5, 1969.

The enclosed plat was prepared by a registered engineer or licensed land surveyor and all coal owners and/or operators have been notified as of the above date.

The above named coal owners and/or operator are hereby notified that any objection they wish to make, or are required to make by Section 3 of the Code, must be received by, or filed with the Department of Mines within ten (10) days. \*

Copies of this notice and the enclosed plat were mailed by registered mail, or delivered to the above named coal operators or coal owners at their above shown respective address same day \_\_\_\_\_ before, or on the same day with the mailing or delivery of this copy to the Department of Mines at Charleston, West Virginia.

Very truly yours, CITIES SERVICE OIL COMPANY  
(Sign Name) Walter S. [Signature]  
Well Operator

PLEASE SUBMIT COPIES OF ALL  
GEOLOGICAL LOGS DIRECTLY TO:

West Virginia Geological and Economic Survey  
P. O. Box 879  
Martinsburg, W. Va. 26505  
Tel. 304-296-4461

Address \_\_\_\_\_  
of \_\_\_\_\_  
Well Operator \_\_\_\_\_  
Box 873 Street  
Charleston City or Town  
West Virginia 25323 State

\*SECTION 3 . . . . If no objections are filed or found by the Department of mines, within said period of ten days from the receipt of notice and plat by the department of mines, to said proposed location, the department shall forthwith issue to the well operator a permit reciting the filing of such plat, that no objections have been made by the coal operators or found thereto by the department and that the same is approved and the well operator authorized to proceed.

BLANKET BOND

W  
KAN.-2078-PP ERAC PERMIT NUMBER

47-039

**THIS IS AN ESTIMATE ONLY**  
**ACTUAL INFORMATION WILL BE SUBMITTED ON OG-10 UPON COMPLETION**

PROPOSED WORK ORDER TO \_\_\_\_\_ DRILL \_\_\_\_\_ DEEPEN  FRACTURE-STIMULATE  
 DRILLING CONTRACTOR: (If Known) \_\_\_\_\_ RESPONSIBLE AGENT: \_\_\_\_\_  
 NAME Unknown \_\_\_\_\_ NAME Sam J. Matthews \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ ADDRESS Box 873, Charleston, W. Va. 25323 \_\_\_\_\_  
 TELEPHONE \_\_\_\_\_ TELEPHONE 344-8383 \_\_\_\_\_  
 ESTIMATED DEPTH OF COMPLETED WELL: 2060' \_\_\_\_\_ ROTARY \_\_\_\_\_ CABLE TOOLS  \_\_\_\_\_  
 PROPOSED GEOLOGICAL FORMATION: Big Injun \_\_\_\_\_  
 TYPE OF WELL: OIL \_\_\_\_\_ GAS  COMB. \_\_\_\_\_ STORAGE \_\_\_\_\_ DISPOSAL \_\_\_\_\_  
 RECYCLING \_\_\_\_\_ WATER FLOOD \_\_\_\_\_ OTHER \_\_\_\_\_

TENTATIVE CASING PROGRAM:

CASING AND TUBING SIZE	USED FOR DRILLING	LEFT IN WELL	CEMENT FILL UP OR SACKS - CUBIC FT.
20 - 16			
13 - 10 <u>13-3/8" 4.8#/ft.</u>	<u>27'</u>	<u>27'</u>	<u>14 sx 16.5 cu ft.</u>
9 - 5/8 <u>32.3#/ft.</u>	<u>2099'</u>	<u>2099'</u>	<u>165 sx 195 cu. ft.</u>
8 - 5/8			
7			
5 1/2			
4 1/2 <u>11.6#/ft.</u>	<u>5925'</u>	<u>Est. 722'</u>	<u>48 sx 56.6</u>
3			Perf. Top <u>2006'</u>
2 <u>-3/8" 4.7#/ft.</u>	<u>5872'</u>	<u>Est. 2000'</u>	Perf. Bottom <u>2038'</u>
Liners			Perf. Top
			Perf. Bottom

APPROXIMATE FRESH WATER DEPTHS 200 FEET \_\_\_\_\_ SALT WATER \_\_\_\_\_ FEET \_\_\_\_\_  
 APPROXIMATE COAL DEPTHS 260 \_\_\_\_\_  
 IS COAL BEING MINED IN THE AREA? No BY WHOM? \_\_\_\_\_

TO DRILL:

SUBMIT FIVE (5) COPIES OF OG - 1, \$100.00 PERMIT FEE, PERFORMANCE BOND AND PERMANENT COPY OF PLAT.

TO DRILL DEEPER OR REDRILL:

SUBMIT FIVE (5) COPIES OF OG - 1, SHOWING ORIGINAL PERMIT NUMBER AND PERFORMANCE BOND. ON WELLS DRILLED PRIOR TO 1929, A PERMANENT COPY OF THE PLAT AND THE ORIGINAL WELL RECORD MUST ALSO BE SUBMITTED.

TO FRACTURE - STIMULATE:

OIL AND/OR GAS WELL ORIGINALLY DRILLED BEFORE JUNE 5, 1929, FIVE (5) COPIES OG - 1, PERFORMANCE BOND, PERMANENT PLAT AND ORIGINAL WELL RECORD.

OIL AND/OR GAS WELL ORIGINALLY DRILLED ON AND/OR AFTER JUNE 5, 1929, FIVE COPIES OG - 1, SHOWING ORIGINAL PERMIT NUMBER, AND PERFORMANCE BOND.

Required forms must be filed within ninety (90) days of completion for bond release. Inspector to be notified twenty-four (24) hours in advance.

The following waiver must be completed by the coal operator if the permit is to be issued within ten days of receipt thereof.

WAIVER: I the undersigned, Agent for \_\_\_\_\_ Coal Company, Owner or Operator of the coal under this lease have examined and place on our mine maps this proposed well location.

We the \_\_\_\_\_ Coal Company have no objections to said well being drilled at this location, providing operator has complied with all rules and regulations in Articles 4, 5, and 7, Chapter 22 of the West Virginia Code.

\_\_\_\_\_  
 For Coal Company

\_\_\_\_\_  
 Official Title