

8,900

LATITUDE 38° 47' 30"

LONGITUDE 81° 12' 30"

SFB 6/23/87
Jamie 6/29/89

MARY FRANK
54 AC.

EDWARD SMITH
24 AC.

RONALD NICHOLS
26 AC.

S-51-E
434.4'

S-14-45-E
508.2'

S-47-45-E
1088.5'

IRON
ROD

N-70-26-W
717.8'

N-68-15-W
693'

WELL

N-7-39-W
1529'

ORAS COTTRELL
123.2 AC.

ORAS
COTTRELL
50 AC.

WESTVACO
151 AC.

ORAS COTTRELL
39.11 AC.

(167)
1167

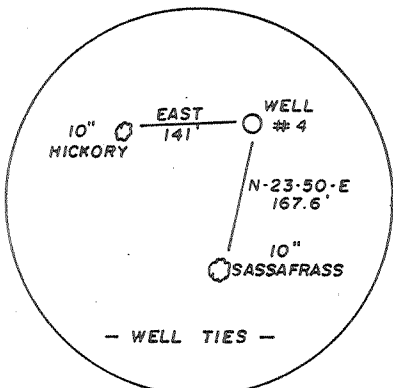
TOPO LOC.

550
3.92

2.62
1.68

THOMAS HARPER
32 AC.

SEC - 48
CLOVER RUN



FILE NO. _____
 DRAWING NO. _____
 SCALE 1" = 500'
 MINIMUM DEGREE OF
 ACCURACY 1 IN 200'
 PROVEN SOURCE OF
 ELEVATION INTER. OF CLOVER RUN RD.
 AND FARM RD. ELV. 754

I THE UNDERSIGNED, HEREBY CERTIFY THAT
 THIS PLAT IS CORRECT TO THE BEST OF MY
 KNOWLEDGE AND BELIEF AND SHOWS ALL THE
 INFORMATION REQUIRED BY LAW AND THE REGU-
 LATIONS ISSUED AND PRESCRIBED BY THE DEPART-
 MENT OF MINES.

(SIGNED) [Signature]
 R.P.E. _____ L.L.S. _____

PLACE SEAL HERE

STATE OF WEST VIRGINIA
 DEPARTMENT OF MINES
 OIL AND GAS DIVISION



DATE 6/1, 19 87
 OPERATOR'S WELL NO. # 4 Kaufman
 API WELL NO. _____
47 - 087 - 4054
 STATE COUNTY PERMIT

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

WELL TYPE: OIL GAS LIQUID INJECTION _____ WASTE DISPOSAL _____
 (IF "GAS,") PRODUCTION STORAGE _____ DEEP _____ SHALLOW

LOCATION: ELEVATION 1098 WATER SHED CLOVER RUN

DISTRICT SMITHFIELD 5 COUNTY ROANE

QUADRANGLE ARNOLDSBURG 7.5' 219 004 7

SURFACE OWNER ORAS COTTRELL ACREAGE 123.2

OIL & GAS ROYALTY OWNER JOSEPH COTTON ETAL LEASE ACREAGE 648

LEASE NO. _____

PROPOSED WORK: DRILL CONVERT _____ DRILL DEEPER _____ REDRILL _____ FRACTURE OR
 STIMULATE _____ PLUG OFF OLD FORMATION _____ PERFORATE NEW
 FORMATION _____ OTHER PHYSICAL CHANGE IN WELL (SPECIFY) _____

PLUG AND ABANDON _____ CLEAN OUT AND REPLUG _____
 TARGET FORMATION MACELLUS SHALE ESTIMATED DEPTH 5500
 WELL OPERATOR BOGGS NATURAL GAS DESIGNATED AGENT HARRY BOGGS
 ADDRESS P.O. BOX 148 103 ADDRESS P.O. BOX 148

SPENCER W.V. 25276

SPENCER W.V. 25276

DEEPWELL

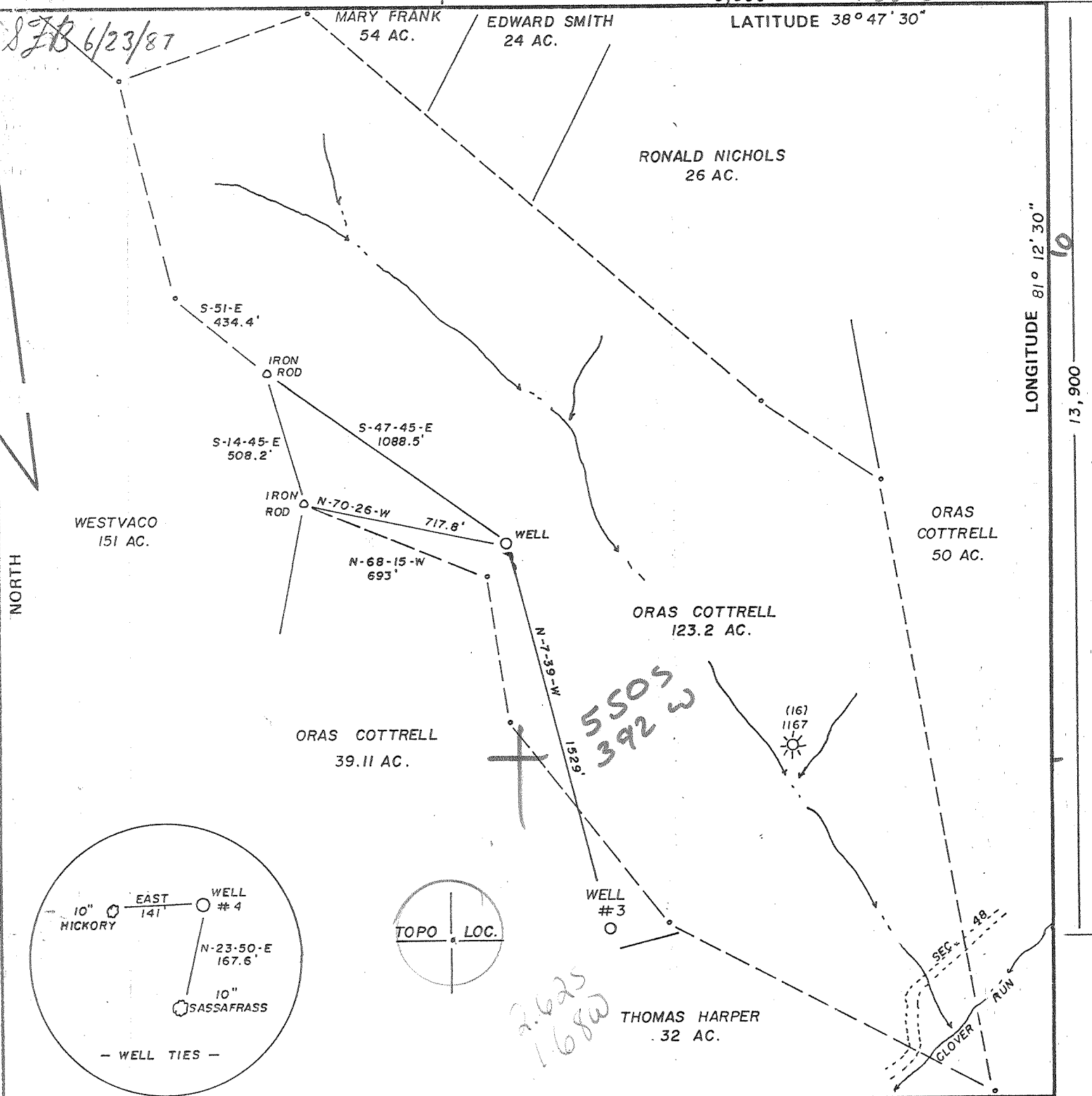
006' 13"

www

ROANE 4054

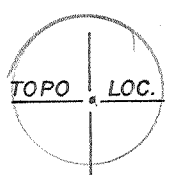
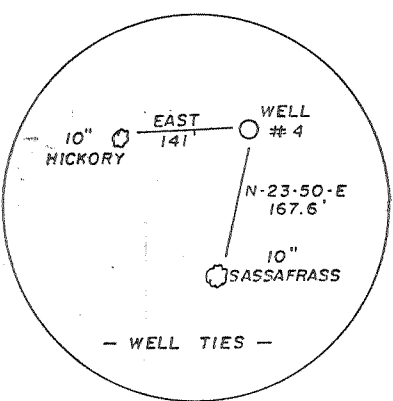
878 6/23/87

8,900 38 50



NORTH

LONGITUDE 81° 12' 30\"/>



FILE NO. _____
 DRAWING NO. _____
 SCALE 1" = 500'
 MINIMUM DEGREE OF ACCURACY 1 IN 200'
 PROVEN SOURCE OF ELEVATION INTER. OF CLOVER RUN RD. AND FARM RD. ELV. 754

I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF MINES.
 (SIGNED) Sheldon J. Board
 R.P.E. _____ L.L.S. 5/26

PLACE SEAL HERE

STATE OF WEST VIRGINIA
 DEPARTMENT OF MINES
 OIL AND GAS DIVISION



DATE 6/1, 19 87
 OPERATOR'S WELL NO. # 4 Kaufman
 API WELL NO. 47-087-4054
 STATE COUNTY PERMIT

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS
 WELL TYPE: OIL X GAS X LIQUID INJECTION _____ WASTE DISPOSAL _____
 (IF "GAS,") PRODUCTION X STORAGE _____ DEEP _____ SHALLOW X
 LOCATION: ELEVATION 1098 WATER SHED CLOVER RUN
 DISTRICT SMITHFIELD COUNTY ROANE
 QUADRANGLE ARNOLDSBURG 7.5' 219 004 7+SW-15'
 SURFACE OWNER ORAS COTTRELL ACREAGE 123.2
 OIL & GAS ROYALTY OWNER JOSEPH COTTON ETAL LEASE ACREAGE 648
 LEASE NO. _____
 PROPOSED WORK: DRILL X CONVERT _____ DRILL DEEPER _____ REDRILL _____ FRACTURE OR STIMULATE _____ PLUG OFF OLD FORMATION _____ PERFORATE NEW FORMATION _____ OTHER PHYSICAL CHANGE IN WELL (SPECIFY) _____

PLUG AND ABANDON _____ CLEAN OUT AND REPLUG _____
 TARGET FORMATION MACELLUS SHALE ESTIMATED DEPTH 5500
 WELL OPERATOR BOGGS NATURAL GAS DESIGNATED AGENT HARRY BOGGS DPP-Orondaga
 ADDRESS P.O. BOX 148 ADDRESS P.O. BOX 148
SPENCER W.V. 25276 DEEPWELL SPENCER W.V. 25276

AUG 03 1987

FORM IV-6 (8-78)



RECEIVED
FEB 18 1988

State of West Virginia
DEPARTMENT OF ENERGY
Oil and Gas Division

Date October 28, 1987
Operator's
Well No. Kauffman No. 4
Farm Oras Cottrell
API No. 47 - 087 - 4054

DIVISION OF OIL & GAS
DEPARTMENT OF ENERGY WELL OPERATOR'S REPORT
OF

DRILLING, FRACTURING AND/OR STIMULATING, OR PHYSICAL CHANGE

WELL TYPE: Oil ___ / Gas x / Liquid Injection ___ / Waste Disposal ___ /
(If "Gas," Production x / Underground Storage ___ / Deep x / Shallow ___ /)

LOCATION: Elevation: 1098 Watershed Clover Run
District: Smithfield County Roane Quadrangle Arnoldsburg

COMPANY Boggs Natural Gas Company

ADDRESS P.O. Box 148 Spencer, WV 25276

DESIGNATED AGENT Harry C. Boggs

ADDRESS P.O. Box 148 Spencer, WV 25276

SURFACE OWNER Oras Cottrell

ADDRESS Otto Route Spencer, WV 25276

MINERAL RIGHTS OWNER Kauffman Heirs

ADDRESS _____

OIL AND GAS INSPECTOR FOR THIS WORK Homer

Daugherty ADDRESS Looneyville, WV 25259

PERMIT ISSUED _____

DRILLING COMMENCED 9/15/87

DRILLING COMPLETED 10/5/87

IF APPLICABLE: PLUGGING OF DRY HOLE ON
CONTINUOUS PROGRESSION FROM DRILLING OR
REWORKING. VERBAL PERMISSION OBTAINED
ON _____

Casing & Tubing	Used in Drilling	Left in Well	Cement fill up XXXXXX Linear
Size 20-16 Cond.			
13-10"	250	250	Surface
9 5/8			
8 5/8			
7	1,958	1,958	600'
5 1/2			
4 1/2	6,000	6,000	4,500'
3			
2			
Liners used			

GEOLOGICAL TARGET FORMATION Corniferous Lime Depth 6,000 feet

Depth of completed well 6,000 feet Rotary x / Cable Tools _____

Water strata depth: Fresh N/A feet; Salt N/A feet

Coal seam depths: _____ Is coal being mined in the area? NO

OPEN FLOW DATA

Producing formation Devonian Shale Pay zone depth 2,400-5,800 feet

Gas: Initial open flow 20 Mcf/d Oil: Initial open flow 0 Bbl/d

Final open flow 400 Mcf/d Oil: Final open flow 0 Bbl/d

Time of open flow between initial and final tests 12 hours

Static rock pressure 1200 psig (surface measurement) after 48 hours shut in

(If applicable due to multiple completion--)

Second producing formation Corniferous Lime Pay zone depth 5,950-6,000 feet

Gas: Initial open flow 0 Mcf/d Oil: Initial open flow 0 Bbl/d

Final open flow 50 Mcf/d Oil: Final open flow 0 Bbl/d

Time of open flow between initial and final tests 12 hours

Static rock pressure 1200 psig (surface measurement) after 48 hours shut in

30 Mcf
of for
well

FEB 22 1988

(C... ..)

DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC.

1st Stage	<u>Marc → Onan</u> 5,900' - 6,000'	- 15 shots	4,000 gal. Hcl	
2nd Stage	<u>Cash ← Rh</u> 5,835' - 5,200'	- 30 shots	60,000# sand	500,000 scf N ₂
3rd Stage	<u>A ← H</u> 5,200' - 4,400'	- 30 shots	60,000# sand	500,000 scf N ₂

WELL LOG

FORMATION	COLOR	HARD OR SOFT	TOP FEET	BOTTOM FEET	REMARKS Including indication of all fresh and salt water, coal, oil and gas
Big Lime			2,040-	2,110	<div data-bbox="1034 845 1428 989" data-label="Text"> <p>RECEIVED</p> </div> <div data-bbox="1120 946 1331 989" data-label="Text"> <p>FEB 18 1988</p> </div> <div data-bbox="1048 1013 1406 1082" data-label="Text"> <p>DIVISION OF OIL & GAS DEPARTMENT OF ENERGY</p> </div>
Big Injun			2,110	2,140	
Coffee Shale			2,540	2,545	
Berea			2,545	2,560	
Shale			2,560	5,900	
Marcellus Shale			5,900	5,950	
<u>Corniferous Lime</u>			5,950	<u>6,000</u>	

~4700-6000 ft.
S J10
S2
SSO Rh
6000
5950
250 cyp. ftg.

(Attach separate sheets as necessary)

Boggs Natural Gas Company
Well Operator
By: Jeffrey C. Boggs Engineer
Date: 10/28/87

Note: Regulation 2.02(i) provides as follows:
"The term 'log' or 'well log' shall mean a systematic detailed geological record of all formations, including ... encountered in the drilling of a well."

1242

087 4054-F

Issued 6/29/89 Expired 6/29/91

Page of

FORM WW-2B

STATE OF WEST VIRGINIA
DEPARTMENT OF ENERGY, DIVISION OF OIL AND GAS
WELL WORK PERMIT APPLICATION

0455, 5, 219

- 1) Well Operator: Boggs Natural Gas Company
- 2) Operator's Well Number: Kauffman #4 3) Elevation: 1098
- 4) Well type: (a) Oil / or Gas /
(b) If Gas: Production / Underground Storage /
Deep / Shallow /
- 5) Proposed Target Formation(s): Big Injun
- 6) Proposed Total Depth: 2150 feet
- 7) Approximate fresh water strata depths: 150
- 8) Approximate salt water depths: 1400
- 9) Approximate coal seam depths: None
- 10) Does land contain coal seams tributary to active mine? Yes / No /
- 11) Proposed Well Work: Frac Big Injun in existing well with nitrogen
- 12)

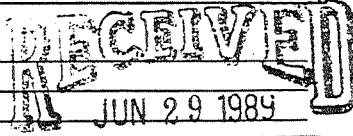
CASING AND TUBING PROGRAM

Existing Well

TYPE	SPECIFICATIONS			FOOTAGE INTERVALS		CEMENT
	Size	Grade	Weight per ft.	For drilling	Left in well	Fill-up (cu. ft.)
Conductor						
Fresh Water	10-3/4			250	250	Surface
Coal						
Intermediate	7"			1,958	1,958	600'
Production	4 1/2"			6,000	6,000	4,500'
Tubing						
Liners						

9077

PACKERS : Kind _____
 Sizes _____
 Depths set _____



For Division of Oil and Gas Use Only DIVISION OF OIL & GAS
DEPARTMENT OF ENERGY

15606
 15
 Fee(s) paid: Well Work Permit Reclamation Fund WPCP
 Plat WW-9 WW-2B Bond Blanket letter Agent
 (Type)

RECEIVED
JUN 29 1989

DIVISION OF OIL & GAS 3)
DEPARTMENT OF ENERGY

Date: June 28, 1989
Operator's well number
Kauffman #4
API Well No: 47 - 087 - 4054 -FRAC
State - County - Permit

STATE OF WEST VIRGINIA
DEPARTMENT OF ENERGY, DIVISION OF OIL AND GAS
NOTICE AND APPLICATION FOR A WELL WORK PERMIT

4) Surface Owner(s) to be served:
(a) Name Oris Cottrell
Address Spencer, WV

(b) Name _____
Address _____

(c) Name _____
Address _____

6) Inspector Homer Daugherty
Address Looneyville, WV

Telephone (304)- 927-4591

5) (a) Coal Operator:
Name NONE
Address _____

(b) Coal Owner(s) with Declaration
Name NONE
Address _____

Name _____
Address _____

(c) Coal Lessee with Declaration
Name NONE
Address _____

TO THE PERSON(S) NAMED ABOVE TAKE NOTICE THAT:

_____ Included is the lease or leases or other continuing contract or contracts by which I hold the right to extract oil and gas OR XX Included is the information required by Chapter 22B, Article 1, Section 8(d) of the Code of West Virginia (see page 2)
I certify that as required under Chapter 22B of the West Virginia Code I have served copies of this notice and application, a location plat, and accompanying documents pages 1 through _____ on the above named parties, by:
X Personal Service (Affidavit attached)
_____ Certified Mail (Postmarked postal receipt attached)
_____ Publication (Notice of Publication attached)

I have read and understand Chapter 22B and 38 CSR 11-18, and I agree to the terms and conditions of any permit issued under this application.
I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete.

I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.
Well Operator Boggs Natural Gas
By: Jeffery C. Boggs *Jeffery C. Boggs*
Its: Engineer
Address P. O. Box 148
Spencer, WV 25276
Telephone 927-1236

Subscribed and sworn before me this 28th day of June, 1989
Quinn D. Richards

My commission expires July 13, 1992 Notary Public

WR-35
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JUL 03 1989

29-Jun-89
API # 47- 87-04054 F

State of West Virginia
DEPARTMENT OF ENERGY
Division of Oil and Gas

DIVISION OF OIL & GAS Well Operator's Report of Well Work
DEPARTMENT OF ENERGY

Farm name: COTTRELL, ORAS Operator Well No.: KAUFFMAN 4

LOCATION: Elevation: 1098.00 Quadrangle: ARNOLDSBURG

District: SMITHFIELD County: ROANE
Latitude: 13900 Feet South of 38 Deg. 47Min. 30 Sec.
Longitude 8900 Feet West of 81 Deg. 12 Min. 30 Sec.

Company: BOGGS NATURAL GAS CO.
P. O. BOX 148
SPENCER, WV 25276-0000

Agent: HARRY C. BOGGS

Inspector: HOMER DOUGHERTY
Permit Issued: 06/29/89
Well work Commenced: June 29 1989
Well work Completed: June 29 1989
Verbal Plugging
Permission granted on: _____
Rotary xx Cable _____ Rig
Total Depth (feet) 6000'
Fresh water depths (ft) N/A
Salt water depths (ft) N/A
Is coal being mined in area (Y/N)? N
Coal Depths (ft): _____

Casing & Tubing Size	Used in Drilling	Left in Well	Cement Fill Up Cu. Ft.
103/4	250	250	surface
7"	1958	1958	600'
4 1/2"	6000'	6000'	4,500

OPEN FLOW DATA

Producing formation Devonian Shale ^{not new} Pay zone depth (ft) 2400-5800
Gas: Initial open flow 20 MCF/d Oil: Initial open flow 0 Bbl/
Final open flow 400 MCF/d Final open flow 0 Bbl/
Time of open flow between initial and final tests 12 Hour
Static rock Pressure 1200 psig (surface pressure) after 48 Hour

Second producing formation Big Injun Pay zone depth (ft) 2110-2140
Gas: Initial open flow 30 MCF/d Oil: Initial open flow 0 Bbl/
Final open flow 800 MCF/d Final open flow 0 Bbl/
Time of open flow between initial and final tests 24 Hour
Static rock Pressure 500 psig (surface pressure) after 24 Hour

NOTE: ON BACK OF THIS FORM PUT THE FOLLOWING: 1). DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC. 2). THE WELL LOG WHICH IS A SYSTEMATIC DETAILED GEOLOGICAL RECORD OF ALL FORMATIONS INCLUDING COAL ENCOUNTERED BY THE WELLBORE.

For: BOGGS NATURAL GAS CO.

By: Jeffrey C. Dwyer
Date: 6/29/89

JUL 7 1989

Shale: First Stage	5900-6000	15 perfs	4,000 gal HCl
Second Stage	5835-5200	30 perfs	60,000# sand 500,000 scf N ₂
Third Stage	5200-4400	30 perfs	60,000# sand 500,000 scf N ₂
Big Injun:	2110-21140	15 perfs	60,000# sand 400,000 scf N ₂

FRAC only.

2560 404
 3946 813
 4812 222
 5052 825
 5358 750

RECEIVED
 JUL 03 1989

DIVISION OF OIL & GAS
 DEPARTMENT OF ENERGY

9077

100

22

RECEIVED JUN 05 1987



1) Date: June 2, 19 87
2) Operator's Well No. Kauffman # 4
3) API Well No. 47 State 087 County 4054 Permit

STATE OF WEST VIRGINIA
DIVISION OF OIL & GAS DEPARTMENT OF ENERGY, OIL AND GAS DIVISION
DEPARTMENT OF ENERGY APPLICATION FOR A WELL WORK PERMIT

- 4) WELL TYPE: A Oil / Gas XXX
5) LOCATION: Elevation: 1098, District: Smithfield 5, County: Roane 087, Quadrangle: ARNOLDSBURG 219
6) WELL OPERATOR: Boggs Natural Gas CODE: 6455, Address: P.O. 148, Spencer WV 25276
7) DESIGNATED AGENT: Harry C. Boggs, Address: P.O. 148, Spencer WV 25276
8) OIL & GAS INSPECTOR TO BE NOTIFIED: Name: Homer Daugherty, Address: Looneyville
9) DRILLING CONTRACTOR: Name: Boggs Natural Gas, Address: P.O. 148, Spencer WV 25276
10) PROPOSED WELL WORK: Drill XX / Drill deeper / Redrill / Stimulate X
11) GEOLOGICAL TARGET FORMATION: Oriskany 475
12) Estimated depth of completed well, 5950 feet
13) Approximate strata depths: Fresh, 655, 150, 743 feet; salt, 1717, 1798 feet.
14) Approximate coal seam depths: NONE Is coal being mined in the area? Yes / No XX
15) CASING AND TUBING PROGRAM FROM ROANE-189, 1129, 1132, 1138

Table with columns: CASING OR TUBING TYPE, SPECIFICATIONS (Size, Grade, Weight per ft., New, Used), FOOTAGE INTERVALS (For drilling, Left in well), CEMENT FILL-UP OR SACKS (Galic feet), PACKERS (Kinds, Sizes, Depth, Top, Bottom)

OFFICE USE ONLY
DRILLING PERMIT

Permit number 47-087-4054 Date July 29 19 87

This permit covering the well operator and well location shown below is evidence of permission granted to drill in accordance with the pertinent legal requirements subject to the conditions contained herein and on the reverse hereof. Notification must be given to the District Oil and Gas Inspector. (Refer to No. 8) Prior to the construction of roads, locations and pits for any permitted work. In addition, the well operator or his contractor shall notify the proper district oil and gas inspector 24 hours before actual permitted work has commenced.)

The permitted work is as described in the Notice and Application, plat, and reclamation plan, subject to any modifications and conditions specified on the reverse hereof. Permit expires July 29, 1989 unless well work is commenced prior to that date and prosecuted with due diligence.

Table with columns: Bond, Agent, Plat, Casings, Fee (14120 209), WPCP, A&E, Other

NOTE: Keep one copy of this permit posted at the drilling location. Director, Division of Oil and Gas

See the reverse side of the APPLICANT'S COPY for instructions to the well operator.