

FORM 16

API WELL NO. 45 - 195 - 20994
State County Permit

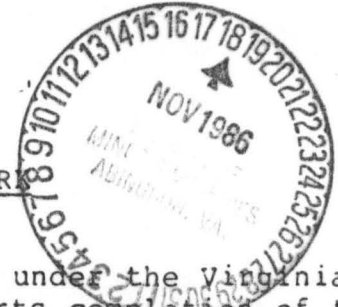
ANR PRODUCTION COMPANY
PENN VA. RESOURCES

Date: November 12, 1986
Operator's Well
Name 10368

WS-222

VIRGINIA OIL AND GAS INSPECTOR
P. O. BOX 1416
ABINGDON, VA 24210
703-628-8115

10368
EL. - 2961.76
FLAT GAP-7 1/2'



REPORT OF COMPLETION OF WELL WORK

Pursuant to Regulation 4.06 of the Regulations under the Virginia Oil and Gas Act, the undersigned well operator reports completion of the type(s) of well work specified below on the referenced well in Gladeville District, Wise County, Virginia on 7 day, November month, 19 86.

WELL TYPE: Oil ___ / Gas X / Enhanced recovery ___ / Waste Disposal ___ / If "Gas", Production X / Underground Storage ___
Exempt by Code Section 45.1-300.B.1. from general oil and gas conservation law: yes X / no ___
WELL WORK: Drill X / Deepen ___ / Redrill ___ / Stimulate X / Plug off old formation ___ / Perforate new formation X / Plug ___ / Replug ___ / Other physical change in well (specify _____)

The well work was done as shown in the Appendix(es) applicable to the type(s) of well work involved.

CONFIDENTIALITY STATUS UNDER CODE OF VIRGINIA SECTION 45.1-332.

X Ninety days from the filing of this report
OR
Two years from _____, 19____, the date on which the referenced well was COMPLETED, the well being an exploratory well as defined in Code of Virginia Section 45.1-288.21.

APPLICANT: ANR Production Company
BY *AB*
ITS District Operations Manager
ADDRESS 111 E. Capitol St., Ste 400, Jackson
TELEPHONE 601/961-6315 MS 39201

OTHER GENERAL INFORMATION

An electric log survey was x / was not ___ / conducted pursuant to Code of Virginia Section 45.1-333.B.2, at the coal owner's or operator's request.

An electric log survey was x / was not ___ / run for other purposes. This survey did ___ / did not ___ / disclose the vertical location of a coal seam.

Note: If a coal seam was located, the part of the survey from the surface through the coal is attached in accordance with Code of Virginia Section 45.1-333.B.3.

Deviation surveys were x / were not ___ / required under Code of Virginia Section 45.1-333.C "to the bottom of the lowest published coal seam depth."

Note: If deviation surveys were required, the survey results are attached.

A continuous survey was ___ / was not x / required under Code of Virginia Section 45.1-333.C.

Note: If a continuous directional survey was required, the survey results are attached.

CHANGES IN THE PERMITTED WELL WORK

The well operator did ___ / did not x / make any change(s) in the permitted well work, verbally approved by the Inspector or Assistant Inspector under Regulation 4.03 of the Regulations under the Virginia Oil and Gas Act, for the purpose of insuring successful completion of the well work.

Note: The nature and purpose of each such change, if any, is set out below or on additional sheets if such are required.

FORM 16
APPENDIX A,
SHEET 1, (OBVERSE)

API WELL NO. 45 - 195 - 20994
State County Permit
Date: November 12, 1986
Operator's Well
Name 10368

REPORT OF COMPLETION OF WELL WORK
IF DRILLING, REDRILLING, OR DEEPENING IS INVOLVED

DRILLING CONTRACTOR Clint Hurt & Associates
ADDRESS P.O. Box 1973, Midland TX 79702
TELEPHONE _____

GEOLOGICAL TARGET FORMATION Devonian Shale, Weir
DEPTH OF COMPLETED WELL 6,085' FEET
DATE DRILLING COMMENCED 10/10/86
DATE DRILLING COMPLETED 10/25/86
DRILLING RIG: ROTARY X / CABLE TOOL _____ /

GEOLOGICAL DATA Depth Thickness
 Top Bottom

Fresh Water

±80

Salt water

Not Known

Coal Seams

MINING IN AREA
Name Yes No Mined Cut

None

Oil

Formation

None

Gas

Formation

See Appendix D

The data on depth of strata is based on the source(s) checked below:

- X Applicant's own drilling experience in the area
X Information supplied by the coal operator in the area
 Information already in possession of the Inspector
 Other (as follows) _____

CASING AND TUBING PROGRAM

PRELIMINARY INFORMATION

Is the subject well underlaid by the red shales? Yes X/ No ___/
 If Yes, was a coal protection string set to the red shales? Yes X/ No ___

	SIZE	TOP	BOTTOM	LENGTH	PERFORATIONS FROM	TO
<u>CONDUCTOR:</u>						
<u>CASING CIRCULATED AND CEMENTED IN TO SURFACE:</u>	13-3/8"	Surface		42'		42'
	10-3/4"	Surface		1223'		1223'
	7"	Surface		4144'		4144'
<u>COAL PROTECTION CASING SET UNDER SPECIAL RULE OF CODE OF VIRGINIA 45.1-334.B:</u>						
	7"	Surface		4144'		4144'
<u>OTHER CASING AND TUBING LEFT IN WELL;</u>						
	4-1/2"	Surface		6051'		6051'

LINERS LEFT IN WELL UNDER CODE OF VIRGINIA SECTION 45.1-336 OR OTHERWISE: None

PACKERS OR BRIDGE PLUGS: KIND SIZE SET AT
 Noen

REMARKS: SHUT DOWN DEPTHS, DATES; FISHING JOB DEPTHS, DATES; CAVING; ETC.)

SAMPLES AND CUTTINGS

WILL X WILL NOT ___ BE AVAILABLE FOR EXAMINATION BY A MEMBER OF THE VIRGINIA DIVISION OF MINERAL RESOURCES
 WILL X WILL NOT ___ BE FURNISHED THE VIRGINIA DIVISION OF MINERAL RESOURCES UPON REQUEST
 WILL ___ WILL NOT ___ REQUIRE SACKS TO BE FURNISHED BY THE VIRGINIA DIVISION OF MINERAL RESOURCES.

DRILLER'S LOG

Compiled by Roswell K. Barranco

<u>Geologic Age</u>	<u>Formation</u>	<u>General Lithology</u>	<u>Color</u>	<u>Depth (feet)</u>		<u>Thickness</u>	<u>Remarks</u>
				<u>Top</u>	<u>Bottom</u>		
Pennsylvania	Wise & Norton	Sandstone		0	2209	2209	
	Lee	Sandstone & Shale		2209	3620	1411	
Mississippian	Bluestone	Sandstone & Shale		3620	3753	133	
	Ravenclyff	Sandstone		3753	3850	97	
	Hinton	Sandstone & Shale		3850	4250	400	
	Maxton	Sandstone		4114	4250	136	
	Bluefield	Sandstone, Shale & Limestone		4250	4455	205	
	Greenbrier (Big Lime)	Limestone		4455	4882	427	
	Injun	Sandstone & Shale		4882	4932	50	
	Weir	Siltstone		4932	5099	167	
	Sunbury	Shale		5099	5249	150	
	Berea	Siltstone		5249	5320	71	
Devonian	Devonian Shale	Shale		5320	6007	687	
	Decollement			5794	5832	38	
Silurian	Corniferous	Limestone		6007	6085	78	

APPENDIX TO REPORT OF COMPLETION OF WELL WORK
ON A WELL DRILLED IN SEARCH OF OIL OR GAS

DISCOVERY OF OIL OR INDICATIONS THEREOF

Indicated potential flow before stimulation N/A BOD
Gravity and grade: N/A

DISCOVERY OF GAS OR INDICATIONS THEREOF

Indicated potential flow before stimulation N/A MCFD
Rock pressure: Not psig N/A hour test
Measurable

RECORD OF STIMULATION

Full description of stimulation:

Zone 1: Lower Devonian Formation
75 Quality Foam Frac, 42,500#s 20/40, 7,500#s 10/20
662,000 SCF of N₂
Perforated 5676'-5996' # Perfs. 67 Perf. Size .375
Breakdown 3099 psig. Avg. Injection 4174 psig.
Avg. I.R. 74.4 BPM Init. S.I.P. 2020 psig 15 Min. S.I.P. 1657 psig

Zone 2: Upper Devonian, Berea Formation
75 Quality Foam Frac: 42,500#s 20/40, 7,500#s 10/20
842,000 SCF of N₂
Perforated 5308'-5516' # Perfs. 68 Perf. Size .375
Breakdown 2950 psig. Avg. Injection 4305 psig.
Avg. I.R. 69 BPM Init. S.I.P. 1800 psig 15 Min. S.I.P. 1655 psig

Zone 3: Weir Formation
75 Quality Foam Frac, 40,000#s 10/20
593,000 SCF of N₂
Perforated 4944'-5082' # Perfs. 72 Perf. Size .375
Breakdown 3105 psig. Avg. Injection 4048 psig.
Avg. I.R. 94 BPM Init. S.I.P. 121 psig 15 Min. S.I.P. 678 psig

Final production () natural (x) after stimulation

	BOD	MCFD	Hours Tested	Rock Pressure	Hours Tested
Zone 1:	<u>Lower Devonian</u>		<u>Commingled</u>		
	<u>Upper Devonian</u>				
Zone 2:	<u>Berea</u>				
Zone 3:	<u>Weir</u>				

Final production if gas zones are comingled: 539 MCFD

3 hours tested: _____ psig. _____ hours tested

Results 10368

Depth From	Depth To	Survey
0 0	170' 350'	$1/4^{\circ}$ $3/8^{\circ}$
0 0	600' 800'	1° 1°
0 0	1000' 1500'	$1-1/4^{\circ}$ 2°
0 0	2000' 2500'	2° $1-3/4^{\circ}$
0 0	3000' 3500'	$2-1/4^{\circ}$ 3°
0 0	4000' 4500'	3° $2-3/4^{\circ}$
0 0	5000' 5500'	$2-1/2^{\circ}$ $1-1/4^{\circ}$
0	6085'	2°

(FOR OFFICE USE ONLY: API Well No. 45 - -
State County Permit

Date: 12 / 9, 1986

Operator's Well No. 10368

WS 222

VIRGINIA OIL AND GAS INSPECTOR
DEPARTMENT OF LABOR AND INDUSTRY
DIVISION OF MINES
219 Wood Avenue
Big Stone Gap, Virginia 24219-1799
Phone 703-523-0335

WELL PLAT

+ Denotes location of well on United States Topographic Maps, scale 1 to 24,000. Latitude and longitude lines are represented by border lines as shown.

This plat is new / updated X /

This plat is X / is not / based on a mine coordinate system established for the areas of the well location.

Well operator ANR PRODUCTION COMPANY

Address JACKSON, MISSISSIPPI
Farm PENN VIRGINIA RESOURCES CORPORATION
Tract 684 Acres 5010.46 Lease No.
Elevation 2961.25'
Quadrangle FLAT GAP
County WISE District GLADEVILLE
Registered Engineer X Registration No. 11439
Certified Land Surveyor Cert. No.
File No. Drawing No.
Date 9-10-86 Scale 1" = 400'



Certification of Well Plat

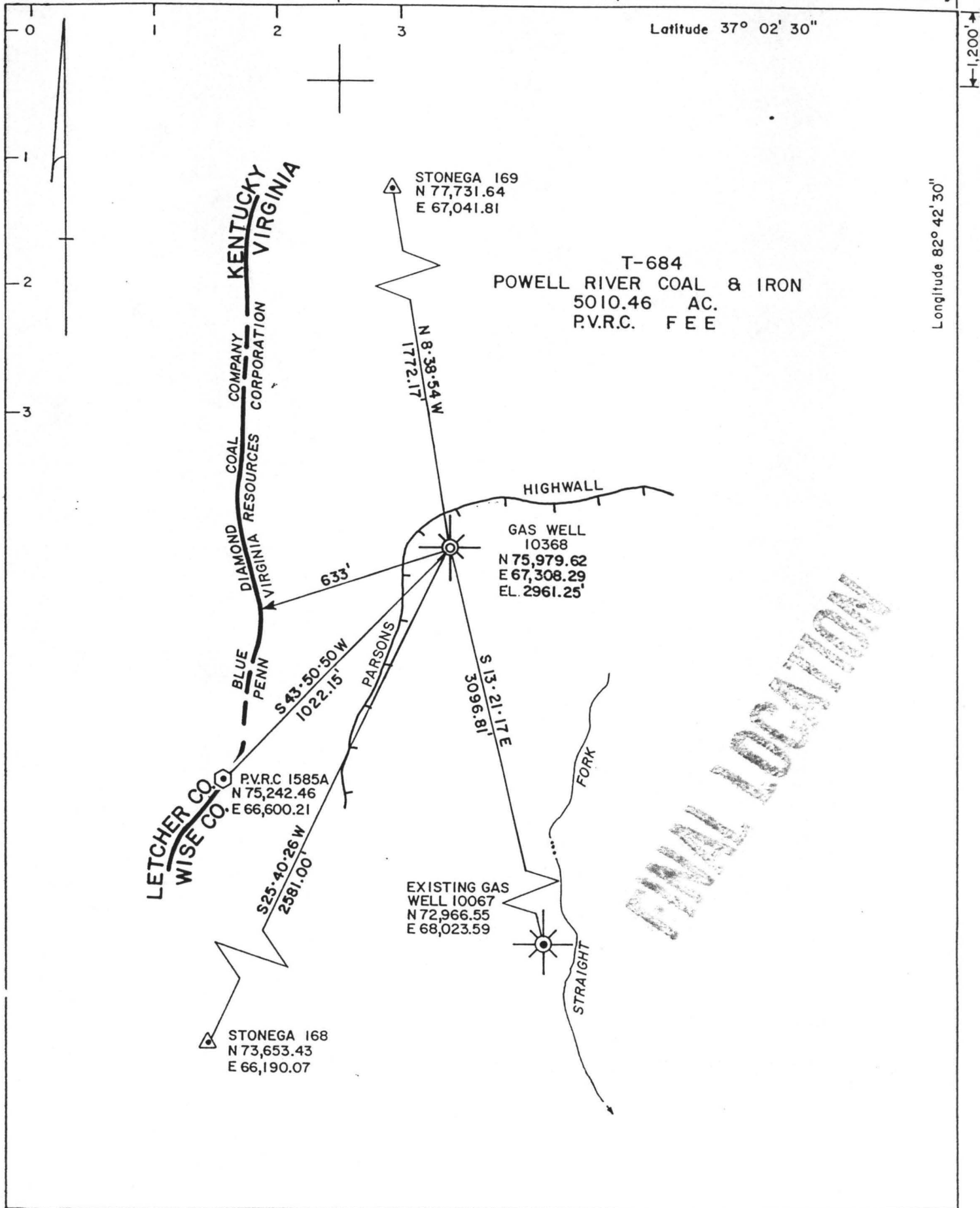
I, the undersigned, hereby certify that this plat is correct to the best of my knowledge and belief, and shows all the information required by law and the regulations of the Virginia Well Review Board.

Jack J. Gant
Registered Engineer or Certified Land Surveyor
in Charge

9,800'

Latitude 37° 02' 30"

Longitude 82° 42' 30"



FINAL LOCATION

WS-222

FG-9-17

OIL AND GAS WELL
SUMMARY REPORT

API No. 45-195-20994-00-03 VDMR Well Rep. No. _____
DMQ File No. WS-222

Operator ANR PRODUCTION COMPANY

Farm PENN VA. RESOURCES

Co. Well No. 10368

County WISE Quadrangle FLAT GAP - 7-1/2'

Location (UTM) N4,100,330; E345,080 UTM Zone 17

(Lat. and Long.) _____

Field _____ Province APPALACHIAN PLATEAUS

Elev. (specify) 2961.76 TD 6085 Form. at TD CORNIFEROUS

INITIAL FLOW - NONE Age DEVONIAN

Date compl. or abandoned NOVEMBER 7, 1986

Result GAS WELL

Gas Shows _____

Gas Pays _____

Main Production _____ Prod. Form. DEVONIAN; BEREA, WEIR

FINAL FLOW - 539,000 CU. FT. Age DEVONIAN; MISSISSIPPIAN

Treatment: LOWER DEVONIAN-75 QUALITY FOAM FRAC, 42,500 POUNDS OF 20/40 SAND, 7500 POUNDS OF 10/20 SAND, 662,000 SCF OF N2. UPPER DEVONIAN, BEREA-75 QUALITY FOAM FRAC, 42,500 POUNDS OF 20/40 SAND, 7500 POUNDS OF 10/20 SAND, 842,000 SCF OF N2. WEIR 75 QUALITY FOAM FRAC, 40,000 POUNDS OF 10/20 SAND, 593,000 SCF OF N2.

Initial Production _____

Oil shows _____

Water FW YES at 80' at _____ at _____
SW _____ at _____ at _____ at _____

Coal _____

Plat _____ Plotted _____ Completion Report X

Drillers Log X Geologic Log _____

Samples _____ Interval Sheet _____

Sample Interval _____

Remarks _____

Geophysical Logs S.P. _____ Res _____ Gamma _____ Neutron _____

Density _____ Sonic _____ Other _____

Stratigraphic Data Source

ROSWELL K. BARRANCO

Formation	Top	Datum (Subsea)	Thickness
WISE AND NORTON	0	+ 2961.76	2209
LEE	2209	+ 752.76	1411
BLUESTONE	3620	- 658.24	133
RAVENCLIFF	3753	- 791.24	97
HINTON	3850	- 888.24	400
MAXTON	4114	- 1152.24	136
BLUEFIELD	4250	- 1288.24	205
GREENBRIER	4455	- 1493.24	427
INTUN	4882	- 1920.24	50
WEIR	4932	- 1970.24	167
SUNBURY	5099	- 2137.24	150
BEREA	5249	- 2287.24	71
Remarks DEVONIAN SHALE	5320	- 2358.24	687
DECOLLEMENT	5794		38
CORNIFEROUS	6007	- 3045.24	78

References

Released to Open File: Completion FEBRUARY 18, 1987
 Samples NO

(Note: UTM measurements in meters, all others in feet)