

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 /

PROGRAM DETAILS

<u>SIZE</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>LENGTH</u>	<u>PERFORATED</u>	
				<u>FROM</u>	<u>TO</u>
<u>Conductor</u>					

Casing circulated and cemented in to the surface:

13-3/8"	Surface	41'	41'
10-3/4"	Surface	505'	505'
7"	Surface	3730'	3730'

Coal protection casing set under the special rule of Code of Virginia S 45.1-334.B:

7"	Surface	3730'	3730'
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Other casing and tubing left in the well:

4-1/2"	Surface	5734'	5734'
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Liners left in well, under Code of Virginia S 45.1-336 or otherwise:

None

Other casing used in drilling but not left in the well:

None

<u>Packers or bridge plugs:</u>	<u>Kind</u>	<u>Size</u>	<u>Set At</u>
None			

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
 Division of Mineral Resources
 will X / will not / be furnished the Division of Mineral Resources
 upon request
 will / will not / require sacks to be furnished by the 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>		
Pennsylvanian	Wise & Norton	Sandstone		0	1678	1678	
	Lee	Sandstone & Shale		1678	3171	1493	
Mississippian	Bluestone	Sandstone & Shale		3171	3297	126	
	Ravencliff	Sandstone		3297	3395	98	
	Hinton	Sandstone & Shale		3395	3814	419	
	Maxon	Sandstone		3649	3814	165	
	Bluefield	Sandstone, Shale & Limestone		3814	4042	228	
	Greenbrier (Big Lime)	Limestone		4042	4475	433	
	Injun	Sandstone & Shale		4475	4542	67	
	Weir	Siltstone		4542	4736	194	
	Sunbury	Shale		4736	4885	149	
	Berea	Siltstone		4885	4960	75	
Devonian	Devonian Shale	Shale		4960	5708	748	
	Decollement			5422	5516	94	
Silurian	Corniferous	Limestone		5708	5754	46	

(Complete on supplemental sheets as necessary.)

OTHER GENERAL INFORMATION

An electric log survey was X/ was not ___/ conducted pursuant to Code of Virginia § 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 X/ 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 § 45.1-333.B.3.

Deviation surveys were X/ were not ___/ required under Code of Virginia § 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 § 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.

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 0 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
617,000 SCF of N₂
Perforated 5334' - 5700' # Perfs. 67 Perf. Size .375
Breakdown 4240 psig. Avg. Injection 3985 psig.
Avg. I.R. .73 BPM Init. S.I.P. 2000 psig 15 Min. S.I.P. 1640 psig

Zone 2: Upper Devonian, Berea, Sunbury Formation
75 quality foam frac; 42,500#s 20/40, 7,500#s 10/20
623,000 SCF of N₂
Perforated 4896' - 5182' # Perfs. 55 Perf. Size .375
Breakdown 3350 psig. Avg. Injection 3860 psig.
Avg. I.R. .88 BPM Init. S.I.P. 2100 psig 15 Min. S.I.P. 1560 psig

Zone 3: Weir Formation
75 quality foam frac; 40,000#s 10/20, 450,000 SCF of N₂
Perforated 3920' - 3581' # Perfs. 66 Perf. Size .375
Breakdown 2820 psig. Avg. Injection 3581 psig.
Avg. I.R. .100 BPM Init. S.I.P. 1400 psig 15 Min. S.I.P. 1170 psig

Final production () natural (x) after stimulation

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

Final production if gas zones are comingled: _____ MCFD

_____ hours tested: _____ psig. _____ hours tested

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: Big Lime Formation
Gelled acid frac; 143 bbls, 1/2, 28% HCL and 1/2 15% HCL
54 bbls H₂O Flush
Perforated 4178' - 4470' # Perfs. 40 Perf. Size .375
Breakdown 1540 psig. Avg. Injection 2923 psig.
Avg. I.R. 25.6 BPM Init. S.I.P. 1200 psig 15 Min. S.I.P. 0 psig

Zone 2: _____ Formation

Perforated _____ # Perfs. _____ Perf. Size _____
Breakdown _____ psig. Avg. Injection _____ psig.
Avg. I.R. _____ BPM Init. S.I.P. _____ psig 15 Min. S.I.P. _____ psig

Zone 3: _____ Formation

Perforated _____ # Perfs. _____ Perf. Size _____
Breakdown _____ psig. Avg. Injection _____ psig.
Avg. I.R. _____ BPM Init. S.I.P. _____ psig 15 Min. S.I.P. _____ psig

Final production () natural (x) after stimulation

	BOD	MCFD	Hours Tested	Rock Pressure	Hours Tested
Zone 1: <u>Big Lime</u>		<u>933</u>	<u>3</u>		
Zone 2:					
Zone 3:					

Final production if gas zones are comingled: 1268 MCFD

3 hours tested: _____ psig. _____ hours tested

DEVIATION SURVEY

Results

Depth From	Depth To	Survey
0	339'	1/4°
0	897'	1-1/4°
0	1784'	1/2°
0	2295'	1°
0	3101'	1°
0	3848'	1/2°
0	4596'	2°
0	5252'	2-1/2°
0	5753'	4°

(F R OFFICE API Well No. 45 - -
(U F ONLY: State County Permit

Date: 10-16- , 1985

Operator's
Well No. 10172

WS-171

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.

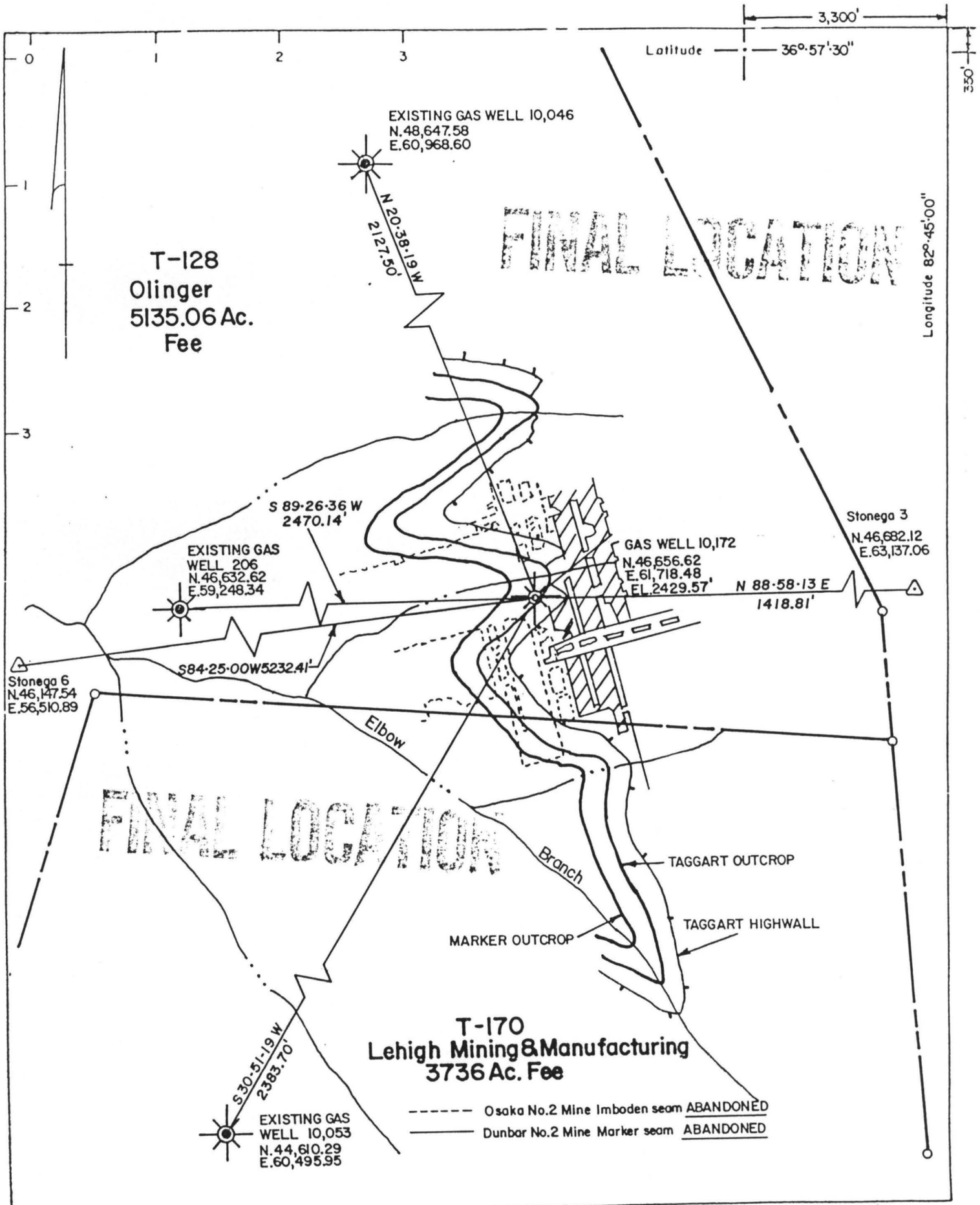
Well operator ANR PRODUCTION COMPANY

Address JACKSON, MISSISSIPPI
Farm PENN VIRGINIA RESOURCES CORPORATION
Tract 128 Acres 5135.06 Lease No. _____
Elevation 2429.57'
Quadrangle APPALACHIA
County WISE District RICHMOND
Registered Engineer X Registration No. 11439
Certified Land Surveyor _____ Cert. No. _____
File No. _____ Drawing No. _____
Date 10-16-85 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 G. Gembach
Registered Engineer or Certified Land Surveyor
in Charge



WS-171