



United States Environmental Protection Agency
**Underground Injection Control
 Permit Application**
*(Collected under the authority of the Safe Drinking
 Water Act, Sections 1421, 1422, 40 CFR 144)*

PERMIT NUMBER: VAS20147BDIC

T/A

C

Read Attached Instructions Before Starting
 For Official Use Only

Application approved mo day year	Date received mo day year	Permit Number	Well ID	FINDS Number

II. Owner Name and Address			III. Operator Name and Address		
Owner Name EnerVest Energy Institutional Fund XIV-A L.P./Fund-XIV-WIC, L.P.			Owner Name EnerVest Operating, LLC		
Street Address 300 Capitol St, Suite #200		Phone Number (304) 343-5505	Street Address 809 Happy Valley Drive		Phone Number (276) 926-1292
City Charleston	State WV	ZIP CODE 25301	City Clintwood	State VA	ZIP CODE 24228
IV. Ownership		V. Ownership		VI. SIC Code	
☒ Yes ☐ No		☒ Private ☐ Federal ☐ Other		☒ Owner ☐ Operator	
				1311	

VII. Well Status			VIII. Well Type		
☒ A. Operating Date Started mo day year 06/16/2014			☐ B. Modification/Conversion ☐ C. Proposed		

IX. Type of Well (Required)			X. Name of Field or Project (Required)		
☒ A. Individual ☐ B. Area			Number of Existing Wells Number of Proposed Wells One (1)		
			Name(s) of field(s) or project(s) Nora and Oakwood Fields, Virginia Operations		

XI. Class(es)		XII. Type(s)		XIII. If class is "other" or type is code 'x', explain		XIV. Number of wells per type (if area permit)	
(enter code(s))		(enter code(s))					
II		D					

XV. Location (Latitude, Longitude, Township and Range)										XVI. Is this well a monitoring well?	
Latitude			Longitude			Township and Range					
Deg	Min	Sec	Deg	Min	Sec	Sec	Twp	Range	1/4 Sec	Feet From	Line
37	07	30	82	15	00						
										☐ Yes ☒ No	

ATTACHMENTS
 (Complete the following questions on a separate sheet(s) and number accordingly; see instructions)
 For Classes I, II, III, (and other classes) complete and submit on a separate sheet(s) Attachments A-U (pp 2-8) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.

XVII. Certification		XVIII. Signature	
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document 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. (Ref. 40 CFR 144.52)		A. Name and Title (Type or Print) James (Jim) McKinney, Senior VP and General Manager - Appalachia East Assets	
		B. Phone No. (Area Code and No.) (304) 343-5505	
C. Signature 		D. Date Signed 3/12/16	

Attachment A

Area of Review

1.0 INTRODUCTION

The fixed radius of $\frac{1}{2}$ miles from existing Well P-171 was used for the area of review. All information presented and mapping provided are based upon the $\frac{1}{2}$ - mile radius using Well P-171 as the center.

On some selective mapping, a radius of one mile, using Well P-171 as the center, will be the area of review as required by this permit application.

Attachment B

Review Area and Well Information

1.0 AREA OF REVIEW MAP

EnerVest (formerly Range Resources – Pine Mountain, Inc.) used 1/2-mile as the Area of Review for UIC Permit Number VAS2D937BDIC (P-171). Drawing 1 is a topographic map that identifies the area within a one mile and 1/2-mile radius of UIC P-171. This drawing provides the following information:

- **Location of P-171** – The permitted injection zones are the Big Lime formation (from 4013-4018 feet deep) and Weir formation (4599-4636 feet deep). There is four (4) coalbed methane wells within the area of review. The wells within the Area of Review are listed in Appendix C.
- **Existing Well Information** – All wells within one mile are identified by operator's well number, state file number and well type for all known producing, abandoned, dry holes, and injection. This information was gathered from well and map records on file with the Virginia Division of Gas and Oil and from EnerVest/Range Resources – Pine Mountains' company files.
- **Surface and Subsurface Features** – The map identifies all surface bodies of water, springs, underground sources of drinking water ("USDW"), mines (surface and deep), quarries, roads, and other pertinent surface and subsurface features. Structures were identified using aerial photography.
- **Geologic Features** – There are no identified faults within one-mile of UIC P-171.
- **Intake and Discharge Structures (as originally submitted)** – A state and federal records review was conducted for the one (1) mile radius using the data resources firm of Environmental Data Resources, Inc. (EDR). A copy of EDR's report was submitted with the original application. The surficial reconnaissance and state and federal records review showed no water intake or discharge structures were present within the one (1) mile radius.
- **Hazardous Waste Facilities (as originally submitted)** - A state and federal records review was conducted for the one (1) mile radius using the data resources firm of Environmental Data Resources, Inc. (EDR).

A copy of EDR's report was submitted with the original application. The surficial reconnaissance and state and federal records review showed no hazardous waste treatment, storage, or disposal facilities were present within one mile.

2.0 UIC Permit Number VAS2D937BDIC (P-171)

UIC P-171 is located within the Ervinton District of Dickenson County, Virginia. The P-171 was drilled and completed in 1985 as a producing natural gas well. The well was drilled to a total depth of 6,291 feet. The Weir, Berea and Devonian shale formations were stimulated and the Big Lime produced naturally behind pipe.

There are two UIC Class IID Injection Wells permitted and operating within the one-mile radius of P-171. These two wells are also permitted to inject into the Weir Formation and are owned and operated by EnerVest Operating, LLC.

The P-171 was drilled to a total depth of 6,271 feet, with the target injection zones (Big Lime and Weir Formations) being more than 4,000 feet deep. The geologic formations and depths for this well are included as Attachment G.

3.0 SURFACE OWNERS

The surface owners within the 1/2-mile radius of UIC well P-171 are listed below. Addresses and tax map identification information are listed for each owner.

One Half Mile Radius Surface Ownership

P-171 Location

Owner Name and Address

1. Heartwood Forestland Fund IV Limit
19045 Stone Mountain Road
Abingdon, VA 24210

½ Mile Surface Owners

<u>Owner Name and Address</u>	<u>Tax Map ID</u>
2. Roger Lambert 4915 Scott Br. Rd Hampshire, TN 38461	Map 149 D, Parcel 2409, 20 Acres
3. Lester Deel 200 Mailboy Lane Dante, VA 2437	Map 149 D, Parcel 1100, 37.8 Acres Map 149 D, Parcel 1099, 7.2 Acres
4. Lonnie and Debbie Deel 9642 Floyd Hwy Copper Hill, VA 24079	Map 149 D, Parcel 1111, 7.0 Acres
5. Ransom Powers Heirs C/O Jody C. Trainham ET ALS 3702 Ellwood Ave Richmond, VA 23221	Map 149 D, Parcel 1112, 8.75 Acres Map 149 D, Parcel 1113, 4.0 Acres Map 149 D, Parcel 1114, 22 Acres
6. A B & Ransom Powers 11128 Linderwood Dr Mechanicsville, VA 23116	Map 149 D, Parcel 1115, 32 Acres
7. Emiline Sweeney (Labmert) Heirs C/O Leonard Lambert 11308 Bright Ridge Dr Seffner, FL 33584	Map 149 D, Parcel 1116, 22 Acres

4.0 SURROUNDING NATURAL GAS WELLS

Within a one mile radius of UIC well P-171, a total of 33 natural gas wells exist and two additional wells are permitted to be drilled (or in the process of being permitted), based on Virginia Division of Gas and Oil and EnerVest (formerly Range Resources – Pine Mountain's) records as of October 2015. The existing wells consist of:

- **Vertical Natural Gas Wells** – There are 4 vertical wells within one mile that penetrate the Big Lime and Weir formations. Drilling and completion reports were attached in Appendix C of the original application.
- **Coalbed Methane Wells** – There are 29 drilled and 2 permitted CBM wells within one mile. Of those, five fall within 1/2-mile. Information on these wells, such as total depth (TD) and formation at TD, is presented in Appendix C. The injection zone in the permitted UIC well is within the Big Lime and Weir formations. There is one CBM well within a ¼-mile radius that is 1,961 feet deep, which provides for a minimum separation of approximately 2,000 feet to the injection zone. Many low permeability formations such as tight sands, shales and limestones form the layers separating the coals and the injection zone. These include the Mauch Chunk Group (Ravencloth sand and Maxton sands) and the Greenbrier Limestone (Big Lime). More detailed information on these formations is included in Attachment G.
- **Horizontal Wells** – There are no existing horizontal wells within one mile of the proposed UIC well.
- **Existing UIC Disposal Wells** – There two operating UIC Class II-D injection wells within one mile (Permit #'s VAS2D947BDIC and VAS2D957BDIC). The injection formation for these wells is also the Weir and they are both operated by EnerVest Operating, LLC.

Appendix C is a listing of all the wells, their total depths and the geologic formation at total depth. Additionally, all wells penetrating the Weir formation have been noted and the drilling and completion reports have been attached. These reports were obtained from the Virginia Division of Gas and Oil.

5.0 WATER SOURCES

A survey of the area within a ½ mile radius of UIC well P-171 was checked for domestic groundwater sources. No domestic water supplies were found within ½ mile radius of P-171. This survey was performed by Environmental Monitoring, Inc., the results are attached.

REVIEW AREA AND WELL INFORMATION

ATTACHMENT

6.0 MINING ACTIVITIES

Data obtained from the Virginia Department of Mines, Minerals and Energy indicates there is one active deep mine located within the ½ mile radius of Well P-171. The deep mine workings are shown on Drawing 1.

The area within the ½ mile radius of Well P-171 has been surface mined. This mining occurred before the drilling of Well P-171. Well P-171 is located on the reclaimed surface mine bench. Drawing 1 provides the located of the past surface mining. No active surface mining is occurring within the ½ mile radius of Well P-171.

Associated with these inactive mines, are several surface and ground water monitoring points and National Pollutant Discharge Elimination System ("NPDES") points that have been identified. Figure B-1 identifies these points, but no data was obtained given the current inactive status of the mines.

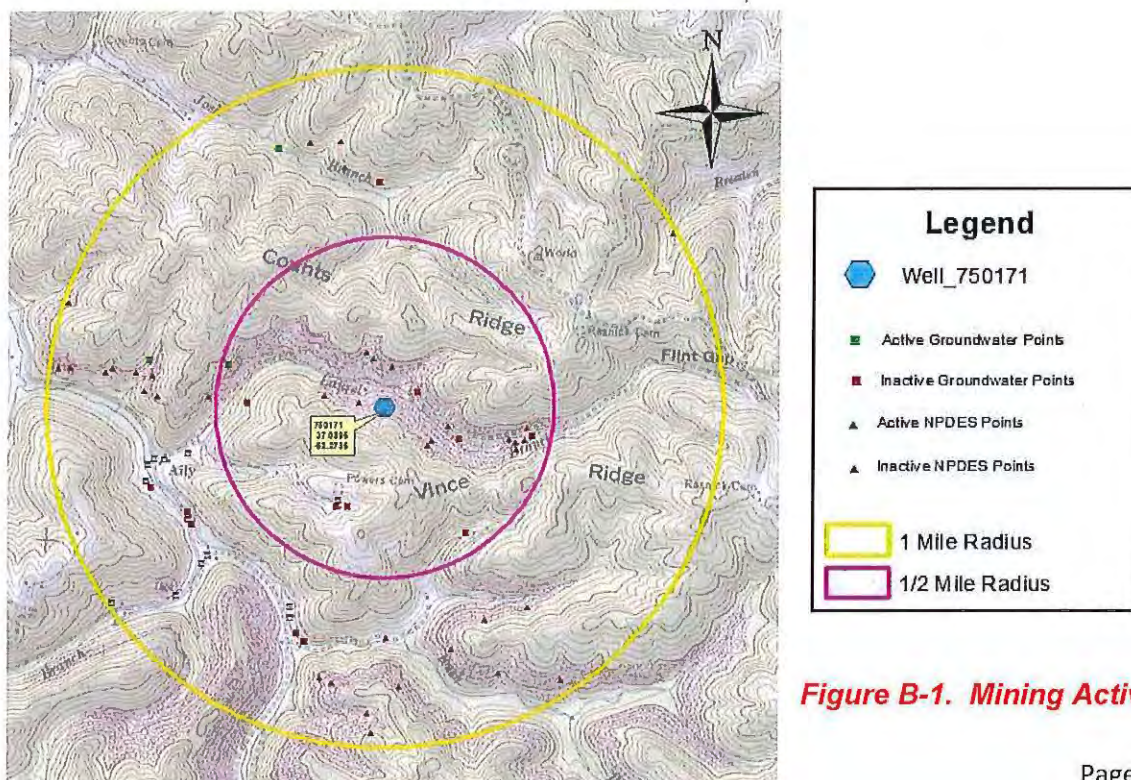


Figure B-1. Mining Activity

7.0 REGIONAL STRUCTURE AND FAULTS

UIC P-171 is properly separated from all USDW's by thousands of feet of confining strata and there are no active faults in the region.

This region consists of an extensive, thick sedimentary sequence with numerous confining strata between all USDW's and the existing injection zone. The permitted injection zone contains the Big Lime and Weir formations, which have confining strata above and below of sufficient thickness and low enough permeability to confine the injection interval and isolate injected fluids to that zone. The Big Lime is thousands of feet below any known underground source of drinking water, thereby allowing adequate separation from potable water zones.

The P-171 well site falls within the Appalachian Plateau geologic province, dominated by relatively flat-lying strata typically dipping one to two degrees (Nolde, et.al., 1984). Rocks near the P-171 have an average dip of 0.6 degrees toward the northwest, while rocks south of the P-171 dip slightly to the southeast. This indicates the P-171 is located along the northwestern limb of the Sourwood Anticline, which is a broad, gentle fold with the axis in Russell County to the east (Diftenbach, 1989).

There are no faults identified within the Area of Review. The entire Appalachian Plateau is considered geologically stable with no active faults. These inactive faults located throughout the southern Appalachians originated during the Acadian and Alleghanian Orogenies approximately 375 million to 260 million years ago. The closest mapped fault to the P-171 is the Russell Fork Fault located more than four (4) miles to the east. The Russell Fork is a right-lateral fault forming the eastern boundary of the Pine Mountain Thrust Block with as much as six miles of lateral displacement. The Pine Mountain decollement underlies the thrust block at an approximate depth of 6,000 feet. Some indications of minor thrust faulting have been noted within the Pennsylvanian coal beds in response to the Pine Mountain Overthrust (Diftenbach, 1989).

REVIEW AREA AND WELL INFORMATION

ATTACHMENT

Maps depicting all recorded seismic activity (see Attachment G) show there is no activity in the vicinity of the P-171. More detailed geologic information is contained in Attachment G.

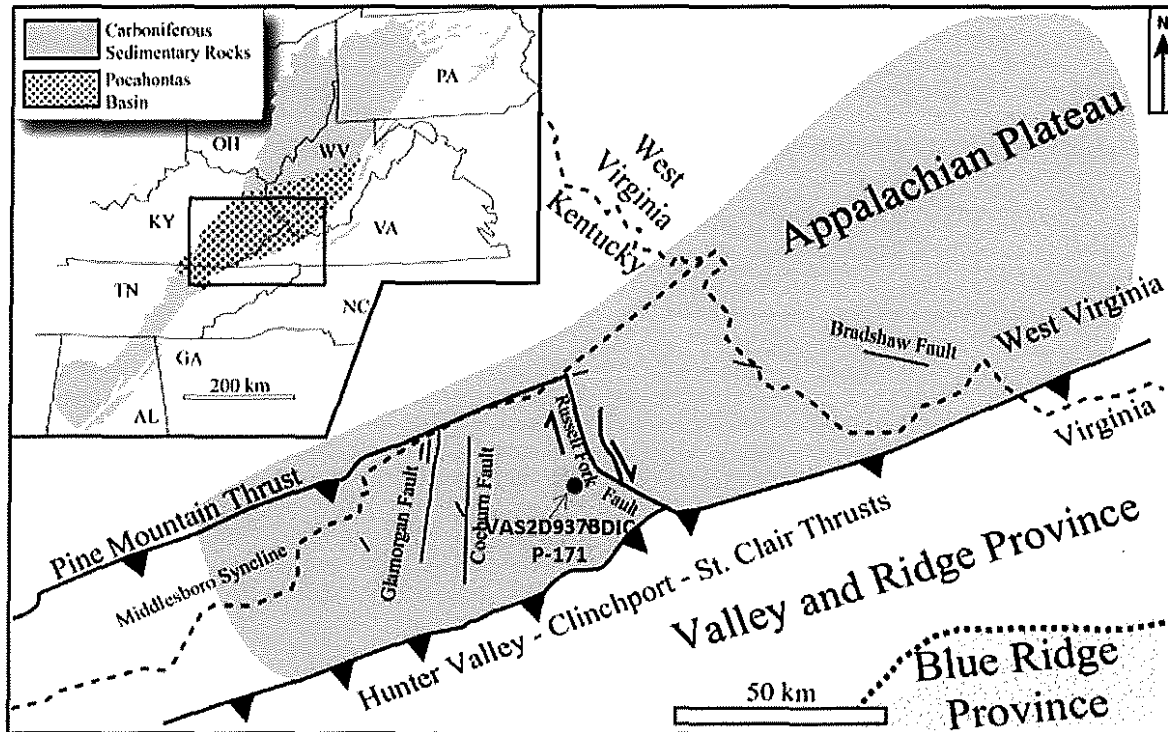


Figure B-2. Regional Faults adapted from Grimm, et.al., 2012

REFERENCES

Diffenbach, Robert N., 1989, Geology of the Nora Quadrangle, Virginia, Virginia Division of Mineral Resources Publication 92.

Grimm, Ryan P., et al, 2012, Seal evaluation and confinement screening criteria for beneficial carbon dioxide storage with enhanced coal bed methane recovery in the Pocahontas Basin, Virginia, *International Journal of Coal Geology*, V. 90-91, p. 110-125.

Attachment B-1

Groundwater Sources Inventory



ENVIRONMENTAL MONITORING, INCORPORATED

ENVIRONMENTAL CONSULTANTS ▲ ANALYTICAL LABORATORIES

5730 INDUSTRIAL PARK ROAD ▲ NORTON, VIRGINIA 24273 ▲ 276/679-6544

October 22, 2015

Ms. Laura Murray
Range Resources
P.O Box 2136
Abingdon, VA 24212

RE: P-171 Injection Well Survey
EMI Project 372.613

Dear Ms. Murray:

On October 21, 2015, the area near the above referenced well was checked for domestic groundwater sources within a half mile radius of P-171. This inventory was conducted by Brandon Baker of EMI.

There were no domestic water supplies found on this date within the half mile radius of P-171. Structures shown on the map to the S-SW no longer exist.

Should you have questions concerning this project, please feel free to contact me at 888-2EMILAB.

Respectfully submitted,

Environmental Monitoring, Inc.

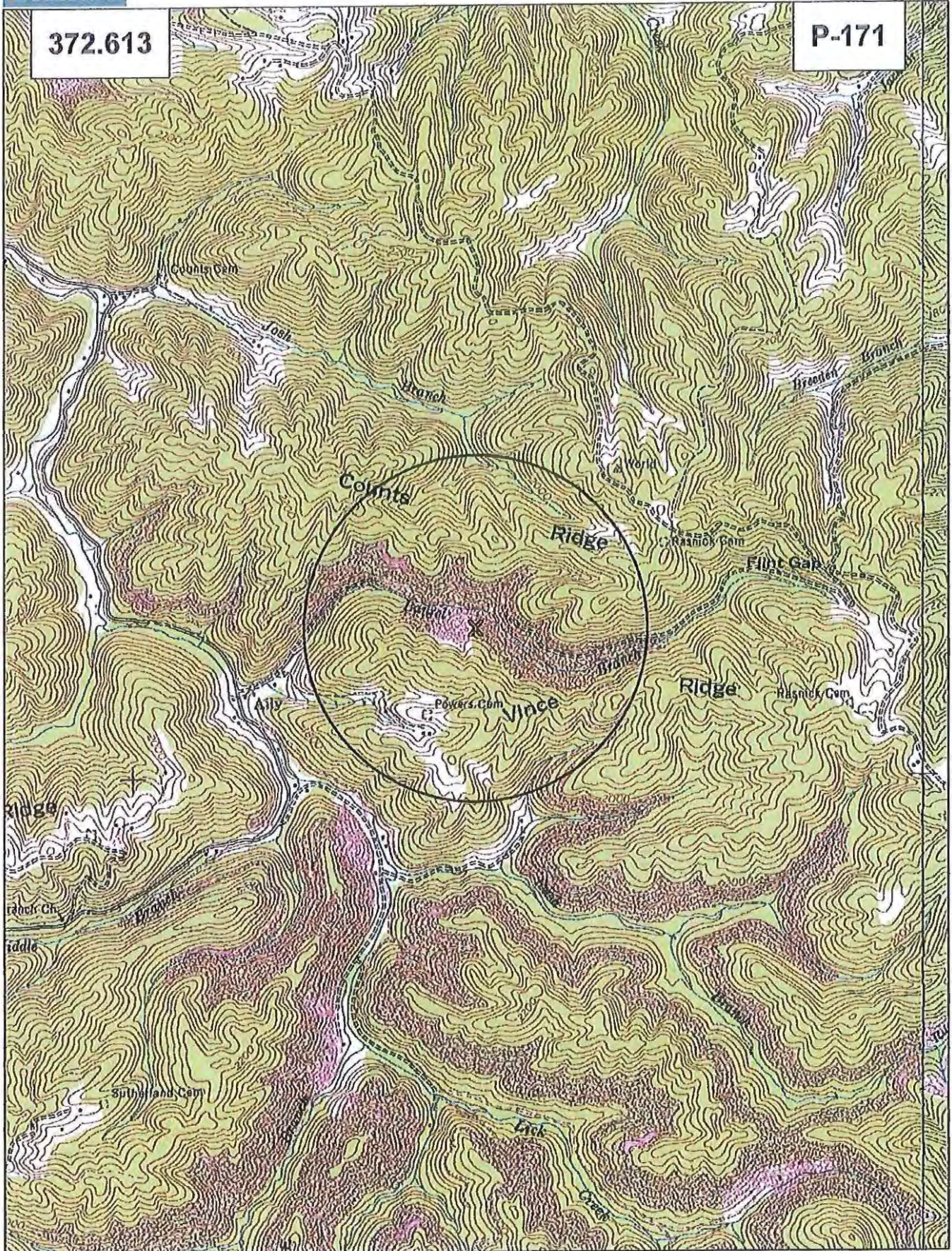
A handwritten signature in black ink, appearing to read "DW Porter", written over a horizontal line.

David W. Porter
Project Manager

attachments

372.613

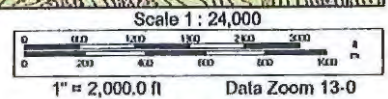
P-171



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www.delorme.com



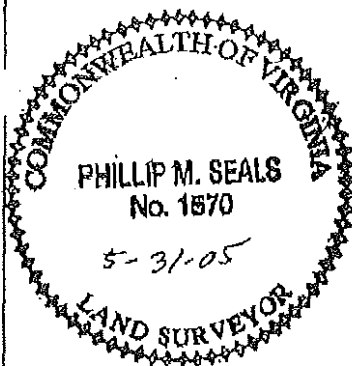
6807'

LATITUDE 37°07' 30"

LONGITUDE 82° 15' 00"

VA NAD 27

LEASE NO. 241490LT-266
 CAMPBELL CARTER
 674.29 ACRES
 HEARTWOOD FORESTLAND FUND IV, L.P.-Surface
 DICKENSON-RUSSELL COAL CO., LLC /
 ALPHA LAND & RESERVES, LLC / ACIN, LLC /
 WBRD, LLC - coal
 PINE MOUNTAIN OIL & GAS, INC - oil, gas & ohm



LEASE NO. 241490LT-450
 J. WAMPLER
 320.80 ACRES
 HEARTWOOD FORESTLAND FUND IV, L.P.-Surface
 DICKENSON-RUSSELL COAL CO., LLC /
 ALPHA LAND & RESERVES, LLC / ACIN, LLC /
 WBRD, LLC - coal
 PINE MOUNTAIN OIL & GAS, INC - oil, gas & ohm

Existing 6" Gas Line

CCC
 COORDINATES OF
 WELL P-171-WD
 S 3784.11
 E 32052.49

LAT. & LONG.
 (HAD 27 DECIMAL DEGREES)
 OF WELL P-171-WD

37.089526
 82.273545

NOTE:

WELL COORDINATES ARE BASED ON CLINGFIELD COAL COMPANY'S MINE
 COORDINATE SYSTEM.

STATE PLANE WELL COORDINATES & ELEVATIONS WERE DETERMINED BY GPS &
 TRIGONOMETRIC METHODS BASED ON BENCH MARK P-424.

PROPERTY INFORMATION PROVIDED BY EQUITABLE PRODUCTION COMPANY.

372.613

WELL LOCATION PLAT

COMPANY EQUITABLE PRODUCTION CO. WELL NAME OR NUMBER P-171-WD
 TRACT NO. 241490LT-39 QUADRANGLE NORA
 DISTRICT ERVINTON
 WELL COORDINATES (VIRGINIA STATE PLANE) N 297,309.85 E 899,608.00
 ELEVATION 1905.31 METHOD USED TO DETERMINE ELEVATION: GPS & TRIG.
 COUNTY DICKENSON SCALE: 1" = 400' DATE 5-31-05
 THIS PLAT IS A NEW PLAT ; AN UPDATED PLAT X; OR A FINAL LOCATION PLAT

+ DENOTES THE LOCATION OF A WELL ON UNITED STATES TOPOGRAPHIC MAPS, SCALE 1 TO 24,000,
 LATITUDE AND LONGITUDE LINES BEING REPRESENTED BY BORDER LINES AS SHOWN.

Attachment C

Existing Wells Within Area of Review

1.0 WELL DATA

Provided in Appendix C is a summary of well data for a one mile radius from existing Well P-171. These wells are located on Drawing-1. Appendix C also provides a reprint of the well plats and drilling and completion reports for vertical wells penetrating the Weir within the one mile radius of UIC well VAS2D937BDIC (P-171).

2.0 WELLS WITHIN AREA OF REVIEW (¼-MILE)

The location of existing Well P-171 is shown on Drawing-1. As shown, there are no conventional gas wells (active, abandoned, or plugged) of record within the ½ mile radius of Well P-171. There are five coal bed methane wells located within the ½ miles radius of Well P-171. The coal bed methane wells do not penetrate any of the formations completed in Well P-171. There are no known plugged or abandoned coal bed methane wells of record within the ½ mile radius of Well P-171.

3.0 CORRECTIVE ACTION PLAN

The production fluid will be injected into Well P-171 at less than fracture pressure of the Big Lime and Weir formations. The maximum surface injection pressure will be 1,260 psig (90% of Big Lime formation instantaneous shut-in pressure of 1,400 psig) or less. Should this pressure or other operating and injection problems be encountered in Well P-171 the following will be undertaken:

- Immediately stop all injections and allow well to stabilize.
- If well cannot be stabilized and problems encountered cannot be corrected to the satisfaction of the state and federal agencies, Well P-171 will be plugged, as outline by Attachment Q.

EnerVest (formerly Range Resources – Pine Mountain) has conducted a detailed record and field search for existing, abandoned, plugged, and unplugged wells within the 1/2-mile radius around existing Well P-171. Should an abandoned and/or unplugged well be found in the future within the ¼-mile radius, EnerVest Operating, LLC. will plug the abandoned well, in accordance with a Plugging and Abandonment Plan approved by Virginia Division of Gas and Oil.

Attachment G

Geological Information

1.0 INTRODUCTION

The permitted injection well VAS2D937BDIC (P-171) is in the Appalachian Basin in an area with an extensive, thick sedimentary sequence with an adequate injection interval and numerous confining strata. The injection zone includes a limestone and siltstone, the Big Lime and Weir formations respectively, that are each relatively homogeneous with no highly permeable zones or major lithological differences across their vast lateral extent. The lateral extent, which covers most of southwest Virginia, into Kentucky, West Virginia and beyond, is large enough to minimize injection pressure variations. The zones have confining strata above and below of sufficient thickness and low enough permeability to confine the injection interval and isolate injected fluids to that zone. The injection zone is thousands of feet below any known underground source of drinking water, thereby allowing adequate separation from potable water zones.

The overall geology in the area is structurally simple with flat-lying strata and no active fault systems. There are no identified faults within the Area of Review. Faults in the region were active hundreds of millions of years ago with no current tectonic forces on fault planes resulting in movement. Since the forces that caused faulting in the area occurred hundreds of millions of years ago, the fault zones are considered inactive and the triggering of seismic activity by fluid injection is unlikely.

The P-171 has been operating since 2005. Rock characteristics at this location allow for an effective injection zone with lithology above and below for adequate confinement.

2.0 INJECTION ZONE

The target formations for the injection of produced fluid are within the Mississippian Greenbrier Formation, also known as the Big Lime, and the Price Formation, also known as the Weir. Both formations are considered hydrocarbon reservoir rocks across the Basin. As such, they have sufficient porosity and permeability to allow the storage and accumulation of fluids under adequate confining conditions. These formations are the target zones in many existing injection wells throughout southwest Virginia, including two EnerVest Operating, LLC (formerly Range

Resources – Pine Mountain's) existing UIC Class II-D injection wells located approximately 0.4 miles to the north and northwest of the P-171.

In the area of the P-171, the Big Lime consists of a dense carbonate more than 450 feet thick. In the P-171, this zone is the upper injection zone and has an average porosity of twelve percent. Water saturation within the Big Lime is minimal. The Big Lime was perforated from 4013-4018 feet. Above the Big Lime lies more than 200 feet of limey shale and limestone of the upper Big Lime and Little Lime formations.

The Weir formation consists of a very fine-grained siltstone. The lower portion of the Weir, locally referred to as the Weir Shale, is finer grained with slightly higher organic content. The target interval within the Weir is in the upper siltstone section with an average offset porosity of approximately six percent. Water saturation in the Weir is around 35% and is mainly associated with bound water found in its clay constituents. Only minor amounts of water were reported when the P-171 was producing natural gas. The Weir is more than 550 feet thick. The perforated interval is from 4599 to 4636 feet deep. Below the Weir is the Weir shale, Sunbury shale and Berea formation.

A local geologic stratigraphic column is included in this section as Figure G-1. Figure G-6 is cross section extending from the P-171 to a vertical well located within the one mile radius showing no faulting between the wells.

3.0 CONFINING ZONES

The sedimentary sequence in the southern Appalachian Basin contains several confining zones above and below the injection zone. Since the Big Lime and Weir are hydrocarbon reservoir rocks across the Basin, there are adequate confining strata above the injection zone that act as barriers to the upward movement of hydrocarbons and fluids. These confining rock layers are stratigraphic traps as a result of lithologic changes in reduced porosity and permeability.

Figure G-1 is a geologic column indicating the formations above and below the permitted injection zone. The following is a brief description of these formations.

GEOLOGICAL INFORMATION

ATTACHMENT

G

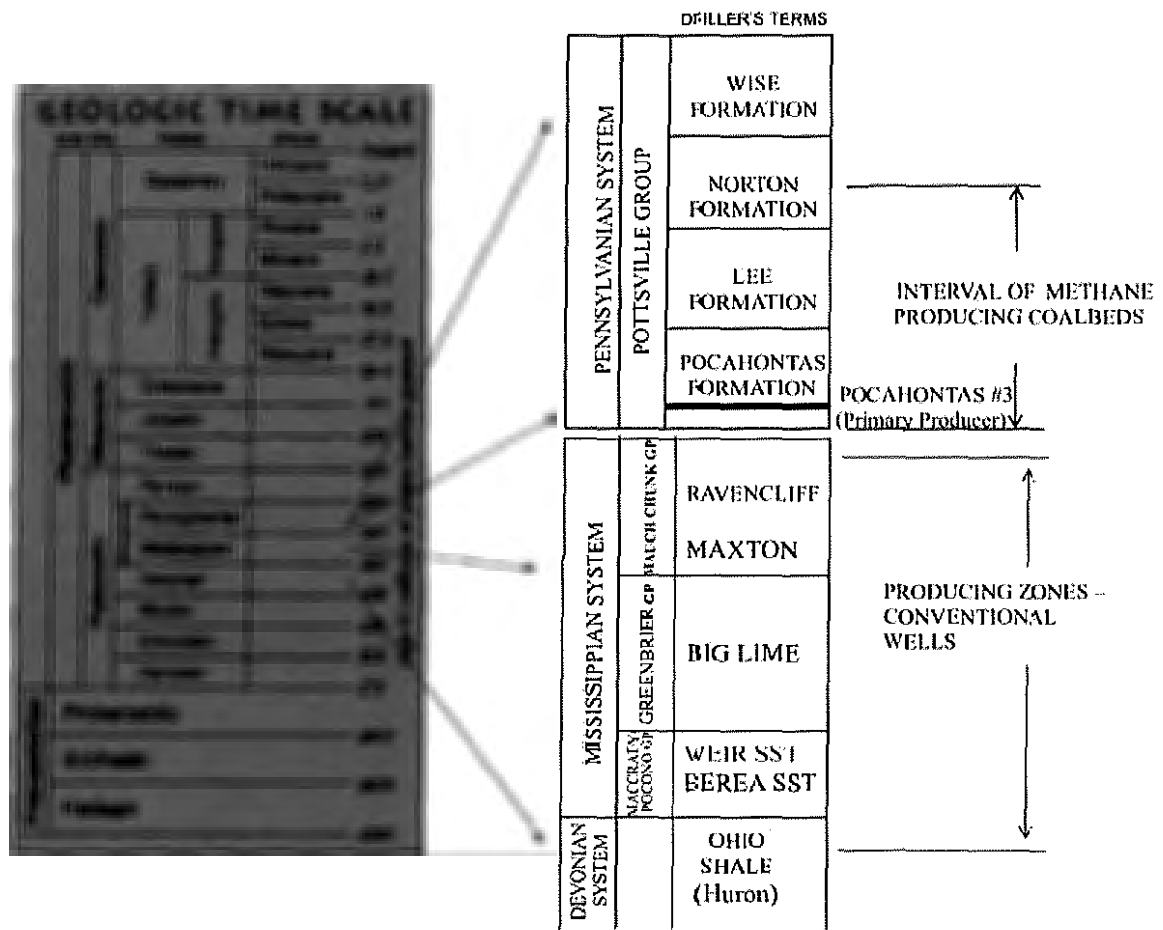


Figure G-1. Virginia Geologic Column

The confining zone directly above the injection zone is the upper Mississippian Greenbrier Group, locally referred to as the Big Lime. This is a dense, thick carbonate. The porosity zones in the Big Lime consist of thin oolitic channel deposits. Overall porosity in the upper Big Lime, based on offset data, is around two percent. Water saturation for the Big Lime is typically near zero. A structure map for the base of the Big Lime/top of the Weir is attached as Figure G-7.

Above the Big Lime is the Mauch Chunk Group consisting of over 1,000 feet of tight sands, siltstones and limestones that act as further barriers to the upward migration of fluids.

Above the Mauch Chunk are several thousand feet of siltstone, tight sands and coal beds that also inhibit the migration of injected fluid.

There are also several confining zones below the Weir, such as the Weir shale and below that the Sunbury shale. The very low permeability of shale inhibits the downward migration of produced fluids.

Additionally the Pocono Formation, locally known as the Berea Sandstone, consists of a fine-grained, dirty siltstone. Offset data indicate the Berea has an average porosity of about four percent. In this area, the Berea is approximately 80 feet thick. As mentioned, directly above the Berea is the Sunbury Shale. This shale is also about 80 feet thick and acts as a further barrier for downward migration of fluid. The top of the Sunbury is at 5018 feet and the top of the Berea at 5102 feet. A structure map of the top of the Berea is attached at the end of this section as Figure G-8.

Figure G-2 is the stratigraphic column for well P-171 as drilled.:

Formation	Depth in Feet (From Surface)		Formation Thickness (Feet)
	Top	Bottom	
Sand & Shale	0	2,682	2,682
Ravenclyff	2,682	2,846	164
Little Stone Gap	2,846	2,910	64
Sandy Shale	2,910	3,214	304
Maxon Sands	3,214	3,660	446
Shale	3,660	3,777	117
Little Lime	3,777	3,833	56
Limey Shale	3,833	3,980	147
Big Lime	3,980	4,458	478
Keener	4,458	4,550	92
Weir	4,550	5,018	468
Coffee Shale	5,018	5,102	84
Berea	5,102	5,186	84
Brown Shale	5,186	6,152	966
White Slate	6,152	6,271	119
Logger's T.D.	6,271		

Figure G-2. Stratigraphic Column for UIC well P-171

4.0 STRUCTURAL GEOLOGY

As stated, the site falls with the Appalachian Plateau geologic province. This region is dominated by relatively flat-lying strata. Rocks near the P-171 have an average dip of 0.6 degrees toward the northwest, while rocks south of the P-171 dip slightly to the southeast. This indicates the P-171 is located along the northwestern limb of the Sourwood Anticline, which is a broad, gentle fold with the axis in Russell County to the east (Diffenbach, 1989).

There are no faults identified within the Area of Review. There are no active tectonic forces in the region since Virginia lies on a passive continental margin. Minimal thrust faulting has been mapped within a few coal beds in the region resulting from the Pine Mountain Thrust Fault (Diffenbach, 1989). Figure G-6 is a cross-section indicating no measureable offset through the permitted injection zone.

One of the main structural features in the region is the Pine Mountain Thrust Block (Figure G-3). Movement along this block occurred several hundred million years ago and was due to regional compression oriented northwest-southeast causing the block to move in a northwest direction. Crustal rupturing occurred along the eastern most extent of this block resulting in the Russell Fork Fault. This fault is a high angle, right-lateral strike-slip fault with the fault plane dipping 75° to 90° to the southwest. Overall vertical movement is slight, with numerous slickensides existing along the fault trace (Giles, 1921).

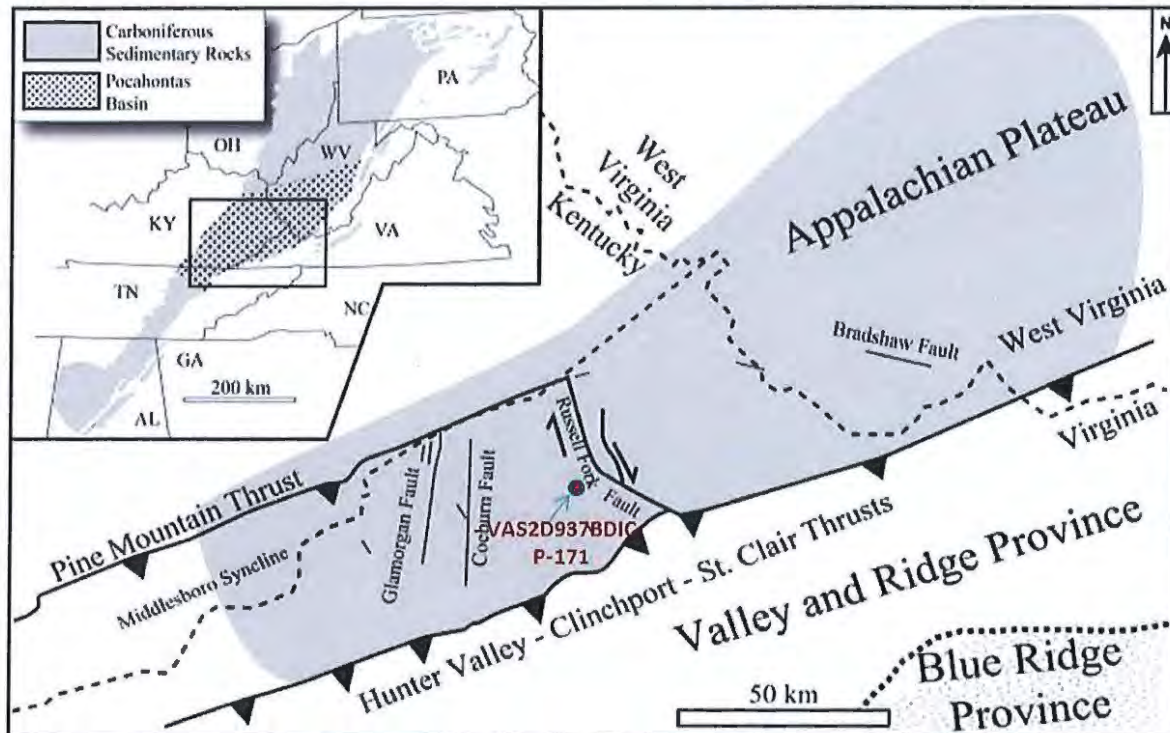


Figure G-3. Regional Geology. (Adapted from Grimm, et al, 2012)

Local Seismic Activity

Historically, seismic activity in Virginia has been minor. The faults that exist in the region were active during the Acadian and Alleghanian Orogenies approximately 375 million to 260 million years ago. The P-171 well is in a region that is not susceptible to earthquakes since there are no active forces causing crustal movement. Figure G-5 is a map from the Advanced National Seismic System (ANSS) of the area around P-171. On their system, earthquakes are shown by red dots. As seen on this map, there are no recorded earthquakes within the area of review.

Two main concentrations of earthquakes in the state are the Central Virginia seismic zone and the Giles County/New River seismic zone. The Eastern Tennessee seismic zone crosses into the southwestern tip of Virginia. Figure G-4 indicates that the P-171 does not coincide with one of these zones and falls within a relatively low density earthquake zone.

GEOLOGICAL INFORMATION

ATTACHMENT

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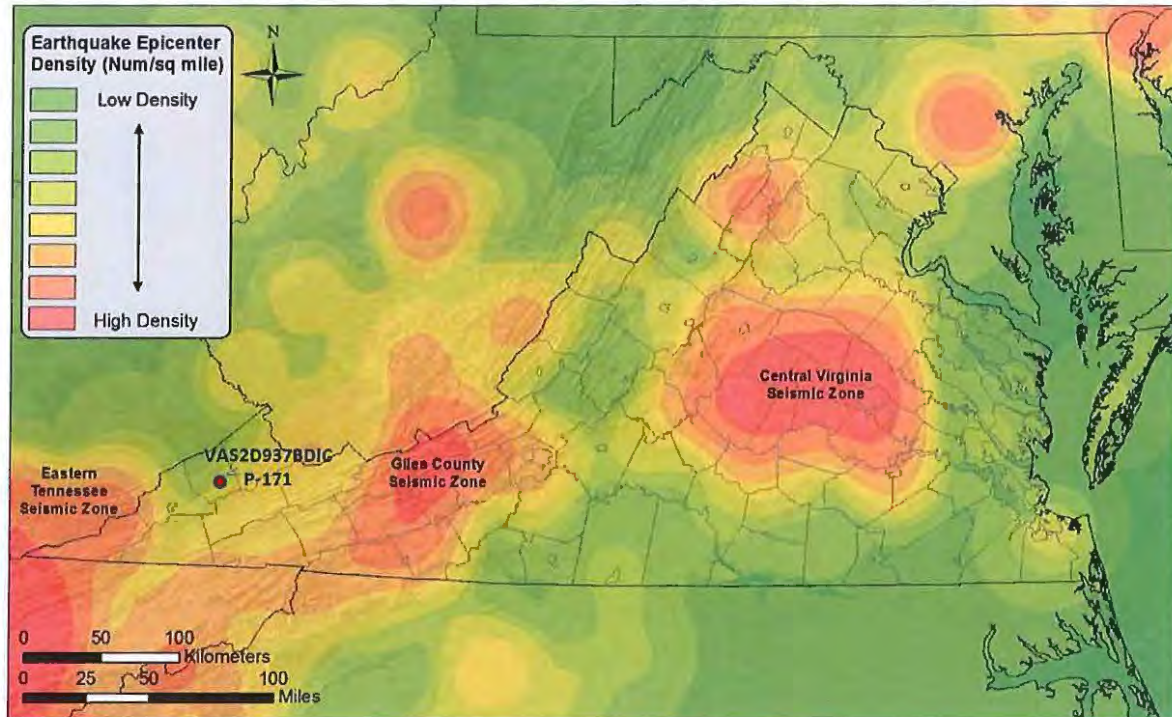


Figure G-4. Seismic Zones in Virginia (<http://www.dmme.virginia.gov/dgmr/earthquakes.shtml>)

The mechanism for Virginia's earthquakes has been attributed to residual stresses from the formation of the Appalachian Mountain range and the Piedmont province hundreds of millions of years ago. Most of the earthquake hypocenters are located miles below the target injection zone at depths between 3-15 miles and are not associated with faults mapped at the surface (VADMME, 2007). As stated, ANSS maps show no earthquake activity recorded in the vicinity of UIC well P-171.

Also of note is that several injection wells have been in operation in Virginia for more than a decade with no associated seismic activity.

GEOLOGICAL INFORMATION

ATTACHMENT

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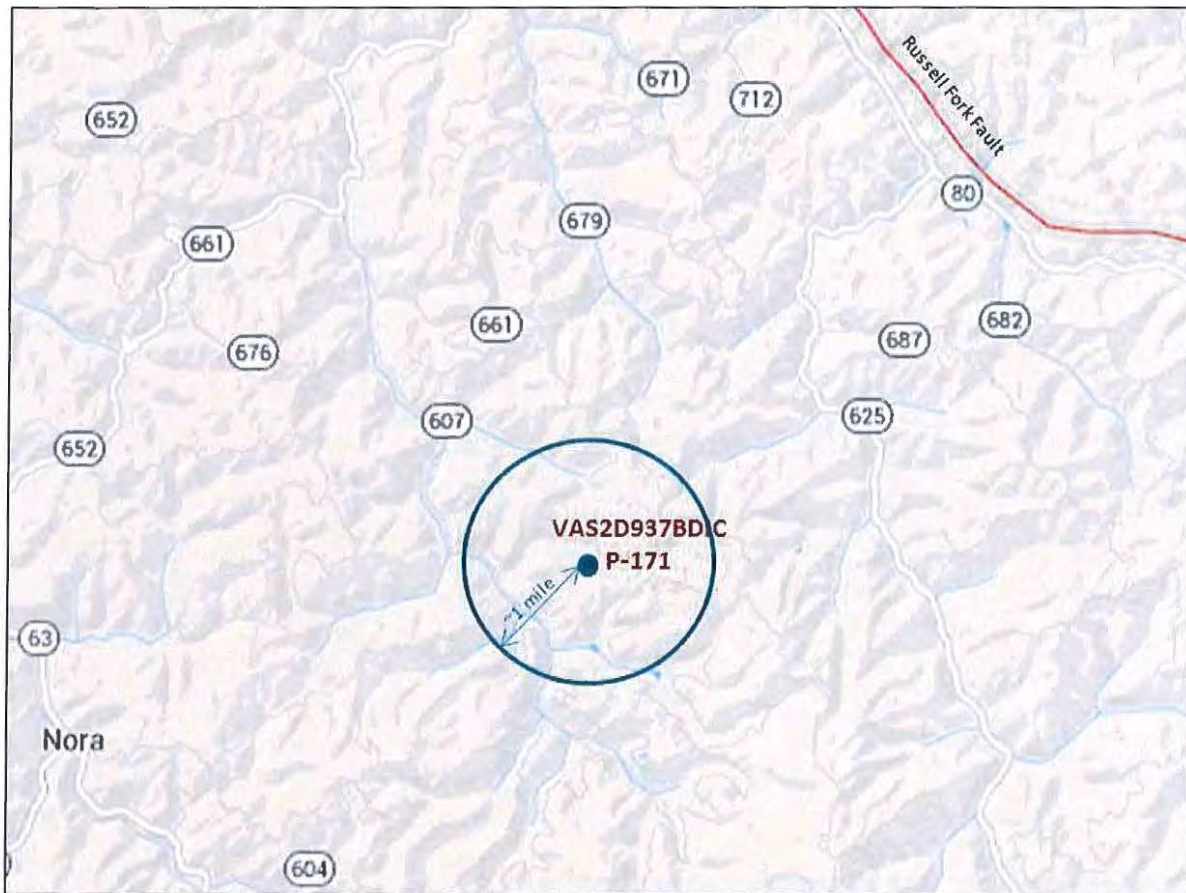


Figure G-5. Location of seismic activity from ANSS (Advanced National Seismic System)
(<http://www.dmme.virginia.gov/DGMR/earthquake2011.shtml>)

5.0 FRACTURE PRESSURES

The fracture pressures and instantaneous shut-in pressures for the two injection zones, as recorded by the Report of Completion of Well Work dated October 28, 1985, are listed below:

Fracture (breakdown) pressures (surface pressures)

Big Lime	2,150 psig
Weir	2,500 psig

Instantaneous shut-in pressures (surface pressures)

Big Lime	1,400 psig
Weir	1,700 psig

Rock pressures (surface pressures)

Big Lime	900 psig for 48-hr test
Weir	600 psig for 48-hr test

(the Weir, Berea, and Devonian shale formations were produced together.
Therefore, rock pressure is for the co-mingled zones)

GEOLOGICAL INFORMATION

ATTACHMENT

G

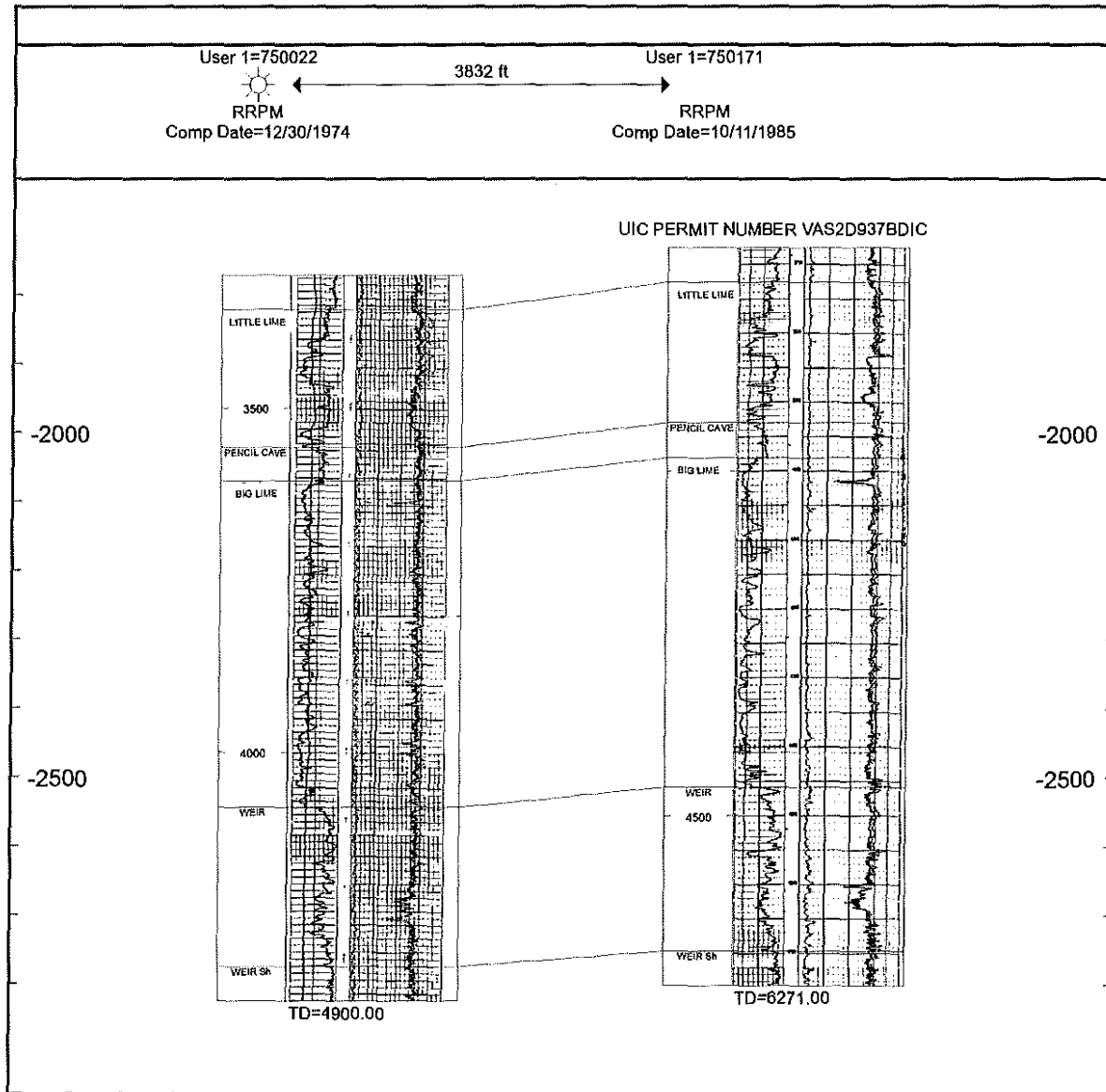


Figure G-6. Cross-Section across injection zone

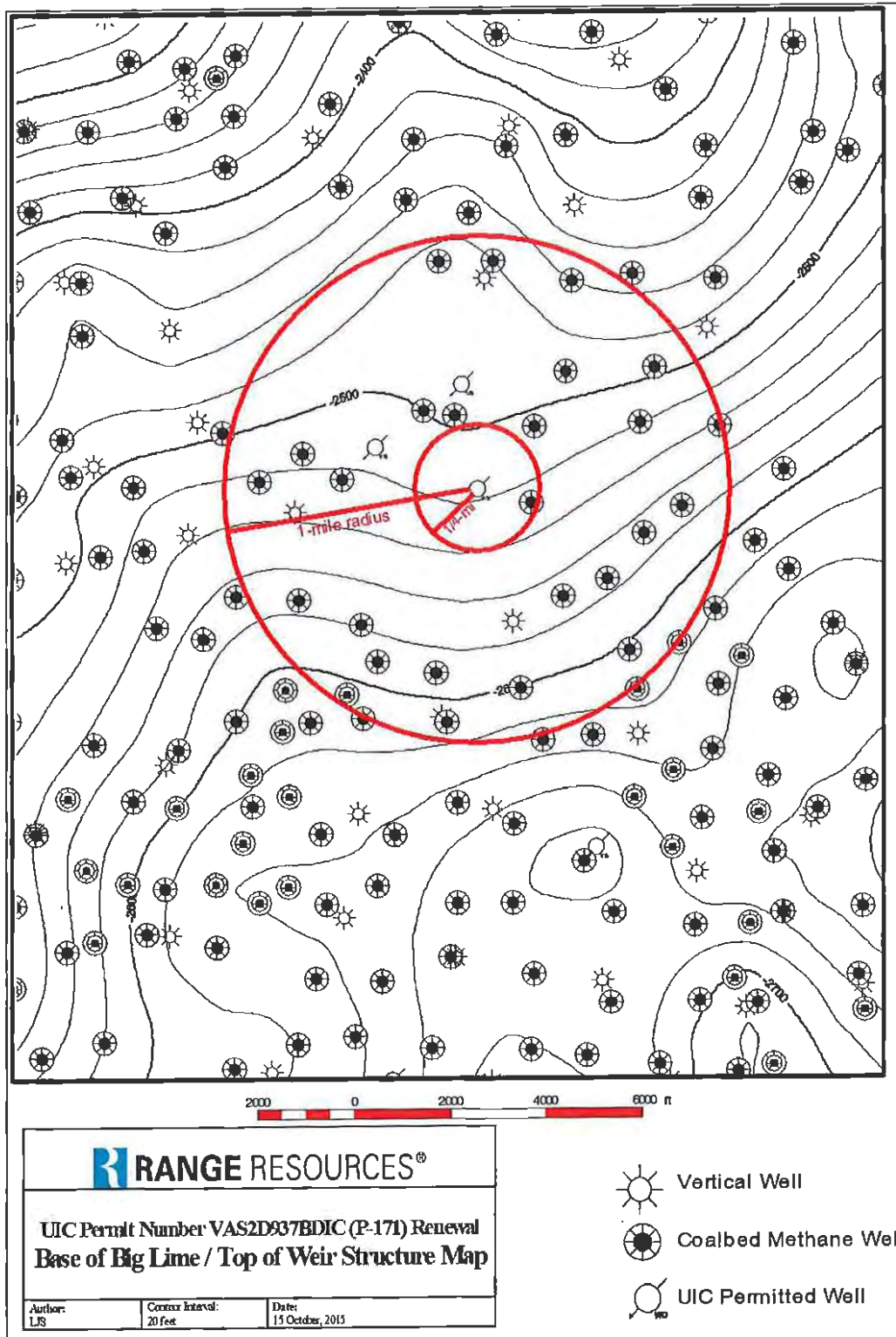


Figure G-7. Structure Map – Base of Big Lime / Top of Weir

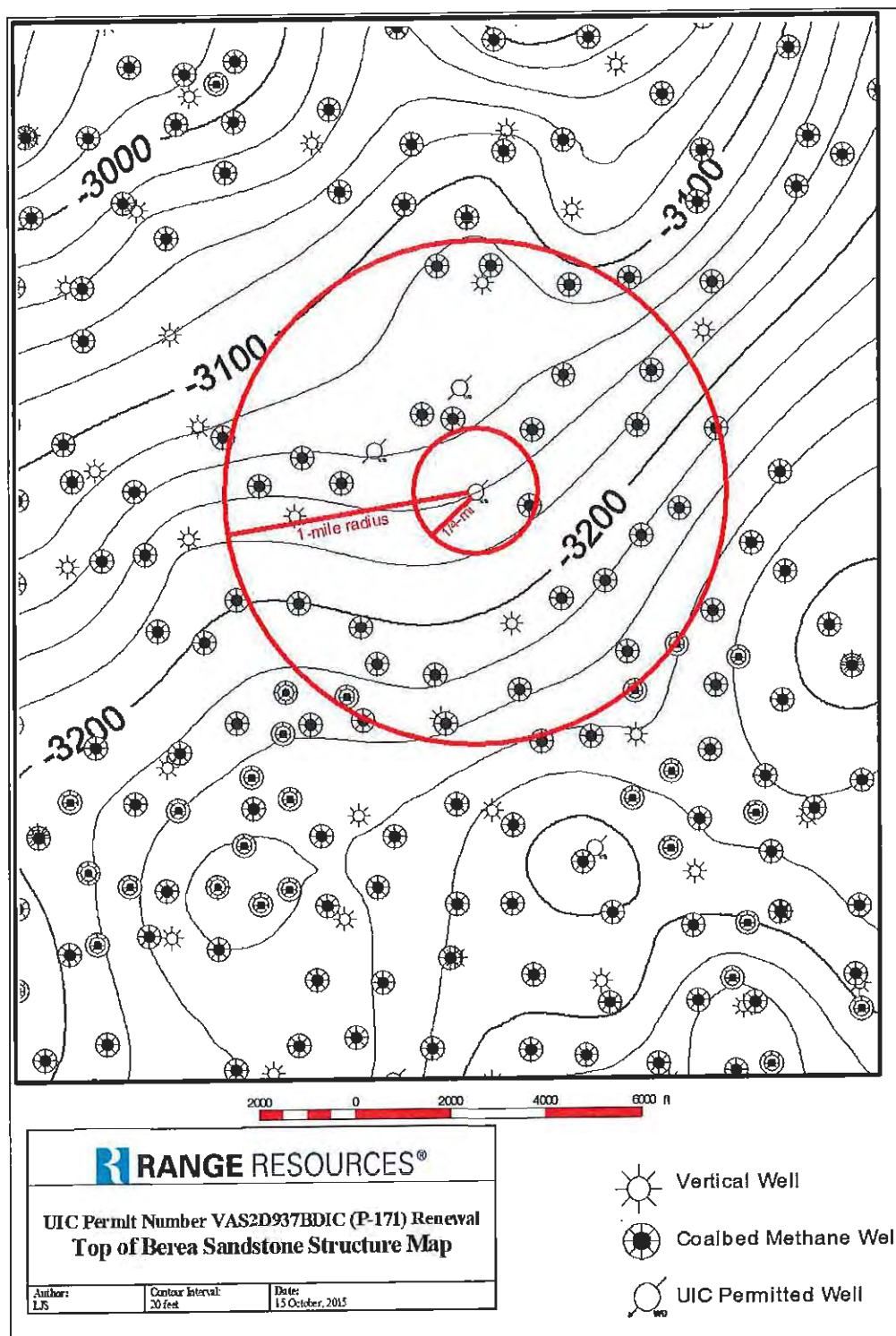


Figure G-8. Structure Map – Top of Berea sand

REFERENCES

Byington, Craig B., 2007, The Tectonic History and Characteristics of Fracture Systems Affecting Coal Mine Roof Stability in Southwest Virginia, Virginia Division of Mineral Resources Open0File Report 07-01.

Diffenbach, Robert, 1989, Geology of the Nora Quadrangle, Virginia. Virginia Division of Mineral Resources, Publication 92.

Giles, Albert W., 1921, *The Geology and Coal Resources of Dickenson County, Virginia*, Virginia Geological Survey, Bulletin No. XXI.

Grimm, Ryan P., et al, 2012, Seal evaluation and confinement screening criteria for beneficial carbon dioxide storage with enhanced coal bed methane recovery in the Pocahontas Basin, Virginia, *International Journal of Coal Geology*, V. 90-91, p. 110-125.

Molinda, M. and D.K. Ingram, 1989, Effects of structural faults on ground control in selected coal mines in southwest Virginia, *International Journal of Mining and Geological Engineering*, V. 1990, 8, p. 332-347.

Virginia Department of Mines, Minerals and Energy, Division of Geology and Mineral Resources, 2007, Earthquake Factsheet (<http://www.dmme.virginia.gov/dgmr/earthquakes.shtml>), and Major Earthquake 2011 (<http://www.dmme.virginia.gov/DGMR/earthquake2011.shtml>).

Appendix C

Existing Well Records within 1-mile Radius of P-171

APPENDIX C

EXISTING WELL RECORDS WITHIN ONE-MILE RADIUS OF WELL P-171

PAGE 1

1.0 INTRODUCTION

This Appendix provides the following information:

- A Summary of the known wells contained in the Virginia Division of Gas and Oil (DGO) records is provided by Pages 2 and 3 of this Appendix. This well summary is provided by the tables identified as:
 - Existing Well P-171
 - UIC Class IID Wells within ½ mile radius of Well P-171.
 - Coal Bed Methane Wells of Record within ½ mile radius of Well P-171.
 - Vertical Wells of Record within ½ mile radius of Well P-171.
 - Coal Bed Methane Wells of Record from ½ mile to 1 mile radius of Well P-171.

Each table provides the well permit number Virginia file number, operator's well number, total drilled depth and the Formation at Total Depth (TD).

- A total of thirty five (35) wells were found to be present within the one mile radius of P-171. These wells consist of:
 - Two (2) UIC Class IID Wells.
 - Four (4) Coal Bed Methane wells within ½ mile.
 - Four (4) Conventional wells within ½ mile.
 - Twenty five (25) Coal Bed Methane wells from ½ mile to one (1) mile.

2.0 WELL RECORDS

Copies of all well records are provided following Page 3 of the Appendix. Well records included are indicated in the tables.

APPENDIX C

EXISTING WELL RECORDS WITHIN ONE-MILE RADIUS OF WELL P-171

PAGE 2

Existing Well P-171				
Permit No.	Virginia File No.	Well No.	Total Depth (feet)	Formation at TD
733	DI-230	P171	6,271	Big Lime, Weir, Berea, Brown Shale

UIC CLASS IID WELLS WITHIN ½ - MILE				
Permit No.	Virginia File No.	Well No.	Total Depth (feet)	Formation at TD
437	DI-0192	P-750132	5,148	Berea
837	DI-0249	P-750205	6,153	Berea

COAL BED METHANE WELLS OF RECORD WITHIN 1/2-MILES OF WELL P-171				
Permit No.	Virginia File No.	Well No.	Total Depth (feet)	Formation at TD
4226	DI-958	VC-4065	1,913	Pocahontas
12863	DI-2595	VC-536376	2660	Pocahontas
12879	DI-2602	VC-536377	2,745	Pocahontas
12824	DI-2586	VC-536378	2,619	Pocahontas

CONVENTIONAL GAS WELLS OF RECORD FROM ½ MILE TO ONE-MILE RADIUS OF WELL P-171				
Permit No.	Virginia File No.	Well No.	Total Depth (feet)	Formation at TD
777	DI-235	P-182	5,284	Berea
161	DI-100	P-22	4,900	Berea
464	DI-195	P-123	5,574	Berea
530	DI-219	P-139	5,392	Berea

APPENDIX C

EXISTING WELL RECORDS WITHIN ONE-MILE RADIUS OF WELL P-171

PAGE 2

COAL BED METHANE WELLS OF RECORD FROM ½ - MILE TO ONE MILE RADIUS OF WELL P-171				
Permit No.	Virginia File No.	Well No.	Total Depth (feet)	Formation at TD
1547	DI-954	PC-148	2,221	Pocahontas
4215	DI-0954	VC-704076	1,819	Pocahontas
3597	DI-871	VC-702484	2,221	Pocahontas
5416	DI-1109	VC-504525	2,418	Pocahontas
5672	DI-1141	VC-535726	2,018	Pocahontas
6206	DI-1253	VC-536330	2,242	Pocahontas
5789	DI-1172	VC-535445	2,737	Pocahontas
5350	DI-1101	VC-504662	2,474	Pocahontas
3424	DI-855	VC-2482	2,610	Pocahontas
5026	DI-1066	VC-504372	2,021	Pocahontas
1700	DI-598	PC-159	2,298	Pocahontas
3482	DI-866	VC-3646	2,486	Pocahontas
5682	DI-1143	VC-535727	2,220	Pocahontas
12826	DI-2587	VCI-531507	2,686	Pocahontas
10915	DI-2311	VCI-531424	2,202	Pocahontas
10312	DI-2162	VC-536315	2,233	Pocahontas
4675	DI-1036	VC-504515	2,500	Pocahontas
12855	DI-2592	VC-536368	2,710	Pocahontas
12856	DI-2593	VC-536369	2,755	Pocahontas
10278	DI-2153	VC-535911	2,599	Pocahontas
7534	DI-1577	VC-536363	2,653	Pocahontas
7535	DI-1578	VC-536364	2,557	Pocahontas
12828	DI-2589	VC-502202	2,750	Pocahontas
12823	DI-2585	VC-536371	2,676	Pocahontas
7580	DI-1590	VC-535444	2,722	Pocahontas

REVISED PLAT

FORM 5 (Draft 07-09-82)

6900'

Latitude 31° 07' 30"

Longitude 82° 15' 00"

PO-148 (T-266)

INTERSTATE COAL & IRON CO.

674.19 AC.

CLINCHFIELD COAL CO.

LAUREL

N. 69° 01' W

2293.32'

N. 21° 09' W 382'

BEECH

N. 65° 40' E. 360'

N. 88° 30' E. 89.77'

N. 32° 08' E. 58.64'

COAL BENCH

R.R. SPIKE

R.R. SPIKE

GAS LINE

BRANCH

P-171

S. 3806.02'

E. 31991.64'

PO-148 (T-450)

JESSE WAMPLER

347.90 AC.

CLINCHFIELD COAL CO.



THIS IS THE
CORRECTED PLAT
OF P-171
B.S. Spradlin
4/18/85

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

Date: Sept. 26, 19 84

Operator's
Well No. P-171

VIRGINIA OIL AND GAS INSPECTOR
DEPARTMENT OF LABOR AND INDUSTRY
DIVISION OF MINES
OIL AND GAS SECTION
205 W. MAIN STREET
ABINGDON, VIRGINIA 24210
PHONE 703 628-1115

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 X / updated /

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

Well operator Philadelphia Oil Company

Address Box 431 Prestonsburg, KY. 41653
Farm Jesse Wampler
Tract T-450 Acres 347.90 Lease No. PO-148
Elevation 1933.57'
Quadrangle Nora, VA.
County Dickenson District Ervinton
Registered Engineer Registration No.
Certified Land Surveyor Cert. No.
File No. Drawing No.
Date 9-26-1984 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.

Luther Adkins, Jr. Va. # 871
~~Registered Engineer~~ or Certified Land Surveyor
in Charge

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

Date: June 19 / , 19 84

Operator's
Well No. P-171

VIRGINIA OIL AND GAS INSPECTOR
DEPARTMENT OF LABOR AND INDUSTRY
DIVISION OF MINES
OIL AND GAS SECTION
205 W. MAIN STREET
ABINGDON, VIRGINIA 24210
PHONE 703 628-8115

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 X / updated /

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

Well operator PHILADELPHIA OIL COMPANY

Address BOX 431 PRESTONSBURG, KY. 41653
Farm Interstate Coal and Iron Co.
Tract T-266 Acres 674.29 Lease No. PO-148
Elevation 1939.45'
Quadrangle Nora
County Dickenson District Ervinton
Registered Engineer Registration No.
Certified Land Surveyor Cert. No.
File No. Drawing No.
Date 6-19-1984 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.

Registered Engineer or Certified Land Surveyor
in Charge

6600'

Latitude 37° 07' 30"

Longitude 82° 15' 00"

PO-148 (T-266)
INTERSTATE COAL & IRON CO.
674.29 AC.
CLINCHFIELD COAL CO.

WELL P-132

3

N. 88° 18' W
2485'

S. 3093.59
E. 32308.31

WELL NO. P-171

N. 49° 58' 57" E 328.46'

IRON PIN

IRON PIN

N. 82° 43' 45" E 291.98'

LAUREL

BEECH.

LYNN.

BRANCH

PO-148 (T-450)
JESSE WAMPLER
347.90 AC.
CLINCHFIELD COAL CO.

Date:	State	County	Permit
October 28, 1985			
Operator's Well			
Name	Jesse Wampler, No. P-171		

VIRGINIA OIL AND GAS INSPECTOR
205 W. MAIN STREET
ABINGDON, VA 24210
703-628-8115

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 Ervington District, Dickenson County, Virginia on 11th day, October month, 19 85.

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 ___/ no ___/

WELL WORK: Drill X/ Deepen ___/ Redrill ___/ Stimulate ___/
Plug off old formation ___/ Perforate new formation ___/
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: Philadelphia Oil Company
BY Brint Camp
ITS District Geologist
ADDRESS 1101 N. Eastman Rd., Kingsport, TN 37664
TELEPHONE (615) 246-4332

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 _____ BOD
Gravity and grade: _____

DISCOVERY OF GAS OR INDICATIONS THEREOF

Indicated potential flow before stimulation 47 MCFD
Rock pressure: N/A psig _____ hour test

RECORD OF STIMULATION

Full description of stimulation:

Zone 1: Brown Shale Formation

The Brown Shale was treated with a 75 Q foam frac using
348 Bbl. of fluid, 60,000# sand and 1,025,000 scf N₂
Perforated 5949-6046 # Perfs. 22 Perf. Size .5
Breakdown 2500 psig. Avg. Injection 3450 psig.
Avg. I.R. 11 BPM Init. S.I.P. N/A psig 15 Min. S.I.P. _____ psig

Zone 2: Berea Formation

The Berea was stimulated with a 75 Q foam frac using 50,000#
sand, 339 Bbl. fluid, and 704 scf N₂
Perforated 5106-5167 # Perfs. 18 Perf. Size .5
Breakdown 3100 psig. Avg. Injection 2200 psig.
Avg. I.R. 8 BPM Init. S.I.P. 900 psig 15 Min. S.I.P. _____ psig

Zone 3: Weir Formation

The weir was treated with a 75 Q foam frac with 40,000#
sand, 518,000 scf N₂ and 280 Bbl. fluid.
Perforated 4599-4636 # Perfs. 13 Perf. Size .5
Breakdown 2500 psig. Avg. Injection 2100 psig.
Avg. I.R. 8 BPM Init. S.I.P. 1700 psig 15 Min. S.I.P. N/A psig

Final production () natural (X) after stimulation

	BOD	MCFD	Hours Tested	Rock Pressure	Hours Tested
Zone 1:	_____	_____	_____	_____	_____
Zone 2:	_____	_____	_____	_____	_____
Zone 3:	_____	_____	_____	_____	_____

Final production if gas zones are comingled: 622 MCFD

7 hours tested: 600 psig. 48 hours tested

Form 16
Appendix DAPI No. 45 - 051 - 20733APPENDIX 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 _____ BOD
Gravity and grade: _____

DISCOVERY OF GAS OR INDICATIONS THEREOF

Indicated potential flow before stimulation 47 MCFD
Rock pressure: N/A psig _____ hour test

RECORD OF STIMULATION

Full description of stimulation:

Zone 1: Big Lime FormationThe lime was acidized with 3,500 gal. 15% HCL and 55,000 scf N₂Perforated 4013 - 4018 # Perfs. 6 Perf. Size .4Breakdown 2150 psig. Avg. Injection 1700 psig.Avg. I.R. 10 BPM Init. S.I.P. 400 psig 15 Min. S.I.P. _____ 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 (☒) after stimulation

	BOD	MCFD	Hours Tested	Rock Pressure	Hours Tested
Zone 1:	_____	<u>220</u>	<u>7</u>	<u>900</u>	<u>48</u>
Zone 2:	_____	_____	_____	_____	_____
Zone 3:	_____	_____	_____	_____	_____

Final production if gas zones are comingled: _____ MCFD

_____ hours tested: _____ psig. _____ hours tested

API WELL NO. 45 - 051 - 20733
 State County Permit
 Date: October 28, 1985
 Operator's Well
 Name Jesse Wampler, No. P-171

DRILLING CONTRACTOR Union Drilling
ADDRESS 1101 N. Eastman Rd., Kingsport, TN 37664
TELEPHONE (615) 246-4332

GEOLOGICAL DATA	Depth		Thickness
	Top	Bottom	

Salt water

Oil Formation

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

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

Form 16
Appendix A, Sheet 1 (Reverse)
Continued from Obverse side

OTHER GENERAL INFORMATION

An electric log survey was ___/ 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 x/ 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.

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>	11-3/4"	Surface	25			
<u>CASING CIRCULATED AND CEMENTED IN TO SURFACE:</u>	8-5/8"	Surface	2277			
<u>COAL PROTECTION CASING SET UNDER SPECIAL RULE OF CODE OF VIRGINIA 45.1-334.B:</u>						
<u>OTHER CASING AND TUBING LEFT IN WELL;</u>	4-1/2"	Surface	6223		5949	6046
					5106	5167
					4599	4636
					4013	4018
<u>LINERS LEFT IN WELL UNDER CODE OF VIRGINIA SECTION 45.1-336 OR OTHERWISE:</u>	2"	Surface	6043			

<u>PACKERS OR BRIDGE PLUGS:</u>	<u>KIND</u>	<u>SIZE</u>	<u>SET AT</u>
	Larkin	4-1/2" X 2"	4220

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 X REQUIRE SACKS TO BE FURNISHED BY THE VIRGINIA
DIVISION OF MINERAL RESOURCES.

FORM 16

Appendix A, Sheet 2 (Reverse)

DRILLER'S LOG

P-171

Compiled by Brint Camp

Geolo- gical Age	Formation	General Lithology	Color	Depth (feet)		Thickness	Remarks
				Top	Bottom		
	Sand & Shale			0	2682	2682	
	Ravencliff			2682	2846	164	
	Little Stone Gap			2846	2910	64	
	Sandy Shale			2910	3214	304	
	Maxon Sands			3214	3660	446	
	Shale			3660	3777	117	
	Little Lime			3777	3833	56	
	Limey Shale			3833	3980	147	
	Big Lime			3980	4458	478	
	Keener			4458	4550	92	
	Weir			4550	5018	468	
	Coffee Shale			5018	5102	84	
	Berea			5102	5186	84	
	Brown Shale			5186	6152	966	
	White Slate			6152	6271	119	
	Logger's T.D.			6271			

Complete on supplemental sheet as necessary

DIRECTIONAL SURVEY

P-171

DEPTH

204'
361'
562'
739'
942'
1111'
1174'
1420'
1637'
1826'
2315'

DEGREES

0°
3/4°
3/4°
0°
0°
1-1/4°
1°
3/4°
3/4°
1°
3/4°

THIS PERMIT IS NOT TRANSFERABLE



Commonwealth of Virginia
Department of Labor and Industry
DIVISION OF MINES

Big Stone Gap, Virginia
WELL WORK PERMIT

Permit No. 733
File No. DI-230
Well No. P-171
API No. 45-051-20733

This is to certify that on this date a well work permit

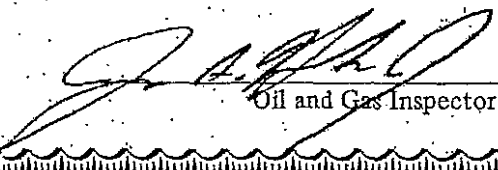
was issued to Philadelphia Oil Company
whose address is 1101 N. Eastman Road, Kingsport, TN 37554
for the operation of P-171 (1) drill (2) stimulate (3) perforate (4) plug
located in Ervinton District, County of Dickenson

THIS WELL WORK PERMIT IS ISSUED IN COMPLIANCE WITH
TITLE 45.1, CHAPTER 22, CODE OF VIRGINIA 1950 AS AMENDED

Any person operating a well within the State without first obtaining a well work permit as provided herein shall be guilty of a class one misdemeanor or other penalties as prescribed in Title 45, Chapter 22, Article 7 of the Code of Virginia. Each day any person operates a well without first obtaining a well work permit shall constitute a separate offense.

Issued this Fourth day
of December 19 84

Fee Paid \$100.00


Oil and Gas Inspector

Latitude 37° 07' 30"

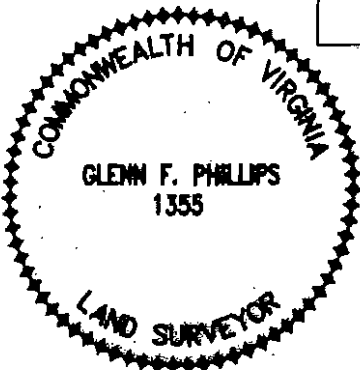
Longitude 82° 15' 00"

Lease No. 241490L / T-266
Campbell - Carter
674.29 Acres
Clinchfield Coal Company /
Pyxis Resources Company - surface & coal
Pine Mountain Oil & Gas, Inc. - oil & gas
Gas 27.96 Ac. 47.57%

Lease No. 241640L / T2-124
Joseph H. Rasnick
300 Acres
Clinchfield Coal Company /
Pyxis Resources Company - coal
Pine Mountain Oil & Gas, Inc. - oil & gas
Gas 1.39 Ac. 2.37%

Lease No. 241490L / T-450
Jesse Wampler
320.9 Acres
Clinchfield Coal Company /
Pyxis Resources Company - coal
Pine Mountain Oil & Gas, Inc. - oil & gas
Gas 11.30 Ac. 19.23%

Lease No. 241640L / T2-126
C. V. Rasnick
305.2 Acres
Clinchfield Coal Company /
Pyxis Resources Company - surface & coal
Pine Mountain Oil & Gas, Inc. - oil & gas
Gas 18.12 Ac. 30.83%



Well elevation determined by GPS
survey from BM Y 108

FINAL PLAT

Area of Unit = 58.77 Ac.

Well Coordinates: (VA St. Plane S. Zone,
Calculated from CCC coordinates)
N 297,035 E 900,658

Well Coordinates: (Clinchfield Coal Co.)
S 4,028.26 E 33,111.38

WELL LOCATION PLAT

COMPANY Equitable Production Company WELL NAME AND NUMBER VC-4065
TRACT NO. T-266 ELEVATION 1921.38' QUADRANGLE Nora
COUNTY Dickenson DISTRICT Ervin SCALE 1" = 400' DATE 8-05-99
This Plot is a new plot ; on updated plot ; or a final location plot x

+ Denotes the location of a well on United States topographic Maps, scale 1 to 24,000, latitude and longitude lines being represented by border lines as shown.

Glenn F. Phillips

Licensed Professional Engineer or Licensed Land Surveyor

Department of Mines, Minerals and Energy
Division of Gas and Oil
P.O. Box 1416
Abingdon, Virginia 24210
540/676-5423

COMPLETION REPORT

WELL TYPE: COALBED METHANE

Date Well Completed 08/17/1999 Total Depth of Well: LTD - 1913 DTD - 1905

Attach the Drilling Report; if not previously submitted. In addition, submit any changes in casing or tubing that were approved after the Drilling Report was submitted.

STIMULATION RECORD

Zone 1 : M HORS, CSEAM, WARCK, UN C, BECKLY, L HORS, XSEAM RIDER

Formation Stimulated With: 70Q FOAM

Total Sand Used: 17742 lbs Sand Size: 12/20 Total Acid: 670 gal. Acid Strength: 7.5%

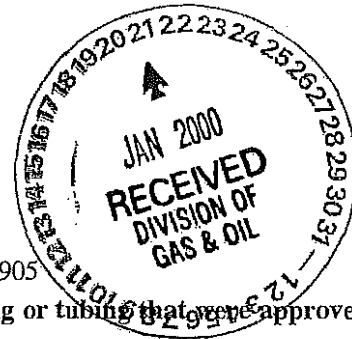
N2 Used: 750100 SCF Total Fluid Injected: 627 bbls.

Perforated: 1389.5 to 1676.5 No. of Perforations: 16 Size: 0.34 "

Formation Broke Down at: 1483 PSIG Average Injection Rate: 55 BPM

ISIP: 1980 PSIG 5 Min SIP: 1501 PSIG Average Injection Pressure: 3600

Date Stimulated: 08/17/1999



FINAL PRODUCTION: After Stimulation

BOD MCFD HOURS TESTED ROCK PRESSURE HOURS TESTED

Final Production If Gas
Zones are Commingled

35 MCF 6 Hours Tested 400 PSIG 48 Hours Tested

Permittee: Equitable Production Company (Company)

By:

James M. Cuel (Signature)

ENTERED

Department of Mines, Minerals and Energy
Division of Gas and Oil

Operations Name: CAMPBELL - CARTE Well #: VCP4065

Permit #: 4226

VA File #: DI-0958

Department of Mines, Minerals and Energy
Division of Gas and Oil
P.O. Box 1416
Abingdon, Virginia 24210
540/676-5423

DRILLING REPORT

Pursuant to VR-480-05-22.1 § 1.36, the undersigned Permittee submits this report on Well VCP4065 in the ERVINTON District of DICKENSON County, Virginia on the 5 day, January month, 2000.

LOCATION

County: DICKENSON District: ERVINTON
Surface Elevation: 1921.78 Elev of Kelly Bushing: 1931.78 Quadrangle: NORA
13100 Ft. S of Latitude 37 ° 07 ' 30 " and 5800 Ft. W of Longitude 82 ° 15 ' 00 "

DRILLING DATA

Date Drilling Commenced: 08/01/1999 Drilling Contractor: UD15
Date Drilling Completed: 08/07/1999 Rig Type: X Rotary Cable Tool
Total Depth of Well: LTD - 1913 DTD - 1905

GEOLOGICAL DATA

Fresh Water at:

101 feet 1/4" STREAM 1561 feet DAMP

Salt Water at:

C L SEAMS:

<u>NAME</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>THICKNESS</u>	<u>MINING IN AREA</u>		
				<u>YES</u>	<u>NO</u>	<u>MINED OUT</u>
RAVEN	584	586	2			
L JAWBONE	723	735	12			
M HORSEPEN	1389	1391	2			
C SEAM	1470	1471	1			
WAR CREEK	1512	1514	2			
UNNAMED C	1539	1540	1			
BECKLY	1557	1560	3			
L HORSEPEN	1612	1613	1			
X SEAM RIDER	1675	1677	2			

GAS AND OIL SHOWS:

<u>FORMATION</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>THICKNESS</u>	<u>IPF (MCFD/BOPD)</u>	<u>PRESSURE</u>	<u>HOURS TESTED</u>

Cuttings or samples are not available for examination by a member of the Virginia Division of Mineral Resources

Cuttings or samples have not been furnished to the Virginia Division of Mineral Resources

ELECTRIC LOGS AND SURVEYS

List logs run on wellbore:

CCL
DEN
GR
TMP
USGS

Did log disclose vertical location of a coal seam ? Yes

SURVEY RESULTS

<u>DEPTH</u> <u>OF SURVEY</u>	<u>DIRECTION/DISTANCE/DEGREE</u> <u>FROM TRUE VERTICAL</u>	<u>DEPTH</u> <u>OF SURVEY</u>	<u>DIRECTION/DISTANCE/DEGREE</u> <u>FROM TRUE VERTICAL</u>
100	0.00°	300	0.25°
500	0.25°	690	0.25°
890	0.25°	1090	0.25°
1175	0.25°	1215	0.25°
1415	0.25°	1530	0.25°
1603	0.50°	1662	0.50°
1698	0.50°	1898	0.75°

CASING AND TUBING

	<u>SIZE</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>LENGTH</u>	<u>CEMENT</u> <u>USED</u> <u>IN CU/FT</u>	<u>DATE</u> <u>CEMENTED</u>	<u>PACKERS OR</u> <u>BRIDGE PLUGS</u> <u>KIND</u> <u>SIZE</u> <u>SET AT</u>
<u>Conductor Pipe</u>	11.750	0.00	19.00	19.00			
<u>Surface Casing</u>	8.625	0.00	308.00	308.00	130	8/02/1999	
<u>Production Casing</u>	4.500	0.00	1892.00	1892.00	526	8/04/1999	
<u>Tubing String 1</u>	2.375	0.00	1841.60	1841.60			

REMARKS: Shntdown, fishing jobs, depths and dates, caving, lost circulation, etc.

LOGGER'S LOG

Controlled by: Engineering

<u>AGE</u>	<u>FORMATION*</u>	<u>GENERAL LITHOLOGY</u>	<u>COLOR</u>	<u>DEPTH</u>		<u>THICKNESS</u>	<u>REMARKS</u>
				<u>TOP</u>	<u>BOTTOM</u>		
PENN	RAVEN			584	586	2	
PENN	L JAWBONE			723	735	12	
PENN	M HORSEPEN			1389	1391	2	
PENN	C SEAM			1470	1471	1	
PENN	WAR CREEK			1512	1514	2	
PENN	UNNAMED C			1539	1540	1	
PENN	BECKLY			1557	1560	3	
PENN	L HORSEPEN			1612	1613	1	
PENN	X SEAM RIDER			1675	1677	2	

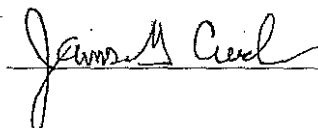
LOGGER'S TOTAL DEPTH

1913

*Formations between coal seams are Sand, Shale and Thin Coals

Permittee: Equitable Production Company (Company)

By:

 (Signature)

PERMIT FOR GAS AND OIL OPERATIONS

THIS CERTIFICATE OF PERMIT IS GRANTED
TO THE COMPANY NAME OF THE COMPANY
HET BENT COMPANY CO. COMPANY'S SIGNATURE AND COMPANY
WHICH HAS BEEN ISSUED TO THE COMPANY AT THE COMPANY
KINGSTON, ON 1/1/1991

AND THE NAME OF THE COMPANY

THIS PERMIT IS ISSUED TO THE COMPANY ON 1/1/1991

THIS PERMIT WAS REQUESTED FOR OPERATIONS UNDER
SECTION 10.1 OF THE ACT

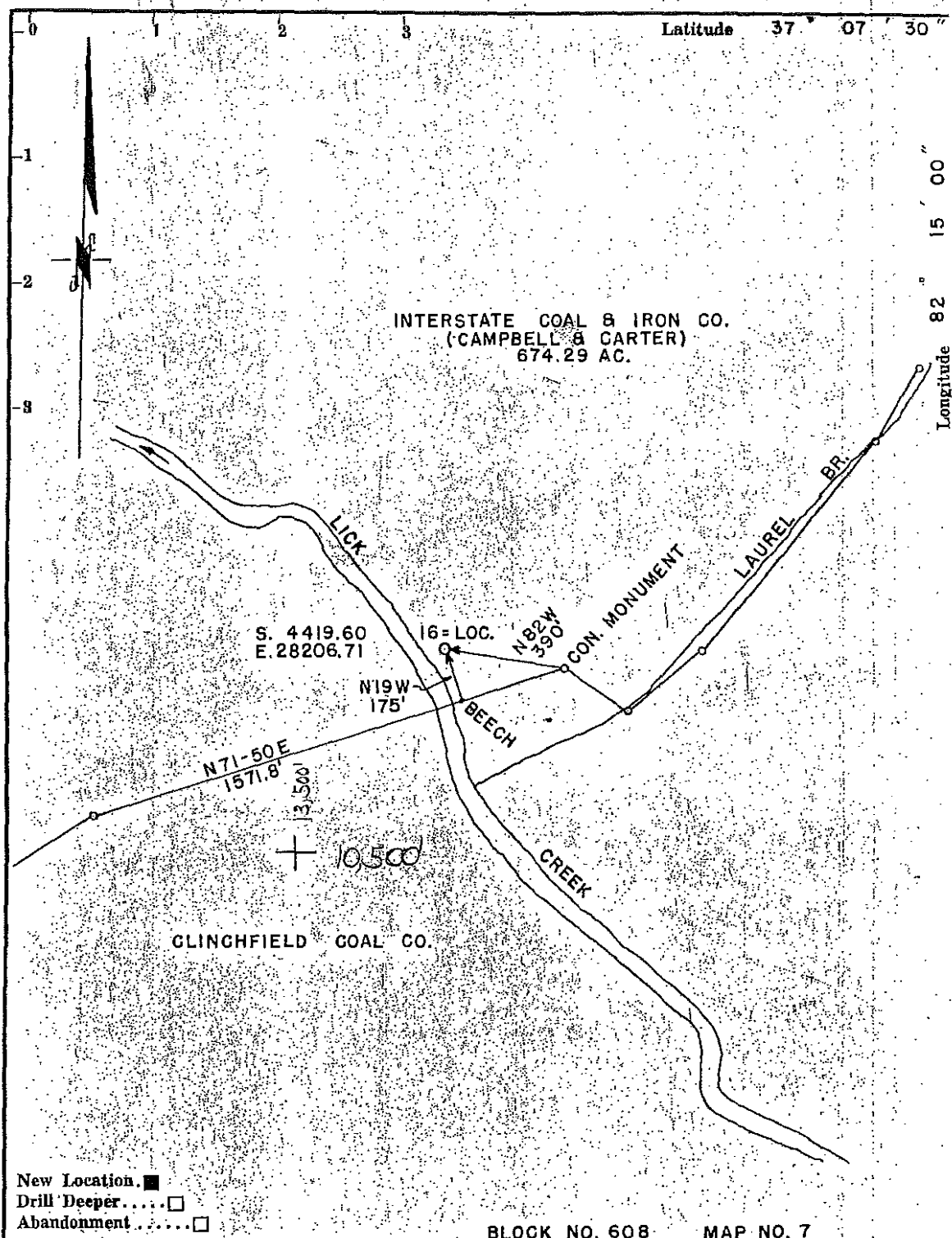
THE PERMITTED OPERATIONS ARE LIMITED TO THE OPERATIONS OF THE
OF THE COMPANY

THIS PERMIT IS ISSUED TO THE COMPANY WITH THE CONDITION THAT THE COMPANY SHALL
BE RESPONSIBLE FOR THE PROTECTION OF THE ENVIRONMENT AND THE HEALTH AND SAFETY OF THE
PUBLIC AND THE COMPANY SHALL BE RESPONSIBLE FOR THE PROTECTION OF THE ENVIRONMENT
AND THE HEALTH AND SAFETY OF THE PUBLIC AND THE COMPANY SHALL BE RESPONSIBLE FOR
THE PROTECTION OF THE ENVIRONMENT AND THE HEALTH AND SAFETY OF THE PUBLIC

THIS PERMIT, WHICH IS THE PROPERTY OF THE COMPANY, IS VALID FOR THE PERMITTED OPERATIONS
AS DESCRIBED IN THE PERMIT

THE PERMIT IS VALID
FOR THE COMPANY

FILE COPY



New Location. ☒
 Drill Deeper. ☐
 Abandonment. ☐

BLOCK NO. 608 MAP NO. 7

Company PHILADELPHIA OIL COMPANY
 Address PRESTONSBURG, KY.
 Farm INTERSTATE COAL & IRON CO.
 Tract T-266 Acres 674.29 Lease No. PO 148
 Well (Farm) No. _____ Serial No. P-22
 Elevation (Spirit Level) 1561.23'
 Quadrangle NORA, VA.
 County DICKENSON District ERVINTON
 Engineer Edmond Owen Ray
 Engineer's Registration No. 3084 L.S. 534 KY.
 File No. _____ Drawing No. _____
 Date 2-20-74 Scale 1" = 400'

COMMONWEALTH OF VIRGINIA
 DEPARTMENT OF LABOR & INDUSTRY
 DIVISION OF MINES
 BIG STONE GAP

WELL LOCATION MAP

FILE NO. DI-100

PERMIT # 161

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

— Denotes one inch spaces on border line of original tracing.

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF LABOR AND INDUSTRY
DIVISION OF MINES AND QUARRIES
BIG STONE GAP, VIRGINIA 24219

NOTICE OF INTENTION TO (DRILL) (REDRILL) (DEEPEN) OIL OR GAS WELL

(One copy of this report and three identical copies of a plat or map, on a scale not smaller than 400 feet to the inch, and showing information required by Section 45.1-114, Code of Virginia, 1950, 1954 and the 1966 Cumulative Supplement, must be submitted to the Division of Mines and Quarries, and copies sent by registered mail to all persons defined in above law, prior to obtaining a permit to drill.)

TO: Division of Mines and Quarries
Drawer V
Big Stone Gap, Virginia 24219

Box 431
Prestonsburg, Kentucky 41653
Place
March 11, 1974
Date

Gentlemen:

The undersigned proposes to begin as soon as a permit therefor is obtained from the Division of Mines and Quarries, to drill, ~~redrill or deepen~~ (drill or deepen) a well for oil or gas on the ^{Interstate Coal} ~~(Campbell-)~~ ^{Iron Co.} ~~Carter~~ Farm, comprising 674.29 acres, in the Ervinton District of Dickenson County, Virginia, having the fee title thereto, or as the case may be, under grant or lease dated July 25, 1972, made by The Pittston Company to Philadelphia Oil Company and recorded on the 30th day of March, 1973 in the office of the County Clerk for said County in Book 159 Page 431. The proposed location of the well, as shown on the attached plat or map, is about 3.52 (feet/miles) Northeast of Nora, Virginia and about 4.13 (feet/miles) East of Stratton, Virginia.

It is proposed to drill this well to a depth of about 4754 feet. Samples or cutting therefrom will ~~not~~ be available for examination by a member of the staff of the Virginia Geological Survey. Cuttings will ~~not~~ be furnished the Survey.

A plat or map, in triplicate, on a scale not smaller than 400 feet to the inch, showing the proposed location of the well and other information, required in Section 45.1-114, Code of Virginia, 1950, 1954 and the 1966 Cumulative Supplement is attached hereto. Copies of the plat and notice of intention to drill, redrill or deepen the aforementioned well have been sent to all interested persons as required by Section 45.1-114, above cited, as follows (list names and mail address of each. Use back of sheet if additional space is required):

1. The Pittston Company, Lebanon, Virginia 24266, Attention: J. E. Yates,
2. Vice President of Engineering, Pittston Coal Group
3. Clinchfield Coal Company, Dante, Virginia 25237, Attention: Robert
4. Ryland, Division Engineer.
- 5.
- 6.

Signature of officer or certifying party:

Edward O. Ray
Name

Edward O. Ray
MINE

Very truly yours,

PHILADELPHIA OIL COMPANY

Drilling Company or Operator

Box 431

Street Address

Prestonsburg, Kentucky 41653

City or Town and State

File DI-100 Date Received 3-13-74 Well No. P-22

COPY

P. A. 7

(To be filled in by
Division of Mines)

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF LABOR AND INDUSTRY

(To be filled in by
Division of Mines)

DICKENSON
County

DIVISION OF MINES

Well No. P-22

ERVINTON
District

BIG STONE GAP, VIRGINIA

Permit No. 161

NORA QUAD.
Map

DEEPEINED
OIL AND GAS WELL COMPLETION REPORT
ABANDONMENT

Office No.

DI-100
File

Location Plat

(This report and a copy of electrical log, if made, must
be submitted to the Division of Mines within 30 days after
abandonment or completion of well, as required by Section
45-113, Code of Virginia, 1950.)

Company Philadelphia Oil Company Address P. O. Box 313
Nora, Virginia
Farm Interstate Coal & Iron Co. Acres 674.29
County Dickenson District Ervington
Well No. (Company) P-22 Elevation (ground surface) 1561.23 ft.

Location: (Give direction and distance in feet or tenths of a mile from two (2) location reference points or map coordinates shown on location plat or map previously filed with the Division of Mines or shown on quadrangle topographic map of area.)

6000 feet Southeast of Counts Cemetery and
4500 feet Northeast of Middle Branch Church

Surface of tract is owned in fee simple by Clinchfield Coal Company
Address Dante, Virginia
Mineral rights are owned by Clinchfield Coal Company
Address Dante, Virginia

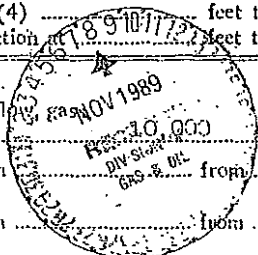
Location made by Mr. B. C. Spradlin
Drilling commenced July 9, 1974 Drilling contractor Union Drilling, Incorporated
Drilling completed July 20, 1974 Address P. O. Drawer 40, Buckannon, W. Va.

Well completed as ^{Gas} well on 12-30-74
~~oil~~ Final open flow - Weir - 94 MCF - Berea - 337 Total Prod. 431 MCF
Well abandoned at feet on : Reason
Well plugged on 19 Affidavit filed 19
Total depth 4900' KB feet. Steel line measurement feet.
Commented producing on not connected to pipeline 19.

Oil Well
Initial production, oil: 1st 24 hours bbls.; 2nd 24 hours bbls.
After shot on from feet to feet with lbs.
qts.
After shot on from feet to feet with lbs.
qts.
1st 24 hours bbls.; 2nd 24 hours bbls.
Settled production bbls. per day after producing days
weeks

Gravity and grade of oil
Oil pays at (1) feet to feet. Oil shows at (1) feet to feet.
(2) feet to feet. (2) feet to feet.
(3) feet to feet. (3) feet to feet.
(4) feet to feet. (4) feet to feet.
Main production feet to feet. (5) feet to feet.

Gas Well
Initial open flow gas Gaged /10ths. Water in inch.
Volume cu. ft. /10ths. Mercury in inch.
After shot on from feet to feet with lbs.
qts.
After shot on from feet to feet with lbs.
qts.
1st 24 hours cu. ft., 2nd 24 hours cu. ft.



Fresh water at (1) 25 feet, 8" GPM; (2) 680 feet, show GPM; (3) feet, G
Salt water at (1) feet; (2) feet; (3) feet; (4) feet.
Coal: from 102 feet inches to 103 feet inches; from 109 feet inches to
feet inches; from 125 feet inches, to 221 feet inches.
Well acidized from feet to feet with (quantity) of acid.
from feet to feet with (quantity) of acid.
from feet to feet with (quantity) of acid.
Remarks: Sand fractured in Berea and Weir with 1000 bbls. water, 55,000# sand, 1000 gals.
MA, 1200# J-140, 60 gal. F-52. Set frac over plug at 4720. Perforated Weir and
Berea formations.

CASING AND TUBING				PACKERS		
SIZE	USED IN DRILLING	LEFT IN WELL	PERFORATED	KIND	SIZE	SET AT
(inch)	(feet)	(feet)	(feet) to (feet)			
16	16	16		Frac-Over	4 1/2	4720'
11 3/4	311	311				
8 5/8	1885	1885				
4 1/2	4915	4915				
			Weir			
			4211-15 5 shots			
			4219-22 4 shots			
			4226-28 3 shots			
			4237-42 6 shots			
			Berea			
			4738-62 13 shots			
			4768-76 13 shots			
2	4720	4720			NONE	
Casing Cemented:	11 3/4	in. from 311	feet to surface	feet.	Date	July 11, 1974
	8 5/8	in. from 1885	feet to surface	feet.	Date	July 15, 1974
	4 1/2	in. from 4915'	feet to 3965	feet.	Date	July 21, 1974

Remarks: (Shut down, depths, dates; fishing jobs, depths, dates; caving; other notes)

Heavy water flow at 25'

Samples or cuttings will be available for examination by a member of the Virginia Geological Survey xix

Will be furnished the Virginia Geological Survey upon request ^(Yes)
~~(No)~~ if sacks for same are furnished by

Survey (Yes)
 (No)

Electrical log made x or not made (check which).

Copy furnished herewith or will be submitted on or by as soon as available, 19.....
Philadelphia Oil Company

Depths Gamma Density Philadelphia Oil Company
.....
..... B O Box 127

Temperature

.....

The operator requests that information given herein and log or logs be kept confidential for a period of ninety days a completion of the well covered by this report

Well No. File No. Permit No.

LOG

Furnished by E. B. Jenkins Date 12-30-74

Compiled by E. B. Jenkins Date 12-30-74

SAMPLE No.	FORMATION	COLOR	HARD OR SOFT	Top (feet)	Bottom (feet)	THICKNESS (feet)	REMARKS Oil, Gas, Water Depth, Soot Down, Fishing, etc.
	Mud			0	25	25	
	Sand			25	102	78	
	Coal			102	103	1	
	Sand			103	109	6	
	Coal			109	111	3	
	Sand			111	122	11	
	Coal			122	125	3	
	Sand			125	221	96	
	Coal			221	223	2	
	Sand			223	285	62	
	Sand & Shale			285	447	142	
	Shale			447	475	28	
	Coal			475	479	4	
	Sand			479	514	35	
	Sand & Shale			514	588	74	
	Coal			588	591	13	
	Sand & Shale			591	621	20	
	Coal			621	623	2	
	Sand & Shale			623	678	55	
	Sand			678	742	64	
	Coal			742	744	2	
	Sand & Shale			744	779	35	
	Coal			779	782	3	
	Sand & Shale			782	1020	238	
	Coal			1020	1022	2	
	Sand & Shale			1022	1057	35	
	Shale			1057	1100	43	
	Coal			1100	1102	2	
	Sand & Shale			1102	1140	38	
	Coal			1140	1142	2	
	Sand & Shale			1142	1178	36	
	Coal			1178	1179	1	
	Sand & Shale			1179	1190	11	
	Coal			1190	1193	3	
	Sand & Shale			1193	1240	47	
	Coal			1240	1242	2	
	Sand & Shale			1242	1255	13	
	Coal			1255	1259	4	
	Sand & Shale			1259	1316	57	
	Coal			1316	1320	4	
	Sand & Shale			1320	1450	130	
	Sand			1450	1652	202	
	Coal			1652	1654	2	
	Sand & Shale			1654	1749	95	
	Coal			1749	1751	2	
	Sand & Shale			1751	1764	13	
	Sand			1764	1800	36	
	Shale			1800	1854	54	
	Red Rock			1854	1855	1	
	Sand & Shale			1855	1888	33	
	Red Rock			1888	1974	86	

Sand & Shale	1774	2195	225
Shale	2190	2380	190
Sand	2380	2481	101
Sand & Shale	2481	2540	59
Red Rock	2540	2570	30
Shale	2570	2665	95
Red Rock	2665	2695	30
Shale	2695	2705	10
Red Rock	2705	2710	5
Sand & Shale	2710	2839	129
Sand	2839	2900	71
Sand & Shale	2900	3020	220
Sand	3020	3083	63
Shale	3083	3129	46
Sand & Shale	3129	3400	271
Little Lime	3400	3468	68
Sand & Shale	3468	3609	141
Big Lime	3609	4080	471
Injun	4080	4140	60
Weir Shells	4140	4310	170
Shale	4310	4630	320
Coffee Shale	4630	4715	85
Berea Sand	4715	4804	89
Shale	4804	4900	96
Total Depth	4900	KB	

NOTE: Driller's Log has been adjusted to Electric Logs

THIS FORM MUST BE SIGNED BY AUTHORIZED PERSON:

E. B. Jenkins (dc)

THE UNIVERSITY OF CHICAGO PRESS

CHICAGO
ILLINOIS
1955

Published by the University of Chicago Press
in conjunction with the Department of
Chemistry, University of Chicago

PROLACTINASE GEL COMPLEX

See also: *Proteinase, Enzymology* (1955)
Proteinase, Enzymology (1955)

From: *Quintessence*

Quintessence

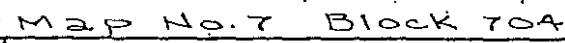
The following is a summary of the results of the
study of the properties of the complex of
prolactinase and gelatin.

Properties

Method

W. FOSTER, JR.

Oil and Gas Technology



COMMONWEALTH OF VIRGINIA
DEPARTMENT OF LABOR & INDUSTRY
DIVISION OF MINES
BIG STONE GAP

FILE NO. LV-195
P-133

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

— Denotes one inch spaces on border line of original tracing.

(To be filled in by
Division of Mines)COMMONWEALTH OF VIRGINIA
DEPARTMENT OF LABOR AND INDUSTRY(To be filled in by
Division of Mines)Dickenson
CountyErvington
DistrictNova
QuadrangleD1-195
File

DIVISION OF MINES

BIG STONE GAP, VIRGINIA

DEEPENED
OIL AND GAS WELL COMPLETION REPORT
ABANDONMENTWell No. P-123Permit No. 464County Code 051Well
Classification DEVELOPER(This report and a copy of electrical log, if made, must
be submitted to the Division of Mines within 30 days after
abandonment or completion of well, as required by Section
45-113, Code of Virginia, 1950.)

Company Philadelphia Oil Company Address P.O. Box 431
Prestonsburg, KY 41653
Farm Wilma C. Helton, et al. Acres 238.00
County Dickenson District Ervington
Well No. (Company) P-123 Elevation (ground surface) 2261.51 ft.

Location: (Give direction and distance in feet from two (2) map coordinates (Latitude and Longitude) shown
on location plat or map previously filed with the Division of Mines or shown on quadrangle topo-
graphic map of area.)

8520 feet south of 37° 07' 30" and
6960 feet west of 82° 15' 00"

Surface of tract is owned in fee simple by Anthony WeingartenAddress Star Route Box 350, Dante, VA 24237Mineral rights are owned by Clinchfield Coal CompanyAddress Dante, VA 24237Location made by Mr. B. C. SpradlinDrilling commenced 3-21-82Drilling contractor Union Drilling, IncorporatedDrilling completed 4-3-82Address P. O. Drawer 40, Buckhannon, W VA 26Well completed as ^{gas}~~oil~~ well on 4-26-82

Well abandoned at _____ feet on _____: Reason _____

Well plugged on _____, 19____ Affidavit filed _____, 19____

Total depth 5574 feet. Steel line measurement _____ feet.Commenced producing on Not connected to pipeline system, 19____

Oil Well

Initial production, _____ Barrels per day.

Stimulation Record _____

Breakdown Pressure _____ psi; Average Injection Pressure _____ psi;

Average Injection Rate _____ BPM; Instant Shut-in Pressure _____ psi;

____ Min. Shut-in Pressure _____ psi;

Final Production _____ Barrels per day.

Gravity and grade of oil _____

Oil pays at (1) _____ feet to _____ feet.	Oil shows at (1) _____ feet to _____ feet.
(2) _____ feet to _____ feet.	(2) _____ feet to _____ feet.
(3) _____ feet to _____ feet.	(3) _____ feet to _____ feet.
(4) _____ feet to _____ feet.	(4) _____ feet to _____ feet.
Main production at _____ feet to _____ feet.	(5) _____ feet to _____ feet.

Gas Well

Initial open flow, gas:

Volume 384 MCF Mcf.; Rock Pressure _____ lbs. _____ hrs.

Stimulation Record _____

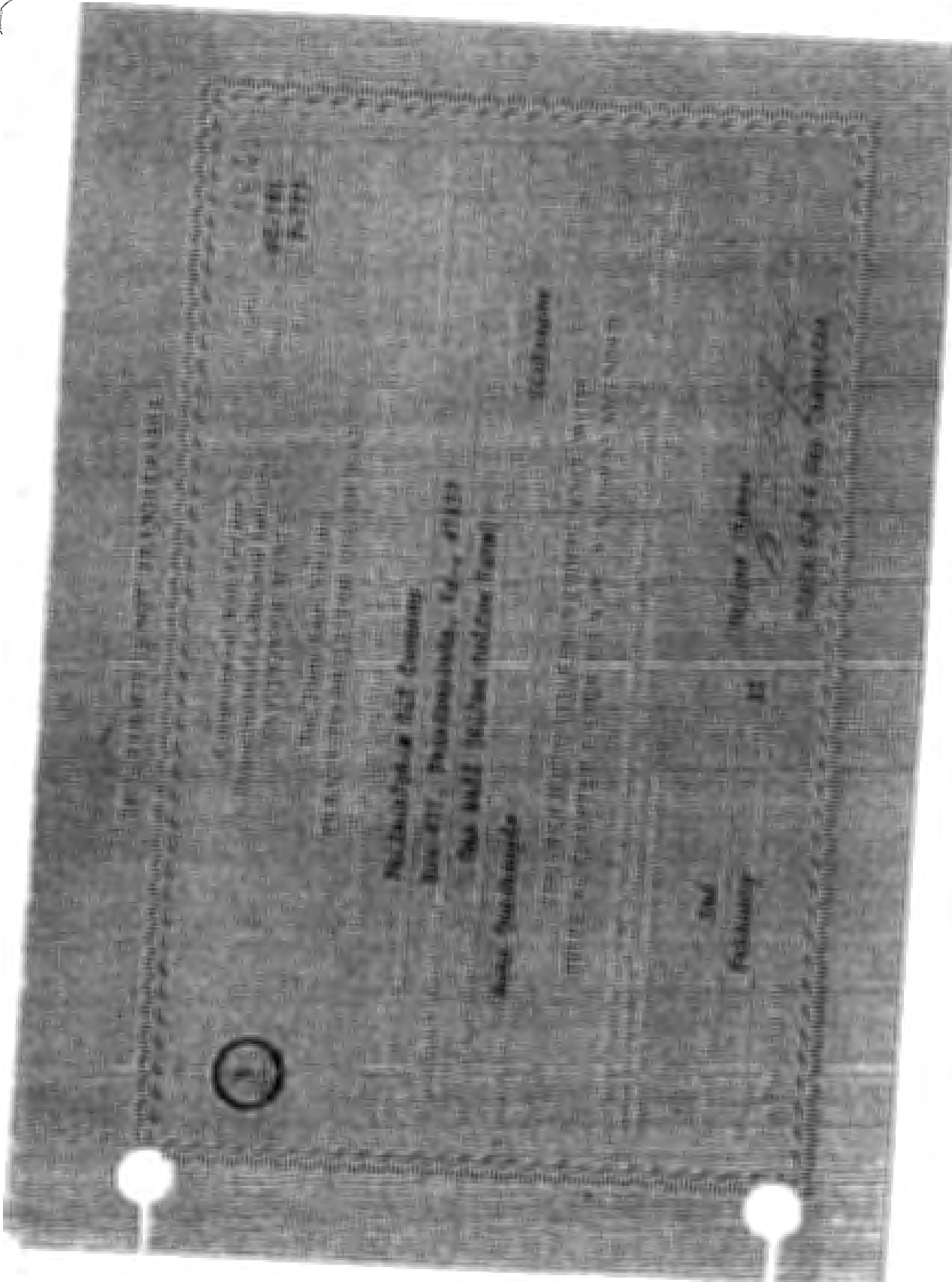
To operator requests that information given herein and log or logs be kept confidential for a period of ninety days after completion of the well covered by this report _____ (Yes) ~~NO~~

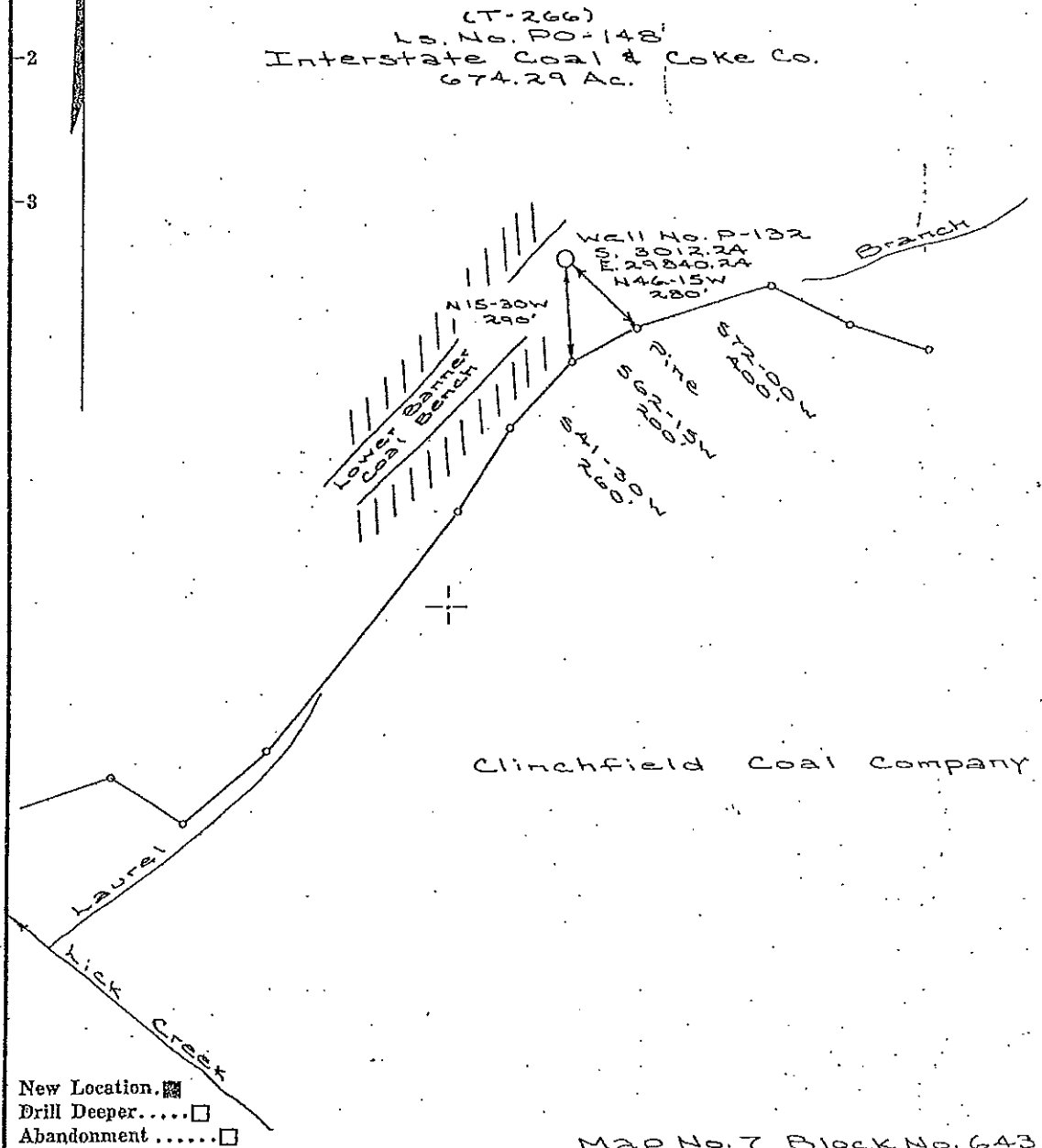
LOG

Furnished by E.R. Minns Date 7-13-82

Compiled by R. McCleese Date 7-5-82

GEOLOGIC AGE	FORMATION	GENERAL LITHOLOGY	COLOR	TOP (feet)	BOTTOM (feet)	THICKNESS (feet)	REMARKS OIL, GAS WATER DEPTHS SHUT DOWN FISHING, ETC.
	Fill			0	10	10	
	Shale			10	30	20	
	Sd & Sh			30	90	60	
	Sand			90	338	248	
	Coal			390	393	3	
	Sand & Shale			393	1377	984	
	Sand			1377	1560	183	
	Sand			1560	1730	170	
	Sand & Shale			1730	2058	328	
	Sand			2058	2519	461	
	Sand & Shale			2519	2570	51	
	Red Rock			2570	2590	20	
	Sand & Shale			2590	2596	6	
	R.R.			2596	2598	2	
	Shale & R.R.			2598	2776	178	
	Sand & Shale			2776	3028	252	
	Rivenclyff			3028	3182	154	
	Sand & Shale			3182	3260	78	
	Sand			3260	3435	175	
	Maxon			3435	4216	781	
	L. Lime			4216	4240	24	
	Sand & Shale			4240	4290	50	Gas @ 4340 -
	Big Lime			4290	4755	465	1387 MCF
	Keener			4755	4940	185	
	Weir			4940	5320	380	Gas @ 4700 -
	Coffee Shale			5320	5395	75	620 MCF
	Berea			5395	5482	87	
	Shale			5482	5574	92	Gas @ 5574 -
	T.D.			5574			260 MCF





Map No. 7 Block No. 643

Company Philadelphia Oil Co.
 Address Nora, Va.
 Farm Interstate Coal & Iron Co.
 (T-266)
 Tract Acres 674.29 Lease No. PO-148
 Well (Farm) No. Serial No. P-132
 Elevation (Spirit Level) 1822.99'
 Quadrangle Nora, Va.
 County Dickenson District Ervinton
 Surveyor B. C. Spradlin
 Surveyor Registration No. 782
 File No. Drawing No.
 Date 6-30-81 Scale 1" = 400'

COMMONWEALTH OF VIRGINIA
 DEPARTMENT OF LABOR & INDUSTRY
 DIVISION OF MINES
 BIG STONE GAP

WELL LOCATION MAP

FILE NO. DI-1921PN-437

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

- Denotes one inch spaces on border line of original tracing.

THIS FORM MUST BE SIGNED BY AUTHORIZED PERSON:

Form 7

(To be filled in by
Division of Mines)

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF LABOR AND INDUSTRY

(To be filled in by
Division of Mines)

DICKENSON
County

DIVISION OF MINES

Well No. P-132

ERVINGTON
District

BIG STONE GAP, VIRGINIA

Permit No. 437

NORA
Quadrangle

DEEPEENED
OIL AND GAS WELL COMPLETION REPORT
ABANDONMENT

County Code 051

D1-192
File

Well
Classification DEVELOPMENT

(This report and a copy of electrical log, if made, must
be submitted to the Division of Mines within 30 days after
abandonment or completion of well, as required by Section
45-113, Code of Virginia, 1950.)

Company Philadelphia Oil Company

Address P. O. Box 431
Prestonsburg, KY 41653

Arm Interstate Coal & Iron Co.

Acres 674.92

County Dickenson

District Ervington

Well No. (Company) P-132

Elevation (ground surface) 1822.99 ft.

Location: (Give direction and distance in feet from two (2) map coordinates (Latitude and Longitude) shown
on location plat or map previously filed with the Division of Mines or shown on quadrangle topo-
graphic map of area.)

9,000 feet West of 82° 15' 00" and

12,050 feet South of 37° 07' 30"

Surface of tract is owned in fee simple by Clinchfield Coal Company

Address Dante, Virginia 24237

Mineral rights are owned by Clinchfield Coal Company

Address Dante, Virginia 24237

Location made by B. C. Spradlin

Drilling commenced 9-21-81 Drilling contractor Union Drilling Company

Drilling completed 10-06-81 Address P. O. Drawer 40, Buckhannon WVA

Well completed as ^{gas}~~oil~~ well on 1-15-82

Well abandoned at _____ feet on _____: Reason _____

Well plugged on _____, 19____ Affidavit filed _____, 19____

Total depth 5,148' feet. Steel line measurement _____ feet.

Commenced producing on not connected to pipeline xxx system.

Oil Well

Initial production, _____ Barrels per day.

Stimulation Record _____

Breakdown Pressure _____ psi; Average Injection Pressure _____ psi;

Average Injection Rate _____ BPM; Instant Shut-in Pressure _____ psi;

Min. Shut-in Pressure _____ psi;

Final Production _____ Barrels per day.

Gravity and grade of oil _____

Oil pays at (1) _____ feet to _____ feet. Oil shows at (1) _____ feet to _____ feet.

(2) _____ feet to _____ feet. (2) _____ feet to _____ feet.

(3) _____ feet to _____ feet. (3) _____ feet to _____ feet.

(4) _____ feet to _____ feet. (4) _____ feet to _____ feet.

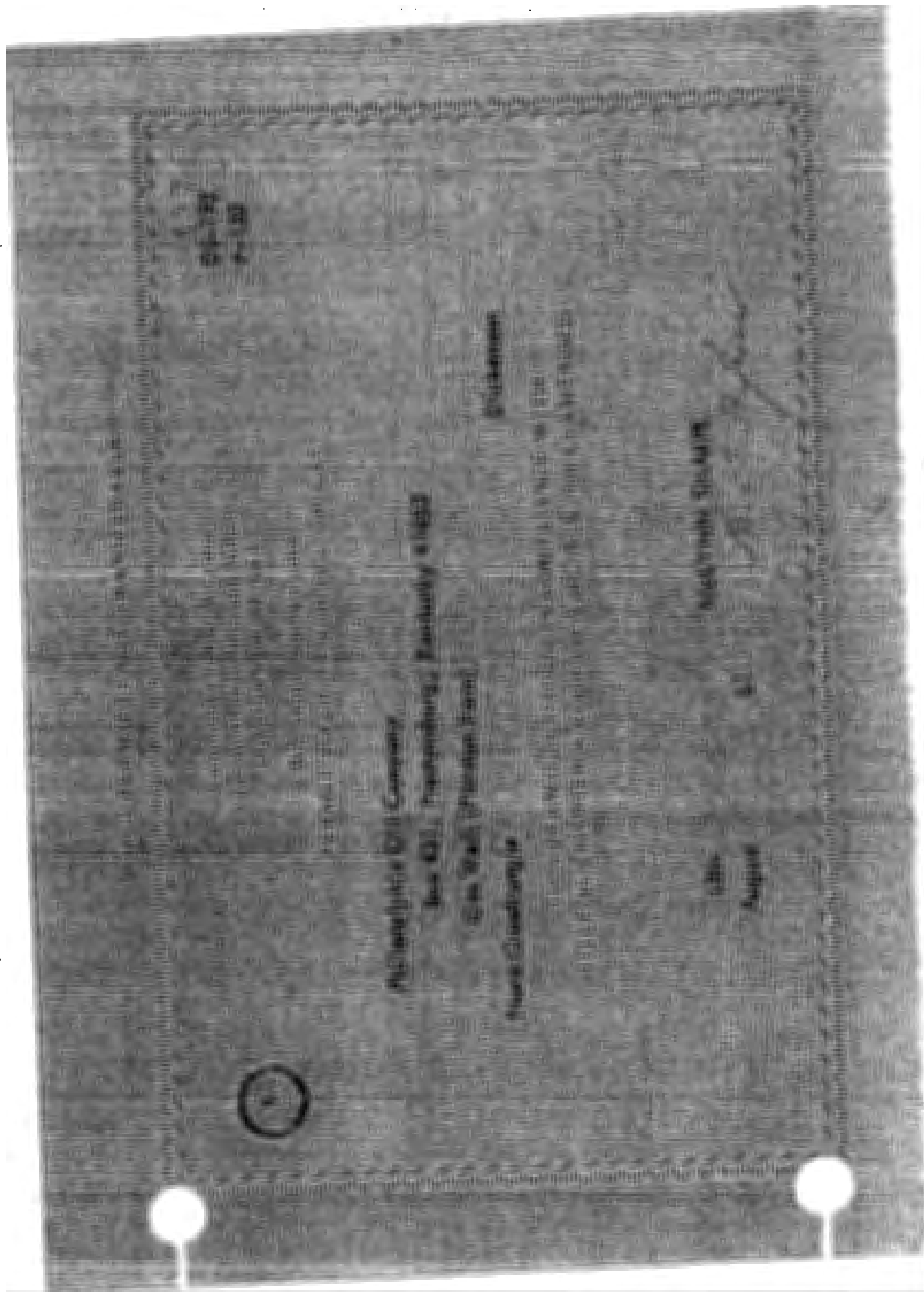
Main production at _____ feet to _____ feet. (5) _____ feet to _____ feet.

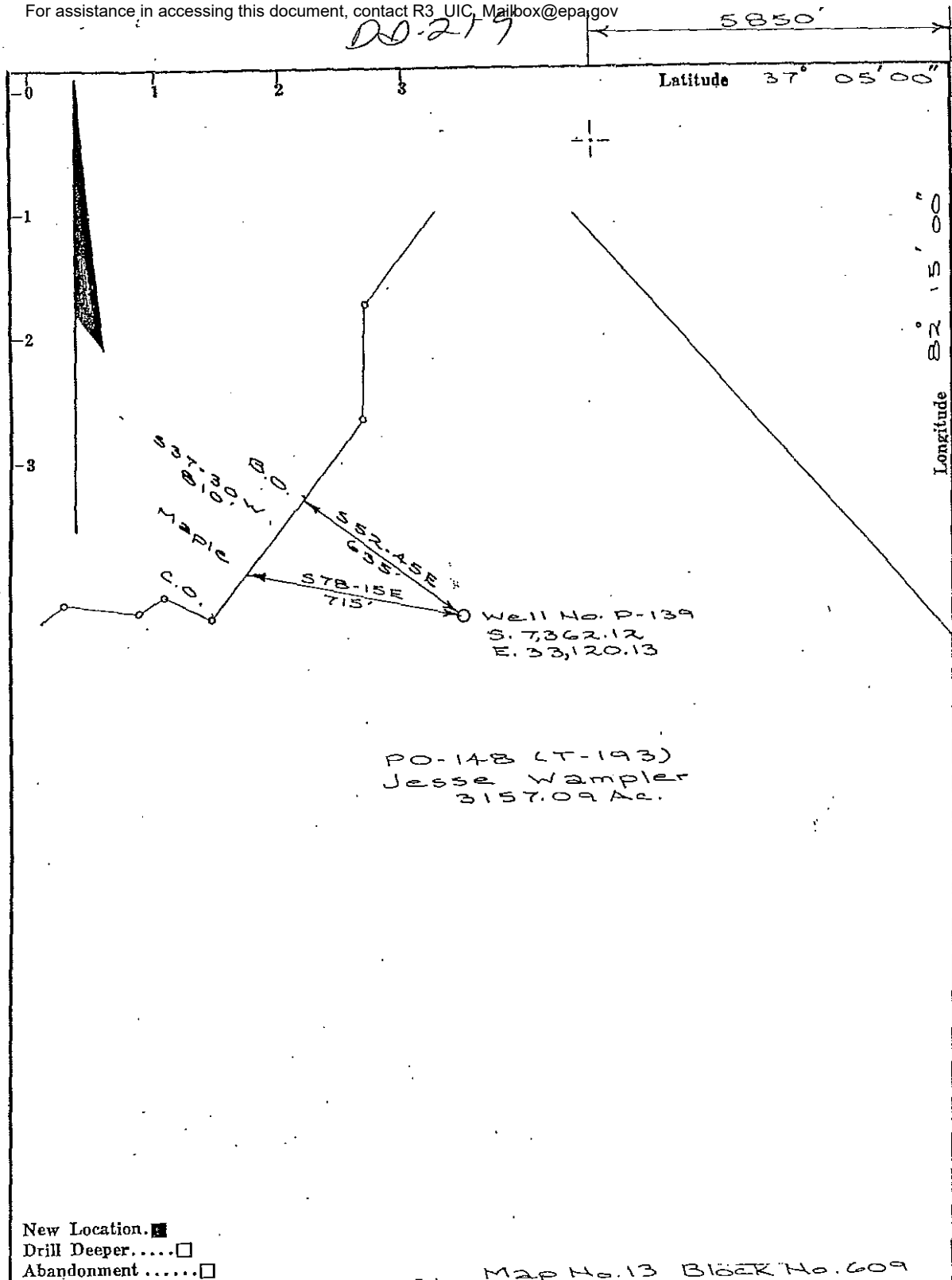
To operator requests that information given herein and log or logs be kept confidential for a period of ninety days after completion of the well covered by this report Yes

Finished by E. R. Minns Date 4-19-82

Compiled by J. R. McCleese Date 4-20-82

GEOLOGIC AGE	FORMATION	GENERAL LITHOLOGY	COLOR	TOP (feet)	BOTTOM (feet)	THICKNESS (feet)	REMARKS OIL, GAS WATER DEPTHS SHUT DOWN FISHING, ETC.
	Fill			0	5	5	
	Sand & Shale			5	8	3	
	Sand			8	483	475	
	Coal			483	486	3	
	Shale			486	505	19	
	Sand			505	555	50	
	Shale			555	603	48	
	Sand & Shale			603	630	27	
	Coal			630	634	4	
	Sand			634	683	49	
	Sand & Shale			683	688	5	
	Sand			688	1005	317	
	Sand & Shale			1005	1044	39	
	Sand			1044	1079	35	
	Coal			1079	1082	3	
	Sand & Shale			1082	1511	429	
	Coal			1511	1516	5	
	Sand & Shale			1516	2122	606	
	Red Rock			2122	2126	4	
	Sand & Shale			2126	2637	511	
	Ravencliff			2637	2747	110	
	Sand			2747	2825	78	
	Maxon			2825	3662	837	
	Sand			3662	3728	66	
	Shale			3728	3796	68	
	Big Lime			3796	4345	549	
	Keener			4345	4560	215	
	Weir			4560	4889	329	
	Coffee Shale			4889	4970	81	Gas 4927'-
	Berea			4970	5064	94	
	Sand & Shale			5064	5148	84	
	Total Depth			5148			33 MCF @ T





Company Philadelphia Oil Co.
Address Nora, Va.
Farm Jesse Wampler
Tract Acres 3157.09 Lease No. PO-148
Well (Farm) No. _____ Serial No. P-139
Elevation (Spirit Level) 1874.83'
Quadrangle Nora, Va.
County Dickenson District Kenady
Surveyor B.C. Spradling
Surveyor Registration No. 782

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF LABOR & INDUSTRY
DIVISION OF MINES
BIG STONE GAP

WELL LOCATION MAP

FILE NO. _____

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

— Denotes one inch spaces on border line of

DM Form 7

(To be filled in by
Division of Mines)COMMONWEALTH OF VIRGINIA
DEPARTMENT OF LAND AND INDUSTRY(To be filled in by
Division of Mines)

DICKENSON
County
KENADY
District
NORR
Quadrangle
D1-219
File

DIVISION OF MINES

BIG STONE GAP, VIRGINIA

OIL AND GAS WELL COMPLETION REPORT
ABANDONMENT(This report and a copy of electrical log, if made, must
be submitted to the Division of Mines within 30 days after
abandonment or completion of well, as required by Section
45-113, Code of Virginia, 1950.)

Well No. P-139
Permit No. 530
County Code 051
Well
Classification DEVL

Company Philadelphia Oil Company Address P. O. Box 431
Prestonsburg, KY 41653
Farm Jesse Wampler Acres 3157.09
County Dickenson District Kenady
Well No. (Company) P-139 Elevation (ground surface) 1729.57 ft.

Location: (Give direction and distance in feet from two (2) map coordinates (Latitude and Longitude) shown on location plat or map previously filed with the Division of Mines or shown on quadrangle topographic map of area.)

5990' feet West of 82° 15' 00" and
550' feet South of 37° 05' 00"

Surface of tract is owned in fee simple by Clinchfield Coal Company
Address P. O. Box 7, Dante, VA 24237
Mineral rights are owned by Clinchfield Coal Company
Address P. O. Box 7, Dante, VA 24237
Location made by Mr. Bill C. Spradlin
Drilling commenced 7-13-84 Drilling contractor Union Drilling Co., Inc.
Drilling completed 7-23-84 Address Buckhannon, W. VA

Well completed as ^{gas} well on 9-21-84

Well abandoned at - feet on -: Reason -
Well plugged on -, 19 - Affidavit filed -, 19 -
Total depth 5,392' feet. Steel line measurement - feet.
Commenced producing on not connected to pipeline system, 19 -

Oil Well

Initial production, - Barrels per day.

Stimulation Record

Breakdown Pressure - psi; Average Injection Pressure - psi;
Average Injection Rate - BPM; Instant Shut-in Pressure - psi;
- Min. Shut-in Pressure - psi;

Final Production - Barrels per day.

Gravity and grade of oil

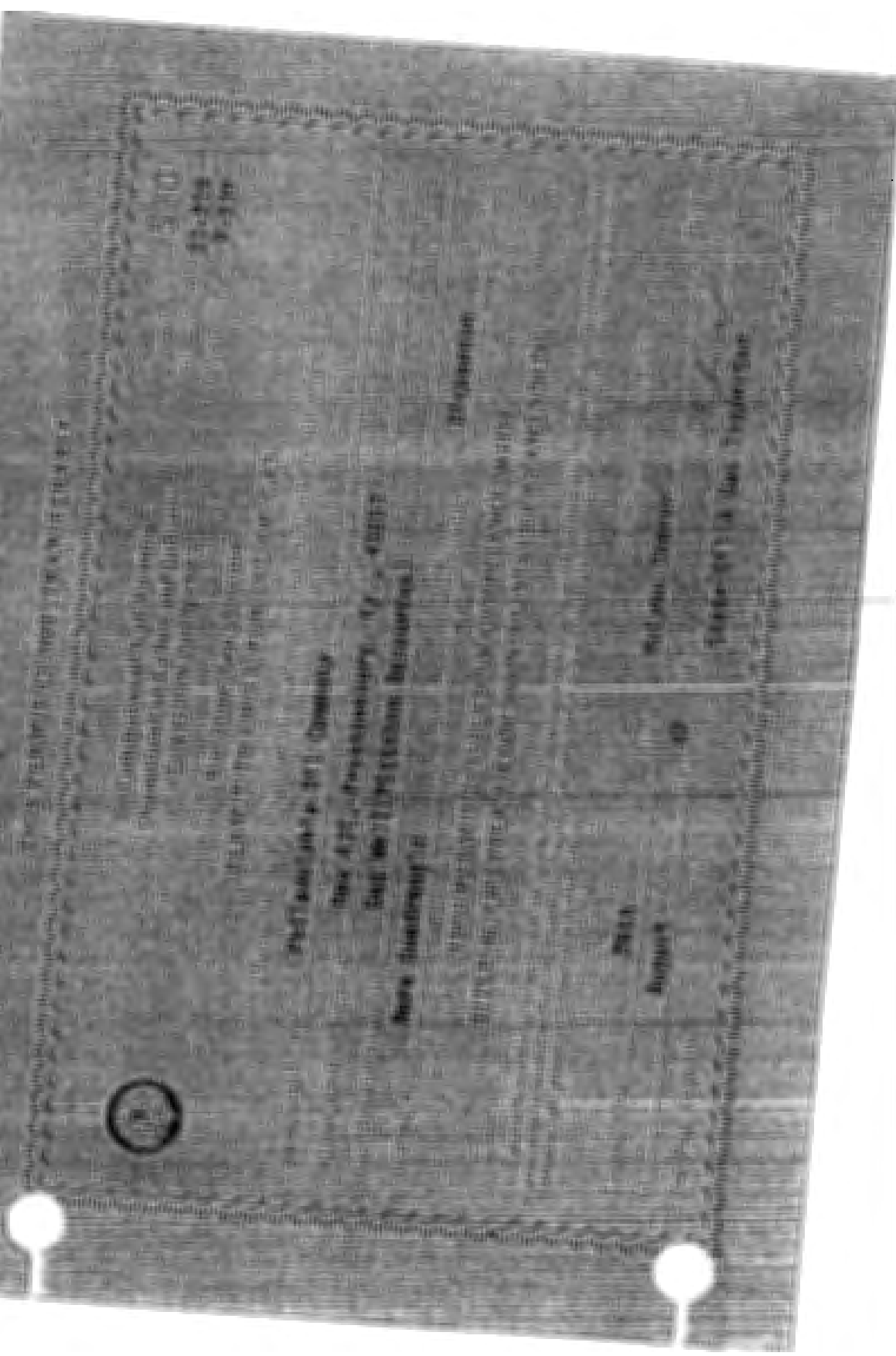
Oil pays at (1) - feet to - feet. Oil shows at (1) - feet to - feet.
(2) - feet to - feet. (2) - feet to - feet.
(3) - feet to - feet. (3) - feet to - feet.
(4) - feet to - feet. (4) - feet to - feet.
Main production at - feet to - feet. (5) - feet to - feet.

To operator requests that information given herein and log or logs be kept confidential for a period of ninety days after completion of the well covered by this report (Yes)
XXXXX

Well No. P-139File No. DI-219Permit No. 530**LOG**Furnished by H.E. Gardner, Jr. Date 10-09-84Compiled by G.B. Camp Date 10-5-84

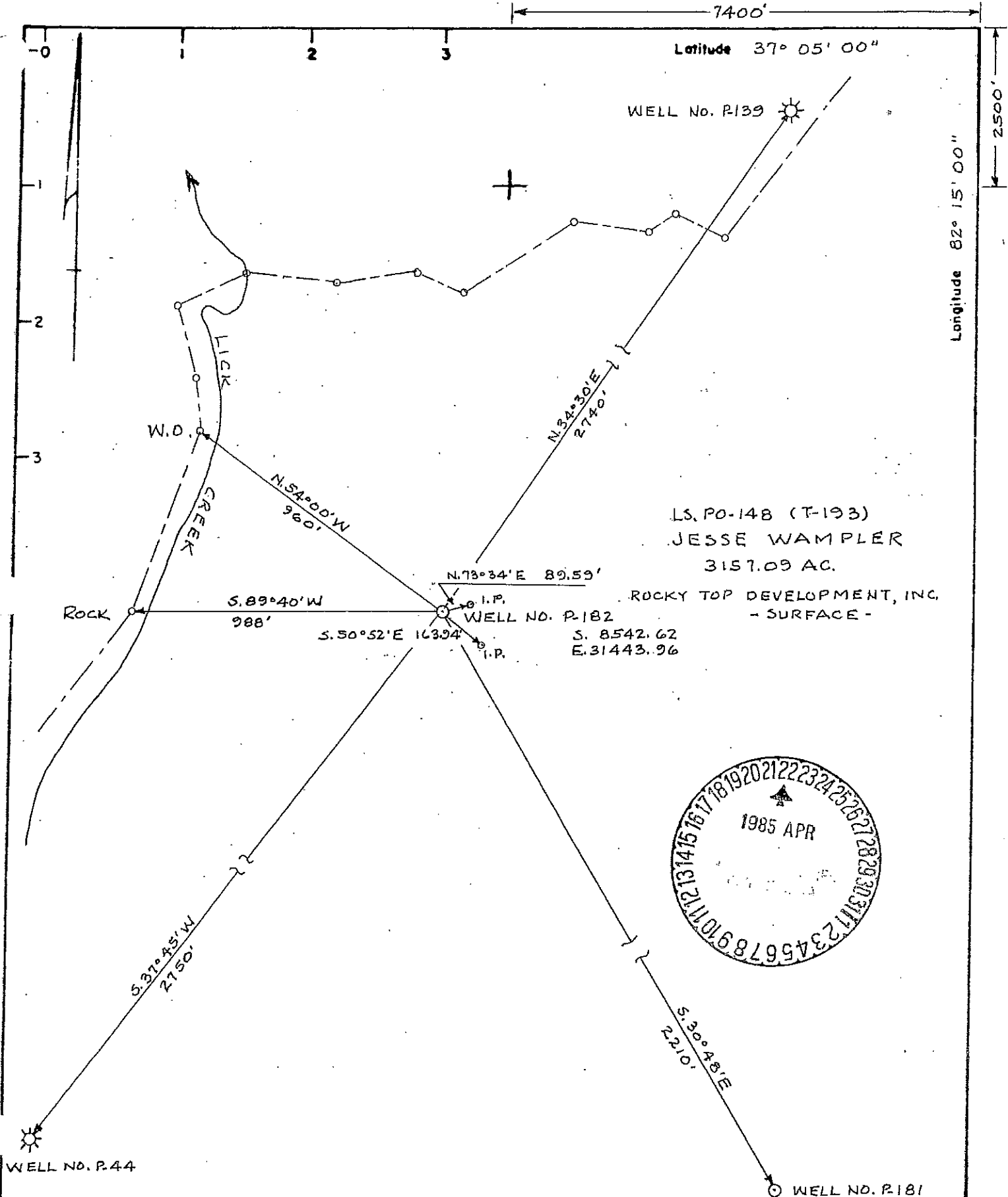
GEOLOGIC AGE	FORMATION	GENERAL LITHOLOGY	COLOR	TOP (feet)	BOTTOM (feet)	THICKNESS (feet)	REMARKS OIL, GAS WATER DEPTHS SHUT DOWN FISHING, ETC.
	Sand & Shale			0	30	30	Water @ 17'
	Shale			30	72	42	
	Coal			72	75	3	
	Shale			75	111	36	
	Sand			111	254	143	
	Coal			254	257	3	
	Shale & Sand			257	360	103	
	Coal			360	365	5	
	Sand			365	422	57	
	Shale			422	484	62	
	Coal			484	487	3	
	Sand			487	505	18	
	Coal			505	508	3	
	Sand			508	759	251	
	Shale			759	772	13	
	Sand			772	789	17	
	Shale			789	803	14	
	Sand			803	904	101	
	Shale			904	945	41	
	Coal			945	947	2	
	Shale			947	1443	496	
	Sand			1443	1461	18	
	Shale			1461	1474	13	
	Coal			1474	1477	3	
	Shale			1477	1506	29	
	Sand			1506	1796	209	
	Shale			1796	1821	25	
	Sand			1821	1908	87	
	Shale			1908	1923	15	
	Coal			1923	1928	5	
	Shale			1928	1930	2	
	Sand & Shale			1930	2150	220	
	Sand			2150	2515	365	
	Ravenscliff			2515	2728	213	
	Sand & Shale			2728	3038	310	
	Maxon			3038	3678	640	
	Sand & Shale			3678	3732	54	
	Little Lime			3732	3814	82	
	Big Lime			3814	4304	490	
	Keener			3404	4364	60	
	Weir			4364	4882	518	
	Coffee Shale			4882	4942	60	
	Berea			4942	5023	81	
	Brown Shale			5023	5392	369	
	Total Depth			5392			

DI 219



235

FORM 5 (Draft 07-09-82)



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

Date: 3-18 / 1, 1985

Operator's

Well No. P-182

OK 235
VIRGINIA OIL AND GAS INSPECTOR
DEPARTMENT OF LABOR AND INDUSTRY
DIVISION OF MINES

OIL AND GAS SECTION
205 W. MAIN STREET
ABINGDON, VIRGINIA 24210
PHONE 703 628-8115

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 X / updated /

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

Well operator PHILADELPHIA OIL COMPANY

Address 1101 N. EASTMAN ROAD
KINGSPORT, TN. 37664
Farm JESSE WAMPLER
Tract T-193 Acres 3157.09 Lease No. PO-148
Elevation 1487.54' 1718.17'
Quadrangle NORA, VA.
County DICKENSON District KENADY
Registered Engineer Registration No.
Certified Land Surveyor Cert. No.
File No. Drawing No.
Date 3-18-1985 Scale 1" = 400'

Certification of Well Plat

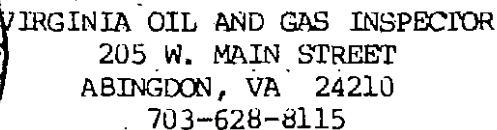
I, the undersigned, hereby certify that this plat is correct to the best of my knowledge and belief, and shows all the information required by law and the regulations of the Virginia Well Review Board.

Luther Perkins, Jr. Va. #871
Registered Engineer or Certified Land Surveyor
in Charge

Date: October 28, 1985

Name Jesse Wampler No. P-182

APR 11/85



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 Kenady District, Dickenson County, Virginia on 21 day, September month, 19 85.

WELL WORK: Drill X / Deepen / Redrill / Stimulate
 Plug off old formation / Perforate new formation
 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.

 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: Philadelphia Oil Company
BY Brint Camp
ITS District Geologist
ADDRESS 1101 N. Eastman Rd., Kingsport, TN 37664
TELEPHONE 615-246-4332

API WELL NO. 45 -051 -20777
State County Permit
 Date: October 28, 1985
 Operator's Well
 Name Jesse Wampler No. P-182

DRILLING CONTRACTOR	Union Drilling
ADDRESS	1101 N. Eastman Road, Kingsport, TN 37646
TELEPHONE	615-246-4332

[illegible]

		MINING IN AREA			
	Name	Yes	No	Mined	Out
Coal Seams	399-402, 502-505, 1605-1609				

Gas	4617, 4955	Formation Big Lime, Weir

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

Form 16
Appendix A, Sheet 1 (Reverse)
Continued from Obverse side

OTHER GENERAL INFORMATION

An electric log survey was ☐ / 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 ☒ / 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 ☒ / 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 ☒ / 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 ☒ / 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.

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

CONDUCTOR:

CASING CIRCULATED AND CEMENTED IN TO SURFACE:	8-5/8	Surface	2148		

COAL PROTECTION CASING
SET UNDER SPECIAL RULE OF
CODE OF VIRGINIA 45.1-334.B:

OTHER CASING AND TUBING LEFT IN WELL;	4-1/2"	Surface	5233	5113 - 5173
				4601 - 4635
				4460 - 4466

LINERS LEFT IN WELL UNDER CODE OF VIRGINIA SECTION 45.1-336 OR OTHERWISE:	2-3/8	Surface	5146	

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

FORM 16

Appendix A, Sheet 2 (Reverse)

DRILLER'S LOG

Compiled by Brint Camp

Geolo- gical Age	Formation	General Lithology	Color	Depth (feet)		Thickness	Remarks
				Top	Bottom		
	Sand & Shale			0	2676	2676	
	Ravencliff			2676	2822	146	
	Little Stone Gap			2822	2888	66	
	Shale			2888	3208	320	
	Maxon Sands			3208	3662	654	
	Sand & Shale			3662	3782	120	
	Little Lime			3782	3860	78	
	Lime & Shale			3860	3985	125	
	Big Lime			3985	4482	497	
	Keener			4482	4560	78	
	Weir			4560	5020	460	
	Coffee Shale			5020	5108	88	
	Berea			5108	5192	84	
	Brown Shale			5192	5284	92	
	Logger's T.D.			5284			

Complete on supplemental sheet as necessary

API No. 45 - 051 - 20777

DISCOVERY OF OIL OR INDICATIONS THEREOF

DISCOVERY OF GAS OR INDICATIONS THEREOF

RECORD OF STIMULATION

Zone 1: Berea Formation

The Berea was stimulated with a 65 Q foam and 57,000# sand,
504,000 scf N₂ and 435 Bbl. fluid.

Perforated 5113-5173 # Perfs. 19 Perf. Size .4

Breakdown 1300 psig. Avg. Injection 2200 psig.

Avg. I.R. 28BPM Init. S.I.P 3000psig 15 Min. S.I.P. psig

Zone 2: Weir Formation
The Weir was stimulated with a 75 Q foam and 30,000# sand,
426,000 scf N₂, and 323 Bbl. fluid.
Perforated 4601-4635 # Perfs. 13 Perf. Size .4
Breakdown 1400 psig. Avg. Injection 2200 psig.
Avg. I.R. 9 BPM Init. S.I.P. 1800 psig 15 Min. S.I.P. psig

Zone 3: Big Lime Formation
The lime was acidized with 4000 gal. 15% HCL.

Perforated 4460-4466 # Perfs. 7 Perf. Size .4
Breakdown 790 psig. Avg. Injection 1150 psig.
Avg. I.R. 10 BPM Init. S.I.P. 450psig 15 Min. S.I.P. psig

Final production () natural (X) after stimulation

	BOD	MCFD	Hours Tested	Rock Pressure	Hours Tested
Zone 1:	_____	_____	_____	_____	_____
Zone 2:	_____	_____	_____	_____	_____
Zone 3:	_____	_____	_____	_____	_____

Final production if gas zones are comingled: 762 MCFD

7 hours tested: 750 psig. 48 hours tested

DIRECTIONAL SURVEY

P-182

DEPTH

110'
297'
359'
473'
681'
898'
1022'
1270'
1516'
1733'
1982'

DEGREE

1°
1-1/4°
3/4°
3/4°
1°
1-1/4°
1-1/4°
3/4°
3/4°
1°
3/4°

THIS PERMIT IS NOT TRANSFERABLE



Commonwealth of Virginia
Department of Mines, Minerals and Energy
DIVISION OF MINES
Oil and Gas Section
Abingdon, Virginia
WELL WORK PERMIT

Permit No. **777**
File No. **DI-235**
Well No. **P-182**
API No. **45-051-20777**

This is to certify that on this date a well work permit

was issued to **Philadelphia Oil Company**
whose address is **1101 N. Eastman Road, Kingsport, Tennessee**
for the operation of **P-182 (1) drill (2) stimulate (3) perforate (4) plug**
located in **Kenady** District, County of **Dickenson**

**THIS WELL WORK PERMIT IS ISSUED IN COMPLIANCE WITH
TITLE 45.1, CHAPTER 22, CODE OF VIRGINIA 1950 AS AMENDED**

Any person operating a well within the State without first obtaining a well work permit as provided herein shall be guilty of a class one misdemeanor or other penalties as prescribed in Title 45, Chapter 22, Article 7 of the Code of Virginia. Each day any person operates a well without first obtaining a well work permit shall constitute a separate offense.

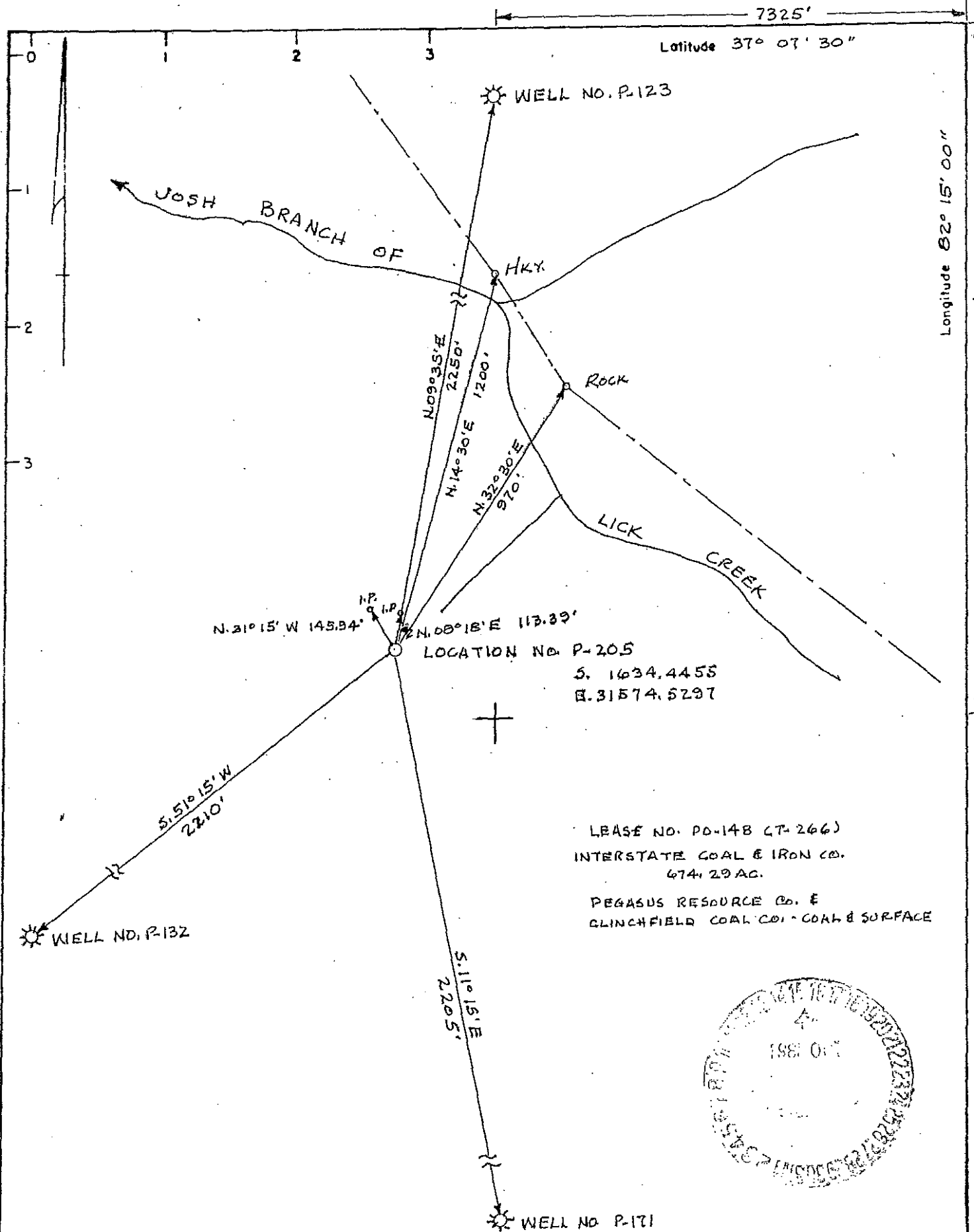
Issued this **15th** day
of **May** 19 **85**

Fee Paid \$100.00

[Signature]
Oil and Gas Inspector

DD-249

FORM 5 (Draft 07-09-82)



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

Date: September 5, 19 85

Operator's
Well No. P-205

VIRGINIA OIL AND GAS INSPECTOR
DEPARTMENT OF LABOR AND INDUSTRY
DIVISION OF MINES

OIL AND GAS SECTION
205 W. MAIN STREET
ABINGDON, VIRGINIA 24210
PHONE 703 628-1115

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 X / updated /

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

Well operator Philadelphia Oil Company
1101 N. Eastman Road
Address Kingsport, TN. 37664
Farm Interstate Coal & Iron Co.
Tract T-266 Acres 674.29 Lease No. PO-148
Elevation 1885.66'
Quadrangle Nora, VA.
County Dickenson District Ervinton
Registered Engineer Registration No.
Certified Land Surveyor Cert. No.
File No. Drawing No.
Date 9-5-1985 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.

Luther Perkins, Jr., Va. # 891
~~Registered Engineer~~ or Certified Land Surveyor
in Charge

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

Date: September 5^r, 1985

Operator's
Well No. P-205

VIRGINIA OIL AND GAS INSPECTOR
DEPARTMENT OF LABOR AND INDUSTRY
DIVISION OF MINES

OIL AND GAS SECTION
205 W. MAIN STREET
ABINGDON, VIRGINIA 24215
PHONE 703 628-1115

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 X / updated /

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

Well operator Philadelphia Oil Company
1101 N. Eastman Road
Address Kingsport, TN. 37664
Farm Interstate Coal & Iron Co.
Tract T-266 Acres 674.29 Lease No. PO-148
Elevation 1885.66'
Quadrangle Nora, VA.
County Dickenson District Ervinton
Registered Engineer Registration No.
Certified Land Surveyor Cert. No.
File No. Drawing No.
Date 9-5-1985 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.

Luther Perkins, Jr. Va # 891
~~Registered Engineer~~ or Certified Land Surveyor
in Charge

ORM 16

API WELL NO. 45 - 051 - 20837
State County Permit

Date: April 1, 1986
Operator's Well
Name Interstate Coal & Iron P-205

OS-249

VIRGINIA OIL AND GAS INSPECTOR
205 W. MAIN STREET
ABINGDON, VA 24210
703-628-8115



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 Ervinton District, Dickenson County, Virginia on 26 day, 3 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 / no

WELL WORK: Drill X/ Deepen / Redrill / Stimulate / Plug off old formation / Perforate new formation / 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: Philadelphia Oil Company
BY Brint Camp
ITS District Geologist
ADDRESS 1101 N. Eastman Road, Kingsport, TN 37664
TELEPHONE 615-246-4332

Form 16
Appendix A, Sheet 1 (Reverse)
Continued from Obverse side

OTHER GENERAL INFORMATION

An electric log survey was ___/ 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 X/ 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 2 (Obverse)

API NO. 45- 051 - 20837

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>	16"	0	16'	16'	
	11 3/4"	0	214'	214'	

<u>CASING CIRCULATED AND CEMENTED IN TO SURFACE:</u>	8 5/8"	0	2218'	2218'	

COAL PROTECTION CASING
SET UNDER SPECIAL RULE OF
CODE OF VIRGINIA 45.1-334.B:

<u>OTHER CASING AND TUBING</u>	4 1/2"	0	6095'	6095'	5020-5086
<u>LEFT IN WELL;</u>	2 3/8"	0	5940'	5940'	5854-6035

LINERS LEFT IN WELL UNDER
CODE OF VIRGINIA SECTION
45.1-336 OR OTHERWISE:

<u>PACKERS OR BRIDGE PLUGS:</u>	<u>KIND</u>	<u>SIZE</u>	<u>SET AT</u>
		2 3/8 X 4 1/2"	5480

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 X REQUIRE SACKS TO BE FURNISHED BY THE VIRGINIA
DIVISION OF MINERAL RESOURCES.

JRM 16
APPENDIX A,
SHEET 1, (OBVERSE)

API WELL NO. 45 - 051 - 20837
State County Permit
Date: April 1, 1986
Operator's Well
Name Interstate Coal & Iron

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

DRILLING CONTRACTOR Union Drilling, Inc.
ADDRESS P. O. Drawer 40, Buchannon, WV 26201
TELEPHONE 304-472-4610

GEOLOGICAL TARGET FORMATION Brown Shale
DEPTH OF COMPLETED WELL 6153 FEET
DATE DRILLING COMMENCED 11/7/85
DATE DRILLING COMPLETED 11/21/85
DRILLING RIG: ROTARY X / CABLE TOOL /

GEOLOGICAL DATA Depth Thickness
 Top Bottom

Fresh Water 49'
 1038'

Salt water

	Name	MINING IN AREA		
		~~Yes~~	No ~~XXXX~~	
Coal Seams	289-294	657-660	788-790	1160-1162
	442-445	661-665	1086-1088	1490-1495
	535-542	680-683	1121-1123	1545-1550
Oil				1615-1620
	Formation			

Gas Formation

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

below:

X Applicant's own drilling experience in the area
 Information supplied by the coal operator in the area
 Information already in possession of the Inspector

FORM 16

Appendix A, Sheet 2 (Reverse)

DRILLER'S LOGCompiled by Brint Camp

Geolo- gical Age	Formation	General Lithology	Color	Depth (feet)		Thickness	Remarks
				Top	Bottom		
Pennsylvanian	Sand & Shale			0	2670	2670	
Mississippian	Ravencliff			2670	2792	122	
"	Little Stone			2792	2856	64	
"	Shale			2856	2929	73	
"	Maxon Sands			2929	3410	481	
"	Shale			3410	3712	302	
"	Little Lime			3712	3785	73	
"	Lime & Shale			3785	3914	129	
"	Big Lime			3914	4378	464	
"	Keener			4378	4404	26	
"	Weir			4404	4948	544	
"	Coffee Shale			4948	5016	68	
"	Berea			5016	5102	86	
"	Brown Shale			5102	6036	934	
"	White Slate			6036	6153	117	
	Logger's Total Depth			6153			

Complete on supplemental sheet as necessary

Form 16
Appendix D

API No. 45 - 051 - 20837

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 -- BOD
Gravity and grade:

DISCOVERY OF GAS OR INDICATIONS THEREOF

Indicated potential flow before stimulation -- MCFD
Rock pressure: psig hour test

RECORD OF STIMULATION

Full description of stimulation:

Zone 1: Brown Shale Formation
was stimulated with a 75 Q foam using 1.1' mmcf of N₂, 306 BBL
fluid and 42,500# 20/40 and 7500# 10/20 sand.
Perforated 5854-6035 # Perfs. 35 Perf. Size .50
Breakdown 2950 psig. Avg. Injection 4000 psig.
Avg. I.R. 10 BPM Init. S.I.P. 2000 psig 15 Min. S.I.P. N/A psig

Zone 2: Berea Formation
was stimulated with a 75 Q foam using 766,000 Scf N₂, 336 BBL
fluid and 52,500# 20/40 and 7500# 10/20.
Perforated 5020-5086 # Perfs. 29 Perf. Size .50
Breakdown 3400 psig. Avg. Injection 3900 psig.
Avg. I.R. 21 BPM Init. S.I.P. 2000 psig 15 Min. S.I.P. N/A 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> -- </u>	<u> 179 </u>	<u> 6hrs. </u>	<u> 930 </u>	<u> 48hrs. </u>
Zone 2:	<u> -- </u>	<u> 340 </u>	<u> 6hrs. </u>	<u> 680 </u>	<u> 48hrs. </u>
Zone 3:	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>

Final production if gas zones are comingled: MCFD

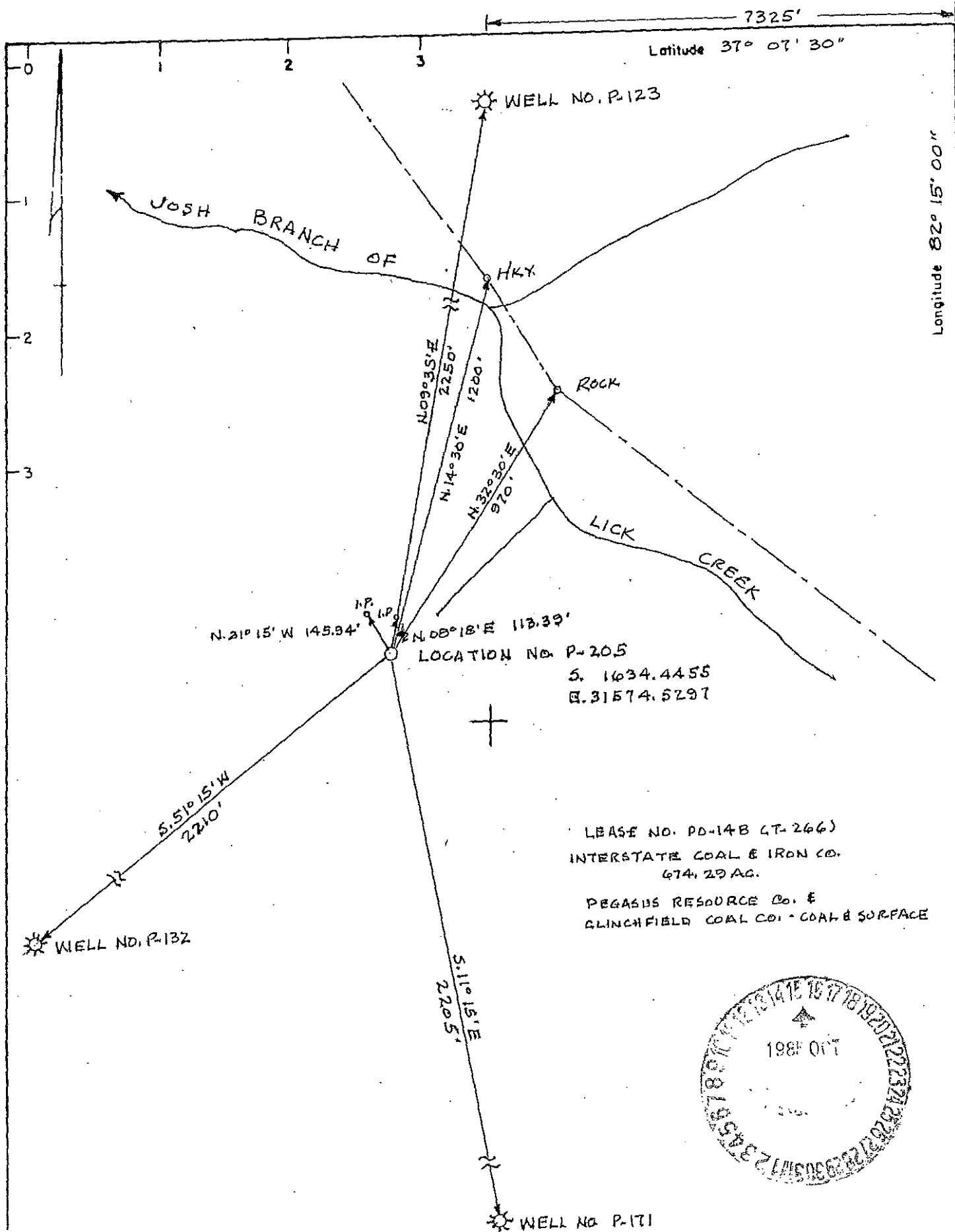
 hours tested: psig. hours tested

DIRECTIONAL SURVEY

P-205

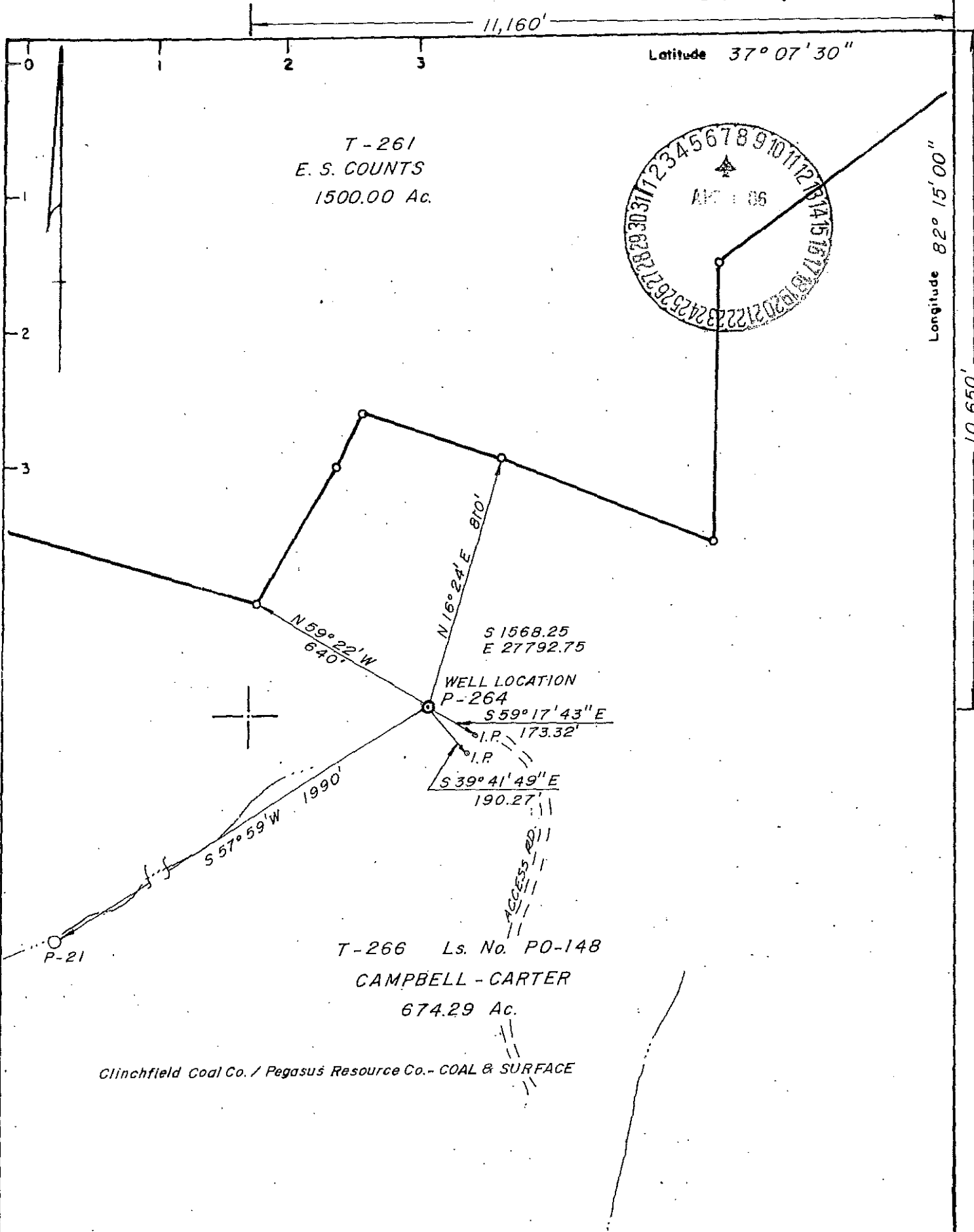
<u>DEPTH</u>	<u>DEGREES</u>
233	3/4
452	3/4
668	1/2
887	1/2
1106	1
1322	1/2
1540	1/2
1759	3/4
1946	1/2
2382	0

FORM 5 (Draft 07-09-82)



00-294

FORM 5 (Draft 07-09-82)



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

Date: February 27, 1986

Operator's
Well No. P-264

VIRGINIA OIL AND GAS INSPECTOR
DEPARTMENT OF LABOR AND INDUSTRY
DIVISION OF MINES

Oil and Gas Section
205 W. MAIN STREET
ABINGDON, VIRGINIA 24210
PHONE 703 628-8115

WELL PLAT

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

This plat is new X / updated /

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

Well operator Philadelphia Oil Company

Address 1101 N. Eastman Road, Kingsport, TN. 37664

Farm Campbell-Carter

Tract T-266 Acres 674.29 Lease No. PO-148

Elevation 1990.54

Quadrangle Nora

County Dickenson District Sand Lick

Registered Engineer X Registration No. 6992

Certified Land Surveyor Cert. No.

File No. Drawing No. 1532

Date 2/27/86 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.

A. L. Baldridge, PE
Registered Engineer or Certified Land Surveyor
in Charge

FORM 2
Sheet 1 (Obverse)

(FOR OFFICE USE ONLY)
API WELL NO. _____
State _____ County _____ Permit _____

Date: March 27, 1986
Operator's Well
No. P-264

VIRGINIA OIL AND GAS INSPECTOR
OIL AND GAS SECTION
P. O. BOX 1416
Abingdon, Virginia 24210
703-628-8115

NOTICE AND APPLICATION FOR A WELL WORK PERMIT

TO: ALL PERSONS LISTED ON FORM 2, SHEET 1 (REVERSE)

Take notice that, pursuant to Code of Virginia Section 45.1-311, the undersigned well operator proposes to file or has filed this Notice and Application for a Well Work Permit with the Virginia Oil and Gas Inspector under Code of Virginia Section 45.1-311, with respect to a well on the Campbell-Carter tract of 674.29 acres, more or less, in Sand Lick District, Dickenson County, Virginia.

Attached is a copy of the well plat required to be filed with this Notice and Application. The Notice and Application show the well work that is to be done, and the well plat shows the location (or proposed location) of the well.

If the proposed well work is to drill a well, an operations plan is also attached. It shows the intended method of spoil placement, and contains a stabilization and drainage plan, including a map of the project area indicating the area to be disturbed. The drainage and stabilization plan meets the requirements of the current Virginia Erosion and Sediment Control Handbook adopted by the Virginia Soil and Water Conservation Commission pursuant to Code of Virginia Section 21-89.4.

Under Code of Virginia Section 45.1-313, you have the right to file objections to the proposed well work within 15 days after the day you receive this notice. Objections must be filed with:

Virginia Oil and Gas Inspector
Oil and Gas Section
P. O. Box 1416
Abingdon, Virginia 24210

Well
Operator Philadelphia Oil Company
Address 1101 N. Eastman Road
Kingsport, IN 37664
Telephone (615)246-4332

Designated
Agent Charles Martin
Address Box 313
Norva, VA 24272
Telephone (703)835-9134

Form 2
Sheet 2 (Obverse)

API NO. 45-_____
Well Name P-264_____

GENERAL DESCRIPTION

WELL TYPE: Oil___ / Gas X / Enhanced Recovery___ / Waste Disposal___/
If "Gas", Production X / Underground Storage___/

Exempt by Code of Virginia Section 45.1-300.B.1 from general
oil and gas conservation law: Yes X / No___/

If "NO" submit map showing unit boundaries and distance
between wells and boundary.

Exploratory well: Yes___/ No X /

LOCATION

QUADRANGLE: <u>Nora, VA</u>	WATERSHED: <u>Lick Creek</u>
DISTRICT: <u>Sand Lick</u>	COUNTY: <u>Dickenson</u>
<u>10,650</u> Ft. South of Latitude	<u>11,160</u> Ft. West of Longitude
<u>37-07-30</u>	<u>82-15-00</u>

The underground well operator is entitled to operate a well for oil and gas or other purposes at the above location under a deed___/ lease X / other contract___/ dated July 25, 19 72, to the undersigned well operator from which document, if recorded, is recorded in the office of the Clerk of th County Commission of Dickenson County, Virginia in Deed Book 159 at page 431.

A PERMIT IS REQUESTED AS FOLLOWS:

Drill X / Deepen___/ Redrill___/ Stimulate X /
Plug off old formation___/ Perforate new formation X /
Plug X / Replug___/
Other physical changes in well (specify) _____

The well work is planned as shown in this Notice and Application and Appendix and other attachments.

OTHER INFORMATION AND SUBMISSIONS

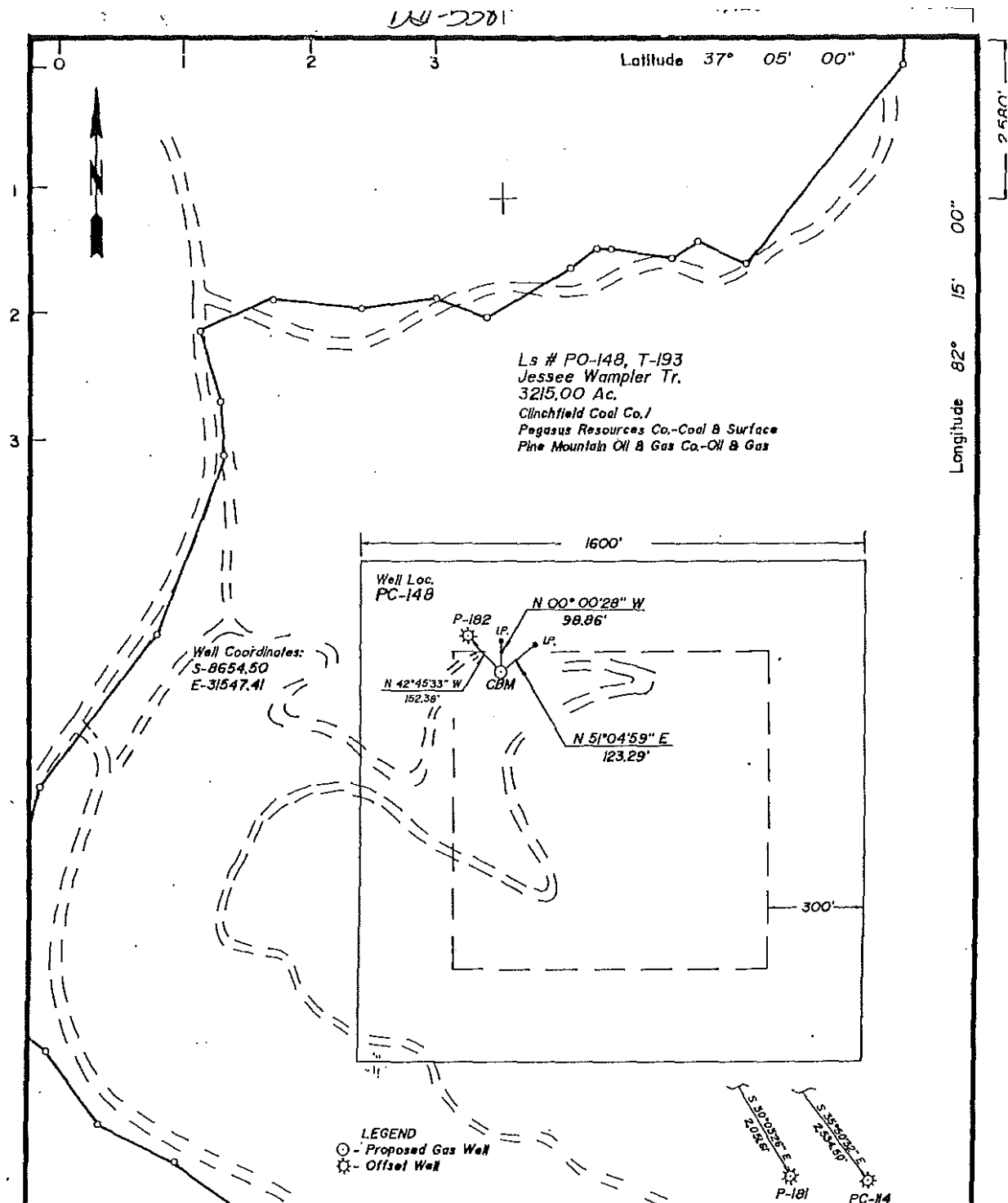
PERMIT FEE

Under Code of Virginia, Section 45.1-311-B, Enclosed is a check or money order in the amount of \$100 payable to the TREASURER OF VIRGINIA.

WELL PLAT

Under Code of Virginia Section 45.1-312.C, the statement checked below applies to the well plat (Form 5) accompanying the application:

- X The plat is new, under Code of Virginia Section 45.1-312.C.1
____ The plat is a copy of an earlier plat, the original of which was submitted after July 1, 1982. This copy has been updated as necessary, under Code of Virginia Section 45.1-312.C.2.



COMPANY Equitable Resources Exploration

ADDRESS 1999 E. Stone Dr., Kingsport, TN 37660

WELL NAME PC-148

FARM Jessie Wampler TRACT T-193

LEASE NO. PO-148 ELEVATION 1851.30

ACRES 3215.00 QUADRANGLE Nora

COUNTY Dickenson DISTRICT Ervin

REG. ENGINEER X REG. NO. 6992

CERT. LAND SURVEYOR CERT. NO.

FILE NO. DRAWING NO. 1981

DATE 7-27-90 SCALE 1" = 400'

This plat is X new updated

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

FORM 5

WELL LOCATION MAP

WELL NO. PC-148

Denotes location of well on United States Topographic Map, 1982, 1:24,000, latitude and longitude lines being represented by border lines as shown.

H. L. BALDRIDGE
CERTIFICATION OF WELL PLAT
CERTIFICATE NO.

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 Va. Well Review Board.

H. L. Baldridge

Registered Engineer or Certified Land Surveyor in Charge

THIS PERMIT IS NOT TRANSFERABLE



COMMONWEALTH OF VIRGINIA
Department of Mines, Minerals and Energy
Division of Gas and Oil
P.O. Box 1416
Abingdon, VA 24210
(703) 628-8115



PERMIT FOR GAS AND OIL OPERATIONS

This certifies that Permit No. 1547 Operations Name PC-148

Has been issued to: (Person) H. F. Gardner, Jr.

(Company) EREX

Whose main office is located at 1989 East Stone Drive
Kingsport, TN 37660

This permit is issued on this 19th day of November, 1990

The permit was requested for: ☒ Operations under Section 45.1-361.29.B.
☐ Gathering pipeline under Section 45.1-361.29.B.
☐ Permit Modification under Section 45.1-361.29.C.
☐ Geophysical Operations under Section 45.1-361.29.C.

The permitted operations are located in the Ervinton District of Dickenson County.

THIS PERMIT IS ISSUED PURSAUNT TO CHAPTER 22.1, TITLE 45.1 OF THE CODE OF VIRGINIA, Being an Act to require permits for gas and oil operations and to fix conditions for issuance thereof; to provide for the safe and environmentally sound operations performed by the Permittee and for the inspection thereof; to provide for a method of maximizing gas, oil, mineral and coal resources; to protect correlative rights of persons owning interest in gas and oil resources; to provide for enforcement by the Director.

This permit shall be valid until 11/19/92 unless the permittee has commenced operations as determined by the Inspector.

Fee Paid \$250
File No. DI-538

Raymond J. Schuman
Gas and Oil Inspector

FILE COPY

API NO. 45 - 051 - 21547
WELL NAME: JESSEE WAMPLER PC-148
DATE JANUARY 20, 1992

Virginia Oil and Gas Inspector
P. O. Box 1416
Abingdon, VA 24210
703 628-8115

ENTERED

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 ERVINTON
District DICKENSON County, Virginia on 17TH day,
OCTOBER month, 19 91.

WELL TYPE: Oil ☐ / Gas ☒ / Enhanced Recovery ☐ / Waste Disposal ☐
If Gas-Production ☒ / Underground Storage ☐ / Exempt by Code Section 45.1-300.B.1. from general Oil and Gas Conservation Law yes ☒ / no ☐

WELL WORK: Drill ☒ / Deepen ☐ / Redrill ☐ / Stimulate ☒ /
Plug Off Old Formation ☐ / Perforate New Formation ☒ / 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

☒ Ninety days from the filing of this report

OR

Two years from _____, 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 EQUITABLE RESOURCES EXPLORATION

BY Joseph A. Aumy

ITS SR. ENGINEER

ADDRESS 1989 E. STONE DR., KINGSPORT, TN 37660

TELEPHONE 615/378-5101

COMPLETION REPORT

WELL TYPE: Oil () Gas Production (X) Gas-Underground Storage ()
Enhanced Recovery () Waste Disposal ()

LOCATION

COUNTY DICKENSON DISTRICT ERVINTON

SURFACE ELEVATION 1851.30' QUADRANGLE NORA

LATITUDE 2580 'S 37° 05 ' 00 " LONGITUDE 7420 'W 82° 15 ' 00 "

DRILLING DATA

DATE DRILLING COMMENCED 5-8-91 DRILLING CONTRACTOR G & H DRILLING
DATE DRILLING COMPLETED 5-12-91 ADDRESS P.O. BOX 582, VINE GROVE, KY
DATE WELL COMPLETED 10-17-91 TELEPHONE NUMBER 502-877-5599
TOTAL DEPTH OF COMPLETED WELL LTD=2221 RIG TYPE X ROTARY CABLE TOOL
DTD=2220

GEOLOGICAL DATA

FRESH WATER AT (1) 40 FEET -GPM: (2) FEET GPM
SALT WATER AT (1) 925 FEET 1/4"STR GPM: (2) FEET GPM

COAL SEAMS:

NAME	TOP	BOTTOM	THICKNESS	MINING IN AREA		
				YES	NO	MINED OUT
M. HORSEPEN	1291	1293	2		X	
L. HORSEPEN	1535	1538	3			
POCO #2	2116	2118	2			

OIL AND GAS SHOWS:

FORMATION	TOP	BOTTOM	THICKNESS	IPF(MCFD/BOPD)	PRESSURE	HOURS TESTED
		1400'		42 MCFD		
		1600/1825'		70 MCFD		
		1900'		92 MCFD		
		2100'		100 MCFD		
		2220'		169 MCFD		

STIMULATION RECORD

ZONE (1) M. HORSEPEN, UNNAMED "C", L. HORSEPEN, X-SEAM, POCO #6, #3, #2
- 14000 # 12/20 SAND - 1050000 SCF N2 - 644 BF FORMATION STIMULATED WITH 70 Q FOAM (L/E)
PERFORATED 1291.5 TO 2116.5 NO. OF PERFORATIONS 16 PERFORATION SIZE .34"
FORMATION BROKE DOWN AT 1194 PSIG AVERAGE INJECTED RATE 11 BPM
INITIAL SHUT IN PRESSURE 2319 PSIG 5 MINUTE SHUT IN PRESSURE 1939 PSIG

RE STIMULATION RECORD

ZONE (2) M. HORSEPEN, C-SEAM, UNNAMED "C", L. HORSEPEN, X-SEAM, POCO #6
- 10000 # 12/20 SNAD-956300 SCF N2 - 693 BF FORMATION STIMULATED WITH 70 Q FOAM
PERFORATED 1292 TO 1840.5 NO. OF PERFORATIONS 8 PERFORATION SIZE .34"
FORMATION BROKE DOWN AT N/A PSIG AVERAGE INJECTED RATE 16.8 BPM
INITIAL SHUT IN PRESSURE 2250 PSIG 5 MINUTE SHUT IN PRESSURE 1940 PSIG

FINAL PRODUCTION: () NATURAL (X) AFTER STIMULATION

BOD MCFD HOURS TESTED ROCK PRESSURE HOURS TESTED

ZONE (1) _____

ZONE (2) _____

FINAL PRODUCTION IF GAS ZONES ARE COMMINGLED 38* MCFD 6 HOURS TESTED
409 PSIG 48 HOURS TESTED

CASING AND TUBING

	SIZE	TOP	BOTTOM	LENGTH	PERFORATIONS FEET TO FEET	PACKERS OR BRIDGE PLUGS KIND SIZE SET AT
CONDUCTOR	9 5/8"		22'			

CASING

Circulated
and Cemented
to Surface 7" 366'

WATER PROTECTION

(Casing Set
According to
Section
45.1-334) 4 1/2" 2162'

COAL PROTECTION

(Casing Set
According to
Section
45.1-334)

OTHER CASING &

Tubing Left
In Well 2 3/8" 2133'

LINERS

Remaining
in Well

OTHER used and not
left

Is the well underlain by Red Shale ☒ Yes ☐ No, If Yes, was coal
protection string set to Red Shales? ☒ Yes ☐ No

REMARKS: Shut down, fishing jobs, depths and dates, caving, etc.

Samples and Cuttings

Will ☒ Will not ☐ be available for examination by a member of the
 Virginia Division of Mineral Resources
 Will ☒ Will not ☐ be furnished to the Virginia Division of Mineral
 Resources upon request
 Will ☐ Will not ☒ require sacks to be furnished by the Virginia
 Division of Mineral Resources

Electric Logs and Surveys:

Type of Electric Log(s) Ran: LDT/GR/HL RES

Did log disclose vertical location of a coal seam? Yes ☒ No ☐

Was log made at request of a coal owner according to Section 45.1-333.B.1
 of the Virginia Code? Yes ☐ No ☒

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

Deviation Surveys

Deviation surveys were ☒ were not ☐ required under Section 45.1-333.C of
 the Virginia Code "to the bottom of the lowers published coal seam depth."

Note: If a deviation survey(s) was/were required, the survey results
 are as follows:

<u>Depth</u> <u>of Survey</u>	<u>Feet/Degree Deviated</u> <u>From True Vertical</u>	<u>Depth</u> <u>of Survey</u>	<u>Feet/Degree Deviated</u> <u>From True Vertical</u>
	See Attachment		

A continuous survey was ☐ was not ☒ required, under Section 45.1-333.C of
 the Virginia Code.

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

Changes in the Permitted Well Work:

The well operator did ☐ did not ☒ 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.

Confidentiality Status:

Confidentiality status under Section 45.1-332 of the Virginia Code:

The operator requests that information herein and log(s) be kept
 confidential (after COMPLETION DATE of the well) for a period of

☒ Ninety (90) days
☐ two (2) years, if the well is exploratory

DRILLER'S LOG

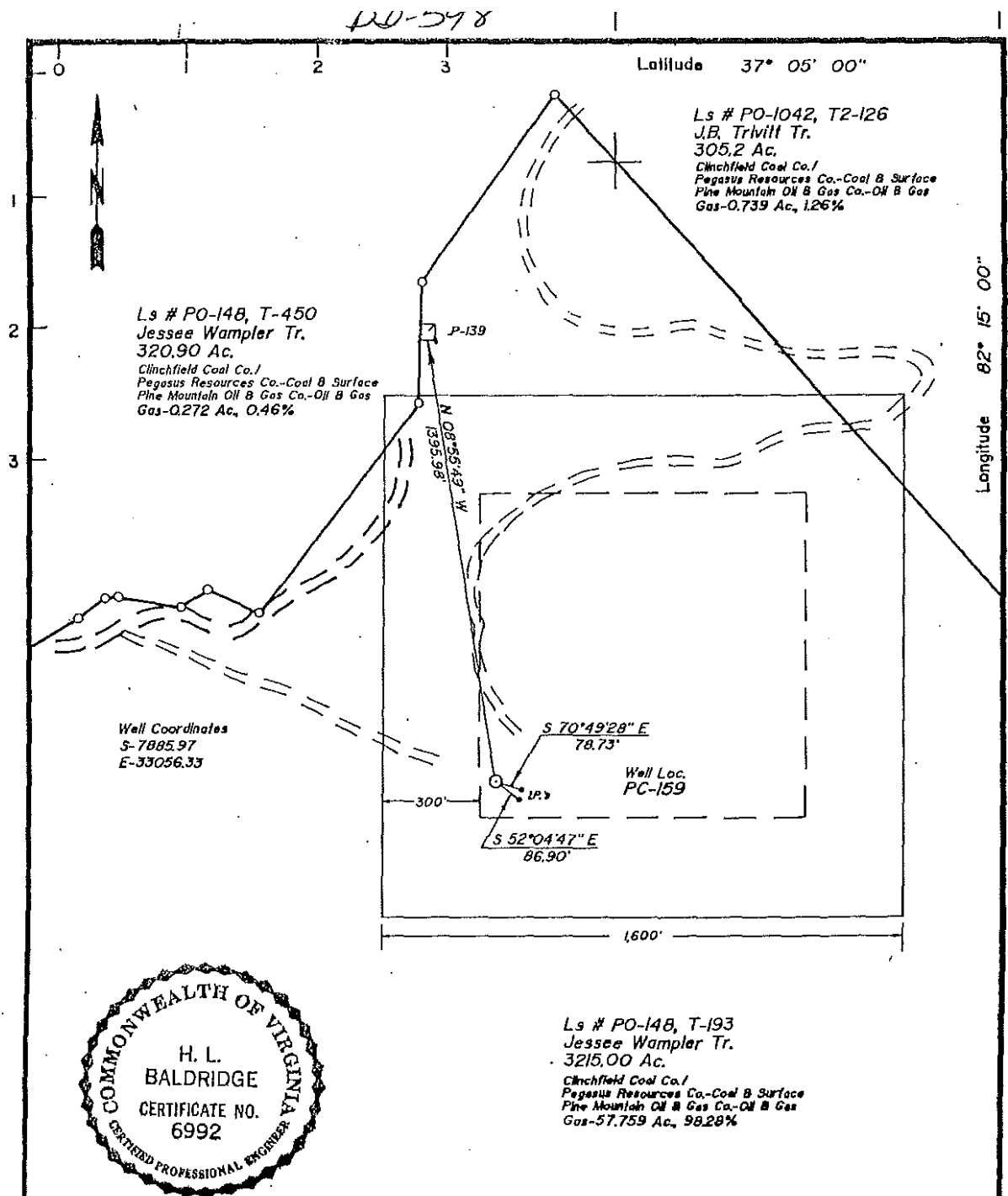
Compiled by R. J. MACDONALD

Geological Age	Formation	General Lithology	Color	Depth		Thickness	Remarks
				Top	Bottom		
PENNSYLVANIA	SAND, SHALE & THIN COAL			0	1291	1291	
PENNSYLVANIA	MIDDLE HORSEPEN COAL			1291	1293	2	
PENNSYLVANIA	SAND, SHALE & THIN COAL			1293	1536	273	
PENNSYLVANIA	LOWER HORSEPEN COAL			1535	1538	3	
PENNSYLVANIA	SAND, SHALE & THIN COAL			1538	2116	578	
PENNSYLVANIA	POCO #2 COAL			2116	2118	2	
PENNSYLVANIA	SAND, SHALE & COAL			2118	2205	87	
MISSISSIPPIAN	RED ROCK & SHALE			2205	2221	16	
LOGGER'S TOTAL DEPTH				2221			

DIRECTIONAL SURVEY

WELL PCI48

<u>DEPTH</u>	<u>DEGREES</u>
194'	1/2°
388'	3/4°
595'	7/8°
800'	1 3/4°
1000'	2 1/2°
1100'	2 3/4°
1150'	2 1/4°
1275'	2 7/8°
1400'	2 7/8°
1600'	3 3/4°
1650'	3 1/4°
1825'	4°
1900'	4°
2100'	5 1/2°
2220'	5 1/2°



COMPANY Equitable Resources Exploration

ADDRESS 1989 E. Stone Dr., Kingsport, TN 37660

WELL NAME PC-159

FARM Jessee Wampler TRACT T-193

LEASE NO. PO-148 ELEVATION 1635.22

ACRES 3215.00 QUADRANGLE Nora

COUNTY Dickenson DISTRICT Ervinton

REG. ENGINEER X REG. NO. 6992

CERT. LAND SURVEYOR CERT. NO. _____

FILE NO. _____ DRAWING NO. 1995

DATE April 18, 1991 SCALE 1" = 400'

This plat is X new _____ updated

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

FORM 5

WELL LOCATION MAP

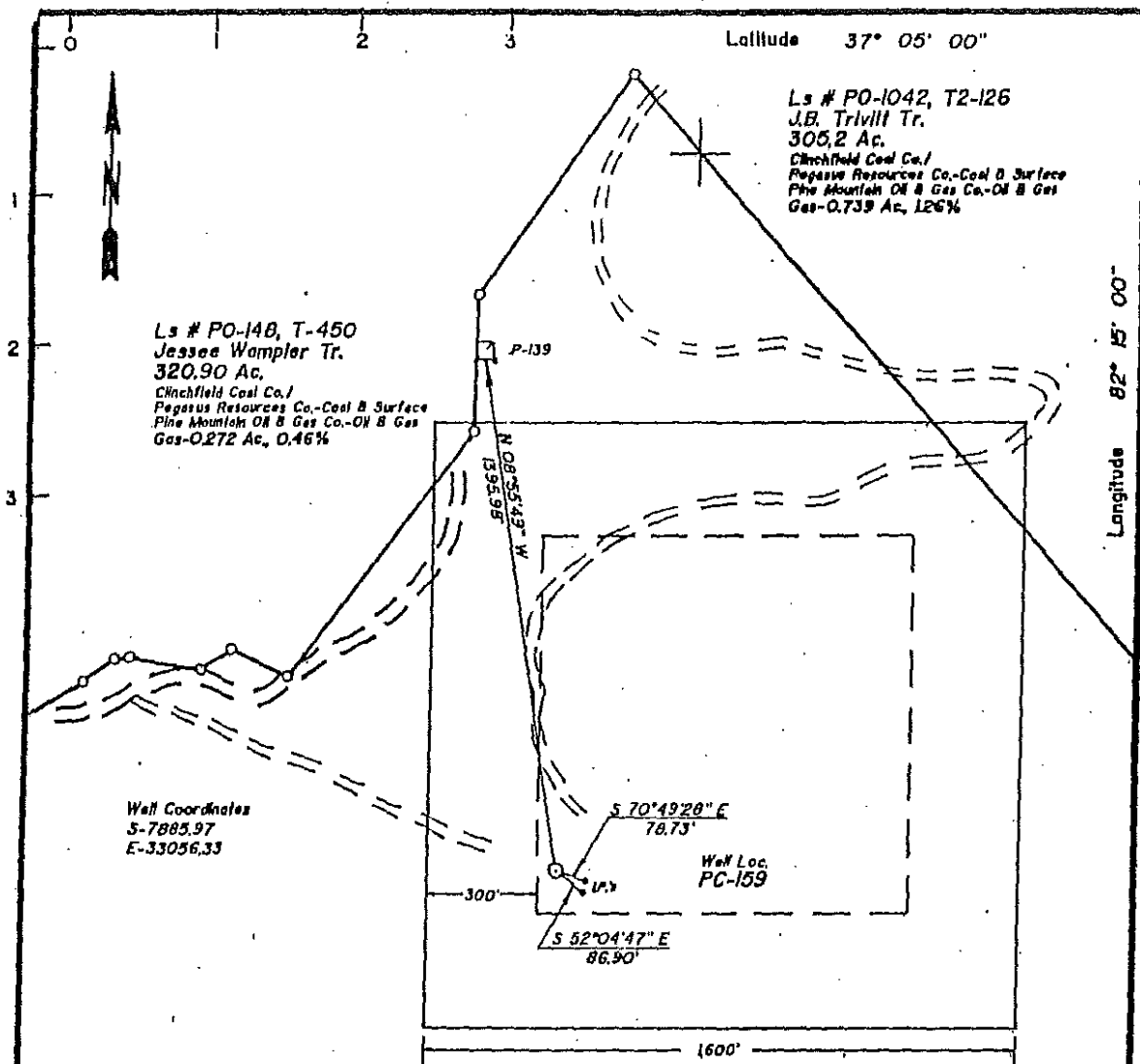
WELL NO. PC-159

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

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 Va. Well Review Board.

H. L. Baldridge
Registered Engineer or Certified
Land Surveyor in Charge



2-G-87
1820 FNL
1180 FEL

Ls # PO-148, T-193
Jesse Wampler Tr.
3215.00 Ac.
Cinchfield Coal Co./
Pegasus Resources Co.-Coal & Surface
Pine Mountain Oil & Gas Co.-Oil & Gas
Gas-57.759 Ac, 98.28%

COMPANY Equitable Resources Exploration

ADDRESS 1989 E. Stone Dr., Kingsport, TN 37660

WELL NAME PC-159

FARM Jesse Wampler TRACT T-193

LEASE NO. PO-148 ELEVATION 1695.22

ACRES 3215.00 QUADRANGLE Noro

COUNTY Dickenson DISTRICT Ervin

REG. ENGINEER X REG. NO. 6992

CERT. LAND SURVEYOR _____ CERT. NO. _____

FILE NO. _____ DRAWING NO. 1995

DATE April 18, 1991 SCALE 1" = 400'

This plat is X new _____ updated

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

FORM 5

WELL LOCATION MAP

WELL NO. PC-159

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

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 Va. Well Review Board.

H. L. Baldridge
Registered Engineer or Certified
Land Surveyor in Charge

THIS PERMIT IS NOT TRANSFERABLE



COMMONWEALTH OF VIRGINIA
Department of Mines, Minerals and Energy
Division of Gas and Oil
P.O. Box 1416
Abingdon, VA 24210
(703) 628-8115



PERMIT FOR GAS AND OIL OPERATIONS

This certifies that Permit No. 1700 Operations Name PC-159

Has been issued to: (Person) Bryan Wolcott
(Company) ERIX

Whose main office is located at 1989 East Stone Drive
Kingsport, TN

This permit is issued on this 26th day of July, 1991.

The permit was requested for: ☒ Operations under Section 45.1-361.29.B.
☐ Gathering pipeline under Section 45.1-361.29.B.
☐ Permit Modification under Section 45.1-361.29.C.
☐ Geophysical Operations under Section 45.1-361.29.C.

The permitted operations are located in the Brinton District of Dickenson County.

THIS PERMIT IS ISSUED PURSUANT TO CHAPTER 22.1, TITLE 45.1 OF THE CODE OF VIRGINIA, Being an Act to require permits for gas and oil operations and to fix conditions for issuance thereof; to provide for the safe and environmentally sound operations performed by the Permittee and for the inspection thereof; to provide for a method of maximizing gas, oil, mineral and coal resources; to protect correlative rights of persons owning interest in gas and oil resources; to provide for enforcement by the Director.

This permit shall be valid until 7/26/95 unless the permittee has commenced operations as determined by the Inspector.

Fee Paid \$250
File No. DL-589

[Signature]
Gas and Oil Inspector

FILE COPY

API NO. 45 - 051 - 21700
WELL NAME: JESSEE WAMPLER PC159
DATE MAY 11, 1992

DL-540

Virginia Oil and Gas Inspector

P. O. Box 1416
Abingdon, VA 24210
703 628-8115

ENTERED

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 ERVINTON

District DICKENSON County, Virginia on 26 day,
SEPTEMBER month, 1991.

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 , 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 EQUITABLE RESOURCES EXPLORATIONBY Joseph A. ChungITS SR. ENGINEERADDRESS 1989 E. STONE DR., KINGSPORT, TN 37660TELEPHONE 615/378-5101

COMPLETION REPORT

WELL TYPE: Oil () Gas Production (X) Gas-Underground Storage ()
Enhanced Recovery () Waste Disposal ()

LOCATION
COUNTY DICKENSON DISTRICT ERVINTON

SURFACE ELEVATION 1863.66 QUADRANGLE NORA

LATITUDE 1820 'S 37° 05 ' 00 " LONGITUDE 5880 'W 82° 15 ' 00 "

DRILLING DATA

DATE DRILLING COMMENCED 9-16-91 DRILLING CONTRACTOR UNION DRILLING
DATE DRILLING COMPLETED 9-20-91 ADDRESS P.O. DRAWER 40, BUCKHANNON, WV
DATE WELL COMPLETED 9-26-91 TELEPHONE NUMBER 304-472-4610
TOTAL DEPTH OF COMPLETED WELL LTD=2298 RIG TYPE X ROTARY CABLE TOOL
DTD=2292

GEOLOGICAL DATA

FRESH WATER AT (1) 142 FEET 2" STRM GPM: (2) FEET GPM
SALT WATER AT (1) FEET GPM: (2) FEET GPM

COAL SEAMS:

NAME	TOP	BOTTOM	THICKNESS	MINING IN AREA		
				YES	NO	MINED OUT
JAWBONE	480	483	3		X	
M. HORSEPEN	1151	1153	2			
WARCREEK	1278	1280	2			
BECKLEY	1326	1328	2			

OIL AND GAS SHOWS:

FORMATION	TOP	BOTTOM	THICKNESS	IPF (MCFD/BOPD)	PRESSURE	HOURS TESTED
		2137		ODOR		
		2292		ODOR		

STIMULATION RECORD

BECKLEY, WARCREK, C-SEAM, M. HORSEPEN
ZONE (1) POCO #2, X-SEAM, L. HORSEPEN FORMATION STIMULATED WITH 70 Q FOAM/LE
W/12009 # 12/20 SAND - 640800 SCF N2 - 670 BF
PERFORATED 1151.5 TO 1849.5 NO. OF PERFORATIONS 15 PERFORATION SIZE .34"
FORMATION BROKE DOWN AT 1520 PSIG AVERAGE INJECTED RATE 16.5 BPM
INITIAL SHUT IN PRESSURE 1900 PSIG 5 MINUTE SHUT IN PRESSURE 1460 PSIG

STIMULATION RECORD

ZONE (2) FORMATION STIMULATED WITH
PERFORATED TO NO. OF PERFORATIONS PERFORATION SIZE
FORMATION BROKE DOWN AT PSIG AVERAGE INJECTED RATE BPM
INITIAL SHUT IN PRESSURE PSIG MINUTE SHUT IN PRESSURE PSIG

FINAL PRODUCTION: () NATURAL (X) AFTER STIMULATION

BOD MCFD HOURS TESTED ROCK PRESSURE HOURS TESTED
ZONE (1)
ZONE (2)

FINAL PRODUCTION IF GAS ZONES ARE COMMINGLED 71 MCFD 6 HOURS TESTED
409 PSIG 48 HOURS TESTED

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 to the Virginia Division of Mineral
Resources upon request
Will Will not X require sacks to be furnished by the Virginia
Division of Mineral Resources

Electric Logs and Surveys:

Type of Electric Log(s) Ran: LDT/TEMP/GR/HI-RES LDT

Did log disclose vertical location of a coal seam? Yes X No

Was log made at request of a coal owner according to Section 45.1-333.B.1
of the Virginia Code? Yes No X

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

Deviation Surveys

Deviation surveys were X were not required under Section 45.1-333.C of
the Virginia Code "to the bottom of the lowers published coal seam depth."

Note: If a deviation survey(s) was/were required, the survey results
are as follows:

<u>Depth</u> <u>of Survey</u>	<u>Feet/Degree Deviated</u> <u>From True Vertical</u>	<u>Depth</u> <u>of Survey</u>	<u>Feet/Degree Deviated</u> <u>From True Vertical</u>
<u> </u>	<u>See Attachment</u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>	<u> </u>

A continuous survey was was not X required, under Section 45.1-333.C of
the Virginia Code.

Note: If a continuous 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.

Confidentiality Status:

Confidentiality status under Section 45.1-332 of the Virginia Code:

The operator requests that information herein and log(s) be kept
confidential (after COMPLETION DATE of the well) for a period of

X Ninety (90) days
 two (2) years, if the well is exploratory

DRILLER'S LOG

Compiled by ENGINEERING

Geological Age	Formation	General Lithology	Color	Depth		Thickness	Remarks
				Top	Bottom		
ENNSYLVANIAN ↓	SAND, SHALE & THIN COALS			0	480	480	
	JAWBONE COAL			480	483	3	
	SAND, SHALE & THIN COALS			483	1151	668	
	MIDDLE HORSEPEN COAL			1151	1153	2	
	SAND, SHALE & THIN COALS			1153	1278	125	
	WARCREEK COAL			1278	1280	2	
	SAND, SHALE & THIN COALS			1280	1326	46	
	BECKLEY COAL			1326	1328	2	
	SAND, SHALE & THIN COALS			1328	2039	711	
MISSISSIPPIAN ↓	RED ROCK			2039	2042	3	
	SAND & SHALE			2042	2298	256	
	LOGGERS TOTAL DEPTH				2298		

CASING AND TUBING

PACKERS OR
PERFORATIONS BRIDGE PLUGS
FEET TO FEET KIND SIZE SET AT

SIZE TOP BOTTOM LENGTH

CONDUCTORCASING

Circulated
and Cemented
to Surface

11 3/4"

38'

28'

WATER PROTECTION

(Casing Set
According to
Section
45.1-334)

8 5/8"

365'

355'

COAL PROTECTION

(Casing Set
According to
Section
45.1-334)

OTHER CASING &

Tubing Left

In Well

4 1/2"

2004'

1993.7'

2 3/8"

1940'

LINERS

Remaining
in Well

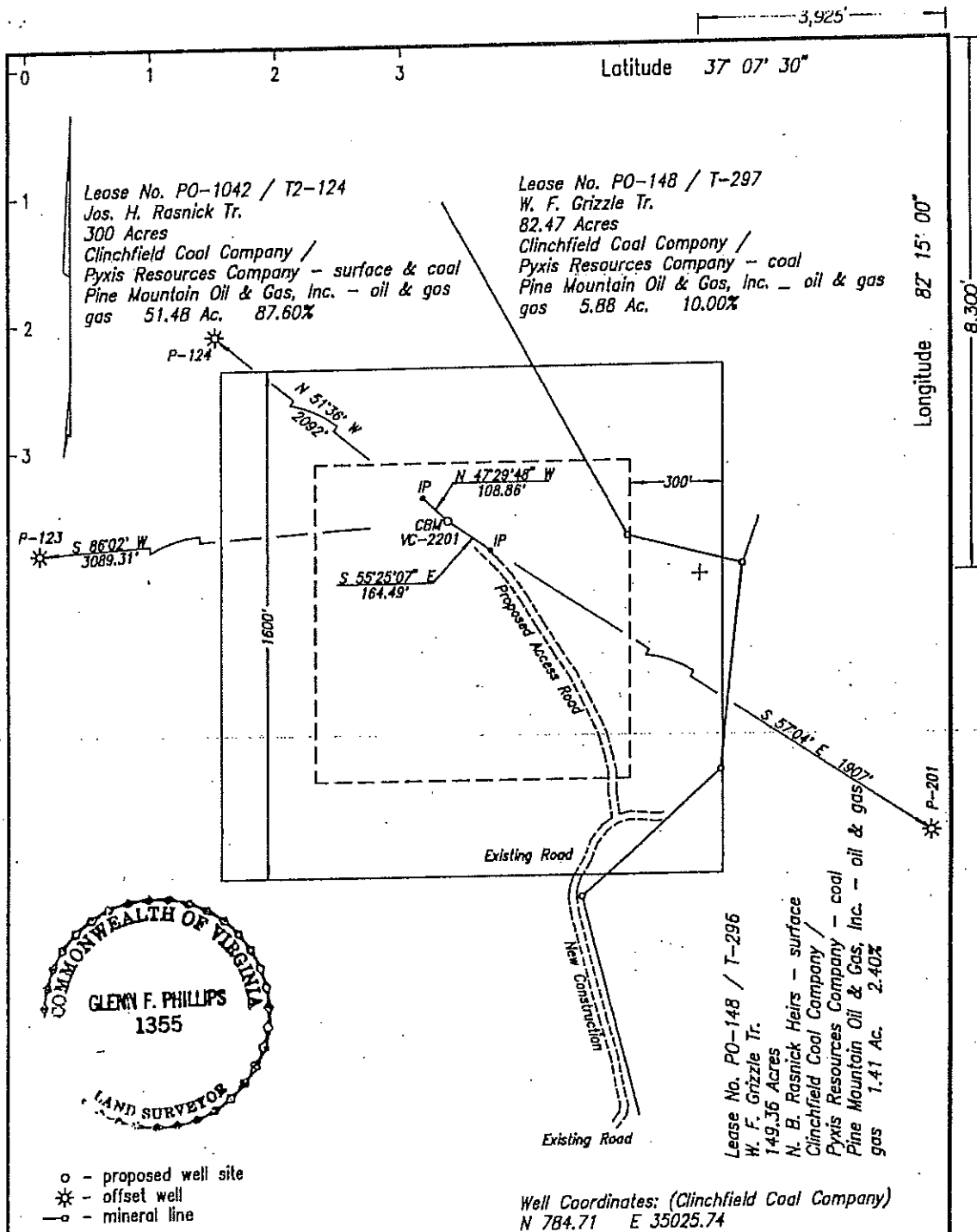
OTHER used and not
left

Is the well underlain by Red Shale ☒ Yes ☐ No, If Yes, was coal
protection string set to Red Shales? ☒ Yes ☐ No

REMARKS: Shut down, fishing jobs, depths and dates, caving, etc.

DIRECTIONAL SURVEY
WELL PC 159

<u>DEPTH</u>	<u>DEGREES</u>
258	3/4°
414	1/2°
635	3/4°
855	3/4°
1011	3/4°
1240	3/4°
1448	1/4°
1667	3/4°
1889	0°
2137	1/2°



COMPANY Equitable Resources Exploration
ADDRESS 1989 E. Stone Or., Kingsport, TN 37660
WELL NAME VC-2201
FARM Jos. H. Rasnick TRACT T2-124
LEASE NO. PO-1042 ELEVATION 2301.78
ACRES 300.0 QUADRANGLE Nora
COUNTY Dickenson DISTRICT Ervinton
REG. ENGINEER _____ REG. NO. _____
CERT. LAND SURVEYOR X CERT. NO. 1355
FILE NO. _____ DRAWING NO. _____
DATE August 22, 1991 SCALE 1" = 400'

This plat is X new _____ updated
This plat X is _____ is not based on a mine
coordinate system established for the areas
of the well locations.

WELL LOCATION MAP

Well No. VC-2201

+ Denotes Location of Well on United States
Topographic Maps, Scale 1 to 24,000, Latitude
and Longitude Lines Being Represented by
Border Lines as Shown.

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
VA Well Review Board.

Glenn F. Phillips
Registered Engineer or Certified
Land Surveyor in Charge

Department of Mines, Minerals and Energy
Division of Gas and Oil
P. O. Box 1416
Abingdon, Virginia 24210
703/676-5423

DRILLING REPORT

Pursuant to VR-480-05-22.1, § 1.36, the undersigned Permittee submits this report on Well VC2201 in the
ERVINTON District of the DICKENSON City/County, Virginia on 23RD day,
JANUARY month, 1992.

LOCATION

City/County: DICKENSON District: ERVINTON
Surface Elevation: 2301.78 Elevation of Kelly Bushing: 2311.78 Quadrangle: NORA
8300 FT. S. of Latitude 37° 07' 30" and 3925 FT. W. of Longitude 82° 15' 00"

Attach a final location plat as required by VR 480-05-22.1, § 1.36.

DRILLING DATA

Date Drilling Commenced: 12-21-91 Drilling Contractor: GASCO DRILLING, INC.
Date Drilling Completed: 12-30-91 Rig Type: X Rotary Cable Tool
Total Depth of Well: LTD=2642 DTD=2660

GEOLOGICAL DATA

Fresh Water at:	Feet	GPM	Feet	GPM
	Feet	GPM	Feet	GPM
Salt Water at:	<u>1500</u> Feet	<u>DAMP</u> GPM	Feet	GPM
	Feet	GPM	Feet	GPM

COAL SEAMS:

NAME	TOP	BOTTOM	THICKNESS	MINING IN AREA		
				YES	NO	MINED OUT
UNNAMED "B"	1691	1693	2		X	
C-SEAM	1855	1857	2			
WARCREEK	1881	1884	3			
L. HORSEPEN	1979	1981	2			
POCO #2 (SPLIT)	2547	2554	7			

GAS AND OIL SHOWS:

FORMATION	TOP	BOTTOM	THICKNESS	IPF (MCFD/BOPD)	PRESSURE	HOURS TESTED
NO SHOWS						

Cuttings or samples are are not X available for examination by a member of the Virginia Division of Mineral Resources
Cuttings or samples have have not X been furnished to the Virginia Division of Mineral Resources

ELECTRIC LOGS AND SURVEYS

List logs run on wellbore: LDT/TEMP/GR/1.2" LDT

Did log disclose vertical location of a coal seam? Yes X No

SURVEY RESULTS

DEPTH OF SURVEY	DIRECTION/DISTANCE/DEGREES FROM TRUE VERTICAL	DEPTH OF SURVEY	DIRECTION/DISTANCE/DEGREES FROM TRUE VERTICAL
410	1/2°	1470	3/4°
490	1/2°	1570	3/4°
690	1/2°	1729	3/4°
710	1/2°	1929	3/4°
910	3/4°	2129	3/4°
070	3/4°	2329	3/4°
270	3/4°	2412	3/4°
		2660	3/4°

CASING AND TUBING

	<u>SIZE</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>LENGTH</u>	<u>CEMENT USED</u> <u>(IN CU/FT)</u>	<u>DATE</u> <u>CEMENTED</u>	<u>PACKERS OR BRIDGE PLUGS</u> <u>KIND SIZE SET AT</u>
<u>tor</u>	11 3/4"		26'	20'			
<u>Surface</u>	8 5/8"		348'	342.25'	95(112)	12-21-91	
<u>Water Protection</u>	4 1/2"		2136'	2130'	452(583)	12-30-91	
<u>Coal Protection</u>							
<u>Other Casing</u> <u>and Tubing Left in Well</u>	2 3/8"		2091'				

Liners

REMARKS: Shut down, fishing jobs, depths and dates, caving, lost circulation, etc.

DR. 1'S LOG

Compiled by ENGINEERING

GEOLOGIC AGE	FORMATION	GENERAL LITHOLOGY	COLOR	DEPTH		THICKNESS	REMARKS
				TOP	BOTTOM		
PENNSYLVANIAN	SAND, SHALE & THIN COALS			0	1691	1691	
	UNNAMED "B" COAL			1691	1693	2	
	SAND, SHALE & THIN COALS			1693	1855	162	
	C-SEAM COAL			1855	1857	2	
	SAND, SHALE & THIN COALS			1857	1881	24	
	WARCREEK COAL			1881	1884	3	
	SAND, SHALE & THIN COALS			1884	1979	95	
	L. HORSEPEN COAL			1979	1981	2	
	SAND, SHALE & THIN COALS			1981	2547	566	
	POCO #2 COAL (SPLIT)			2547	2554	7	
MISSISSIPPIAN	SAND, SHALE & THIN COALS			2554	2635	81	
	RED ROCK			2635	2642	7	
LOGGER'S TOTAL DEPTH				2642			

Permittee: EQUITABLE RESOURCES EXPLORATION (Company)

By: Joseph R. Penny (Signature)

PERMIT FOR GAS AND OIL OPERATIONS

This certifies that Permit No. 1780
Operation Name VC-2201
Has been issued to: (Company) EREX
Whose main office is located at 1989 East Stone Drive
Kingsport, TN 37660

Applicant George Mason

This permit is issued on this 26th day of November, 1991.

This permit was requested for Operations under
Section 45.1-361.29.B.
and pipeline for VC-2201

The permitted operations are located in the Ervinton District
of Dickenson County.

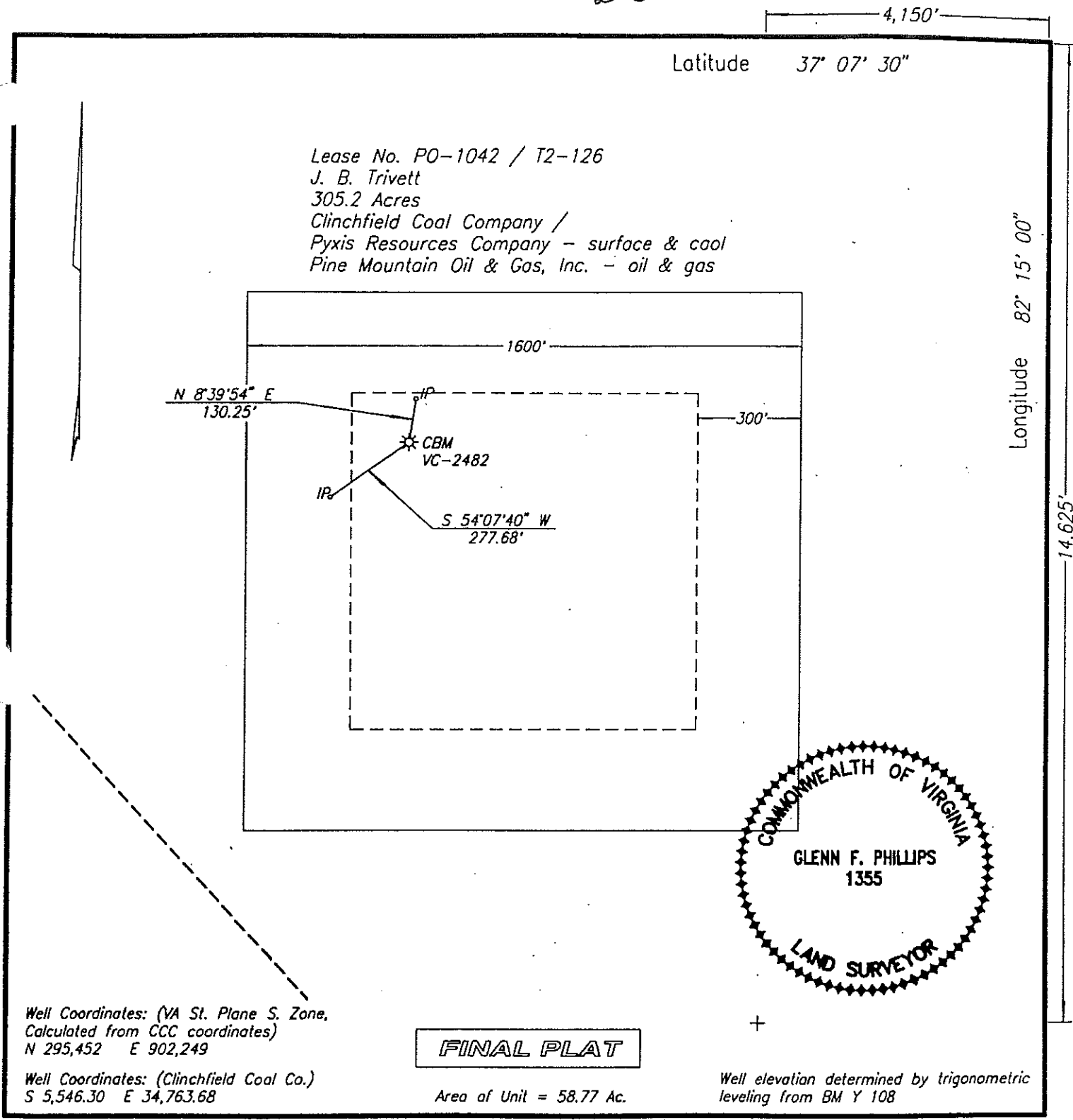
THIS PERMIT IS ISSUED BY THE DIRECTOR PURSUANT TO CHAPTER 22.1, TITLE 45.1 OF THE CODE OF VIRGINIA,
Being an Act to require permits for gas and oil operations and to fix conditions for issuance thereof; to provide for the safe and
environmentally sound operations performed by the Permittee and for the inspection thereof; to provide for a method of maximizing
gas, oil, mineral and coal resources; to protect correlative rights of persons owning interest in gas and oil resources; to provide for
enforcement by the Director.

This permit shall expire 11/26/1993 unless the permittee has commenced
operations as determined by the Inspector.

Fee Paid \$250.00
File No. DI-0616

FILE COPY

20-855



Well Coordinates: (VA St. Plane S. Zone,
Calculated from CCC coordinates)
N 295,452 E 902,249

Well Coordinates: (Clinchfield Coal Co.)
S 5,546.30 E 34,763.68

FINAL PLAT

Area of Unit = 58.77 Ac.

Well elevation determined by trigonometric
leveling from BM Y 108

WELL LOCATION PLAT

21-H-87

COMPANY Equitable Resources Energy Company WELL NAME AND NUMBER VC-2482
TRACT NO. T2-126 ELEVATION 2224.85 QUADRANGLE Nora
COUNTY Dickenson DISTRICT Ervinton SCALE 1" = 400' DATE 10-05-1997

This Plat is a new plat ☐; an updated plat ☐; or a final location plat ☒

+ Denotes the location of a well on United States topographic Maps, scale 1 to 24,000, latitude and longitude lines being represented by border lines as shown.

Glenn F. Phillips

Licensed Professional Engineer or Licensed Land Surveyor

Department of Mines, Minerals and Energy
Division of Gas and Oil
P.O. Box 1416
Abingdon, Virginia 24210
540/676-5423

COMPLETION REPORT

WELL TYPE: COALBED METHANE

Date Well Complete 08/19/1998 Total Depth of Well: LTD - 2610 DTD - 2640

Attach the Drilling Report; if not previously submitted. In addition, submit any changes in casing or tubing that were approved after the Drilling Report was submitted.

STIMULATION RECORD

Zone 1 : GREASY CK, M SEAB, L SEAB, M HORS, CSEAM, WARCK, UNNAMED C, XSEAM RIDER

Formation Stimulated With: 70Q FOAM

Total Sand Used: 13133 lbs Sand Size: 12/20 Total Acid: 600 gal. Acid Strength: 7.5%

N2 Used: 540000 SCF Total Fluid Injected: 556 bbls.

Perforated: 1435 to 1980.5 No. of Perforations: 14 Size: 0.34 "

Formation Broke Down at: 1641 PSIG Average Injection Rate: 31 BPM

ISIP: 1208 PSIG 5 Min SIP: 1149 PSIG Average Injection Pressure: 3765

Date Stimulated: 08/19/1997

FINAL PRODUCTION: _____ Natural X After Stimulation

BOD MCFD HOURS TESTED ROCK PRESSURE HOURS TESTED

Zone 1:

Zone 2:

Zone 3:

Zone 4:

Final Production If Gas

Zones are Commingled

75 MCF 6 Hours Tested 220 PSIG 48 Hours Tested

Permittee: Equitable Resources Energy Company (Company)

By:

Joseph L. Dwyer (Signature)

ENTERED

Department of Mines, Minerals and Energy
Division of Gas and Oil

Operations Name: TRIVETT, J B
Permit #: 3424

Well #: VCP2482
VA File #: DI-0855

Department of Mines, Minerals and Energy
Division of Gas and Oil
P.O. Box 1416
Abingdon, Virginia 24210
540/676-5423

DRILLING REPORT

Pursuant to VR-480-05-22.1 § 1.36, the undersigned Permittee submits this report on Well VCP2482 in the ERVINTON
District of DICKENSON County, Virginia on the 19 day, May month, 1998.

LOCATION

County: Dickenson District: ERVINTON
Surface Elevation: 2226.61 Elev of Kelly Bushing: 2236.61 Quadrangle: NORA
14625 Ft. S of Latitude 37 ° 07 ' 30 " and 4150 Ft. W of Longitude 82 ° 15 ' 00 "

DRILLING DATA

Date Drilling Commenced: 08/02/1997 Drilling Contractor: UD 10
Date Drilling Completed: 08/06/1997 Rig Type: X Rotary Cable Tool
Total Depth of Well: LTD - 2610 DTD - 2640

GEOLOGICAL DATA

Fresh Water at:
138 feet DAMP 1770 feet 1/4" STREAM

Salt Water at:

C L SEAMS:

<u>NAME</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>THICKNESS</u>	<u>MINING IN AREA</u>		
				<u>YES</u>	<u>NO</u>	<u>MINED OUT</u>
L JAWBONE	1007	1010	3			
GREASY CREEK	1435	1437	2			
M SEABOARD	1469	1470	1			
L SEABOARD	1506	1507	1			
M HORSEPEN	1671	1673	2			
C SEAM	1750	1752	2			
WAR CREEK	1789	1790	1			
UNNAMED C	1819	1820	1			
X-SEAM RIDER	1980	1982	2			

GAS AND OIL SHOWS:

<u>FORMATION</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>THICKNESS</u>	<u>IPF (MCFD/BOPD)</u>	<u>PRESSURE</u>	<u>HOURS TESTED</u>

Loggings or samples are not available for examination by a member of the Virginia Division of Mineral Resources
Loggings or samples have not been furnished to the Virginia Division of Mineral Resources

ELECTRIC LOGS AND SURVEYS

List logs run on wellbore:

CCL
DEN
GR
TMP

Did log disclose vertical location of a coal seam ? No

SURVEY RESULTS

<u>DEPTH</u> <u>OF SURVEY</u>	<u>DIRECTION/DISTANCE/DEGREE</u> <u>FROM TRUE VERTICAL</u>	<u>DEPTH</u> <u>OF SURVEY</u>	<u>DIRECTION/DISTANCE/DEGREE</u> <u>FROM TRUE VERTICAL</u>
88	0.25°	273	0.25°
433	0.50°	601	0.50°
765	0.75°	965	0.75°
1165	0.75°	1365	0.75°
1436	0.75°	1636	0.75°
1753	0.75°	1792	0.75°
1904	0.75°	2005	1.00°
2205	1.25°	2405	1.50°
2422	1.50°	2622	1.25°

CASING AND TUBING

	<u>SIZE</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>LENGTH</u>	<u>CEMENT</u> <u>USED</u> <u>IN CU/FT</u>	<u>DATE</u> <u>CEMENTED</u>	<u>PACKERS OR</u> <u>BRIDGE PLUGS</u> <u>KIND</u> <u>SIZE</u> <u>SET AT</u>
<u>Conductor Pipe</u>	13.375	0.00	39.00	39.00			
<u>Surface Casing</u>	8.625	0.00	354.00	354.00	177	8/3/97	
<u>Production Casing</u>	4.500	0.00	2300.00	2300.00	607	8/7/97	
<u>Tubing String 1</u>	2.375	0.00	2165.00	2165.00			

REMARKS: Shutdown, fishing jobs, depths and dates, caving, lost circulation, etc.

LOGGER'S LOG

Compiled by: Engineering

<u>AGE</u>	<u>FORMATION*</u>	<u>GENERAL LITHOLOGY</u>	<u>COLOR</u>	<u>DEPTH</u>		<u>THICKNESS</u>	<u>REMARKS</u>
				<u>TOP</u>	<u>BOTTOM</u>		
PENN	L JAWBONE			1007	1010	3	
PENN	GREASY CREEK			1435	1437	2	
PENN	M SEABOARD			1469	1470	1	
PENN	L SEABOARD			1506	1507	1	
PENN	M HORSEPEN			1671	1673	2	
PENN	C SEAM			1750	1752	2	
PENN	WAR CREEK			1789	1790	1	
PENN	UNNAMED C			1819	1820	1	
PENN	X-SEAM RIDER			1980	1982	2	

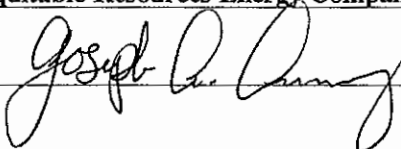
LOGGER'S TOTAL DEPTH

2610

*Formations between coal seams are Sand, Shale and Thin Coals

Permittee: Equitable Resources Energy Company (Company)

By:

 (Signature)

TOTAL UNIT AREA
= 58.77 ACRES

LATITUDE 37° 05' 00"

UNIT

BOUNDARY

LS #241490L / T-450

JESSEE WAMPLER

320.9 ACRES

CLINCHFIELD COAL COMPANY/

PYXIS RESOURCES COMPANY

- coal & surface

PINE MOUNTAIN OIL & GAS, INC.

- oil & gas

GAS 46.57 AC. 79.24 %

AS-DRILLED

COORDINATES OF WELL

S 7445.37

E 30060.47

BOUNDARY

BOUNDARY

IPS N 20°42'36" W
221.92'

VC-2484

S 22°06'17" E
212.13'

IPS

UNIT

UNIT

LONGITUDE 82° 15' 00"

LS # 241501L

FREDDIE E. MULLINS

- coal, oil & gas

1423.0 ACRES

G. MARK FRENCH HEIRS

- surface

GAS 3.97 AC. 6.76 %

UNIT

BOUNDARY

LS #241490L / T-193

JESSEE WAMPLER

3,228.95 ACRES

CLINCHFIELD COAL COMPANY/

PYXIS RESOURCES COMPANY

- coal

PINE MOUNTAIN OIL & GAS, INC.

- oil & gas

GAS 8.23 AC. 14.00 %

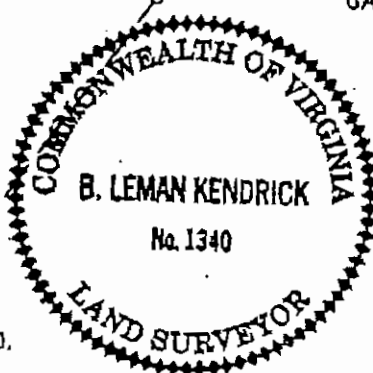
NOTE !!!

WELL COORDINATES ARE BASED ON CLINCHFIELD
COAL COMPANY'S MINE COORDINATE SYSTEM

STATE PLANE WELL COORDINATES ARE CALCULATED
FROM CLINCHFIELD COAL COMPANY COORDINATES.

PROPERTY INFORMATION PROVIDED BY EQUITABLE
RESOURCES ENERGY COMPANY.

ELEVATIONS ARE BASED ON BM Y 108, ELEV. = 1640.30.



AS-DRILLED
STATE PLANE COORDINATES
OF WELL VC-2484
N 293742.49
E 897472.52

WELL LOCATION PLAT

COMPANY Equitable Resources Energy Co. WELL NAME AND NUMBER VC-2484

TRACT No. LS #241490L/T-450 ELEVATION 1827.33 (Trig) QUADRANGLE NORA

COUNTY DICKENSON DISTRICT ERVINTON SCALE: 1" = 400' DATE APRIL 7, 1998

PLAT IS A NEW PLAT ; AN UPDATED PLAT ; OR A FINAL LOCATION PLAT x
PROPOSED TOTAL DEPTH OF WELL =

+ DENOTES THE LOCATION OF A WELL ON UNITED STATES TOPOGRAPHIC MAPS, SCALE 1 TO
24,000, LATITUDE AND LONGITUDE LINES BEING REPRESENTED BY BORDER LINES AS SHOWN.

Department of Mines, Minerals and Energy
Division of Gas and Oil

Operations Name: WAMPLER, JESSEEWell #: VCP2484Permit #: 3597VA File #: DI-0871

DRILLER'S LOG

Compiled by: Engineering

AGE	FORMATION*	GENERAL LITHOLOGY	COLOR	DEPTH		THICKNESS	REMARKS
				TOP	BOTTOM		
PENN	RAVEN			482	484	2	
PENN	L JAWBONE			644	646	2	
PENN	M SEABOARD			1102	1103	1	
PENN	L SEABOARD			1136	1137	1	
PENN	M HORSEPEN			1296	1298	2	
PENN	C SEAM			1376	1377	1	
PENN	WAR CREEK			1415	1416	1	
PENN	UNNAMED C			1447	1448	1	
PENN	L HORSEPEN			1549	1551	2	
PENN	X-SEAM RIDER			1604	1606	2	
LOGGER'S TOTAL DEPTH				2221			

*Formations between coal seams are Sand, Shale and Thin Coals

Permittee: Equitable Resources Energy Company (Company)By: Joseph A. Long (Signature)

Department of Mines, Minerals and Energy
Division of Gas and Oil

Operations Name: WAMPLER, JESSEE Well #: VCP2484
Permit #: 3597 VA File #: DI-0871

Cuttings or samples are not available for examination by a member of the Virginia Division of Mineral Resources
Cuttings or samples have not been furnished to the Virginia Division of Mineral Resources

ELECTRIC LOGS AND SURVEYS

List logs run on wellbore:

DEN
GR
TMP

Did log disclose vertical location of a coal seam? Yes

SURVEY RESULTS

<u>DEPTH OF SURVEY</u>	<u>DIRECTION/DISTANCE/DEGREE FROM TRUE VERTICAL</u>	<u>DEPTH OF SURVEY</u>	<u>DIRECTION/DISTANCE/DEGREE FROM TRUE VERTICAL</u>
200	0.25°	400	0.25°
499	0.25°	608	0.25°
630	0.25°	830	0.50°
1030	0.50°	1230	0.50°
1430	0.50°	1545	0.50°
1599	0.75°	1799	1.00°
1999	1.00°	2040	1.00°
2100	1.00°		

CASING AND TUBING

	<u>SIZE</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>LENGTH</u>	<u>CEMENT USED IN CU/FT</u>	<u>DATE CEMENTED</u>	<u>PACKERS OR BRIDGE PLUGS KIND SIZE SET AT</u>
<u>Conductor Casing</u>	11.750	0.00	24.00	24.00			
<u>Surface Casing</u>	8.625	0.00	309.00	309.00	130	4/6/98	
<u>Production Casing</u>	4.500	0.00	2192.00	2192.00	622	4/10/98	
<u>Tubing String 1</u>	2.375	0.00	1845.00	1845.00			

REMARKS: Shutdown, fishing jobs, depths and dates, caving, lost circulation, etc.

Department of Mines, Minerals and Energy
Division of Gas and Oil

Operations Name: WAMPLER, JESSEE
Permit #: 3597

Well #: VCP2484
VA File #: DI-0871

Department of Mines, Minerals and Energy
Division of Gas and Oil
P.O. Box 1416
Abingdon, Virginia 24210
540/676-5423

DRILLING REPORT

Pursuant to VR-480-05-22.1 § 1.36, the undersigned Permittee submits this report on Well VCP2484 in the ERVINTON District of DICKENSON County, Virginia on the 3 day, June month, 1998.

LOCATION

County: Dickenson District: ERVINTON
Surface Elevation: 1833.01 Elev of Kelly Bushing: 1843.01 Quadrangle: NORA
1300 Ft. S of Latitude 37° 05' 00" and 8900 Ft. W of Longitude 82° 15' 00"

DRILLING DATA

Date Drilling Commenced: 04/06/1998 Drilling Contractor: UD 15
Date Drilling Completed: 04/09/1998 Rig Type: X Rotary Cable Tool
Total Depth of Well: LTD - 2221 DTD - 2258

GEOLOGICAL DATA

Fresh Water at:
221 feet DAMP 1470 feet DAMP

Salt Water at:

COAL SEAMS:

NAME	TOP	BOTTOM	THICKNESS	MINING IN AREA		
				YES	NO	MINED OUT
RAVEN	482	484	2			
L JAWBONE	644	646	2			
M SEABOARD	1102	1103	1			
L SEABOARD	1136	1137	1			
M HORSEPEN	1296	1298	2			
C SEAM	1376	1377	1			
WAR CREEK	1415	1416	1			
UNNAMED C	1447	1448	1			
L HORSEPEN	1549	1551	2			
X-SEAM RIDER	1604	1606	2			

GAS AND OIL SHOWS:

FORMATION	TOP	BOTTOM	THICKNESS	IPF (MCFD/BOPD)	PRESSURE	HOURS TESTED

Department of Mines, Minerals and Energy
Division of Gas and Oil

Operations Name: WAMPLER, JESSEE
Permit #: 3597

Well #: VCP2484
VA File #: DI-0871

Department of Mines, Minerals and Energy
Division of Gas and Oil
P.O. Box 1416
Abingdon, Virginia 24210
540/676-5423

COMPLETION REPORT

WELL TYPE: COALBED METHANE

Date Well Completed 04/20/1998 Total Depth of Well: LTD - 2221 DTD - 2258

Attach the Drilling Report; if not previously submitted. In addition, submit any changes in casing or tubing that were approved after the Drilling Report was submitted.

STIMULATION RECORD

Zone 1 : M SEAB, L SEAB, M HORS, CSEAM, WARCK, UN C, L HORS, XSEAM RFormation Stimulated With: 70Q FOAMTotal Sand Used: 18695 lbs Sand Size: 12/20 Total Acid: 0 gal. Acid Strength:N2 Used: 655623 SCF Total Fluid Injected: 520 bbls.Perforated: 1103 to 1606 No. of Perforations: 15 Size: 0.34 "Formation Broke Down at: 1693 PSIG Average Injection Rate: 35 BPMISIP: 1332 PSIG 5 Min SIP: 1263 PSIG Average Injection Pressure: 3632Date Stimulated: 04/20/1998FINAL PRODUCTION: _____ Natural X After Stimulation

BOD MCFD HOURS TESTED ROCK PRESSURE HOURS TESTED

Zone 1:

Zone 2:

Zone 3:

Zone 4:

Final Production If Gas

Zones are Commingled

17 MCF 6 Hours Tested 360 PSIG 48 Hours Tested

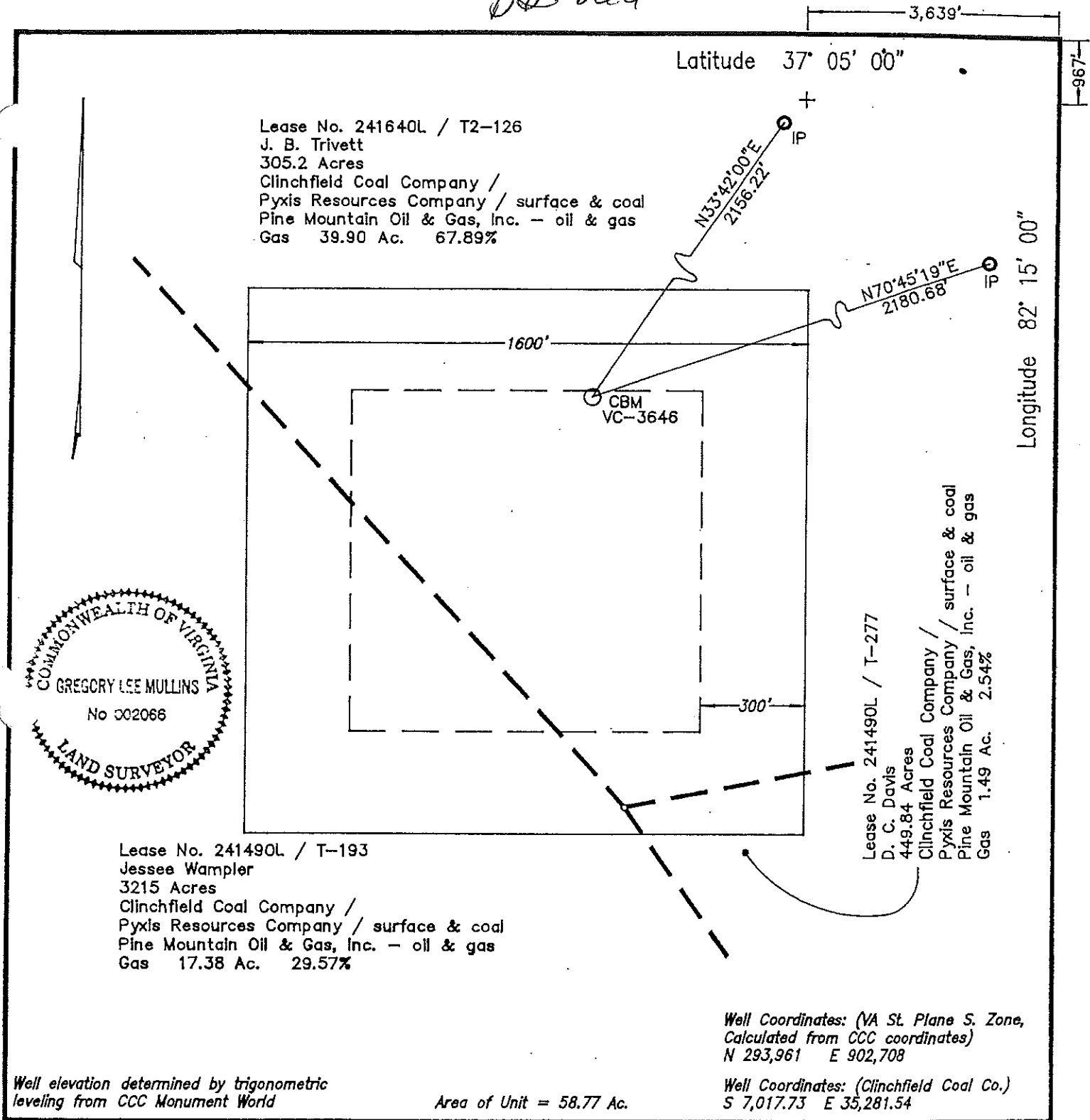
Permittee: Equitable Resources Energy Company (Company)

By:

Joseph R. [Signature] (Signature)

ENTERED

02-866



WELL LOCATION PLAT

COMPANY Equitable Resources Energy Company WELL NAME AND NUMBER VC-3646
TRACT NO. T2-126 ELEVATION 2202.34 QUADRANGLE Nora
COUNTY Dickenson DISTRICT Ervinton SCALE 1" = 400' DATE 10-13-97
This Plat is a new plat ; an updated plat ; or a final location plat

+ Denotes the location of a well on United States topographic Maps, scale 1 to 24,000, latitude and longitude lines, being represented by border lines as shown.

Greg Mullins
Licensed Professional Engineer or Licensed Land Surveyor

Department of Mines, Minerals and Energy
Division of Gas and Oil

Operations Name: TRIVETT, J B (CCC/PY) Well #: VCP3646

Permit #: 3482

VA File #: DI-0866

Department of Mines, Minerals and Energy
Division of Gas and Oil
P.O. Box 1416
Abingdon, Virginia 24210
540/676-5423

COMPLETION REPORT

WELL TYPE: COALBED METHANE

Date Well Completed 10/08/1997 Total Depth of Well: LTD - 2486 DTD - 2487

Attach the Drilling Report; if not previously submitted. In addition, submit any changes in casing or tubing that were approved after the Drilling Report was submitted.

STIMULATION RECORD

Zone 1 : M HORS, CSEAM, WARCK, UNNAMED C, POCO #6 RIDER

Formation Stimulated With: 70Q FOAM

Total Sand Used: 14700 lbs Sand Size: 12/20 Total Acid: 0 gal. Acid Strength:

N2 Used: 656000 SCF Total Fluid Injected: 561 bbls.

Perforated: 1643.5 to 2177.5 No. of Perforations: 11 Size: 0.34 "

Formation Broke Down at: 2005 PSIG Average Injection Rate: 49 BPM

ISIP: 1850 PSIG 5 Min SIP: 1760 PSIG Average Injection Pressure: 3670

Date Stimulated: 10/08/1997

FINAL PRODUCTION: _____ Natural X After Stimulation

BOD MCFD HOURS TESTED ROCK PRESSURE HOURS TESTED

Zone 1:

Zone 2:

Zone 3:

Zone 4:

Final Production If Gas

Zones are Commingled

15 MCF

6

Hours Tested

360

PSIG

48

Hours Tested

Permittee: Equitable Resources Energy Company (Company)

By:

Joseph A. Long

(Signature)

ENTERED

Department of Mines, Minerals and Energy
Division of Gas and Oil

Operations Name: TRIVETT, J B (CCC/P) Well #: VCP3646
Permit #: 3482 VA File #: DI-0866

Department of Mines, Minerals and Energy
Division of Gas and Oil
P.O. Box 1416
Abingdon, Virginia 24210
540/676-5423

DRILLING REPORT

Pursuant to VR-480-05-22.1 § 1.36, the undersigned Permittee submits this report on Well VCP3646 in the ERVINTON
District of DICKENSON County, Virginia on the 19 day, May month, 1998.

LOCATION

County: DICKENSON District: ERVINTON
Surface Elevation: 2211.85 Elev of Kelly Bushing: 2221.85 Quadrangle: NORA
967 Ft. S of Latitude 37 ° 05 ' 00 " and 3639 Ft. W of Longitude 82 ° 15 ' 00 "

DRILLING DATA

Date Drilling Commenced: 09/25/1997 Drilling Contractor: UD 15
Date Drilling Completed: 09/29/1997 Rig Type: X Rotary Cable Tool
Total Depth of Well: LTD - 2486 DTD - 2487

GEOLOGICAL DATA

Fresh Water at:
1590 feet DAMP

Salt Water at:

L SEAMS:

<u>NAME</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>THICKNESS</u>	<u>MINING IN AREA</u>		
				<u>YES</u>	<u>NO</u>	<u>MINED OUT</u>
L JAWBONE	974	976	2			
M HORSEPEN	1643	1644	1			
C SEAM	1729	1730	1			
WAR CREEK	1767	1769	2			
UNNAMED C	1787	1788	1			
POCO #6-R	2176	2178	2			

GAS AND OIL SHOWS:

<u>FORMATION</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>THICKNESS</u>	<u>IPF (MCFD/BOPD)</u>	<u>PRESSURE</u>	<u>HOURS TESTED</u>

Cuttings or samples are not available for examination by a member of the Virginia Division of Mineral Resources
Cuttings or samples have not been furnished to the Virginia Division of Mineral Resources

ELECTRIC LOGS AND SURVEYS

List logs run on wellbore:

CCL
DEN
GR
TMP

Did log disclose vertical location of a coal seam ? Yes

SURVEY RESULTS

<u>DEPTH</u> <u>OF SURVEY</u>	<u>DIRECTION/DISTANCE/DEGREE</u> <u>FROM TRUE VERTICAL</u>	<u>DEPTH</u> <u>OF SURVEY</u>	<u>DIRECTION/DISTANCE/DEGREE</u> <u>FROM TRUE VERTICAL</u>
200	0.25°	400	0.25°
600	0.50°	928	0.50°
1128	0.50°	1328	0.75°
1528	0.75°	1635	0.75°
1760	0.75°	1970	1.00°
2166	1.00°	2266	1.00°
2466	1.00°		

CASING AND TUBING

	<u>SIZE</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>LENGTH</u>	<u>CEMENT</u> <u>USED</u> <u>IN CU/FT</u>	<u>DATE</u> <u>CEMENTED</u>	<u>PACKERS OR</u> <u>BRIDGE PLUGS</u> <u>KIND</u> <u>SIZE</u> <u>SET AT</u>
<u>Conductor Pipe</u>	11.750	0.10	24.10	24.10	47	9/26/97	
<u>Surface Casing</u>	8.625	0.10	310.10	310.10	153	9/26/97	
<u>Production Casing</u>	4.500	0.10	2413.10	2413.10	664	9/29/97	
<u>Tubing String 1</u>	2.375	0.10	2327.10	2327.10			

REMARKS: Shutdown, fishing jobs, depths and dates, caving, lost circulation, etc.
OPEN MINE @ 243-244

LOGGER'S LOG

Controlled by: Engineering

<u>AGE</u>	<u>FORMATION*</u>	<u>GENERAL LITHOLOGY</u>	<u>COLOR</u>	<u>DEPTH</u>		<u>THICKNESS</u>	<u>REMARKS</u>
				<u>TOP</u>	<u>BOTTOM</u>		
PENN	L JAWBONE			974	976	2	
PENN	M HORSEPEN			1643	1644	1	
PENN	C SEAM			1729	1730	1	
PENN	WAR CREEK			1767	1769	2	
PENN	UNNAMED C			1787	1788	1	
PENN	POCO #6-R			2176	2178	2	
LOGGER'S TOTAL DEPTH					2486		

*Formations between coal seams are Sand, Shale and Thin Coals

Permittee: Equitable Resources Energy Company (Company)

By: _____ (Signature)

PERMIT FOR GAS AND OIL OPERATIONS

This certifies that Permit No. 3482
Operation Name VC-3646
Has been issued to: (Company) Equitable Resources Energy Co.
Whose main office is located at Eastern Region
Kingsport, TN 37662

Applicant MICHAEL P JASKOSKI

This permit is issued on this 8th day of August, 1997.

This permit was requested for Operations under
Section 45.1-361.29.B.

The permitted operations are located in the Ervinton District
of Dickenson County.

THIS PERMIT IS ISSUED BY THE DIRECTOR PURSUANT TO CHAPTER 22.1, TITLE 45.1 OF THE CODE OF VIRGINIA,
Being an Act to require permits for gas and oil operations and to fix conditions for issuance thereof ; to provide for the safe and
environmentally sound operations performed by the Permittee and for the inspection thereof ; to provide for a method of maximizing
gas, oil, mineral and coal resources ; to protect correlative rights of persons owning interest in gas and oil resources ; to provide for
enforcement by the Director.

This permit shall expire 08/08/99 unless the permittee has commenced
operations as determined by the Inspector.

Fee Paid \$250.00
File No. DI-0866

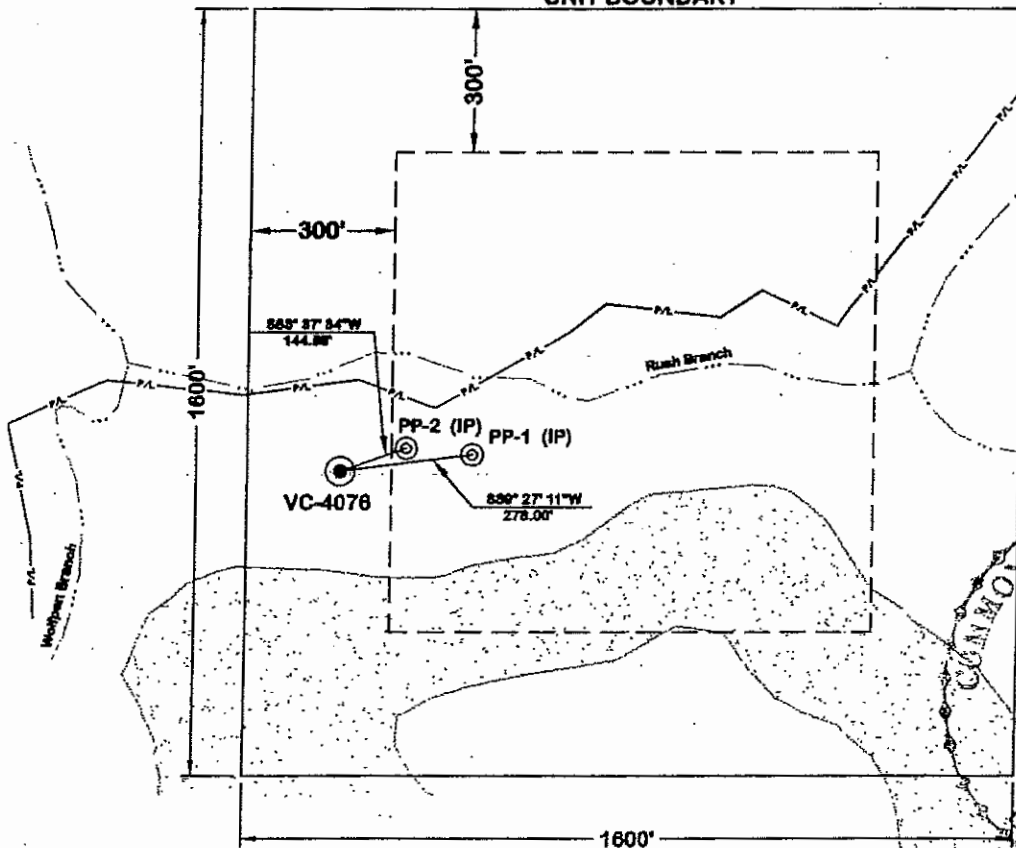
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W-954

**TOTAL UNIT AREA
= 58.77 ACRES**

LEASE NO. 241490L / T-450
J. WAMPLER
320.90 ACRES
CLINCHFIELD COAL CO.,
PYNB RESOURCES COMPANY - coal, surface
PINE MOUNTAIN OIL & GAS, INC. oil & gas
GAS - 23.48 ACRES, 40%

UNIT BOUNDARY



STATE PLANE
COORDINATES OF
WELL VC-4076
N 293505
E 898691

CCC COORDINATES
OF WELL VC-4076
N -7633.16
E 31287.24

LEASE NO. 241490L / T-193
JESSEE WAMPLER
3215 ACRES
CLINCHFIELD COAL CO.,
PYNB RESOURCES COMPANY - coal, surface
PINE MOUNTAIN OIL & GAS, INC. oil & gas
GAS - 36.29 ACRES, 60%

NOTE:
WELL COORDINATES ARE BASED ON CLINCHFIELD
COAL COMPANY'S MINE COORDINATE SYSTEM.
STATE PLANE WELL COORDINATES ARE CALCULATED
FROM CLINCHFIELD COAL COMPANY COORDINATES.
PROPERTY INFORMATION PROVIDED BY EQUITABLE
PRODUCTION COMPANY.
ELEVATIONS WERE DETERMINED BY GPS & TRIGONOMETRIC
METHODS BASED ON BENCH MARK P-424.

COMPANY	EQUITABLE PRODUCTION CO.		WELL NAME & NUMBER	VC - 4076
TRACT NO.	LEASE NO. 241490L / T-193	ELEVATION	1618.30 (TRIG.)	QUADRANGLE
COUNTY	DICKENSON	DISTRICT	ERVINTON	DATE
THIS PLAT IS A NEW PLAT.		AN UPDATED PLAT		OR A FINAL LOCATION PLAT
				X

⊕ DENOTES THE LOCATION OF A WELL ON UNITED STATES TOPOGRAPHIC MAPS, SCALE 1 TO 24,000,
LATITUDE AND LONGITUDE LINES BEING REPRESENTED BY BORDER LINES AS SHOWN.

LICENSED LAND SURVEYOR

(AFFIX SEAL)

Jay

Department of Mines, Minerals and Energy
Division of Gas and Oil
P.O. Box 1416
Abingdon, Virginia 24210
540/676-5423

COMPLETION REPORT

WELL TYPE: COALBED METHANE

Date Well Completed 08/17/1999 Total Depth of Well: LTD - 1819 DTD - 1825

Attach the Drilling Report; if not previously submitted. In addition, submit any changes in casing or tubing that were approved after the Drilling Report was submitted.

STIMULATION RECORD

Zone 1 : CSEAM, WARCK, UN C, BECKLY, L HORS, XSEAM RIDER

Formation Stimulated With: 70D

Total Sand Used: 14653 lbs Sand Size: 12/20 Total Acid: 550 gal. Acid Strength: 7.5%

N2 Used: 663700 SCF Total Fluid Injected: 544 bbls.

Perforated: 1166.5 to 1396 No. of Perforations: 13 Size: 0.34 "

Formation Broke Down at: 1368 PSIG Average Injection Rate: 50 BPM

ISIP: 1400 PSIG 5 Min SIP: 1148 PSIG Average Injection Pressure: 3910

Date Stimulated: 08/17/1999



FINAL PRODUCTION: After Stimulation

BOD MCFD HOURS TESTED ROCK PRESSURE HOURS TESTED

Final Production If Gas
Zones are Commingled

39 MCF 6 Hours Tested 240 PSIG 48 Hours Tested

Permittee: Equitable Production Company (Company)

By: *James M. Caud* (Signature)

Department of Mines, Minerals and Energy
Division of Gas and Oil

Operations Name: WAMPLER, JESSEE
Permit #: 4215

Well #: VCP4076
VA File #: DI-0954

Department of Mines, Minerals and Energy
Division of Gas and Oil
P.O. Box 1416
Abingdon, Virginia 24210
540/676-5423

DRILLING REPORT

Pursuant to VR-480-05-22.1 § 1.36, the undersigned Permittee submits this report on Well VCP4076 in the ERVINTON District of DICKENSON County, Virginia on the 6 day, October month, 1999.

LOCATION

County: DICKENSON District: ERVINTON
Surface Elevation: 1617.7 Elev of Kelly Bushing: 1627.70 Quadrangle: NORA
1583 Ft. S of Latitude 37 ° 05 ' 00 " and 7628 Ft. W of Longitude 82 ° 15 ' 00 "

DRILLING DATA

Date Drilling Commenced: 08/04/1999 Drilling Contractor: UD15
Date Drilling Completed: 08/07/1999 Rig Type: X Rotary Cable Tool
Total Depth of Well: LTD - 1819 DTD - 1825

GEOLOGICAL DATA

Fresh Water at:
69 feet 1/4" STREAM 1243 feet DAMP

Salt Water at:

COAL SEAMS:

<u>NAME</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>THICKNESS</u>	<u>MINING IN AREA</u>		
				<u>YES</u>	<u>NO</u>	<u>MINED OUT</u>
U JAWBONE	390	392	2			
L JAWBONE	412	415	3			
L SEABOARD	912	914	2			
C SEAM	1166	1167	1			
WAR CREEK	1207	1208	1			
UNNAMED C	1236	1237	1			
BECKLY	1266	1268	2			
L HORSEPEN	1335	1338	3			
X SEAM RIDER	1395	1398	3			

GAS AND OIL SHOWS:

<u>FORMATION</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>THICKNESS</u>	<u>IPF (MCFD/BOPD)</u>	<u>PRESSURE</u>	<u>HOURS TESTED</u>

Cuttings or samples are not available for examination by a member of the Virginia Division of Mineral Resources

Cuttings or samples have not been furnished to the Virginia Division of Mineral Resources

ELECTRIC LOGS AND SURVEYS

List logs run on wellbore:

CCL
DEN
GR
TMP

Did log disclose vertical location of a coal seam ? Yes

SURVEY RESULTS

<u>DEPTH</u> <u>OF SURVEY</u>	<u>DIRECTION/DISTANCE/DEGREE</u> <u>FROM TRUE VERTICAL</u>	<u>DEPTH</u> <u>OF SURVEY</u>	<u>DIRECTION/DISTANCE/DEGREE</u> <u>FROM TRUE VERTICAL</u>
171	0.25°	263	0.25°
420	0.25°	620	0.25°
801	0.25°	1000	0.50°
1200	0.50°	1327	0.50°
1387	0.50°	1523	0.75°
1723	0.75°		

CASING AND TUBING

	<u>SIZE</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>LENGTH</u>	<u>CEMENT</u> <u>USED</u> <u>IN CU/FT</u>	<u>DATE</u> <u>CEMENTED</u>	<u>PACKERS OR</u> <u>BRIDGE PLUGS</u> <u>KIND</u> <u>SIZE</u> <u>SET AT</u>
<u>Conductor Pipe</u>	11.750	0.00	24.00	24.00			
<u>Surface Casing</u>	8.625	0.00	310.00	310.00	130	8/5/99	
<u>Production Casing</u>	4.500	0.00	1778.00	1778.00	516	8/8/99	
<u>Tubing String 1</u>	2.375	0.00	1546.00	1546.00			

REMARKS: Shutdown, fishing jobs, depths and dates, caving, lost circulation, etc.

LOGGER'S LOG

Compiled by: Engineering

<u>AGE</u>	<u>FORMATION*</u>	<u>GENERAL LITHOLOGY</u>	<u>COLOR</u>	<u>DEPTH</u>		<u>THICKNESS</u>	<u>REMARKS</u>
				<u>TOP</u>	<u>BOTTOM</u>		
PENN	U JAWBONE			390	392	2	
PENN	L JAWBONE			412	415	3	
PENN	L SEABOARD			912	914	2	
PENN	C SEAM			1166	1167	1	
PENN	WAR CREEK			1207	1208	1	
PENN	UNNAMED C			1236	1237	1	
PENN	BECKLY			1266	1268	2	
PENN	L HORSEPEN			1335	1338	3	
PENN	X SEAM RIDER			1395	1398	3	

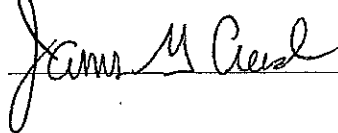
LOGGER'S TOTAL DEPTH

1819

*Formations between coal seams are Sand, Shale and Thin Coals

Permittee: Equitable Production Company (Company)

By:



(Signature)

PERMIT FOR GAS AND OIL OPERATIONS

This certifies that Permit No. 4215
Operation Name VC-4076 W/PIPELINE
Has been issued to: (Company) Equitable Production Company
Whose main office is located at Eastern Region
Kingsport, TN 37662

Applicant MICHAEL P. JASKOSKI

This permit is issued on this 8th day of June, 1999.

This permit was requested for Operations under
Section 45-1-361.29, B.

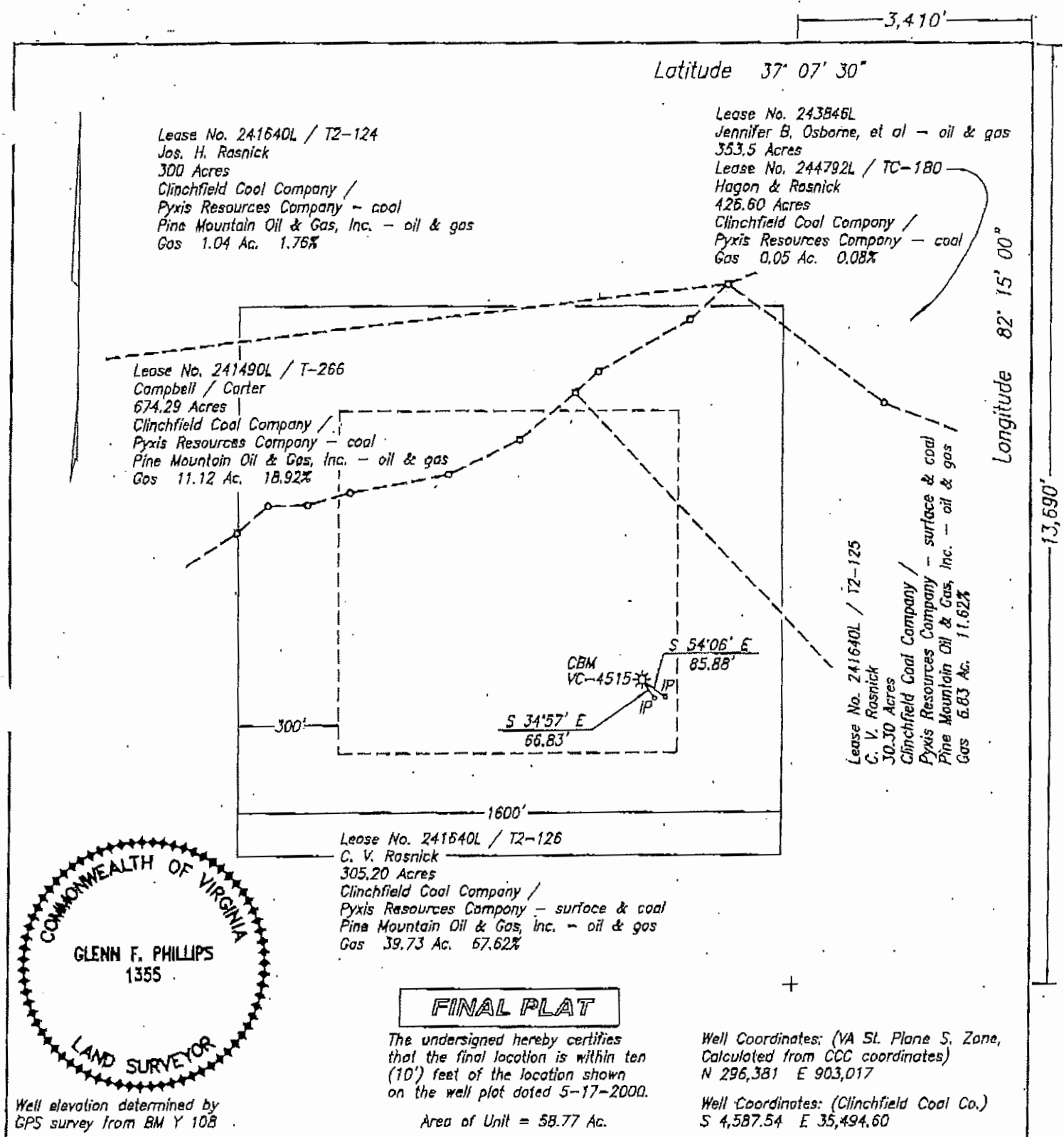
The permitted operations are located in the Ervinlon District
of Dickenson County

THIS PERMIT IS ISSUED BY THE DIRECTOR PURSUANT TO CHAPTER 22.1, TITLE 45.1 OF THE CODE OF VIRGINIA,
Being an Act to require permits for gas and oil operations and to fix conditions for issuance thereof, to provide for the safe and
environmentally sound operations performed by the Permittee and for the inspection thereof, to provide for a method of maximizing
gas, oil, mineral and coal resources, to protect correlative rights of persons owning interest in gas and oil resources, to provide for
enforcement by the Director.

This permit shall expire 06/08/2001 unless the permittee has commenced
operations as determined by the Inspector

Fee Paid \$250.00
File No. DI-0954

FILE COPY



WELL LOCATION PLAT

COMPANY Equitable Production Company WELL NAME AND NUMBER VC-4515
TRACT NO. T2-126 ELEVATION 2255.85 QUADRANGLE Nora
COUNTY Dickenson DISTRICT Ervinton SCALE 1" = 400' DATE 5-01-2001
This Plat is a new plat ; an updated plat ; or a final location plat x
+ Denotes the location of a well on United States topographic Maps, scale 1 to 24,000, latitude and longitude lines being represented by border lines as shown.

Glenn F. Phillips

Licensed Professional Engineer or Licensed Land Surveyor

Permit: 4675 Well: VC-4515

DI-1036

Department of Mines, Minerals and Energy
Division of Gas and Oil
P O Box 1416
Abingdon, Virginia 24210
540-676-5423

COMPLETION REPORT

Well Type: Gas Well

Date Well Completed: 4/16/2001 Total Depth of Well: 2500 LTD: 2500

Attach the Drilling Report if not previously submitted. In addition, submit any changes in casing and tubing that were approved after the Drilling Report was submitted.

STIMULATION RECORD**Zone 1: Greasy Crk/L Seaboard/M.L Horsepen/C Seam/War Creek/Unnamed C/X Seam Rider**Formation Stimulated With: 70 Q FoamPerforated: 1464 to 2001 No. of Perforations: 18 Perforation Size: 0.34"Formation Broke Down at: 1250 PSIG Average Injection Rate: 56 BPMISIP: 1072 PSIG 5 Min SIP: 1036 PSIG Average Downhole Injection Pressure: 3098 PSIGStimulated: Yes: X No: Date Stimulated: 4/10/2001**Zone 2:**

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:

Formation Broke Down at: PSIG Average Injection Rate: BPM

ISIP: PSIG Min SIP PSIG Average Downhole Injection Pressure: PSIG

Stimulated: Yes No Date Stimulated:

Zone 3:

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:

Formation Broke Down at: PSIG Average Injection Rate: BPM

ISIP: PSIG Min SIP PSIG Average Downhole Injection Pressure: PSIG

Stimulated: Yes No Date Stimulated:

Zone 4:

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:

Formation Broke Down at: PSIG Average Injection Rate: BPM

ISIP: PSIG Min SIP PSIG Average Downhole Injection Pressure: PSIG

Stimulated: Yes No Date Stimulated:

FINAL PRODUCTION:After Stimulation

Final Production if Gas
Zones are Commingled:

BOD MCFD20 (In Line)HOURS
TESTEDROCK
PRESSUREHOURS
TESTED350PERMITTED EQUITABLE PRODUCTION COMPANY (Company)BY: [Signature] (Signature)

ENTERED

Permit: 4675 Well: VC-4516

Department of Mines, Minerals and Energy
 Division of Gas and Oil
 P O Box 1416
 Abingdon, Virginia 24210
 540-676-5423

DRILLING REPORT

ATTACH A FINAL LOCATION PLAT AS REQUIRED BY 4 VAC 25-150-360.C.

DRILLING DATADate Drilling Commenced: 3/27/2001

Drilling Contractor: Union Drilling Company

Date Drilling Completed: 4/2/2001Rig Type: Rotary: X Cable Tool:Total Depth of Well: 2500LTD: 2500GEOLOGICAL DATA

Fresh Water at	<u>180</u>	Feet	$\frac{1}{2}$ "	GPM/Inch Stream	<u>2500</u>	Feet	1"	GPM/Inch Stream
		Feet		GPM/Inch Stream		Feet		GPM/Inch Stream
Salt Water at	<u>1416</u>	Feet	$\frac{1}{2}$ "	GPM/Inch Stream		Feet		GPM/Inch Stream
	<u>2190</u>	Feet	1"	GPM/Inch Stream		Feet		GPM/Inch Stream

COAL SEAMS

<u>NAME</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>THICKNESS</u>	<u>YES</u>	<u>NO</u>	<u>MINED OUT</u>

MINING IN AREASEE DRILLERS LOG ON PAGE 3GAS AND OIL SHOWS

<u>FORMATION</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>THICKNESS</u>	<u>IPF (MCFD.BOPD)</u>	<u>PRESSURE</u>	<u>HOURS TESTED</u>
	<u>2500</u>			<u>42 mcf</u>		

Permit: 4675 Well: VC-4515Cuttings or samples **are not** available for examination by a member of the Virginia Division of Mineral Resources.Cuttings or samples **have not** been furnished to the Virginia Division of Mineral Resources.**ELECTRIC LOGS AND SURVEYS**

List logs run on wellbore:

GR/Density/Temperature/Enhanced Coal Log

Did logs disclose vertical location of a coal seam? Yes: ☒ No**SURVEY RESULTS**

<u>DEPTH OF SURVEY</u>	<u>DIRECTION/DISTANCE/DEGREE FROM TRUE VERTICAL</u>	<u>DEPTH OF SURVEY</u>	<u>DIRECTION/DISTANCE/DEGREE FROM TRUE VERTICAL</u>
200'	1/4°		
318'	1/4°		
514'	1/4°		
715'	1/4°		
919'	1/2°		
1034'	1/2°		
1234'	3/4°		
1434'	3/4°		
1464'	3/4°		
1530'	3/4°		
1593'	3/4°		
1768'	3/4°		
1809'	3/4°		
1928'	3/4°		
2129'	3/4°		
2269'	3/4°		
2500'	1°		

CASING AND TUBING

	<u>CASING</u>	<u>CASING INTERVAL</u>	<u>HOLE SIZE</u>	<u>CEMENT USED IN CU/FT</u>	<u>DATE CEMENTED</u>	<u>PACKERS OR BRIDGE PLUGS KIND/SIZE/SET</u>
<u>Conductor</u>	11-3/4"	0-41'	15"	Grtd		
<u>Surface</u>						
<u>Water Protection</u>	8-5/8"	0-452'	11"	160 FT³	3/29/2001	
<u>Other Casing and Tubing Left in Well</u>	4-1/2"	0-2425'	8"	679 FT³	4/2/2001	
<u>Liners</u>						

MARKS: Shutdown, fishing jobs, depths and dates, caving, lost circulation, etc: Coal pillar @ 211' – Blew out-lost circulation.

Permit: 4675 Well: VC-4515**DRILLERS LOG**

Compiled By: Geologist

Ally	800.00
Raven Rider	888.00
Raven	906.00
Jawbone Rider	1004.00
Jawbone	1035.00
Tiller Rider	1134.00
Tiller	1151.00
Upper Seaboard A	1275.00
Upper Seaboard	1293.00
Greasy Creek	1464.00
Middle Seaboard	1502.00
Lower Seaboard	1535.00
Unnamed A	1601.00
Middle Horsepen	1694.00
C Seam	1770.00
War Creek	1811.00
Unnamed C	1838.00
Lower Horsepen	1925.00
X Seam Rider	1997.00
TD	2500.00

*Formations between coal seams are Sand, Shale and Thin Coals

PERMITTEE: EQUITABLE PRODUCTION COMPANY (Company)BY: *Robert A. Davis* (Signature)

PERMIT FOR GAS AND OIL OPERATIONS

This certifies that Permit No. 4675
Operation Name VC-4515 W/PIPELINE
Has been issued to (Company) **EQUITABLE PRODUCTION COMPANY**
Whose main office is located at **CLOVERLEAF SQUARE BLDG B**
BIG STONE GAP VA 24219

Applicant **DONG P TERRY**

This permit is issued on this 15th day of August, 2000.

This permit was requested for Operations under
Section 45.1-861.29 B.

The permitted operations are located in the Ervinton District
of Dickenson County.

THIS PERMIT IS ISSUED BY THE DIRECTOR PURSUANT TO CHAPTER 22.1, TITLE 45.1 OF THE CODE OF VIRGINIA.
Being an Act to require permits for gas and oil operations and to fix conditions for issuance thereof; to provide for the safe and
environmentally sound operations performed by the Permittee and for the inspection thereof; to provide for a method of maximizing
gas, oil, mineral and coal resources; to protect correlative rights of persons owning interest in gas and oil resources; to provide for
enforcement by the Director.

This permit shall expire 08/15/2002 unless the permittee has commenced
operations as determined by the Inspector.

Fee Paid \$250.00
File No. DI-1036

FILE COPY

**TOTAL UNIT AREA
= 58.77 ACRES**



UNIT BOUNDARY

LEASE NO. 241490L / T-450
J. WAMPLER
320.80 ACRES
CLINCHFIELD COAL CO.
PYXIS RESOURCES COMPANY - coal, surface
PINE MOUNTAIN OIL & GAS, INC. oil & gas
GAS 11.57 AC. 20%

MOTIVATION COAL CO.
LOWER BANNER
NO. 1 DEEP MINE

LEASE NO. 241490L / T-128
J.B. TRIVITT
305.20 ACRES
CLINCHFIELD COAL CO.
PYXIS RESOURCES COMPANY - coal, surface
PINE MOUNTAIN OIL & GAS, INC. oil & gas
GAS 32.34 AC. 55%

LEASE NO. 241490L / T-193
JESSE WAMPLER
3215 ACRES
CLINCHFIELD COAL CO.
PYXIS RESOURCES COMPANY - coal, surface
PINE MOUNTAIN OIL & GAS, INC. oil & gas
GAS 14.88 AC. 25%

FINAL WELL LOCATION
VC-504372

PP-2
(SPIKE NAIL)
N 83° 25' 22" E
84.89'

PP-1
(SPIKE NAIL)
S 76° 28' 54" W
121.05'

NOTE:

WELL COORDINATES ARE BASED ON CLINCHFIELD
COAL COMPANY'S MINE COORDINATE SYSTEM.

STATE PLANE WELL COORDINATES ARE CALCULATED
FROM CLINCHFIELD COAL COMPANY COORDINATES.

PROPERTY INFORMATION PROVIDED BY EQUITABLE
PRODUCTION COMPANY.

ELEVATIONS WERE DETERMINED BY GPS & TRIGONOMETRIC
METHODS BASED ON BM P-424.

FINAL PLAT

The undersigned hereby certifies
that the final location is within ten
(10') feet of the location shown on
the well plat dated 06-15-01.

WELL LOCATION PLAT

COMPANY EQUITABLE PRODUCTION CO.

WELL NAME OR NUMBER VC-504372

TRACT NO. 241490L / T-126

QUADRANGLE NORA

DISTRICT ERVINTON

WELL COORDINATES (VIRGINIA STATE PLANE) N 295079 E 901320

ELEVATION 2130.98

METHOD USED TO DETERMINE ELEVATION: GPS & TRIG.

COUNTY DICKENSON

SCALE: 1" = 400'

DATE 9-11-01

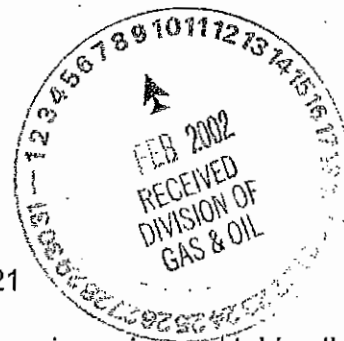
THIS PLAT IS A NEW PLAT ☐ ; AN UPDATED PLAT ☐ ; OR A FINAL LOCATION PLAT ☒

+ DENOTES THE LOCATION OF A WELL ON UNITED STATES TOPOGRAPHIC MAPS, SCALE 1 TO 24,000,
LATITUDE AND LONGITUDE LINES BEING REPRESENTED BY BORDER LINES AS SHOWN.

Permit: 5026 Well: VC-504372

Department of Mines, Minerals and Energy
Division of Gas and Oil
P O Box 1416
Abingdon, Virginia 24210
540-676-5423

COMPLETION REPORT



Well Type: Gas Well

Date Well Completed: 9/20/2001

Total Depth of Well: 2020 LTD: 2021

Attach the Drilling Report if not previously submitted. In addition, submit any changes in casing and tubing that were approved after the Drilling Report was submitted.

STIMULATION RECORD

Zone 1: See Attachment

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:
Formation Broke Down at: PSIG Average Injection Rate: BPM
ISIP: PSIG 5 Min SIP PSIG Average Downhole Injection Pressure: PSIG
Stimulated: Yes: X No: Date Stimulated:

Zone 2:

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:
Formation Broke Down at: PSIG Average Injection Rate: BPM
ISIP: PSIG 5 Min SIP PSIG Average Downhole Injection Pressure: PSIG
Stimulated: Yes X No Date Stimulated:

Zone 3:

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:
Formation Broke Down at: PSIG Average Injection Rate: BPM
ISIP: PSIG 5 Min SIP PSIG Average Downhole Injection Pressure: PSIG
Stimulated: Yes X No Date Stimulated:

Zone 4:

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:
Formation Broke Down at: PSIG Average Injection Rate: BPM
ISIP: PSIG 5 Min SIP PSIG Average Downhole Injection Pressure: PSIG
Stimulated: Yes X No Date Stimulated:

ENTERED

FINAL PRODUCTION:

After Stimulation

BOD MCFD

HOURS
TESTED

ROCK
PRESSURE

HOURS
TESTED

Final Production if Gas
Zones are Commingled:

20 (In Line)

195

PERMITTEE: EQUITABLE PRODUCTION COMPANY (Company)

BY: [Signature] (Signature)

WELL NUMBER	VC-504372
COMPLETION DATE	09/20/2001
TOTAL DEPTH	2020
PERMIT NUMBER	5026

	ZONE 1	ZONE 2	ZONE 3
COALS (FORMATION)	M/L Horsepen/C Seam/Warcreek Unnamed C/Beckley/X Seam Rider		
TREATMENT			
Nitrogen (MSCF)	647		
Water (BBLs)	668		
Sand (SXS)	173		
TOP PERF	1589		
BOTTOM PERF	1896		
# PERFS	16		
PERF SIZE	0.34"		
BD PRESSURE	2143		
AVG RATE	69.9 bpm		
ISIP	1073		
MIN	5		
MIN. PRESSURE	1031		
AVG PRESSURE	3268		
STIMULATED	Y		
STIMULATION DATE	09/17/2001		

Permit: 5026 Well: VC-504372

Department of Mines, Minerals and Energy
Division of Gas and Oil
P O Box 1416
Abingdon, Virginia 24210
540-676-5423

DRILLING REPORT

ATTACH A FINAL LOCATION PLAT AS REQUIRED BY 4 VAC 25-150-360.C.

DRILLING DATA

Date Drilling Commenced: 9/9/2001 Drilling Contractor: Union Drilling Company
Date Drilling Completed: 9/13/2001 Rig Type: Rotary: X Cable Tool:
Total Depth of Well: 2020 LTD: 2021

GEOLOGICAL DATA

Fresh Water at	71	Feet	Damp	GPM/Inch Stream	Feet	GPM/Inch Stream
		Feet		GPM/Inch Stream	Feet	GPM/Inch Stream
Salt Water at	902	Feet	Damp	GPM/Inch Stream	Feet	GPM/Inch Stream
	2020	Feet	1/4"	GPM/Inch Stream	Feet	GPM/Inch Stream

COAL SEAMS

<u>NAME</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>THICKNESS</u>	<u>YES</u>	<u>NO</u>	<u>MINED OUT</u>

MINING IN AREA

DRILLERS LOG ON PAGE 3

GAS AND OIL SHOWS

<u>FORMATION</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>THICKNESS</u>	<u>IPF (MCFD.BOPD)</u>	<u>PRESSURE</u>	<u>HOURS TESTED</u>

GT's @ survey points= NS

Cuttings or samples **are not** available for examination by a member of the Virginia Division of Mineral Resources.

Cuttings or samples **have not** been furnished to the Virginia Division of Mineral Resources.

ELECTRIC LOGS AND SURVEYS

List logs run on wellbore:

GR/Density/Temperature/Enhanced Coal Log

Did logs disclose vertical location of a coal seam?

Yes: **X** No**SURVEY RESULTS**

<u>DEPTH OF SURVEY</u>	<u>DIRECTION/DISTANCE/DEGREE FROM TRUE VERTICAL</u>	<u>DEPTH OF SURVEY</u>	<u>DIRECTION/DISTANCE/DEGREE FROM TRUE VERTICAL</u>
200'	1/4°		
212'	1/4°		
310'	1/2°		
510'	1/2°		
710'	1/2°		
900'	1/2°		
910'	1/2°		
922'	1/2°		
1122'	1/2°		
1322'	3/4°		
1354'	3/4°		
154'	3/4°		
155'	3/4°		
1750'	3/4°		
1757'	1°		
1825'	1°		

CASING AND TUBING

	<u>CASING</u>	<u>CASING INTERVAL</u>	<u>HOLE SIZE</u>	<u>CEMENT USED IN CU/FT</u>	<u>CMTD TO SURFACE</u>	<u>DATE CEMENTED</u>	<u>PACKERS OR BRIDGE PLUGS KIND/SIZE/SET</u>
Conductor	11-3/4"	0-48'	15"	Grtd			
Surface							
Water Protection	8-5/8"	0-384'	11"	177 FT³	Yes	9/10/2001	
Other Casing and Tubing Left in Well	4-1/2" 2-3/8"	0-1961' 0-1917'	7-7/8"	520 FT³	No	9/13/2001	
Liners							

REMARKS: Shutdown, fishing jobs, depths and dates, caving, lost circulation, etc: Lost circulation from 212-307'.

Permit: 5026

Well: VC-504372

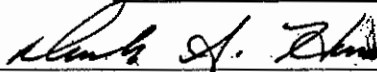
DRILLERS LOG

Compiled By: Geologist

COAL SEAM	TOP
Aily	673.00
Raven Rider	769.00
Raven	778.00
Jawbone Rider	892.00
Jawbone	920.00
Tiller Rider	1023.00
Tiller	1035.00
Upper Seaboard A	1146.00
Upper Seaboard	1175.00
Greasy Creek	1351.00
Middle Seaboard	1387.00
Lower Seaboard	1422.00
Unnamed A	1489.00
Middle Horsepen	1589.00
C Seam	1667.00
War Creek	1707.00
Unnamed C	1732.00
Beckley	1757.00
Lower Horsepen	1826.00
X Seam Rider	1894.00
X Seam	1918.00
Logger TD	2021.00

*Formations between coal seams are Sand, Shale and Thin Coals

PERMITTEE: **EQUITABLE PRODUCTION COMPANY** (Company)

BY:  (Signature)

PERMIT FOR GAS AND OIL OPERATIONS

This certifies that Permit No. 5026
Operation Name VC-504372 W/PIPELINE
Has been issued to: (Company) EQUITABLE PRODUCTION COMPANY
Whose main office is located at CLOVERLEAF SQUARE BLDG B
BIG STONE GAP, VA 24219

Applicant DOUG P TERRY

This permit is issued on this 27th day of July, 2001.

This permit was requested for Operations under
Section 45.1-361.29 B.

The permitted operations are located in the Ervinton District
of Dickenson County.

*THIS PERMIT IS ISSUED BY THE DIRECTOR PURSUANT TO CHAPTER 22.1, TITLE 45.1 OF THE CODE OF VIRGINIA,
Being an Act to require permits for gas and oil operations and to fix conditions for issuance thereof ; to provide for the safe and
environmentally sound operations performed by the Permittee and for the inspection thereof ; to provide for a method of maximizing
gas, oil, mineral and coal resources ; to protect correlative rights of persons owning interest in gas and oil resources ; to provide for
enforcement by the Director.*

This permit shall expire 07/27/2003 unless the permittee has commenced
operations as determined by the Inspector.

Fee Paid \$250.00
File No. DI-1066

FILE COPY

DI-1109
Sam

10,580'

Latitude 37° 05' 00"

195'

Longitude 82° 15' 00"

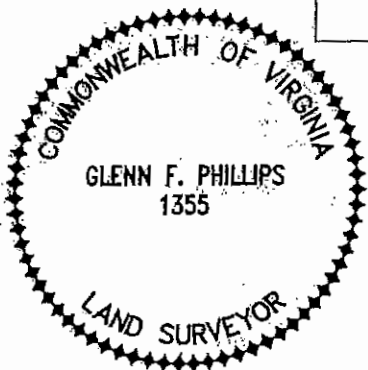
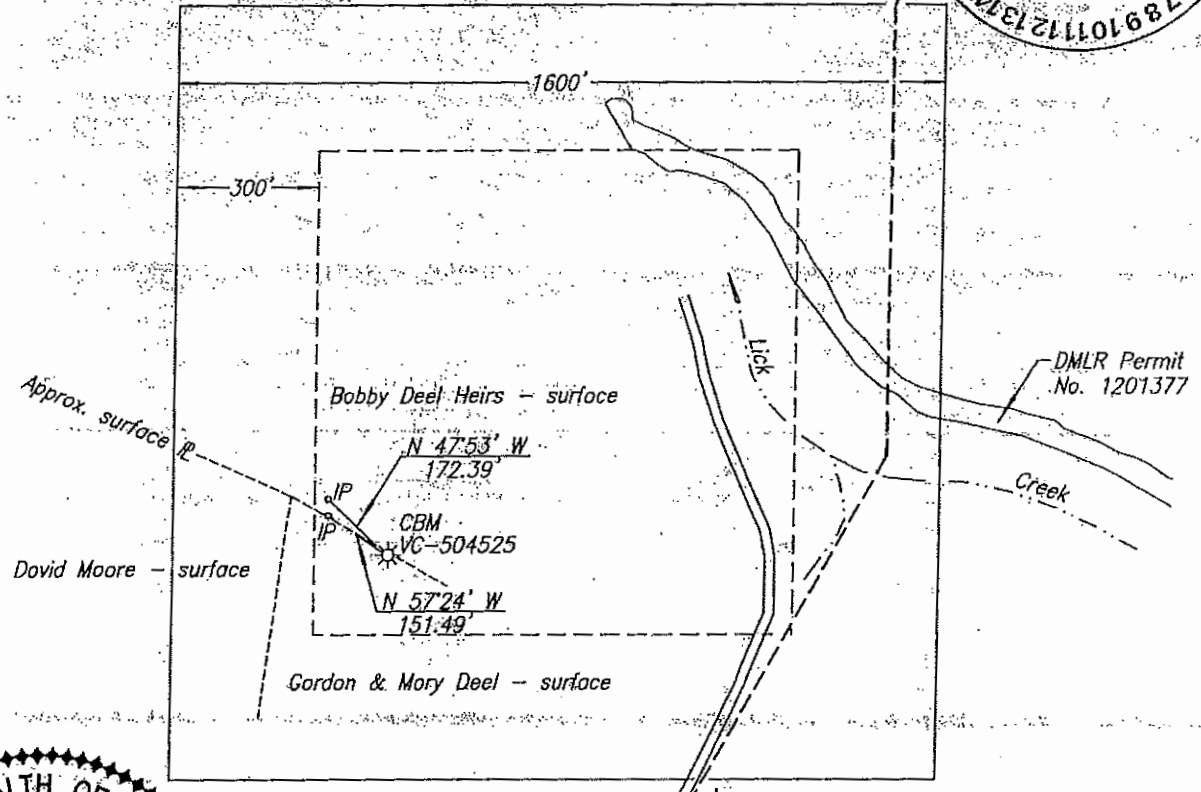
APPROVED

STATE GAS & OIL INSPECTOR

Joseph S. Cox
218 Acres

DATE

241490L / T-156
Climchfield Coal Company /
Pyxis Resources Company - coal
Pine Mountain Oil & Gas, Inc. - oil & gas
Gas 51.98 Ac. 88.45%



Well elevation determined by GPS survey from Mon. Hatchet

Lease No. 241490L / T-450
Jesse Wampler
347.90 Acres
Climchfield Coal Company /
Pyxis Resources Company - coal
Pine Mountain Oil & Gas, Inc. - oil & gas
Gas 6.79 Ac. 11.55%

FINAL PLAT

The undersigned hereby certifies that the final location is within ten (10') feet of the location shown on the well plot dated 5-21-2002.
Area of Unit = 58.77 Ac.

Well Coordinates: (VA St. Plane S. Zone, Calculated from CCC coordinates)
N 295,020 E 895,817
Well Coordinates: (Climchfield Coal Co.)
S 6,234.78 E 28,355.65

WELL LOCATION PLAT

COMPANY Equitable Production Company WELL NAME AND NUMBER VC-504525
TRACT NO. T-156 ELEVATION 1981.05' QUADRANGLE Nora
COUNTY Dickenson DISTRICT Ervington SCALE 1" = 400' DATE 9-24-2002

This Plat is a new plat ; an updated plat ; or a final location plat x

+ Denotes the location of a well on United States topographic Maps, scale 1 to 24,000, latitude and longitude lines being represented by border lines as shown.

Glenn F. Phillips

Licensed Professional Engineer or Licensed Land Surveyor

JP

100-1109

Permit: 5416 Well: VC-504525

Department of Mines, Minerals and Energy
Division of Gas and Oil
P O Box 1416
Abingdon, Virginia 24210
540-676-5423



COMPLETION REPORT

Well Type: Gas Well

Date Well Completed: 9/23/2002

Total Depth of Well: 2418

LTD: 2411

Attach the Drilling Report if not previously submitted. In addition, submit any changes in casing and tubing that were approved after the Drilling Report was submitted.

STIMULATION RECORD

Zone 1: See Attached

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:
Formation Broke Down at: PSIG Average Injection Rate: BPM
ISIP: PSIG 5 Min SIP PSIG Average Downhole Injection Pressure: PSIG
Stimulated: Yes: X No: Date Stimulated:

Zone 2:

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:
Formation Broke Down at: PSIG Average Injection Rate: BPM
ISIP: PSIG 5 Min SIP PSIG Average Downhole Injection Pressure: PSIG
Stimulated: Yes No Date Stimulated:

Zone 3:

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:
Formation Broke Down at: PSIG Average Injection Rate: BPM
ISIP: PSIG 5 Min SIP PSIG Average Downhole Injection Pressure: PSIG
Stimulated: Yes No Date Stimulated:

Zone 4:

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:
Formation Broke Down at: PSIG Average Injection Rate: BPM
ISIP: PSIG 5 Min SIP PSIG Average Downhole Injection Pressure: PSIG
Stimulated: Yes No Date Stimulated:

FINAL PRODUCTION:

After Stimulation

	<u>BOD</u>	<u>MCFD</u>	<u>HOURS TESTED</u>	<u>ROCK PRESSURE</u>	<u>HOURS TESTED</u>
Final Production if Gas Zones are Commingled:	0	(In Line)		25	

PERMITTEE: EQUITABLE PRODUCTION COMPANY (Company)

BY: [Signature] (Signature)

ENTERED

JAN 95

WELL NUMBER VC-504525
 COMPLETION DATE 09/23/2002
 TOTAL DEPTH 2418
 PERMIT NUMBER 5416

	ZONE 1	ZONE 2	ZONE 3	ZONE 4	ZONE 5	ZONE 6	ZONE 7	ZONE 8
COALS (FORMATION)	Poca 2	Poca 3	X Seam	L Horsepen	Unnamed C	War creek	C Seam	M Horsepen
	Cobra/Delta Frac	Cobra/Delta Frac	Cobra/Delta Frac	Cobra/Delta Frac	Cobra/Delta Frac	Cobra/Delta Frac	Cobra/Delta Frac	Cobra/Delta Frac
TREATMENT								
Nitrogen (MSCF)								
Water (BBLs)	141	129	84	230	119	111	103	135
Sand (SXS)	99	74	34	159	61	56	63	84
TOP PERF	2245	2216.75	1795.5	1697	1596.75	1572.5	1530.5	1458
BOTTOM PERF	2247	2218.75	1797.5	1701	1598.75	1574.5	1532.5	1460
# PERFS	8	8	8	16	8	8	8	8
PERF SIZE	0.34"	0.34"	0.34"	0.34"	0.34"	0.34"	0.34"	0.34"
BD PRESSURE	3230	2177	1550	2167	3824	3255	3156	3343
AVG RATE	7.8 bpm	8 bpm	8 bpm	9 bpm	8.4 bpm	8 bpm	7.9 bpm	8 bpm
ISIP	2454	1649	NA	3079	1307	1304	1185	1135
MIN	NA	NA	NA	NA	NA	NA	NA	NA
MIN. PRESSURE	NA	NA	NA	NA	NA	NA	NA	NA
AVG PRESSURE	4470	3045	2806	4394	2932	3624	3380	3135
STIMULATED	Y	Y	Y	Y	Y	Y	Y	Y
STIMULATION DATE	09/18/2002	09/18/2002	09/18/2002	09/18/2002	09/18/2002	09/18/2002	09/18/2002	09/18/2002
	200 gal	200 gal	200 gal	200 gal	200 gal	200 gal	200 gal	200 gal
	7.5% acid	7.5% acid	7.5% acid	7.5% acid	7.5% acid	7.5% acid	7.5% acid	7.5% acid
			Screened out	Cut job short due to increased pressure				

WELL NUMBER VC-504525
 COMPLETION DATE 09/23/2002
 TOTAL DEPTH 2418
 PERMIT NUMBER 5416

Page 2

	ZONE 9	ZONE 10	ZONE 11	ZONE 12	ZONE 13
COALS (FORMATION)	M Seaboard	Greasy Creek	U Seaboard	U Seaboard A	Tiller
	Cobra/Delta Frac	Cobra/Delta Frac	Cobra/Delta Frac	Cobra/Delta Frac	Cobra/Delta Frac
TREATMENT					
Nitrogen (MSCF)					
Water (BBLs)	114	116	113	66	115
Sand (SXS)	56	52	65	21	46
TOP PERF	1254	1216.25	1066.5	1024.5	917.5
BOTTOM PERF	1256	1218.25	1068.5	1026.5	920
# PERFS	8	8	8	8	10
PERF SIZE	0.34"	0.34"	0.34"	0.34"	0.34"
BD PRESSURE	5013	3700	2451	4079	2901
AVG RATE	7.6 bpm	8 bpm	8.1 bpm	6.3 bpm	6.0 bpm
ISIP	1087	1362	1376	NA	3812
MIN	NA	NA	NA	NA	NA
MIN. PRESSURE	NA	NA	NA	NA	NA
AVG PRESSURE	3429	3349	3007	4389	4322
STIMULATED	Y	Y	Y	Y	Y
STIMULATION DATE	09/18/2002	09/18/2002	09/18/2002	09/18/2002	09/18/2002
	200 gal	200 gal	200 gal	200 gal	200 gal
	7.5% acid	7.5% acid	7.5% acid	7.5% acid	7.5% acid

Cut 45% short
 into job, high
 treating press.

Permit: 5416 Well: VC-504525

Department of Mines, Minerals and Energy
Division of Gas and Oil
P O Box 1416
Abingdon, Virginia 24210
540-676-5423

DRILLING REPORT

ATTACH A FINAL LOCATION PLAT AS REQUIRED BY 4 VAC 25-150-360.C.

DRILLING DATA

Date Drilling Commenced: 9/3/2002	Drilling Contractor: Gasco Drilling Company
Date Drilling Completed: 9/5/2002	Rig Type: Rotary: X Cable Tool:
Total Depth of Well: 2418	LTD: 2411

GEOLOGICAL DATA

Fresh Water at	Feet	GPM/Inch Stream	Feet	GPM/Inch Stream
	Feet	GPM/Inch Stream	Feet	GPM/Inch Stream
Salt Water at 1950'	Feet	Damp GPM/Inch Stream	Feet	GPM/Inch Stream
	Feet	GPM/Inch Stream	Feet	GPM/Inch Stream

COAL SEAMS

<u>NAME</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>THICKNESS</u>	<u>YES</u>	<u>NO</u>	<u>MINED OUT</u>

MINING IN AREA

DRILLERS LOG ON PAGE 3

GAS AND OIL SHOWS

<u>FORMATION</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>THICKNESS</u>	<u>IPF (MCFD.BOPD)</u>	<u>PRESSURE</u>	<u>HOURS TESTED</u>

GT's at survey points=NS

Cuttings or samples **are not** available for examination by a member of the Virginia Division of Mineral Resources.

Cuttings or samples **have not** been furnished to the Virginia Division of Mineral Resources.

ELECTRIC LOGS AND SURVEYS

List logs run on wellbore: GR/Density/Temperature/Enhanced Coal Log

Did logs disclose vertical location of a coal seam? Yes: X No

SURVEY RESULTS

<u>DEPTH OF SURVEY</u>	<u>DIRECTION/DISTANCE/DEGREE FROM TRUE VERTICAL</u>	<u>DEPTH OF SURVEY</u>	<u>DIRECTION/DISTANCE/DEGREE FROM TRUE VERTICAL</u>
190'	0°		
380'	¼°		
567'	¼°		
754'	¼°		
942'	¼°		
1160'	¼°		
1348'	¼°		
1535'	¼°		
1722'	¼°		
1910'	¼°		
1950'	½°		
145'	½°		
2'	½°		

CASING AND TUBING

	<u>CASING</u>	<u>CASING INTERVAL</u>	<u>HOLE SIZE</u>	<u>CEMENT USED IN CU/FT</u>	<u>CMTD TO SURFACE</u>	<u>DATE CEMENTED</u>	<u>PACKERS OR BRIDGE PLUGS KIND/SIZE/SET</u>
Conductor	12-¾"	0-20'	15"	Grtd			
Surface							
Water Protection	8-5/8"	0-316'	11"	165 FT³	Yes	9/3/2002	
Other Casing and Tubing Left in Well	4-½" 2-3/8"	0-2332' 0-2303'	8"	423 FT³	Yes	9/5/2002	

Liners

REMARKS: Shutdown, fishing jobs, depths and dates, caving, lost circulation, etc: 8-5/8" did not circulate, grouted baskets w/ 5 bbls cmt.

Permit: 5416 Well: VC-504525

DRILLERS LOG

Compiled By: Geologist

<i>Ailly</i>	558
<i>Raven</i>	656.5
Jawbone Rider	777
Jawbone	802
Tiller	917.5
Upper Seaboard A	1025
Upper Seaboard	1067
Greasy Creek	1216.5
Middle Seaboard	1254.5
Lower Seaboard	1296
Unnamed A	1361
Upper Horsepen	1423
Middle Horsepen	1458
C Seam	1531
War Creek	1573
Unnamed C	1597
Beckley	1647
Lower Horsepen	1697
X Seam	1796
Pocahontas #9	1879.5
Pocahontas #3	2217
Pocahontas #2	2245
TD	2418

PERMITTEE: EQUITABLE PRODUCTION COMPANY (Company)

BY: *Robert A. Thies* (Signature)

PERMIT FOR GAS AND OIL OPERATIONS

This certifies that Permit No. 5416-01
Operation Name VC-504525 W/Pipeline
Has been issued to: (Company) Equitable Production Company
Whose main office is located at Cloverleaf Square
Big Stone Gap, VA 24219

Applicant J. Gary CHARLES

This permit is issued on this 7th day of November, 2002.

This permit was requested for Permit Modification under
Section 45.1-361.29.C.

The permitted operations are located in the Ervinton District
of Dickenson County.

*THIS PERMIT IS ISSUED BY THE DIRECTOR PURSUANT TO CHAPTER 22.1, TITLE 45.1 OF THE CODE OF VIRGINIA,
Being an Act to require permits for gas and oil operations and to fix conditions for issuance thereof ; to provide for the safe and
environmentally sound operations performed by the Permittee and for the inspection thereof ; to provide for a method of maximizing
gas, oil, mineral and coal resources ; to protect correlative rights of persons owning interest in gas and oil resources ; to provide for
enforcement by the Director.*

This permit shall expire unless the permittee has commenced
operations as determined by the Inspector.

Fee Paid \$100.00
File No. DI-1109

FILE COPY

DS-1107

2,660'

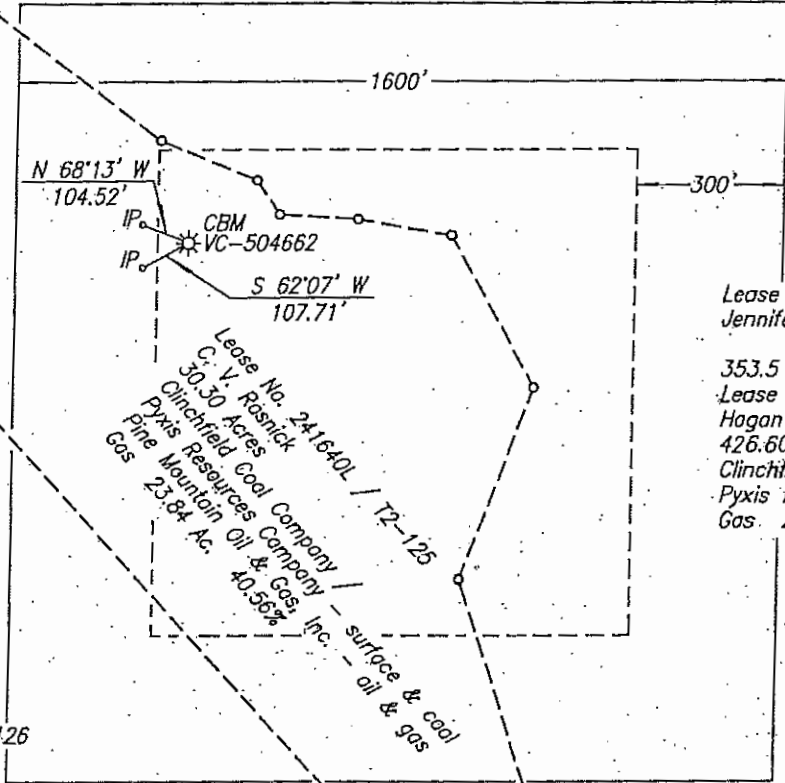
Latitude 37° 07' 30"

Longitude 82° 15' 00"

13,110'

Branch
Laurel

OFFICE OF
PUBLIC
WORKS
DIVISION

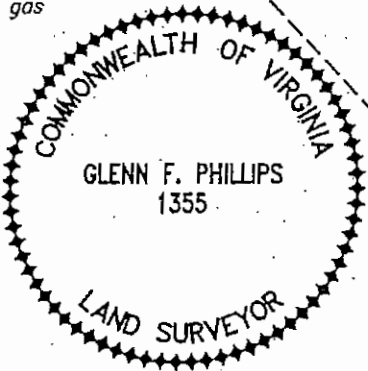


Lease No. 243846L
Jennifer B. Osborne, et al -
oil & gas
353.5 Acres
Lease No. 244792L / TC-180
Hagan & Rasnick
426.60 Acres
Clinchfield Coal Company /
Pyxis Resources Company - coal
Gas 29.61 Ac. 50.38%

Lease No. 241640L / T2-126
C. V. Rasnick
305.20 Acres
Clinchfield Coal Company /
Pyxis Resources Company - surface & coal
Pine Mountain Oil & Gas, Inc. - oil & gas
Gas 5.32 Ac. 9.06%

FINAL PLAT

The undersigned hereby certifies
that the final location is within ten
(10') feet of the location shown
on the well plat dated 4-11-2002.



Well elevation determined by
GPS survey from BM Y 108

Area of Unit = 58.77 Ac.

Well Coordinates: (VA St. Plane S. Zone,
Calculated from CCC coordinates).
N 296,946 E 903,811

Well Coordinates: (Clinchfield Coal Co.)
S 3,991.74 E 36,265.19

WELL LOCATION PLAT

COMPANY Equitable Production Company WELL NAME AND NUMBER VC-504662
TRACT NO. T2-125 ELEVATION 2043.26 QUADRANGLE Nora
COUNTY Dickenson DISTRICT Ervinton SCALE 1" = 400' DATE 9-23-2002

This Plat is a new plat ; an updated plat ; or a final location plat x

+ Denotes the location of a well on United States topographic Maps, scale 1 to
24,000, latitude and longitude lines being represented by border lines as shown.

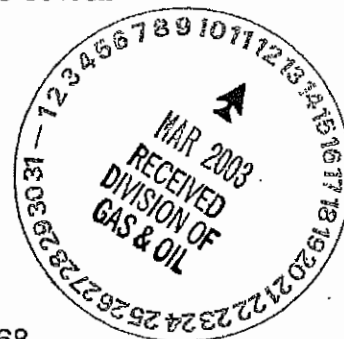
Glenn F. Phillips

Licensed Professional Engineer or Licensed Land Surveyor

20-1101
Permit: 5350 Well: VC-504662

Department of Mines, Minerals and Energy
Division of Gas and Oil
P O Box 1416
Abingdon, Virginia 24210
540-676-5423

COMPLETION REPORT



Well Type: Gas Well

Date Well Completed: 9/17/2002

Total Depth of Well: 2474

LTD: 2468

Attach the Drilling Report if not previously submitted. In addition, submit any changes in casing and tubing that were approved after the Drilling Report was submitted.

STIMULATION RECORD

Zone 1: See Attached

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:
Formation Broke Down at: PSIG Average Injection Rate: BPM
ISIP: PSIG 5 Min SIP PSIG Average Downhole Injection Pressure: PSIG
Stimulated: Yes: X No: Date Stimulated:

Zone 2:

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:
Formation Broke Down at: PSIG Average Injection Rate: BPM
ISIP: PSIG 5 Min SIP PSIG Average Downhole Injection Pressure: PSIG
Stimulated: Yes No Date Stimulated:

Zone 3:

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:
Formation Broke Down at: PSIG Average Injection Rate: BPM
ISIP: PSIG 5 Min SIP PSIG Average Downhole Injection Pressure: PSIG
Stimulated: Yes No Date Stimulated:

Zone 4:

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:
Formation Broke Down at: PSIG Average Injection Rate: BPM
ISIP: PSIG 5 Min SIP PSIG Average Downhole Injection Pressure: PSIG
Stimulated: Yes No Date Stimulated:

FINAL PRODUCTION:

After Stimulation

	<u>BOD</u>	<u>MCFD</u>	<u>HOURS</u> <u>TESTED</u>	<u>ROCK</u> <u>PRESSURE</u>	<u>HOURS</u> <u>TESTED</u>
Final Production if Gas Zones are Commingled:	53	(In Line)		125	

PERMITTEE: EQUITABLE PRODUCTION COMPANY (Company)

BY: [Signature] (Signature)

Form DGO-GO-15

Rev 7/00

ENTERED

WELL NUMBER VC-504662
 COMPLETION DATE 09/17/2002
 TOTAL DEPTH 2474
 PERMIT NUMBER 5350

	ZONE 1	ZONE 2	ZONE 3	ZONE 4	ZONE 5
COALS (FORMATION)	X Seam Rdr/Beckley L Horsepen	Warcreek/Unnamed C M Horsepen/C Seam	M/L Seaboard	U Seaboard A/ U Seaboard/Greasy Crk	Raven/Jawbone Rider
TREATMENT					
Nitrogen (MSCF)	287	605	242	348	382
Water (BBLs)	201	384	160	189	303
Sand (SXS)	46	115	43	53	94
TOP PERF	1669	1480.5	1281	1042	700
BOTTOM PERF	1769	1633.5	1318	1246.5	788
# PERFS	12	30	18	18	26
PERF SIZE	0.34"	0.34"	0.34"	0.34"	0.34"
BD PRESSURE	3711	2121	2932	3035	2487
AVG RATE	20 bpm	47 bpm	42.5 bpm	27.5 bpm	42.5 bpm
ISIP	880	1686	1535	2647	2080
MIN	5	5	5	5	5
MIN. PRESSURE	1590	1567	1436	2487	1735
AVG PRESSURE	3266	2756	2603	3464	2666 Y
STIMULATED	Y	Y	Y	Y	Y
STIMULATION DATE	09/04/2002	09/04/2002	09/04/2002	09/04/2002	09/04/2002
	200 gal 7-½% acid	400 gal 7-½% acid	900 gal 7-½% acid	900 gal 7-½% acid	900 gal 7-½% acid

Permit: 5350 Well: VC-504662

Department of Mines, Minerals and Energy
Division of Gas and Oil
P O Box 1416
Abingdon, Virginia 24210
540-676-5423

DRILLING REPORT

ATTACH A FINAL LOCATION PLAT AS REQUIRED BY 4 VAC 25-150-360.C.

DRILLING DATA

Date Drilling Commenced: 8/24/2002	Drilling Contractor: Gasco Drilling Company
Date Drilling Completed: 8/28/2002	Rig Type: Rotary: X Cable Tool:
Total Depth of Well: 2474	LTD: 2468

GEOLOGICAL DATA

Fresh Water at	Feet	GPM/Inch Stream	Feet	GPM/Inch Stream
<i>NONE REPORTED</i>	Feet	GPM/Inch Stream	Feet	GPM/Inch Stream
Salt Water at	Feet	GPM/Inch Stream	Feet	GPM/Inch Stream
	Feet	GPM/Inch Stream	Feet	GPM/Inch Stream

COAL SEAMS

<u>NAME</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>THICKNESS</u>	<u>YES</u>	<u>NO</u>	<u>MINING IN AREA</u>	<u>MINED OUT</u>

SEE DRILLERS LOG ON PAGE 3

GAS AND OIL SHOWS

<u>FORMATION</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>THICKNESS</u>	<u>IPF (MCFD.BOPD)</u>	<u>PRESSURE</u>	<u>HOURS TESTED</u>

No shows @ survey points

Permit: 5350 Well: VC-504662

Cuttings or samples **are not** available for examination by a member of the Virginia Division of Mineral Resources.

Cuttings or samples **have not** been furnished to the Virginia Division of Mineral Resources.

ELECTRIC LOGS AND SURVEYS

List logs run on wellbore: GR/Density/Temperature/Enhanced Coal Log

Did logs disclose vertical location of a coal seam? Yes: ☒ No

SURVEY RESULTS

<u>DEPTH OF SURVEY</u>	<u>DIRECTION/DISTANCE/DEGREE FROM TRUE VERTICAL</u>	<u>DEPTH OF SURVEY</u>	<u>DIRECTION/DISTANCE/DEGREE FROM TRUE VERTICAL</u>
197'	0°		
381'	0°		
569'	¼°		
755'	¼°		
941'	¼°		
1150'	¼°		
1337'	¼°		
1522'	¼°		
1731'	¼°		
1914'	¼°		
2101'	¼°		
2186'	½°		

CASING AND TUBING

	<u>CASING</u>	<u>CASING INTERVAL</u>	<u>HOLE SIZE</u>	<u>CEMENT USED IN CU/FT</u>	<u>CMTD TO SURFACE</u>	<u>DATE CEMENTED</u>	<u>PACKERS OR BRIDGE PLUGS KIND/SIZE/SET</u>
Conductor	12-¾"	0-30'	15"	Grtd			
Surface	8-5/8"	0-310'	11"	165 FT³	Yes	8/24/2002	
Water Protection							
Other Casing and Tubing Left in Well	4-½" 2-3/8"	0-2358' 0-1913'	6-½"	400 FT³	Yes	8/27/2002	
Liners							

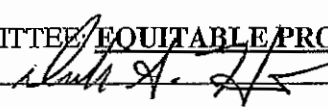
REMARKS: Shutdown, fishing jobs, depths and dates, caving, lost circulation, etc:

Permit: 5350 Well: VC-504662

DRILLERS LOG

Compiled By: Geologist

<i>Aily</i>	584
<i>Raven</i>	700
Jawbone Rider	781.5
Jawbone	812
Tiller	928
Upper Seaboard A	1042
Upper Seaboard	1069
Greasy Creek	1244.5
Middle Seaboard	1281
Lower Seaboard	1315
Unnamed A	1384
Middle Horsepen	1480.5
C Seam	1563
War Creek	1601.5
Unnamed C	1631.5
Beckley	1669
Lower Horsepen	1706.5
X Seam Rider	1768
TD	2474

PERMITTEE: EQUITABLE PRODUCTION COMPANY (Company)
BY:  (Signature)

90

PERMIT FOR GAS AND OIL OPERATIONS

This certifies that Permit No. 5350
Operation Name VC-504662 W/Pipeline
Has been issued to: (Company) EQUITABLE PRODUCTION COMPANY
Whose main office is located at CLOVERLEAF SQUARE BLDG B
BIG STONE GAP, VA 24219

Applicant J. Gary CHARLES

This permit is issued on this 7th day of May, 2002.

This permit was requested for Operations under
Section 45 1-361 29 B.

The permitted operations are located in the Ervinton District
of Dickenson County.

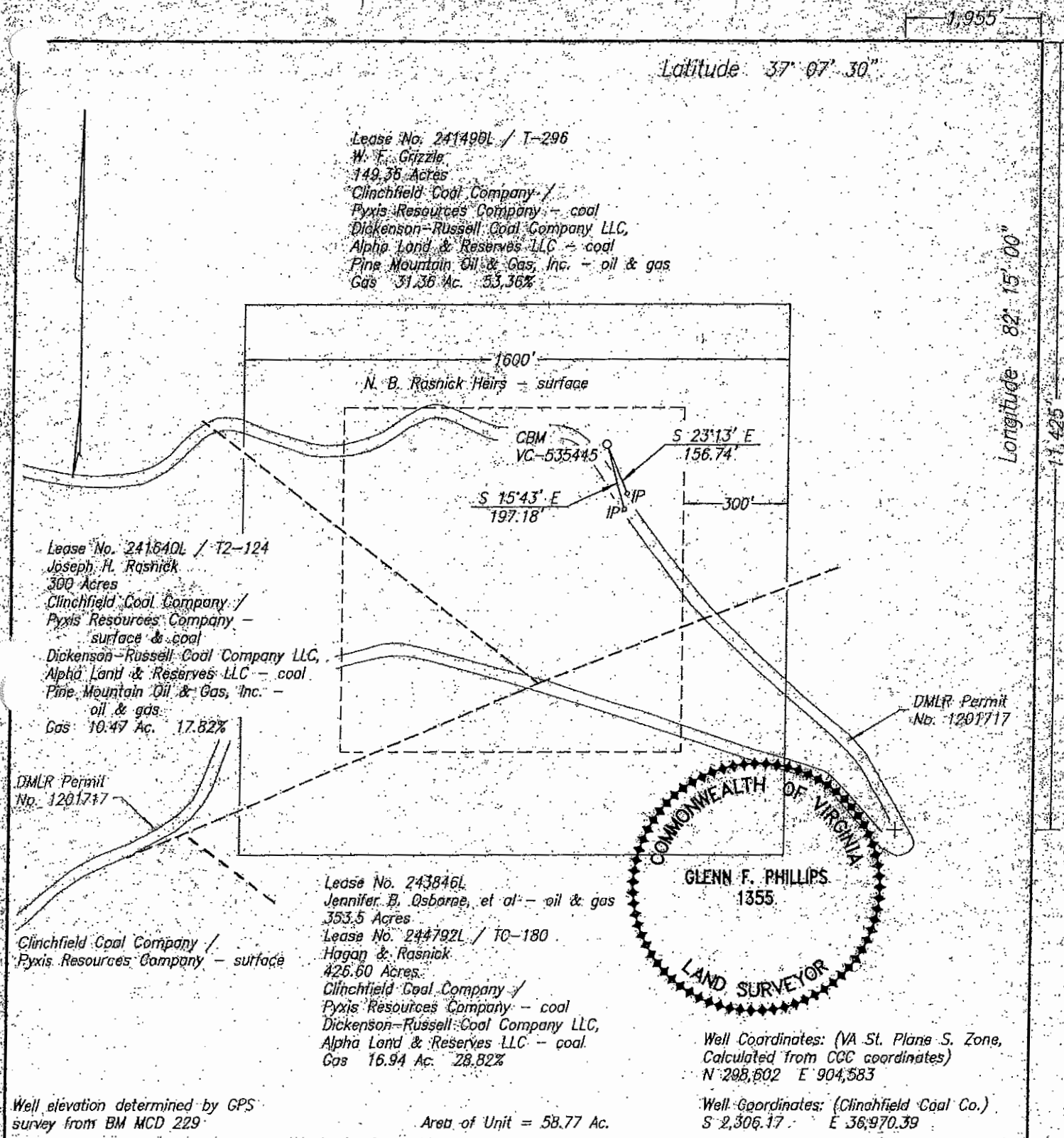
THIS PERMIT IS ISSUED BY THE DIRECTOR PURSUANT TO CHAPTER 22.1, TITLE 45.1 OF THE CODE OF VIRGINIA,
Being an Act to require permits for gas and oil operations and to fix conditions for issuance thereof; to provide for the safe and
environmentally sound operations performed by the Permittee and for the inspection thereof; to provide for a method of maximizing
gas, oil, mineral and coal resources; to protect correlative rights of persons owning interest in gas and oil resources; to provide for
enforcement by the Director.

This permit shall expire 05/07/2004 unless the permittee has commenced
operations as determined by the Inspector.

Fee Paid \$250.00
File No. 01-1101

FILE COPY

DI 11/12



WELL LOCATION PLAT

COMPANY Equitable Production Company WELL NAME AND NUMBER VC-535445
TRACT NO. T-296 ELEVATION 2,331.83' QUADRANGLE Nora
COUNTY Dickenson DISTRICT Ervinton SCALE 1" = 400' DATE 4-16-2003
This Plat is a new plat x; an updated plat ; or a final location plat

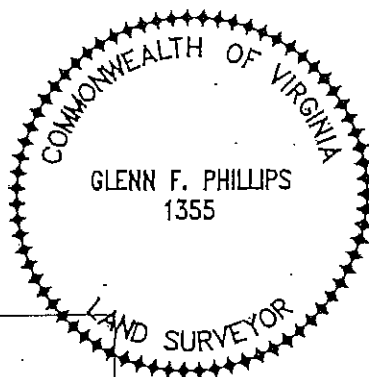
+ Denotes the location of a well on United States topographic Maps, scale 1 to 24,000, latitude and longitude lines being represented by border lines as shown.

Glenn F. Phillips

Licensed Professional Engineer or Licensed Land Surveyor

Latitude 37° 07' 30"

Lease No. 241490L / T-296
W. F. Grizzle
149.36 Acres
Clinchfield Coal Company /
Pyxis Resources Company - coal
Dickenson-Russell Coal Company LLC,
Alpha Land & Reserves LLC - coal
Pine Mountain Oil & Gas, Inc. - oil & gas
Gas: 31.36 Ac. 53.36%



Longitude 82° 15' 00"

Lease No: 241640L / T2-124
Joseph H. Rasnick
300 Acres
Clinchfield Coal Company /
Pyxis Resources Company -
surface & coal
Dickensah-Russell Coal Company LLC,
4pha Land & Reserves LLC - coal
ie Mountain Oil & Gas, Inc. -
oil & gas
Gas 10.47 Ac. 17.82%

DMLR Permit
No. 1201717

Clinchfield Coal Company /
Pyxis Resources Company - surface

N. B. Rasnick Heirs - surface

CBM
VC-535445

S 15°56' E
204.57'

$$\begin{array}{r} S\ 23^{\circ}08'\ E \\ \hline 164.16' \end{array}$$

300.-

Lease No. 243846L
Jennifer B. Osborne, et al - oil & gas
353.5 Acres
Lease No. 244792L / TC-180
Hagan & Rasnick
426.60 Acres
Clinchfield Coal Company /
Pyxis Resources Company - coal
Dickenson-Russell Coal Company LLC,
Alpha-Land & Reserves LLC - coal
Gas 16.94 Ac. 28.82%

DMLR Permit
No. 1201717

FINAL PLAT

The undersigned hereby certifies
that the final location is within ten
(10') feet of the location shown
on the well plat dated 4-16-2003.
Area of Unit = 58.77 Ac.

Well Coordinates: (VA St. Plone S. Zone,
Calculated from CCC coordinates)
N 298,609 E 904,580

Well Coordinates: (Clinchfield Coal Co.)
S 2,299.27 E 36,967.64

Well elevation determined by GPS
survey from BM MCD 229

WELL LOCATION PLAT

COMPANY Equitable Production Company WELL NAME AND NUMBER VC-535445
TRACT NO. T-296 ELEVATION 2,328.7' QUADRANGLE Nora
COUNTY Dickenson DISTRICT Ervinton SCALE 1" = 400' DATE 11-07-2003
This Plot is a new plot ; an updated plot ; or a final location plot x

+ Denotes the location of a well on United States topographic Maps, scale 1 to 24,000, latitude and longitude lines being represented by border lines as shown.

Mr Phillips

~~Licensed Professional Engineer or Licensed Land Surveyor~~

VL-71172
JAN

Permit: 5789 Well: VC-535445

Department of Mines, Minerals and Energy
Division of Gas and Oil
P O Box 1416
Abingdon, Virginia 24210
540-676-5423

COMPLETION REPORT

Well Type: Gas Well

Date Well Completed: 11-19-03 **Total Depth of Well:** 2737' **LTD:** 2734'

Attach the Drilling Report if not previously submitted. In addition, submit any changes in casing and tubing that were approved after the Drilling Report was submitted.

STIMULATION RECORD

Zone 1: (See attached)

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:
Formation Broke Down at: PSIG Average Injection Rate: BPM
ISIP: PSIG 5 Min SIP PSIG Average Downhole Injection Pressure: PSIG
Stimulated: Yes: X No: Date Stimulated:

Zone 2:

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:
Formation Broke Down at: PSIG Average Injection Rate: BPM
ISIP: PSIG 5 Min SIP PSIG Average Downhole Injection Pressure: PSIG
Stimulated: Yes No Date Stimulated:

Zone 3:

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:
Formation Broke Down at: PSIG Average Injection Rate: BPM
ISIP: PSIG 5 Min SIP PSIG Average Downhole Injection Pressure: PSIG
Stimulated: Yes No Date Stimulated:

Zone 4:

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:
Formation Broke Down at: PSIG Average Injection Rate: BPM
ISIP: PSIG 5 Min SIP PSIG Average Downhole Injection Pressure: PSIG
Stimulated: Yes No Date Stimulated:

FINAL PRODUCTION:

After Stimulation

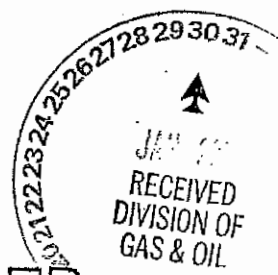
	<u>BOD</u>	<u>MCFD</u>	<u>HOURS TESTED</u>	<u>ROCK PRESSURE</u>	<u>HOURS TESTED</u>
Final Production if Gas Zones are Commingled:	56	(In Line)		260	

PERMITTEE: EQUITABLE PRODUCTION COMPANY (Company)

BY: [Signature] (Signature)

JAR

ENTERED



WELL NUMBER	VC-535445
COMPLETION DATE	11/19/2003
TOTAL DEPTH	2737'
PERMIT NUMBER	5789

COALS (FORMATION)	ZONE 1 Poca #2	ZONE 2 Lower Horsepen	ZONE 3 Unnamed C/ Warcreek/ C-Seam	ZONE 4 Middle Horsepen/ Lower Seaboard/ Middle Seaboard/ Greasy Creek/ Upper Seaboard/ Upper Seaboard A
TREATMENT				
Nitrogen (MSCF)	412	293	467	659
Water (BBLs)	169	123	206	335
Sand (SXS)	44	38	61	1
TOP PERF	2573	1997.5	1853	1337
BOTTOM PERF	2578.5	1999.5	1919	1773
# PERFS	22	8	30	16
PERF SIZE	0.34"	0.34"	0.34"	0.34"
BD PRESSURE	3775	3352	2944	2981
AVG RATE	28 bpm	37 bpm	49 bpm	46 bpm
ISIP	2780	2111	1928	1395
MIN	10	10	10	10
MIN. PRESSURE	2495	1578	1650	1262
AVG PRESSURE	3665	3582	2822	3217
STIMULATED	Yes	Yes	Yes	Yes
STIMULATION DATE	11/13/2003	11/13/2003	11/13/2003	11/13/2003
GALLONS	500 gals	800 gals	800 gals	1000 gals
ACID	7.5% acid	7.5% acid	7.5% acid	7.5% acid

Permit: 5789 Well: VC-535445

Department of Mines, Minerals and Energy
Division of Gas and Oil
P O Box 1416
Abingdon, Virginia 24210
540-676-5423

DRILLING REPORT

ATTACH A FINAL LOCATION PLAT AS REQUIRED BY 4 VAC 25-150-360.C.

DRILLING DATA

Date Drilling Commenced: 11/05/03
Date Drilling Completed: 11/08/03
Total Depth of Well: 2737'

Drilling Contractor: Union Drilling Company
Rig Type: Rotary: **X** Cable Tool:
LTD: 2734'

GEOLOGICAL DATA

Fresh Water at	Feet	GPM/Inch Stream	Feet	GPM/Inch Stream
<i>None Reported</i>	Feet	GPM/Inch Stream	Feet	GPM/Inch Stream
Salt Water at	Feet	GPM/Inch Stream	Feet	GPM/Inch Stream
	Feet	GPM/Inch Stream	Feet	GPM/Inch Stream

COAL SEAMS

<u>NAME</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>THICKNESS</u>	<u>YES</u>	<u>NO</u>	<u>MINED OUT</u>

MINING IN AREA

DRILLERS LOG ON PAGE 3

GAS AND OIL SHOWS

<u>FORMATION</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>THICKNESS</u>	<u>IPF (MCFD.BOPD)</u>	<u>PRESSURE</u>	<u>HOURS TESTED</u>

GT @ Survey points, 1525', 2218', & TD @ 2737' = NS

Permit: 5789 Well: VC-535445

Cuttings or samples are not available for examination by a member of the Virginia Division of Mineral Resources.

Logs or samples have not been furnished to the Virginia Division of Mineral Resources.

ELECTRIC LOGS AND SURVEYS

List logs run on wellbore: GR/Density/Temp/Enhanced coal log

Did logs disclose vertical location of a coal seam? Yes: X No:

SURVEY RESULTS

<u>DEPTH OF SURVEY</u>	<u>DIRECTION/DISTANCE/DEGREE FROM TRUE VERTICAL</u>	<u>DEPTH OF SURVEY</u>	<u>DIRECTION/DISTANCE/DEGREE FROM TRUE VERTICAL</u>
200'	1/4°		
385'	1/4°		
585'	1/2°		
722'	1/4°		
1018'	1/4°		
1218'	1/4°		
1418'	1/2°		
1618'	1/2°		
1818'	1/2°		
2018'	1/2°		
2218'	3/4°		
118'	3/4°		

CASING AND TUBING

	<u>CASING</u>	<u>CASING INTERVAL</u>	<u>HOLE SIZE</u>	<u>CEMENT USED IN CU/FT</u>	<u>CMTD TO SURFACE</u>	<u>DATE CEMENTED</u>	<u>PACKERS OR BRIDGE PLUGS KIND/SIZE/SET</u>
Conductor	11-3/4"	0-32'	12-3/4"	Grtd			
Surface	8-5/8"	0-476'	11"	189 Ft³	Yes	11-06-03	
Water Protection							
Other Casing and Tubing Left in Well	4-1/2" 2-3/8"	0-2692' 0-2619'	6-1/4"	466 Ft³	No	11-08-03	
Liners							

REMARKS: Shutdown, fishing jobs, depths and dates, caving, lost circulation, etc:

Lost circulation @ 385'.

CBL on 4-1/2" csg shows TOC @ 150'

Permit: 5789 Well: VC-535445

DRILLERS LOG

Compiled By: Geologist

COAL SEAM	Coal Top
Kennedy	723
Aily	873
Raven	970
Jawbone Rider	1077
Jawbone	1102.5
Tiller	1204
Upper Seaboard A	1337
Upper Seaboard	1358.5
Greasy Creek	1545.5
Middle Seaboard	1566
Lower Seaboard	1604
Unnamed A	1668
Middle Horsepen	1772.5
C Seam	1853.5
War Creek	1889
Unnamed C	1917.5
Beckley	1948
Lower Horsepen	1985.5
X Seam Rider	2068
Pocahontas #6	2320
Pocahontas #2	2573.5
TD	2737.0

PERMITTEE: EQUITABLE PRODUCTION COMPANY (Company)

BY: *Alach J. Davis* (Signature)

PERMIT FOR GAS AND OIL OPERATIONS

This certifies that Permit No. 5789
Operation Name VC-535445 W/PL
Has been issued to: (Company) Equitable Production Company
Whose main office is located at Cloverleaf Square
Big Stone Gap, VA 24219

Applicant Charles Gary

This permit is issued on this 29th day of May, 2003.

This permit was requested for Operations under
Section 45 1-361 29 B.

The permitted operations are located in the Ervinton District
of Dickenson County.

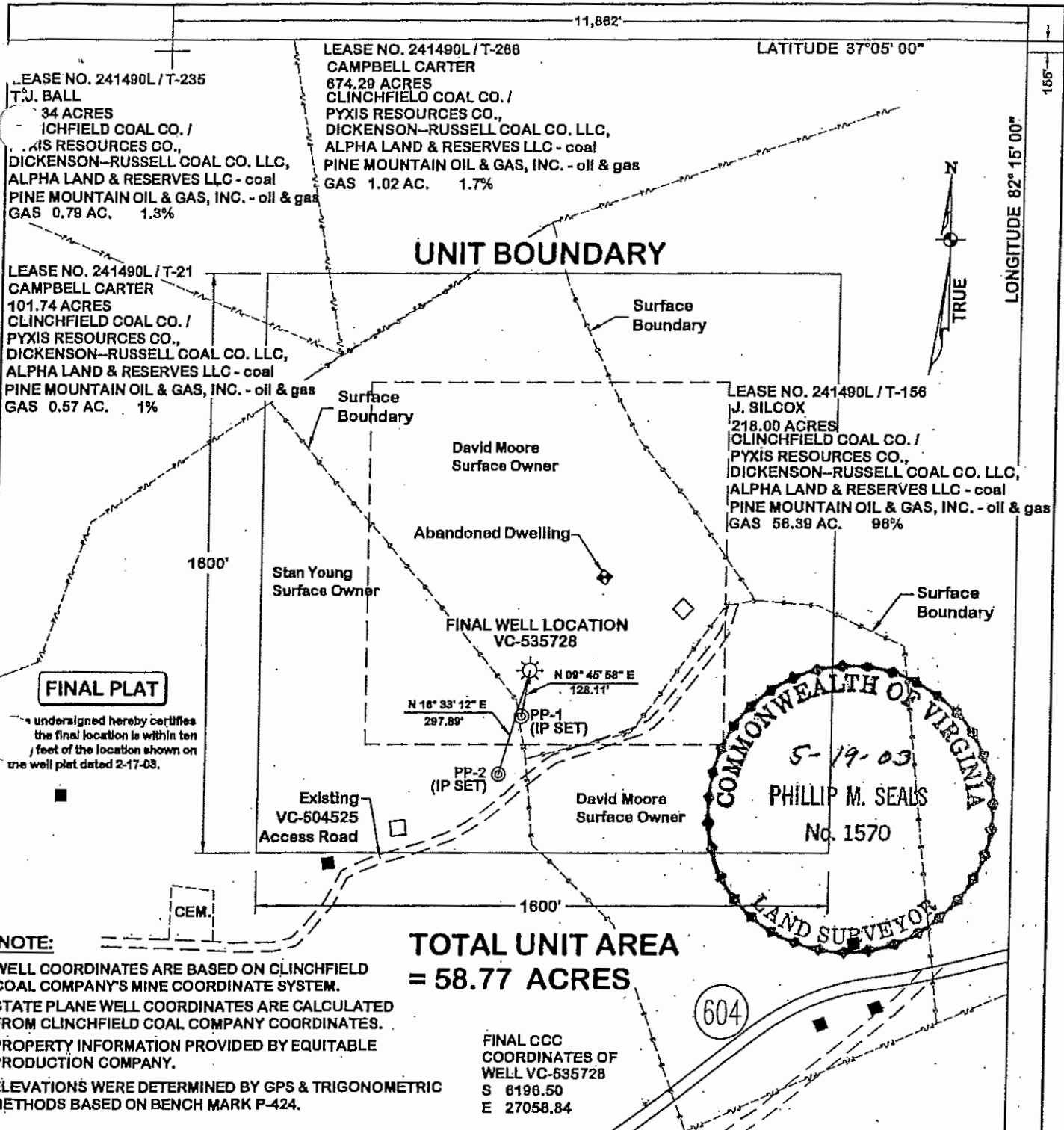
*THIS PERMIT IS ISSUED BY THE DIRECTOR PURSUANT TO CHAPTER 22.1, TITLE 45.1 OF THE CODE OF VIRGINIA,
Being an Act to require permits for gas and oil operations and to fix conditions for issuance thereof; to provide for the safe and
environmentally sound operations performed by the Permittee and for the inspection thereof; to provide for a method of maximizing
gas, oil, mineral and coal resources; to protect correlative rights of persons owning interest in gas and oil resources; to provide for
enforcement by the Director.*

This permit shall expire 05/29/2005 unless the permittee has commenced
operations as determined by the Inspector.

Fee Paid \$250.00
File No. DI-1172

FILE COPY

00-1141

**WELL LOCATION PLAT**

COMPANY EQUITABLE PRODUCTION CO. WELL NAME OR NUMBER VC-535728

TRACT NO. T - 156 QUADRANGLE NORA

DISTRICT ERVINTON

WELL COORDINATES (VIRGINIA STATE PLANE) N 295110 E 894523

ELEVATION 2068.96 METHOD USED TO DETERMINE ELEVATION: GPS & TRIG.

COUNTY DICKENSON SCALE: 1" = 400' DATE 5-19-03

THIS PLAT IS A NEW PLAT ☐ ; AN UPDATED PLAT ☐ ; OR A FINAL LOCATION PLAT ☒

□ DENOTES THE LOCATION OF A WELL ON UNITED STATES TOPOGRAPHIC MAPS, SCALE 1 TO 24,000, LATITUDE AND LONGITUDE LINES BEING REPRESENTED BY BORDER LINES AS SHOWN.

Phillip M. Seals

LICENSED LAND SURVEYOR

(AFFIX SEAL)

JAY

Permit: 5672 Well: VC-535726

Department of Mines, Minerals and Energy
Division of Gas and Oil
P O Box 1416
Abingdon, Virginia 24210
540-676-5423



COMPLETION REPORT

Well Type: Gas Well

Date Well Completed: 06-06-03 **Total Depth of Well:** 2018' **LTD:** 2022'

Attach the Drilling Report if not previously submitted. In addition, submit any changes in casing and tubing that were approved after the Drilling Report was submitted.

STIMULATION RECORD

Zone 1: (See attached)

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:
Formation Broke Down at: PSIG Average Injection Rate: BPM
ISIP: PSIG 5 Min SIP PSIG Average Downhole Injection Pressure: PSIG
Stimulated: Yes: X No: Date Stimulated:

Zone 2:

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:
Formation Broke Down at: PSIG Average Injection Rate: BPM
ISIP: PSIG 5 Min SIP PSIG Average Downhole Injection Pressure: PSIG
Stimulated: Yes No Date Stimulated:

Zone 3:

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:
Formation Broke Down at: PSIG Average Injection Rate: BPM
ISIP: PSIG 5 Min SIP PSIG Average Downhole Injection Pressure: PSIG
Stimulated: Yes No Date Stimulated:

Zone 4:

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:
Formation Broke Down at: PSIG Average Injection Rate: BPM
ISIP: PSIG 5 Min SIP PSIG Average Downhole Injection Pressure: PSIG
Stimulated: Yes No Date Stimulated:

FINAL PRODUCTION:

After Stimulation

	<u>BOD</u>	<u>MCFD</u>	<u>HOURS TESTED</u>	<u>ROCK PRESSURE</u>	<u>HOURS TESTED</u>
Final Production if Gas Zones are Commingled:	46	(In Line)		310	

PERMITTEE: **EQUITABLE PRODUCTION COMPANY** (Company)

BY: Chuk of. Davis (Signature)

IAA

ENTERED

WELL NUMBER VC-535726
 COMPLETION DATE 6/6/2003
 TOTAL DEPTH 2018'
 PERMIT NUMBER 5672

	ZONE 1	ZONE 2	ZONE 3	ZONE 4	ZONE 5
	Poca #2	Lower Horsepen/ X-Seam Rider	C Seam/ Warcreek Rider/ Warcreek/ Unnamed C	Middle Seaboard/ Lower Seaboard/ Middle Horsepen	Upper Seaboard A/ Greasy Creek
COALS (FORMATION)					
TREATMENT					
Nitrogen (MSCF)	148	298	469	218	203
Water (BBLs)	98	208	348	182	209
Sand (SXS)	9	54	81	44	45
TOP PERF	1830	1279.5	1145.5	852	629
BOTTOM PERF	1840.5	1349	1210	1060	816.5
# PERFS	18	24	46	26	26
PERF SIZE	0.34"	0.34"	0.34"	0.34"	0.34"
BD PRESSURE	4411	3087	3141	2804	2726
AVG RATE	25 bpm	40 bpm	40 bpm	43 bpm	45 bpm
ISIP	2772	1875	1850	1668	1360
MIN	5	5	5	5	5
MIN. PRESSURE	2507	1704	1666	1375	1254
AVG PRESSURE	3617	3400	3400	3750	2800
STIMULATED	Yes	Yes	Yes	Yes	Yes
STIMULATION DATE	6/3/2003	6/3/2003	6/3/2003	6/3/2003	6/3/2003
	700 gals	800 gals	800 gals	800 gals	800 gals
	7.5% acid	7.5% acid	7.5% acid	7.5% acid	7.5% acid
	Job cut short due to high treating psi				

Permit: 5672 Well: VC-535726

Department of Mines, Minerals and Energy
Division of Gas and Oil
P O Box 1416
Abingdon, Virginia 24210
540-676-5423

DRILLING REPORT

ATTACH A FINAL LOCATION PLAT AS REQUIRED BY 4 VAC 25-150-360.C.

DRILLING DATA

Date Drilling Commenced: 05-20-03
Date Drilling Completed: 05-27-03
Total Depth of Well: 2018'

Drilling Contractor: Union Drilling Company
Rig Type: Rotary: X Cable Tool:
LTD: 2022'

GEOLOGICAL DATA

Fresh Water at	65 Feet	6-7	GPM/Inch Stream	140 Feet	6-7	GPM/Inch Stream
	107 Feet	6-7	GPM/Inch Stream	Feet		GPM/Inch Stream
Salt Water at	1475 Feet	Damp	GPM/Inch Stream	Feet		GPM/Inch Stream
	Feet		GPM/Inch Stream	Feet		GPM/Inch Stream

COAL SEAMS

<u>NAME</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>THICKNESS</u>	<u>YES</u>	<u>NO</u>	<u>MINED OUT</u>

MINING IN AREA

SEE DRILLERS LOG ON PAGE 3

GAS AND OIL SHOWS

<u>FORMATION</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>THICKNESS</u>	<u>IPF (MCFD.BOPD)</u>	<u>PRESSURE</u>	<u>HOURS TESTED</u>

GT @ Survey points = NS
GT @ 1689' = trace

Permit: 5672 Well: VC-535726

Cuttings or samples **are not** available for examination by a member of the Virginia Division of Mineral Resources.

Cuttings or samples **have not** been furnished to the Virginia Division of Mineral Resources.

ELECTRIC LOGS AND SURVEYS

List logs run on wellbore: GR/Density/Temp/Enhanced coal log

Did logs disclose vertical location of a coal seam?

Yes: X No:

SURVEY RESULTS

<u>DEPTH OF SURVEY</u>	<u>DIRECTION/DISTANCE/DEGREE FROM TRUE VERTICAL</u>	<u>DEPTH OF SURVEY</u>	<u>DIRECTION/DISTANCE/DEGREE FROM TRUE VERTICAL</u>
417'	¼°		
617'	¼°		
817'	¼°		
1017'	¼°		
1217'	½°		
1417'	½°		
1620'	½°		
1820'	½°		
2018'	¾°		

CASING AND TUBING

	<u>CASING</u>	<u>CASING INTERVAL</u>	<u>HOLE SIZE</u>	<u>CEMENT USED IN CU/FT</u>	<u>CMTD TO SURFACE</u>	<u>DATE CEMENTED</u>	<u>PACKERS OR BRIDGE PLUGS KIND/SIZE/SET</u>
Conductor	16"	0-61'	20"	Grtd			
Surface	8-5/8"	0-308'	11"	142 Ft³	Yes	05-21-03	
Water Protection							
Other Casing and Tubing Left in Well Liners	4-1/2" 2-3/8"	0-1969' 0-1919.90'	6-1/2"	323 Ft³	Yes	05-27-03	

REMARKS: Shutdown, fishing jobs, depths and dates, caving, lost circulation, etc:

Permit: 5672 Well: VC-535726

DRILLERS LOG

Compiled By: Geologist

COAL SEAM	Coal Top
Ailly	163
Raven	255
Jawbone Rider	380
Jawbone	406.5
Tiller	516.5
Upper Seaboard A	629.5
Upper Seaboard	666
Greasy Creek	813
Middle Seaboard	852.5
Lower Seaboard	885.5
Unnamed A	952.5
Middle Horsepen	1058
C Seam	1146
War Creek Rider	1164
War Creek	1196.5
Unnamed C	1208
Lower Horsepen	1280
X Seam Rider	1347
X Seam	1378
Pocahontas #6	1576.5
Pocahontas #3	1812
Pocahontas #2	1830.5
TD	2018.0

PERMITTEE: EQUITABLE PRODUCTION COMPANY (Company)

BY: *Robert J. Thia* (Signature)

PERMIT FOR GAS AND OIL OPERATIONS

This permit is issued to the State of Texas, Department of Natural Resources, under the authority of the Texas Natural Resource Conservation Act, Chapter 66, Article 1, Section 1, of the Texas Constitution, and the Texas Natural Resource Conservation Act, Chapter 66, Article 1, Section 1, of the Texas Constitution, and the Texas Natural Resource Conservation Act, Chapter 66, Article 1, Section 1, of the Texas Constitution.

Department of Natural Resources

This permit is issued on this 10th day of October, 1993.

This permit is issued for the purpose of conducting operations under the authority of the Texas Natural Resource Conservation Act, Chapter 66, Article 1, Section 1, of the Texas Constitution.

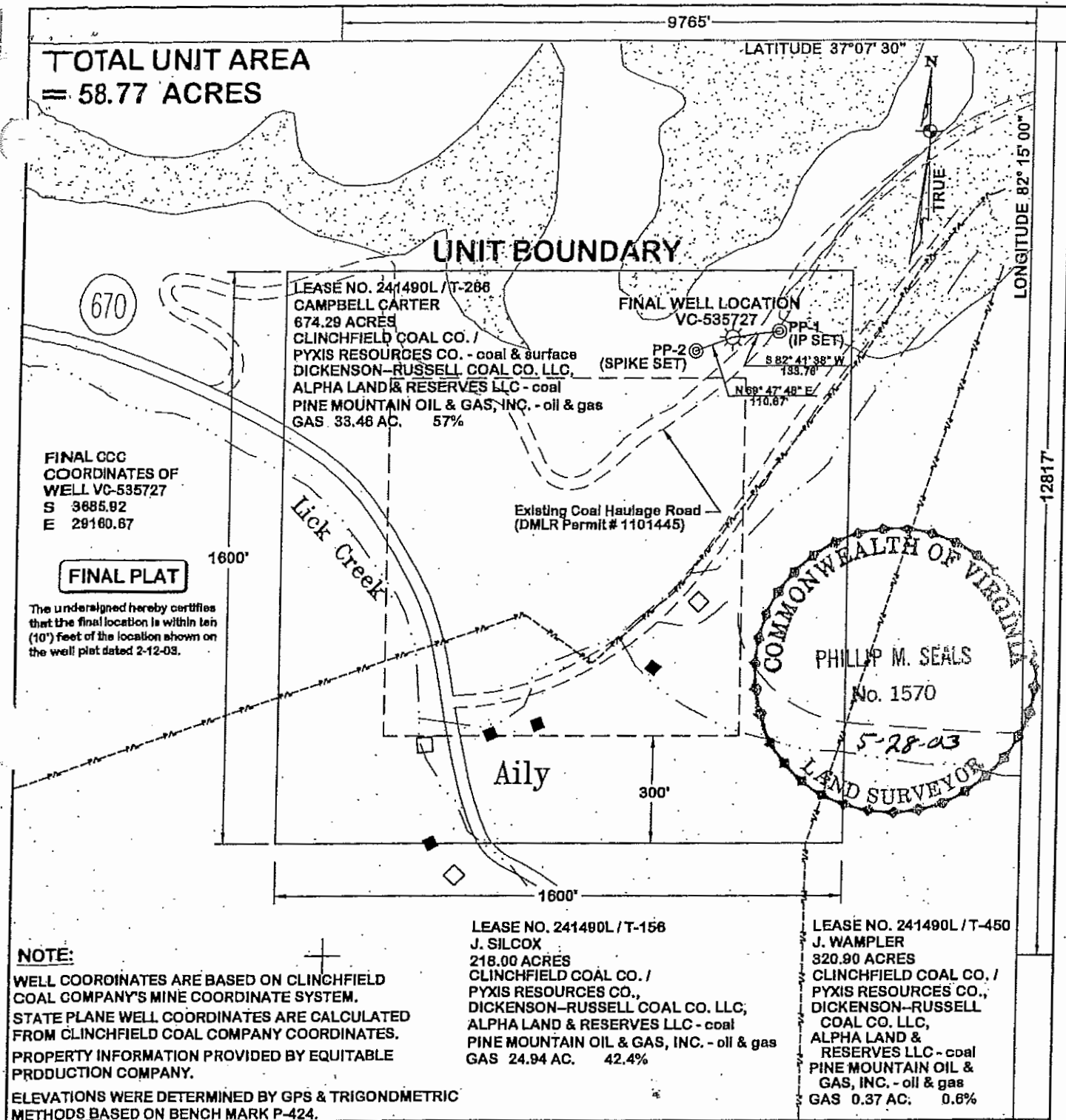
The permit is issued for the purpose of conducting operations under the authority of the Texas Natural Resource Conservation Act, Chapter 66, Article 1, Section 1, of the Texas Constitution.

This permit is issued for the purpose of conducting operations under the authority of the Texas Natural Resource Conservation Act, Chapter 66, Article 1, Section 1, of the Texas Constitution, and the Texas Natural Resource Conservation Act, Chapter 66, Article 1, Section 1, of the Texas Constitution, and the Texas Natural Resource Conservation Act, Chapter 66, Article 1, Section 1, of the Texas Constitution.

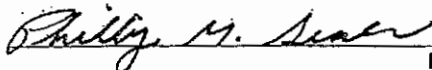
This permit shall expire on the date of the expiration of the permit, unless the permit is renewed by the Department.

The State of Texas
Department of Natural Resources

FILE COPY

**WELL LOCATION PLAT**COMPANY EQUITABLE PRODUCTION CO.WELL NAME OR NUMBER VC-535727TRACT NO. T - 266QUADRANGLE NORADISTRICT ERVINTONWELL COORDINATES (VIRGINIA STATE PLANE) N 297534 E 896724ELEVATION 1794.21METHOD USED TO DETERMINE ELEVATION: GPS & TRIG.COUNTY DICKENSONSCALE: 1" = 400'DATE 5-28-03THIS PLAT IS A NEW PLAT ☐ ; AN UPDATED PLAT ☐ ; OR A FINAL LOCATION PLAT ☒

+ DENOTES THE LOCATION OF A WELL ON UNITED STATES TOPOGRAPHIC MAPS, SCALE 1 TO 24,000,
LATITUDE AND LONGITUDE LINES BEING REPRESENTED BY BORDER LINES AS SHOWN.

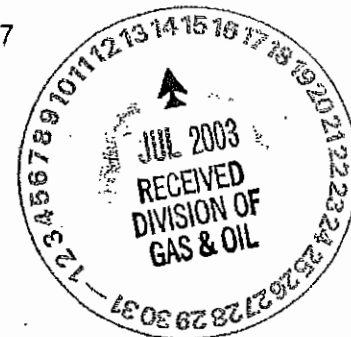


LICENSED LAND SURVEYOR

(AFFIX SEAL)

Permit: 5682 Well: VC-535727

Department of Mines, Minerals and Energy
Division of Gas and Oil
P O Box 1416
Abingdon, Virginia 24210
540-676-5423



COMPLETION REPORT

Well Type: Gas Well

Date Well Completed: 06-11-03

Total Depth of Well: 2220'

LTD: 2218'

Attach the Drilling Report if not previously submitted. In addition, submit any changes in casing and tubing that were approved after the Drilling Report was submitted.

STIMULATION RECORD

Zone 1: (See attached)

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:
Formation Broke Down at: PSIG Average Injection Rate: BPM
ISIP: PSIG 5 Min SIP PSIG Average Downhole Injection Pressure: PSIG
Stimulated: Yes: X No: Date Stimulated:

Zone 2:

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:
Formation Broke Down at: PSIG Average Injection Rate: BPM
ISIP: PSIG 5 Min SIP PSIG Average Downhole Injection Pressure: PSIG
Stimulated: Yes No Date Stimulated:

Zone 3:

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:
Formation Broke Down at: PSIG Average Injection Rate: BPM
ISIP: PSIG 5 Min SIP PSIG Average Downhole Injection Pressure: PSIG
Stimulated: Yes No Date Stimulated:

Zone 4:

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:
Formation Broke Down at: PSIG Average Injection Rate: BPM
ISIP: PSIG 5 Min SIP PSIG Average Downhole Injection Pressure: PSIG
Stimulated: Yes No Date Stimulated:

FINAL PRODUCTION:

After Stimulation

	<u>BOD</u>	<u>MCFD</u>	<u>HOURS TESTED</u>	<u>ROCK PRESSURE</u>	<u>HOURS TESTED</u>
Final Production if Gas					
Zones are Commingled:	62	(In Line)		220	

PERMITTEE: EQUITABLE PRODUCTION COMPANY (Company)

BY: [Signature] (Signature)

ENTERED

WELL NUMBER VC-535727
 COMPLETION DATE 6/11/2003
 TOTAL DEPTH 2220'
 PERMIT NUMBER 5682

	ZONE 1	ZONE 2	ZONE 3	ZONE 4	ZONE 5
COALS (FORMATION)	Poca #2/ Poca #3	Lower Horsepen	Warcreek Rider/ Warcreek/ Unnamed C	Middle Seaboard/ Middle Horsepen C Seam	Jawbone/ Tiller Upper Seaboard A Greasy Creek
TREATMENT					
Nitrogen (MSCF)	245	68	352	349	437
Water (BBLs)	138	50	222	241	387
Sand (SXS)	15	0	62	71	127
TOP PERF	2010	1501	1390	1078.5	621.5
BOTTOM PERF	2053	1504.5	1434.5	1358	843.5
# PERFS	20	14	32	28	52
PERF SIZE	0.34"	0.34"	0.34"	0.34"	0.34"
BD PRESSURE	2454	4008	3552	2456	1692
AVG RATE	25 bpm	12 bpm	45 bpm	50 bpm	60 bpm
ISIP	2400	3000	1825	1700	1200
MIN	5	5	5	5	2
MIN. PRESSURE	2247	2535	1724	1540	1196
AVG PRESSURE	3750	3900	3450	2650	2100
STIMULATED	Yes	Yes	Yes	Yes	Yes
STIMULATION DATE	6/5/2003	6/5/2003	6/5/2003	6/5/2003	6/5/2003
	700 gals	800 gals	800 gals	800 gals	800 gals
	7.5% acid	7.5% acid	7.5% acid	7.5% acid	7.5% acid
	Cut job short; screen out	Aborted job w/ no sand; pressure too high			

Permit: 5682 Well: VC-535727

Department of Mines, Minerals and Energy
Division of Gas and Oil
P O Box 1416
Abingdon, Virginia 24210
540-676-5423

DRILLING REPORT

ATTACH A FINAL LOCATION PLAT AS REQUIRED BY 4 VAC 25-150-360.C.

DRILLING DATA

Date Drilling Commenced: 05-27-03
Date Drilling Completed: 05-30-03
Total Depth of Well: 2220'

Drilling Contractor: Union Drilling Company
Rig Type: Rotary: **X** Cable Tool:
LTD: 2218'

GEOLOGICAL DATA

Fresh Water at	Feet	GPM/Inch Stream	Feet	GPM/Inch Stream
	Feet	GPM/Inch Stream	Feet	GPM/Inch Stream
Salt Water at	1700 Feet	Damp GPM/Inch Stream	Feet	GPM/Inch Stream
	Feet	GPM/Inch Stream	Feet	GPM/Inch Stream

COAL SEAMS

<u>NAME</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>THICKNESS</u>	<u>YES</u>	<u>NO</u>	<u>MINING IN AREA</u>	<u>MINED OUT</u>

MINING IN AREA

SEE DRILLERS LOG ON PAGE 3

GAS AND OIL SHOWS

<u>FORMATION</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>THICKNESS</u>	<u>IPF (MCFD.BOPD)</u>	<u>PRESSURE</u>	<u>HOURS TESTED</u>

GT @ Survey points = NS
GT @ 2200' = trace

Permit: 5682 Well: VC-535727

Cuttings or samples **are not** available for examination by a member of the Virginia Division of Mineral Resources.Cuttings or samples **have not** been furnished to the Virginia Division of Mineral Resources.**ELECTRIC LOGS AND SURVEYS**

List logs run on wellbore: GR/Density/Temp/Enhanced coal log

Did logs disclose vertical location of a coal seam? Yes: X No:

SURVEY RESULTS

<u>DEPTH OF SURVEY</u>	<u>DIRECTION/DISTANCE/DEGREE FROM TRUE VERTICAL</u>	<u>DEPTH OF SURVEY</u>	<u>DIRECTION/DISTANCE/DEGREE FROM TRUE VERTICAL</u>
203'	1/8°		
403'	1/4°		
607'	1/4°		
800'	1/4°		
1000'	1/4°		
1200'	1/4°		
1400'	1/2°		
1600'	1/2°		
1800'	1/2°		
2000'	1/2°		
2020'	3/4°		

CASING AND TUBING

	<u>CASING</u>	<u>CASING INTERVAL</u>	<u>HOLE SIZE</u>	<u>CEMENT USED IN CU/FT</u>	<u>CMTD TO SURFACE</u>	<u>DATE CEMENTED</u>	<u>PACKERS OR BRIDGE PLUGS KIND/SIZE/SET</u>
Conductor	11-3/4"	0-21'	15"	Grtd			
Surface	8-5/8"	0-338'	11"	153 Ft³	Yes	05-28-03	
Water Protection							
Other Casing and Tubing Left in Well Liners	4-1/2" 2-3/8"	0-2144' 0-2071.90'	6-1/2"	364 Ft³	Yes	05-30-03	

REMARKS: Shutdown, fishing jobs, depths and dates, caving, lost circulation, etc:

Permit: 5682 Well: VC-535727

DRILLERS LOG

Compiled By: Geologist

COAL SEAM	Coal Top
Aily	381.5
Raven	470.5
Jawbone Rider	590.5
Jawbone	622
Tiller	731
Upper Seaboard A	842
Upper Seaboard	884.5
Greasy Creek	1034.5
Middle Seaboard	1079.5
Lower Seaboard	1109.5
Unnamed A	1178
Middle Horsepen	1275
C Seam	1356.5
War Creek Rider	1390.5
War Creek	1421.5
Unnamed C	1432.5
Lower Horsepen	1501.5
X Seam Rider	1569
X Seam	1596
Pocahontas #3	2010.5
Pocahontas #2	2051
TD	2220.0

PERMITTEE: EQUITABLE PRODUCTION COMPANY (Company)

BY: *Mark J. Zima* (Signature)

PERMIT FOR GAS AND OIL OPERATIONS

*This certifies that Permit No. 5682-01
Operation Name VC-535727 W/Pipeline
Has been issued to: (Company) Equitable Production Company
whose main office is located at Cloverleaf Square
Big Stone Gap, VA 24219*

Applicant Charles Gary

This permit is issued on this 10th day of July, 2003.

*This permit was requested for Permit Modification under
Section 45.1-361.29 C.*

*The permitted operations are located in the Eppington District
of Dickenson County.*

*THIS PERMIT IS ISSUED BY THE DIRECTOR PURSUANT TO CHAPTER 22.1, TITLE 45.1 OF THE CODE OF VIRGINIA,
being an act to require permits for gas and oil operations and to fix conditions for issuance thereof; to provide for the safe and
environmentally sound operations performed by the Permittee and for the inspection thereof; to provide for a method of maximizing
gas, oil, mineral and coal resources; to protect correlative rights of persons owning interest in gas and oil resources; to provide for
enforcement by the Director.*

*This permit shall expire unless the permittee has commenced
operations as determined by the Inspector.*

*Fee Paid \$100.00
File No. DI-1143*

FILE COPY

10604'

LATITUDE 37°07'30"

TOTAL UNIT AREA
= 58.77 ACRES

LAT. & LONG.
 (NAD 27 DECIMAL DEGREES)
 OF WELL VC-536330

37.091219
 82.286357

UNIT BOUNDARY

LEASE NO. 241490L / T-266
 CAMPBELL CARTER
 674.29 ACRES
 HEARTWOOD FORESTLAND FUND IV, L.P. - Surface
 DICKENSON-RUSSELL COAL CO., LLC /
 ALPHA LAND & RESERVES, LLC / ACIN, LLC /
 WBRD, LLC - coal
 PINE MOUNTAIN OIL & GAS, INC. - oil, gas, & cbm
 GAS 58.77 AC. 100%

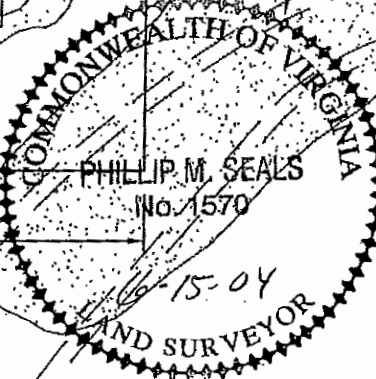
CCC COORDINATES OF
 WELL VC-536330
 S 3178.77
 E 28315.73

1600'

300'

Existing Coal Haulage Road
 (DMLR Permit #1101445)

PP-1
 (SPIKE NAIL)
 N 71° 43' 17" E
 286.25'
 S 08° 38' 23" W
 91.97'
 Well
 VC-536330
 PP-2
 (SPIKE NAIL)



NOTE:

PROPERTY INFORMATION PROVIDED BY EQUITABLE
 PRODUCTION COMPANY.

ELEVATIONS WERE DETERMINED BY GPS & TRIGONOMETRIC
 METHODS BASED ON BENCH MARK P-424.

FINAL PLAT

The undersigned hereby certifies
 that the final location is within ten
 (10') feet of the location shown on
 the well plat dated 4-26-04.

WELL LOCATION PLAT

COMPANY EQUITABLE PRODUCTION CO.

WELL NAME OR NUMBER VC-536330

TRACT NO. T - 266

QUADRANGLE NORA

DISTRICT ERVINTON

WELL COORDINATES (VIRGINIA STATE PLANE 27) N 298,075.25 E 895,899.69

ELEVATION 1785.96

METHOD USED TO DETERMINE ELEVATION: GPS & TRIG.

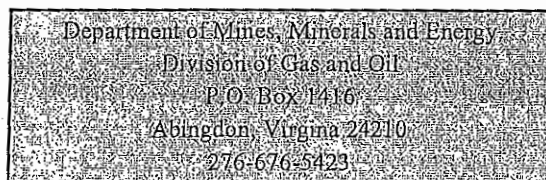
COUNTY DICKENSON

SCALE: 1" = 400'

DATE 6-15-04

THIS PLAT IS A NEW PLAT ; AN UPDATED PLAT ; OR A FINAL LOCATION PLAT X

+ DENOTES THE LOCATION OF A WELL ON UNITED STATES TOPOGRAPHIC MAPS, SCALE 1 TO 24,000,
 LATITUDE AND LONGITUDE LINES BEING REPRESENTED BY BORDER LINES AS SHOWN.



Permit: 6206

Well: VC536330

Completion Report

Well Type: Gas Well

Date Well Completed 06/25/2004

Total Depth of Well: 2,242.00

LTD: 2,240.00

Attach the drilling report if not previously submitted. In addition, submit any changes in casing and tubing that were approved after the drilling report was submitted.

Stimulation Record**Zone 1**

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:

Formation Broke Down at: PSIG Average Injection Rate: BPM

ISIP: PSIG 5 Min SIP PSIG Average Downhole Injection Pressure: PSIG

Stimulated: Yes: X No: Date Stimulated:

Zone 2

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:

Formation Broke Down at: PSIG Average Injection Rate: BPM

ISIP: PSIG 5 Min SIP PSIG Average Downhole Injection Pressure: PSIG

Stimulated: Yes: X No: Date Stimulated:

Zone 3

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:

Formation Broke Down at: PSIG Average Injection Rate: BPM

ISIP: PSIG 5 Min SIP PSIG Average Downhole Injection Pressure: PSIG

Stimulated: Yes: X No: Date Stimulated:

Zone 4

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:

Formation Broke Down at: PSIG Average Injection Rate: BPM

ISIP: PSIG 5 Min SIP PSIG Average Downhole Injection Pressure: PSIG

Stimulated: Yes: X No: Date Stimulated:

Final Production**After Stimulation**

Final Production if Gas Zones
are commingled

BOD**MCFD****Hours Tested****Rock Pressure**

145

0

240

(In Line)

Permitee: EQUITABLE PRODUCTION COMPANY (Company)By: Victoria Dugan (Signature)

ENTERED

10/14/04

Well: VC536330
 Date Well Completed: 06/25/2004
 Total Depth of Well: 2,242.00
 Permit: 6206

Formation Record

Permit: 6206 Well: VC536330

Stage1		Stage2		Stage3		Stage4		Stage5	
Date	06/23/2004	Date	06/23/2004	Date	06/23/2004	Date	06/23/2004	Date	06/23/2004
FracType	70Q Foam	FracType	70Q Foam	FracType	70Q Foam	FracType	70Q Foam	FracType	70Q Foam
Zone	Poca #3 & Poca #2	Zone	L Hrspn/ X-Sm/ Poca #9	Zone	Wrcrk Rdr/ Wrcrk/ Unnmd C	Zone	M Sbrd/Unnmd A/M Hrspn/ C.	Zone	Tiller/ U Sbrd A/ GrsyCrk
# of Perfs	28	# of Perfs	26	# of Perfs	26	# of Perfs	36	# of Perfs	34
From/To	2,005— 2,059	From/To	1,500— 1,681	From/To	1,385— 1,426	From/To	1,071— 1,348	From/To	727— 1,032
BD Press	2,581	BD Press	2,761	BD Press	3,179	BD Press	2,919	BD Press	3,090
ATP Psi	3,897	ATP Psi	3,670	ATP Psi	3,705	ATP Psi	3,518	ATP Psi	3,325
Avg Rate	48	Avg Rate	60	Avg Rate	50	Avg Rate	63	Avg Rate	45
Max Press Psi	4,074	Max Press Psi	4,227	Max Press Psi	4,491	Max Press Psi	3,612	Max Press Psi	3,776
ISIP Psi	2,725	ISIP Psi	1,843	ISIP Psi	1,992	ISIP Psi	1,808	ISIP Psi	1,668
10min SIP	2,348 5 min.	10min SIP	1,720 5 min.	10min SIP	1,767 5 min.	10min SIP	1,572 5 min.	10min SIP	1,323 5 min.
Frac Gradient	1.45	Frac Gradient	1.30	Frac Gradient	1.54	Frac Gradient	1.60	Frac Gradient	2.00
Sand Proppant	39.63	Sand Proppant	44.62	Sand Proppant	42.68	Sand Proppant	54.22	Sand Proppant	69.26
Water-bbl	174	Water-bbl	192	Water-bbl	207	Water-bbl	206	Water-bbl	260
SCF N2	301,200	SCF N2	295,500	SCF N2	286,000	SCF N2	272,000	SCF N2	298,900
-gal	500 gal	Acid-gal	800 gal	Acid-gal	800 gal	Acid-gal	800 gal	Acid-gal	800 gal
	7.5%		7.5%		7.5%		7.5%		7.5%

Department of Mines, Minerals and Energy
Division of Gas and Oil
P.O. Box 1416
Abingdon, Virginia 24210
276-676-5423

Permit: 6206

Well: VC536330

Drilling Report

Attach a final location Plat as required by 4 VAC 25-150-360.C

Drilling Data

Date Drilling Commenced: 06/15/2004 Drilling Contractor: SW Jack Drilling
Date Drilling Completed: 06/18/2004
Date Well Completed: 06/25/2004 Rig Type: Rotary: X Cable Tool:
DTD: 2,242.00
LTD: 2,240.00

Geological Data

Type	From / GPM per Inch
Fresh water	None Reported
Salt Water	None Reported

Coal Seams & Open Mines

Type	From
Coal	80-81, 132-133, 160-161, 195-196, 228-231, 380-381,
Coal	470-472, 548-549, 575-577, 723-726, 828-830, 876-
Coal	877, 987-988, 1026-1028, 1068-1070, 1171-1173,
Coal	1410-1411, 1418-1420, 1496-1497, 1889-1890, 2048-
Open Mine	2050

Gas and Oil Shows

Gas Tests

Depth	Remarks
200	No Show
400	No Show
600	No Show
800	No Show
1,000	No Show
1,200	No Show
1,400	No Show
1,600	No Show
1,800	No Show
2,000	No Show
2,200	odor
2,242	odor

Permit: 6206 Well: VC536330

Cuttings or samples are not available for examination by a member of the Virginia Division of Mineral Resources
 Cuttings or samples have not been furnished to the Virginia Division of Mineral Resources

Electric Logs and Surveys

List logs run on wellbore: GR/Density/Temp/Enhanced Coal Log

Did Logs disclose vertical location of a coal seam? Yes: ☒ No: ☐**Survey Results**

<u>Depth</u>	<u>Direction/Distance/Degrees From True Vertical</u>
200	1/4
400	0
600	1/4
800	1/4
1,000	1/4
1,200	1/2
1,400	1/2
1,600	1/2
1,800	3/4
2,000	3/4
2,200	1/2

Casing Data

<u>Casing Outside Diameter</u>	<u>Casing Interval</u>	<u>Hole Size</u>	<u>Cement used in Cu. ft.</u>	<u>Cmtd To Surface</u>	<u>Date Cemented</u>	<u>Cement Baskets</u>
11 3/4	0- 33	15				
8 5/8	0- 338	11	165.20	Yes	06/16/2004	66
4 1/2	0- 2196	6 1/2	399.51	Yes	06/18/2004	

Tubing Size

2 3/8

Footage

2,129.00

Drillers Log

Permit: 6206

Well: VC536330

<u>Formation Name</u>	<u>Depth Top</u>	<u>Depth Bottom</u>	<u>Formation Thickness</u>
Ailev	373.00	0.00	0.00
en	470.50	0.00	0.00
one	587.00	0.00	0.00
Tiller	727.50	0.00	0.00
Upper Seaboard A	836.00	0.00	0.00
Greasy Creek	1,029.50	0.00	0.00
Middle Seaboard	1,071.00	0.00	0.00
Lower Seaboard	1,113.00	0.00	0.00
Unnamed A	1,176.00	0.00	0.00
Upper Horsene	1,228.00	0.00	0.00
Middle Horsene	1,270.00	0.00	0.00
C Seam	1,346.00	0.00	0.00
War Creek Rider	1,385.50	0.00	0.00
War Creek	1,414.50	0.00	0.00
Unnamed C	1,424.00	0.00	0.00
Becklev	1,445.00	0.00	0.00
Lower Horsene	1,500.00	0.00	0.00
X Seam Rider	1,567.00	0.00	0.00
X Seam	1,592.50	0.00	0.00
Poca #9	1,679.00	0.00	0.00
Poca #3	2,005.00	0.00	0.00
Poca #2	2,052.00	0.00	0.00
Poca #1	2,102.50	0.00	0.00

Total Depth of Well: 2,242.00

Permittee: EQUITABLE PRODUCTION COMPANY (Company)By: Victoria Dugan (Signature)

PERMIT FOR GAS AND OIL OPERATIONS

This certifies that Permit No. 6206
Operation Name VC-536330 W/PL
Has been issued to: (Company) Equitable Production Company
Whose main office is located at Cloverleaf Square
Big Stone Gap, VA 24219

Applicant Hall Don

This permit is issued on this 20th day of May, 2004.

This permit was requested for Operations under
Section 45-1-361.29.B.

The permitted operations are located in the Ervinton District
of Dickenson County.

THIS PERMIT IS ISSUED BY THE DIRECTOR PURSUANT TO CHAPTER 22.1, TITLE 45.1 OF THE CODE OF VIRGINIA,
Being an Act to require permits for gas and oil operations and to fix conditions for issuance thereof ; to provide for the safe and
environmentally sound operations performed by the Permittee and for the inspection thereof ; to provide for a method of maximizing
gas, oil, mineral and coal resources ; to protect correlative rights of persons owning interest in gas and oil resources ; to provide for
enforcement by the Director.

This permit shall expire 05/20/2006 unless the permittee has commenced
operations as determined by the Inspector.

Fee Paid \$250.00
File No. DI-1253

FILE COPY



Commonwealth of Virginia
Department of Mines, Minerals, and Energy
Division of Gas and Oil
P.O. Drawer 159, Lebanon, VA 24266
Telephone: (276) 415-9700

Tracking Number:	6075
Company:	Range Resources-Pine Mountain,
File Number:	DI-2587
Operations Name:	VCI-531507 w/PL
Operation Type:	Coalbed/Pipeline
Drilling Report Type:	Original

DRILLING REPORT (DGO-GO-14)

1. Drilling Data

Date drilling commenced:	11/5/2014	Drilling Contractor:	Gasco #2
Date drilling completed:	11/11/2014	Rig Type:	☒ Rotary ☐ Cable
Driller's Total Depth (feet):	2686.00		
Log Total Depth (feet):	2685.00	Coal Seam at Total Depth:	POCAHONTAS #1

2. Final Location Plat (as required by 4 VAC25-150-360.C.)

Permitted State Plane X:	10386731.6400	Final Plat State Plane X:	10386730.1900
Permitted State Plane Y:	3574987.8500	Final Plat State Plane Y:	3574988.3000

Plat Previously Submitted Or... ☐

List of Attached Items:

Description	FileName
VCI-531507 Final Plat	VCI-531507.pdf

3. Geological Data

Fresh Water At:

Depth (in feet)	Rate	Unit of Measure

Salt Water At:

Depth (in feet)	Rate	Unit of Measure

Coal Seams:

List of Attached Items:

Description	FileName
VCI-531507 Coal	Coal Log.xls

Gas and Oil Shows:

List of Attached Items:

Description	FileName
VCI-531507 Gas Shows	531507 Shows.xls

4. Electric Logs (As required by 4VAC25-150-280.A)

List all logs run: GR/CDL/PE/DIL/Neu/TEMP/Audio

Did logs disclose vertical locations of a coal seam?

☐

5. Survey Results (As required by 4VAC25-150-280.B.2)

List of Attached Items:

Description	FileName
VCI-531507 Survey	531507 Survey.xls

6. Casing and Tubing Program

List of Attached Items:

Description	FileName
VCI-531507 Casing/Tubing	531507 Casing.xls

7. Remarks

Use this space to note any conditions or occurrences, such as lost circulation, fishing jobs, junk left in hole, sidetracks, squeeze jobs, etc., not shown above. Include data and depth of condition/occurrence.

8. Drillers Log

Compiled By: Range Resources

List of Attached Items:

Description	FileName
VCI-531507 Driller's Log	Drillers Log.xls

9. Comments

10. Signature

Permitee: Range Resources-Pine Mountain, Date: 1/7/2015

Signed By: Laura Murray Title: Regulatory Compliance Specialist

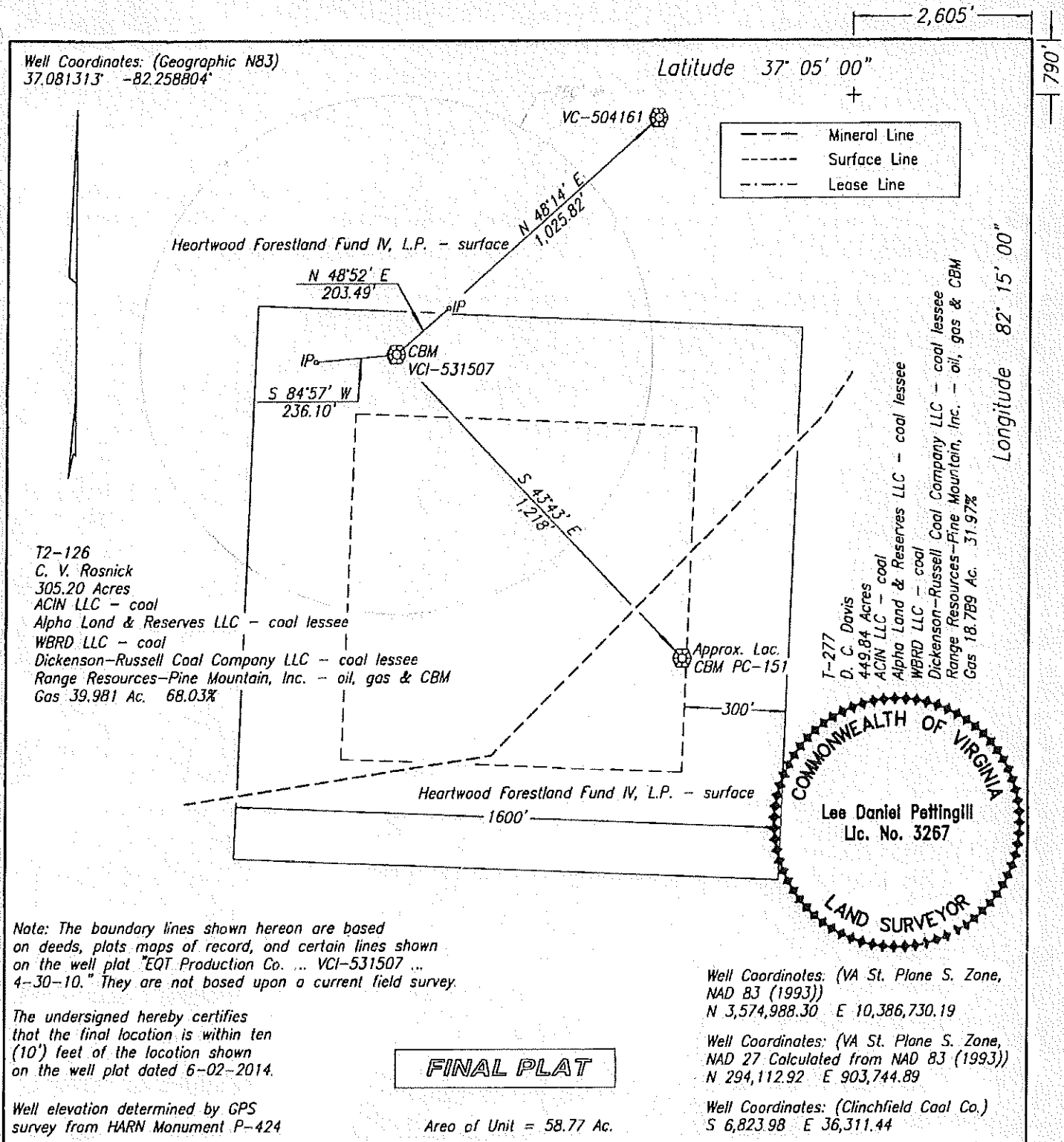
INTERNAL USE ONLY

Submit Date: 1/7/2015

Status: A

Date: 2/2/2015

Final PDF Date: 3/12/2015



WELL LOCATION PLAT NORA GRID BF-60

COMPANY Range Resources-Pine Mountain, Inc. WELL NAME AND NUMBER VCI-531507
TRACT NO. C. V. Rosnick ELEVATION 2,229.52' QUADRANGLE Nora
COUNTY Dickenson DISTRICT Ervin SCALE 1" = 400' DATE 11-07-2014

This Plat is a new plat ; an updated plat ; or a final location plat x

+ Denotes the location of a well on United States topographic Maps, scale 1 to 24,000, latitude and longitude lines being represented by border lines as shown.

LDJ PDM

Licensed Professional Engineer or Licensed Land Surveyor

Coal Seams	531507					
				MINING IN AREA		
NAME	TOP	BOTTOM	THICKNESS	YES	NO	MINED OUT
Coal	61	80	19		No	
Coal	110	111	1		No	
Coal	190	191	1		No	
Coal	270	271	1		NO	Yes
Coal	410	411	1		NO	Yes
Coal	500	501	1		No	
Coal	600	601	1		No	
Coal	720	721	1		No	
Coal	900	901	1		No	
Coal	950	951	1		No	
Coal	1120	1121	1		No	
Coal	1208	1209	1		No	
Coal	1250	1251	1		No	
Coal	1320	1321	1		No	
Coal	1450	1451	1		No	
Coal	1510	1511	1		No	
Coal	1530	1531	1		No	
Coal	1560	1561	1		No	
Coal	1600	1601	1		No	
Coal	1632	1633	1		No	
Coal	1650	1651	1		No	
Coal	1740	1741	1		No	
Coal	1801	1802	1		No	
Coal	1850	1851	1		No	
Coal	1909	1910	1		No	
Coal	2015	2016	1		No	
Coal	2114	2115	1		No	

Gas and Oil Shows

FORMATION	DEPTH	THICKNESS	IPF (MCFD/BOPD)	PRESSURE	HOURS TESTED
	1139		NS		
	1454		Odor		
	1863		Odor		
	2304		Odor		
	2682		Odor		

Survey Results

Depth of Survey	Direction/Distance/Degree From True Vertical
400'	1/4
573'	1/2
760'	1/2
950'	1/2
1139'	1/4
1360'	1/4
1547'	3/4
1737'	1/2
1928'	1/2
2117'	1/4
2304'	1/2
2494'	3/4

Casing/Tubing Program

Casing Type	Casing Size	Casing Interval	Hole Size	Cement Used In Cubic Ft.	Cemented To Surface Yes/No	Date Cemented	Packers Or Bridge Plugs Kind/Size/Set	Cement Baskets (ft)
Conductor	13 3/8	0-40'	15	Sanded In	No			
Water Protection	9 5/8"	0-470'	12 1/4	230 ft³	Yes	11/06/14		302' 344'
Coal Protection								
Production Casing	4 1/2"	0-2642'	6 1/2	500 ft³	Yes	11/11/14		926'
Other Casing And Tubing Left In Well	2 3/8"							
Liners								

Driller's Log	531507						
		General		Depth	Depth		
Geologic Age	Formation	Lithology	Color	Top	Bottom	Thickness	Remarks
Pennsylvanian		RKB to GL		0	8	8	
Pennsylvanian		Red Sand		8	15	7	
Pennsylvanian		Sandstone		15	60	45	
Pennsylvanian		Sandy Shale		60	61	1	
Pennsylvanian		Coal		61	80	19	
Pennsylvanian		Sandy Shale		80	110	30	
Pennsylvanian		Coal		110	111	1	
Pennsylvanian		Sandy Shale		111	140	29	
Pennsylvanian		Sandstone		140	190	50	
Pennsylvanian		Coal		190	191	1	
Pennsylvanian		Sandstone		191	270	79	
Pennsylvanian		Coal		270	271	1	
Pennsylvanian		Shale/ Sand		271	350	79	
Pennsylvanian		Sandstone		350	410	60	
Pennsylvanian		Coal		410	411	1	
Pennsylvanian		Shale/ Sand		411	500	89	
Pennsylvanian		Coal		500	501	1	
Pennsylvanian		Shale/ Sand		501	580	79	
Pennsylvanian		Sanstone		580	600	20	
Pennsylvanian		Coal		600	601	1	
Pennsylvanian		Shale/ Sand		601	670	69	
Pennsylvanian		Sandstone		670	720	50	
Pennsylvanian		Coal		720	721	1	
Pennsylvanian		Sandstone		721	810	89	
Pennsylvanian		Shale/ Sand		810	900	90	
Pennsylvanian		Coal		900	901	1	
Pennsylvanian		Shale/ Sand		901	950	49	
Pennsylvanian		Coal		950	951	1	
Pennsylvanian		Shale/ Sand		951	1010	59	
Pennsylvanian		Sandstone		1010	1120	110	
Pennsylvanian		Coal		1120	1121	1	
Pennsylvanian		Shale/ Sand		1121	1208	87	
Pennsylvanian		Coal		1208	1209	1	
Pennsylvanian		Sandstone		1209	1250	41	
Pennsylvanian		Coal		1250	1251	1	
Pennsylvanian		Sandstone		1251	1320	69	
Pennsylvanian		Coal		1320	1321	1	
Pennsylvanian		Sandstone		1321	1450	129	
Pennsylvanian		Coal		1450	1451	1	
Pennsylvanian		Sandstone		1451	1510	59	
Pennsylvanian		Coal		1510	1511	1	
Pennsylvanian		Sandstone		1511	1530	19	
Pennsylvanian		Coal		1530	1531	1	
Pennsylvanian		Sandstone		1531	1560	29	
Pennsylvanian		Coal		1560	1561	1	
Pennsylvanian		Sandstone		1561	1600	39	
Pennsylvanian		Coal		1600	1601	1	
Pennsylvanian		Shale/ Sand		1601	1632	31	
Pennsylvanian		Coal		1632	1633	1	
Pennsylvanian		Sandstone		1633	1650	17	
Pennsylvanian		Coal		1650	1651	1	
Pennsylvanian		Shale/ Sand		1651	1740	89	



Commonwealth of Virginia
Department of Mines, Minerals, and Energy
Division of Gas and Oil
P.O. Drawer 159, Lebanon, VA 24266
Telephone: (276) 415-9700

Tracking Number: 6381
Company: Range Resources-Pine Mountain,
File Number: DI-2587
Completion Report Type: Original

COMPLETION REPORT (DGO-GO-15)

Well Type:	Coalbed/Pipeline	Date Well Completed:	1/5/2015
Driller's Total Depth:	2686.00	Log's Total Depth:	2685.00

1. Changes In Casing/Tubing from Approved Drilling Report

Description	FileName
VCI-531507 Casing with tubing	531507 Casing.xls

2. Stimulation Record

Stimulation Status: ☒ Stimulated ☐ GOB ☐ Not Stimulated ☐ Service Well

Description	FileName
VCI-531507 Completion Report	PMD-CompletionReport_wv101.pdf

3. Final Production

Description	FileName
VCI-531507 Final Production	Final_Prod.xls

4. Comments

Notes:

approved. [4/27/2015, jal]

5. Signature

Permittee:	Range Resources-Pine Mountain,	Date:	4/13/2015	(Company)
By:	Laura Murray	Title:	Regulatory Compliance Specialist	(Signature)

INTERNAL USE ONLY

Submit Date: 4/13/2015

Status:

Date: 4/27/2015

Final PDF Date: 6/25/2015

Permit: 4675 Well: VC-4515

Department of Mines, Minerals and Energy
Division of Gas and Oil
P O Box 1416
Abingdon, Virginia 24210
540-676-5423

DRILLING REPORT

ATTACH A FINAL LOCATION PLAT AS REQUIRED BY 4 VAC 25-150-360.C.

DRILLING DATA

Date Drilling Commenced: 3/27/2001 Drilling Contractor: Union Drilling Company
Date Drilling Completed: 4/2/2001 Rig Type: Rotary: X Cable Tool:
Total Depth of Well: 2500 LTD: 2500

GEOLOGICAL DATA

Fresh Water at	<u>180</u>	Feet	<u>1/2"</u>	GPM/Inch Stream	<u>2500</u>	Feet	<u>1"</u>	GPM/Inch Stream
		Feet		GPM/Inch Stream		Feet		GPM/Inch Stream
Salt Water at	<u>1416</u>	Feet	<u>1/2"</u>	GPM/Inch Stream		Feet		GPM/Inch Stream
	<u>2190</u>	Feet	<u>1"</u>	GPM/Inch Stream		Feet		GPM/Inch Stream

COAL SEAMS

MINING IN AREA

<u>NAME</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>THICKNESS</u>	<u>YES</u>	<u>NO</u>	<u>MINED OUT</u>

SEE DRILLERS LOG ON PAGE 3

GAS AND OIL SHOWS

<u>FORMATION</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>THICKNESS</u>	<u>IPF (MCFD.BOPD)</u>	<u>PRESSURE</u>	<u>HOURS TESTED</u>
	<u>2500</u>			<u>42 mcf/d</u>		

Permit: **4675** Well: **VC-4515**Cuttings or samples **are not** available for examination by a member of the Virginia Division of Mineral Resources.Cuttings or samples **have not** been furnished to the Virginia Division of Mineral Resources.**ELECTRIC LOGS AND SURVEYS**

List logs run on wellbore:

GR/Density/Temperature/Enhanced Coal LogDid logs disclose vertical location of a coal seam? Yes: **X** No**SURVEY RESULTS**

<u>DEPTH OF SURVEY</u>	<u>DIRECTION/DISTANCE/DEGREE FROM TRUE VERTICAL</u>	<u>DEPTH OF SURVEY</u>	<u>DIRECTION/DISTANCE/DEGREE FROM TRUE VERTICAL</u>
200'	1/4°		
318'	1/4°		
514'	1/4°		
715'	1/2°		
919'	1/2°		
1034'	1/2°		
1234'	3/4°		
1434'	3/4°		
1464'	3/4°		
1530'	3/4°		
1693'	3/4°		
1768'	3/4°		
1809'	3/4°		
1928'	3/4°		
2129'	3/4°		
2269'	3/4°		
2500'	1°		

CASING AND TUBING

	<u>CASING</u>	<u>CASING INTERVAL</u>	<u>HOLE SIZE</u>	<u>CEMENT USED IN CU/FT</u>	<u>DATE CEMENTED</u>	<u>PACKERS OR BRIDGE PLUGS KIND/SIZE/SET</u>
<u>Conductor</u>	11-3/4"	0-41'	15"	Grtd		
<u>Surface</u>						
<u>Water Protection</u>	8-5/8"	0-452'	11"	160 FT³	3/29/2001	
<u>Other Casing and Tubing Left in Well</u>	4-1/2"	0-2425'	8"	679 FT³	4/2/2001	

Liners**REMARKS:** Shutdown, fishing jobs, depths and dates, caving, lost circulation, etc: **Coal pillar @ 211' – Blew out-lost circulation.**

Permit: 4675 Well: VC-4515

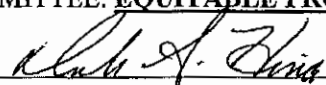
DRILLERS LOG

Compiled By: Geologist

Aily	800.00
Raven Rider	888.00
Raven	906.00
Jawbone Rider	1004.00
Jawbone	1035.00
Tiller Rider	1134.00
Tiller	1151.00
Upper Seaboard A	1275.00
Upper Seaboard	1293.00
Greasy Creek	1464.00
Middle Seaboard	1502.00
Lower Seaboard	1535.00
Unnamed A	1601.00
Middle Horsepen	1694.00
C Seam	1770.00
War Creek	1811.00
Unnamed C	1838.00
Lower Horsepen	1925.00
X Seam Rider	1997.00
TD	2500.00

*Formations between coal seams are Sand, Shale and Thin Coals

PERMITTEE: **EQUITABLE PRODUCTION COMPANY** (Company)

BY:  (Signature)

Permit: **4675** Well: **VC-4515**

DI-1036

Department of Mines, Minerals and Energy
Division of Gas and Oil
P O Box 1416
Abingdon, Virginia 24210
540-676-5423

COMPLETION REPORT

Well Type: Gas Well

Date Well Completed: 4/16/2001 **Total Depth of Well:** 2500 **LTD:** 2500

Attach the Drilling Report if not previously submitted. In addition, submit any changes in casing and tubing that were approved after the Drilling Report was submitted.

STIMULATION RECORD

Zone 1: Greasy Crk/L Seaboard/M,L Horsepen/C Seam/War Creek/Unnamed C/X Seam Rider

Formation Stimulated With: 70 Q Foam

Perforated: 1464 to 2001 No. of Perforations: 18 Perforation Size: 0.34"

Formation Broke Down at: 1250 PSIG Average Injection Rate: 56 BPM

ISIP: 1072 PSIG 5 Min SIP: 1036 PSIG Average Downhole Injection Pressure: 3098 PSIG

Stimulated: Yes: X No: Date Stimulated: 4/10/2001

Zone 2:

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:

Formation Broke Down at: PSIG Average Injection Rate: BPM

ISIP: PSIG Min SIP PSIG Average Downhole Injection Pressure: PSIG

Stimulated: Yes No Date Stimulated:

Zone 3:

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:

Formation Broke Down at: PSIG Average Injection Rate: BPM

ISIP: PSIG Min SIP PSIG Average Downhole Injection Pressure: PSIG

Stimulated: Yes No Date Stimulated:

Zone 4:

Formation Stimulated With:

Perforated: to No. of Perforations: Perforation Size:

Formation Broke Down at: PSIG Average Injection Rate: BPM

ISIP: PSIG Min SIP PSIG Average Downhole Injection Pressure: PSIG

Stimulated: Yes No Date Stimulated:

FINAL PRODUCTION:

After Stimulation

	<u>BOD</u>	<u>MCFD</u>	<u>HOURS</u> <u>TESTED</u>	<u>ROCK</u> <u>PRESSURE</u>	<u>HOURS</u> <u>TESTED</u>
Final Production if Gas Zones are Commingled:		20 (In Line)		350	

PERMITTEE EQUITABLE PRODUCTION COMPANY (Company)

BY: [Signature] (Signature)

ENTERED

PERMIT FOR GAS AND OIL OPERATIONS

This certifies that Permit No. 4675-01
Operation Name VC-4515 W/PIPELINE
Has been issued to: (Company) EQUITABLE PRODUCTION COMPANY
Whose main office is located at CLOVERLEAF SQUARE BLDG B
BIG STONE GAP, VA 24219

Applicant J. Gary CHARLES

This permit is issued on this 9th day of October, 2001.

This permit was requested for Permit Modification under
Section 45.1-361.29 C.

The permitted operations are located in the Ervinton District
of Dickenson County.

*THIS PERMIT IS ISSUED BY THE DIRECTOR PURSUANT TO CHAPTER 22.1, TITLE 45.1 OF THE CODE OF VIRGINIA,
Being an Act to require permits for gas and oil operations and to fix conditions for issuance thereof ; to provide for the safe and
environmentally sound operations performed by the Permittee and for the inspection thereof ; to provide for a method of maximizing
gas, oil, mineral and coal resources ; to protect correlative rights of persons owning interest in gas and oil resources ; to provide for
enforcement by the Director.*

This permit shall expire unless the permittee has commenced
operations as determined by the Inspector.

Fee Paid \$100.00
File No. DI-1036

FILE COPY



Commonwealth of Virginia
Department of Mines, Minerals, and Energy
Division of Gas and Oil
P.O. Box 1416; Abingdon, VA 24212
Telephone: (276) 676-5423

Tracking Number: 153
Company: Equitable Production Company
File Number: DI-1578
Operations Name: VC-536364 W/PL
Operation Type: Coalbed/Pipeline
Drilling Report Type: Original

DRILLING REPORT (DGO-GO-14)

1. Drilling Data

Date drilling commenced: 9/16/2006 Drilling Contractor: Gasco
Date drilling completed: 9/19/2006 Rig Type: ☒ Rotary ☐ Cable Tool
Driller's Total Depth (feet): 2,557
Log Total Depth (feet): 2,552 Coal Seam At Total Depth POCAHONTAS #3

2. Final Location Plat (as required by 4 VAC25-150-360.C.)

Permitted State Plane X 901,516 Final Plat State Plane X: 901,517
Permitted State Plane Y: 301,632 Final Plat State Plane Y: 301,640

☐ Plat Previously Submitted Or...

List of Attached Items:

Description	FileName
final plat 536364	VC-536364 final plat.tif

3. Geological Data

Fresh Water At:

Depth (in feet)	Rate	Unit of Measure
2,225	wet	INCH

Salt Water At:

Depth (in feet)	Rate	Unit of Measure

Coal Seams

List of Attached Items:

Description	FileName
coal seams 536364	Coal Seams.doc

Gas and Oil Shows

List of Attached Items:

Description	FileName
gas shows 536364	Gas and Oil Shows.doc

4. Electric Logs (As required by 4VAC25-150-280.A.)

List all logs run: GR/Density/Temp/Induction/Neutron

Did logs disclose vertical locations of a coal seam? ☐ Yes ☒ No

5. Survey Results (As required by 4VAC25-150-280.B.2)

List of Attached Items:

Description	FileName
survey 536364	Survey Results.doc

6. Casing and Tubing Program

List of Attached Items:

Description	FileName
csg 536364	Casing Data.doc
tbg 536364	Tubing Size.doc

7. Remarks

Use this space to note any conditions or occurrences, such as lost circulation, fishing jobs, junk left in hole, sidetracks, squeeze jobs, etc., not shown above. Include data and depth of condition/occurrence.

8. Drillers Log

Compiled By: _____

List of Attached Items:

Description	FileName
driller's log	Drillers Log.doc

9. Comments

10. Signature

Permitee: Equitable Production Company Date: 4/2/2007 (Company)

Signed By: L. Todd Tetrick Title: Director of Drilling (Signature)

INTERNAL USE ONLY

Submit Date: 4/2/2007

Status: Inspr Approved

Date: 4/9/2007

Final PDF Date: 4/9/2007

TOTAL UNIT AREA
= 58.77 ACRES

- DENOTES MINERAL LINE
 - - - - - DENOTES SURFACE LINE
 - - - - - DENOTES SURFACE & MINERAL LINES
 / / / / / DENOTES DMLR PERMIT #1201855

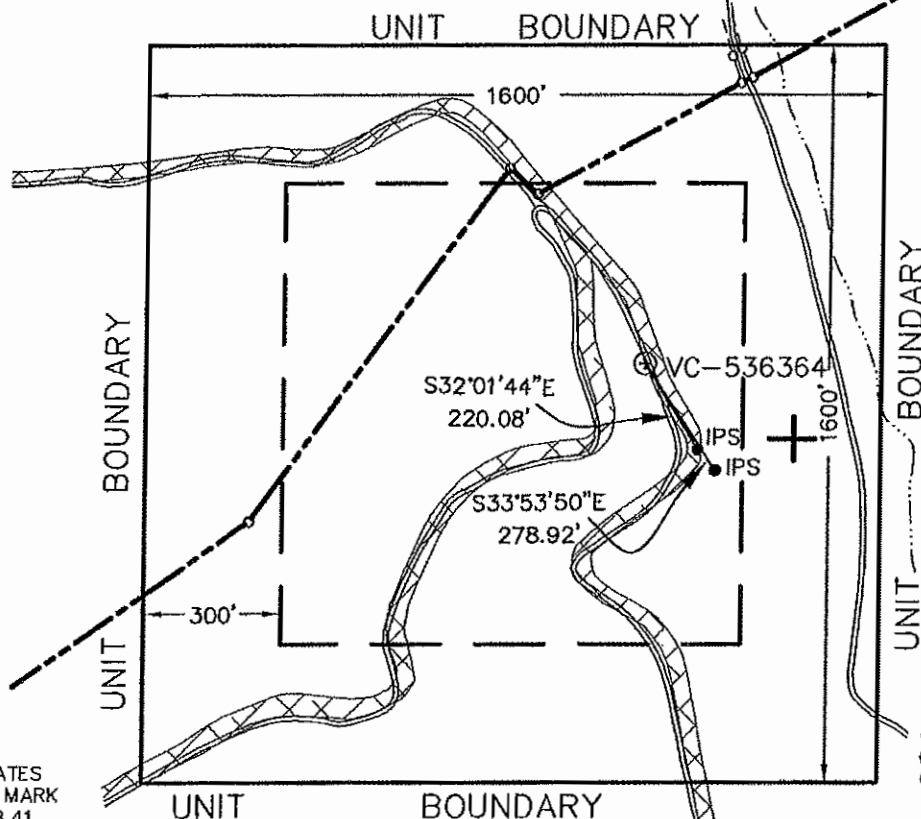
FINAL PLAT

The undersigned hereby certifies that the final location is within ten (10) feet of the location shown on the well plat dated JULY 12, 2006.

LEASE No. 241565L
 WILMA C. HELTON, et al - surface, oil & gas
 238.00 ACRES
 LEASE No. 244792 / TC-180
 HAGAN & RASNAKE
 1388.30 ACRES
 DICKENSON-RUSSELL COAL COMPANY, LLC/ALPHA
 LAND & RESERVES, LLC/ACIN, LLC/WBRD, LLC - coal
 (less UPPER BANNER)
 CLINCHFIELD COAL COMPANY- UPPER BANNER
 WBRD, LLC - JAWBONE
 GAS 41.96 AC. - 71.40%

5134'
LATITUDE 37°07'30"

LONGITUDE 82°15'00"



(AS-DRILLED)
 STATE PLANE
 NAD 27 COORDINATES
 OF WELL VC-536364
 N 301640.07
 E 901516.61
 LAT 37.101620°
 LON -82.267603°

(AS-DRILLED)
 CCC COORDINATES
 OF WELL VC-536364
 N 607.92
 E 33785.48

COORDINATES
 OF BENCH MARK
 S 77498.41
 E 22826.48
 ELEV. = 1754.09

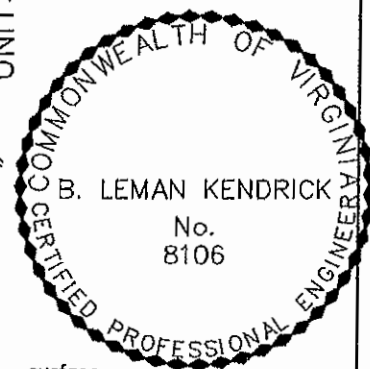
NOTE !!!

WELL COORDINATES ARE BASED ON CLINCHFIELD
 COAL COMPANY'S COORDINATE SYSTEM
 CLINCHFIELD COAL COMPANY COORDINATES ARE
 CALCULATED FROM STATE PLANE WELL COORDINATES.

PROPERTY INFORMATION PROVIDED BY EQUITABLE
 PRODUCTION COMPANY.

ELEVATIONS ARE BASED ON NGS CONTROL ST. PAUL 2.

Lease No. 241640L / T2-124
 JOSEPH H. RASNICK
 300.00 ACRES
 HEARTWOOD FORESTLAND FUND IV, LP - surface
 DICKENSON-RUSSELL COAL COMPANY, LLC/ALPHA
 LAND & RESERVES, LLC/ACIN, LLC/WBRD, LLC - coal
 (less UPPER BANNER)
 CLINCHFIELD COAL COMPANY- UPPER BANNER
 WBRD, LLC - JAWBONE
 GAS 41.96 AC. - 71.40%



WELL LOCATION PLAT

COMPANY Equitable Production Company WELL NAME AND NUMBER VC-536364

TRACT No. LEASE NO. 241640L/T2-124 ELEVATION 2199.60 (GPS) QUADRANGLE NORA

COUNTY DICKENSON DISTRICT ERVINTON SCALE: 1" = 400' DATE SEPTEMBER 19, 2006

THIS PLAT IS A NEW PLAT ; AN UPDATED PLAT ; OR A FINAL LOCATION PLAT x

PROPOSED TOTAL DEPTH OF WELL =

+ DENOTES THE LOCATION OF A WELL ON UNITED STATES TOPOGRAPHIC MAPS, SCALE 1 TO
 24,000, LATITUDE AND LONGITUDE LINES BEING REPRESENTED BY BORDER LINES AS SHOWN.

[Signature] 9/19/06
LICENSED PROFESSIONAL ENGINEER OR LICENSED LAND SURVEYOR

(AFFIX SEAL)

Coal Seams & Open Mines

<u>Type</u>	<u>From</u>
Coal	327'-30',636'-37',1012'-13',1242'-43',1712'-13',
Coal	1745'-47',1785'-86',1952'-53',2167'-68',

Gas and Oil Shows

Gas Tests

<u>Depth</u>	<u>Remarks</u>
196	No Show
400	No Show
600	No Show
800	No Show
1,000	No Show
1,200	No Show
1,400	No Show
1,600	No Show
1,800	No Show
2,000	No Show
2,200	No Show
2,400	No Show
2,557	No Show

Survey Results

<u>Depth</u>	<u>Direction/Distance/Degrees From True Vertical</u>
196	1/4
400	1/4
600	1/4
800	1/4
1,000	1/4
1,200	1/4
1,400	1/4
1,600	1/4
1,800	1/4
2,000	1/4
2,200	1/2
2,400	1/2
2,557	1/2

Casing Outside Diameter	Casing Data		Hole Size	Cement used in Cu. ft.	Cmtd To Surface	Date Cemented Cement Baskets
	Casing Interval					
12 3/4	20		15			
8 5/8	403		12 1/4	359.90	09/16/2006	264
4 1/2	2529		6 1/2	515.10	09/18/2006	

<u>Tubing</u> <u>Size</u>	<u>Footage</u>
2 3/8	2,488.95
5/8"	2498.05

Drillers
Log

<u>Formation</u> <u>Name</u>	<u>Depth</u> <u>Top</u>	<u>Depth</u> <u>Bottom</u>	<u>Formation</u> <u>Thickness</u>
Aily	759.50	759.90	0.40
sand & shale	759.90	842.00	82.10
Raven	842.00	844.80	2.80
sand & shale	844.80	970.00	125.20
Jawbone	970.00	971.90	1.90
Rider			
sand & shale	971.90	1,003.80	31.90
Jawbone	1,003.80	1,007.80	4.00
sand & shale	1,007.80	1,116.50	108.70
Tiller	1,116.50	1,118.00	1.50
sand & shale	1,118.00	1,233.50	115.50
Upper	1,233.50	1,234.50	1.00
Seaboard A			
sand & shale	1,234.50	1,267.50	33.00
Upper	1,267.50	1,268.50	1.00
Seaboard			
sand & shale	1,268.50	1,387.00	118.50
Greasy Creek	1,387.00	1,389.00	2.00
sand & shale	1,389.00	1,463.50	74.50
Middle	1,463.50	1,464.70	1.20
Seaboard			
sand & shale	1,464.70	1,497.00	32.30
Lower	1,497.00	1,497.80	0.80
Seaboard			
sand & shale	1,497.80	1,561.00	63.20
Unnamed A	1,561.00	1,561.00	0.00
sand & shale	1,561.00	1,625.00	64.00
Upper	1,625.00	1,625.00	0.00
Horsepen			
sand & shale	1,625.00	1,664.30	39.30
Middle	1,664.30	1,665.80	1.50
Horsepen			
sand & shale	1,665.80	1,742.50	76.70
C Seam	1,742.50	1,743.50	1.00
sand & shale	1,743.50	1,776.70	33.20
War Creek	1,776.70	1,780.40	3.70
sand & shale	1,780.40	1,806.50	26.10
Unnamed C	1,806.50	1,807.30	0.80
sand & shale	1,807.30	1,879.30	72.00
Lower	1,879.30	1,881.50	2.20
Horsepen			
sand & shale	1,881.50	1,942.50	61.00
Pocahontas #9	1,942.50	1,944.30	1.80
sand & shale	1,944.30	2,275.00	330.70
Pocahontas #6	2,275.00	2,275.40	0.40
sand & shale	2,275.40	2,449.00	173.60

Pocahontas #3	2,449.00	2,451.90	2.90
sand & shale	2,451.90	2,557.00	105.10



Commonwealth of Virginia
Department of Mines, Minerals, and Energy
Division of Gas and Oil
P.O. Box 1416; Abingdon, VA 24212
Telephone: (276) 676-5423

Tracking Number: 140
Company: Equitable Production Company
File Number: DI-1578
Operations Name: VC-536364 W/PL
Operation Type: Coalbed/Pipeline
Completion Report Type: Original

COMPLETION REPORT (DGO-GO-15)

Well Type: Coalbed/Pipeline	Date Well Completed: 9/28/2006
Driller's Total Depth: 2,557	Log's Total Depth: 2,552

1. Changes In Casing/Tubing from Approved Drilling Report

Description	FileName

2. Stimulation Record

☒ Stimulated ☐ Not Stimulated ☐ Gob

Description	FileName
treatment summary 536364	treatment summary.doc

3. Final Production

Description	FileName
final production 536364	Final Production.doc

4. Comments

Notes:

5. Signature

Permittee: Equitable Production Company Date: 4/2/2007 7:59:06 AM (Company)

By: L. Todd Tetrick Title: Director of Drilling (Signature)

INTERNAL USE ONLY

Submit Date: 4/2/2007

Status: Inspr Approved

Date: 5/2/2007

Final PDF Date: 7/6/2007

[REDACTED]

Date	09/26/2006		
FracType	70Q	Foam	
Zone		Poca#9/Poca#3	
# of Perfs	24		
From/To	1,952	2,456	
BD Press	2,444		
ATP Psi	3,018		
Avg Rate	19		
Max Press Psi	3,632		
ISIP Psi	1,931		
10min SIP	1,493		5 min.
		1.12	
Frac Gradient			
Sand Proppant	55.01		
Water-bbl	234		
SCF N2	300,370		
Acid-gal	1,000	gal	
		10%MSA	

[REDACTED]

Date	09/26/2006		
FracType	70Q	Foam	
Zone		C-Sm/ Wcrk/ L Hrspn	
# of Perfs	35		
From/To	1,742	1,882	
BD Press	1,899		

ATP Psi		2,730	
Avg Rate		38	
Max Press Psi		3,021	
ISIP Psi		2,005	
10min SIP	1,654		5 min.
		1.28	
Frac Gradient			
Sand Proppant		82.13	
Water-bbl		309	
SCF N2		383,610	
Acid-gal	1,000	gal	
		10%MSA	

Date 09/26/2006

FracType	70Q	Foam
Zone		Grsyerk/M&L Sbrd/M Hrspn
# of Perfs		31
From/To		1,430 1,667
BD Press		2,843
ATP Psi		3,052
Avg Rate		24
Max Press Psi		3,224
ISIP Psi		2,049
10min SIP	1,446	5 min.
		1.56
Frac Gradient		

Sand
Proppant 65.53

Water-bbl 233
SCF N2 347,893

Acid-gal 1,000 gal
10%MSA

Date 09/26/2006

FracType 70Q Foam
Zone Tiller/U Sbrd A/U Sbrd

of Perfs 32

From/To 1,116 1,269

BD Press 3,258

ATP Psi 2,933
Avg Rate 20

Max Press Psi 3,102

ISIP Psi 1,998

10min SIP 0 5 min.
1.92

Frac Gradient

Sand
Proppant 41.51

Water-bbl 156
SCF N2 189,405

Acid-gal 1,000 gal
10%MSA

Date 09/26/2006

FracType	70Q	Foam	
Zone		Jawbone/ Jawbone Rider	
# of Perfs		31	
From/To		970	1,009
BD Press		2,010	
ATP Psi		2,944	
Avg Rate		21	
Max Press Psi		3,341	
ISIP Psi		2,617	
10min SIP	21		5 min.
		2.83	
Frac Gradient			
Sand Proppant		71.33	
Water-bbl		238	
SCF N2		277,258	
Acid-gal	0	gal	
		10%MSA	

Final Production

Final Production if Gas Zones are
commingled

**After
Stimulation**

BOD

MCFD

**Hours
Tested**

**Rock
Pressure**

77

0

210



Commonwealth of Virginia
Department of Mines, Minerals, and Energy
Division of Gas and Oil
P.O. Drawer 159, Lebanon, VA 24266
Telephone: (276) 415-9700

Tracking Number:	5974
Company:	Range Resources-Pine Mountain,
File Number:	DI-2585
Operations Name:	VC-536371 w/PL
Operation Type:	Coalbed/Pipeline
Drilling Report Type:	Original

DRILLING REPORT (DGO-GO-14)

1. Drilling Data

Date drilling commenced:	11/1/2014	Drilling Contractor:	Gasco #8
Date drilling completed:	11/4/2014	Rig Type:	☒ Rotary ☐ Cable
Driller's Total Depth (feet):	2676.00		
Log Total Depth (feet):	2676.00	Coal Seam at Total Depth:	POCAHONTAS #2

2. Final Location Plat (as required by 4 VAC25-150-360.C.)

Permitted State Plane X:	10386209.4200	Final Plat State Plane X:	10386210.6600
Permitted State Plane Y:	3580701.1600	Final Plat State Plane Y:	3580695.8600

Plat Previously Submitted Or... ☐

List of Attached Items:

Description	FileName
VC-536371 Final Plat	VC-536371 Final Plat.pdf

3. Geological Data

Fresh Water At:

Depth (in feet)	Rate	Unit of Measure

Salt Water At:

Depth (in feet)	Rate	Unit of Measure

Coal Seams:

List of Attached Items:

Description	FileName
VC-536371 Coal	Coal Log.xls

Gas and Oil Shows:

List of Attached Items:

Description	FileName
VC-536371 Gas Shows	536371 Shows.xls

4. Electric Logs (As required by 4VAC25-150-280.A)

List all logs run: GR/CDL/PE/DIL/Neu/TEMP/Audio

Did logs disclose vertical locations of a coal seam?

☐

5. Survey Results (As required by 4VAC25-150-280.B.2)

List of Attached Items:

Description	FileName
VC-536371 Survey	536371 Survey.xls

6. Casing and Tubing Program

List of Attached Items:

Description	FileName
VC-536371 Casing/Tubing	536371 Casing.xls

7. Remarks

Use this space to note any conditions or occurrences, such as lost circulation, fishing jobs, junk left in hole, sidetracks, squeeze jobs, etc., not shown above. Include data and depth of condition/occurrence.

8. Drillers Log

Compiled By: Range Resources

List of Attached Items:

Description	FileName
VC-536371 Driller's Log	Drillers Log.xls

9. Comments

10. Signature

Permittee: Range Resources-Pine Mountain, Date: 1/7/2015

Signed By: Laura Murray Title: Regulatory Compliance Specialist

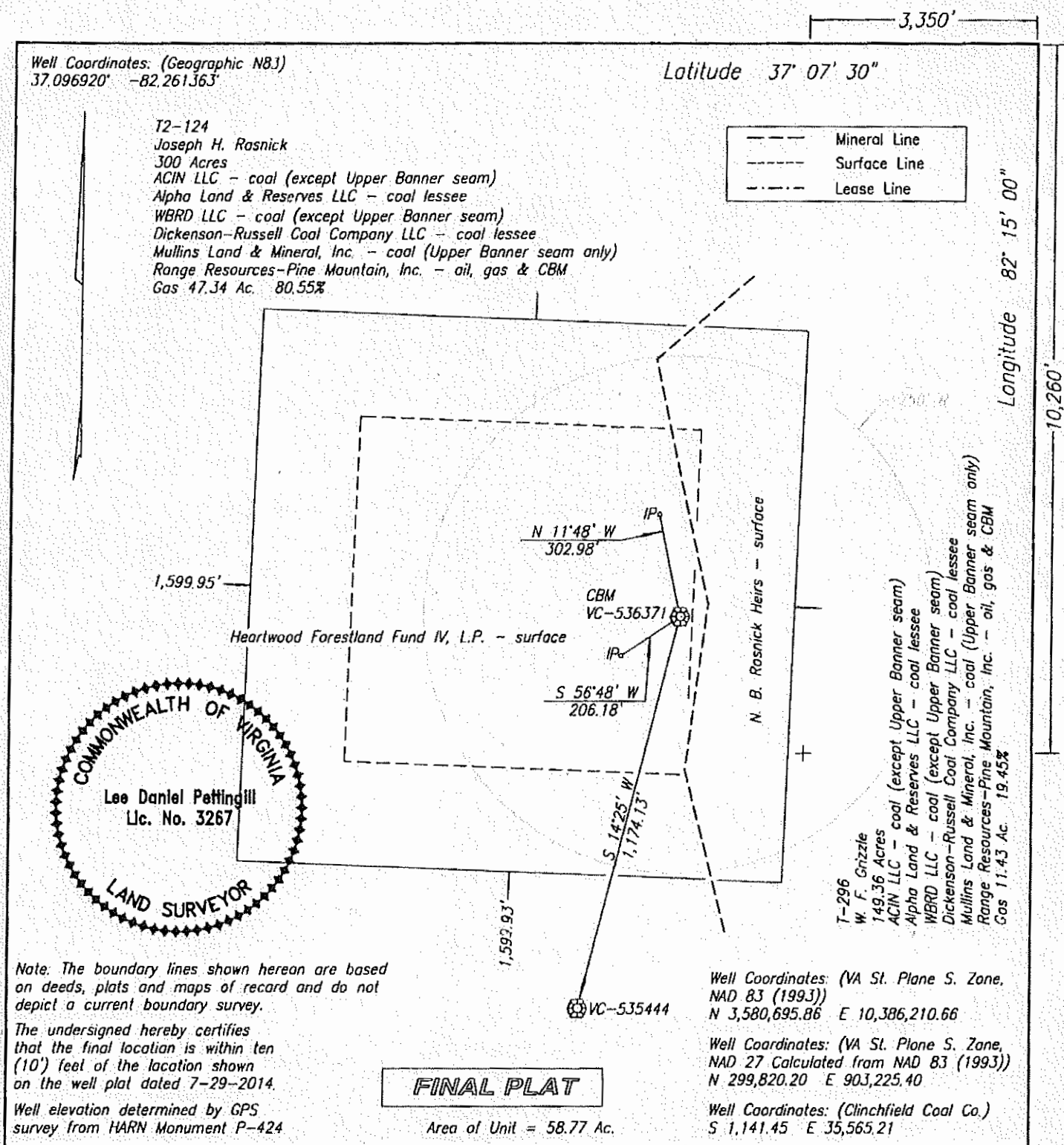
INTERNAL USE ONLY

Submit Date: 1/7/2015

Status: A

Date: 2/2/2015

Final PDF Date: 3/12/2015



WELL LOCATION PLAT NORA GRID BB-59

COMPANY Range Resources-Pine Mountain, Inc. WELL NAME AND NUMBER VC-536371
TRACT NO. Joseph H. Rasnick ELEVATION 2,304.04' QUADRANGLE Nora
COUNTY Dickenson DISTRICT Ervinton SCALE 1" = 400' DATE 11-03-2014
This Plat is a new plat ; an updated plat ; or a final location plat x

+ Denotes the location of a well on United States topographic Maps, scale 1 to 24,000, latitude and longitude lines being represented by border lines as shown.

Handwritten signature: L. D. P. 2-11

Licensed Professional Engineer or Licensed Land Surveyor

Latitude 37° 07' 30"

Mineral Line
Surface Line
Lease Line

Longitude 82° 15' 00"

10,260,

1,599.95'

Heartwood Forestland Fund IV, L.P. - surface

N 11°48' W
302.98'

CBM
VC-536371

$$\begin{array}{r} S\ 56^{\circ}48' \\ \hline 206.18' \end{array}$$

S 14° 25' W
1.174.13'

N. B. Rasnick Heirs - surface

296

W. F. Grizzle
149.36 Acres

UPHOLD LLC - coal (except Upper Banner seam)
Upho Land & Reserves LLC - coal lessee

WBRO LLC - coal (except Upper Banner seam)
Dickenson-Russell Coal Company LLC - coal lease

Mullins Land & Mineral, Inc. -- coal (Upper Banner seam only)
Range Resources--Pine Mountain, Inc. -- oil, gas & CBM

Gas 11.43 Ac. 19.45%

A circular professional seal for Lee Daniel Pettingill, a Land Surveyor in the Commonwealth of Virginia. The seal features a scalloped outer border. Inside the border, the words "COMMONWEALTH OF VIRGINIA" are arched across the top, and "LAND SURVEYOR" is arched across the bottom. In the center of the seal, the name "Lee Daniel Pettingill" is printed above the license number "Lic. No. 3267". A rectangular stamp is partially visible on the right side of the seal.

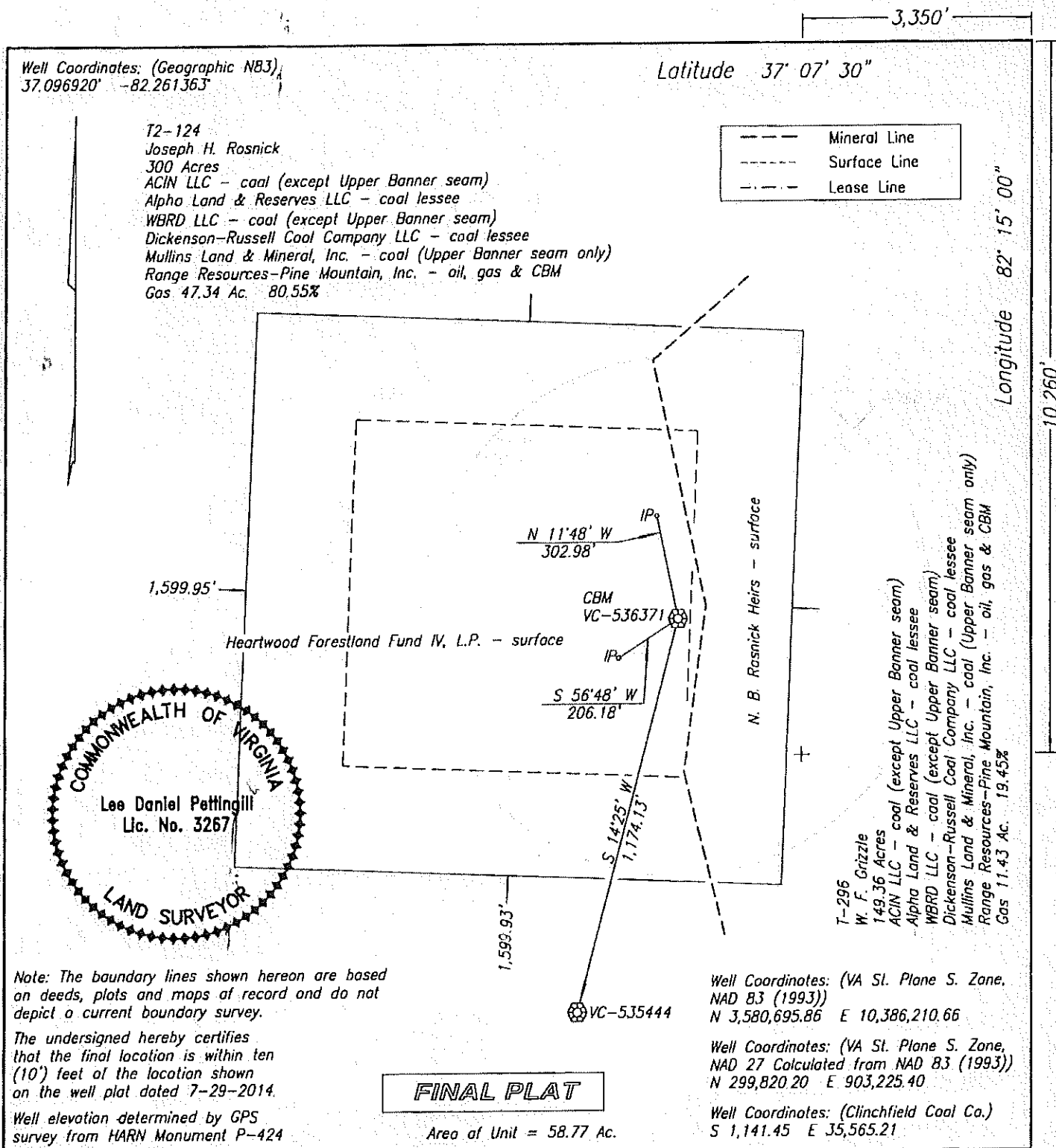
FINAL PLAT

Well Coordinates: (Clinchfield Coal Co.)
S 1,141.45 E 35,565.21

WELL LOCATION PLAT NORA GRID 8B-59

+ Denotes the location of a well on United States topographic Maps, scale 1 to 24,000, latitude and longitude lines being represented by border lines as shown.

~~Licensed Professional Engineer or Licensed Land Surveyor~~



WELL LOCATION PLAT NORA GRID BB-59

COMPANY Range Resources-Pine Mountain, Inc. WELL NAME AND NUMBER VC-536371
TRACT NO. Joseph H. Rasnick ELEVATION 2,304.04' QUADRANGLE Nora
COUNTY Dickenson DISTRICT Ervinton SCALE 1" = 400' DATE 11-03-2014
This Plat is a new plat ; an updated plat ; or a final location plat x
+ Denotes the location of a well on United States topographic Maps, scale 1 to 24,000, latitude and longitude lines being represented by border lines as shown.

Licensed Professional Engineer or Licensed Land Surveyor

Coal Seams	536371					
				MINING IN AREA		
NAME	TOP	BOTTOM	THICKNESS	YES	NO	MINED OUT
Coal	255	256	1		No	
Coal	317	318	1		No	
Coal	390	391	1		No	
Coal	400	401	1		No	
Coal	725	726	1		No	
Coal	870	871	1		No	
Coal	988	989	1		No	
Coal	1075	1076	1		No	
Coal	1571	1572	1		No	
Coal	1604	1605	1		No	
Coal	1763	1764	1		No	
Coal	1888	1889	1		No	
Coal	1920	1921	1		No	
Coal	1983	1984	1		No	
Coal	2320	2321	1		No	
Coal	2558	2561	3		No	

Gas and Oil Shows

FORMATION	DEPTH	THICKNESS	IPF (MCFD/BOPD)	PRESSURE	HOURS TESTED
	1232		NS		
	1577		NS		
	1924		NS		
	2461		NS		
	2676		Trace		

Survey Results

Depth of Survey	Direction/Distance/Degree From True Vertical
197'	1/4
384'	1/2
571'	1/2
760'	1/2
947'	3/4
1137'	1/4
1327'	1/4
1514'	1/2
1703'	1/4
1892'	1/2
2082'	1/2
2273'	1/2
2401'	3/4
2588'	1/2

Casing/Tubing Program

Casing Type	Casing Size	Casing Interval	Hole Size	Cement Used In Cubic Ft.	Cemented To Surface Yes/No	Date Cemented	Packers Or Bridge Plugs Kind/Size/Set	Cement Baskets (ft)
Conductor	13 3/8	0-41'	16 1/4	Sanded In	No			
Water Protection	9 5/8"	0-512'	12 3/8"	240 ft³	Yes	11/01/14		294'
Production Casing	4 1/2"	0-2632'	6 3/8"	526 ft³	Yees	11/04/14		925'
Other Casing And Tubing Left In Well Liners	2 3/8"	0-2575'						

Driller's Log	536371						
		General		Depth	Depth		
Geologic Age	Formation	Lithology	Color	Top	Bottom	Thickness	Remarks
Pennsylvanian		KB		0	8	8	
Pennsylvanian		Sandy Shale		8	11	3	
Pennsylvanian		Sandstone		11	255	244	
Pennsylvanian		Coal		255	256	1	
Pennsylvanian		Sandstone		256	317	61	
Pennsylvanian		Coal		317	318	1	
Pennsylvanian		Sandstone		318	390	72	
Pennsylvanian		Coal		390	391	1	
Pennsylvanian		Sandstone		391	400	9	
Pennsylvanian		Coal		400	401	1	
Pennsylvanian		Sandstone		401	480	79	
Pennsylvanian		Sandy Shale		480	500	20	
Pennsylvanian		Sandstone		500	725	225	
Pennsylvanian		Coal		725	726	1	
Pennsylvanian		Sandstone		726	820	94	
Pennsylvanian		Coal		820	821	1	
Pennsylvanian		Sandstone		821	988	167	
Pennsylvanian		Coal		988	989	1	
Pennsylvanian		Sandstone		989	1075	86	
Pennsylvanian		Coal		1075	1076	1	
Pennsylvanian		Sandy Shale		1076	1105	29	
Pennsylvanian		Sandstone		1105	1571	466	
Pennsylvanian		Coal		1571	1572	1	
Pennsylvanian		Sandy Shale		1572	1604	32	
Pennsylvanian		Coal		1604	1605	1	
Pennsylvanian		Sandy Shale		1605	1763	158	
Pennsylvanian		Coal		1763	1764	1	
Pennsylvanian		Sandy Shale		1764	1888	124	
Pennsylvanian		Coal		1888	1889	1	
Pennsylvanian		Sandy Shale		1889	1920	31	
Pennsylvanian		Coal		1920	1921	1	
Pennsylvanian		Sandy Shale		1921	1983	62	
Pennsylvanian		Coal		1983	1984	1	
Pennsylvanian		Sandy Shale		1984	2370	386	
Pennsylvanian		Coal		2370	2371	1	
Pennsylvanian		Sandstone		2371	2558	187	
Pennsylvanian		Coal		2558	2561	3	
Pennsylvanian		Sandy Shale		2561	2676	115	
				2676	TD	0	



Commonwealth of Virginia
Department of Mines, Minerals, and Energy
Division of Gas and Oil
P.O. Drawer 159, Lebanon, VA 24266
Telephone: (276) 415-9650

Tracking Number: 6105
Company: Range Resources-Pine Mountain,
File Number: DI-2585
Completion Report Type: Original

COMPLETION REPORT (DGO-GO-15)

Well Type:	Coalbed/Pipeline	Date Well Completed:	12/10/2014
Driller's Total Depth:	2676.00	Log's Total Depth:	2676.00

1. Changes In Casing/Tubing from Approved Drilling Report

Description	FileName

2. Stimulation Record

Stimulation Status: ☒ Stimulated ☐ GOB ☐ Not Stimulated ☐ Service Well

Description	FileName
VC-536371 Completions Report	PMD-CompletionReport.pdf

3. Final Production

Description	FileName
VC-536371 Final Production	Final_Prod.xls

4. Comments

Notes:

5. Signature

Permittee: Range Resources-Pine Mountain, Date: 1/15/2015 (Company)

By: Bonnie Kelley Title: Regulatory Compliance Technician (Signature)

INTERNAL USE ONLY

Submit Date: 1/15/2015

Status: Approved

Date: 2/9/2015

Final PDF Date: 3/12/2015

Range Resources - Pine Mountain

12/12/2014 1:23:37 PM

Completion Report**105009134 --536371 VC-536371**

Stage:	Stage 01	Service Co.	Nabors (Superior)	Avg DH Rate:	49.0
Stage Date:	12/10/2014 2:15:00 PM	Fluid Type:	70Q Foam	Max DH Rate:	58.0
Perf Date:	12/10/2014 2:15:00 PM	BD:	0	Total Slurry Volume:	556
Logging Co.	Blue Dot	ISIP:	0	Total Fluid Volume:	536
Formation	Pocohontas #8, #6, #2	Avg Press:	3497	Avg N2 Rate:	38,000
Perf Top:	2153.3	Max Treat Pressure:	3538	Max N2 Rate:	45,000
Perf Bottom:	2565.9	Final ISIP:	1157	Total N2 Volume:	1,016,900
# Shots:	31	2 Min SIP:	823	Max DH PPA:	2.1
Perf Size:	0.52	5 Min SIP:	0	Total Proppant Sks:	203
Perf Comments:		10 Min SIP:	0	Total Acid:	750
		Sand Mesh:	20/40 Sand	Acid Type:	15% HCL
Comments:		Frac Gradient:	0		

Stage:	Stage 02	Service Co.	Nabors (Superior)	Avg DH Rate:	53.0
Stage Date:	12/10/2014 5:00:00 PM	Fluid Type:	70Q Foam	Max DH Rate:	58.5
Perf Date:	12/10/2014 5:00:00 PM	BD:	2012	Total Slurry Volume:	285
Logging Co.	Blue Dot	ISIP:	0	Total Fluid Volume:	264
Formation	Horsepen, X Seam, X Seam	Avg Press:	2892	Avg N2 Rate:	41,000
Perf Top:	1979.6	Max Treat Pressure:	3205	Max N2 Rate:	45,000
Perf Bottom:	2062.35	Final ISIP:	1113	Total N2 Volume:	612,100
# Shots:	24	2 Min SIP:	1103	Max DH PPA:	0.0
Perf Size:	0.52	5 Min SIP:	0	Total Proppant Sks:	182
Perf Comments:		10 Min SIP:	0	Total Acid:	500
		Sand Mesh:	20/40 Sand	Acid Type:	15% HCL
Comments:		Frac Gradient:	0		

Stage:	Stage 03	Service Co.	Nabors (Superior)	Avg DH Rate:	49.0
Stage Date:	12/11/2014 10:45:00 AM	Fluid Type:	70Q Foam	Max DH Rate:	51.0
Perf Date:	12/11/2014 10:45:00 AM	BD:	3336	Total Slurry Volume:	293
Logging Co.	Blue Dot	ISIP:	0	Total Fluid Volume:	276
Formation	War Creek, Unnamed C,	Avg Press:	3682	Avg N2 Rate:	35,600
Perf Top:	1879.7	Max Treat Pressure:	3912	Max N2 Rate:	37,200
Perf Bottom:	1937.8	Final ISIP:	1582	Total N2 Volume:	481,000
# Shots:	27	2 Min SIP:	0	Max DH PPA:	1.5
Perf Size:	0.52	5 Min SIP:	0	Total Proppant Sks:	197
Perf Comments:		10 Min SIP:	0	Total Acid:	500
		Sand Mesh:	20/40 Sand	Acid Type:	15% HCL
Comments:		Frac Gradient:	1.3		

Stage:	Stage 04	Service Co.	Nabors (Superior)	Avg DH Rate:	44.0
Stage Date:	12/11/2014 1:15:00 PM	Fluid Type:	70Q Foam	Max DH Rate:	47.0
Perf Date:	12/11/2014 1:15:00 PM	BD:	2769	Total Slurry Volume:	277

Range Resources - Pine Mountain

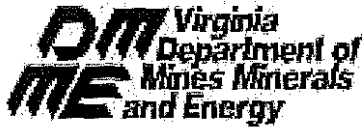
12/12/2014 1:23:37 PM

Completion Report**105009134 --536371 VC-536371**

Logging Co.	Blue Dot	ISIP:	0	Total Fluid Volume:	257
Formation	M.Seaboard, I.Seaboard, Un A,	Avg Press:	3721	Avg N2 Rate:	31,600
Perf Top:	1563.5	Max Treat Pressure:	3823	Max N2 Rate:	32,400
Perf Bottom:	1844.7	Final ISIP:	1123	Total N2 Volume:	522,000
# Shots:	30	2 Min SIP:	0	Max DH PPA:	1.8
Perf Size:	0.52	5 Min SIP:	0	Total Proppant Sks:	241
Perf Comments:		10 Min SIP:	0	Total Acid:	750
		Sand Mesh:	20/40 Sand	Acid Type:	15% HCL
Comments:		Frac Gradient:	1.2		

Stage:	Stage 05	Service Co.	Nabors (Superior)	Avg DH Rate:	44.0
Stage Date:	12/11/2014 2:45:00 PM	Fluid Type:	70Q Foam	Max DH Rate:	50.0
Perf Date:	12/11/2014 2:45:00 PM	BD:	3906	Total Slurry Volume:	197
Logging Co.	Blue Dot	ISIP:	0	Total Fluid Volume:	183
Formation	Up Seaboard A, Up Seaboard,	Avg Press:	3889	Avg N2 Rate:	32,800
Perf Top:	1307.5	Max Treat Pressure:	4028	Max N2 Rate:	35,600
Perf Bottom:	1518.6	Final ISIP:	1758	Total N2 Volume:	372,000
Perf Size:	0.52	2 Min SIP:	1167	Max DH PPA:	1.5
		5 Min SIP:	1147	Total Proppant Sks:	158
Perf Comments:		10 Min SIP:	0	Total Acid:	250
		Sand Mesh:	20/40 Sand	Acid Type:	15% HCL
Comments:		Frac Gradient:	1.4		

Final Production After Stimulation				
	BOD	MCFD	Hours Tested	Rock Pressure
Final/Commingled Zones				
commingled		104	in-line	



Commonwealth of Virginia
 Department of Mines, Minerals, and Energy
 Division of Gas and Oil
 P.O. Box 1416; Abingdon, VA 24212
 Telephone: (276) 676-5423

Tracking Number: 297
 Company: Equitable Production Company
 File Number: DI-1590
 Operations Name: VC-535444 W/PL
 Operation Type: Coalbed/Pipeline
 Drilling Report Type: Original

DRILLING REPORT (DGO-GO-14)

1. Drilling Data

Date drilling commenced: 10/11/2006 Drilling Contractor: Gasco
 Date drilling completed: 10/15/2006 Rig Type: ☒ Rotary ☐ Cable Tool
 Driller's Total Depth (feet): 2,722
 Log Total Depth (feet): 2,771 Coal Seam At Total Depth POCAHONTAS #2

2. Final Location Plat (as required by 4 VAC25-150-360.C.)

Permitted State Plane X 902,932 Final Plat State Plane X: 902,933
 Permitted State Plane Y: 298,683 Final Plat State Plane Y: 298,684

☐ Plat Previously Submitted Or...

List of Attached Items:

Description	FileName
final plat 535444	VC-535444 final plat.tif

3. Geological Data

Fresh Water At:

Depth (in feet)	Rate	Unit of Measure

Salt Water At:

Depth (in feet)	Rate	Unit of Measure

Coal Seams

List of Attached Items:

Description	FileName
coal seams 535444	Coal Seams.doc

Gas and Oil Shows

List of Attached Items:

Description	FileName
gas shows 535444	Gas and Oil Shows.doc

4. Electric Logs (As required by 4VAC25-150-280.A.)

List all logs run: GR/Density/Temp/Induction/Neutron

Did logs disclose vertical locations of a coal seam? ☒ Yes ☐ No

5. Survey Results (As required by 4VAC25-150-280.B.2)

List of Attached Items:

Description	FileName
surveys 535444	Survey Results.doc

6. Casing and Tubing Program

List of Attached Items:

Description	FileName
csg 535444	Casing Data.doc
tbg 535444	Tubing Size.doc

7. Remarks

Use this space to note any conditions or occurrences, such as lost circulation, fishing jobs, junk left in hole, sidetracks, squeeze jobs, etc., not shown above. Include data and depth of condition/occurrence.

8. Drillers Log

Compiled By: _____

List of Attached Items:

Description	FileName
drillers log 535444	Drillers Log.doc

9. Comments

10. Signature

Permitee: Equitable Production Company Date: 6/3/2007 (Company)

Signed By: L. Todd Tetrick Title: Director of Drilling (Signature)

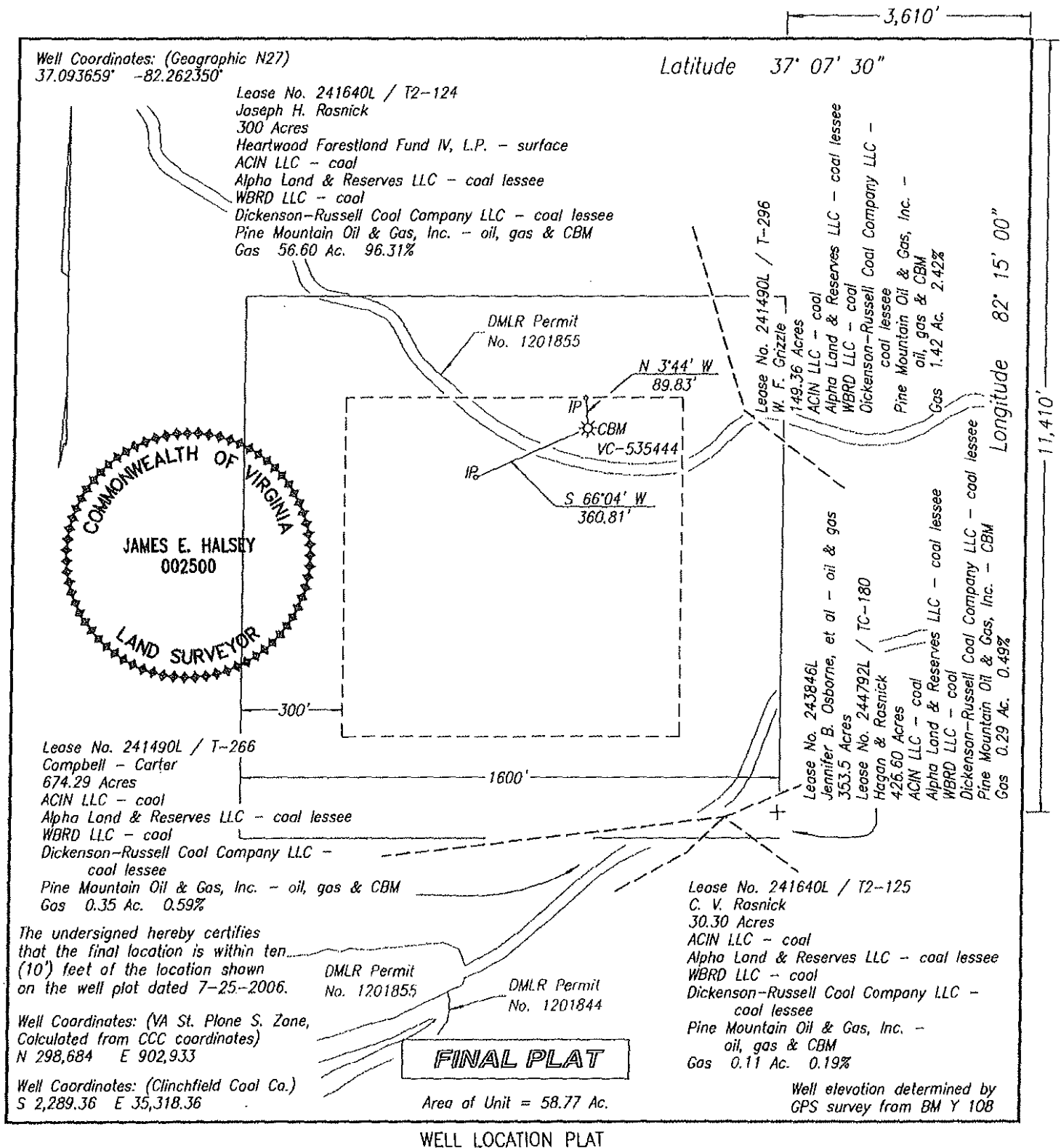
INTERNAL USE ONLY

Submit Date: 6/3/2007

Status: Inspr Approved

Date: 6/11/2007

Final PDF Date: 7/3/2007



WELL LOCATION PLAT

COMPANY Equitable Production Company WELL NAME AND NUMBER VC-535444
 TRACT NO. T2-124 ELEVATION 2,371.72' QUADRANGLE Nora
 COUNTY Dickenson DISTRICT Erivinton SCALE 1" = 400' DATE 10-12-2006

This Plat is a new plat ; an updated plat ; or a final location plat x
 + Denotes the location of a well on United States topographic Maps, scale 1 to 24,000, latitude and longitude lines being represented by border lines as shown.

James E. Halsey
 Licensed Professional Engineer or Licensed Land Surveyor

Coal Seams & Open Mines

<u>Type</u>	<u>From</u>
Coal	1153'-55',1594'-96',1902'-04',1937'-39',1996'-98'
Coal	2034'-36',2366'-68',2621'-23'
Open Mine	465'-67'

Gas and Oil Shows

Gas Tests

<u>Depth</u>	<u>Remarks</u>
2,216	No Show
2,403	No Show
2,620	No Show
2,772	No Show
224	No Show
411	No Show
615	No Show
806	No Show
1,023	No Show
1,209	No Show
1,429	No Show
1,615	No Show
1,811	No Show
1,998	No Show

Survey Results

<u>Depth</u>	<u>Direction/Distance/Degrees From True Vertical</u>
224	1/4
411	1/4
615	1/4
806	1/4
1,023	1/4
1,209	1/4
1,429	1/4
1,615	1/2
1,811	1/2
1,998	1/2
2,216	1/2
2,403	1/2
2,620	1/2
2,772	1/2

Casing Outside Diameter	Casing Interval	Hole Size	Cement used in Cu. ft.	Date Cemented Cmtd To Surface	Cement Baskets
12 3/4	22	15			
8 5/8	582	12 1/4	541.62	10/12/2006	405' & 449'
4 1/2	2719	6 1/2	637.50	10/14/2006	

<u>Tubing</u> <u>Size</u>	<u>Footage</u>
2 3/8	2,670.15
5/8"	2679.4'

Drillers
Log

<u>Formation Name</u>	<u>Depth Top</u>	<u>Depth Bottom</u>	<u>Formation Thickness</u>
Aily	924.50	926.50	2.00
sand & shale	926.50	1,023.50	97.00
Raven	1,023.50	1,029.00	5.50
sand & shale	1,029.00	1,124.50	95.50
Jawbone Rider	1,124.50	1,125.70	1.20
sand & shale	1,125.70	1,257.00	131.30
Tiller	1,257.00	1,258.30	1.30
sand & shale	1,258.30	1,378.50	120.20
Upper Seaboard A	1,378.50	1,379.50	1.00
sand & shale	1,379.50	1,414.00	34.50
Upper Seaboard	1,414.00	1,415.20	1.20
sand & shale	1,415.20	1,579.00	163.80
Greasy Creek	1,579.00	1,580.00	1.00
sand & shale	1,580.00	1,626.50	46.50
Middle Seaboard	1,626.50	1,627.30	0.80
sand & shale	1,627.30	1,655.50	28.20
Lower Seaboard	1,655.50	1,656.80	1.30
sand & shale	1,656.80	1,722.00	65.20
Unnamed A	1,722.00	1,722.50	0.50
sand & shale	1,722.50	1,820.00	97.50
Middle Horsepen	1,820.00	1,821.70	1.70
sand & shale	1,821.70	1,901.50	79.80
C Seam	1,901.50	1,902.80	1.30
sand & shale	1,902.80	1,941.00	38.20
War Creek	1,941.00	1,942.80	1.80
sand & shale	1,942.80	1,970.50	27.70
Unnamed C	1,970.50	1,971.50	1.00
sand & shale	1,971.50	1,985.50	14.00
Beckley	1,985.50	1,988.50	3.00
sand & shale	1,988.50	2,036.50	48.00
Lower Horsepen	2,036.50	2,039.00	2.50
sand & shale	2,039.00	2,150.00	111.00
Pocahontas #9	2,150.00	2,150.30	0.30
sand & shale	2,150.30	2,444.00	293.70
Pocahontas #6	2,444.00	2,444.50	0.50
sand & shale	2,444.50	2,621.50	177.00
Pocahontas #3	2,605.00	2,607.00	2.00
sand & shale	2,607.00	2,621.50	14.50
Pocahontas #2	2,621.50	2,625.00	3.50
sand & shale	2,625.00	2,772.00	147.00



Commonwealth of Virginia
Department of Mines, Minerals, and Energy
Division of Gas and Oil
P.O. Box 1416; Abingdon, VA 24212
Telephone: (276) 676-5423

Tracking Number: 284
Company: Equitable Production Company
File Number: DI-1590
Operations Name: VC-535444 W/PL
Operation Type: Coalbed/Pipeline
Completion Report Type: Original

COMPLETION REPORT (DGO-GO-15)

Well Type:	Coalbed/Pipeline	Date Well Completed:	10/24/2006
Driller's Total Depth:	2,722	Log's Total Depth:	2,771

1. Changes In Casing/Tubing from Approved Drilling Report

Description	FileName

2. Stimulation Record

☒ Stimulated ☐ Not Stimulated ☐ Gob

Description	FileName
treatment summary	Stage1.doc

3. Final Production

Description	FileName
final production 535444	Final Production.doc

4. Comments

Notes:

5. Signature

Permittee: Equitable Production Company Date: 6/3/2007 4:12:08 PM (Company)

By: L. Todd Tetrick Title: Director of Drilling (Signature)

INTERNAL USE ONLY

Submit Date: 6/3/2007

Status: Inspr Approved

Date: 8/6/2007

Final PDF Date: 8/6/2007

[REDACTED]

Date	10/20/2006		
FracType	70Q	Foam	
Zone	Poca #6/#3/#2		
# of Perfs	32		
From/To	2,443	2,628	
BD Press	3,692		
ATP Psi	3,167		
Avg Rate	14		
Max Press Psi	3,405		
ISIP Psi	2,090		
10min SIP	1,610		5 min.
		0.99	
Frac Gradient			
Sand Proppant	70.71		
Water-bbl	233		
SCF N2	253,168		
Acid-gal	1,000	gal	
		10%MSA	

[REDACTED]

Date	10/20/2006		
FracType	70Q	Foam	
Zone	C-Sm/ WrCrk/ Unnmd C/ Bkl.		
# of Perfs	39		
From/To	1,901	2,040	

BD Press		2,564	
ATP Psi		3,113	
Avg Rate		30	
Max Press Psi		3,289	
ISIP Psi		2,039	
10min SIP	1,749		5 min.
		1.20	
Frac Gradient			
Sand Proppant		115.92	
Water-bbl		383	
SCF N2		575,326	
Acid-gal	1,000	gal	
		10%MSA	
Date		10/20/2006	
FracType	70Q	Foam	
Zone		Grsyck/M&L Sbrd/M Hrspn	
# of Perfs		29	
From/To		1,579	1,823
BD Press		2,972	
ATP Psi		2,601	
Avg Rate		21	
Max Press Psi		2,850	
ISIP Psi		1,646	
10min SIP	1,436		5 min.
		1.17	
Frac Gradient			

Sand
Proppant

58.39

Water-bbl
SCF N2

226
246,400

Acid-gal

1,000

gal
10%MSA

Date

10/20/2006

FracType
Zone

70Q

Foam

Jwbn Rdtr/Tllr/U Sbrd A/U .

of Perfs

32

From/To

1,124

1,416

BD Press

2,552

ATP Psi

2,969

Avg Rate

25

Max Press Psi

3,354

ISIP Psi

1,760

10min SIP

0

5 min.

1.70

Frac Gradient

Sand
Proppant

55.74

Water-bbl
SCF N2

184
205,468

Acid-gal

1,000

gal
10%MSA

Date	10/20/2006		
FracType	70Q	Foam	
Zone			Raven
# of Perfs			34
From/To			1,023 1,051
BD Press			2,288
ATP Psi			2,676
Avg Rate			34
Max Press Psi			2,892
ISIP Psi			1,719
10min SIP	1,291		5 min.
		1.81	
Frac Gradient			
Sand Proppant			
		66.68	
Water-bbl		216	
SCF N2		265,983	
Acid-gal	1,000	gal	
		10%MSA	

Final Production

Final Production if Gas Zones are
commingled

**After
Stimulation**

BOD

MCFD

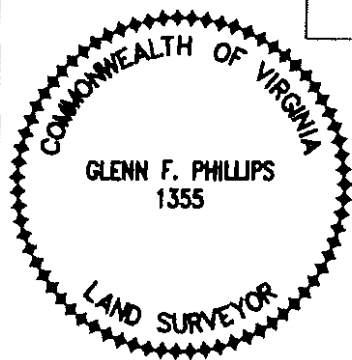
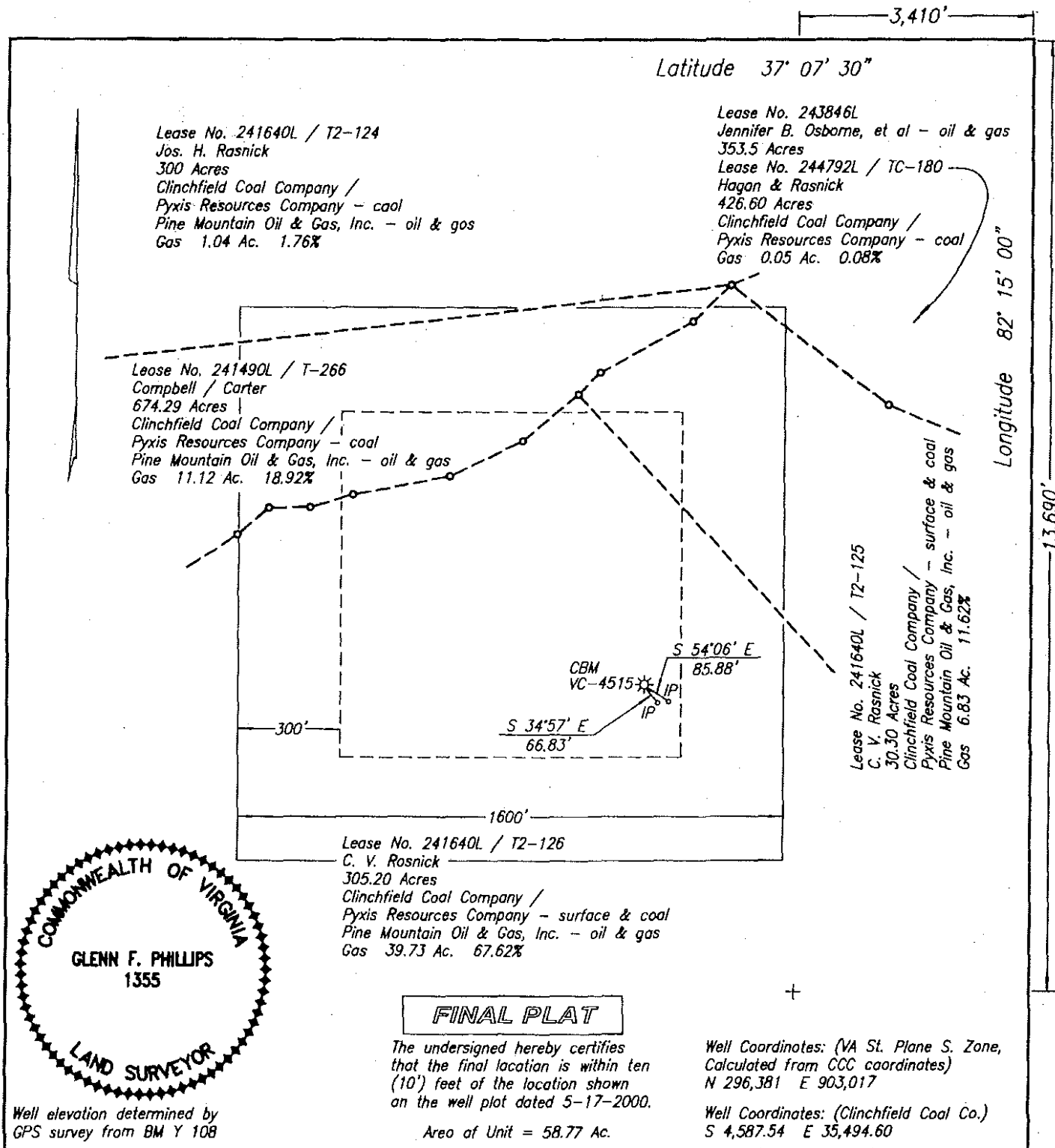
**Hours
Tested**

**Rock
Pressure**

67

0

110



Well elevation determined by GPS survey from BM Y 108

COMPANY Equitable Production Company WELL NAME AND NUMBER VC-4515
 TRACT NO. T2-126 ELEVATION 2255.85 QUADRANGLE Nora
 COUNTY Dickenson DISTRICT Ervington SCALE 1" = 400' DATE 5-01-2001
 This Plat is a new plat ; an updated plat ; or a final location plat x
 + Denotes the location of a well on United States topographic Maps, scale 1 to 24,000, latitude and longitude lines being represented by border lines as shown.

Glenn F. Phillips
 Licensed Professional Engineer or Licensed Land Surveyor



Commonwealth of Virginia
Department of Mines, Minerals, and Energy
Division of Gas and Oil
P.O. Drawer 159, Lebanon, VA 24266
Telephone: (276) 415-9700

Tracking Number:	6121
Company:	Range Resources-Pine Mountain,
File Number:	DI-2595
Operations Name:	VC-536376 w/PL
Operation Type:	Coalbed/Pipeline
Drilling Report Type:	Original

DRILLING REPORT (DGO-GO-14)

1. Drilling Data

Date drilling commenced:	<u>12/22/2014</u>	Drilling Contractor:	<u>Gasco #2</u>
Date drilling completed:	<u>12/30/2014</u>	Rig Type:	☒ Rotary ☐ Cable
Driller's Total Depth (feet):	<u>2660.00</u>		
Log Total Depth (feet):	<u>2664.00</u>	Coal Seam at Total Depth:	<u>POCAHONTAS #2</u>

2. Final Location Plat (as required by 4 VAC25-150-360.C.)

Permitted State Plane X:	<u>10381407.6800</u>	Final Plat State Plane X:	<u>10381403.0800</u>
Permitted State Plane Y:	<u>3579834.0100</u>	Final Plat State Plane Y:	<u>3579829.1400</u>

Plat Previously Submitted Or... ☐

List of Attached Items:

Description	FileName
VC-536376 Final Plat	VC-536376 Final Plat.pdf

3. Geological Data

Fresh Water At:

Depth (in feet)	Rate	Unit of Measure

Salt Water At:

Depth (in feet)	Rate	Unit of Measure

Coal Seams:

List of Attached Items:

Description	FileName
VC-536376 Coal	Coals 536376.xlsx

Gas and Oil Shows:

List of Attached Items:

Description	FileName
VC-536376 Gas Shows	Shows 536376.xlsx

4. Electric Logs (As required by 4VAC25-150-280.A)

List all logs run: GR/CDL/PE/DIL/Neu/TEMP/Audio

Did logs disclose vertical locations of a coal seam?

☐

5. Survey Results (As required by 4VAC25-150-280.B.2)

List of Attached Items:

Description	FileName
VC-536376 Survey	Survey 536376.xlsx

6. Casing and Tubing Program

List of Attached Items:

Description	FileName
VC-536376 Casing	Casing 536376.xlsx

7. Remarks

Use this space to note any conditions or occurrences, such as lost circulation, fishing jobs, junk left in hole, sidetracks, squeeze jobs, etc., not shown above. Include data and depth of condition/occurrence.

8. Drillers Log

Compiled By: Range Resources

List of Attached Items:

Description	FileName
VC-536376 Driller's Log	Drilling 536376.xlsx

9. Comments

plat corrected. [2/2/2015, jal]
wrong plat. [2/2/2015, jal]

10. Signature

Permittee: Range Resources-Pine Mountain, Date: 2/2/2015
Signed By: Laura Murray Title: Regulatory Compliance Specialist

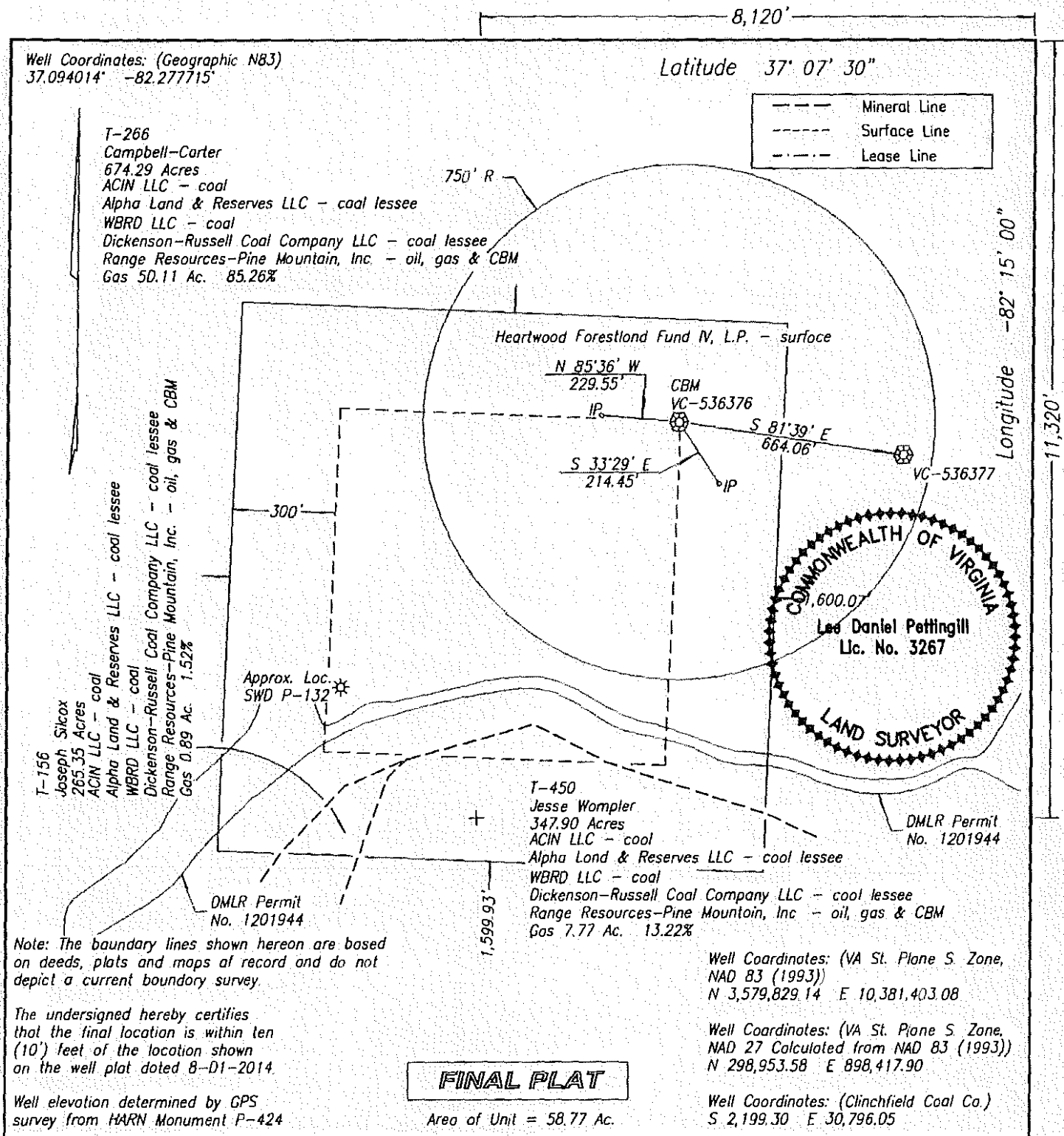
INTERNAL USE ONLY

Submit Date: 2/2/2015

Status: A

Date: 2/2/2015

Final PDF Date: 3/12/2015

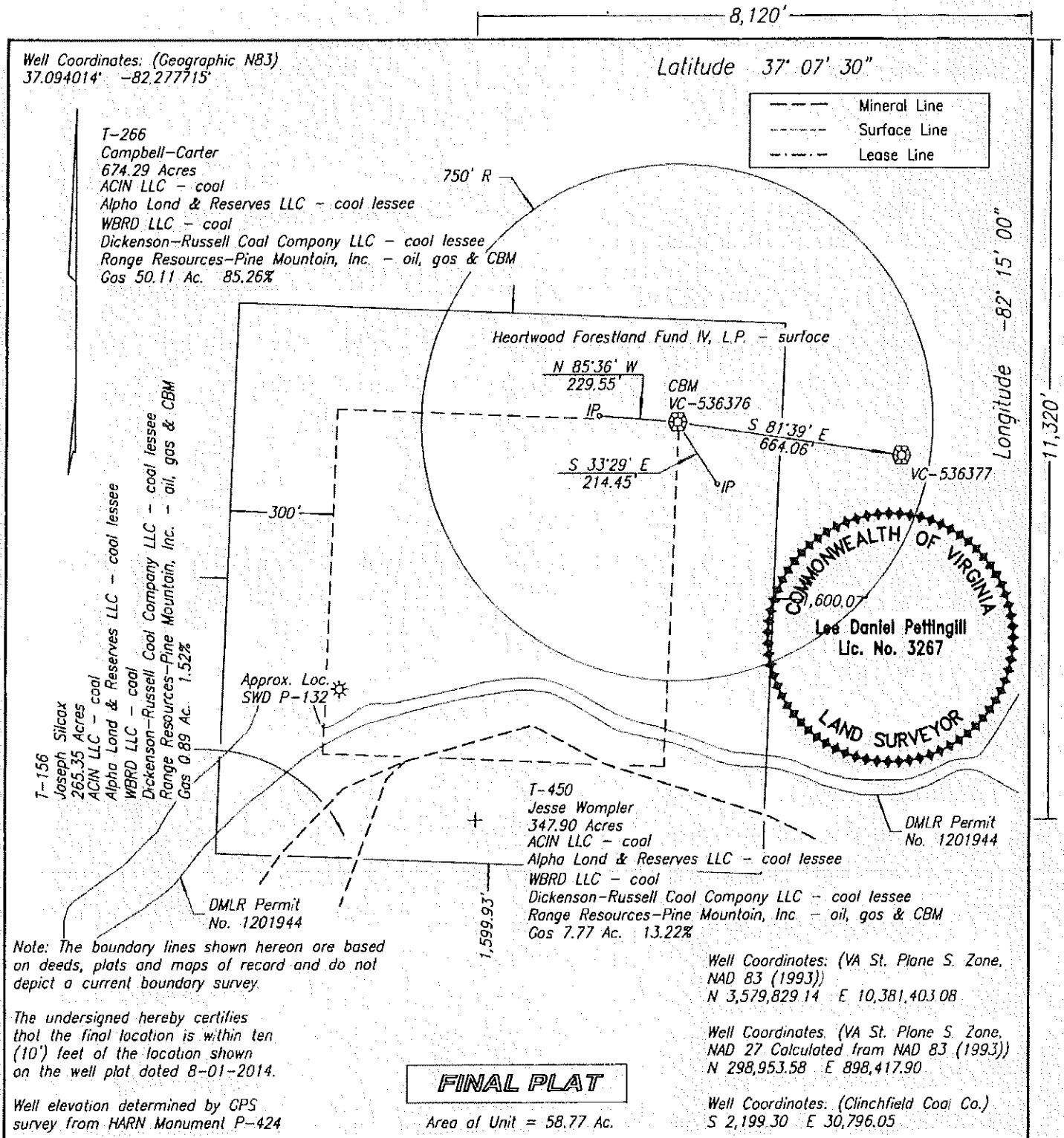


WELL LOCATION PLAT NORA GRID BC-56

COMPANY Range Resources-Pine Mountain, Inc. WELL NAME AND NUMBER VC-536376
TRACT NO. Campbell-Carter ELEVATION 2,159.57' QUADRANGLE Nora
COUNTY Dickenson DISTRICT Ervin SCALE 1" = 400' DATE 12-22-2014
This Plat is a new plat ; an updated plat ; or a final location plat
+ Denotes the location of a well on United States topographic Maps, scale 1 to 24,000, latitude and longitude lines being represented by border lines as shown.

LDP

Licensed Professional Engineer or Licensed Land Surveyor



WELL LOCATION PLAT NORA GRID BC-56

COMPANY Range Resources-Pine Mountain, Inc. WELL NAME AND NUMBER VC-536376
TRACT NO. Campbell-Carter ELEVATION 2,159.52' QUADRANGLE Nora
COUNTY Dickenson DISTRICT Ervinton SCALE 1" = 400' DATE 12-22-2014

This Plat is a new plat ; an updated plat ; or a final location plat
+ Denotes the location of a well on United States topographic Maps, scale 1 to 24,000, latitude and longitude lines being represented by border lines as shown.

L. J. P. G. M.

Licensed Professional Engineer or Licensed Land Surveyor

Gas and Oil Shows

FORMATION	DEPTH	THICKNESS	IPF (MCFD/BOPD)	PRESSURE	HOURS TESTED
	1143		NS		
	1458		Odor		
	1836		Odor		
	2406		Odor		
	2660		Odor		

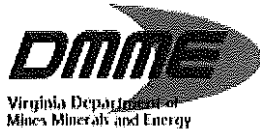
Survey Results

Depth of Survey	Direction/Distance/Degree From True Vertical
197	1/4
400	1/4
574	1/2
763	3/4
954	3/4
1143	1/2
1332	1/2
1520	1/2
1709	3/4
1900	3/4
2090	1/2
2280	1/2
2469	1/2
2650	1/2

Casing Program

Casing Type	Casing Size	Casing Interval	Hole Size	Cement Used In Cubic Ft.	Cemented To Surface Yes/No	Date Cemented	Packers Or Bridge Plugs Kind/Size/Set	Cement Baskets (ft)
Conductor	13 3/8	0-40'	15		No			
Water Protection	9 5/8	0-471'	12 3/8	236	Grouted, yes	12/23/14		302' 344'
Coal Protection								
Production Casing	4 1/2"	0-2603'	6 1/2	526	Yes	12/30/14		1572'
Other Casing And Tubing Left In Well Liners	2 3/8"							

Drillers Log		Well # 536376 1/9/2015			
Geologic Age	Formation	General Lithology	Depth Top	Depth Bottom	Thickness
Pennsylvanian	Lee	KB	0.00	8.00	8.00
Pennsylvanian	Lee	Overburden	8.00	160.00	152.00
Pennsylvanian	Lee	Sandstone	160.00	490.00	330.00
Pennsylvanian	Lee	Sandyshale	490.00	564.00	74.00
Pennsylvanian	Lee	Coal	564.00	565.00	1.00
Pennsylvanian	Lee	Sandyshale	565.00	649.00	84.00
Pennsylvanian	Lee	Coal	649.00	650.00	1.00
Pennsylvanian	Lee	Sandstone	650.00	740.20	90.20
Pennsylvanian	Aily	Coal	740.20	742.00	1.80
Pennsylvanian	Lee	Sandyshale	742.00	833.00	91.00
Pennsylvanian	Raven	Coal	833.00	834.3	1.30
Pennsylvanian	Lee	Sandyshale	834.30	837.8	3.50
Pennsylvanian	Raven	Coal	837.80	839	1.20
Pennsylvanian	Lee	Sandyshale	839.00	962.1	123.10
Pennsylvanian	Jawbone Rider	Coal	962.10	962.7	0.60
Pennsylvanian	Lee	Sandyshale	962.70	965.6	2.90
Pennsylvanian	Jawbone Rider	Coal	965.60	967	1.40
Pennsylvanian	Lee	Sandyshale	967.00	986.4	19.40
Pennsylvanian	Jawbone	Coal	986.40	990	3.60
Pennsylvanian	Lee	Sandyshale	990.00	1090.3	100.30
Pennsylvanian	Tiller	Coal	1090.30	1093	2.70
Pennsylvanian	Lee	Sandyshale	1093.00	1197.1	104.10
Pennsylvanian	Upper Seaboard A	Coal	1197.10	1198.1	1.00
Pennsylvanian	Lee	Sandyshale	1198.10	1239.9	41.80
Pennsylvanian	Upper Seaboard	Coal	1239.90	1240.5	0.60
Pennsylvanian	Lee	Sandyshale	1240.50	1365.3	124.80
Pennsylvanian	Greasy Creek	Coal	1365.30	1365.6	0.30
Pennsylvanian	Lee	Sandyshale	1365.60	1390.8	25.20
Pennsylvanian	Greasy Creek	Coal	1390.80	1392	1.20
Pennsylvanian	Lee	Sandyshale	1392.00	1429.9	37.90
Pennsylvanian	Middle Seaboard	Coal	1429.90	1430.9	1.00
Pennsylvanian	Lee	Sandyshale	1430.90	1464.2	33.30
Pennsylvanian	Lower Seaboard	Coal	1464.20	1465.2	1.00
Pennsylvanian	Lee	Sandyshale	1465.20	1536	70.80
Pennsylvanian	Unnamed A	Coal	1536.00	1536.45	0.45
Pennsylvanian	Lee	Sandyshale	1536.45	1634	97.55
Pennsylvanian	Middle Horsepen	Coal	1634.00	1635.5	1.50
Pennsylvanian	Lee	Sandyshale	1635.50	1706	70.50
Pennsylvanian	C Seam	Coal	1706.00	1706.9	0.90
Pennsylvanian	Lee	Sandyshale	1706.90	1752.5	45.60
Pennsylvanian	War Creek	Coal	1752.50	1754.9	2.40
Pennsylvanian	Lee	Sandyshale	1754.90	1781	26.10
Pennsylvanian	Unnamed C	Coal	1781.00	1782.2	1.20
Pennsylvanian	Lee	Sandyshale	1782.20	1792.9	10.70



Commonwealth of Virginia
Department of Mines, Minerals, and Energy
Division of Gas and Oil
P.O. Drawer 159, Lebanon, VA 24266
Telephone: (276) 415-9700

Tracking Number: 6550
Company: Range Resources-Pine Mountain,
File Number: DI-2595
Completion Report Type: Original

COMPLETION REPORT (DGO-GO-15)

Well Type:	Coalbed/Pipeline	Date Well Completed:	3/3/2015
Driller's Total Depth:	2660.00	Log's Total Depth:	2664.00

1. Changes In Casing/Tubing from Approved Drilling Report

Description	FileName
VC-536376 Casing/Tubing	Casing 536376.xlsx

2. Stimulation Record

Stimulation Status: ☒ Stimulated ☐ GOB ☐ Not Stimulated ☐ Service Well

Description	FileName
VC-536376 Completion Report	Copy of PMD-CompletionReport_wv10(1).pdf

3. Final Production

Description	FileName
VC-536376 Final Production	Final_Prod.xls

4. Comments

Notes:

approved. [6/29/2015, jal]

5. Signature

Permittee: Range Resources-Pine Mountain, _____ Date: 4/24/2015 _____ (Company)

By: Laura Murray _____ Title: Regulatory Compliance Specialist _____ (Signature)

INTERNAL USE ONLY

Submit Date: 4/24/2015 _____

Status: _____

Date: 6/29/2015 _____

Final PDF Date: _____



Commonwealth of Virginia
Department of Mines, Minerals, and Energy
Division of Gas and Oil
P.O. Drawer 159, Lebanon, VA 24266
Telephone: (276) 415-9700

Tracking Number:	6119
Company:	Range Resources-Pine Mountain,
File Number:	DI-2602
Operations Name:	VC-536377 w/ PL
Operation Type:	Coalbed/Pipeline
Drilling Report Type:	Original

DRILLING REPORT (DGO-GO-14)

1. Drilling Data

Date drilling commenced:	12/18/2014	Drilling Contractor:	Gasco #2
Date drilling completed:	12/22/2014	Rig Type:	☒ Rotary ☐ Cable
Driller's Total Depth (feet):	2745.00		
Log Total Depth (feet):	2751.00	Coal Seam at Total Depth:	POCAHONTAS #1

2. Final Location Plat (as required by 4 VAC25-150-360.C.)

Permitted State Plane X:	10382059.9100	Final Plat State Plane X:	10382060.1100
Permitted State Plane Y:	3579734.1600	Final Plat State Plane Y:	3579732.7300

Plat Previously Submitted Or... ☐

List of Attached Items:

Description	FileName
VC-536377 Final Plat	VC-536377 Final Plat.pdf

3. Geological Data

Fresh Water At:

Depth (in feet)	Rate	Unit of Measure

Salt Water At:

Depth (in feet)	Rate	Unit of Measure

Coal Seams:

List of Attached Items:

Description	FileName
VC-536377 Coal	Coal Log.xlsx

Gas and Oil Shows:

List of Attached Items:

Description	FileName
VC-536377 Gas Shows	Shows 536377.xlsx

4. Electric Logs (As required by 4VAC25-150-280.A)

List all logs run: GR/CDL/PE/DIL/Neu/TEMP/Audio

Did logs disclose vertical locations of a coal seam?

☐

5. Survey Results (As required by 4VAC25-150-280.B.2)

List of Attached Items:

Description	FileName
VC-536377 Survey	Survey 536377.xlsx

6. Casing and Tubing Program

List of Attached Items:

Description	FileName
VC-536377 Casing	Casing 536377.xlsx

7. Remarks

Use this space to note any conditions or occurrences, such as lost circulation, fishing jobs, junk left in hole, sidetracks, squeeze jobs, etc., not shown above. Include data and depth of condition/occurrence.

8. Drillers Log

Compiled By: Range Resources

List of Attached Items:

Description	FileName
VC-536377 Driller's Log	Drilling Log.xlsx

9. Comments

10. Signature

Permittee: Range Resources-Pine Mountain, Date: 1/13/2015

Signed By: Laura Murray Title: Regulatory Compliance Specialist

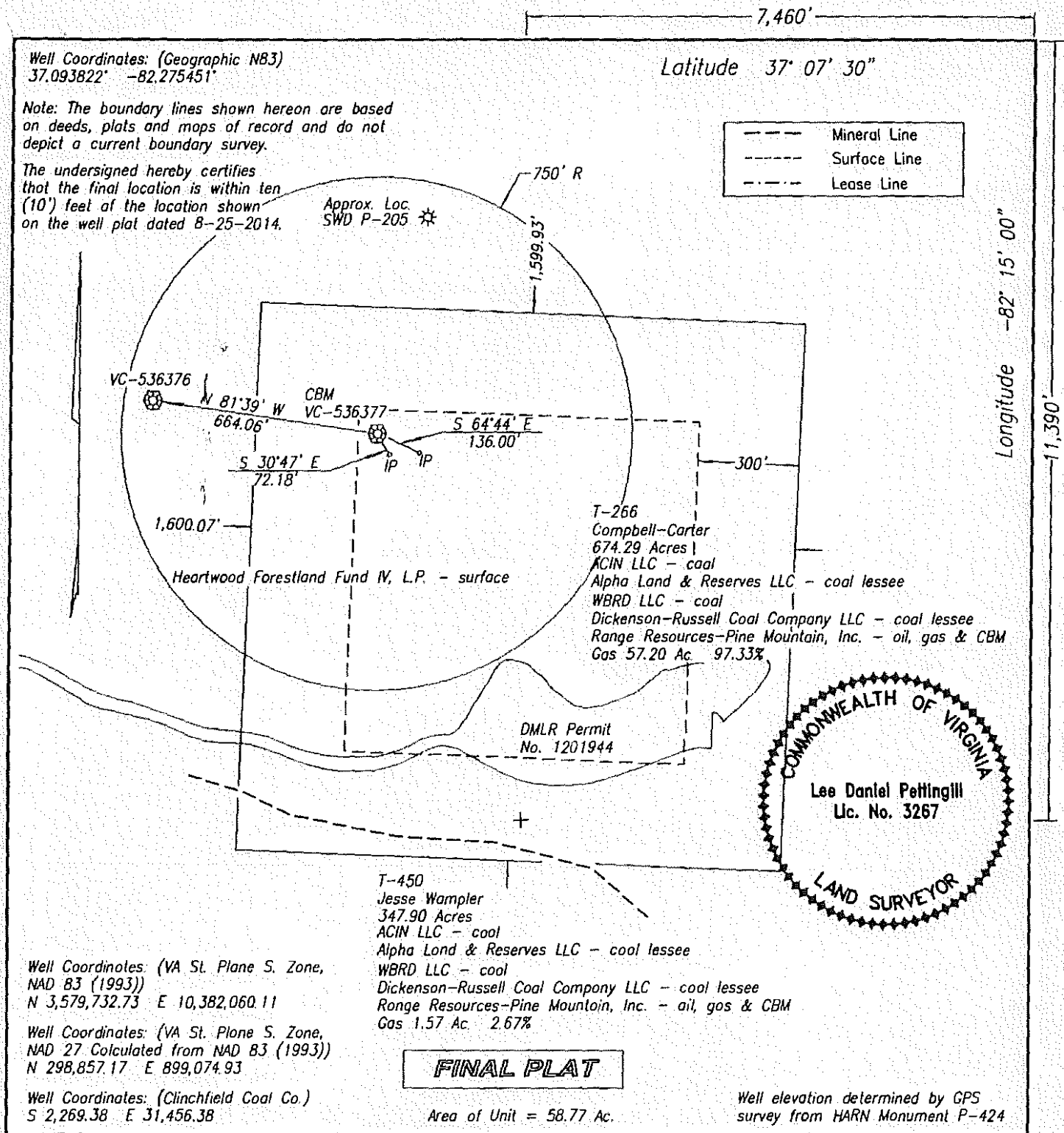
INTERNAL USE ONLY

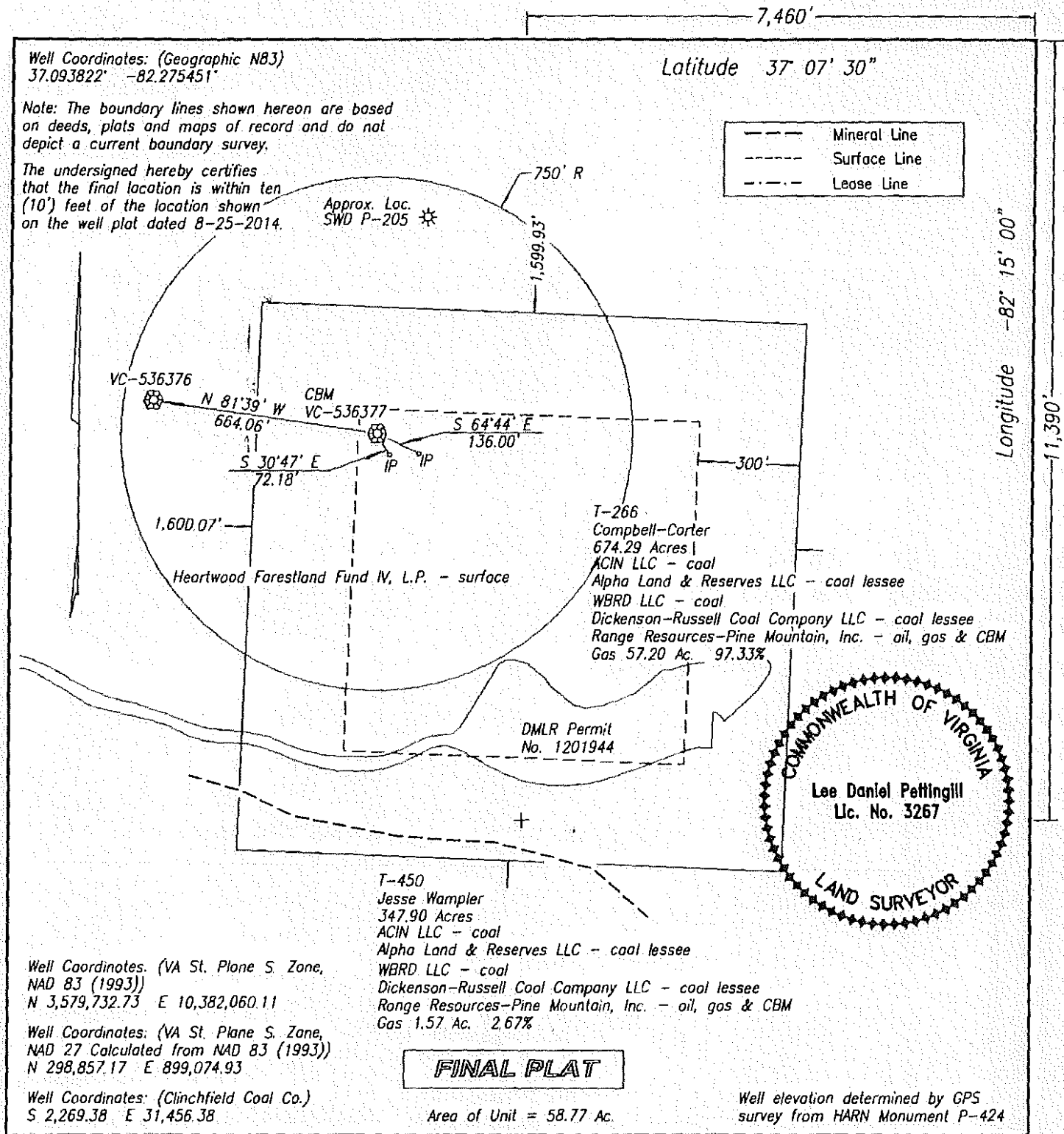
Submit Date: 1/13/2015

Status: A

Date: 2/2/2015

Final PDF Date: 3/12/2015



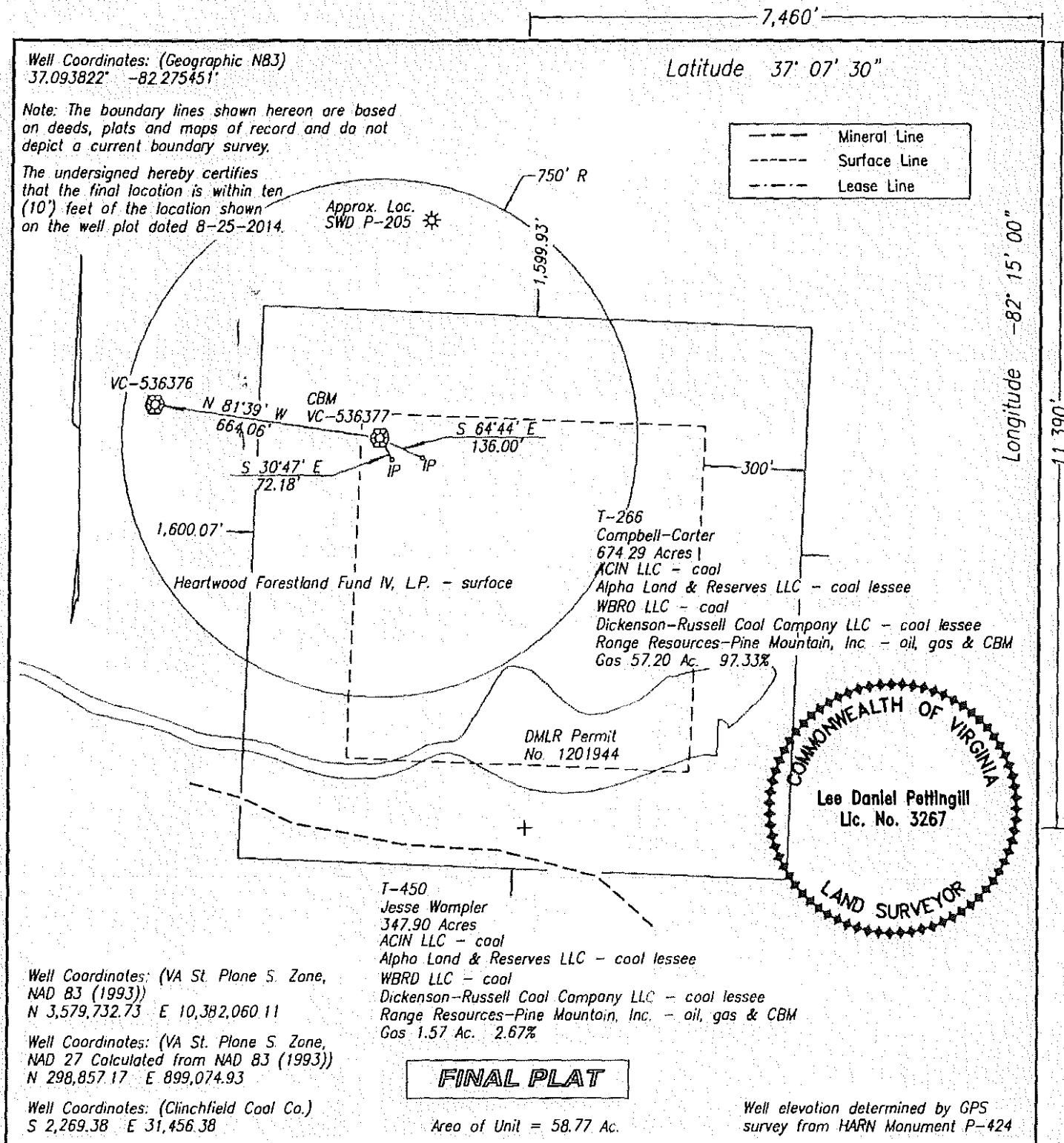


WELL LOCATION PLAT NORA GRID BC-57

COMPANY Range Resources-Pine Mountain, Inc. WELL NAME AND NUMBER VC-536377
TRACT NO. Campbell-Carter ELEVATION 2,218.59' QUADRANGLE Nora
COUNTY Dickenson DISTRICT Ervington SCALE 1" = 400' DATE 12-22-2014
This Plat is a new plat ; an updated plat ; or a final location plat x
+ Denotes the location of a well on United States topographic Maps, scale 1 to 24,000, latitude and longitude lines being represented by border lines as shown.

LD Pettingill

Licensed Professional Engineer or Licensed Land Surveyor



WELL LOCATION PLAT NORA GRID BC-57

COMPANY Range Resources-Pine Mountain, Inc. WELL NAME AND NUMBER VC-536377
TRACT NO. Campbell-Carter ELEVATION 2,218.59' QUADRANGLE Nora
COUNTY Dickenson DISTRICT Ervin SCALE 1" = 400' DATE 12-22-2014
This Plat is a new plat ; an updated plat ; or a final location plat
+ Denotes the location of a well on United States topographic Maps, scale 1 to 24,000, latitude and longitude lines being represented by border lines as shown.

LD J.P. 2014

Licensed Professional Engineer or Licensed Land Surveyor

Coal seams			Well # 536377		01/08/15	
Names	Depth Top	Depth Bottom	Thickness	Mining in Area Yes No		Mined Out
Coal	100.0	101.0	1.0		No	
Coal	140.0	141.0	1.0		No	
Coal	391.0	392.0	1.0		No	
Coal	415.0	416.0	1.0		No	
Banner Void	433.0	438.0	5.0			yes
Coal	560.0	561.0	1.0		No	
Coal	620.0	621.0	1.0		No	
Ailly	790.2	791.9	1.7		No	
Raven	881.8	882.6	0.8		No	No
Raven	888.0	889.0	1.0		No	No
Jawbone Rider	1001.5	1001.8	0.3		No	No
Jawbone Rider	1006.0	1006.4	0.4		No	No
Jawbone	1033.9	1034.7	0.8		No	No
Tiller	1138.0	1138.3	0.3		No	No
Tiller	1142.8	1143.6	0.8		No	No
Upper Seaboard A	1248.5	1249.2	0.7		No	No
Upper Seaboard	1291.8	1292.5	0.7		No	No
Greasy Creek	1399.5	1399.9	0.4		No	No
Greasy Creek	1446.8	1447.6	0.8		No	No
Greasy Creek	1407.0	1407.5	0.5		No	No
Middle Seaboard	1488.7	1489.5	0.8		No	No
Lower Seaboard	1522.2	1523.4	1.1		No	No
Unnamed A	1595.2	1596.0	0.8		No	No
Middle Horsepen	1688.6	1690.4	1.8		No	No
C Seam	1768.8	1770.5	1.7		No	No
War Creek	1811.2	1813.2	2.0		No	No
Unnamed C	1842.8	1843.9	1.1		No	No
Beckley	1854.8	1856.4	1.6		No	No
Beckley	1870.9	1871.3	0.4		No	No
Lower Horsepen	1920.5	1923.4	2.9		No	No
X Seam Rider	1986.6	1988.3	1.7		No	No
Pocahontas #9	2251.9	2252.2	0.3		No	No
Pocahontas #6	2298.6	2298.8	0.2		No	No
Pocahontas #4	2431.2	2432.7	1.5		No	No
Pocahontas #2	2475.4	2477.1	1.7		No	No
Pocahontas #2	2479.8	2480.7	0.9		No	No

Gas and Oil Shows

FORMATION	DEPTH	THICKNESS	IPF (MCFD/BOPD)	PRESSURE	HOURS TESTED
	1202		NS		
	1508		Odor		
	1929		Odor		
	2460		Odor		
	2745		Odor		

Survey Results

Depth of Survey	Direction/Distance/Degree From True Vertical
197	1/4
387	1/2
450	1/2
635	3/4
825	1/2
1014	1/2
1202	1/2
1391	3/4
1508	3/4
1770	1/4
1961	1/2
2150	3/4
2340	3/4
2530	1/2
2730	3/4

Casing Program

Casing Type	Casing Size	Casing Interval	Hole Size	Cement Used In Cubic Ft.	Cemented To Surface Yes/No	Date Cemented	Packers Or Bridge Plugs Kind/Size/Set	Cement Baskets (ft)
Conductor	13 3/8	0-40'	15		No			
Water Protection	9 5/8	0-512'	12 3/8	362	No, Grouted	12/19/14		336' 378'
Coal Protection								
Production Casing	4 1/2"	0-2698'	6 1/2	539	Yes	12/22/14		1524'
Other Casing And Tubing Left In Well	2 1/4"							
Liners								

Drillers Log			Well # 536377 1/8/2015		
Geologic Age	Formation	General Lithology	Depth Top	Depth Bottom	Thickness
Pennsylvanian	Lee	KB to GL	0.0	8.0	8.0
Pennsylvanian	Lee	Overburden	8.0	26.0	18.0
Pennsylvanian	Lee	Sand and Shale	26.0	100.0	74.0
Pennsylvanian	Lee	Coal	100.0	101.0	1.0
Pennsylvanian	Lee	Sand and Shale	101.0	140.0	39.0
Pennsylvanian	Lee	Coal	140.0	141.0	1.0
Pennsylvanian	Lee	Sand and Shale	141.0	280.0	139.0
Pennsylvanian	Lee	Sandstone	280.0	391.0	111.0
Pennsylvanian	Lee	Coal	391.0	392.0	1.0
Pennsylvanian	Lee	Sand and Shale	392.0	415.0	23.0
Pennsylvanian	Lee	Coal	415.0	416.0	1.0
Pennsylvanian	Lee	Shale and Water	416.0	433.0	17.0
Pennsylvanian	Lee	MINE VOID	433.0	438.0	5.0
Pennsylvanian	Lee	Coal	433.0	561.0	128.0
Pennsylvanian	Lee	Sand	561.0	620.0	59.0
Pennsylvanian	Lee	Coal	620.0	621.0	1.0
Pennsylvanian	Lee	Sand	621.0	770.0	149.0
Pennsylvanian	Lee	Coal	770.0	771.0	1.0
Pennsylvanian	Lee	Sand and Shale	771.0	790.2	19.2
Pennsylvanian	Aily	Coal	790.2	791.9	1.7
Pennsylvanian	Lee	SS,SH,Thin Coals	791.9	881.8	89.9
Pennsylvanian	Raven	Coal	881.8	882.6	0.8
Pennsylvanian	Lee	SS,SH,Thin Coals	882.6	888.0	5.4
Pennsylvanian	Raven	Coal	888.0	889.0	1.0
Pennsylvanian	Lee	SS,SH,Thin Coals	889.0	1001.5	112.5
Pennsylvanian	Jawbone Rider	Coal	1001.5	1001.8	0.3
Pennsylvanian	Lee	SS,SH,Thin Coals	1001.8	1006.0	4.2
Pennsylvanian	Jawbone Rider	Coal	1006.0	1006.4	0.4
Pennsylvanian	Lee	SS,SH,Thin Coals	1006.4	1033.9	27.5
Pennsylvanian	Jawbone	Coal	1033.9	1034.7	0.8
Pennsylvanian	Lee	SS,SH,Thin Coals	1034.7	1138.0	103.3
Pennsylvanian	Tiller	Coal	1138.0	1138.3	0.3
Pennsylvanian	Lee	SS,SH,Thin Coals	1138.3	1142.8	4.5
Pennsylvanian	Tiller	Coal	1142.8	1143.6	0.8
Pennsylvanian	Lee	SS,SH,Thin Coals	1143.6	1248.5	104.9
Pennsylvanian	Upper Seaboard A	Coal	1248.5	1249.2	0.7
Pennsylvanian	Lee	SS,SH,Thin Coals	1249.2	1291.8	42.6
Pennsylvanian	Upper Seaboard	Coal	1291.8	1292.5	0.7
Pennsylvanian	Lee	SS,SH,Thin Coals	1292.2	1399.5	107.3
Pennsylvanian	Greasy Creek	Coal	1399.5	1399.9	0.4
Pennsylvanian	Lee	SS,SH,Thin Coals	1399.9	1407.0	7.1
Pennsylvanian	Greasy Creek	Coal	1407.0	1407.5	0.5
Pennsylvanian	Lee	SS,SH,Thin Coals	1407.5	1446.8	39.3

Pennsylvanian	Greasy Creek	Coal	1446.8	1447.6	0.8
Pennsylvanian	Lee	SS,SH,Thin Coals	1447.6	1488.7	41.1
Pennsylvanian	Middle Seaboard	Coal	1488.7	1489.5	0.8
Pennsylvanian	Lee	SS,SH,Thin Coals	1489.5	1522.2	32.7
Pennsylvanian	Lower Seaboard	Coal	1522.2	1523.4	1.1
Pennsylvanian	Lee	SS,SH,Thin Coals	1523.4	1595.2	71.8
Pennsylvanian	Unnamed A	Coal	1595.2	1596.0	0.8
Pennsylvanian	Lee	SS,SH,Thin Coals	1596.0	1688.6	92.6
Pennsylvanian	Middle Horsepen	Coal	1688.6	1690.4	1.8
Pennsylvanian	Lee	SS,SH,Thin Coals	1690.4	1768.8	78.4
Pennsylvanian	C Seam	Coal	1768.8	1770.5	1.7
Pennsylvanian	Lee	SS,SH,Thin Coals	1770.5	1811.2	40.7
Pennsylvanian	War Creek	Coal	1811.2	1813.2	2.0
Pennsylvanian	Lee	SS,SH,Thin Coals	1813.2	1842.8	29.6
Pennsylvanian	Unnamed C	Coal	1842.8	1843.9	1.1
Pennsylvanian	Lee	SS,SH,Thin Coals	1843.9	1854.8	10.9
Pennsylvanian	Beckley	Coal	1854.8	1856.4	1.6
Pennsylvanian	Lee	SS,SH,Thin Coals	1856.4	1870.9	14.5
Pennsylvanian	Beckley	Coal	1870.9	1871.3	0.4
Pennsylvanian	Lee	SS,SH,Thin Coals	1871.3	1920.5	49.2
Pennsylvanian	Lower Horsepen	Coal	1920.5	1923.4	2.9
Pennsylvanian	Lee	SS,SH,Thin Coals	1923.4	1986.6	63.2
Pennsylvanian	X Seam Rider	Coal	1986.6	1988.3	1.7
Pennsylvanian	Lee	SS,SH,Thin Coals	1988.3	2251.9	263.6
Pennsylvanian	Pocahontas #9	Coal	2251.9	2252.2	0.3
Pennsylvanian	Lee	SS,SH,Thin Coals	2252.2	2298.6	46.4
Pennsylvanian	Pocahontas #6	Coal	2298.6	2298.8	0.2
Pennsylvanian	Lee	SS,SH,Thin Coals	2298.8	2431.2	132.4
Pennsylvanian	Pocahontas #4	Coal	2431.2	2432.7	1.5
Pennsylvanian	Lee	SS,SH,Thin Coals	2432.7	2475.4	42.7
Pennsylvanian	Pocahontas #2	Coal	2475.4	2477.1	1.7
Pennsylvanian	Lee	SS,SH,Thin Coals	2477.1	2479.8	2.7
Pennsylvanian	Pocahontas #2	Coal	2479.8	2480.7	0.9
Pennsylvanian	Lee	SS,SH,Thin Coals	2480.7	2745.0	264.3

Range Resources - Pine Mountain

3/26/2015 12:44:38 PM

Completion Report**105009162 --536377 VC-536377**

Stage:	01	Service Co.	Nabors	Avg DH Rate:	53.4
Stage Date:	03/25/2015	Fluid Type:	70Q Foam	Max DH Rate:	60.0
Perf Date:	03/25/2015	BD:	3356	Total Slurry Volume:	290
Logging Co.	KLX (Blue Dot)	ISIP:	0	Total Fluid Volume:	258
Formation	Lower Horsepen,XSeam	Avg Press:	3406	Avg N2 Rate:	41,800
Perf Top:	1920.5	Max Treat Pressure:	3662	Max N2 Rate:	42,900
Perf Bottom:	2480.7	Final ISIP:	1533	Total N2 Volume:	533,000
# Shots:	42	2 Min SIP:	1455	Max DH PPA:	2.30
Perf Size:	0.52	5 Min SIP:	0	Total Proppant Sks:	388
Perf Comments:		10 Min SIP:	0	Total Acid:	500
Comments:		Sand Mesh:	20/40 Sand	Acid Type:	15% HCL
		Frac Gradient:	0.84		

Stage:	02	Service Co.	Nabors	Avg DH Rate:	53.7
Stage Date:	03/25/2015	Fluid Type:	70Q Foam	Max DH Rate:	56.0
Perf Date:	03/25/2015	BD:	1904	Total Slurry Volume:	250
Logging Co.	KLX (Blue Dot)	ISIP:	0	Total Fluid Volume:	229
Formation	C Seam,War Creek,Unnamed	Avg Press:	3434	Avg N2 Rate:	40,450
Perf Top:	1768.8	Max Treat Pressure:	3508	Max N2 Rate:	41,200
Perf Bottom:	1871.3	Final ISIP:	1411	Total N2 Volume:	470,000
# Shots:	33	2 Min SIP:	1187	Max DH PPA:	1.60
Perf Size:	0.52	5 Min SIP:	0	Total Proppant Sks:	271
Perf Comments:		10 Min SIP:	0	Total Acid:	250
Comments:		Sand Mesh:	20/40 Sand	Acid Type:	15% HCL
		Frac Gradient:	0.84		

Stage:	03	Service Co.	Nabors	Avg DH Rate:	42.0
Stage Date:	03/25/2015	Fluid Type:	70Q Foam	Max DH Rate:	50.0
Perf Date:	03/25/2015	BD:	1733	Total Slurry Volume:	178
Logging Co.	KLX (Blue Dot)	ISIP:	0	Total Fluid Volume:	169
Formation	Unnamed A, Middle Horsepen	Avg Press:	3779	Avg N2 Rate:	36,600
Perf Top:	1595.2	Max Treat Pressure:	4224	Max N2 Rate:	40,700
Perf Bottom:	1690.4	Final ISIP:	1050	Total N2 Volume:	368,000
# Shots:	14	2 Min SIP:	942	Max DH PPA:	1.50
Perf Size:	0.52	5 Min SIP:	0	Total Proppant Sks:	111
Perf Comments:		10 Min SIP:	0	Total Acid:	250
Comments:		Sand Mesh:	20/40 Sand	Acid Type:	15% HCL
		Frac Gradient:	0		

Stage:	04	Service Co.	Nabors	Avg DH Rate:	35.4
Stage Date:	03/25/2015	Fluid Type:	70Q Foam	Max DH Rate:	53.0
Perf Date:	03/25/2015	BD:	1392	Total Slurry Volume:	254
Logging Co.	KLX (Blue Dot)	ISIP:	0	Total Fluid Volume:	229
Formation	Unnamed A, Middle Horsepen	Avg Press:	3779	Avg N2 Rate:	36,600
Perf Top:	1595.2	Max Treat Pressure:	4224	Max N2 Rate:	40,700
Perf Bottom:	1690.4	Final ISIP:	1050	Total N2 Volume:	368,000
# Shots:	14	2 Min SIP:	942	Max DH PPA:	1.50
Perf Size:	0.52	5 Min SIP:	0	Total Proppant Sks:	111
Perf Comments:		10 Min SIP:	0	Total Acid:	250
Comments:		Sand Mesh:	20/40 Sand	Acid Type:	15% HCL
		Frac Gradient:	0		

Range Resources - Pine Mountain

3/26/2015 12:44:38 PM

Completion Report**105009162 --536377 VC-536377**

Logging Co.	KLX (Blue Dot)	ISIP:	0	Total Fluid Volume:	243
Formation	Greasy Creek, Greasy	Avg Press:	3055	Avg N2 Rate:	31,229
Perf Top:	1399.5	Max Treat Pressure:	4077	Max N2 Rate:	35,500
Perf Bottom:	1523.4	Final ISIP:	947	Total N2 Volume:	462,000
# Shots:	24	2 Min SIP:	830	Max DH PPA:	1.40
Perf Size:	0.52	5 Min SIP:	0	Total Proppant Sks:	161
Perf Comments:		10 Min SIP:	0	Total Acid:	500
		Sand Mesh:	20/40 Sand	Acid Type:	15% HCL
Comments:		Frac Gradient:	0.72		

Stage:	05	Service Co.	Nabors	Avg DH Rate:	44.8
Stage Date:	03/25/2015	Fluid Type:	70Q Foam	Max DH Rate:	48.0
Perf Date:	03/25/2015	BD:	4077	Total Slurry Volume:	127
Logging Co.	KLX (Blue Dot)	ISIP:	0	Total Fluid Volume:	121
Formation	Upper Seaboard A, Upper	Avg Press:	3655	Avg N2 Rate:	35,880
Perf Top:	1248.5	Max Treat Pressure:	3906	Max N2 Rate:	40,000
Perf Bottom:	1292.5	Final ISIP:	2173	Total N2 Volume:	284,000
# Shots:	12	2 Min SIP:	1187	Max DH PPA:	1.70
Size:	0.52	5 Min SIP:	1147	Total Proppant Sks:	81
Perf Comments:		10 Min SIP:	1167	Total Acid:	250
		Sand Mesh:	20/40 Sand	Acid Type:	15% HCL
Comments:		Frac Gradient:	1.8		



Commonwealth of Virginia
Department of Mines, Minerals, and Energy
Division of Gas and Oil
P.O. Drawer 159, Lebanon, VA 24266
Telephone: (276) 415-9700

Tracking Number:	5936
Company:	Range Resources-Pine Mountain,
File Number:	DI-2586
Operations Name:	VC-536378 w/PL
Operation Type:	Coalbed/Pipeline
Drilling Report Type:	Original

DRILLING REPORT (DGO-GO-14)

1. Drilling Data

Date drilling commenced:	10/22/2014	Drilling Contractor:	Gasco #8
Date drilling completed:	10/28/2014	Rig Type:	☒ Rotary ☐ Cable
Driller's Total Depth (feet):	2619.00		
Log Total Depth (feet):	2615.00	Coal Seam at Total Depth:	POCAHONTAS #2

2. Final Location Plat (as required by 4 VAC25-150-360.C.)

Permitted State Plane X:	10383716.0400	Final Plat State Plane X:	10383716.1800
Permitted State Plane Y:	3579492.1500	Final Plat State Plane Y:	3579492.3800

Plat Previously Submitted Or... ☐

List of Attached Items:

Description	FileName
VC-536378 Final Plat	VC-536378 Final Plat.pdf

3. Geological Data

Fresh Water At:

Depth (in feet)	Rate	Unit of Measure
420	1	INCH

Salt Water At:

Depth (in feet)	Rate	Unit of Measure

Coal Seams:

List of Attached Items:

Description	FileName
VC-536378 Coal	Coal Log 536378.xls

Gas and Oil Shows:

List of Attached Items:

Description	FileName
VC-536378 Gas Shows	536378 Shows.xls

4. Electric Logs (As required by 4VAC25-150-280.A)

List all logs run: GR/CDL/PE/DIL/Neu/TEMP/Audio

Did logs disclose vertical locations of a coal seam?

☐

5. Survey Results (As required by 4VAC25-150-280.B.2)

List of Attached Items:

Description	FileName
VC-536378 Survey	536378 Survey.xls

6. Casing and Tubing Program

List of Attached Items:

Description	FileName
VC-536378 Casing	536378 Casing.xls

7. Remarks

Use this space to note any conditions or occurrences, such as lost circulation, fishing jobs, junk left in hole, sidetracks, squeeze jobs, etc., not shown above. Include data and depth of condition/occurrence.

8. Drillers Log

Compiled By: Range Resources

List of Attached Items:

Description	FileName
VC-536378 Driller's Log	Drillers Log 536378.xls

9. Comments

pplat corrected. approved. [2/9/2015, jal]
rejected. plat description on page 1 is incorrect with wrong well name. correct file and re-submit.
[1/26/2015, jal]
driller's log attached and ok. [1/26/2015, jal]
rejected until response or updated download received. [12/16/2014, jal]
do you have a full driller's log to submit on page 3? [12/16/2014, jal]
driller's log submitted on page 3 is the same as the coal log [12/16/2014, jal]

10. Signature

Permitee: Range Resources-Pine Mountain, Date: 1/26/2015
Signed By: Laura Murray Title: Regulatory Compliance Specialist

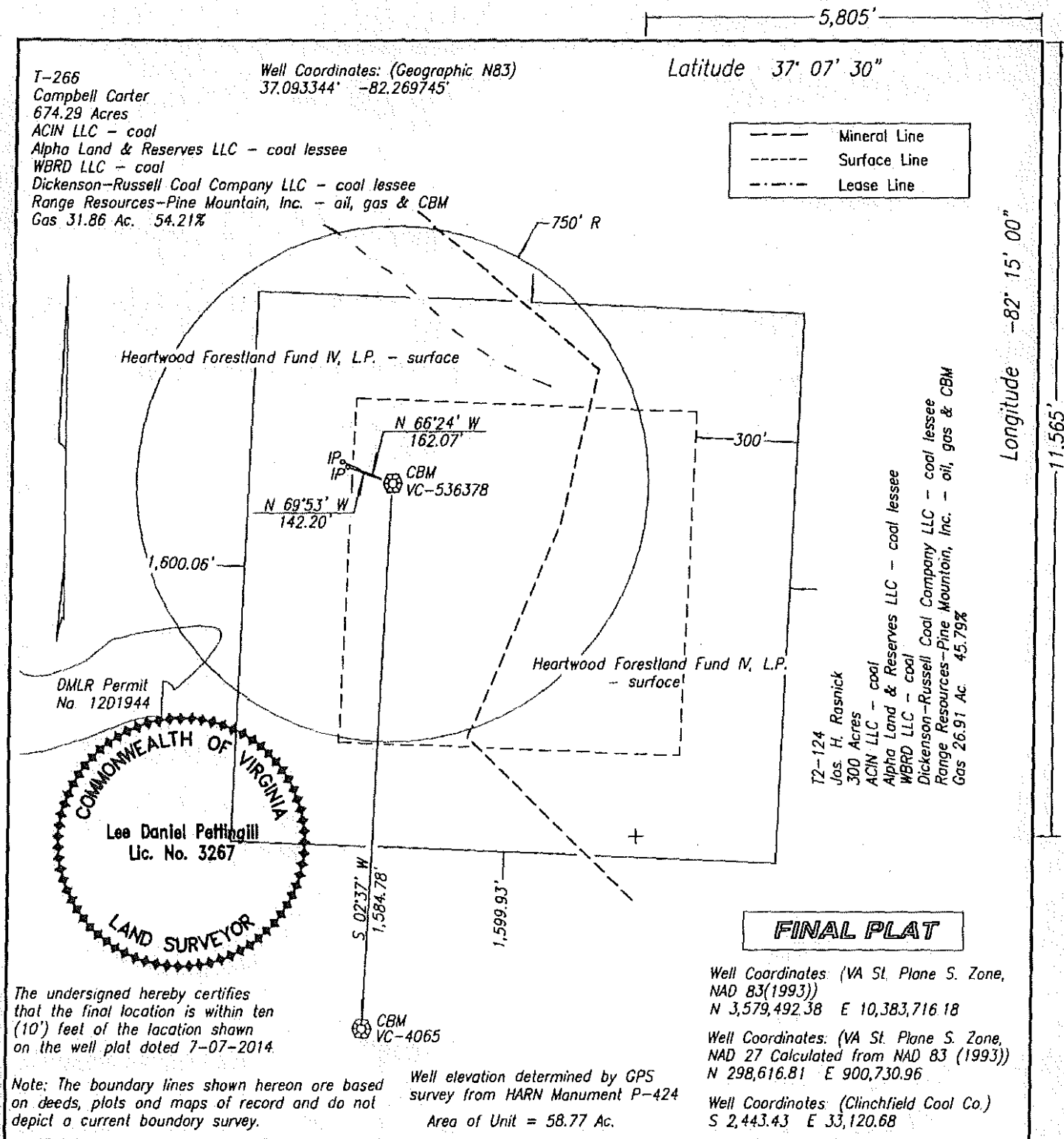
INTERNAL USE ONLY

Submit Date: 1/26/2015

Status: A

Date: 2/9/2015

Final PDF Date: 3/12/2015



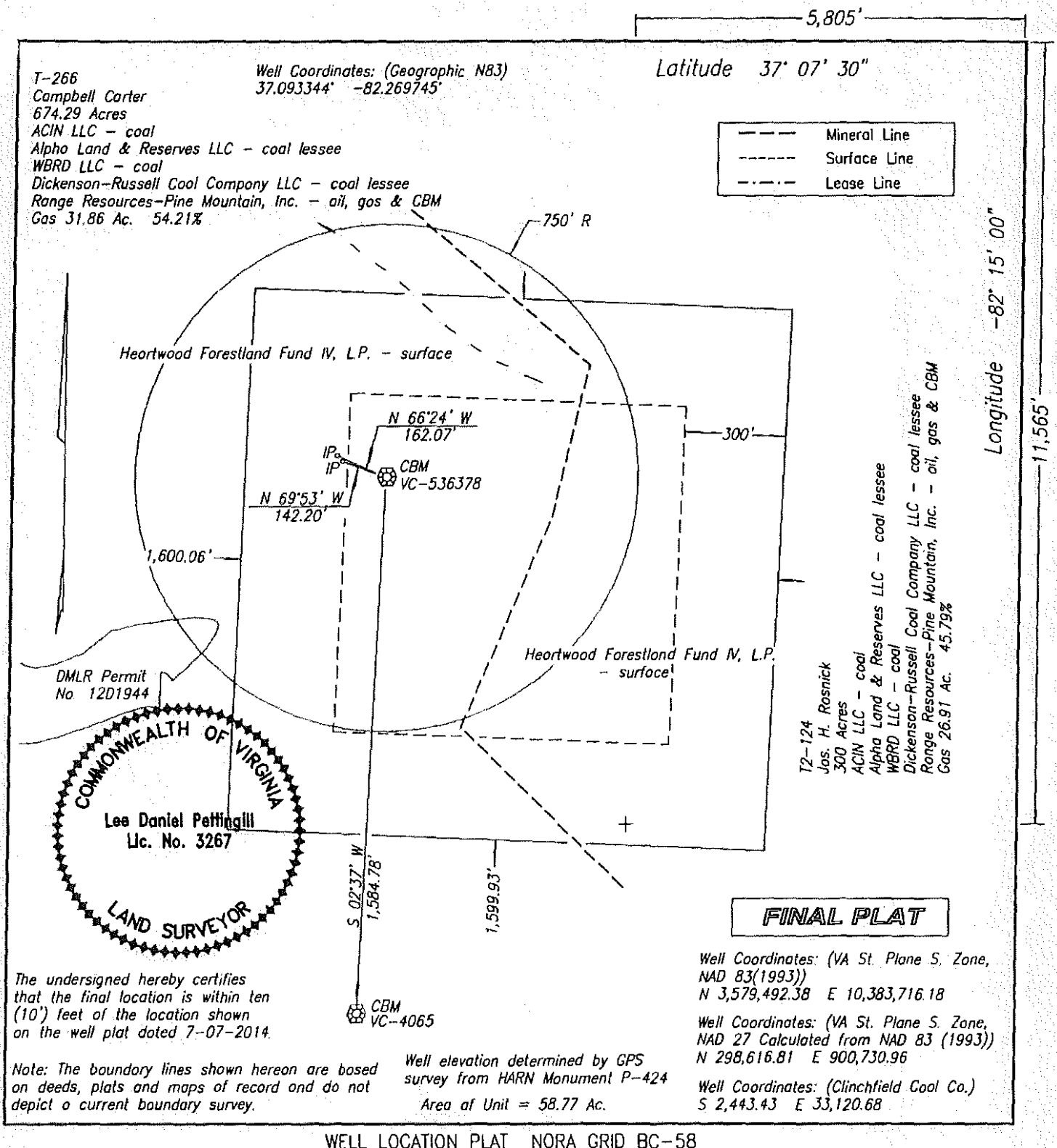
WELL LOCATION PLAT NORA GRID BC-58

COMPANY Range Resources-Pine Mountain, Inc. WELL NAME AND NUMBER VC-536378
 TRACT NO. Campbell Carter ELEVATION 2,219.92' QUADRANGLE Nora
 COUNTY Dickenson DISTRICT Ervinton SCALE 1" = 400' DATE 10-22-2014
 This Plat is a new plat ; an updated plat ; or a final location plat

+ Denotes the location of a well on United States topographic Maps, scale 1 to 24,000, latitude and longitude lines being represented by border lines as shown.

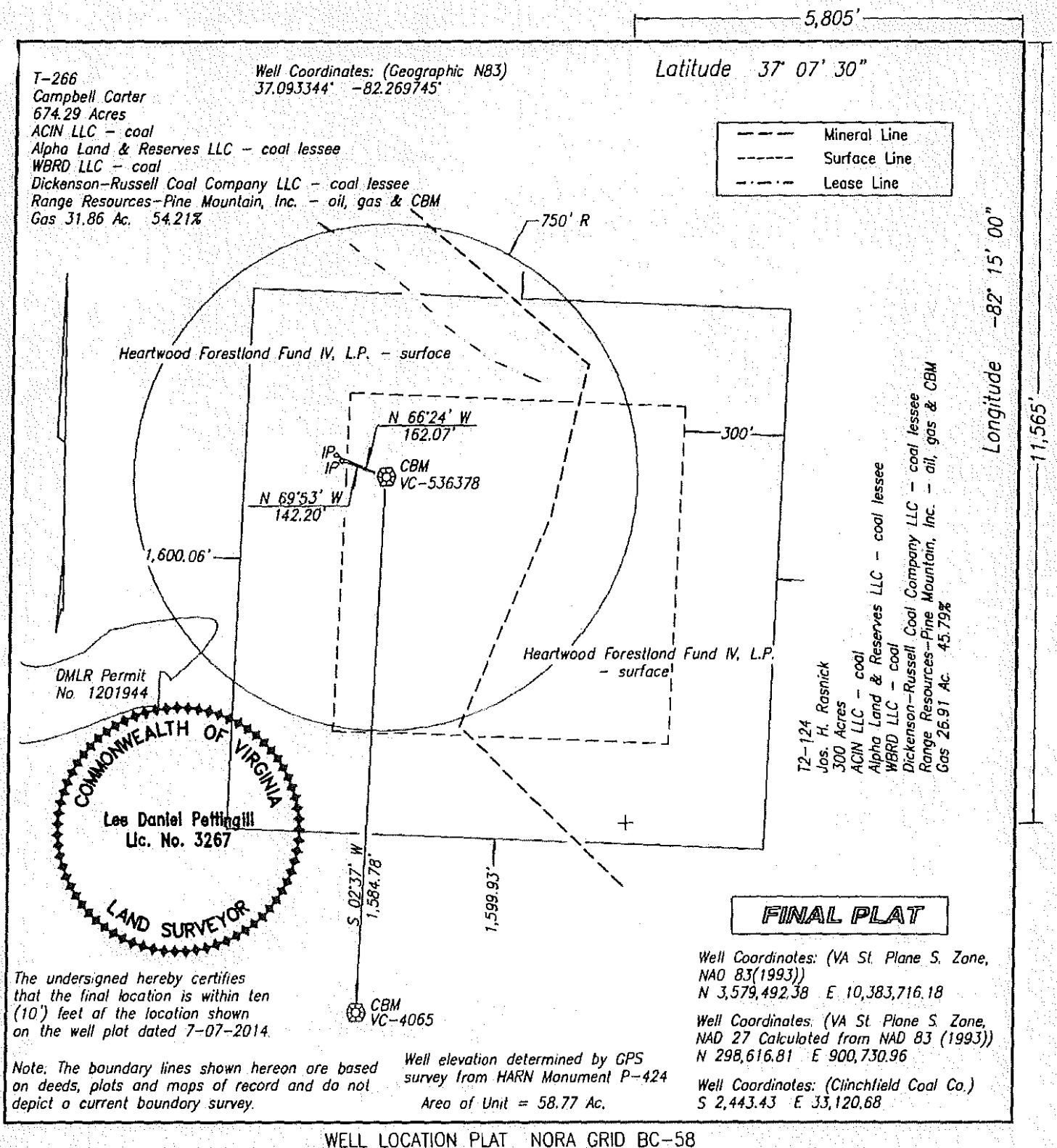
[Signature]

Licensed Professional Engineer or Licensed Land Surveyor



COMPANY Range Resources-Pine Mountain, Inc. WELL NAME AND NUMBER VC-536378
 TRACT NO. Campbell Carter ELEVATION 2,219.92' QUADRANGLE Nora
 COUNTY Dickenson DISTRICT Ervinton SCALE 1" = 400' DATE 10-22-2014
 This Plat is a new plat ; an updated plat ; or a final location plat x
 + Denotes the location of a well on United States topographic Maps, scale 1 to 24,000, latitude and longitude lines being represented by border lines as shown.

Lee Daniel Pettingilli
 Licensed Professional Engineer or Licensed Land Surveyor



COMPANY Range Resources-Pine Mountain, Inc. WELL NAME AND NUMBER VC-536378
TRACT NO. Campbell Carter ELEVATION 2,219.92' QUADRANGLE Nora
COUNTY Dickenson DISTRICT Ervinton SCALE 1" = 400' DATE 10-22-2014
This Plat is a new plat ; an updated plat ; or a final location plat x
+ Denotes the location of a well on United States topographic Maps, scale 1 to
24,000, latitude and longitude lines being represented by border lines as shown.

~~Licensed Professional Engineer or Licensed Land Surveyor~~

Coal Seams	536378					
				MINING IN AREA		
NAME	TOP	BOTTOM	THICKNESS	YES	NO	MINED OUT
Coal	210	211	1		No	No
Coal	412	413	1		No	No
Coal	635	636	1		No	No
Coal	870	871	1		No	No
Coal	1030	1031	1		No	No
Coal	1360	1361	1		No	No
Coal	1445	1446	1		No	No
Coal	1520	1521	1		No	No
Coal	1620	1621	1		No	No
Coal	1749	1750	1		No	No
Coal	1870	1871	1		No	No
Coal	1890	1891	1		No	No
Coal	1982	1983	1		No	No
Coal	2515	2516	1		No	No
Coal	2431	2434	3		No	No
Coal	2485	2486	1		No	No

Gas and Oil Shows

FORMATION	DEPTH	THICKNESS	IPF (MCFD/BOPD)	PRESSURE	HOURS TESTED
	1140		NS		
	1518		NS		
	1897		NS		
	2434		NS		
	2619		Trace		

Survey Results

Depth of Survey	Direction/Distance/Degree From True Vertical
197'	1/2
386'	1/2
574'	1/4
753'	1/2
952'	1/4
1140'	1/4
1327'	3/4
1518'	1/2
1707'	3/4
1897'	1/2
2086'	1/4
2275'	3/4
2434'	3/4

Casing Program

Casing Type	Casing Size	Casing Interval	Hole Size	Cement Used In Cubic Ft.	Cemented To Surface Yes/No	Date Cemented	Packers Or Bridge Plugs Kind/Size/Set	Cement Baskets
Conductor/Surface	13 3/8"	0-41	16 1/4"		Sanded In			
Coal Protection	9 5/8"	0-470	12 1/4"	254.1	Yes, Grouted	10/23/14		336' 378'
Intermediate	7"							
Production Casing	4 1/2"	0-2580	6 1/4"	552.3	Yes	10/28/14		
Other Casing And Tubing Left In Well	2 3/8"							
Liners								

Driller's Log	536378						
		General		Depth	Depth		
Geologic Age	Formation	Lithology	Color	Top	Bottom	Thickness	Remarks
Pennsylvanian		KB and Overburden		0	8	8	
Pennsylvanian		Sand		8	45	37	
Pennsylvanian		Sandstone		45	210	165	
Pennsylvanian		Coal		210	211	1	
Pennsylvanian		Sandstone		211	412	201	
Pennsylvanian		Coal		412	413	1	
Pennsylvanian		Sandstone		413	580	167	2" H2O stream
Pennsylvanian		Sandy Shale		580	635	55	
Pennsylvanian		Coal		635	636	1	
Pennsylvanian		Sandy Shale		636	870	234	
Pennsylvanian		Coal		870	871	1	
Pennsylvanian		Sandy Shale		871	1030	159	
Pennsylvanian		Coal		1030	1031	1	
Pennsylvanian		Sandy Shale		1031	1300	269	
Pennsylvanian		Sandstone		1300	1360	60	
Pennsylvanian		Coal		1360	1361	1	
Pennsylvanian		Sandstone		1361	1445	84	
Pennsylvanian		Coal		1445	1446	1	
Pennsylvanian		Sandy Shale		1446	1520	74	
Pennsylvanian		Coal		1520	1521	1	
Pennsylvanian		Sandy Shale		1521	1620	99	
Pennsylvanian		Coal		1620	1621	1	
Pennsylvanian		Sandstone		1621	1749	128	
Pennsylvanian		Coal		1749	1750	1	
Pennsylvanian		Sandstone		1750	1870	120	
Pennsylvanian		Coal		1870	1871	1	
Pennsylvanian		Sandstone		1871	1890	19	
Pennsylvanian		Coal		1890	1891	1	
Pennsylvanian		Sandy Shale		1891	1982	91	
Pennsylvanian		Coal		1982	1983	1	
Pennsylvanian		Sandy Shale		1983	2212	229	
Pennsylvanian		Sandstone		2212	2275	63	
Pennsylvanian		Sandy Shale		2275	2315	40	
Pennsylvanian		Coal		2315	2316	1	
Pennsylvanian		Sandy Shale		2316	2355	39	
Pennsylvanian		Sandy Shale		2355	2432	77	
Pennsylvanian		Coal		2432	2434	2	
Pennsylvanian		Sandstone		2434	2485	51	
Pennsylvanian		Coal		2485	2486	1	
Pennsylvanian		Sandy Shale		2486	2514	28	
Pennsylvanian		Red Rock		2514	2534	20	



Commonwealth of Virginia
Department of Mines, Minerals, and Energy
Division of Gas and Oil
P.O. Drawer 159, Lebanon, VA 24266
Telephone: (276) 415-9650

Tracking Number: 6103
Company: Range Resources-Pine Mountain,
File Number: DI-2586
Completion Report Type: Original

COMPLETION REPORT (DGO-GO-15)

Well Type:	Coalbed/Pipeline	Date Well Completed:	12/8/2014
Driller's Total Depth:	2619.00	Log's Total Depth:	2615.00

1. Changes In Casing/Tubing from Approved Drilling Report

Description	FileName

2. Stimulation Record

Stimulation Status: ☒ Stimulated ☐ GOB ☐ Not Stimulated ☐ Service Well

Description	FileName
VC-536378 Completions Report	536378 Completion Report.pdf

3. Final Production

Description	FileName
VC-536378 Final Production	Final_Prod.xls

4. Comments

Notes:

5. Signature

Permittee: Range Resources-Pine Mountain, Date: 1/15/2015 (Company)

By: Bonnie Kelley Title: Regulatory Compliance Technician (Signature)

INTERNAL USE ONLY

Submit Date: 1/15/2015

Status: Approved

Date: 2/9/2015

Final PDF Date: 3/12/2015

Range Resources - Pine Mountain

12/10/2014 11:34:26 AM

Completion Report**105009163 --536378 VC-536378**

Stage:	Stage 01	Service Co.	Nabors (Superior)	Avg DH Rate:	39.0
Stage Date:	12/8/2014 1:15:00 PM	Fluid Type:	70Q Foam	Max DH Rate:	44.0
Perf Date:	12/8/2014 1:15:00 PM	BD:	2129	Total Slurry Volume:	402
Logging Co.	Blue Dot	ISIP:	0	Total Fluid Volume:	389
Formation	Pocohontas #2	Avg Press:	3907	Avg N2 Rate:	28,100
Perf Top:	2477	Max Treat Pressure:	4053	Max N2 Rate:	33,200
Perf Bottom:	2482	Final ISIP:	2202	Total N2 Volume:	758,000
# Shots:	16	2 Min SIP:	0	Max DH PPA:	0.5
Perf Size:	0.52	5 Min SIP:	0	Total Proppant Sks:	164
Perf Comments:		10 Min SIP:	0	Total Acid:	0
		Sand Mesh:	20/40 Sand	Acid Type:	15% HCL
Comments:		Frac Gradient:	1.3		

Stage:	Stage 02	Service Co.	Nabors (Superior)	Avg DH Rate:	27.0
Stage Date:	12/8/2014 2:15:00 PM	Fluid Type:	70Q Foam	Max DH Rate:	33.0
Perf Date:	12/8/2014 2:15:00 PM	BD:	3651	Total Slurry Volume:	218
Logging Co.	Blue Dot	ISIP:	0	Total Fluid Volume:	206
Formation	Poco #9, #7, #6 Ryder, #6, #4	Avg Press:	4502	Avg N2 Rate:	24,500
Perf Top:	2000	Max Treat Pressure:	4707	Max N2 Rate:	27,000
Perf Bottom:	2423.9	Final ISIP:	810	Total N2 Volume:	327,000
# Shots:	34	2 Min SIP:	0	Max DH PPA:	0.3
Perf Size:	0.52	5 Min SIP:	0	Total Proppant Sks:	26
Perf Comments:		10 Min SIP:	0	Total Acid:	500
		Sand Mesh:	20/40 Sand	Acid Type:	15% HCL
Comments:		Frac Gradient:	0.8		

Stage:	Stage 03	Service Co.	Nabors (Superior)	Avg DH Rate:	52.0
Stage Date:	12/8/2014 4:00:00 PM	Fluid Type:	70Q Foam	Max DH Rate:	54.0
Perf Date:	12/8/2014 4:00:00 PM	BD:	3945	Total Slurry Volume:	302
Logging Co.	Blue Dot	ISIP:	0	Total Fluid Volume:	274
Formation	Horsepen, X-Seam	Avg Press:	3689	Avg N2 Rate:	36,000
Perf Top:	1905.7	Max Treat Pressure:	3794	Max N2 Rate:	36,400
Perf Bottom:	1976.4	Final ISIP:	1026	Total N2 Volume:	556,000
# Shots:	20	2 Min SIP:	0	Max DH PPA:	2.0
Perf Size:	0.52	5 Min SIP:	0	Total Proppant Sks:	340
Perf Comments:		10 Min SIP:	0	Total Acid:	250
		Sand Mesh:	20/40 Sand	Acid Type:	15% HCL
Comments:		Frac Gradient:	0.9		

Stage:	Stage 04	Service Co.	Nabors (Superior)	Avg DH Rate:	53.0
Stage Date:	12/8/2014 5:15:00 PM	Fluid Type:	70Q Foam	Max DH Rate:	57.0
Perf Date:	12/8/2014 5:15:00 PM	BD:	2061	Total Slurry Volume:	348

Completion Report

105009163 --536378 VC-536378

Logging Co.	Blue Dot	ISIP:	0	Total Fluid Volume:	309
Formation	War Creek, Un C, Beckley,	Avg Press:	3474	Avg N2 Rate:	36,400
Perf Top:	1801.9	Max Treat Pressure:	3591	Max N2 Rate:	36,700
Perf Bottom:	1859.1	Final ISIP:	1460	Total N2 Volume:	644,000
# Shots:	29	2 Min SIP:	0	Max DH PPA:	2.0
Perf Size:	0.52	5 Min SIP:	0	Total Proppant Sks:	461
Perf Comments:		10 Min SIP:	0	Total Acid:	250
		Sand Mesh:	20/40 Sand	Acid Type:	15% HCL
Comments:		Frac Gradient:	1.2		

Stage:	Stage 05	Service Co.	Nabors (Superior)	Avg DH Rate:	64.0
Stage Date:	12/9/2014 10:30:00 AM	Fluid Type:	70Q Foam	Max DH Rate:	65.0
Perf Date:	12/9/2014 10:30:00 AM	BD:	1823	Total Slurry Volume:	416
Logging Co.	Blue Dot	ISIP:	0	Total Fluid Volume:	380
Formation	Up Seaboard, Un A, Up	Avg Press:	2513	Avg N2 Rate:	36,300
Perf Top:	1510.9	Max Treat Pressure:	2844	Max N2 Rate:	38,800
Perf Bottom:	1763.5	Final ISIP:	1135	Total N2 Volume:	700,000
# Shots:	27	2 Min SIP:	0	Max DH PPA:	2.5
Perf Size:	0.52	5 Min SIP:	0	Total Proppant Sks:	393
Perf Comments:		10 Min SIP:	0	Total Acid:	750
		Sand Mesh:	20/40 Sand	Acid Type:	15% HCL
Comments:		Frac Gradient:	1.1		

Stage:	Stage 06	Service Co.	Nabors (Superior)	Avg DH Rate:	62.0
Stage Date:	12/9/2014 1:15:00 PM	Fluid Type:	70Q Foam	Max DH Rate:	63.0
Perf Date:	12/9/2014 1:15:00 PM	BD:	1213	Total Slurry Volume:	304
Logging Co.	Blue Dot	ISIP:	0	Total Fluid Volume:	276
Formation	Up Sea A, Up Sea, Gr Creek,	Avg Press:	2288	Avg N2 Rate:	33,000
Perf Top:	1233.9	Max Treat Pressure:	2570	Max N2 Rate:	33,400
Perf Bottom:	1498.8	Final ISIP:	1760	Total N2 Volume:	494,000
# Shots:	25	2 Min SIP:	1555	Max DH PPA:	2.3
Perf Size:	0.52	5 Min SIP:	1506	Total Proppant Sks:	297
Perf Comments:		10 Min SIP:	0	Total Acid:	750
		Sand Mesh:	20/40 Sand	Acid Type:	15% HCL
Comments:		Frac Gradient:	0.9		

Final Production After Stimulation				
	BOD	MCFD	Hours Tested	Rock Pressure
Final/Commingled Zones				
Commingled		120	in-line	



Commonwealth of Virginia
Department of Mines, Minerals, and Energy
Division of Gas and Oil
P.O. Drawer 159, Lebanon, VA 24266
Telephone: (276) 415-9700

Tracking Number:	2509
Company:	EQT Production Company
File Number:	DI-2311
Operations Name:	VCI-531424
Operation Type:	Coal Bed
Drilling Report Type:	Original

DRILLING REPORT (DGO-GO-14)

1. Drilling Data

Date drilling commenced:	<u>3/26/2010</u>	Drilling Contractor:	<u>Gasco Drilling</u>
Date drilling completed:	<u>3/30/2010</u>	Rig Type:	☒ Rotary ☐ Cable
Driller's Total Depth (feet):	<u>2202.00</u>		
Log Total Depth (feet):	<u>2204.00</u>	Coal Seam At Total Depth	<u>POCAHONTAS #2</u>

2. Final Location Plat (as required by 4 VAC25-150-360.C.)

Permitted State Plane X:	<u>10379802.6000</u>	Final Plat State Plane X:	<u>10379806.3300</u>
Permitted State Plane Y:	<u>3573945.1700</u>	Final Plat State Plane Y:	<u>3573943.0500</u>

Plat Previously Submitted Or... ☐

List of Attached Items:

Description	FileName
Final Plat 531424	531424 Final Plat.tif

3. Geological Data

Fresh Water At:

Depth (in feet)	Rate	Unit of Measure

Salt Water At:

Depth (in feet)	Rate	Unit of Measure

Coal Seams:

List of Attached Items:

Description	FileName
Coal Seams 531424	Coal Seams.doc

Gas and Oil Shows:

List of Attached Items:

Description	FileName
Gas & Oil Shows 531424	Gas and Oil Shows.doc

4. Electric Logs (As required by 4VAC25-150-280.A)

List all logs run: GR/Density/Temp/Induction/Neutron

Did logs disclose vertical locations of a coal seam?



5. Survey Results (As required by 4VAC25-150-280.B.2)

List of Attached Items:

Description	FileName
Survey Results 531424	Survey Results.doc

6. Casing and Tubing Program

List of Attached Items:

Description	FileName
Casing 531424	Casing Data.doc
Tubing 531424	Tubing Size.doc

7. Remarks

Use this space to note any conditions or occurrences, such as lost circulation, fishing jobs, junk left in hole, sidetracks, squeeze jobs, etc., not shown above. Include data and depth of condition/occurrence.

8. Drillers Log

Compiled By: _____

List of Attached Items:

Description	FileName
Drillers Log 531424	Drillers Log.doc

9. Comments

10. Signature

Permittee: EQT Production Company Date: 5/3/2010

Signed By: Michael D. Butcher Title: Director of Drilling

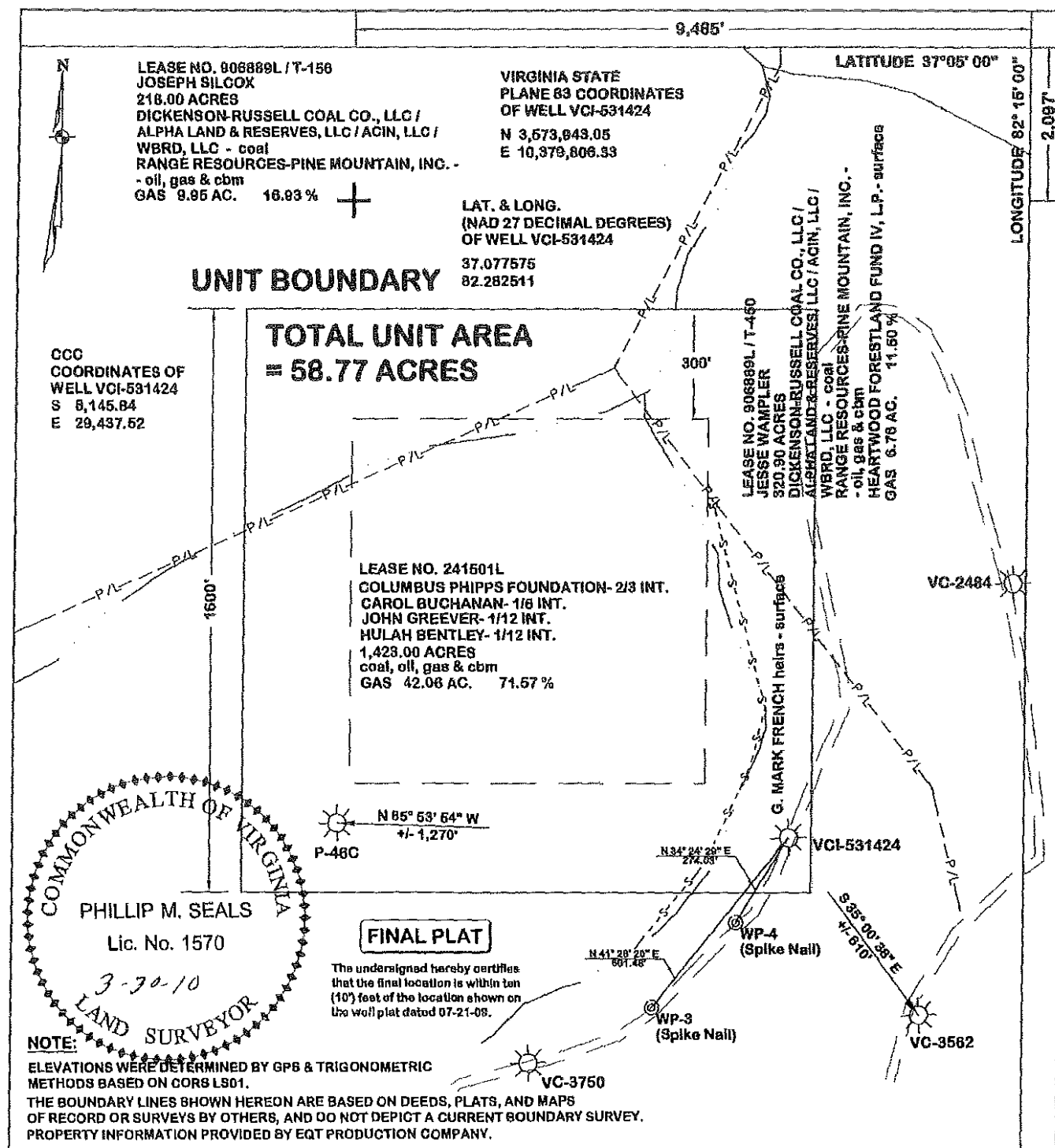
INTERNAL USE ONLY

Submit Date: 5/3/2010

Status: A

Date: 6/2/2010

Final PDF Date: 6/10/2010



WELL LOCATION PLAT (Nora Grid BF-55)

COMPANY EQT PRODUCTION COMPANY WELL NAME OR NUMBER VCI-531424

TRACT NO. Lease No 241501L QUADRANGLE Nora

DISTRICT Ervin

WELL COORDINATES (VIRGINIA STATE PLANE 27) N 293,066.45 E 896,821.65

ELEVATION 1,832.52 METHOD USED TO DETERMINE ELEVATION: GPS & TRIG.

COUNTY Dickenson SCALE: 1" = 400' DATE 03-30-10

THIS PLAT IS A NEW PLAT ☐ AN UPDATED PLAT ☐ ; OR A FINAL LOCATION PLAT ☒

+ DENOTES THE LOCATION OF A WELL ON UNITED STATES TOPOGRAPHIC MAPS, SCALE 1 TO 24,000,
 LATITUDE AND LONGITUDE LINES BEING REPRESENTED BY BORDER LINES AS SHOWN.

Coal Seams & Open Mines

<u>Type</u>	<u>From</u>
Coal	401.5'-03.58', 499.5'-00.92', 601.5'-02.83', 635'-38.08', 749'-49.92', 855.5'-56.33',
Coal	895.5'-895.92', 1059'-60.25', 1101'-01.67', 1136'-37.5', 1202.5'-03.17', 1269.5'-70.25',
Coal	1296.5'-98.33', 1372.5'-72.75', 1380'-81.33', 1425'-27.25', 1448.5'-49.5',
Coal	1477.5'-79.58', 1537.5'-39.75', 1630.5'-31.25', 2059.5'--60.58', 2085'-85.67',

Gas and Oil Shows

Gas Tests

<u>Depth</u>	<u>Remarks</u>
192	No Show
382	No Show
571	No Show
759	No Show
948	No Show
1,136	No Show
1,327	No Show
1,517	No Show
1,708	No Show
1,897	No Show
2,085	No Show
2,202	No Show

Survey Results

<u>Depth</u>	<u>Direction/Distance/Degrees From True Vertical</u>
192	1/4
382	1/4
571	1/4
759	1/4
948	1/4
1,136	1/4
1,327	1/4
1,517	1/4
1,708	1/4
1,897	1/4
2,085	1/4
2,202	1/4

Casing Outside Diameter	Casing Data		Casing Interval	Hole Size	Cement used in Cu. ft.	Cmtd To Surface	Date Cemented	Cement Baskets
12 3/4			44	16 1/4				
7			343	8 7/8	118.00	y	03/29/2010	84
4 1/2			2173	6 1/2	470.75	y	03/30/2010	

<u>Tubing Size</u>	<u>Footage</u>
2 3/8	2,105.80
5/8"	2106.85"

Drillers
Log

<u>Formation Name</u>	<u>Depth Top</u>	<u>Depth Bottom</u>	<u>Formation Thickness</u>
OverBurden	0.00	10.00	10.00
sandstone	10.00	30.00	20.00
Sandy Shale	30.00	230.00	200.00
Sand Stone	230.00	309.00	79.00
Sandy Shale	309.00	401.50	92.50
Aily	401.50	403.58	2.08
sand & shale	403.58	499.50	95.92
Raven	499.50	500.92	1.42
sand & shale	500.92	601.50	100.58
Jawbone Rider	601.50	602.83	1.33
sand & shale	602.83	635.00	32.17
Jawbone	635.00	638.08	3.08
sand & shale	638.08	749.00	110.92
Tiller	749.00	749.92	0.92
sand & shale	749.92	855.50	105.58
Upper Seaboard A	855.50	856.33	0.83
sand & shale	856.33	895.50	39.17
Upper Seaboard	895.50	895.92	0.42
sand & shale	895.92	1,059.00	163.08
Greasy Creek	1,059.00	1,060.25	1.25
sand & shale	1,060.25	1,101.00	40.75
Middle Seaboard	1,101.00	1,101.67	0.67
sand & shale	1,101.67	1,136.00	34.33
Lower Seaboard	1,136.00	1,137.50	1.50
sand & shale	1,137.50	1,202.50	65.00
Unnamed A	1,202.50	1,203.17	0.67
sand & shale	1,203.17	1,269.50	66.33
Upper Horsepen	1,269.50	1,270.25	0.75
sand & shale	1,270.25	1,296.50	26.25
Middle Horsepen	1,296.50	1,298.33	1.83
sand & shale	1,298.33	1,372.50	74.17
C Seam Rider	1,372.50	1,372.75	0.25
sand & shale	1,372.75	1,380.00	7.25
C Seam	1,380.00	1,381.33	1.33
sand & shale	1,381.33	1,425.00	43.67
War Creek	1,425.00	1,427.25	2.25
sand & shale	1,427.25	1,448.50	21.25
Unnamed C	1,448.50	1,449.58	1.08
sand & shale	1,449.58	1,477.50	27.92
Beckley	1,477.50	1,479.58	2.08
sand & shale	1,479.58	1,537.50	57.92
Lower Horsepen	1,537.50	1,539.75	2.25
sand & shale	1,539.75	1,630.50	90.75
X Seam	1,630.50	1,631.25	0.75
sand & shale	1,631.25	2,059.50	428.25
Pocahontas #3	2,059.50	2,060.58	1.08

sand & shale	2,060.58	2,085.00	24.42
Pocahontas #2	2,085.00	2,085.67	0.67
sand & shale	2,085.67	2,202.00	116.33



Commonwealth of Virginia
Department of Mines, Minerals, and Energy
Division of Gas and Oil
P.O. Drawer 159, Lebanon, VA 24266
Telephone: (276) 415-9700

Tracking Number: 2446
Company: EQT Production Company
File Number: DI-2311
Completion Report Type: Original

COMPLETION REPORT (DGO-GO-15)

Well Type:	Coal Bed	Date Well Completed:	4/20/2010
Driller's Total Depth:	2202.00	Log's Total Depth:	2204.00

1. Changes In Casing/Tubing from Approved Drilling Report

Description	FileName

2. Stimulation Record

Stimulation Status: ☒ Stimulated ☐ GOB ☐ Not Stimulated ☐ Service Well

Description	FileName
Treatment Summary 531424	Stage1.doc

3. Final Production

Description	FileName
Final Production 531424	Final Production.doc

4. Comments

Notes:

5. Signature

Permittee: EQT Production Company Date: 5/3/2010 (Company)

By: Michael D. Butcher Title: Director of Drilling (Signature)

INTERNAL USE ONLY

Submit Date: 5/3/2010

Status: _____

Date: 6/2/2010

Final PDF Date: 6/10/2010

[REDACTED]

Date 04/13/2010

FracType 65Q Foam
Zone Poca #3/X
Seam

of Perfs 18

From/To 2,062 1,630

BD Press 2,661

ATP Psi 2,751

Avg Rate 31

Max Press Psi 3,045

ISIP Psi 1,981

10min SIP 1,692 5 min.
1.22

Frac Gradient

Sand Proppant 84.73

Water-bbl 229
SCF N2 261,165

Acid-gal gal 850
7.5%HCL

[REDACTED]

Date 04/13/2010

FracType 65Q Foam
Zone Lower
Horsepen

of Perfs 16

From/To 1,542 1,538

BD Press 0

ATP Psi	0	
Avg Rate	0	
Max Press Psi	0	
ISIP Psi	0	
10min SIP	0	5 min. 0.15
Frac Gradient		
Sand Proppant		0.00
Water-bbl	37	
SCF N2		18,238
Acid-gal	gal	350
	7.5%HCL	



Date	04/13/2010	
FracType	65Q	Foam
Zone	Bckly/Unmd C/WrCrk/C Sm	

# of Perfs	40	
From/To	1,480	1,379
BD Press	3,381	
ATP Psi	3,056	
Avg Rate	35	
Max Press Psi	3,391	
ISIP Psi	1,992	
10min SIP	1,859	5 min. 1.55
Frac Gradient		
Sand Proppant		251.20

Water-bbl	513

SCF N2 634,618

Acid-gal gal 350
7.5%HCL

[REDACTED]

Date 04/13/2010

FracType 65Q Foam
Zone M Hrspn/L Sbrd/GrSyCrk

of Perfs 34

From/To 1,299 1,059

BD Press 1,858

ATP Psi 3,213
Avg Rate 31

Max Press Psi 3,283

ISIP Psi 2,853

10min SIP 2,346 5 min.
2.57

Frac Gradient

Sand Proppant 173.04

Water-bbl 385
SCF N2 407,646

Acid-gal gal 350
7.5%HCL

[REDACTED]

Date 04/13/2010

FracType 65Q Foam
Zone U Seaboard A

of Perfs 8

From/To	858	856
BD Press	3,422	
ATP Psi	3,345	
Avg Rate	13	
Max Press Psi	3,720	
ISIP Psi	2,025	
10min SIP	0	5 min. 2.52
Frac Gradient		
Sand Proppant		20.62
Water-bbl	112	
SCF N2		79,802
Acid-gal	gal 7.5%HCL	700

Final Production

After Stimulation

BOD

MCFD

Hours Tested

**Rock
Pressure**

Final Production if Gas Zones are commingled

9

0

110

TIL Date: 4/22/10



Commonwealth of Virginia
Department of Mines, Minerals, and Energy
Division of Gas and Oil
P.O. Drawer 159, Lebanon, VA 24266
Telephone: (276) 415-9700

Tracking Number:	1935
Company:	Equitable Production Company
File Number:	DI-2162
Operations Name:	VC-536315
Operation Type:	Coal Bed
Drilling Report Type:	Original

DRILLING REPORT (DGO-GO-14)

1. Drilling Data

Date drilling commenced:	<u>5/19/2009</u>	Drilling Contractor:	<u>Crossrock Drilling</u>
Date drilling completed:	<u>5/21/2009</u>	Rig Type:	☒ Rotary ☐ Cable
Driller's Total Depth (feet):	<u>2233.00</u>		
Log Total Depth (feet):	<u>2248.00</u>	Coal Seam At Total Depth	<u>POCAHONTAS #3</u>

2. Final Location Plat (as required by 4 VAC25-150-360.C.)

Permitted State Plane X:	<u>10380110.8200</u>	Final Plat State Plane X:	<u>10380111.0900</u>
Permitted State Plane Y:	<u>3575392.5500</u>	Final Plat State Plane Y:	<u>3575392.6900</u>

Plat Previously Submitted Or... ☐

List of Attached Items:

Description	FileName
Final Plat 536315	VC-536315 final plat.tif

3. Geological Data

Fresh Water At:

Depth (in feet)	Rate	Unit of Measure
300	1	INCH

Salt Water At:

Depth (in feet)	Rate	Unit of Measure

Coal Seams:

List of Attached Items:

Description	FileName
Coal Seams 536315	Coal Seams.doc

Gas and Oil Shows:

List of Attached Items:

Description	FileName
Gas & Oil Shows 536315	Gas and Oil Shows.doc

4. Electric Logs (As required by 4VAC25-150-280.A)

List all logs run: GR/Density/Temp/Induction/Neutron

Did logs disclose vertical locations of a coal seam? ☒

5. Survey Results (As required by 4VAC25-150-280.B.2)

List of Attached Items:

Description	FileName
Survey Results 536315	Survey Results.doc

6. Casing and Tubing Program

List of Attached Items:

Description	FileName
Casing 536315	Casing Data.doc
Tubing 536315	Tubing Size.doc

7. Remarks

Use this space to note any conditions or occurrences, such as lost circulation, fishing jobs, junk left in hole, sidetracks, squeeze jobs, etc., not shown above. Include data and depth of condition/occurrence.

8. Drillers Log

Compiled By: _____

List of Attached Items:

Description	FileName
Drillers Log 536315	Drillers Log.doc

9. Comments

10. Signature

Permitee: Equitable Production Company Date: 8/25/2009
Signed By: Michael D. Butcher Title: Director of Drilling

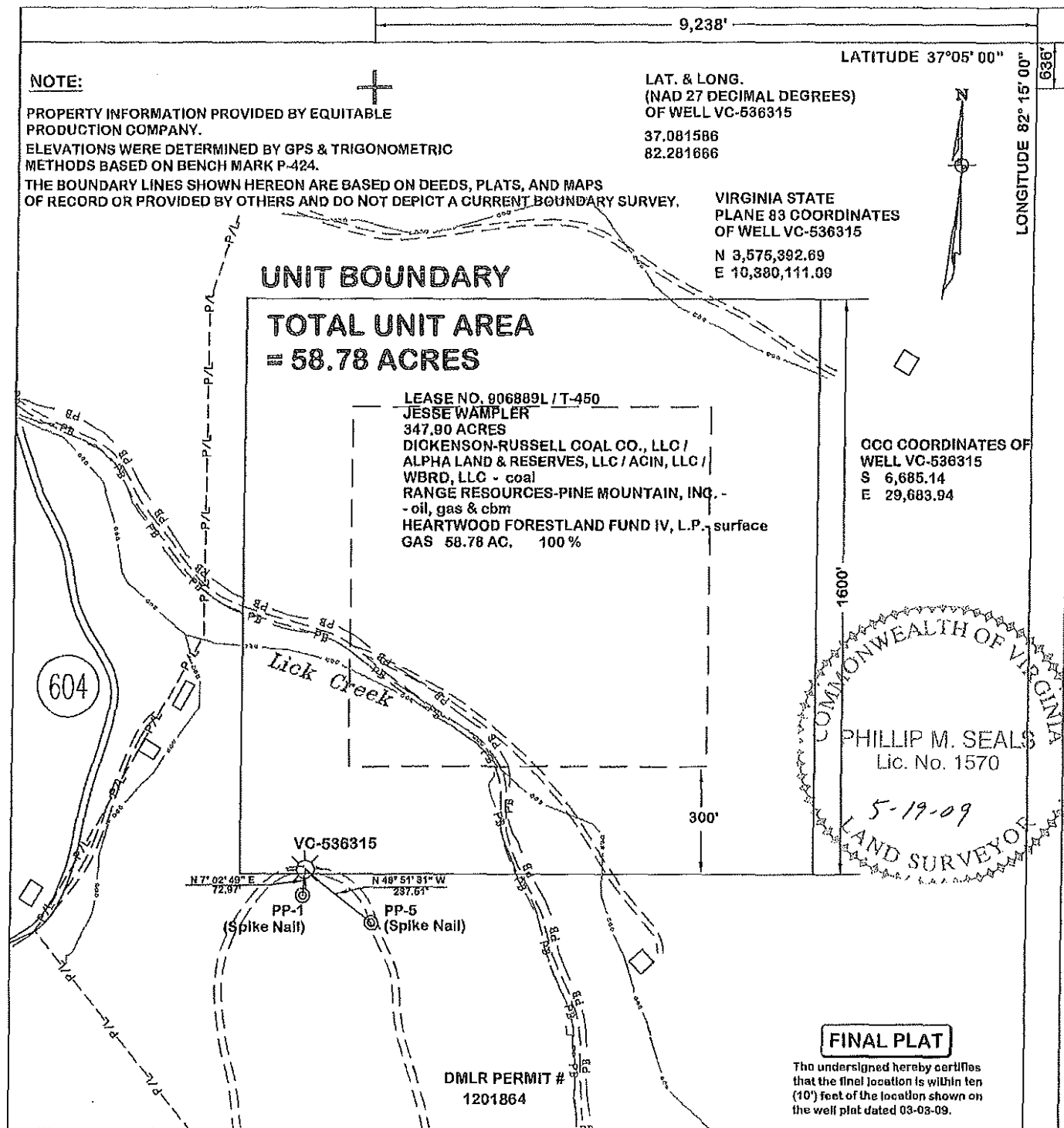
INTERNAL USE ONLY

Submit Date: 8/25/2009

Status: A

Date: 10/1/2009

Final PDF Date: 10/13/2009



WELL LOCATION PLAT (Nora Grid BE-56)

COMPANY EQUITABLE PRODUCTION CO. WELL NAME OR NUMBER VC-536315

TRACT NO. T-450 QUADRANGLE Nora

DISTRICT Ervinton

WELL COORDINATES (VIRGINIA STATE PLANE 27) N 294,516.04 E 897,126.42

ELEVATION 1,817.60 METHOD USED TO DETERMINE ELEVATION: GPS & TRIG.

COUNTY Dickenson SCALE: 1" = 400' DATE 5-19-09

THIS PLAT IS A NEW PLAT AN UPDATED PLAT ; OR A FINAL LOCATION PLAT X

+ DENOTES THE LOCATION OF A WELL ON UNITED STATES TOPOGRAPHIC MAPS, SCALE 1 TO 24,000, LATITUDE AND LONGITUDE LINES BEING REPRESENTED BY BORDER LINES AS SHOWN.

Phillip M. Seals

Coal Seams & Open Mines

<u>Type</u>	<u>From</u>
Coal	81'-82', 207'-08', 226'-27', 415.5'-17.5', 502'-05.1', 636.5'-38.5',
Coal	673.5'-77.5', 759'-59.5', 898'-99.3', 938'-39', 1106.5'-07.8', 1158.5'-59.8',
Coal	1200.5'-01.5', 1264'-64.6', 1364'-65', 1443'-43.3', 1471.5'-72.8', 1505.5'-07.3',
Coal	1533.5'-34.3', 1564.5'-68.9', 1595'-96.6', 1680.5'-82.3', 2028'-29.3', 2168.5'-69.8',

Gas and Oil Shows

Gas Tests

<u>Depth</u>	<u>Remarks</u>
184	No Show
364	No Show
544	No Show
722	No Show
902	No Show
1,082	No Show
1,262	No Show
1,442	No Show
1,622	No Show
1,802	No Show
1,982	No Show
2,162	No Show
2,185	No Show
2,233	No Show

Survey Results

<u>Depth</u>	<u>Direction/Distance/Degrees</u> <u>From True Vertical</u>
184	1/8
364	1/8
544	1/8
722	1/4
902	1/4
1,082	1/4
1,262	1/4
1,442	1/8
1,622	1/4
1,802	1/8
1,982	1/4
2,162	1/4

Casing Data						
Casing Outside Diameter	Casing Interval	Hole Size	Cement used in Cu. ft.	Cmtd To Surface	Date Cemented	Cement Baskets
13 3/8	42	17 1/2				
7	348	8 7/8	118.00	y	05/19/2009	132
4 1/2	2190	6 3/8	371.85	y	05/21/2009	

<u>Tubing Size</u>	<u>Footage</u>
2 3/8	2,115.90
5/8"	2120.85

Drillers
Log

<u>Formation Name</u>	<u>Depth Top</u>	<u>Depth Bottom</u>	<u>Formation Thickness</u>
Fill	0.00	18.00	18.00
Sand	18.00	81.00	63.00
Coal	81.00	82.00	1.00
Sand and Shale	82.00	207.00	125.00
Coal	207.00	208.00	1.00
Sand and Shale	208.00	226.00	18.00
Coal	226.00	227.00	1.00
Sand and Shale	227.00	415.50	188.50
Aily	415.50	417.50	2.00
sand & shale	417.50	502.00	84.50
Raven	502.00	505.10	3.10
sand & shale	505.10	636.50	131.40
Jawbone Rider	636.50	638.50	2.00
sand & shale	638.50	673.50	35.00
Jawbone	673.50	677.50	4.00
sand & shale	677.50	759.00	81.50
Tiller	759.00	759.50	0.50
sand & shale	759.50	898.00	138.50
Upper Seaboard A	898.00	899.30	1.30
sand & shale	899.30	938.00	38.70
Upper Seaboard	938.00	939.00	1.00
sand & shale	939.00	1,106.50	167.50
Greasy Creek	1,106.50	1,107.80	1.30
sand & shale	1,107.80	1,158.50	50.70
Middle Seaboard	1,158.50	1,159.80	1.30
sand & shale	1,159.80	1,200.50	40.70
Lower Seaboard	1,200.50	1,201.50	1.00
sand & shale	1,201.50	1,264.00	62.50
Unnamed A	1,264.00	1,264.60	0.60
sand & shale	1,264.60	1,364.00	99.40
Middle Horsepen	1,364.00	1,365.00	1.00
sand & shale	1,365.00	1,443.00	78.00
C Seam Rider	1,443.00	1,443.30	0.30
sand & shale	1,443.30	1,471.50	28.20
C Seam	1,471.50	1,472.80	1.30
sand & shale	1,472.80	1,505.50	32.70
War Creek	1,505.50	1,507.30	1.80
sand & shale	1,507.30	1,533.50	26.20
Unnamed C	1,533.50	1,534.30	0.80
sand & shale	1,534.30	1,564.50	30.20
Beckley	1,564.50	1,568.90	4.40
sand & shale	1,568.90	1,595.00	26.10
Lower Horsepen	1,595.00	1,596.60	1.60
sand & shale	1,596.60	1,680.50	83.90
X Seam	1,680.50	1,682.30	1.80
sand & shale	1,682.30	2,028.00	345.70

Pocahontas #4	2,028.00	2,029.30	1.30
sand & shale	2,029.30	2,168.50	139.20
Pocahontas #3	2,168.50	2,169.80	1.30
sand & shale	2,169.80	2,233.00	63.20



Commonwealth of Virginia
Department of Mines, Minerals, and Energy
Division of Gas and Oil
P.O. Drawer 159, Lebanon, VA 24266
Telephone: (276) 415-9700

Tracking Number: 1875
Company: EQT Production Company
File Number: DI-2162
Completion Report Type: Original

COMPLETION REPORT (DGO-GO-15)

Well Type:	Coal Bed	Date Well Completed:	6/19/2009
Driller's Total Depth:	2233.00	Log's Total Depth:	2248.00

1. Changes In Casing/Tubing from Approved Drilling Report

Description	FileName

2. Stimulation Record

Stimulation Status: ☒ Stimulated ☐ GOB ☐ Not Stimulated ☐ Service Well

Description	FileName
Treatment Summary 536315	Stage1.doc

3. Final Production

Description	FileName
Final Production 536315	Final Production.doc

4. Comments

Notes:

5. Signature

Permittee: EQT Production Company Date: 8/25/2009 (Company)

By: Michael D. Butcher Title: Director of Drilling (Signature)

INTERNAL USE ONLY

Submit Date: 8/25/2009

Status: _____

Date: 3/26/2010

Final PDF Date: 3/29/2010

[REDACTED]

Date 05/30/2009

FracType	65Q	Foam
Zone	Poca #3/Poca #2	
# of Perfs	20	
From/To	2,086	2,053
BD Press	2,820	
ATP Psi	3,134	
Avg Rate	34	
Max Press Psi	3,253	
ISIP Psi	2,174	
10min SIP	1,920	5 min. 1.19
Frac Gradient		
Sand Proppant		61.00
Water-bbl	188	
SCF N2		307,000
Acid-gal	gal 7.5%HCL	850

[REDACTED]

Date 05/30/2009

FracType	65Q	Foam
Zone	L Hrspn/X Sm Rdr/X Sm	
# of Perfs	32	
From/To	1,628	1,541
BD Press	2,415	
ATP Psi	3,054	

Avg Rate	47	
Max Press Psi	3,175	
ISIP Psi	1,902	
10min SIP	1,563	5 min. 1.36
Frac Gradient		
Sand Proppant		117.00
Water-bbl	320	
SCF N2		491,000
Acid-gal	gal 7.5%HCL	350



Date	05/30/2009	
FracType	65Q	Foam
Zone	M Hrspn/C Sm/WrCrk/Unnmd .	

# of Perfs	40	
From/To	1,445	1,288
BD Press	1,077	
ATP Psi	2,716	
Avg Rate	47	
Max Press Psi	3,184	
ISIP Psi	1,683	
10min SIP	1,345	5 min. 1.44
Frac Gradient		
Sand Proppant		131.00

Water-bbl	335

SCF N2 484,000

Acid-gal gal 350
7.5%HCL


Date 05/30/2009

FracType 65Q Foam
Zone GrsyCrk/M&L Sbrd/Unmd A

of Perfs 32

From/To 1,195 1,048

BD Press 2,225

ATP Psi 2,677

Avg Rate 48

Max Press Psi 2,770

ISIP Psi 1,405

10min SIP 1,208 5 min.
1.47

Frac Gradient

Sand Proppant
115.00

Water-bbl 295
SCF N2 398,000

Acid-gal gal 350
7.5%HCL


Date 05/30/2009

FracType 65Q Foam
Zone U Sbrd A/U Sbrd/GrsyCrk

of Perfs 24

From/To	996	848
BD Press	2,346	
ATP Psi	0	
Avg Rate	0	
Max Press Psi	0	
ISIP Psi	0	
10min SIP	0	5 min.
		0.13
Frac Gradient		
Sand Proppant		10.00
Water-bbl	127	
SCF N2		150,000
Acid-gal	gal	700
	7.5%HCL	

<u>Final Production</u>	<u>After Stimulation</u>		<u>Hours Tested</u>	<u>Rock Pressure</u>
	<u>BOD</u>	<u>MCFD</u>		
Final Production if Gas Zones are commingled		8	0	150



Commonwealth of Virginia
Department of Mines, Minerals, and Energy
Division of Gas and Oil
P.O. Drawer 159, Lebanon, VA 24266
Telephone: (276) 415-9700

Tracking Number:	6847
Company:	Range Resources-Pine Mountain,
File Number:	DI-2592
Operations Name:	VC-536368 w/PL
Operation Type:	Coalbed/Pipeline
Drilling Report Type:	Original

DRILLING REPORT (DGO-GO-14)

1. Drilling Data

Date drilling commenced:	5/11/2015	Drilling Contractor:	Noah Horn 243
Date drilling completed:	5/14/2015	Rig Type:	☒ Rotary ☐ Cable
Driller's Total Depth (feet):	2710.00		
Log Total Depth (feet):	2717.00	Coal Seam at Total Depth:	POCAHONTAS #2

2. Final Location Plat (as required by 4 VAC25-150-360.C.)

Permitted State Plane X:	10378904.3200	Final Plat State Plane X:	10378901.0800
Permitted State Plane Y:	3580929.7400	Final Plat State Plane Y:	3580925.9200

Plat Previously Submitted Or... ☐

List of Attached Items:

Description	FileName
VC-536368 Final Plat	VC-536368 Final Plat.pdf

3. Geological Data

Fresh Water At:

Depth (in feet)	Rate	Unit of Measure
218	1/2	INCH

Salt Water At:

Depth (in feet)	Rate	Unit of Measure
2165	1/2	INCH
2700	1/2	INCH

Coal Seams:

List of Attached Items:

Description	FileName
VC-536368 Coal	Coals.xlsx

Gas and Oil Shows:

List of Attached Items:

Description	FileName
VC-536368 Gas Shows	Shows 536368.xlsx

4. Electric Logs (As required by 4VAC25-150-280.A)

List all logs run: GR/CDL/PE/DIL/Neu/TEMP/Audio

Did logs disclose vertical locations of a coal seam? ☐

5. Survey Results (As required by 4VAC25-150-280.B.2)

List of Attached Items:

Description	FileName
VC-536368 Survey	Surveys 536368.xlsx

6. Casing and Tubing Program

List of Attached Items:

Description	FileName
VC-536368 Casing/Tubing	Casing 536368.xlsx

7. Remarks

Use this space to note any conditions or occurrences, such as lost circulation, fishing jobs, junk left in hole, sidetracks, squeeze jobs, etc., not shown above. Include data and depth of condition/occurrence.

8. Drillers Log

Compiled By: Range Resources

List of Attached Items:

Description	FileName
VC-536368 Driller's Log	Drillers Log.xlsx

9. Comments

approved. [7/21/2015, jal]

10. Signature

Permittee: Range Resources-Pine Mountain, Date: 7/10/2015
Signed By: Laura Murray Title: Regulatory Compliance Specialist

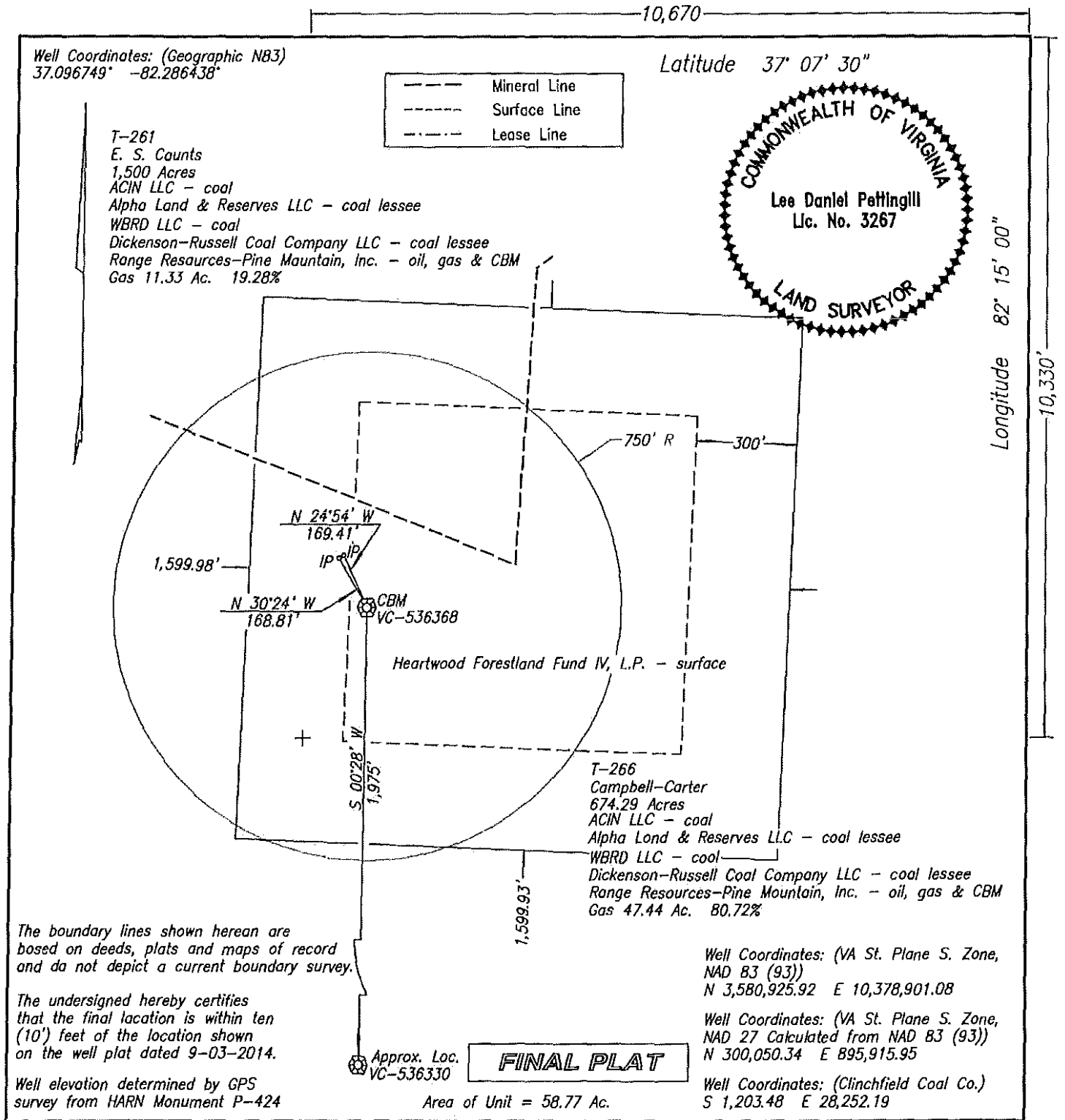
INTERNAL USE ONLY

Submit Date: 7/10/2015

Status: A

Date: 7/21/2015

Final PDF Date: 10/30/2015



WELL LOCATION PLAT NORA GRID BB-55

COMPANY Range Resources-Pine Mountain, Inc. WELL NAME AND NUMBER VC-536368
TRACT NO. Campbell-Carter ELEVATION 2,236.84' QUADRANGLE Nora
COUNTY Dickenson DISTRICT Ervington SCALE 1" = 400' DATE 5-12-2015
This Plat is a new plat ; an updated plat ; or a final location plat x

+ Denotes the location of a well on United States topographic Maps, scale 1 to 24,000, latitude and longitude lines being represented by border lines as shown.

Lee Daniel Pettingill

~~Licensed Professional Engineer or~~ Licensed Land Surveyor

Gas and Oil Shows

FORMATION	DEPTH	THICKNESS	IPF (MCFD/BOPD)	PRESSURE	HOURS TESTED
	1205		N/S		
	1535		N/S		
	2495		N/S		
	2710		Trace		

Survey Results VC-536368

Depth of Survey	Direction/Distance/Degree From True Vertical
218	1/2
395	1/2
600	1/2
800	1/2
995	1/2
1205	1/2
1415	1/2
1625	1/2
1805	1/2
2000	1/2
2190	1/2
2400	3/4
2610	3/4

Casing Program

Casing Type	Casing Size	Casing Interval	Hole Size	Cement Used In Cubic Ft.	Cemented To Surface Yes/No	Date Cemented	Packers Or Bridge Plugs Kind/Size/Set	Cement Baskets (ft)
Conductor	13 3/8	0-24'	15 3/8	Sanded in	No			
Water Protection	9 5/8	0-355'	12 3/8	185	Yes	05/11/15		168'
Coal Protection								
Production Casing	4 1/2"	0-2648'	6 1/2	500	Yes	05/14/15		
Other Casing And Tubing Left In Well	2 3/4"	2524'						
Liners								

Drillers Log		Well # 536368 6/9/2015			
Geologic Age	Formation	General Lithology	Depth Top	Depth Bottom	Thickness
Pennsylvanian	Lee	KB	0.0	8.0	8.0
Pennsylvanian	Lee	Overburden	8.0	18.0	10.0
Pennsylvanian	Lee	Sandy shale	18.0	128.0	110.0
Pennsylvanian	Lee	Sand	128.0	158.0	30.0
Pennsylvanian	Lee	Sandy shale	158.0	240.0	82.0
Pennsylvanian	Lee	Coal	240.0	241.0	1.0
Pennsylvanian	Lee	Sandy shale	241.0	355.0	114.0
Pennsylvanian	Lee	Sandstone	355.0	365.0	10.0
Pennsylvanian	Lee	Sandy shale	365.0	451.0	86.0
Pennsylvanian	Lee	Coal	451.0	452.0	1.0
Pennsylvanian	Lee	Sandy Shale	452.0	805.0	353.0
Pennsylvanian	Lee	Coal	805.7	807.4	1.7
Pennsylvanian	Lee	Sandy Shale	807.4	1025.5	218.1
Pennsylvanian	Lee	Coal	1025.5	1030.6	5.1
Pennsylvanian	Lee	Sandy Shale	1030.6	1052.1	21.5
Pennsylvanian	Lee	Coal	1052.1	1057.9	5.8
Pennsylvanian	Lee	Sandy Shale	1057.9	1164.0	106.1
Pennsylvanian	Lee	Coal	1164.0	1165.7	1.7
Pennsylvanian	Lee	Sandy Shale	1165.7	1278.9	113.2
Pennsylvanian	Lee	Coal	1278.9	1280.4	1.5
Pennsylvanian	Lee	Sandy Shale	1280.4	1317.0	36.6
Pennsylvanian	Lee	Coal	1317.0	1317.7	0.7
Pennsylvanian	Lee	Sandy Shale	1317.7	1432.0	114.3
Pennsylvanian	Lee	Coal	1432.0	1435.2	3.2
Pennsylvanian	Lee	Sandy Shale	1435.2	1469.0	33.8
Pennsylvanian	Lee	Coal	1469.0	1470.8	1.8
Pennsylvanian	Lee	Sandy Shale	1470.8	1507.2	36.5
Pennsylvanian	Lee	Coal	1507.2	1508.5	1.3
Pennsylvanian	Lee	Sandy Shale	1508.5	1538.4	29.9
Pennsylvanian	Lee	Coal	1538.4	1538.6	0.2
Pennsylvanian	Lee	Sandy Shale	1538.6	1609.6	71.0
Pennsylvanian	Lee	Coal	1609.6	1610.2	0.6
Pennsylvanian	Lee	Sandy Shale	1610.2	1713.0	102.8
Pennsylvanian	Lee	Coal	1713.0	1714.5	1.5
Pennsylvanian	Lee	Sandy Shale	1714.5	1818.3	103.8
Pennsylvanian	Lee	Coal	1818.3	1820.0	1.7
Pennsylvanian	Lee	Sandy Shale	1820.0	1846.8	26.8
Pennsylvanian	Lee	Coal	1846.8	1847.9	1.1
Pennsylvanian	Lee	Sandy Shale	1847.9	1856.5	8.6
Pennsylvanian	Lee	Coal	1856.5	1857.5	1.0
Pennsylvanian	Lee	Sandy Shale	1857.5	1938.2	80.7
Pennsylvanian	Lee	Coal	1938.2	1939.6	1.4
Pennsylvanian	Lee	Sandy Shale	1939.6	1991.3	51.7

Pennsylvanian	Lee	Coal	1991.3	1993.0	1.7
Pennsylvanian	Lee	Sandy Shale	1993.0	2303.6	310.6
Pennsylvanian	Lee	Coal	2303.6	2303.9	0.3
Pennsylvanian	Lee	Sandy Shale	2303.9	2310.2	6.3
Pennsylvanian	Lee	Coal	2310.2	2310.7	0.5
Pennsylvanian	Lee	Sandy Shale	2310.7	2445.2	134.5
Pennsylvanian	Lee	Coal	2445.2	2445.4	0.2
Pennsylvanian	Lee	Sandy Shale	2445.4	2460.4	15.0
Pennsylvanian	Lee	Coal	2460.4	2460.6	0.2
Pennsylvanian	Lee	Sandy Shale	2460.6	2486.2	25.6
Pennsylvanian	Lee	Coal	2486.2	2487.0	0.8
Pennsylvanian	Lee	Sandy Shale	2487.0	2494.2	7.2
Pennsylvanian	Lee	Coal	2494.2	2494.6	0.4
Pennsylvanian	Lee	Sandy Shale	2494.6	2558.0	63.4
Pennsylvanian	Lee	Red Shale	2558	2564	6.0
Pennsylvanian	Lee	Sandy Shale	2564	2598	34.0
Pennsylvanian	Lee	Red Shale	2598	2640	42.0
Pennsylvanian	Lee	Sandy Shale	2640	2700	60.0
Pennsylvanian	Lee	Sandy Shale	2700	2710	10.0
			2710	2711	TD



Commonwealth of Virginia
Department of Mines, Minerals, and Energy
Division of Gas and Oil
P.O. Drawer 159, Lebanon, VA 24266
Telephone: (276) 415-9700

Tracking Number:	7302
Company:	Range Resources-Pine Mountain,
File Number:	DI-2592
Completion Report Type:	Original

COMPLETION REPORT (DGO-GO-15)

Well Type:	Coalbed/Pipeline	Date Well Completed:	6/2/2015
Driller's Total Depth:	2710.00	Log's Total Depth:	2717.00

1. Changes In Casing/Tubing from Approved Drilling Report

Description	FileName

2. Stimulation Record

Stimulation Status: ☒ Stimulated ☐ GOB ☐ Not Stimulated ☐ Service Well

Description	FileName
VC-536368 Completion Report	PMD-CompletionReport_wv10.pdf

3. Final Production

Description	FileName
VC-536368 Final Production	Final_Prod.xls

4. Comments

Notes:

5. Signature

Permittee: Range Resources-Pine Mountain, Date: 8/13/2015 (Company)

By: Laura Murray Title: Regulatory Compliance Specialist (Signature)

INTERNAL USE ONLY

Submit Date: 8/13/2015

Status: Approved

Date: 9/8/2015

Final PDF Date: 10/30/2015

Range Resources - Pine Mountain

6/4/2015 9:38:21 AM

Completion Report**105009367 --536368 VC-536368**

Stage:	01	Service Co.	C&J Energy Services	Avg DH Rate:	27.6
Stage Date:	06/02/2015	Fluid Type:	65Q Foam	Max DH Rate:	36.0
Perf Date:	06/02/2015	BD:	4834	Total Slurry Volume:	389
Logging Co.	KLX (Blue Dot)	ISIP:	0	Total Fluid Volume:	371
Formation	Pocohontas #6, #6, #3, #3, #2,	Avg Press:	3952	Avg N2 Rate:	22,000
Perf Top:	2303.58	Max Treat Pressure:	4209	Max N2 Rate:	24,800
Perf Bottom:	2494.6	Final ISIP:	1351	Total N2 Volume:	638,400
# Shots:	24	2 Min SIP:	0	Max DH PPA:	1.40
Perf Size:	0.52	5 Min SIP:	0	Total Proppant Sks:	193
Perf Comments:		10 Min SIP:	0	Total Acid:	750
		Sand Mesh:	20/40 Sand	Acid Type:	10% HCL
Comments:		Frac Gradient:	0.72		

Stage:	02	Service Co.	C&J Energy Services	Avg DH Rate:	55.6
Stage Date:	06/02/2015	Fluid Type:	70Q Foam	Max DH Rate:	58.3
Perf Date:	06/02/2015	BD:	2268	Total Slurry Volume:	327
Logging Co.	KLX (Blue Dot)	ISIP:	0	Total Fluid Volume:	297
Formation	Beckley, Lower Horsepen, X-	Avg Press:	3552	Avg N2 Rate:	43,600
Perf Top:	1856.5	Max Treat Pressure:	3767	Max N2 Rate:	45,000
Perf Bottom:	1993	Final ISIP:	1360	Total N2 Volume:	660,300
# Shots:	23	2 Min SIP:	0	Max DH PPA:	1.90
Perf Size:	0.52	5 Min SIP:	0	Total Proppant Sks:	330
Perf Comments:		10 Min SIP:	0	Total Acid:	250
		Sand Mesh:	20/40 Sand	Acid Type:	10% HCL
Comments:		Frac Gradient:	0.83		

Stage:	03	Service Co.	C&J Energy Services	Avg DH Rate:	58.5
Stage Date:	06/02/2015	Fluid Type:	70Q Foam	Max DH Rate:	61.9
Perf Date:	06/02/2015	BD:	2388	Total Slurry Volume:	322
Logging Co.	KLX (Blue Dot)	ISIP:	0	Total Fluid Volume:	290
Formation	Middle Horsepen, War Creek,	Avg Press:	3643	Avg N2 Rate:	46,100
Perf Top:	1713	Max Treat Pressure:	3701	Max N2 Rate:	46,700
Perf Bottom:	1847.9	Final ISIP:	1284	Total N2 Volume:	675,500
# Shots:	21	2 Min SIP:	0	Max DH PPA:	1.80
Perf Size:	0.52	5 Min SIP:	0	Total Proppant Sks:	348
Perf Comments:		10 Min SIP:	0	Total Acid:	500
		Sand Mesh:	20/40 Sand	Acid Type:	10% HCL
Comments:		Frac Gradient:	0.84		

Stage:	04	Service Co.	C&J Energy Services	Avg DH Rate:	54.6
Stage Date:	06/02/2015	Fluid Type:	70Q Foam	Max DH Rate:	56.3
Perf Date:	06/02/2015	BD:	2031	Total Slurry Volume:	296

Range Resources - Pine Mountain

6/4/2015 9:38:21 AM

Completion Report**105009367 --536368 VC-536368**

Logging Co.	KLX (Blue Dot)	ISIP:	0	Total Fluid Volume:	268
Formation	Greasy Creek,Mid	Avg Press:	3145	Avg N2 Rate:	39,660
Perf Top:	1469	Max Treat Pressure:	3418	Max N2 Rate:	41,500
Perf Bottom:	1610.2	Final ISIP:	1167	Total N2 Volume:	600,000
# Shots:	24	2 Min SIP:	0	Max DH PPA:	1.80
Perf Size:	0.52	5 Min SIP:	0	Total Proppant Sks:	308
Perf Comments:		10 Min SIP:	0	Total Acid:	250
		Sand Mesh:	20/40 Sand	Acid Type:	10% HCL
Comments:		Frac Gradient:	0.87		

Stage:	05	Service Co.	C&J Energy Services	Avg DH Rate:	47.8
Stage Date:	06/02/2015	Fluid Type:	70Q Foam	Max DH Rate:	50.6
Perf Date:	06/02/2015	BD:	3179	Total Slurry Volume:	209
Logging Co.	KLX (Blue Dot)	ISIP:	0	Total Fluid Volume:	183
Formation	Upper Seaboard A, Upper	Avg Press:	3067	Avg N2 Rate:	33,200
Perf Top:	1278.9	Max Treat Pressure:	3184	Max N2 Rate:	33,600
Perf Bottom:	1435.2	Final ISIP:	1450	Total N2 Volume:	411,000
# Shots:	24	2 Min SIP:	1313	Max DH PPA:	2.00
Perf Size:	0.52	5 Min SIP:	1284	Total Proppant Sks:	280
Perf Comments:		10 Min SIP:	1245	Total Acid:	0
		Sand Mesh:	20/40 Sand	Acid Type:	10% HCL
Comments:		Frac Gradient:	1.2		



Commonwealth of Virginia
Department of Mines, Minerals, and Energy
Division of Gas and Oil
P.O. Drawer 159, Lebanon, VA 24266
Telephone: (276) 415-9700

Tracking Number:	7080
Company:	Range Resources-Pine Mountain,
File Number:	DI-2593
Operations Name:	VC-536369 w/PL
Operation Type:	Coalbed/Pipeline
Drilling Report Type:	Original

DRILLING REPORT (DGO-GO-14)

1. Drilling Data

Date drilling commenced:	5/15/2015	Drilling Contractor:	Noah Horn 243
Date drilling completed:	5/21/2015	Rig Type:	☒ Rotary ☐ Cable
Driller's Total Depth (feet):	2755.00		
Log Total Depth (feet):	2769.00	Coal Seam at Total Depth:	POCAHONTAS #2

2. Final Location Plat (as required by 4 VAC25-150-360.C.)

Permitted State Plane X:	10380793.2700	Final Plat State Plane X:	10380787.8400
Permitted State Plane Y:	3580766.7300	Final Plat State Plane Y:	3580764.9600

Plat Previously Submitted Or... ☐

List of Attached Items:

Description	FileName
VC-536369 Final Plat	536369 FINAL PLAT.pdf

3. Geological Data

Fresh Water At:

Depth (in feet)	Rate	Unit of Measure
80	1/2	INCH
97	1/2	INCH

Salt Water At:

Depth (in feet)	Rate	Unit of Measure
2495	Damp	

Coal Seams:

List of Attached Items:

Description	FileName
VC-536369 Coal	Coal Log.xlsx

Gas and Oil Shows:

List of Attached Items:

Description	FileName
VC-536369 Shows	Shows 536369.xlsx

4. Electric Logs (As required by 4VAC25-150-280.A)

List all logs run: GR/CDL/PE/DIL/Neu/TEMP/Audio

Did logs disclose vertical locations of a coal seam?

☐

5. Survey Results (As required by 4VAC25-150-280.B.2)

List of Attached Items:

Description	FileName
VC-536369 Survey	Surveys 536369.xlsx

6. Casing and Tubing Program

List of Attached Items:

Description	FileName
VC-536369 Casing/Tubing	Casing 536369.xlsx

7. Remarks

Use this space to note any conditions or occurrences, such as lost circulation, fishing jobs, junk left in hole, sidetracks, squeeze jobs, etc., not shown above. Include data and depth of condition/occurrence.

8. Drillers Log

Compiled By: Range Resources - Pine Mountain, Inc.

List of Attached Items:

Description	FileName
VC-536369 Driller's Log	Drillers Log.xlsx

9. Comments

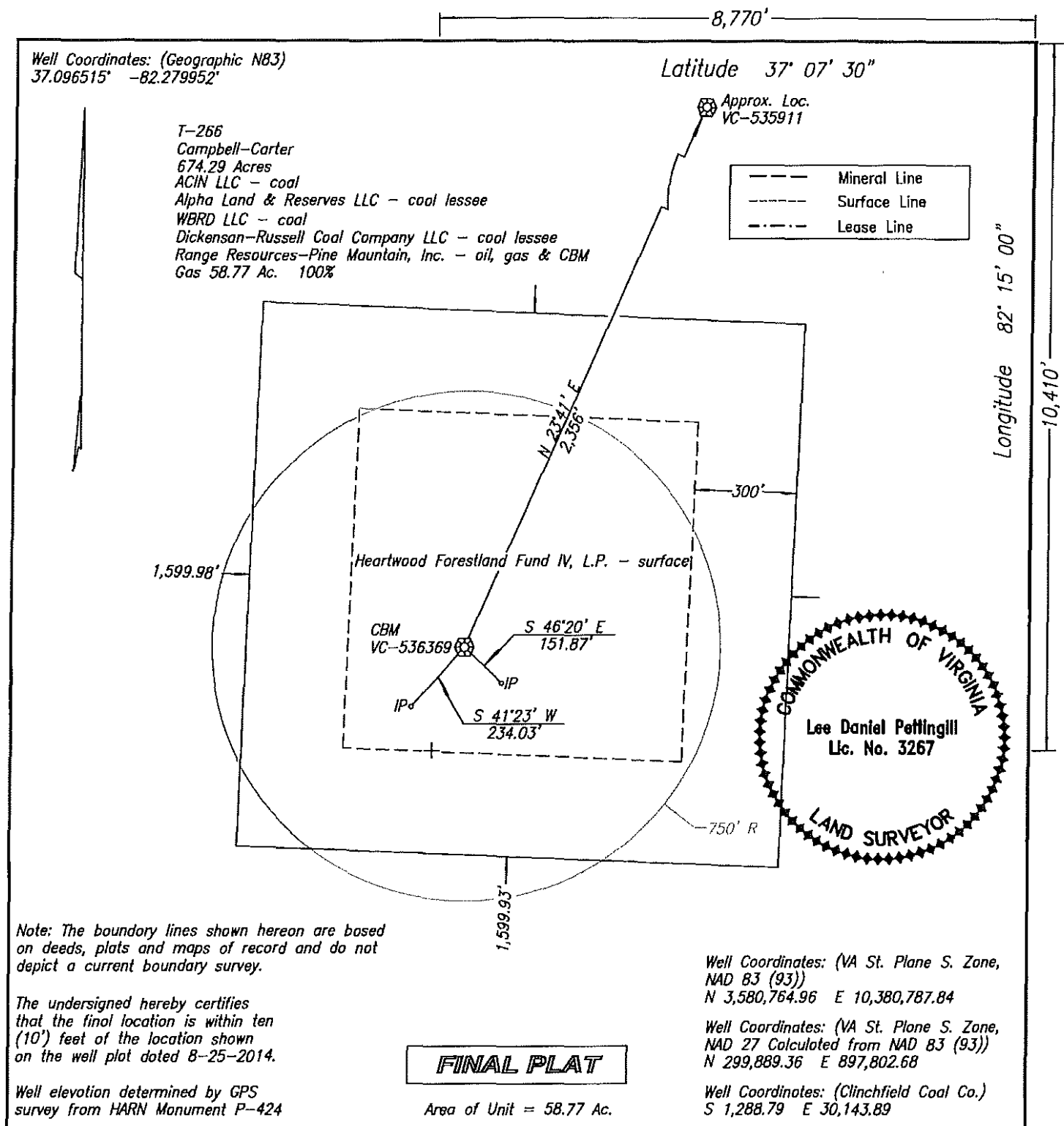
approved. [8/6/2015, jal]

10. Signature

Permitee: Range Resources-Pine Mountain, Date: 7/21/2015

Signed By: Laura Murray Title: Regulatory Compliance Specialist

INTERNAL USE ONLY		
Submit Date:	7/21/2015	
Status:	A	Date: 8/6/2015
Final PDF Date:	10/30/2015	



WELL LOCATION PLAT NORA GRID BB-56

COMPANY Range Resources-Pine Mountain, Inc. WELL NAME AND NUMBER VC-536369
TRACT NO. Campbell-Carter ELEVATION 2,320.10' QUADRANGLE Nora
COUNTY Dickenson DISTRICT Ervinton SCALE 1" = 400' DATE 5-20-2015

This Plat is a new plat ____; an updated plat ____; or a final location plat x

+ Denotes the location of a well on United States topographic Maps, scale 1 to 24,000, latitude and longitude lines being represented by border lines as shown.

~~Licensed Professional Engineer or Licensed Land Surveyor~~

Coal seams			Well # 536369		06/09/15	
Names	Depth Top	Depth Bottom	Thickness	Mining in Area Yes No		Mined Out
Coal	145.0	146.0	1.0		No	No
Coal	175.0	176.0	1.0		No	No
Coal	320.0	321.0	1.0		No	No
Aily	892.0	893.8	1.8		No	No
Raven	984.0	989.5	5.5		No	No
Jawbone Rider	1109.5	1113.5	4.0		No	No
Jawbone	1137.8	1140.0	2.3		No	No
Tiller	1251.1	1253.3	2.2		No	No
Upper Seaboard A	1362.3	1363.3	1.0		No	No
Upper Seaboard	1408.3	1408.8	0.5		No	No
Greasy Creek	1548.8	1548.8	0.0		No	No
Middle Seaboard	1590.5	1591.5	1.0		No	No
Lower Seaboard	1625.8	1626.7	0.8		No	No
Unnamed A	1694.3	1695.2	0.9		No	No
Unnamed A	1680.9	1681.1	0.2		No	No
Upper Horsepen	1750.7	1751.0	0.3		No	No
Middle Horsepen	1797.3	1798.6	1.3		No	No
War Creek	1901.3	1905.5	4.3		No	No
Unnamed C	1933.0	1934.3	1.3		No	No
Beckley	1943.0	1944.0	1.0		No	No
Lower Horsepen	2015.3	2018.0	2.8		No	No
X Seam	2090.0	2090.5	0.5		No	No
Pocahontas #9	2120.3	2120.8	0.5		No	No
Pocahontas #3	2541.5	2541.7	0.2		No	No
Pocahontas #2	2579.4	2580.9	1.5		No	No
Pocahontas #2	2570.3	2571.5	1.3		No	No

Gas and Oil Shows

FORMATION	DEPTH	THICKNESS	IPF (MCFD/BOPD)	PRESSURE	HOURS TESTED
	1385		Trace		
	1595		Trace		
	1785		Trace		
	2755		Trace		

Survey Results

Depth of Survey	Direction/Distance/Degree From True Vertical
188	1/4
395	1/4
603	1/4
795	1/4
995	1/4
1205	1/4
1385	1/4
1595	1/4
1805	1/4
2015	1/4
2195	1/4
2405	1/2
2615	1/2

Casing Program

Casing Type	Casing Size	Casing Interval	Hole Size	Cement Used In Cubic Ft	Cemented To Surface Yes/No	Date Cemented	Packers Or Bridge Plugs Kind/Size/Set	Cement Baskets (ft)
Conductor	13 3/8	0-29'	15 3/8	Sanded in	No			
Water Protection	9 5/8	0-342'	12 3/8	180	Yes	05/18/15		42'
Coal Protection								
Production Casing	4 1/2"	0-2692'	6 1/2	515	Yes	05/20/15		
Other Casing And Tubing Left In Well	2 1/2"	0-2600'						
Liners								

Drillers Log		Well # 536369 6/9/2015			
Geologic Age	Formation	General Lithology	Depth Top	Depth Bottom	Thickness
Pennsylvanian	Lee	KB	0.0	8.0	8.0
Pennsylvanian	Lee	Overburden	8.0	18.0	10.0
Pennsylvanian	Lee	Sandstone	18.0	45.0	27.0
Pennsylvanian	Lee	Sandyshale	45.0	190.0	145.0
Pennsylvanian	Lee	Coal	145.0	146.0	1.0
Pennsylvanian	Lee	Sandyshale	146.0	175.0	29.0
Pennsylvanian	Lee	Coal	175.0	176.0	1.0
Pennsylvanian	Lee	Sandstone	176.0	320.0	144.0
Pennsylvanian	Lee	Coal	320.0	321.0	1.0
Pennsylvanian	Lee	Sandyshale	321.0	892.0	571.0
Pennsylvanian	Lee	Aily	892.0	893.8	1.8
Pennsylvanian	Lee	Sandyshale	893.8	984.0	90.2
Pennsylvanian	Lee	Raven	984.0	989.5	5.5
Pennsylvanian	Lee	Sandyshale	989.5	1109.5	120.0
Pennsylvanian	Lee	Jawbone Rider	1109.5	1113.5	4.0
Pennsylvanian	Lee	Sandyshale	1113.5	1137.8	24.3
Pennsylvanian	Lee	Jawbone	1137.8	1140.0	2.3
Pennsylvanian	Lee	Sandyshale	1140.0	1251.1	111.1
Pennsylvanian	Lee	Tiller	1251.1	1253.3	2.2
Pennsylvanian	Lee	Sandyshale	1253.3	1362.3	109.0
Pennsylvanian	Lee	Upper Seaboard A	1362.3	1363.3	1.0
Pennsylvanian	Lee	Sandyshale	1363.3	1408.3	45.0
Pennsylvanian	Lee	Upper Seaboard	1408.3	1408.8	0.5
Pennsylvanian	Lee	Sandyshale	1408.8	1548.5	139.7
Pennsylvanian	Lee	Greasy Creek	1548.8	1548.8	0.0
Pennsylvanian	Lee	Sandyshale	1548.8	1590.5	41.7
Pennsylvanian	Lee	Middle Seaboard	1590.5	1591.5	1.0
Pennsylvanian	Lee	Sandyshale	1591.5	1625.8	34.3
Pennsylvanian	Lee	Lower Seaboard	1625.8	1626.7	0.8
Pennsylvanian	Lee	Sandyshale	1626.7	1680.9	54.3
Pennsylvanian	Lee	Unnamed A	1680.9	1681.1	0.2
Pennsylvanian	Lee	Sandyshale	1681.1	1694.3	13.2
Pennsylvanian	Lee	Unnamed A	1694.3	1695.2	0.9
Pennsylvanian	Lee	Sandyshale	1695.2	1750.7	55.5
Pennsylvanian	Lee	Upper Horsepen	1750.7	1751.0	0.3
Pennsylvanian	Lee	Sandyshale	1751.0	1797.3	46.3
Pennsylvanian	Lee	Middle Horsepen	1797.3	1798.6	1.3
Pennsylvanian	Lee	Sandyshale	1798.6	1901.3	102.7
Pennsylvanian	Lee	War Creek	1901.3	1905.5	4.3
Pennsylvanian	Lee	Sandyshale	1905.5	1933.0	27.5
Pennsylvanian	Lee	Unnamed C	1933.0	1934.3	1.3
Pennsylvanian	Lee	Sandyshale	1934.3	1943.0	8.7
Pennsylvanian	Lee	Beckley	1943.0	1944.0	1.0

Pennsylvanian	Lee	Sandyshale	1944.0	2015.3	71.3
Pennsylvanian	Lee	Lower Horsepen	2015.3	2018.0	2.8
Pennsylvanian	Lee	Sandyshale	2018.0	2090.0	72.0
Pennsylvanian	Lee	X Seam	2090.0	2090.5	0.5
Pennsylvanian	Lee	Sandyshale	2090.5	2120.3	29.8
Pennsylvanian	Lee	Pocahontas #9	2120.3	2120.8	0.5
Pennsylvanian	Lee	Sandyshale	2120.8	2541.5	420.7
Pennsylvanian	Lee	Pocahontas #3	2541.5	2541.7	0.2
Pennsylvanian	Lee	Sandyshale	2541.7	2570.3	28.6
Pennsylvanian	Lee	Pocahontas #2	2570.3	2571.5	1.3
Pennsylvanian	Lee	Sandyshale	2571.5	2579.4	7.9
Pennsylvanian	Lee	Pocahontas #2	2579.4	2580.9	1.5
Pennsylvanian	Lee	Sandyshale	2580.9	2637.0	56.1
Pennsylvanian	Lee	Red Shale	2637.0	2645.0	8.0
Pennsylvanian	Lee	Sandyshale	2645.0	2700.0	55.0
Pennsylvanian	Lee	Red Shale	2700.0	2730.0	30.0
Pennsylvanian	Lee	Sandyshale	2730.0	2755.0	25.0
Pennsylvanian	Lee	Sandyshale	2730.0	2755.0	25.0
Pennsylvanian	Lee	Sandyshale	2755.0	2769.6	TD



Commonwealth of Virginia
Department of Mines, Minerals, and Energy
Division of Gas and Oil
P.O. Drawer 159, Lebanon, VA 24266
Telephone: (276) 415-9700

Tracking Number:	7303
Company:	Range Resources-Pine Mountain,
File Number:	DI-2593
Completion Report Type:	Original

COMPLETION REPORT (DGO-GO-15)

Well Type:	Coalbed/Pipeline	Date Well Completed:	6/8/2015
Driller's Total Depth:	2755.00	Log's Total Depth:	2769.00

1. Changes In Casing/Tubing from Approved Drilling Report

Description	FileName

2. Stimulation Record

Stimulation Status: ☒ Stimulated ☐ GOB ☐ Not Stimulated ☐ Service Well

Description	FileName
VC-536369 Completion Report	PMD-CompletionReport_wv10.pdf

3. Final Production

Description	FileName
VC-536369 Final Production	Final_Prod.xls

4. Comments

Notes:

5. Signature

Permittee: Range Resources-Pine Mountain, Date: 8/13/2015 (Company)

By: Laura Murray Title: Regulatory Compliance Specialist (Signature)

INTERNAL USE ONLY

Submit Date: 8/13/2015

Status: Approved

Date: 9/8/2015

Final PDF Date: 10/30/2015

Range Resources - Pine Mountain

6/10/2015 7:49:33 AM

Completion Report**105009164 --536369 VC-536369**

Stage:	01	Service Co.	C&J Energy Services	Avg DH Rate:	34.5
Stage Date:	06/08/2015	Fluid Type:	70Q Foam	Max DH Rate:	36.8
Perf Date:	06/08/2015	BD:	4677	Total Slurry Volume:	293
Logging Co.	KLX (Blue Dot)	ISIP:	0	Total Fluid Volume:	284
Formation	Pocohontas #3, #2, #2	Avg Press:	3845	Avg N2 Rate:	34,500
Perf Top:	2541.47	Max Treat Pressure:	3940	Max N2 Rate:	36,800
Perf Bottom:	2580.92	Final ISIP:	1797	Total N2 Volume:	1,311,000
# Shots:	19	2 Min SIP:	0	Max DH PPA:	0.70
Perf Size:	0.52	5 Min SIP:	0	Total Proppant Sks:	203
Perf Comments:		10 Min SIP:	0	Total Acid:	750
		Sand Mesh:	20/40 Sand	Acid Type:	10% HCL
Comments:		Frac Gradient:	0.83		

Stage:	02	Service Co.	C&J Energy Services	Avg DH Rate:	29.7
Stage Date:	06/09/2015	Fluid Type:	60Q Foam	Max DH Rate:	36.3
Perf Date:	06/09/2015	BD:	1980	Total Slurry Volume:	343
Logging Co.	KLX (Blue Dot)	ISIP:	0	Total Fluid Volume:	316
Formation	Lower Horsepen, X Seam, #2	Avg Press:	4041	Avg N2 Rate:	22,300
Perf Top:	2015.25	Max Treat Pressure:	4102	Max N2 Rate:	23,000
Perf Bottom:	2120.75	Final ISIP:	1657	Total N2 Volume:	561,800
# Shots:	18	2 Min SIP:	0	Max DH PPA:	2.00
Perf Size:	0.52	5 Min SIP:	0	Total Proppant Sks:	308
Perf Comments:		10 Min SIP:	0	Total Acid:	250
		Sand Mesh:	20/40 Sand	Acid Type:	10% HCL
Comments:		Frac Gradient:	0.94		

Stage:	03	Service Co.	C&J Energy Services	Avg DH Rate:	51.0
Stage Date:	06/09/2015	Fluid Type:	65Q Foam	Max DH Rate:	55.0
Perf Date:	06/09/2015	BD:	2432	Total Slurry Volume:	440
Logging Co.	KLX (Blue Dot)	ISIP:	0	Total Fluid Volume:	421
Formation	War Creek, Unnamed C, #1	Avg Press:	3312	Avg N2 Rate:	36,600
Perf Top:	1901.25	Max Treat Pressure:	3662	Max N2 Rate:	37,300
Perf Bottom:	1944	Final ISIP:	1122	Total N2 Volume:	859,000
# Shots:	28	2 Min SIP:	0	Max DH PPA:	2.30
Perf Size:	0.52	5 Min SIP:	0	Total Proppant Sks:	386
Perf Comments:		10 Min SIP:	0	Total Acid:	750
		Sand Mesh:	20/40 Sand	Acid Type:	10% HCL
Comments:		Frac Gradient:	0.71		

Stage:	04	Service Co.	C&J Energy Services	Avg DH Rate:	52.0
Stage Date:	06/09/2015	Fluid Type:	70Q Foam	Max DH Rate:	59.0
Perf Date:	06/09/2015	BD:	1948	Total Slurry Volume:	421

Range Resources - Pine Mountain

6/10/2015 7:49:33 AM

Completion Report**105009164 --536369 VC-536369**

Logging Co.	KLX (Blue Dot)	ISIP:	0	Total Fluid Volume:	400
Formation	M.Seaboard,L Seaboard,Un A,	Avg Press:	3018	Avg N2 Rate:	38,400
Perf Top:	1590.5	Max Treat Pressure:	4111	Max N2 Rate:	40,200
Perf Bottom:	1798.58	Final ISIP:	977	Total N2 Volume:	791,000
# Shots:	28	2 Min SIP:	0	Max DH PPA:	2.40
Perf Size:	0.52	5 Min SIP:	0	Total Proppant Sks:	269
Perf Comments:		10 Min SIP:	0	Total Acid:	750
		Sand Mesh:	20/40 Sand	Acid Type:	10% HCL
Comments:		Frac Gradient:	0.74		

Stage:	05	Service Co.	C&J Energy Services	Avg DH Rate:	37.8
Stage Date:	06/09/2015	Fluid Type:	65Q Foam	Max DH Rate:	40.0
Perf Date:	06/09/2015	BD:	3105	Total Slurry Volume:	162
Logging Co.	KLX (Blue Dot)	ISIP:	0	Total Fluid Volume:	150
Formation	Upper Seaboard A, Upper	Avg Press:	3943	Avg N2 Rate:	28,800
Perf Top:	1362.25	Max Treat Pressure:	4487	Max N2 Rate:	30,600
Perf Bottom:	1550.25	Final ISIP:	1587	Total N2 Volume:	313,000
ots:	17	2 Min SIP:	1196	Max DH PPA:	2.50
Size:	0.52	5 Min SIP:	12130	Total Proppant Sks:	204
Perf Comments:		10 Min SIP:	1191	Total Acid:	250
		Sand Mesh:	20/40 Sand	Acid Type:	10% HCL
Comments:		Frac Gradient:	1.2		



Commonwealth of Virginia
Department of Mines, Minerals, and Energy
Division of Gas and Oil
P.O. Drawer 159, Lebanon, VA 24266
Telephone: (276) 415-9700

Tracking Number:	2100
Company:	EQT Production Company
File Number:	DI-2153
Operations Name:	VC-535911
Operation Type:	Coal Bed
Drilling Report Type:	Original

DRILLING REPORT (DGO-GO-14)

1. Drilling Data

Date drilling commenced:	<u>6/25/2009</u>	Drilling Contractor:	<u>Crossrock Drilling</u>
Date drilling completed:	<u>6/28/2009</u>	Rig Type:	☒ Rotary ☐ Cable
Driller's Total Depth (feet):	<u>2599.00</u>		
Log Total Depth (feet):	<u>2582.00</u>	Coal Seam At Total Depth	<u>POCAHONTAS #1</u>

2. Final Location Plat (as required by 4 VAC25-150-360.C.)

Permitted State Plane X:	<u>10381733.8189</u>	Final Plat State Plane X:	<u>10381734.2900</u>
Permitted State Plane Y:	<u>3582922.9681</u>	Final Plat State Plane Y:	<u>3582922.8700</u>

Plat Previously Submitted Or... ☐

List of Attached Items:

Description	FileName
Final Plat 535911	VC-535911 FINAL PLAT.pdf

3. Geological Data

Fresh Water At:

Depth (in feet)	Rate	Unit of Measure

Salt Water At:

Depth (in feet)	Rate	Unit of Measure

Coal Seams:

List of Attached Items:

Description	FileName
Coal Seams 535911	Coal Seams.doc

Gas and Oil Shows:

List of Attached Items:

Description	FileName
Gas & Oil Shows 535911	Gas and Oil Shows.doc

4. Electric Logs (As required by 4VAC25-150-280.A)

List all logs run: GR/Density/Temp/Induction/Neutron

Did logs disclose vertical locations of a coal seam? ☒

5. Survey Results (As required by 4VAC25-150-280.B.2)

List of Attached Items:

Description	FileName
Survey Results 535911	Survey Results.doc

6. Casing and Tubing Program

List of Attached Items:

Description	FileName
Casing 535911	Casing Data.doc
Tubing 535911	Tubing Size.doc

7. Remarks

Use this space to note any conditions or occurrences, such as lost circulation, fishing jobs, junk left in hole, sidetracks, squeeze jobs, etc., not shown above. Include data and depth of condition/occurrence.

Did not hit anticipated opening @ 320'

8. Drillers Log

Compiled By: _____

List of Attached Items:

Description	FileName
Drillers Log 535911	Drillers Log.doc

9. Comments

10. Signature

Permittee: EQT Production Company Date: 10/14/2009
Signed By: Michael D. Butcher Title: Director of Drilling

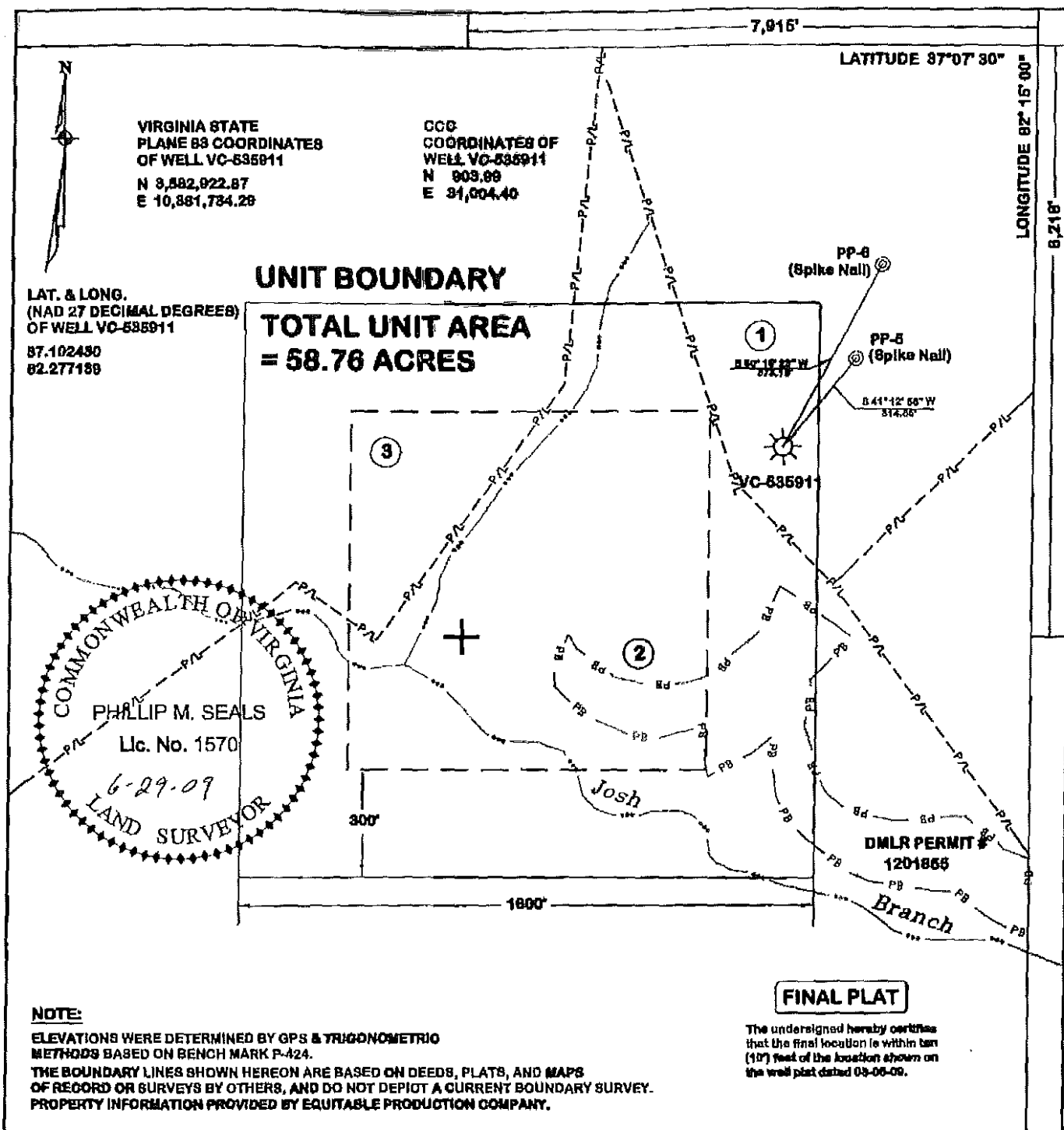
INTERNAL USE ONLY

Submit Date: 10/14/2009

Status: A

Date: 1/8/2010

Final PDF Date: 1/14/2010

**WELL LOCATION PLAT**

COMPANY EQUITABLE PRODUCTION CO. WELL NAME OR NUMBER VC-535911

TRACT NO. T-352 QUADRANGLE Noro

DISTRICT Ervin

WELL COORDINATES (VIRGINIA STATE PLANE 27) N 302,045.87 E 898,749.62

ELEVATION 2,182.81 METHOD USED TO DETERMINE ELEVATION: GPS & TRIG.

COUNTY Dickenson SCALE: 1" = 400' DATE 06-29-09

THIS PLAT IS A NEW PLAT ☐ AN UPDATED PLAT ☐ ; OR A FINAL LOCATION PLAT ☒

+ DENOTES THE LOCATION OF A WELL ON UNITED STATES TOPOGRAPHIC MAPS, SCALE 1 TO 24,000, LATITUDE AND LONGITUDE LINES BEING REPRESENTED BY BORDER LINES AS SHOWN.

Phillip M. Seals

LICENSED LAND SURVEYOR

EXHIBIT PL-1

Property Ownership Information for EPCO Well # VC-535911

①

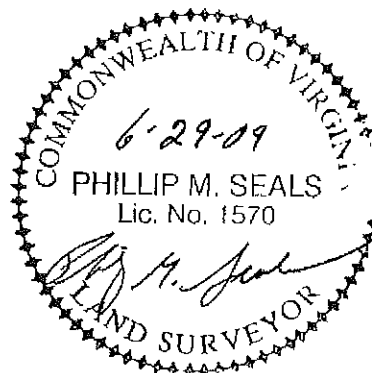
LEASE NO. 908889L / T-352
E.J. RASNICK
91.83 ACRES
DICKENSON-RUSSELL COAL CO., LLC /
ALPHA LAND & RESERVES, LLC / ACIN, LLC /
WBRD, LLC - coal
RANGE RESOURCES-PINE MOUNTAIN, INC. -
- oil, gas & obm
PARAMONT LAND COMPANY - surface
GAS 4.18 AC. 7.11 %

②

LEASE NO. 908889L / T-288
INTERSTATE COAL & IRON CO.
(CAMPBELL - CARTER)
874.29 ACRES
DICKENSON-RUSSELL COAL CO., LLC /
ALPHA LAND & RESERVES, LLC / ACIN, LLC /
WBRD, LLC - coal
RANGE RESOURCES-PINE MOUNTAIN, INC. -
- oil, gas & obm
HEARTWOOD FORESTLAND FUND IV, L.P. - surface
GAS 40.31 AC. 88.60 %

③

LEASE NO. 908889L / T-281
E.S. COUNTS
1600.00 ACRES
DICKENSON-RUSSELL COAL CO., LLC /
ALPHA LAND & RESERVES, LLC / ACIN, LLC /
WBRD, LLC - coal
RANGE RESOURCES-PINE MOUNTAIN, INC. -
- oil, gas & obm
GAS 14.27 AC. 24.29 %



Coal Seams & Open Mines

Type

Coal

Coal

Coal

Coal

From

50'-51',113'-14',191'-92',200'-01',251'-52',260'-61',274'-75',315'-16'

384'-85',397'-98',416'-17',594'-95',750'-51.58',843'-45.58',996'-98.42'

1116.5'-18.33',1226'-27.25',1263'-63.83',1372'-74.67',1448'-48.92',1478.5'-79.25',1559'-61.33',1642'-43.67'

1732'-33.58',1754'-56.75',1768'-69',1857.5'-60.08',1909.5'-10.42',1957.5'-58.53',2412.5'-13.58',2450'-51.83'

Gas and Oil Shows

Gas Tests

<u>Depth</u>	<u>Remarks</u>
182	No Show
362	No Show
542	No Show
722	No Show
902	No Show
1,082	No Show
1,262	No Show
1,442	No Show
1,622	No Show
1,802	No Show
1,982	No Show
2,162	No Show
2,342	No Show
2,522	No Show
2,513	TSTM
2,599	No Show

Survey Results

<u>Depth</u>	<u>Direction/Distance/Degrees</u> <u>From True Vertical</u>
182	1/8
362	1/4
542	1/8
722	1/8
902	1/4
1,082	1/4
1,262	1/8
1,442	1/8
1,622	1/4
1,802	1/8
1,982	1/4
2,162	1/8
2,342	1/8
2,522	1/4

Casing Data						
Casing Outside Diameter	Casing Interval	Hole Size	Cement used in Cu. ft.	Cmtd To Surface	Date Cemented	Cement Baskets
13 3/8	42	17 1/2				
7	404	8 7/8	129.80	Y	06/25/2009	295, 300
4 1/2	2512	6 3/8	512.50	Y	06/27/2009	

<u>Tubing Size</u>	<u>Footage</u>
2 3/8	2,240.15
5/8"	2452.15

Drillers
Log

<u>Formation Name</u>	<u>Depth Top</u>	<u>Depth Bottom</u>	<u>Formation Thickness</u>
Fill	0.00	2.00	2.00
Sand and Shale	2.00	50.00	48.00
Coal	50.00	51.00	1.00
Sand and Shale	51.00	113.00	62.00
Coal	113.00	114.00	1.00
Sand and Shale	114.00	191.00	77.00
Coal	191.00	192.00	1.00
Sand and Shale	192.00	200.00	8.00
Coal	200.00	201.00	1.00
Sand and Shale	201.00	251.00	50.00
Coal	251.00	252.00	1.00
Sand and Shale	252.00	260.00	8.00
Coal	260.00	261.00	1.00
Sand and Shale	261.00	274.00	13.00
Coal	274.00	275.00	1.00
Sand and Shale	275.00	315.00	40.00
Coal	315.00	316.00	1.00
Sand and Shale	316.00	384.00	68.00
Coal	384.00	385.00	1.00
Sand and Shale	385.00	397.00	12.00
Coal	397.00	398.00	1.00
Sand and Shale	398.00	416.00	18.00
Coal	416.00	417.00	1.00
Sand and Shale	417.00	594.00	177.00
Coal	594.00	595.00	1.00
Sand and Shale	595.00	750.00	155.00
Aily	750.00	751.58	1.58
sand & shale	751.58	843.00	91.42
Raven	843.00	845.58	2.58
sand & shale	845.58	960.00	114.42
Jawbone Rider	960.00	961.33	1.33
sand & shale	961.33	996.00	34.67
Jawbone	996.00	998.42	2.42
sand & shale	998.42	1,116.50	118.08
Tiller	1,116.50	1,118.33	1.83
sand & shale	1,118.33	1,226.00	107.67
Upper Seaboard A	1,226.00	1,227.25	1.25
sand & shale	1,227.25	1,263.00	35.75
Upper Seaboard	1,263.00	1,263.83	0.83
sand & shale	1,263.83	1,372.00	108.17
Greasy Creek	1,372.00	1,374.67	2.67
sand & shale	1,374.67	1,448.00	73.33
Middle Seaboard	1,448.00	1,448.92	0.92
sand & shale	1,448.92	1,478.50	29.58
Lower Seaboard	1,478.50	1,479.25	0.75
sand & shale	1,479.25	1,559.00	79.75

Unnamed A	1,559.00	1,561.33	2.33
sand & shale	1,561.33	1,642.00	80.67
Middle Horsepen	1,642.00	1,643.67	1.67
sand & shale	1,643.67	1,732.00	88.33
War Creek Rider	1,732.00	1,733.58	1.58
sand & shale	1,733.58	1,754.00	20.42
War Creek	1,754.00	1,756.75	2.75
sand & shale	1,756.75	1,768.00	11.25
Unnamed C	1,768.00	1,769.00	1.00
sand & shale	1,769.00	1,857.50	88.50
Lower Horsepen	1,857.50	1,860.08	2.58
sand & shale	1,860.08	1,909.50	49.42
X Seam	1,909.50	1,910.42	0.92
sand & shale	1,910.42	1,957.50	47.08
Pocahontas #9	1,957.50	1,958.58	1.08
sand & shale	1,958.58	2,412.50	453.92
Pocahontas #3	2,412.50	2,413.58	1.08
sand & shale	2,413.58	2,450.00	36.42
Pocahontas #1	2,450.00	2,451.83	1.83
sand & shale	2,451.83	2,599.00	147.17



Commonwealth of Virginia
Department of Mines, Minerals, and Energy
Division of Gas and Oil
P.O. Drawer 159, Lebanon, VA 24266
Telephone: (276) 415-9700

Tracking Number:	2043
Company:	EQT Production Company
File Number:	DI-2153
Completion Report Type:	Original

COMPLETION REPORT (DGO-GO-15)

Well Type:	Coal Bed	Date Well Completed:	7/23/2009
Driller's Total Depth:	2599.00	Log's Total Depth:	2582.00

1. Changes In Casing/Tubing from Approved Drilling Report

Description	FileName

2. Stimulation Record

Stimulation Status: ☒ Stimulated ☐ GOB ☐ Not Stimulated ☐ Service Well

Description	FileName
Treatment Summary 535911	Stage1.doc

3. Final Production

Description	FileName
Final Production 535911	Final Production.doc

4. Comments

Notes:

5. Signature

Permittee: EQT Production Company Date: 10/14/2009 (Company)

By: Michael D. Butcher Title: Director of Drilling (Signature)

INTERNAL USE ONLY

Submit Date: 10/14/2009

Status: _____

Date: 3/29/2010

Final PDF Date: 4/5/2010

[REDACTED]

Date 07/16/2009

FracType 65Q Foam
Zone L Hrspn/X Sm/Poca #3

of Perfs 32

From/To 2,414 1,857

BD Press 1,998

ATP Psi 2,614
Avg Rate 47

Max Press Psi 3,919

ISIP Psi 1,797

10min SIP 1,609 5 min.
1.12

Frac Gradient

Sand Proppant
96.94

Water-bbl 314
SCF N2 389,046

Acid-gal gal 850
7.5%HCL

[REDACTED]

Date 07/16/2009

FracType 65Q Foam
Zone WrCrk Rdr/WrCrk/Unnmd C

of Perfs 34

From/To 1,770 1,732

BD Press 3,772

ATP Psi 3,442
Avg Rate 25

Max Press Psi	3,770	
ISIP Psi	3,689	
10min SIP	2,008	5 min. 2.28
Frac Gradient		
Sand Proppant		44.45
Water-bbl	339	
SCF N2		407,589
Acid-gal	gal	550
	7.5%HCL	



Date	07/16/2009	
FracType	65Q	Foam
Zone	Unnamed A/M. Horsepen	

# of Perfs	30	
From/To	1,645	1,559
BD Press	2,453	
ATP Psi	3,728	
Avg Rate	17	
Max Press Psi	3,877	
ISIP Psi	3,573	
10min SIP	2,315	5 min. 2.44
Frac Gradient		
Sand Proppant		15.62
Water-bbl	177	
SCF N2		254,032

Acid-gal	gal	350
	7.5%HCL	

Date 07/16/2009

FracType	65Q	Foam
Zone	U Sbrd/GrsyCrk/M&L Sbrd	

of Perfs 40

From/To	1,480	1,263

BD Press 3,101

ATP Psi	3,322
Avg Rate	35

Max Press Psi	3,639

ISIP Psi	2,195

10min SIP	0	5 min.
		1.89

Frac Gradient

Sand Proppant	123.63

Water-bbl	397	
SCF N2		607,611

Acid-gal	gal	350
	7.5%HCL	

Date 07/16/2009

FracType	65Q	Foam
Zone	Tiller/U Sbrd	
	A	

of Perfs 20

From/To	1,228	1,116

BD Press	3,102	
ATP Psi	3,527	
Avg Rate	27	
Max Press Psi	3,837	
ISIP Psi	2,844	
10min SIP	2,509	5 min. 2.70
Frac Gradient		
Sand Proppant		81.06
Water-bbl	314	
SCF N2		398,920
Acid-gal	gal 7.5%HCL	650

<u>Final Production</u>	<u>After Stimulation</u>		<u>Hours Tested</u>	<u>Rock Pressure</u>
	<u>BOD</u>	<u>MCFD</u>		
Final Production if Gas Zones are commingled		11	0	180



Commonwealth of Virginia
 Department of Mines, Minerals, and Energy
 Division of Gas and Oil
 P.O. Box 1416; Abingdon, VA 24212
 Telephone: (276) 676-5423

Tracking Number: 149
 Company: Equitable Production Company
 File Number: DI-1577
 Operations Name: VC-536363 W/PL
 Operation Type: Coalbed/Pipeline
 Drilling Report Type: Original

DRILLING REPORT (DGO-GO-14)

1. Drilling Data

Date drilling commenced: 9/12/2006 Drilling Contractor: Gasco
 Date drilling completed: 9/16/2006 Rig Type: ☒ Rotary ☐ Cable Tool
 Driller's Total Depth (feet): 2,653
 Log Total Depth (feet): 2,650 Coal Seam At Total Depth POCAHONTAS #2

2. Final Location Plat (as required by 4 VAC25-150-360.C.)

Permitted State Plane X 899,862 Final Plat State Plane X: 899,860
 Permitted State Plane Y: 302,051 Final Plat State Plane Y: 302,047

☐ Plat Previously Submitted Or...

List of Attached Items:

Description	FileName
final plat 536363	VC-536363a final plat.tif

3. Geological Data

Fresh Water At:

Depth (in feet)	Rate	Unit of Measure
1,965	1/4	INCH

Salt Water At:

Depth (in feet)	Rate	Unit of Measure

Coal Seams

List of Attached Items:

Description	FileName
coal seams 536363	Coal Seams.doc

Gas and Oil Shows

List of Attached Items:

Description	FileName
gas shows 536363	Gas and Oil Shows.doc

4. Electric Logs (As required by 4VAC25-150-280.A.)

List all logs run: GR/Density/Temp/Induction/Neutron

Did logs disclose vertical locations of a coal seam? ☒ Yes ☐ No

5. Survey Results (As required by 4VAC25-150-280.B.2)

List of Attached Items:

Description	FileName
surveys 536363	Survey Results.doc

6. Casing and Tubing Program

List of Attached Items:

Description	FileName
csg 536363	Casing Data.doc
tbg 536363	Tubing Size.doc

7. Remarks

Use this space to note any conditions or occurrences, such as lost circulation, fishing jobs, junk left in hole, sidetracks, squeeze jobs, etc., not shown above. Include data and depth of condition/occurrence.

8. Drillers Log

Compiled By: _____

List of Attached Items:

Description	FileName
driller's log 536363	Drillers Log.doc

9. Comments

10. Signature

Permitee: Equitable Production Company Date: 3/30/2007 (Company)

Signed By: L. Todd Tetrick Title: Director of Drilling (Signature)

INTERNAL USE ONLY

Submit Date: 3/30/2007

Status: Inspr Approved

Date: 4/6/2007

Final PDF Date: 4/9/2007

TOTAL UNIT AREA

= 58.77 ACRES

- DENOTES MINERAL LINE
 - - - - - DENOTES SURFACE LINE
 - - - - - DENOTES SURFACE & MINERAL LINES
 [X] DENOTES DMLR PERMIT #1201855

LEASE No. 241490 / T-352

E.J. RASNAKE

91.83 ACRES

DICKENSON-RUSSELL COAL COMPANY, LLC/ALPHA
 LAND & RESERVES, LLC/ACIN, LLC/WBRD, LLC - coal
 PINE MOUNTAIN OIL & GAS, INC. - oil, gas & CBM
 GAS 7.85 AC. 13.36%

LEASE No. 241565L

WILMA C. HELTON, et al - surface, oil & gas

238.00 ACRES

LEASE No. 244792 / TC-180

HAGAN & RASNAKE

1388.30 ACRES

DICKENSON-RUSSELL COAL COMPANY, LLC/ALPHA

LAND & RESERVES, LLC/ACIN, LLC/WBRD, LLC - coal

(less UPPER BANNER)

CLINCHFIELD COAL COMPANY- UPPER BANNER

WBRD, LLC - JAWBONE

GAS 41.65 AC. 70.87%

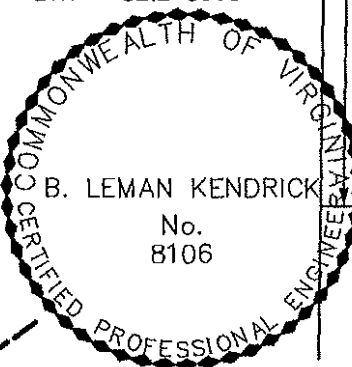
6804'

LATITUDE 37°07'30"

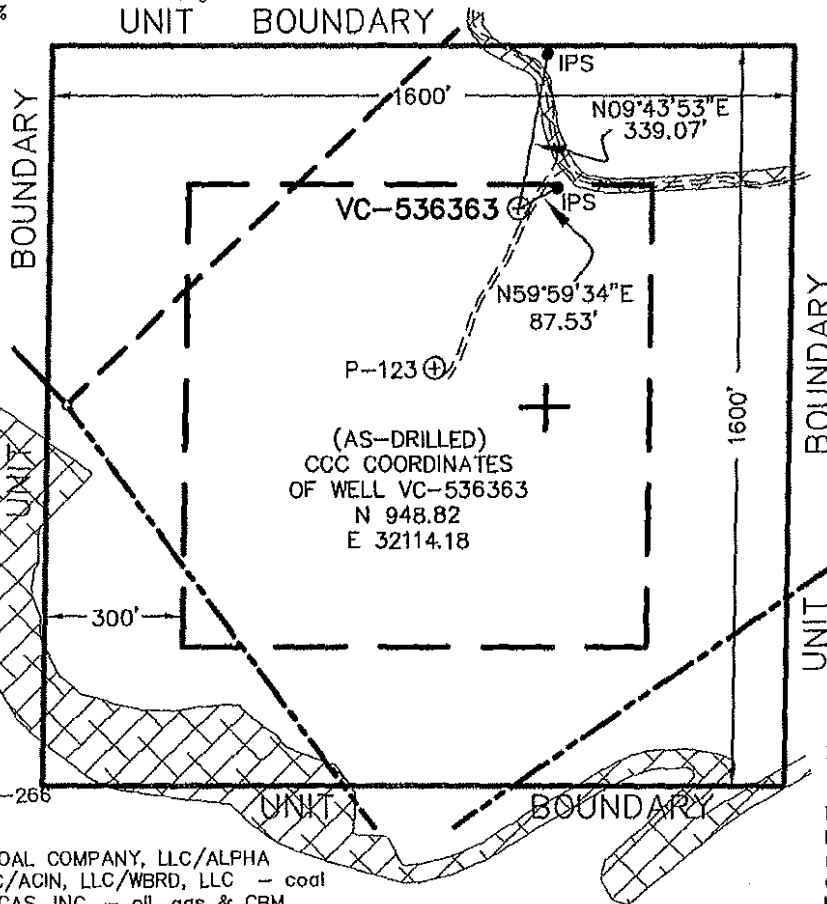
LONGITUDE 82°15'00"

8157'

(AS-DRILLED)
 STATE PLANE
 NAD 27 COORDINATES
 OF WELL VC-536363
 N 302047.41
 E 899860.40
 LAT 37.102556°
 LON -82.273333°



Lease No. 241640L / T2-124
 JOSEPH H. RASNICK
 300.00 ACRES
 DICKENSON-RUSSELL COAL
 COMPANY, LLC/ALPHA
 LAND & RESERVES, LLC/ACIN,
 LLC/WBRD, LLC - coal
 (less UPPER BANNER)
 CLINCHFIELD COAL COMPANY-
 UPPER BANNER
 WBRD, LLC - JAWBONE
 GAS 0.75 AC. - 1.28%



COORDINATES
 OF BENCH MARK
 S 77498.41
 E 22826.48
 ELEV. = 1754.09

LEASE No. 241490 / T-266

CAMPBELL CARTER

674.29 ACRES

DICKENSON-RUSSELL COAL COMPANY, LLC/ALPHA
 LAND & RESERVES, LLC/ACIN, LLC/WBRD, LLC - coal
 PINE MOUNTAIN OIL & GAS, INC. - oil, gas & CBM
 GAS 6.56 AC. 11.16%

NOTE !!!

WELL COORDINATES ARE BASED ON CLINCHFIELD
 COAL COMPANY'S COORDINATE SYSTEM
 CLINCHFIELD COAL COMPANY COORDINATES ARE
 CALCULATED FROM STATE PLANE WELL COORDINATES.
 PROPERTY INFORMATION PROVIDED BY EQUITABLE
 PRODUCTION COMPANY.
 ELEVATIONS ARE BASED ON NGS CONTROL ST. PAUL 2.

FINAL PLAT

The undersigned hereby certifies that
 the final location is within ten (10)
 feet of the location shown on the
 well plat dated JULY 12, 2006.

WELL LOCATION PLAT

COMPANY Equitable Production Company WELL NAME AND NUMBER VC-536363TRACT No. LEASE NO. 241565L ELEVATION 2272.69 (GPS) QUADRANGLE NORACOUNTY DICKENSON DISTRICT ERVINTON SCALE: 1" = 400' DATE SEPTEMBER 13, 2006THIS PLAT IS A NEW PLAT ; AN UPDATED PLAT ; OR A FINAL LOCATION PLAT xPROPOSED TOTAL DEPTH OF WELL =

+ DENOTES THE LOCATION OF A WELL ON UNITED STATES TOPOGRAPHIC MAPS, SCALE 1 TO
 24,000, LATITUDE AND LONGITUDE LINES BEING REPRESENTED BY BORDER LINES AS SHOWN.

LICENSED PROFESSIONAL ENGINEER OR LICENSED LAND SURVEYOR

(AFFIX SEAL)

Coal Seams & Open Mines

<u>Type</u>	<u>From</u>
Coal	153'-54',300'-02',380'-82',720'-21',950'-51',1081'-82',
Coal	1110'-11',1466'-67',1512'-13',1822'-23',1856'-57',
Coal	1920'-21',1965'-66',2019'-20',2270'-71',2515'-16'
Open Mine	410'-414'

Gas and Oil Shows

Gas Tests

<u>Depth</u>	<u>Remarks</u>
200	No Show
419	TSTM
600	No Show
800	No Show
1,000	No Show
1,200	No Show
1,400	No Show
1,600	No Show
1,800	No Show
2,000	No Show
2,200	No Show
2,400	No Show
2,600	TSTM

Survey Results

<u>Depth</u>	<u>Direction/Distance/Degrees From True Vertical</u>
200	1/4
419	1/4
600	1/4
800	1/4
1,000	1/4
1,200	1/4
1,400	1/4
1,600	1/4
1,800	1/2
2,000	1/2
2,200	1/2
2,400	1/2
2,600	1/2

Casing Outside Diameter	Casing Data		Hole Size	Cement used in Cu. ft.	Cmtd To Surface	Date Cemented Cement Baskets
	Casing Interval					
12 3/4	22		15			
8 5/8	493		12 1/4	385.86	09/12/2006	356
4 1/2	2196		6 1/2	586.50	09/15/2006	

<u>Tubing</u>	<u>Footage</u>
<u>Size</u>	
2 3/8	2,050.10
5/8"	2056.95

Drillers
Log

<u>Formation</u> <u>Name</u>	<u>Depth</u> <u>Top</u>	<u>Depth</u> <u>Bottom</u>	<u>Formation</u> <u>Thickness</u>
Aily	850.50	852.50	2.00
sand & shale	852.50	943.30	90.80
Raven	943.30	946.10	2.80
sand & shale	946.10	1,068.50	122.40
Jawbone	1,068.50	1,070.80	2.30
Rider	1,070.80	1,100.00	29.20
sand & shale	1,100.00	1,103.70	3.70
Jawbone	1,103.70	1,208.30	104.60
sand & shale	1,208.30	1,210.00	1.70
Tiller	1,210.00	1,313.00	103.00
sand & shale	1,313.00	1,314.20	1.20
Upper	1,314.20	1,350.50	36.30
Seaboard A	1,350.50	1,351.80	1.30
sand & shale	1,351.80	1,463.00	111.20
Upper	1,463.00	1,465.00	2.00
Seaboard	1,465.00	1,542.00	77.00
sand & shale	1,542.00	1,543.00	1.00
Middle	1,543.00	1,576.50	33.50
Seaboard	1,576.50	1,576.90	0.40
sand & shale	1,576.90	1,645.00	68.10
Unnamed A	1,645.00	1,647.00	2.00
sand & shale	1,647.00	1,701.00	54.00
Upper	1,701.00	1,701.00	0.00
Horsepen	1,701.00	1,740.50	39.50
sand & shale	1,740.50	1,742.00	1.50
Middle	1,742.00	1,817.00	75.00
Horsepen	1,817.00	1,818.00	1.00
sand & shale	1,818.00	1,862.00	44.00
C Seam	1,862.00	1,866.50	4.50
sand & shale	1,866.50	1,958.00	91.50
War Creek	1,958.00	1,960.20	2.20
sand & shale	1,960.20	2,001.00	40.80
Lower	2,001.00	2,001.80	0.80
Horsepen	2,001.80	2,051.00	49.20
sand & shale	2,051.00	2,051.00	0.00
X Seam	2,051.00	2,348.00	297.00
Pocahontas #9	2,348.00	2,348.50	0.50
sand & shale	2,348.50	2,511.30	162.80

Pocahontas #3	2,511.30	2,512.50	1.20
sand & shale	2,512.50	2,568.00	55.50
Pocahontas #2	2,568.00	2,569.50	1.50
sand & shale	2,569.50	2,653.00	83.50



Commonwealth of Virginia
Department of Mines, Minerals, and Energy
Division of Gas and Oil
P.O. Box 1416; Abingdon, VA 24212
Telephone: (276) 676-5423

Tracking Number: 136
Company: Equitable Production Company
File Number: DI-1577
Operations Name: VC-536363 W/PL
Operation Type: Coalbed/Pipeline
Completion Report Type: Original

COMPLETION REPORT (DGO-GO-15)

Well Type: <u>Coalbed/Pipeline</u>	Date Well Completed: <u>9/26/2006</u>
Driller's Total Depth: <u>2,653</u>	Log's Total Depth: <u>2,650</u>

1. Changes In Casing/Tubing from Approved Drilling Report

Description	FileName

2. Stimulation Record

☒ Stimulated ☐ Not Stimulated ☐ Gob

Description	FileName
treatment summaries 536363	treatment summary.doc

3. Final Production

Description	FileName
final production 536363	Final Production.doc

4. Comments

Notes:

5. Signature

Permittee: Equitable Production Company Date: 3/30/2007 12:39:23 PM (Company)

By: L. Todd Tetrick Title: Director of Drilling (Signature)

INTERNAL USE ONLY

Submit Date: 3/30/2007

Status: Inspr Approved

Date: 4/9/2007

Final PDF Date: 7/6/2007

[REDACTED]

Date	09/22/2006		
FracType	70Q	Foam	
Zone	L Horsepen/ X-Seam		
# of Perfs	20		
From/To	1,958	2,003	
BD Press	2,893		
ATP Psi	2,755		
Avg Rate	27		
Max Press Psi	3,582		
ISIP Psi	2,041		
10min SIP	1,558		5 min.
		1.16	
Frac Gradient			
Sand Proppant	34.00		
Water-bbl	127		
SCF N2	214,000		
Acid-gal	1,000	gal	
		10%MSA	

[REDACTED]

Date	09/22/2006		
FracType	70Q	Foam	
Zone	M Horsepen/ C-Seam/ Warcr.		
# of Perfs	34		
From/To	1,740	1,870	

BD Press		2,267	
ATP Psi		3,338	
Avg Rate		26	
Max Press Psi		3,641	
ISIP Psi		2,607	
10min SIP	1,901		5 min.
		1.57	
Frac Gradient			
Sand Proppant		84.00	
Water-bbl		311	
SCF N2		540,000	
Acid-gal	1,000	gal	
		10%MSA	

Date 09/22/2006

FracType 70Q **Foam**
Zone GrsyCrk/M Sbrd/Unnmd A

# of Perfs		36	
From/To		1,463	1,667
BD Press		2,252	
ATP Psi		2,758	
Avg Rate		34	
Max Press Psi		3,162	
ISIP Psi		1,875	
10min SIP	1,549		5 min.
		1.33	
Frac Gradient			

Sand
Proppant 61.00

Water-bbl 227
SCF N2 359,000

Acid-gal 1,000 gal
10%MSA

[REDACTED]

Date 09/22/2006

FracType 70Q Foam
Zone Tiller/U Sbrd A/U Sbrd

of Perfs 30

From/To 1,208 1,353

BD Press 3,360

ATP Psi 3,601
Avg Rate 20

Max Press Psi 3,787

ISIP Psi 2,371

10min SIP 1,830 5 min.
1.90

Frac Gradient

Sand
Proppant 49.00

Water-bbl 196
SCF N2 257,000

Acid-gal 1,000 gal
10%MSA

[REDACTED]

Date 09/22/2006

FracType	70Q	Foam	
Zone		Jawbone Rdr/ Jawbone	
# of Perfs		36	
From/To		1,068	1,105
BD Press		1,491	
ATP Psi		2,639	
Avg Rate		26	
Max Press Psi		3,221	
ISIP Psi		1,291	
10min SIP	1,241		5 min.
		1.32	
Frac Gradient			
Sand Proppant		76.00	
Water-bbl		231	
SCF N2		304,000	
Acid-gal	1,000	gal	
		10%MSA	

Final Production

Final Production if Gas Zones are
commingled

**After
Stimulation**

BOD

MCFD

**Hours
Tested**

**Rock
Pressure**

85

0

190



Commonwealth of Virginia
Department of Mines, Minerals, and Energy
Division of Gas and Oil
P.O. Drawer 159, Lebanon, VA 24266
Telephone: (276) 415-9700

Tracking Number:	6129
Company:	Range Resources-Pine Mountain,
File Number:	DI-2589
Operations Name:	VC-502202
Operation Type:	Coalbed/Pipeline
Drilling Report Type:	Original

DRILLING REPORT (DGO-GO-14)

1. Drilling Data

Date drilling commenced:	10/28/2014	Drilling Contractor:	Gasco #8
Date drilling completed:	10/31/2014	Rig Type:	☒ Rotary ☐ Cable
Driller's Total Depth (feet):	2750.00		
Log Total Depth (feet):	2755.00	Coal Seam at Total Depth:	POCAHONTAS #2

2. Final Location Plat (as required by 4 VAC25-150-360.C.)

Permitted State Plane X:	10384367.8300	Final Plat State Plane X:	10384363.5400
Permitted State Plane Y:	3580633.8600	Final Plat State Plane Y:	3580632.3200

Plat Previously Submitted Or... ☐

List of Attached Items:

Description	FileName
VC-502202 Final Plat	VC-502202 Final Plat.pdf

3. Geological Data

Fresh Water At:

Depth (in feet)	Rate	Unit of Measure

Salt Water At:

Depth (in feet)	Rate	Unit of Measure

Coal Seams:

List of Attached Items:

Description	FileName
VC-502202 Coal	Coal Log.xls

Gas and Oil Shows:

List of Attached Items:

Description	FileName
VC-502202 Gas Shows	502202 Shows.xls

4. Electric Logs (As required by 4VAC25-150-280.A)

List all logs run: GR/CDL/PE/DIL/Neu/TEMP/Audio

Did logs disclose vertical locations of a coal seam?

☐

5. Survey Results (As required by 4VAC25-150-280.B.2)

List of Attached Items:

Description	FileName
VC-502202 Survey	502202 Survey.xls

6. Casing and Tubing Program

List of Attached Items:

Description	FileName
VC-502202 Casing/Tubing	502202 Casing.xls

7. Remarks

Use this space to note any conditions or occurrences, such as lost circulation, fishing jobs, junk left in hole, sidetracks, squeeze jobs, etc., not shown above. Include data and depth of condition/occurrence.

8. Drillers Log

Compiled By: Range Resources

List of Attached Items:

Description	FileName
VC-502202 Driller's Log	502202 Drillers Log.xls

9. Comments

10. Signature

Permittee: Range Resources-Pine Mountain, Date: 1/15/2015

Signed By: Laura Murray Title: Regulatory Compliance Specialist

INTERNAL USE ONLY

Submit Date: 1/15/2015

Status: A

Date: 2/2/2015

Final PDF Date: 3/12/2015

COMPANY Range Resources-Pine Mountain, Inc. WELL NAME AND NUMBER VC-502202
TRACT NO. Joseph H. Rasnick ELEVATION 2,346.87' QUADRANGLE Nora
COUNTY Dickenson DISTRICT Ervinton SCALE 1" = 400' DATE 10-29-2014

+ This Plat is a new plat ____; an updated plat ____; or a final location plat ____
Denotes the location of a well on United States topographic Maps, scale 1 to 24,000, latitude and longitude lines, being represented by border lines as shown.

Form DGO-GO-7

Coal Seams	502202					
				MINING IN AREA		
NAME	TOP	BOTTOM	THICKNESS	YES	NO	MINED OUT
Coal	90	91	1		No	
Coal	150	151	1		No	
Coal	394	395	1		No	
Coal	753	754	1		No	
Coal	1070	1071	1		No	
Coal	1275	1276	1		No	
Coal	1320	1321	1		No	
Coal	1420	1421	1		No	
Coal	1622	1623	1		No	
Coal	1871	1872	1		No	
Coal	2195	2196	1		No	

Gas and Oil Shows

FORMATION	DEPTH	THICKNESS	IPF (MCFD/BOPD)	PRESSURE	HOURS TESTED
	1320		NS		
	1699		NS		
	1893		NS		
	2750		60		
	2750		Trace		

Survey Results

Depth of Survey	Direction/Distance/Degree From True Vertical
197'	1/4
384'	1/2
565'	1/4
753'	1/4
943'	1/4
1131'	1/2
1320'	1/2
1510'	1/4
1699'	1/2
1888'	1/2
2078'	1/4
2268'	3/4
2457'	1/2
2647'	1/4

Casing/Tubing Program

	Casing	Casing	Hole	Cement Used	Cemented To Surface	Date	Packers Or Bridge Plugs	Cement Baskets
Casing Type	Size	Interval	Size	In Cubic Ft.	Yes/No	Cemented	Kind/Size/Set	(ft)
Conductor	13 3/8	0-41'	16 1/4	Sanded In	No			
Water Protection	9 5/8"	0-386'	12 3/8"	252 ft ³	Yes	10/29/14		84'
Coal Protection								
Production Casing	4 1/2"	0-2712'	6 3/8"	513 ft ³	Yes	10/31/14		1925'
Other Casing And Tubing Left In Well	2 3/8"	0-2130'						
Liners								

Driller's Log	502202						
		General		Depth	Depth		
Geologic Age	Formation	Lithology	Color	Top	Bottom	Thickness	Remarks
Pennsylvanian		Overburden		0	8	8	
Pennsylvanian		Sandy Shale		8	15	7	
Pennsylvanian		Sandstone		15	90	75	
Pennsylvanian		Coal		90	91	1	
Pennsylvanian		Sandstone		91	150	59	
Pennsylvanian		Coal		150	151	1	
Pennsylvanian		Sandstone		151	394	243	
Pennsylvanian		Coal		394	395	1	
Pennsylvanian		Sandy Shale		395	450	55	
Pennsylvanian		Sandstone		450	500	50	
Pennsylvanian		Sandy Shale		500	753	253	
Pennsylvanian		Coal		753	754	1	
Pennsylvanian		Sandy Shale		754	995	241	
Pennsylvanian		Coal		995	996	1	
Pennsylvanian		Sandy Shale		996	1070	74	
Pennsylvanian		Coal		1070	1071	1	
Pennsylvanian		Sandy Shale		1071	1275	204	
Pennsylvanian		Coal		1275	1276	1	
Pennsylvanian		Sandy Shale		1276	1370	94	
Pennsylvanian		Coal		1370	1371	1	
Pennsylvanian		Sandy Shale		1371	1420	49	
Pennsylvanian		Coal		1420	1421	1	
Pennsylvanian		Sandy Shale		1421	1575	154	
Pennsylvanian		Coal		1575	1576	1	
Pennsylvanian		Sandy Shale		1576	1622	46	
Pennsylvanian		Coal		1622	1623	1	
Pennsylvanian		Sandy Shale		1623	1871	248	
Pennsylvanian		Coal		1871	1872	1	
Pennsylvanian		Sandy Shale		1872	2195	323	
Pennsylvanian		Coal		2195	2196	1	
Pennsylvanian		Sandy Shale		2196	2230	34	
Pennsylvanian		Sandstone		2230	TD		
Pennsylvanian							
Pennsylvanian							



Commonwealth of Virginia
Department of Mines, Minerals, and Energy
Division of Gas and Oil
P.O. Drawer 159, Lebanon, VA 24266
Telephone: (276) 415-9650

Tracking Number:	6114
Company:	Range Resources-Pine Mountain,
File Number:	DI-2589
Completion Report Type:	Original

COMPLETION REPORT (DGO-GO-15)

Well Type:	Coalbed/Pipeline	Date Well Completed:	11/21/2014
Driller's Total Depth:	2750.00	Log's Total Depth:	2755.00

1. Changes In Casing/Tubing from Approved Drilling Report

Description	FileName

2. Stimulation Record

Stimulation Status: ☒ Stimulated ☐ GOB ☐ Not Stimulated ☐ Service Well

Description	FileName
VC-502202 Completion Report	502202 Completion Report.pdf

3. Final Production

Description	FileName
VC-502202 Final Production	Final_Prod.xls

4. Comments

Notes:

5. Signature

Permittee: Range Resources-Pine Mountain, Date: 1/15/2015 (Company)

By: Bonnie Kelley Title: Regulatory Compliance Technician (Signature)

INTERNAL USE ONLY

Submit Date: 1/15/2015

Status: Approved

Date: 2/9/2015

Final PDF Date: 3/12/2015

Range Resources - Pine Mountain

11/24/2014 11:01:28 AM

Completion Report**105009135 --502202 VC-502202**

Stage:	Stage 01	Service Co.:	Universal	Avg DH Rate:	0.0
Stage Date:	11/21/2014 9:30:00 AM	Fluid Type:	70Q Foam	Max DH Rate:	0.0
Perf Date:	11/21/2014 9:30:00 AM	BD:	1614	Total Slurry Volume:	0
Logging Co.:	Blue Dot	ISIP:	0	Total Fluid Volume:	0
Formation	Pocohontas #2	Avg Press:	0	Avg N2 Rate:	0
Perf Top:	2595	Max Treat Pressure:	0	Max N2 Rate:	0
Perf Bottom:	2598	Final ISIP:	0	Total N2 Volume:	0
# Shots:	0	2 Min SIP:	0	Max DH PPA:	0.0
Perf Size:	0	5 Min SIP:	0	Total Proppant Sks:	0
Perf Comments:	This stage was not completed due to wiper plug being in 1st baffle.		10 Min SIP:	Total Acid:	0
Comments:			Sand Mesh:	Acid Type:	15% HCL
		Frac Gradient:	0		

Stage:	Stage 02	Service Co.:	Universal	Avg DH Rate:	53.0
Stage Date:	11/21/2014 12:15:00 PM	Fluid Type:	70Q Foam	Max DH Rate:	55.0
Perf Date:	11/21/2014 12:15:00 PM	BD:	2825	Total Slurry Volume:	349
Logging Co.:	Blue Dot	ISIP:	0	Total Fluid Volume:	336
Formation	Horsepen, X-Seam	Avg Press:	2816	Avg N2 Rate:	33,380
Perf Top:	2022	Max Treat Pressure:	3317	Max N2 Rate:	34,115
Perf Bottom:	2099	Final ISIP:	1607	Total N2 Volume:	568,114
# Shots:	20	2 Min SIP:	1532	Max DH PPA:	2.6
Perf Size:	0.52	5 Min SIP:	0	Total Proppant Sks:	114
Perf Comments:			10 Min SIP:	Total Acid:	500
Comments:			Sand Mesh:	Acid Type:	15% HCL
		Frac Gradient:	1.2		

Stage:	Stage 03	Service Co.:	Universal	Avg DH Rate:	45.0
Stage Date:	11/21/2014 2:45:00 PM	Fluid Type:	70Q Foam	Max DH Rate:	48.0
Perf Date:	11/21/2014 2:45:00 PM	BD:	1614	Total Slurry Volume:	401
Logging Co.:	Blue Dot	ISIP:	0	Total Fluid Volume:	368
Formation	C Seam, War Creek, Un C,	Avg Press:	3515	Avg N2 Rate:	36,200
Perf Top:	1877	Max Treat Pressure:	3687	Max N2 Rate:	37,050
Perf Bottom:	1962	Final ISIP:	1270	Total N2 Volume:	750,771
# Shots:	34	2 Min SIP:	1261	Max DH PPA:	2.7
Perf Size:	0.52	5 Min SIP:	0	Total Proppant Sks:	465
Perf Comments:			10 Min SIP:	Total Acid:	750
Comments:			Sand Mesh:	Acid Type:	15% HCL
		Frac Gradient:	0		

Stage:	Stage 04	Service Co.:	Universal	Avg DH Rate:	55.0
Stage Date:	11/21/2014 4:30:00 PM	Fluid Type:	65Q Foam	Max DH Rate:	58.0

Range Resources - Pine Mountain

11/24/2014 11:01:28 AM

Completion Report**105009135 --502202 VC-502202**

Perf Date:	11/21/2014 4:30:00 PM	BD:	1942	Total Slurry Volume:	285
Logging Co.	Blue Dot	ISIP:	0	Total Fluid Volume:	264
Formation	M Seaboard, L Seaboard, Un	Avg Press:	3052	Avg N2 Rate:	36,210
Perf Top:	1599.5	Max Treat Pressure:	3370	Max N2 Rate:	37,078
Perf Bottom:	1802.9	Final ISIP:	1845	Total N2 Volume:	427,757
# Shots:	26	2 Min SIP:	1139	Max DH PPA:	2.7
Perf Size:	0.52	5 Min SIP:	0	Total Proppant Sks:	275
Perf Comments:		10 Min SIP:	0	Total Acid:	252
		Sand Mesh:	20/40 Sand	Acid Type:	15% HCL
Comments:		Frac Gradient:	0		

Stage:	Stage 05	Service Co.	Universal	Avg DH Rate:	53.0
Stage Date:	11/21/2014 6:30:00 PM	Fluid Type:	75 Q Foam	Max DH Rate:	56.0
Perf Date:	11/21/2014 6:30:00 PM	BD:	2560	Total Slurry Volume:	219
Logging Co.	Blue Dot	ISIP:	1046	Total Fluid Volume:	198
Formation	U.Seaboard A, U Seaboard,	Avg Press:	3465	Avg N2 Rate:	44,220
Perf Top:	1362.5	Max Treat Pressure:	3728	Max N2 Rate:	46,107
Bottom:	1560.59	Final ISIP:	1817	Total N2 Volume:	519,734
# Shots:	27	2 Min SIP:	1435	Max DH PPA:	3.0
Perf Size:	0.52	5 Min SIP:	1421	Total Proppant Sks:	301
Perf Comments:		10 Min SIP:	0	Total Acid:	0
		Sand Mesh:	20/40 Sand	Acid Type:	15% HCL
Comments:		Frac Gradient:	0		

Final Production After Stimulation				
	BOD	MCFD	Hours Tested	Rock Pressure
Final/Commingled Zones				
Commingled		95	in-line	