



west virginia department of environmental protection

Office of Oil and Gas
601 57th Street SE
Charleston, WV 25304
(304) 926-0450
(304) 926-0452 fax

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

PERMIT MODIFICATION APPROVAL

October 01, 2013

NOBLE ENERGY, INC.
333 TECHNOLOGY DRIVE, SUITE 110
CANONSBURG, PA 15317

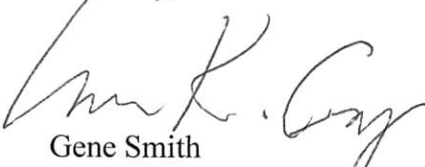
Re: Permit Modification Approval for API Number 8510031 , Well #: PENS 1 FHS
extended lateral

Oil and Gas Operator:

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before permitted well work is commenced.

Please call James Martin at 304-926-0499, extension 1654 if you have any questions.

Sincerely,


for Gene Smith
Regulatory/Compliance Manager
Office of Oil and Gas



85-1003(MOD)

Laura Adkins
Regulatory Analyst
724.820.3118 direct
412.841.9567 mobile

July 16, 2013

Laura Cooper
West Virginia Department of Environmental Protection
Office of Oil and Gas
601 57th St. S.E
Charleston, WV 25304

Permit Modification Request – Wells PENS1FH5/PENS1GHS /PENS1HHS

Dear Laura,

Enclosed are permit modification requests to extend laterals on the above referenced wells. Please let me know of any deficiencies and we will provide the information you have requested.

If any further information or correspondence is required, please contact me at the above or by email ladkins@nobleenergyinc.com

Sincerely,

A handwritten signature in black ink that reads "Laura L. Adkins".

Laura Adkins

Enclosure(s):

Received

JUL 19 2013

Office of Oil and Gas
WV Dept. of Environmental Protection

10/04/2013

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
W.VA. CODE §22-6A - WELL WORK PERMIT APPLICATION

1) Well Operator: Noble Energy, Inc. 494501907 085-RITCHIE Clay Pennsboro
Operator ID County District Quadrangle

2) Operator's Well Number: PENS1FHS Well Pad Name: PENS1HS

3 Elevation, current ground: 1110' Elevation, proposed post-construction: 1110'

4) Well Type: (a) Gas Oil
Other _____
(b) If Gas: Shallow Deep
Horizontal

5) Existing Pad? Yes or No: Yes

6) Proposed Target Formation(s), Depth(s), Anticipated Thicknesses and Associated Pressure(s):
MARCELLUS, Depth 6291'. Thickness-78', Pressure-4204#

7) Proposed Total Vertical Depth: 6369'

8) Formation at Total Vertical Depth: MARCELLUS

9) Proposed Total Measured Depth: 15,810'

10) Approximate Fresh Water Strata Depths: 130'

11) Method to Determine Fresh Water Depth: Offset well data

12) Approximate Saltwater Depths: 1525', 1805'

13) Approximate Coal Seam Depths: No known coal in area

14) Approximate Depth to Possible Void (coal mine, karst, other): None

15) Does land contain coal seams tributary or adjacent to, active mine? No

16) Describe proposed well work: Drill a horizontal well and produce the Marcellus. Case and cement well as prescribed in the following casing program.

17) Describe fracturing/stimulating methods in detail:
Well will be completed following the procedure attached. Offset wells will be monitored as described in attached procedure.

18) Total area to be disturbed, including roads, stockpile area, pits, etc, (acres): 15 acres

19) Area to be disturbed for well pad only, less access road (acres): 8.08 acres

Received
JUL 19 2013

WW - 6B
(1/12)

20)

CASING AND TUBING PROGRAM

<u>TYPE</u>	<u>Size</u>	<u>New or Used</u>	<u>Grade</u>	<u>Weight per ft.</u>	<u>FOOTAGE: For Drilling</u>	<u>INTERVALS: Left in Well</u>	<u>CEMENT: Fill -up (Cu. Ft.)</u>
Conductor	20"	New	LS	81.3#	40'	40'	cts 15.6 PPG yield 1.2 to surface
Fresh Water	13 3/8"	New	J-55	54.5#	650'	650'	cts 15.6 ppg 40% excess yield 1.19
Coal							
Intermediate	9 5/8"	New	HCN80	40#	5500'	5500'	cts 15.6 ppg 30% excess yield 1.19
Production	5 1/2"	New	HCP110	20#	15,810'	15,810'	at least 500' above shallowest producing formation
Tubing							
Liners							

Noble Energy, Inc. requests to run surface casing to 650' so that our casing point will be in competent rock.

<u>TYPE</u>	<u>Size</u>	<u>Wellbore Diameter</u>	<u>Wall Thickness</u>	<u>Burst Pressure</u>	<u>Cement Type</u>	<u>Cement Yield</u>
Conductor	20"	26"	.438	2110	Type 1	1.2
Fresh Water	13 3/8"	17 1/2"	.380	2730	Type 1	1.2
Coal						
Intermediate	9 5/8"	12 3/8"	.352	7910	Type 1	1.19
Production	5 1/2"	8 3/4" & 8 1/2"	.361	12,640	Type 1	1.27
Tubing						
Liners						

PACKERS

ACE 10/1/13

Kind:			
Sizes:			
Depths Set:			

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DRILLING WELL PLAN
PENS-1F-HS
 Macellus Shale Horizontal
 Ritchie County, WV

PENS-1F-HS (Marcellus HZ)

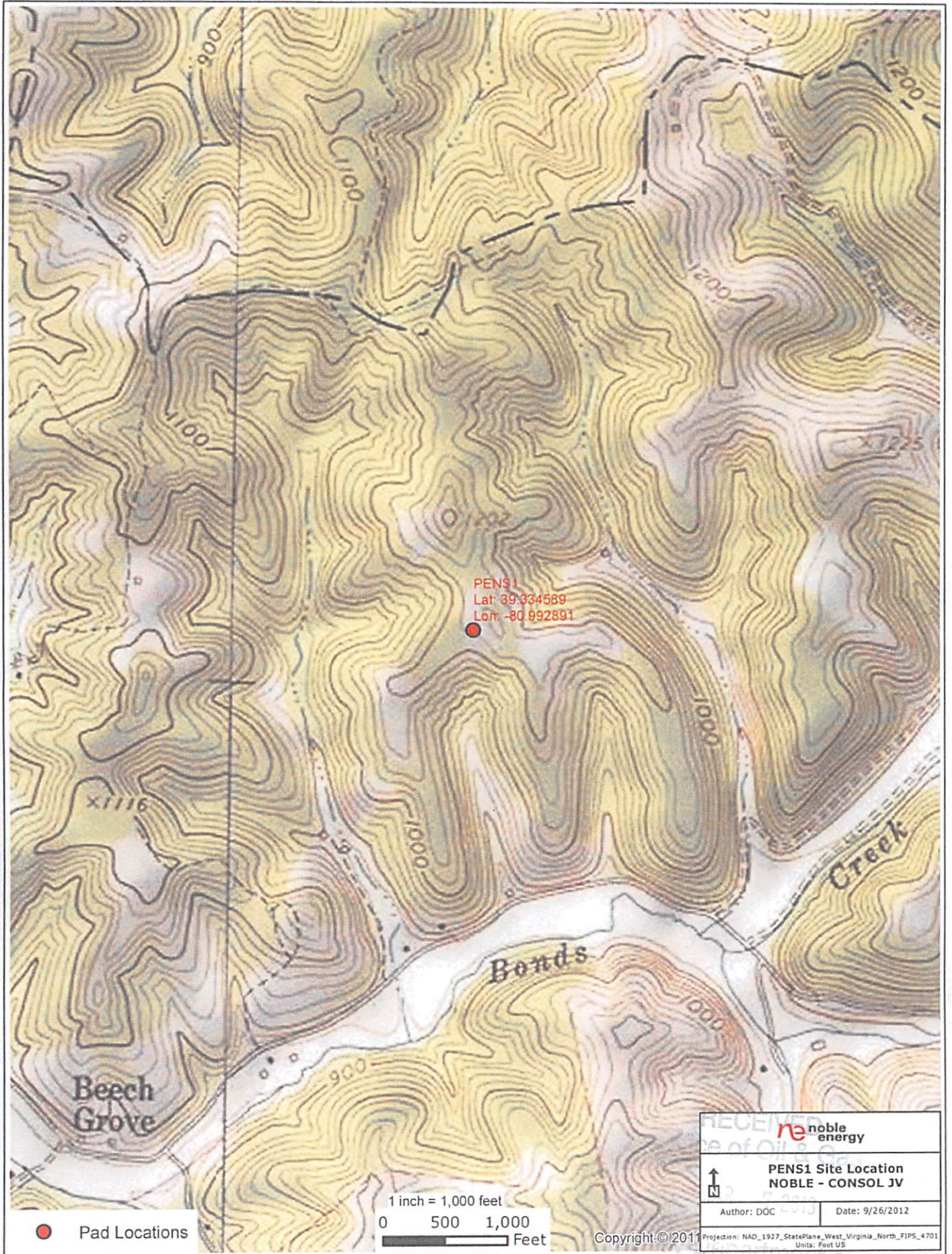
Ground Elevation	1112'		Landing Point (NAD 27)			N 307091.70 E 1576375.23				
SHL (NAD 27)	N 307591.67, E 1577698.16		BHL (NAD 27)			N 313818.55, E 1570732.24				
WELLBORE DIAGRAM	HOLE	CASING	GEOLOGY	TOP TVD	BASE TVD	MUD	CEMENT	CENTRALIZERS	CONDITIONING	COMMENTS
	26"	20" 52# LS				AIR	15.6 ppg Type I/II + 2% CaCl Yield = 1.2 To Surface	N/A	Ensure the hole is clean via air circulation at TD.	Conductor casing = 0.25" wall thickness
	17.5"	13-3/8" 54.5# J-55 BTC	Conductor	40	40	AIR	15.6 ppg Type I/II + 2% CaCl, 0.25# Lost Circ 40% Excess Yield = 1.2 To Surface	Bow Spring on first 2 joints then every third joint to 100' form surface	Fill with KCl water once drilled to TD. Once casing is at setting depth, circulate a minimum of one hole volume prior to pumping cement.	Surface casing = 0.380" wall thickness Burst=2730 psi
			Surface Casing	650	650					
	12.25"	9-5/8" 36# HCK-55 BTC	Maxton Sand	1968	2012	AIR or 8.5ppg SOBM	Two stage cement job, stage tool at +/-2500' TVD. 1st stage lead=14.2 ppg, TOC=2500' TVD; 1st stage tail=15.6 ppg, TOC=4750' TVD; 2nd stage 14.2 ppg. TOC=Surface	Bow Spring on first 2 joints then every third joint to 100' form surface	Once at TD, circulate at drilling pump rate for at least three hours. Once on bottom with casing, circulate a minimum of one hole volume prior to pumping cement.	Intermediate casing = 0.352" wall thickness Burst=3520 psi
			Big Lime	2044	2121					
			Big Injun	2121	2169					
			Weir Sand	2488	2504					
			5th Sand	2960	2966					
			Gordon	2989	2991					
			Warren Sand	3571	3605					
			Speechley	3889	4443					
			Riley	4640	4654					
Benson			4994	5000						
Alexander	5243	5249								
Int. Casing		5300								
8.75" Vertical	5-1/2" 20# HCP-110 TXP BTC	Marcellus	6291	6369	12.5ppg SOBM	14.8ppg Class A 25:75:0 System +2.6% Cement extender, 0.7% Fluid Loss additive, 0.5% high temp retarder, 0.2% friction reducer 10% Excess TOC >= 200' above 9.625" shoe	Rigid Bow Spring every joint to KOP. Rigid Bow Spring every third joint from KOP to TOC	Once at TD, circulate at drilling pump rate for at least three hours. Once on bottom with casing, circulate a minimum of one hole volume prior to pumping cement.	Production casing = 0.361" wall thickness Burst=12640 psi	
8.75" Curve										
8.75" - 8.5" Lateral										
			Onondaga	6369	6372					
LP @ +/-6359 TVD		8.75 / 8.5 Hole - Cemented Long String 5-1/2" 20# HCP-110 TXP BTC				+/-8781 Ft Lateral			TD @ +/-6359 TVD +/-15,810 MD	

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JUL 19 2013

Office of Oil and Gas
 WV Dept. of Environmental Protection

10/04/2013



NOTES:

Well is located on topo map 14,612' feet south of Latitude: 39° 22' 30"

- There are no water wells or developed springs within 250' of proposed well.
- There are no existing buildings within 625' of proposed well.
- Proposed well is greater than 100' from perennial stream, wetland, pond, reservoir or lake.
- There are no native trout streams within 300' of proposed well.
- Proposed well is greater than 1000' from surface/groundwater intake or public water supply.
- It is not the purpose or intention of this plat to represent surveyed locations of the surface or mineral parcels depicted hereon. The location of the boundary lines, as shown, are based on record deed descriptions, field evidence found and/or tax map position, unless otherwise noted.

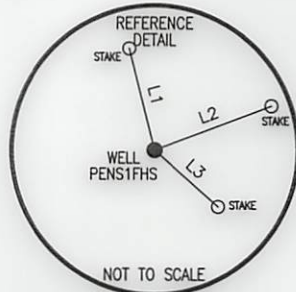


LEGEND

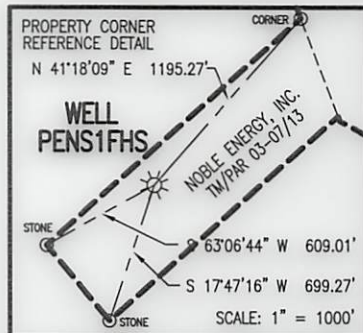
- TOPO MAP POINT
- PROPOSED GAS WELL
- ALL ARE POINTS UNLESS OTHERWISE NOTED.
- WATER SOURCE
- LEASE NUMBER BASED ON ATTACHED WW-6A1
- SURFACE BOUNDARY
- PARCEL LINES
- WELL REFERENCE
- PROPOSED HORIZONTAL WELL
- ROAD
- STREAM CENTER LINE

WELLS WITHIN 3,000'

- EXISTING WELLS
- PLUGGED WELLS



LINE	BEARING	DISTANCE
L1	N 14°14'26" W	217.46'
L2	N 69°23'15" E	261.56'
L3	S 48°39'04" E	177.91'

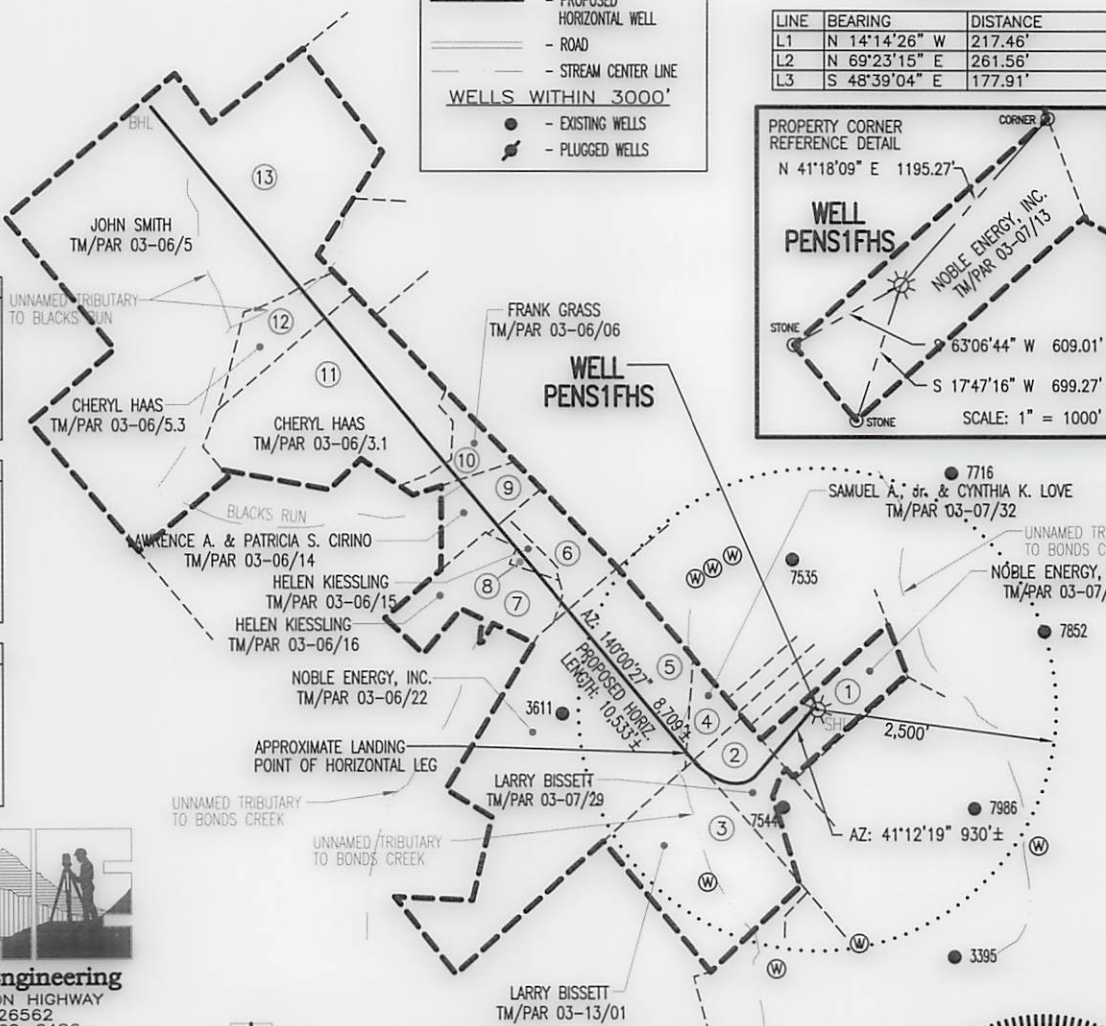


SURFACE HOLE LOCATION (SHL)
 UTM 17-NAD83
 N:4353949.073
 E:500612.699
 LAT/LOG DATUM-WGS84
 N:307591.67
 E:1577698.16

APPROX. LANDING POINT
 UTM 17-NAD83
 N:4353806.32
 E:500198.06
 NAD27, WV NORTH
 N:307146.00
 E:1576329.67

BOTTOM HOLE LOCATION (BHL)
 UTM 17-NAD83
 N:4355810.62
 E:498458.86
 NAD27, WV NORTH
 N:313818.55
 E:1570732.24

Blue Mountain Engineering
 11023 MASON DIXON HIGHWAY
 BURTON, WV 26562
 PHONE: (304) 662-6486



Well is located on topo map 9,829' feet west of Longitude: 80° 57' 30"

FILE #: PENS1FHS
 DRAWING #: PENS1FHS
 SCALE: 1" = 2000'
 MINIMUM DEGREE OF ACCURACY: 1/2500
 PROVEN SOURCE OF ELEVATION: U.S.G.S. MONUMENT THOMAS 1498.81'

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

Signed: *[Signature]*
 R.P.E.: _____ L.L.S.: P.S. No. 2000

PLACE SEAL HERE

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS WVDEP
 OFFICE OF OIL & GAS
 601 57TH STREET
 CHARLESTON, WV 25304



DATE: JUNE 5, 2013
 OPERATOR'S WELL #: PENS1FHS
 API WELL #: 47 85
 STATE COUNTY PERMIT

Well Type: Oil Waste Disposal Production Deep
 Gas Liquid Injection Storage Shallow

WATERSHED: BONDS CREEK ELEVATION: 1116.40'
 COUNTY/DISTRICT: RITCHIE / CLAY QUADRANGLE: PENNSBORO, WV 7.5'
 SURFACE OWNER: NOBLE ENERGY, INC. ACREAGE: 19.759±
 OIL & GAS ROYALTY OWNER: SEE ATTACHED WW-6A1 ACREAGE: 612.769±

DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
 PLUG OFF OLD FORMATION PERFORATE NEW FORMATION PLUG & ABANDON
 CLEAN OUT & REPLUG OTHER CHANGE (SPECIFY): _____

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: TVD: 6,359'± TMD: 15,810'±
 WELL OPERATOR NOBLE ENERGY, INC. DESIGNATED AGENT STEVEN M. GREEN
 Address 333 TECHNOLOGY DRIVE, SUITE 110 Address 500 VIRGINIA STREET EAST, UNITED CENTER SUITE 1001
 City CANONSBURG State PA Zip Code 15317 City CHARLESTON State WV Zip Code 25301

10/04/2013