



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

July 22, 2014

NORTHEAST NATURAL ENERGY LLC
707 VIRGINIA STREET EAST, SUITE 1200
CHARLESTON, WV 25301

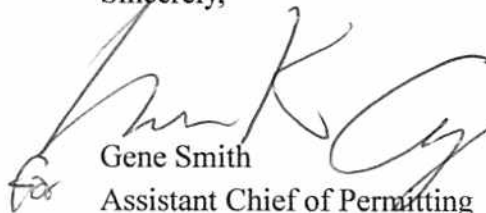
Re: Permit Modification Approval for API Number 6101666 , Well #: BEACH 4H
Shortened intermediate casing

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,



Gene Smith
Assistant Chief of Permitting
Office of Oil and Gas

WW-6B
(9/13)

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
WELL WORK PERMIT APPLICATION

61 03 256

1) Well Operator: Northeast Natural Energy LLC 494498281 Monongalia Clay Blacksville, WV
Operator ID County District Quadrangle

2) Operator's Well Number: Beach 4H Well Pad Name: Beach

3) Farm Name/Surface Owner: Nancy Kay Beach Davis and Russell C. Beach Public Road Access: County Route 29

4) Elevation, current ground: 1,380' Elevation, proposed post-construction: 1,358.7

5) Well Type (a) Gas Oil Underground Storage

Other

(b) If Gas Shallow Deep

Horizontal

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):
Marcellus Shale, 8,215 TVD, 80', 3,600 PSI Formation Pressure

AS
12/12/13

8) Proposed Total Vertical Depth: 8,215'

SDW 12/12/13

9) Formation at Total Vertical Depth: Marcellus Shale

10) Proposed Total Measured Depth: 15,567'

11) Proposed Horizontal Leg Length: 7,500'

12) Approximate Fresh Water Strata Depths: 300'-1,150'

13) Method to Determine Fresh Water Depths: Driller's Log From Offset Wells

14) Approximate Saltwater Depths: 1,800' - 2,400'

15) Approximate Coal Seam Depths: 450' - 1,000'

16) Approximate Depth to Possible Void (coal mine, karst, other): NA

17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes No

(a) If Yes, provide Mine Info: Name: _____

Depth: _____

Seam: _____

Owner: _____

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DEC 16 2013

WV Department
Environmental Protection

WW-6B
(9/13)

18)

CASING AND TUBING PROGRAM

<u>TYPE</u>	<u>Size</u>	<u>New or Used</u>	<u>Grade</u>	<u>Weight per ft. (lb/ft)</u>	<u>FOOTAGE: For Drilling</u>	<u>INTERVALS: Left in Well</u>	<u>CEMENT: Fill-up (Cu. Ft.)</u>
Conductor	24"	New	NA	63.41	60'	60'	GTS
Fresh Water	13-3/8"	New	J-55	54.5	1,330'	1,300'	CTS
Coal							
Intermediate	9-5/8"	New	J-55	40	2,380'	2,350'	CTS
Production	5-1/2"	New	P-110	20	15,567'	15,562'	3,620 ft3
Tubing	2-7/8"	New	J-55	6.5	NA	8,000'	NA
Liners							

MJIC 7-21-14

<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 (cu. ft./k)</u>
Conductor	24"	28"	0.25"	1,300	Grout	N/A
Fresh Water	13-3/8"	17-1/2"	0.38"	2,730	Class A	1.23
Coal						
Intermediate	9-5/8"	12-1/4"	0.395"	3,950	Type 1	1.3
Production	5-1/2"	8-3/4"	0.361"	12,530	50:50 Poz	1.21
Tubing	2-7/8"	NA	0.217"	7,260	NA	NA
Liners						

PACKERS

Kind:				
Sizes:				
Depths Set:				

Received

JUL 22 2014

WW-6B
(9/13)

19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

Drilling and completion of a horizontal Marcellus well. The well will be drilled on air to an approximate depth of 7,100' TVD/MD. Well will then be horizontally drilled from KOP to approximately 8,215' TVD / 15,567' MD along a 149.29 degree azimuth.

20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:

Multi-stage / high-rate slickwater fracture treatment using various size sands as proppant. First stage will be initiated via pressurization against a burst disc ran in the production casing string or perforated with coiled tubing. Subsequent stages will be perforated with pumped down guns ran on wireline. Individual stages will be isolated with composite frac plugs. Maximum pump rate during any stage will be 110 BPM with a maximum allowable surface pressure of 9,500 PSI. Composite bridge plugs will be set at the end of the last stage to isolate the treated formation. After fracture treatment, composite frac plugs will be drilled out using a service rig and/or snubbing unit.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 33.6

22) Area to be disturbed for well pad only, less access road (acres): 15.3

23) Describe centralizer placement for each casing string:

Surface and intermediate casing strings will have bow spring centralizers placed every third joint (~120') from shoe joint to surface. Production casing will have rigid body centralizers placed every fourth joint (~160') from TD to surface.

24) Describe all cement additives associated with each cement type:

Surface string cement will be a Class A + 3% bwoc Calcium Chloride + Fresh Water blend. Intermediate string cement will be a Type I Cement + 0.5% bwoc EC-1 + 0.75 gals/100 sack FP-12L + 0.25 lbs/sack Cello Flake + 0.5% bwoc Sodium Metasilicate + 0.5% bwoc BA-10A + 50.9% Fresh Water. Production string cement will be a (50:50) Poz (Fly Ash):Type I Cement with a gas migration additive.

25) Proposed borehole conditioning procedures:

Surface string will use a 35.0 bbls Gel Pill + LCM + 25 lbs Cello Flake + 20 lbs/bbl Bentonite + 80 lbs Fed Seal @ 8.4 ppg & 10 bbls fresh water spacer prior to cement. Intermediate string will use a 35.0 bbls Gel Pill + LCM + 25 lbs Cello Flake + 20 lbs/bbl Bentonite + 80 lbs Fed Seal @ 8.4 ppg & 10 bbls fresh water spacer prior to cement. Production string will use a 50.0 bbls SealBond 25 + 1 gal/bbl US-40 + 275 lbs/bbl Barite, Bulk + 1 gal/bbl SS-2 @ 12.5 ppg spacer prior to cement.

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*Note: Attach additional sheets as needed.

Beach 4H
47-61-01666 MOD

1.0 Wellbore Casing and Cementing Standards

Anticipated Depths:

Freshwater	1,150'
Saltwater	1,800' - 2,400'
Oil and Gas	7,780' - 8,230'
Hydrogen Sulfide	N/A*
Thief Zones	N/A*
High Pressure	N/A*
High Volume	N/A*

*These depths are not applicable to this well site based on existing wells on this well pad.

Casing and Cementing Program:

Type	Size	New or Used	Grade	Weight Per Foot	Footage: For Drilling	Intervals: Left in Well	Cement: Fill-Up (Cu. Ft.)
Conductor	24"	New	N/A	63.41	60'	60'	GTS
Freshwater	13 3/8"	New	J-55	54.5	1,330'	1,300'	CTS
Coal							
Intermediate	9 5/8"	New	J-55	40	2,380'	2,350'	CTS
Production	5 1/2"	New	P-110	20	15,567'	15,562'	3,620 ft3

*Applicable casing string depths and cement properties are highlighted below.

MSK 7-21-14

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JUL 22 2014

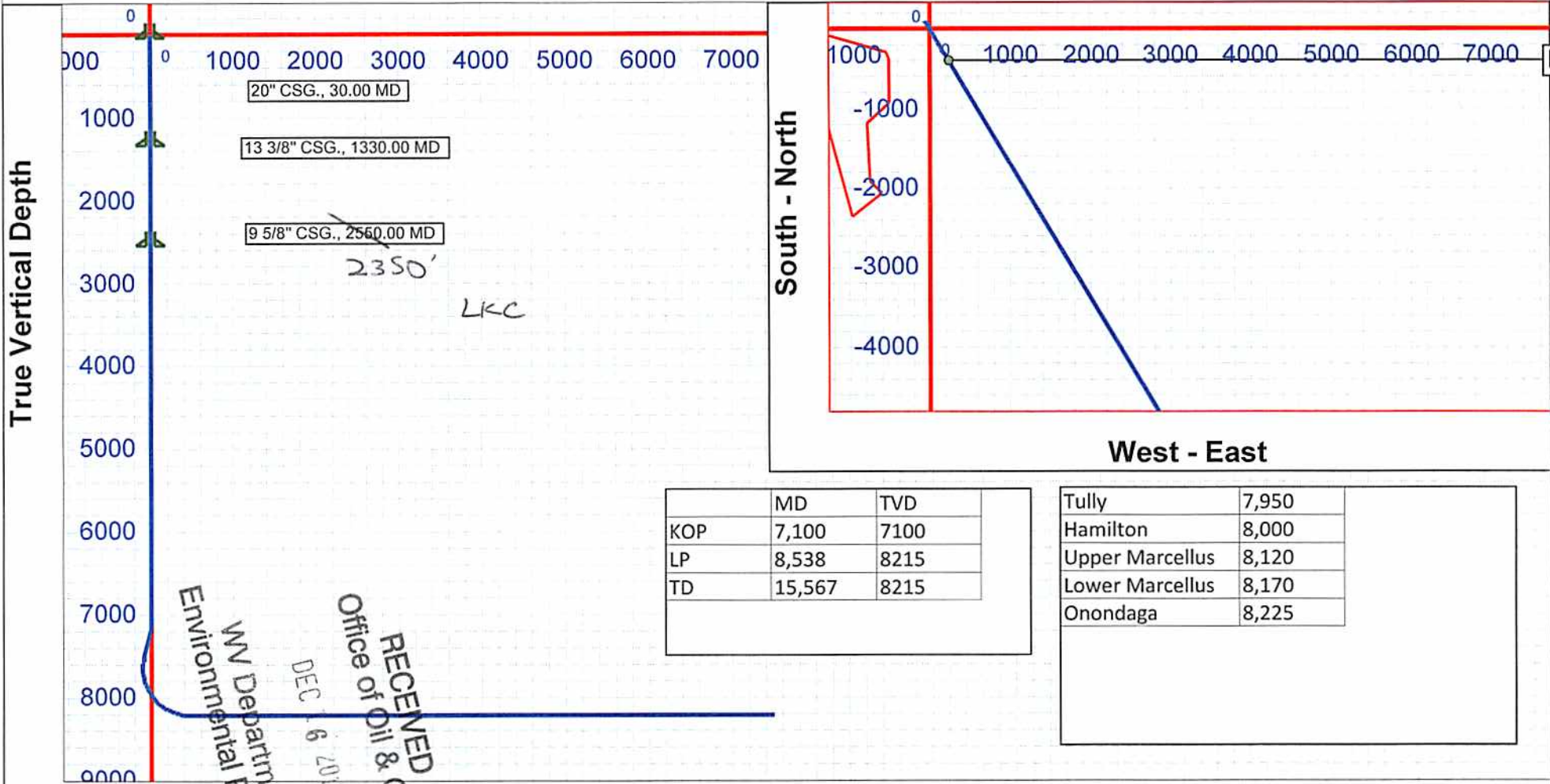
Office of Oil and Gas
WV Dept. of Environmental Protection

07/25/2014



Job Number:
Company: Northeast Natural Energy
Lease/Well: 4H
Location: Beach
Rig Name:
State/County: WV/ Mon
Country: US
API Number:

Elevation (To MSL): 1358.70 ft
RKB: 18.00 ft
Projection System: US State Plane 1983
Projection Group: West Virginia Northern Zone
Projection Datum: GRS80
Magnetic Declination: -8.90
Grid Convergence: -0.41623 W
Date: Tuesday, November 19, 2013



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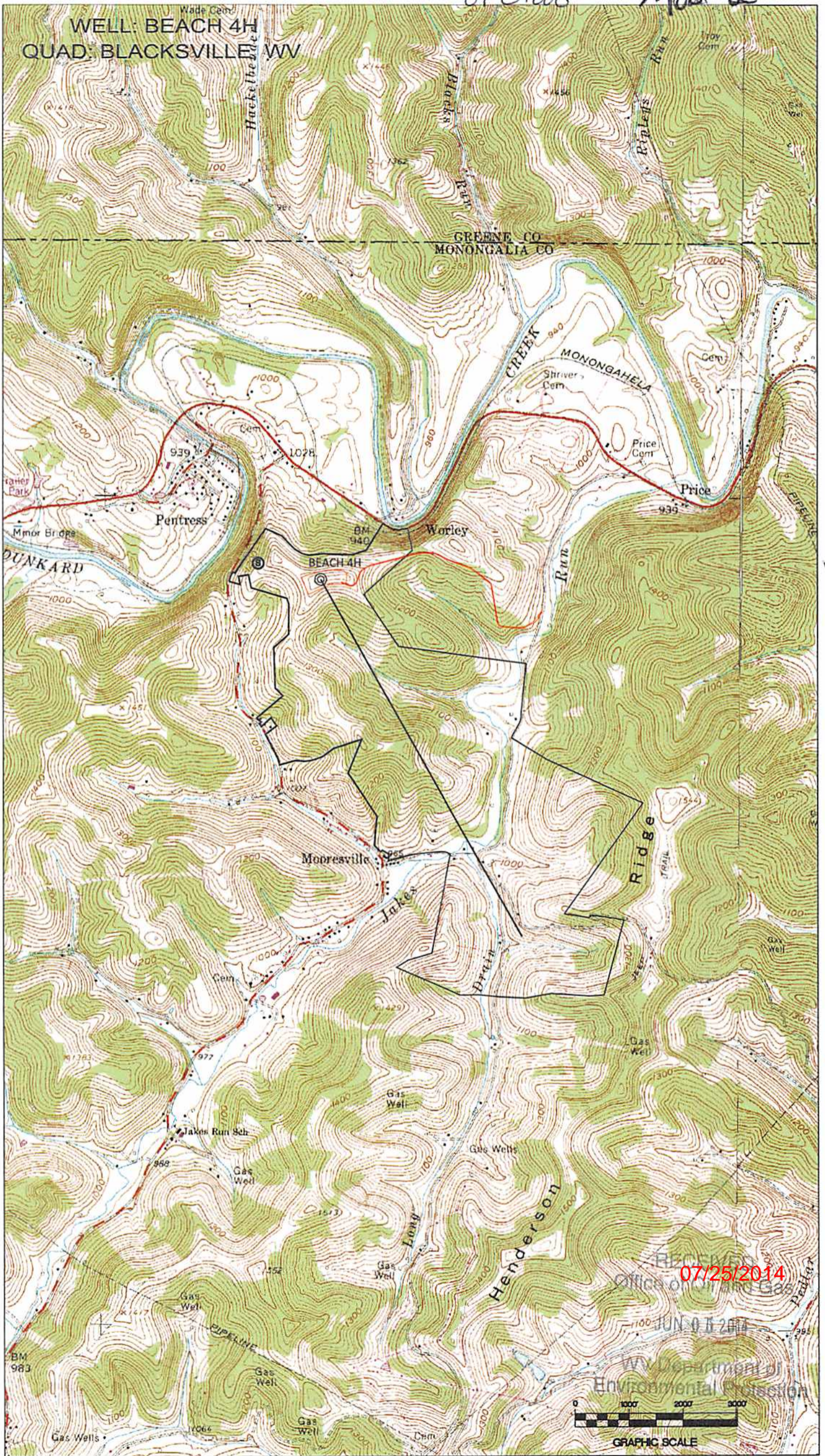
Vertical Section (1000 Ft/Div) VSP: 149.29°

61-01666 (MOD)

61-01666

Mod 2

WELL: BEACH 4H
QUAD: BLACKSVILLE WV



07/25/2014

JUN 06 2014

REC'D Office of Mining Gas

WV Department of Environmental Protection



GRAPHIC SCALE

TOP HOLE (UTM 60)
N) 4395284.6
E) 572863.5

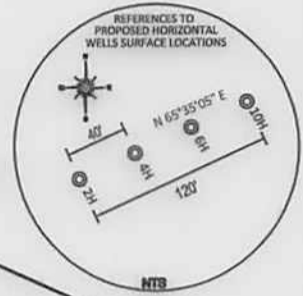
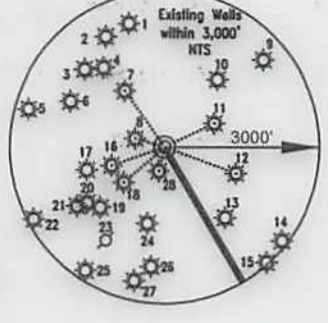
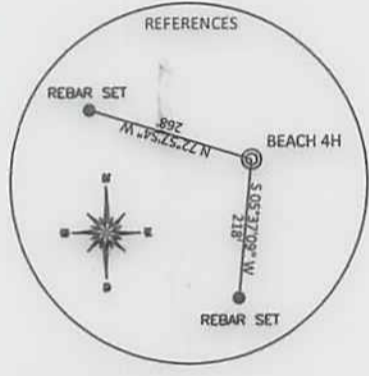
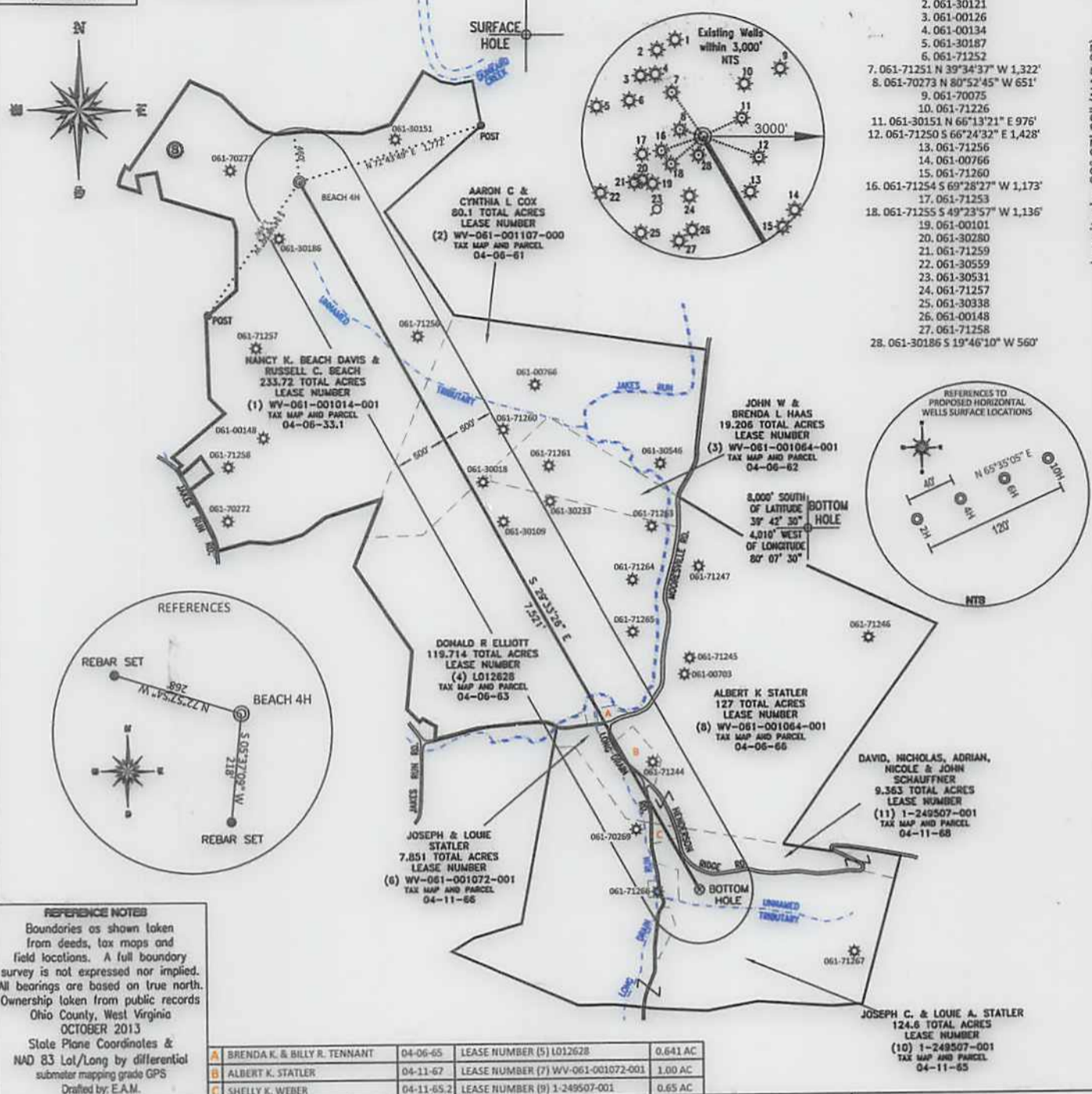
BOTTOM HOLE (UTM 60)
N) 4393310.3
E) 573827.2

NO DWELLINGS WERE FOUND WITHIN 625'
OF THE CENTER OF WELL PAD

NO WATER WELLS WERE FOUND WITHIN 250'
OF THE CENTER OF WELL PAD

WELL REFERENCE (API#, DISTANCE TO LATERAL)

1. 061-00125
2. 061-30121
3. 061-00126
4. 061-00134
5. 061-30187
6. 061-71252
7. 061-71251 N 39°34'37" W 1,322'
8. 061-70273 N 80°52'45" W 651'
9. 061-70075
10. 061-71226
11. 061-30151 N 66°13'21" E 976'
12. 061-71250 S 66°24'32" E 1,428'
13. 061-71256
14. 061-00766
15. 061-71260
16. 061-71254 S 69°28'27" W 1,173'
17. 061-71253
18. 061-71255 S 49°23'57" W 1,136'
19. 061-00101
20. 061-30280
21. 061-71259
22. 061-30559
23. 061-30531
24. 061-71257
25. 061-30338
26. 061-00148
27. 061-71258
28. 061-30186 S 19°46'10" W 560'



REFERENCE NOTES
Boundaries as shown taken from deeds, tax maps and field locations. A full boundary survey is not expressed nor implied. All bearings are based on true north. Ownership taken from public records Ohio County, West Virginia OCTOBER 2013
State Plane Coordinates & NAD 83 Lot/Long by differential submeter mapping grade GPS
Drafted by: E.A.M.

A	BRENDA K. & BILLY R. TENNANT	04-06-65	LEASE NUMBER (5) L012628	0.641 AC
B	ALBERT K. STATLER	04-11-67	LEASE NUMBER (7) WV-061-001072-001	1.00 AC
C	SHELLY K. WEBER	04-11-65.2	LEASE NUMBER (9) 1-249507-001	0.65 AC

FILE #: NNE009
DRAWING #: 2294
SCALE: PLAT = (1"=1400')
TICK MARK = (1"=2000')
MINIMUM DEGREE OF ACCURACY: 1/200
PROVEN SOURCE: SUBMETER MAPPING GRADE GPS
OF ELEVATION: GRADE GPS

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:

L.L.S. #2124 : Ernest J. Benchek III



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

OFFICE OF OIL & GAS
601 57TH STREET
CHARLESTON, WV 25304

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

WATERSHED: DUNKARD CREEK ELEVATION: 1380'

COUNTY/DISTRICT: MONONGALIA / CLAY QUADRANGLE: BLACKSVILLE, WV.

SURFACE OWNER: NANCY K. BEACH DAVIS & RUSSELL C. BEACH ACREAGE: 233.72 +/-

OIL & GAS ROYALTY OWNER: TED K. MOORE, ET AL ACREAGE: 723.85 +/- 07/25/2014

LEASE NUMBERS: _____

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

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: TVD: 8,215' TMD: 15,567'

WELL OPERATOR : NORTHEAST NATURAL ENERGY LLC DESIGNATED AGENT : JOHN ADAMS
ADDRESS: 707 VIRGINIA STREET SUITE 1200 ADDRESS: 707 VIRGINIA STREET SUITE 1200
CITY: CHARLESTON STATE: WV ZIP CODE: 25301 CITY: CHARLESTON STATE: WV ZIP CODE: 25301