



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 02, 2015

NORTHEAST NATURAL ENERGY LLC
707 VIRGINIA STREET EAST
CHARLESTO, WV 25301

Re: Permit Modification Approval for API Number 6101710, Well #: CAMPBELL 1H

Extend Vertical and 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,

A handwritten signature in black ink that reads "Gene Smith" followed by a stylized "For" written vertically.

Gene Smith
Assistant Chief of Permitting
Office of Oil and Gas

Promoting a healthy environment.

10/02/2015



northeast
NATURAL ENERGY

470610:710 Mod

September 17, 2015

WV Department of Environmental Protection
Office of Oil and Gas
601 57th Street SE
Charleston, WV 25304

Re: Campbell 1H and 6H Modification Request
API # 47-6101710; 47-6101700

Dear Permit Reviewer,

Northeast Natural Energy LLC ("NNE") would like to request a modification to its existing Campbell 1H and 6H permits identified by the API nos. 47-06101710 and 47-06101700. NNE has adjusted the horizontal well bores to allow for more efficient development of the natural gas surrounding its Campbell Well Pad. No additional leases will be affected by these adjustments; therefore, a WW-6A1 form has not been attached but can be provided upon request. Please find enclosed with this request: updated Mylar Plats, Well Bore Schematics and WW-6B forms with revised TVD and TMD for both wells.

Should you have any questions please contact me at 304.241.5752 Ext. 7108 or by email at hmedley@nne-llc.com.

Sincerely,


Hollie M. Medley
Regulatory Coordinator

4706101710

API NO. 47 - Mad
OPERATOR WELL NO. Campbell 1H
Well Pad Name: Campbell

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

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

2) Operator's Well Number: Campbell 1H Well Pad Name: Campbell

3) Farm Name/Surface Owner: Ellen F. Campbell Public Road Access: State Route 218 (Daybrook Road)

4) Elevation, current ground: 1293.6' Elevation, proposed post-construction: 1293.6'

5) Well Type (a) Gas Oil Underground Storage
Other _____
(b) If Gas Shallow Deep
Horizontal

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus, 8,118' , 103' , 3,600 psi

8) Proposed Total Vertical Depth: 8,118'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 17,642'

11) Proposed Horizontal Leg Length: 9,070'

12) Approximate Fresh Water Strata Depths: 50' , 1,137'

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

14) Approximate Saltwater Depths: 1,521' , 2,363'

15) Approximate Coal Seam Depths: 316' , 1,135'

16) Approximate Depth to Possible Void (coal mine, karst, other): N/A

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: Adjacent Mine - Federal No. 2
Depth: 1,100'
Seam: Pittsburgh
Owner: Patriot Coal Corporation

18)

CASING AND TUBING PROGRAM

| TYPE | Size (in) | New or Used | Grade | Weight per ft. (lb/ft) | FOOTAGE: For Drilling (ft) | INTERVALS: Left in Well (ft) | CEMENT: Fill-up (Cu. Ft.)/CTS |
|--------------|------------------|--------------------|--------------|-------------------------------|-----------------------------------|-------------------------------------|--------------------------------------|
| Conductor | 24" | New | NA | 94.71 | 50' | 50' | GTS |
| Fresh Water | 13-3/8" | New | J-55 | 54.5 | 1,280' | 1,250' | CTS |
| Coal | | | | | | | |
| Intermediate | 9-5/8" | New | J-55 | 40 | 2,430' | 2,400' | CTS |
| Production | 5-1/2" | New | P-110 | 20 | 17,642' | 17,612' | Cu. Ft. |
| Tubing | 2-7/8" | New | N-80 | 6.5 | NA | 8,500' | NA |
| Liners | | | | | | | |

| TYPE | Size (in) | Wellbore Diameter (in) | Wall Thickness (in) | Burst Pressure (psi) | Anticipated Max. Internal Pressure (psi) | Cement Type | Cement Yield (cu. ft./k) |
|--------------|------------------|-------------------------------|----------------------------|-----------------------------|---|--------------------|---------------------------------|
| Conductor | 24" | 30" | .375 | 415 | | 4,500 psi Grout | NA |
| Fresh Water | 13-3/8" | 17 1/2" | .38" | 2,760 | 2,000 | Class A | 1.23 |
| Coal | | | | | | | |
| Intermediate | 9-5/8" | 12 1/4" | .395" | 3,950 | 3,000 | Class A | 1.3 |
| Production | 5-1/2" | 8 3/4" | .361" | 12,530 | 9,700 | 50:50 Poz | 1.21 |
| Tubing | 2-7/8" | NA | .217" | 10,570 | 3,600 | NA | NA |
| Liners | | | | | | | |

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PACKERS

| | | | | |
|-------------|--|--|--|--|
| Kind: | | | | |
| Sizes: | | | | |
| Depths Set: | | | | |

WW-6B
(10/14)

API NO. 47- _____ - _____
OPERATOR WELL NO. Campbell 1H
Well Pad Name: Campbell

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 7,307' TVD/MD. The well will then be horizontally drilled on synthetic based mud from the KOP to approximately 8,118' TVD / 17,642' MD along a 323 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.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): NA - Existing Pad

22) Area to be disturbed for well pad only, less access road (acres): NA - Existing Pad

23) Describe centralizer placement for each casing string:

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

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

Surface string cement will be a Class A + Max 3% bwoc Calcium Chloride Fresh Water blend. Intermediate string cement will be a Class A Cement + Max 3% bwoc Calcium Chloride + Fresh Water. Production string cement will be (50:50) Poz (Fly Ash):Type I Cement with a gas migration additive.

25) Proposed borehole conditioning procedures:

Surface string will use a 25.0 bbls Gel Pill + LCM + 25 lbs Cello Flake + 20 lbs/bbl Bentonite @ 8.4 ppg & 10 bbls fresh water spacer prior to cement. Intermediate string will use a 25.0 bbls Gel Pill + LCM + 25 lbs Cello Flake + 20 lbs/bbl Bentonite @ 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 + 1 gal/bbl SS-2 Spacer @ 13.5 ppg prior to cement.

*Note: Attach additional sheets as needed.



NORTHEAST NATURAL ENERGY, LLC

Location: Monongalia County, WV
 Field: Monongalia
 Facility: Campbell Pad

Slot: Slot 01
 Well: Campbell 1H
 Wellbore: Campbell 1H PWB



Scale 1 inch = 1500 ft

Easting (ft)

-8750 -6000 -5250 -4500 -3750 -3000 -2250 -1500 -750 0

Scale 1 inch = 1500 ft

Northing (ft)

-7500 6750 6000 5250 4500 3750 3000 2250 1500 750 0 -750

Tie On: 0.00" Inc. 16.00ft MD, 16.00ft TVD, 0.00ft VS
 24in Conductor (GL): 0.00" Inc. 50.00ft MD, 50.00ft TVD, 0.00ft VS

13.375in Casing Surface (GL): 0.00" Inc. 1250.00ft MD, 1250.00ft TVD, 0.00ft VS

9.625in Casing Intermediate (GL): 0.00" Inc. 2400.00ft MD, 2400.00ft TVD, 0.00ft VS

| Location Information | | | |
|---|-------------------|--------------------|-----------------|
| Facility Name | Grid East (US ft) | Grid North (US ft) | Longitude |
| Campbell Pad | 1776099.874 | 437747.321 | 80°11'01.7007"W |
| Slot | Local N (ft) | Grid East (US ft) | Longitude |
| Slot 01 | -12.07 | 1776087.400 | 80°11'01.6507"W |
| Top Hole (PKS) to Mid Line (At Slot: Slot 01) | | 16ft | |
| Mean Sea Level to Mid Line (At Slot: Slot 01) | | -1294ft | |
| Top Hole (PKS) to Mean Sea Level | | 1310ft | |

| Formation | Depth (KBTVS) |
|-----------------|---------------|
| Tully | 7865' |
| Hamilton | 7929' |
| Upper Marcellus | 8036' |
| Lower Marcellus | 8081' |
| Onondaga | 8139' |

| Type | Hole Size | Casing Size | Grade | GL Depth (Hole) | GL Depth (Csg) |
|--------------|-----------|-------------|-------|-----------------|----------------|
| Conductor | 28" | 24" | NA | 50' | 50' |
| Surface | 17-1/2" | 13-3/8" | J-55 | 1280' | 1250' |
| Intermediate | 12-1/4" | 9-5/8" | J-55 | 2430' | 2400' |

Curve KOP: 0.00" Inc. 7307.00ft MD, 7307.00ft TVD, 0.00ft VS
 10.00"/100ft
 End of Build: 42.48" Inc. 7731.75ft MD, 7693.89ft TVD, -3.48ft VS
 10.00"/100ft

Landing PL: 90.00" Inc. 8633.82ft MD, 8118.00ft TVD, 562.55ft VS

Campbell 1H LP Rev-3

10.00"/100ft

Curve KOP: 0.00" Inc. 7307.00ft MD, 7307.00ft TVD, 0.00ft VS

End of Build: 42.48" Inc. 7731.75ft MD, 7693.89ft TVD, -3.48ft VS

Landing PL: 90.00" Inc. 8633.82ft MD, 8118.00ft TVD, 562.55ft VS

Campbell 1H LP Rev-3

10.00"/100ft

Curve KOP: 0.00" Inc. 7307.00ft MD, 7307.00ft TVD, 0.00ft VS

End of Build: 42.48" Inc. 7731.75ft MD, 7693.89ft TVD, -3.48ft VS

Landing PL: 90.00" Inc. 8633.82ft MD, 8118.00ft TVD, 562.55ft VS

Campbell 1H LP Rev-3

10.00"/100ft

BHL: 90.00" Inc. 13493.82ft MD, 8118.00ft TVD, 5421.82ft VS

Turn: 90.00" Inc. 13603.66ft MD, 8118.00ft TVD, 5531.66ft VS

Campbell 1H IP Rev-1

10.00"/100ft

Curve KOP: 0.00" Inc. 7307.00ft MD, 7307.00ft TVD, 0.00ft VS

End of Build: 42.48" Inc. 7731.75ft MD, 7693.89ft TVD, -3.48ft VS

Landing PL: 90.00" Inc. 8633.82ft MD, 8118.00ft TVD, 562.55ft VS

Campbell 1H LP Rev-3

10.00"/100ft

Curve KOP: 0.00" Inc. 7307.00ft MD, 7307.00ft TVD, 0.00ft VS

End of Build: 42.48" Inc. 7731.75ft MD, 7693.89ft TVD, -3.48ft VS

BHL: 8118.00ft TVD, 7313.12ft N, 6196.24ft W
 Campbell 1H BHL Rev-2

Turn: 8118.00ft TVD, 4037.18ft N, 3854.10ft W
 IP: 8118.00ft TVD, 3949.34ft N, 3768.17ft W
 Campbell 1H IP Rev-1

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BGM (1945.0 to 2017.0) Dip: 66.97° Field: 5291.6 m²
 Magnetic Declination: 10.00° (10ep/2015)
 Grid North is 0.44 degrees West of True North
 To correct azimuth from True to Grid add 0.44 degrees
 To correct azimuth from Magnetic to Grid subtract 6.57 degrees

End of Build: 7693.89ft TVD, 93.26ft S, 117.98ft W
 Curve KOP: 7307.00ft TVD, 0.00ft N, 0.00ft E
 Tie On: 16.00ft TVD, 0.00ft N, 0.00ft E

Landing PL: 8118.00ft TVD, 119.11ft N, 776.69ft W
 Campbell 1H LP Rev-3

Slot 01

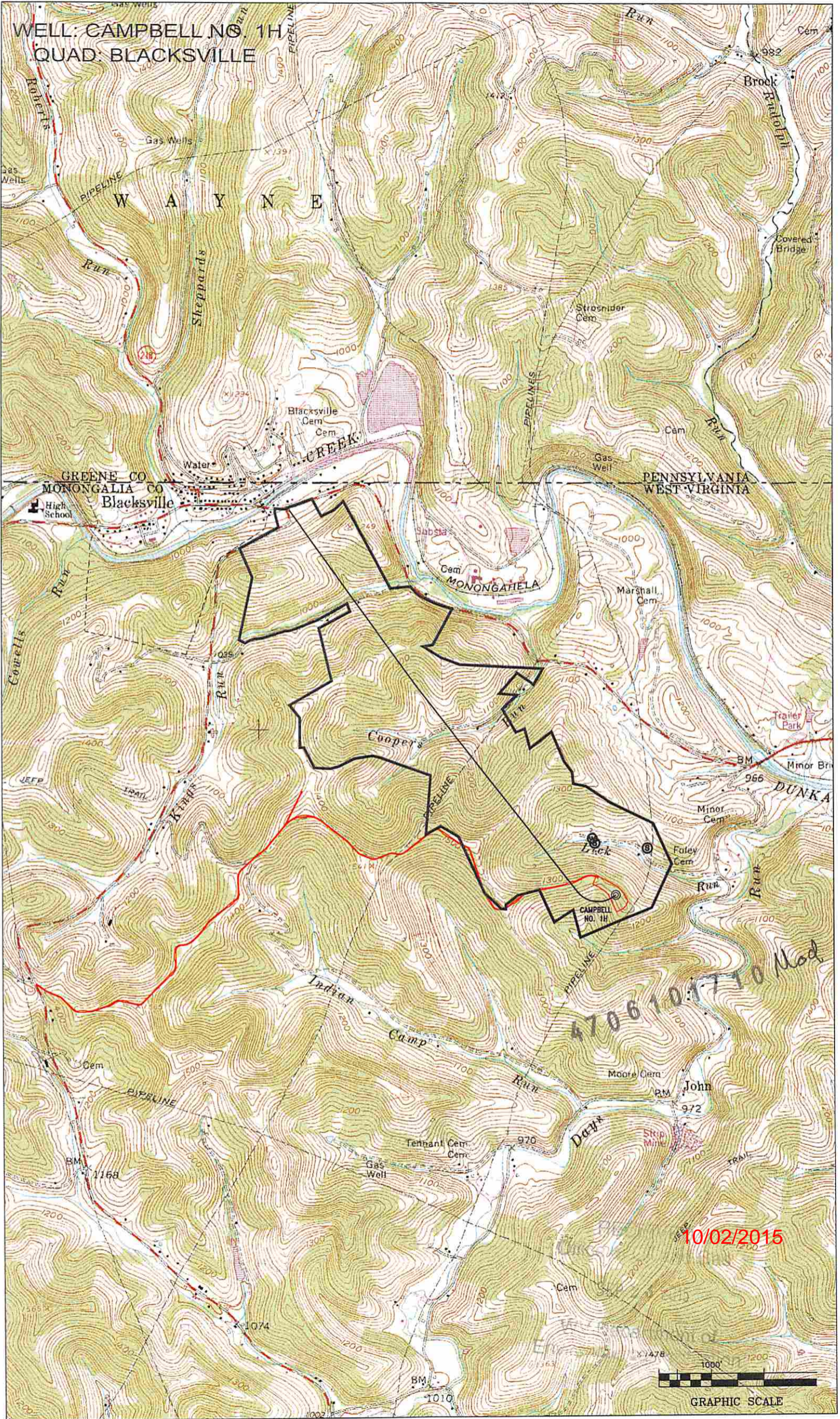
Scale 1 inch = 1500 ft

Vertical Section (ft)

0 750 1500 2250 3000 3750 4500 5250 6000 6750 7500 8250 9000 9750 10500 11250

Azimuth 323.00° with reference 0.00 N, 0.00 E

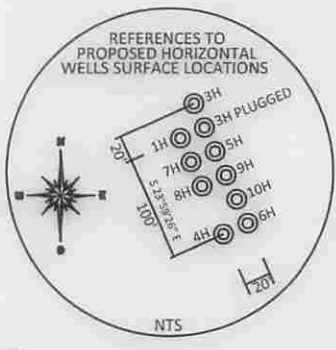
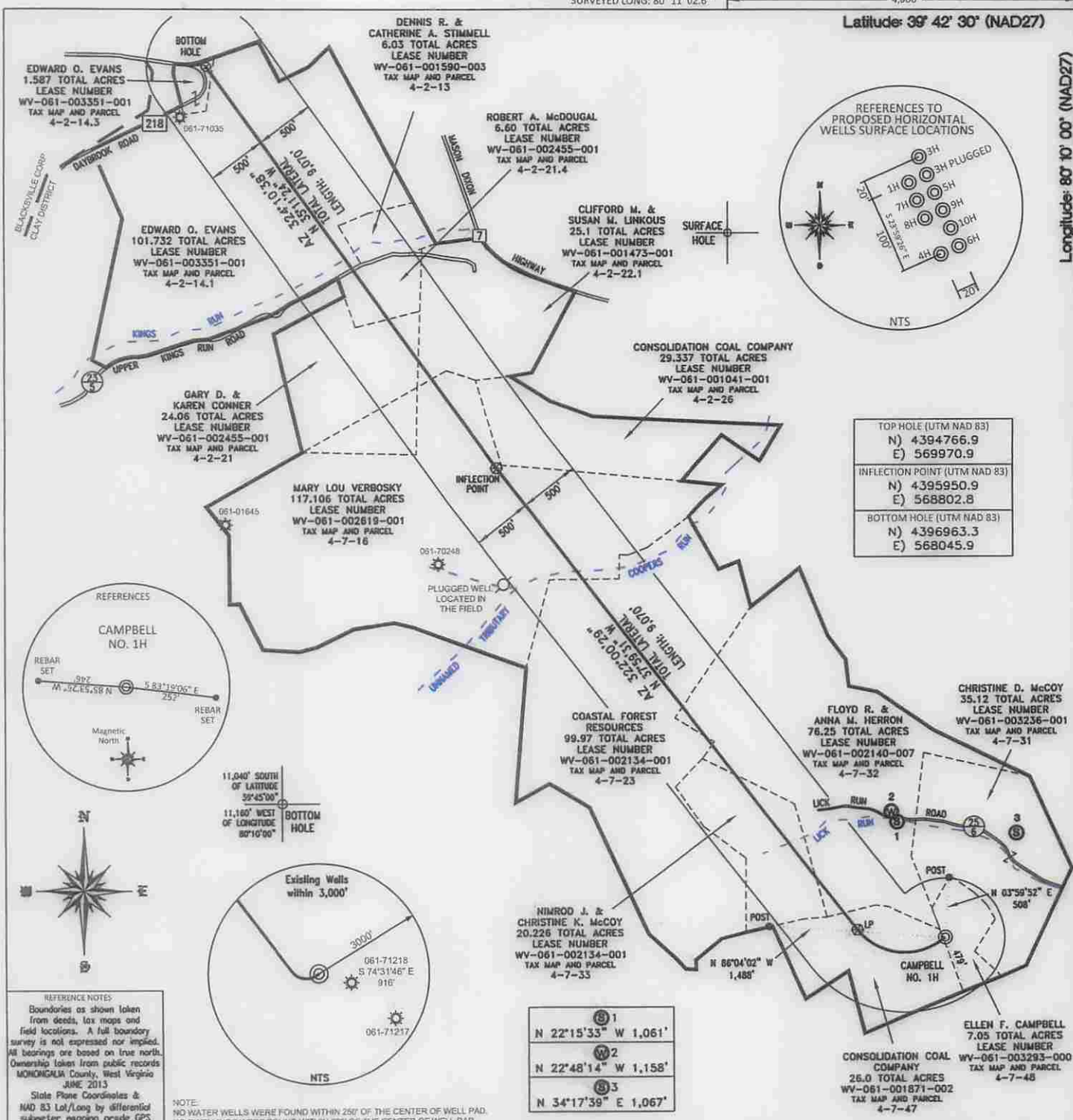
WELL: CAMPBELL NO. 1H
QUAD: BLACKSVILLE



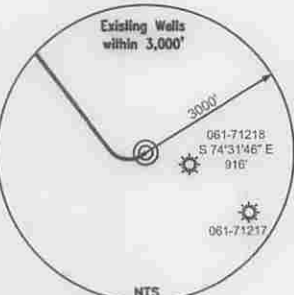
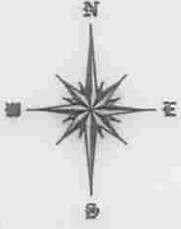
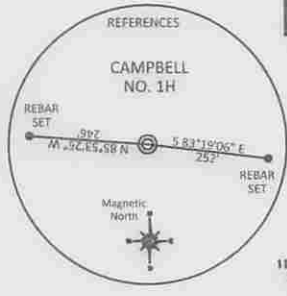
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10/02/2015





| |
|-------------------------------|
| TOP HOLE (UTM NAD 83) |
| N) 4394766.9 |
| E) 569970.9 |
| INFLECTION POINT (UTM NAD 83) |
| N) 4395950.9 |
| E) 568802.8 |
| BOTTOM HOLE (UTM NAD 83) |
| N) 4396963.3 |
| E) 568045.9 |



| | |
|---|----------------------|
| 1 | N 22°15'33" W 1,061' |
| 2 | N 22°48'14" W 1,158' |
| 3 | N 34°17'39" E 1,067' |

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 MONONGALIA County, West Virginia JUNE 2013
State Plane Coordinates & NAD 83 Lat/Long by differential submeter mapping grade GPS drafted by: EAM

NOTE:
NO WATER WELLS WERE FOUND WITHIN 250' OF THE CENTER OF WELL PAD.
NO DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF WELL PAD.

FILE #: NNE12
DRAWING #: 2322
SCALE: PLAT: 1" = 1200'
TICK: 1" = 2000'
MINIMUM DEGREE OF ACCURACY: 1/200
PROVEN SOURCE OF ELEVATION: SUBMETER MAPPING 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: [Signature]
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

DATE: SEPTEMBER 17, 2015
OPERATOR'S WELL #: CAMPBELL NO. 1H
API WELL #: 47 61 01710 H6A
STATE COUNTY PERMIT
MOD

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

WATERSHED: DUNKARD CREEK ELEVATION: 1,293.6'
COUNTY/DISTRICT: MONONGALIA / CLAY QUADRANGLE: BLACKSVILLE
SURFACE OWNER: ELLEN F. CAMPBELL ACREAGE: 7.05 +/-
OIL & GAS ROYALTY OWNER: ELLEN FOLEY CAMPBELL, ET AL ACREAGE: 576.168 +/-
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: 8,118' TMD: 17,642'
WELL OPERATOR: NORTHEAST NATURAL ENERGY LLC DESIGNATED AGENT: JOHN ADAMS
ADDRESS: 707 VIRGINIA STREET EAST, SUITE 1200 ADDRESS: 707 VIRGINIA STREET EAST, SUITE 1200
CITY: CHARLESTON STATE: WV ZIP CODE: 25301 CITY: CHARLESTON STATE: WV ZIP CODE: 25301