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

February 01, 2016

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

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

Modified Direction of 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,

Laura L. Adkins

for Gene Smith
Assistant Chief of Permitting
Office of Oil and Gas

WW-6B
(04/15)

API NO. 47- 61 - 01710
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 X Oil _____ Underground Storage _____
Other _____
(b)If Gas Shallow X Deep _____
Horizontal X

MJK 1/26/2016

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: 17,282'

11) Proposed Horizontal Leg Length: 8,550'

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 X No _____

(a) If Yes, provide Mine Info: Name: Adjacent Mine - Federal No. 2
Depth: 1,100'
Seam: Pittsburgh
Owner: Patriot Coal Corporation

API NO. 47- 61 - 01710 MOD
OPERATOR WELL NO. Campbell 1H
Well Pad Name: Campbell

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	40'	40'	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	17,282'	17,252'	4059 Cu. Ft.
Tubing	2-7/8"	New	N-80	6.5	NA	8,500'	NA
Liners							

MJK 1/26/2016

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							

PACKERS

Kind:				
Sizes:				
Depths Set:				

API NO. 47- 61 - 01710406
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 7,155' TVD/MD. The well will then be horizontally drilled on synthetic based mud from the KOP to approximately 8,118' TVD / 17,282' MD along a 326 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.

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

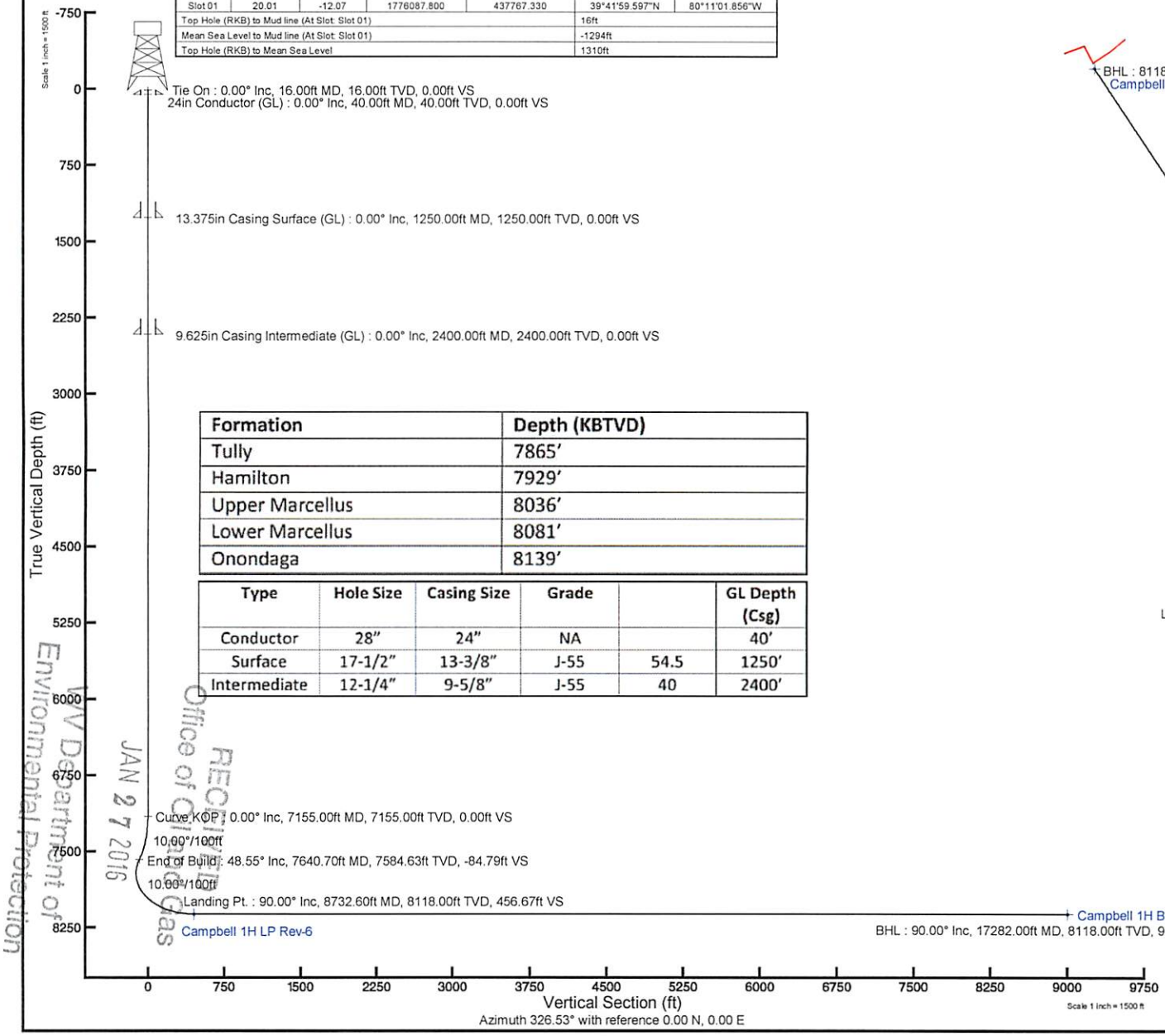
Location: Monongalia County, WV
Field: Monongalia
Facility: Campbell Pad

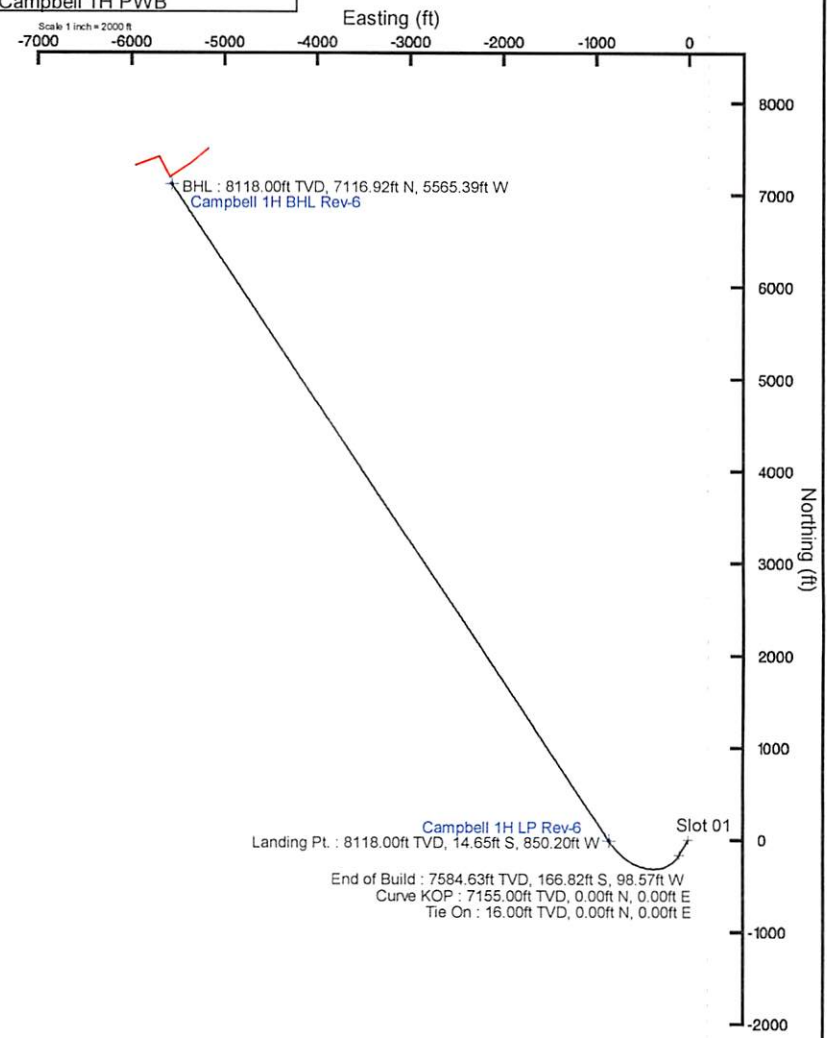
Slot: Slot 01
Well: Campbell 1H
Wellbore: Campbell 1H PWB

northeast NATURAL ENERGY

BAKER HUGHES

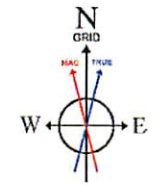
Location Information						
Facility Name			Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Campbell Pad			1776099.874	437747.321	39°41'59.400"N	80°11'01.700"W
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Slot 01	20.01	-12.07	1776087.800	437767.330	39°41'59.597"N	80°11'01.856"W
Top Hole (RKB) to Mud line (At Slot: Slot 01)					16ft	
Mean Sea Level to Mud line (At Slot: Slot 01)					-1294ft	
Top Hole (RKB) to Mean Sea Level					1310ft	





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

Type	Hole Size	Casing Size	Grade		GL Depth (Csg)
Conductor	28"	24"	NA		40'
Surface	17-1/2"	13-3/8"	J-55	54.5	1250'
Intermediate	12-1/4"	9-5/8"	J-55	40	2400'



BGGM (1945.0 to 2017.0) Dip: 66.94° Field: 52241.1 nT
Magnetic North is 9.02 degrees West of True North (at 15/Jan/2016)
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 8.58 degrees

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WV Department of Environmental Protection

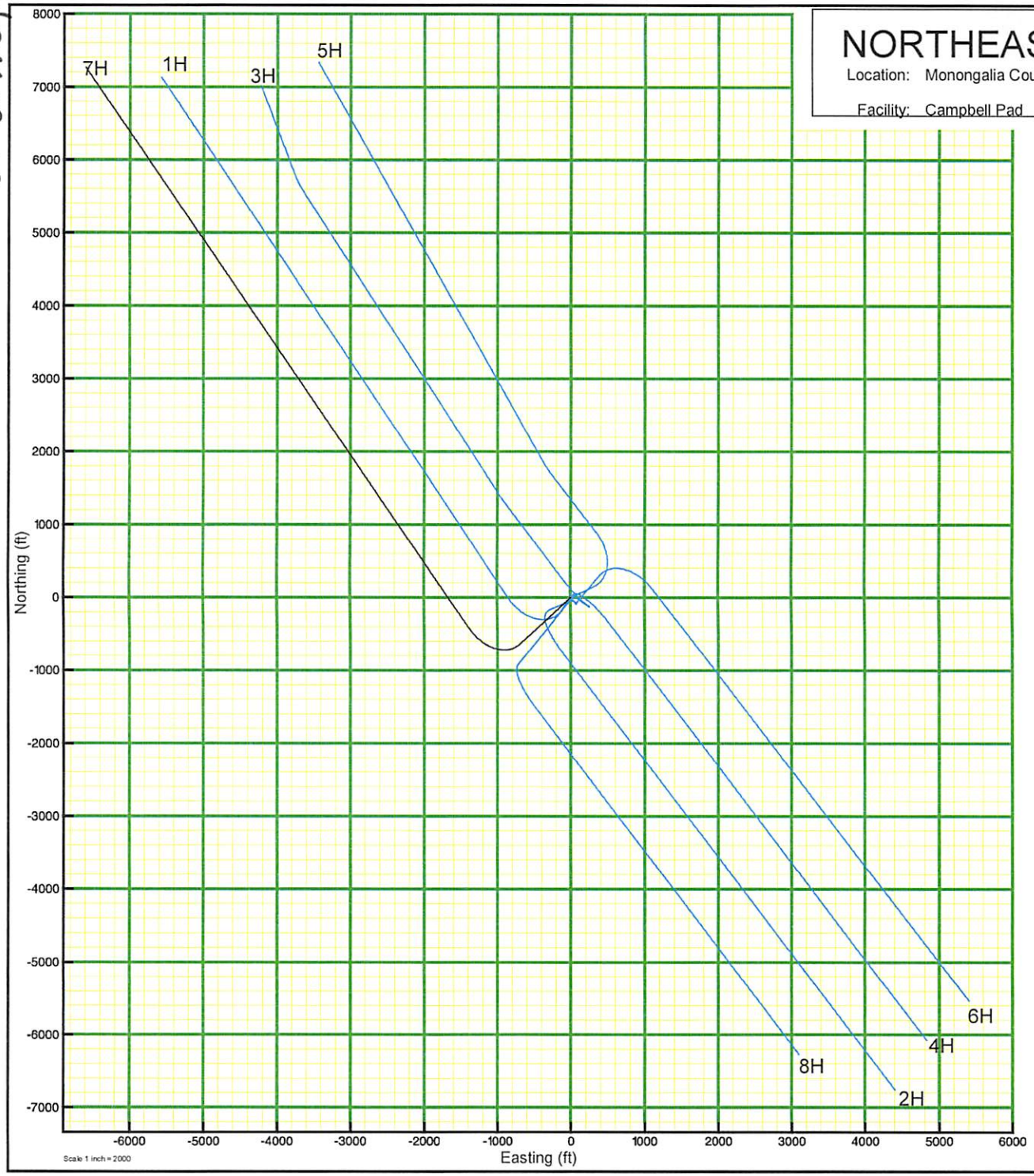
04/01/2016

61-01710 mon

NORTHEAST NATURAL ENERGY, LLC

Location: Monongalia County, WV

Facility: Campbell Pad



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WW-6A1
(5/13)

Operator's Well No. Campbell 1H

INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE
Chapter 22, Article 6A, Section 5(a)(5)
IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S)

Under the oath required to make the verification on page 1 of this Notice and Application, I depose and say that I am the person who signed the Notice and Application for the Applicant, and that –

(1) the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;

(2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
See Attachment	See Attachment	See Attachment	See Attachment	See Attachment

Acknowledgement of Possible Permitting/Approval
In Addition to the Office of Oil and Gas

The permit applicant for the proposed well work addressed in this application hereby acknowledges the possibility of the need for permits and/or approvals from local, state, or federal entities in addition to the DEP, Office of Oil and Gas, including but not limited to the following:

- WV Division of Water and Waste Management
- WV Division of Natural Resources WV Division of Highways
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- County Floodplain Coordinator

The applicant further acknowledges that any Office of Oil and Gas permit in no way overrides, replaces, or nullifies the need for other permits/approvals that may be necessary and further affirms that all needed permits/approvals should be acquired from the appropriate authority before the affected activity is initiated.

Well Operator: Northeast Natural Energy LLC
By: Holli Medley
Its: Regulatory Coordinator

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61-01710
MOD

WW-6A1

Operator's Well No. Campbell 1H

NNE Lease No.	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page	Tax Map & Parcel
WV-061-003293-000	CAMPBELL, ELLEN FOLEY	NORTHEAST NATURAL ENERGY LLC	SURFACE	1494/880	4-7-48
WV-061-001093-001	KING, SUSAN H.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1534/124	4-7-48
WV-061-003293-000	CAMPBELL, ELLEN FOLEY	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1494/880	4-7-48
WV-061-003293-002	LEWIS, BARRY W.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1520/90	4-7-48
WV-061-003293-003	STANTON, JOSEPH F.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1521/188	4-7-48
WV-061-003293-004	SNYDER, PRISCILLA JANE	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1520/684	4-7-48
WV-061-003293-005	MADDEN, JAMES D.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1520/682	4-7-48
WV-061-003293-006	JOHNSON, MARTHA N.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1523/451	4-7-48
WV-061-003293-007	STANTON, TIMOTHY P.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1521/740	4-7-48
WV-061-003293-008	TENNANT, RICHARD B. AND JUDITH	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1523/437	4-7-48
WV-061-003293-009	NEWSOME, MARTHA AND ROGER	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1521/602	4-7-48
WV-061-003293-010	BODENHAMER, CHARLOTTE	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1524/782	4-7-48
WV-061-003293-011	STANTON, JOHN M. AND ELIZABETH	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1523/409	4-7-48
WV-061-003293-012	STANTON, MATTHEW J. AND TERESA	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1523/407	4-7-48
WV-061-003293-013	ELERMAN, TERESA J. AND JOSEPH	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1523/500	4-7-48
WV-061-003293-014	MADDEN, MICHAEL W.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1523/254	4-7-48
WV-061-003293-015	GARDNER, DAVID	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1528/1	4-7-48
WV-061-003293-016	GRASSIE, MARGARET G.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1530/180	4-7-48
WV-061-003293-017	PUGH, ELIZABETH G.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1528/50	4-7-48
WV-061-003293-018	OPYOKE, JONI A. AND JOSEPH	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1529/578	4-7-48
WV-061-003293-019	HURST, JOHN C.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1529/568	4-7-48
WV-061-003293-020	GARDNER, BROWN L.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1532/88	4-7-48
WV-061-003293-021	HENKINS, ROBERT CURTIS	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1533/187	4-7-48
WV-061-003293-022	HENKINS, E. SCOTT	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1533/189	4-7-48
WV-061-003293-023	CASTAGNARI, RUTH ANN	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1538/569	4-7-48
WV-061-001871-002	LEMLEY, SUSAN AND WILLIAM	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1515/745	4-7-47
WV-061-002140-001	OLIVE CEMETERY OF PENTRESS	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1396/669	4-7-32
WV-061-002140-002	MONONGALIA HOME CORPORATION	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1397/616	4-7-32
WV-061-002140-003	UNITED OLIVE M.E. CHURCH OF PENTRESS	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1410/526	4-7-32
WV-061-002140-004	CONN, JOHN L.	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1419/595	4-7-32
WV-061-002140-005	AUSTIN, LINDA	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1419/591	4-7-32
WV-061-002140-006	HERRON, ANNA MARGARET	NORTHEAST NATURAL ENERGY LLC	.125 or greater	NA	4-7-32
WV-061-002140-007	HERRON, ANNA MARGARET	Northeast Natural Energy LLC	.125 or greater	1506/764	4-7-32
WV-061-002140-008	HERRON, DONALD R. AND JENNIFER	Northeast Natural Energy LLC	.125 or greater	1507/411	4-7-32
WV-061-002140-009	HERRON, JAMES F. AND DIANE	Northeast Natural Energy LLC	.125 or greater	1507/403	4-7-32
WV-061-002140-010	HERRON, CHARLES K.	Northeast Natural Energy LLC	.125 or greater	1507/242	4-7-32
WV-061-002140-011	HERRON, HENRY G.	Northeast Natural Energy LLC	.125 or greater	1509/264	4-7-32
WV-061-002134-001	TENNANT, RAYMER F.	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1396/663	4-7-33, P/O 23
WV-061-002134-002	OLIVE CEMETERY OF PENTRESS	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1396/666	4-7-33, P/O 23
WV-061-002134-003	MONONGALIA HOME CORPORATION	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1397/612	4-7-33, P/O 23
WV-061-002134-004	UNITED OLIVE M.E. CHURCH OF PENTRESS	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1410/527	4-7-33, P/O 23
WV-061-002134-005	RAMSEY, KATHY JO	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1410/551	4-7-33, P/O 23
WV-061-002134-006	WALKER, CHARLENE K.	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1410/548	4-7-33, P/O 23
WV-061-002134-007	CONN, JOHN L.	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1415/389	4-7-33, P/O 23

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WW-6A1 Operator's Well No. Campbell 1H

NNE Lease No.	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page	Tax Map & Parcel
WV-061-002134-008	AUSTIN, LINDA	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1415/392	4-7-33, P/O 23
WV-061-002134-009	TUTTLE, JAMES A.	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1417/298	4-7-33, P/O 23
WV-061-002134-010	TENNANT, WILLIAM R.	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1417/302	4-7-33, P/O 23
WV-061-002134-011	HAINES, ELLEN J.	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1417/381	4-7-33, P/O 23
WV-061-002134-012	CORDER, LEORA	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1421/369	4-7-33, P/O 23
WV-061-002134-013	TENNANT, FRANCIS MAHLON	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1418/107	4-7-33, P/O 23
WV-061-002134-014	BURKE, HAROLD E.	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1418/103	4-7-33, P/O 23
WV-061-002134-015	MCCULLOUGH, MARY R.	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1421/377	4-7-33, P/O 23
WV-061-002134-016	HOSKINS, FRANCES M.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1505/125	4-7-33, P/O 23
WV-061-003466-001	WILLIAMS, NORMA JANE AND FREDDIE	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1518/33	4-7-33, P/O 23
WV-061-000182-001	LEMLEY,MARY LOU	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1431/224	4-7-P/O 23
WV-061-000578-006	SLEETH,LUZETTA	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1439/627	4-7-P/O 23
WV-061-000578-007	AMMONS, VIRGINIA LEMLEY	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1437/822	4-7-P/O 23
WV-061-000578-009	PRATT, ROGER	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1439/625	4-7-P/O 23
WV-061-002489-001	CAMPBELL, FRANCIS M.	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1427/373	4-7-P/O 23
WV-061-002489-002	COX, DELORES E.	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1427/377	4-7-P/O 23
WV-061-002489-003	PHILLIPS, BETTY RUTH	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1430/324	4-7-P/O 23
WV-061-002489-004	MORRIS, ELMA JEAN	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1430/310	4-7-P/O 23
WV-061-002489-005	FAUST, SHARON	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1430/349	4-7-P/O 23
WV-061-002489-006	GRECO, DENISE	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1431/428	4-7-P/O 23
WV-061-002489-007	MORRIS, BARBARA H.	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1436/454	4-7-P/O 23
WV-061-002489-008	HINCHEY, MARY LEE	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1438/635	4-7-P/O 23
WV-061-002489-009	CREAMER, STEVEN ROSS	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1438/639	4-7-P/O 23
WV-061-002489-010	MOORE, LLOYD HOWARD AND RUTH R.	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1445/054	4-7-P/O 23
WV-061-002489-011	STROSNIDER, JAMES MICHAEL	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1441/850	4-7-P/O 23
WV-061-002489-012	FETTY, JENNA	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1441/845	4-7-P/O 23
WV-061-002489-013	CREAMER, KARL WILLIAM AND DARLENE E.	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1442/569	4-7-P/O 23
WV-061-002489-014	BENNETT, PATRICIA	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1454/857	4-7-P/O 23
WV-061-002489-015	DUNN, MAX G.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1512/564	4-7-P/O 23
WV-061-002489-016	DUNN, WAYNE H. AND JO ANN	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1513/826	4-7-P/O 23
WV-061-002489-017	BARGER, DAWN AND ALAN	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1517/411	4-7-P/O 23
WV-061-002489-018	LEMLEY, MARY LOU	NORTHEAST NATURAL ENERGY LLC	DEED	1516/844	4-7-P/O 23
WV-061-002489-019	BAPTIST HOMES SOCIETY	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1534/112	4-7-P/O 23
WV-061-002489-020	SHARON STEWART FAUST	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1532/722	4-7-P/O 23
WV-061-003286-001	TRUSTEES OF UNITED OLIVE M.E. CHURCH OR PENTRE	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1492/567	4-7-P/O 23
WV-061-003286-002	TRUSTEES OF THE OLIVE CEMETERY AT PENTRESS	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1492/830	4-7-P/O 23
WV-061-002619-001	TENNANT, BILLIE JEAN	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1441/293	4-7-16
WV-061-002619-002	DAWSON, MARY SPRAGG	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1441/289	4-7-16
WV-061-002619-003	MATHENY, BECKY SUE	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1442/62	4-7-16
WV-061-002619-004	LEMLEY, LUANNE	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1442/589	4-7-16
WV-061-002619-005	MASON, LUE	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1442/593	4-7-16
WV-061-002589-001	WACO OIL & GAS CO INC	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1442/593	4-7-16
WV-061-002621-001	THE SPRAGG TRUST	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1441/411	4-7-16
WV-061-001137-001	WILLARD, MARJORIE SIMPSON	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1360/274	4-7-16
WV-061-001473-001	THOMAS, JAMES HENRY	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1379/323	4-2-22.1
WV-061-001473-002	THOMAS, CHARLES L.	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1379/311	4-2-22.1
WV-061-002455-001	COPELAND, RAYMOND E.	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1418/111	4-2-21.4
WV-061-002455-002	COPELAND, JIMMIE	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1420/853	4-2-21.4
WV-061-002455-004	COPELAND, DANIEL M.	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1422/493	4-2-21.4
WV-061-002455-005	COPELAND, ROBERT LYLE	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1422/499	4-2-21.4
WV-061-002455-006	SIMPSON, RUBY JANE	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1422/511	4-2-21.4
WV-061-002455-007	COPELAND, AMY LYNN	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1431/258	4-2-21.4
WV-061-002455-008	COPELAND, III, JOHN MAX	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1431/819	4-2-21.4
WV-061-002455-009	STOKES, JACQUELINE MAXINE	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1435/218	4-2-21.4

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Operator's Well No. Campbell 1H

NNE Lease No.	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page	Tax Map & Parcel
WV-061-002455-010	SINCLAIR, JOAN L.	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1439/200	4-2-21.4
WV-061-002455-011	BENNETT,JR. CHARLES E.	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1439/196	4-2-21.4
WV-061-002455-012	HAYHURST, DEBORAH S.	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1440/626	4-2-21.4
WV-061-002455-013	THE CHARLES LEE THOMAS TRUST	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1510/015	4-2-21.4
WV-061-002455-015	HIGGINS, JOHN W.	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1388/19	4-2-21.4
WV-061-002455-016	OGAWA, MARY L.	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1391/402	4-2-21.4
WV-061-002455-017	THOMPSON, SARAH E.	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1388/22	4-2-21.4
WV-061-002455-019	HIGGINS, PAULA E.	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1395/99	4-2-21.4
WV-061-003472-001	TENNANT, JAMES STUART	NORTHEAST NATURAL ENERGY LLC	DEED	1516/568	4-2-21.4
WV-061-003472-002	HIGGINS, ARTHUR R.	NORTHEAST NATURAL ENERGY LLC	DEED	1516/532	4-2-21.4
WV-061-001590-003	THOMAS, JAMES HENRY	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1385/328	4-2-13
WV-061-001590-004	BAKEWELL, FRANCES P.	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1391/335	4-2-13
WV-061-001590-005	LEESON, LENNA LOU	*CHESAPEAKE APPALACHIA LLC	.125 or greater	1396/561	4-2-13
WV-061-001590-006	THE CHARLES LEE THOMAS TRUST	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1498/629	4-2-13
WV-061-001590-007	GASTON, WILLIAM H. AND DIANE MARKET	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1514/126	4-2-13
WV-061-001590-008	BOBBY, MATTHEW P.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1518/19	4-2-13
WV-061-001590-009	BOBBY, CHRISTOPHER	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1517/845	4-2-13
WV-061-001590-010	MIZER, EMILY MARGARET	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1520/688	4-2-13
WV-061-001590-011	MIZER, CHARLES JEROME	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1521/604	4-2-13
WV-061-001590-012	MIZER, LAURA	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1525/254	4-2-13
WV-061-001590-013	MIZER, LAURA AND BOBBY	NORTHEAST NATURAL ENERGY LLC	.125 or greater	15285/143	4-2-13
WV-061-001590-015	MCCLIMANS, PHYLLIS K. AND DONALD C.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1538/151	4-2-13
WV-061-003351-001	EVANS, EDWARD O.	*NOVUS EXPLORATION LLC	.125 or greater	1501/435	4-2-14.1
WV-061-001040-001	MOHAMMADI, AMIR H.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1483/497	4-2-p/o 25
WV-061-001040-002	AFSHARI, ALIAKBAR	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1483/833	4-2-p/o 25
WV-061-000180-000	MOORE, REBECCA S., ET AL	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1428/594	4-7-25
WV-061-000179-001	HEIMSATH, CHRISTINE	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1428/872	4-7-26
WV-061-000179-002	PUGH, MARGARET G. AND EDZEL R.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1438/568	4-7-26
WV-061-000179-003	SPENCER, WILLIAM A. AND KAREN J.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1438/564	4-7-26
WV-061-000179-004	JOHNSTON, MONTGOMERY JOE	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1441/638	4-7-26
WV-061-000179-005	HEADLEY, DWIGHT L.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1441/634	4-7-26
WV-061-000179-006	KINSEY, WILLIS D.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1441/630	4-7-26
WV-061-000179-007	HEADLEY, CHARLES L.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1441/601	4-7-26
WV-061-000179-008	JOHNSTON, DONALD RAY	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1441/643	4-7-26
WV-061-000179-009	FOLTZ, CYNTHIA J. AND GREGORY JAY	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1441/626	4-7-26
WV-061-000179-010	JOHNSTON, CHARLES L. AND BARBARA M.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1441/622	4-7-26
WV-061-000179-011	BENNER, BARBARA H.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1441/618	4-7-26
WV-061-000179-012	COEN, EARL L. AND JO ANN	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1441/614	4-7-26
WV-061-000179-013	TROTTER, GEORGE PHILLIPS	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1441/605	4-7-26
WV-061-000179-014	CLOVIS, JAMES ROBERT JR.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1441/609	4-7-26
WV-061-000179-015	MATTHEWS, ANNA MAE AND ROBERT J.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1444/48	4-7-26
WV-061-000179-016	COEN, FLORENCE E.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1444/52	4-7-26
WV-061-000179-017	LEMLEY, RAYMOND A. AND KAREN A.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1444/44	4-7-26
WV-061-000179-018	SEAMAN, EDGAR D.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1444/36	4-7-26
WV-061-000179-019	VARNER, WILLA JANE	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1444/56	4-7-26
WV-061-000179-020	GLENN, MARY ANN TROTTER	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1444/27	4-7-26
WV-061-000179-021	LEMLEY, SOLOMON E.	NORTHEAST NATURAL ENERGY LLC	DEED	1447/366	4-7-26
WV-061-000179-022	LEMLEY, BETTY J.	NORTHEAST NATURAL ENERGY LLC	DEED	1447/381	4-7-26
WV-061-000179-023	LEMLEY, CHARLES O. AND BONNIE L.	NORTHEAST NATURAL ENERGY LLC	DEED	1447/371	4-7-26
WV-061-000179-024	LEMLEY, JOSEPHINE	NORTHEAST NATURAL ENERGY LLC	DEED	1447/376	4-7-26
WV-061-000179-025	ANDERSON, NANCY ELIZABETH TROTTER	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1441/236	4-7-26
WV-061-000179-026	HARKER, DARRELL EUGENE	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1442/618	4-7-26
WV-061-000179-027	SEAMAN, FRANCES EFAMY	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1442/616	4-7-26
WV-061-000179-028	LEMLEY, ROMELLE S.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1445/797	4-7-26
WV-061-000179-029	KENNEDY, JOHN THADDEUS, ET AL	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1447/822	4-7-26
WV-061-000179-030	JOHNSTON, BERNICE L.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1444/40	4-7-26
WV-061-000179-031	MOORE, SHIRLEY WHITLATCH	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1445/799	4-7-26
WV-061-000179-032	MEANS, MARY JANE	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1446/353	4-7-26
WV-061-000179-033	ELLIOTT, ROBERT	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1446/351	4-7-26
WV-061-000179-034	WHYTE, PATRICIA B.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1446/355	4-7-26
WV-061-000179-035	WHITE, DAVID	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1447/843	4-7-26
WV-061-000179-036	SCHRUM, CHRISTI	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1447/8[illegible]	4-7-26

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NNE Lease No.	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page	Tax Map & Parcel
WV-061-000179-037	KENNETH COPELAND EVANGELICAL ASSOC.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1448/216	4-7-26
WV-061-000179-038	GABBERT, ANNA JEAN	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1447/841	4-7-26
WV-061-000179-039	BESS, CLAYTON P.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1450/6	4-7-26
WV-061-000179-040	HEADLEY, BETTY JEAN	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1454/421	4-7-26
WV-061-000179-041	HOWARD, PATRICIA	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1456/43	4-7-26
WV-061-000179-042	RICHARDSON, BETTY J.	NORTHEAST NATURAL ENERGY LLC	.125 or greater	1483/817	4-7-26

*See Attachment

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Chesapeake Appalachia, LLC.

Northeast Natural Energy
Assignment
BK 120/769

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Novus Exploration, LLC.

Chesapeake Appalachia, LLC.
Assignment
BK 114/749

Northeast Natural Energy
Assignment
BK 120/769

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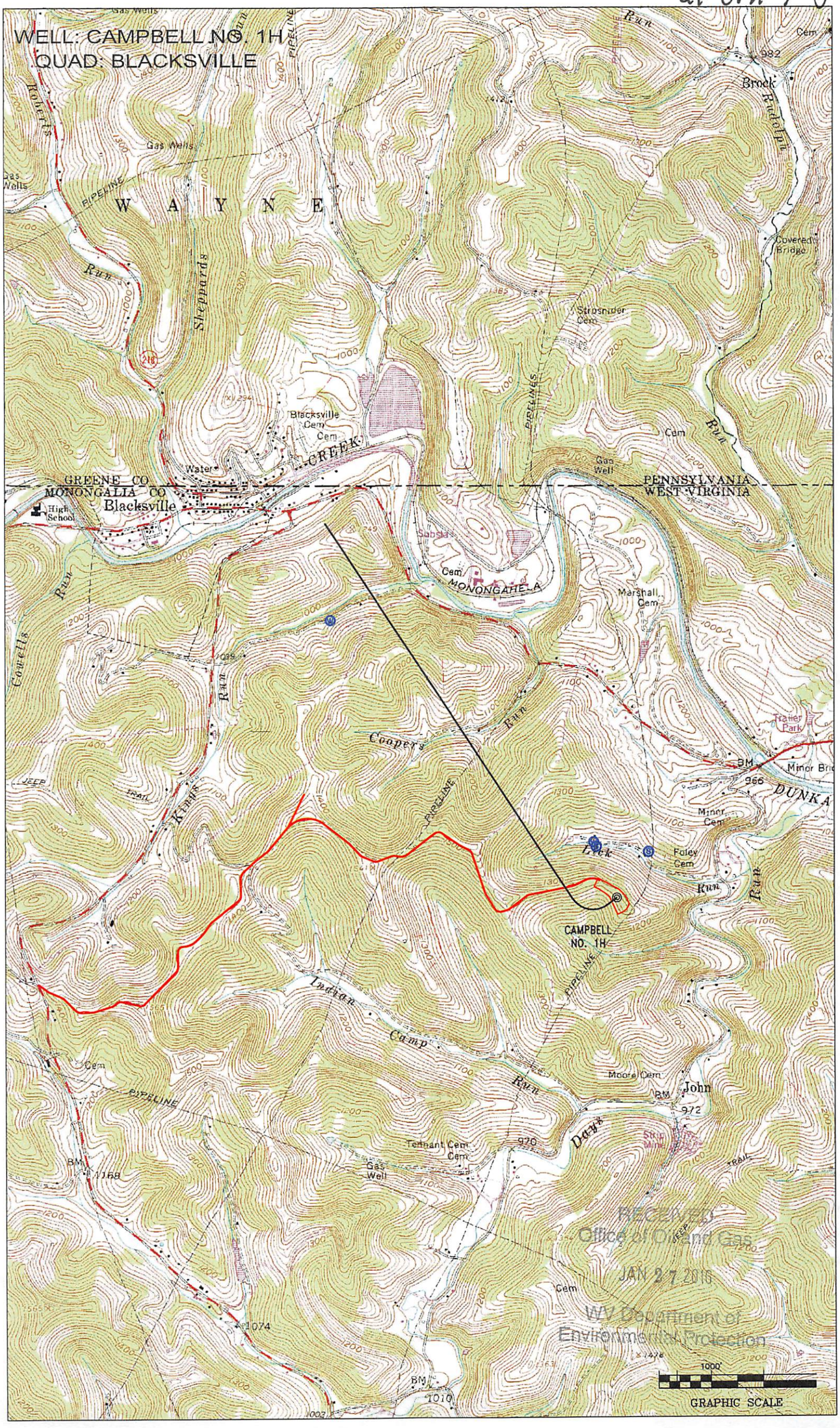

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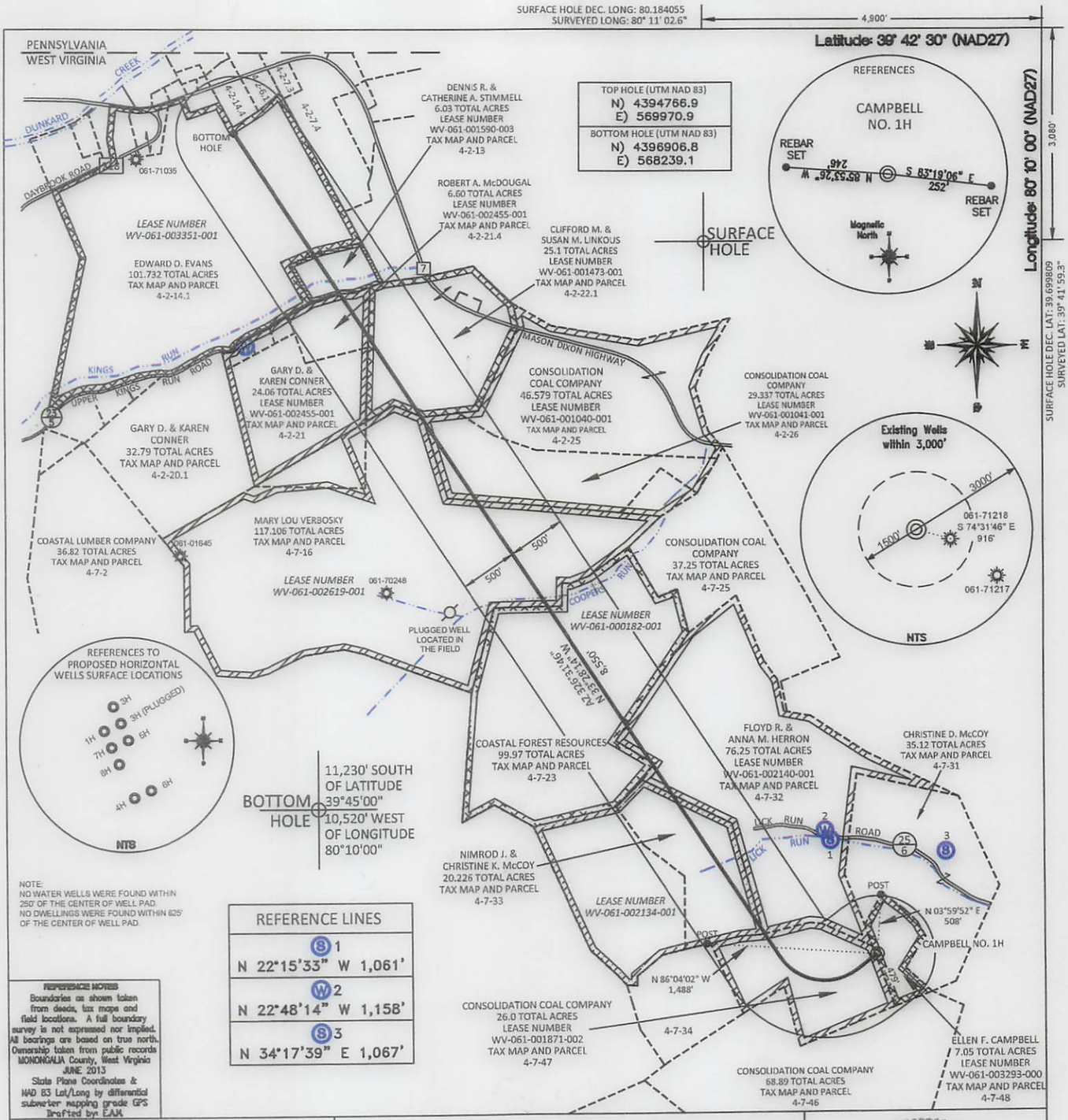

FILE #: NNE12

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: _____

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

ERNEST J. BENCHEK III
LICENSED
No. 2124
STATE OF WEST VIRGINIA
PROFESSIONAL SURVEYOR

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

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

DATE: JANUARY 22, 2016

OPERATOR'S WELL #: CAMPBELL NO. 1H

API WELL #: 47 (STATE) 61 (COUNTY) 01710 MOD (PERMIT) H6A

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: 535.018 +/-

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: 17,282'

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

61-01710

northeast
NATURAL ENERGY

January 26, 2016

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

Re: Campbell 1H and 7H Permit Modifications
API # 061-01710, 061-01711

Dear Permit Reviewer,

Northeast Natural Energy LLC ("NNE") would like to request modifications to its existing Campbell 1H and 7H Permits (061-01710, 061-01711). NNE has adjusted the horizontal well bores to allow for more efficient development of the permitted Campbell Well Pad.

Please find enclosed with this request revised WW-6B Forms, WW-6A1 Forms and Attachments, Well Bore Schematics, Mylar Plats and SSP Overview Maps for all four 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

Hollie M. Medley
Regulatory Coordinator

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WW-6B
(04/15)

API NO. 47-4706101710
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 (Operator ID) | Monongalia (County) | Clay (District) | Blacksville (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 X Oil ____ Underground Storage ____
Other ____
(b)If Gas Shallow X Deep ____
Horizontal X

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: 17,282'

11) Proposed Horizontal Leg Length: 8,550'

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 X No ____

(a) If Yes, provide Mine Info: Name: Adjacent Mine - Federal No. 2
Depth: 1,100'
Seam: Pittsburgh
Owner: Patriot Coal Corporation

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WW-6B
(04/15)

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

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	40'	40'	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	17,282'	17,252'	4059 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							

PACKERS

Kind:				
Sizes:				
Depths Set:				

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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 7,155' TVD/MD. The well will then be horizontally drilled on synthetic based mud from the KOP to approximately 8,118' TVD / 17,282' MD along a 326 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.

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.

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*Note: Attach additional sheets as needed.