west virginia department of environmental protection

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

Harold D. Ward, Cabinet Secretary
www.dep.wv.gov

Monday, April 26, 2021
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

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

Re: Permit Modification Approval for ERP 4H
47-061-01867-00-00

Extend Conductor to 100' for pilot hole revision.

NORTHEAST NATURAL ENERGY LLC

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.

If there are any questions, please feel free to contact me at (304) 926- 0450.

James A. Martin
Chief

Operator's Well Number: ERP 4H
Farm Name: PHOENIX ENERGY RESOURCES, LLC
U.S. WELL NUMBER: 47-061-01867-00-00
Horizontal 6A New Drill
Date Modification Issued: 04/26/2021

Promoting a healthy environment.

04/30/2021

WW-6B
(04/15)

API NO. 47- 061 - 01867
OPERATOR WELL NO. 4H
Well Pad Name: ERP

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

1) Well Operator:	Northeast Natural Energy	494498281	Monongalia	Battelle	Wadestown
		Operator ID	County	District	Quadrangle

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

3) Farm Name/Surface Owner: Phoenix Energy Resources LLC Public Road Access: Route 17/Miracle Run Rd

4) Elevation, current ground: 1,350' Elevation, proposed post-construction: 1,338'

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

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus, 8,113', 99', 5200 psi

8) Proposed Total Vertical Depth: Pilot: 8,233' Horizontal: 8,113'

9) Formation at Total Vertical Depth: Pilot: Oriskany Horizontal: Marcellus

10) Proposed Total Measured Depth: 21,638'

11) Proposed Horizontal Leg Length: 12,952' ✓

12) Approximate Fresh Water Strata Depths: 50', 1,242'

13) Method to Determine Fresh Water Depths: Drillers Log from Offset Wells

14) Approximate Saltwater Depths: 2,050', 2,500'

15) Approximate Coal Seam Depths: 500', 1,240'

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 X active/non-producing No _____

(a) If Yes, provide Mine Info: Name: Federal #2
Depth: 1,230'
Seam: Pittsburgh
Owner: Phoenix Federal No 2 Mining, LLC

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API NO. 47- 061 - 01867
OPERATOR WELL NO. 4H
Well Pad Name: ERP

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	NA	100'	100'	113/GTS
Fresh Water	13-3/8	New	J-55	54.5	1,340'	1,310	1037/CTS
Coal							
Intermediate	9-5/8	New	J-55	36	2,630'	2,600'	900/CTS
Production	5-1/2	New	P-110	20	21,638'	21,608'	3,330
Tubing	2-7/8	New	P-110	6.5	NA	8000	NA
Liners							

Bryan Harris 4/20/21

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	28	0.375	NA	NA	Type 1	1.18
Fresh Water	13-3/8	17-1/2	0.380	2730	500	Class A	1.19
Coal							
Intermediate	9-5/8	12-3/8	0.395	3520	2800	Class A	1.19
Production	5-1/2	8-3/4	0.361	14,360	11,400	50:50 POZ	1.07
Tubing	2-7/5	NA	0.217	13,870	NA	NA	NA
Liners							

PACKERS

Kind:			RECEIVED Office of Oil and Gas
Sizes:			APR 21 2021
Depths Set:			WV Department of Environmental Protection

04/30/2021

API NO. 47- 061 - 01867
OPERATOR WELL NO. 4H
Well Pad Name: ERP

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

Utilize auger rig to set cellar & conductor. The conductor will be grouted with cement to surface.
Mobilize top hole drilling rig. Drill surface section on air. Run surface (freshwater & coal string) casing to desired depth. The surface section will not penetrate sea level. Surface casing will be cemented to surface. Drill intermediate section on air. Run intermediate casing to desired depth. Intermediate casing will be cemented to surface. After 5,100' the a pilot hole will continue to be drilled vertically to an approximate depth of 8,233' TVD. After geologic evaluation, wellbore will be plugged back with cement to approximately 5,100'. Drill on air the production section to the start of the curve (KOP). The well will be loaded with synthetic oil base drilling mud (SOBM). Demobilize top hole rig.
Mobilize horizontal drilling rig. Finish drilling the production section utilizing MWD surveys and geosteering practices to maintain the wellbore in the Marcellus shale and prevent anti-collision. Production casing will be ran to TD and cement top will be inside the intermediate casing.

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

A cement bond log will determine the top of production casing cement.
The production casing will be pressure tested. The hydraulic fracturing equipment will then open the toe sleeves and begin pumping the first stage. The plug-and-perf method will be used for the remaining stages. The max anticipated pressure during frac is 11,200psi and a max rate of 90bpm. After frac, the drillout rig will drill all plugs out of the well. Land production tubing at desired depth. Then flowback well until ready to turn in line to production facilities.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 51.23

22) Area to be disturbed for well pad only, less access road (acres): 29.70

23) Describe centralizer placement for each casing string:

Surface: shoe track & every 3rd joint to surface
Intermediate: shoe track & every 3rd joint to surface
Production: Rigid bow centralizers at shoe track & every other joint in the lateral to KOP. Bow springs from KOP to surface every third joint.

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

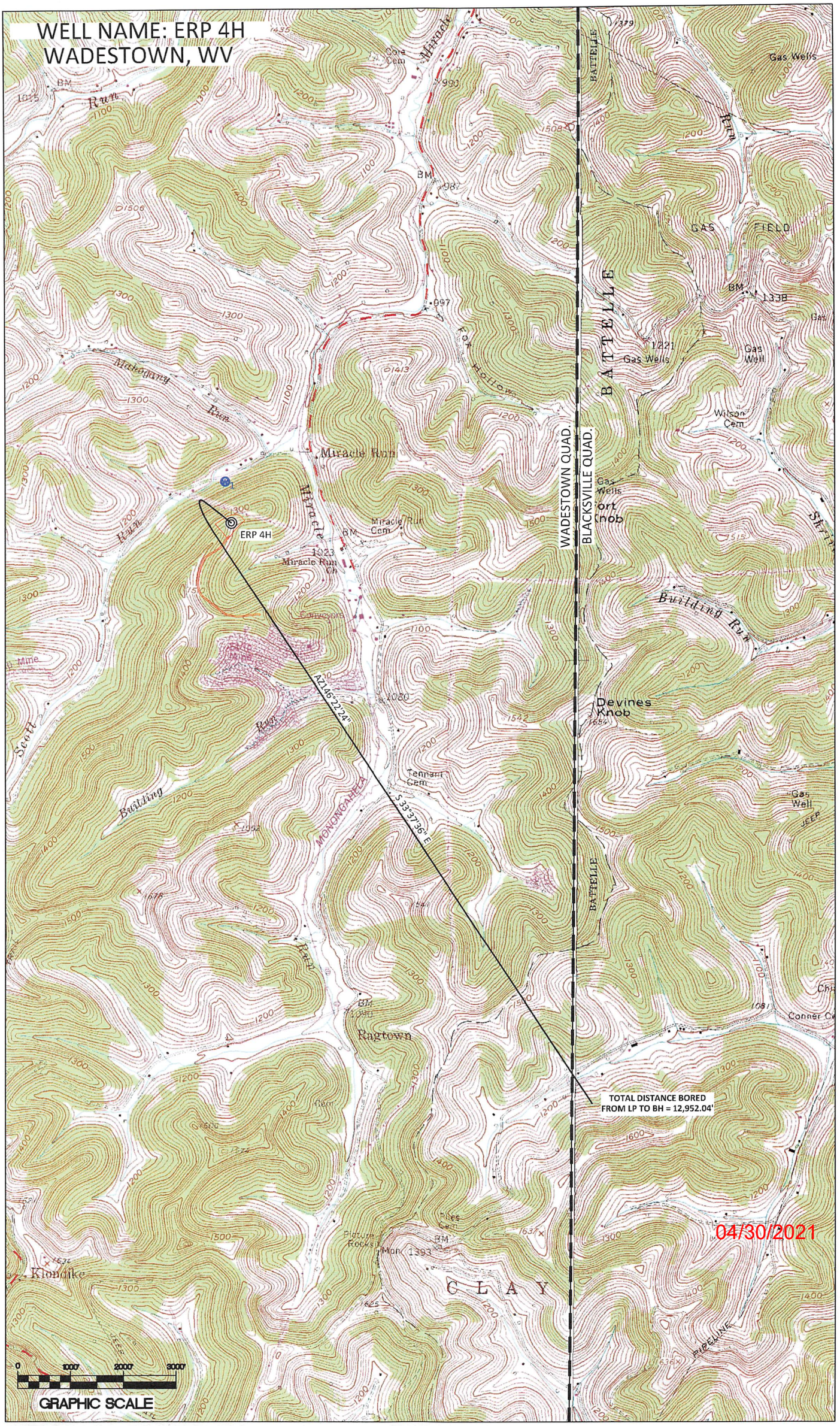
Surface string cement will be a Type 1 + Max 3% bwoc Calcium Chloride Fresh Water blend.
Intermediate string cement will be a Type 1 Cement + Max 3% bwoc Calcium Chloride + Fresh Water.
Production string cement will be (50:50) Poz (Fly Ash):Type I Cement with a gas migration additive.

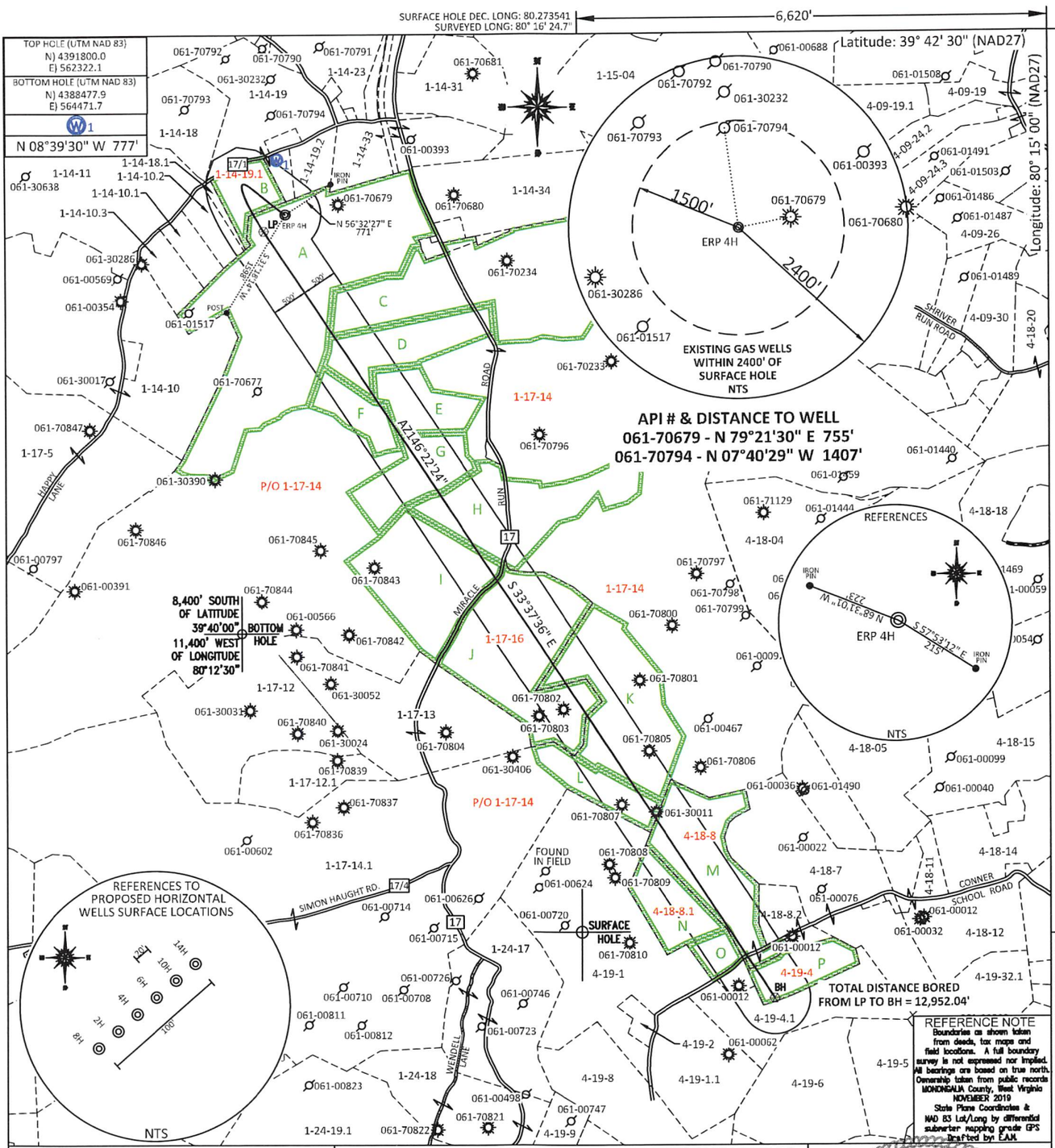
25) Proposed borehole conditioning procedures:

Surface & intermediate on air will utilize high volumetric flow rates of air to ensure the wellbore is clean prior to TOH.
Production section will utilize synthetic oil based drilling mud to properly clean the wellbore. At TD, pump rate and rotation will be maximized and tripping will not begin until shakers flow clean.
Production casing will be circulated prior to cementing to ensure a prepared wellbore for cement.

*Note: Attach additional sheets as needed.

04/30/2021


WELL NAME: ERP 4H
WADESTOWN, WV
ERP 4H
AZ 146° 22' 24"
S 33° 37' 36" E
TOTAL DISTANCE BORED
FROM LP TO BH = 12,952.04'
WADESTOWN QUAD.
BLACKSVILLE QUAD.
BATTELLE
CLAY
Miracle Run
Middegang Run
Fox Hollow
Building Run
Devines Knob
Ragtown
Klondike
Miracle Run Cem
Tennant Cem
Wilson Cem
Gas Wells
Gas Well
GAS FIELD
Conveyors
Mine
PIPELINE
0 1000 2000 3000
GRAPHIC SCALE
04/30/2021



FILE #: NNE20

DRAWING #: 2988

SCALE: PLAT: 1" = 2000' 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: APRIL 15, 2021

OPERATOR'S WELL #: ERP 4H

API WELL #: 47 (STATE) 61 (COUNTY) 01867 MOD (PERMIT)

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

CURRENT ELEVATION: 1,350'

PROPOSED ELEVATION: 1,338.60'

WATERSHED: DUNKARD CREEK

COUNTY/DISTRICT: MONONGALIA / BATTELLE

QUADRANGLE: WADESTOWN

SURFACE OWNER: Phoenix Energy Resources, LLC

ACREAGE: 1,510.488 +/-

OIL & GAS ROYALTY OWNER: Phoenix Energy Resources, LLC, et al.

ACREAGE: 785.782 +/-

04/30/2021

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: 8,113' PILOT HOLE TVD: 8,233' TMD: 21,638 +/-

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

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	PROPERTY OWNER INDEX
1-14-19.1	PHOENIX ENERGY RESOURCES, LLC
1-17-14	PHOENIX ENERGY RESOURCES, LLC
1-17-16	PHOENIX ENERGY RESOURCES, LLC
4-18-8	DALE LYNN MOORE
4-18-8.1	PATRICIA ANN & BERNARD COTTON
4-19-4	KEMBLE D. JR. & VERONICA TATE

	LEASE INDEX		
A	WV-061-005667-001	I	WV-061-004351-005
B	WV-061-005667-001	J	WV-061-004514-001
C	WV-061-003767-004	K	WV-061-003767-004
D	WV-061-003767-004	L	WV-061-005667-001
E	WV-061-005168-004	M	WV-061-005135-002
F	WV-061-005474-001	N	WV-061-005285-004
G	WV-061-005168-004	O	WV-061-005643-008
H	WV-061-004975-003	P	WV-061-004719-007

04/30/2021

FILE #: NEE20

DRAWING #: 2988

SCALE: N/A

DATE: APRIL 15, 2021

OPERATOR'S WELL #: ERP 4H

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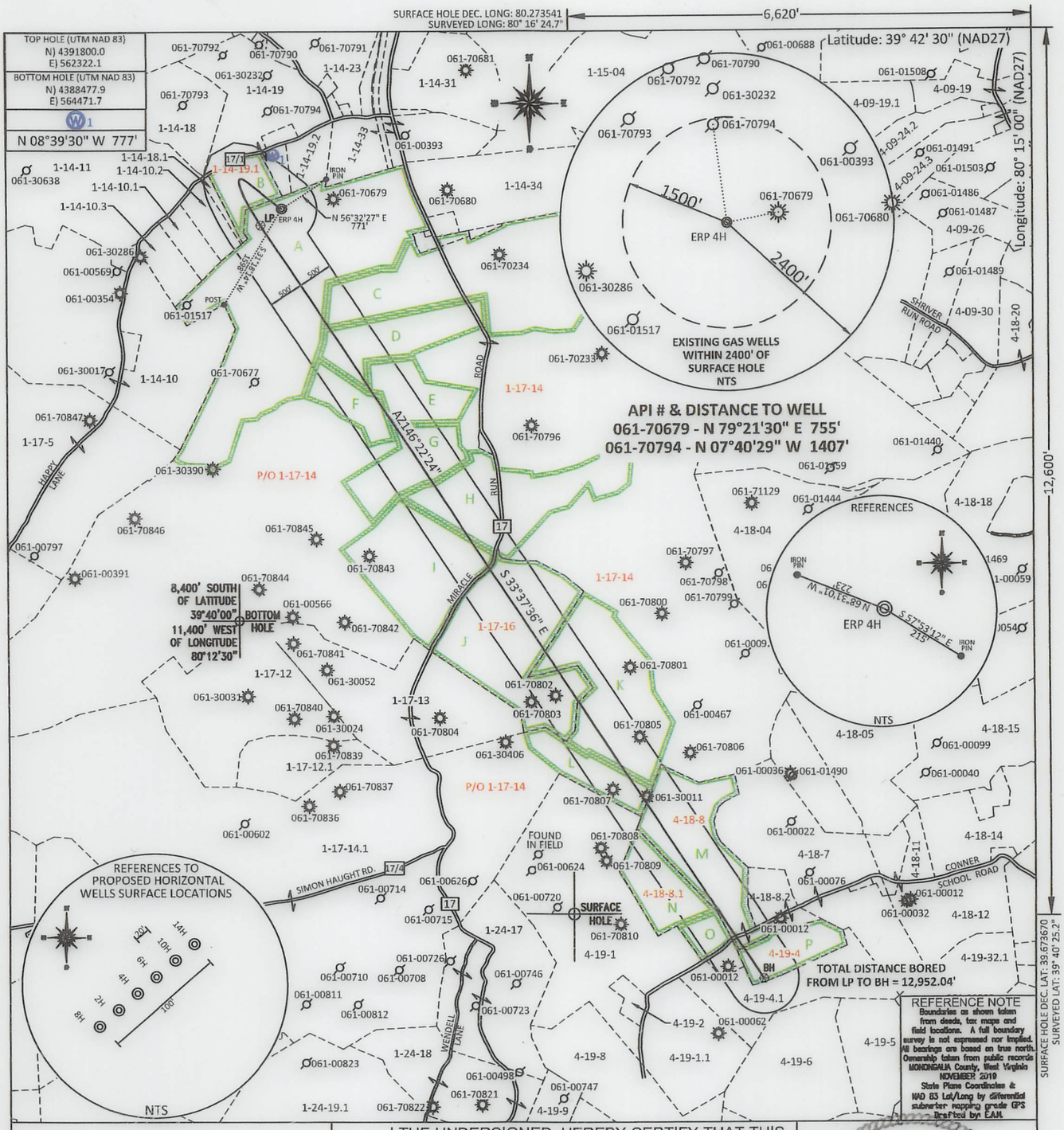

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601 57TH STREET
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ACREAGE: 1,510.488 +/-

OIL & GAS ROYALTY OWNER: Phoenix Energy Resources, LLC, et al.

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04/30/2021

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: 8,113' PILOT HOLE TVD: 8,233' TMD: 21,638 +/-

WELL OPERATOR: NORTHEAST NATURAL ENERGY LLC

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E	WV-061-005168-004	M	WV-061-005135-002
F	WV-061-005474-001	N	WV-061-005285-004
G	WV-061-005168-004	O	WV-061-005643-008
H	WV-061-004975-003	P	WV-061-004719-007

04/30/2021

FILE #: NEE20

DRAWING #: 2988

SCALE: N/A

DATE: APRIL 15, 2021

OPERATOR'S WELL #: ERP 4H

API WELL #: 47 (STATE) 61 (COUNTY) 01867 MOD (PERMIT)

northeast
NATURAL ENERGY

April 20, 2021

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

Re: Bunner 2H (061-01868) & Bunner 8H (061-01870) Drill Permit Modifications
ERP 4H (061-01867) Pilot Modification Revision

Dear Permit Reviewer,

~~Please consider this Northeast Natural Energy~~'s ("NNE") for~~mal request to modify existing Drill Permits Bunner 2H~~ (API # ~~47-061-01868~~) ~~and Bunner 8H~~ (API # 47-~~061-01870~~). T~~he modification request is to extend the existing lateral~~ footage.

Also enclosed is a revision to the ERP 4H Drill Permit (47-061-01867) modification request. Northeast Natural Energy is requesting to add a pilot hole to the well bore that will be plugged back during drilling operations. ✓

-WS 4/26/21

Should you have any questions please contact me at kbrooks@nne-llc.com.

Sincerely,

Kristen Brooks

Kristen Brooks
Operations Analyst

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04/30/2021

61-01867MOD

northeast
NATURAL ENERGY

April 5, 2021

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

Re: ERP 2H, 6H, 8H, 14H Permit Application
ERP 4H Permit Modification

Dear Permit Reviewer,

Please find enclosed Permit Applications for Northeast Natural Energy's ("NNE") proposed ERP 2H, 6H, 8H, and 14H wells. The proposed wells will be in the Battelle District of Monongalia County, WV.

Also included is a modification request for our ERP 4H drill permit (47-061-01867) to modify the casing program, extending the conductor from 40' to 100'.

Should you have any questions please contact me at 304.212.0445 or by email at kbrooks@nne-llc.com.

Sincerely,

Kristen Brooks

Kristen Brooks
Operations Analyst

VOID

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WV Department of
Environmental Protection

04/30/2021

WW-6B
(04/15)

API NO. 47- 061 - 01867 MOD
OPERATOR WELL NO. 4H
Well Pad Name: ERP

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

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		Operator ID	County	District	Quadrangle

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(b)If Gas Shallow X Deep _____
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6) Existing Pad: Yes or No No

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(a) If Yes, provide Mine Info: Name: Federal #2
Depth: 1,230'
Seam: Pittsburgh
Owner: Phoenix Federal No 2 Mining, LLC

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Bryan Harris
3-23-21

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Liners							

PACKERS

VOID

Kind:				
Sizes:				
Depths Set:				

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Environmental Protection

04/30/2021

WW-6B
(10/14)

API NO. 47-_____-_____
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Office of Oil and Gas

*Note: Attach additional sheets as needed.

APR 07 2021

WV Department of
Environmental Protection

04/30/2021