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

June 16, 2015

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

Re: Permit Modification Approval for API Number 6101707, Well #: MIP 3H

Adjust and extend 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,

Gene Smith
Assistant Chief of Permitting
Office of Oil and Gas

northeast
NATURAL ENERGY

4706101707

June 9, 2015

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

Re: MIP 3H Permit Modification
API # 47-061-01707

Dear Permit Reviewer,

Northeast Natural Energy LLC ("NNE") would like to request a modification to its existing MIP 3H Permit (061-01707). NNE has adjusted and extended the horizontal well bore to allow for more efficient development of the natural gas surrounding its MIP Well Pad. Please find enclosed with this request an updated Mylar Plat, Well Bore Schematic, WW-6A-1 form and attachment and both a revised WW-6B and Site Safety Plan initialed by the inspector.

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

Received
Office of Oil & Gas
JUN 09 2015

4706101707 MOD

WW-6B
(9/13)

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	Grant	Morgantown South
		Operator ID	County	District	Quadrangle

2) Operator's Well Number: MIP 3H Well Pad Name: MIP

3) Farm Name/Surface Owner: Enrout Properties, LLC Public Road Access: CR 19/19; Industrial Park Rd

4) Elevation, current ground: 1,058' Elevation, proposed post-construction: 1,058'

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

6) Existing Pad: Yes or No Yes MJK 6/9/2015

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):
Marcellus ; 7,528' ; 103' , 3,270 psi

8) Proposed Total Vertical Depth: 7,528'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 14,085'

11) Proposed Horizontal Leg Length: 6,104'

12) Approximate Fresh Water Strata Depths: 50' , 450'

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

14) Approximate Saltwater Depths: 1,600'

15) Approximate Coal Seam Depths: 200' , 225'

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: _____
Depth: _____
Seam: _____
Owner: _____

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4706101707 MOD

WW-6B
(9/13)

18) **CASING AND TUBING PROGRAM**

TYPE	Size	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling	INTERVALS: Left in Well	CEMENT: Fill-up (Cu. Ft.)
Conductor	20"	New	STD	78.67	40'	40'	GTS
Fresh Water	13 3/8"	New	J-55	54.5	530'	500'	CTS
Coal							
Intermediate	9 5/8"	New	J-55	40	1,830'	1,800'	CTS
Production	5 1/2"	New	P-110	20	14,085'	14,055'	3,364 cu. ft.
Tubing	2 3/8"	New	J-55	4.7		7,800'	NA
Liners							

MJK 6/9/2015

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield (cu. ft./k)
Conductor	20"	24"	.375	499	Grout	NA
Fresh Water	13 3/8"	17 1/2"	.38"	2,760	Class A	1.23
Coal						
Intermediate	9 5/8"	12 1/4"	.395"	3,950	Class A	1.3
Production	5 1/2"	8 3/4"	.361"	12,530	50:50 Poz	1.21
Tubing	2 3/8"	NA	.190"	7,700	NA	NA
Liners						

PACKERS

Kind:				
Sizes:				
Depths Set:				

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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 KOP at an approximate depth of 6,500' TVD/MD. From KOP, the well will then be horizontally drilled on synthetic based mud to approximately 7,528' TVD / 14,085' MD along a 324 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): N/A - Existing Pad

22) Area to be disturbed for well pad only, less access road (acres): N/A - 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 shoe joint to surface. Production casing will have rigid body centralizers placed at a minimum 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.

4706101707 mod

Job Number:
Company: Northeast Natural Energy
Lease/Well: MIP 3H
Location: MIP
Rig Name: Patterson 258
State/County: WV/ Mon
Country: US
API Number:

Elevation (To MSL): 1060.00 ft
RKB: 18.00 ft
Projection System: US State Plane 1983
Projection Group: West Virginia Northern Zone
Projection Datum: GRS80
Magnetic Declination: -9.02
Grid Convergence: -0.30366 W
Date: Tuesday, June 02, 2015

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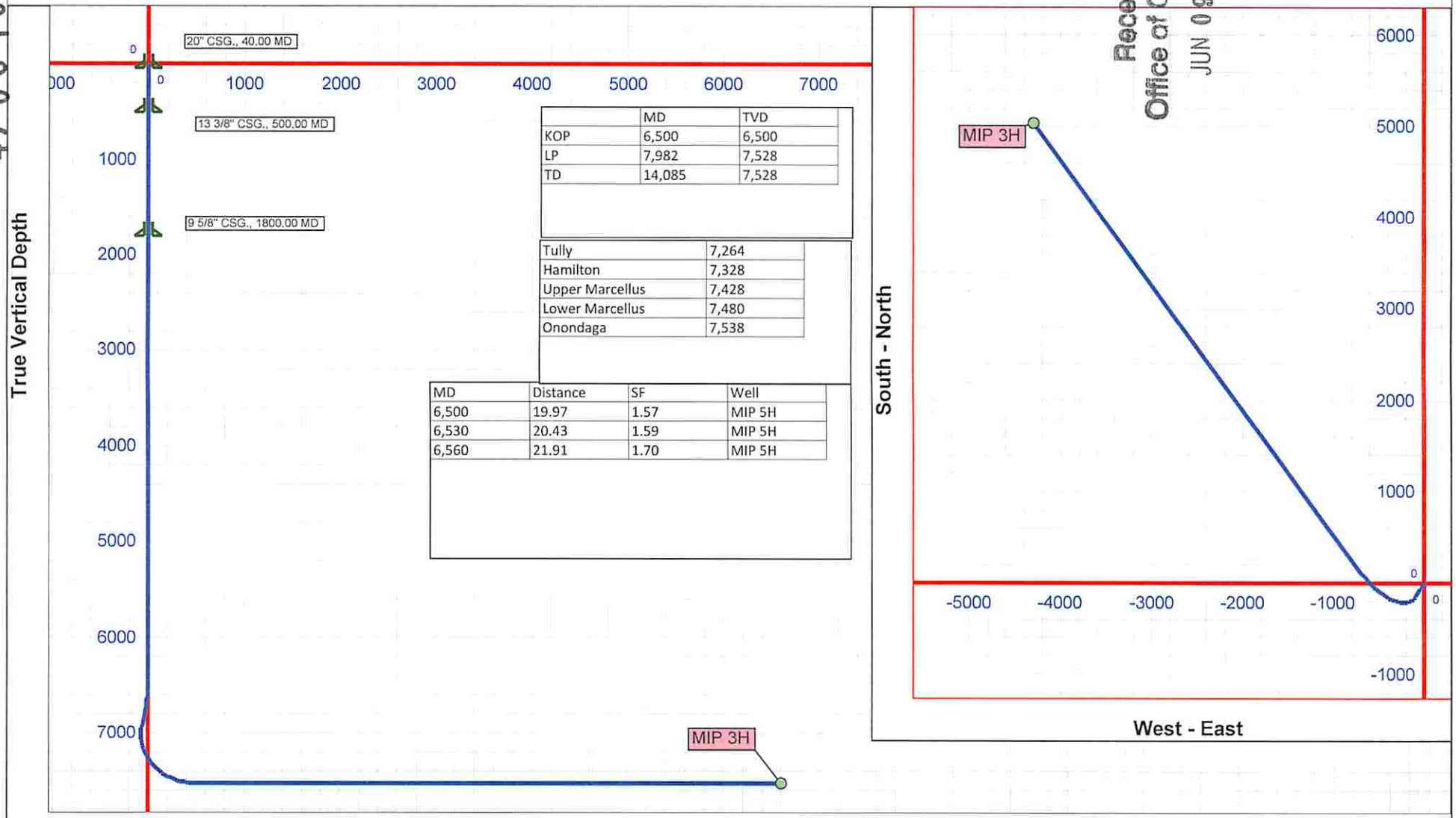


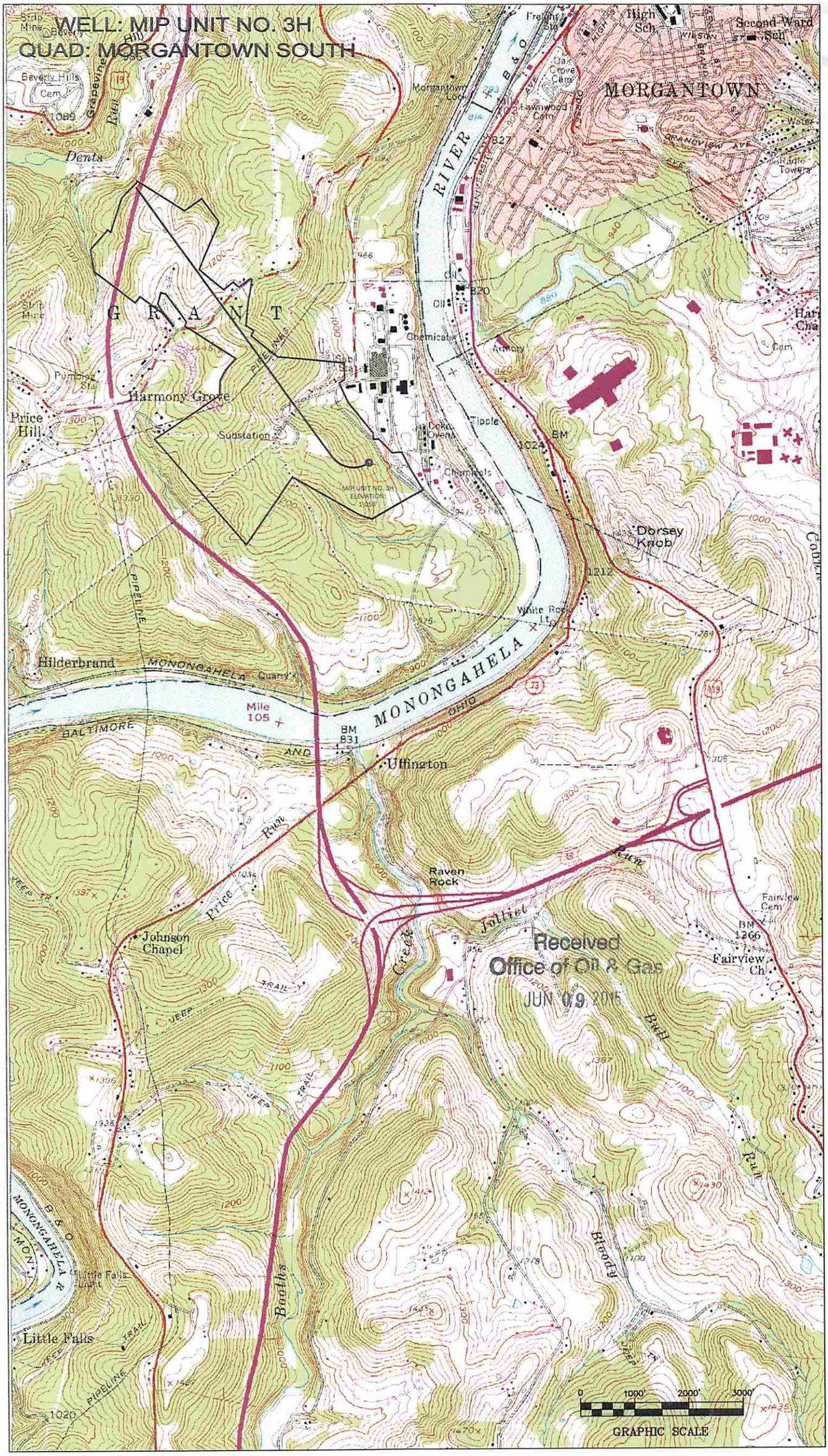
	MD	TVD
KOP	6,500	6,500
LP	7,982	7,528
TD	14,085	7,528

Tully	7,264
Hamilton	7,328
Upper Marcellus	7,428
Lower Marcellus	7,480
Onondaga	7,538

MD	Distance	SF	Well
6,500	19.97	1.57	MIP 5H
6,530	20.43	1.59	MIP 5H
6,560	21.91	1.70	MIP 5H

Vertical Section (1000 Ft/Div) VSP: 323.00°

Performance Drilling Technology, Inc. - HawkEye™ ©2014



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SURFACE HOLE DEC. LONG: 79.976335
SURVEYED LONG: 79° 58' 34.8"

5070'

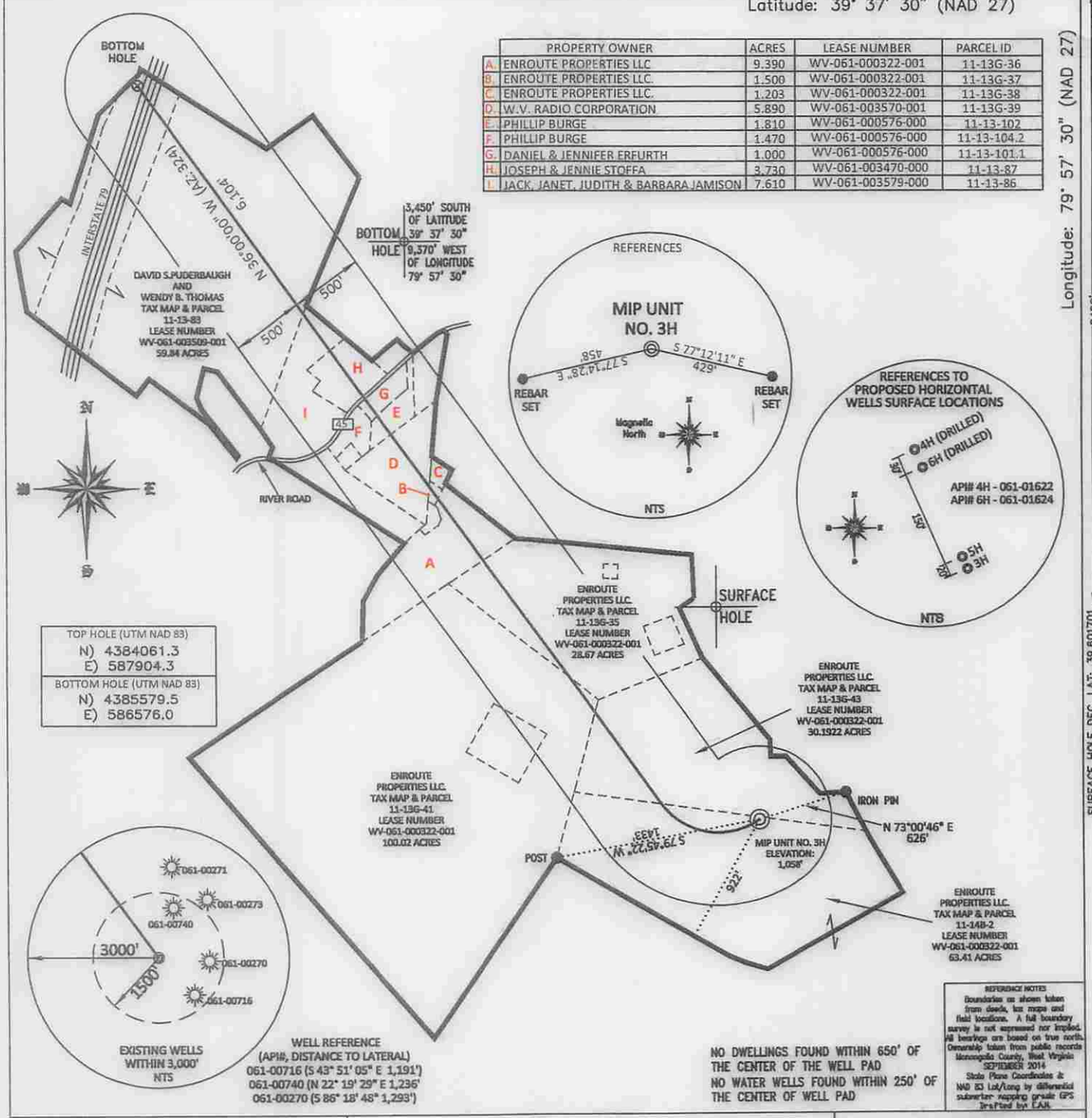
Latitude: 39° 37' 30" (NAD 27)

Longitude: 79° 57' 30" (NAD 27)

8490'

SURFACE HOLE DEC. LAT: 39.601701
SURVEYED LAT: 39° 36' 06.1"

	PROPERTY OWNER	ACRES	LEASE NUMBER	PARCEL ID
A.	ENROUTE PROPERTIES LLC	9.390	WV-061-000322-001	11-13G-36
B.	ENROUTE PROPERTIES LLC.	1.500	WV-061-000322-001	11-13G-37
C.	ENROUTE PROPERTIES LLC.	1.203	WV-061-000322-001	11-13G-38
D.	W.V. RADIO CORPORATION	5.890	WV-061-003570-001	11-13G-39
E.	PHILLIP BURGE	1.810	WV-061-000576-000	11-13-102
F.	PHILLIP BURGE	1.470	WV-061-000576-000	11-13-104.2
G.	DANIEL & JENNIFER ERFURTH	1.000	WV-061-000576-000	11-13-101.1
H.	JOSEPH & JENNIE STOFFA	3.730	WV-061-003470-000	11-13-87
I.	JACK, JANET, JUDITH & BARBARA JAMISON	7.610	WV-061-003579-000	11-13-86



TOP HOLE (UTM NAD 83)	
N)	4384061.3
E)	587904.3
BOTTOM HOLE (UTM NAD 83)	
N)	4385579.5
E)	586576.0

FILE #: NNE004
DRAWING #: 2443
SCALE: 1"=1000'
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: JUNE 1, 2015

OPERATOR'S WELL #: MIP UNIT NO. 3H

API WELL #: 47 (STATE) 61 (COUNTY) 01707 H6D (PERMIT)

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

AS-BUILT

WATERSHED: UPPER MONONGAHELA

ELEVATION : 1,058'

COUNTY/DISTRICT: MONONGALIA/GRANT

QUADRANGLE: MORGANTOWN SOUTH

SURFACE OWNER: ENROUTE PROPERTIES LLC.

ACREAGE: 63.41 +/-

OIL & GAS ROYALTY OWNER: ENROUTE PROPERTIES LLC.

ACREAGE: 316.115 +/-

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: 7,528' TMD: 14,085'

WELL OPERATOR : NORTHEAST NATURAL ENERGY

DESIGNATED AGENT : JOHN ADAMS

ADDRESS: 707 VIRGINIA STREET – SUITE 1400

ADDRESS: 707 VIRGINIA STREET – SUITE 1400

CITY: CHARLESTON STATE: WV ZIP CODE: 25301

CITY: CHARLESTON STATE: WV ZIP CODE: 25301

4706101707 mon

WW-6A1
(5/13)

Operator's Well No. MIP 3H

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:

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- 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: Hollie Medley
Its: Regulatory Coordinator

4706101707MOD

WW-6A1 Operator's Well No. MIP 3H

NNE Lease No.	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page	Tax Map & Parcel
WV-061-000322-001	Enroute Properties, LLC	Northeast Natural Energy LLC	0.125 or greater	1420/577	14B-2; 13G-43,35,41,36,37,38
WV-061-003570-001	WV Radio Corporation	Northeast Natural Energy LLC	.125 or greater	1521/233	13G-39
WV-061-000576-000	Morgantown Industrial Park Associates, L.P.	Northeast Natural Energy LLC	0.125 or greater	1420/571	11-13G-104.2,102,101.1
WV-061-003470-000	STOFFA, JENNIE	Northeast Natural Energy LLC	0.125 or greater	1514/12	13-87
WV-061-003579-000	JAMISON, BARBARA	Northeast Natural Energy LLC	.125 or greater	1522/765	13-86
WV-061-003509-001	MOORE, CHARLES	Northeast Natural Energy LLC	0.125 or greater	1517/65	13-83

*See Attachment

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4706101707 mop

northeast
NATURAL ENERGY

MIP 3H

SITE SAFETY PLAN

June 5, 2015

MJK
6/8/2015

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SITE NAME MIP 3H

COUNTY Monongalia

ACCESS ROAD ENTRANCE N39º 39' 10.22" , E -79º 58' 28.30" (NAD 83)

N 4384179.85, E 588039.81(NAD 83 UTM)

DIRECTIONS TO SITE:

From Westover, Take Fairmont Road to DuPont Road (CR 19/19), Follow DuPont Road (CR 19/19) for approximately 1.3 miles, Continue straight onto Industrial Park Road for approximately 0.8 miles, Turn left onto Industrial Park Road for approximately 0.1 miles, Turn right onto Industrial Park Road for approximately 0.2 miles, The MIP Well Pad Access Entrance will be on your right.

or

From Morgantown, Cross the Westover Bridge heading toward Westover, turn left onto River Road for approximately 1.6 miles, Turn left onto Industrial Park Road for approximately 0.8 miles, Turn left onto Industrial Park Road for approximately 0.1 miles, Turn right onto Industrial Park Road for approximately 0.2 miles, The MIP Well Pad Access Entrance will be on your right.

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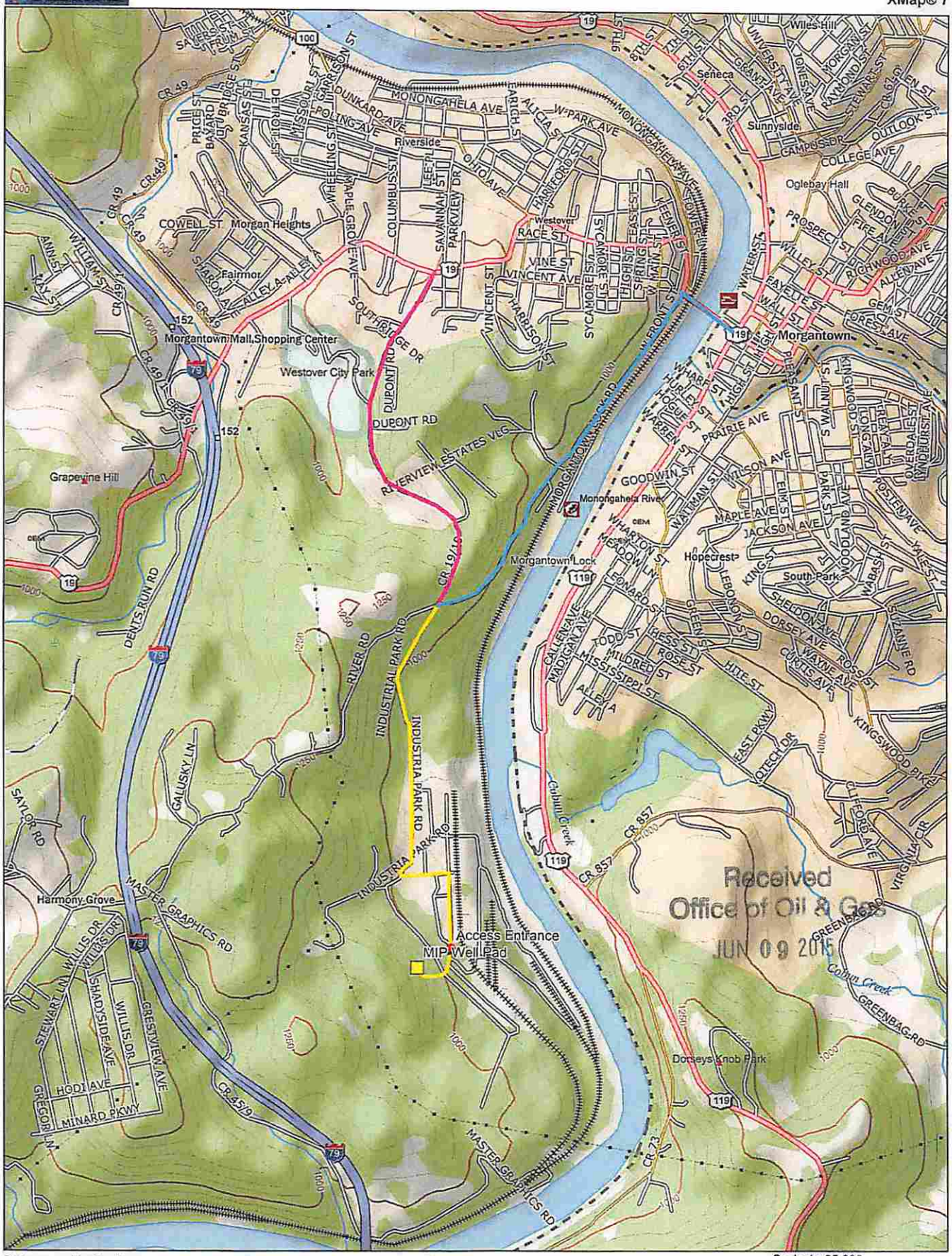
DeLORME

XMap® 7



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Data use subject to license.

© DeLorme. XMap® 7.

www.delorme.com

TN

MN (9.0°W)

Scale 1 : 25,000

0 600 1200 1800 2400 3000 ft

0 200 400 600 800 1000 m

1" = 2,083.3 ft

Data Zoom 13-0

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Introduction

Northeast Natural Energy LLC ("NNE") is an oil and gas exploration and production company with company headquarters located at the following address:

Northeast Natural Energy LLC
707 Virginia Street East, Suite 1200
Charleston, WV 25301

And a Field Operations Office located at the following address:

Northeast Natural Energy LLC
48 Donley Street, Suite 601
Morgantown, WV 26501

NNE is committed to protecting the people, property, and resources of the company and of the communities in which it works by establishing a safe and healthy work environment that is free from recognized hazards and complies with all local, state and federal regulations.

This Plan will be reviewed annually and may be subject to revision and/or update whenever any of the following occur:

- An incident occurs.
- A new chemical or process is utilized onsite.
- Existing processes are modified significantly.
- Regulations are revised significantly.
- The current Plan fails in an emergency situation.
- Changes in emergency response equipment occur.
- Changes in internal and external emergency resources occur.

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2 – Maps and Diagrams

3 – Well Work

4 – Chemical Inventory & MSDS

5 – BOP and Well Control

6 – Hydrogen Sulfide (H_2S)

7 – Flaring

8 – Collision Avoidance Safeguards, Practices and Standards

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1

Contacts, Schedules and Meetings

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A. NORTHEAST NATURAL ENERGY LLC CONTACTS:

24 hour emergency number 1-866-207-1846

Construction/Reclamation

- Mike Shreve – Construction Coordinator 304.918.3050
- Dave McDougal – Manager of Civil Engineering 304.941.5033
- Brett Loflin – VP of Regulatory Affairs 304.414.7063

Drilling/Completion

- Jay Hewitt – Drilling Manager 304.382.1825
- Ian Costello – Completions Engineer 304.610.9764
- Zack Arnold – Manager of Operations 304.203.8059

Production

- Ryan Warner - Production Engineer 304.777.3287
- Zack Arnold – Manager of Operations 304.203.8059

B. EMERGENCY CONTACTS :

In the case of an emergency call 911

1. **OPERATOR CONTACTS**
   - 24 hour emergency number 1-866-207-1846

2. **DRILLING CONTRACTORS**
   - Performance Drilling –Vertical Drilling 304.553.2180
   - Pioneer Drilling – Horizontal Drilling 570.465.2151

   KEY CONTRACTORS AND VENDORS
   - Baker Hughes – Cement/Pumping 724.743.9208
   - Halliburton – Cement/Pumping 888.223.4255
   - Schlumberger – Logging/Cement 724.820.3360

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3. **WV DEP/ OFFICE OF OIL AND GAS**

   Pollution and Emergency Spills 1-800-642-3074
   - James Martin – Chief 304.926.0499 Ext. 1654
   - Gayne Knitoswski – Inspector 304.546.8171
   - Joe McCourt– WV DEP Northern Inspector Supervisor 304.380.2467

4. LOCAL EMERGENCY RESPONSE UNITS

MONONGALIA COUNTY OFFICE OF EMERGENCY MANAGEMENT

- Mike Wolfe – Director 304.598.0301
- James Smith – Deputy Director

FIRE DEPARTMENTS

- Blacksville Volunteer 304.432.8282

AMBULANCE / EMS

- MON EMS 304.599.0650
- JAN-CARE 304.296.9700

LIFE FLIGHT AMBULANCE SERVICE (HELICOPTER)

- Angel MedFlight 866.604.8307

STATE POLICE

- Morgantown Detachment 304.285.3200

COUNTY POLICE

- Monongalia Sheriff 304.291.7290

5. LOCAL ER PERSONNEL

HOSPITAL

- Ruby Memorial (trauma 1) 304.598.4000
- Monongalia General (trauma 4) 304.598.1200

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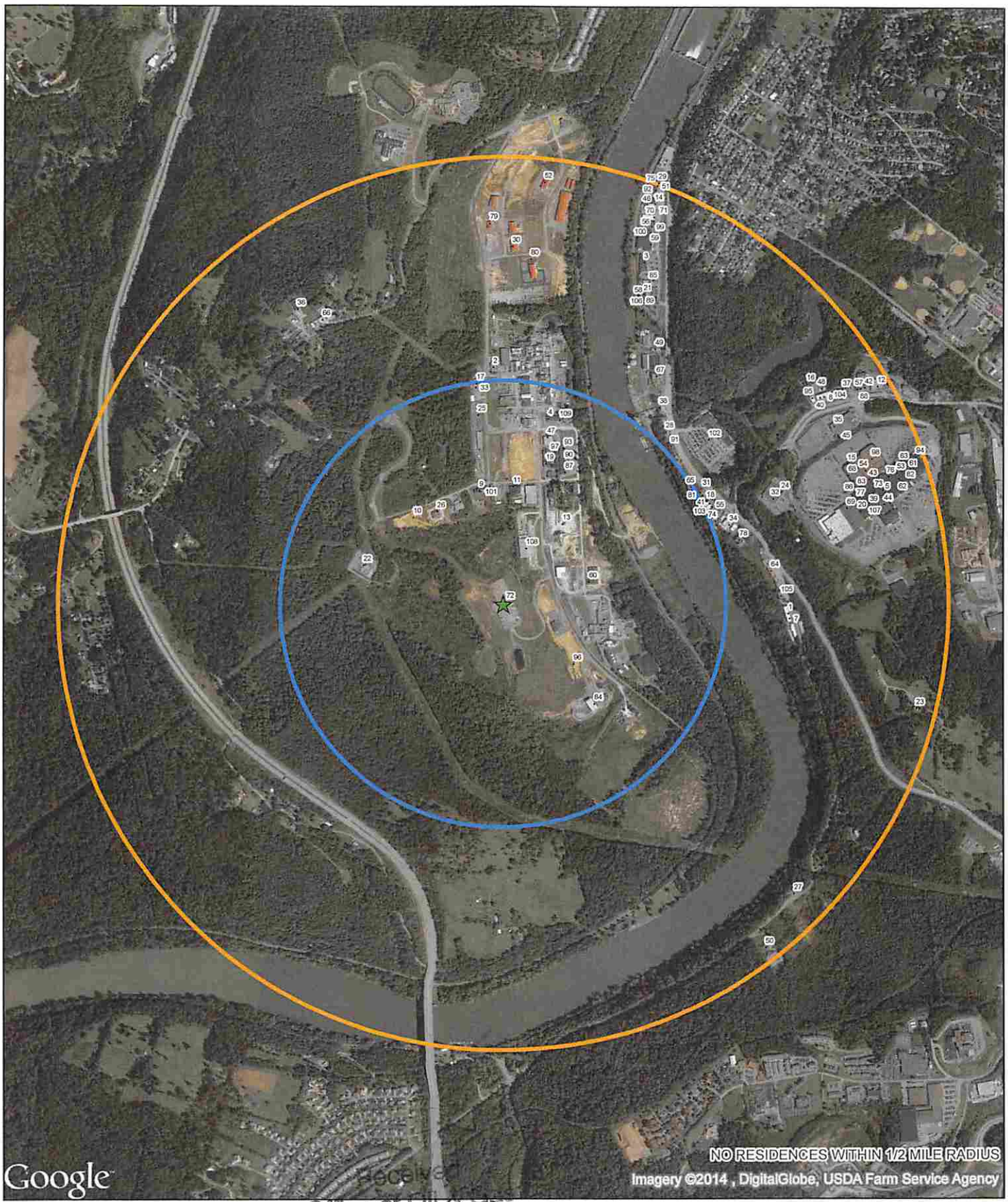

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CORE
ENVIRONMENTAL SERVICES, INC.
4 BROOKSTONE PLAZA
MORGANTOWN, WV 26508
T: 304-292-CORE (2673) | F: 304-292-2773
WWW.CORE-ENV.COM

Legend

- 20 Business Locations
- Center of Pad
- 1/2 Mile Radius
- 1 Mile Radius

N

1 inch = 1,500 feet

0 375 750 1,500 Feet

DRAWN BY: DJ	PROJECT NUMBER:
CHECKED BY: MH	DATE: 10/28/2014
APPROVED:	REVISED:
DES:	FIGURE NUMBER: 1

TITLE:

AERIAL RADIUS MAP

MORGANTOWN INDUSTRIAL PARK
#4H PAD SITE
NORTHEAST NATURAL ENERGY

Morgantown South Quadrangle
Monongalia County, West Virginia

Map #	Business Name	Physical Address	Phone Number	Latitude	Longitude
1	24/7 Self Storage	30 Smithtown Road, Morgantown, WV 26508	(304)-296-1410	39.60173	-79.964432
2	Addivant	1000 Morgantown Industrial Park, Morgantown WV, 26501	(304) 296-2554	39.609659	-79.976911
3	Aldi	245 Don Knotts Blvd., Morgantown, WV 26501	(855) 955-2534	39.613092	-79.970605
4	American Environmental	1750 Morgantown Industrial Park, Morgantown, WV 26501	(304) 292-0659	39.608008	-79.974592
5	Animal Friends Thrift Shop	5000 Greenbag Road, Morgantown, WV 26505	(304) 290-4738	39.605672	-79.960385
6	Aquilla Stone	271 Don Knotts Blvd. Morgantown, WV 26501	(304) 292-7950	39.614344	-79.970186
7	Arnett Law Office	30 Smithtown Road, Morgantown, WV 26508	(304) 292-3604	39.601569	-79.964379
8	Artistry House LLC	135 Green Bag Road, Morgantown, WV 26501	(304) 435-8090	39.608766	-79.96299
9	Azimuth Incorporated	3741 Morgantown Industrial Park, Morgantown, WV 26501	(304) 292-3700	39.605673	-79.977461
10	Black Diamond Equipment Rental	4100 Morgantown Industrial Park, Morgantown, WV 26501	(855) 250-5807	39.604808	-79.98024
11	Blackhawk Interiors	3500 Industrial Park, Morgantown, WV 26501	(304) 292-4011	39.605797	-79.976043
12	Center Service Auto Body	181 Green Bag Road, Morgantown, WV 26501	(304) 292-0345	39.609126	-79.960743
13	Central Supply	3100 Morgantown Industrial Park, Morgantown, WV 26501	(304) 292-5577	39.604601	-79.973959
14	Chico Enterprises Inc.	281 Don Knotts Blvd., Morgantown, WV 26501	(304) 292-5480	39.614986	-79.970171
15	Children's Discovery Museum of WV	Mountaineer Mall, 5000 Greenbag Road, Morgantown, WV 26508	(304) 292-4646	39.606598	-79.961976
16	Children's Home Society of WV	129 Green Bag Road, Morgantown, WV 26501	(304) 284-0992	39.609181	-79.96372
17	City Plumbing and Heating	1500 Morgantown Industrial Park Morgantown WV 26501	(304) 296-7135	39.609136	-79.977614
18	Coomb's Family Chiropratic	55 Don Knotts BoulevaRoad, Suite 4, Morgantown, WV 26508	(304) 943-0124	39.605369	-79.967907
19	Core Building Solutions	2200 Industrial Park Road, Morgantown, WV 26501	(304) 376-1940	39.606554	-79.974682
20	Dance Rebellion & Fitness	5000 Greenbag Road, Morgantown, WV 26505	(843) 847-1774	39.605078	-79.961434
21	Dinsmore & Shohl Law Office	215 Don Knotts Blvd., Morgantown, WV 26501	(304) 225-1414	39.612063	-79.970612
22	Dominion Resource	2800 Morgantown Industrial Park, Morgantown, WV 26501	(304) 288-2702	39.603245	-79.982312
23	Dorsey's Knob Lodge	Fawley Ln, Morgantown, WV 26508	(304) 296-8356	39.59867	-79.95904
24	Dunham's Sports	5000 Greenbag Road, Morgantown, WV 26505	(304) 292-4111	39.605674	-79.964769
25	Dynamic Industries	2800 Morgantown Industrial Park, Morgantown, WV 26501	(304) 413-0232	39.608108	-79.97755
26	Easley Rivers	3800 Morgantown Industrial Park, Morgantown, WV 26501	(304) 291-6803	39.604992	-79.97925
27	Elite Gentlemen's Club	334 Smithtown Road, Morgantown, WV 26508	(304) 284-8448	39.592629	-79.964141
28	Enterprise Rent A Car	75 Don Knotts Blvd., Morgantown, WV 26501	(304) 225-6700	39.607598	-79.969644
29	Fabric On a Roll...	295 Don Knotts Blvd., Morgantown, WV 26501	(304) 296-1922	39.615666	-79.970027
30	Flint Energy Services	451 N Metro Dr Morgantown, WV 26501	(304) 292-0041	39.613578	-79.976159
31	Galloway Florist	57 Don Knotts Blvd., Morgantown, WV 26508	(304) 292-7783	39.605555	-79.968076
32	GCO Carpet Outlet	82 Green Bag Road, Morgantown, WV 26501	(888) 311-0395	39.605459	-79.965099
33	Gerrick Electrical Company, LLC	1510 Morgantown Industrial Park, Morgantown, WV 26501	(304) 291-8114	39.609006	-79.977637
34	Get Go	54 Don Knotts Blvd., Morgantown, WV 26508	(304) 291-4620	39.604608	-79.966956
35	Giant Eagle	130 Green Bag Road, Morgantown, WV 26501	(304) 292-6066	39.607816	-79.962548
36	Global Land - Radio Tower	860 River Road, Morgantown, WV 26501	(845) 359-0444	39.611512	-79.985182
37	Goodyear Auto Service Center	149 Green Bag Road, Morgantown, WV 26501	(304) 296-1748	39.608997	-79.962201
38	Greer Limestone	Don Knotts Blvd., Morgantown WV 26508	(304) 296-2463	39.608393	-79.969919
39	Ground Zero Fighting Systems	5000 Greenbag Road, Morgantown, WV 26505	(304) 290-0615	39.605263	-79.961029
40	H&R Block	133 Green Bag Road, Morgantown, WV 26501	(304) 292-6846	39.608737	-79.96316
41	Hawkeye Research Inc	55 Don Knotts BoulevaRoad, Suite 3, Morgantown, WV 26508	(304) 212-5597	39.605293	-79.967791
42	Heidi's Hot Spot	177 Greenbag Road, Morgantown, WV 26508	(304) 241-1511	39.609073	-79.961279
43	Hollywood Nails	5000 Greenbag Road, Morgantown, WV 26505	(304) 292-4018	39.60611	-79.961068
44	Horizon Medical Technologies	5000 Greenbag Road, Morgantown, WV 26505	(304) 599-7470	39.605302	-79.960435
45	Huntington Bank	130 Green Bag Road, Morgantown, WV 26501	(304) 291-7790	39.607536	-79.962398
46	Insane Cycles	285 Don Knotts Blvd., Morgantown, WV 26501	(304) 291-2453	39.615102	-79.970176
47	Javins Corp.	2000 Morgantown Industrial Park, Morgantown, WV 26501	(304) 292-3234	39.6074	-79.974626
48	Kinderhaus Child Care	129 Green Bag Road, Morgantown, WV 26501	(304) 292-7863	39.609042	-79.963114
49	King Mixed Martial Arts	195 Don Knotts Blvd., Morgantown, WV 26501	(772) 486-7736	39.610291	-79.970109
50	Kingdom Hall of Jehovah's	379 Smithtown Road, Morgantown, WV 26508	(304) 296-8304	39.590889	-79.965326
51	Koreana Asian Grocery Market	293 Don Knotts Blvd., Morgantown, WV 26501	(304) 291-2388	39.61557	-79.970077
52	LEAM Drilling Services LLC	200 N Metro Dr, Morgantown, WV 26501	(304) 381-2299	39.61566	-79.97483
53	Long Arm Sally	5000 Greenbag Road, Morgantown, WV 26505	(304) 296-6802	39.606324	-79.959904
54	Lotus Place LLC	5000 Greenbag Road, Morgantown, WV 26505	(304) 612-1582	39.606393	-79.961232
55	Mattress Warehouse	55 Don Knotts Blvd., Suite 2, Morgantown, WV 26508	(304) 296-6389	39.605209	-79.967699
56	Maverick's Hot Spot	273 Don Knotts Blvd., Morgantown, WV 26501	(304) 284-0667	39.614424	-79.970216
57	Meadow Mountain Catering	167 Green Bag Road, Morgantown, WV 26501	(304) 328-5124	39.609022	-79.961602
58	Med Express	215 Don Knotts Blvd., Suite 130, Morgantown, WV 26501	(304) 291-3627	39.612159	-79.970501
59	Mon County Habitat for Humanity	251 Don Knotts Blvd., Morgantown, WV 26501	(304) 291-2991	39.613677	-79.970325
60	Mon County Solid Waste Authority	255 South Plant St. , Morgantown, WV 26501	(304) 292-3801	39.602733	-79.972826
61	Morgantown Art Association Gallery	5000 Greenbag Road, Morgantown, WV 26505	(304) 291-5900	39.606586	-79.959579
62	Morgantown Dance Studio	5000 Greenbag Road, Morgantown, WV 26505	(304) 292-3266	39.60613	-79.959829
63	Morgantown Early Learning Facility	302 Scott Ave, Morgantown, WV 26508	(304) 291-5845	39.606659	-79.95978
64	Morgantown Motel	2 Smithtown Road, Morgantown, WV 26508	(304) 292-3374	39.603125	-79.965178
65	Morgantown Outdoor Power	59 Don Knotts Blvd., Morgantown, WV 26508	(304) 212-7015	39.605825	-79.968587
66	Morgantown Septic Service	816 River Road, Morgantown, WV 26501	(304) 599-5340	39.611181	-79.984127
67	Morgantown Utility Board Treatment Facility	171 Don Knotts Blvd., Morgantown, WV 26501	(304) 292-8443	39.609408	-79.970055
68	Mountaineer Home Medical	5000 Greenbag Road, Morgantown, WV 26505	(304) 225-6290	39.606227	-79.961939
69	Mylan Pharmaceuticals	5005 Greenbag Road, Morgantown, WV 26501	(304) 599-2595	39.605165	-79.961992
70	NAPA Auto	275 Don Knotts Blvd., Morgantown, WV 26501	(304) 296-4468	39.614558	-79.970204
71	Nationwide Insurance	277 Don Knotts Blvd., Morgantown, WV 26501	(304) 296-3229	39.614798	-79.970146
72	Northeast Natural Energy	Morgantown Industrial Park, Morgantown, WV 26501	(304) 241-5752	39.602038	-79.976302
73	Osher Lifelong Learning Institute	5000 Greenbag Road, Morgantown, WV 26505	(304) 293-1793	39.60576	-79.960499
74	Paula's Great Food and Fun	55 Don Knotts BoulevaRoad, Suite 1, Morgantown, WV 26508	(304) 284-9797	39.605183	-79.967[illegible]
75	Pipeline Swabs and Pigs	297 Don Knotts Blvd., Morgantown, WV 26501	(304) 282-1727	39.615766	-79.969996
76	Playworks Child and Adult Therapy	5000 Greenbag Road, Morgantown, WV 26505	(304) 292-0173	39.606198	-79.960258
77	Pomeray Computer Resources	5000 Greenbag Road, Morgantown, WV 26505	(304) 296-7055	39.605641	-79.960869
78	Premier Computer Services	23 Don Knotts Blvd., Morgantown, WV 26508	(304) 292-7000	39.604115	-79.966508
79	Premium Valve Services, LLC	Morgantown Industrial Park, Morgantown, WV 26501	(304) 284-8040	39.614318	-79.977112
80	Professional Directional, LTD	421 N Metro Dr., Morgantown, WV 26501	(936) 441-7266	39.61317	-79.975379
81	QCBS	57 Don Knotts Blvd., Morgantown, WV 26508	(304) 292-4991	39.605639	-79.968177
82	RBS Hair	5000 Greenbag Road, Morgantown, WV 26505	(877) 379-6793	39.606518	-79.959503
83	Reliable Healthcare Solutions	5000 Greenbag Road, Morgantown, WV 26505	(304) 212-4342	39.606052	-79.961738

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84	Republic Services (Allied Waste)	Morgantown Industrial Park, Morgantown, WV 26501	(304) 368-7777	39.59877	-79.972573
85	Riverside Automotive	225 Don Knotts Blvd., Morgantown, WV 26501	(304) 241-1717	39.612465	-79.970376
86	Rob's Fitness Factory	5000 Greenbag Road, Morgantown, WV 26505	(304) 241-1516	39.605811	-79.961564
87	Roto Rooter	2203 Industrial Park Road, Morgantown, WV 26505	(304) 296-7686	39.606277	-79.973863
88	Safelite	173 Greenbag Road, Morgantown, WV 26501	(877) 609-6714	39.609031	-79.96147
89	Sargasso	215 Don Knotts Blvd., Morgantown, WV 26501	(304) 554-0100	39.611874	-79.970702
90	Schwebel's	Morgantown Industrial Park, Morgantown, WV 26501	(412) 257-6067	39.606634	-79.97387
91	Secure Us	63 Don Knotts Blvd., Morgantown, WV 26501	(304) 291-2994	39.607143	-79.969422
92	Sherwin Williams	289 Don Knotts Blvd., Morgantown, WV 26501	(304) 292-8409	39.615417	-79.970133
93	Sid Harvey's	Morgantown Industrial Park, Morgantown, WV 26501	(304) 296-0496	39.607039	-79.9739
94	Social Security Administration	5000 Greenbag Road, Morgantown, WV 26505	(800) 772-1213	39.606839	-79.959099
95	Styled & Pampered Salon	125 Greenbag Road, Morgantown, WV 26501	(304) 291-3223	39.608732	-79.963488
96	SustainU	Industrial Park Road, Morgantown, WV 26501	(304) 413-0418	39.600043	-79.973449
97	Swanson Industries	3400 Morgantown Industrial Park, Morgantown, WV 26501	(800) 327-6203	39.607051	-79.973955
98	Teletech	255 Scott Ave, Morgantown, WV 26501	(800) 835-3832	39.606763	-79.960966
99	The Hite Company - Electrical Lighting and Supply	269 Don Knotts Blvd. Morgantown, WV 26501	(304) 292-3316	39.614253	-79.970296
100	The Ranch Community Store	255 Don Knotts Blvd., Morgantown, WV 26501	(304) 381-2606	39.614043	-79.97035
101	Tradesmen International	3717 Industrial Park Road, Morgantown, WV 26501	(304) 212-6625	39.605639	-79.9774
102	University Motors	60 Don Knotts Blvd., Morgantown, WV 26508	(304) 296-4401	39.607352	-79.967835
103	Valley Alliance Treatment Services	53 Don Knotts Blvd., Morgantown, WV 26508	(304) 284-0025	39.604996	-79.967499
104	Viking Performance Training LLC	139 Green Bag Road, Morgantown, WV 26501	(304) 216-7496	39.608854	-79.96275
105	Wassick Novelty Co.	20 Smithtown Road, Morgantown, WV 26508	(304) 292-3791	39.602302	-79.964753
106	Waterfront Family Pharmacy	215 Don Knotts Blvd., Morgantown, WV 26501	(304) 225-7979	39.611921	-79.970493
107	Woodburn Shanks Pit BBQ	5000 Greenbag Road, Morgantown, WV 26505	(304) 504-3047	39.605341	-79.961067
108	WV United Linen Services	2100 Rail St. Morgantown, WV 26501	(304) 216-7644	39.603797	-79.975488
109	WVU College of Engineering	Morgantown Industrial Park, Morgantown, WV 26501	(304) 293-0111	39.607957	-79.974105

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C. NOTIFICATION OF H_2S GAS PRESENCE

Detection of H_2S shall sound an alarm which notifies personnel to shut in the well(s) and evacuate to the predetermined safe zone immediately.

A wind sock and/or flags will be utilized on location to identify wind direction. A safe zone upwind and away from the well will be established at the beginning of each tour. Personnel are trained to evacuate the well and gather at this safe zone immediately at the first sound of an H_2S explosive gas alarm.

When in a historically known area, or after H_2S is first detected, operations will halt, evacuation procedures will be followed, and all personnel will be trained for detailed H_2S protocols before operations begin or resume.

After personnel are located in a safe area, the onsite supervisor will take a head count, and make the proper offsite notifications. The DEP Office of Oil and Gas will be notified by a phone call to both the local inspector and the emergency number. The local emergency responders may also be notified of the detection.

In the event that H_2S has been detected, the onsite supervisor shall use his discretion as to the severity of the event and whether the local community should be notified. NNE will make a diligent effort to identify local residents and businesses within a ½ mile radius of its unconventional well sites (*see attached). Notification of such residence may be done in the form of a phone call or a door to door visit. NNE also recognizes that in most emergency situations the local emergency responders will coordinate any notification or evacuation procedures for the community and NNE will work closely with such emergency responders in their efforts.

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D. PRE-SPUD MEETINGS

Prior to drilling operations, an onsite "Pre-Spud" meeting will be held to address operations and the site safety plan. This meeting shall include the overseeing NNE Drilling/Completions Engineer, the staff or contracted site supervisor(s) ("Company Man"), any staff or contracted safety personnel, key contractors to the drilling process, the contracted rig's superintendent/tool pusher, and the local oil and gas inspector if available. Local emergency response personnel may also be invited to the pre-spud meeting. The regional DEP inspector will be notified 48-hours in advance of the meeting. All attending personnel will be documented. Contractors will be provided copy of and instructed to go over the site safety plan with their respective individual employees.

E. WELL SITE SAFETY MEETINGS

Safety Meetings will be held on-site, at a minimum, on a weekly basis and prior to the beginning of drilling, completion and work-over operations. Attendance at each safety meeting will be logged.

Additionally, as a means of safety and maintaining a head count in case of an incident, a check-in and check-out list of both personnel and visitors will be kept during all drilling, completion, and work over phases of operation. The rig/frac supervisor will be responsible for the checking in and out of all personnel on location. A sign will be posted at the entrance to the location directing all visitors to the company trailer.

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Maps and Diagrams

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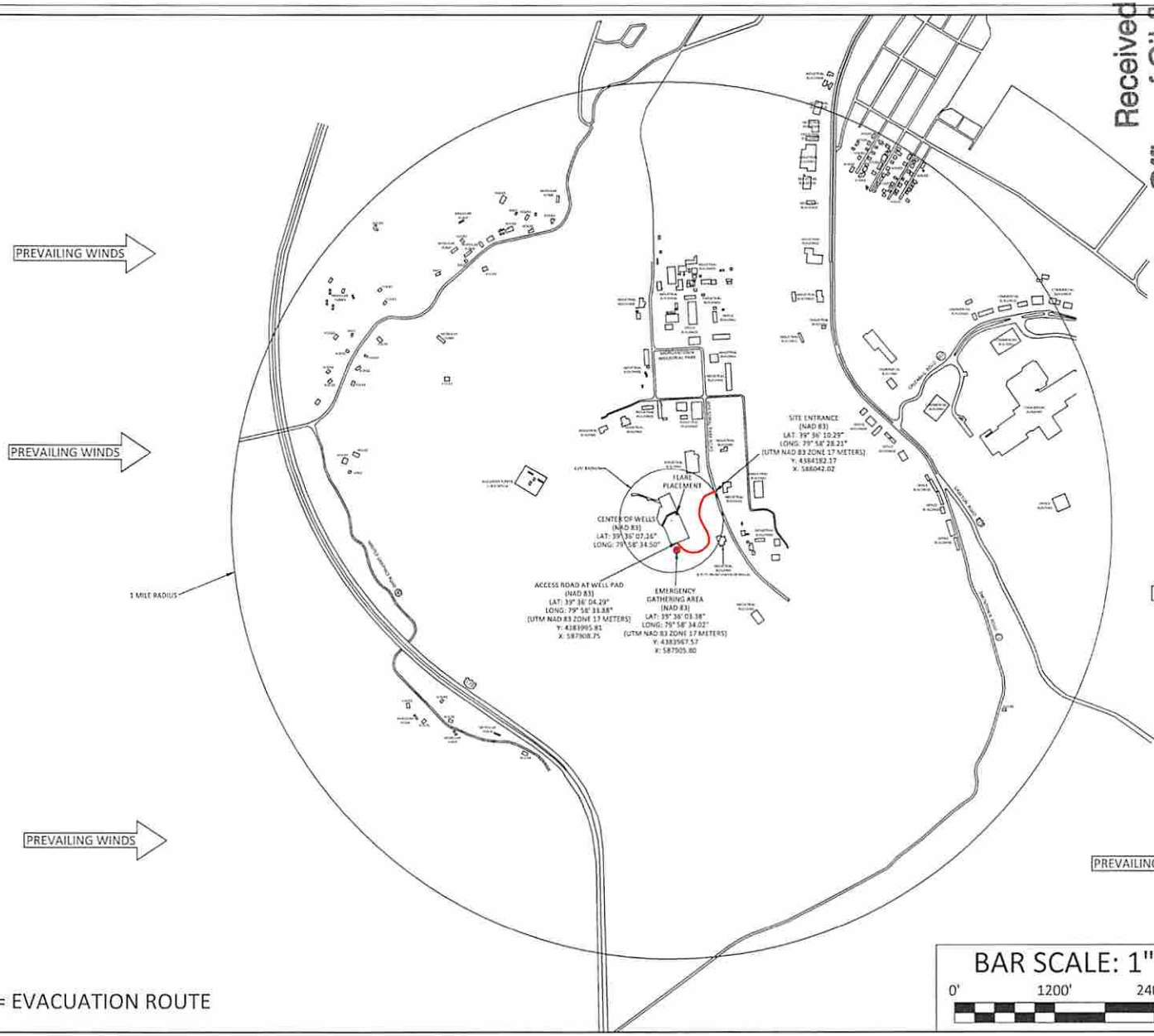

BAR SCALE: 1" = 1200'

0' 1200' 2400' 3600'

BOORD, BENCHEK and ASSOC., INC.
Engineering, Surveying, Construction, and Mining Services
Southpointe, PA 15317 Phone: 724-746-1055

EVACUATION ROUTE/ PREVAILING WINDS

THIS DOCUMENT WAS PREPARED BY:
BOORD, BENCHEK AND ASSOC., INC.
FOR: NORTHEAST NATURAL ENERGY, LLC.

SHEET 2

DATE:
JUNE 2015

M.I.P.
PAD A

GRANT DISTRICT,
MONONGALIA
COUNTY, WV

ANDREW E. BENCHEK
REGISTERED
18444
STATE OF
WEST VIRGINIA
PROFESSIONAL ENGINEER

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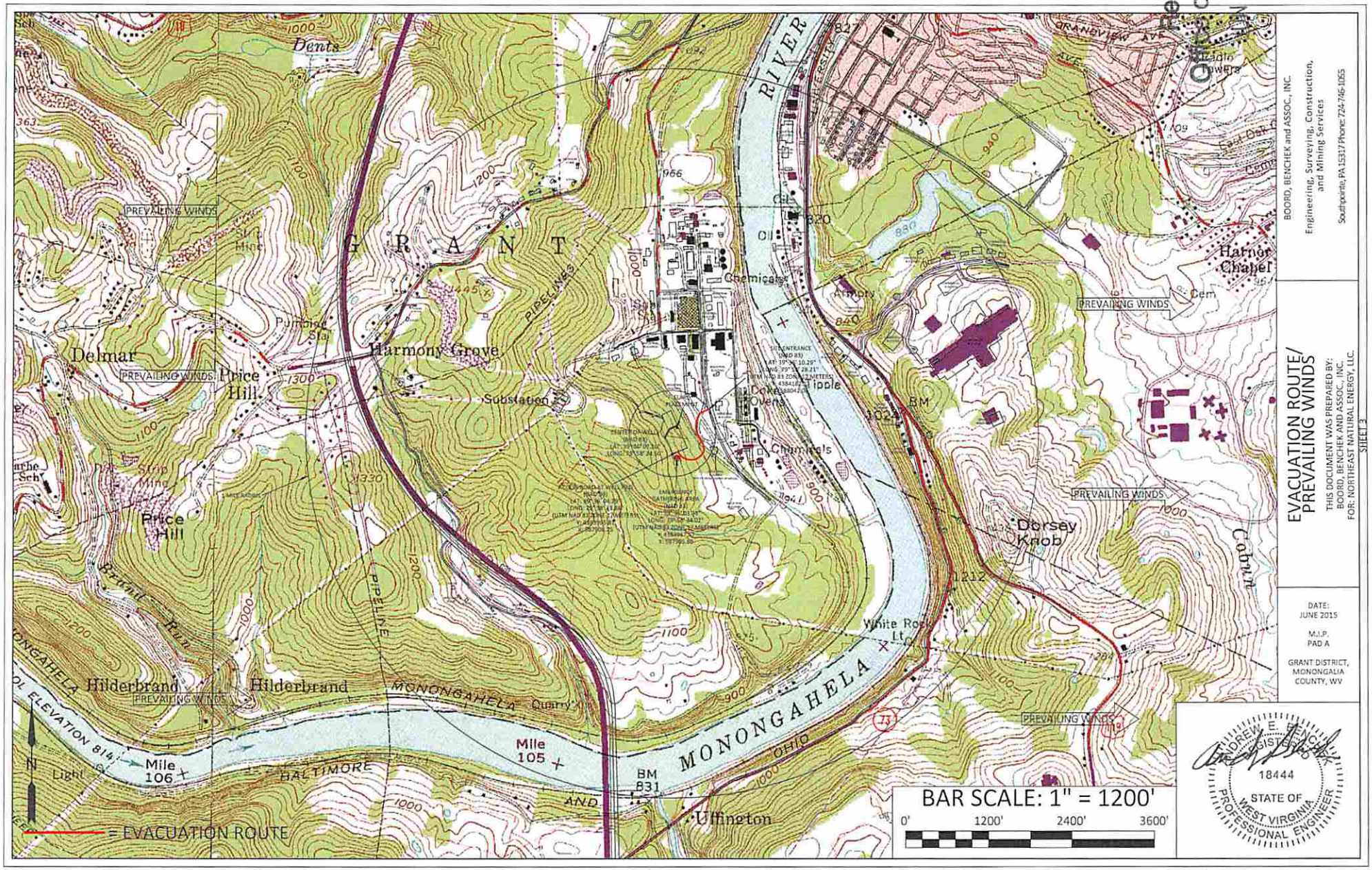
NOV 09 2015



EVACUATION ROUTE/ PREVAILING WINDS

THIS DOCUMENT WAS PREPARED BY:
BOORD, BENCHEK AND ASSOC., INC.
FOR: NORTHEAST NATURAL ENERGY, LLC.

SHEET 3

DATE:
JUNE 2015

M.I.P.
PAD A

GRANT DISTRICT,
MONONGALIA
COUNTY, WV

BOORD, BENCHEK and ASSOC., INC.
Engineering, Surveying, Construction, and Mining Services
Southpointe, PA 15317 Phone: 724-746-1055

ANDREW E. BENCHEK
ASSISTANT
18444
STATE OF WEST VIRGINIA
PROFESSIONAL ENGINEER

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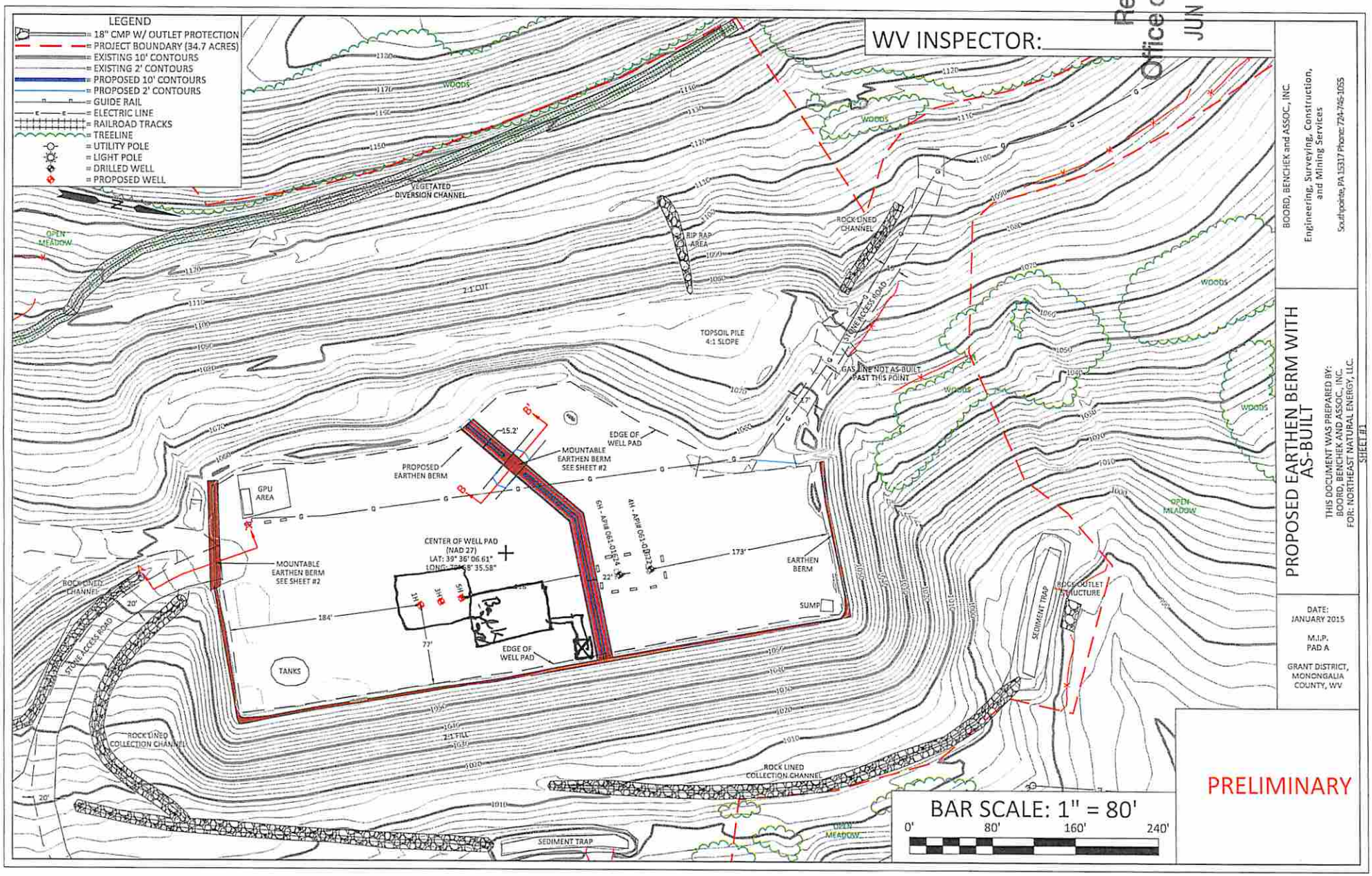


BOORD, BENCHEK and ASSOC., INC.
Engineering, Surveying, Construction, and Mining Services
Southpointe, PA 15317 Phone: 724-746-1055

PROPOSED EARTHEN BERM WITH AS-BUILT

THIS DOCUMENT WAS PREPARED BY:
BOORD, BENCHEK AND ASSOC., INC.
FOR: NORTHEAST NATURAL ENERGY, LLC.

SHEET #1

DATE:
JANUARY 2015

M.I.P.
PAD A

GRANT DISTRICT,
MONONGALIA
COUNTY, WV

SURFACE HOLE DEC. LONG: 79.976335
SURVEYED LONG: 79° 58' 34.8"

5070'

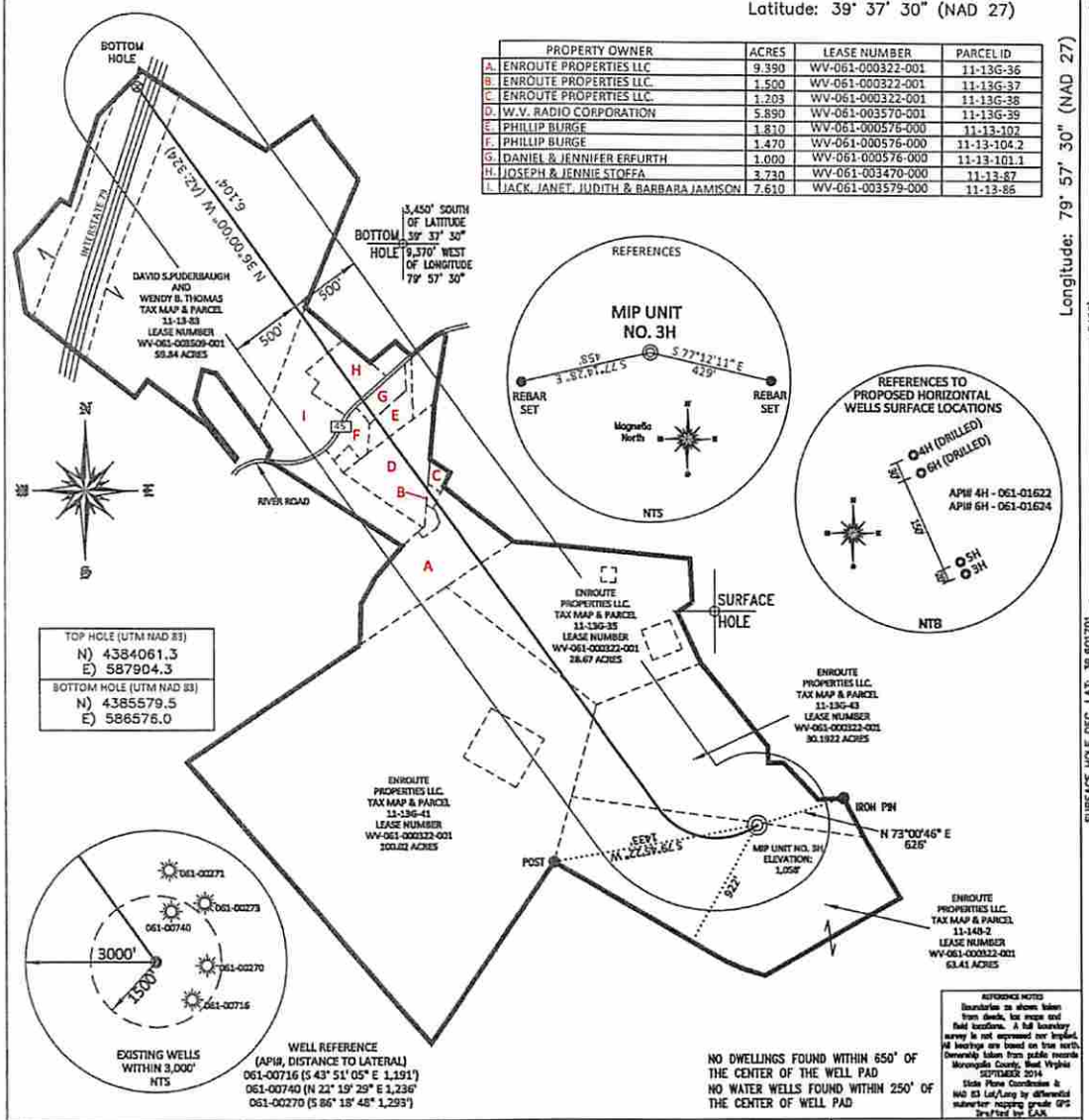
Latitude: 39° 37' 30" (NAD 27)

Longitude: 79° 57' 30" (NAD 27)

8490'

SURFACE HOLE DEC. LAT: 39.691701
SURVEYED LAT: 39° 38' 06.1"

	PROPERTY OWNER	ACRES	LEASE NUMBER	PARCEL ID
A.	ENROUTE PROPERTIES LLC	9.390	WV-061-000322-001	11-13G-36
B.	ENROUTE PROPERTIES LLC.	1.500	WV-061-000322-001	11-13G-37
C.	ENROUTE PROPERTIES LLC.	1.203	WV-061-000322-001	11-13G-38
D.	W.V. RADIO CORPORATION	5.890	WV-061-003570-001	11-13G-39
E.	PHILLIP BURGE	1.810	WV-061-000576-000	11-13-102
F.	PHILLIP BURGE	1.470	WV-061-000576-000	11-13-104.2
G.	DANIEL & JENNIFER ERFURTH	1.000	WV-061-000576-000	11-13-101.1
H.	JOSEPH & JENNIE STOFFA	3.730	WV-061-003470-000	11-13-87
I.	JACK, JANET, JUDITH & BARBARA JAMISON	7.610	WV-061-003579-000	11-13-86



FILE #: NNE004
DRAWING #: 2443
SCALE: 1"=1000'
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: JUNE 1, 2015

OPERATOR'S WELL #: MIP UNIT NO. 3H

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

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

WATERSHED: UPPER MONONGAHELA ELEVATION : 1,058'

COUNTY/DISTRICT: MONONGALIA/GRANT QUADRANGLE: MORGANTOWN SOUTH

SURFACE OWNER: ENROUTE PROPERTIES LLC. ACREAGE: 63.41 +/-

OIL & GAS ROYALTY OWNER: ENROUTE PROPERTIES LLC. ACREAGE: 316.115 +/-

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: 7,528' TMD: 14,085'

WELL OPERATOR : NORTHEAST NATURAL ENERGY DESIGNATED AGENT : JOHN ADAMS

ADDRESS: 707 VIRGINIA STREET – SUITE 1400 ADDRESS: 707 VIRGINIA STREET – SUITE 1400

CITY: CHARLESTON STATE: WV ZIP CODE: 25301 CITY: CHARLESTON STATE: WV ZIP CODE: 25301

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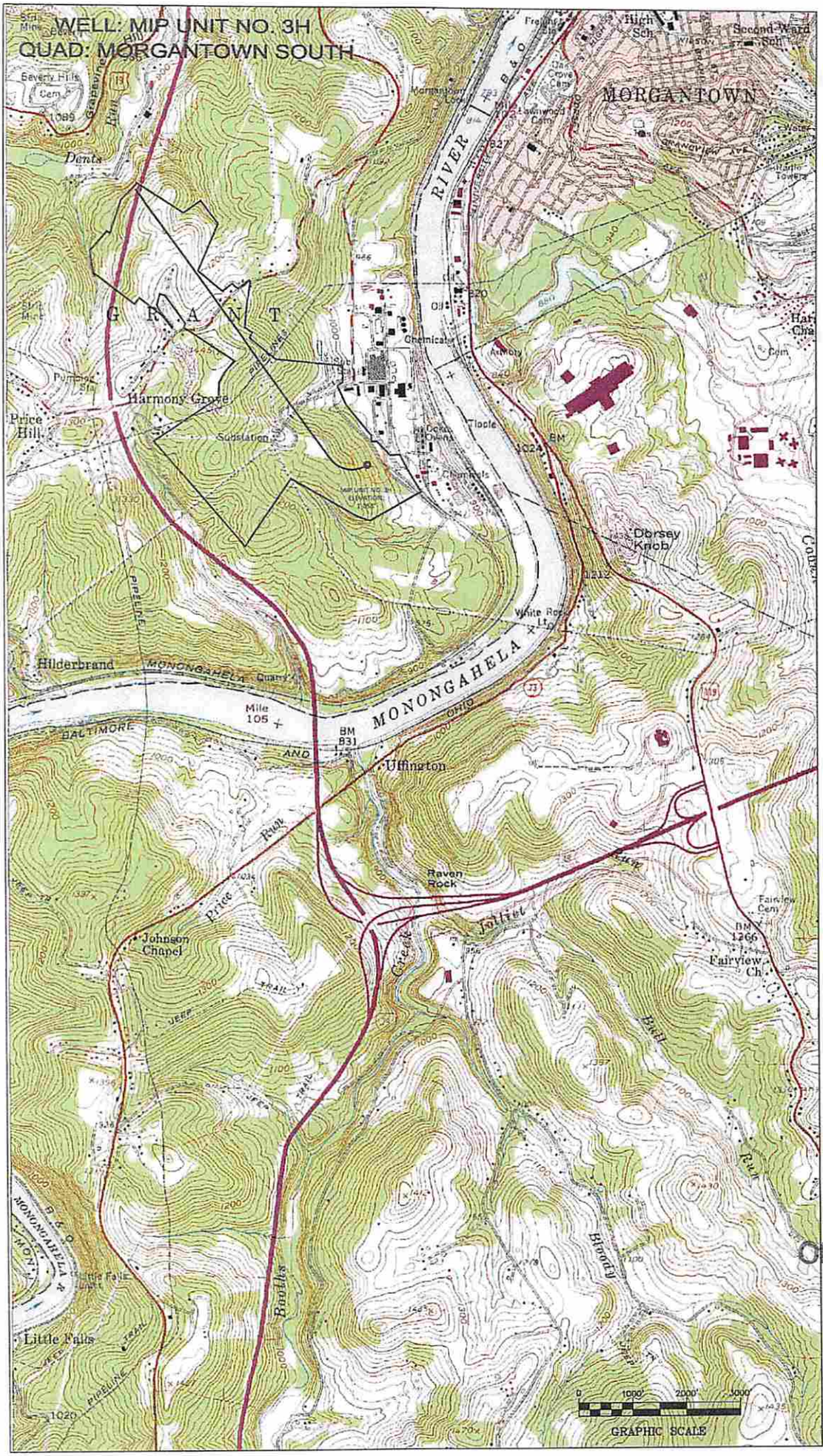

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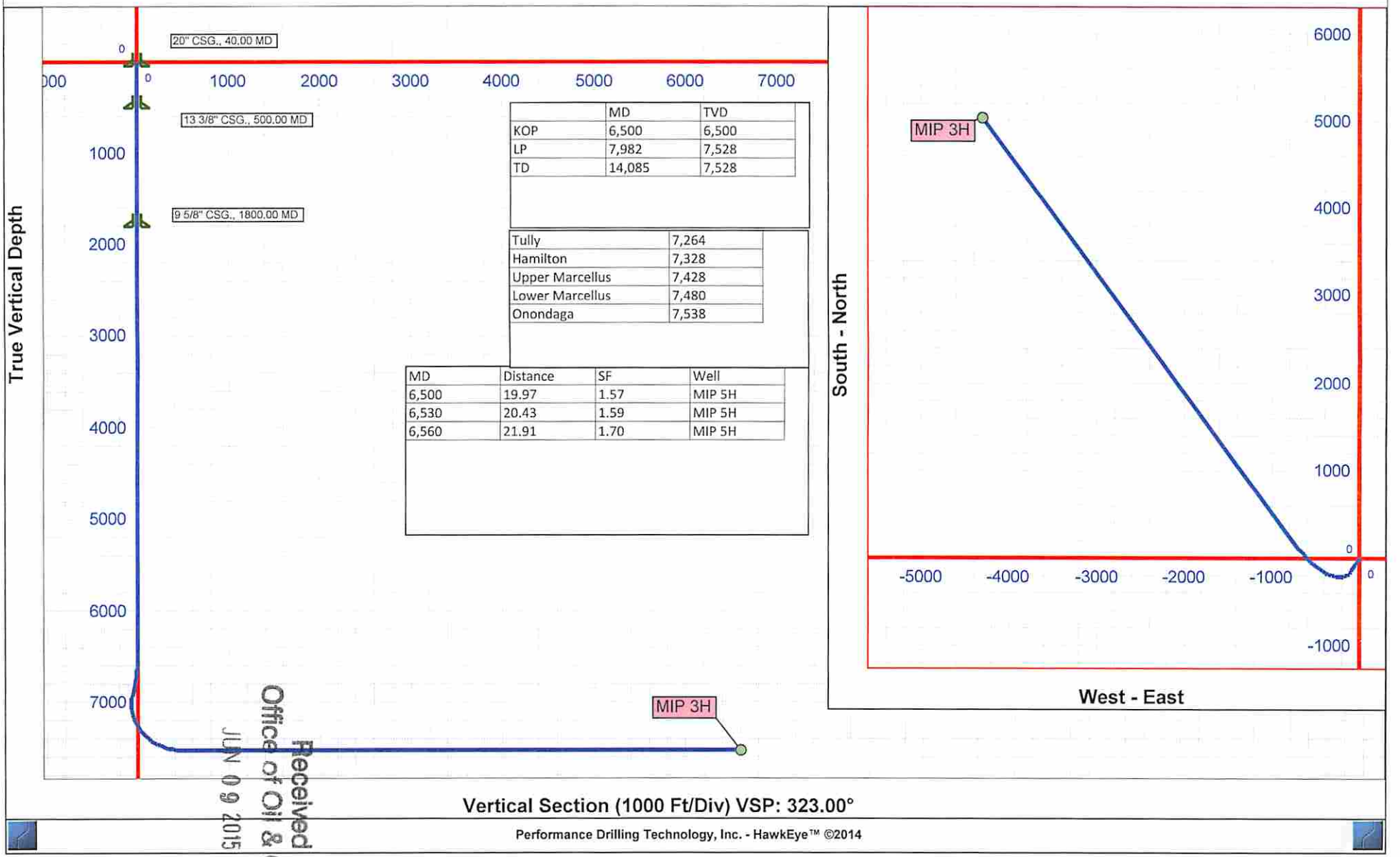
Job Number:
Company: Northeast Natural Energy
Lease/Well: MIP 3H
Location: MIP
Rig Name: Patterson 258
State/County: WV/ Mon
Country: US
API Number:

Elevation (To MSL): 1060.00 ft
RKB: 18.00 ft
Projection System: US State Plane 1983
Projection Group: West Virginia Northern Zone
Projection Datum: GRS80
Magnetic Declination: -9.02
Grid Convergence: -0.30366 W
Date: Tuesday, June 02, 2015



	MD	TVD
KOP	6,500	6,500
LP	7,982	7,528
TD	14,085	7,528

Tully	7,264
Hamilton	7,328
Upper Marcellus	7,428
Lower Marcellus	7,480
Onondaga	7,538

MD	Distance	SF	Well
6,500	19.97	1.57	MIP 5H
6,530	20.43	1.59	MIP 5H
6,560	21.91	1.70	MIP 5H

Vertical Section (1000 Ft/Div) VSP: 323.00°

Performance Drilling Technology, Inc. - HawkEye™ ©2014

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Well Work

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A(1.0) Description of Drilling Operations

The MIP 3H well will be drilled on air to an approximate depth of 6,500' TVD/MD. The well will then be horizontally drilled on synthetic based mud from the KOP of approximately 7,528' TVD and 14,085' MD along a 324 degree azimuth.

A(1.1) Anticipated Equipment/Materials

During the drilling of a horizontal Marcellus gas well the following equipment and materials could be on the drilling location:

Equipment / Materials	Potential Hazard
Double Stand Drilling Rig	Medical, Fire/Explosion, Spill/Release
Mud Pumps	Medical, Fire/Explosion, Spill/Release
Mud Tanks	Medical, Fire/Explosion, Spill/Release
Fork Lift	Medical, Fire/Explosion, Spill/Release
Excavator	Medical, Fire/Explosion, Spill/Release
Diesel Tank	Medical, Fire/Explosion, Spill/Release
Diesel Fuel	Medical, Fire/Explosion, Spill/Release
Generators	Medical, Fire/Explosion, Spill/Release
Air Compressor	Medical, Fire/Explosion
Light Tower	Medical, Fire/Explosion, Spill/Release
Frac Tanks (mud, cement additives,	Medical, Fire/Explosion, Spill/Release
Drilling Mud Additives	Medical, Fire/Explosion, Spill/Release

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A(2.0) Description of Completions Operations

The MIP 3H well will be completed using a multi-stage / high-rate slickwater fracture treatment using sand as a proppant. The First Stage will be initiated via pressurization against a burst disc ran in the production casing string and perforated by pumping down guns on wireline. Subsequent stages will also 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 the fracture treatment, composite frac plugs will be drilled out using a service rig and/or snubbing unit.

A(2.1) Anticipated Equipment/Materials

During the completion of a horizontal Marcellus gas well the following equipment and materials could be on the drilling location:

Equipment / Materials	Potential Hazard
Approximately 10 - 15 Pump Trucks	Medical, Fire/Explosion, Spill/Release
2 Blender Trucks	Medical, Fire/Explosion, Spill/Release
Belt Truck	Medical, Fire/Explosion, Spill/Release
Perforation Truck	Medical, Fire/Explosion, Spill/Release
Crane	Medical, Fire/Explosion, Spill/Release
Sand Tanks	Medical, Fire/Explosion, Spill/Release
Frac Tanks	Medical, Fire/Explosion, Spill/Release
Man Lift	Medical, Fire/Explosion, Spill/Release
Acid Truck	Medical, Fire/Explosion, Spill/Release

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Fork Lift	Medical, Fire/Explosion, Spill/Release
Gel Truck	Medical, Fire/Explosion, Spill/Release
Communications Truck	Medical, Fire/Explosion, Spill/Release
Diesel Truck	Medical, Fire/Explosion, Spill/Release
Diesel Fuel	
80/90 wt gear oil	Medical, Fire/Explosion, Spill/Release
5/40 motor oil	Medical, Fire/Explosion, Spill/Release
Antifreeze	Medical, Fire/Explosion, Spill/Release
Ethylene Glycol	Medical, Fire/Explosion, Spill/Release
Tri-Ethylene Glycol	Medical, Fire/Explosion, Spill/Release
Frac Sand	Medical, Fire/Explosion, Spill/Release
Hydrochloric Acid (HCl)	Medical, Fire/Explosion, Spill/Release
Friction Reducer	Medical, Fire/Explosion, Spill/Release
Gelling Agents	Medical, Fire/Explosion, Spill/Release
Biocide	Medical, Fire/Explosion, Spill/Release
Scale Inhibitor	Medical, Fire/Explosion, Spill/Release
Iron Control	Medical, Fire/Explosion, Spill/Release
Gel Breaker Agent	Medical, Fire/Explosion, Spill/Release
Corrosion Inhibitor	Medical, Fire/Explosion, Spill/Release

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A(3.0) Description of Production Operations

During the production phase, the well stream will flow through buried, welded piping to Gas Production Units. At this point, the gas will be separated from the water and sent through a meter to a sales pipeline. The water will be piped and stored in above ground tanks on the well site. Well pressures and flow rates will be monitored and recorded to ensure proper facility operation. All facilities will be installed according to industry standards and will have appropriate safety systems in place.

A(3.1) Anticipated Equipment/Materials

Production

Equipment / Materials	Potential Hazard
Well Head	Medical, Fire/Explosion, Spill/Release
Buried Flow Line	Medical, Fire/Explosion, Spill/Release
Sand Separator	Medical, Fire/Explosion, Spill/Release
Gas Processing Unit	Medical, Fire/Explosion, Spill/Release
Water Tanks	Medical, Fire/Explosion, Spill/Release
Condensate Tank	Medical, Fire/Explosion, Spill/Release
Water Truck Hauling & Hook Up Equipment	Medical, Fire/Explosion, Spill/Release
Pig Launcher	Medical, Fire/Explosion, Spill/Release

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M & R Station

Equipment / Materials	Potential Hazard
Flowline	Medical, Fire/Explosion, Spill/Release
Pig Receiver	Medical, Fire/Explosion, Spill/Release
Two Phase Separator	Medical, Fire/Explosion, Spill/Release
Filter Units	Medical, Fire/Explosion, Spill/Release
Heater Unit	Medical, Fire/Explosion, Spill/Release
Dehydration Tower	Medical, Fire/Explosion, Spill/Release
50 – 100 Barrel Water Tank	Medical, Fire/Explosion, Spill/Release
Meter House	Medical, Fire/Explosion, Spill/Release
Meter Skid	Medical, Fire/Explosion, Spill/Release

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B DISTRIBUTION OF THE SITE SAFETY PLAN

Copies of this Plan will be located at NNE's corporate office building in Charleston, West Virginia, its field office in Morgantown, West Virginia, with the Designated Response Coordinators and field operation sites when applicable. This Plan may be accessed electronically by all NNE employees on the company's shared drive/share point. All NNE employees are to abide by the provisions of this Plan and are required to participate in its implementation. This Plan will also be shared with external entities such as the Monongalia County Office of Emergency Management within at least seven (7) days prior to earth disturbance and/or well work.

Efforts will be made to familiarize police, fire departments, emergency response teams and the County Emergency Management Coordinator with the layout of the well site, the properties and dangers associated with the equipment and materials that are on site, places where personnel would normally be working, and the possible evacuation routes should an emergency occur.

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Chemical Inventory & Material Safety Data Sheets ("MSDS")

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A Material Safety Data Sheets ("MSDS")

MSDS Sheets will be provided upon request on a CD or USB drive.

B Location of MSDS

MSDS sheets will be kept in the company trailer during the drilling and completion phases of operation. Any Contractors that bring hazardous materials on site will provide MSDS for such. The onsite supervisor will be responsible for ensuring that all MSDS sheets are obtained and are easily accessible in case of an emergency.

C DRILLING MUD

1,500 bbl of 12.9 ppg synthetic drilling mud will be used along with the below listed chemicals. The mud will be kept in an open top above ground mud pit and circulated by nozzles and paddles.

Material	Unit	Amount
Barite	4000lb	9
Calcium Choloride Powder	50lb	200
Carbo Gel	50lb	60
Base Oil	1 gal	1440
Lime	50lb	69
Mil Sorb	50lb	87

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Blow Out Preventer ("BOP") and Well Control

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A BOP EQUIPMENT – DRILLING PHASE

From the shoe of the intermediate casing string (9-5/8") to KOP, the well will continue to be drilled on air. For this section, at a minimum, an 11" 3,000 PSI annular-type BOP will be utilized as a means of well control. Installation of this equipment will be dependent upon two different conditions...

- Should the top-hole drilling rig have a substructure large enough to sit upon a cellar, an 11" 5,000 PSI API flanged casing head will be welded onto the top of the intermediate casing string (9-5/8") below grade after it has been set and cement has cured for a minimum of 8 hours. It is upon this casing head that the annular-type BOP will be bolted and torqued to specification as a means of well control for the section.
- Should the top-hole drilling rig have a substructure too small to sit upon a cellar, the intermediate casing string (9-5/8") will be landed at surface and a screw-on or weld flange annular-type BOP will be used as a means of well control for the section. Under this scenario, a cellar will be installed around the wellbore after the top-hole rig is released from the pad. Once installed, an 11" 5,000 PSI API flanged casing head will then be welded onto the top of the intermediate casing string (9-5/8") below grade.

For the remainder of the drilling of the well on fluid; at a minimum and from bottom to top; an 11" 5,000 PSI kill spool, an 11" 5,000 PSI blind ram-type BOP, an 11" 5,000 PSI pipe ram-type BOP, and an 11" 5,000 PSI annular-type BOP will be bolted and torqued to specification upon the 11" 5,000 PSI casing head.

B PROCEDURE AND SCHEDULE FOR TESTING BOP

For the bottom and horizontal wellbore drilling phase, function testing of BOP equipment shall occur upon initial installation, weekly, and after each trip. Pressure testing of all BOP equipment shall occur upon initial installation and every twenty-one (21) days thereafter, should the well not be completed within that time. Annular preventers are to be tested to seventy percent (70%) of the rated capacity and ram preventers should be tested to eighty percent (80%) of the rated capacity according to the following procedure;

- The WV DEP Regional Oil and Gas Inspector will be notified 24 hrs. in advance of the pressure testing of all BOP equipment.

- For the testing of the 3,000 PSI annular-type BOP before drilling through the shoe of the intermediate casing string to KOP, a cup-type tester will be lowered into the intermediate casing (9-5/8") or a plug-type tester will be inserted into the

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casing head if installed. After a successful function test, the annular BOP will be closed around drill pipe and the void between the cup or plug will be pressurized using fluid as a medium. This shall consist of a minimum five minute low pressure (300 PSI maximum) test, and a thirty minute high pressure (2,100 PSI minimum) test. Annular preventer and valves shall be tested from the direction they are exposed to wellbore pressure. A successful test shall consist of less than a 10% bleed off after buildup over the entire duration of the low/high test period.

- For the testing of the BOP stack from KOP to TD of the well, a plug-type tester will be placed into the bowl of the 11" 5M x 9-5/8" casing head. After a successful functional test, all rams, valves, TIW valves, chokes, and annular preventers will be pressure tested from the direction they are subjected to wellbore pressure. The annular preventer will be tested by pressurization around drill pipe using water as a medium and subject to a minimum five minute low pressure (300 PSI maximum) test, and a minimum thirty minute high pressure (2,100 PSI minimum for 3M equipment, 3,500 PSI minimum for 5M equipment) test. Rams, valves, TIW, and choke components shall be tested using water as a medium and subject to a minimum five minute low pressure (300 PSI maximum) test, and a minimum thirty minute high pressure (2,400 PSI minimum for 3M equipment, 4,000 PSI minimum for 5M equipment) test. Each individual component must pass its respective test before drilling may commence. A successful test shall consist of less than a 10% bleed off after buildup over the entire duration of the low/high test period.

C ASSEMBLY INSTALLATION SCHEDULE

- During top hole operations a 11" 5,000 PSI API flanged casing head will be welded onto the top of the intermediate casing string (9-5/8") below grade and an 11" 3,000 PSI annular-type BOP will be used to KOP
- From curve to TD the following will be added to the flanged casing; 11" 5,000 PSI kill spool, 11" 5,000 PSI blind ram-type BOP, 11" 5,000 PSI pipe ram-type BOP, and 11" 5,000 PSI annular-type BOP 11" 5,000 PSI casing head.

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D PERSONNEL WITH WELL CONTROL TRAINING

Throughout operations, the following Northeast Natural Energy representatives shall have and maintain IADC well control certification:

- Jay Hewitt – Drilling Manager
- Ian Costello – Completions Engineer
- Ryan Warner – Production Engineer
- Any onsite consultant hired to oversee drilling or completions operations

E SYSTEM OF MAINTAINING DETAILED RECORDS

A detailed Driller's Log shall be maintained, including but not limited to, lost circulation, the presence of hydrogen sulfide gas, fluid entry, kicks, and abnormal pressures.

F NOTIFICATION OF THE OFFICE OF OIL AND GAS

The WV DEP Office of Oil and Gas will be immediately notified of the presence of hydrogen sulfide gas above 10 ppm, significant kicks, or blow-out events.

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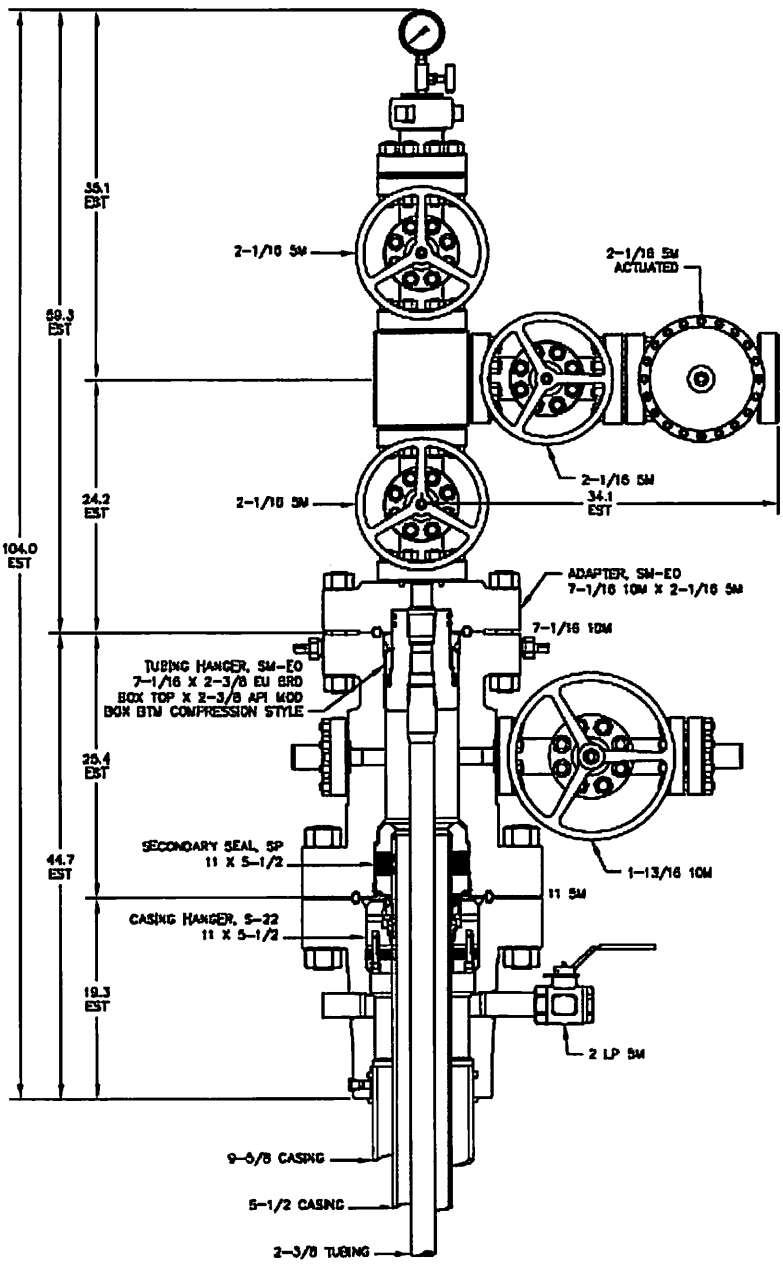
G WELL HEAD ASSEMBLY

A 5,000 PSI production tree will be placed upon the tubing spool after the drill out process. This unit will consist of, at a minimum and from bottom to top; one flanged 2-1/16" 5,000 PSI gated master valve, a studded three-way tee, a flanged 2-1/16" 5,000 PSI gated swab valve, and a 5,000 PSI flanged tree cap. The side outlet of the studded three-way tee shall include a flanged 2-1/16" 5,000 PSI gated wing valve. A schematic of the proposed wellhead and tree assembly is attached for reference.



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H WELL KILLING PROCEDURE

An oil-based synthetic drilling fluid will be utilized for the bottom and horizontal sections of the well. A total onsite volume of 1,600 Bbls (1.5 times the hole volume) will be maintained at 12.5 ppg. Enough weighting material, in the form of barite, will be kept onsite to increase the density of the entire volume of drilling mud by 1.0 ppg. This constitutes enough weighting material to initiate a 16 ppg slug, should a kick be encountered.

Dual-purpose paddle style mixing/reserve tanks will be used for the blending of mud additives and weighting material. A minimum of two units will be employed, with the final number based upon the drilling contractor selected.

The well will be drilled in an overbalanced manner to maintain control over formation fluids. Should a kick be detected, the well will be killed by either the IADC approved "Driller's Method" or "Wait and Weight" method. Bottomhole pressure will be calculated from SIDPP obtained post-kick, and the drilling fluid density will be increased by adding barite to the system and circulated throughout the wellbore when using the "Wait and Weight" method. After circulation with either method, the well will then be checked for flow, and if none is detected, then drilling operations will resume.

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Hydrogen Sulfide ("H_2S")

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A DETECTION, MONITORING AND WARNING EQUIPMENT

Based upon previous experience and history in the area, no H_2S is expected to be encountered during the drilling or completion activities of the MIP 3H. As a means of additional protection, mud loggers will be utilized during the drilling process to monitor any gas stream from the well through the flowline during the bottom and horizontal sections. Additional portable detection equipment shall be available on or near potential sources of explosive or hydrogen sulfide gases on the pad throughout all operations. Monitoring equipment shall be calibrated by and in accordance with the supplying contractor's guidelines. Detection of either shall sound an alarm which notifies personnel to shut in the well(s) and evacuate to the predetermined safe zone immediately.

B H_2S TRAINING

A safe zone upwind and away from the well will be established at the beginning of each tour. Personnel are trained to evacuate the well and gather at this safe zone immediately at the first sound of an H_2S explosive gas alarm.

When in a historically known area, or after H_2S is first detected, operations will halt, evacuation procedures will be followed, and all personnel will be trained for detailed H_2S protocols before operations begin or resume.

C NOTIFYING THE OFFICE OF OIL AND GAS

In the event that H2S is encountered, after all personnel have gathered in the safe zone, the onsite supervisor will take a head count, and then proper offsite notifications shall be made. The DEP Office of Oil and Gas will be notified by a phone call to both the local inspector and the emergency number.

D PROTECTION ZONES

A wind sock and/or flags will be utilized on location to identify wind direction, and safe zone upwind and away from the well will be established at the beginning of each tour. Personnel are trained to evacuate the well and gather at this safe zone immediately at the first sound of an H_2S explosive gas alarm.

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E LIST OF PERSONAL PROTECTIVE EQUIPMENT ("PPE")

Since drilling in a historically known area to not contain H2S through the intervals drilled, H2S specific PPE will not be kept on site. Centralized H2S alarms, and supplemental personal alarms, will be maintained and used throughout the drilling and completion process. Personnel on site will be notified to cease the current operation safely, shut-in all wells on the pad, and evacuate all personnel to the pre-determined safe zone at the first signal of H2S from these alarms. It is at this time that NNE personnel would assess the hazards, and bring in H2S specialists and PPE to mitigate the situation. Normal work would return to the pad after all personnel passed a specific H2S training and were equipped with the proper PPE.

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Flaring

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A FLARING PLAN

Post frac, a system of 2" and 3" Figure 1502 integrated-hammer pup joints will be assembled from the wellhead to a 5,000 PSI plug catcher and choke manifold. The choke manifold shall consist of two parallel adjustable chokes to control the initial flow of the well. Using the same construction iron, from the choke manifold, flow will enter a high capacity temporary production unit. The liquid fraction from the well will be diverted to gas buster equipped frac- tanks on location. All or part of the gas fraction from the well will be diverted to a thirty foot flare stack approximately 150' downwind of the wellhead. Any gas not diverted to a flare line shall be diverted to sales.

Iron pipe used in the flow/flare line assembly shall be banded at the joints with chain or steel cable. The flow/flare assembly shall be anchored in place by attachment to concrete blocks at vendor recommended intervals.

The flare stack will be equipped with an electronic ignition system, and a minimum of two backup ignition sticks will be kept on location at all times.

All gas diverted through the choke manifold shall either be burned through the flare stack or sent to sales. The local fire department will be given prior notice of the window in which gas flaring is to occur. They will also be notified immediately prior to lighting the flare, if possible, otherwise, as soon after lighting the flare as possible.

A 50' circumference shall be maintained around the flare stack which is to be kept free of flammable materials at all times prior to and during the flaring of any gas.

It is expected to flare the gas fraction of the well stream for a one week period.

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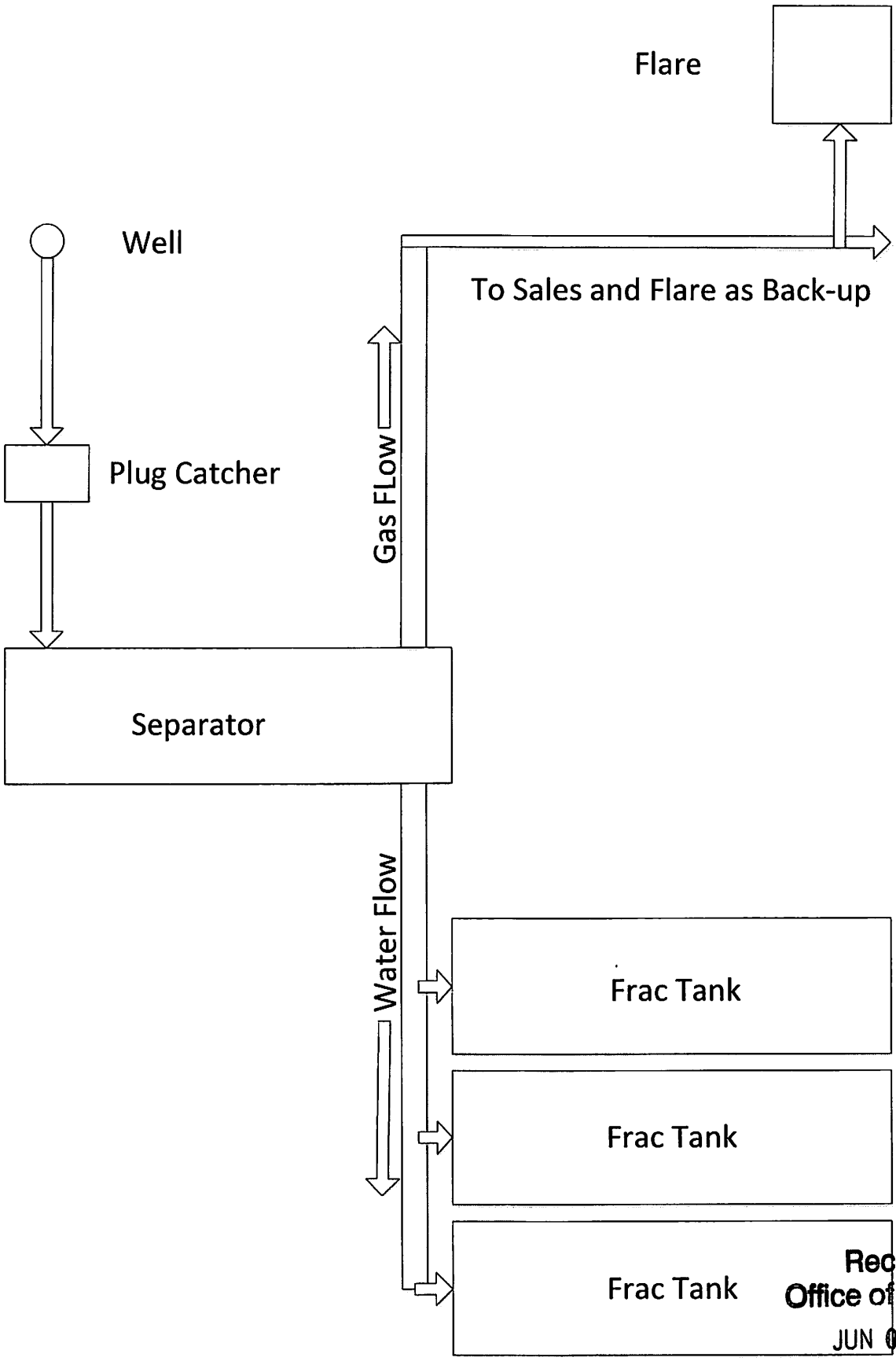

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Collision Avoidance Safeguards, Practices and Standards

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Scope of Work:

To ensure that wells are drilled in a safe manner that mitigates the risk of underground collisions on multi-well pads. Key portions of work will be described including roles, responsibilities and steps taken when returning to pads with existing producing or stimulated wells.

Definitions:

1) Proposed Wellbore- Involves sections of the vertical top-hole, the KOP, the lateral landing, and the lateral drilling to the total measured depth TMD.
2) Nudge- Technique generally used in the vertical top-hole section. The well path is nudged from vertical to pass areas of possible magnetic interferences and to reduce the risk of collision by maintaining separation with other wellbores.
3) KOP- Kick off Point. Diverting a well path from one trajectory to another
4) MWD- Measurement While Drilling
5) LWD- Logging While Drilling
6) EM - Electromagnetic Telemetry
7) SF- Separation Factor or Clearance Factor:
   $SF^* = CC \div [UR_{ref} + UR_{off}]$
   CC - Well separation distance (center to center of wellbores)
   UR_{ref} – radius ellipse of uncertainty on reference well
   UR_{off} – radius ellipse of uncertainty on offset well
   Note: ellipses are half-axes or radii.
   *Calculation options may be considered
8) TMD- Total Measured Depth
9) Gyro – High accuracy well bore survey instrument unaffected by magnetic interference.
10) QC / QA – Quality Control and Quality Assurance
11) HSE – Health Safety and the Environment
12) UBHO Sub – Universal Bottom Hole Orientation Sub

Established descriptions of risk:

1)	SF ≤ 1.0	Level 1	Extreme collision risk
2)	SF = 1.0 to 1.5	Level 2	High collision risk
3)	SF = 1.5 to 2.0	Level 3	Moderate collision risk
4)	SF > 2.0	Level 4	Low to no collision risk

*Please see attached directional schematic.

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Well Planning:

Prior to drilling any well, a directional plan will be developed to ensure that the well is properly placed with consideration to permits, lease limitations and future drilling considerations. The well should be planned to maintain a SF of ≥ 2.0 whenever possible. If a SF of <2.0 is encountered, additional risk mitigation steps may be required such as downhole mechanical barriers and increased survey frequency.

Survey Protocol:

When drilling wells on a pad without producing or stimulated wells, surveys will be taken every 500' in the vertical portion of the wellbore.

When drilling wells on pads with producing or stimulated wells, the survey frequency will be at a minimum of every 250' and will be increased as needed.

Tool Alignment Procedure:

All work groups responsible for the placement of the wellbore share responsibility in ensuring accuracy. The Company Representative, Directional Drilling Supervisor and Gyro Supervisor are all responsible for the alignment of the UBHO Sub and the motor to ensure that azimuthal directional is correct. All parties should visually verify the orientation of the shoe and agree upon a coordinate system and reference point. When possible, MWD tools will be used to minimize risk of incorrect orientation.

Directional Planning and Controls – Vertical Wellbore:

When drilling on pads without producing or stimulated wells, all wells should be planned with a minimum SF ≥ 1.5. Surveys should be taken at intervals of 500' to record the well path as it is drilled but the frequency can be increased if needed.

Drilling parameters should be held constant for the vertical portions of all wells to ensure the natural drilling path is similar for all wells on the pad.

Following the drilling of the vertical section of the wellbore, a gyro survey will be taken. Anti-collision software will be used to analyze this data to ensure safe wellbore spacing. Internally, Hawkeye will be used for tracking and planning 3D wellbore geometry and, as a redundancy, the directional company will utilize their own software to confirm results.

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If drilling wells on a pad with existing producing or completed wells, additional steps in directional planning may be required. If possible, all additional wells to an active pad should be planned with a SF ≥ 2.0. If a well cannot be planned in such a manner, additional means of risk mitigation will be considered including nudging the wellbores, use of MWD/EM, down hole barriers in at risk wells and increased survey frequency.

Directional Planning and Controls – Curve and Lateral Wellbore:

While drilling the curve and lateral portions of the wellbores, MWD technology will be used to ensure the well path is drilled according to the drilling plan and the state permit. Azimuth, gamma ray and other data will be collected and transmitted to surface. The information will be analyzed by the Directional Drilling Contractor, Company Representative, Drilling Manager and Geologist to ensure the quality of the data and proper interpretation.

The path of the well being drilled will be monitored in relationship to all adjacent wells to ensure adequate SF is maintained during the vertical, curve and horizontal portions of the wellbore.

Other Data:

Prior to drilling new wells on a pad, a site overview with the wellhead arrangement will be developed. Among the information that should be included is API number, surface footage separation and wellbore status. Additionally, all survey data for each existing well will be compiled for use in well planning.

Contingency Plans:

The wellbore being drilled will be monitored in relation to existing wellbores. Should the active well approach an existing well and the SF be < 1.5, drilling should be suspended until risks are mitigated by adjusting the directional plan, increasing survey frequency and verifying any necessary mechanical barriers are present in the adjacent wells. If a SF ≤1 is experienced, the WV DEP Office of Oil and Gas Regional Inspector will be immediately contacted.

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Should a collision occur, the WV DEP Office of Oil and Gas Regional Inspector will be immediately contacted, drilling will be suspended and all existing wells will be monitored for integrity. If a loss of pressure control in any well is experienced, Wild Well Control, or another professional well control company, will be contracted for technical support and services. If there is not a loss of pressure control, a separate well work procedure will be developed to repair or plug and abandon the effected wells.

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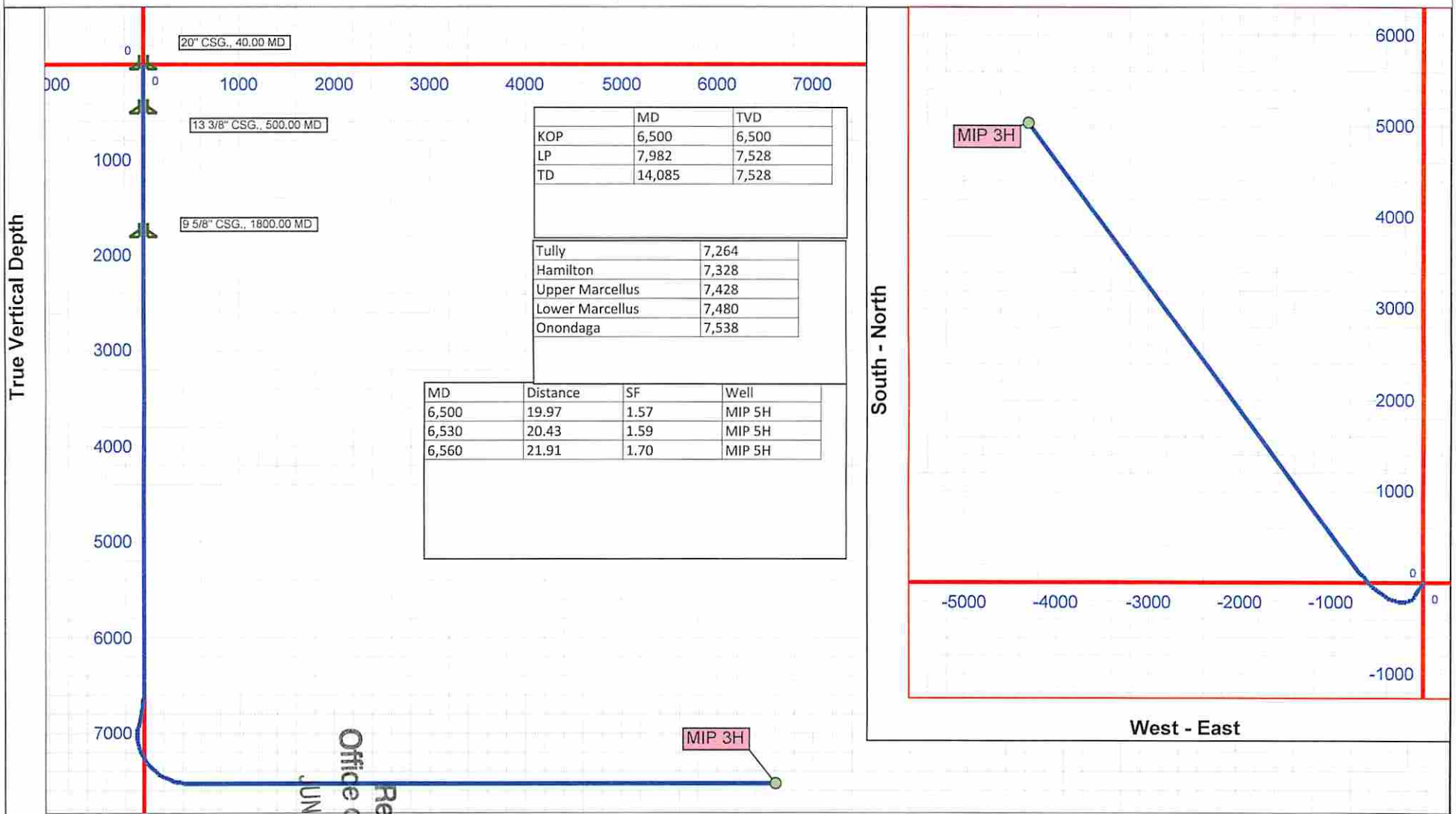
Job Number:
Company: Northeast Natural Energy
Lease/Well: MIP 3H
Location: MIP
Rig Name: Patterson 258
State/County: WV/ Mon
Country: US
API Number:

Elevation (To MSL): 1060.00 ft
RKB: 18.00 ft
Projection System: US State Plane 1983
Projection Group: West Virginia Northern Zone
Projection Datum: GRS80
Magnetic Declination: -9.02
Grid Convergence: -0.30366 W
Date: Tuesday, June 02, 2015



	MD	TVD
KOP	6,500	6,500
LP	7,982	7,528
TD	14,085	7,528

Tully	7,264
Hamilton	7,328
Upper Marcellus	7,428
Lower Marcellus	7,480
Onondaga	7,538

MD	Distance	SF	Well
6,500	19.97	1.57	MIP 5H
6,530	20.43	1.59	MIP 5H
6,560	21.91	1.70	MIP 5H

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