



State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Well Operator's Report of Well Work

API 47-051-01741 County Marshall District Franklin
Quad Powhatan Point Pad Name MND 3 Field/Pool Name NA
Farm name Consol Mining Co., LLC Well Number MND 3 EHS
Operator (as registered with the OOG) Noble Energy, Inc.
Address 333 Technology Drive, Suite 116 City Canonsburg State PA Zip 15317

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4411175.91 Easting 517790.62
Landing Point of Curve Northing 4411017.80 Easting 517908.76
Bottom Hole Northing 4409567.47 Easting 518952.59

Elevation (ft) 1128.39' GL Type of Well New Existing Type of Report Interim Final
Permit Type Deviated Horizontal Horizontal 6A Vertical Depth Type Deep Shallow
Type of Operation Convert Deepen Drill Plug Back Redrilling Rework Stimulate
Well Type Brine Disposal CBM Gas Oil Secondary Recovery Solution Mining Storage Other _____
Type of Completion Single Multiple Fluids Produced Brine Gas NGL Oil Other _____
Drilled with Cable Rotary

Drilling Media Surface hole Air Mud Fresh Water Intermediate hole Air Mud Fresh Water Brine
Production hole Air Mud Fresh Water Brine
Mud Type(s) and Additive(s)
Synthetic Oil Based

Date permit issued 3/25/2014 Date drilling commenced 4/16/2014 Date drilling ceased 7/30/2014
Date completion activities began 10/23/2014 Date completion activities ceased 12/11/2014
Verbal plugging (Y/N) N Date permission granted _____ Granted by _____

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 165' and 298' Open mine(s) (Y/N) depths N
Salt water depth(s) ft None noted for Offsets Void(s) encountered (Y/N) depths N
Coal depth(s) ft 612' Pittsburgh Base Cavern(s) encountered (Y/N) depths _____
Is coal being mined in area (Y/N) Y - Ireland Mine

RECEIVED
Office of Oil and Gas
FEB 02 2015
WV Department of
Environmental Protection

Reviewed by: _____

API 47-051 - 01741 Farm name Consol Mining Co., LLC Well number MND 3 EHS

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	36	30	40	N			
Surface	24	20	404.8	N	J-55 94#		Y
Coal							
Intermediate 1	17 1/2	13 3/8	1,079.0	N	J-55 54.5#		Y
Intermediate 2	12 3/8	9 5/8	2,617.0	N	K 55 36#		Y
Intermediate 3							
Production	8 3/4	5 1/2	11,841.0	N	P-110 20#		Y
Tubing							
Packer type and depth set							

Comment Details _____

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor							
Surface	Type I	559	15.6	1.21	120.0	0	8
Coal							
Intermediate 1	Class A	929	15.6	1.19	196.9	0	8
Intermediate 2	Class A	890	15.6	1.19	187.0	0	8
Intermediate 3							
Production	Class A	Lead - 1025 Tail - 1280	Lead 14.2 Tail 15.0	Lead - 1.32 Tail - 1.30	Lead 241.0 - Tail 296.0	2,629.0	8
Tubing							

Drillers TD (ft) 12,436 Loggers TD (ft) 12,411

Deepest formation penetrated Marcellus Plug back to (ft) Not a Pilot Hole

Plug back procedure Not a Pilot Hole

Kick off depth (ft) 7,125

Check all wireline logs run caliper density deviated/directional induction
 neutron resistivity gamma ray temperature sonic

Well cored Yes No Conventional Sidewall Were cuttings collected Yes No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING _____

4 Centralizers on Surface Casing, 9 Centralizers on Intermediate 1 Casing, 22 Centralizer used on the Intermediate 2 String, and on the Production 250 Centralizers were utilized.

On the Surface and Intermediate strings the centralizers are on every 3 joint of casing.

On the Production String, they are on every 3rd joint from the Surface to Top of Curve, then every joint until TD.

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____

API 47- 051 - 01741 Farm name Consol Mining Co., LLC Well number MND 3 EHS

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
	PLEASE SEE ATTACHED PERFORATION RECORD				

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
	PLEASE SEE ATTACHED STIMULATION INFORMATION							

Please insert additional pages as applicable.

Perforation Record

API: 47-051-01741

Farm name:

Consol Mining Co.
LLC.

Well Name: MND-3E-HS

Stage No.	Stim Date	Top Perf	Bottom Perf	# of Perfs	Formation
Toe Prep Inj Test	10/28/2014	11,489	11,626	45	Marcellus
1	10/29/2014	12,009	12,169	48	Marcellus
2	10/29/2014	11,746	11,943	48	Marcellus
3	10/29/2014	11,512	11,659	36	Marcellus
4	10/30/2014	11,286	11,446	48	Marcellus
5	10/30/2014	10,992	11,228	48	Marcellus
6	10/30/2014	10,763	10,930	45	Marcellus
7	10/31/2014	10,470	10,698	48	Marcellus
8	10/31/2014	10,177	10,404	48	Marcellus
9	10/31/2014	9,949	10,111	45	Marcellus
10	11/1/2014	9,581	9,815	50	Marcellus
11A	11/1/2014	9,280	9,510	48	Marcellus
11B	11/1/2014	-	-	-	Marcellus
12	11/1/2014	9,019	9,213	48	Marcellus
13	11/2/2014	8,746	8,953	48	Marcellus
14	11/2/2014	8,455	8,658	48	Marcellus
15	11/2/2014	8,157	8,363	48	Marcellus
16	11/3/2014	7,840	8,069	48	Marcellus
17	11/3/2014	7,573	7,773	48	Marcellus
18	11/3/2014	7,272	7,475	48	Marcellus
19	11/3/2014	7,053	7,187	45	Marcellus
20	11/4/2014	6,818	6,977	48	Marcellus
21	11/4/2014	-	-	-	Marcellus

STIMULATION INFORMATION PER STAGE

API: 47-051-01741

Farm name: Consol Mining Co.
LLC.

Well Name: MND-3E-HS

Stage No.	Stim Date	Avg Rate (bpm)	ATP (psi)	Max BD Pressure	ISIP (psi)	Proppant (lbs)	Water (BBLS)	Amount of N ² / other (units)
Toe Prep Inj Test	10/28/2014	20.7	7,571	8,987	4,530	-	439.50	
1	10/29/2014	89.9	7,139	6,187	3,410	403,006	9,259.27	
2	10/29/2014	91	7,416	6,242	3,264	502,112	10,171.23	
3	10/29/2014	88.3	8,220	5,774	3,712	400,497	9,864.20	
4	10/30/2014	75.5	7,144	5,732	5,075	403,814	11,732.85	
5	10/30/2014	71.3	9,623	6,100	7,278	102,561	7,034.43	
6	10/30/2014	64.2	9,936	5,699	3,379	499,548	16,446.36	
7	10/31/2014	82.3	8,322	5,555	3,755	600,734	13,799.82	
8	10/31/2014	88.5	7,808	5,978	3,647	600,725	12,829.79	
9	10/31/2014	68.1	9,276	5,585	3,769	500,003	16,989.71	
10	11/1/2014	89.5	7,154	5,501	3,844	600,504	12,509.93	
11A	11/1/2014	64.8	10,016	5,749	6,411	17,142	9,276.51	
11B	11/1/2014	89.8	8,546	-	3,994	589,430	12,461.48	
12	11/1/2014	70.9	8,360	5,745	4,078	501,766	17,703.97	
13	11/2/2014	88.7	7,371	5,477	3,551	602,181	12,898.24	
14	11/2/2014	75.8	8,061	5,721	3,896	605,968	17,814.21	
15	11/2/2014	88.7	6,947	5,655	4,114	596,834	12,163.54	
16	11/3/2014	88.9	7,149	5,292	4,108	415,918	9,906.30	
17	11/3/2014	89	7,094	5,713	4,378	602,430	11,890.31	
18	11/3/2014	69.6	8,948	6,202	3,625	499,427	12,011.14	
19	11/3/2014	61.3	9,287	5,778	4,601	500,350	16,456.91	
20	11/4/2014	74.5	7,833	5,293	4,797	396,097	12,123.64	
21	11/4/2014	-	-	-	-	-	23.28	

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<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>		
<u>Marcellus</u>	<u>6,271</u>	<u>TVD</u>	<u>12,436</u> <u>MD</u>
_____	_____	_____	_____
_____	_____	_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface _____ psi Bottom Hole _____ psi DURATION OF TEST _____ hrs

OPEN FLOW Gas 2,208 mcfpd Oil 624 bpd NGL 302 bpd Water 912 bpd GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP DEPTH IN FT	BOTTOM DEPTH IN FT	TOP DEPTH IN FT	BOTTOM DEPTH IN FT	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
	NAME TVD	TVD	MD	MD	
	0		0		
PLEASE SEE ATTACHED FORMATION SHEET					

Please insert additional pages as applicable.

Drilling Contractor Precision Drilling Company
Address 5400 D Big Tyler Road City Charleston State WV Zip 25313

Logging Company _____
Address _____ City _____ State _____ Zip _____

Cementing Company Schlumberger
Address 4600 J Barry Court, Suite 200 City Canonsburg State PA Zip 15317

Stimulating Company Halliburton Energy SRCS
Address 121 Champion Way, Suite 110 City Canonsburg State PA Zip 15317

Please insert additional pages as applicable.

Completed by Regina A. Logue Telephone 724-820-3559
Signature Regina A. Logue Title Regulatory Analyst Date 1/27/15

Submission of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

MND 3E 47-051-01741

Formations	Top TVD	Base TVD	Top MD	Base MD	Fluid
Shale and Sandstone	0	606	0	606	
Pittsburgh Coal	606	616	606	616	
Shale and Sandstone	616	1069	616	1069	
Dunkard Sand	1069	1090	1069	1090	
Shale	1090	1239	1090	1239	
Gas Sand	1239	1310	1239	1310	
Shale	1310	1379	1310	1379	
1st Salt Sand	1379	1395	1379	1395	
Shale	1395	1502	1395	1502	
2nd Salt Sand	1502	1531	1502	1531	
Shale and Sandstone	1531	1661	1531	1661	
Maxton Sand	1661	1708	1661	1708	
Shale	1708	1726	1708	5044	
Big Lime	1726	1798	1726	5120	
Big Injun	1798	2068	1798	5711	
Price	2068	2166	2068	6033	
Murrysville	2166	2273	2166	6107	
Shale and Sandstone	2273	2811	2273	6131	
Gordon	2811	2841	2811	6194	
Shale and Sandstone	2841	3362	2841	6220	
Fifth Sand	3362	3415	3363	6247	
Shale and Sandstone	3415	4217	3416	not encountered	
Warren Sand	4217	4226	4226	not encountered	
Shale	4226	4943	4236	not encountered	
Java Shale	4943	5027	4960	not encountered	
Pipe Creek Shale	5027	5102	5044	5120	
Angola Shale	5102	5686	5120	5711	
Rhinestreet	5686	6005	5711	6033	
Cashaqua	6005	6077	6033	6107	
Middlesex	6077	6100	6107	6131	
West River	6100	6161	6131	6194	
Burkett	6161	6185	6194	6220	
Tully Limestone	6185	6211	6220	6247	Gas
Hamilton	6211	6246	6247	not encountered	
Marcellus	6246	6299	not encountered	not encountered	
Onondaga	6299		not encountered	not encountered	

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	10/28/2014
Job End Date:	11/4/2014
State:	West Virginia
County:	Marshall
API Number:	47-051-01741-00-00
Operator Name:	Noble Energy, Inc.
Well Name and Number:	MND 3 E
Longitude:	-80.79222200
Latitude:	39.85034200
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	6,271
Total Base Water Volume (gal):	11,163,877
Total Base Non Water Volume:	0



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Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Fresh Water	Operator	Base Fluid					
			Fresh Water	7732-18-5	100.00000	89.44599	Density = 8.330
SAND - PREMIUM WHITE	Halliburton	Proppant					
			Crystalline silica, quartz	14808-60-7	100.00000	7.66329	
SAND - COMMON WHITE	Halliburton	Proppant					
			Crystalline silica, quartz	14808-60-7	100.00000	1.95830	
HYDROCHLORIC ACID 5-10%	Halliburton	Solvent					
			Hydrochloric acid	7647-01-0	10.00000	0.07227	
FR-66	Halliburton	Friction Reducer					
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.02518	
HYDROCHLORIC ACID 10-30%	Halliburton	Solvent					
			Hydrochloric acid	7647-01-0	30.00000	0.01549	
FE-1A ACIDIZING COMPOSITION	Halliburton	Additive					
			Acetic anhydride	108-24-7	100.00000	0.00401	
			Acetic acid	64-19-7	60.00000	0.00240	
BE-9W	Halliburton	Biocide					

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			Tributyl tetradecyl phosphonium chloride	81741-28-8	10.00000	0.00361	
Scalechek® LP-65 Scale Inhibitor	Halliburton	Scale Inhibitor					
			Ammonium chloride	12125-02-9	10.00000	0.00253	
LoSurf-300D	Halliburton	Non-ionic Surfactant					
			Ethanol	64-17-5	60.00000	0.00043	
			Heavy aromatic petroleum naphtha	64742-94-5	30.00000	0.00021	
			Poly(oxy-1,2-ethanediyl), alpha-(4-nonylphenyl)-omega-hydroxy-, branched	127087-87-0	5.00000	0.00004	
			Naphthalene	91-20-3	5.00000	0.00004	
			1,2,4 Trimethylbenzene	95-63-6	1.00000	0.00001	
BE-9	Halliburton	Biocide					
			Tributyl tetradecyl phosphonium chloride	81741-28-8	10.00000	0.00068	
HAI-OS ACID INHIBITOR	Halliburton	Corrosion Inhibitor					
			Methanol	67-56-1	60.00000	0.00042	
			Propargyl alcohol	107-19-7	10.00000	0.00007	
LGC-36 UC	Halliburton	Liquid Gel Concentrate					
			Naphtha, hydrotreated heavy	64742-48-9	60.00000	0.00018	
			Guar gum	9000-30-0	60.00000	0.00018	
Biovert NWB	Halliburton	Viscosifier					
			Poly lactide resin	Confidential	100.00000	0.00012	Denise Tuck, Halliburton 3000 N. Sam Houston Pkwy E., Houston, TX 77032 281-871-6226
SP BREAKER	Halliburton	Breaker					
			Sodium persulfate	7775-27-1	100.00000	0.00001	
Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.							
		Other Ingredient(s)					
			Water	7732-18-5		0.88286	
		Other Ingredient(s)					
			Polyacrylamide copolymer	Confidential		0.02518	
		Other Ingredient(s)					
			Propylene glycol	57-55-6		0.02166	
		Other Ingredient(s)					
			Organic phosphonate	Confidential		0.01519	
		Other Ingredient(s)					
			Fatty acid tall oil amide	Confidential		0.00420	
		Other Ingredient(s)					
			Alcohols, C12-16, ethoxylated	68551-12-2		0.00420	
		Other Ingredient(s)					
			Ammonium chloride	12125-02-9		0.00420	
		Other Ingredient(s)					

		Sodium chloride	7647-14-5		0.00420
	Other Ingredient(s)				
		Sorbitan monooleate polyoxyethylene derivative	9005-65-6		0.00084
	Other Ingredient(s)				
		Sorbitan, mono-9-octadecenoate, (Z)	1338-43-8		0.00084
	Other Ingredient(s)				
		Formaldehyde	50-00-0		0.00025
	Other Ingredient(s)				
		Oxyalkylated phenolic resin	Confidential		0.00021
	Other Ingredient(s)				
		Alcohols, C14-C15, ethoxylated	68951-67-7		0.00021
	Other Ingredient(s)				
		Reaction product of acetophenone, formaldehyde, thiourea and oleic acid in dimethyl formamide	68527-49-1		0.00021
	Other Ingredient(s)				
		Fatty acids, tail oil	Confidential		0.00021
	Other Ingredient(s)				
		Oxyalkylated phenolic resin	Confidential		0.00007
	Other Ingredient(s)				
		Olefins	Confidential		0.00004
	Other Ingredient(s)				
		Olefins	Confidential		0.00004
	Other Ingredient(s)				
		Quaternary ammonium compounds, bis(hydrogenated tallow alkyl) dimethyl, salts with bentonite	68953-58-2		0.00001
	Other Ingredient(s)				
		Olefins	Confidential		0.00001
	Other Ingredient(s)				
		Olefins	Confidential		0.00001
	Other Ingredient(s)				
		Fatty alcohol polyglycol ether surfactant	9043-30-5		0.00000
	Other Ingredient(s)				
		Crystalline silica, quartz	14808-60-7		0.00000
	Other Ingredient(s)				
		Sodium sulfate	7757-82-6		0.00000

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* Total Water Volume sources may include fresh water, produced water, and/or recycled water
 ** Information is based on the maximum potential for concentration and thus the total may be over 100%

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.
 Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)



Actual Wellpath Report

MND-3E-HS AWP Proj: 12436'
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REFERENCE WELLPATH IDENTIFICATION			
Operator	NOBLE ENERGY	Slot	Slot E
Area	Marshall County, WV	Well	MND-3E-HS
Field	Marshall	Wellbore	MND-3E-HS AWB
Facility	MND-3 Pad		

REPORT SETUP INFORMATION			
Projection System	NAD27 / Lambert West Virginia SP, Northern Zone (4701), US feet	Software System	WellArchitect® 4.0.1
North Reference	Grid	User	Kroschr
Scale	0.999948	Report Generated	8/20/2014 at 9:39:53 AM
Convergence at slot	0.82° West	Database/Source file	WA_NorthEast/MND-3E-HS_AWB.xml

WELLPATH LOCATION						
	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	-48.66	-35.00	1637199.73	494437.91	39°51'01.231"N	80°47'32.000"W
Facility Reference Pt			1637234.73	494486.57	39°51'01.717"N	80°47'31.561"W
Field Reference Pt			609601.22	0.00	38°23'48.753"N	84°21'09.765"W

WELLPATH DATUM			
Calculation method	Minimum curvature	Precision 543 (RKB) to Facility Vertical Datum	1134.21ft
Horizontal Reference Pt	Slot	Precision 543 (RKB) to Mean Sea Level	1134.21ft
Vertical Reference Pt	Precision 543 (RKB)	Precision 543 (RKB) to Mud Line at Slot (Slot E)	18.50ft
MD Reference Pt	Precision 543 (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	145.00°



Actual Wellpath Report
 MND-3E-HS AWP Proj: 12436'
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REFERENCE WELLPATH IDENTIFICATION					
Operator	NOBLE ENERGY			Slot	Slot E
Area	Marshall County, WV			Well	MND-3E-HS
Field	Marshall			Wellbore	MND-3E-HS AWB
Facility	MND-3 Pad				

WELLPATH DATA (148 stations) † = interpolated/extrapolated station														
MD [ft]	Course Length [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]
0.00†	0.00	0.000	90.320	0.00	0.00	0.00	0.00	1637199.73	494437.91	39°51'01.231"N	80°47'32.000"W	0.00	0.000	0.00
18.50	18.50	0.000	90.320	18.50	0.00	0.00	0.00	1637199.73	494437.91	39°51'01.231"N	80°47'32.000"W	0.00	0.000	0.00
109.50	91.00	0.360	90.320	109.50	0.17	0.00	0.29	1637200.02	494437.91	39°51'01.231"N	80°47'31.997"W	0.29	90.320	0.40
209.50	100.00	0.500	88.970	209.50	0.59	0.00	1.04	1637200.77	494437.91	39°51'01.231"N	80°47'31.987"W	1.04	89.752	0.14
309.50	100.00	0.170	94.040	309.49	0.93	0.00	1.62	1637201.35	494437.91	39°51'01.231"N	80°47'31.980"W	1.62	89.933	0.33
409.50	100.00	0.590	106.260	409.49	1.42	-0.15	2.26	1637201.99	494437.76	39°51'01.230"N	80°47'31.971"W	2.27	93.861	0.43
509.50	100.00	0.530	104.620	509.49	2.18	-0.41	3.20	1637202.93	494437.50	39°51'01.227"N	80°47'31.959"W	3.23	97.355	0.06
574.50	65.00	0.860	103.130	574.48	2.77	-0.60	3.97	1637203.70	494437.31	39°51'01.226"N	80°47'31.949"W	4.02	98.598	0.51
611.00	36.50	0.820	133.410	610.98	3.23	-0.84	4.43	1637204.16	494437.07	39°51'01.223"N	80°47'31.943"W	4.51	100.769	1.21
651.00	40.00	0.940	130.250	650.97	3.83	-1.25	4.89	1637204.62	494436.66	39°51'01.219"N	80°47'31.937"W	5.04	104.360	0.32
741.00	90.00	0.820	181.400	740.96	5.06	-2.37	5.43	1637205.16	494435.54	39°51'01.208"N	80°47'31.930"W	5.93	113.581	0.85
830.00	89.00	1.880	227.610	829.94	5.76	-3.99	4.34	1637204.07	494433.92	39°51'01.192"N	80°47'31.944"W	5.90	132.617	1.62
921.00	91.00	2.410	237.410	920.88	5.87	-6.03	1.62	1637201.35	494431.88	39°51'01.172"N	80°47'31.978"W	6.24	164.919	0.71
965.00	44.00	2.270	247.100	964.84	5.65	-6.87	0.04	1637199.77	494431.04	39°51'01.163"N	80°47'31.998"W	6.87	179.645	0.95
1010.00	45.00	2.020	257.740	1009.81	5.16	-7.38	-1.55	1637198.18	494430.53	39°51'01.158"N	80°47'32.019"W	7.54	191.883	1.04
1055.00	45.00	1.390	267.620	1054.79	4.56	-7.57	-2.87	1637196.86	494430.34	39°51'01.156"N	80°47'32.036"W	8.10	200.780	1.54
1099.00	44.00	0.850	40.730	1098.79	4.19	-7.35	-3.19	1637196.54	494430.56	39°51'01.158"N	80°47'32.040"W	8.01	203.494	4.70
1144.00	45.00	2.530	76.540	1143.76	4.47	-6.86	-2.01	1637197.72	494431.05	39°51'01.163"N	80°47'32.025"W	7.15	196.324	4.24
1189.00	45.00	3.960	89.490	1188.69	5.71	-6.62	0.51	1637200.24	494431.29	39°51'01.166"N	80°47'31.993"W	6.64	175.596	3.55
1235.00	46.00	4.760	90.280	1234.56	7.72	-6.61	4.01	1637203.74	494431.30	39°51'01.166"N	80°47'31.948"W	7.73	148.793	1.74
1280.00	45.00	5.230	97.950	1279.39	10.19	-6.91	7.91	1637207.63	494431.00	39°51'01.164"N	80°47'31.898"W	10.50	131.144	1.81
1323.00	43.00	5.510	109.620	1322.20	13.21	-7.87	11.79	1637211.52	494430.04	39°51'01.155"N	80°47'31.848"W	14.18	123.725	2.62
1368.00	45.00	5.310	122.690	1367.00	16.90	-9.72	15.58	1637215.31	494428.19	39°51'01.137"N	80°47'31.799"W	18.36	121.965	2.77
1457.00	89.00	4.830	144.300	1455.66	24.46	-14.99	21.23	1637220.96	494422.92	39°51'01.086"N	80°47'31.725"W	25.99	125.221	2.20
1542.00	85.00	3.310	166.350	1540.45	30.32	-20.28	23.90	1637223.63	494417.63	39°51'01.034"N	80°47'31.690"W	31.34	130.317	2.54
1587.00	45.00	3.090	169.800	1585.38	32.63	-22.74	24.42	1637224.15	494415.18	39°51'01.010"N	80°47'31.683"W	33.37	132.954	0.65
1676.00	89.00	3.540	162.190	1674.23	37.43	-27.71	25.69	1637225.41	494410.20	39°51'00.961"N	80°47'31.666"W	37.79	137.174	0.71
1765.00	89.00	4.110	160.610	1763.03	43.13	-33.34	27.58	1637227.31	494404.57	39°51'00.906"N	80°47'31.640"W	43.27	140.394	0.65
1855.00	90.00	3.160	156.530	1852.85	48.67	-38.66	29.64	1637229.37	494399.26	39°51'00.853"N	80°47'31.613"W	48.71	142.517	1.09
1945.00	90.00	1.720	120.210	1942.77	52.32	-41.61	31.80	1637231.53	494396.30	39°51'00.824"N	80°47'31.585"W	52.37	142.613	2.27



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REFERENCE WELLPATH IDENTIFICATION			
Operator	NOBLE ENERGY	Slot	Slot E
Area	Marshall County, WV	Well	MND-3E-HS
Field	Marshall	Wellbore	MND-3E-HS AWB
Facility	MND-3 Pad		

WELLPATH DATA (148 stations)														
MD [ft]	Course Length [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]
2034.00	89.00	2.180	92.770	2031.72	54.57	-42.36	34.64	1637234.37	494395.55	39°51'00.817"N	80°47'31.548"W	54.73	140.725	1.15
2123.00	89.00	2.160	92.870	2120.66	56.64	-42.53	38.01	1637237.74	494395.38	39°51'00.816"N	80°47'31.505"W	57.04	138.212	0.02
2212.00	89.00	1.700	128.090	2209.61	58.93	-43.43	40.72	1637240.45	494394.48	39°51'00.808"N	80°47'31.470"W	59.54	136.841	1.40
2302.00	90.00	2.110	146.760	2299.56	61.87	-45.64	42.68	1637242.41	494392.27	39°51'00.786"N	80°47'31.445"W	62.49	136.916	0.82
2391.00	89.00	1.660	141.360	2388.51	64.79	-48.02	44.39	1637244.11	494389.90	39°51'00.763"N	80°47'31.422"W	65.39	137.249	0.54
2481.00	90.00	1.220	131.960	2478.48	67.02	-49.67	45.91	1637245.64	494388.24	39°51'00.747"N	80°47'31.403"W	67.64	137.253	0.55
2569.00	88.00	1.420	137.110	2566.46	69.02	-51.10	47.35	1637247.08	494386.81	39°51'00.733"N	80°47'31.384"W	69.67	137.180	0.26
2671.00	102.00	1.170	122.130	2668.43	71.23	-52.58	49.09	1637248.82	494385.33	39°51'00.718"N	80°47'31.361"W	71.94	136.964	0.41
2715.00	44.00	0.820	129.920	2712.43	71.95	-53.02	49.72	1637249.44	494384.89	39°51'00.714"N	80°47'31.353"W	72.68	136.842	0.85
2804.00	89.00	0.320	104.600	2801.42	72.75	-53.49	50.44	1637250.17	494384.42	39°51'00.710"N	80°47'31.344"W	73.52	136.679	0.62
2894.00	90.00	0.310	178.610	2891.42	73.15	-53.80	50.69	1637250.42	494384.11	39°51'00.707"N	80°47'31.340"W	73.92	136.702	0.42
2983.00	89.00	0.390	258.390	2980.42	73.23	-54.10	50.40	1637250.13	494383.81	39°51'00.704"N	80°47'31.344"W	73.94	137.026	0.51
3073.00	90.00	0.310	318.330	3070.42	72.86	-53.98	49.94	1637249.67	494383.93	39°51'00.705"N	80°47'31.350"W	73.54	137.226	0.40
3162.00	89.00	0.700	14.550	3159.42	72.27	-53.27	49.92	1637249.64	494384.64	39°51'00.712"N	80°47'31.351"W	73.01	136.863	0.66
3252.00	90.00	0.540	6.700	3249.41	71.60	-52.32	50.10	1637249.83	494385.59	39°51'00.721"N	80°47'31.348"W	72.44	136.239	0.20
3341.00	89.00	0.500	344.100	3338.41	70.92	-51.53	50.05	1637249.77	494386.38	39°51'00.729"N	80°47'31.349"W	71.83	135.836	0.23
3430.00	89.00	0.750	337.760	3427.40	69.98	-50.62	49.72	1637249.45	494387.30	39°51'00.738"N	80°47'31.354"W	70.95	135.512	0.29
3520.00	90.00	0.980	344.990	3517.39	68.68	-49.33	49.30	1637249.03	494388.58	39°51'00.751"N	80°47'31.359"W	69.74	135.018	0.28
3609.00	89.00	0.700	327.930	3606.38	67.43	-48.13	48.81	1637248.54	494389.78	39°51'00.762"N	80°47'31.366"W	68.55	134.599	0.42
3699.00	90.00	1.080	315.350	3696.37	66.04	-47.06	47.92	1637247.65	494390.85	39°51'00.773"N	80°47'31.377"W	67.17	134.481	0.47
3788.00	89.00	0.960	298.510	3785.36	64.55	-46.11	46.68	1637246.41	494391.80	39°51'00.782"N	80°47'31.393"W	65.61	134.649	0.36
3878.00	90.00	1.080	297.860	3875.34	63.12	-45.35	45.27	1637244.99	494392.56	39°51'00.789"N	80°47'31.412"W	64.08	135.055	0.13
3967.00	89.00	0.540	311.260	3964.33	61.96	-44.69	44.21	1637243.94	494393.23	39°51'00.796"N	80°47'31.425"W	62.86	135.307	0.64
4057.00	90.00	1.300	332.590	4054.32	60.54	-43.50	43.42	1637243.15	494394.41	39°51'00.807"N	80°47'31.436"W	61.46	135.052	0.91
4146.00	89.00	0.180	120.350	4143.32	59.67	-42.67	43.08	1637242.81	494395.24	39°51'00.815"N	80°47'31.440"W	60.64	134.731	1.64
4236.00	90.00	0.190	184.300	4233.31	59.91	-42.89	43.19	1637242.92	494395.02	39°51'00.813"N	80°47'31.439"W	60.87	134.805	0.22
4325.00	89.00	0.040	170.110	4322.31	60.05	-43.07	43.18	1637242.91	494394.84	39°51'00.812"N	80°47'31.439"W	60.99	134.927	0.17
4415.00	90.00	0.310	119.350	4412.31	60.30	-43.22	43.40	1637243.13	494394.69	39°51'00.810"N	80°47'31.436"W	61.25	134.883	0.32
4504.00	89.00	0.400	295.140	4501.31	60.25	-43.21	43.33	1637243.06	494394.70	39°51'00.810"N	80°47'31.437"W	61.19	134.921	0.80
4594.00	90.00	0.560	282.990	4591.31	59.65	-42.98	42.62	1637242.34	494394.94	39°51'00.812"N	80°47'31.446"W	60.52	135.242	0.21



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REFERENCE WELLPATH IDENTIFICATION			
Operator	NOBLE ENERGY	Slot	Slot E
Area	Marshall County, WV	Well	MND-3E-HS
Field	Marshall	Wellbore	MND-3E-HS AWB
Facility	MND-3 Pad		

WELLPATH DATA (148 stations)														
MD [ft]	Course Length [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS ["/100ft]
4683.00	89.00	0.700	275.860	4680.31	58.97	-42.82	41.65	1637241.38	494395.09	39°51'00.814"N	80°47'31.458"W	59.74	135.795	0.18
4773.00	90.00	0.860	277.970	4770.30	58.15	-42.67	40.44	1637240.16	494395.24	39°51'00.815"N	80°47'31.474"W	58.79	136.543	0.18
4863.00	90.00	2.450	315.650	4860.26	55.79	-41.20	38.42	1637238.15	494396.71	39°51'00.829"N	80°47'31.500"W	56.34	137.001	2.05
4952.00	89.00	5.460	318.350	4949.04	49.71	-36.68	34.28	1637234.01	494401.23	39°51'00.873"N	80°47'31.554"W	50.20	136.939	3.39
5042.00	90.00	5.420	315.600	5038.63	41.26	-30.44	28.46	1637228.19	494407.47	39°51'00.934"N	80°47'31.630"W	41.67	136.931	0.29
5131.00	89.00	6.510	323.160	5127.15	32.07	-23.40	22.49	1637222.22	494414.51	39°51'01.003"N	80°47'31.708"W	32.46	136.136	1.51
5221.00	90.00	7.300	325.540	5216.50	21.25	-14.60	16.20	1637215.93	494423.31	39°51'01.089"N	80°47'31.790"W	21.81	132.039	0.93
5310.00	89.00	7.610	321.320	5304.74	9.72	-5.34	9.31	1637209.04	494432.57	39°51'01.180"N	80°47'31.880"W	10.74	119.831	0.71
5355.00	45.00	8.250	321.420	5349.31	3.52	-0.49	5.44	1637205.17	494437.42	39°51'01.227"N	80°47'31.930"W	5.46	95.157	1.42
5490.00	135.00	1.880	304.780	5483.72	-8.24	8.35	-2.43	1637197.30	494446.26	39°51'01.313"N	80°47'32.033"W	8.70	343.788	4.79
5579.00	89.00	7.580	165.660	5572.49	-4.10	3.49	-2.17	1637197.56	494441.40	39°51'01.265"N	80°47'32.029"W	4.11	328.079	10.21
5669.00	90.00	12.780	156.000	5661.05	11.23	-11.37	3.35	1637203.08	494426.54	39°51'01.119"N	80°47'31.955"W	11.85	163.581	6.06
5758.00	89.00	19.770	139.660	5746.48	35.93	-31.87	17.12	1637216.85	494406.04	39°51'00.919"N	80°47'31.775"W	36.18	151.754	9.32
5847.00	89.00	27.250	138.280	5828.03	71.20	-58.59	40.46	1637240.19	494379.33	39°51'00.658"N	80°47'31.471"W	71.20	145.373	8.43
5937.00	90.00	35.500	137.440	5904.81	117.65	-93.27	71.90	1637271.62	494344.64	39°51'00.320"N	80°47'31.061"W	117.77	142.374	9.18
6026.00	89.00	43.300	139.360	5973.53	173.72	-135.53	109.31	1637309.04	494302.38	39°50'59.907"N	80°47'30.574"W	174.12	141.113	8.87
6116.00	90.00	52.060	143.340	6034.08	240.05	-187.53	150.69	1637350.41	494250.39	39°50'59.399"N	80°47'30.034"W	240.58	141.217	10.26
6206.00	90.00	58.260	146.080	6085.48	313.87	-247.83	193.28	1637393.00	494190.10	39°50'58.810"N	80°47'29.477"W	314.29	142.049	7.33
6295.00	89.00	63.550	145.460	6128.74	391.61	-312.10	237.02	1637436.74	494125.83	39°50'58.181"N	80°47'28.904"W	391.90	142.785	5.97
6384.00	89.00	70.120	145.620	6165.73	473.38	-379.53	283.30	1637483.01	494058.40	39°50'57.521"N	80°47'28.298"W	473.60	143.261	7.38
6474.00	90.00	77.280	146.630	6188.97	559.69	-451.21	331.40	1637531.11	493986.73	39°50'56.819"N	80°47'27.669"W	559.83	143.704	8.03
6563.00	89.00	88.000	147.920	6200.36	647.76	-525.36	379.04	1637578.75	493912.58	39°50'56.093"N	80°47'27.044"W	647.82	144.190	12.13
6653.00	90.00	90.250	144.840	6201.73	737.70	-600.28	428.85	1637628.56	493837.66	39°50'55.360"N	80°47'26.392"W	737.74	144.457	4.24
6742.00	89.00	90.950	143.020	6200.80	826.68	-672.21	481.25	1637680.95	493765.73	39°50'54.657"N	80°47'25.707"W	826.72	144.400	2.19
6832.00	90.00	89.940	140.420	6200.10	916.52	-742.85	537.00	1637736.70	493695.10	39°50'53.967"N	80°47'24.979"W	916.62	144.137	3.10
6921.00	89.00	89.290	142.370	6200.70	1005.34	-812.40	592.52	1637792.22	493625.55	39°50'53.287"N	80°47'24.255"W	1005.52	143.895	2.31
7011.00	90.00	89.230	142.820	6201.86	1095.25	-883.89	647.19	1637846.89	493554.07	39°50'52.589"N	80°47'23.541"W	1095.49	143.788	0.50
7100.00	89.00	89.380	143.830	6202.94	1184.20	-955.26	700.34	1637900.04	493482.70	39°50'51.891"N	80°47'22.846"W	1184.48	143.753	1.15
7190.00	90.00	89.230	145.700	6204.03	1274.19	-1028.76	752.26	1637951.95	493409.20	39°50'51.172"N	80°47'22.167"W	1274.46	143.825	2.08
7280.00	90.00	89.250	146.130	6205.23	1364.17	-1103.30	802.69	1638002.38	493334.67	39°50'50.443"N	80°47'21.507"W	1364.40	143.963	0.48



Actual Wellpath Report
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REFERENCE WELLPATH IDENTIFICATION			
Operator	NOBLE ENERGY	Slot	Slot E
Area	Marshall County, WV	Well	MND-3E-HS
Field	Marshall	Wellbore	MND-3E-IIS AWB
Facility	MND-3 Pad		

WELLPATH DATA (148 stations)															
MD [ft]	Course Length [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Seet [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	
7369.00	89.00	89.750	146.580	6206.00	1453.14	-1177.38	852.00	1638051.69	493260.59	39°50'49.717"N	80°47'20.861"W	1453.32	144.109	0.76	
7459.00	90.00	89.880	146.750	6206.29	1543.11	-1252.58	901.46	1638101.14	493185.40	39°50'48.981"N	80°47'20.213"W	1543.24	144.258	0.24	
7549.00	90.00	89.850	146.080	6206.51	1633.08	-1327.55	951.25	1638150.92	493110.43	39°50'48.248"N	80°47'19.561"W	1633.17	144.377	0.75	
7638.00	89.00	89.720	145.860	6206.84	1722.06	-1401.31	1001.05	1638200.73	493036.68	39°50'47.526"N	80°47'18.909"W	1722.14	144.459	0.29	
7728.00	90.00	89.010	145.290	6207.84	1812.05	-1475.54	1051.93	1638251.60	492962.45	39°50'46.799"N	80°47'18.243"W	1812.12	144.515	1.01	
7817.00	89.00	89.080	144.800	6209.32	1901.04	-1548.48	1102.91	1638302.58	492889.52	39°50'46.086"N	80°47'17.576"W	1901.10	144.539	0.56	
7907.00	90.00	89.080	144.300	6210.77	1991.03	-1621.78	1155.10	1638354.77	492816.22	39°50'45.369"N	80°47'16.894"W	1991.09	144.540	0.56	
7997.00	90.00	89.880	146.260	6211.58	2081.02	-1695.75	1206.36	1638406.02	492742.25	39°50'44.645"N	80°47'16.223"W	2081.07	144.572	2.35	
8086.00	89.00	89.780	146.270	6211.85	2169.99	-1769.76	1255.79	1638455.45	492668.24	39°50'43.921"N	80°47'15.576"W	2170.04	144.641	0.11	
8176.00	90.00	89.480	145.520	6212.43	2259.98	-1844.28	1306.25	1638505.91	492593.73	39°50'43.192"N	80°47'14.915"W	2260.01	144.691	0.90	
8266.00	90.00	89.320	146.260	6213.37	2349.96	-1918.79	1356.72	1638556.37	492519.22	39°50'42.462"N	80°47'14.255"W	2349.99	144.737	0.84	
8355.00	89.00	89.230	143.950	6214.50	2438.95	-1991.78	1407.62	1638607.28	492446.24	39°50'41.748"N	80°47'13.589"W	2438.97	144.751	2.60	
8444.00	89.00	89.450	144.380	6215.52	2527.93	-2063.93	1459.72	1638659.38	492374.09	39°50'41.043"N	80°47'12.907"W	2527.96	144.730	0.54	
8534.00	90.00	89.380	141.680	6216.44	2617.87	-2135.82	1513.84	1638713.49	492302.20	39°50'40.340"N	80°47'12.201"W	2617.91	144.672	3.00	
8624.00	90.00	89.450	144.340	6217.36	2707.80	-2207.70	1567.99	1638767.63	492230.33	39°50'39.637"N	80°47'11.493"W	2707.86	144.616	2.96	
8713.00	89.00	89.600	144.600	6218.10	2796.79	-2280.13	1619.70	1638819.35	492157.91	39°50'38.929"N	80°47'10.817"W	2796.86	144.612	0.34	
8803.00	90.00	89.080	141.660	6219.14	2886.73	-2352.11	1673.69	1638873.33	492085.92	39°50'38.225"N	80°47'10.112"W	2886.81	144.565	3.32	
8892.00	89.00	88.830	140.570	6220.76	2975.51	-2421.38	1729.55	1638929.19	492016.66	39°50'37.549"N	80°47'09.383"W	2975.64	144.462	1.26	
8982.00	90.00	89.010	142.730	6222.46	3065.33	-2491.94	1785.38	1638985.02	491946.10	39°50'36.859"N	80°47'08.654"W	3065.51	144.380	2.41	
9071.00	89.00	88.770	145.700	6224.18	3154.30	-2564.12	1837.41	1639037.04	491873.93	39°50'36.154"N	80°47'07.974"W	3154.49	144.375	3.35	
9161.00	90.00	88.890	149.120	6226.02	3244.19	-2639.92	1885.87	1639085.50	491798.13	39°50'35.411"N	80°47'07.339"W	3244.33	144.459	3.80	
9250.00	89.00	88.740	149.460	6227.86	3332.92	-2716.43	1931.31	1639130.94	491721.63	39°50'34.662"N	80°47'06.743"W	3333.01	144.588	0.42	
9340.00	90.00	88.550	150.380	6229.99	3422.56	-2794.28	1976.41	1639176.03	491643.78	39°50'33.899"N	80°47'06.150"W	3422.60	144.728	1.04	
9429.00	89.00	89.570	150.140	6231.45	3511.17	-2871.55	2020.55	1639220.17	491566.52	39°50'33.142"N	80°47'05.570"W	3511.18	144.868	1.18	
9519.00	90.00	89.910	145.760	6231.86	3601.03	-2947.81	2068.30	1639267.92	491490.26	39°50'32.395"N	80°47'04.944"W	3601.03	144.945	4.88	
9608.00	89.00	89.850	140.750	6232.04	3689.96	-3019.10	2121.52	1639321.14	491418.97	39°50'31.698"N	80°47'04.249"W	3689.97	144.904	5.63	
9698.00	90.00	89.230	135.520	6232.76	3779.28	-3086.10	2181.56	1639381.18	491351.97	39°50'31.044"N	80°47'03.467"W	3779.32	144.744	5.85	
9787.00	89.00	89.290	137.280	6233.91	3867.27	-3150.55	2242.93	1639442.54	491287.53	39°50'30.416"N	80°47'02.668"W	3867.39	144.552	1.98	
9877.00	90.00	89.480	143.800	6234.88	3956.94	-3219.99	2300.10	1639499.70	491218.09	39°50'29.738"N	80°47'01.923"W	3957.12	144.461	7.25	
9967.00	90.00	89.110	150.790	6235.99	4046.81	-3295.67	2348.69	1639548.30	491142.42	39°50'28.997"N	80°47'01.286"W	4046.95	144.524	7.78	



Actual Wellpath Report
MND-3E-HS AWP Proj: 12436'
Page 6 of 8



51.01741

REFERENCE WELLPATH IDENTIFICATION					
Operator	NOBLE ENERGY			Slot	Slot E
Area	Marshall County, WV			Well	MND-3E-HS
Field	Marshall			Wellbore	MND-3E-IIS AWB
Facility	MND-3 Pad				

WELLPATH DATA (148 stations)														
MD [ft]	Course Length [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]
10056.00	89.00	89.260	150.390	6237.26	4135.38	-3373.19	2392.39	1639591.99	491064.90	39°50'28.237"N	80°47'00.712"W	4135.45	144.654	0.48
10146.00	90.00	89.200	149.440	6238.47	4225.04	-3451.06	2437.50	1639637.10	490987.03	39°50'27.474"N	80°47'00.119"W	4225.07	144.766	1.06
10235.00	89.00	89.170	147.080	6239.73	4313.88	-3526.74	2484.31	1639683.91	490911.36	39°50'26.733"N	80°46'59.505"W	4313.90	144.838	2.65
10414.00	179.00	89.540	144.640	6241.75	4492.83	-3674.87	2584.76	1639784.35	490763.24	39°50'25.283"N	80°46'58.191"W	4492.84	144.879	1.38
10504.00	90.00	89.170	143.620	6242.76	4582.82	-3747.79	2637.49	1639837.08	490690.32	39°50'24.570"N	80°46'57.502"W	4582.83	144.864	1.21
10593.00	89.00	89.230	145.380	6244.00	4671.80	-3820.24	2689.16	1639888.75	490617.87	39°50'23.861"N	80°46'56.826"W	4671.81	144.857	1.98
10683.00	90.00	89.750	145.530	6244.80	4761.79	-3894.37	2740.20	1639939.78	490543.75	39°50'23.136"N	80°46'56.158"W	4761.81	144.869	0.60
10773.00	90.00	89.200	139.540	6245.63	4851.66	-3965.77	2794.91	1639994.50	490472.35	39°50'22.438"N	80°46'55.444"W	4851.69	144.825	6.68
10862.00	89.00	89.200	140.190	6246.87	4940.30	-4033.80	2852.28	1640051.85	490404.32	39°50'21.774"N	80°46'54.696"W	4940.35	144.736	0.73
10951.00	89.00	89.050	145.190	6248.23	5029.19	-4104.56	2906.20	1640105.77	490333.57	39°50'21.082"N	80°46'53.992"W	5029.26	144.700	5.62
11041.00	90.00	89.200	147.460	6249.61	5119.15	-4179.45	2956.09	1640155.67	490258.69	39°50'20.349"N	80°46'53.339"W	5119.20	144.728	2.53
11130.00	89.00	89.380	147.060	6250.71	5208.07	-4254.30	3004.22	1640203.79	490183.84	39°50'19.616"N	80°46'52.708"W	5208.11	144.772	0.49
11220.00	90.00	90.220	146.360	6251.02	5298.03	-4329.53	3053.62	1640253.19	490108.61	39°50'18.880"N	80°46'52.061"W	5298.06	144.805	1.21
11310.00	90.00	90.280	144.060	6250.63	5388.02	-4403.44	3104.97	1640304.53	490034.71	39°50'18.157"N	80°46'51.389"W	5388.05	144.811	2.56
11399.00	89.00	89.600	143.540	6250.72	5477.00	-4475.26	3157.53	1640357.09	489962.89	39°50'17.454"N	80°46'50.703"W	5477.04	144.795	0.96
11489.00	90.00	89.450	143.310	6251.47	5566.96	-4547.53	3211.16	1640410.72	489890.62	39°50'16.748"N	80°46'50.002"W	5567.01	144.773	0.31
11578.00	89.00	89.350	144.380	6252.40	5655.94	-4619.39	3263.66	1640463.22	489818.77	39°50'16.045"N	80°46'49.316"W	5655.99	144.758	1.21
11668.00	90.00	89.540	146.310	6253.27	5745.93	-4693.41	3314.84	1640514.39	489744.75	39°50'15.321"N	80°46'48.646"W	5745.98	144.767	2.15
11757.00	89.00	89.320	146.680	6254.16	5834.89	-4767.62	3363.96	1640563.51	489670.55	39°50'14.594"N	80°46'48.003"W	5834.93	144.794	0.48
11847.00	90.00	88.710	146.630	6255.71	5924.84	-4842.79	3413.42	1640612.97	489595.38	39°50'13.859"N	80°46'47.355"W	5924.87	144.822	0.68
11936.00	89.00	88.310	145.820	6258.02	6013.79	-4916.75	3462.89	1640662.43	489521.43	39°50'13.135"N	80°46'46.708"W	6013.81	144.843	1.01
12026.00	90.00	88.550	147.070	6260.49	6103.73	-4991.72	3512.61	1640712.15	489446.46	39°50'12.401"N	80°46'46.057"W	6103.74	144.866	1.41
12115.00	89.00	88.550	148.180	6262.74	6192.60	-5066.86	3560.25	1640759.79	489371.32	39°50'11.665"N	80°46'45.433"W	6192.61	144.906	1.25
12205.00	90.00	88.370	149.360	6265.16	6282.38	-5143.79	3606.90	1640806.43	489294.40	39°50'10.911"N	80°46'44.821"W	6282.38	144.961	1.33
12295.00	90.00	88.460	150.470	6267.65	6372.01	-5221.63	3651.99	1640851.53	489216.56	39°50'10.149"N	80°46'44.228"W	6372.01	145.031	1.24
12385.00	90.00	88.490	148.300	6270.04	6461.71	-5299.05	3697.81	1640897.34	489139.14	39°50'09.390"N	80°46'43.627"W	6461.72	145.092	2.41
12411.00	26.00	88.340	147.560	6270.76	6487.66	-5321.08	3711.61	1640911.14	489117.12	39°50'09.174"N	80°46'43.446"W	6487.67	145.103	2.90
12436.00	25.00	88.340	147.560	6271.49	6512.63	-5342.17	3725.01	1640924.54	489096.03	39°50'08.968"N	80°46'43.271"W	6512.64	145.113	0.00



Actual Wellpath Report
 MND-3E-HS AWP Proj: 12436'
 Page 7 of 8



HLL1015

REFERENCE WELLPATH IDENTIFICATION			
Operator	NOBLE ENERGY	Slot	Slot E
Area	Marshall County, WV	Well	MND-3E-HS
Field	Marshall	Wellbore	MND-3E-HS AWB
Facility	MND-3 Pad		

TARGETS									
Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
MND-3E-HS LP Rev-1		6187.00	-494.53	360.54	1637560.25	493943.41	39°50'56.395"N	80°47'27.287"W	point
MND-3E-HS Mid Rev-1		6220.00	-2877.29	2028.97	1639228.59	491560.77	39°50'33.086"N	80°47'05.461"W	point
MND-3E-HS BHL Rev-1		6270.00	-5273.46	3706.79	1640906.32	489164.73	39°50'09.644"N	80°46'43.517"W	point
MND-3 Pad LL		6500.00	0.00	0.00	1637199.73	494437.91	39°51'01.231"N	80°47'32.000"W	polygon

WELLPATH COMPOSITION - Ref Wellbore: MND-3E-HS AWB Ref Wellpath: MND-3E-HS AWP Proj: 12436'					
Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore	
18.50	1010.00	ISCWSA MWD, Rev. 2 (Standard)	01 Schlum MWD <17-1/2"> (109.5'-574.5')	MND-3E-HS AWB	
1010.00	1368.00	Generic gyro - northseeking (Standard)	02 Gyro MS <17-1/2"> (1055'-1368')	MND-3E-HS AWB	
1368.00	2569.00	ISCWSA MWD, Rev. 2 (Standard)	03 Schlum MWD <12-1/4"> (1368')(1457'-2569')	MND-3E-HS AWB	
2569.00	5355.00	NaviTrak (MagCorr)	04 BHI MWD <8-3/4"> (2569')(2671'-5355')	MND-3E-HS AWB	
5355.00	12411.00	NaviTrak (AT Curve Short Spaced)	05 BHI AT Curve <8-3/4"> (5355')(5490'-12411')	MND-3E-HS AWB	
12411.00	12436.00	Blind Drilling (std)	Projection to bit	MND-3E-HS AWB	



Actual Wellpath Report
 MND-3E-HS AWP Proj: 12436'
 Page 8 of 8



51.01741

REFERENCE WELLPATH IDENTIFICATION			
Operator	NOBLE ENERGY	Slot	Slot E
Area	Marshall County, WV	Well	MND-3E-HS
Field	Marshall	Wellbore	MND-3E-HS AWB
Facility	MND-3 Pad		

COMMENTS
<p>Wellpath general comments API: 47-051-01741-0100 BHI Job #: 6565936 Rig: Precision 543 Duration: 07.31.2014 - 08.07.2014 Schlum MWD <17-1/2"> (109.5'-574.5') Gyro MS <17-1/2"> (1055'-1368') Schlum MWD <12-1/4"> (1368')(1457'-2569') BHI MWD <8-3/4"> (2569')(2671'-5355') BHI AT Curve <8-3/4"> (5355')(5490'-12411') Projected MD at TD: 12436'</p>

Location: Marshall County, WV
 Field: Marshall
 Facility: MND-3 Pad

Slot: Slot E
 Well: MND-3E-HS
 Wellbore: MND-3E-HS PWB

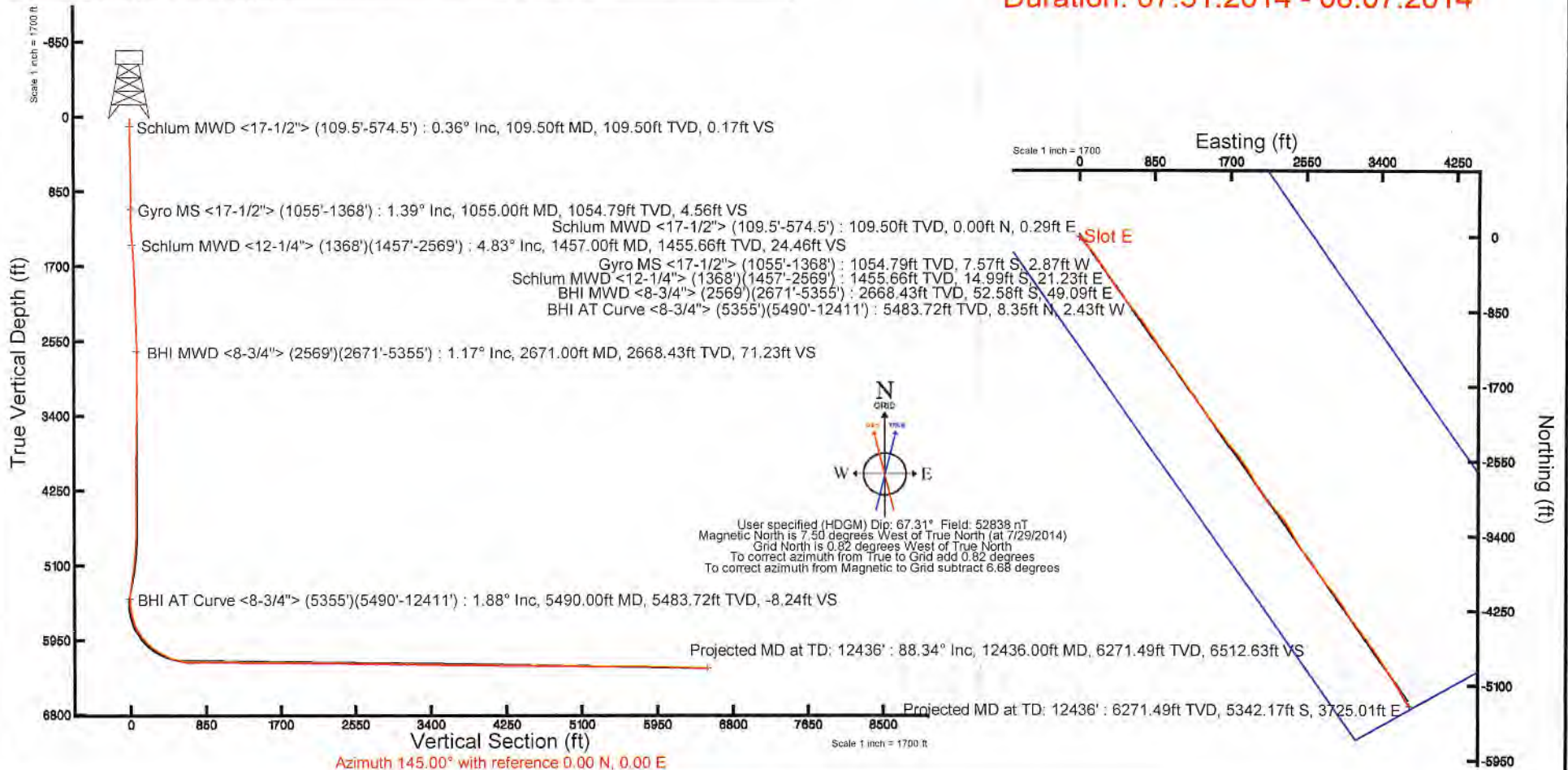
Plot reference wellpath is MND-3E-HS PWP Rev-A.0	
True vertical depths are referenced to Precision 543 (RKB)	Grid System: NAD27 / Lambert West Virginia SP, Northern Zone (4701), US feet
Measured depths are referenced to Precision 543 (RKB)	North Reference: Grid north
Precision 543 (RKB) to Mean Sea Level: 1134.21 feet	Scale: True distance
Mean Sea Level to Mud line (At Slot: Slot E): -1115.71 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: kroschr on 8/20/2014

Well Data			
Slot	Well	Wellbore	Wellpath
Slot E	MND-3E-HS	MND-3E-HS AWB	MND-3E-HS AWP Proj: 12436'
Slot E	MND-3E-HS	MND-3E-HS PWB	MND-3E-HS PWP Rev-A.0

Location Information						
Facility Name		Grid East (US ft)	Grid North (US ft)	Latitude	Longitude	
MND-3 Pad		1637234.730	494486.570	39°51'01.717"N	80°47'31.561"W	
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Slot E	-48.66	-35.00	1637199.730	494437.910	39°51'01.231"N	80°47'32.000"W
Precision 543 (RKB) to Mud line (At Slot: Slot E)				18.5ft		
Mean Sea Level to Mud line (At Slot: Slot E)				-1115.71ft		
Precision 543 (RKB) to Mean Sea Level				1134.21ft		

API: 47-051-01741-0100
 BHI Job #: 6565936
 Rig: Precision 543
 Duration: 07.31.2014 - 08.07.2014

51.01741



Well is located on topo map 8,988' feet south of Latitude: 39° 52' 30"

AS DRILLED PLAT

Well is located on topo map 154' feet west of Longitude: 80° 47' 30"

AS DRILLED SURFACE HOLE LOCATION (SHL):
 UTM 17-NAD83
 N:4411175.91
 E:517790.62
 NAD27 WV NORTH
 N:494437.91
 E:1637199.73
 LAT/LON DATUM-NAD83
 LAT:39.8504196
 LON:-80.7922230

PERMITTED SURFACE HOLE LOCATION (SHL):
 UTM 17-NAD83
 N:4411175.910
 E:517790.606
 NAD27 WV NORTH
 N:494437.892
 E:1637199.695
 LAT/LON DATUM-NAD83
 LAT:39.850417335
 LON:-80.792033887

LEGEND	
	LEASE NUMBER
	WELL
	PROPOSED HORIZONTAL WELL
	ROAD
	STREAM
	AS DRILLED
	EXISTING WELL
	PERMITTED WELL

PARCEL	LESSOR
1	BARBARA G. MATTHEWS, ET AL
2	GLEN ALBERT YUTZEY, ET AL
3	CNX GAS COMPANY LLC ET AL
4	CNX GAS COMPANY LLC ET AL
5	THOMAS A. BARNHART, ET UX
6	WESBANKO BANK, TRUSTEE

PERMITTED BOTTOM HOLE LOCATION (BHL):
 UTM 17-NAD83
 N:4409588.31
 E:518946.69
 NAD27 WV NORTH
 N:489164.73
 E:1640906.32
 LAT/LON DATUM-NAD83
 LAT:39.836088106
 LON:-80.778565739

PERMITTED APPROX. LANDING POINT:
 UTM 17-NAD83
 N:4411027.10
 E:517902.97
 NAD27 WV NORTH
 N:493943.41
 E:1637560.25
 LAT/LON DATUM-NAD83
 LAT:39.849074216
 LON:-80.790724496

AS DRILLED BOTTOM HOLE LOCATION (BHL):
 UTM 17-NAD83
 N:4409567.47
 E:518952.59
 NAD27 WV NORTH
 N:489086.03
 E:1640924.54
 LAT/LON DATUM-NAD83
 LAT:39.83582438
 LON:-80.77868627

AS DRILLED APPROX. LANDING POINT:
 UTM 17-NAD83
 N:4411017.80
 E:517908.76
 NAD27 WV NORTH
 N:493912.58
 E:1637578.75
 LAT/LON DATUM-NAD83
 LAT:39.84881485
 LON:-80.79084561



LINE	BEARING	DISTANCE
1	S 88° 01' 30" W	1460.31
2	N 11° 06' 16" W	2081.7
3	S 85° 10' 04" E	1446.12
4	N 87° 03' 36" E	180.96
5	S 44° 13' 00" E	230.84
6	S 88° 01' 30" W	163.48

APPROXIMATE LANDING POINT OF HORIZONTAL LEG

AS DRILLED POINT OF HORIZONTAL LEG

- NOTES:
- There are no water wells or developed springs within 250' of proposed well.
 - There are no existing buildings within 625' of proposed well.
 - Proposed well is greater than 100' from perennial stream, wetland, pond, reservoir or lake.
 - There are no native trout streams within 300' of proposed well.
 - Proposed well is greater than 1000' from surface/groundwater intake or public water supply.
 - It is not the purpose or intention of this plat to represent surveyed locations of the surface or mineral parcels depicted hereon. The location of the boundary lines, as shown, are based on record deed descriptions, field evidence found and/or tax map position, unless otherwise noted.

Blue Mountain Inc.
 10125 MASON DIXON HIGHWAY
 BURTON, WV 26562
 PHONE: (304) 662-6486

FILE #: MND3EHS-AS DRILLED
 DRAWING #: MND3EHS-AS DRILLED
 SCALE: 1" = 2000'
 MINIMUM DEGREE OF ACCURACY: 1/2500
 PROVEN SOURCE OF ELEVATION: U.S.G.S. MONUMENT THOMAS 1498.81'

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:

R.P.E.: _____ L.L.S.: P.S. No. 2000

PLACE SEAL HERE

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS WYDEP
 OFFICE OF OIL & GAS
 601 57TH STREET
 CHARLESTON, WV 25304



DATE: JANUARY 6, 2015
 OPERATOR'S WELL #: MND3EHS-AS DRILLED
 API WELL #: 47 51 01741
 STATE COUNTY PERMIT

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

WATERSHED: SHORT CREEK ELEVATION: 1127.19'

COUNTY/DISTRICT: MARSHALL / FRANKLIN QUADRANGLE: POWHATAN POINT, OH-WV 7.5'

SURFACE OWNER: CONSOLIDATION COAL COMPANY - CONSOL MINING CO. ACREAGE: 180.214±

OIL & GAS ROYALTY OWNER: BARBARA G. MATTHEWS, ET AL ACREAGE: 404.109

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

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: TVD: 6,279'± TMD: 12,441'±

WELL OPERATOR NOBLE ENERGY, INC. DESIGNATED AGENT STEVEN M. GREEN
 Address 333 TECHNOLOGY DRIVE, SUITE 116 Address 500 VIRGINIA STREET EAST, UNITED CENTER SUITE 590
 City CANONSBURG State PA Zip Code 15317 City CHARLESTON State WV Zip Code 25301

Well is located on topo map 8,988' feet south of Latitude: 39° 52' 30"

AS DRILLED PLAT

Well is located on topo map 154' feet west of Longitude: 80° 47' 30"

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 N:494437.91
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 LAT/LON DATUM-NAD83
 LAT:39.85034196
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PERMITTED SURFACE HOLE LOCATION (SHL)
 UTM 17-NAD83
 N:4411175.910
 E:517790.606
 NAD27 - WV NORTH
 N:494437.892
 E:1637199.695
 LAT/LON DATUM-NAD83
 LAT:39.850417335
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 N:4409588.31
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 NAD27 - WV NORTH
 N:489164.73
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 LAT/LON DATUM-NAD83
 LAT:39.836088106
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 N:489096.03
 E:1640924.54
 LAT/LON DATUM-NAD83
 LAT:39.83582438
 LON:-80.77868627

PERMITTED APPROX. LANDING POINT
 UTM 17-NAD83
 N:4411027.10
 E:517902.97
 NAD27 - WV NORTH
 N:493943.41
 E:1637560.25
 LAT/LON DATUM-NAD83
 LAT:39.849074216
 LON:-80.790724496

AS DRILLED APPROX. LANDING POINT
 UTM 17-NAD83
 N:4411017.80
 E:517908.76
 NAD27 - WV NORTH
 N:493912.58
 E:1637578.75
 LAT/LON DATUM-NAD83
 LAT:39.84891485
 LON:-80.79084561

LEGEND	
	- TOPO MAP POINT
	- WELL
	- ALL API POINTS UNLESS OTHERWISE NOTED
	- LEASE NUMBER
	- MINERAL TRACT BOUNDARY
	- PARCEL LINE
	- WELL REFERENCE
	- PROPOSED HORIZONTAL WELL
	- ROAD
	- STREAM CENTER LINE
	- AS DRILLED
EXISTING WELLS	
	- EXISTING WELLS
	- PLUGGED WELLS

PARCEL	LESSOR
1	BARBARA G. MATTHEWS, ET AL
2	GLEN ALBERT YUTZEY, ET AL
3	CNX GAS COMPANY LLC ET AL
4	CNX GAS COMPANY LLC ET AL
5	THOMAS A. BARNHART, ET UX
6	WESBANKO BANK, TRUSTEE

NOTES:

- There are no water wells or developed springs within 250' of proposed well.
- There are no existing buildings within 625' of proposed well.
- Proposed well is greater than 100' from perennial stream, wetland, pond, reservoir or lake.
- There are no native trout streams within 300' of proposed well.
- Proposed well is greater than 1000' from surface/groundwater intake or public water supply.
- It is not the purpose or intention of this plat to represent surveyed locations of the surface or mineral parcels depicted hereon. The location of the boundary lines, as shown, are based on record deed descriptions, field evidence found and/or tax map position, unless otherwise noted.



LINE	BEARING	DISTANCE
R1	S 68°03'58" W	1460.78'
R2	N 11°08'16" W	1084.77'
R3	S 68°37'04" L	1448.43'
R4	N 50°29'36" E	180.96'
R5	S 44°43'46" E	230.44'
R6	S 04°28'51" E	263.48'

Blue Mountain Inc.
 10125 MASON DIXON HIGHWAY
 BURTON, WV 26562
 PHONE: (304) 662-6486

FILE #: MND3EHS-AS DRILLED
 DRAWING #: MND3EHS-AS DRILLED
 SCALE: 1" = 2000'
 MINIMUM DEGREE OF ACCURACY: 1/2500
 PROVEN SOURCE OF ELEVATION: U.S.G.S. MONUMENT THOMAS 1498.81'

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

Signed: [Signature]
 R.P.E.: _____ L.L.S.: P.S. No. 2000

GEORGE D SIX LICENSED No. 2000 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR

PLACE SEAL HERE

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

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

DATE: JANUARY 6, 2015
 OPERATOR'S WELL #: MND3EHS-AS DRILLED
 API WELL #: 47 51 01741
 STATE COUNTY PERMIT

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

WATERSHED: SHORT CREEK ELEVATION: 1127.19'
 COUNTY/DISTRICT: MARSHALL / FRANKLIN QUADRANGLE: POWHATAN POINT, OH-WV 7.5'
 SURFACE OWNER: CONSOLIDATION COAL COMPANY - CONSOL MINING CO. ACREAGE: 180.214±
 OIL & GAS ROYALTY OWNER: BARBARA G. MATTHEWS, ET AL ACREAGE: 404.109

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

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: TVD: 6,279± TMD: 12,441±
 WELL OPERATOR NOBLE ENERGY, INC. DESIGNATED AGENT STEVEN M. GREEN
 Address 333 TECHNOLOGY DRIVE, SUITE 116 Address 500 VIRGINIA STREET EAST, UNITED CENTER SUITE 590
 City CANONSBURG State PA Zip Code 15317 City CHARLESTON State WV Zip Code 25301