

Revised

WR-35
Rev. 8/23/13

Page ___ of ___

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

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API 47-051-01761 County Marshall District Franklin
Quad Powhatan Point Pad Name MND 06 Field/Pool Name N/A
Farm name Consolidated Coal Company Well Number MND 06 EHS
Operator (as registered with the OOG) Noble Energy, Inc.
Address 1000 Noble Energy Drive 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 39.817687 Easting 80.791727
Landing Point of Curve Northing 39.817319 Easting 80.796267
Bottom Hole Northing 39.837700 Easting 80.815286

Elevation (ft) 722' 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 06/10/2014 Date drilling commenced 09/02/2014 Date drilling ceased 11/23/2014
Date completion activities began Not completed Date completion activities ceased na
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 128' and 265' Open mine(s) (Y/N) depths N
Salt water depth(s) ft none noted for offsets Void(s) encountered (Y/N) depths N-drilled in pillar
Coal depth(s) ft 284' - 294' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) No

APPROVED

NAME: [Signature]
DATE: 7/6/2017

Reviewed by:

[Signature] 09/15/2017

API 47-051 - 01761 Farm name Consolidated Coal Company Well number MND 06 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	26"	20"	40'	New	DH-36		Y
Surface	18"	16"	116'	New	H-40		Y
Coal	17.5"	13 3/8"	717'	New	J-55		Y
Intermediate 1	12.38"	9 5/8"	2031'	New	HCK-55		Y
Intermediate 2							
Intermediate 3							
Production	8-3/4" & 8-1/2"	5 1/2"	15,646.5'	New	P-110		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	CaCl 1.15					0	8
Surface	CaCl 1.15					0	8
Coal	Type 1 / Class A	490	15.6	1.39	681.1	0	8
Intermediate 1	Type 1 / Class A	745	15.6	1.18	879.1	0	8
Intermediate 2							
Intermediate 3							
Production	Type 1 / Class A	lead 718 tail 2250	14.8	Lead 1.54 tail 1.37	total 4,490.99	1815.0	8
Tubing							

Drillers TD (ft) 15,653 Loggers TD (ft) 15,631

Deepest formation penetrated Marcellus Plug back to (ft) NA

Plug back procedure _____

Kick off depth (ft) 3656'

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 No centralizers used on conductor.

19 Centralizers on Intermediate String (Bow string centralizers on first two joints then every third joint to 100' from surface).

289 Centralizers on Production String (rigid bow string every joint to KOP, rigid bow spring every third joint from KOP to top of cement).

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 _____

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Perforations						
API	Well Name	Date	Top (ftKB)	Btm (ftKB)	Com	Entered Shot Total
47-051-01761	MND-6E-HS	4/27/2017	6,132.00	6,309.00	STG #46	58
47-051-01761	MND-6E-HS	4/26/2017	6,334.00	6,511.00	STG #45	58
47-051-01761	MND-6E-HS	4/26/2017	6,536.00	6,713.00	STG #44	58
47-051-01761	MND-6E-HS	4/26/2017	6,738.00	6,915.00	STG #43	58
47-051-01761	MND-6E-HS	4/13/2017	6,940.00	7,117.00	STG #42	58
47-051-01761	MND-6E-HS	4/13/2017	7,142.00	7,319.00	STG #41	58
47-051-01761	MND-6E-HS	4/12/2017	7,344.00	7,521.00	STG #40	58
47-051-01761	MND-6E-HS	4/12/2017	7,546.00	7,718.00	STG #39	58
47-051-01761	MND-6E-HS	4/12/2017	7,748.00	7,925.00	STG #38	58
47-051-01761	MND-6E-HS	4/7/2017	7,950.00	8,124.00	STG #37	58
47-051-01761	MND-6E-HS	3/22/2017	8,152.00	8,329.00	STG #36	58
47-051-01761	MND-6E-HS	3/22/2017	8,254.00	8,531.00	STG #35	58
47-051-01761	MND-6E-HS	3/22/2017	8,733.00	8,556.00	STG #34	58
47-051-01761	MND-6E-HS	3/21/2017	8,760.00	8,930.00	STG #33	58
47-051-01761	MND-6E-HS	3/21/2017	8,960.00	9,137.00	STG #32	58
47-051-01761	MND-6E-HS	3/21/2017	9,162.00	9,335.00	STG #31	58
47-051-01761	MND-6E-HS	3/21/2017	9,365.00	9,541.00	STG #30	58
47-051-01761	MND-6E-HS	3/20/2017	9,566.00	9,743.00	STG #29	58
47-051-01761	MND-6E-HS	3/20/2017	9,943.00	9,769.00	STG #28	58
47-051-01761	MND-6E-HS	3/20/2017	9,970.00	10,147.00	STG #27	58
47-051-01761	MND-6E-HS	3/20/2017	10,175.00	10,349.00	STG #26	58
47-051-01761	MND-6E-HS	3/20/2017	10,374.00	10,551.00	STG #25	58
47-051-01761	MND-6E-HS	3/19/2017	10,576.00	10,748.00	STG #24	58
47-051-01761	MND-6E-HS	3/19/2017	10,778.00	10,955.00	STG #23	58
47-051-01761	MND-6E-HS	3/19/2017	10,980.00	11,157.00	STG #22	58
47-051-01761	MND-6E-HS	3/19/2017	11,182.00	11,359.00	STG #21	58
47-051-01761	MND-6E-HS	3/18/2017	11,386.00	11,561.00	STG #20	58
47-051-01761	MND-6E-HS	3/18/2017	11,586.00	11,763.00	STG #19	58
47-051-01761	MND-6E-HS	3/18/2017	11,788.00	11,961.00	STG #18	58
47-051-01761	MND-6E-HS	3/17/2017	11,990.00	12,167.00	STG #17	58
47-051-01761	MND-6E-HS	3/17/2017	12,192.00	12,369.00	STG #16	58
47-051-01761	MND-6E-HS	3/17/2017	12,397.00	12,571.00	STG #15	58
47-051-01761	MND-6E-HS	3/17/2017	12,596.00	12,773.00	STG #14	58
47-051-01761	MND-6E-HS	3/16/2017	12,798.00	12,975.00	STG #13	58
47-051-01761	MND-6E-HS	3/16/2017	13,000.00	13,180.00	STG #12	58
47-051-01761	MND-6E-HS	3/16/2017	13,202.00	13,379.00	STG #11	58
47-051-01761	MND-6E-HS	3/15/2017	13,404.00	13,581.00	STG #10	58
47-051-01761	MND-6E-HS	3/15/2017	13,606.00	13,783.00	STG #9	58
47-051-01761	MND-6E-HS	3/14/2017	13,808.00	13,985.00	STG #8	58
47-051-01761	MND-6E-HS	3/14/2017	14,015.00	14,187.00	STG #7	58
47-051-01761	MND-6E-HS	3/13/2017	14,211.00	14,391.00	STG #6	58
47-051-01761	MND-6E-HS	3/13/2017	14,414.00	14,591.00	STG #5	58
47-051-01761	MND-6E-HS	3/13/2017	14,791.00	14,617.00	STG #4	58
47-051-01761	MND-6E-HS	3/12/2017	14,880.00	14,822.00	STG #3B	28
47-051-01761	MND-6E-HS	3/8/2017	14,910.00	15,087.00	STG #3A	58
47-051-01761	MND-6E-HS	3/7/2017	15,115.00	15,289.00	STG #2	58
47-051-01761	MND-6E-HS	3/7/2017	15,314.00	15,489.00	STG# 1	58

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Well Header							
API: 47-051-01761	Well Name: MND-6E-H5						
WR-35 - Stimulation Information Per Stage							
Int Des	Start Date	Slurry Rate Avg (bbl/min)	P Treat Avg (psi)	P Breakdown (psi)	ISIP (psi)	Propan Deliver (lb)	Vol Slurry Total (gal)
STG# 1 INJ TEST	3/7/2017	16.9	7,636.00		6,060.00	0	35,364.00
STG# 1	3/7/2017	80.7	7,999.00	5,742.00	3,182.00	611,518.00	630,222.60
STG# 2	3/8/2017	83.1	7,586.00	5,338.00	3,465.00	599,382.00	615,258.00
STG# 3A	3/8/2017	64	9,519.00	5,694.00		156,568.00	355,816.86
STG# 3A INJ TEST	3/8/2017	4.3	6,545.00			0	19,538.40
STG# 3B	3/12/2017	91	8,936.00	5,715.00	3,207.00	711,645.00	717,057.60
STG# 3B INJ TEST	3/12/2017	19.6	7,290.00			0	26,800.20
STG# 4	3/13/2017	93.7	8,282.00		3,533.00	607,000.00	555,643.20
STG# 5	3/13/2017	87	8,282.00	5,241.00	3,591.00	606,672.00	623,855.40
STG# 6	3/14/2017	91.6	8,638.00	5,589.00	3,645.00	599,438.00	626,971.80
STG# 7	3/14/2017	94.6	8,730.00	5,469.00	3,625.00	599,266.00	580,099.80
STG# 8	3/14/2017	96.2	8,996.00	5,587.00	3,405.00	603,414.00	710,056.20
STG# 9	3/15/2017	70.9	10,197.00	6,309.00	2,972.00	602,852.00	759,015.60
STG# 10	3/16/2017	88.2	8,152.00	6,473.00	2,933.00	604,455.00	569,536.80
STG# 11	3/16/2017	85.5	8,291.00	5,403.00	3,538.00	603,527.00	531,342.00
STG# 12	3/16/2017	91.7	8,140.00	5,763.00	3,885.00	607,348.00	520,367.40
STG# 13	3/16/2017	90.2	7,836.00	4,985.00	3,199.00	606,035.00	543,501.00
STG# 14	3/17/2017	90.1	7,872.00	4,878.00	3,590.00	597,744.00	535,810.80
STG# 15	3/17/2017	88.3	8,351.00	5,212.00	3,586.00	600,877.00	516,978.00
STG# 16	3/17/2017	89.7	8,388.00	5,103.00	3,125.00	602,210.00	537,352.20
STG# 17	3/17/2017	90.7	7,732.00	5,123.00	3,788.00	606,348.00	536,499.60
STG# 18	3/18/2017	87.6	7,680.00	4,871.00	3,384.00	600,150.00	552,274.80
STG# 19	3/18/2017	90.4	8,541.00	5,295.00	3,522.00	600,017.00	643,057.80
STG# 20	3/18/2017	90.2	8,130.00	4,821.00	4,336.00	600,600.00	607,517.40
STG# 21	3/19/2017	90.1	7,755.00	5,229.00	4,185.00	601,299.00	556,290.00
STG# 22	3/19/2017	88.2	8,549.00	8,376.00	4,419.00	598,094.00	628,677.00
STG# 23	3/19/2017	90.4	7,815.00	9,201.00	4,388.00	605,222.00	541,216.20
STG# 24	3/19/2017	88.6	8,092.00	5,090.00	4,244.00	600,362.00	634,523.40
STG# 25	3/20/2017	94.8	7,885.00	5,063.00	4,382.00	605,278.00	542,896.20
STG# 26	3/20/2017	89.5	4,928.00	4,885.00	3,562.00	597,022.00	531,321.00
STG# 27	3/20/2017	87.2	8,204.00	4,834.00	3,898.00	545,424.00	585,622.80
STG# 28	3/20/2017	87.7	8,748.00	4,737.00	4,035.00	601,225.00	561,401.40
STG# 29	3/21/2017	86.4	8,260.00	4,893.00	4,058.00	584,671.00	632,646.00
STG# 30	3/21/2017	90.7	7,784.00	5,333.00	5,533.00	541,699.00	511,740.60
STG# 31	3/21/2017	84.2	8,377.00	5,139.00	8,734.00	417,205.00	493,029.60
STG# 32	3/21/2017	90.4	8,155.00	5,069.00	3,328.00	731,070.00	711,055.80
STG# 33	3/21/2017	88.4	8,135.00	4,911.00	4,259.00	622,006.00	641,596.20
STG# 34	3/22/2017	86.6	7,442.00	5,126.00	4,708.00	594,375.00	606,131.40
STG# 35	3/22/2017	88.4	7,375.00	7,918.00	3,477.00	597,745.00	569,679.60
STG# 36	3/22/2017	88.8	7,579.00	8,196.00		434,355.00	461,542.20
STG# 36 INJ TEST	3/22/2017	3.1	8,985.00			0	6,447.00
STG# 36 INJ TEST 2	3/23/2017	3.3	4,865.00			0	12,213.60
STG# 37 INJ TEST	4/7/2017	16.4	3,983.00			0	14,952.00
STG# 37	4/12/2017	97.7	7,785.00	5,132.00	4,240.00	684,566.00	590,058.00
STG# 38	4/12/2017	90.5	6,769.00	5,231.00	4,285.00	681,209.00	594,346.20
STG# 39	4/12/2017	94.4	7,268.00	5,339.00	4,282.00	602,539.00	555,794.40
STG# 40	4/12/2017	93.8	7,308.00	5,158.00	3,969.00	602,553.00	528,410.40
STG# 41	4/13/2017	91.4	7,090.00	5,306.00	4,647.00	602,597.00	522,417.00

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MND 6

Formations	Top TVD	Base TVD	Top MD	Base MD	Fluid
Shale and Sandstone	0	284	0	284	
Pittsburgh Coal	284	294	284	294	
Shale and Sandstone	294	706	294	706	
Dunkard Sand	706	727	706	727	
Shale	727	876	727	876	
Gas Sand	876	947	876	5972	
Shale	947	1016	947	6191	
1st Salt Sand	1016	1032	1016	6313	
Shale	1032	1139	1032	6719	
2nd Salt Sand	1139	1168	1139	7118	
Shale and Sandstone	1168	1298	1168	7333	
Maxton Sand	1298	1345	1298	8194	
Shale	1345	1363	1345	8194	
Big Lime	1363	1435	1363	8541	
Big Injun	1435	1705	1435	8869	
Price	1705	1803	1705	8890	
Murrysville	1803	1910	1803	8983	
Shale and Sandstone	1910	2448	1910	8998	
Gordon	2448	2478	2448	9073	
Shale and Sandstone	2478	2999	2478	9179	
Fifth Sand	2999	3052	2999	9995	
Shale and Sandstone	3052	3854	3052	9179	
Warren Sand	3854	3863	3860	9995	
Shale	3863	4580	3869	10660	
Java Shale	4580	4664	4593	not encountered	
Pipe Creek Shale	4664	4739	4678	not encountered	
Angola Shale	4739	5323	4754	not encountered	
Rhinestreet	5323	5642	5344	not encountered	
Cashaqua	5642	5714	5666	not encountered	
Middlesex	5714	5737	5739	not encountered	
West River	5737	5798	5762	not encountered	
Burkett	5798	5822	5824	not encountered	
Tully Limestone	5822	5848	5848	not encountered	
Hamilton	5848	5883	5875	not encountered	
Marcellus	5883	5936	5910	not encountered	
Onondaga	5936	5944	5964	not encountered	
Huntersville	5944	6158	5972	6191	
Oriskany	6158	6270	6191	6313	
Helderburg	6270	6530	6313	6719	
Bass Island Dolomite	6530	6609	6719	7118	
Salina G Big Lime	6609	6809	7118	7333	
Salina F	6809	7608	7333	8194	
Lockport Dolomite	7608	7930	8194	8541	
Rochester Shale	7930	8235	8541	8869	
Dayton Fm/Packer Shell	8235	8254	8869	8890	

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Fracture Date:	3/7/2017
State:	West Virginia
County:	Marshall
API Number:	4705101761
Operator Name:	NOBLE ENERGY INC
Well Name and Number:	MND 6 E
Longitude:	-80.79
Latitude:	38.87
Long/Lat Projection:	NAD83
Indian/Federal:	none
Production Type:	
True Vertical Depth (TVD):	5,801
Total Water Volume (gal):	25,540,574

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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)**	Ingredient Mass lbs	Comments	Company	First Name	Last Name	Email	Phone
Fresh Water	Operator	Base Fluid	Water	7732-18-5	100.00%	96.17011%	212752275	Density = 8.330					
FE-1A ACIDIZING COMPOSITION	Halliburton	Additive	Listed Below	Listed Below			0	NA					
FR-70	Halliburton	Friction Reducer	Listed Below	Listed Below			0	NA					
HAZDS ACID INHIBITOR	Halliburton	Corrosion Inhibitor	Listed Below	Listed Below			0	NA					
HYDROCHLORIC ACID	Halliburton	Solvent	Listed Below	Listed Below			0	NA					
CILPERM A	Halliburton	Non-ionic Surfactant	Listed Below	Listed Below			0	NA					
SAND-COMMON WHITE-100 MESH SSA-2, BULK (10000076)	Halliburton	Proppant	Listed Below	Listed Below			0	NA					
SAND-PREMIUM WHITE-40/70 BULK	Halliburton	Proppant	Listed Below	Listed Below			0	NA					
SP BREAKER	Halliburton	Breaker	Listed Below	Listed Below			0	NA					
WG-30 GELLING AGENT	Halliburton	Gelling Agent	Listed Below	Listed Below			0	NA					
MSDS and Non-MSDS ingredients are listed below the green line.													
Ingredients	Listed Above	Listed Above	1,2,4-Trimesylbenzene	95-63-6	1.00%	0.10000%	23						
			Acetic acid	64-19-7	100.00%	96.17011%	4088						
			Acetic anhydride	108-24-7	100.00%	0.0026%	6810						
			Acrylamide acrylate copolymer	Proprietary	100.00%	0.11414%	43828	Denise Tuck, Halliburton, 3000 N. Sam Houston Pkwy E., Houston TX 77032, 281-571-0226	Halliburton	Denise	Tuck	Denise.Tuck@Halliburton.com	281-871-0220
			Crystalline silica, quartz	14808-90-7	100.00%	11.52460%	27781530						
			Ethanol	64-17-5	100.00%	0.00000%	1374						
			Ethoxyethyl alcohol	Proprietary	100.00%	0.00014%	338		Halliburton	Denise	Tuck	Denise.Tuck@Halliburton.com	281-871-0225
			Fatty acids, tall oil	Proprietary	100.00%	0.00034%	338		Halliburton	Denise	Tuck	Denise.Tuck@Halliburton.com	281-871-0223
			Gear gum	9009-30-9	100.00%	0.00004%	135						
			Heavy aromatic petroleum naphtha	64742-04-5	100.00%	0.00000%	837						
			Hydrochloric acid	7647-01-9	7.50%	0.21063%	25623.625						
			Hydrocracked light petroleum distillate	04742-47-8	100.00%	0.00000%	43828						
			Inorganic salt	Proprietary	100.00%	0.00000%	43828		Halliburton	Denise	Tuck	Denise.Tuck@Halliburton.com	281-871-0220
			Methanol	67-58-1	100.00%	0.00000%	676						
			Naphthalene	91-20-3	5.00%	0.00000%	195						
			Olefins	Proprietary	5.00%	0.00000%	138		Halliburton	Denise	Tuck	Denise.Tuck@Halliburton.com	281-871-0220
			Oxalkylated phenolic resin	Proprietary	100.00%	0.00035%	916		Halliburton	Denise	Tuck	Denise.Tuck@Halliburton.com	281-871-0220
			Poly(ox-1,2-ethanediyl), alpha-(4-nonylphenyl)-omega-hydroxy-, branched	127087-87-0	5.00%	0.00000%	195						
			Propargyl alcohol	107-16-7	100.00%	0.00000%	113						
			Reaction product of acetophenone, formaldehyde, thiourea and oleic acid in dimethyl formamide	08527-49-1	100.00%	0.00013%	338						
			Sodium persulfate	7775-27-1	100.00%	0.00000%	1						
			Sodium sulfite	7757-02-6	100.00%	0.00000%	1						
			Water	7732-18-5	100.00%	0.17011%	429504						

* 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.

All component information listed was obtained from the supplier's Material Safety Data Sheets (MSDS). As such, the Operator is not responsible for inaccurate and/or incomplete information. Any questions regarding the content of the MSDS should be directed to the supplier who provided it. The Occupational Safety and Health Administration's (OSHA) regulations govern the criteria for the disclosure of this information. Please note that Federal Law protects "proprietary", "trade secret", and "confidential business information" and the criteria for how this information is reported on an MSDS is subject to 29 CFR 1910.1200(i) and Appendix D.



Actual Wellpath Report

MND-6E-HS AWP Proj: 15653'

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REFERENCE WELLPATH IDENTIFICATION			
Operator	NOBLE ENERGY	Slot	Slot E
Area	Marshall County, WV	Well	MND-6E-HS
Field	Marshall	Wellbore	MND-6E-HS AWB
Facility	MND-6 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	0.999946	Report Generated	12/3/2014 at 10:38:05 AM
Convergence at slot	0.82° West	Database/Source file	WA_NorthEast/MND-6E-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	3.57	-63.31	1637114.47	482515.80	39°49'03.401"N	80°47'30.895"W
Facility Reference Pt			1637177.78	482512.23	39°49'03.375"N	80°47'30.083"W
Field Reference Pt			609601.22	0.00	38°23'48.753"N	84°21'09.765"W

WELLPATH DATUM			
Calculation method	Minimum curvature	Nomac 79 (RKB) to Facility Vertical Datum	746.79ft
Horizontal Reference Pt	Slot	Nomac 79 (RKB) to Mean Sea Level	746.79ft
Vertical Reference Pt	Nomac 79 (RKB)	Nomac 79 (RKB) to Mud Line at Slot (Slot E)	26.00ft
MD Reference Pt	Nomac 79 (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	325.00°

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Actual Wellpath Report

MND-6E-HS AWP Proj: 15653

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BAKER HUGHES

REFERENCE WELLPATH IDENTIFICATION			
Operator	NOBLE ENERGY	Slot	Slot E
Area	Marshall County, WV	Well	MND-6E-HS
Field	Marshall	Wellbore	MND-6E-HS AWB
Facility	MND-6 Pad		

WELLPATH DATA (172 stations) † = interpolated/extrapolated station													
MID [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [ft]	Grid North [ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [ft/100ft]
0.00	0.00	1.150	0.00	0.00	0.00	0.00	1637114.47	482515.80	39°49'03.401"N	80°47'30.895"W	0.00	0.00	0.00
26.00	0.000	1.150	26.00	0.00	0.00	0.00	1637114.47	482515.80	39°49'03.401"N	80°47'30.895"W	0.00	0.00	0.00
50.00	0.220	1.150	50.00	0.04	0.05	0.00	1637114.47	482515.85	39°49'03.401"N	80°47'30.895"W	0.05	1.150	0.92
100.00	0.430	282.070	100.00	0.25	0.18	-0.18	1637114.29	482515.98	39°49'03.403"N	80°47'30.897"W	0.26	315.103	0.89
150.00	0.530	227.990	150.00	0.37	0.12	-0.47	1637114.00	482515.92	39°49'03.402"N	80°47'30.901"W	0.49	284.763	0.71
200.00	0.430	315.220	200.00	0.54	0.16	-0.71	1637113.76	482515.96	39°49'03.402"N	80°47'30.904"W	0.73	282.769	1.06
250.00	0.830	309.140	249.99	1.07	0.52	-1.12	1637113.35	482516.32	39°49'03.406"N	80°47'30.910"W	1.23	294.906	0.79
265.00	1.000	277.410	264.99	1.26	0.60	-1.33	1637113.14	482516.40	39°49'03.407"N	80°47'30.912"W	1.46	294.398	3.51
311.00	0.520	159.270	310.99	1.33	0.46	-1.66	1637112.81	482516.26	39°49'03.405"N	80°47'30.916"W	1.72	285.551	2.88
327.00	0.540	167.240	326.99	1.19	0.32	-1.61	1637112.86	482516.12	39°49'03.404"N	80°47'30.916"W	1.65	281.199	0.48
426.00	1.110	160.580	425.98	-0.17	-1.04	-1.19	1637113.28	482514.76	39°49'03.391"N	80°47'30.910"W	1.58	228.926	0.58
523.00	1.590	155.260	522.95	-2.40	-3.15	-0.32	1637114.15	482512.65	39°49'03.370"N	80°47'30.899"W	3.16	185.756	0.51
617.00	1.930	149.540	616.91	-5.26	-5.70	1.03	1637115.50	482510.10	39°49'03.345"N	80°47'30.881"W	5.79	169.743	0.41
702.00	1.370	142.310	701.87	-7.70	-7.73	2.38	1637116.85	482508.07	39°49'03.325"N	80°47'30.863"W	8.09	162.912	0.70
904.00	3.710	144.820	903.66	-16.65	-14.99	7.62	1637122.09	482500.81	39°49'03.254"N	80°47'30.795"W	16.81	153.051	1.16
999.00	5.500	152.910	998.35	-24.23	-21.55	11.46	1637125.93	482494.25	39°49'03.190"N	80°47'30.744"W	24.41	151.992	2.00
1094.00	5.480	149.840	1092.91	-33.26	-29.53	15.82	1637130.29	482486.27	39°49'03.111"N	80°47'30.687"W	33.50	151.825	0.31
1188.00	3.740	149.140	1186.61	-40.79	-36.04	19.64	1637134.11	482479.76	39°49'03.048"N	80°47'30.637"W	41.05	151.408	1.85
1281.00	2.120	143.660	1279.48	-45.54	-40.03	22.22	1637136.69	482475.77	39°49'03.009"N	80°47'30.603"W	45.79	150.967	1.77
1375.00	2.010	138.560	1373.42	-48.91	-42.67	24.34	1637138.81	482473.13	39°49'02.983"N	80°47'30.575"W	49.12	150.296	0.23
1470.00	2.010	134.940	1468.36	-52.21	-45.09	26.62	1637141.09	482470.71	39°49'02.959"N	80°47'30.546"W	52.37	149.443	0.13
1564.00	1.770	131.000	1562.31	-55.24	-47.21	28.89	1637143.35	482468.59	39°49'02.939"N	80°47'30.516"W	55.35	148.540	0.29
1656.00	1.590	127.530	1654.27	-57.84	-48.92	30.97	1637145.44	482466.88	39°49'02.922"N	80°47'30.489"W	57.90	147.663	0.22
1755.00	1.550	123.030	1753.23	-60.39	-50.49	33.18	1637147.65	482465.32	39°49'02.907"N	80°47'30.461"W	60.42	146.686	0.13
1850.00	1.430	121.990	1848.20	-62.67	-51.82	35.26	1637149.73	482463.99	39°49'02.894"N	80°47'30.434"W	62.68	145.762	0.13
1944.00	1.310	115.520	1942.18	-64.69	-52.90	37.23	1637151.70	482462.90	39°49'02.884"N	80°47'30.408"W	64.69	144.863	0.21
2015.00	1.280	111.380	2013.16	-66.05	-53.54	38.70	1637153.17	482462.26	39°49'02.877"N	80°47'30.389"W	66.06	144.139	0.14
2139.00	1.120	108.900	2137.13	-68.19	-54.44	41.14	1637155.60	482461.37	39°49'02.869"N	80°47'30.358"W	68.23	142.922	0.14
2234.00	0.630	303.660	2232.13	-68.45	-54.45	41.58	1637156.05	482461.36	39°49'02.869"N	80°47'30.352"W	68.51	142.632	1.83
2329.00	0.890	307.530	2327.12	-67.26	-53.71	40.56	1637155.03	482462.09	39°49'02.876"N	80°47'30.366"W	67.30	142.940	0.28



Actual Wellpath Report

MND-6E-HS AWP Proj: 15653

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REFERENCE WELLPATH IDENTIFICATION

Operator	NOBLE ENERGY
Area	Marshall County, WV
Field	Marshall
Facility	MND-6-Pad
Well	MND-6E-HS
Wellbore	MND-6E-HS AWB
Slot	Slot E

WELLPATH DATA (172 stations)

MD	Inclination	Azimuth	TVD	Vert Sect	North	East	Grid East	Grid North	Latitude	Longitude	Closure Dist	Closure Dir	DLS
[ft]	[°]	[°]	[ft]	[ft]	[ft]	[ft]	[US ft]	[US ft]	[N]	[W]	[ft]	[°]	[ft/100ft]
2423.00	0.960	294.510	2421.11	-65.88	-52.94	39.26	1637153.23	482462.87	39°49'02.883"N	80°47'30.382"W	65.91	143.435	0.24
2518.00	0.920	293.790	2516.09	-64.55	-52.30	37.84	1637152.31	482463.50	39°49'02.890"N	80°47'30.401"W	64.55	144.111	0.04
2613.00	0.710	293.920	2611.08	-63.39	-51.75	36.61	1637151.07	482464.05	39°49'02.895"N	80°47'30.417"W	63.39	144.727	0.22
2707.00	0.790	306.200	2705.07	-62.28	-51.13	35.55	1637150.02	482464.67	39°49'02.901"N	80°47'30.430"W	62.28	145.191	0.19
2802.00	0.580	298.670	2800.07	-61.23	-50.52	34.60	1637149.07	482465.29	39°49'02.907"N	80°47'30.442"W	61.23	145.591	0.24
2897.00	0.530	299.610	2895.06	-60.38	-50.06	33.78	1637148.25	482465.74	39°49'02.911"N	80°47'30.453"W	60.39	145.987	0.03
3181.00	0.620	285.950	3179.05	-57.96	-48.96	31.12	1637145.59	482466.84	39°49'02.922"N	80°47'30.487"W	58.02	147.561	0.05
3276.00	3.180	256.170	3273.99	-56.61	-49.45	28.07	1637142.54	482466.35	39°49'02.916"N	80°47'30.526"W	56.86	150.423	2.80
3371.00	6.800	241.040	3368.62	-55.06	-52.81	20.58	1637135.05	482463.00	39°49'02.882"N	80°47'30.622"W	56.68	158.704	4.02
3466.00	8.360	240.460	3462.78	-53.82	-58.94	9.65	1637124.12	482456.87	39°49'02.820"N	80°47'30.761"W	59.72	170.697	1.64
3561.00	9.820	238.060	3556.59	-52.73	-66.63	-3.23	1637111.24	482449.18	39°49'02.742"N	80°47'30.924"W	66.71	182.775	1.59
3656.00	12.650	236.200	3649.76	-52.08	-76.70	-18.75	1637095.72	482439.10	39°49'02.640"N	80°47'31.121"W	78.96	193.738	3.00
3708.00	13.800	239.910	3700.38	-51.43	-82.98	-28.85	1637085.62	482432.83	39°49'02.577"N	80°47'31.250"W	87.85	199.171	2.75
3817.00	19.400	246.550	3804.81	-46.68	-96.71	-56.73	1637057.74	482419.09	39°49'02.437"N	80°47'31.604"W	112.12	210.395	5.42
3912.00	26.670	245.870	3892.17	-40.23	-112.40	-90.39	1637024.08	482403.40	39°49'02.277"N	80°47'32.035"W	144.24	218.805	7.73
4007.00	26.620	241.350	3977.09	-34.59	-132.00	-128.21	1636986.26	482383.81	39°49'02.078"N	80°47'32.514"W	184.02	224.166	1.19
4101.00	26.780	238.200	4061.07	-31.08	-153.26	-164.69	1636949.79	482362.55	39°49'01.863"N	80°47'32.977"W	224.97	227.060	1.52
4196.00	26.400	236.070	4146.02	-29.49	-176.32	-200.41	1636914.07	482339.49	39°49'01.630"N	80°47'33.431"W	266.93	228.658	1.08
4291.00	26.830	237.230	4230.96	-28.26	-199.72	-235.96	1636878.53	482316.10	39°49'01.394"N	80°47'33.882"W	309.13	229.755	0.71
4385.00	22.340	232.930	4316.42	-28.08	-221.98	-268.07	1636846.42	482293.83	39°49'01.169"N	80°47'34.289"W	348.05	230.373	5.14
4480.00	26.700	240.110	4402.85	-26.83	-243.51	-301.00	1636813.49	482272.30	39°49'00.952"N	80°47'34.707"W	387.17	231.027	5.55
4575.00	26.680	238.380	4487.73	-23.67	-265.33	-337.67	1636776.82	482250.48	39°49'00.731"N	80°47'35.173"W	429.44	231.840	0.82
4669.00	26.420	238.630	4571.82	-21.10	-287.28	-373.49	1636741.00	482228.53	39°49'00.509"N	80°47'35.628"W	471.20	232.433	0.30
4764.00	26.320	239.660	4656.93	-18.05	-308.92	-409.72	1636704.78	482206.89	39°49'00.290"N	80°47'36.088"W	513.13	232.984	0.49
4859.00	25.460	241.280	4742.40	-14.11	-329.37	-445.80	1636668.69	482186.44	39°49'00.083"N	80°47'36.547"W	554.28	233.542	1.17
4953.00	25.340	240.950	4827.24	-9.80	-348.92	-481.23	1636633.26	482166.90	39°48'59.885"N	80°47'36.997"W	594.42	234.056	0.17
5048.00	25.460	240.210	4912.99	-5.82	-369.01	-516.86	1636597.64	482146.81	39°48'59.681"N	80°47'37.450"W	635.07	234.475	0.35
5142.00	24.890	240.860	4998.06	-1.97	-388.68	-551.67	1636562.83	482127.14	39°48'59.482"N	80°47'37.892"W	674.84	234.833	0.67
5237.00	25.670	241.200	5083.96	2.30	-408.33	-587.16	1636527.34	482107.49	39°48'59.282"N	80°47'38.344"W	715.19	235.184	0.84
5331.00	25.470	240.920	5168.75	6.58	-427.96	-622.67	1636491.84	482087.86	39°48'59.083"N	80°47'38.795"W	755.56	235.499	0.25



Actual Wellpath Report

MIND-6E-IIS AWP Proj: 15653

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WV Department of Environmental Protection

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REFERENCE WELLPATH IDENTIFICATION

Operator	NOBLE ENERGY	Slot	Slot E
Area	Marshall County, WV	Well	MIND-6E-IIS
Field	Marshall		MIND-6E-IIS AWB
Facility	MIND-6 Pad		

WELLPATH DATA (172 stations)

MID [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 [ft/100ft]
5426.00	25.280	240.710	5254.59	10.71	-447.81	-658.21	1636156.29	482068.01	39°48'58.882"N	80°47'39.247"W	796.10	235.771	0.22
5521.00	25.150	249.890	5340.57	17.92	-464.69	-694.87	1636419.64	482051.14	39°48'58.710"N	80°47'39.713"W	835.93	236.228	4.12
5615.00	27.840	262.710	5424.76	33.27	-474.35	-735.44	1636379.07	482041.48	39°48'58.609"N	80°47'40.231"W	875.15	237.179	6.71
5710.00	31.070	272.020	5507.51	58.36	-476.30	-781.98	1636332.53	482039.53	39°48'58.583"N	80°47'40.827"W	915.62	238.655	5.89
5805.00	33.370	281.770	5587.93	92.19	-470.10	-832.10	1636282.42	482045.72	39°48'58.637"N	80°47'41.471"W	955.71	240.535	5.98
5899.00	40.310	290.230	5663.16	136.08	-454.28	-886.04	1636228.48	482061.54	39°48'58.786"N	80°47'42.165"W	995.71	242.855	9.13
5994.00	50.950	293.590	5729.51	192.98	-428.82	-948.87	1636165.66	482087.00	39°48'59.028"N	80°47'42.975"W	1041.27	245.680	11.48
6089.00	59.560	301.840	5783.67	262.33	-392.34	-1017.67	1636096.85	482123.48	39°48'59.379"N	80°47'43.863"W	1090.68	248.917	11.52
6184.00	64.190	309.310	5828.49	341.28	-343.57	-1085.66	1636028.87	482127.25	39°48'59.851"N	80°47'44.743"W	1138.73	252.440	8.47
6278.00	72.030	316.220	5863.54	426.42	-284.33	-1149.50	1635965.04	482231.49	39°49'00.428"N	80°47'45.572"W	1184.14	256.107	10.77
6373.00	80.020	323.230	5886.49	518.08	-214.04	-1208.93	1635905.61	482301.78	39°49'01.114"N	80°47'46.347"W	1227.73	259.960	11.04
6468.00	89.260	326.680	5895.36	612.55	-136.68	-1263.16	1635851.38	482379.12	39°49'01.871"N	80°47'47.056"W	1270.53	263.824	10.38
6493.00	90.310	326.960	5895.44	637.54	-115.76	-1276.84	1635837.70	482400.03	39°49'02.073"N	80°47'47.235"W	1282.07	264.820	4.58
6563.00	90.310	327.900	5895.02	707.47	-56.77	-1314.52	1635800.02	482459.03	39°49'02.653"N	80°47'47.729"W	1315.74	267.527	1.35
6658.00	90.400	327.910	5894.44	802.35	23.71	-1364.99	1635749.55	482539.51	39°49'03.441"N	80°47'48.390"W	1365.20	270.995	0.10
6752.00	90.370	327.130	5893.80	896.26	-145.47	-1415.47	1635699.08	482618.80	39°49'04.217"N	80°47'49.052"W	1419.21	274.162	0.83
6847.00	90.400	327.130	5893.17	991.19	-147.03	-1467.03	1635647.52	482698.58	39°49'04.998"N	80°47'49.727"W	1478.37	277.102	0.03
6942.00	90.590	328.280	5892.35	1086.08	-263.09	-1517.78	1635596.77	482778.88	39°49'05.785"N	80°47'50.193"W	1540.42	279.834	1.23
7036.00	90.650	328.670	5891.33	1179.90	-343.21	-1566.93	1635547.63	482858.99	39°49'06.569"N	80°47'51.037"W	1604.08	282.355	0.42
7130.00	90.620	327.490	5890.29	1273.76	-422.99	-1616.63	1635497.93	482938.77	39°49'07.351"N	80°47'51.689"W	1671.05	284.663	1.26
7225.00	90.550	324.140	5889.32	1368.73	-501.56	-1669.99	1635444.57	483017.34	39°49'08.119"N	80°47'52.387"W	1743.69	286.717	3.53
7320.00	90.370	321.710	5888.55	1463.65	-577.35	-1727.26	1635387.31	483093.12	39°49'08.860"N	80°47'53.135"W	1821.20	288.483	2.56
7415.00	90.430	322.030	5887.89	1558.51	-652.08	-1785.92	1635328.65	483167.84	39°49'09.590"N	80°47'53.901"W	1901.24	290.058	0.34
7510.00	90.650	324.180	5886.99	1653.45	-728.05	-1842.94	1635271.63	483243.81	39°49'10.335"N	80°47'54.645"W	1981.54	291.556	2.27
7605.00	90.310	324.620	5886.20	1748.44	-805.29	-1898.24	1635216.33	483321.04	39°49'11.088"N	80°47'55.368"W	2061.99	292.988	0.59
7700.00	90.460	322.170	5885.56	1843.39	-881.54	-1954.89	1635159.69	483397.29	39°49'11.834"N	80°47'56.108"W	2144.46	294.273	2.58
7794.00	90.340	322.290	5884.90	1937.28	-955.85	-2012.46	1635102.12	483471.59	39°49'12.560"N	80°47'56.860"W	2227.92	295.406	0.18
7889.00	90.280	322.530	5884.39	2032.18	-1031.12	-2070.41	1635044.18	483546.86	39°49'13.295"N	80°47'57.616"W	2312.96	296.475	0.26
7984.00	90.430	322.990	5883.80	2127.11	-1106.75	-2127.90	1634986.69	483622.49	39°49'14.034"N	80°47'58.367"W	2398.51	297.480	0.51
8079.00	90.650	323.750	5882.91	2222.06	-1182.98	-2184.57	1634930.02	483698.72	39°49'14.780"N	80°47'59.107"W	2484.31	298.436	0.83



Actual Wellpath Report

MND-6E-HS AWP Proj: 15653

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WV Department of
Environmental Protection

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REFERENCE WELLPATH IDENTIFICATION

Operator	Area	Field	Facility
NOBLE ENERGY	Marshall County, WV	Marshall	MND-6 Pad
			Wellbore
			MND-6E-HS AWP
			Well
			MND-6E-HS
			Slot
			Slot E

WELLPATH DATA (172 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [ft]	Grid North [ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [ft/100ft]
8173.00	91.010	324.880	5881.54	2316.05	1259.33	-2239.40	1634875.19	483775.05	39°49'15.52"N	80°48'19.555"W	2569.21	299.351	1.26
8268.00	90.980	325.420	5879.89	2411.03	1337.27	-2293.68	1634820.92	483853.00	39°49'16.289"N	80°48'00.534"W	2655.05	301.108	1.35
8363.00	91.050	326.700	5878.21	2506.00	1416.07	-2346.71	1634767.89	483931.80	39°49'17.060"N	80°48'01.228"W	2740.86	301.108	1.35
8458.00	91.170	325.460	5876.37	2600.96	1494.89	-2399.71	1634714.89	484010.61	39°49'17.831"N	80°48'01.922"W	2827.25	301.921	1.31
8553.00	91.200	325.790	5874.41	2695.94	1573.28	-2453.34	1634661.27	484089.00	39°49'18.598"N	80°48'02.624"W	2914.46	302.671	0.35
8648.00	91.300	326.880	5872.26	2790.88	1652.33	-2505.99	1634608.62	484168.04	39°49'19.372"N	80°48'03.313"W	3001.69	303.399	1.16
8742.00	91.320	327.330	5870.04	2884.79	1731.24	-2557.02	1634557.39	484246.94	39°49'20.144"N	80°48'03.982"W	3087.97	304.100	0.48
8837.00	90.980	326.870	5868.13	2979.71	1810.98	-2608.61	1634506.00	484326.68	39°49'20.925"N	80°48'04.658"W	3175.61	304.770	0.60
8931.00	90.890	326.320	5866.60	3073.66	1889.44	-2660.36	1634454.26	484405.14	39°49'21.693"N	80°48'05.336"W	3263.05	305.383	0.39
9026.00	91.050	325.700	5864.99	3168.63	1968.20	-2713.46	1634401.16	484483.89	39°49'22.463"N	80°48'06.031"W	3352.12	305.953	0.67
9121.00	91.080	326.000	5863.22	3263.61	2046.81	-2766.78	1634347.84	484562.49	39°49'23.232"N	80°48'06.729"W	3441.58	306.493	0.32
9215.00	90.620	327.470	5861.83	3357.55	2125.39	-2818.33	1634296.29	484641.07	39°49'24.002"N	80°48'07.404"W	3529.91	307.021	1.64
9310.00	90.680	328.640	5860.75	3452.41	2206.00	-2868.59	1634246.04	484721.68	39°49'24.791"N	80°48'08.063"W	3618.74	307.561	1.23
9405.00	90.460	331.750	5859.80	3547.00	2288.42	-2915.81	1634198.83	484804.09	39°49'25.599"N	80°48'08.683"W	3706.39	308.126	3.28
9500.00	90.370	332.240	5859.12	3641.29	2372.29	-2960.41	1634154.22	484887.96	39°49'26.421"N	80°48'09.270"W	3793.65	308.707	0.52
9594.00	89.880	328.110	5858.91	3734.89	2453.82	-3007.15	1634107.49	484969.49	39°49'27.220"N	80°48'09.885"W	3881.26	309.214	4.42
9644.00	89.970	325.960	5858.98	3784.85	2495.77	-3034.36	1634080.28	485011.43	39°49'27.631"N	80°48'10.241"W	3928.89	309.437	4.30
9689.00	90.000	323.500	5858.99	3829.85	2532.51	-3060.34	1634054.30	485048.17	39°49'27.990"N	80°48'10.581"W	3972.31	309.609	5.47
9781.00	90.490	321.490	5858.58	3924.75	2607.87	-3118.17	1633996.47	485123.52	39°49'28.726"N	80°48'11.336"W	4064.97	309.907	2.18
9879.00	90.460	319.840	5857.79	4019.47	2681.34	-3178.39	1633936.26	485196.99	39°49'29.444"W	80°48'12.121"W	4158.33	310.152	1.74
9973.00	90.490	318.870	5857.02	4113.01	2752.66	-3239.61	1633875.04	485268.31	39°49'30.140"N	80°48'12.919"W	4251.14	310.354	1.03
10068.00	90.400	319.860	5856.28	4207.55	2824.75	-3301.48	1633813.18	485340.39	39°49'30.843"N	80°48'13.725"W	4344.99	310.550	1.03
10162.00	90.310	322.680	5855.69	4301.34	2898.07	-3360.28	1633754.38	485413.71	39°49'31.559"N	80°48'14.493"W	4437.38	310.776	3.00
10257.00	90.460	323.210	5855.06	4396.28	2973.88	-3417.53	1633697.13	485489.52	39°49'32.300"N	80°48'15.240"W	4530.28	311.029	0.58
10352.00	90.960	322.330	5853.88	4491.19	3049.52	-3475.00	1633639.67	485565.15	39°49'33.039"N	80°48'15.991"W	4623.33	311.269	1.07
10447.00	90.770	321.200	5852.45	4586.03	3124.13	-3533.78	1633580.88	485639.75	39°49'33.768"N	80°48'16.758"W	4716.76	311.479	1.21
10542.00	90.370	323.620	5851.50	4680.92	3199.40	-3591.73	1633522.94	485715.02	39°49'34.504"N	80°48'17.515"W	4810.06	311.694	2.38
10637.00	90.030	326.860	5851.17	4775.91	3277.43	-3645.88	1633468.79	485793.05	39°49'35.267"N	80°48'18.223"W	4902.45	311.954	3.43
10732.00	90.770	328.220	5850.50	4870.81	3357.59	-3696.87	1633417.81	485873.20	39°49'36.052"N	80°48'18.892"W	4994.02	312.247	1.63
10827.00	91.170	327.380	5848.90	4965.68	3437.96	-3747.48	1633367.20	485953.57	39°49'36.839"N	80°48'19.555"W	5085.39	312.533	0.98



Actual Wellpath Report

MND-6E-HS AWP Proj: 15633

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WV Department of
Environmental Protection

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REFERENCE WELLPATH IDENTIFICATION

Operator	NOBLE ENERGY	Slot	Slot E
Area	Marshall County, WV	Well	MND-6E-HS
Field	Marshall	Wellbore	MND-6E-HS AWB
Facility	MND-6 Pad		

WELLPATH DATA (172 stations)

MID	Inclination	Azimuth	TVD	Vert Sect	North	East	Grid East	Grid North	Latitude	Longitude	Closure Dist	Closure Dir	DLS
[ft]	[°]	[°]	[ft]	[ft]	[ft]	[ft]	[US ft]	[US ft]	[US ft]	[US ft]	[ft]	[°]	[ft/100ft]
10923.00	91.420	325.630	5846.73	5061.62	3518.00	-3800.45	1633314.24	486033.60	39°49'37.622"N	80°48'20.249"W	5178.77	312.790	1.84
11112.00	90.370	320.700	5843.69	5250.30	3667.24	-3916.25	1633198.44	486182.84	39°49'39.080"N	80°48'21.761"W	5365.23	313.119	0.83
11396.00	90.310	324.160	5840.85	5534.18	3898.50	-4080.92	1633033.77	486414.08	39°49'41.342"N	80°48'23.914"W	5643.78	313.690	2.08
11491.00	90.710	327.990	5840.00	5629.15	3977.31	-4133.93	1632980.77	486492.89	39°49'42.113"N	80°48'24.608"W	5736.58	313.894	4.05
11586.00	92.030	336.390	5837.73	5723.29	4061.23	-4178.20	1632936.50	486576.81	39°49'42.936"N	80°48'25.191"W	5826.75	314.187	8.95
11680.00	91.730	332.880	5834.64	5815.90	4146.11	-4218.44	1632896.26	486661.68	39°49'43.769"N	80°48'25.723"W	5914.85	314.505	3.75
11775.00	92.250	325.850	5831.54	5910.50	4227.75	-4266.79	1632847.92	486743.32	39°49'44.569"N	80°48'26.358"W	6006.61	314.737	7.42
11870.00	92.340	320.470	5827.53	6005.34	4303.69	-4323.68	1632791.03	486819.25	39°49'45.311"N	80°48'27.101"W	6100.49	314.867	5.66
11965.00	90.920	319.130	5824.83	6099.91	4376.22	-4384.97	1632729.74	486891.78	39°49'46.019"N	80°48'27.900"W	6195.10	314.943	2.05
12060.00	90.280	323.650	5823.83	6194.69	4450.43	-4444.24	1632670.48	486965.98	39°49'46.744"N	80°48'28.674"W	6289.48	315.040	4.81
12154.00	90.460	326.890	5823.23	6288.67	4527.67	-4497.78	1632616.94	487043.22	39°49'47.499"N	80°48'29.374"W	6382.00	315.190	3.45
12249.00	90.830	325.390	5822.16	6383.65	4606.55	-4550.71	1632564.02	487122.10	39°49'48.271"N	80°48'30.067"W	6475.28	315.349	1.63
12344.00	91.050	324.900	5820.60	6478.63	4684.50	-4604.99	1632509.73	487200.04	39°49'49.033"N	80°48'30.778"W	6568.90	315.490	0.57
12438.00	91.110	322.600	5818.83	6572.59	4760.29	-4660.56	1632454.17	487275.82	39°49'49.774"N	80°48'31.504"W	6661.92	315.606	2.45
12533.00	90.990	321.570	5817.09	6667.45	4835.22	-4718.93	1632395.80	487350.75	39°49'50.506"N	80°48'32.266"W	6756.30	315.697	1.09
12628.00	90.890	325.270	5815.53	6762.38	4911.49	-4775.53	1632339.21	487427.01	39°49'51.252"N	80°48'33.005"W	6850.43	315.804	3.90
12722.00	91.170	326.150	5813.84	6856.36	4989.14	-4828.47	1632286.26	487504.66	39°49'52.012"N	80°48'33.699"W	6943.03	315.938	0.98
12816.00	91.230	324.140	5811.87	6950.33	5066.25	-4882.18	1632232.56	487581.77	39°49'52.766"N	80°48'34.401"W	7035.81	316.060	2.14
12911.00	91.260	323.860	5809.80	7045.30	5143.09	-4938.01	1632176.74	487658.60	39°49'53.517"N	80°48'35.131"W	7129.89	316.165	0.30
13006.00	91.230	324.550	5807.74	7140.26	5220.13	-4993.56	1632121.19	487735.64	39°49'54.270"N	80°48'35.858"W	7223.94	316.271	0.73
13101.00	90.770	323.630	5806.08	7235.24	5297.06	-5049.27	1632065.48	487812.56	39°49'55.023"N	80°48'36.586"W	7318.05	316.372	1.08
13196.00	90.890	322.160	5804.71	7330.16	5372.81	-5106.57	1632008.18	487888.31	39°49'55.763"N	80°48'37.335"W	7412.44	316.455	1.55
13290.00	90.520	320.990	5803.55	7423.98	5446.45	-5164.99	1631949.77	487961.95	39°49'56.482"N	80°48'38.097"W	7506.06	316.519	1.31
13385.00	90.490	324.850	5802.71	7518.90	5522.22	-5222.25	1631892.51	488037.71	39°49'57.223"N	80°48'38.845"W	7600.45	316.599	4.06
13480.00	90.460	326.840	5801.92	7613.88	5600.83	-5275.58	1631839.18	488116.32	39°49'57.992"N	80°48'39.543"W	7694.22	316.713	2.09
13575.00	90.460	327.020	5801.16	7708.82	5680.44	-5327.42	1631787.55	488195.92	39°49'58.771"N	80°48'40.223"W	7787.73	316.837	0.19
13669.00	90.990	330.470	5799.97	7802.60	5760.78	-5376.18	1631738.59	488276.25	39°49'59.558"N	80°48'40.863"W	7879.71	316.978	3.71



Actual Wellpath Report

MND-6E-IIS AWP Proj: 15653

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WV Department of
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REFERENCE WELLPATH IDENTIFICATION

Operator	NOBLE ENERGY
Area	Marshall County, WV
Field	Marshall
Facility	MND-6 Pad
Slot	Slot E
Well	MND-6E-IIS
Wellbore	MND-6E-IIS AWB

WELLPATH DATA (172 stations)

MID [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [ft]	Grid East [ft]	Grid North [ft]	Latitude [ft]	Longitude [ft]	Closure Dist [ft]	Closure Dir [ft]	DLG [ft/1000]
13764.00	90.990	332.040	5798.33	7897.02	5844.05	-5421.86	1631692.91	488359.53	39°50'00.374"N	80°48'41.464"W	7971.79	317.146	1.65	
13859.00	91.170	326.680	5796.54	7991.69	5925.75	-5470.25	1631644.53	488441.22	39°50'01.174"N	80°48'42.099"W	8064.62	317.289	5.64	
13954.00	91.110	324.900	5794.65	8086.66	6004.29	-5523.65	1631591.13	488519.76	39°50'01.943"N	80°48'42.798"W	8158.56	317.388	1.87	
14048.00	91.110	323.990	5792.83	8180.64	6080.75	-5578.29	1631536.49	488596.21	39°50'02.691"N	80°48'43.513"W	8251.84	317.468	0.97	
14143.00	90.950	322.980	5791.12	8275.59	6157.09	-5634.81	1631479.97	488672.55	39°50'03.437"N	80°48'44.252"W	8346.31	317.536	1.08	
14238.00	91.140	323.400	5789.39	8370.52	6233.13	-5691.72	1631423.06	488748.59	39°50'04.180"N	80°48'44.995"W	8440.83	317.600	0.49	
14332.00	91.350	321.860	5787.34	8464.42	6307.82	-5748.76	1631366.03	488823.27	39°50'04.910"N	80°48'45.740"W	8534.45	317.655	1.65	
14427.00	91.510	323.380	5784.97	8559.30	6383.28	-5806.42	1631308.38	488898.73	39°50'05.647"N	80°48'46.493"W	8629.07	317.709	1.61	
14522.00	91.050	322.160	5782.85	8654.21	6458.90	-5863.88	1631250.92	488974.34	39°50'06.386"N	80°48'47.244"W	8723.67	317.764	1.37	
14616.00	90.580	320.390	5781.51	8747.99	6532.23	-5922.68	1631192.12	489047.66	39°50'07.102"N	80°48'48.011"W	8817.49	317.802	1.95	
14711.00	90.680	322.370	5780.47	8842.79	6606.44	-5981.96	1631132.84	489121.88	39°50'07.827"N	80°48'48.785"W	8912.29	317.840	2.09	
14805.00	90.740	325.530	5779.30	8936.76	6682.43	-6037.27	1631077.54	489197.85	39°50'08.570"N	80°48'49.508"W	9005.75	317.904	3.36	
14900.00	90.550	329.430	5778.23	9031.65	6762.51	-6088.33	1631026.48	489277.93	39°50'09.354"N	80°48'50.178"W	9099.41	318.003	4.11	
14994.00	91.350	328.510	5776.68	9125.41	6843.05	-6136.78	1630978.04	489358.47	39°50'10.143"N	80°48'50.814"W	9191.70	318.115	1.30	
15089.00	91.140	326.720	5774.61	9220.28	6923.25	-6187.64	1630927.17	489438.66	39°50'10.928"N	80°48'51.481"W	9285.38	318.211	1.90	
15184.00	91.410	326.120	5772.50	9315.23	7002.37	-6240.18	1630874.64	489517.78	39°50'11.702"N	80°48'52.169"W	9379.59	318.294	0.69	
15279.00	91.230	325.440	5770.31	9410.19	7080.91	-6293.59	1630821.23	489596.31	39°50'12.470"N	80°48'52.868"W	9473.57	318.369	0.74	
15374.00	90.710	327.620	5768.70	9505.14	7160.14	-6345.97	1630768.85	489675.54	39°50'13.246"N	80°48'53.555"W	9567.60	318.450	2.36	
15469.00	90.620	325.580	5767.60	9600.09	7239.44	-6398.26	1630716.57	489754.84	39°50'14.022"N	80°48'54.240"W	9661.63	318.530	2.15	
15563.00	90.680	321.030	5766.53	9694.02	7314.79	-6454.41	1630660.42	489830.18	39°50'14.758"N	80°48'54.974"W	9755.28	318.576	4.84	
15631.00	90.710	322.130	5765.71	9761.89	7368.06	-6496.66	1630618.17	489883.45	39°50'15.279"N	80°48'55.525"W	9823.18	318.596	1.62	
15653.00	90.710	322.130	5765.43	9783.86	7385.42	-6510.17	1630604.67	489900.81	39°50'15.448"N	80°48'55.702"W	9845.14	318.604	0.00	



Actual Wellpath Report

MND-6E-HS AWP Proj: 15653'

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REFERENCE WELLPATH IDENTIFICATION			
Operator	NOBLE ENERGY	Slot	Slot E
Area	Marshall County, WV	Well	MND-6E-HS
Field	Marshall	Wellbore	MND-6E-HS AWB
Facility	MND-6 Pad		

TARGETS									
Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
MND-6E-HS BHL Rev-2		5758.62	7386.22	-6509.25	1630605.58	489901.61	39°50'15.456"N	80°48'55.690"W	point
MND-6E-HS LP Rev-2		5895.00	-92.64	-1272.50	1635842.04	482423.17	39°49'02.304"N	80°47'47.184"W	point
MND-6E-HS LP Plat		5940.00	-125.00	-1249.85	1635864.69	482390.81	39°49'01.988"N	80°47'46.888"W	point
MND-6 Pad LL		6499.81	15.70	58.19	1637172.66	482531.50	39°49'03.564"N	80°47'30.152"W	polygon

WELLPATH COMPOSITION - Ref Wellbore: MND-6E-HS AWB Ref Wellpath: MND-6E-HS AWP Proj: 15653'				
Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
26.00	265.00	Generic gyro - northseeking (Standard)	01 Gyro <14-3/4"> (50'-265')	MND-6E-HS AWB
265.00	702.00	ISCWSA MWD, Rev. 2 (Standard)	02 APS EM <14-3/4"> (265')(311'-702') Proj: 760'	MND-6E-HS AWB
702.00	2015.00	ISCWSA MWD, Rev. 2 (Standard)	03 APS EM <12-1/4"> (702')(904'-2015') Proj: 2070'	MND-6E-HS AWB
2015.00	3656.00	NaviTrak (MagCorr)	04 BHI MWD <8-3/4"> (2015')(2139'-3656')	MND-6E-HS AWB
3656.00	15631.00	NaviTrak (AT Curve Short Spaced)	05 BHI AT Curve <8-3/4"> (3656')(3708'-15631')	MND-6E-HS AWB
15631.00	15653.00	Blind Drilling (std)	Projection to bit	MND-6E-HS AWB

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Actual Wellpath Report
 MND-6E-HS AWP Proj: 15653'
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REFERENCE WELLPATH IDENTIFICATION

Operator	NOBLE ENERGY	Slot	Slot E
Area	Marshall County, WV	Well	MND-6E-HS
Field	Marshall	Wellbore	MND-6E-HS AWB
Facility	MND-6 Pad		

COMMENTS

Wellpath general comments
 APR: 47-051-01761-0000
 BHI Job #: 6639448A
 Rig: Nomac 79
 Duration: 11.15.2014 - 11.23.2014
 Gyro <14-3/4" > (50'-265')
 APS EM <14-3/4" > (265')(311'-702')
 APS EM <12-1/4" > (702')(904'-2015')
 BHI MWD <8-3/4" > (2015')(2139'-3656')
 BHI AT Curve <8-3/4" > (3656')(3708'-15631')
 Projected MD at TD: 15653'

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NOBLE ENERGY



Location: Marshall County, WV
 Field: Marshall
 Facility: MND-6 Pad

Slot: Slot E
 Well: MND-6E-HS
 Wellbore: MND-6E-HS PWB

Location Information

Facility Name		Grid East (US ft)	Grid North (US ft)	Latitude	Longitude	
MND-6 Pad		1637177.780	482512.230	39°49'03.375"N	80°47'30.083"W	
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Slot E	3.57	-63.31	1637114.470	482515.800	39°49'03.401"N	80°47'30.895"W
Nomac 79 (RKB) to Mud line (At Slot: Slot E)				26ft		
Mean Sea Level to Mud line (At Slot: Slot E)				-720.79ft		
Nomac 79 (RKB) to Mean Sea Level				746.79ft		

Plot reference wellpath is MND-6E-HS PWB Rev-B.0

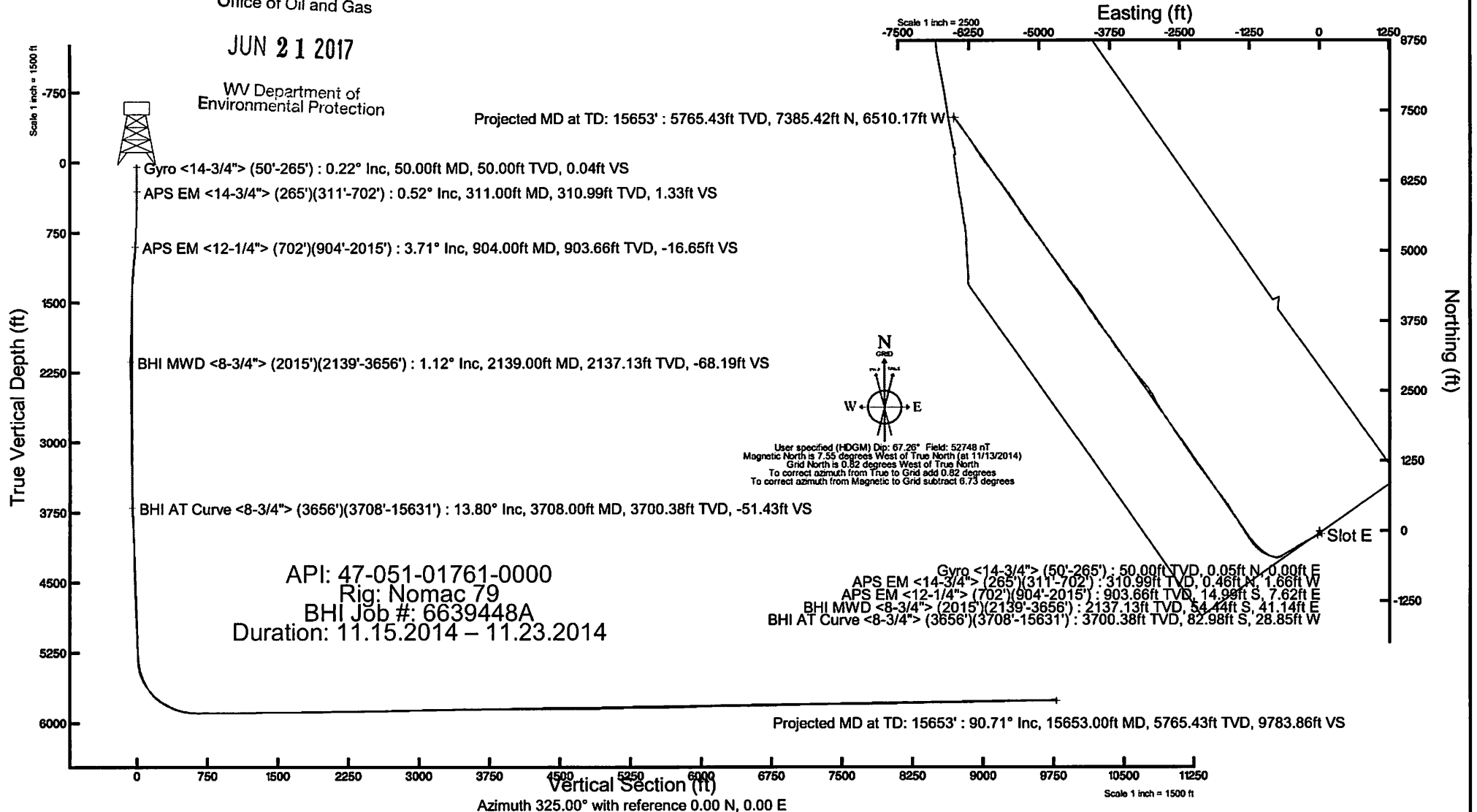
True vertical depths are referenced to Nomac 79 (RKB)	Grid System: NAD27 / Lambert West Virginia SP, Northern Zone (4701), US feet
Measured depths are referenced to Nomac 79 (RKB)	North Reference: Grid north
Nomac 79 (RKB) to Mean Sea Level: 746.79 feet	Scale: True distance
Mean Sea Level to Mud line (At Slot: Slot E): -720.79 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: kroschr on 12/3/2014

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Projected MD at TD: 15653' : 5765.43ft TVD, 7385.42ft N, 6510.17ft W

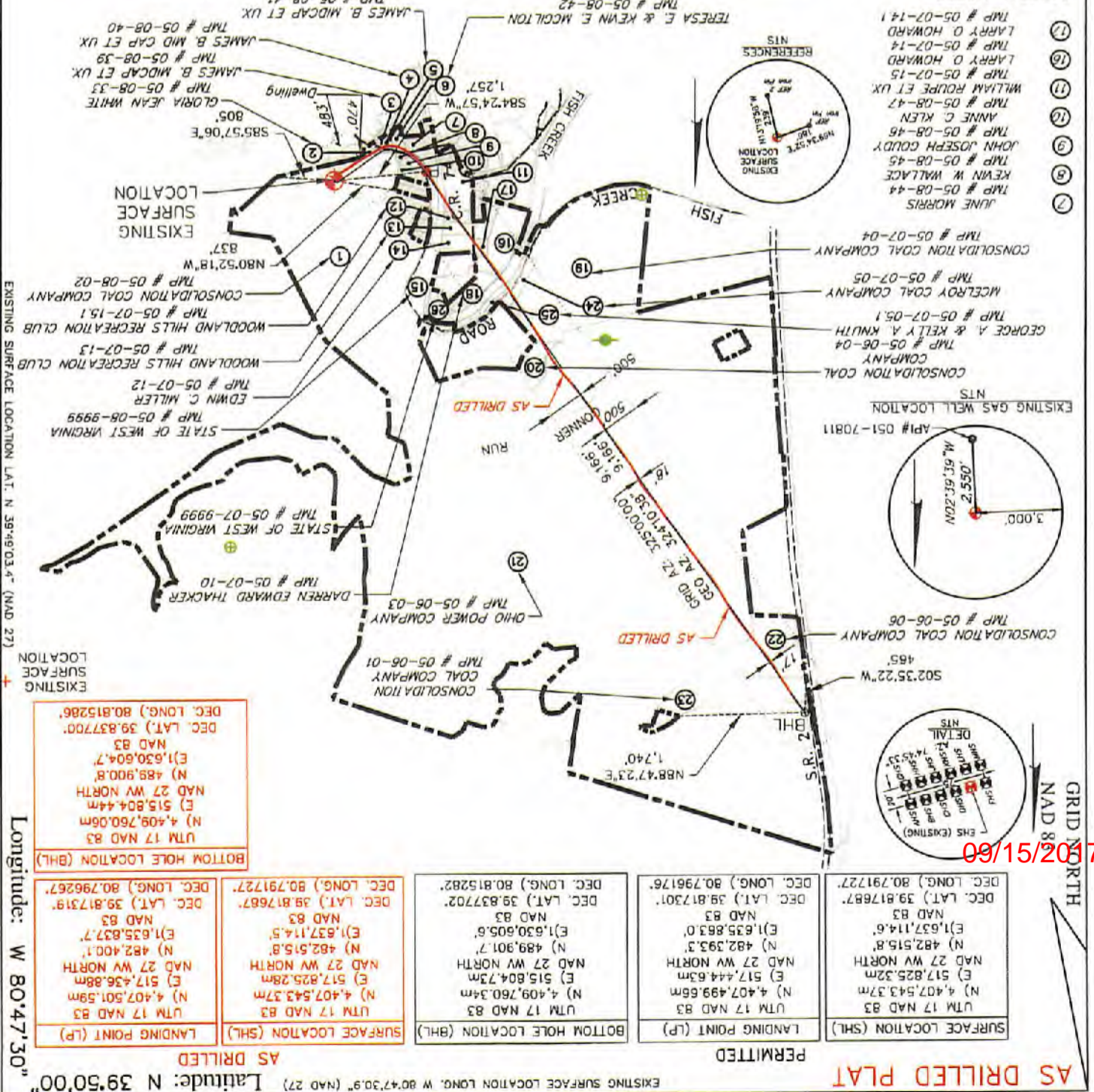


(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS
 WADE
 OFFICE OF OIL & GAS
 601 57TH STREET
 CHARLESTON, WV 25304
 WATERSHED: FISH CREEK
 COUNTY/DISTRICT: MARSHALL / FRANKLIN
 SURFACE OWNER: CONSOLIDATION COAL COMPANY
 OIL & GAS ROYALTY OWNER: CNX GAS COMPANY LLC and NOBLE ENERGY, INC.
 WELL OPERATOR: NOBLE ENERGY, INC.
 DESIGNATED AGENT: STEVEN GREEN
 ADDRESS: 333 TECHNOLOGY DRIVE, SUITE 118
 CITY: CANONSBURG STATE: PA ZIP CODE: 15317
 ESTIMATED DEPTH: TMD: 5,940'± TMD: 15,804'±
 TARGET FORMATION: MARCELLUS
 WELL TYPE: OIL GAS WASTE DISPOSAL LIQUID INJECTION PRODUCTION STORAGE DEEP SHALLOW
 ELEVATION: 722'-DESIGN (NAVD 88)
 QUADRANGLE: POMHATAN POINT, OHIO-W.VA
 ACREAGE: 136.587±
 ACREAGE: 136.587±
 DATE: OCTOBER 7, 2016
 OPERATOR'S WELL #: MND 6 EHS
 API WELL #: 47
 STATE: 47
 COUNTY: 051
 PERMIT: 01761



FILE #: 093842010
 DRAWING #: 093842010_SV-Plot
 SCALE: PLAT & TICK: 1" = 2,000'
 MINIMUM DEGREE OF ACCURACY: 1/200
 PROVEN SOURCE OF ELEVATION: NGS (CORS)
 SIGNED: [Signature]
 R.P.E.: [Signature]
 L.L.S.: 2241

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 RULES ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.



09/15/2017

AS DRILLED PLAT