

Revised

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

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Office of Oil and Gas

JUN 26 2017

WV Department of
Environmental Protection

API 47-051-01762 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 DHS
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 39.817699 Easting 80.791676
Landing Point of Curve Northing 39.818272 Easting 80.794456
Bottom Hole Northing 39.841442 Easting 80.816118

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 09/04/2014 Date drilling ceased 11/14/2014
Date completion activities began Not completed Date completion activities ceased na
Verbal plugging (Y/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: Jessie [Signature]
DATE: 7/6/17

Reviewed by: [Signature] **09/15/2017**

API 47- 051 - 01762 Farm name Consolidated Coal Company Well number MND 06 DHS

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"	110'	New	H-40		Y
Coal	17.5"	13 3/8"	718'	New	J-55		Y
Intermediate 1	12.38"	9 5/8"	2032'	New	HCK-55		Y
Intermediate 2							
Intermediate 3							
Production	8-3/4" & 8-1/2"	5 1/2"	16,756'	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 721 tail 2536	14.8	Lead 1.54 tail 1.37	total 4,495.61	2070	8
Tubing							

Drillers TD (ft) 16,756' Loggers TD (ft) 16,755'
 Deepest formation penetrated Marcellus Plug back to (ft) _____
 Plug back procedure _____

Kick off depth (ft) 2143

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.
18 Centralizers on Intermediate String (Bow string centralizers on first two joints then every third joint to 100' from surface).
 294 Bow Tech 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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EXISTING SURFACE LOCATION LONG. W 80°47'30.7" (NAD 27)

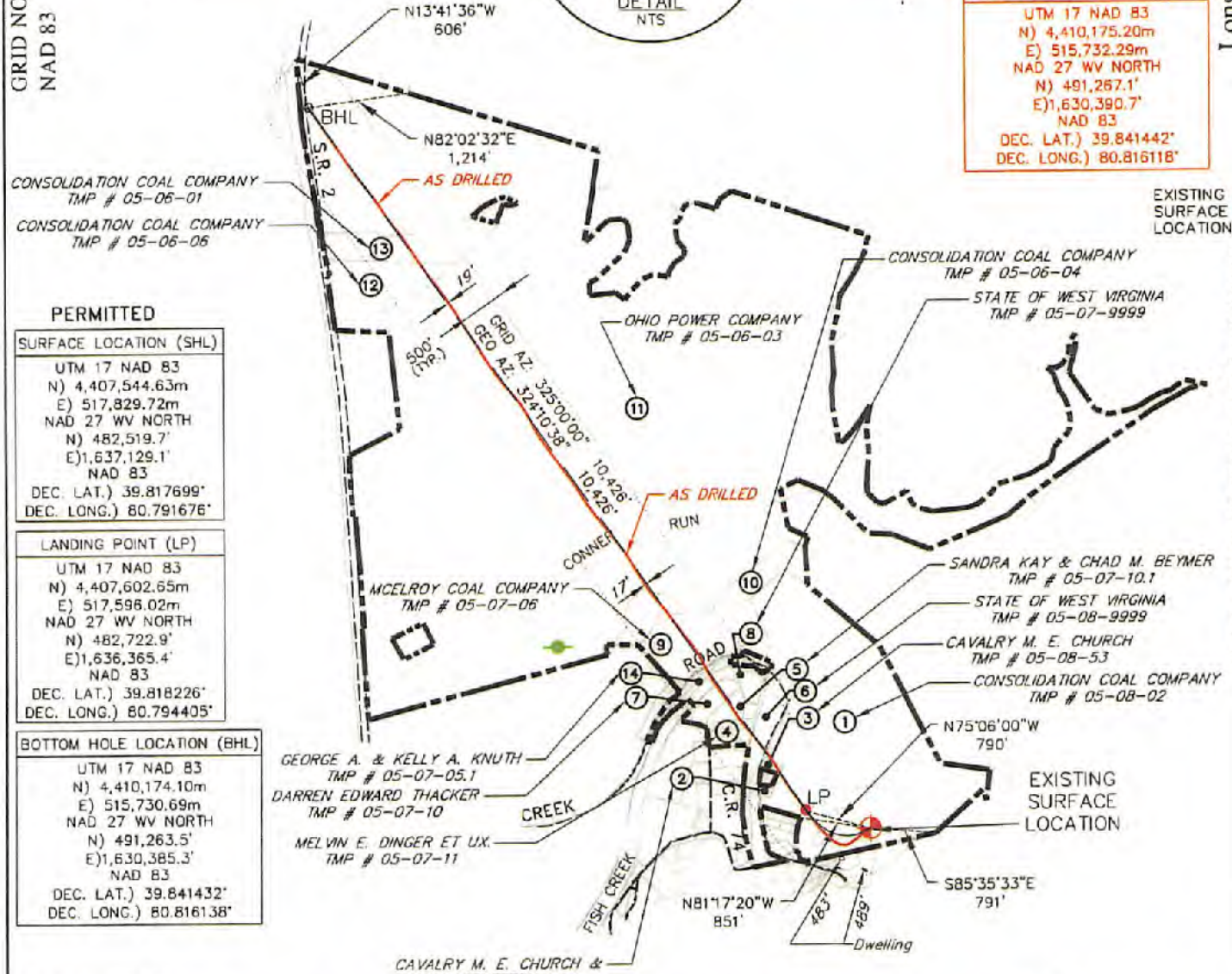
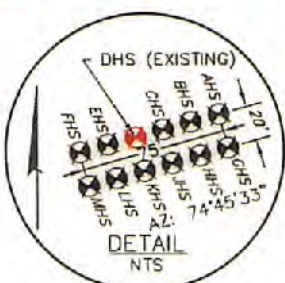
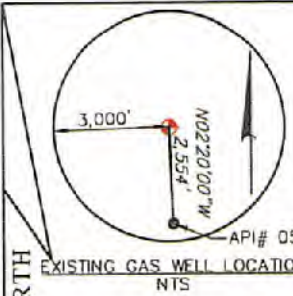
Latitude: N 39°50'00"

AS DRILLED PLAT

AS DRILLED

SURFACE LOCATION (SHL)	LANDING POINT (LP)
UTM 17 NAD 83 N) 4,407,544.68m E) 517,829.70m NAD 27 WV NORTH N) 482,519.9' E) 1,637,129.1' NAD 83 DEC. LAT.) 39.817699° DEC. LONG.) 80.791676°	UTM 17 NAD 83 N) 4,407,607.80m E) 517,591.60m NAD 27 WV NORTH N) 482,740.1' E) 1,636,351.2' NAD 83 DEC. LAT.) 39.818272° DEC. LONG.) 80.794456°

BOTTOM HOLE LOCATION (BHL)
UTM 17 NAD 83 N) 4,410,175.20m E) 515,732.29m NAD 27 WV NORTH N) 491,267.1' E) 1,630,390.7' NAD 83 DEC. LAT.) 39.841442° DEC. LONG.) 80.816118°



PERMITTED

SURFACE LOCATION (SHL)
UTM 17 NAD 83 N) 4,407,544.63m E) 517,829.72m NAD 27 WV NORTH N) 482,519.7' E) 1,637,129.1' NAD 83 DEC. LAT.) 39.817699° DEC. LONG.) 80.791676°

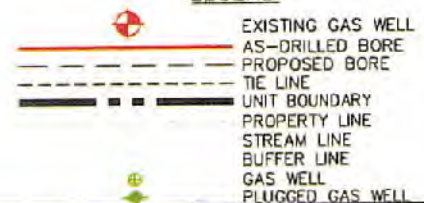
LANDING POINT (LP)
UTM 17 NAD 83 N) 4,407,602.65m E) 517,598.02m NAD 27 WV NORTH N) 482,722.9' E) 1,636,365.4' NAD 83 DEC. LAT.) 39.818226° DEC. LONG.) 80.794405°

BOTTOM HOLE LOCATION (BHL)
UTM 17 NAD 83 N) 4,410,174.10m E) 515,730.69m NAD 27 WV NORTH N) 491,263.5' E) 1,630,385.3' NAD 83 DEC. LAT.) 39.841432° DEC. LONG.) 80.816138°

GENERAL NOTES:

1. THE LOCATION OF BOUNDARY LINES SHOWN HEREON ARE BASED ON RECORD DEED, PLATS, AND TAX MAPS BEST FIT TO FOUND FIELD EVIDENCE AND AERIAL PHOTOS, UNLESS OTHERWISE NOTED.
2. THIS PLAT DOES NOT REPRESENT AN ACTUAL BOUNDARY SURVEY OF THE INDIVIDUAL PARCELS.
3. THERE ARE NO EXISTING WATER WELLS OR DEVELOPED SPRINGS WITHIN 250' OF PROPOSED WELL.
4. PROPOSED WELL IS GREATER THAN 100' FROM PERENNIAL STREAM, WETLAND, POND, RESERVOIR OR LAKE.
5. THERE ARE NO NATIVE TROUT STREAMS WITHIN 300' OF PROPOSED WELL.
6. THERE ARE TWO DWELLINGS LOCATED WITHIN 650' OF PROPOSED WELLBORE.
7. THE SURROUNDING LANDS ARE BEING SERVED BY PUBLIC WATER BY THE GRAND VIEW DOOLIN WATER SYSTEM PROVIDED BY MARSHALL COUNTY PUBLIC HEALTH AND SANITATION DIVISION.

LEGEND



FILE #: 093842010
DRAWING #: 093842010_SV-Plat
SCALE: PLAT & TICK: 1" = 2,000'
MINIMUM DEGREE OF ACCURACY: 1/200
PROVEN SOURCE OF ELEVATION: NGS (CORS)

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.

SIGNED: [Signature]
R.P.E.: _____ L.L.S.: 2241



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

WELL TYPE: OIL GAS WASTE DISPOSAL LIQUID INJECTION PRODUCTION STORAGE DEEP SHALLOW

WATERSHED: FISH CREEK
COUNTY/DISTRICT: MARSHALL / FRANKLIN
SURFACE OWNER: CONSOLIDATION COAL COMPANY
OIL & GAS ROYALTY OWNER: CNX GAS COMPANY LLC and NOBLE ENERGY, INC.

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

TARGET FORMATION: MARCELLUS
WELL OPERATOR: NOBLE ENERGY, INC.
ADDRESS: 333 TECHNOLOGY DRIVE, SUITE 116
CITY: CANONSBURG STATE: PA ZIP CODE: 15317



DATE: OCTOBER 7, 2016
OPERATOR'S WELL #: MND 6 DHS
API WELL #: 47 051 01762
STATE COUNTY PERMIT

ELEVATION: 722'-DE 89/15/2017
QUADRANGLE: POWHATAN POINT, OHIO-W.VA
ACREAGE: 136.587±
ACREAGE: 136.587±

ESTIMATED DEPTH: TVD: 5,940'± TMD: 16,882'±
DESIGNATED AGENT: STEVEN GREEN
ADDRESS: 1000 NOBLE ENERGY DRIVE
CITY: CANONSBURG STATE: PA ZIP CODE: 15317

Perforations

API	Well Name	Date	Top (ftKB)	Btm (ftKB)	Com	Entered Shot Total	Est Hole Dia (in)
47-051-01762	MND-6F-HS	4/9/2017	6,350.00	6,527.00	STG #40	58	
47-051-01762	MND-6F-HS	4/9/2017	6,552.00	6,729.00	STG #39	58	
47-051-01762	MND-6F-HS	4/8/2017	6,754.00	6,931.00	STG #38	58	
47-051-01762	MND-6F-HS	4/8/2017	6,960.00	7,133.00	STG #37	58	
47-051-01762	MND-6F-HS	4/8/2017	7,157.00	7,331.00	STG #36	58	
47-051-01762	MND-6F-HS	4/7/2017	7,360.00	7,537.00	STG #35	58	
47-051-01762	MND-6F-HS	4/6/2017	7,564.00	7,739.00	STG #34	58	
47-051-01762	MND-6F-HS	4/6/2017	7,763.00	7,942.00	STG #33	58	
47-051-01762	MND-6F-HS	4/2/2017	7,966.00	8,139.00	STG #32	58	
47-051-01762	MND-6F-HS	4/2/2017	8,168.00	8,345.00	STG #31	58	
47-051-01762	MND-6F-HS	4/2/2017	8,370.00	8,547.00	STG #30	58	
47-051-01762	MND-6F-HS	4/2/2017	8,572.00	8,749.00	STG #29	58	
47-051-01762	MND-6F-HS	4/1/2017	8,774.00	8,952.00	STG #28	58	
47-051-01762	MND-6F-HS	4/1/2017	8,976.00	9,152.00	STG #27	58	
47-051-01762	MND-6F-HS	4/1/2017	9,178.00	9,355.00	STG #26	58	
47-051-01762	MND-6F-HS	3/31/2017	9,380.00	9,557.00	STG #25	58	
47-051-01762	MND-6F-HS	3/31/2017	9,582.00	9,754.00	STG #24	58	
47-051-01762	MND-6F-HS	3/31/2017	9,784.00	9,959.00	STG #23	58	
47-051-01762	MND-6F-HS	3/30/2017	9,986.00	10,163.00	STG #22	58	
47-051-01762	MND-6F-HS	3/30/2017	10,188.00	10,365.00	STG #21	58	
47-051-01762	MND-6F-HS	3/30/2017	10,390.00	10,567.00	STG #20	58	
47-051-01762	MND-6F-HS	3/29/2017	10,590.00	10,748.00	STG #19	58	
47-051-01762	MND-6F-HS	3/29/2017	10,773.00	10,929.00	STG #18	58	
47-051-01762	MND-6F-HS	3/29/2017	10,996.00	10,954.00	STG #17B	28	
47-051-01762	MND-6F-HS	3/28/2017	11,014.00	11,191.00	STG #17	58	
47-051-01762	MND-6F-HS	3/28/2017	11,216.00	11,393.00	STG #16	58	
47-051-01762	MND-6F-HS	3/28/2017	11,418.00	11,460.00	STG #15B	28	
47-051-01762	MND-6F-HS	3/27/2017	11,478.00	11,650.00	STG #15A	58	
47-051-01762	MND-6F-HS	3/27/2017	11,675.00	11,850.00	STG #14	58	
47-051-01762	MND-6F-HS	3/27/2017	11,877.00	12,054.00	STG #13	58	
47-051-01762	MND-6F-HS	3/26/2017	12,074.00	12,256.00	STG #12	58	
47-051-01762	MND-6F-HS	3/26/2017	12,281.00	12,453.00	STG #11	58	
47-051-01762	MND-6F-HS	3/26/2017	12,483.00	12,660.00	STG #10	58	
47-051-01762	MND-6F-HS	3/26/2017	12,685.00	12,862.00	STG #9	58	
47-051-01762	MND-6F-HS	3/25/2017	12,887.00	13,064.00	STG #8	58	
47-051-01762	MND-6F-HS	3/25/2017	13,091.00	13,266.00	STG #7	58	
47-051-01762	MND-6F-HS	3/25/2017	13,290.00	13,470.00	STG #6	58	
47-051-01762	MND-6F-HS	3/24/2017	13,493.00	13,665.00	STG #5	58	
47-051-01762	MND-6F-HS	3/24/2017	13,695.00	13,872.00	STG #4	58	
47-051-01762	MND-6F-HS	3/24/2017	14,069.00	13,897.00	STG #3	58	
47-051-01762	MND-6F-HS	3/23/2017	14,099.00	14,276.00	STG #2	58	
47-051-01762	MND-6F-HS	3/23/2017	14,301.00	14,478.00	STG #1	58	

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WV Department of
Environmental Protection
09/15/2017

Well Header
 API: 47-051-01762

Well Name: MND-6F-HS

WR-35 - Stimulation Information Per Stage							
Int Des	Start Date	Slurry Rate Avg (bbl/min)	P Treat Avg (psi)	P Breakdown (psi)	ISIP (psi)	Propant Deliver (lb)	Vol Slurry Total (gal)
STG# 1 INJ TEST	3/6/2017	19.7	7,892.00		6,106.00	0	39,211.20
STG# 1 INJ TEST 2	3/23/2017	12.6	6,227.00			0	12,028.80
STG# 1	3/23/2017	84.6	8,088.00		3,426.00	806,094.00	850,311.00
STG# 2	3/23/2017	85.7	8,516.00	5,670.00	3,955.00	809,774.00	763,198.80
STG# 3	3/24/2017	84.9	8,390.00	9,141.00	4,079.00	800,751.00	758,402.40
STG# 4	3/24/2017	85	7,975.00	5,561.00	5,561.00	803,032.00	742,723.80
STG# 5	3/24/2017	90	7,978.00	5,402.00	4,241.00	807,939.00	748,889.40
STG# 6	3/25/2017	90.6	7,855.00	4,912.00	4,051.00	808,899.00	744,445.80
STG# 7	3/25/2017	85.7	7,887.00	9,259.00	4,399.00	806,398.00	793,086.00
STG# 8	3/25/2017	86.8	8,081.00	5,254.00	3,870.00	802,051.00	736,083.60
STG# 9	3/26/2017	90.1	8,542.00	5,285.00	4,355.00	807,845.00	738,658.20
STG# 10	3/26/2017	85.1	8,315.00	5,358.00	3,976.00	806,047.00	771,800.40
STG# 11	3/26/2017	88.3	7,773.00	5,339.00	3,952.00	810,686.00	744,655.80
STG# 12	3/26/2017	90	7,725.00	5,303.00	3,996.00	810,550.00	748,074.60
STG# 13	3/27/2017	86.5	7,728.00		4,454.00	808,385.00	748,074.60
STG# 14	3/27/2017	88.7	7,986.00	5,057.00	4,553.00	813,994.00	735,504.00
STG# 15	3/27/2017	89.2	8,919.00	5,760.00	5,760.00	7,639.00	116,739.00
STG# 15B	3/28/2017	65.6	7,898.00	6,815.00	4,046.00	803,239.00	959,964.60
STG# 16	3/28/2017	76.9	9,421.00	5,514.00	4,273.00	806,095.00	1,055,796.00
STG# 17A	3/29/2017	47	9,700.00	5,311.00	9,111.00	8,455.00	139,003.20
STG# 17B	3/29/2017	69	8,866.00	6,489.00	4,192.00	805,032.00	979,540.80
STG# 18	3/29/2017	84.9	7,396.00	5,437.00	4,348.00	806,235.00	744,420.60
STG# 19	3/29/2017	89	7,511.00	5,243.00	4,306.00	804,147.00	749,061.60
STG# 20	3/30/2017	88.6	7,572.00	5,759.00	4,542.00	805,590.00	748,893.60
STG# 21	3/30/2017	88.1	7,607.00	5,460.00	4,616.00	807,296.00	745,164.00
STG# 22	3/30/2017	88.9	7,662.00	5,773.00	4,311.00	803,789.00	731,077.20
STG# 23	3/31/2017	88.7	7,407.00	5,898.00	4,414.00	799,368.00	740,090.40
STG# 24	3/31/2017	88.4	7,621.00	5,879.00	4,310.00	805,703.00	693,949.20
STG# 25	4/1/2017	88.1	7,683.00	5,089.00	4,143.00	804,584.00	709,014.60
STG# 26	4/1/2017	89.9	7,987.00	6,116.00	4,365.00	804,914.00	735,840.00
STG# 27	4/1/2017	87.8	7,912.00	5,513.00	4,404.00	801,889.00	730,871.40
STG# 28	4/1/2017	89	7,864.00	5,846.00	4,064.00	798,980.00	738,910.20
STG# 29	4/2/2017	89.1	7,696.00	5,660.00	4,209.00	806,625.00	740,094.60
STG# 30	4/2/2017	89.3	7,544.00	5,547.00	4,167.00	802,862.00	729,153.60
STG# 31	4/2/2017	88.6	7,320.00	5,104.00	4,711.00	802,141.00	709,254.00
STG# 32	4/3/2017	88.6	7,331.00	5,324.00		778,955.00	714,445.20
STG# 32 INJ TEST	4/3/2017	2.1	6,172.00			0	2,809.80
STG# 33 INJ TEST	4/6/2017	12.2	3,401.00			0	13,020.00
STG# 33	4/6/2017	84.6	6,659.00	4,952.00	4,326.00	805,710.00	717,402.00
STG# 34	4/7/2017	92.1	6,991.00	5,621.00	4,244.00	841,670.00	749,057.40
STG# 35	4/7/2017	89.4	7,198.00	5,902.00	3,730.00	843,937.00	728,666.40
STG# 36	4/8/2017	95.9	7,109.00	5,612.00	4,619.00	844,148.00	743,320.20
STG# 37	4/8/2017	97.6	7,098.00	5,037.00	4,566.00	801,327.00	676,825.80
STG# 38	4/8/2017	100.1	7,352.00	5,704.00	5,271.00	802,601.00	687,829.80
STG# 39	4/9/2017	100.2	7,060.00	5,953.00	4,281.00	801,515.00	655,632.60
STG# 40	4/9/2017	99.1	7,168.00	6,094.00	3,853.00	806,667.00	656,838.00

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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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API 47- 051 - 01763 Farm name Consolidated Coal Company Well number MND 06 FHS

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
Marcellus	5940	TVD 14,650 MD
_____	_____	_____
_____	_____	_____
_____	_____	_____

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 5058 mcfpd Oil 168.90 bpd NGL 316.14 bpd Water 335 bpd GAS MEASURED BY Estimated Orifice Pilot

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

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Please insert additional pages as applicable.

Drilling Contractor Nomac 79 Drilling
Address 171 Locust Ave. Ext. City Mt. Morris State PA Zip 15349

Logging Company Baker Hughes
Address 400 Technology Drive City Canonsburg State PA Zip 15317

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

Stimulating Company _____
Address _____ City _____ State _____ Zip _____

Please insert additional pages as applicable.

Completed by Regina Logue Telephone 724-820-3559
Signature Regina Logue Title Regulatory Analyst Date 06/22/2017

MND 6

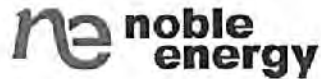
Formations	Top TVD	Base TVD	Top MD	Base MD	Fluid
Shale and Sandstone	0	284	0	284	
Pittsburgh Coal	284	294	284	294	
Shale and Sandstone	294	706	294	706	
Dunkard Sand	706	727	706	727	
Shale	727	876	727	876	
Gas Sand	876	947	876	5972	
Shale	947	1016	947	6191	
1st Salt Sand	1016	1032	1016	6313	
Shale	1032	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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Actual Wellpath Report

MND-6F-HS AWP Proj: 14650'
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Environmental Protection

REFERENCE WELLPATH IDENTIFICATION

Operator	NOBLE ENERGY	Slot	Slot F
Area	Marshall County, WV	Well	MND-6F-HS
Field	Marshall	Wellbore	MND-6F-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	12/17/2014 at 11:51:22 AM
Convergence at slot	0.82° West	Database/Source file	WA_NorthEast/MND-6F-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	-0.22	-77.74	1637100.04	482512.01	39°49'03.362"N	80°47'31.079"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	746.82ft
Horizontal Reference Pt	Slot	Nomac 79 (RKB) to Mean Sea Level	746.82ft
Vertical Reference Pt	Nomac 79 (RKB)	Nomac 79 (RKB) to Mud Line at Slot (Slot F)	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°



Actual Wellpath Report

MND-6F-HS AWP Proj: 14650

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WV Department of Environmental Protection



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REFERENCE WELLPATH IDENTIFICATION

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

WELLPATH DATA (170 stations) † = interpolated/extrapolated station

MD	Inclination	Azimuth	TVD	Vert Sect	North	East	Grid East	Grid North	Latitude	Longitude	Closure Dist	Closure Dir	D1S
[ft]	[°]	[°]	[ft]	[ft]	[ft]	[ft]	[US ft]	[US ft]			[ft]	[°]	[%/100ft]
0.00†	0.00	0.00	248.560	0.00	0.00	0.00	1637100.04	482512.01	39°49'03.362"N	80°47'31.079"W	0.00	0.00	0.00
26.00	0.000	248.560	26.00	0.00	0.00	0.00	1637100.04	482512.01	39°49'03.362"N	80°47'31.079"W	0.00	0.00	0.00
50.00	0.060	248.560	50.00	0.00	0.00	-0.01	1637100.03	482512.01	39°49'03.361"N	80°47'31.080"W	0.01	0.01	248.560
100.00	0.550	306.650	100.00	0.24	0.13	-0.23	1637099.81	482512.14	39°49'03.363"N	80°47'31.082"W	0.26	0.26	299.453
150.00	0.680	316.290	150.00	0.76	0.49	-0.63	1637099.41	482512.50	39°49'03.366"N	80°47'31.087"W	0.79	0.79	307.863
200.00	1.070	306.290	199.99	1.49	0.98	-1.21	1637098.83	482512.99	39°49'03.371"N	80°47'31.095"W	1.55	1.55	308.994
250.00	1.140	314.070	249.98	2.42	1.60	-1.94	1637098.10	482513.61	39°49'03.377"N	80°47'31.105"W	2.52	2.52	309.495
300.00	1.690	307.140	299.97	3.61	2.39	-2.89	1637097.15	482514.40	39°49'03.385"N	80°47'31.117"W	3.75	3.75	309.638
323.00	2.030	313.020	322.95	4.34	2.87	-3.45	1637096.59	482514.88	39°49'03.389"N	80°47'31.124"W	4.49	4.49	309.756
391.00	1.930	306.440	390.91	6.60	4.38	-5.26	1637094.78	482516.39	39°49'03.404"N	80°47'31.148"W	6.84	6.84	309.776
420.00	2.090	304.690	419.90	7.56	4.97	-6.08	1637093.96	482516.98	39°49'03.410"N	80°47'31.158"W	7.85	7.85	309.226
461.00	1.930	304.010	460.87	8.90	5.78	-7.27	1637092.77	482517.79	39°49'03.418"N	80°47'31.174"W	9.29	9.29	308.474
491.00	1.790	299.820	490.85	9.80	6.29	-8.10	1637091.94	482518.30	39°49'03.423"N	80°47'31.184"W	10.25	10.25	307.856
551.00	2.010	294.090	583.81	12.46	7.72	-10.70	1637089.34	482519.73	39°49'03.436"N	80°47'31.218"W	13.19	13.19	305.800
646.00	2.670	297.410	645.75	14.67	8.82	-12.97	1637087.07	482520.83	39°49'03.447"N	80°47'31.247"W	15.69	15.69	304.224
708.00	2.770	294.050	707.68	17.23	10.10	-15.62	1637084.42	482522.11	39°49'03.459"N	80°47'31.281"W	18.60	18.60	302.881
773.00	2.980	303.620	772.60	20.16	11.68	-18.46	1637081.58	482523.69	39°49'03.474"N	80°47'31.318"W	21.85	21.85	302.306
805.00	3.100	297.690	804.56	21.70	12.54	-19.92	1637080.12	482524.55	39°49'03.483"N	80°47'31.337"W	23.54	23.54	302.183
902.00	3.180	285.680	901.41	26.11	14.48	-24.84	1637075.20	482526.49	39°49'03.501"N	80°47'31.400"W	28.75	300.250	0.68
943.00	4.650	272.720	942.32	28.01	14.87	-27.59	1637072.45	482526.88	39°49'03.505"N	80°47'31.436"W	31.34	298.322	4.16
992.00	5.300	263.630	991.13	30.31	14.71	-31.82	1637068.22	482526.72	39°49'03.502"N	80°47'31.490"W	35.06	294.813	2.08
1085.00	5.990	238.600	1083.70	32.67	11.71	-40.24	1637059.81	482523.72	39°49'03.471"N	80°47'31.597"W	41.91	286.224	2.72
1180.00	0.930	174.480	1178.51	32.31	8.36	-44.40	1637055.65	482520.37	39°49'03.438"N	80°47'31.650"W	45.18	280.659	5.94
1276.00	1.100	93.180	1274.50	31.06	7.53	-43.40	1637056.64	482519.54	39°49'03.430"N	80°47'31.637"W	44.05	279.841	1.58
1370.00	1.080	86.960	1368.48	30.04	7.53	-41.62	1637058.43	482519.54	39°49'03.430"N	80°47'31.614"W	42.29	280.251	0.13
1465.00	1.780	78.600	1463.45	28.97	7.87	-39.28	1637060.77	482519.87	39°49'03.434"N	80°47'31.584"W	40.06	281.324	0.77
1561.00	2.020	77.880	1559.40	27.72	8.52	-36.16	1637063.88	482520.52	39°49'03.441"N	80°47'31.544"W	37.15	283.251	0.25
1656.00	1.690	71.720	1654.35	26.66	9.31	-33.19	1637066.85	482521.32	39°49'03.449"N	80°47'31.506"W	34.47	285.661	0.41
1752.00	1.780	58.230	1750.30	26.17	10.54	-30.58	1637069.46	482522.54	39°49'03.461"N	80°47'31.473"W	32.34	289.009	0.43



Actual Wellpath Report

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WV Department of Environmental Protection

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REFERENCE WELLPATH IDENTIFICATION

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

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/1000]
1846.00	1.670	62.690	1844.26	25.90	11.93	-28.12	1637071.92	482523.94	39°49'03.475"N	80°47'31.442"W	30.55	292.991	0.18
1941.00	1.420	57.090	1939.23	25.68	13.21	-25.90	1637074.14	482525.22	39°49'03.488"N	80°47'31.414"W	29.08	297.014	0.21
2015.00	1.230	60.920	2013.21	25.56	14.09	-24.44	1637075.60	482526.10	39°49'03.497"N	80°47'31.395"W	28.21	299.565	0.28
2233.00	0.910	51.550	2231.17	25.42	16.30	-21.04	1637079.00	482528.31	39°49'03.520"N	80°47'31.352"W	26.62	307.773	0.17
2328.00	1.220	225.360	2326.16	25.30	16.06	-21.17	1637078.87	482528.07	39°49'03.517"N	80°47'31.354"W	26.57	307.191	2.24
2422.00	1.360	236.400	2420.14	25.16	14.74	-22.81	1637077.23	482526.75	39°49'03.504"N	80°47'31.374"W	27.16	302.875	0.30
2518.00	1.260	242.500	2516.11	25.33	13.62	-24.70	1637075.35	482525.63	39°49'03.493"N	80°47'31.398"W	28.20	298.886	0.18
2612.00	3.540	226.740	2610.03	25.04	11.16	-27.73	1637072.32	482523.17	39°49'03.468"N	80°47'31.437"W	29.89	291.923	2.50
2707.00	5.290	229.900	2704.74	24.23	6.33	-33.21	1637066.83	482518.34	39°49'03.419"N	80°47'31.506"W	33.81	280.786	1.86
2802.00	4.200	221.570	2799.41	23.04	0.90	-38.87	1637061.17	482512.91	39°49'03.365"N	80°47'31.578"W	38.88	271.332	1.35
2896.00	8.900	2892.78	2892.78	21.80	-6.20	-46.85	1637053.19	482505.81	39°49'03.294"N	80°47'31.679"W	47.26	262.466	5.13
2991.00	12.750	229.700	2986.07	20.39	-17.55	-60.61	1637039.43	482494.46	39°49'03.179"N	80°47'31.853"W	63.10	253.852	4.07
3086.00	13.160	237.520	3078.66	19.90	-30.14	-77.73	1637022.31	482481.87	39°49'03.053"N	80°47'32.070"W	83.37	248.807	1.89
3181.00	10.890	232.290	3171.57	19.95	-41.44	-93.96	1637006.09	482470.58	39°49'02.939"N	80°47'32.276"W	102.69	246.201	2.65
3276.00	12.990	2264.52	3264.52	20.66	-52.09	-110.40	1636989.64	482459.92	39°49'02.831"N	80°47'32.484"W	122.08	244.742	2.92
3371.00	17.530	235.060	3356.15	21.80	-65.45	-131.49	1636968.56	482446.56	39°49'02.696"N	80°47'32.752"W	146.88	243.537	5.06
3465.00	20.380	230.660	3445.05	20.41	-84.07	-155.65	1636944.40	482427.94	39°49'02.509"N	80°47'33.058"W	176.91	241.625	3.19
3560.00	22.120	227.960	3533.59	16.79	-106.67	-181.62	1636918.43	482405.34	39°49'02.282"N	80°47'33.387"W	210.63	239.573	2.00
3655.00	22.770	232.740	3621.40	13.88	-129.78	-209.54	1636890.51	482382.23	39°49'02.049"N	80°47'33.740"W	246.48	238.227	2.04
3750.00	20.850	243.870	3709.63	15.76	-148.37	-239.36	1636860.69	482363.65	39°49'01.861"N	80°47'34.119"W	281.62	238.208	4.79
3773.00	21.100	242.170	3731.11	16.91	-152.10	-246.70	1636853.35	482359.91	39°49'01.823"N	80°47'34.213"W	289.82	238.344	2.86
3786.00	21.270	243.590	3743.23	17.55	-154.24	-250.88	1636849.17	482357.77	39°49'01.802"N	80°47'34.266"W	294.51	238.416	4.16
3880.00	27.980	239.660	3828.84	21.47	-173.10	-284.65	1636815.40	482338.92	39°49'01.610"N	80°47'34.695"W	333.15	238.695	8.54
3975.00	34.400	240.060	3910.07	25.65	-197.78	-327.18	1636772.87	482314.24	39°49'01.361"N	80°47'35.235"W	382.32	238.848	6.76
4070.00	35.310	238.850	3988.02	29.86	-225.37	-373.94	1636726.12	482286.65	39°49'01.081"N	80°47'35.829"W	436.60	238.922	1.20
4165.00	35.200	234.990	4065.61	31.70	-255.29	-419.86	1636680.20	482256.73	39°49'00.779"N	80°47'36.412"W	491.38	238.699	2.35
4259.00	35.170	231.620	4142.44	30.10	-287.64	-463.28	1636636.78	482224.38	39°49'00.453"N	80°47'36.963"W	545.31	238.164	2.07
4354.00	35.210	230.770	4220.08	26.47	-321.95	-505.94	1636594.12	482190.08	39°49'00.108"N	80°47'37.503"W	599.69	237.530	0.52
4449.00	35.240	231.930	4297.69	22.98	-356.17	-548.74	1636551.33	482155.86	39°48'59.764"N	80°47'38.045"W	654.19	237.013	0.70

Actual Wellpath Report

MND-6F-HS AWP Proj: 14650

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REFERENCE WELLPATH IDENTIFICATION

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

WELLPATH DATA (170 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [L/S ft]	Grid North [L/S ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/1000ft]
4544.00	35.260	235.030	4375.28	21.53	-388.79	-592.79	1636507.29	482123.24	39°48'59.45"N	80°47'38.604"W	708.91	236.740	1.88
4638.00	35.120	234.490	4452.10	21.30	-420.05	-637.03	1636463.05	482091.98	39°48'59.120"N	80°47'39.717"W	763.05	236.600	0.36
4732.00	35.220	232.710	4528.94	19.98	-452.18	-680.61	1636419.47	482059.86	39°48'58.796"N	80°47'39.717"W	817.12	236.401	1.10
4827.00	34.190	234.070	4607.04	18.45	-484.44	-724.02	1636376.06	482027.60	39°48'58.471"N	80°47'40.267"W	871.14	236.214	1.36
4922.00	33.830	232.660	4685.79	16.94	-516.14	-766.65	1636333.43	481995.90	39°48'58.152"N	80°47'40.808"W	924.21	236.050	0.91
5016.00	31.920	235.390	4764.74	16.04	-546.13	-807.92	1636292.17	481965.91	39°48'57.850"N	80°47'41.331"W	975.19	235.942	2.57
5111.00	32.010	238.250	4845.34	17.64	-573.65	-850.00	1636250.09	481938.39	39°48'57.572"N	80°47'41.865"W	1025.46	235.985	1.60
5205.00	32.040	235.810	4925.03	19.40	-600.77	-891.81	1636208.28	481911.27	39°48'57.298"N	80°47'42.396"W	1075.29	236.034	1.38
5300.00	32.010	234.870	5005.58	19.70	-629.42	-933.25	1636166.84	481882.63	39°48'57.009"N	80°47'42.922"W	1125.66	236.003	0.53
5395.00	31.930	235.520	5086.17	19.87	-658.13	-974.55	1636125.54	481853.92	39°48'56.719"N	80°47'43.446"W	1175.96	235.968	0.37
5490.00	32.070	236.300	5166.73	20.67	-686.34	-1016.24	1636083.86	481825.70	39°48'56.435"N	80°47'43.975"W	1226.30	235.966	0.46
5584.00	31.930	235.200	5246.45	21.32	-714.38	-1057.41	1636042.69	481797.67	39°48'56.152"N	80°47'44.497"W	1276.11	235.957	0.64
5679.00	33.000	233.760	5327.05	20.87	-743.60	-1098.35	1636001.76	481768.46	39°48'55.857"N	80°47'45.016"W	1326.38	235.901	0.81
5773.00	33.890	249.350	5406.07	26.83	-767.61	-1143.04	1635957.06	481744.45	39°48'55.613"N	80°47'45.584"W	1376.87	236.117	9.22
5868.00	36.800	266.380	5483.74	48.27	-778.77	-1196.37	1635909.74	481733.28	39°48'55.496"N	80°47'46.266"W	1427.51	236.938	10.78
5962.00	39.990	270.360	5557.42	80.43	-780.36	-1254.69	1635845.42	481731.69	39°48'55.471"N	80°47'47.013"W	1477.57	238.120	4.29
6057.00	43.730	282.670	5628.28	122.45	-772.95	-1317.38	1635782.73	481739.10	39°48'55.536"N	80°47'47.817"W	1527.40	239.598	9.49
6152.00	48.150	294.150	5694.44	177.22	-751.23	-1381.85	1635718.27	481760.82	39°48'56.080"N	80°47'48.647"W	1572.84	241.470	9.84
6247.00	57.230	301.180	5752.01	244.33	-715.97	-1448.49	1635651.63	481796.08	39°48'56.080"N	80°47'49.508"W	1615.28	243.697	11.22
6342.00	62.790	303.130	5799.48	320.14	-672.17	-1518.10	1635582.02	481839.88	39°48'56.503"N	80°47'50.408"W	1660.25	246.118	6.12
6436.00	67.580	308.360	5838.94	400.65	-622.30	-1587.25	1635512.88	481889.74	39°48'56.986"N	80°47'51.303"W	1704.88	248.592	7.17
6531.00	76.910	319.570	5867.96	489.23	-559.51	-1652.02	1635448.11	481952.53	39°48'57.597"N	80°47'52.145"W	1744.20	251.289	14.91
6626.00	81.070	322.090	5886.10	582.21	-487.23	-1710.89	1635389.25	482024.80	39°48'58.303"N	80°47'52.912"W	1778.91	254.104	5.09
6721.00	90.920	321.520	5892.73	676.71	-412.85	-1769.42	1635330.72	482099.19	39°48'59.030"N	80°47'53.676"W	1816.94	256.867	10.39
6770.00	92.090	323.180	5891.44	725.64	-374.07	-1799.44	1635300.80	482137.96	39°48'59.409"N	80°47'54.067"W	1837.81	258.256	4.14
6815.00	91.080	326.150	5890.20	770.62	-337.37	-1825.35	1635274.79	482174.65	39°48'59.768"N	80°47'54.407"W	1856.26	259.528	6.97
6910.00	91.350	323.700	5888.18	865.59	-259.65	-1879.92	1635220.22	482252.37	39°49'00.528"N	80°47'55.120"W	1897.77	262.136	2.59
7005.00	91.110	320.210	5886.14	960.42	-184.86	-1938.45	1635161.70	482327.16	39°49'01.258"N	80°47'55.884"W	1947.24	264.552	3.68
7099.00	91.140	322.750	5884.30	1054.21	-111.34	-1996.97	1635103.18	482400.68	39°49'01.977"N	80°47'56.648"W	2000.08	266.809	2.70
7194.00	91.170	324.520	5882.38	1149.16	-34.86	-2053.29	1635046.87	482477.15	39°49'02.724"N	80°47'57.384"W	2053.58	269.027	1.86



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REFERENCE WELLPATH IDENTIFICATION

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

WELLPATH DATA (170 stations)

MID [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [ft]	Grid North [ft]	Latitude [ft]	Longitude [ft]	Close Dist [ft]	Close Dir [°]	DLS [°/100ft]
7289.00	90.800	325.530	5880.75	1244.15	42.97	-2107.73	1634992.42	482554.98	39°49'03.486"N	80°47'58.096"W	2108.17	271.168	1.13
7283.00	90.180	327.650	5879.95	1338.10	121.43	-2159.49	1634940.67	482633.43	39°49'04.254"N	80°47'58.773"W	2162.90	273.218	2.35
7478.00	90.310	331.190	5879.54	1432.80	203.20	-2207.81	1634892.35	482715.20	39°49'05.055"N	80°47'59.408"W	2217.14	275.259	3.73
7573.00	90.340	329.640	5879.00	1527.38	285.82	-2254.71	1634845.45	482797.81	39°49'05.864"N	80°48'00.024"W	2272.75	277.224	1.63
7668.00	90.340	326.420	5878.44	1622.23	366.39	-2305.00	1634795.16	482878.38	39°49'06.653"N	80°48'00.683"W	2333.94	279.032	3.79
7763.00	90.250	322.600	5877.95	1717.21	443.73	-2360.15	1634740.02	482955.71	39°49'07.410"N	80°48'01.404"W	2401.50	280.648	4.02
7857.00	90.250	327.54	5877.54	1811.17	519.25	-2416.11	1634684.06	483031.23	39°49'08.148"N	80°48'02.136"W	2471.28	282.129	1.83
7952.00	90.430	329.050	5876.97	1906.10	598.61	-2468.27	1634631.91	483110.59	39°49'08.925"N	80°48'02.819"W	2539.82	283.632	4.98
8047.00	90.830	331.500	5875.93	2000.70	681.02	-2515.51	1634584.67	483192.99	39°49'09.732"N	80°48'03.439"W	2606.07	285.148	2.41
8142.00	90.710	333.160	5874.65	2094.93	765.07	-2559.77	1634540.41	483277.03	39°49'10.557"N	80°48'04.022"W	2671.66	286.640	1.96
8236.00	92.090	328.890	5872.35	2188.36	847.26	-2605.28	1634494.90	483359.22	39°49'11.362"N	80°48'04.621"W	2739.59	288.015	4.77
8332.00	91.390	323.040	5869.44	2284.26	926.74	-2658.97	1634441.22	483438.70	39°49'12.140"N	80°48'05.323"W	2815.84	289.215	6.13
8426.00	90.680	321.290	5867.74	2378.12	1000.96	-2716.61	1634383.58	483512.92	39°49'12.865"N	80°48'06.076"W	2895.15	290.227	2.01
8521.00	90.650	321.960	5866.64	2472.95	1075.43	-2775.58	1634324.61	483587.38	39°49'13.593"N	80°48'06.845"W	2976.65	291.179	0.71
8616.00	90.650	325.460	5865.56	2567.91	1151.99	-2831.80	1634268.40	483663.94	39°49'14.341"N	80°48'07.580"W	3057.15	292.137	3.68
8711.00	90.740	327.620	5864.41	2662.86	1231.23	-2884.17	1634216.03	483743.18	39°49'15.117"N	80°48'08.266"W	3135.98	293.117	2.28
8805.00	91.170	324.500	5862.84	2756.82	1309.20	-2936.64	1634163.56	483821.14	39°49'15.880"N	80°48'08.952"W	3215.25	294.028	3.35
8900.00	91.350	317.050	5860.75	2851.47	1382.72	-2996.66	1634103.55	483894.66	39°49'16.598"N	80°48'09.735"W	3300.28	294.770	7.84
8995.00	90.680	317.510	5859.06	2945.60	1452.51	-3061.10	1634039.11	483964.43	39°49'17.278"N	80°48'10.574"W	3388.23	295.385	0.86
9089.00	90.580	322.470	5858.03	3039.20	1524.48	-3121.51	1633978.71	484036.40	39°49'17.980"N	80°48'11.362"W	3473.88	296.030	5.28
9184.00	90.490	326.710	5857.14	3134.17	1601.88	-3176.54	1633923.68	484113.80	39°49'18.738"N	80°48'12.081"W	3557.59	296.761	4.46
9278.00	90.740	329.360	5856.13	3228.03	1681.62	-3226.30	1633873.92	484193.53	39°49'19.518"N	80°48'12.734"W	3638.24	297.530	2.83
9373.00	91.880	326.100	5853.96	3322.88	1761.91	-3277.00	1633823.23	484273.82	39°49'20.304"N	80°48'13.398"W	3720.62	298.265	3.63
9468.00	89.880	321.060	5852.50	3417.81	1838.32	-3333.37	1633766.86	484350.23	39°49'21.051"N	80°48'14.135"W	3806.67	298.876	5.71
9563.00	89.690	320.830	5852.86	3512.57	1912.09	-3393.23	1633707.00	484423.99	39°49'21.772"N	80°48'14.916"W	3894.88	299.401	0.31
9657.00	89.690	324.530	5853.37	3606.47	1986.83	-3450.20	1633650.03	484498.73	39°49'22.502"N	80°48'15.660"W	3981.38	299.936	3.94
9752.00	89.750	323.610	5853.83	3701.46	2063.75	-3505.95	1633594.29	484575.65	39°49'23.254"N	80°48'16.388"W	4068.26	300.483	0.97
9847.00	89.750	322.930	5854.25	3796.41	2139.89	-3562.76	1633537.48	484651.78	39°49'23.999"N	80°48'17.131"W	4156.01	300.990	0.72
9942.00	89.720	324.120	5854.68	3891.38	2216.28	-3619.23	1633481.01	484728.17	39°49'24.745"N	80°48'17.868"W	4243.91	301.482	1.25
10037.00	90.030	331.460	5854.89	3986.20	2296.60	-3669.84	1633430.41	484808.49	39°49'25.532"N	80°48'18.532"W	4329.21	302.039	7.75



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REFERENCE WELLPATH IDENTIFICATION

Operator	NOBLE ENERGY
Area	Marshall County, WV
Field	Marshall
Facility	MND-6 Pad
Well	MND-6F-HS
Slot	MND-6F-HS AVB
Slot F	

WELLPATH DATA (170 stations)

MID	Inchation	Azimuth	TVD	Vert Sect	North	East	Grid East	Grid North	Latitude	Longitude	Closure Dist	Closure Dir	DLS
[ft]	[°]	[ft]	[ft]	[ft]	[ft]	[ft]	[US ft]	[US ft]	[US ft]	[°]	[ft]	[°]	[%/100ft]
10131.00	90.060	330.380	5854.82	4079.70	2578.75	-3715.52	1633384.72	484890.63	39°49'26.337"N	80°48'19.133"W	4411.76	302.628	1.13
10226.00	90.090	325.480	5854.69	4174.54	2459.23	-3765.95	1633334.30	484971.10	39°49'27.125"N	80°48'19.794"W	4497.80	303.145	5.16
10320.00	90.520	331.730	5854.19	4268.31	2339.43	-3814.89	1633285.36	485051.30	39°49'27.911"N	80°48'20.436"W	4582.80	303.650	6.66
10415.00	90.800	328.170	5853.10	4362.93	2621.64	-3862.45	1633237.80	485133.51	39°49'28.716"N	80°48'21.061"W	4668.14	304.167	3.76
10511.00	91.450	329.760	5848.81	4533.44	2785.10	-3961.15	1633139.11	485296.95	39°49'30.317"N	80°48'22.356"W	4821.26	305.111	1.02
10606.00	91.450	329.760	5848.81	4533.44	2785.10	-3961.15	1633139.11	485296.95	39°49'30.317"N	80°48'22.356"W	4821.26	305.111	1.02
10701.00	90.620	322.890	5847.09	4648.34	2864.10	-4013.79	1633086.48	485375.95	39°49'31.090"N	80°48'23.045"W	4930.88	305.510	7.28
10796.00	90.710	317.860	5845.99	4743.00	2937.24	-4074.35	1633025.92	485449.09	39°49'31.804"N	80°48'23.835"W	5022.72	305.788	5.30
10891.00	90.620	317.410	5844.89	4837.21	3007.43	-4138.36	1632961.91	485519.27	39°49'32.489"N	80°48'24.669"W	5115.73	306.007	0.48
10986.00	90.580	322.140	5843.89	4931.78	3079.94	-4199.69	1632900.58	485591.77	39°49'33.196"N	80°48'25.468"W	5208.01	306.258	4.98
11081.00	90.710	320.680	5842.82	5026.59	3154.18	-4258.94	1632841.33	485666.02	39°49'33.922"N	80°48'26.241"W	5299.76	306.524	1.54
11175.00	90.620	319.470	5841.71	5120.23	3226.26	-4319.26	1632781.02	485738.10	39°49'34.625"N	80°48'27.028"W	5391.18	306.758	1.29
11270.00	90.580	321.780	5840.69	5214.94	3299.69	-4379.52	1632720.76	485811.52	39°49'35.342"N	80°48'27.814"W	5483.45	306.996	2.43
11364.00	90.580	326.480	5839.73	5308.90	3375.84	-4434.59	1632665.70	485887.66	39°49'36.078"N	80°48'28.534"W	5573.31	307.280	5.00
11460.00	91.140	331.330	5838.29	5404.64	3458.01	-4484.14	1632616.14	485969.83	39°49'36.891"N	80°48'29.184"W	5662.63	307.638	5.09
11554.00	91.290	329.250	5836.30	5498.21	3539.63	-4530.72	1632569.57	486051.44	39°49'37.691"N	80°48'29.796"W	5749.47	307.999	2.22
11649.00	91.480	324.340	5834.00	5593.11	3619.07	-4582.71	1632517.58	486130.88	39°49'38.469"N	80°48'30.477"W	5839.43	308.299	5.17
11744.00	91.230	319.560	5831.75	5687.92	3693.84	-4641.23	1632459.07	486205.64	39°49'39.199"N	80°48'31.241"W	5931.74	308.515	5.04
11839.00	91.170	320.790	5829.76	5782.56	3766.78	-4702.06	1632398.24	486278.58	39°49'39.911"N	80°48'32.034"W	6024.78	308.698	1.30
11933.00	90.980	322.450	5828.00	5876.38	3840.45	-4760.41	1632339.89	486352.25	39°49'40.631"N	80°48'32.796"W	6116.42	308.895	1.78
12028.00	91.140	321.110	5826.24	5971.21	3915.08	-4819.17	1632281.13	486426.87	39°49'41.360"N	80°48'33.563"W	6209.05	309.090	1.42
12123.00	91.140	321.740	5824.35	6066.00	3989.33	-4878.40	1632221.91	486501.12	39°49'42.085"N	80°48'34.336"W	6301.87	309.275	0.66
12218.00	91.050	322.970	5822.54	6160.88	4064.54	-4936.41	1632163.91	486576.32	39°49'42.820"N	80°48'35.093"W	6394.42	309.467	1.30
12312.00	91.260	324.160	5820.64	6254.83	4140.15	-4992.22	1632108.09	486651.93	39°49'43.559"N	80°48'35.823"W	6485.61	309.670	1.29
12407.00	91.080	326.330	5818.70	6349.81	4218.18	-5046.37	1632053.95	486729.95	39°49'44.322"N	80°48'36.531"W	6577.14	309.892	2.29
12502.00	91.050	327.930	5816.94	6444.72	4297.95	-5097.92	1632002.41	486809.72	39°49'45.103"N	80°48'37.207"W	6667.92	310.134	1.68
12596.00	91.260	330.230	5815.04	6538.46	4378.57	-5146.20	1631954.12	486890.34	39°49'45.893"N	80°48'37.841"W	6756.87	310.392	2.46
12690.00	91.260	328.540	5812.97	6632.16	4459.45	-5194.06	1631906.27	486971.21	39°49'46.685"N	80°48'38.469"W	6845.80	310.648	1.80
12785.00	91.200	326.970	5810.93	6727.02	4539.77	-5244.73	1631855.60	487051.53	39°49'47.472"N	80°48'39.134"W	6936.63	310.879	1.65
12880.00	91.110	321.990	5809.02	6821.97	4617.05	-5299.90	1631800.44	487128.81	39°49'48.227"N	80°48'39.855"W	7028.95	311.061	5.24



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REFERENCE WELLPATH IDENTIFICATION

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

WELLPATH DATA (170 stations)

Mid	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]
12974.00	91.200	323.570	5807.12	6915.88	4691.89	-5356.75	1631743.59	487203.64	39°49'48.959"N	80°48'40.598"W	7120.99	311.215	1.68
13069.00	91.140	326.490	5805.18	7010.84	4769.71	-5411.18	1631689.16	487281.46	39°49'49.720"N	80°48'41.310"W	7213.25	311.395	3.07
13164.00	91.200	330.240	5803.24	7105.64	4850.57	-5460.99	1631639.36	487362.31	39°49'50.512"N	80°48'41.963"W	7304.13	311.612	3.95
13259.00	90.950	327.450	5801.46	7200.40	4931.84	-5510.12	1631590.23	487443.58	39°49'51.308"N	80°48'42.608"W	7394.90	311.830	2.95
13353.00	90.950	322.750	5799.90	7294.37	5008.90	-5563.88	1631536.47	487520.64	39°49'52.061"N	80°48'43.312"W	7486.28	311.995	5.00
13449.00	90.680	330.760	5798.53	7390.17	5084.03	-5623.62	1631476.73	487595.75	39°49'52.795"N	80°48'44.092"W	7581.06	312.115	2.61
13543.00	90.710	320.390	5797.39	7483.85	5156.37	-5683.63	1631416.72	487668.09	39°49'53.501"N	80°48'44.874"W	7674.10	312.215	0.14
13638.00	90.620	323.120	5796.29	7578.68	5230.97	-5742.43	1631357.93	487742.69	39°49'54.230"N	80°48'45.642"W	7767.79	312.331	2.88
13733.00	90.620	324.590	5795.26	7673.65	5307.68	-5798.46	1631301.90	487819.39	39°49'54.980"N	80°48'46.374"W	7860.89	312.470	1.55
13828.00	90.680	330.700	5794.18	7768.50	5387.89	-5849.27	1631251.09	487899.60	39°49'55.765"N	80°48'47.041"W	7952.57	312.649	6.43
13922.00	90.710	334.190	5793.04	7861.69	5471.20	-5892.75	1631207.62	487982.91	39°49'56.582"N	80°48'47.613"W	8041.05	312.876	3.71
14017.00	90.770	327.800	5791.82	7956.11	5554.24	-5938.78	1631161.59	488065.94	39°49'57.396"N	80°48'48.219"W	8131.34	313.084	6.73
14111.00	90.650	319.520	5790.65	8050.00	5629.89	-5994.43	1631105.94	488141.58	39°49'58.136"N	80°48'48.946"W	8223.68	313.204	8.81
14206.00	91.110	321.290	5789.19	8144.68	5703.08	-6054.97	1631045.40	488214.77	39°49'58.850"N	80°48'49.736"W	8317.92	313.286	1.92
14301.00	91.110	324.220	5787.35	8239.58	5778.68	-6112.45	1630987.95	488290.37	39°49'59.580"N	80°48'50.487"W	8411.61	313.392	3.08
14395.00	91.450	325.500	5785.25	8333.55	5855.43	-6166.68	1630933.71	488367.12	39°50'00.340"N	80°48'51.196"W	8503.76	313.517	1.20
14490.00	91.480	326.960	5782.82	8428.50	5934.28	-6219.60	1630880.79	488445.96	39°50'01.111"N	80°48'51.889"W	8596.46	313.655	1.75
14585.00	91.420	326.000	5780.42	8523.43	6013.46	-6272.04	1630828.34	488525.13	39°50'01.886"N	80°48'52.576"W	8689.09	313.794	1.01
14677.00	91.380	328.310	5779.39	8618.73	6098.73	-6324.82	1630805.57	488600.40	39°50'02.231"N	80°48'52.875"W	8779.94	313.858	5.30
14650.00	91.380	328.310	5778.84	8588.34	6068.30	-6306.89	1630793.50	488579.97	39°50'02.423"N	80°48'53.033"W	8752.21	313.895	0.00

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Actual Wellpath Report

MND-6F-HS AWP Proj: 14650'
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REFERENCE WELLPATH IDENTIFICATION			
Operator	NOBLE ENERGY	Slot	Slot F
Area	Marshall County, WV	Well	MND-6F-HS
Field	Marshall	Wellbore	MND-6F-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-6F-HS BHL Rev-2		5779.58	6071.00	-6304.02	1630796.37	488582.67	39°50'02.450"N	80°48'52.997"W	point
MND-6F-HS LP Rev-2		5890.00	-424.88	-1755.56	1635344.58	482087.15	39°48'58.913"N	80°47'53.496"W	point
MND-6 Pad LL		6499.84	19.49	72.62	1637172.66	482531.50	39°49'03.564"N	80°47'30.152"W	polygon

WELLPATH COMPOSITION - Ref Wellbore: MND-6F-HS AWB Ref Wellpath: MND-6F-IIS AWP Proj: 14650'				
Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
26.00	300.00	Generic gyro - northseeking (Standard)	01 Gyro <14-3/4"> (50'-300')	MND-6F-HS AWB
300.00	708.00	ISCWSA MWD, Rev. 2 (Standard)	02 APS EM <14-3/4"> (300')(323'-708') Proj: 764'	MND-6F-IIS AWB
708.00	2015.00	ISCWSA MWD, Rev. 2 (Standard)	03 APS EM <12-1/4"> (708')(773'-2015') Proj:2070'	MND-6F-IIS AWB
2015.00	3750.00	NaviTrak (MagCorr)	04 BHI MWD <8-3/4"> (2015')(2233'-3750')	MND-6F-HS AWB
3750.00	14627.00	NaviTrak (AT Curve Short Spaced)	05 BHI AT Curve <8-3/4"> (3750')(3773'-14627')	MND-6F-IIS AWB
14627.00	14650.00	Blind Drilling (std)	Projection to bit	MND-6F-IIS AWB



Actual Wellpath Report

MIND-6F-HIS AWP Proj: 14650'
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REFERENCE WELLPATH IDENTIFICATION

Operator	NOBLE ENERGY	Slot	Slot F
Area	Marshall County, WV	Well	MIND-6F-HIS
Field	Marshall	Wellbore	MIND-6F-HIS AWB
Facility	MIND-6 Pad		

COMMENTS

Wellpath general comments
 APl: 47-051-01762-0000
 BHI Job #: 6638017
 Rig: Nomac 79
 Duration: 11.24.2014 - 12.09.201
 Gyro <14-3/4"> (50'-300')
 APS EM <14-3/4"> (300')(323'-708')
 APS EM <12-1/4"> (708')(773'-2015')
 BHI MWD <8-3/4"> (2015')(2233'-3750')
 BHI AT Curve <8-3/4"> (3750')(3773'-14627')
 Projected MID at ID: 14650'

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NOBLE ENERGY

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

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



Plot reference wellpath is MND-6F-HS PWB Rev-9.0	
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: 746.82 feet	Scale: True distance
Mean Sea Level to Mud line (At Slot: Slot F): -720.82 feet	Depths are in feet
Coordinates are in feet referenced to BMA	Created by: Irochtr on 12/17/2014

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)	Latitude	Longitude
Slot F	-0.22	-77.74	39°49'03.362"N	80°47'31.078"W
Nomac 79 (RKB) to Mud line (At Slot: Slot F)	26ft			
Mean Sea Level to Mud line (At Slot: Slot F)	-720.82ft			
Nomac 79 (RKB) to Mean Sea Level	746.82ft			

