

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

API 47-085-10090FH6A County Ritchie District Clay  
Quad Ellenboro 7.5' Pad Name PEN20HS Field/Pool Name Pennsboro  
Farm Name COKELEY, LAWRENCE & ANGELA Well Number PEN20HHS - Fracture  
Operator (as registered with the OOG) CNX Gas Company LLC  
Address P.O. Box 1248 City Jane Lew State WV Zip 26378

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey  
Top Hole Northing 4,353,166.70 m Easting 497,764.45 m  
Landing Point of Curve Northing 4,353,098.39 m Easting 497,977.05 m  
Bottom Hole Northing 4,351,565.70 m Easting 499,299.77 m

Elevation (ft) 1081' 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

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

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Date Permit Issued 03/13/2017 Date drilling commenced 10/02/2014 Date drilling ceased 10/16/2014  
Date completion activities began 07/26/2017 Date completion activities ceased 8/2/2017  
Verbal plugging (Y/N) N Date permission granted N/A Granted by N/A

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

Freshwater depth(s) ft 398' Open mine(s) (Y/N) depths N  
Salt water depth(s) ft None Noted for Offsets Void(s) encountered (Y/N) depths N  
Coal depth(s) ft N/A Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) N

Reviewed by: AS

Reviewed

02/16/2018

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CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement Circulate (Y/N) * Provide details to the right *
Conductor	26"	20"	40'	New	DH-36		
Surface	17 1/2"	13 3/8"	548.1'	New	J-55		Y
Coal							
Intermediate 1	12 3/8"	9 5/8"	5245.5'	New	HCK-55		Y
Intermediate 2							
Intermediate 3							
Production	8 3/4"	5 1/2"	13256.3'	New	P-110		Y
Tubing	5 1/2"	2 3/8"	6374.20'	New	P-110 4.7# / 6374.20'		
Packer Type and Depth Set		None					

Comment Details \*approved cement variance of 2% accelerator (S001) 0.2% Antifoam (D046) 0.125 lb/sk Polyester Flake (D130).

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft 3/sks)	Volume (ft 3)	Cement Top (MD)	WOC (hrs)
Conductor							
Surface	PJSM Cement	520 sks	15.60	1.20	624	0'	8
Coal							
Intermediate 1	Type I / Class A	1010 sks / 314 sks	15.60	1.92 / 1.19	2312.86	0'	8
Intermediate 2							
Intermediate 3							
Production	Type I / Class A	382 sks / 1610 sks	14.8	1.62 / 1.37	2824.54	0'	8
Tubing							

Drillers TD (ft) 6251' Loggers TD (ft) 6233'  
 Deepest formation penetrated: Marcellus Plug back to (ft) \_\_\_\_\_  
 Plug back procedure: \_\_\_\_\_

Kick Off Depth (ft) 5280'

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 \_\_\_\_\_  
Conductor - No centralizers used. Fresh Water - 5 centralizers used Intermediate - 68 centralizers used (Bow spring centralizers on first two joints then every third joint to 100' from surface). Production - 252 centralizers used (rigid bow spring 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 Plug And Perforation Shot Hole

WAS WELL COMPLETED OPEN HOLE  Yes  No DETAILS \_\_\_\_\_

WERE TRACERS USE  Yes  No TYPES OF TRACER(S) USED \_\_\_\_\_

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PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number Of Perforations	Formation(s)
1	7/26/2017	12969	13125	40	Marcellus
2	7/26/2017	12777	12937	40	Marcellus
3	7/26/2017	12580	12740	40	Marcellus
4	7/27/2017	12383	12543	40	Marcellus
5	7/27/2017	12186	12346	40	Marcellus
6	7/27/2017	11989	12149	40	Marcellus
7	7/27/2017	11792	11952	40	Marcellus
8	7/28/2017	11595	11755	40	Marcellus
9	7/28/2017	11398	11558	40	Marcellus
10	7/28/2017	11201	11361	40	Marcellus
11	7/29/2017	11004	11164	40	Marcellus
12	7/29/2017	10807	10967	40	Marcellus
13	7/29/2017	10610	10770	40	Marcellus
14	7/29/2017	10413	10573	40	Marcellus
15	7/30/2017	10216	10376	40	Marcellus
16	7/30/2017	10019	10179	40	Marcellus
17	7/30/2017	9822	9982	40	Marcellus
18	7/30/2017	9625	9785	40	Marcellus
19	7/31/2017	9428	9588	40	Marcellus
20	7/31/2017	9231	9391	40	Marcellus
21	7/31/2017	9034	9194	40	Marcellus
22	7/31/2017	8837	8997	40	Marcellus
23	7/31/2017	8640	8800	40	Marcellus
24	8/1/2017	8443	8603	40	Marcellus
25	8/1/2017	8246	8406	40	Marcellus
26	8/1/2017	8049	8209	40	Marcellus
27	8/1/2017	7854	8012	40	Marcellus
28	8/2/2017	7655	7815	40	Marcellus
29	8/2/2017	7458	7618	40	Marcellus
30	8/2/2017	7261	7421	40	Marcellus
31	8/2/2017	7064	7224	40	Marcellus
32	8/2/2017	6867	7027	40	Marcellus
33	8/2/2017	6670	6830	40	Marcellus
34	8/2/2017	6473	6633	40	Marcellus

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STIMULATION INFORMATION PER STAGE

Stage No.	Stimulations Date	Avg Pump Rate (BPM)	Avg Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen / other (gals)
1	7/26/2017	87.3	6799	6777	2973	401363	7904	4368
2	7/26/2017	91.8	7394	6011	3227	401394	7228	4309
3	7/26/2017	88.4	7523	2837	3734	400795	7532	4263
4	7/27/2017	90.6	7428	6224	3745	400166	6946	4238
5	7/27/2017	95.0	7420	5990	4045	399871	6866	4262
6	7/27/2017	91.6	7635	5675	3705	400387	7518	4219
7	7/28/2017	89.3	7522	3648	3563	400547	7503	4231
8	7/28/2017	95.6	7290	5782	4416	400048	6825	4239
9	7/28/2017	83.1	7036	5955	3701	399754	6736	4233
10	7/28/2017	89.9	7793	6219	4168	342988	10946	4387
11	7/29/2017	91.2	7463	6570	3875	400256	7268	4250
12	7/29/2017	94.0	7455	5630	3983	399941	5924	4215
13	7/29/2017	87.4	7237	6083	3962	399855	5953	3206
14	7/29/2017	92.2	6888	3164	3950	400386	7279	4276
15	7/30/2017	90.7	7124	7202	3701	400393	7366	4237
16	7/30/2017	94.1	7457	5944	4306	400737	5897	3169
17	7/30/2017	93.7	7371	6553	4444	384193	5702	3168
18	7/31/2017	91.0	7247	6043	3675	400973	9762	4358
19	7/31/2017	92.2	7280	3283	4036	401402	6308	3207
20	7/31/2017	93.1	7371	6765	3806	400725	5919	3235
21	7/31/2017	93.2	6912	6126	3888	405834	6000	3226
22	7/31/2017	94.4	7268	6647	3690	400446	6296	3198
23	8/1/2017	91.3	7000	6507	3747	400284	5895	3225
24	8/1/2017	92.8	7144	5953	4860	396340	5870	3147
25	8/1/2017	93.8	7335	6539	4439	401225	5850	3251
26	8/1/2017	93.6	7114	6644	4507	400793	5621	3350
27	8/1/2017	92.5	7183	7183	3708	404539	5938	2839
28	8/2/2017	91.8	6774	6112	3773	400534	5808	3194
29	8/2/2017	93.9	6921	5716	4188	395050	5524	3248
30	8/2/2017	85.5	6661	6878	6878	400559	5722	3217
31	8/2/2017	92.7	6848	6647	4306	386933	5721	3275
32	8/2/2017	89.8	6691	6728	3480	399355	5869	3196
33	8/3/2017	91.8	6698	7197	3498	399098	5732	3196
34	8/3/2017	92.1	6497	6785	3575	391941	5920	3199

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PRODUCING FORMATION(S)	DEPTHS			
MARCELLUS	6251'	TVD	13272'	MD

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump  
 SHUT-IN PRESSURE Surface 722 psi Bottom Hole 2612 psi DURATION OF TEST .5 hrs  
 OPEN FLOW Gas 6004.77 mcfpd Oil 72 bpd NGL N/A bpd Water 288 bpd GAS MEASURED BY  
 Estimated  Orifice  Pilot

LITHOLOGY / FORMATION	TOP DEPTH IN FT TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY TYPE OF FLUID (FRESHWATER,BRINE,GAS,H2S, ETC)
					SEE ATTACHED

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Please insert additional pages as applicable.

Drilling Contractor Nomac 78 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 U.S. Well Service  
 Address 533 Industrial Park Drive City Jane Lew State WV Zip 26378

Please insert additional pages as applicable.

Completed by CNX Gas WV Operations Company, LLC - Drilling and Completions Telephone 304-884-2000  
 Signature [Signature] Title Adam Shutler - Completions Superintendent-Gas WV Date 2/26/17



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LITHOLOGY / FORMATION	TOP	BOTTOM	TOP	BOTTOM	DESCRIBE ROCK TYPE AND RECORD QUANTITY TYPE OF FLUID (FRESHWATER,BRINE,GAS,H2S, ETC)
	DEPTH IN FT	DEPTH IN FT	DEPTH IN FT	DEPTH IN FT	
	TVD	TVD	MD	MD	
SHALE/SANDSTONE	0	1222			
SANDSTONE	1222	1346			
SHALE/SANDSTONE	1346	1506			
SANDSTONE	1506	1548			
SHALE/SANDSTONE	1548	1650			
MAXTON SAND	1650	1733			
SHALE/SANDSTONE	1733	1856			
BIG LIME	1856	1911			
BIG INJUN	1911	2046			
PRICE	2046	2318			
WEIR	2318	2357			
SHALE	2357	2637			
GORDON	2637	2654			
SHALE/SANDSTONE	2654	2834			
5TH SAND	2834	2846			
SHALE	2846	2989			
SANDSTONE	2989	3003			
SHALE/SANDSTONE	3003	3411			
BENSON	4838	4900			
SHALE	4900	5060			
ALEXANDER	5060	5128			
SHALE	5128	5638			
RHINESTREET	5638	5964			
CASHAQUA	5964	6056			
MIDDLESEX SHALE	6056	6085			
WEST RIVER	6085	6129			
BURKETT	6129	6172			
TULLY LIMESTONE	6172	6173			
HAMILTON SHALE	6173	6174			
MARCELLUS	6174	6233			
ONONDAGA	6233				

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# NOBLE ENERGY



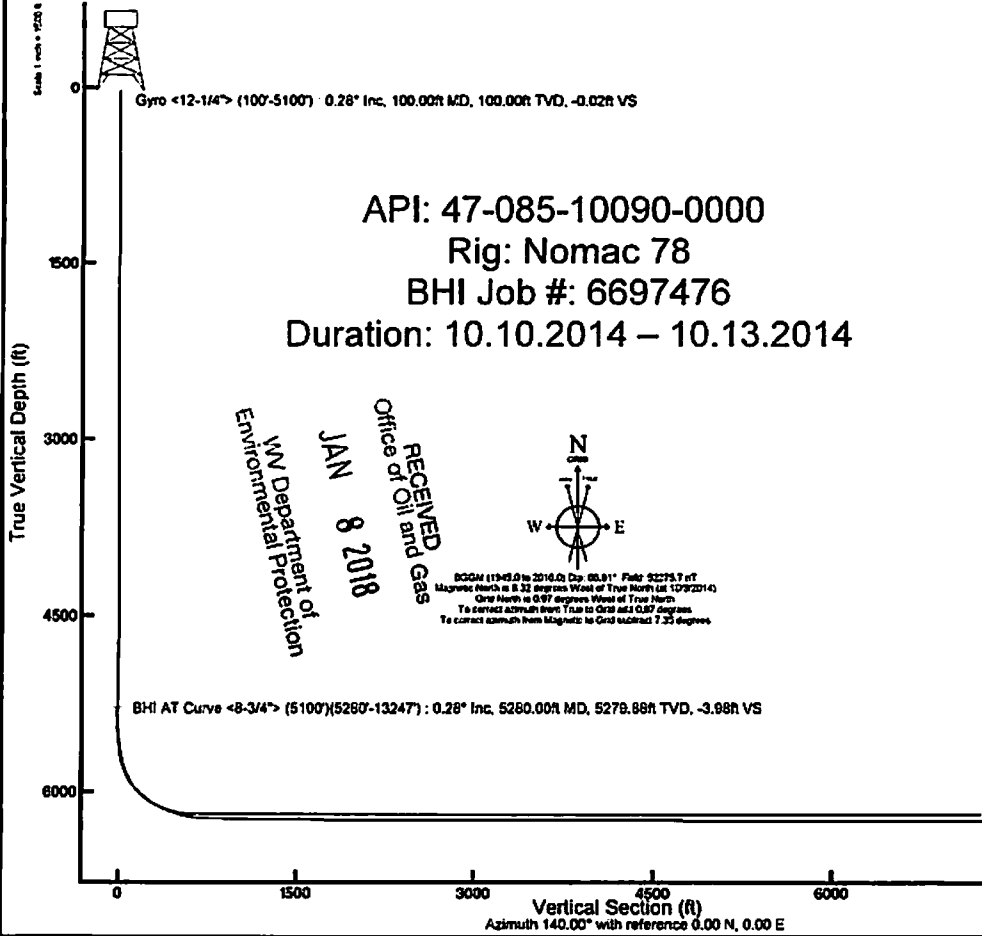
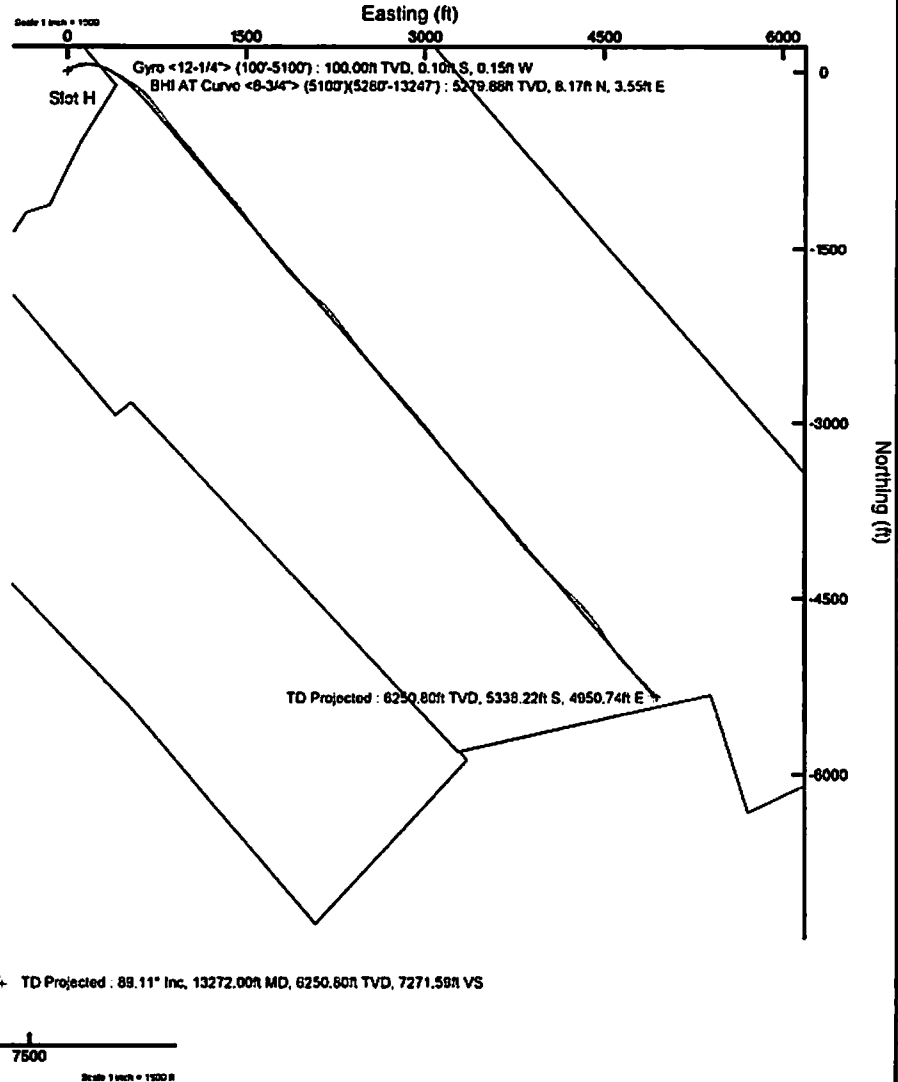
Location: Ritchie County, WV  
 Field: Ritchie  
 Facility: PEN-20 Pad

Slot: Slot H  
 Well: PEN-20H-HS  
 Wellbore: PEN-20H-HS PWB

Plot reference wellbore is PEN-20H-HS PWB Rev-A.0	
True vertical depths are referenced to Nomac 78 (RKB)	Grid System: NAD27 / Lambert West Virginia SP, Northern Zone (4701), US feet
Measured depths are referenced to Nomac 78 (RKB)	North Reference: Grid north
Nomac 78 (RKB) to Mean Sea Level: 1023 feet	Scale: True distance
Mean Sea Level to Mud line (At Slot: Slot H): -1029 feet	Depths are in feet
Coordinates are in feet referenced to Grid	Created by: gufford on 10/16/2014

### Location Information

Facility Name	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude		
PEN-20 Pad	1568205.600	305275.569	39°19'41.124"N	81°01'35.306"W		
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Slot H	-65.00	102.79	1568303.590	305160.569	39°19'40.202"N	81°01'33.976"W
Nomac 78 (RKB) to Mud line (At Slot: Slot H)	26ft					
Mean Sea Level to Mud line (At Slot: Slot H)	-1025ft					
Nomac 78 (RKB) to Mean Sea Level	1055ft					



DCGM (11-14-0 to 2016.0) Dr: 05.91" Field: 92275.7 ft  
 Magnetic North is 8.32 degrees West of True North (at 10/9/2014)  
 Grid North is 0.87 degrees West of True North  
 To correct azimuth from True to Grid add 0.87 degrees  
 To correct azimuth from Magnetic to Grid subtract 7.35 degrees





# Actual Wellpath Report

PEN-20H-IIS AWP Proj: 13272'

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REFERENCE WELLPATH IDENTIFICATION			
Operator	NOBLE ENERGY	Slot	Slot H
Area	Ritchie County, WV	Well	PEN-20H-IIS
Field	Ritchie	Wellbore	PEN-20H-IIS AWB
Facility	PEN-20 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	Gotfbra1
Scale	0.999954	Report Generated	10/16/2014 at 9:23:15 AM
Convergence at slot	0.97° West	Database/Source file	WANorthEast/PEN-20H-IIS_AWB.xml

WELLPATH LOCATION	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	-95.00	102.79	1568308.59	305180.58	39°19'40.202"N	81°01'33.978"W
Facility Reference Pt			1568205.80	305275.58	39°19'41.124"N	81°01'35.306"W
Field Reference Pt			0.00	0.00	38°17'12.460"N	86°28'23.077"W

WELLPATH DATUM			
Calculation method	Minimum curvature	Nomac 78 (RKB) to Facility Vertical Datum	1055.00ft
Horizontal Reference Pt	Slot	Nomac 78 (RKB) to Mean Sea Level	1055.00ft
Vertical Reference Pt	Nomac 78 (RKB)	Nomac 78 (RKB) to Mud Line at Slot (Slot H)	26.00ft
MD Reference Pt	Nomac 78 (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	140.00°

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# Actual Wellpath Report

PEN-20H-HS AWP Proj: 13272  
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## REFERENCE WELLPATH IDENTIFICATION

Operator	NOBLE ENERGY
Area	Ritchie County, WV
Field	Ritchie
Facility	PEN-20 Pad
Well	PEN-20H-HS
Slot #	PEN-20H-HS AWB

MD [ft]	Inchation [ft]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [ft]	Grid North [ft]	Latitude [ft]	Longitude [ft]	Closure Dist [ft]	Closure Dir [ft]	DLS [ft/100ft]
26.00	0.000	237.780	76.00	0.00	0.00	0.00	1568308.59	305180.58	39°19'40.202"N	81°01'33.978"W	0.00	0.00	0.00
100.00	0.280	237.780	100.00	-0.02	-0.10	-0.15	1568308.44	305180.48	39°19'40.201"N	81°01'33.980"W	0.18	0.18	0.38
200.00	0.050	234.210	200.00	-0.06	-0.25	-0.40	1568308.19	305180.33	39°19'40.200"N	81°01'33.983"W	0.47	0.47	0.88
300.00	0.020	222.540	300.00	-0.06	-0.29	-0.44	1568308.15	305180.29	39°19'40.199"N	81°01'33.984"W	0.53	0.53	1.03
400.00	0.070	289.580	400.00	-0.11	-0.28	-0.51	1568308.08	305180.30	39°19'40.200"N	81°01'33.984"W	0.58	0.58	1.06
500.00	0.100	292.790	500.00	-0.24	-0.23	-0.65	1568307.94	305180.35	39°19'40.200"N	81°01'33.986"W	0.69	0.69	1.03
600.00	0.070	200.610	600.00	-0.29	-0.25	-0.75	1568307.84	305180.33	39°19'40.200"N	81°01'33.987"W	0.79	0.79	1.12
700.00	0.140	192.260	700.00	-0.19	-0.43	-0.80	1568307.79	305180.15	39°19'40.198"N	81°01'33.988"W	0.91	0.91	1.07
800.00	0.090	69.690	800.00	-0.08	-0.52	-0.75	1568307.84	305180.06	39°19'40.197"N	81°01'33.987"W	0.91	0.91	1.07
900.00	0.210	91.580	900.00	0.06	-0.50	-0.49	1568308.10	305180.08	39°19'40.197"N	81°01'33.984"W	0.70	0.70	1.13
1000.00	0.290	100.240	1000.00	0.38	-0.55	-0.06	1568308.53	305180.03	39°19'40.197"N	81°01'33.979"W	0.55	0.55	0.99
1100.00	0.290	98.380	1100.00	0.76	-0.63	0.44	1568309.03	305179.95	39°19'40.196"N	81°01'33.972"W	0.77	0.77	1.01
1200.00	0.250	47.680	1200.00	0.94	-0.52	0.85	1568309.44	305180.06	39°19'40.197"N	81°01'33.967"W	1.00	1.00	0.23
1300.00	0.420	51.640	1299.99	0.95	-0.15	1.30	1568309.89	305180.43	39°19'40.201"N	81°01'33.961"W	1.31	0.64	0.17
1400.00	0.460	65.680	1399.99	1.06	0.25	1.95	1568310.54	305180.83	39°19'40.205"N	81°01'33.953"W	1.96	1.96	0.11
1500.00	0.460	52.980	1499.99	1.19	0.66	2.63	1568311.22	305181.24	39°19'40.209"N	81°01'33.945"W	2.72	2.72	0.10
1600.00	0.410	74.170	1599.98	1.35	1.00	3.30	1568311.89	305181.58	39°19'40.213"N	81°01'33.936"W	3.45	3.45	0.17
1700.00	0.300	79.550	1699.98	1.63	1.15	3.90	1568312.49	305181.73	39°19'40.214"N	81°01'33.929"W	4.06	4.06	0.11
1800.00	0.280	93.290	1799.98	1.93	1.18	4.40	1568312.99	305181.76	39°19'40.215"N	81°01'33.922"W	4.56	4.56	0.07
1900.00	0.450	95.450	1899.98	2.37	1.13	5.04	1568313.63	305181.71	39°19'40.214"N	81°01'33.914"W	5.16	5.16	0.17
2000.00	0.280	108.420	1999.98	2.86	1.01	5.66	1568314.25	305181.59	39°19'40.213"N	81°01'33.906"W	5.75	5.75	0.19
2100.00	0.300	134.300	2099.98	3.33	0.75	6.08	1568314.67	305181.33	39°19'40.211"N	81°01'33.901"W	6.12	6.12	0.13
2200.00	0.130	101.390	2199.98	3.68	0.55	6.38	1568314.97	305181.13	39°19'40.209"N	81°01'33.897"W	6.40	6.40	0.20
2300.00	0.180	66.700	2299.97	3.81	0.59	6.63	1568315.22	305181.17	39°19'40.209"N	81°01'33.894"W	6.66	6.66	0.10
2400.00	0.130	61.060	2399.97	3.88	0.70	6.88	1568315.47	305181.28	39°19'40.211"N	81°01'33.891"W	6.91	6.91	0.05
2500.00	0.070	32.230	2499.97	3.88	0.81	7.01	1568315.60	305181.39	39°19'40.212"N	81°01'33.889"W	7.05	7.05	0.08
2600.00	0.040	225.120	2599.97	3.87	0.84	7.02	1568315.61	305181.42	39°19'40.212"N	81°01'33.889"W	7.07	7.07	0.11
2700.00	0.130	136.070	2699.97	3.98	0.73	7.07	1568315.66	305181.31	39°19'40.211"N	81°01'33.888"W	7.11	7.11	0.14
2800.00	0.170	185.750	2799.97	4.20	0.50	7.13	1568315.72	305181.08	39°19'40.209"N	81°01'33.887"W	7.15	7.15	0.13

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REFERENCE WELLPATH IDENTIFICATION

Operator	NOBLE ENERGY
Area	Richie County, WV
Field	Richie
Facility	PEN-20 Pad
Well	PEN-20H-HS
Wellbore	PEN-20H-HS AWB
Slot	Slot H

MD [ft]	Inclination [°]	Azimuth [°]	TYD	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°/100ft]	DLS
2900.00	0.150	216.150	2899.97	4.33	0.25	7.04	1568315.63	305180.83	39°19'40.206"N	81°01'33.888"W	7.05	87.970	0.09
3000.00	0.190	201.560	2999.97	4.45	-0.01	6.90	1568315.49	305180.57	39°19'40.203"N	81°01'33.890"W	6.90	90.086	0.06
3100.00	0.270	165.370	3099.97	4.74	-0.39	6.90	1568315.49	305180.19	39°19'40.200"N	81°01'33.890"W	6.91	92.255	0.16
3200.00	0.260	159.560	3199.97	5.16	-0.83	7.04	1568315.63	305179.75	39°19'40.195"N	81°01'33.888"W	7.09	96.749	0.03
3300.00	0.190	135.510	3299.97	5.54	-1.16	7.24	1568315.83	305179.42	39°19'40.192"N	81°01'33.886"W	7.33	99.139	0.12
3400.00	0.230	114.340	3399.97	5.89	-1.37	7.53	1568316.12	305179.22	39°19'40.190"N	81°01'33.882"W	7.66	100.268	0.09
3500.00	0.200	109.670	3499.97	6.22	-1.51	7.88	1568316.47	305179.07	39°19'40.189"N	81°01'33.877"W	8.02	100.820	0.03
3600.00	0.300	110.040	3599.97	6.60	-1.65	8.29	1568316.88	305178.93	39°19'40.187"N	81°01'33.872"W	8.46	101.286	0.10
3700.00	0.290	109.000	3699.97	7.04	-1.83	8.78	1568317.37	305178.75	39°19'40.186"N	81°01'33.866"W	8.97	101.758	0.01
3800.00	0.250	119.040	3799.97	7.46	-2.02	9.21	1568317.80	305178.56	39°19'40.184"N	81°01'33.860"W	9.43	102.346	0.06
3900.00	0.170	889.97	3899.97	7.72	-2.07	9.54	1568318.13	305178.51	39°19'40.184"N	81°01'33.856"W	9.76	102.250	0.19
4000.00	0.110	143.420	3999.96	7.86	-2.10	9.73	1568318.32	305178.48	39°19'40.183"N	81°01'33.854"W	9.96	102.159	0.17
4100.00	0.110	409.96	4099.96	7.98	-2.13	9.88	1568318.47	305178.45	39°19'40.183"N	81°01'33.852"W	10.11	102.179	0.14
4200.00	0.240	11.730	4199.96	7.88	-1.88	10.01	1568318.60	305178.70	39°19'40.185"N	81°01'33.850"W	10.18	100.664	0.19
4300.00	0.270	355.490	4299.96	7.55	-1.44	10.03	1568318.62	305179.14	39°19'40.190"N	81°01'33.850"W	10.13	98.193	0.08
4400.00	0.300	439.96	4399.96	7.12	-0.96	9.93	1568318.52	305179.62	39°19'40.195"N	81°01'33.851"W	9.98	95.526	0.07
4500.00	0.410	332.490	4499.96	6.53	-0.39	9.68	1568318.27	305180.19	39°19'40.200"N	81°01'33.855"W	9.69	92.134	0.12
4600.00	0.500	326.580	4599.96	5.74	0.29	9.28	1568317.87	305180.87	39°19'40.207"N	81°01'33.860"W	9.28	88.229	0.10
4700.00	0.580	324.280	4699.95	4.81	1.06	8.74	1568317.33	305181.64	39°19'40.214"N	81°01'33.867"W	8.81	83.073	0.08
4800.00	0.840	323.300	4799.94	3.57	2.06	8.01	1568316.60	305182.64	39°19'40.224"N	81°01'33.877"W	8.27	75.570	0.26
4900.00	0.920	326.870	4899.93	2.04	3.32	7.13	1568315.72	305183.90	39°19'40.236"N	81°01'33.888"W	7.87	65.031	0.10
5000.00	1.110	322.690	4999.92	0.28	4.76	6.11	1568314.70	305185.34	39°19'40.250"N	81°01'33.901"W	7.74	52.039	0.20
5100.00	1.170	322.000	5099.90	-1.71	6.34	4.89	1568313.48	305186.92	39°19'40.266"N	81°01'33.917"W	8.01	37.649	0.06
5200.00	0.280	331.330	5279.88	-3.98	8.17	3.55	1568312.14	305188.75	39°19'40.284"N	81°01'33.935"W	8.91	23.464	0.50
5375.00	7.890	58.930	5374.58	-3.19	11.75	9.03	1568317.62	305192.33	39°19'40.320"N	81°01'33.866"W	14.82	17.549	8.30
5471.00	63.480	63.480	5468.85	0.47	20.21	24.82	1568333.40	305200.79	39°19'40.406"N	81°01'33.667"W	32.00	50.842	6.05
5566.00	69.700	5560.45	5560.45	7.79	30.06	47.95	1568356.54	305210.64	39°19'40.508"N	81°01'33.374"W	56.60	37.916	4.04
5662.00	72.730	5650.76	5650.76	19.53	40.51	78.66	1568387.25	305221.09	39°19'40.616"N	81°01'32.986"W	88.48	62.751	5.60
5758.00	83.450	5737.81	5737.81	38.75	48.59	118.19	1568426.77	305229.17	39°19'40.702"N	81°01'32.485"W	127.79	67.650	7.20
5853.00	31.210	85.870	5820.59	65.28	52.87	164.57	1568473.15	305233.45	39°19'40.753"N	81°01'31.895"W	172.85	72.189	4.07

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#### REFERENCE WELLPATH IDENTIFICATION

Operator	NOBLE ENERGY
Area	Ritchie County, WV
Field	Ritchie
Facility	PE-N-20 Pad
Shot	Wellbore
Shot II	PE-N-2011-HS AWP

#### WELLPATH DATA (139 stations)

MD [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]	DLS [ft/1000]
5949.00	95.60	5901.56	52.03	99.01	276.66	216.05	1568523.63	305232.61	391940.73	N	81°01'31.240"W	222.23	76.459	6.13
6043.00	42.20	106.310	5975.55	144.21	40.54	272.66	1568581.23	305221.12	391940.64	N	81°01'30.518"W	275.65	87.543	11.36
6199.00	53.080	114.140	6040.12	205.86	15.68	338.94	1568441.52	305196.25	391940.41	N	81°01'29.669"W	339.31	87.352	12.71
6330.00	64.760	121.250	6135.40	359.94	-64.36	483.26	1568791.83	305116.22	391939.64	N	81°01'27.815"W	487.53	97.586	3.94
6426.00	69.840	123.740	6172.44	444.37	-111.95	557.91	1568868.47	305068.64	391939.190	N	81°01'26.855"W	569.03	101.346	5.81
6521.00	75.450	131.650	6200.74	532.89	-167.41	629.52	1568938.08	305013.18	391938.65	N	81°01'25.932"W	651.40	104.892	9.96
6617.00	82.100	141.710	6219.39	626.73	-235.86	693.94	1569002.49	304944.73	391937.98	N	81°01'25.098"W	732.92	108.772	12.34
6712.00	88.800	143.210	6226.92	721.29	-310.91	751.60	1569060.15	304869.69	391937.26	N	81°01'24.148"W	813.37	112.473	7.23
6808.00	88.860	142.550	6228.88	817.15	-387.44	809.52	1569118.07	304793.16	391936.50	N	81°01'23.594"W	897.46	115.576	0.69
6903.00	88.280	141.310	6231.25	912.06	-462.21	868.08	1569176.63	304718.40	391935.780	N	81°01'22.833"W	983.46	118.033	1.44
6999.00	88.280	140.200	6234.13	1008.01	-536.52	928.79	1569231.33	304644.09	391935.05	N	81°01'22.045"W	1072.61	120.013	1.16
7094.00	89.320	140.040	6236.12	1102.99	-609.40	989.68	1569298.23	304571.21	391934.34	N	81°01'21.254"W	1162.26	121.623	1.11
7189.00	90.400	139.450	6236.36	1197.98	-681.90	1051.07	1569359.61	304498.71	391933.640	N	81°01'20.458"W	1252.89	122.974	1.30
7285.00	90.340	141.800	6235.74	1293.97	-756.10	1111.97	1569420.50	304424.51	391932.917	N	81°01'19.667"W	1344.68	124.215	2.45
7380.00	89.940	141.700	6235.50	1388.92	-830.71	1170.78	1569479.32	304349.91	391932.189	N	81°01'18.902"W	1435.55	125.357	0.43
7476.00	89.510	139.090	6235.96	1484.91	-904.67	1231.97	1569540.51	304275.96	391931.469	N	81°01'18.108"W	1528.46	126.291	2.76
7571.00	89.350	139.240	6236.91	1579.90	-976.54	1294.09	1569602.62	304204.09	391930.769	N	81°01'17.302"W	1621.20	127.039	0.23
7666.00	88.770	138.200	6238.47	1674.86	-1047.92	1356.76	1569665.28	304132.71	391930.074	N	81°01'16.489"W	1714.33	127.682	1.25
7760.00	88.950	141.080	6240.34	1768.83	-1119.53	1417.61	1569726.13	304061.11	391929.377	N	81°01'15.700"W	1806.37	128.299	3.07
7855.00	89.940	145.080	6241.26	1863.67	-1195.46	1474.66	1569783.18	303985.18	391928.636	N	81°01'14.957"W	1898.35	129.030	4.34
7949.00	89.850	144.600	6241.43	1957.33	-1272.31	1528.79	1569837.31	303908.34	391927.885	N	81°01'14.252"W	1988.96	129.768	0.52
8045.00	89.940	142.620	6241.61	2053.14	-1349.58	1585.74	1569894.26	303831.06	391927.131	N	81°01'13.511"W	2082.29	130.400	2.06
8139.00	90.000	143.380	6241.66	2147.01	-1424.65	1642.31	1569950.83	303756.00	391926.399	N	81°01'12.775"W	2174.13	130.941	0.81
8233.00	90.220	142.440	6241.48	2240.88	-1499.63	1699.00	1570007.51	303681.02	391925.667	N	81°01'12.038"W	2266.17	131.433	1.03
8327.00	90.180	139.760	6241.15	2334.86	-1572.78	1758.02	1570066.53	303607.87	391924.954	N	81°01'11.271"W	2358.88	131.817	2.85
8422.00	89.480	141.290	6241.43	2429.85	-1646.11	1818.42	1570126.92	303534.55	391924.240	N	81°01'10.487"W	2452.82	132.153	1.77
8516.00	89.720	139.410	6242.09	2523.84	-1718.48	1878.39	1570186.89	303462.18	391923.535	N	81°01'09.708"W	2545.89	132.454	2.02
8611.00	90.340	135.250	6242.04	2618.72	-1788.32	1942.77	1570251.27	303392.35	391922.855	N	81°01'08.874"W	2640.53	132.630	4.43
8705.00	89.850	132.490	6241.88	2712.17	-1853.45	2010.53	1570319.02	303327.22	391922.223	N	81°01'07.998"W	2734.50	132.672	2.98

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REFERENCE WELLPATH IDENTIFICATION

Operator	NOBLE ENERGY	Slot	Slot H
Area	Richie County, WV	Well	PEN-20H-HS
Field	Richie	Wellbore	PEN-20H-HS AWB
Facility			
			PEN-20 Pad

MD	Inclination [°]	Azimuth	TVD	Vert Sect [ft]	North [ft]	East [ft]	Grid East [ft S.M]	Grid North [ft S.M]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [ft/100ft]
8801.00	89.010	133.300	6242.08	2807.43	-1918.80	2080.86	1570389.35	3031261.88	39°12'1.58"N	81°01'07.08"W	2830.50	133.680	0.85
8895.00	89.850	135.240	6242.28	2900.96	-1984.41	2148.16	1570456.65	3031962.27	39°12'0.95"N	81°01'06.21"W	2924.46	133.731	2.06
8900.00	90.250	139.760	6242.20	2995.84	-2054.43	2212.33	1570520.81	3031262.25	39°12'0.270"N	81°01'05.387"W	3019.12	132.881	4.78
9085.00	90.090	143.290	6241.91	3090.79	-2128.79	2271.42	1570579.91	303051.89	39°12'0.620"W	81°01'04.620"W	3113.06	133.143	3.72
9180.00	90.090	142.990	6241.76	3185.67	-2204.50	2278.81	1570637.29	302976.18	39°12'0.807"N	81°01'03.873"W	3206.74	133.429	0.95
9274.00	90.060	142.620	6241.64	3279.58	-2279.08	2386.02	1570694.50	302901.61	39°12'0.079"N	81°01'03.129"W	3299.59	133.687	0.25
9368.00	90.150	144.220	6241.47	3373.41	-2354.56	2442.04	1570750.51	302826.13	39°12'0.343"N	81°01'02.400"W	3392.28	133.955	1.70
9464.00	90.180	142.780	6241.19	3469.23	-2431.73	2499.14	1570807.61	302748.96	39°12'0.590"N	81°01'01.657"W	3486.98	134.217	1.50
9558.00	90.180	140.400	6240.90	3563.19	-2505.38	2557.54	1570866.01	302675.32	39°12'0.899"W	81°01'00.899"W	3580.22	134.410	2.53
9652.00	90.060	138.100	6240.70	3657.17	-2576.59	2618.89	1570927.36	302604.11	39°12'0.178"N	81°01'00.103"W	3671.88	134.533	2.45
9746.00	89.480	138.450	6241.08	3751.13	-2646.71	2681.46	1570989.92	302533.96	39°12'0.495"N	81°00'59.292"W	3767.69	134.627	0.72
9841.00	89.570	138.920	6241.87	3846.10	-2718.10	2744.52	1571052.63	302462.61	39°12'0.801"N	81°00'58.478"W	3862.45	134.726	0.50
9936.00	89.540	139.040	6242.60	3941.08	-2789.77	2806.52	1571114.98	302390.94	39°12'0.103"N	81°00'57.670"W	3957.19	134.828	0.13
10031.00	89.600	139.050	6243.32	4036.07	-2861.51	2868.79	1571177.24	302319.20	39°12'0.404"N	81°00'56.862"W	4051.94	134.927	0.06
10125.00	89.850	138.650	6243.77	4130.05	-2932.29	2930.64	1571239.09	302248.43	39°12'1.715"N	81°00'56.060"W	4145.72	135.016	0.50
10219.00	89.850	140.860	6244.01	4224.04	-3004.04	2991.37	1571298.81	302176.69	39°12'0.016"N	81°00'55.272"W	4239.40	135.121	2.35
10314.00	89.910	143.310	6244.21	4318.97	-3078.98	3049.74	1571358.18	302101.75	39°12'0.285"N	81°00'54.513"W	4333.71	135.273	2.58
10409.00	89.850	143.760	6244.41	4413.79	-3155.38	3106.20	1571414.64	302025.35	39°12'0.540"N	81°00'53.779"W	4427.74	135.450	0.48
10504.00	89.940	142.340	6244.59	4508.65	-3231.30	3163.31	1571471.74	301949.44	39°12'0.799"N	81°00'53.036"W	4521.92	135.609	1.50
10599.00	89.720	141.100	6244.87	4603.61	-3305.87	3222.16	1571530.59	301874.87	39°12'0.072"N	81°00'52.271"W	4616.39	135.735	1.33
10694.00	89.850	141.570	6245.22	4698.58	-3380.05	3281.51	1571589.94	301800.69	39°12'0.349"N	81°00'51.500"W	4710.95	135.847	0.51
10789.00	89.720	139.760	6245.58	4793.57	-3453.52	3341.72	1571650.15	301727.22	39°12'0.633"N	81°00'50.719"W	4805.61	135.943	1.91
10884.00	89.630	138.410	6246.12	4888.55	-3525.31	3403.94	1571712.37	301655.44	39°12'0.912"W	81°00'49.912"W	4900.47	136.003	1.42
10978.00	89.540	141.320	6246.80	4982.54	-3597.16	3464.52	1571772.95	301583.59	39°12'0.234"N	81°00'49.126"W	4994.25	136.076	3.10
11073.00	89.600	142.390	6247.51	5077.49	-3671.87	3523.20	1571831.62	301508.88	39°12'0.505"N	81°00'48.361"W	5088.77	136.184	1.13
11168.00	89.720	141.270	6248.08	5172.43	-3746.56	3581.90	1571890.32	301434.20	39°12'0.777"N	81°00'47.600"W	5183.31	136.287	1.19
11263.00	89.570	139.570	6248.67	5267.43	-3819.77	3642.43	1571950.85	301360.99	39°12'0.063"N	81°00'46.814"W	5278.07	136.361	1.80
11358.00	90.030	141.720	6249.00	5362.41	-3893.23	3702.67	1572011.08	301287.54	39°12'0.347"N	81°00'46.032"W	5372.80	136.437	2.31
11453.00	89.940	140.740	6249.02	5457.39	-3967.29	3762.16	1572070.57	301213.48	39°12'0.625"N	81°00'45.260"W	5467.47	136.520	1.04
11549.00	90.090	139.490	6249.00	5553.39	-4040.94	3823.74	1572132.15	301139.84	39°12'0.908"N	81°00'44.461"W	5563.29	136.582	1.35

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REFERENCE WELLPATH IDENTIFICATION

Operator	NOBLE ENERGY
Area	Richie County, WV
Field	Richie
Facility	PEN-20 Pad
Wellbore	PEN-20H-HS AWB
Well	PEN-20H-HS
Slot	Slot 11

WELLPATH DATA (139 stations)

MD	Inclination	Azimuth	TVD	Vert Sect	North	East	Grid East	Grid East	Grid North	Latitude	Longitude	Closure Dist	Closure Dir	DLS
11645.00	90.430	136.810	6248.56	5649.33	-11.42	3887.81	172196.21	301068.36	301068.36	39°18'00.212"N	81°00'43.630"W	5659.24	136.608	2.77
11741.00	89.880	137.100	6248.30	5745.19	-1182.57	3953.34	157261.74	300998.21	300998.21	39°18'59.530"N	81°00'42.782"W	5755.24	136.614	0.65
11836.00	90.090	136.010	6248.33	5840.02	-4251.55	4018.66	157327.06	300929.24	300929.24	39°18'58.859"N	81°00'41.936"W	5850.24	136.613	1.17
11932.00	89.820	136.040	6248.40	5935.79	-4320.63	4085.32	1572393.71	300860.16	300860.16	39°18'58.187"N	81°00'41.073"W	5946.23	136.603	0.28
12027.00	89.940	135.560	6248.60	6030.53	-4388.74	4151.55	1572459.94	300792.05	300792.05	39°18'57.525"N	81°00'40.216"W	6041.22	136.591	0.52
12123.00	90.150	134.240	6248.53	6126.15	-4456.50	4219.55	1572527.94	300724.29	300724.29	39°18'56.867"N	81°00'39.336"W	6137.18	136.564	1.39
12218.00	89.750	135.420	6248.61	6220.76	-4523.47	4286.92	1572595.31	300657.32	300657.32	39°18'56.216"N	81°00'38.465"W	6232.14	136.538	1.31
12314.00	89.880	139.230	6248.92	6316.64	-4594.04	4351.98	1572660.36	300586.76	300586.76	39°18'55.530"N	81°00'37.622"W	6328.11	136.550	3.97
12409.00	89.850	143.210	6249.14	6411.60	-4668.08	4411.47	1572719.85	300512.72	300512.72	39°18'54.808"N	81°00'36.850"W	6422.78	136.619	4.19
12505.00	89.910	145.900	6249.34	6507.29	-4746.28	4467.14	1572775.51	300434.52	300434.52	39°18'54.044"N	81°00'36.125"W	6517.86	136.735	2.80
12600.00	90.340	147.160	6249.14	6601.67	-4825.53	4519.53	1572827.90	300355.28	300355.28	39°18'53.270"N	81°00'35.441"W	6611.50	136.875	1.40
12696.00	90.280	146.380	6248.62	6697.00	-4905.83	4572.14	1572880.51	300274.99	300274.99	39°18'52.485"N	81°00'34.755"W	6706.09	137.016	0.81
12792.00	90.220	144.030	6248.20	6792.59	-4984.66	4626.91	1572935.28	300196.16	300196.16	39°18'51.715"N	81°00'34.041"W	6801.11	137.132	2.45
12887.00	90.120	138.470	6247.92	6887.53	-5058.72	4686.35	1572994.72	300122.10	300122.10	39°18'50.993"N	81°00'33.269"W	6895.83	137.188	5.85
12983.00	89.940	135.150	6247.87	6983.37	-5128.70	4752.05	1573060.41	300052.12	300052.12	39°18'50.313"N	81°00'32.419"W	6991.82	137.183	3.46
13078.00	89.630	133.820	6248.22	7077.93	-5195.27	4819.82	1573128.18	299985.56	299985.56	39°18'49.666"N	81°00'31.542"W	7086.71	137.147	1.44
13174.00	89.110	137.350	6249.28	7173.62	-5263.82	4886.99	1573195.35	299917.01	299917.01	39°18'49.000"N	81°00'30.673"W	7182.65	137.126	3.72
13247.00	89.110	140.630	6250.41	7246.59	-5318.89	4934.88	1573243.24	299861.94	299861.94	39°18'48.463"N	81°00'30.052"W	7255.60	137.145	4.49
13272.00	89.110	140.630	6250.80	7271.59	-5338.22	4950.74	1573259.09	299842.62	299842.62	39°18'48.275"N	81°00'29.846"W	7280.55	137.157	0.00

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**Actual Wellpath Report**  
 PEN-20H-HS AWP Proj: 13272'  
 Page 7 of 8



REFERENCE WELLPATH IDENTIFICATION			
Operator	NOBLE ENERGY	Slot	Slot II
Area	Ritchie County, WV	Well	PEN-20H-HS
Field	Ritchie	Wellbore	PEN-20H-HS AWB
Facility	PEN-20 Pad		

TARGETS									
Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
PEN-20H-HS BHL Rev-2		6195.00	-5328.97	4922.79	1573231.14	299851.86	39°18'48.362"N	81°00'30.204"W	point
PEN-20H-HS LP Rev-2		6195.00	-275.00	681.99	1568990.55	304905.59	39°19'37.599"N	81°01'25.241"W	point
PEN-20 ALT Vertices		6948.00	23.60	-59.87	1568248.72	305204.18	39°19'40.426"N	81°01'34.745"W	polygon
PEN-20 Cokely Tract 1		6948.00	23.60	-59.87	1568248.72	305204.18	39°19'40.426"N	81°01'34.745"W	polygon
PEN-20 Cokely Tract 2		6948.00	23.60	-59.87	1568248.72	305204.18	39°19'40.426"N	81°01'34.745"W	polygon
PEN-20 LL		6948.00	23.60	-59.87	1568248.72	305204.18	39°19'40.426"N	81°01'34.745"W	polygon
PEN-20 Parcel 3.12-1.2		6948.00	23.60	-59.87	1568248.72	305204.18	39°19'40.426"N	81°01'34.745"W	polygon

WELLPATH COMPOSITION - Ref Wellbore: PEN-20H-HS AWB Ref Wellpath: PEN-20H-HS AWP Proj: 13272'				
Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
26.00	5100.00	Generic gyro - northseeking (Standard)	01 Gyro <12-1/4"> (100'-5100')	PEN-20H-HS AWB
5100.00	13247.00	NaviTrak (AT Curve Short Spaced)	02 BHI AT Curve <8-3/4"> (5100')(5280'-13247')	PEN-20H-HS AWB
13247.00	13272.00	Blind Drilling (std)	Projection to bit	PEN-20H-HS AWB

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**Actual Wellpath Report**  
 PEN-2011-HS AWP Proj: 13272  
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**REFERENCE WELLPATH IDENTIFICATION**

Operator	Slot	Slot H
NOBLE ENERGY	Well	PEN-2011-HS
Area Ritchie County, WV	Wellbore	PEN-2011-HS AWB
Field Ritchie		
Facility PEN-20 Pad		

**COMMENTS**

Wellpath general comments

API: 47-085-10090-0000

Rig: Nomatic 78

BHJ Job #: 6697476

Duration: 10.10.2014 – 10.13.2014

Gyro: <12-1/4"> (100'-51.00')

BHJ AT Curve <8-3/4"> (5100'x5280'-13247')

TD Projected: 13272'

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# Hydraulic Fracturing Fluid Product Component Information Disclosure



Job Start Date:	7/26/2017
Job End Date:	8/3/2017
State:	West Virginia
County:	Ritchie
API Number:	47-085-10090-00-00
Operator Name:	CONSOL Energy Inc.
Well Name and Number:	PEN20HHS
Latitude:	39.32788000
Longitude:	-81.02613000
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,251
Total Base Water Volume (gal):	9,252,936
Total Base Non Water Volume:	0

## Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Consol	Carrier/Base Fluid					
			Water	7732-18-5	100.00000	84.50448	None
Sand	UPP	Proppant					
			Crystalline Silica in the form of Quartz	14808-60-7	99.90000	14.18103	None
HCL Acid (7.5%)	UPP	Acidizing					
			Hydrochloric Acid	7647-01-0	7.50000	0.09183	None
Unislick CST	UPP	Friction Reducer					
			copolymer of 2-propenamide	Proprietary	30.00000	0.01377	None
			Petroleum Distillate	64742-47-8	20.00000	0.00918	None
			Alcohols, C12-16, ethoxylated	68551-12-2	2.00000	0.00092	None
			Oleic Acid Diethanolamide	93-83-4	2.00000	0.00092	None
			Ammonium chloride ((NH4)Cl)	12125-02-9	1.00000	0.00046	None
K-Bac 1020	UPP	Biocide					
			Polyethylene glycol	25322-68-3	50.00000	0.00807	None
			Water	7732-18-5	30.00000	0.00484	None
			2,2-Dibromo-3-nitripropionamide	10222-01-2	21.00000	0.00335	None
Scale-Hib A	UPP	Scale Inhibitor					



			Triethanolamine Tri(Phosphate Ester), Sodium Salt	68171-29-9	30.00000	0.00360	None
			Ethylene Glycol	107-21-1	30.00000	0.00360	None
Unihib G	UPP	Acid inhibitor					
			Butyl diglycol	112-34-5	75.00000	0.00072	None
			Alcohols, C10-16, ethoxylated	68002-97-1	50.00000	0.00048	None
			Methanol	67-56-1	5.00000	0.00005	None
			Formaldehyde	50-00-0	1.00000	0.00001	None
			Thiourea	62-56-6	1.00000	0.00001	None
WGA-7	UPP	Viscosifier					
			Guar gum	9000-30-0	55.00000	0.00050	None
			Distillates (petroleum), hydrotreated light	64742-47-8	55.00000	0.00050	None
AP Breaker	UPP	Gel breaker					
			Ammonium peroxydisulfate	7727-54-0	100.00000	0.00000	None
			Sulfuric Acid	7664-93-9	0.50000	0.00000	None
Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.							
Other Chemical(s)	Listed Above	See Trade Name(s) List					
			Petroleum Distillate	64742-47-8	20.00000	0.00918	
			Polyethylene glycol	25322-68-3	50.00000	0.00807	
			Water	7732-18-5	30.00000	0.00484	
			Ethylene Glycol	107-21-1	30.00000	0.00360	
			Alcohols, C12-16, ethoxylated	68551-12-2	2.00000	0.00092	
			Oleic Acid Diethanolamide	93-83-4	2.00000	0.00092	
			Distillates (petroleum), hydrotreated light	64742-47-8	55.00000	0.00050	
			Alcohols, C10-16, ethoxylated	68002-97-1	50.00000	0.00048	
			Ammonium chloride ((NH4)Cl)	12125-02-9	1.00000	0.00046	
			Methanol	67-56-1	5.00000	0.00005	
			Formaldehyde	50-00-0	1.00000	0.00001	
			Thiourea	62-56-6	1.00000	0.00001	
			Sulfuric Acid	7664-93-9	0.50000	0.00000	

\* Total Water Volume sources may include fresh water, produced water, and/or recycled water

\*\* Information is based on the maximum potential for concentration and thus the total may be over 100%

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.

Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

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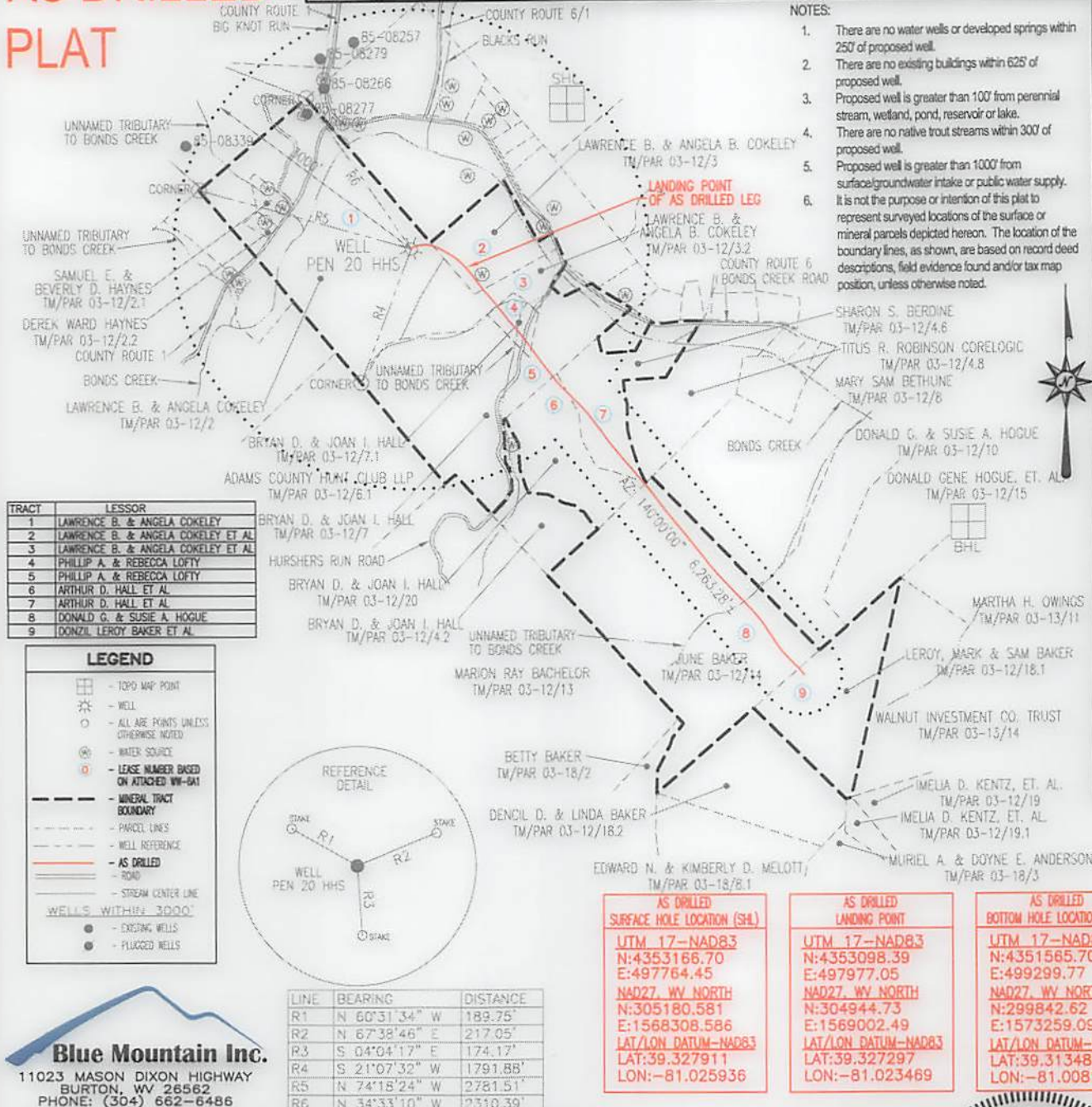


# AS DRILLED PLAT

BHL is located on topo map 7,228 feet south of Latitude: 39° 20' 00"  
 SHL is located on topo map 1,975 feet south of Latitude: 39° 20' 00"

BHL is located on topo map 2,298 feet west of Longitude: 81° 00' 00"  
 SHL is located on topo map 7,337 feet west of Longitude: 81° 00' 00"

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



**Blue Mountain Inc.**  
 11023 MASON DIXON HIGHWAY  
 BURTON, WV 26562  
 PHONE: (304) 662-6486

AS DRILLED SURFACE HOLE LOCATION (SHL)	AS DRILLED LANDING POINT	AS DRILLED BOTTOM HOLE LOCATION (BHL)
UTM 17-NAD83 N:4353166.70 E:497764.45 NAD27, WV NORTH N:305180.581 E:1568308.586 LAT/LON DATUM-NAD83 LAT:39.327911 LON:-81.025936	UTM 17-NAD83 N:4353098.39 E:497977.05 NAD27, WV NORTH N:304944.73 E:1569002.49 LAT/LON DATUM-NAD83 LAT:39.327297 LON:-81.023469	UTM 17-NAD83 N:4351565.70 E:499299.77 NAD27, WV NORTH N:299842.62 E:1573259.09 LAT/LON DATUM-NAD83 LAT:39.313489 LON:-81.008122

FILE #: PEN 20 HHS-AS DRILLED  
 DRAWING #: PEN 20 HHS-AS DRILLED  
 SCALE: 1" = 2000'  
 MINIMUM DEGREE OF ACCURACY: 1/2500  
 PROVEN SOURCE OF ELEVATION: U.S.G.S. MONUMENT THOMAS 1498.81'

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

Signed: George D. Six  
 R.P.E.: \_\_\_\_\_ L.L.S.: P.S. No. 2000



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

DATE: NOVEMBER 2, 2017  
 OPERATOR'S WELL #: PEN 20 HHS-AS DRILLED  
 API WELL #: 47 85 10090  
 STATE COUNTY PERMIT

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

WATERSHED: NORTH FORK HUGHES RIVER ELEVATION: 1081'±  
 COUNTY/DISTRICT: RITCHIE / CLAY QUADRANGLE: ELLENBORO, WV 7.5'  
 SURFACE OWNER: LAWRENCE & ANGELA COKELEY ACREAGE: 126.17±  
 OIL & GAS ROYALTY OWNER: LAWRENCE B. & ANGELA COKELEY ACREAGE: 512.655±

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

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: TVD: 6,251'± TMD: 13,272'±  
 WELL OPERATOR CNX GAS COMPANY LLC DESIGNATED AGENT CHRIS TURNER  
 Address 1000 CONSOL ENERGY DRIVE Address 1 DOMINION DR.  
 City CANONSBURG State PA Zip Code 15317 City JANE LEW State WV Zip Code 26378

02/16/2018