

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

API 47 - 051 - 02410 County Marshall District Franklin  
Quad Powhatan Point, WV/OH Pad Name MND23 Field/Pool Name Moundsville  
Farm name HG Energy II Appalachia, LLC Well Number MND23 N-4H  
Operator (as registered with the OOG) HG Energy II Appalachia, LLC  
Address 5260 Dupont Rd. City Parkersburg State WV Zip 26101

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey  
Top hole Northing 4407234.4 Easting 520040.8  
Landing Point of Curve Northing 4407003.8 Easting 519927.4  
Bottom Hole Northing 4409099.1 Easting 518367.1

Elevation (ft) 1238 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)  
Air/ OBM

Barite, Lime, CaCL, base oil, Gilsonite, Asphalt, clay, Emulsifier, sulfatone, safevert FLG, safevert WA

Date permit issued 09/13/2021 Date drilling commenced 11/2/2021 Date drilling ceased 4/20/2022  
Date completion activities began 5/23/2022 Date completion activities ceased 11/18/2022  
Verbal plugging (Y/N) \_\_\_\_\_ Date permission granted \_\_\_\_\_ Granted by \_\_\_\_\_

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

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Freshwater depth(s) ft Not observed Open mine(s) (Y/N) depths 862-868 WV Department of Environmental Protection  
Salt water depth(s) ft Not observed Void(s) encountered (Y/N) depths N  
Coal depth(s) ft 862,877 Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) Y

**APPROVED**

Reviewed by:  
[Signature]  
**09/15/2023**

API 47-051 - 02410 Farm name HG Energy II Appalachia, LLC Well number MND23 N-4H

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	28"	20"	40'	New	94 lbs/ft J-55		Yes
Surface	18.5"	13.375"	1195	New	54.5 lbs/ft J-55		Yes
Coal							
Intermediate 1	12.25"	9.625"	3157	New	40 lbs/ft J55		Yes
Intermediate 2							
Intermediate 3							
Production	8.5	5.5	15541	New	20 lbs/ft P-110		Yes
Tubing	4.67	2.375	7062	New	4.7 lbs/ft J55		not cemented
Packer type and depth set							

Comment Details Conductor: 19.5 bbls cement to surface performed by Lightning Energy Services along with cellars

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	Class A	93				Surface	8
Surface	Class A	1321	15.6	1.19	1572	Surface	8
Coal							
Intermediate 1	Class A	1013	15.6	1.24	1256	Surface	8
Intermediate 2							
Intermediate 3							
Production	Class A	437/3701	16.0/16.0	1.23/1.13	537/4182	Surface	8
Tubing							

Drillers TD (ft) 15583 Loggers TD (ft) \_\_\_\_\_  
 Deepest formation penetrated Marcellus Plug back to (ft) \_\_\_\_\_  
 Plug back procedure \_\_\_\_\_

Kick off depth (ft) 6859

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 \_\_\_\_\_

13.375" casing: Bow spring centralizers run on first 2 joints then placed every 3 joints to 100' from surface  
 9.625" casing: Bow spring centralizers run every joint for first 12 joints then placed every 3 joints to 100' from surface  
 5.5" casing: Spiral centralizer run every 3 joints from the 1st long joint to the top of the curve (KOP) Spiral centralizer run every 5 joints from the top of curve (KOP) to surface

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WAS WELL COMPLETED AS SHOT HOLE  Yes  No DETAILS \_\_\_\_\_

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

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

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**HG Energy II Appalachia, LLC**

**MND23 N-4H**

**Perforation Record**

Stage #	Perforation Date	Perforation from Depth	Perforation to Depth	Number of Perforations	Formation
Sleeve/1	10/15/2022	15489	15489	2	Marcellus
2	10/15/2022	15428	15260	28	Marcellus
3	10/16/2022	15232	15064	28	Marcellus
4	10/16/2022	15036	14868	28	Marcellus
5	10/16/2022	14840	14672	28	Marcellus
6	10/17/2022	14644	14476	28	Marcellus
7	10/17/2022	14448	14280	28	Marcellus
8	10/18/2022	14252	14084	28	Marcellus
9	10/18/2022	14056	13888	28	Marcellus
10	10/18/2022	13860	13692	28	Marcellus
11	10/19/2022	13664	13496	28	Marcellus
12	10/19/2022	13468	13300	28	Marcellus
13	10/20/2022	13272	13104	28	Marcellus
14	10/20/2022	13076	12908	28	Marcellus
15	10/21/2022	12880	12712	28	Marcellus
16	10/21/2022	12684	12516	28	Marcellus
17	10/22/2022	12488	12320	28	Marcellus
18	10/22/2022	12292	12124	28	Marcellus
19	10/23/2022	12096	11928	28	Marcellus
20	10/23/2022	11900	11732	28	Marcellus
21	10/23/2022	11704	11536	28	Marcellus
22	10/24/2022	11508	11340	28	Marcellus
23A	10/24/2022	11312	11144	28	Marcellus
23B	10/25/2022	11312	11114	53	Marcellus
24	10/25/2022	11086	10933	28	Marcellus
25	10/25/2022	10905	10752	28	Marcellus
26	10/26/2022	10724	10556	28	Marcellus
27	10/26/2022	10528	10360	28	Marcellus
28	10/26/2022	10332	10164	28	Marcellus
29	10/27/2022	10136	9968	28	Marcellus
30	10/27/2022	9940	9772	28	Marcellus
31	10/27/2022	9744	9576	28	Marcellus
32	10/28/2022	9548	9380	28	Marcellus
33	10/28/2022	9353	9185	28	Marcellus
34	10/28/2022	9159	8991	28	Marcellus
35	10/29/2022	8965	8797	28	Marcellus
36	10/29/2022	8771	8603	28	Marcellus
37	10/29/2022	8577	8409	28	Marcellus
38A	10/30/2022	8383	8215	28	Marcellus
38B	10/30/2022	8383	8185	53	Marcellus
39	10/30/2022	8157	8006	28	Marcellus
40	10/30/2022	7978	7827	28	Marcellus
41	10/31/2022	7801	7633	28	Marcellus
42	10/31/2022	7607	7439	28	Marcellus
43	11/1/2022	7413	7245	28	Marcellus
44	11/1/2022	7219	7075	25	Marcellus

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**HG Energy II Appalachia, LLC**  
**MND23 N-4H**  
**Stimulation Record**

Stage #	Date	Ave pump rate (BPM)	Ave Treatment Press (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Proppant (LBS)	Water (BBLs)
Sleeve/1	10/15/2022	19.0	8863	7890	3774	500	2,280
2	10/15/2022	89.0	7,541	5,881	4,171	635000	13,804
3	10/16/2022	108.0	7,921	5,347	4,581	662000	12,588
4	10/16/2022	100.0	7,550	5,556	5,311	663200	12,067
5	10/16/2022	109.0	8,176	5,745	4,324	663200	11,340
6	10/17/2022	102.0	7,712	6,096	5,142	661000	9,837
7	10/17/2022	94.0	7,575	6,381	4,884	661000	10,102
8	10/18/2022	106.0	7,765	5,423	6,473	661000	8,514
9	10/18/2022	97.0	7,525	5,974	5,007	661000	8,982
10	10/18/2022	103.0	8,272	4,379	4,467	630000	9,285
11	10/19/2022	97.0	7,638	5,671	4,887	630000	8,764
12	10/19/2022	100.0	7,578	4,271	5,093	630000	9,193
13	10/20/2022	105.0	7,399	5,863	5,403	630000	9,186
14	10/20/2022	101.0	7,758	4,093	4,702	630300	11,709
15	10/21/2022	97.0	7,305	4,593	5,073	630000	12,792
16	10/21/2022	85.8	7,821	4,073	5,224	630200	11,085
17	10/22/2022	98.0	7,358	4,993	5,238	630300	15,244
18	10/22/2022	106.0	7,002	3,586	5,151	630200	10,190
19	10/23/2022	98.0	6,841	5,376	5,466	630000	11,022
20	10/23/2022	98.0	7,297	4,083	5,547	630000	9,964
21	10/23/2022	105.0	7,107	6,439	5,012	630300	11,523
22	10/24/2022	104.0	7,204	4,748	4,782	630300	9,623
23A	10/24/2022	10.8	7,960	3,264	4,529	5000	2,171
23B	10/25/2022	102.0	7,480	4,944	4,376	620300	10,203
24	10/25/2022	95.0	7,051	4,585	4,999	620300	11,254
25	10/25/2022	109.0	7,325	4,256	5,119	620700	8,941
26	10/26/2022	110.0	7,601	3,470	4,746	620200	9,326
27	10/26/2022	104.0	7,069	5,345	4,973	620300	9,446
28	10/26/2022	106.0	7,353	3,800	5,350	620200	8,894
29	10/27/2022	104.2	7,319	4,932	4,986	620275	8,891
30	10/27/2022	104.0	7,022	3,714	4,951	625000	9,374
31	10/27/2022	100.0	7,519	3,308	5,316	620000	11,364
32	10/28/2022	99.0	7,218	3,429	4,515	620000	8,594
33	10/28/2022	102.0	6,846	3,637	4,824	620000	9,085
34	10/28/2022	103.0	6,942	3,530	5,404	620000	8,981
35	10/29/2022	108.0	6,921	3,564	5,322	620000	8,782
36	10/29/2022	106.0	6,705	4,574	4,838	620000	9,466
37	10/29/2022	110.0	6,987	3,412	5,484	620000	8,869
38A	10/30/2022	71.0	8,275	5,086	4,761	500	2,300
38B	10/30/2022	109.0	6,691	5,076	4,229	620000	9,490
39	10/30/2022	108.0	6,845	3,319	5,440	620000	9,665
40	10/30/2022	104.0	6,663	3,477	5,481	620000	9,208
41	10/31/2022	108.0	6,740	5,483	4,931	620000	9,527
42	10/31/2022	105.0	6,454	5,703	5,363	620000	9,205
43	11/1/2022	109.0	6,567	4,283	5,357	620000	9,599
44	11/1/2022	103.0	6,712	6,004	4,918	620000	9,452

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**HG Energy II Appalachia, LLC**  
**MND23 N4H**  
**Lithology Record**

Actual Tops MND23 N4H				
GI	1238			
PD110	1265			
	Top		Base	
Formation	MD	TVD	MD	TVD
Pittsburgh Co	862	862	868	868
Coal	877	877	880	880
Surface casin	1195	set		
Big lime	1957	1957	2049	2049
Big Injun	2049	2049	2133	2131
Pocono Big Ir	2133	2131	2251	2248
5th Sand/we	2408	2405	2439	2437
berea	2597	2594	2630	2627
gordon	2850	2846	2858	2854
50'	2942	2938	2974	2970
Casing	3157	set		
Speechley	3503	3497	3589	3582
Benson	5200	5060	5218	5077
Alexander	5250	5104	5300	5148
Rhinestreet	6174	5934	6630	6315
Cashaqua	6630	6315	6664	6338
Middlesex	6664	6338	6669	6341
West River	6669	6341	6769	6401
Burket	6769	6401	6796	6416
Tully	6796	6416	6875	6453
Hamilton	6875	6453	7000	6496
Marcellus	7000	6496	15583	6400

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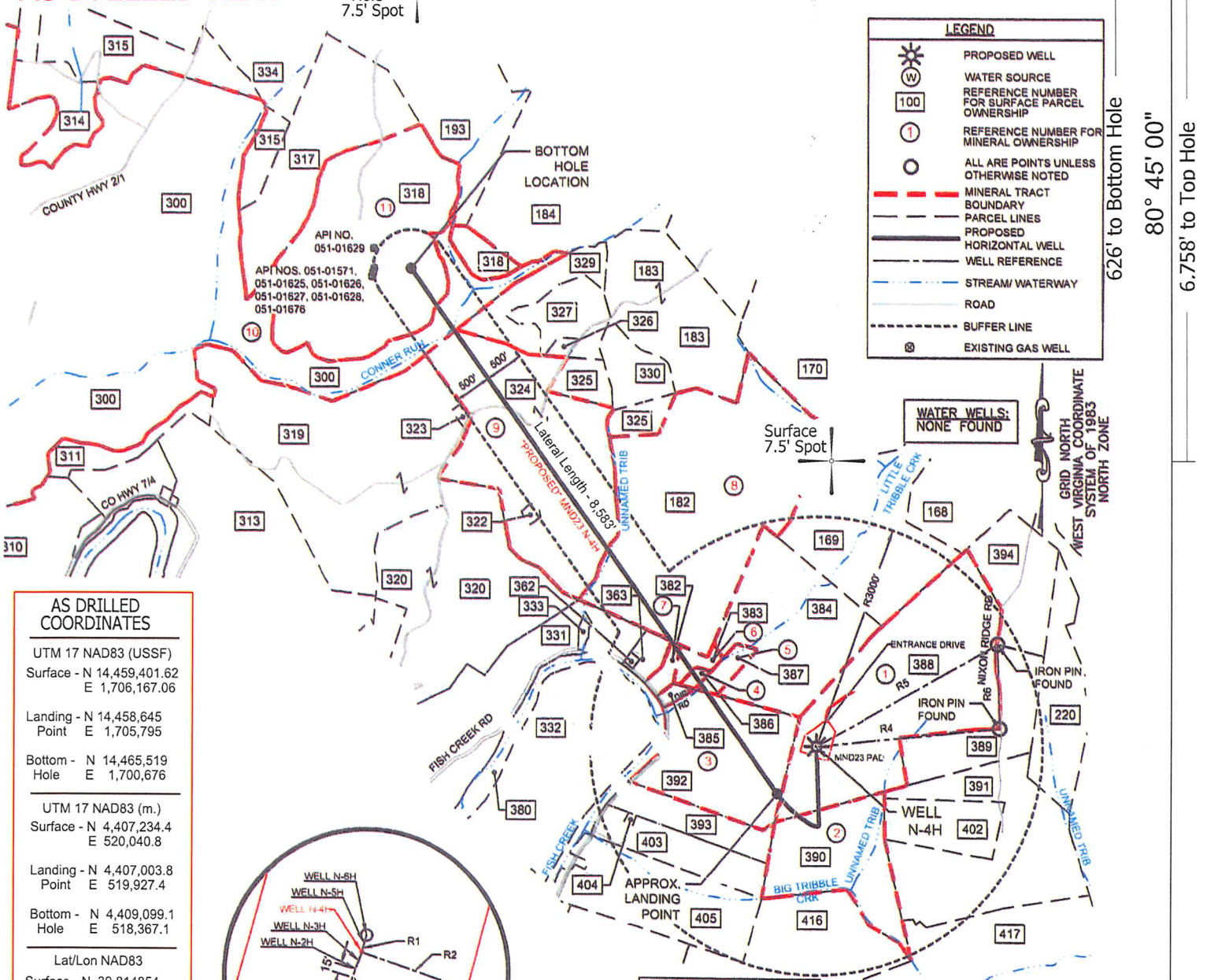
# AS DRILLED PLAT

Bottom Hole 7.5' Spot

9,979' to Bottom Hole

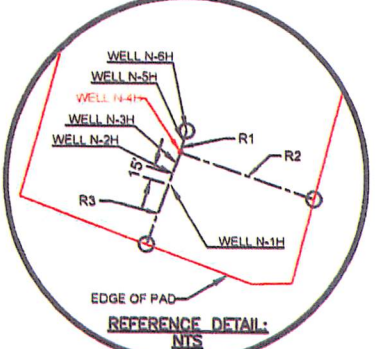
4,504' to Top Hole

39° 50' 00"

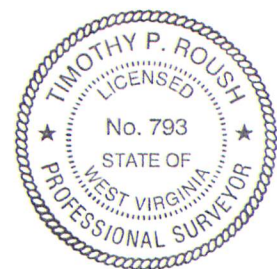


LEGEND	
	PROPOSED WELL
	WATER SOURCE
	REFERENCE NUMBER FOR SURFACE PARCEL OWNERSHIP
	REFERENCE NUMBER FOR MINERAL OWNERSHIP
	ALL ARE POINTS UNLESS OTHERWISE NOTED
	MINERAL TRACT BOUNDARY
	PARCEL LINES
	PROPOSED HORIZONTAL WELL
	WELL REFERENCE
	STREAM/WATERWAY
	ROAD
	BUFFER LINE
	EXISTING GAS WELL

AS DRILLED COORDINATES	
UTM 17 NAD83 (USSF)	
Surface - N	14,459,401.62
E	1,706,167.06
Landing - N	14,458,645
Point E	1,705,795
Bottom - N	14,465,519
Hole E	1,700,676
UTM 17 NAD83 (m.)	
Surface - N	4,407,234.4
E	520,040.8
Landing - N	4,407,003.8
Point E	519,927.4
Bottom - N	4,409,099.1
Hole E	518,367.1
Lat/Lon NAD83	
Surface - N	39.814854
E	80.765851
Landing - N	39.812779
Point E	80.767183
Bottom - N	39.831692
Hole E	80.785353



LINE TABLE		
LINE	BEARING	DISTANCE
R1	S15°36'10"W	30.00'
R2	N71°15'18"W	189.27'
R3	N20°19'49"E	129.71'
R4	S84°00'01"W	2446.38'
R5	S60°40'44"W	2755.37'
R6	N01°36'10"W	1094.04'



- NOTES ON PLAT**
- The purpose of this plat is to show coordinates for the subject well as drilled.
  - The drawing shown hereon is from the original drilling permit application plat dated 6/4/19 prepared by Adam J. Westfall, W.Va. PS #2269.
  - As drilled Landing Point, Bottom Hole Location and lateral length are calculated from gyro measurements taken while drilling the well.
  - Latitude/Longitude offset measurements are referenced to NAD 1927.

(SIGNED) *Timothy P. Roush*  
TIMOTHY P. ROUSH PS 793

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.

FILE NO. \_\_\_\_\_  
SCALE: 1" = 2,000'  
MINIMUM DEGREE OF ACCURACY: Sub-Meter  
PROVEN SOURCE OF ELEVATION: DGPS Survey



WEST VIRGINIA  
Department of Environmental Protection  
Office of Oil and Gas  
601 57th Street  
Charleston, West Virginia 25301

DATE: November 9, 2022  
WELL NAME: MND23 N-4H  
API WELL NO.: 47 - 051 - 02410  
State County Permit

WELL TYPE: OIL \_\_\_\_\_ GAS  LIQUID INJECTION \_\_\_\_\_ WASTE DISPOSAL \_\_\_\_\_ (IF "GAS") PRODUCTION  STORAGE \_\_\_\_\_ DEEP \_\_\_\_\_ SHALLOW

LOCATION: ELEVATION 1,237' WATERSHED Big Tribble Creek  
DISTRICT: Franklin COUNTY: Marshall QUADRANGLE: Powhatan Point 7.5'  
SURFACE OWNER: HG Energy II, Appalachia ACREAGE: 126.6 Ac.  
OIL & GAS ROYALTY OWNER: Charles W. Miller et al. LEASE ACREAGE: 190.4 Ac. LEASE NO. \_\_\_\_\_  
PROPOSED WORK: DRILL \_\_\_\_\_ CONVERT \_\_\_\_\_ DRILL DEEPER \_\_\_\_\_ REDRILL \_\_\_\_\_ FRACTURE OR STIMULATE \_\_\_\_\_ PLUG OFF OLD FORMATION \_\_\_\_\_  
PERFORATE NEW FORMATION \_\_\_\_\_ OTHER PHYSICAL CHANGE IN WELL (SPECIFY) Show As Drilled Coordinates and Lateral Length  
PLUG AND ABANDON \_\_\_\_\_ CLEAN OUT AND REPLUG \_\_\_\_\_ TARGET FORMATION Marcellus Shale ESTIMATED DEPTH 6,400' TVD 15,583' TMD

WELL OPERATOR: HG Energy II Appalachia, LLC. DESIGNATED AGENT: Diane White  
ADDRESS: 5260 DuPont Road ADDRESS: 5260 DuPont Road  
Parkersburg, WV 26101 Parkersburg, WV 26101

09/15/2023



