

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

API 47 - 051 - 02409 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-3H  
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 4407230.0 Easting 520039.6  
Landing Point of Curve Northing 4406865.5 Easting 519737.4  
Bottom Hole Northing 4408964.6 Easting 518176.9

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 9/13/2021 Date drilling commenced 11/2/2021 Date drilling ceased 4/25/2022  
Date completion activities began 5/23/2022 Date completion activities ceased 11/18/2022  
Verbal plugging (Y/N) Y Date permission granted 12/6/2021 Granted by \_\_\_\_\_

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

Freshwater depth(s) ft Not observed Open mine(s) (Y/N) depths 862-868  
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

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Reviewed by: [Signature]  
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API 47-051 - 02409 Farm name HG Energy II Appalachia, LLC Well number MND23 N-3H

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"	1138	New	54.5 lbs/ft J-55		Yes
Coal							
Intermediate 1	12.25"	9.625"	3121	New	40 lbs/ft J55		Yes
Intermediate 2							
Intermediate 3							
Production	8.5	5.5	15753	New	20 lbs/ft P-110		Yes
Tubing	4.67	2.375	7254	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	1273	15.6	1.19	1515	Surface	8
Coal							
Intermediate 1	Class A	1173	15.6	1.24	1454	Surface	8
Intermediate 2							
Intermediate 3							
Production	Class A	502/3671	16.0/16.0	1.23/1.13	617/4148	Surface	8
Tubing							

Drillers TD (ft) 15786 Loggers TD (ft) \_\_\_\_\_

Deepest formation penetrated Marcellus Plug back to (ft) \_\_\_\_\_

Plug back procedure cement plug pumped before setting 9.625" casing, tight hole conditions @1570', after reaching 3193' and TOOH

2.875" tubing run to 1548', 97 bbls 16.0 ppg 1.17 yield cement pumped, TOOH pulling tubing out of cement to 1040' stuffed wiper balls and circulate at 1040', rig skidded to 4H well to allow cure time.

Kick off depth (ft) 6066'

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

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-3H**

**Perforation Record**

Stage #	Perf Date	Perf from depth	Perf to depth	Number of perfs	Formation
Sleeve/1	7/13/2022	15699	15673	2	Marcellus
2	7/14/2022	15639	15471	28	Marcellus
3	7/14/2022	15443	15275	28	Marcellus
4	7/15/2022	15247	15079	28	Marcellus
5	7/16/2022	15051	14883	28	Marcellus
6	7/17/2022	14855	14687	28	Marcellus
7	7/18/2022	14659	14491	28	Marcellus
8	7/21/2022	14463	14295	28	Marcellus
9	7/22/2022	14267	14099	28	Marcellus
10	7/24/2022	14071	13903	28	Marcellus
11	10/3/2022	13875	13707	28	Marcellus
12	10/4/2022	13679	13511	28	Marcellus
13	10/4/2022	13483	13315	28	Marcellus
14	10/5/2022	13287	13119	28	Marcellus
15	10/5/2022	13091	12923	28	Marcellus
16	10/5/2022	12895	12727	28	Marcellus
17	10/6/2022	12699	12531	28	Marcellus
18	10/6/2022	12503	12335	28	Marcellus
19	10/6/2022	12307	12139	28	Marcellus
20	10/7/2022	12111	11943	28	Marcellus
21	10/7/2022	11915	11747	28	Marcellus
22	10/7/2022	11719	11551	28	Marcellus
23	10/8/2022	11523	11355	28	Marcellus
24	10/8/2022	11327	11159	28	Marcellus
25	10/8/2022	11131	10963	28	Marcellus
26	10/9/2022	10935	10767	28	Marcellus
27	10/9/2022	10739	10571	28	Marcellus
28	10/9/2022	10543	10375	28	Marcellus
29	10/9/2022	10347	10179	28	Marcellus
30	10/10/2022	10151	9983	28	Marcellus
31	10/10/2022	9955	9787	28	Marcellus
32	10/10/2022	9759	9591	28	Marcellus
33	10/11/2022	9563	9395	28	Marcellus
34	10/11/2022	9367	9199	28	Marcellus
35	10/11/2022	9171	9003	28	Marcellus
36	10/12/2022	8975	8807	28	Marcellus
37	10/12/2022	8779	8611	28	Marcellus
38	10/12/2022	8583	8415	28	Marcellus
39	10/13/2022	8387	8219	28	Marcellus
40	10/13/2022	8191	8023	28	Marcellus
41	10/13/2022	7996	7828	28	Marcellus
42	10/13/2022	7802	7634	28	Marcellus
43	10/13/2022	7608	7440	28	Marcellus
44	10/14/2022	7414	7270	25	Marcellus

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**HG Energy II Appalachia, LLC**  
**MND23 N-3H**  
**Stimulation Record**

Stage #	Date	Avg pump rate (BPM)	Avg Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Proppant (LBS)	Water (BBLs)
Sleeve/1	7/13/2022	70.0	7215	4815	3040	96300	5,750
2	7/14/2022	73.0	7,635	5,322	5,108	642600	15,171
3	7/14/2022	89.0	7,272	5,600	5,321	663000	11,931
4	7/15/2022	90.0	7,297	5,321	4,818	512600	12,347
5	7/16/2022	87.0	6,965	5,645	4,232	627300	12,658
6	7/17/2022	88.0	7,052	5,271	4,519	664100	11,427
7	7/18/2022	89.0	7,585	5,168	4,393	512000	10,336
8	7/21/2022	84.2	7,495	5,047	4,160	623628	11,490
9	7/22/2022	85.0	7,134	5,284	4,599	649300	11,041
10	7/24/2022	83.0	8,178	6,257	4,610	654500	8,429
11	10/3/2022	79.0	7,812	4,655	4,194	665500	9,032
12	10/4/2022	89.0	8,011	4,952	4,748	665500	8,651
13	10/4/2022	92.0	7,506	5,085	4,748	651900	10,287
14	10/5/2022	96.0	7,687	4,869	5,519	630000	8,329
15	10/5/2022	85.0	7,496	4,944	4,893	630300	13,192
16	10/5/2022	95.0	7,655	4,858	4,962	630200	10,112
17	10/6/2022	101.0	7,754	5,067	5,096	632000	9,960
18	10/6/2022	98.0	7,355	5,085	4,988	630200	9,876
19	10/6/2022	104.0	7,790	4,853	4,840	629700	10,381
20	10/7/2022	107.0	7,733	4,981	4,897	630300	10,229
21	10/7/2022	107.0	7,406	4,870	4,720	630300	9,611
22	10/7/2022	105.0	7,680	4,342	4,936	630300	9,768
23	10/8/2022	110.0	7,680	5,068	4,850	630200	9,202
24	10/8/2022	103.0	7,429	4,853	5,059	630300	9,681
25	10/8/2022	108.0	7,392	4,862	5,011	630300	9,593
26	10/9/2022	108.0	7,641	4,981	4,776	630300	10,061
27	10/9/2022	105.0	7,558	4,677	4,831	630300	10,075
28	10/9/2022	104.0	7,133	4,743	4,690	630300	9,414
29	10/9/2022	110.0	7,335	4,969	4,603	630300	9,805
30	10/10/2022	110.0	7,509	3,412	5,109	630300	9,660
31	10/10/2022	104.0	7,065	4,775	4,948	630300	9,842
32	10/10/2022	104.0	7,203	4,520	4,654	630300	9,771
33	10/11/2022	102.0	7,128	4,867	4,979	630000	9,643
34	10/11/2022	106.0	6,991	5,074	4,682	630000	10,354
35	10/11/2022	104.0	7,145	4,927	4,726	630000	9,875
36	10/12/2022	109.0	7,067	3,504	4,839	630000	10,021
37	10/12/2022	108.0	7,200	5,620	5,339	630000	10,903
38	10/12/2022	104.0	6,911	5,810	4,961	630000	15,610
39	10/13/2022	107.0	7,259	4,899	4,954	630000	9,969
40	10/13/2022	110.0	6,860	5,232	5,175	630000	9,071
41	10/13/2022	109.0	6,847	5,324	4,872	630000	7,615
42	10/13/2022	110.0	6,725	4,916	4,903	630000	8,524
43	10/13/2022	110.0	6,774	4,772	4,752	600000	9,060
44	10/14/2022	109.0	7,443	5,399	4,685	600000	8,876

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**HG Energy II Appalachia, LLC**  
**MND23 N3H (thru Storage)**  
**Lithology Information**

<b>Actual Tops - MND23 N3H</b>				
GI	1238			
PD110	1265			
	<b>Base</b>		<b>Base</b>	
<b>Formation</b>	<b>MD</b>	<b>TVD</b>	<b>MD</b>	<b>TVD</b>
Pittsburgh Coal	862	862	868	868
Coal	877	877	880	880
Surface casing	1155	set		
Big lime	1966	1960	2055	2047
Big Injun	2055	2047	2131	2123
Pocono Big In	2131	2123	2258	2249
5th Sand/wei	2419	2409	2441	2430
berea	2603	2590	2641	2629
gordon	2862	2847	2867	2852
50'	2944	2928	2978	2961
Casing	3149	set		
speechley	3534	3505	3615	3579
Benson	5221	5026	5280	5071
Alexander	5316	5100	5373	5148
Rhinestreet	6322	5926	6697	6236
Cashaqua	6697	6236	6799	6307
Middlesex	6799	6307	6837	6330
West River	6837	6330	6957	6393
Burket	6957	6393	6982	6405
Tully	6982	6405	7070	6442
Hamilton	7070	6442	7195	6483
Marcellus	7195	6483	15786	6394

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# AS DRILLED PLAT

4,508' to Top Hole

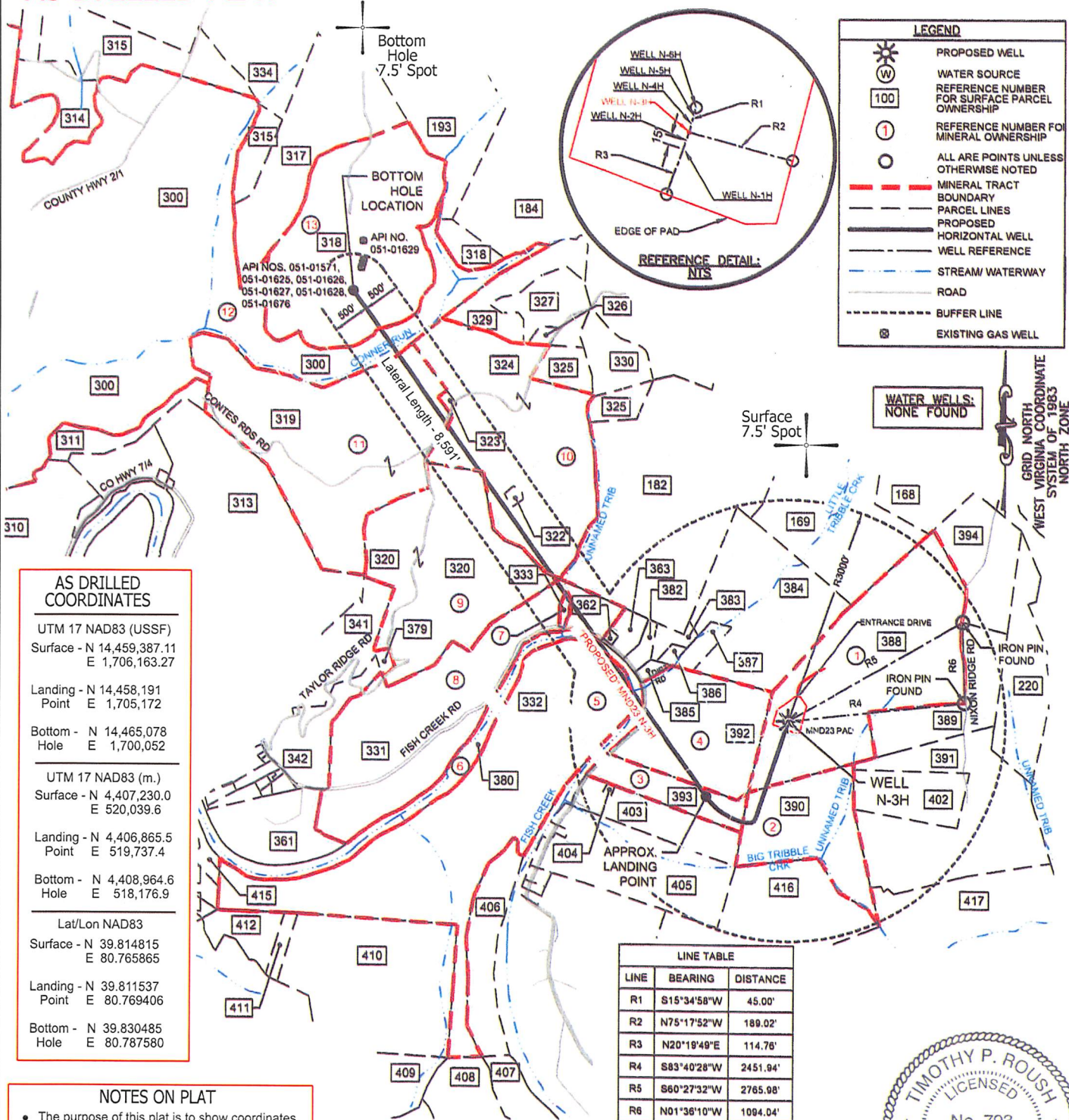
39° 50' 00"

10,604' to Bottom Hole

1,065' to Bottom Hole

80° 45' 00"

6,772' to Top Hole



**AS DRILLED COORDINATES**

UTM 17 NAD83 (USSF)  
 Surface - N 14,459,387.11  
 E 1,706,163.27

Landing - N 14,458,191  
 Point E 1,705,172

Bottom - N 14,465,078  
 Hole E 1,700,052

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UTM 17 NAD83 (m.)  
 Surface - N 4,407,230.0  
 E 520,039.6

Landing - N 4,406,865.5  
 Point E 519,737.4

Bottom - N 4,408,964.6  
 Hole E 518,176.9

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Lat/Lon NAD83  
 Surface - N 39.814815  
 E 80.765865

Landing - N 39.811537  
 Point E 80.769406

Bottom - N 39.830485  
 Hole E 80.787580

**LINE TABLE**

LINE	BEARING	DISTANCE
R1	S15°34'58"W	45.00'
R2	N75°17'52"W	189.02'
R3	N20°19'49"E	114.76'
R4	S83°40'28"W	2451.94'
R5	S60°27'32"W	2765.98'
R6	N01°36'10"W	1084.04'

- 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-3H  
 API WELL NO.: 47-051-02409  
 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 6,394' TVD 15,786' 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

