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

API 47 - 051 - 02407 County Marshall District Franklin
Quad Powhatan Point Pad Name MND23 Field/Pool Name Moundsville
Farm name HG Energy II Appalachia, LLC Well Number MND23 N-1H
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 4407221.2 Easting 520037.3
Landing Point of Curve Northing 4406883.5 Easting 519172.7
Bottom Hole Northing 4408729.0 Easting 517795.6

Elevation (ft) 1237 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 11/1/2021 Date drilling ceased 5/19/2022
Date completion activities began 5/23/2022 Date completion activities ceased 11/17/2022
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

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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

APPROVED
Reviewed by:
8/1/2023
09/15/2023

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API 47- 051 - 02407 Farm name HG Energy II Appalachia, LLC Well number MND23 N-1H

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"	1143	New	54.5 lbs/ft J-55		Yes
Coal							
Intermediate 1	12.25"	9.625"	3173	New	40 lbs/ft J55		Yes
Intermediate 2							
Intermediate 3							
Production	8.5	5.5	15193	New	23 lbs/ft P-110		No, 3000' from CBL
Tubing	4.67	2.375	7728	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 ^{3}/sks)	Volume (ft ^{3})	Cement Top (MD)	WOC (hrs)
Conductor	Class A	93				Surface	8
Surface	Class A	1203	15.6	1.19	1431	Surface	8
Coal							
Intermediate 1	Class A	1064	15.6	1.24	1319	Surface	8
Intermediate 2							
Intermediate 3							
Production	Class A	457/3482	16.0/16.0	1.23/1.13	562/3934	3000	8
Tubing							

Drillers TD (ft) 15235 Loggers TD (ft) ___

Deepest formation penetrated Marcellus Plug back to (ft) ___

Plug back procedure ___

Kick off depth (ft) 6926

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 ___

WAS WELL COMPLETED OPEN HOLE? ☐ Yes ■ No DETAILS ___

WERE TRACERS USED ☐ Yes ■ No TYPE OF TRACER(S) USED ___

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API 47- 051 - 02407 Farm name HG Energy II Appalachia, LLC Well number MND23 N-1H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
			See Attached		

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
			See Attached					

Please insert additional pages as applicable.

HG Energy II Appalachia, LLC
MND23 N1H
Perforation Record

Stage #	Perforation Date	Perforation from Depth	Perforation to Depth	Number of Perforations	Formation
Sleeve/1	7/14/2022	15136	15109	2	Marcellus
2	7/15/2022	15075	14907	28	Marcellus
3	7/16/2022	14879	14711	28	Marcellus
4	7/17/2022	14683	14515	28	Marcellus
5	7/18/2022	14487	14319	28	Marcellus
6	7/19/2022	14291	14123	28	Marcellus
7	7/21/2022	14096	13928	28	Marcellus
8	7/23/2022	13902	13734	28	Marcellus
9	7/24/2022	13708	13540	28	Marcellus
10	7/26/2022	13514	13346	28	Marcellus
11	7/27/2022	13320	13152	28	Marcellus
12	7/27/2022	13126	12958	28	Marcellus
13	7/28/2022	12932	12764	28	Marcellus
14	7/28/2022	12738	12570	28	Marcellus
15	7/28/2022	12544	12376	28	Marcellus
16	7/29/2022	12350	12182	28	Marcellus
17	7/29/2022	12156	11988	28	Marcellus
18	7/30/3033	11962	11794	28	Marcellus
19	7/30/3033	11768	11600	28	Marcellus
20	7/30/3033	11574	11406	28	Marcellus
21	7/30/3033	11380	11212	28	Marcellus
22	7/31/2022	11186	11018	28	Marcellus
23	7/31/2022	10992	10824	28	Marcellus
24	7/31/2022	10798	10630	28	Marcellus
25	7/31/2022	10604	10436	28	Marcellus
26	7/31/2022	10410	10212	53	Marcellus
27	10/4/2022	10184	10033	28	Marcellus
28	10/5/2022	10005	9854	28	Marcellus
29	10/6/2022	9828	9660	28	Marcellus
30	10/7/2022	9634	9466	28	Marcellus
31	10/8/2022	9440	9272	28	Marcellus
32	10/8/2022	9246	9078	28	Marcellus
33	10/9/2022	9052	8884	28	Marcellus
34	10/9/2022	8858	8690	28	Marcellus
35	10/10/2022	8664	8496	28	Marcellus
36	10/10/2022	8470	8302	28	Marcellus
37	10/11/2022	8276	8108	28	Marcellus
38	10/11/2022	8082	7914	28	Marcellus
39	10/12/2022	7888	7744	25	Marcellus

HG Energy II Appalachia, LLC
MND23 N1H
Stimulation Record

Stage #	Date	Ave pump rate (BPM)	Ave Treament Press (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Proppant (LBS)	Water (BBLs)
Sleeve/1	7/14/2022	74.0	7490	8960	3340	271300	7,478
2	7/15/2022	81.0	6,924	5,639	3,953	580000	12,022
3	7/16/2022	91.0	7,250	5,327	4,406	662000	11,986
4	7/17/2022	91.0	7,382	5,565	4,748	662300	10,943
5	7/18/2022	91.0	7,286	5,308	5,134	632300	11,304
6	7/19/2022	88.0	7,707	5,705	4,879	652500	20,546
7	7/21/2022	90.0	7,568	5,161	4,747	803400	22,037
8	7/23/2022	84.0	7,222	5,281	4,864	655453	11,076
9	7/24/2022	78.0	7,250	4,907	4,599	634700	13,087
10	7/26/2022	89.0	7,989	6,059	4,102	640050	10,992
11	7/27/2022	77.0	7,012	5,195	3,572	639900	10,203
12	7/27/2022	85.0	7,724	7,200	4,388	527609	10,690
13	7/28/2022	88.0	7,762	5,450	4,173	621734	9,857
14	7/28/2022	87.0	7,793	4,867	4,195	621700	11,000
15	7/28/2022	92.0	7,443	5,019	4,388	625600	10,021
16	7/29/2022	85.0	7,320	5,178	4,828	621503	9,835
17	7/29/2022	88.0	7,476	4,891	4,231	595700	11,875
18	7/30/3033	96.0	7,342	5,260	4,336	514700	9,425
19	7/30/3033	100.0	7,528	5,341	5,101	620300	8,809
20	7/30/3033	99.0	7,471	5,408	4,700	623200	8,943
21	7/30/3033	98.0	7,252	5,212	4,449	622400	9,534
22	7/31/2022	96.0	8,043	5,213	4,297	619995	9,475
23	7/31/2022	99.0	7,377	5,109	4,448	622500	9,678
24	7/31/2022	99.0	7,260	5,352	4,910	569900	8,875
25	7/31/2022	100.0	7,066	5,196	4,686	622200	8,577
26	7/31/2022	91.0	6,885	5,201	3,204	660900	9,242
27	10/4/2022	97.0	6,979	6,467	5,119	609800	7,977
28	10/5/2022	99.0	7,214	5,365	4,831	608800	9,103
29	10/6/2022	105.0	7,484	6,417	4,733	608700	9,520
30	10/7/2022	103.0	7,207	6,079	4,530	609700	10,086
31	10/8/2022	81.0	8,201	6,499	4,580	608800	10,472
32	10/8/2022	108.0	7,605	6,028	4,720	601000	9,489
33	10/9/2022	97.0	7,627	6,178	4,527	609800	10,778
34	10/9/2022	109.0	7,368	6,466	5,067	609800	9,618
35	10/10/2022	103.0	6,900	6,164	4,899	609800	9,894
36	10/10/2022	107.0	7,328	7,012	4,942	600000	11,473
37	10/11/2022	104.0	7,496	6,554	4,691	601000	9,980
38	10/11/2022	110.0	7,252	6,236	5,130	600000	9,653
39	10/12/2022	109.0	7,013	2,684	4,770	600000	9,709

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API 47- 051 - 02407 Farm name HG Energy II Appalachia, LLC Well number MND23 N-1H

PRODUCING FORMATION(S)	DEPTHS		
Marcellus	6397-6454 TVD	7668-15235 MD	

Please insert additional pages as applicable.

GAS TEST ☐ Build up ☐ Drawdown ■ Open Flow OIL TEST ☐ Flow ☐ Pump

SHUT-IN PRESSURE Surface 3096 psi Bottom Hole _____ psi DURATION OF TEST 812 hrs

OPEN FLOW	Gas	Oil	NGL	Water	GAS MEASURED BY
	7358 mcfpd	_____ bpd	_____ bpd	2160 bpd	☐ Estimated ■ Orifice ☐ Pilot

LITHOLOGY/ FORMATION NAME	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 AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H_2S, ETC)
	0		0		
		See Attached			

Please insert additional pages as applicable.

Drilling Contractor Precision Drilling
Address 10350 Richmond Ave. City Houston State TX Zip 77042

Logging Company Renegade Wireline Services
Address 191 Earnhardt Rd. City Hunker State PA Zip 15639

Cementing Company Schlumberger
Address 300 Schlumberger Dr. City Sugar Land State TX Zip 77478

Stimulating Company Nextier
Address 8300 Route 119 North City Black Lick State PA Zip 15716
Please insert additional pages as applicable.

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Completed by Diane White Telephone 304--420-1119
Signature Diane White Title _____ Date 5/19/2023

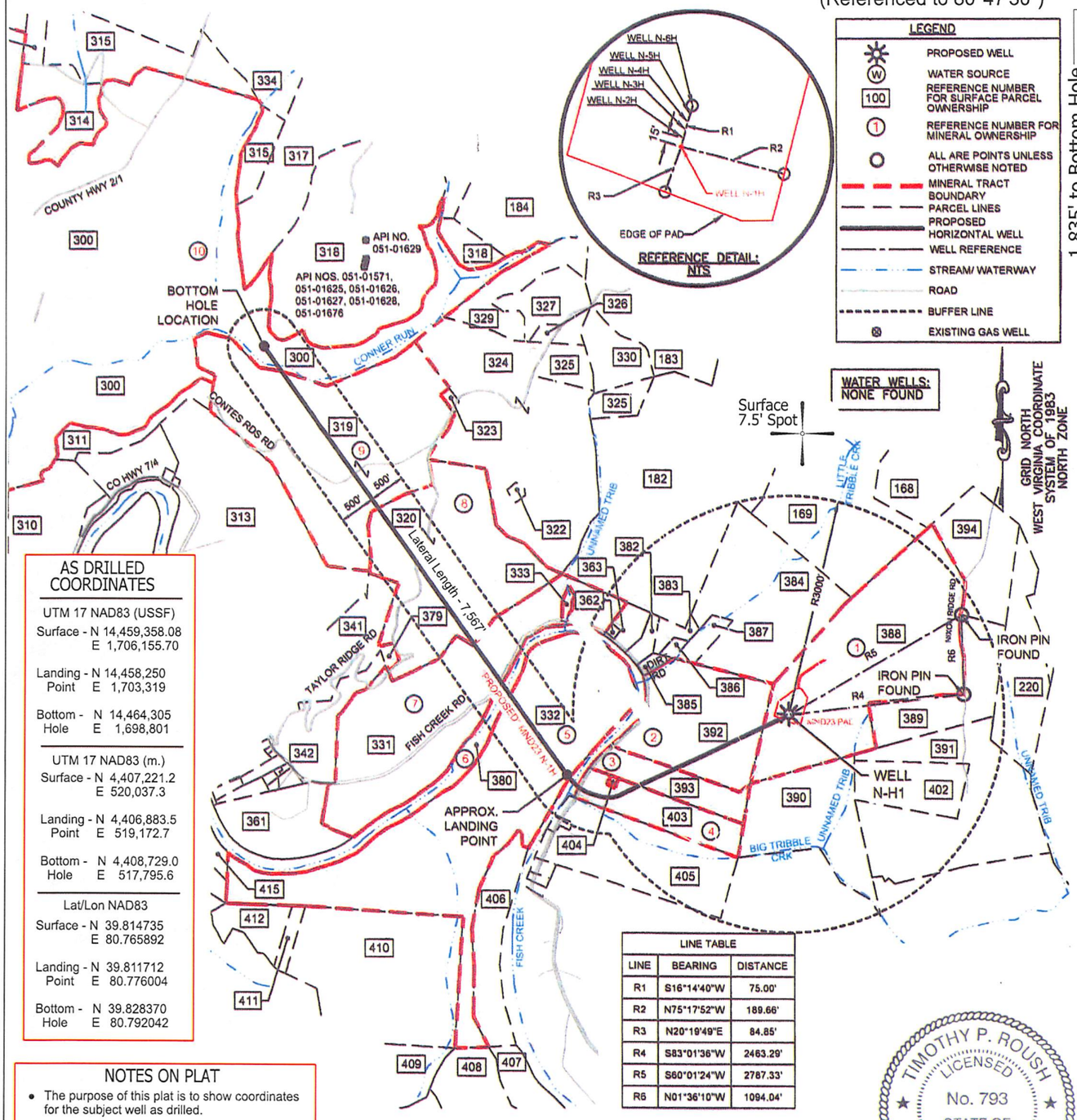
Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

09/15/2023

HG Energy II Appalachia, LLC
MND23 N1H
Lithology Information

Actual Tops MND23 N1H				
Ground Elevation	1238			
PD110	1265			
		Top		Base
Formation	**MD**	**TVD**	**MD**	**TVD**
Pitsburgh Coal	862	862	868	868
Coal	877	877	880	880
Surface casing	1143	set	1183	drill to
Big lime	1966	1960	2055	2047
Big Injun	2055	2047	2131	2123
Pocono Big Injun	2131	2123	2258	2249
5th Sand/weir	2419	2409	2441	2430
berea	2603	2590	2641	2629
gordon	2862	2847	2867	2852
50'	2944	2928	2978	2961
Casing	3173	set	3202	drill to
speechley	3534	3505	3615	3579
Benson	5564	5039	5584	5054
Alexander	5625	5083	5728	5156
Rhinestreet	6755	5912	7181	6212
Cashaqua	7181	6212	7289	6281
Middlesex	7289	6281	7325	6303
West River	7325	6303	7445	6367
Burket	7445	6367	7477	6382
Tully	7477	6382	7553	6415
Hamilton	7553	6415	7668	6454
Marcellus	7668	6454	15235	6397

AS DRILLED PLAT



AS DRILLED COORDINATES

UTM 17 NAD83 (USSF)

Surface - N 14,459,358.08
E 1,706,155.70

Landing - N 14,458,250
Point E 1,703,319

Bottom - N 14,464,305
Hole E 1,698,801

UTM 17 NAD83 (m.)

Surface - N 4,407,221.2
E 520,037.3

Landing - N 4,406,883.5
Point E 519,172.7

Bottom - N 4,408,729.0
Hole E 517,795.6

Lat/Lon NAD83

Surface - N 39.814735
E 80.765892

Landing - N 39.811712
Point E 80.776004

Bottom - N 39.828370
Hole E 80.792042

LINE TABLE		
LINE	BEARING	DISTANCE
R1	S16°14'40"W	75.00'
R2	N75°17'52"W	189.66'
R3	N20°19'49"E	84.85'
R4	S83°01'36"W	2463.29'
R5	S60°01'24"W	2787.33'
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.

- DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.

TIMOTHY P. ROUSH LICENSED No. 793 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR

(SIGNED) 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-1H
API WELL NO.
47 – 051 – 02407
State County Permit

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

09/15/2023

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 6,397' TVD 15,235' TMD

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

DESIGNATED AGENT: Diane White
ADDRESS: 5260 DuPont Road Parkersburg, WV 26101

Fracture Start Date/Time:	10/4/22 20:09
Fracture End Date/Time:	10/13/22 9:58
State:	West Virginia
County:	Marshall
API Number:	47-051-02229-0000
Operator Number:	
Well Name:	1H
Federal Well:	No
Tribal Well:	No
Longitude:	-80.765892
Latitude:	39.814735
Long/Lat Projection:	NAD83
True Vertical Depth (TVD):	6,468'
Total Clean Fluid Volume* (gal):	5,857,112

FracFocus Chemical Disclosure Registry

(e.g. XX-XXX-XXXXX-0000)

MN023 N1H

Additive	*Specific Gravity*	*Additive Quantity*	*Mass (lbs)*	
Water	1.00	5,857,112	*48,877,600*	*gal*
Proppant (Sand)	2.65	8,555,375	*8,555,375*	*lb*
15% HCl	1.08	9,868	*88,936*	*gal*
NCI-25	0.95	390	*3,092*	*gal*
3rd Party FR		7,908		*gal*
3rd Party Biocide		1,598		*gal*
3rd Party Gel		70		*gal*
3rd Party Scale Inhibitor		1,638		*gal*
3rd Party Breaker		14		*gal*
				gal
				lb
				gal
				gal
				gal
				gal
				gal
				gal
				gal
			Total Slurry Mass (Lbs)	
			57,525,003	

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Ingredients Section:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Mass per Component (LBS)	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments	
15% HCl	NexTier	Acid	Hydrochloric Acid	7647-01-0	15.00%	*13,340*	*0.02319%*		15% HCl
15% HCl	NexTier	Acid	Water	7732-18-5	85.00%	*75,596*	*0.13141%*		15% HCl
Proppant (Sand)	Nextier	Proppant	Crystalline silica: Quartz (SiO2)	14808-60-7	100.00%	*8,555,375*	*14.87245%*		Proppant (Sand)
Water	Operator	Carrier/Base Fluid	Water	7732-18-5	100.00%	*48,877,600*	*84.96757%*		Water
NCI-25	Nextier	Corrosion Inhibitor	Methanol	67-56-1	60.00%	*1,855*	*0.00322%*		NCI-25
NCI-25	Nextier	Corrosion Inhibitor	Ammonium bisulfate	10192-30-0	5.00%	*155*	*0.00027%*		NCI-25
NCI-25	Nextier	Corrosion Inhibitor	Citric Acid	77-92-9	5.00%	*155*	*0.00027%*		NCI-25
NCI-25	Nextier	Corrosion Inhibitor	3-aminopropyldimethylamine	109-55-7	1.00%	*31*	*0.00005%*		NCI-25
NCI-25	Nextier	Corrosion Inhibitor	Sodium nitrite	7632-00-0	1.00%	*31*	*0.00005%*		NCI-25
NCI-25	Nextier	Corrosion Inhibitor	Benzyl Chloride	100-44-7	1.00%	*31*	*0.00005%*		NCI-25
NCI-25	Nextier	Corrosion Inhibitor	Cocamidopropyl Dimethylamine	68140-01-2	1.00%	*31*	*0.00005%*		NCI-25
									NCI-25
									NCI-25
									NCI-25