

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

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JAN 15 2020

WV Department of
Environmental Protection

API 47-051-01837 County Marshall District Clay
Quad Powhatan Point, WV/OH Pad Name MND1 Field/Pool Name _____
Farm name CCC/Murray Energy Well Number MND1 EHS
Operator (as registered with the OOG) HG Energy II Appalachia, LLC
Address 5260 Dupont Road 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 4411114.717 Easting 519309.461
Landing Point of Curve Northing 4410930.172 Easting 519240.696
Bottom Hole Northing 4408424.023 Easting 521071.444

Elevation (ft) 1150 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 Base Mud, Additives - Lime, Calcium Chloride, Gilsonite, Asphalt, Barite, Emulsifier, Base Oil

Date permit issued 05/04/2018 Date drilling commenced 5/19/2018 Date drilling ceased 8/30/18
Date completion activities began 9/24/18 Date completion activities ceased 11/7/18
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 521' Open mine(s) (Y/N) depths No
Salt water depth(s) ft Not observed Void(s) encountered (Y/N) depths No
Coal depth(s) ft 620', 692' Cavern(s) encountered (Y/N) depths No
Is coal being mined in area (Y/N) _____

Reviewed

Reviewed by
Justin [Signature]

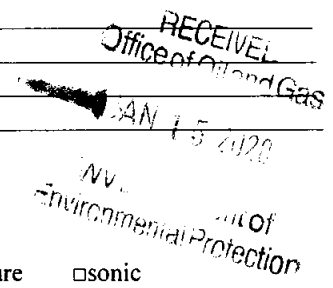
API 47-051 - 01837 Farm name CCC/Murray Energy Well number MND1 EHS

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	LS 117#		N - Drilled In
Surface	17 1/2"	13 3/8"	1030'	New	J55 54.5#	None	Y
Coal							
Intermediate 1	12 3/8"	9 5/8"	2535'	New	J55 40#	None	Y
Intermediate 2							
Intermediate 3							
Production	8 1/2"	5 1/2"	16722.5	New	P-110 23#	None	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	Drilled In	-	-	-			
Surface	Class A	816	15.6	1.196		Surface	8
Coal							
Intermediate 1	Class A	871	15.4	1.14		Surface	8
Intermediate 2							
Intermediate 3							
Production	Class A	3915	15.3	1.17		Surface	8
Tubing							

Drillers TD (ft) 16722.5' Loggers TD (ft) 5715.5 TVD, 16722.5 TMD
 Deepest formation penetrated Marcellus Plug back to (ft) _____
 Plug back procedure _____



Kick off depth (ft) 5743'

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 _____
 Fresh Water - Bow spring centralizers on first joint then every fourth joint to 100 feet from surface
 Coal - Bow spring centralizers on first joint then every fourth joint to 100 feet from surface
 Intermediate - Bow spring centralizers on the first two joints and every fourth joint inside surface casing
 Production - Run 1 spiral centralizer every 3 joints from the 1st 5.5" long joint to the top of the curve

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 _____

API 47- 051 - 01837 Farm name CCC/Murray Energy Well number MND1 EHS

PERFORATION RECORD

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

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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.

API 47- 051 - 01837 Farm name CCC/Murray Energy Well number MND1 EHS

PRODUCING FORMATION(S)	DEPTHS	TVD	MD
Marcellus	6260'		6880 - 16446'

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Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 2956 psi Bottom Hole _____ psi DURATION OF TEST 422 hrs

OPEN FLOW Gas 6108 mcfpd Oil _____ bpd NGL 768 bpd Water 1488 bpd GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP DEPTH IN FT NAME 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 ₂ S, ETC)
	0		0		
Pittsburg Coal	692	700	692	700	Coal
Big Lime	1730	1820	1730	1820	Limestone
Big Injun	1820	1910	1820	1910	Sandstone
Pocono Big Injun	1910	2150	1910	2150	Sandstone
5th Sand	2150	2165	2150	2165	Sandstone
Rhinestreet	5720	6006	6034	6270	Grey Shale
Cashaqua	6006	6078	6270	6405	Silty Shale
Middlesex	6078	6101	6405	6454	Grey Shale
West River	6101	6170	6454	6612	Grey Shale
Burket	6170	6186	6612	6652	Dark Grey Shale
Tully	6186	6219	6652	6744	Limestone
Hamilton	6219	6260	6744	6880	Shale
Marcellus	6260	6439	6880	16446	Black Shale

Please insert additional pages as applicable.

Drilling Contractor Patterson Drilling
Address 2198 University Drive City Lemont Furnace State PA Zip 15456

Logging Company Schlumberger
Address 100 Gillingham Lane City Sugar Land State TX Zip 77478

Cementing Company C&J Energy Services
Address 3990 Rogerdale City Houston State TX Zip 77042

Stimulating Company Sting Ray
Address 14201 Caliber Drive City Oklahoma City State OK Zip 73134

Please insert additional pages as applicable.

Completed by Diane White Telephone 304-420-1119
Signature Diane White Title _____ Date 6-26-19

HG Energy II Appalachia, LLC
MND1 EHS - 47-051-01837
Stimulation Information Per Stage

Stage Number	Stimulation Date	Avg Pump Rate (BPM)	Avg Pressure (psi)	Breakdown (psi)	ISIP (psi)	Amount of Proppant (klbs)	Amount of Water (bbls)	Amount of Acid (gallons)
1	10/5/2018	84.8	8,478	N/A	3,943	270.0	7,119	2,022
2	10/6/2018	88.0	9,083	6,312	4,390	666.4	14,174	2,132
3	10/6/2018	85.1	8,488	5,459	4,455	628.6	17,145	2,014
4	10/6/2018	85.2	8,284	5,691	4,997	702.3	14,550	2,358
5	10/7/2018	95.5	8,942	5,899	4,840	702.1	14,551	1,503
6	10/7/2018	89.6	8,371	5,574	4,662	702.3	14,556	1,515
7	10/7/2018	95.1	8,909	5,722	5,200	709.6	13,487	992
8	10/8/2018	95.1	8,635	5,282	5,314	709.2	13,598	1,051
9	10/8/2018	96.4	8,871	5,346	5,275	709.4	13,142	1,053
10	10/9/2018	93.3	8,703	6,463	4,997	705.0	13,136	1,061
11	10/9/2018	100.0	8,922	5,971	5,190	704.1	13,356	1,081
12	10/10/2018	100.8	8,715	6,056	5,340	652.1	13,036	1,059
13	10/10/2018	99.3	8,456	5,501	5,013	711.0	13,172	1,028
14	10/10/2018	100.0	8,154	6,130	5,183	706.1	13,211	994
15	10/11/2018	99.0	9,105	5,799	5,149	694.8	12,285	1,010
16	10/11/2018	98.5	8,506	5,892	5,340	698.1	12,207	996
17	10/11/2018	101.0	9,244	6,157	5,090	620.0	11,497	1,028
18	10/12/2018	101.0	8,340	6,123	5,019	626.0	11,467	970
19	10/12/2018	99.9	8,556	5,284	4,780	619.6	11,479	1,026
20	10/12/2018	100.0	8,334	5,193	4,720	620.2	11,605	978
21	10/13/2018	101.0	8,923	5,644	5,090	620.8	11,540	921
22	10/13/2018	98.9	8,807	5,420	5,260	475.0	10,440	1,036
23	10/13/2018	92.4	8,441	6,155	5,332	592.4	11,207	996
24	10/14/2018	101.5	9,413	6,573	4,610	619.9	11,225	1,018
25	10/14/2018	101.0	8,843	6,219	4,895	619.5	11,156	1,000
26	10/14/2018	94.4	8,859	5,680	4,794	620.1	11,454	1,022
27	10/14/2018	97.0	8,334	5,199	5,087	620.8	11,458	1,047
28	10/15/2018	100.0	8,147	6,152	4,730	619.1	11,369	1,036
29	10/15/2018	101.5	8,519	5,717	5,020	619.5	11,468	998
30	10/15/2018	98.0	7,518	6,138	5,093	626.7	11,560	1,020
31	10/15/2018	101.0	8,450	6,211	5,180	619.4	11,394	1,051
32	10/16/2018	101.0	8,311	5,206	4,910	622.0	11,636	1,012
33	10/16/2018	102.0	8,515	5,597	5,108	625.5	11,643	1,020
34	10/19/2018	99.1	8,338	6,187	5,215	619.0	11,480	994
35	10/19/2018	99.5	8,080	4,828	4,853	619.9	11,395	1,032
36	10/19/2018	99.8	8,218	5,780	4,765	626.0	11,417	962
37	10/20/2018	97.7	7,993	5,111	3,944	620.7	11,517	992
38	10/20/2018	94.3	8,083	5,091	4,048	619.7	11,455	1,032
39	10/20/2018	101.0	7,968	4,615	3,836	619.0	11,535	800
40	10/22/2018	99.6	7,993	3,853	4,490	621.5	11,438	1,016
41	10/22/2018	98.8	8,241	5,212	4,884	619.1	11,353	1,049
42	10/23/2018	100.0	8,170	6,406	5,311	619.2	10,695	1,032
43	10/23/2018	99.3	7,739	5,254	5,065	624.4	11,561	972
44	10/23/2018	100.0	7,583	5,147	4,118	617.2	11,424	1,020
45	10/24/2018	99.8	7,897	5,646	3,356	620.0	11,220	994
46	10/24/2018	99.1	7,878	5,755	3,350	621.9	11,102	1,028
47	10/24/2018	101.0	7,438	5,975	4,490	619.6	11,375	1,034
48	10/25/2018	100.0	7,387	5,544	4,986	619.5	11,388	978
49	10/25/2018	100.8	7,365	5,942	5,040	568.7	11,545	1,049
50	10/25/2018	100.5	7,414	5,692	4,854	619.9	11,399	1,032
51	10/26/2018	101.1	7,142	6,048	4,556	619.8	11,512	889
52	10/26/2018	101.8	7,502	6,016	4,040	720.5	8,486	939

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HG Energy II Appalachia, LLC**MND1 EHS - 47-051-01837****Perforation Record**

Stage Number	Perforation	Perforated	Perforated	Number of	
Number	Date	from MD ft.	to MD ft.	Perforations	Formations
1	10/5/2018	16,609		N/A	Marcellus
2	10/6/2018	16,531	16,356	48	Marcellus
3	10/6/2018	16,332	16,157	48	Marcellus
4	10/6/2018	16,133	15,958	48	Marcellus
5	10/7/2018	15,934	15,759	48	Marcellus
6	10/7/2018	15,735	15,560	48	Marcellus
7	10/7/2018	15,536	15,361	48	Marcellus
8	10/8/2018	15,337	15,162	48	Marcellus
9	10/8/2018	15,138	14,963	48	Marcellus
10	10/9/2018	14,939	14,764	48	Marcellus
11	10/9/2018	14,740	14,565	48	Marcellus
12	10/10/2018	14,541	14,366	48	Marcellus
13	10/10/2018	14,342	14,167	48	Marcellus
14	10/10/2018	14,143	13,968	48	Marcellus
15	10/11/2018	13,944	13,769	48	Marcellus
16	10/11/2018	13,745	13,570	48	Marcellus
17	10/11/2018	13,546	13,371	48	Marcellus
18	10/12/2018	13,347	13,172	48	Marcellus
19	10/12/2018	13,148	12,973	48	Marcellus
20	10/12/2018	12,949	12,774	48	Marcellus
21	10/13/2018	12,750	12,575	48	Marcellus
22	10/13/2018	12,551	12,376	48	Marcellus
23	10/13/2018	12,352	12,177	48	Marcellus
24	10/14/2018	12,153	11,978	48	Marcellus
25	10/14/2018	11,954	11,779	48	Marcellus
26	10/14/2018	11,755	11,580	48	Marcellus
27	10/14/2018	11,556	11,381	48	Marcellus
28	10/15/2018	11,357	11,182	48	Marcellus
29	10/15/2018	11,158	10,983	48	Marcellus
30	10/15/2018	10,959	10,784	48	Marcellus
31	10/15/2018	10,760	10,585	48	Marcellus
32	10/16/2018	10,561	10,386	48	Marcellus
33	10/16/2018	10,362	10,187	48	Marcellus
34	10/19/2018	10,163	9,988	48	Marcellus
35	10/19/2018	9,964	9,789	48	Marcellus
36	10/19/2018	9,765	9,590	48	Marcellus
37	10/20/2018	9,566	9,391	48	Marcellus
38	10/20/2018	9,367	9,192	48	Marcellus
39	10/20/2018	9,168	8,993	48	Marcellus
40	10/22/2018	8,969	8,801	48	Marcellus
41	10/22/2018	8,777	8,609	48	Marcellus
42	10/23/2018	8,585	8,417	48	Marcellus
43	10/23/2018	8,393	8,225	48	Marcellus
44	10/23/2018	8,201	8,033	48	Marcellus
45	10/24/2018	8,009	7,841	48	Marcellus
46	10/24/2018	7,817	7,649	48	Marcellus
47	10/24/2018	7,625	7,457	48	Marcellus
48	10/25/2018	7,433	7,265	48	Marcellus
49	10/25/2018	7,241	7,073	48	Marcellus
50	10/25/2018	7,049	6,881	48	Marcellus
51	10/26/2018	6,857	6,689	48	Marcellus
52	10/26/2018	6,665	6,497	48	Marcellus

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MND1 EHS



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

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Fracture Start Date/Time:	10/6/18 1:30
Fracture End Date/Time:	10/26/18 20:30
State:	West Virginia
County:	Marshall
API Number:	47-051-01837-0000
Operator Number:	HG Energy
Well Name:	MND 1 EHS
Federal Well:	Yes
Tribal Well:	No
Longitude:	39.8497572
Latitude:	-80.7744702
Long/Lat Projection:	NAD27
True Vertical Depth (TVD):	6,446'
Total Clean Fluid Volume* (gal):	26,094,474

Ingredients Section:

Trade Name	Supplier	Purpose	Ingredients	CH
Water	HG Energy	Carrier/Base Fluid	Water	77
Sand (100 Mesh Proppant)	US Silica	Proppant	Silica Substrate	148
Sand (40/70 Proppant)	US Silica	Proppant	Silica Substrate	148
Hydrochloric Acid (28%)	Dover	Acidizing	Hydrochloric Acid (Hydrogen Chloride)	77
			Water	77
HiRate 680	Innospec	Friction Reducer	Petroleum Distillate	64
			Alcohols, C10-C16	68
			Ethoxylated and/or Alcohols, C12-14	68
			Ethoxylated and/or Alcohols, C12-16	68
			Ethoxylated and/or Alcohols, C11-14	78
NEFE-180	Dover	Corrosion Inhibitor/Iron Control	Acetic acid	64
			Methanol	67
			2-Ethylhexanol	10
			Fatty acids, tall oil	61
			Coconut oil acid diethanolamine	68
			Alcohols, C14-15, ethoxylated	68
			2-Propyn-1-ol	10
Biosuite GQ123	Innospec	Biocide	Didecyl dimethyl ammonium chlorides	71
			Ethanol	64
Scalecase 7300	Innospec	Scale Inhibitor	Ammonium chloride	12
LFC-G4	Innospec	Gelling Agent	Distillates (petroleum), hydrotreated light	64
GelBrake 100	Innospec	Breaker	diammonium peroxodisulphate	77
Plexgel 907	Chemplex	Gelling Agent	Distillates (petroleum) hydrotreated light	64
			C-11 to C-14 n-alkanes, mixed	11
			Propylene pentamer	15

Additive	Specific Gravity	Additive Quantity	Mass (lbs)	
Water	1.00	26,094,474	217,758,386	gal
Sand (100 Mesh Proppant)	2.65	5,108,660	5,108,660	lb
Sand (40/70 Proppant)	2.65	27,194,060	27,194,060	lb
Hydrochloric Acid (28%)	1.12	28,560	266,933	gal
NEFE-180	0.99	199	1,646	gal
Biosuite GQ123	0.98	6,080	49,719	gal
HiRate 680	1.08	20,140	181,514	gal
Scalecease 7300	1.04	10,778	93,900	gal
LFC-G4	1.06	135	1,194	gal
GelBrake 100	1.98	28	463	gal
Plexgel 907	1.04	131	1,140	gal
				gal
				gal
				gal
				gal
				gal
				gal
				gal
			Total Slurry Mass (Lbs)	
			250,657,613	

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
2-18-5	100.00%	217,758,386	86.87483%	
08-60-7	100.00%	5,108,660	2.03810%	
08-60-7	100.00%	27,194,060	10.84909%	
2-18-5	36.00%	96,096	0.03834%	
2-18-5	64.00%	170,837	0.06816%	
42-47-8	30.00%	54,454	0.02172%	
02-97-1	4.99%	9,058	0.00361%	
39-50-9	4.99%	9,058	0.00361%	
51-12-2	4.99%	9,058	0.00361%	
30-21-9	4.99%	9,058	0.00361%	
19-7	89.00%	1,465	0.00058%	
56-1	40.00%	658	0.00026%	
-76-7	10.00%	165	0.00007%	
90-12-3	5.00%	82	0.00003%	
03-42-9	5.00%	82	0.00003%	
51-67-7	5.00%	82	0.00003%	
-19-7	5.00%	82	0.00003%	
3-51-5	11.50%	5,718	0.00228%	
17-5	2.00%	994	0.00040%	
25-02-9	4.99%	4,686	0.00187%	
42-47-8	60.00%	717	0.00029%	
7-54-0	100.00%	463	0.00018%	
42-47-8	70.00%	798	0.00032%	
0-21-4	60.00%	684	0.00027%	
20-87-8	60.00%	684	0.00027%	

AS-DRILLED

Well is located on topo map 9,167 feet south of Latitude: 39° 52' 30"

Well is located on topo map 6,820 feet west of Longitude: 80° 45' 00"

SURFACE HOLE LOCATION (SHL)

UTM 17-NAD83(m)
N: 4411114.717
E: 519309.461
NAD27, WV NORTH
N: 494153.707
E: 1642180.358
LAT/LON DATUM-NAD83
LAT: 39.849832798
LON: -80.774260924

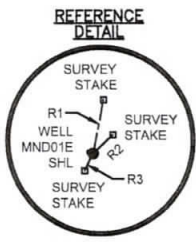
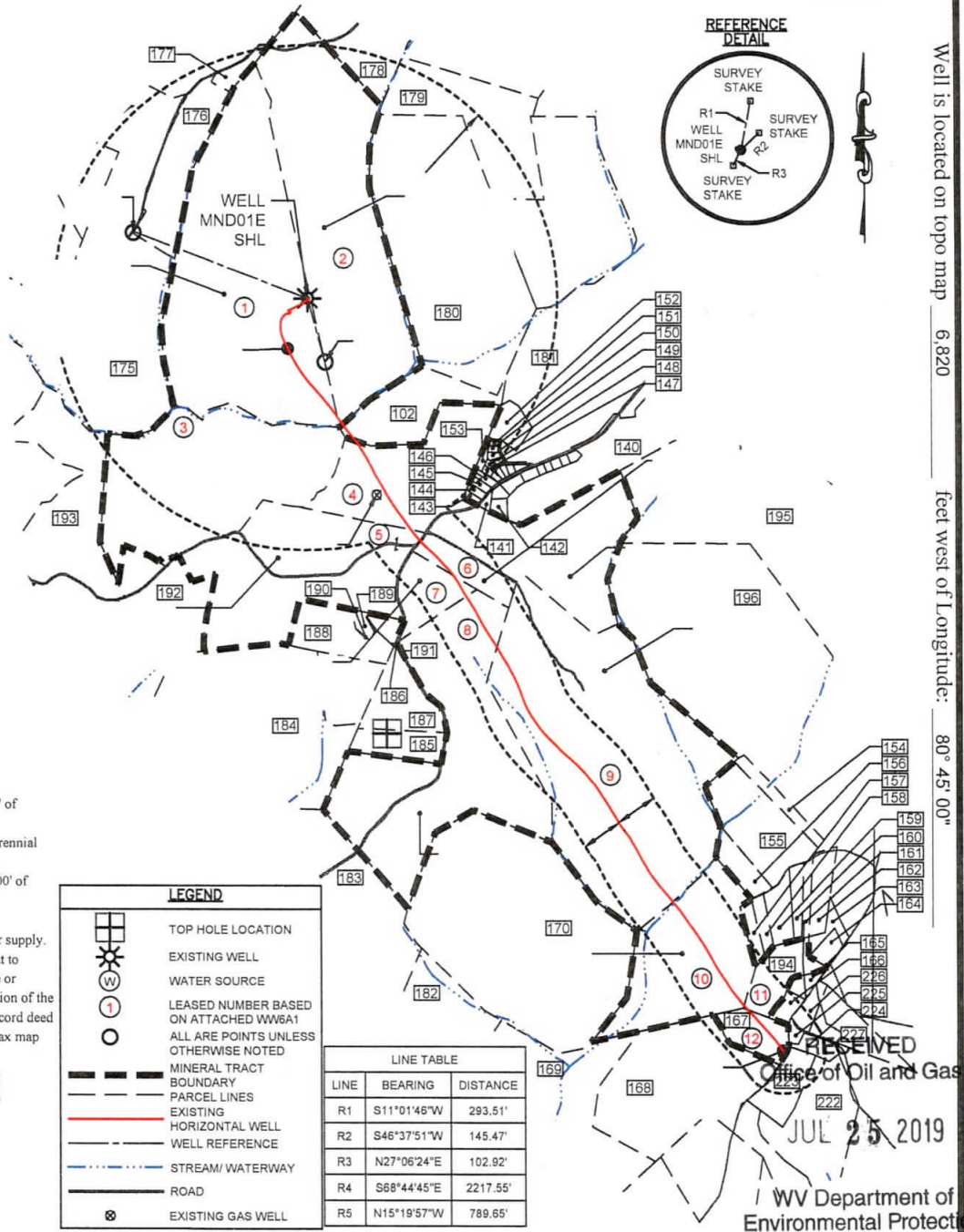
LANDING POINT

UTM 17-NAD83(m)
N: 4410930.172
E: 519240.696
NAD27, WV NORTH
N: 493551.9
E: 1641944.6
LAT/LON DATUM-NAD83
LAT: 39.848171621
LON: -80.775090178

BOTTOM HOLE LOCATION

UTM 17-NAD83(m)
N: 4408424.023
E: 521071.444
NAD27, WV NORTH
N: 485227.47
E: 1647814.77
LAT/LON DATUM-NAD83
LAT: 39.825547815
LON: -80.753770877

WATER WELLS:
NONE FOUND



Waterfront Corporate Park III, Suite 101
2000 Georgetowne Drive
Sewersky, PA 15143

P: 724-444-1100
F: 724-444-1104
www.pve-llc.com

Civil Engineering | Land Development | Structures Design
Land Planning | Landscape Architecture | Environmental

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FILE #: N:\Project Files\161479 - HG Energy
MND\Drawings\Survey\

DRAWING #: 161479 MND01 EHS ASDRILL

SCALE: 1"=2000'

MINIMUM DEGREE OF ACCURACY: 1/2500

PROVEN SOURCE U.S.G.S. MONUMENT
OF ELEVATION: H 138: 638.58'

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:

R.P.E.: L.L.S.: P.S. NO. 2269



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

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

WATERSHED: SHORT CREEK-OHIO RIVER
COUNTY/DISTRICT: MARSHALL / CLAY
SURFACE OWNER: CONSOLIDATION COAL COMPANY / MURRAY ENERGY
OIL & GAS ROYALTY OWNER: CNX GAS COMPANY, LLC, ET AL.

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

TARGET FORMATION: MARCELLUS
WELL OPERATOR: HG ENERGY II APPALCHIA, LLC
Address: 5260 DUPONT ROAD
City PARKERSBURG State WV Zip Code 26101

DATE: MAY 16, 2019

OPERATOR'S WELL #: MND 01 EHS

API WELL #	47	051	01837
STATE	COUNTY	PERMIT	

ELEVATION: 1150.00'
QUADRANGLE: POWHATAN POINT, W. VA./OHIO
ACREAGE: 126.99

ESTIMATED DEPTH: TVD: 6,175' TMD: 16,742' LATERAL: 10,235'
DESIGNATED AGENT: DIANE C. WHITE
Address: 5260 DUPONT ROAD
City PARKERSBURG State WV Zip Code 26101



Bottom hole is located on topo map 14,979 feet south of Latitude: 39° 52' 00"

Bottom hole is located on topo map 1,062 feet west of Longitude: 80° 45' 00"

AS-DRILLED

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LEGEND	
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	TOP HOLE LOCATION
	EXISTING WELL
	WATER SOURCE
	LEASED NUMBER BASED ON ATTACHED WM6A1
	ALL ARE POINTS UNLESS OTHERWISE NOTED
	MINERAL TRACT BOUNDARY
	PARCEL LINES
	EXISTING HORIZONTAL WELL
	WELL REFERENCE
	STREAM/WATERWAY
	ROAD
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Waterfront Corporate Park III, Suite 101
 2000 Georgetown Drive
 Sewickley, PA 15143

P: 724-444-1100
 F: 724-444-1104
 www.pve-llc.com

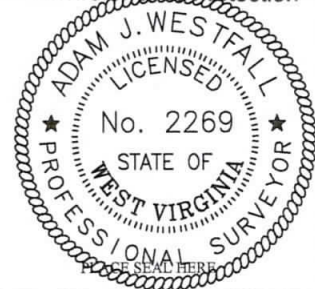


Civil Engineering | Land Development | Structure Design
 Land Planning | Landscape Architecture | Environmental

RECEIVED
 Office of Oil and Gas

JUL 25 2019

WV Department of Environmental Protection



FILE #: N:\Project Files\161479 - HG Energy
WMD1\Drawings\Survey\
 DRAWING #: 161479 MND01 EHS ASDRILL
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 MINIMUM DEGREE OF ACCURACY: 1/2500
 PROVEN SOURCE: U.S.G.S. MONUMENT
 OF ELEVATION: H 138: 638.58'

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 WELL OPERATOR: HG ENERGY II APPALACHIA, LLC DESIGNATED AGENT: DIANE C. WHITE
 Address: 5260 DUPONT ROAD Address: 5260 DUPONG ROAD
 City PARKERSBURG State WV Zip Code 26101 City PARKERSBURG State WV Zip Code 26101

Fracture Start Date/Time:	3/19/15 7:44
Fracture End Date/Time:	3/23/15 9:25
State:	COLORADO
County:	WELD
API Number:	05-123-39498-00-00
Operator Number:	A1210112
Well Name:	CRUICKSHANK 1C-24HZ
Federal Well:	Yes
Tribal Well:	Yes
Longitude:	-104.718133
Latitude:	40.205372
Long/Lat Projection:	NAD83
True Vertical Depth (TVD):	7,422'
Total Clean Fluid Volume* (gal):	4,135,736



Total Slurry Mass (Lbs)
37,455,995

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
Water	Company 1	Carrier/Base Fluid	Water	7732-18-5	100.00%	34,512,715	92.00000%	
WHITE OTTAWA/ST. PET	CALFRAC	PROPPING AGENT		Listed Below				
7.5% HCL	CALFRAC	ACID		Listed Below				
DAP-925	CALFRAC	ACID INHIBITOR		Listed Below				
DWP-621	CALFRAC	FRICITION REDUCER		Listed Below				
DWP-944	CALFRAC	BIOCIDE		Listed Below				
DWP-962	CALFRAC	BIOCIDE		Listed Below				
			CRYSTALLINE SILICA	14808-60-7	100.00%	1,002,500	2.67647%	
			CRYSTALLINE SILICA IN THE FORM OF QUARTZ	14808-60-7	99.90%	1,001,498	2.67380%	
			HYDROCHLORIC ACID	7647-01-0	37.00%	50,020	0.13354%	
			WATER	7732-18-5	63.00%	85,169	0.22738%	
			FATTY ACIDS	Proprietary	30.00%	75	0.00020%	
			METHANOL	67-56-1	60.00%	151	0.00040%	
			OLEFIN	Proprietary	5.00%	13	0.00003%	
			POLYOXYALKENES	Proprietary	30.00%	75	0.00020%	
			PROPARGYL ALCOHOL	107-19-7	10.00%	25	0.00007%	
			NO HAZARDOUS INGREDIENTS	Not Assigned	100.00%	25,411	0.06784%	
			2,2-DIBROMO-3-NITRILOPROPIONAMIDE	10222-01-2	20.00%	2,152	0.00575%	
			TETRAKIS(HYDROXYMETHYL)PHOSPHONIUM	55566-30-8	75.00%	13,963	0.03728%	
			Ingred Other	Not Assigned				Non-MSDS Component
			Ingred Other2	Not Assigned				Non-MSDS Component

AS-DRILLED

Well is located on topo map 9,167 feet south of Latitude: 39° 52' 30"

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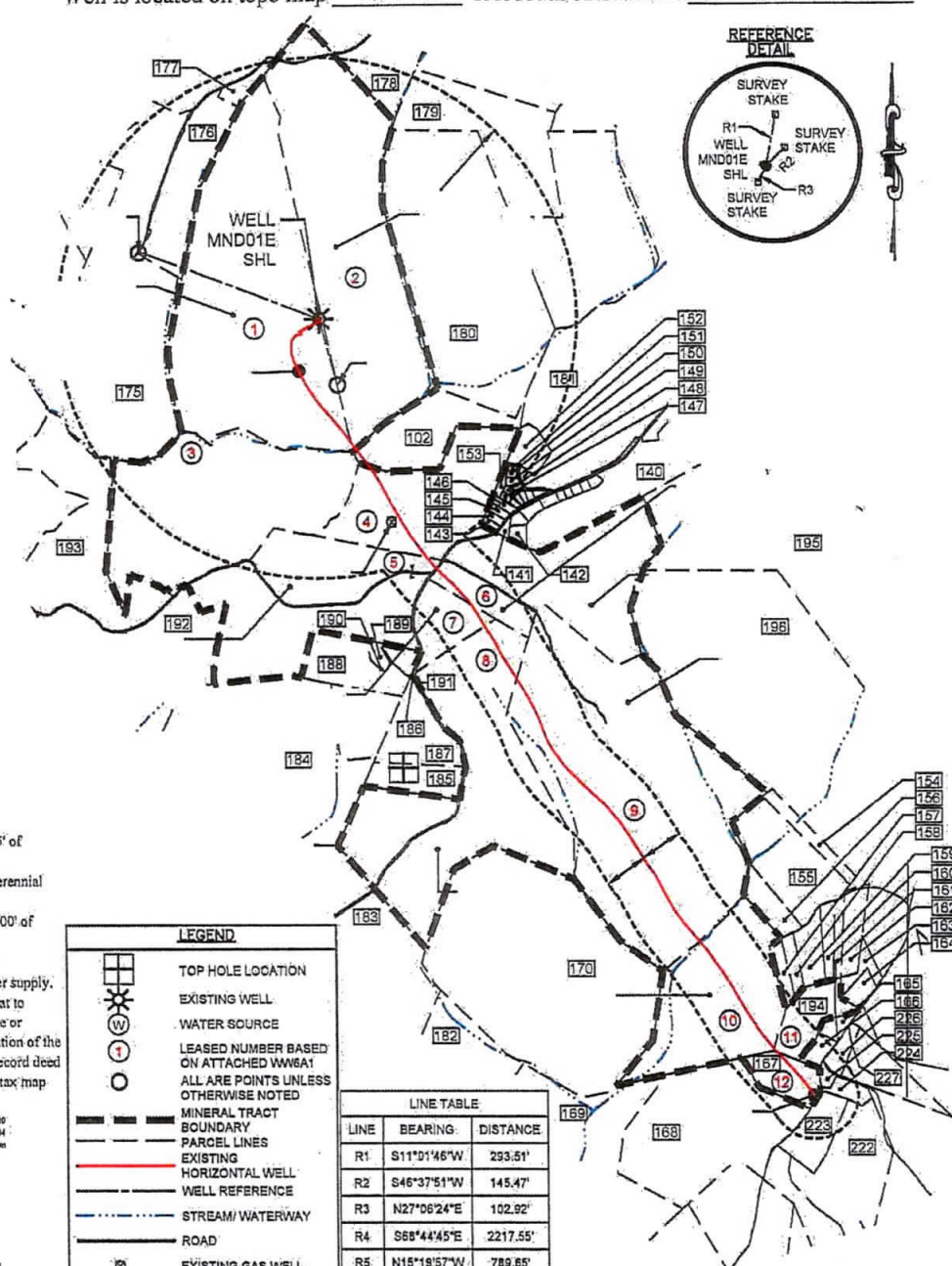
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**WATER WELLS:
 NONE FOUND**



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Westford Dupont Park R. Sully 101
 2000 Dupont Drive
 Southbury, PA 15143



Civil Engineering | Land Development | Structure Design
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FILE #: N:\Project Files\161479 - HG Energy
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- ROAD
- EXISTING GAS WELL

NOTES:

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

Waterloo Coplaner Plan #, 9/19/11 P: 724-441-1109
2000 Coplaner Drive P: 724-441-1101
Beverly, PA 15115 www.pve.com



Civil Engineering | Land Development | Structural Design
Land Planning | Landscape Architecture | Environmental

FILE #: N:\Project Files\161479 - HG Energy
WMD1\Drawings\Survey\
DRAWING #: 161479 MND01 EHS ASDRILL
SCALE: 1"=2000'
MINIMUM DEGREE OF ACCURACY: 1/2500
PROVEN SOURCE U.S.G.S. MONUMENT
OF ELEVATION: H 138: 638.58'

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:
R.P.E.: _____ L.L.S.: P.S. NO. 2269



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



DATE: MAY 16, 2019
OPERATOR'S WELL #: MND 01 EHS
API WELL # 47 051 01837
STATE COUNTY PERMIT

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

WATERSHED: SHORT CREEK-OHIO RIVER ELEVATION: 1150.00'
COUNTY/DISTRICT: MARSHALL / CLAY QUADRANGLE: POWHATAN POINT, WV VA/OHIO
SURFACE OWNER: CONSOLIDATION COAL COMPANY/ MURRAY ENERGY ACREAGE: 126.99
OIL & GAS ROYALTY OWNER: CNX GAS COMPANY, LLC, ET AL. ACREAGE: 126.99

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

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: TVD: 6,175' TMD: 16,742' LATERAL: 10,235'
WELL OPERATOR: HG ENERGY II APPALACHIA, LLC DESIGNATED AGENT: DIANE C. WHITE
Address: 5260 DUPONT ROAD Address: 5260 DUPONG ROAD
City PARKERSBURG State WV Zip Code 26101 City PARKERSBURG State WV Zip Code 26101