

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

API 47 - 051 - 01958 County Marshall District Webster  
Quad Majorsville Pad Name SHL27 Field/Pool Name \_\_\_\_\_  
Farm name Steve and Ed Ward Well Number SHL27 JHS  
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 4423205.2 Easting 535381.0  
Landing Point of Curve Northing 4422963.7 Easting 535087.2  
Bottom Hole Northing 4425145.4 Easting 534144.0

Elevation (ft) 1154' 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)  
Mud Type - SOBM, Additives - Lime, Calcium Chloride, Gilsonite, Asphalt, Barite, Emulsifier, Base Oil

Date permit issued 11/03/17 Date drilling commenced 2/18/18 Date drilling ceased 4/28/18  
Date completion activities began 5/7/18 Date completion activities ceased 7/16/18  
Verbal plugging (Y/N) \_\_\_\_\_ Date permission granted \_\_\_\_\_ Granted by JAN 24 2019

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug. WV Department of Environmental Protection

Freshwater depth(s) ft 500' Open mine(s) (Y/N) depths N  
Salt water depth(s) ft Not observed Void(s) encountered (Y/N) depths N  
Coal depth(s) ft 653' Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) Yes

**Reviewed**  
Reviewed by: J. [Signature]  
3/28/19

WR-35  
Rev. 8/23/13

API 47-051 - 01958 Farm name Steve and Ed Ward Well number SHL27 JHS

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							
Surface							
Coal							
Intermediate 1							
Intermediate 2			See Attached				
Intermediate 3							
Production							
Tubing							
Packer type and depth set							

Comment Details \_\_\_\_\_

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	NA	NA	NA	NA	NA		
Surface	Class A	935	15.6	1.1966	183.1	0	8 hours
Coal							
Intermediate 1	Class A	921	15.6	1.19	188	0	8 hours
Intermediate 2							
Intermediate 3							
Production	Class A	1119/2010	13.5/14.5	1.41/1.17	280/419	0	8 hours
Tubing							

Drillers TD (ft) 14888' TMD, 6436' TVD Loggers TD (ft) \_\_\_\_\_  
 Deepest formation penetrated Marcellus Plug back to (ft) \_\_\_\_\_  
 Plug back procedure \_\_\_\_\_

Kick off depth (ft) 5601' TVD, 5893' TMD \_\_\_\_\_

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 See Attached \_\_\_\_\_

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 \_\_\_\_\_

CASING INFORMATION							SHOWS (Fresh Water, Oil, Gas)		
Conductor	Set 30" 157.5ppf LS (3 jts - welded) to 60'						Depth	Formation	Show
	Surface	Intermediate 1	Intermediate 2	Production					
No. Jts. Run	22	27	69	350		5,286	elks	496	
Hole Depth	481	1100	3008	14888					
Csg Size	20"	13 3/8	9 5/8	5-1/2					
Wt.	94	54.5	40	23					
Grade	J-55	j-55	j-55	P-110					
Type Thrd	BTC	BTC	BTC	CDC-HTQ					
New/Used	New	New	New	New					
Casing Depth Set	451	1073	2965	14,857					
Plug	427	1031	2920	14,794					
Shoe	451	1073	2965	14,857					
Basket	N/A	N/A	N/A	N/A					
Centralizers	7	9	38	152					
Cmt Return	40 bbls	23	34	73					
Sks. Lead	935	921	1110	1119					
Type Cmt Lead.	Class A	Class A	Class H	Class A					
Sks. Tail				2010					
Type Cmt. Tail				Class A					
Top Cmt.	Surface	Surface	Surface	Surface					

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API 47- 051 - 01958 Farm name Steve and Ed Ward Well number SHL27 JHS

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**  
**SHL27 JHS - 47-051-01958**  
**Perforation Record**

Stage Number	Perforation	Perforated	Perforated	Number of	
Number	Date	from MD ft.	to MD ft.	Perforations	Formations
1	5/20/2018	N/A	N/A	Toe Ports	
2	5/20/2018	14,679	14,497	49	
3	5/21/2018	14,483	14,301	49	
4	5/21/2018	14,287	14,105	49	
5	5/22/2018	14,091	13,909	49	
6	5/22/2018	13,895	13,713	49	
7	5/23/2018	13,699	13,517	49	
8	5/23/2018	13,503	13,321	49	
9	5/24/2018	13,307	13,125	49	
10	5/24/2018	13,111	12,929	49	
11	5/24/2018	12,915	12,733	49	
12	5/25/2018	12,719	12,537	49	
13	5/25/2018	12,523	12,341	49	
14	5/26/2018	12,327	12,145	49	
15	5/26/2018	12,131	11,949	49	
16	5/27/2018	11,935	11,753	49	
17	5/27/2018	11,739	11,557	49	
18	5/28/2018	11,543	11,361	49	
19	5/29/2018	11,347		49	
20	5/29/2018	11,151		49	
21	5/30/2018	10,955		49	
22	5/30/2018	10,759	10,577	70	
23	5/31/2018	10,563	10,381	70	
24	5/31/2018	10,367	10,185	70	
25	6/1/2018	10,171	9,989	70	
26	6/1/2018	9,975	9,795	70	
27	6/1/2018	9,779	9,599	70	
28	6/1/2018	9,583	9,403	70	
29	6/2/2018	9,387	9,207	70	
30	6/3/2018	9,191	9,011	70	
31	6/4/2018	8,995	8,815	70	
32	6/4/2018	8,799	8,619	70	
33	6/4/2018	8,603	8,423	70	
34	6/4/2018	8,407	8,227	70	
35	6/4/2018	8,211	8,031	70	
36	6/5/2018	8,015	7,835	70	
37	6/5/2018	7,819	7,639	70	
38	6/5/2018	7,623	7,443	70	
39	6/5/2018	7,427	7,247	70	
40		7,231	7,051	70	
KP		7,025			

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**HG Energy II Appalachia, LLC****SHL27 JHS - 47-051-01958****Stimulation Information Per Stage**

Stage Number	Stimulation Date	Avg Pump Rate (BPM)	Avg Pressure (psi)	Breakdown Psi	ISIP (psi)	Amount of Proppant (kibs)	Amount of Water (bbls)	Amount of acid (gallons)
1	5/20/2018	75.5	8936	10231	3653	2,701.8	7563	2031
2	5/20/2018	87.7	10,286	5,991	4,100	5,285.6	13,488	2,016
3	5/21/2018	87.2	9,690	6,147	4,472	6,004.2	14,190	1,037
4	5/21/2018	71.6	11,242	5,698	4,800	2,958.2	10,749	2,014
5	5/22/2018	91.2	9,892	NA	7,131	3,095.6	11,883	1,996
6	5/22/2018	93.6	9,971	5,358	4,400	5,553.0	13,005	1,028
7	5/23/2018	88.4	8,953	5,680	4,870	40.0	2,287	1,053
8	5/23/2018	89.1	9,880	5,186	4,582	6,009.4	13,829	1,018
9	5/24/2018	86.4	10,907	5,310	4,492	40.0	2,009	1,024
10	5/24/2018	50.6	11,201	5,120	5,712	100.0	8,307	1,950
11	5/24/2018	90.1	9,410	5,624	4,264	6,059.0	13,048	1,028
12	5/25/2018	86.0	8,543	5,349	4,035	6,027.6	14,064	1,032
13	5/25/2018	93.3	9,541	6,019	4,444	6,031.0	13,567	1,038
14	5/26/2018	90.9	8,563	5,222	4,508	6,505.0	14,510	1,020
15	5/26/2018	69.5	11,058	5,420	7,100	430.0	11,963	1,970
16	5/27/2018	89.9	8,080	5,321	4,414	6,692.4	14,928	1,028
17	5/27/2018	77.9	9,187	5,633	4,585	3,120.0	9,786	818
18	5/28/2018	85.7	8,436	5,201	4,405	6,432.0	14,477	1,020
19	5/29/2018	89.2	8,588	5,377	4,825	6,499.2	14,580	994
20	5/29/2018	88.4	9,083	5,695	7,520	3,176.0	10,735	1,028
21	5/30/2018	77.8	8,513	5,427	6,724	3,039.0	8,861	1,000
22	5/30/2018	99.4	8,594	5,261	4,286	6,503.0	14,424	1,000
23	5/31/2018	89.3	8,721	5,395	4,847	6,552.0	14,442	990
24	5/31/2018	96.0	9,293	5,116	4,795	6,502.0	14,259	980
25	6/1/2018	92.7	8,520	5,045	4,550	7,009.0	15,127	1,000
26	6/1/2018	92.8	8,355	5,125	4,279	7,000.0	14,538	980
27	6/1/2018	101.0	8,708	5,630	4,762	7,007.0	14,880	1,010
28	6/1/2018	92.8	8,586	5,347	4,600	7,027.4	14,837	1,072
29	6/2/2018	95.1	7,628	5,017	4,900	7,008.2	16,388	978
30	6/3/2018	98.7	8,127	5,054	4,343	6,963.0	14,949	1,044
31	6/4/2018	93.4	7,555	5,329	4,750	7,004.0	15,913	996
32	6/4/2018	92.5	8,294	5,810	5,230	7,003.0	15,159	984
33	6/4/2018	99.9	8,119	6,203	5,272	6,996.0	14,437	1,012
34	6/4/2018	100.7	8,033	5,864	5,248	3,238.0	9,066	952
35	6/4/2018	101.9	7,805	-	5,250	7,025.4	15,060	1,010
36	6/5/2018	102.8	8,805	5,698	-	2,746.2	8,653	988
37	6/5/2018	96.9	7,596		4,719	8,532.0	18,914	990
38	6/5/2018	100.5	7,582	6,124	4,752	8,056.0	18,253	948
39	6/5/2018	101.0	7,690	5,711	4,670	8,038.0	18,483	980
40		102.4	7,666	5,468	4,864	8,510.2	18,987	994
KP								

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JAN 24 2019

WR-35  
Rev. 8/23/13

API 47- 051 - 01958 Farm name Steve and Ed Ward Well number SHL27 JHS

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>		
Marcellus Shale (~53' thick)	6452	TVD	7027 MD
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

SHUT-IN PRESSURE Surface 3095 psi Bottom Hole \_\_\_\_\_ psi DURATION OF TEST 648 hrs

OPEN FLOW Gas 6995 mcfpd Oil 336 bpd NGL \_\_\_\_\_ bpd Water 456 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 <sub>2</sub> S, ETC)
	0		0		
			See Attached		

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 Stingray  
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 01/9/18

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JAN 24 2019  
Department of  
Environmental Protection

**HG Energy II Appalachia, LLC**  
**SHL-27J-HS Actual tops**  
**Lithology/Formation**

	MD		TVD	
T - Pittsburgh Coal (~5' thick)	653	1257	653	1257
T - Gas/Salt Sands (~250')	1257	1562	1257	1562
T - Greenbrier Big Lime (~19' thick)	1562	1590	1562	1590
T - Loyalhanna Big Injun (~39' thick)	1590	1712	1590	1712
T - Pocono Big Injun (~153' thick)	1712	2114	1712	2114
T - Berea (~18' thick)	2114	2276	2114	2276
T - Gantz/Upper 30-Foot sand	2276	2590	2276	2590
T - Gordon Stray sand (~10' thick)	2590	2643	2590	2643
T - Gordon sand (~17' thick)	2643	2755	2643	2755
T - 5th sand (~5' thick)	2755	6030	2755	5700
T - Rhinestreet (454' thick)	6030	6468	5700	6125
T - Cashaqua (100' Thick)	6468	6570	6125	6206
T - Middlesex (32' thick)	6570	6600	6206	6247
T - West River (71' thick)	6600	6693	6247	6311
T - Burket (~10' thick)	6693	6734	6311	6318
T - Tully (~26' thick)	6734	6780	6318	6346
T-Hamilton (~115' thick)	6780	7027	6346	6452
T - Marcellus shale (~53' thick)	7027		6452	

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JAN 24 2019

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Environmental Protection



As Drilled well is located on topo map 32 feet south of Latitude: 39° 57' 30"

Proposed well is located on topo map 680 feet west of Longitude: 80° 35' 00"

**SURFACE HOLE LOCATION (SHL)**

UTM 17 - NAD83(m)  
 N: 4423205.161  
 E: 535380.953  
 NAD27, WV NORTH  
 N: 532946.000  
 E: 1695580.195  
 LAT/LON DATUM-NAD83  
 LAT: 39.958247  
 LON: -80.585760

**LANDING POINT LOCATION**

UTM 17 - NAD83(m)  
 N: 4422963.449  
 E: 535087.632  
 NAD27, WV NORTH  
 N: 532168.932  
 E: 1694604.438  
 LAT/LON DATUM-NAD83  
 LAT: 39.956081  
 LON: -80.589208

**BOTTOM HOLE LOCATION**

UTM 17 - NAD83(m)  
 N: 4425145.427  
 E: 534144.047  
 NAD27, WV NORTH  
 N: 539380.999  
 E: 1691627.811  
 LAT/LON DATUM-NAD83  
 LAT: 39.975779  
 LON: -80.600140

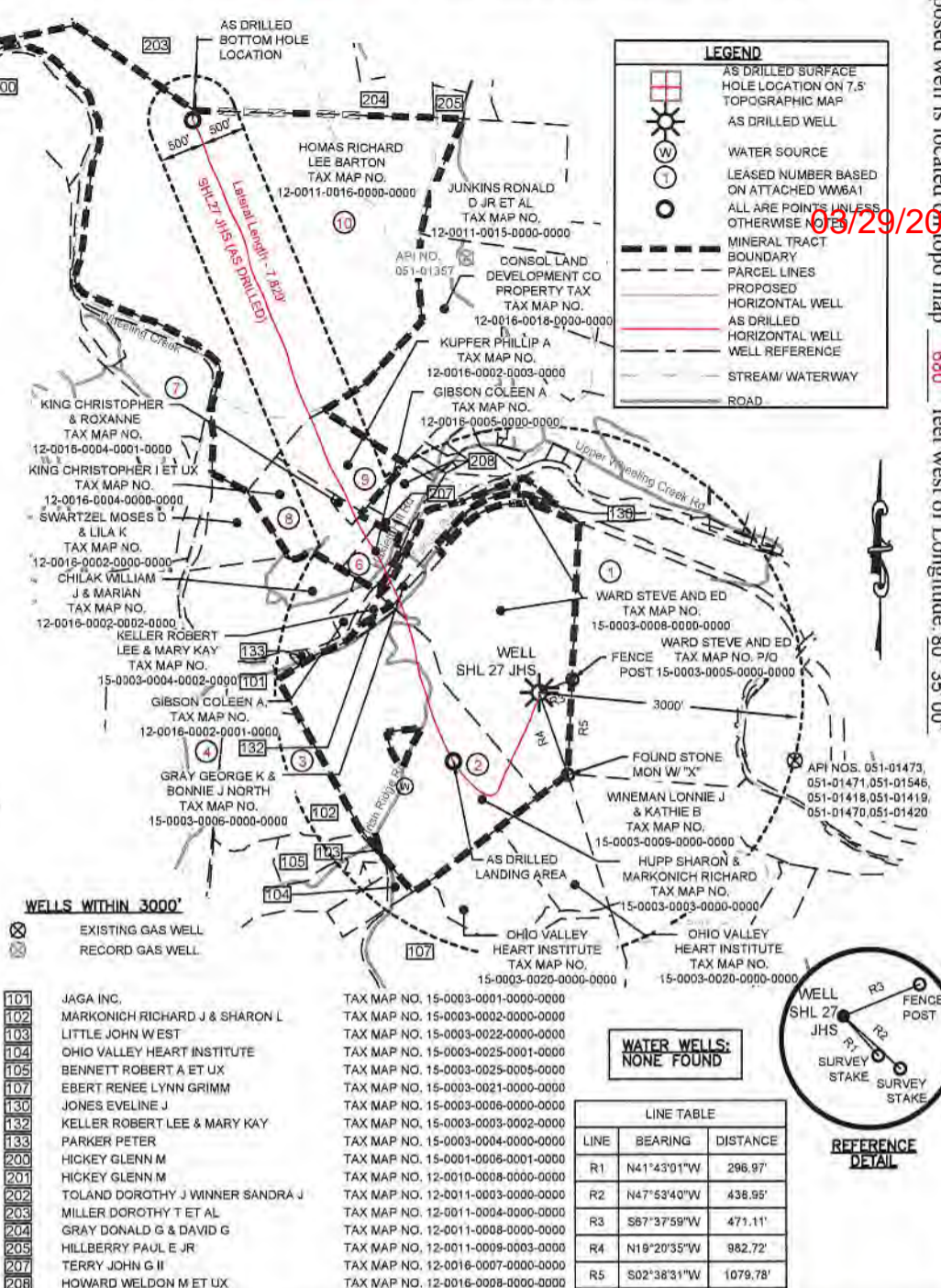
- NOTES:
- There are no water wells or developed springs within 250' of proposed well.
  - There are no existing buildings within 625' of proposed well.
  - Proposed well is greater than 100' from perennial stream, wetland, pond, reservoir or lake.
  - There are no native trout streams within 300' of 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.

Waterford Corporate Park III, Suite 101  
 2000 Georgetown Drive  
 Seaside, PA 15142

P 724-446-1100  
 F 724-444-1104  
 www.pve-llc.com



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



FILE #: SHL 27 JHS  
 DRAWING #: SHL 27 JHS  
 SCALE: 1"=2000'  
 MINIMUM DEGREE OF ACCURACY: 1/2500  
 PROVEN SOURCE OF ELEVATION: USGS MONUMENT U 124: 951.16'

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: [Signature]  
 R.P.E.: 18766 L.L.S.: P.S. NO. \_\_\_\_\_

(+) 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: WHEELING CREEK ELEVATION: 1,153.60'  
 COUNTY/DISTRICT: MARSHALL / WEBSTER QUADRANGLE: MAJORSVILLE, W. VA.  
 SURFACE OWNER: STEVE WARD AND ED WARD ACREAGE: 122.47  
 OIL & GAS ROYALTY OWNER: BOUNTY MINERALS, LLC ACREAGE: 122.47

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 APPALACHIA, LLC  
 Address: 5260 DUPONT ROAD  
 City PARKERSBURG State WV Zip Code 26101

DATE: JANUARY 18, 2018  
 OPERATOR'S WELL #: SHL 27 JHS  
 API WELL # 47 051 01958  
 STATE COUNTY PERMIT

AS DRILLED DEPTH: TVD: 6,436' TMD: 14,888'  
 DESIGNATED AGENT: DIANE C. WHITE  
 Address: 5260 DUPONT ROAD  
 City PARKERSBURG State WV Zip Code 26101

03/29/2019



Bottom hole is located on topo map 8,823 feet south of Latitude: 40° 00' 00"

Bottom hole is located on topo map 4,710 feet west of Longitude: 80° 35' 00"

03/29/2019

AS DRILLED

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 LAT/LON DATUM-NAD83  
 LAT: 39.975779  
 LON: -80.600140

**LEGEND**

 BOTTOM HOLE LOCATION ON 7.5' TOPOGRAPHIC MAP



NOTES:

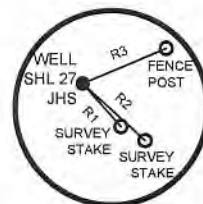
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Waterfront Corporate Park II, Suite 101  
 2000 Georgetown Drive  
 Sewickley, PA 15143

P: 724-446-1100  
 F: 724-444-1104  
 www.pve-llc.com



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



REFERENCE DETAIL

LINE TABLE		
LINE	BEARING	DISTANCE
R1	N41°43'01"W	296.97'
R2	N47°53'40"W	438.95'
R3	S67°37'59"W	471.11'
R4	N19°20'35"W	982.72'
R5	S02°38'31"W	1079.78'

FILE #: SHL 27 JHS

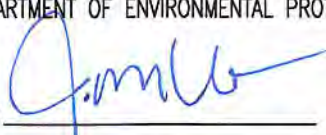
DRAWING #: SHL 27 JHS

SCALE: 1"=2000'

MINIMUM DEGREE OF ACCURACY: 1/2500

PROVEN SOURCE OF ELEVATION: USGS MONUMENT U 124: 951.16'

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SIGNED: 

R.P.E.: 18766 L.L.S.: P.S. NO. \_\_\_\_\_



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



DATE: JANUARY 18, 2018

OPERATOR'S WELL #: SHL 27 JHS

API WELL # 47 051 01958  
 STATE COUNTY PERMIT

Well Type:  Oil  Waste Disposal  Production  Deep  
 Gas  Liquid Injection  Storage  Shallow SHEET: 2 OF 2

WATERSHED: WHEELING CREEK ELEVATION: 1,153.60'  
 COUNTY/DISTRICT: MARSHALL / WEBSTER QUADRANGLE: MAJORSVILLE, W. VA  
 SURFACE OWNER: STEVE WARD AND ED WARD ACREAGE: 122.47  
 OIL & GAS ROYALTY OWNER: BOUNTY MINERALS, LLC ACREAGE: 122.47

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 AS DRILLED DEPTH: TVD: 6,436' TMD: 14,888'  
 WELL OPERATOR: HG ENERGY II APPALACHIA, LLC DESIGNATED AGENT: DIANE C. WHITE  
 Address: 5260 DUPONT ROAD Address: 5260 DUPONT ROAD  
 City PARKERSBURG State WV Zip Code 26101 City PARKERSBURG State WV Zip Code 26101