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west virginia department of environmental protection

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Office of Oil and Gas  
601 57<sup>th</sup> Street, S.E.  
Charleston, WV 25304  
(304) 926-0450  
fax: (304) 926-0452

Harold D. Ward, Cabinet Secretary  
[www.dep.wv.gov](http://www.dep.wv.gov)

Wednesday, September 1, 2021  
PERMIT MODIFICATION APPROVAL  
Horizontal 6A / New Drill

HG ENERGY II APPALACHIA, LLC

Re: Permit Modification Approval for EVANS 1213 S-5H  
47-041-05721-00-00

*Extend Intermediate 2 Casing*

HG ENERGY II APPALACHIA, LLC

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before permitted well work is commenced.

If there are any questions, please feel free to contact me at (304) 926- 0450.

A blue ink signature of James A. Martin.

James A. Martin  
Chief

Operator's Well Number: EVANS 1213 S-5H  
Farm Name: JAMES M. & SUZANNE L. EVANS, III  
U.S. WELL NUMBER: 47-041-05721-00-00  
Horizontal 6A New Drill  
Date Modification Issued: 9/1/2021

Promoting a healthy environment.

09/03/2021

STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
WELL WORK PERMIT APPLICATION

1) Well Operator: HG Energy II Appalachia, L.P.

<u>494519932</u>	<u>Lewis</u>	<u>Freeman</u>	<u>Camden 7.5'</u>
Operator ID	County	District	Quadrangle

2) Operator's Well Number: Evans 1213 S-5H Well Pad Name: Evans 1213

3) Farm Name/Surface Owner: James & Suzanne Evans Public Road Access: Mare Run Rd at CR 10/9

4) Elevation, current ground: 1233' Elevation, proposed post-construction: 1227' ✓

5) Well Type (a) Gas  Oil \_\_\_\_\_ Underground Storage \_\_\_\_\_

Other \_\_\_\_\_

(b) If Gas Shallow  Deep \_\_\_\_\_

Horizontal  \_\_\_\_\_

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):  
Marcellus at 6709'/6791' and 82' in thickness. Anticipated pressure at 4314#.

8) Proposed Total Vertical Depth: 6760'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 19,430'

11) Proposed Horizontal Leg Length: 12,228'

12) Approximate Fresh Water Strata Depths: 60', 136', 151', 200'

13) Method to Determine Fresh Water Depths: Nearest offset well data, (47-041-01847, 1786, 1233)

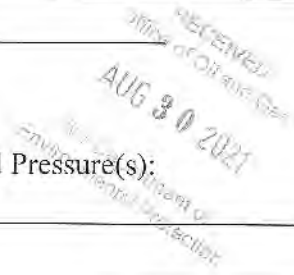
14) Approximate Saltwater Depths: None found

15) Approximate Coal Seam Depths: 220', 445', 650', 800', 805' (Surface casing is being extended to cover the coal in the DTI Storage Field)

16) Approximate Depth to Possible Void (coal mine, karst, other): None

17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes \_\_\_\_\_ No

(a) If Yes, provide Mine Info: Name: \_\_\_\_\_  
Depth: \_\_\_\_\_  
Seam: \_\_\_\_\_  
Owner: \_\_\_\_\_



WW-6B  
(04/15)

API NO. 47- D41 - D5721  
 OPERATOR WELL NO. Evans 1213 S-5H  
 Well Pad Name: Evans 1213

18)

CASING AND TUBING PROGRAM

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	30"	New	LS	157.5	120'	120' ✓	Drilled In
Fresh Water/Coal	20"	NEW	J-55	94	1100'	1100' ✓	40% Excess, CTS ✓
Intermediate 1	13 3/8"	NEW	J-55 BTC	68	2100'	2100' ✓	40% Excess, CTS ✓
Intermediate 2	9 5/8"	NEW	N-80 BTC	40	4700'	4700' ✓	40% Excess Tail, CTS ✓
Production	5 1/2"	NEW	P-110 HP	23	19430'	19430' ✓	20% Excess, Tail, CTS ✓
Tubing							
Liners							

SDW/  
8/25/2021

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	30"	30"	.500				Drilled In
Fresh Water/Coal	20"	26"	.438	2110	1200	Type 1, Class A	40% excess yield = 1.20, CTS
Intermediate 1	13 3/8"	17 1/2"	.480	3450		Type 1/Class A	Lead 40% excess, Tail 0% excess
Intermediate 2	9 5/8"	12 1/4"	.395	5750		Type 1/Class A	Lead 40% excess, Tail 0% excess
Production	5 1/2"	8 1/2"	.415	16240	12500	Type 1/Class A	20% excess yield = 1.19, tail yield 1.24
Tubing							
Liners							

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Office of Oil and Gas  
AUG 30 2021

WV Department of Environmental Protection

PACKERS

Kind:				
Sizes:				
Depths Set:				



19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

Drill the vertical depth to the Marcellus at an estimated total vertical depth of approximately 6760 feet. Drill horizontal leg to estimated 12,228' lateral length, 19,430' TMD. Hydraulically fracture, stimulate and be capable of producing from the Marcellus Formation. Should we encounter an unanticipated void in the coal, we will install a minimum of 20' of casing below the void but not more than 100' below the void, set a basket and grout to surface. We plan to run an ACP above the Gantz/Dominion Storage interval to aid in sealing off and isolating the storage interval.

20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:

The stimulation will be completed with multiple stages divided over the lateral length of the well. Stage spacing is dependent upon engineering design. Slickwater fracturing technique will be utilized on each stage using sand, water, and chemicals. See attached list. Maximum pressure not to exceed 12,500 psi.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 14.36 acres

22) Area to be disturbed for well pad only, less access road (acres): 6.26 acres

23) Describe centralizer placement for each casing string:

No centralizers will be used with conventional casing.  
Freshwater/Coal - centralize every 3 joints to surface.  
Intersections 1 - Bow Spring on every joint, will also be running ACP for isolating storage zone.  
Intersections 2 - Bow Spring on first 3 joints then every third joint to 100' from surface.  
Production - Run 1 spiral centralizer every 3 joints from the top of the curve to surface. Run 1 spiral centralizer every 3 joints from the 1st 5.5' long joint to the top of the curve.

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WV Department  
Environmental Protection

24) Describe all cement additives associated with each cement type:

Conductor - N/A, Casing to be drilled in w/ Dual Rotary Rig.  
Fresh Water/Coal - 15.3 ppg PNE-1 + 3% bwoc CaCl<sub>2</sub> 40% Excess Yield = 1.20, CTR  
Intermediate 1 - Lean: 15.4 ppg PNE-1 + 2.5% bwoc CaCl<sub>2</sub> 40% Excess / Tail: 15.8 ppg PNE-1 + 2.5% bwoc CaCl<sub>2</sub> zero% Excess, CTR  
Intermediate 2 - Lean: 15.4 ppg PNE-1 + 2.5% bwoc CaCl<sub>2</sub> 40% Excess / Tail: 15.8 ppg PNE-1 + 2.5% bwoc CaCl<sub>2</sub> zero% Excess, CTR  
Production - Lean: 14.5 ppg POZ-PNE-1 + 0.2% bwoc RS + 1% bwoc ECI + 0.75 gal/sk FP13L + 0.1% bwoc MPA170, Tail: 14.8 ppg PNE-1 + 0.35% bwoc R3 + 0.75 gal/sk FP13L + 50% bwoc ASCA1 + 0.5% bwoc MPA170 20% Excess, Lean Yield=1.19, Tail Yield=1.34, CTR

25) Proposed borehole conditioning procedures:

Conductor - Ensure the hole is open at TD.  
Fresh Water/Coal - Once casing is at setting depth, circulate a minimum of one hole volume with Fresh Water prior to pumping cement.  
Intermediate 1 - Once casing is at setting depth, circulate one condition at TD. Circulate a minimum of one hole volume prior to pumping cement.  
Intermediate 2 - Once casing is at setting depth, circulate one condition at TD. Circulate a minimum of one hole volume prior to pumping cement.  
Production - Once on bottom/TD with casing, circulate at max allowable pump rate for at least 5x bottoms up, or until returns and pump pressures indicate the hole is clean. Circulate a minimum of one hole volume prior to pumping cement.

\*Note: Attach additional sheets as needed.



1213 S-5H ✓  
 Marcellus Shale Horizontal  
 Lewis County, WV

4704105721

Ground Elevation			1213 S-5H SHL				14205067.28N 1777976.97E			
Azim			1213 S-5H LP				14204540.1N 1777824.13E			
WELLBORE DIAGRAM			1213 S-5H BHL				14193005.17N 1781870.33E			
HOLE	CASING	GEOLOGY	TOP	BASE	MUD	CEMENT	CENTRALIZERS	CONDITIONING	COMMENTS	
30"	30" 157.5# LS	Conductor	0	120	AIR	N/A, Casing to be drilled in w/ Dual Rotary Rig	N/A	Ensure the hole is clean at TD.	Conductor casing = 0.5" wall thickness	
26"	20" 94# J-55	Fresh Water	0	214, 600, 661	AIR	15.6 ppg PNE-1 + 3% bwoc CaCl 40% Excess Yield=1.20 / CTS	Centralized every 3 joints to surface	Once casing is at setting depth, circulate a minimum of one hole volume with Fresh Water prior to pumping cement.	Surface casing = 0.435" wall thickness Burst=2110 psi	
		Kittaning Coal	800	805						
		Fresh Water Protection	0	1100						
17.5"	13-3/8" 68# J-55 BTC	Little Lime	1474	1494	AIR / KCL Salt Polymer	Lead: 15.4 ppg PNE-1 + 2.5% bwoc CaCl 40% Excess / Tail: 15.9 ppg PNE-1 + 2.5% bwoc CaCl zero% Excess. CTS	Bow Spring on every joint <i>*will also be running ACP for isolating storage zone*</i>	Once casing is at setting depth, Circulate and condition at TD. Circulate a minimum of one hole volume prior to pumping cement.	Intermediate casing = 0.480" wall thickness Burst=3450 psi	
		Big Lime	1524	1594						
		Irjun / Gantz (Storage)	1594 / 1866	1692 / 1926						
		Intermediate 1	0	2100 ✓						
12.25"	9-5/8" 40# N-80 BTC	Fifty / Thirty Foot	1978 / 2075	1998 / 2102	AIR / KCL Salt Polymer	Lead: 15.4 ppg PNE-1 + 2.5% bwoc CaCl 40% Excess / Tail: 15.9 ppg PNE-1 + 2.5% bwoc CaCl zero% Excess. CTS	Bow Spring on first 2 joints then every third joint to 100' form surface	Once casing is at setting depth, Circulate and condition mud at TD. Circulate a minimum of one hole volume prior to pumping cement.	Intermediate casing = 0.395" wall thickness Burst=5750 psi	
		Gordon Stray / Gordon	2120 / 2156	2154 / 2232						
		5th Sand	2369	2409						
		Bayard / Warren	2449 / 2771	2479 / 2796						
		Speechley	3076	3096						
		Balltown	3286	3346						
		Benson	4386	4411						
Intermediate 2	0	TVD: 4600 MD: 4700 Inc. 7 deg.								
8.75"	5-1/2" 23# P-110 HP CDC HTQ	Rhinestreet	6009	6279	AIR / 9.0ppg SOB M	Lead: 14.5 ppg POZ:PNE-1 + 0.3% bwoc R3 + 1% bwoc EC1 + 0.75 gal/sk FP13L + 0.3% bwoc MPA170 Tail: 14.8 ppg PNE-1 + 0.35% bwoc R3 + 0.75 gal/sk FP13L + 50% bwoc ASCA1 + 0.5% bwoc MPA170 20% Excess Lead Yield=1.19 Tail Yield=1.94 CTS	Run 1 spiral centralizer every 5 joints from the top of the curve to surface.	Once on bottom/TD with casing, circulate at max allowable pump rate for at least 2x bottoms up, or until returns and pump pressures indicate the hole is clean. Circulate a minimum of one hole volume prior to pumping cement.	Production casing = 0.415" wall thickness Burst=16240 psi Note: Actual centralizer schedules may be changed due to hole conditions	
Cashaqua		6279	6379							
Middlesex		6379	6411							
West River		6411	6482							
Burkett		6482	6492							
Tully Limestone		6492	6800							
Hamilton		6600	6753							
Marcellus		6709	6791							
TMD / TVD (Production)		19430	6760							
Orondaga		6791								
8.5" Curve	8.5" Lateral	TMD / TVD (Production)	19430	6760	11.5ppg-12.5ppg SOB M	Run 1 spiral centralizer every 3 joints from the 1st 5.5" long joint to the top of the curve.				
8.5" Lateral		Orondaga	6791		11.5ppg-12.5ppg SOB M					

LP @ 6760' TVD / 7202' MD

8.5" Hole - Cemented Long String  
 5-1/2" 23# P-110 HP CDC HTQ

+/-12228' ft Lateral ✓

TD @ -/-6760' TVD  
 +/-19430' MD

X=centralizers





**HG Energy, LLC**  
5260 Dupont Road  
Parkersburg, WV 26101  
(304) 420-1100 - Office  
(304) 863-3172 - Fax

CK # 028047  
8/27/21  
\$2,500

August 23, 2021

Office of Oil & Gas

AUG 30 2021

WV Department of  
Environmental Protection

WV DEP  
Division of Oil & Gas  
Attn: Kelly Kees  
601 57<sup>th</sup> Street  
Charleston, West Virginia 25304

RE: Evans 1213 S-5II Request for Permit Revision – (47-041-05721)  
Freemans Creek District, Lewis County, West Virginia  
**Request for Modification Due to Changes to the Intermediate 2 Casing**

Dear Ms. Kees -

Per our discussions, enclosed are revised forms WW-6B and the casing schematic for the requested 1213 S-5II well work permit revision. Also included is a check for the modification. We ask the permit be modified to reflect the change in the Intermediate 2 casing.

HG Energy is requesting permission to extend the Intermediate 2 casing from 2900' to 4700' just below the Benson formation. The cased pipe will be upgraded to a N-80 grade providing greater yield strength and internal yield pressure. We believe the Benson formation is causing mud losses while drilling our production hole interval.

Please let me know if you have any questions or require additional information. I can be reached at (304) 420-1119 or [dwhite@hgenergyllc.com](mailto:dwhite@hgenergyllc.com).

Very truly yours,

*Diane White*

Diane C. White

Enclosures

cc: Sam Ward – DEP State Inspector

09/03/2021



Stansberry, Wade A <wade.a.stansberry@wv.gov>

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## Modification H6A Horizontal Well Work Permit (API: 47-041-05721)

1 message

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**Stansberry, Wade A** <wade.a.stansberry@wv.gov>

Thu, Sep 2, 2021 at 10:21 AM

To: Diane White <dwhite@hgenergyllc.com>, "Ward, Samuel D" <samuel.d.ward@wv.gov>, John Breen <jbreen@assessor.state.wv.us>

I have attached a copy of the newly issued well [permit](#) number, "EVANS 1213 S-5H", API: (47-041-05721). This will serve as your copy.

If you have any questions, then [please](#) contact us here at the Office of Oil and Gas.

Thank you,

**Wade A. Stansberry**

**Environmental Resource Specialist 3**

**West Virginia Department of Environmental Protection**

**Office of Oil & Gas**

**601 57th St. SE**

**Charleston, WV 25304**

**(304) 926-0499 ext. 41115**

**(304) 926-0452 fax**

**[Wade.A.Stansberry@wv.gov](mailto:Wade.A.Stansberry@wv.gov)**

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### 2 attachments



**47-041-05721 - mod.pdf**

595K



**IR-26 Blank.pdf**

152K

09/03/2021