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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)

Thursday, September 2, 2021  
PERMIT MODIFICATION APPROVAL  
Horizontal 6A / New Drill

HG ENERGY II APPALACHIA, LLC

Re: Permit Modification Approval for EVANS 1213 S-8H  
47-041-05724-00-00

**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 handwritten signature in blue ink, appearing to read 'James A. Martin', is positioned above the printed name and title.

James A. Martin  
Chief

Operator's Well Number: EVANS 1213 S-8H  
Farm Name: JAMES M. & SUZANNE L. EVANS, III  
U.S. WELL NUMBER: 47-041-05724-00-00  
Horizontal 6A New Drill  
Date Modification Issued: 9/2/2021

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. 494519932  Operator ID Lewis  County Freeman  District Camden 7.5'  Quadrangle

2) Operator's Well Number: Evans 1213 S-8H  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: 21,106'

11) Proposed Horizontal Leg Length: 12,560'

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)

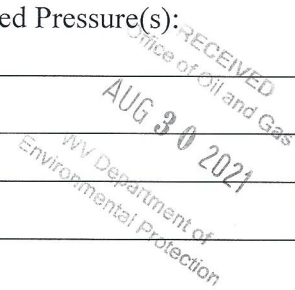
14) Approximate Saltwater Depths: None found

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. 47-041-05724  
OPERATOR WELL NO. Evans 1213 S-8H  
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                     | 5200'                      | 5200' /                      | 40% Excess Tail, CTS ✓        |
| Production       | 5 1/2"    | NEW         | P-110 HP | 23                     | 21106'                     | 21106' ✓                     | 20% Excess Tail, CTS ✓        |
| Tubing           |           |             |          |                        |                            |                              |                               |
| Liners           |           |             |          |                        |                            |                              |                               |

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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 1.04 |
| Tubing           |           |                        |                     |                      |  |                 |  |
| Liners           |           |                        |                     |                      |  |                 |  |

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 12,560' lateral length, 21,106' 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 conductor casing.  
Fresh Water/Coal - centralized every 3 joints to surface.  
Intermediate 1 - Bow Spring on every joint, will also be running ACP for isolating storage zone  
Intermediate 2 - Bow Spring on first 2 joints then every third joint to 100' from surface.  
Production - Run 1 spiral centralizer every 5 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 of  
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 - 15.6 ppg PNE-1 + 3% bwoc CaCl, 40% Excess Yield = 1.20, CTS  
Intermediate 1 - 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  
Intermediate 2 - 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  
Production - 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

25) Proposed borehole conditioning procedures:

Conductor - Ensure the hole is clean 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 and condition at TD. Circulate a minimum of one hole volume prior to pumping cement.  
Intermediate 2 - Once casing is at setting depth, Circulate and condition mud 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 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.

\*Note: Attach additional sheets as needed.



1213 S-8H  
 Marcellus Shale Horizontal  
 Lewis County, WV

| Ground Elevation |                             |                                       | 1213 S-8H SHL           |             |                     |  | 14205067.25N 1778021.97E   |   |  |   |
|------------------|-----------------------------|---------------------------------------|-------------------------|-------------|---------------------|--|--|---|--|---|
| Azm              |                             |                                       | 1213 S-8H LP            |             |                     |  | 14205775.32N 1781319.08E   |   |  |   |
| WELLBORE DIAGRAM |                             |                                       | 1213 S-8H BHL           |             |                     |  | 14193937.76N 1785502.03E   |   |  |   |
| 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, 861       | AIR  | 15.6 ppg PNE-1 + 3% bwoc CaCl<br>40% Excess<br>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 = 0.438" wall thickness<br>Burst=2110 psi      |
|                  |                             |                                       | Kittanning 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<br>40% Excess / Tail: 15.9 ppg PNE-1 + 2.5% bwoc CaCl<br>zero% Excess. CTS | Bow Spring on every joint<br><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<br>Burst=3450 psi |
|                  |                             |                                       | Big Lime                | 1524        | 1594                |  |  |   |  |   |
|                  |                             |                                       | Injun / 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<br>40% Excess / Tail: 15.9 ppg PNE-1 + 2.5% bwoc CaCl<br>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<br>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<br>MD: 5200<br>Inc. 44 deg. |                         |             |                     |  |  |   |  |   |
| 8.75"            | 5-1/2" 23# P-110 HP CDC HTQ | Rhinestreet                           | 6009                    | 6279        | AIR / 9.0ppg SOB    | Lead: 14.5 ppg<br>POZ:PNE-1 + 0.3% bwoc R3 + 1% bwoc EC1 + 0.75 gal/sk FP13L + 0.3% bwoc MPA170<br>Tail: 14.8 ppg PNE-1 + 0.35% bwoc R3 + 0.75 gal/sk FP13L + 50% bwoc ASCA1 + 0.5% bwoc MPA170<br>20% Excess<br>Lead Yield=1.19<br>Tail Yield=1.94<br>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<br>Burst=16240 psi<br>Note: Actual centralizer schedules may be changed due to hole conditions |   |
| 8.5" Curve       |                             | Cashaqua                              | 6279                    | 6379        | 11.5ppg-12.5ppg SOB |  |  |   |  |   |
|                  |                             | Middlesex                             | 6379                    | 6411        |                     |  |  |   |  |   |
|                  |                             | West River                            | 6411                    | 6482        |                     |  |  |   |  |   |
|                  |                             | Burkett                               | 6482                    | 6492        |                     |  |  |   |  |   |
|                  |                             | Tully Limestone                       | 6492                    | 6600        |                     |  |  |   |  |   |
| 8.5" Lateral     |                             | Hamilton                              | 6600                    | 6753        | 11.5ppg-12.5ppg SOB |  |  |   |  |   |
|                  |                             | Marcellus                             | 6709                    | 6791        |                     |  |  |   |  |   |
|                  |                             | TMD / TVD (Production)                | 21106                   | 6760 ✓      |                     |  |  |   |  |   |
|                  |                             | Onondaga                              | 6791 ✓                  |             |                     |  |  |   |  |   |

LP @ 6760' TVD / 8546' MD

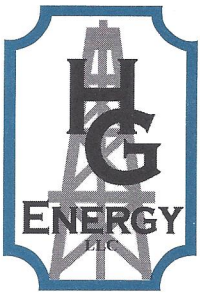
8.5" Hole - Cemented Long String  
 5-1/2" 23# P-110 HP CDC HTQ

+/-12560' ft Lateral

TD @ +/-6760' TVD  
 +/-21106' MD

X=centralizers

4709105724



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

CHK # 026231  
5/14/21  
\$ 2,500

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AUG 30 2021

WV Department of  
Environmental Protection

August 25, 2021

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

RE: Evans 1213 S-8H Request for Permit Revision – (47-041-05724)  
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-8H 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 5200' 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: 47-041-05724)

1 message

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

Thu, Sep 2, 2021 at 1:43 PM

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-8H", API: (47-041-05724). 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

 **IR-26 Blank.pdf**  
152K

 **47-041-05724 - mod.pdf**  
4030K

09/03/2021