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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, March 10, 2022  
PERMIT MODIFICATION APPROVAL  
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION  
1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit Modification Approval for CLUTTER 1H  
47-095-02776-00-00

**Lateral Extension**

ANTERO RESOURCES CORPORATION

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 'J. Martin', is written over the typed name and title.

James A. Martin  
Chief

Operator's Well Number: CLUTTER 1H  
Farm Name: ELDON J & RUTH A HELMAN  
U.S. WELL NUMBER: 47-095-02776-00-00  
Horizontal 6A New Drill  
Date Modification Issued: 3/10/2022

Promoting a healthy environment.

03/18/2022

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

1) Well Operator: Antero Resources Corporation 494507062 095 - Tyler Ellsworth Middlebourne 7.5'  
Operator ID County District Quadrangle

2) Operator's Well Number: Clutter Unit 1H Well Pad Name: Eldon Pad

3) Farm Name/Surface Owner: Eldon J. & Ruth A Helman Public Road Access: CR 10/1

4) Elevation, current ground: 880' Elevation, proposed post-construction: \_\_\_\_\_

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

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

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):  
Marcellus Shale: 6400' TVD, Anticipated Thickness- 55 feet, Associated Pressure- 2850#

8) Proposed Total Vertical Depth: 6400' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 15,600'

11) Proposed Horizontal Leg Length: 6,779'

12) Approximate Fresh Water Strata Depths: 156'

13) Method to Determine Fresh Water Depths: 47095009120000 Offset well records. Depths have been adjusted according to surface elevations.

14) Approximate Saltwater Depths: 1676'

15) Approximate Coal Seam Depths: None Anticipated

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

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: \_\_\_\_\_

*DCW  
2-28-2022*

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Office of Oil and Gas

MAR 07 2022

WV Department of  
Environmental Protection

WW-6B  
(04/15)

API NO. 47-095 - 02776 MOD  
OPERATOR WELL NO. Clutter Unit 1H  
Well Pad Name: Eldon Pad

18)

**CASING AND TUBING PROGRAM**

<u>TYPE</u>	<u>Size (in)</u>	<u>New or Used</u>	<u>Grade</u>	<u>Weight per ft. (lb/ft)</u>	<u>FOOTAGE: For Drilling (ft)</u>	<u>INTERVALS: Left in Well (ft)</u>	<u>CEMENT: Fill-up (Cu. Ft.)/CTS</u>
Conductor	20"	New	H-40	79#	80'	80'	CTS, 77 Cu. Ft.
Fresh Water	13-3/8"	New	J/K-55	54.5#	300'	300'	CTS, 313Cu. Ft.
Coal	9-5/8"	New	J-/K55	36#	2500'	2500'	CTS, 1018 Cu. Ft.
Intermediate							
Production	5-1/2"	New	P-110CY	20#	15,600'	15,600'	CTS, 3003 Cu. Ft.
Tubing	2-3/8"	New	N-80	4.7#			
Liners							

<u>TYPE</u>	<u>Size (in)</u>	<u>Wellbore Diameter (in)</u>	<u>Wall Thickness (in)</u>	<u>Burst Pressure (psi)</u>	<u>Anticipated Max. Internal Pressure (psi)</u>	<u>Cement Type</u>	<u>Cement Yield (cu. ft./k)</u>
Conductor	20"	24"	0.375"	2250	50	Class A	~1.18
Fresh Water	13-3/8"	17-1/2"	0.38"	2730	1000	Class A	~1.18
Coal	9-5/8"	12-1/4"	0.352"	3520	1500	Class A	~1.18
Intermediate							
Production	5-1/2"	8-3/4" & 8-1/2"	0.415"	14,360	2500	Class G/H	~1.8
Tubing	2-3/8"	4.778"	0.19"	11,200			
Liners							

**PACKERS**

Kind:	N/A			
Sizes:	N/A			
Depths Set:	N/A			

*DCN  
2-29-2022*

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MAR 07 2022

WV Department of  
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Page 2 of 3

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

Drill a new horizontal shallow well into the Marcellus Shale.

\*Antero will be air drilling the fresh water string which makes it difficult to determine when fresh water is encountered. Therefore, we have built in a buffer for the casing setting depth which helps to ensure that all fresh water zones are covered.

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

Antero plans to pump Slickwater into the Marcellus Shale formation in order to ready the well for production. The fluid will be comprised of approximately 99 percent water and sand, with less than 1 percent special-purpose additives as shown in the attached "List of Anticipated Additives Used for Fracturing or Stimulating Well."

Anticipated Max Pressure - 9300 lbs  
Anticipated Max Rate - 80 bpm

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 35.04 acres

22) Area to be disturbed for well pad only, less access road (acres): 12.85 acres

23) Describe centralizer placement for each casing string:

Conductor: no centralizers

Surface Casing: one centralizer 10' above the float shoe, one on the insert float collar and one every 4th joint spaced up the hole to surface.

Intermediate Casing: one centralizer above float joint, one centralizer 5' above float collar and one every 4th collar to surface.

Production Casing: one centralizer at shoe joint and one every 3 joints to top of cement in intermediate casing.

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

Conductor: no additives, Class A cement.

Surface: Class A cement with 2-3% calcium chloride and 1/4 lb of flake

Intermediate: Class A cement with 1/4 lb of flake, 5 gallons of clay treat

Production: Lead cement- 50/50 Class H/Poz + 1.5% salt + 1% C-45 + 0.5% C-16a + 0.2% C-12 + 0.45% C-20 + 0.05% C-51

Production: Tail cement- Class H + 45 PPS Calcium Carbonate + 1.0% FL-160 + 0.2% ACGB-47 + 0.05% ACSA-51 + 0.2% ACR-20

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25) Proposed borehole conditioning procedures:

Conductor: blowhole clean with air, run casing, 10 bbls fresh water.

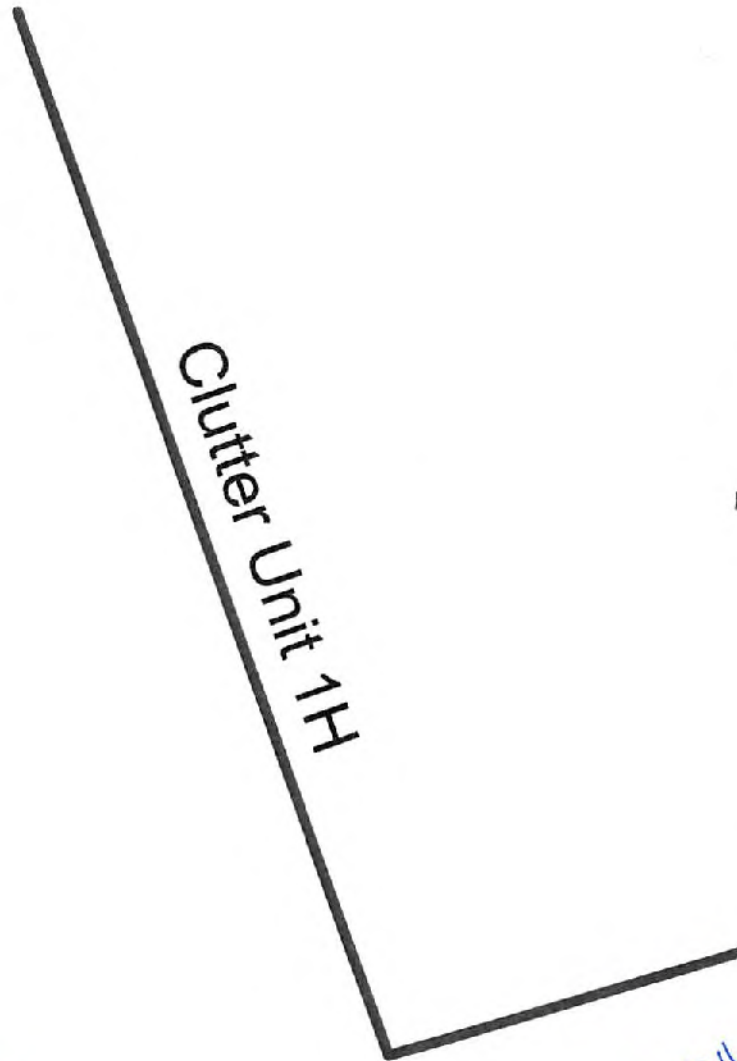
Surface: blowhole clean with air, trip to conductor shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate pipe capacity + 40 bbls fresh water followed by 25 bbls bentonite mud, 10 bbls fresh water spacer.

Intermediate: blowhole clean with air, trip to surface casing shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate 40 bbls brine water followed by 10 bbls fresh water and 25 bbls bentonite mud, pump 10 bbls fresh water.

Production: circulate with 14 lb/gal NaCl mud, trip to middle of lateral, circulate, pump high viscosity sweep, trip to base of curve, pump high viscosity sweep, trip to top of curve, trip to bottom, circulate, pump high viscosity sweep, trip out, run casing, circulate 10 bbls fresh water, pump 48 bbls barite pill, pump 10 bbls fresh water followed by 48 bbls mud flush and 10 bbls water.

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\*Note: Attach additional sheets as needed.



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Environmental Protection

*CHK# 4004768  
Amts 2500  
Date 2/8/22*



Antero Resources Corporation

Clutter Unit 1H - AOR



REMARKS  
No Wells of Interest

February 7, 2022

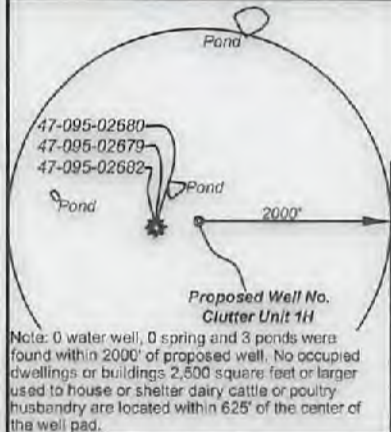
03/18/2022

**Antero Resources**  
**Well No. Clutter 1H**  
**BHL MOD**  
 Antero Resources Corporation



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 rules issued and prescribed by the Department of Environmental Protection.

*Bradley D. Miller*  
 Bradley D. Miller, P.S. 2167



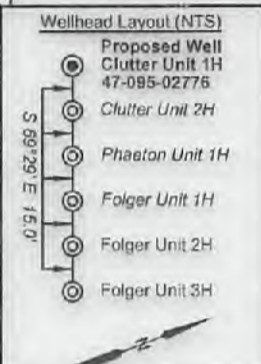
	Bearing	Dist.
L1	S 07°44' E	867.5'
L2	N 43°17' E	1,097.1'
L3	N 66°24' E	1,141.4'
L4	N 70°53' E	1,831.2'
L5	S 73°44' W	2,239.9'

Legend

- Proposed gas well
- Monument, as noted
- Existing Well, as noted
- Digitized Well, as noted
- Creek or Drain
- Road
- Surface boundary (approx.)
- Interior surface tracts (approx.)
- District Line

**Notes**  
 West Virginia Coordinate System of 1927, North Zone  
 based upon Differential GPS Measurements.  
 Well No. Clutter Unit 1H Top Hole coordinates are  
 N: 365,225.00' Latitude: 39°29'37.02"  
 E: 1,589,082.04' Longitude: 80°57'22.03"  
 Bottom Hole coordinates are  
 N: 371,041.90' Latitude: 39°30'33.81"  
 E: 1,584,822.96' Longitude: 80°58'17.57"  
 UTM Zone 17, NAD 1983  
 Top Hole Coordinates Bottom Hole Coordinates  
 N: 4,371,565.499m N: 4,373,315.676m  
 E: 503,787.622m E: 502,460.522m  
 Plat orientation and corner and well references are based upon the grid north meridian.  
 Well location references are based upon the magnetic meridian.

**Notes:**  
 Well No. Clutter Unit 1H UTM Zone 17, NAD 1927  
 Top Hole Coordinates  
 N: 14,341,684.12'  
 E: 1,652,795.74'  
 Point of Entry Coordinates  
 N: 14,341,001.25'  
 E: 1,650,656.98'  
 Bottom Hole Coordinates  
 N: 14,347,406.23'  
 E: 1,648,441.65'



FILE NO: 268-54-E-21  
 DRAWING NO: Clutter Unit 1H Well Plat  
 SCALE: 1" = 1000'  
 MINIMUM DEGREE OF ACCURACY: Submeter  
 PROVEN SOURCE OF ELEVATION: WVDOT, Harrisville, WV

**STATE OF WEST VIRGINIA**  
 DEPARTMENT OF ENVIRONMENTAL PROTECTION  
**OIL AND GAS DIVISION**

DATE: February 9 2022  
 OPERATOR'S WELL NO. Clutter Unit 1H  
 API WELL NO  
 47 - 095 - 02776  
 STATE COUNTY PERMIT

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

LOCATION: ELEVATION: As-Built 880' WATERSHED: Outlet Middle Island Creek QUADRANGLE: Top Hole: Middleboure Btm Hole: Paden City  
 DISTRICT: Elsworth Union Elson J. & COUNTY: Tyler 03/18/2022  
 SURFACE OWNER: Ruth A. Helman David S. Clough; ACREAGE: 61.83 61.83; 186.008;  
 ROYALTY OWNER: Elson J. & Ruth A. Helman; WVDNR; Gary C. & Maryjane Richards; Norma R. Spencer; 53; 57.23; 25.05;  
 Lora Keller Thomas (2); Richard Keith McCollum; LEASE NO: ACREAGE: 83.13; 190; 78.49;

PROPOSED WORK:  DRILL  CONVERT  DRILL DEEPER  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION  
 PERFORATE NEW FORMATION  OTHER PHYSICAL CHANGE IN WELL (SPECIFY) BHL MOD  
 PLUG AND ABANDON  CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 6,400' TVD 15,600' MD

WELL OPERATOR: Antero Resources Corporation DESIGNATED AGENT: Dianna Stamper - CT Corporation System  
 ADDRESS: 1615 Wynkoop Street ADDRESS: 5400 D Big Tyler Road  
 Denver, CO 80202 Charleston, WV 25313

**Antero Resources**  
**Well No. Clutter 1H**  
**BHL MOD**  
 Antero Resources Corporation

11,134' to Top Hole  
 3,728' to Bottom Hole  
 TOP HOLE LATITUDE 39 - 30 - 00  
 BTM HOLE LATITUDE 39 - 32 - 30



**Notes**  
 West Virginia Coordinate System of 1927, North Zone based upon Differential GPS Measurements. Well No. Clutter Unit 1H Top Hole coordinates are  
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TOP HOLE LONGITUDE 80 - 55 - 00  
 BTM HOLE LONGITUDE 80 - 57 - 30

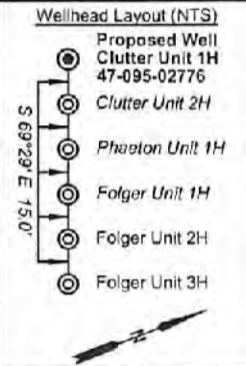


I, the undersigned, hereby certify that this plat is correct to the best of my knowledge and belief and shows all the information required by law and the rules issued and prescribed by the Department of Environmental Protection.

*Bradley D. Miller*  
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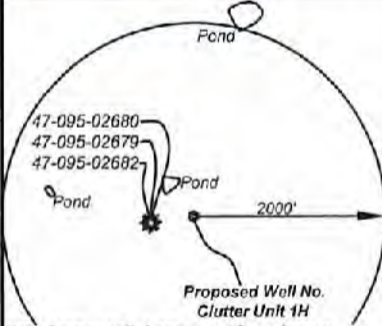


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- Legend**
- Proposed gas well
  - ⊗ Monument, as noted
  - ⊙ Existing Well, as noted
  - ⊛ Digitized Well, as noted
  - Creek or Drain
  - Road
  - Surface boundary (approx.)
  - Interior surface tracts (approx.)
  - District Line



Note: 0 water well, 0 spring and 3 ponds were found within 2000' of proposed well. No occupied dwellings or buildings 2,500 square feet or larger used to house or shelter dairy cattle or poultry husbandry are located within 625' of the center of the well pad.

FILE NO: 268-54-E-21  
 DRAWING NO: Clutter Unit 1H Well Plat  
 SCALE: 1" = 1000'  
 MINIMUM DEGREE OF ACCURACY: Submeter  
 PROVEN SOURCE OF ELEVATION: WVDOT, Harrisville, WV

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 ADDRESS: 1615 Wynkoop Street ADDRESS: 5400 D Big Tyler Road  
 Denver, CO 80202 Charleston, WV 25313



ID	TM/Par	Owner	Bk/Pg	Acres
1	19-1	Eldon J. & Ruth A. Helman	383/761	61.83
2	19-42	Carol J. Cox	334/298	142.00
3	10-10	Lora K. Thomas	201/359	307.05
4	10-1	Lora K. Thomas	175/19	53.00
5	6-2	Eldon J. & Ruth A. Helman	383/761	83.13
6	6-1	Eldon J. & Ruth A. Helman	383/761	169.00
7	6-6.14	Arlen G. Wells, Jr.	339/611	15.00
8	6-6.13	David S. Clough	351/752	12.25
9	6-6.12	David S. Clough	351/752	12.95
10	6-6.11	David S. Clough	351/752	12.40
11	6-6.10	Jeffrey M. & Jill S. Mennillo	368/770	9.90
12	6-6.9	David S. Clough	351/712	24.54
13	6-6.7	David S. Clough	351/752	16.35
14	6-6.8	Alan B. & Traci L. Clough	354/306	18.30
15	6-6.3	Eathan P. Wells	445/727	9.55
16	6-6.6	Richard Keith McCollum	362/348	25.05
17	6-6.5	Crystal R. & Charles J. Young, Jr.	345/211	25.65
18	6-6.4	Crystal R. & Charles J. Young, Jr.	368/773	25.35

Leases	
A	Eldon J. & Ruth A. Helman
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C	Lora Keller Thomas
D	Lora Keller Thomas
E	Gary C. & Maryjane Richards
F	Norma R. Spencer
G	WVDNR
H	Arlen G. Jr. & Marsha A. Wells
I	OPEN
J	Jeffrey M. Mennillo, et ux
K	David S. Clough
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 Denver, CO 80202 Charleston, WV 25313

INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE  
Chapter 22, Article 6A, Section 5(a)(5)  
IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S)

Under the oath required to make the verification on page 1 of this Notice and Application, I depose and say that I am the person who signed the Notice and Application for the Applicant, and that –

- (1) the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;
- (2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

	Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
A	<u>Eldon J. and Ruth A. Helman Lease</u> Eldon J. and Ruth A. Helman	Antero Resources Corporation	1/8+	0427/0610
C	<u>Lora Keller Thomas Lease</u> Lora Keller Thomas	Antero Resources Corporation	1/8+	62/581
D	<u>Lora Keller Thomas Lease</u> Lora Keller Thomas	Antero Resources Corporation	1/8+	626/599
E	<u>Gary C &amp; Maryjane Richards Lease</u> <u>Gary C &amp; Maryjane Richards</u>	Antero Resources Corporation	1/8+	505/680
F	<u>Norma R Spencer Lease</u> Norma R Spencer	Antero Resources Corporation	1/8+	564/428
G	<u>WVDNR Lease</u> WVDNR	Antero Resources Corporation	1/8+	121/242
K	<u>David S Clough Lease</u> David S Clough Antero Resources Appalachian Corporation	Antero Resources Appalachian Corporation Antero Resources Corporation	1/8+ Name Change	421/50 557/430

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FEB 18 2022

WV Department of  
Environmental Protection

03/18/2022

**INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE  
Chapter 22, Article 6A, Section 5(a)(5)  
IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S)**

Under the oath required to make the verification on page 1 of this Notice and Application, I depose and say that I am the person who signed the Notice and Application for the Applicant, and that –

- (1) the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;
- (2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
M <u>Richard Keith McCollum Lease</u>	Richard Keith McCollum	Antero Resources Appalachian Corporation	1/8+	422/488
	Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	577/430

\*Partial Assignments to Antero Resources Corporation include 100% rights to extract, produce and market the oil and gas from the Marcellus and any other formations completed with this well.

**Acknowledgement of Possible Permitting/Approval  
In Addition to the Office of Oil and Gas**

The permit applicant for the proposed well work addressed in this application hereby acknowledges the possibility of the need for permits and/or approvals from local, state, or federal entities in addition to the DEP, Office of Oil and Gas, including but not limited to the following:

- WV Division of Water and Waste Management
- WV Division of Natural Resources WV Division of Highways
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- County Floodplain Coordinator

The applicant further acknowledges that any Office of Oil and Gas permit in no way overrides, replaces, or nullifies the need for other permits/approvals that may be necessary and further affirms that all needed permits/approvals should be acquired from the appropriate authority before the affected activity is initiated.

Well Operator: Antero Resources Corporation RECEIVED  
 By: Tim Rady *Tim Rady* Office of Oil and Gas  
 Its: VP of Land FEB 18 2022

WV Department of  
Environmental Protection  
Page 2 of 2



February 17, 2022

West Virginia Department of Environmental Protection  
Office of Oil and Gas  
Attn: Mr. Taylor Brewer  
601 57<sup>th</sup> Street  
Charleston, WV 25304

Antero Resources  
1615 Wynkoop Street  
Denver, CO 80202  
Office 303.357.7310  
Fax 303.357.7315

Mr. Brewer:

Antero Resources Corporation (Antero) would like to submit the following permit modification for approved well on the existing Eldon Pad: Clutter Unit 1H (47-095-02776-00).

Attached you will find the following:

- Revised Form WW-6B
- Revised Form WW-6A1
- Revised Mylar Plat
- AOR

*\*Sign-off Rec.  
CK # 4004768  
\$ 2500*

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Office of Oil and Gas

FEB 18 2022

WV Department of  
Environmental Protection

If you have any questions please feel free to contact me at (303) 357-7182.

Thank you in advance for your consideration.

Sincerely,

Mallory Stanton  
Permitting Supervisor  
Antero Resources Corporation

Enclosures



Stansberry, Wade A &lt;wade.a.stansberry@wv.gov&gt;

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**Modification Horizontal H6A Well Work Permit API: 47-095-02776, 02777, 02778, 02780)**

1 message

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

Tue, Mar 15, 2022 at 10:25 AM

To: Mallory Stanton &lt;mstanton@anteroresources.com&gt;, Diane Blair &lt;dblair@anteroresources.com&gt;, Dani DeVito &lt;ddevito@shalepro.com&gt;, Douglas Newlon &lt;douglas.c.newlon@wv.gov&gt;, ljackson@wvassessor.com

I have attached a copy of the newly issued well [permit](#) number. This will serve as your copy.

**47-095-02776 - CLUTTER UNIT 1H**  
**47-095-02777 - GREENWOOD UNIT 1H**  
**47-095-02778 - JED UNIT 1H**  
**47-095-02780 - WABLE UNIT 1H**

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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**4 attachments**

-  **47-095-02776 - mod.pdf**  
1233K
-  **47-095-02777 - mod.pdf**  
1501K
-  **47-095-02780 - moc.pdf**  
1441K
-  **47-095-02778 - mod.pdf**  
1467K

**03/18/2022**