



---

west virginia department of environmental protection

---

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)

Monday, January 3, 2022  
PERMIT MODIFICATION APPROVAL  
New Drill / Modification

ANTERO RESOURCES CORPORATION  
1615 WYNKOOP STREET  
DENVER, CO 80202

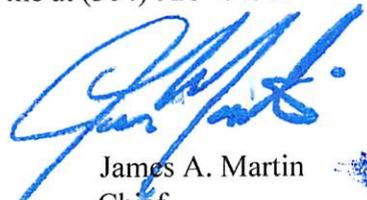
Re: Permit Modification Approval for MAROON UNIT 2H  
47-095-02757

**Extending Lateral, Updated Total Vertical Depth 5197' to 16426', Total Measured Depth 13800' to 25100'.. Updated Lease Chain.**

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.



James A. Martin  
Chief

Operator's Well Number: MAROON UNIT 2H  
Farm Name: CLARA SUZANNE WALLACE & RICKIE WALLAC  
U.S. WELL NUMBER: 47-095-02757  
New Drill Modification  
Date Modification Issued: 01/03/2022

Promoting a healthy environment.

01/07/2022

WW-6B  
(04/15)

API NO. 47-095 - 02757 MOD  
OPERATOR WELL NO. Maroon Unit 2H  
Well Pad Name: Thin Air Pad

**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 Porter Falls 7.5'  
Operator ID County District Quadrangle

2) Operator's Well Number: Maroon Unit 2H Well Pad Name: Thin Air Pad

3) Farm Name/Surface Owner: Clara Suzanne Wallace & Rickie Wallace Public Road Access: CR 11

4) Elevation, current ground: 1235' Elevation, proposed post-construction: ~1200'

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 Shale: 7300' TVD, Anticipated Thickness- 55 feet, Associated Pressure- 2950#

8) Proposed Total Vertical Depth: 7300' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 25,100' MD

11) Proposed Horizontal Leg Length: 16,426'

12) Approximate Fresh Water Strata Depths: 76' and 328'

13) Method to Determine Fresh Water Depths: 47-09-02266

14) Approximate Saltwater Depths: 1660'

15) Approximate Coal Seam Depths: None Identified

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: \_\_\_\_\_

RECEIVED  
Office of Oil and Gas

DEC 21 2021

WV Department of  
Environmental Protection

18)

**CASING AND TUBING PROGRAM**

<b>TYPE</b>	<b>Size (in)</b>	<b>New or Used</b>	<b>Grade</b>	<b>Weight per ft. (lb/ft)</b>	<b>FOOTAGE: For Drilling (ft)</b>	<b>INTERVALS: Left in Well (ft)</b>	<b>CEMENT: Fill-up (Cu. Ft.)/CTS</b>
Conductor	20"	New	H-40	94#	80	80	CTS, 77 Cu. Ft.
Fresh Water	13-3/8"	New	J-/k55	54.5#	378'	378'	CTS, 341 Cu. Ft.
Coal	9-5/8"	New	J/k-55	36#	2500'	2500'	CTS, 1018 Cu. Ft.
Intermediate							
Production	5-1/2"	New	PY-110	23#	25,100'	25,100'	5397 Cu. Ft
Tubing	2-3/8"	New	N-80	4.7#			
Liners							

<b>TYPE</b>	<b>Size (in)</b>	<b>Wellbore Diameter (in)</b>	<b>Wall Thickness (in)</b>	<b>Burst Pressure (psi)</b>	<b>Anticipated Max. Internal Pressure (psi)</b>	<b>Cement Type</b>	<b>Cement Yield (cu. ft./k)</b>
Conductor	30"	24"	0.438"	1530	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"	0.361"	12,630	2500	Lead-H/POZ & Tel - H	H/POZ-1.44 & 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			

RECEIVED  
Office of Oil and Gas

DEC 21 2021

WV Department of  
Environmental Protection

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

Drill, perforate, fracture a new horizontal shallow well and complete 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): 45.05 acres

22) Area to be disturbed for well pad only, less access road (acres): 17.67 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

RECEIVED  
Office of Oil and Gas  
DEC 21 2021  
WV Department of  
Environmental Protection

25) Proposed borehole conditioning procedures:

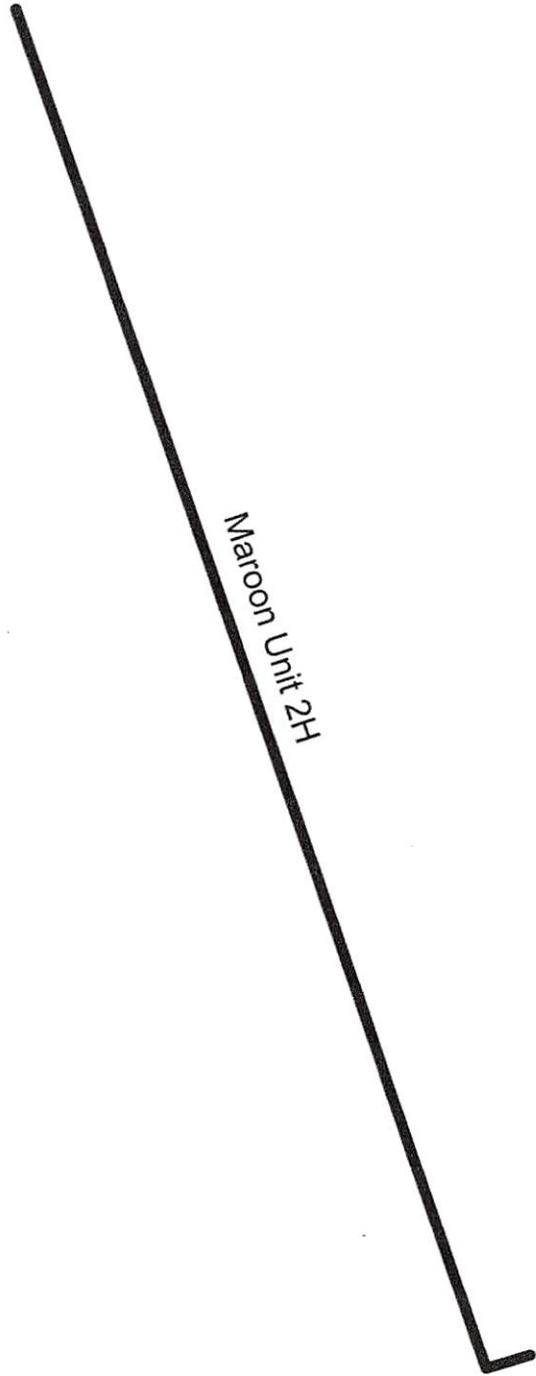
Conductor: blowhole clean with air, run casing, 10 bbls fresh water.

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.

\*Note: Attach additional sheets as needed.



Antero Resources Corporation

Maroon Unit 2H - AOR



REMARKS  
No Wells of Interest

December 8, 2021

RECEIVED  
Office of Oil and Gas

DEC 21 2021

WV Department of  
Environmental Protection

01/07/2022

LATITUDE 39°32'30"

LATITUDE 39°32'30"

400'

6,294' TO BOTTOM HOLE

4,478' TO BOTTOM HOLE

LONGITUDE 80°47'30"

Antero Resources Corporation Well No. Maroon Unit 2H

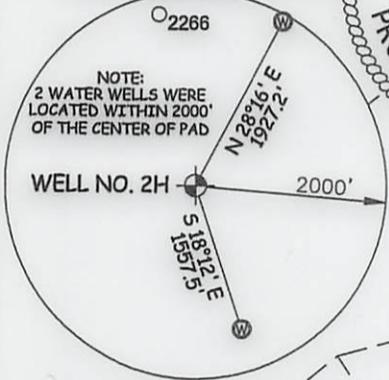
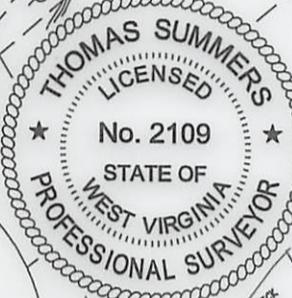
NOTES: WELL 2H TOP HOLE INFORMATION: N: 376,986ft E: 1,635,266ft LAT: 39°31'40.22" LON: 80°47'35.11" BOTTOM HOLE INFORMATION: N: 392,805ft E: 1,629,600ft LAT: 39°34'16.03" LON: 80°48'49.74" WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE. ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE GEOXT SUBMETER MAPPING GRADE GPS UNIT. PLAT ORIENTATION, CORNER, AND WELL REFERENCE TIE LINES ARE BASED ON GRID NORTH.

(NAD) 83 (UTM) ZONE 17 COORDS: WELL 2H TOP HOLE INFORMATION: N: 4,375,383m E: 517,798m BOTTOM HOLE INFORMATION: N: 4,380,174m E: 515,992m

(NAD) 27 (UTM) ZONE 17 COORDS: WELL 2H TOP HOLE INFORMATION: N: 14,354,189ft E: 1,698,762ft POINT OF ENTRY INFORMATION: N: 14,354,390ft E: 1,698,212ft BOTTOM HOLE INFORMATION: N: 14,369,906ft E: 1,692,834ft

NOTE: NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.

Table listing landowners and lease numbers for Ellsworth District - Tyler County and Green District - Wetzel County.



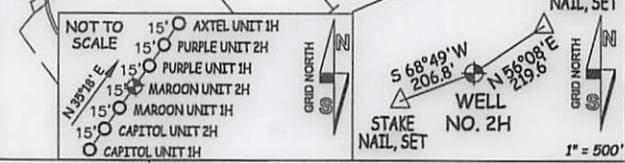
I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE RULES ISSUED AND PERSCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.



STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS. WILLow LAND SURVEYING PLLC, 220 MASONIC AVE. PENNSBORO WEST VIRGINIA 26415

JOB # 20-012WA, DRAWING # MAROON2HR2, SCALE 1" = 2000', MINIMUM DEGREE OF ACCURACY SUBMETER, PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS, STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS

LEGEND: Surface Owner Boundary Lines +/-, Adjoining Surface Tracts +/-, Found monument, as noted. THOMAS SUMMERS P.S. 2109, DATE 12/08/21, OPERATOR'S WELL # MAROON UNIT #2H



WELL TYPE: OIL \_\_\_ GAS X LIQUID INJECTION \_\_\_ WASTE DISPOSAL \_\_\_ 47 - 095 - 02757 Mbd (IF "GAS") PRODUCTION X STORAGE \_\_\_ DEEP \_\_\_ SHALLOW X STATE COUNTY PERMIT LOCATION: ELEVATION 1,235' - ORIGINAL 1,200' - PROPOSED WATERSHED OUTLET MIDDLE ISLAND CREEK QUADRANGLE PORTER FALLS 7.5' DISTRICT ELLSWORTH COUNTY TYLER SURFACE OWNER CLARA SUZANNE WALLACE & RICKIE WALLACE ACREAGE 60 ACRES +/- LEASE ACREAGE 60 AC +/-: 76.88 AC +/-; BRC APPALACHIAN MINERALS I LLC; D RALPH HACKER; D RALPH THACKER; MURIEL SHERWOOD; WILLIAM D. HOPE; HAROLD S. YOST ET UX; 43 AC +/-; 59 AC +/-; 75.97 AC +/-; 163.96 AC +/-; 183.72 AC +/-; 87 AC +/-; CHARLES E. GUMP ET UX; BRC APPALACHIAN MINERALS I LLC; SHIBEN ESTATES INC.; ROBERT B. MYERS, SR.; ROBERT B. MYERS, SR.; DAVID L. SMITH 52.08 AC +/-; 39 AC +/-; 23.08 AC +/-; 10 AC +/-; 93.5 AC +/-; 30 AC +/- PROPOSED WORK: DRILL \_\_\_ CONVERT \_\_\_ DRILL DEEPER X REDRILL \_\_\_ FRACTURE OR STIMULATE X PLUG OFF OLD FORMATION \_\_\_ PERFORATE NEW FORMATION X OTHER PHYSICAL CHANGE IN WELL (SPECIFY) MOD-BHL PLUG & ABANDON CLEAN OUT & REPLUG TARGET FORMATION MARCELLUS ESTIMATED DEPTH 7,300' TVD 25,100' MD WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM ADDRESS 1615 WYNKOOP ST. ADDRESS 5400 D BIG TYLER ROAD CHARLESTON, WV 25313

LATITUDE 39°32'30"

400'

LATITUDE 39°32'30"

6,294' TO BOTTOM HOLE

4,478' TO BOTTOM HOLE

5,036'

LONGITUDE 80°47'30"

LONGITUDE 80°47'30"

Antero Resources Corporation  
Well No. Maroon Unit 2H

NOTES:

WELL 2H TOP HOLE INFORMATION:  
N: 376,986ft E: 1,635,266ft  
LAT: 39°31'40.22" LON: 80°47'35.11"

BOTTOM HOLE INFORMATION:  
N: 392,805ft E: 1,629,600ft  
LAT: 39°34'16.03" LON: 80°48'49.74"

WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE. ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE GEOXT SUBMETER MAPPING GRADE GPS UNIT. PLAT ORIENTATION, CORNER, AND WELL REFERENCE TIE LINES ARE BASED ON GRID NORTH.

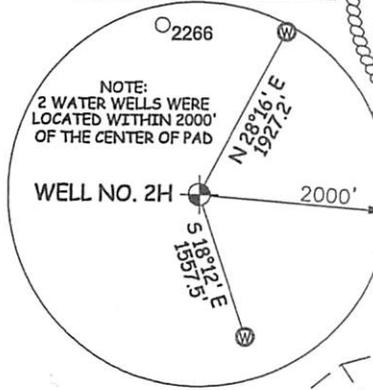
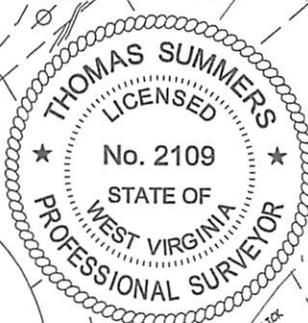
(NAD) 83 (UTM) ZONE 17 COORDS:  
WELL 2H TOP HOLE INFORMATION:  
N: 4,375,383m E: 517,798m  
BOTTOM HOLE INFORMATION:  
N: 4,380,174m E: 515,992m

(NAD) 27 (UTM) ZONE 17 COORDS:  
WELL 2H TOP HOLE INFORMATION:  
N: 14,354,189ft E: 1,698,762ft  
POINT OF ENTRY INFORMATION:  
N: 14,354,390ft E: 1,698,212ft  
BOTTOM HOLE INFORMATION:  
N: 14,369,906ft E: 1,692,834ft

NOTE  
NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.

WV NORTH ZONE  
GRID NORTH

Ellsworth District - Tyler County	
07-07	Lillie Gump
07-08	Lillie Gump
07-09	Harold Yost
07-10	William Hope
07-11	William Hope
07-12	William Hope
07-14	William Hope
07-25	BB Farm Investments LLC
07-26	William Hope
07-27	James Kleech
11-15	BB Farm Investments LLC
11-16	James Kleech
11-17	James Kleech
11-18	Sarah Sine
11-18.1	Sarah Sine
11-19	Elzie Hall
11-20	Edward Quirk
11-21	Edward Quirk
11-59	Edward Quirk
11-60	Michael Martin
12-01	James Kleech
12-02	Gary Midcap
12-07	Coastal Forest Resources Co.
12-08	Shirley Carroll
12-09	Coastal Forest Resources Co.
12-10	Michael Martin
12-11	Rickie Wallace
12-12	Rockford Energy LLC
12-13	Eric Fisher
12-33	Richard Neff
Green District - Wetzel County	
11-16	David Smith Et Al
11-18	David Smith Et Al
11-19	David Smith Et Al
11-21	Fluharty Family Trust
11-22	Fluharty Family Trust
11-23	David Smith Et Al
11-24	David Smith Et Al
11-30	Fluharty Family Trust
11-31	Steven Beatty
11-31.1	Brian Stradley
11-32	David Smith Et Al
11-36	Thomas Gaffney
11-37	Sylvia Warrick
11-38	Charles Gump
11-39	Michael Smith
11-40	David Smith Et Al



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 PERSCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.



STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS

WILLOW LAND SURVEYING PLLC  
220 MASONIC AVE. PENNSBORO WEST VIRGINIA 26415

JOB # 20-012WA  
DRAWING # MAROON2HR2  
SCALE 1" = 2000'  
MINIMUM DEGREE OF ACCURACY SUBMETER  
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

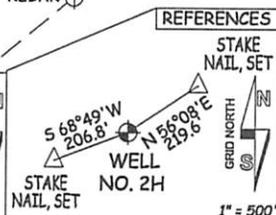
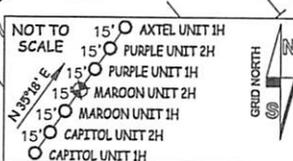
LEGEND

- Surface Owner Boundary Lines +/-
- Adjoining Surface Tracts +/-
- Found monument, as noted

THOMAS SUMMERS P.S. 2109

STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS

DATE 12/08/21  
OPERATOR'S WELL# MAROON UNIT #2H



WELL TYPE: OIL \_\_\_ GAS X LIQUID INJECTION \_\_\_ WASTE DISPOSAL \_\_\_ 47 - 095 - 02757 MOD

(IF "GAS") PRODUCTION X STORAGE \_\_\_ DEEP \_\_\_ SHALLOW X STATE COUNTY PERMIT

LOCATION: ELEVATION 1,235'-ORIGINAL 1,200'-PROPOSED WATERSHED OUTLET MIDDLE ISLAND CREEK

QUADRANGLE PORTER FALLS 7.5' DISTRICT ELLSWORTH COUNTY TYLER

SURFACE OWNER CLARA SUZANNE WALLACE & RICKIE WALLACE ACREAGE 60 ACRES +/-

OIL & GAS ROYALTY OWNER PHILLIP K. GEORGE; SAMUEL K. STONEKING, JR.; LEASE ACREAGE 60 AC +/-; 76.88 AC +/-;

BRC APPALACHIAN MINERALS I LLC; D RALPH HACKER; D. RALPH THACKER; MURIEL SHERWOOD; WILLIAM D. HOPE; HAROLD S. YOST ET UX; 43 AC +/-; 59 AC +/-; 75.97 AC +/-; 183.96 AC +/-; 183.72 AC +/-; 87 AC +/-;

CHARLES E. GUMP ET UX; BRC APPALACHIAN MINERALS I LLC; SHIBEN ESTATES INC.; ROBERT B. MYERS, SR.; ROBERT B. MYERS, SR.; DAVID L. SMITH 52.08 AC +/-; 39 AC +/-; 23.06 AC +/-; 10 AC +/-; 93.5 AC +/-; 30 AC +/-

PROPOSED WORK: DRILL \_\_\_ CONVERT \_\_\_ DRILL DEEPER X REDRILL \_\_\_ FRACTURE OR STIMULATE X

PLUG OFF OLD FORMATION \_\_\_ PERFORATE NEW FORMATION X OTHER PHYSICAL CHANGE IN WELL

(SPECIFY) MOD-BHL PLUG & ABANDON CLEAN OUT & REPLUG

TARGET FORMATION MARCELLUS ESTIMATED DEPTH 7,300' TVD 25,100' MD

WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM

ADDRESS 1615 WYNKOOP ST. ADDRESS 5400 D BIG TYLER ROAD

FORM WW-6 DENVER, CO 80202 CHARLESTON, WV 25313

01/07/2022

COUNTY NAME PERMIT



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

---

**Expedited Modification Horizontal H6A Well Work Permit (API: 47-095-02757)**

1 message

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

Mon, Jan 3, 2022 at 10:56 AM

To: Mallory Stanton &lt;mstanton@anteroresources.com&gt;, mhamsher@anteroresources.com, 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](#) numbers:

**47-095-02757 - MAROON UNIT 2H**

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)**

---

**2 attachments** **47-095-02757 - mod.pdf**  
2023K **IR-26 Blank.pdf**  
164K**01/07/2022**