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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

Austin Caperton, Cabinet Secretary  
[www.dep.wv.gov](http://www.dep.wv.gov)

Wednesday, September 16, 2020  
PERMIT MODIFICATION APPROVAL  
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION  
1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit Modification Approval for VULCAN 2H  
47-095-02702-00-00

**Lateral Length**

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 'James A. Martin', is positioned above the printed name and title.

James A. Martin  
Chief

Operator's Well Number: VULCAN 2H  
Farm Name: RICHARD D. PYLES  
U.S. WELL NUMBER: 47-095-02702-00-00  
Horizontal 6A New Drill  
Date Modification Issued: September 16, 2020

Promoting a healthy environment.

WW-6B  
(04/15)

Chuck# 220082  
7/23/2020  
\$5,000.00

PERMIT MODIFICATION API # 47-095-02702

API NO. 47-095 - 02702

OPERATOR WELL NO. Vulcan Unit 2H

Well Pad Name: Pyles 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: Vulcan Unit 2H Well Pad Name: Pyles Pad

3) Farm Name/Surface Owner: Richard D. Pyles Public Road Access: US Route 34

4) Elevation, current ground: 1081' Elevation, proposed post-construction: ~1081'

5) Well Type (a) Gas X Oil Underground Storage  
Other

(b) If Gas Shallow X Deep  
Horizontal X

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):  
Marcellus Shale: 7100' TVD, Anticipated Thickness- 55 feet, Associated Pressure- 2850#

8) Proposed Total Vertical Depth: 7100' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 22700' MD

11) Proposed Horizontal Leg Length: 14348'

12) Approximate Fresh Water Strata Depths: 61'

13) Method to Determine Fresh Water Depths: 47-095-01958

14) Approximate Saltwater Depths: 2200'

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 X

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

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WW-6B  
(04/15)

API NO. 47- 095 - 02702

OPERATOR WELL NO. Vulcan Unit 2H

Well Pad Name: Pyles Pad

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-55         | 54.5#                         | 300                               | 300                                 | CTS, 417 Cu. Ft.                     |
| Coal         | 9-5/8"           | New                | J-55         | 36#                           | 2500                              | 2500                                | CTS, 1018 Cu. Ft.                    |
| Intermediate |                  |                    |              |                               |                                   |                                     |                                      |
| Production   | 5-1/2"           | New                | P-110        | 23#                           | 22700                             | 22700                               | 5834 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    | 20"              | 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"               | 0.415"                     | 12,630                      | 2500  | Lead-H/POZ & Tail - H | H/POZ-1.44 & H-1.8              |
| Tubing       | 2-3/8"           | 4.778"                        | 0.19"                      | 11,200                      |   |                       |                                 |
| Liners       |                  |                               |                            |                             |   |                       |                                 |

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**PACKERS**

WV Department of  
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|             |     |  |  |  |
|-------------|-----|--|--|--|
| Kind:       | N/A |  |  |  |
| Sizes:      | N/A |  |  |  |
| Depths Set: | N/A |  |  |  |

WW-6B  
(10/14)

API NO. 47- 095 - 02702  
 OPERATOR WELL NO. Vulcan Unit 2H  
 Well Pad Name: Pyles Pad

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.

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): 23.71 acres

22) Area to be disturbed for well pad only, less access road (acres): 10.00 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.

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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

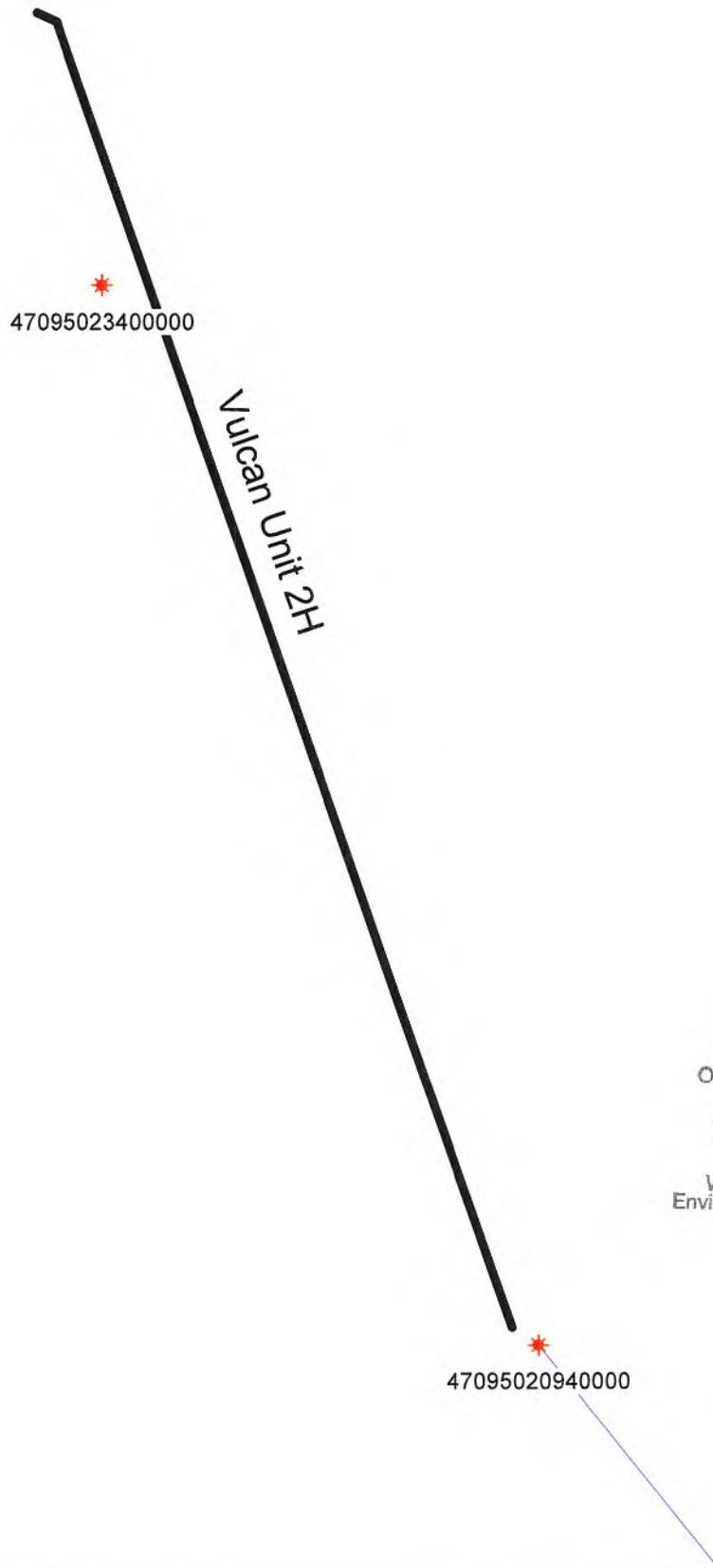
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25) Proposed borehole conditioning procedures:

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.

\*Note: Attach additional sheets as needed.

PERMIT MODIFICATION API # 47-095-02702



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**Antero**  
Resources

Antero Resources Corporation

Vulcan Unit 2H - AOR

0 2,500  
FEET

WELL SYMBOLS  
Gas Well

April 14, 2020

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 |
|--|--------------------------------|------------|-----------|
| <b><u>Richard D. Pyles Lease (TM 16 PCL 42)</u></b>      |                                |            |           |
| Richard D. Pyles   | Antero Resources Corporation   | 1/8+       | 0562/0590 |
| <b><u>Joseph L. Sitko Jr. et ux Lease</u></b>            |                                |            |           |
| Joseph L. Sitko Jr. et ux                                | TNG LLC                        | 1/8        | 0375/0384 |
| TNG LLC  | Statoil USA Onshore Properties | Assignment | 0423/0152 |
| Statoil USA Onshore Properties                           | EQT Production Company         | Assignment | 0539/0239 |
| EQT Production Company                                   | Antero Resources Corporation   | Assignment | 0022/0144 |
| <b><u>Richard D. Pyles Lease (TM 16 PCL 42.1)</u></b>    |                                |            |           |
| Richard D. Pyles   | Antero Resources Corporation   | 1/8+       | 0562/0590 |
| <b><u>Helen E. Boggs Lease</u></b>                       |                                |            |           |
| Helen E. Boggs   | Energy Production Inc.         | 1/8+       | 0429/0656 |
| Energy Production Inc.                                   | Antero Resources Corporation   | Assignment | 0465/0312 |
| <b><u>Alfred Lonzo Eddy Lease</u></b>                    |                                |            |           |
| Alfred Lonzo Eddy  | Antero Resources Corporation   | 1/8+       | 0411/0532 |
| <b><u>Ridgetop Capital II LP Lease (TM 22 PCL 3)</u></b> |                                |            |           |
| Ridgetop Capital II LP                                   | Statoil USA Onshore Properties | Assignment | 0387/0206 |
| Statoil USA Onshore Properties                           | EQT Production Company         | Assignment | 0539/0239 |
| EQT Production Company                                   | Antero Resources Corporation   | Assignment | 0663/0001 |
| <b><u>Ridgetop Capital II LP Lease (TM 22 PCL 4)</u></b> |                                |            |           |
| Ridgetop Capital II LP                                   | Statoil USA Onshore Properties | Assignment | 0387/0206 |
| Statoil USA Onshore Properties                           | EQT Production Company         | Assignment | 0539/0239 |
| EQT Production Company                                   | Antero Resources Corporation   | Assignment | 0663/0001 |
| <b><u>BRC Appalachian Minerals I LLC Lease</u></b>       |                                |            |           |
| BRC Appalachian Minerals I LLC                           | BRC Working Interest Company   | 1/8        | 0369/0300 |
| BRC Working Interest Company                             | Chesapeake Appalachia LLC      | Assignment | 0369/0784 |
| Chesapeake Appalachia LLC                                | Statoil USA Onshore Properties | Assignment | 0378/0764 |
| Statoil USA Onshore Properties                           | EQT Production Company         | Assignment | 0539/0239 |
| EQT Production Company                                   | Antero Resources Corporation   | Assignment | 0663/0001 |

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\*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.

WW-6A1

Operator's Well Number Vulcan Unit 2H

INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE  
Chapter 22, Article 6A, Section 5(a)(5)  
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| <u>Grantor, lessor, etc.</u>   | <u>Grantee, lessee, etc.</u>  | <u>Royalty</u>                                | <u>Book/Page</u>                                 |
|--|---|---|--|
| <u>Ronald P. Webb Lease</u><br>Ronald P. Webb  | Antero Resources Corporation  | 1/8   | 0044/0697  |
| <u>Carol J. Knapp Lease</u><br>Carol J. Knapp<br>JB Production Company<br>Statoil USA Onshore Properties<br>Statoil USA Onshore Properties<br>EQT Production Company | JB Production Company<br>Statoil USA Onshore Properties<br>EQT Production Company<br>Antero Resources Corporation | 1/8<br>Assignment<br>Assignment<br>Assignment | 0388/0141<br>0469/0419<br>0539/0239<br>0663/0001 |
| <u>Anthony Bruce Parr Lease</u><br>Anthony Bruce Parr  | Antero Resources Corporation  | 1/8+  | 0031/0723  |
| <u>Larry Stevens Lease</u><br>Larry Stevens  | Antero Resources Corporation  | 1/8+  | 0587/0787  |
| <u>Richard Lee White II Lease</u><br>Richard Lee White II  | Antero Resources Corporation  | 1/8   | 0023/0777  |

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WW-6A1  
(5/13)

Operator's Well No. Vulcan Unit 2H

**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)**

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| Lease Name or Number        | Grantor, Lessor, etc. | Grantee, Lessee, etc.        | Royalty | Book/Page |
|-----------------------------|-----------------------|------------------------------|---------|-----------|
| <u>Kendra K. Wyke Lease</u> | Kendra K. Wyke        | Antero Resources Corporation | 1/8+    | 0044/0694 |

\*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

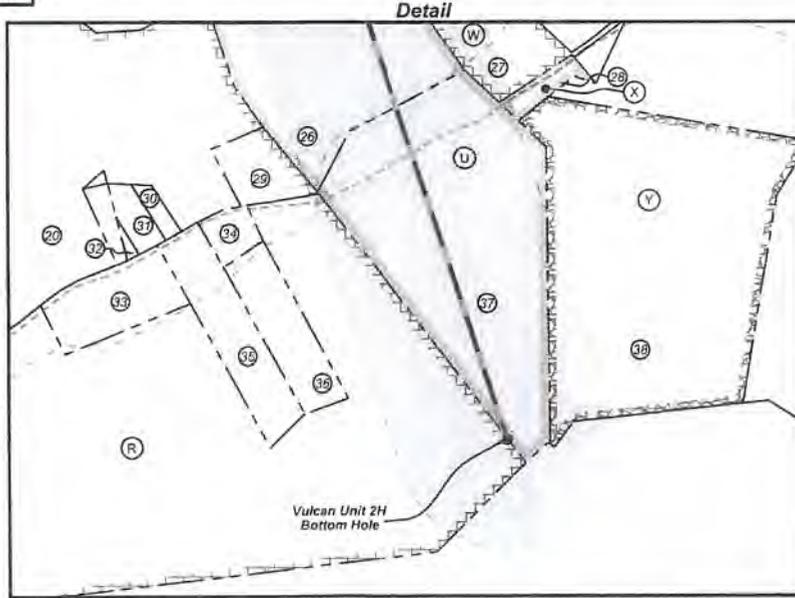
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The applicant further acknowledges that any Office of Oil and Gas permit in no way overrides, replaces, or nullifies the need for other permits/approvals that may be necessary and further affirms that all needed permits/approvals should be acquired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

Well Operator: Antero Resources Corporation  
By: Tim Rady  
Its: VP of Land

**\*Co-tenancy utilization – At least 7 mineral owners in tract. At least 75% of the royalty owners have executed a lease on the tract. The interests of the remaining co-tenants were acquired pursuant to the Co-tenancy Modernization and Majority Protection Act**





| ID | TM/Par   | Owner                            | DB/PG    | Acres  |
|----|----------|----------------------------------|----------|--------|
| 1  | 16-42    | Richard D. Pyles                 | 379/20   | 188.50 |
| 2  | 16-22    | Joseph L. Jr. & Karen L. Silko   | 296/13   | 81.70  |
| 3  | 16-23    | Joseph L. Silko                  | 314/462  | 29.70  |
| 4  | 16-44.1  | Carl Strangli                    | 543/598  | 3.70   |
| 5  | 15-36    | Rodney A. & Candis L. Nash       | 351/701  | 85.48  |
| 6  | 16-44    | Robert A. Pyles, et al           | 335/482  | 87.82  |
| 7  | 16-42.1  | Richard D. Pyles                 | 336/815  | 4.56   |
| 8  | 15-32    | William S. & Opal Marie Nash     | 335/188  | 78.58  |
| 9  | 22-3     | Harold L. & Deborah C. Holloway  | 287/669  | 22.95  |
| 10 | 16-43    | Alfred L. Eddy                   | 344/22   | 37.10  |
| 11 | 22-1     | Robert I. Reed & Floyd W. Reed   | 321/763  | 37.60  |
| 12 | 22-2     | Ronald Hartline & Jamie Barnhart | 591/741  | 1.50   |
| 13 | 22-4     | Stephen H. & Barbara J. Dunthorn | 216/40   | 69.00  |
| 14 | 22-6     | Antero Resources Inc.            | 662/782  | 131.57 |
| 15 | 22-5     | Antero Resources Corporation     | 662/782  | 84.67  |
| 16 | 22-41    | Anthony B. Parr                  | 342/763  | 222.00 |
| 17 | 22-40    | Ronald P. & Sandra L. Webb       | 282/7    | 65.00  |
| 18 | 22-39    | Ronald P. & Sandra L. Webb       | 270/567  | 45.00  |
| 19 | 28-9     | David & Cheryl L. Barrick        | 263/606  | 87.53  |
| 20 | 28-31    | Victor A. & Lorraine B. Weekley  | AR49/717 | 271.00 |
| 21 | 22-38    | Bruce & Sandra L. Parr           | 368/790  | 113.0  |
| 22 | 22-37    | B.W. Weekley                     | 107/562  | 15.78  |
| 23 | 22-34    | Raymond L. Parr, et al           | 329/181  | 55.25  |
| 24 | 22-36    | B.W. Weekley                     | 107/562  | 23.50  |
| 25 | 22-35    | Marie Eddy                       | 344/358  | 52.96  |
| 26 | 28-32    | B.W. Weekley                     | 107/562  | 33.31  |
| 27 | 28-43    | Wanda J. Parr                    | 327/435  | 8.02   |
| 28 | 28-42    | Robert H. Anderson               | 238/76   | 0.99   |
| 29 | 28-31.1  | Joshua M. & Crystal L. Rocchio   | 348/33   | 2.30   |
| 30 | 28-31.16 | William Morgan                   | 374/472  | 0.50   |
| 31 | 28-31.12 | William Morgan                   | 374/472  | 1.00   |
| 32 | 28-31.19 | James & Peggy Morgan             | 377/10   | 0.14   |
| 33 | 28-31.10 | Danny Swiger & Peggy Smith       | 336/675  | 4.00   |
| 34 | 28-31.20 | Randy Wells                      | 445/315  | 1.00   |
| 35 | 28-31.3  | David Lantz & Rita Parr          | 618/688  | 5.00   |
| 36 | 28-31.2  | David Lantz & Rita Parr          | 618/688  | 4.00   |
| 37 | 28-33    | B.W. Weekley                     | 107/562  | 25.30  |
| 38 | 28-35    | Shir N. Baker Jr.                | WB 38/1  | 32.00  |

| Leases |                                    |
|--------|------------------------------------|
| A      | Richard D. & Cathy J. Pyles        |
| B      | Joseph L. Silko, et ux             |
| C      | Joseph L. Silko, et ux             |
| D      | Bruce Winkelmann                   |
| E      | Helen E. Boggs                     |
| F      | Richard D. & Cathy J. Pyles        |
| G      | William S. Nash, et al             |
| H      | Ridgetop Capital II, LP            |
| I      | Alfred Lonzo Eddy                  |
| J      | Ridgetop Capital II, LP            |
| K      | Marjorie R. Asher Longston, et vir |
| L      | Ridgetop Capital II, LP            |
| M      | Anthony Bruce Parr                 |
| N      | BRC Appalachian Minerals I, LLC    |
| O      | Ronald P. Webb                     |
| P      | Carol J. Knapp                     |
| Q      | Anthony Bruce Parr, et ux          |
| R      | Kendra K. Wyke                     |
| S      | OPEN                               |
| T      | Nancy L. Mams                      |
| U      | Richard Lee White, II              |
| V      | Larry Stevens                      |
| W      | Wanda J. Parr                      |
| X      | Lucille Adams                      |
| Y      | Bounty Minerals, LLC               |

FILE NO: 190-54-E-19  
DRAWING NO: Vulcan Unit 2H Well Plat  
SCALE: 1" = 2000'  
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: July 30 2020  
OPERATOR'S WELL NO. Vulcan 2H  
API WELL NO  
47 095 02702  
STATE COUNTY PERMIT

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

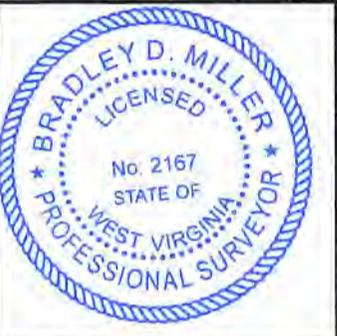
LOCATION: ELEVATION: As-Built 1,081' WATERSHED: Outlet Middle Island Creek QUADRANGLE: Shirley  
DISTRICT: Ellsworth COUNTY: Tyler 45, 79 042; 177,  
SURFACE OWNER: Richard D. Pyles, et ux; Richard L. White, II, et ux; Ridgetop Capital II, LP (2); BRC Appalachian Minerals I, LLC; Ronald P. Webb, et ux; 37 10; 22.95; 69.50;  
ROYALTY OWNER: Richard D. & Cathy J. Pyles; Joseph L. Silko, et ux; Helen E. Boggs; Alfred Lonzo Eddy LEASE NO: ACREAGE: 90; 65; 45; 113;  
PROPOSED WORK:  DRILL  CONVERT  DRILL DEEPER  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION  
 PERFORATE NEW FORMATION  OTHER PHYSICAL CHANGE IN WELL (SPECIFY) BHL MOD 7,100' TVD  
 PLUG AND ABANDON  CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 22,700' 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. Vulcan 2H**  
**BHL MOD**  
**Antero Resources Corporation**



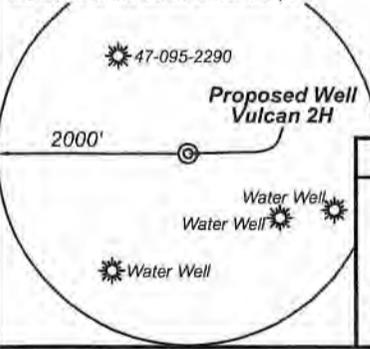
- Wellhead Layout**
- Vulcan Unit 1H  
47-095-02701  
Proposed
  - Vulcan Unit 2H  
47-095-02702  
Proposed
  - Prosper Unit 1H  
47-095-02699
  - Prosper Unit 2H  
47-095-02700
  - Friend Unit 1H  
47-095-02695
  - Friend Unit 2H  
47-095-02696
  - Seagrave Unit 1H  
47-095-02697
  - Seagrave Unit 2H  
47-095-02698



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.

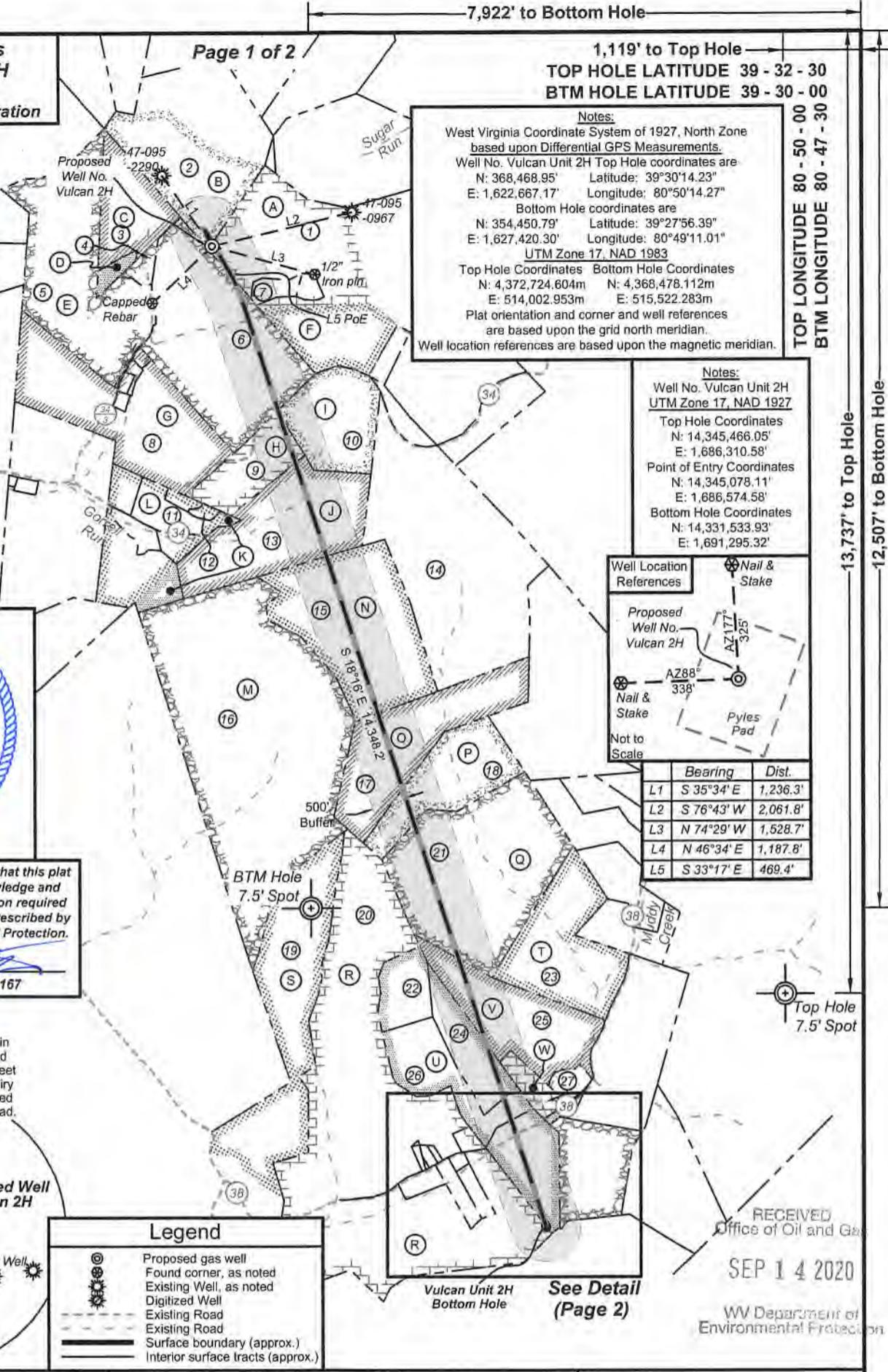
*Bradley D. Miller*  
**Bradley D. Miller, P.S. 2167**

Note: 3 water wells 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.



**Legend**

- Proposed gas well
- Found corner, as noted
- Existing Well, as noted
- Digitized Well
- Existing Road
- Existing Road
- - - Surface boundary (approx.)
- - - Interior surface tracts (approx.)



**Notes:**  
 West Virginia Coordinate System of 1927, North Zone based upon Differential GPS Measurements.  
 Well No. Vulcan Unit 2H Top Hole coordinates are  
 N: 368,468.95' Latitude: 39°30'14.23"  
 E: 1,622,667.17' Longitude: 80°50'14.27"  
 Bottom Hole coordinates are  
 N: 354,450.79' Latitude: 39°27'56.39"  
 E: 1,627,420.30' Longitude: 80°49'11.01"  
 UTM Zone 17, NAD 1983  
 Top Hole Coordinates Bottom Hole Coordinates  
 N: 4,372,724.604m N: 4,368,478.112m  
 E: 514,002.953m E: 515,522.283m  
 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. Vulcan Unit 2H  
 UTM Zone 17, NAD 1927  
 Top Hole Coordinates  
 N: 14,345,466.05'  
 E: 1,686,310.58'  
 Point of Entry Coordinates  
 N: 14,345,078.11'  
 E: 1,686,574.58'  
 Bottom Hole Coordinates  
 N: 14,331,533.93'  
 E: 1,691,295.32'



|    | Bearing    | Dist.    |
|----|------------|----------|
| L1 | S 35°34' E | 1,236.3' |
| L2 | S 76°43' W | 2,061.8' |
| L3 | N 74°29' W | 1,528.7' |
| L4 | N 46°34' E | 1,187.8' |
| L5 | S 33°17' E | 469.4'   |

Vulcan Unit 2H Bottom Hole **See Detail (Page 2)**

RECEIVED  
 Office of Oil and Gas  
 SEP 14 2020  
 WV Department of Environmental Protection

FILE NO: 190-54-E-19  
 DRAWING NO: Vulcan Unit 2H Well Plat  
 SCALE: 1" = 2000'  
 MINIMUM DEGREE OF ACCURACY:  
 Submeter  
 PROVEN SOURCE OF ELEVATION:  
 WVDOT, Harrisville, WV

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

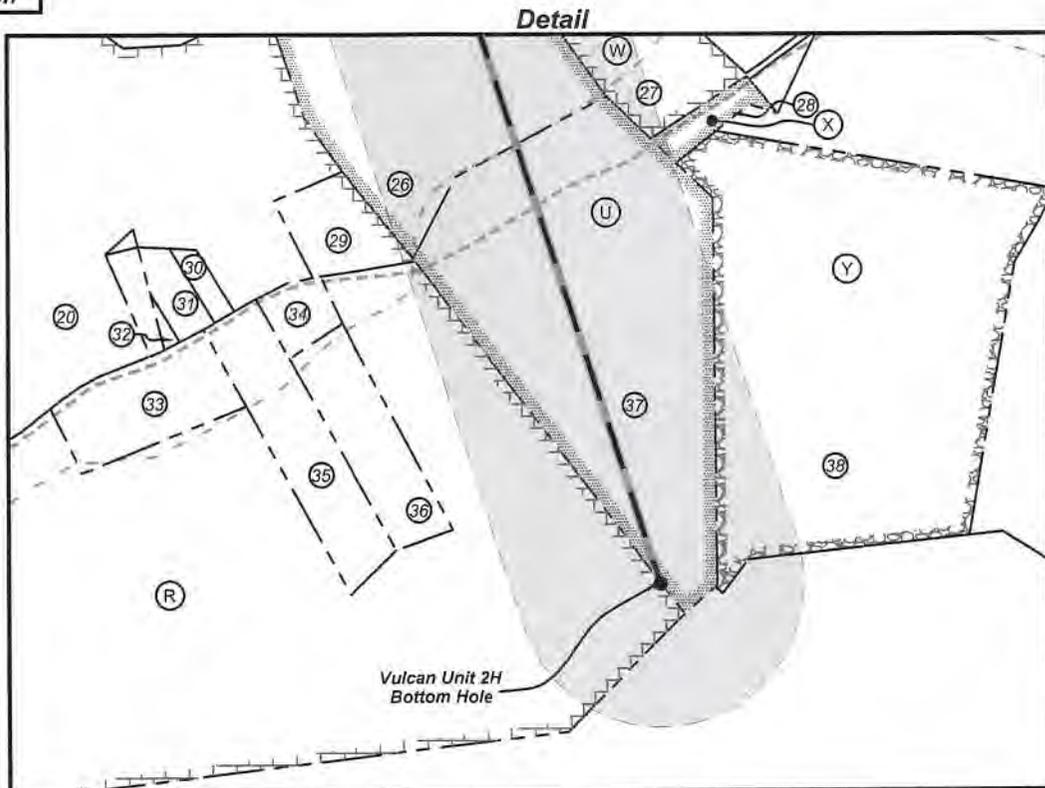
DATE: July 30 2020  
 OPERATOR'S WELL NO. Vulcan 2H  
 API WELL NO MOD1  
 47 - 095 - 02702  
 STATE COUNTY PERMIT

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

LOCATION: ELEVATION: As-Built 1,081' WATERSHED: Outlet Middle Island Creek QUADRANGLE: Shirley  
 DISTRICT: Ellsworth COUNTY: Tyler  
 SURFACE OWNER: Richard D. Pyles ACREAGE: 168.5  
 ROYALTY OWNER: Richard D. & Cathy J. Pyles; Joseph L. Sitko, et ux; Helen E. Boggs; Alfred Lonzo Eddy LEASE NO: ACREAGE: 97.2; 52,938; 271

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: 7,100' TVD 22,700' 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



| ID | TM/Par   | Owner                            | DB/PG    | Acres  |
|----|----------|----------------------------------|----------|--------|
| 1  | 16-42    | Richard D. Pyles                 | 379/20   | 168.50 |
| 2  | 16-22    | Joseph L. Jr. & Karen L. Sitko   | 296/13   | 81.70  |
| 3  | 16-23    | Joseph L. Sitko                  | 314/462  | 29.70  |
| 4  | 16-44.1  | Carl Straight                    | 543/ 598 | 3.70   |
| 5  | 15-38    | Rodney A. & Candis L. Nash       | 351/701  | 85.48  |
| 6  | 16-44    | Robert A. Pyles, et al           | 335/482  | 87.82  |
| 7  | 16-42.1  | Richard D. Pyles                 | 336/815  | 4.56   |
| 8  | 15-32    | William S. & Opal Marie Nash     | 335/188  | 78.58  |
| 9  | 22-3     | Harold L. & Deborah C. Hollaway  | 287/669  | 22.95  |
| 10 | 16-43    | Alfred L. Eddy                   | 344/22   | 37.10  |
| 11 | 22-1     | Robert I. Reed & Floyd W. Reed   | 321/763  | 37.60  |
| 12 | 22-2     | Ronald Hartline & Jamie Barnhart | 591/741  | 1.50   |
| 13 | 22-4     | Stephen H. & Barbara J. Dunthorn | 216/40   | 69.00  |
| 14 | 22-6     | Antero Resources Inc.            | 662/782  | 131.57 |
| 15 | 22-5     | Antero Resources Corporation     | 662/782  | 84.67  |
| 16 | 22-41    | Anthony B. Parr                  | 342/763  | 222.00 |
| 17 | 22-40    | Ronald P. & Sandra L. Webb       | 282/1    | 65.00  |
| 18 | 22-39    | Ronald P. & Sandra L. Webb       | 270/587  | 45.00  |
| 19 | 28-9     | David & Cheryl L. Barrick        | 263/606  | 87.53  |
| 20 | 28-31    | Victor A. & Lorraine B. Weekley  | AR49/717 | 271.00 |
| 21 | 22-38    | Bruce & Sandra L. Parr           | 368/790  | 113.0  |
| 22 | 22-37    | B.W. Weekley                     | 107/562  | 15.78  |
| 23 | 22-34    | Raymond L. Parr, et al           | 329/181  | 55.25  |
| 24 | 22-36    | B.W. Weekley                     | 107/562  | 23.50  |
| 25 | 22-35    | Marie Eddy                       | 344/358  | 52.96  |
| 26 | 28-32    | B.W. Weekley                     | 107/562  | 33.31  |
| 27 | 28-43    | Wanda J. Parr                    | 327/435  | 8.02   |
| 28 | 28-42    | Robert H. Anderson               | 238/76   | 0.99   |
| 29 | 28-31.1  | Joshua M. & Crystal L. Rocchio   | 348/33   | 2.30   |
| 30 | 28-31.16 | William Morgan                   | 374/472  | 0.50   |
| 31 | 28-31.12 | William Morgan                   | 374/472  | 1.00   |
| 32 | 28-31.19 | James & Peggy Morgan             | 377/10   | 0.14   |
| 33 | 28-31.10 | Danny Swiger & Peggy Smith       | 356/675  | 4.00   |
| 34 | 28-31.20 | Randy Wells                      | 445/315  | 1.00   |
| 35 | 28-31.3  | David Lantz & Rita Parr          | 618/689  | 5.00   |
| 36 | 28-31.2  | David Lantz & Rita Parr          | 618/689  | 4.00   |
| 37 | 28-33    | B.W. Weekley                     | 107/562  | 25.30  |
| 38 | 28-35    | Shirl N. Baker Jr.               | WB 38/1  | 32.00  |

| Leases |                                    |
|--------|------------------------------------|
| A      | Richard D. & Cathy J. Pyles        |
| B      | Joseph L. Sitko, et ux             |
| C      | Joseph L. Sitko, et ux             |
| D      | Bruce Winkelmann                   |
| E      | Helen E. Boggs                     |
| F      | Richard D. & Cathy J. Pyles        |
| G      | William S. Nash, et al             |
| H      | Ridgetop Capital II, LP            |
| I      | Alfred Lonzo Eddy                  |
| J      | Ridgetop Capital II, LP            |
| K      | Marjorie R. Asher Longston, et vir |
| L      | Ridgetop Capital II, LP            |
| M      | Anthony Bruce Parr                 |
| N      | BRC Appalachian Minerals I, LLC    |
| O      | Ronald P. Webb                     |
| P      | Carol J. Knapp                     |
| Q      | Anthony Bruce Parr, et ux          |
| R      | Kendra K. Wyke                     |
| S      | OPEN                               |
| T      | Nancy L. Mains                     |
| U      | Richard Lee White, II              |
| V      | Larry Stevens                      |
| W      | Wanda J. Parr                      |
| X      | Lucille Adams                      |
| Y      | Bounty Minerals, LLC               |

RECEIVED  
Office of Oil and Gas

SEP 14 2020

WV Department of  
Environmental Protection

FILE NO: 190-54-E-19  
DRAWING NO: Vulcan Unit 2H Well Plat  
SCALE: 1" = 2000'  
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: July 30 2020  
OPERATOR'S WELL NO. Vulcan 2H  
API WELL NO 16001  
47 - 095 - 02702  
STATE COUNTY PERMIT

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

LOCATION: ELEVATION: As-Built 1,081' WATERSHED: Outlet Middle Island Creek QUADRANGLE: Shirley  
DISTRICT: Ellsworth COUNTY: Tyler  
SURFACE OWNER: Richard D. Pyles Larry Stevens; Kendra K. Wyke; COUNTY: Tyler 45; 79.042; 177;  
Ridgetop Capital II, LP (2); BRC Appalachian Minerals I, LLC; Ronald P. Webb; ACREAGE: 168.5 37.10; 22.95; 69.50;  
ROYALTY OWNER: Richard D. & Cathy J. Pyles; Joseph L. Sitko, et ux; Helen E. Boggs; Alfred Lonzo Eddy LEASE NO: ACREAGE: 97.2; 52.938; 271;  
PROPOSED WORK:  DRILL  CONVERT  DRILL DEEPER  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION  
 PERFORATE NEW FORMATION  OTHER PHYSICAL CHANGE IN WELL (SPECIFY) BHL MOD 7,100' TVD  
 PLUG AND ABANDON  CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 22,700' 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. Vulcan 2H**  
**BHL MOD**  
**Antero Resources Corporation**



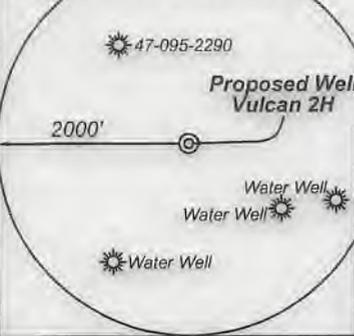
- Wellhead Layout**
- Vulcan Unit 1H  
47-095-02701  
Proposed
  - Vulcan Unit 2H  
47-095-02702  
Prosper Unit 1H  
47-095-02699
  - Prosper Unit 2H  
47-095-02700
  - Friend Unit 1H  
47-095-02695
  - Friend Unit 2H  
47-095-02696
  - Seagrave Unit 1H  
47-095-02697
  - Seagrave Unit 2H  
47-095-02698



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.

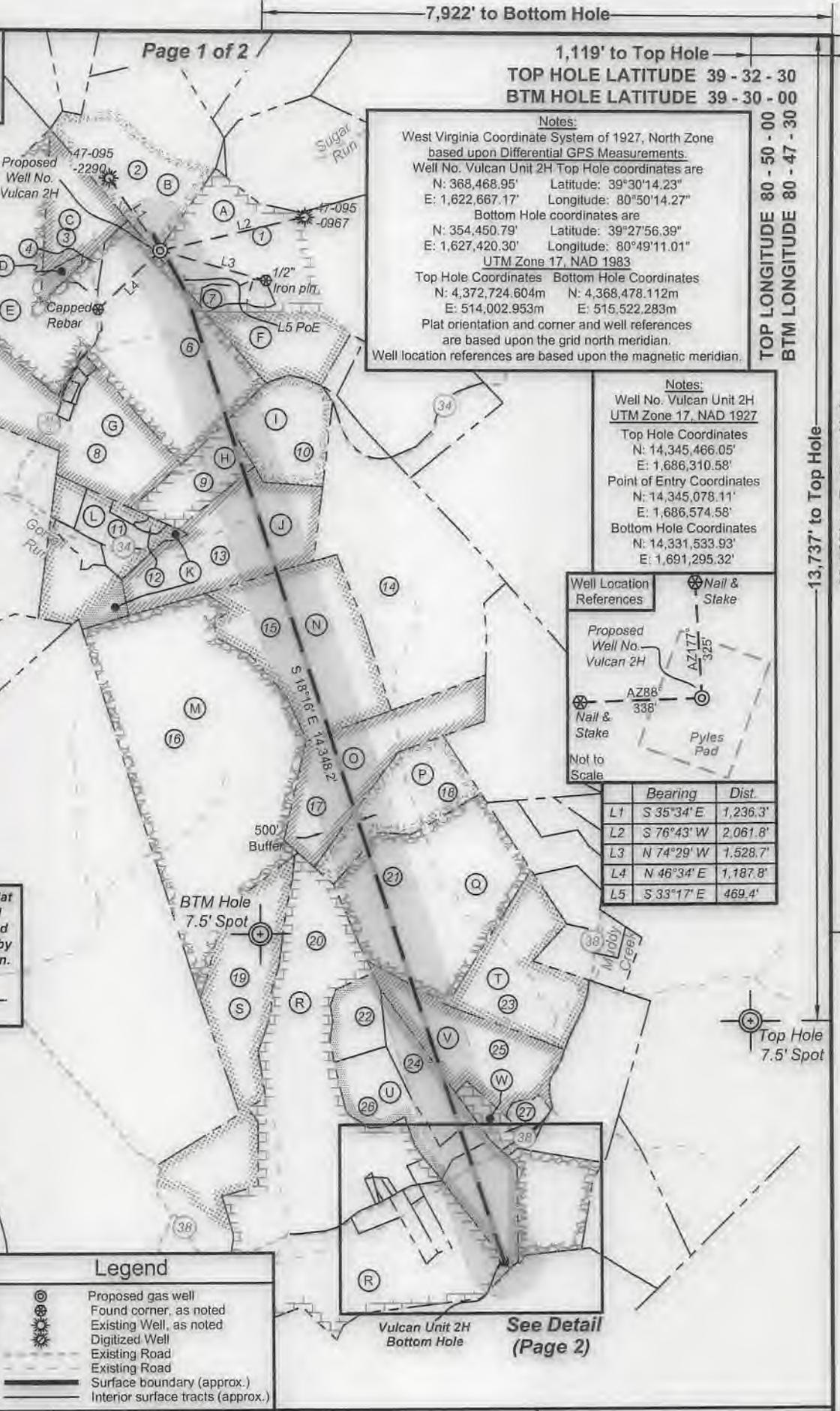
*Bradley D. Miller*  
**Bradley D. Miller, P.S. 2167**

Note: 3 water wells 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.



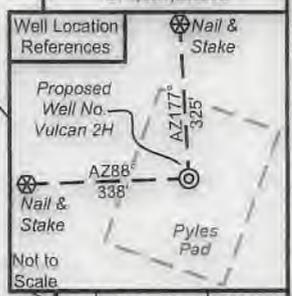
**Legend**

- Proposed gas well
- Found corner, as noted
- ⊙ Existing Well, as noted
- ⊙ Digitized Well
- Existing Road
- Existing Road
- - - Surface boundary (approx.)
- - - Interior surface tracts (approx.)



**Notes:**  
 West Virginia Coordinate System of 1927, North Zone based upon Differential GPS Measurements.  
 Well No. Vulcan Unit 2H Top Hole coordinates are  
 N: 368,468.95' Latitude: 39°30'14.23"  
 E: 1,622,667.17' Longitude: 80°50'14.27"  
 Bottom Hole coordinates are  
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 E: 1,627,420.30' Longitude: 80°49'11.01"  
 UTM Zone 17, NAD 1983  
 Top Hole Coordinates Bottom Hole Coordinates  
 N: 4,372,724.604m N: 4,368,478.112m  
 E: 514,002.953m E: 515,522.283m  
 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. Vulcan Unit 2H  
 UTM Zone 17, NAD 1927  
 Top Hole Coordinates  
 N: 14,345,466.05'  
 E: 1,686,310.58'  
 Point of Entry Coordinates  
 N: 14,345,078.11'  
 E: 1,686,574.58'  
 Bottom Hole Coordinates  
 N: 14,331,533.93'  
 E: 1,691,295.32'



|    | Bearing    | Dist.    |
|----|------------|----------|
| L1 | S 35°34' E | 1,236.3' |
| L2 | S 76°43' W | 2,061.8' |
| L3 | N 74°29' W | 1,528.7' |
| L4 | N 46°34' E | 1,187.8' |
| L5 | S 33°17' E | 469.4'   |



FILE NO: 190-54-E-19  
 DRAWING NO: Vulcan Unit 2H Well Plat  
 SCALE: 1" = 2000'  
 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: July 30 2020  
 OPERATOR'S WELL NO. Vulcan 2H  
 API WELL NO. 4709502702  
 STATE COUNTY PERMIT

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

LOCATION: ELEVATION: As-Built 1,081' WATERSHED: Outlet Middle Island Creek QUADRANGLE: Shirley  
 DISTRICT: Ellsworth COUNTY: Tyler  
 SURFACE OWNER: Richard D. Pyles Larry Stevens; Kendra K. Wyke; ACREAGE: 168.5  
 ROYALTY OWNER: Richard D. & Cathy J. Pyles; Joseph L. Sitko, et ux; Helen E. Boggs; Alfred Lonzo Eddy Ridgetop Capital II, LP (2); BRC Appalachian Minerals I, LLC; Ronald P. Webb; 45; 79.042; 177;  
 80; 65; 45; 113;  
 97.2; 52.938; 271

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: 7,100' TVD  
 22,700' 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

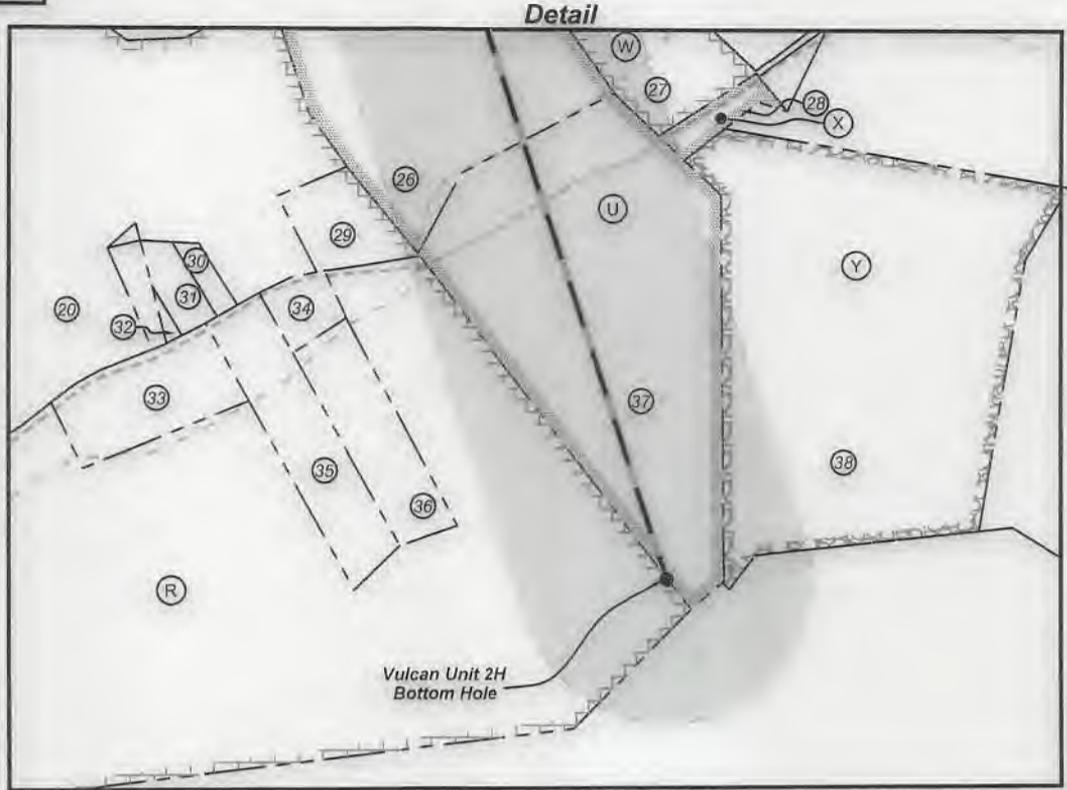
7,922' to Bottom Hole

1,119' to Top Hole

TOP HOLE LATITUDE 39 - 32 - 30  
 BTM HOLE LATITUDE 39 - 30 - 00

TOP LONGITUDE 80 - 50 - 00  
 BTM LONGITUDE 80 - 47 - 30

13,737' to Top Hole  
 12,507' to Bottom Hole



| ID | TM/Par   | Owner                            | DB/PG    | Acres  |
|----|----------|----------------------------------|----------|--------|
| 1  | 16-42    | Richard D. Pyles                 | 379/20   | 168.50 |
| 2  | 16-22    | Joseph L. Jr. & Karen L. Sitko   | 296/13   | 81.70  |
| 3  | 16-23    | Joseph L. Sitko                  | 314/462  | 29.70  |
| 4  | 16-44.1  | Carl Straight                    | 543/598  | 3.70   |
| 5  | 15-38    | Rodney A. & Candis L. Nash       | 351/701  | 85.48  |
| 6  | 16-44    | Robert A. Pyles, et al           | 335/482  | 87.82  |
| 7  | 16-42.1  | Richard D. Pyles                 | 336/815  | 4.56   |
| 8  | 15-32    | William S. & Opal Marie Nash     | 335/188  | 78.58  |
| 9  | 22-3     | Harold L. & Deborah C. Hollaway  | 287/669  | 22.95  |
| 10 | 16-43    | Alfred L. Eddy                   | 344/22   | 37.10  |
| 11 | 22-1     | Robert I. Reed & Floyd W. Reed   | 321/763  | 37.60  |
| 12 | 22-2     | Ronald Hartline & Jamie Barnhart | 591/741  | 1.50   |
| 13 | 22-4     | Stephen H. & Barbara J. Dunthorn | 216/40   | 69.00  |
| 14 | 22-5     | Antero Resources Inc.            | 662/782  | 131.57 |
| 15 | 22-5     | Antero Resources Corporation     | 662/782  | 84.67  |
| 16 | 22-41    | Anthony B. Parr                  | 342/763  | 222.00 |
| 17 | 22-40    | Ronald P. & Sandra L. Webb       | 282/1    | 65.00  |
| 18 | 22-39    | Ronald P. & Sandra L. Webb       | 270/587  | 45.00  |
| 19 | 28-9     | David & Cheryl L. Barrick        | 263/606  | 87.53  |
| 20 | 28-31    | Victor A. & Lorraine B. Weekley  | AR49/717 | 271.00 |
| 21 | 22-38    | Bruce & Sandra L. Parr           | 368/790  | 113.0  |
| 22 | 22-37    | B.W. Weekley                     | 107/562  | 15.78  |
| 23 | 22-34    | Raymond L. Parr, et al           | 329/181  | 55.25  |
| 24 | 22-36    | B.W. Weekley                     | 107/562  | 23.50  |
| 25 | 22-35    | Marie Eddy                       | 344/358  | 52.96  |
| 26 | 28-32    | B.W. Weekley                     | 107/562  | 33.31  |
| 27 | 28-43    | Wanda J. Parr                    | 327/435  | 8.02   |
| 28 | 28-42    | Robert H. Anderson               | 238/76   | 0.99   |
| 29 | 28-31.1  | Joshua M. & Crystal L. Rocchio   | 348/33   | 2.30   |
| 30 | 28-31.16 | William Morgan                   | 374/472  | 0.50   |
| 31 | 28-31.12 | William Morgan                   | 374/472  | 1.00   |
| 32 | 28-31.19 | James & Peggy Morgan             | 377/10   | 0.14   |
| 33 | 28-31.10 | Danny Swiger & Peggy Smith       | 356/675  | 4.00   |
| 34 | 28-31.20 | Randy Wells                      | 445/315  | 1.00   |
| 35 | 28-31.3  | David Lantz & Rita Parr          | 618/689  | 5.00   |
| 36 | 28-31.2  | David Lantz & Rita Parr          | 618/689  | 4.00   |
| 37 | 28-33    | B.W. Weekley                     | 107/562  | 25.30  |
| 38 | 28-35    | Shirli N. Baker Jr.              | WB 38/1  | 32.00  |

| Leases |                                    |
|--------|------------------------------------|
| A      | Richard D. & Cathy J. Pyles        |
| B      | Joseph L. Sitko, et ux             |
| C      | Joseph L. Sitko, et ux             |
| D      | Bruce Winkelmann                   |
| E      | Helen E. Boggs                     |
| F      | Richard D. & Cathy J. Pyles        |
| G      | William S. Nash, et al             |
| H      | Ridgetop Capital II, LP            |
| I      | Alfred Lonzo Eddy                  |
| J      | Ridgetop Capital II, LP            |
| K      | Marjorie R. Asher Longston, et vir |
| L      | Ridgetop Capital II, LP            |
| M      | Anthony Bruce Parr                 |
| N      | BRC Appalachian Minerals I, LLC    |
| O      | Ronald P. Webb                     |
| P      | Carol J. Knapp                     |
| Q      | Anthony Bruce Parr, et ux          |
| R      | Kendra K. Wyke                     |
| S      | OPEN                               |
| T      | Nancy L. Mains                     |
| U      | Richard Lee White, II              |
| V      | Larry Stevens                      |
| W      | Wanda J. Parr                      |
| X      | Lucille Adams                      |
| Y      | Bounty Minerals, LLC               |

FILE NO: 190-54-E-19  
DRAWING NO: Vulcan Unit 2H Well Plat  
SCALE: 1" = 2000'  
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: July 30 2020  
OPERATOR'S WELL NO. Vulcan 2H  
API WELL NO **ModI**  
47 - 095 - 02702  
STATE COUNTY PERMIT

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

LOCATION: ELEVATION: As-Built 1,081' WATERSHED: Outlet Middle Island Creek QUADRANGLE: Shirley  
DISTRICT: Ellsworth COUNTY: Tyler 45; 79,042; 177;  
SURFACE OWNER: Richard D. Pyles Larry Stevens; Kendra K. Wyke; Carol J. Knapp; Anthony Bruce Parr, et ux; Richard L. White, II; Ridgetop Capital II, LP (2); BRC Appalachian Minerals I, LLC; Ronald P. Webb; ACREAGE: 168.5 37.10; 22.95; 69.50;  
ROYALTY OWNER: Richard D. & Cathy J. Pyles; Joseph L. Sitko, et ux; Helen E. Boggs; Alfred Lonzo Eddy LEASE NO: \_\_\_\_\_ ACREAGE: 97.2; 52.938; 271  
PROPOSED WORK:  DRILL  CONVERT  DRILL DEEPER  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION  
 PERFORATE NEW FORMATION  OTHER PHYSICAL CHANGE IN WELL (SPECIFY) BHL MOD 7,100' TVD  
 PLUG AND ABANDON  CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 22,700' 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