



west virginia department of environmental protection

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

Austin Caperton, Cabinet Secretary
www.dep.wv.gov

Monday, November 9, 2020
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION
1615 WYNKOOP STREET
DENVER, CO 80202

Re: Permit Modification Approval for GRAPEVINE UNIT 1H
47-095-02707-00-00

Extend Lateral Length. Total Measured Depth 11700' to 21000'. Horizontal Leg Length 3134' to 11573'. Updated Leases Included

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 blue ink signature of James A. Martin, Chief, is written over the printed name and title.

James A. Martin
Chief

Operator's Well Number: GRAPEVINE UNIT 1H
Farm Name: KAYLA LEEK
U.S. WELL NUMBER: 47-095-02707-00-00
Horizontal 6A New Drill
Date Modification Issued: 11/09/2020

Promoting a healthy environment.

WW-6B
(04/15)

API NO. 47-095 - 02707
 OPERATOR WELL NO. Grapevine Unit 1H
 Well Pad Name: Margery 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: Grapevine Unit 1H Well Pad Name: Margery Pad

3) Farm Name/Surface Owner: Kayla Leek Public Road Access: CR 11

4) Elevation, current ground: 1070' Elevation, proposed post-construction: ~1042'

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: 7000' TVD, Anticipated Thickness- 55 feet, Associated Pressure- 2850#

8) Proposed Total Vertical Depth: 7000' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 21000' MD

11) Proposed Horizontal Leg Length: 11573'

12) Approximate Fresh Water Strata Depths: 102'

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

14) Approximate Saltwater Depths: 1998'

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: _____

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John Cragin
 Blevins

Digitally signed by John Cragin Blevins
 Date: 2020.11.06 11:55:18 -05'00'

JCB
 11/6/2020

WW-6B
(04/15)

API NO. 47-095 - 02707
 OPERATOR WELL NO. Grapevine Unit 1H
 Well Pad Name: Margery Pad

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	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#	21000	21000	CTS, 5367 Cu. Ft
Tubing	2-3/8"	New	N-80	4.7#			
Liners							

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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	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-HPOZ & Tail - 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			

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WW-6B
(10/14)

API NO. 47- 095 - 02707
 OPERATOR WELL NO. Grapevine Unit 1H
 Well Pad Name: Margery 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.

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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): Existing 51.65 acres

22) Area to be disturbed for well pad only, less access road (acres): Existing 13.44 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

25) Proposed borehole conditioning procedures:

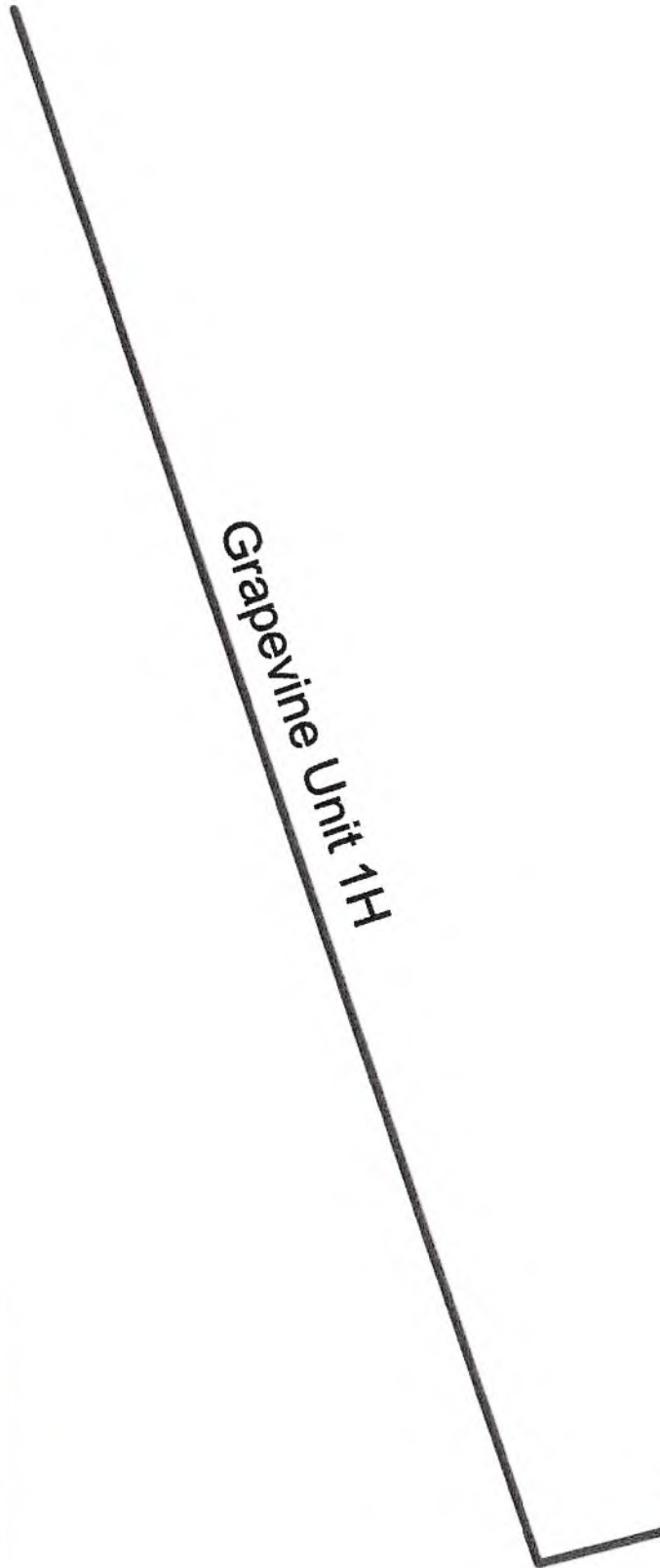
Conductor: blowhole clean with air, run casing, 10 bbls fresh water.
 Surface: blowhole clean with air, trip to conductor shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate pipe capacity + 40 bbls fresh water followed by 25 bbls bentonite mud, 10 bbls fresh water spacer.
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

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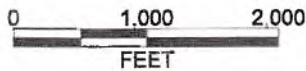
NOV 06 2020

PERMIT MODIFICATION API # 47-095-02707



Antero Resources Corporation

Grapevine Unit 1H - AOR



WELL SYMBOLS
○ Location Only

REMARKS
No Wells of Interest
August 13, 2020

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11/6/2020

LATITUDE 39°32'30"

10,769'

LATITUDE 39°35'00"

3,633' TO BOTTOM HOLE

Antero Resources Corporation Well No. Grapevine Unit 1H

NOTES: WELL 1H TOP HOLE INFORMATION: N: 373,247ft E: 1,624,843ft LAT: 39°31'01.77" N LONG: 80°49'47.42" W BOTTOM HOLE INFORMATION: N: 384,141ft E: 1,620,385ft LAT: 39°32'48.78" N LONG: 80°50'46.38" W 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 1H TOP HOLE INFORMATION: N: 4,374,191m E: 514,642m BOTTOM HOLE INFORMATION: N: 4,377,488m E: 513,228m

Table listing land parcels A through AA with owner names and acreage. Includes owners like Helen M. Karcinski et al, Rose Enterprises LLC, and Antero Resources Corp.

(NAD) 27 (UTM) ZONE 17 COORDS: WELL 1H TOP HOLE INFORMATION: N: 14,350,276ft E: 1,688,406ft POINT OF ENTRY INFORMATION: N: 14,350,144ft E: 1,687,504ft BOTTOM HOLE INFORMATION: N: 14,361,093ft E: 1,683,768ft

Table with columns: LINE, BEARING, DISTANCE. Lists lines L1 through L12 with bearings and distances.



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.



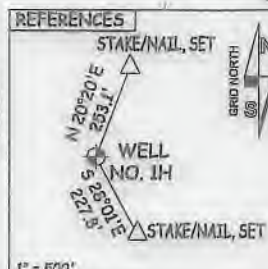
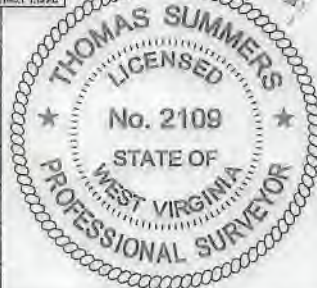
STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS

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

Professional surveyor information including name, license number, and date.

JOB # 20-006WA DRAWING # GRAPEVINE1HR3 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. Includes signature of Thomas Summers.



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

DATE 09/29/20 OPERATOR'S WELL # GRAPEVINE UNIT #1H

WELL TYPE: OIL GAS X LIQUID INJECTION WASTE DISPOSAL API WELL # (IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X STATE COUNTY PERMIT LOCATION: ELEVATION ORIGINAL -1,070' PROPOSED -1,042' WATERSHED OUTLET MIDDLE ISLAND CREEK

QUADRANGLE PORTER FALLS 7.5' DISTRICT ELLSWORTH COUNTY TYLER SURFACE OWNER KAYLA LEEK ACREAGE 69.06 ACRES +/-

OIL & GAS ROYALTY OWNER RIDGETOP CAPITAL LP; DAVID LEEK; RICHARD J. FERRELL ET UX LEASE ACREAGE 69.06 AC.±; 34.38 AC.±; 15.08 AC.±; DAVID LEEK; RICHARD J. FERRELL; ROBERT PITTMAN ET UX; REITA JANE HALL; JERRY R. BRIGHTWELL ET UX; 2.25 AC.±; 1.69 AC.±; 2.4 AC.±; 21.39 AC.±; 31.74 AC.±; PATHFINDER RESOURCES II, LLC; DARWIN MARTIN ET UX; RIDGETOP CAPITAL II, LP; HELEN M. KARCINSKI ET AL.; HELEN M. KARCINSKI ET AL.; LINDA K. LOEHR; WACO OIL AND GAS CO., INC; BRC APPALACHIAN MINERALS I LLC; 50.5 AC.±; 24.47 AC.±; 50.25 AC.±; 28.77 AC.±

PROPOSED WORK: DRILL CONVERT X DRILL DEEPER X REDRILL X 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 7,000' TVD 21,000' 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

8,927' 13,277' TO BOTTOM HOLE LONGITUDE 80°47'30" LONGITUDE 80°50'00"

LATITUDE 39°32'30"

10,769'

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WV NORTH ZONE GRID NORTH

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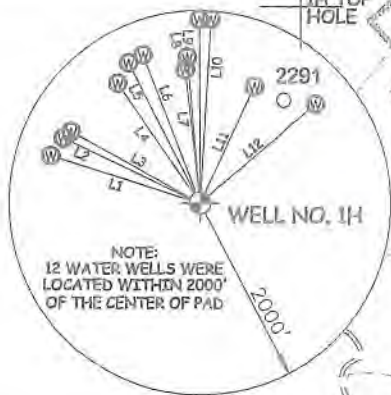
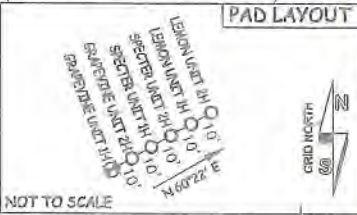


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STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS

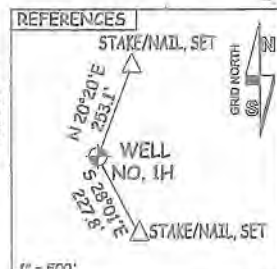
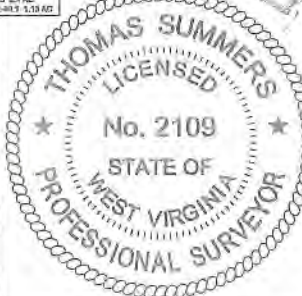
WILLOW LAND SURVEYING PLLC 220 MASONIC AVE. PENNSBORO WEST VIRGINIA 26415



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.

JOB # 20-006WA DRAWING # GRAPEVINE1HR3 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. Signature of Thomas Summers, P.S. 2109



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13,277' TO BOTTOM HOLE

LONGITUDE 80°47'30"

LONGITUDE 80°50'00"

COUNTY NAME PERMIT

WW-6A1

Operator's Well Number Grapevine Unit 1H

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
<u>Ridgetop Capital LP Lease</u>			
Ridgetop Capital LP	Petroedge Energy LLC	1/8	0420/0643
Petroedge Energy LLC	Statoil USA Onshore Properties Inc.	Assignment	0436/0001
Statoil USA Onshore Properties Inc.	EQT Production Company	Assignment	0539/0239
EQT Production Company	Antero Resources Corporation	Assignment	0663/0001 ✓
<u>David Leek Lease</u>			
David Leek	Statoil USA Onshore Properties	1/8	0431/0198
Statoil USA Onshore Properties	EQT Production Company	Assignment	0539/0239
EQT Production Company	Antero Resources Corporation	Assignment	0663/0001 ✓
<u>Richard J. Ferrell et ux Lease</u>			
Richard J. Ferrell et ux	Antero Resources Corporation	1/8+	0431/0457 ✓
<u>Richard J. Ferrell Lease</u>			
Richard J. Ferrell	Antero Resources Corporation	1/8+	0435/0728 ✓
<u>Robert Pittman et ux Lease</u>			
Robert Pittman et ux	Stone Energy Corporation	1/8+	0415/0448 ✓
Stone Energy Corporation	EQT Production Company	Assignment	0556/0132
EQT Production Company	Antero Resources Corporation	Assignment	0663/0001
<u>Reita Jane Hall Lease</u>			
Reita Jane Hall	Stone Energy Corporation	1/8+	0401/0209 ✓
Stone Energy Corporation	EQT Production Company	Assignment	0556/0132
EQT Production Company	Antero Resources Corporation	Assignment	0663/0001
<u>Jerry R. Brightwell et al Lease</u>			
Jerry R. Brightwell et al	Antero Resources Corporation	1/8	0051/0105 ✓
<u>Pathfinder Resources II LLC Lease</u>			
Pathfinder Resources II LLC	Antero Resources Corporation	1/8	0630/0788
<u>Darwin Martin et ux Lease</u>			
Darwin Martin et ux	Antero Resources Corporation	1/8+	0428/0474
<u>Ridgetop Capital II LP Lease</u>			
Ridgetop Capital II LP	Antero Resources Corporation	1/8+	0628/0444
<u>Helen M. Karcinski et al Lease (TM 11 PCL 3)</u>			
Helen M. Karcinski et al	Antero Resources Corporation	1/8+	0606/0347

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Office of Oil and Gas

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Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
<u>Helen M. Karcinski et al Lease (TM10 PCL 69)</u> Helen M. Karcinski et al	Antero Resources Corporation	1/8+	0606/0347
<u>Linda K. Loehr Lease</u> Linda K. Loehr	Antero Resources Corporation	1/8+	0598/0636
<u>Waco Oil & Gas Co. Lease</u> Waco Oil & Gas Co.	Antero Resources Corporation	1/8+	0032/0442

*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.

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Office of Oil and Gas

NOV 06 2020

WV Department of
Environmental Protection

WW-6A1
(5/13)

Operator's Well No. Grapevine Unit 1H

**INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE
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Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
BRC Appalachian Minerals I LLC Lease	BRC Appalachian Minerals I LLC	BRC Working Interest Company	1/8+	0069/0300
	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

*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.

*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

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

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Office of Oil and Gas

Page 1 of 1

NOV 06 2020



October 7, 2020

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

West Virginia Department of Environmental Protection
Office of Oil and Gas
Attn: Ms. Laura Adkins
601 57th Street
Charleston, WV 25304

Ms. Laura Adkins:

Antero Resources Corporation (Antero) would like to submit the following permit modification for the following expedited approved well on the existing Margery Pad: Grapevine Unit 1H (API # 47-095-02707).

Attached you will find the following documents:

- REVISED Form WW-6B, which shows the updated POE & Measured Depth
- REVISED Form WW-6A1, which shows the new leases we will be drilling into
- REVISED Mylar Plat, which shows the new Lateral Length & Estimated Measured Depth
- AOR & As-Built Design

If you have any questions please feel free to contact me at (303) 357-7223.

Thank you in advance for your consideration.

Sincerely,

A handwritten signature in black ink, appearing to read "Megan Griffith", with a long, sweeping underline.

Megan Griffith
Permitting Agent
Antero Resources Corporation

Enclosures

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~~OCT 8 2020~~

~~WV Department of
Environmental Protection~~

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WV Department of
Environmental Protection

Sign-offs
Cover



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

October 7, 2020

West Virginia Department of Environmental Protection
Office of Oil and Gas
Attn: Ms. Laura Adkins
601 57th Street
Charleston, WV 25304

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Sincerely,

A handwritten signature in black ink, appearing to read "Megan Griffith", with a long horizontal flourish extending to the right.

Megan Griffith
Permitting Agent
Antero Resources Corporation

Enclosures

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NOV 06 2020

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WW-6B
(04/15)

API NO. 47-095 - 02707
OPERATOR WELL NO. Grapevine Unit 1H
Well Pad Name: Margery 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: Grapevine Unit 1H Well Pad Name: Margery Pad

3) Farm Name/Surface Owner: Kayla Leek Public Road Access: CR 11

4) Elevation, current ground: 1070' Elevation, proposed post-construction: ~1042'

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: 7000' TVD, Anticipated Thickness- 55 feet, Associated Pressure- 2850#

8) Proposed Total Vertical Depth: 7000' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 21000' MD

11) Proposed Horizontal Leg Length: 11573'

12) Approximate Fresh Water Strata Depths: 102'

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

14) Approximate Saltwater Depths: 1998'

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: _____



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WW-6B
(04/15)

API NO. 47- 095 - 02707
OPERATOR WELL NO. Grapevine Unit 1H
Well Pad Name: Margery Pad

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	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#	21000	21000	CTS, 5367 Cu. Ft.
Tubing	2-3/8"	New	N-80	4.7#			
Liners							

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	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

Kind:	N/A			
Sizes:	N/A			RECEIVED Office of Oil and Gas
Depths Set:	N/A			OCT 9 2020

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Environmental Protection

WW-6B
(10/14)

API NO. 47-095 - 02707
OPERATOR WELL NO. Grapevine Unit 1H
Well Pad Name: Margery 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): Existing 51.65 acres

22) Area to be disturbed for well pad only, less access road (acres): Existing 13.44 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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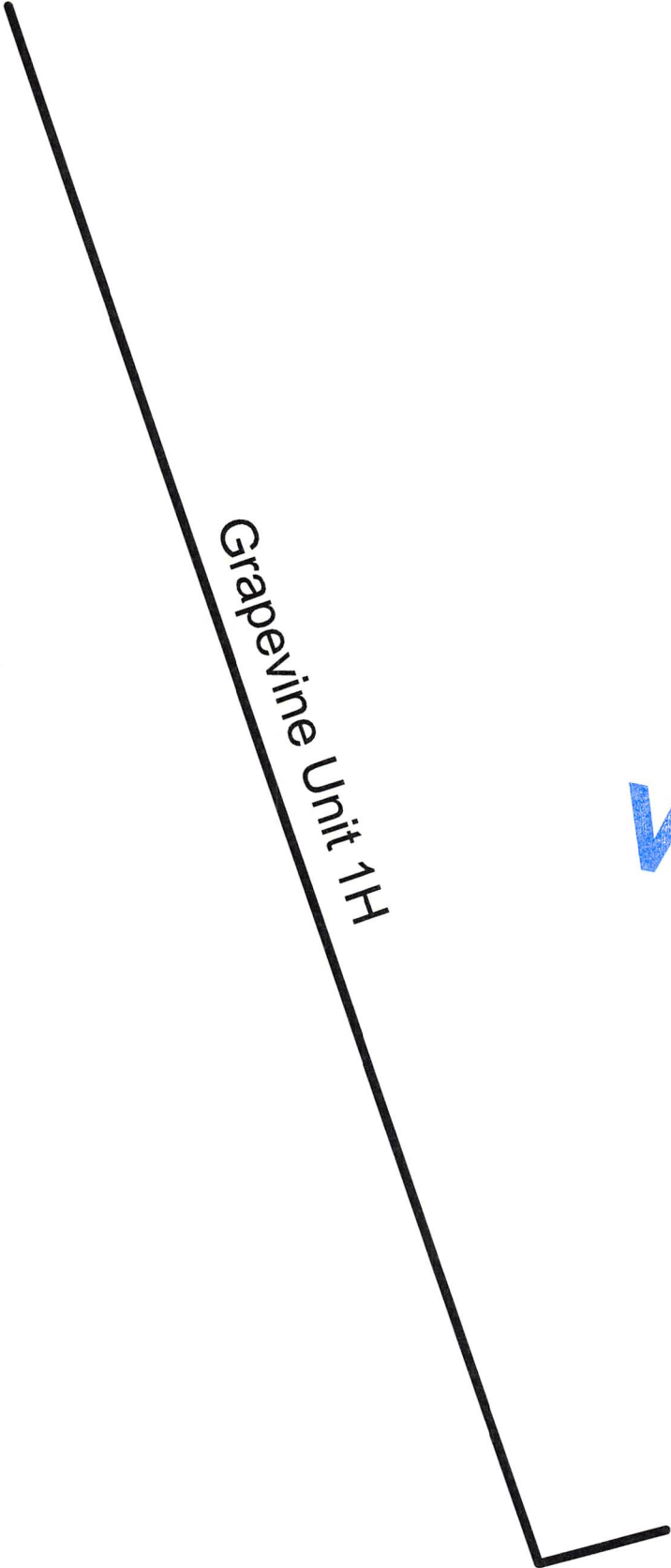
25) Proposed borehole conditioning procedures:

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.


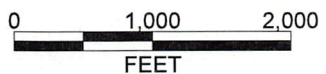


PERMIT MODIFICATION API # 47-095-02707



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WV Department of
Environmental Protection

	
<p>Antero Resources Corporation</p>	
<p>Grapevine Unit 1H - AOR</p>	
	
<p>WELL SYMBOLS</p> <p><input type="radio"/> Location Only</p>	
<p>REMARKS</p> <p>No Wells of Interest</p>	
<p>August 13, 2020</p>	

WW-6A1

Operator's Well Number Grapevine Unit 1H

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
<u>Ridgetop Capital LP Lease</u>			
Ridgetop Capital LP	Petroedge Energy LLC	1/8	0420/0643
Petroedge Energy LLC	Statoil USA Onshore Properties Inc.	Assignment	0436/0001
Statoil USA Onshore Properties Inc.	EQT Production Company	Assignment	0539/0239
EQT Production Company	Antero Resources Corporation	Assignment	0663/0001
<u>David Leek Lease</u>			
David Leek	Statoil USA Onshore Properties	1/8	0431/0198
Statoil USA Onshore Properties	EQT Production Company	Assignment	0539/0239
EQT Production Company	Antero Resources Corporation	Assignment	0663/0001
<u>Richard J. Ferrell et ux Lease</u>			
Richard J. Ferrell et ux	Antero Resources Corporation	1/8+	0431/0457
<u>Richard J. Ferrell Lease</u>			
Richard J. Ferrell	Antero Resources Corporation	1/8+	0435/0728
<u>Robert Pittman et ux Lease</u>			
Robert Pittman et ux	Stone Energy Corporation	1/8+	0415/0448
Stone Energy Corporation	EQT Production Company	Assignment	0556/0132
EQT Production Company	Antero Resources Corporation	Assignment	0663/0001
<u>Reita Jane Hall Lease</u>			
Reita Jane Hall	Stone Energy Corporation	1/8+	0401/0209
Stone Energy Corporation	EQT Production Company	Assignment	0556/0132
EQT Production Company	Antero Resources Corporation	Assignment	0663/0001
<u>Jerry R. Brightwell et al Lease</u>			
Jerry R. Brightwell et al	Antero Resources Corporation	1/8	0051/0105
<u>Pathfinder Resources II LLC Lease</u>			
Pathfinder Resources II LLC	Antero Resources Corporation	1/8	0630/0788
<u>Darwin Martin et ux Lease</u>			
Darwin Martin et ux	Antero Resources Corporation	1/8+	0428/0474
<u>Ridgetop Capital II LP Lease</u>			
Ridgetop Capital II LP	Antero Resources Corporation	1/8+	0628/0444
<u>Helen M. Karcinski et al Lease (TM 11 PCL 3)</u>			
Helen M. Karcinski et al	Antero Resources Corporation	1/8+	0606/0347

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Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
<u>Helen M. Karcinski et al Lease (TM10 PCL 69)</u> Helen M. Karcinski et al	Antero Resources Corporation	1/8+	0606/0347
<u>Linda K. Loehr Lease</u> Linda K. Loehr	Antero Resources Corporation	1/8+	0598/0636
<u>Waco Oil & Gas Co. Lease</u> Waco Oil & Gas Co.	Antero Resources Corporation	1/8+	0032/0442



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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
(5/13)

Operator's Well No. Grapevine Unit 1H

**INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE
Chapter 22, Article 6A, Section 5(a)(5)
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Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
BRC Appalachian Minerals I LLC Lease	BRC Appalachian Minerals I LLC	BRC Working Interest Company	1/8+	0069/0300
	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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VOID

**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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WV Department of
Environmental Protection

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.

*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

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

LATITUDE 39°32'30"

10,769'

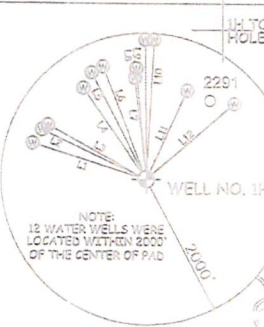
LATITUDE 39°35'00"

3,633' TO BOTTOM HOLE

Antero Resources Corporation
Well No. Grapevine Unit 1H

WV NORTH ZONE
GRID NORTH

LINE	BEARING	DISTANCE
L1	N 72°40' W	1838.0'
L2	N 64°54' W	1582.1'
L3	N 61°22' W	1537.8'
L4	N 34°54' W	1512.5'
L5	N 27°18' W	1636.7'
L6	N 21°11' W	1650.6'
L7	N 06°24' W	1382.6'
L8	N 05°00' W	1521.3'
L9	N 00°15' W	1911.6'
L10	N 03°25' E	1913.3'
L11	N 25°08' E	1336.6'
L12	N 49°41' E	1582.6'



NOTES:
WELL 1H TOP HOLE INFORMATION:
N: 373,247.7' E: 1,624,849.4'
LAT: 39°31'01.77" LONG: 80°49'47.42"
BOTTOM HOLE INFORMATION:
N: 384,141.7' E: 1,620,385.7'
LAT: 39°32'46.78" LONG: 80°50'46.39"
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 THE LINES ARE BASED ON GRID NORTH.

(NAD 83 (UTM) ZONE 17 COORDS:
WELL 1H TOP HOLE INFORMATION:
N: 4,374,191m E: 514,642m
BOTTOM HOLE INFORMATION:
N: 4,377,488m E: 513,226m

- A HELEN M. KARCINSKI ET AL. 5.1 ACRES
- B ROSE ENTERPRISES LLC 19.34 ACRES
- C ROSE ENTERPRISES LLC 22 ACRES
- D BRC APPALACHIAN MINERALS I LLC 51.39 ACRES
- E LINDA K. LOEHR 24.25 ACRES
- F WACO OIL AND GAS CO., INC. 50.25 ACRES
- G BRC APPALACHIAN MINERALS I LLC 55 ACRES
- H LINDA K. LOEHR 24.47 ACRES
- I HELEN M. KARCINSKI ET AL. 50.5 ACRES
- J CARR FAMILY IRREVOCABLE TRUST 54.27 ACRES
- K HELEN M. KARCINSKI ET AL. 50.5 ACRES
- L RIDGETOP CAPITAL II, LP 70 ACRES
- M DARWIN MARTIN ET UX 50.00 ACRES
- N JERRY R. BRIGHTWELL ET AL. 31.74 ACRES
- O PATHFINDER RESOURCES II, LLC 22.5 ACRES
- P ANTERO RESOURCES CORP. 12.5 ACRES
- Q REITA JANE HALL 21.38 ACRES
- R MELISSA DAWN FILANT 31.48 ACRES
- S RICHARD J. FERRELL ET UX 16.00 ACRES
- T DAVID LEEK 34.00 ACRES
- U RIDGETOP CAPITAL LP 39.00 ACRES
- V BRC APPALACHIAN MINERALS I LLC 51.76 ACRES
- W BRC APPALACHIAN MINERALS I LLC 52.59 ACRES
- X ROBERT PITMAN ET UX 2.4 ACRES
- Y RICHARD J. FERRELL 1.50 ACRES
- Z DAVID LEEK 2.20 ACRES
- AA RICHARD E. FOWNER 0.0 ACRES

(NAD 27 (UTM) ZONE 17 COORDS:
WELL 1H TOP HOLE INFORMATION:
N: 14,050,578.7' E: 1,658,435.7'
POINT OF ENTRY INFORMATION:
N: 14,250,144.7' E: 1,657,804.7'
BOTTOM HOLE INFORMATION:
N: 14,251,009.7' E: 1,658,769.7'

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

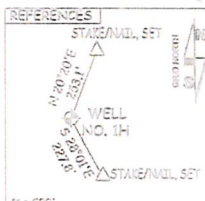
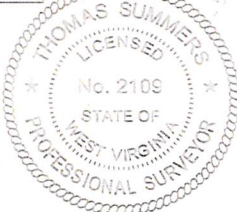


NO COINED CHANGING OR BUILDING TWO THOUSAND FIVE HUNDRED (2000) POUNDS FEET OF LIGNITE USED TO HOUSE OR CHILTERN DAIRY CATTLE OR POLTRY HUSBANDRY ARE LOCATED WITHIN ONE HUNDRED TWENTY-FIVE (125) FEET OF THE CENTER OF THE WELL PAD.

JOB # 20-006WA
DRAWING # GRAPEVINE1HRS
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
DATE 09/23/20
OPERATOR'S WELL # GRAPEVINE UNIT 1H



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

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL API WELL # 47 - 093 - 02707
(IF "GAS") PRODUCTION STORAGE DEEP SHALLOW STATE COUNTY PERMIT
LOCATION: ELEVATION ORIGINAL - 1,070' PROPOSED - 1,042' WATERSHED OUTLET MIDDLE ISLAND CREEK
QUADRANGLE PORTER FALLS 7.5' DISTRICT ELLSWORTH COUNTY TYLER
SURFACE OWNER KAYLA LEEK ACREAGE 59.05 ACRES +/-
OIL & GAS ROYALTY OWNER RIDGETOP CAPITAL LP; DAVID LEEK; RICHARD J. FERRELL ET UX; LEASE ACREAGE 59.05 AC +/- 34.38 AC +/- 15.08 AC +/-
DAVID LEEK; RICHARD J. FERRELL; ROBERT PITMAN ET UX; REITA JANE HALL; JERRY R. BRIGHTWELL ET UX; 2.25 AC +/- 1.68 AC +/- 2.4 AC +/- 21.38 AC +/- 31.74 AC +/-
PATHFINDER RESOURCES II, LLC; DARWIN MARTIN ET UX; RIDGETOP CAPITAL II, LP; HELEN M. KARCINSKI ET AL.; 50.5 AC +/- 24.47 AC +/- 50.25 AC +/- 28.77 AC +/-
HELEN M. KARCINSKI ET AL.; LINDA K. LOEHR; WACO OIL AND GAS CO., INC.; BRC APPALACHIAN MINERALS I, LLC

PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
PLUG OFF OLD FORMATION PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) MOD-BH1 PLUG & ABANDON CLEAN OUT & REPLUG
TARGET FORMATION MARCELLUS ESTIMATED DEPTH 7,000' TVD 21,000' MD
WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM
ADDRESS 1815 WYMKOOP ST. ADDRESS 5400 D BIG TYLER ROAD
FORM WW-8 DENVER, CO 80202 CHARLESTON, WV 25313

13,277' TO BOTTOM HOLE

LONGITUDE 80°47'30"

LONGITUDE 80°50'00"

COUNTY NAME PERMIT

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