

#### 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

Friday, January 24, 2020 PERMIT MODIFICATION APPROVAL Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION 1615 WYNKOOP STREET

DENVER, CO 80202

Re:

Permit Modification Approval for STAMPEDE UNIT 1H

47-095-02654-00-00

#### 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: STAMPEDE UNIT 1H

Farm Name: ANTERO RESOURCES CORPORATION

U.S. WELL NUMBER: 47-095-02654-00-00

Horizontal 6A New Drill

Date Modification Issued:

Promoting a healthy environment.

WW-6B (04/15) PERMIT MODIFICATION API#

API NO. 47- 095 OPERATOR WELL NO. Stampede Unit 1H
Well Pad Name: Colorado East Pad

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

1) Well Operator: Antero Res	ources Corporat	494507062	Tyler	McElroy	Shirley 7.5'		
		Operator ID	County	District	Quadrangle		
2) Operator's Well Number: Sta	ampede Unit 1H	Well Pad	Name: Colora	ado East P	ad		
3) Farm Name/Surface Owner:	Antero Resources Corpo	Public Road	d Access: CR	60			
4) Elevation, current ground:	743' Ele	evation, proposed p	ost-construction	on:			
5) Well Type (a) Gas X	Oil	Unde	rground Storag	e			
Other					-		
(b)If Gas Sha	llow X	Deep					
Hor	rizontal X				10/21		
6) Existing Pad: Yes or No No					1.22-20		
7) Proposed Target Formation(s) Marcellus Shale: 6900' TVD, A		•			1-22-40		
	· · · · · · · · · · · · · · · · · · ·	35- 35 leet, Associa	leu Flessuie- Z	330#			
8) Proposed Total Vertical Depth		1000000					
9) Formation at Total Vertical D				****			
10) Proposed Total Measured De	epth: 19300' MD	)		*			
11) Proposed Horizontal Leg Le	ngth: 10358'						
12) Approximate Fresh Water St	rata Depths:	235', 241', 298'			***************************************		
13) Method to Determine Fresh Water Depths: 47-095-01251, 47-095-00507, 47-095-01643							
14) Approximate Saltwater Dept	14) Approximate Saltwater Depths: 970'						
15) Approximate Coal Seam Depths: None Identified							
16) Approximate Depth to Possi	ble Void (coal min	e, karst, other): 1	lone Anticipat	ed			
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:						

WW-6B (04/15) 4709502654

API NO. 47- 095 -

OPERATOR WELL NO. Stampede Unit 1H
Well Pad Name: Colorado East 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#	348 *see # 19	348 *see # 19	CTS, 483 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#	19300	19300	CTS, 4899 Cu. Ft
Tubing	2-3/8"	New	N-80	4.7#			
Liners							

DMH 1-22-20

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							

### **PACKERS**

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

WW-6B (10/14) PERMIT MODIFIC 9.15, QP 2 6 5 4

API NO. 47- 095

OPERATOR WELL NO. Stampede Unit 1H

Well Pad Name: Colorado East 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.

\*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 DM17

- 21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): Existing 24.73 acres
- 22) Area to be disturbed for well pad only, less access road (acres): Existing 4.67 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-47 + 0.05% ACSA-47

#### 25) Proposed borehole conditioning procedures:

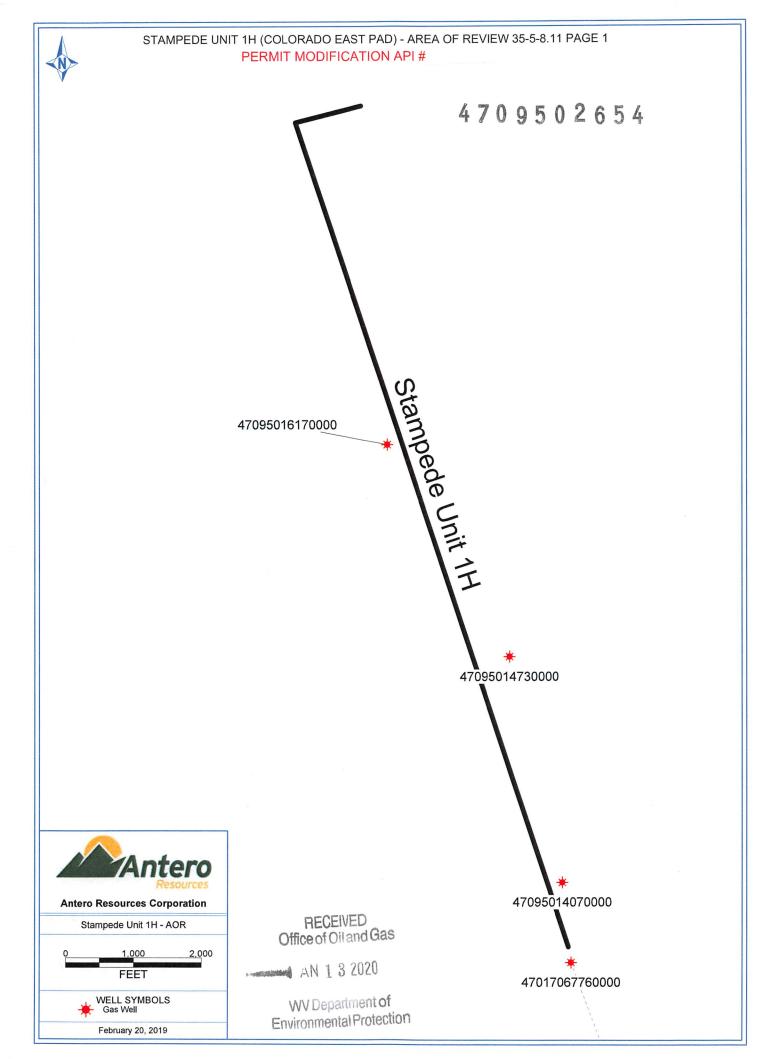
Conductor: blowhole clean with air, run casing, 10 bbls fresh water.

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.

<sup>\*</sup>Note: Attach additional sheets as needed.



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 Perforated Formation(s)
 Producible Formation(s) not perfd

 Riley, Benson
 Weir, Fifth, Warren, Alexander

 Riley, Benson
 Weir, Fifth, Warren, Alexander

 Riley, Benson
 Weir, Fifth, Warren, Alexander

 Marcellus
 Marcellus

5,097 5,200 5,050 5,050

Historical Operator STONEWALL GAS STONEWALL GAS STONEWALL GAS

CONSOL GAS COMPANY
CONSOL GAS COMPANY
CONSOL GAS COMPANY
CONSOL GAS COMPANY
ANTERO RESOURCES CORPORATION

 UWI (APINum)
 Weil Name

 47095016170000
 CUMBERLEDGE JACOB

 47095014730000
 MCCULLOUGH ENID

 47095014070000
 PITTS STEPHEN

 47017067760000
 MANZAREK UNIT

Well Number

WV Department of Environmental Protection

Operator's Well Number

Stampede Unit 1H

709502654

# 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
D. F. Dood 9 M. I. Dood Loose							
B.F. Reed & M.J. Reed Lease B.F. Reed & M. J. Reed	E H. Morco				1/8		0069/0004
F.H Morse	F.H. Morse						0101/0036
	The Philadelphia Company of W				Assignment		0132/0445
The Philadelphia Company of WV	Pittsburgh & West Virginia Gas C	Lompany			Assignment		0132/0445
Pittsburgh & West Virginia Gas Company	Equitable Gas Company LLC				Assignment		
Equitable Gas Company LLC	Equitrans Inc				Assignment		0274/0471
Equitrans Inc	EQT Capital Corporation				Merger		0433/0738
EQT Capital Corporation	Equitable Resources Inc				Merger		0433/0738
Equitable Resources Inc	Equitable Gas Company LLC				Merger		0433/0738
Equitable Gas Company LLC	Equitrans LP				Assignment		0433/0777
Equitrans LP	EQT Production Company				Agreement		0440/0107
EQT Production Company	Antero Resources Corporation				Assignment		0663/0001
Susan L. Spencer et vir Lease							
Susan L. Spencer et vir	Equitrans LP				Assignment		0404/0635
Equitrans LP	EQT Production Company			Agreement			0440/0107
EQT Production Company	Antero Resources Corporation				Assignment		0663/0001
Kenneth Orr et al Lease							
Kenneth Orr et al	<b>Equitable Gas Company LLC</b>				1/8		0172/0012
Equitable Gas Company LLC	Equitrans Inc				Assignment		0274/0471
Equitrans Inc	<b>EQT Capital Corporation</b>				Merger		0433/0738
EQT Capital Corporation	Equitable Resources Inc				Merger		0433/0738
Equitable Resources Inc	Equitable Gas Company LLC				Merger		0433/0755
Equitable Gas Company LLC	Equitrans LP				Assignment		0433/0777
Equitrans LP	<b>EQT Production Company</b>				Agreement		0440/0107
<b>EQT Production Company</b>	Antero Resources Corporation				Assignment		0663/0001
			Ā				
Jacob A. Cumberledge et ux Lease		m	£				
Jacob A. Cumberledge et ux	<b>Equitable Gas Company LLC</b>	N. C	<u>E</u>	0	1/8		0175/0495
Equitable Gas Company LLC	Equitrans Inc	0 ≥		<b></b>	Assignment		0274/0471
Equitrans Inc	EQT Capital Corporation	m D	-	e Z	Merger		0433/0738
EQT Capital Corporation	Equitable Resources Inc	en e	anned .	웃	Merger		0433/0738
Equitable Resources Inc	Equitable Gas Company LLC	2 3 0	೭೦ :		Merger		0433/0755
Equitable Gas Company LLC	Equitrans LP	WV Department of //ironmental Protect	2020	E E	Assignment		0433/0777
Equitrans LP	<b>EQT Production Company</b>	WV Department of Environmental Protection	<u> </u>	RECEIVED Office of Oil and Gas	Agreement		0440/0107
<b>EQT Production Company</b>	<b>Antero Resources Corporation</b>	9	Č	CO	Assignment		0663/0001

<sup>\*</sup>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.

Stampede Unit 1H

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Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
Gay Cumberledge et al Lease			
Gay Cumberledge et al	Equitable Gas Company LLC	1/8	0193/0502
Equitable Gas Company LLC	Equitrans LP	Assignment	0433/0777
Equitrans LP	EQT Production Company	Agreement	0440/0107
EQT Production Company	Antero Resources Corporation	Assignment	0663/0001
	•		
Fanny Davis et al Lease			
Fanny Davis et al	Equitable Gas Company	1/8	0193/0068
Equitable Gas Company	Equitrans Inc	Assignment	0274/0471
Equitrans Inc	EQT Capital Corporation	Merger	0433/0738
EQT Capital Corporation	Equitable Resources Inc	Merger	0433/0738
Equitable Resources Inc	Equitable Gas Company	Merger	0433/0755
Equitable Gas Company	Equitrans LP	Assignment	0433/0777
Equitrans LP	EQT Production Company	Agreement	0396/0640
<b>EQT Production Company</b>	Antero Resources Corporation	Assignment	0663/0001
Alto Pratt et al Lease			
Alto Pratt et al	Equitable Gas Company LLC	1/8	0192/0292
Equitable Gas Company LLC	Equitrans LP	Assignment	0433/0777
Equitrans LP	EQT Production Company	Agreement	0440/0107
<b>EQT Production Company</b>	Antero Resources Corporation	Assignment	0663/0001
Enid McCullough et vir Lease			
Enid McCullough et vir	Equitable Gas Company LLC	1/8	0194/0061
Equitable Gas Company LLC	Equitrans Inc	Assignment	0274/0471
Equitrans Inc	EQT Capital Corporation	Merger	0433/0738
EQT Capital Corporation	Equitable Resources Inc	Merger	0433/0738
Equitable Resources Inc	Equitable Gas Company LLC	Merger	0433/0755
Equitable Gas Company LLC	Equitrans LP	Assignment	0433/0777
Equitrans LP	EQT Production Company	Agreement	0396/0640
<b>EQT Production Company</b>	Antero Resources Corporation	Assignment	0663/0001

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AN 1 3 2020

WV Department of Environmental Protection Operator's Well Number

Stampede Unit 1H

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Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
W.S. Wright et al Lease			
W.S. Wright et al	Equitable Gas Company LLC	1/8	0196/0132
Equitable Gas Company LLC	Equitrans Inc	Assignment	0274/0471
Equitrans Inc	EQT Capital Corporation	Merger	0433/0738
EQT Capital Corporation	Equitable Resources Inc	Merger	0433/0738
Equitable Resources Inc	Equitable Gas Company LLC	Merger	0433/0755
Equitable Gas Company LLC	Equitrans LP	Assignment	0433/0777
Equitrans LP	EQT Production Company	Agreement	0396/0640
<b>EQT Production Company</b>	Antero Resources Corporation	Assignment	0663/0001

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WV Department of Environmental Protection

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## 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.	Grantas Laggas eta	D ovelty	Book/Page
Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	BOOK/Fage
James B. Fahey et ux Lease				
	James B. Fahey et ux	Equitable Gas Company LLC	1/8	0213/0184
	Equitable Gas Company LLC	Equitrans Inc	Assignment	0274/0471
	Equitrans Inc	<b>EQT Capital Corporation</b>	Merger	0433/0738
	<b>EQT Capital Corporation</b>	Equitable Resources Inc	Merger	0433/0738
	Equitable Resources Inc	Equitable Gas Company LLC	Merger	0433/0755
	Equitable Gas Company LLC	Equitrans LP	Assignment	0433/0777
	Equitrans LP	<b>EQT Production Company</b>	Agreement	0396/0640
	<b>EQT Production Company</b>	<b>Antero Resources Corporation</b>	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.

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

1 1 3 2020

Page 1 of 1

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