

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

Harold D. Ward, Cabinet Secretary www.dep.wv.gov

Tuesday, March 15, 2022 PERMIT MODIFICATION APPROVAL Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION 1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit Modification Approval for TOROWEAP UNIT 2H 47-095-02766-00-00

Lateral Extension

ANTERO RESOURCES CORPORATION

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before permitted well work is commenced.

If there are any questions, please feel free to contact me at (304) 926-0450.

James A. Martin Chief

Operator's Well Number: Farm Name: U.S. WELL NUMBER: Horizontal 6A Date Modification Issued: 3/15/2022

Promoting a healthy environment.

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WW-6B
(04/15)

API NO. 47-095 - 02766 MOD OPERATOR WELL NO. Toroweap Unit 2H Well Pad Name: Grand Pad

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

1) Well Operat	or: Antero	Resources	Corporat	494507062	095-Tyler	Ellsworth	Porter Falls 7.5'
· •				Operator ID	County	District	Quadrangle
2) Operator's V	Well Numbe	r: Torowea	p Unit 2	H Well Pad	Name: Gran	d Pad	
3) Farm Name	/Surface Ow	ner: Kenneth	Tomblin et	ux Public Roa	d Access: Gor	rells Run F	load
4) Elevation, c	urrent grour	id: <u>1243'</u>	Ele	evation, proposed	post-constructi	on:	
5) Well Type	(a) Gas Other	<u>×</u>	_ Oil	Unde	erground Storag	ge	
	(b)If Gas	Shallow Horizontal	X X	Deep			5 Jul 3(10/2022
6) Existing Pac	l: Yes or No		- <u></u>				
7) Proposed Ta Marcellus S	arget Format Shale: 7400	tion(s), Depth D' TVD, Antic	(s), Antici ipated Th	pated Thickness a nickness- 55 feet	nd Expected Pit, Associated	ressure(s): Pressure-	9300#
8) Proposed To	otal Vertical	Depth: <u>7,40</u>	0'				
9) Formation a	t Total Vert	ical Depth:	Marcellus				
10) Proposed 7	Total Measur	red Depth:	21,100'			Off	RECEIVED
11) Proposed H	Iorizontal L	eg Length:	11,781'				AR 1 4 2022
12) Approxima	ate Fresh Wa	ater Strata De	pths:	25'		WA	V Department of
 13) Method to 14) Approxima 				7-095-02267		Enviro	onmental Protection
15) Approxima		• —					
16) Approxima	ate Depth to	Possible Void	l (coal mi	ne, karst, other):	None Anticipa	ted	
17) Does Prope directly overly				ns Yes	No	<u>x</u>	
(a) If Yes, pro	ovide Mine	Info: Name:		·····	·		
		Depth:	<u> </u>				
		Seam:					
		Owner					

API NO. 47- 095 __ 02768 MOD OPERATOR WELL NO. Toroweap Unit 2H Well Pad Name: Grand Pad

18)

CASING AND TUBING PROGRAM

TYPE	<u>Size</u> (in)	<u>New</u> or <u>Used</u>	<u>Grade</u>	<u>Weight per ft.</u> (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	<u>CEMENT:</u> <u>Fill-up</u> (Cu. Ft.)/CTS
Conductor	20"	New	H-40	79#	80	80	CTS, 218 Cu. Ft.
Fresh Water	13-3/8°	New	J/K-55	54.5#	300	300	CTS, 417 Cu. Ft.
Coal	9-5/8"	New	J/K-55	36#	2500	2500	CTS, 1018 Cu. Ft.
Intermediate							
Production	5-1/2"	New	PY-110	23#	21,100	21,000	CTS, 4389 Cu. Ft
Tubing	2-3/8*	New	N-80	4.7#	· · · · · · · · · · · · · · · · · · ·		
Liners							

50w 3110/2022

TYPE	<u>Size (in)</u>	<u>Wellbore</u> Diameter (in)	<u>Wall</u> <u>Thickness</u> (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	<u>Cement</u> <u>Type</u>	<u>Cement</u> <u>Yield</u> (cu, ft./k)
Conductor	20"	24"	0.438"	1530	50	Class A	
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	Lasd-H/POZ & Tall - H	H/POZ-1.44 & H-1.8
Tubing	2-3/8"	4.778"	0.19"	11,200			
Liners							

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PACKERS

		TACKERS	_ WV Department of
Kind:	N/A		Environmental Protection
Sizes:	N/A		
Depths Set:	N/A		

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WW-6B

(04/15)

19)	Describe p	roposed wel	l work, includ	ing the drilling	and plugging	back of any pilot hole:
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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 A	rea to be disturbed	, including roads,	, stockpile area, 1	pits, etc., (acres)	: Existing 41.0 acres
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22) A	Area to be	disturbed fo	r well pad only	less access road (acres)	: Existing 13.72 acro	es
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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:

WV Department of Environmental Protection

Conductor: no additives, Class A cement.WVSurface: Class A cement with 2-3% calcium chloride and 1/4 lb of flakeEnvirorIntermediate: Class A cement with 1/4 lb of flake, 5 gallons of clay treatProduction: 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-51Production: 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:

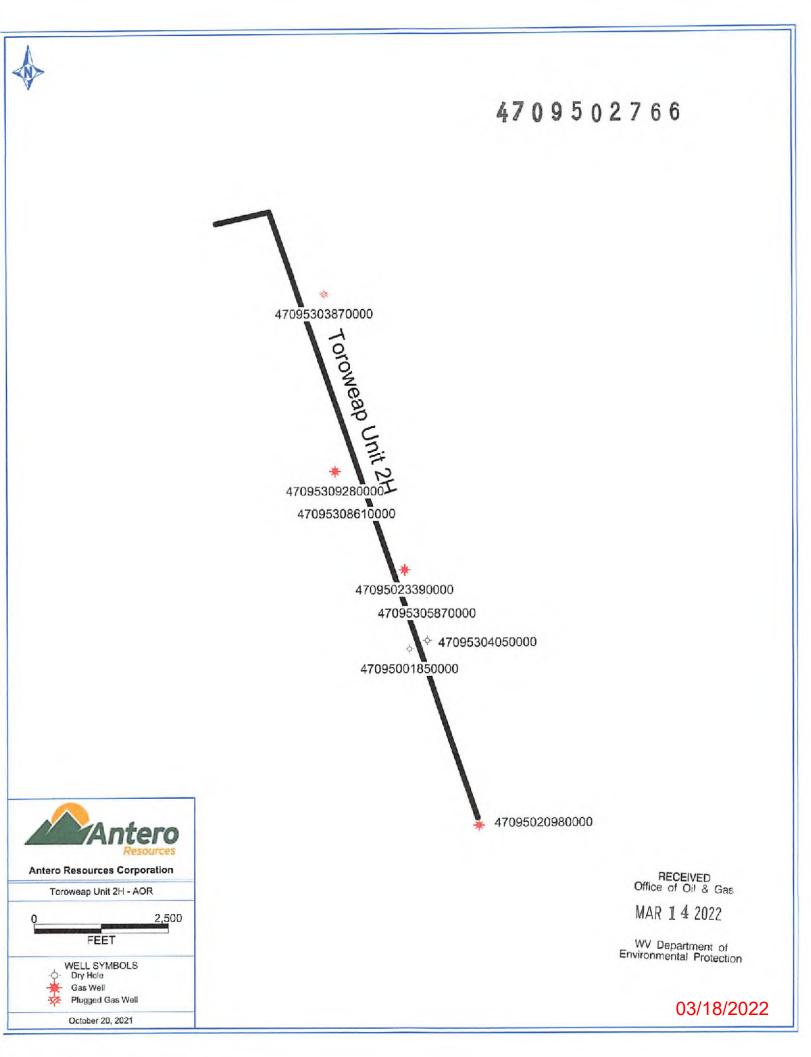
Conductor: blowhole clean with air, run casing, 10 bbls fresh water.

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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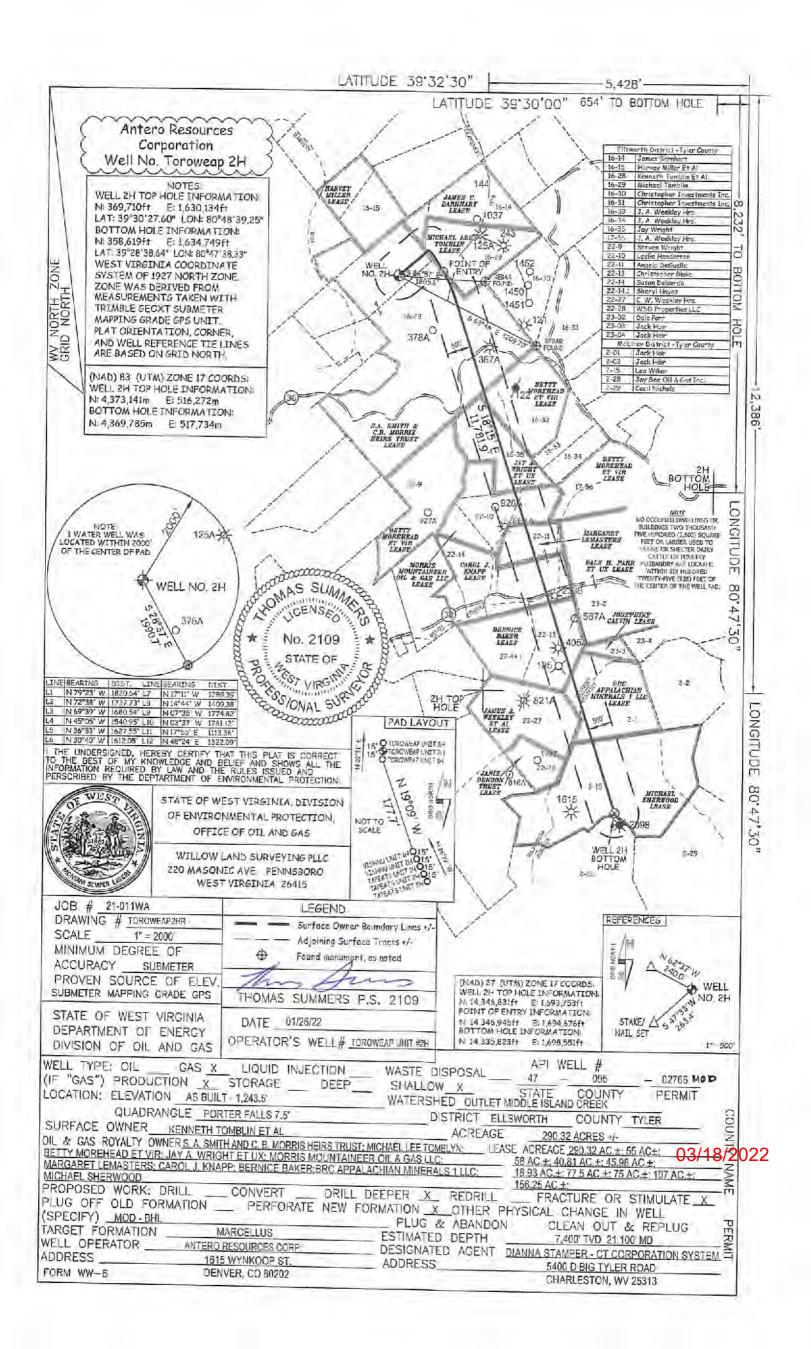
UWI (APINum)	Well Name	Well Number	Operator	Historical Operator	TD	Perforated Interval	Perforated Formation(s)	Producible Formation(s) not perf'd
47095303870000	K S BOREMAN 2	2025	MANUFACT LIGHT & HEAT	MANUFACT LIGHT & HEAT	2,171		Big Injun	Alexander, Weir, Berea
47095309280000	D W BENNETT/E WELLS 1	2065	MANUFACT LIGHT & HEAT	MANUFACT LIGHT & HEAT	2,644	A second provide the	Gordon	Alexander, Weir, Berea
47095308610000	A WEEKLEY 1	1311	MANUFACT LIGHT & HEAT	MANUFACT LIGHT & HEAT	2,057		Big Injun, Gordon	Alexander, Weir, Berea
47095023390000	COTTONWOOD 1	V-1	BOWYER DAVID	ALLIANCE PETR CORP	4,430	2359 - 2806	Gordon	Alexander, Weir, Berea
47095305870000	A & L WEEKLEY 1	1612	MANUFACT LIGHT & HEAT	MANUFACT LIGHT & HEAT	2,878		Gordon	Alexander, Weir, Berea
47095001850000	T L BAKER	1	UNKNOWN	UNKNOWN	2,253		Cow Run	Alexander, Weir, Berea
47095304050000	GAY SOLE	1	MANUFACT LIGHT & HEAT	MANUFACT LIGHT & HEAT			Big Injun	Alexander, Weir, Berea
47095020980000	LEMASTERS D ET AL	RPT 5-1	JAY-BEE OIL & GAS	JAY-BEE OIL & GAS	13,865		Marcellus	

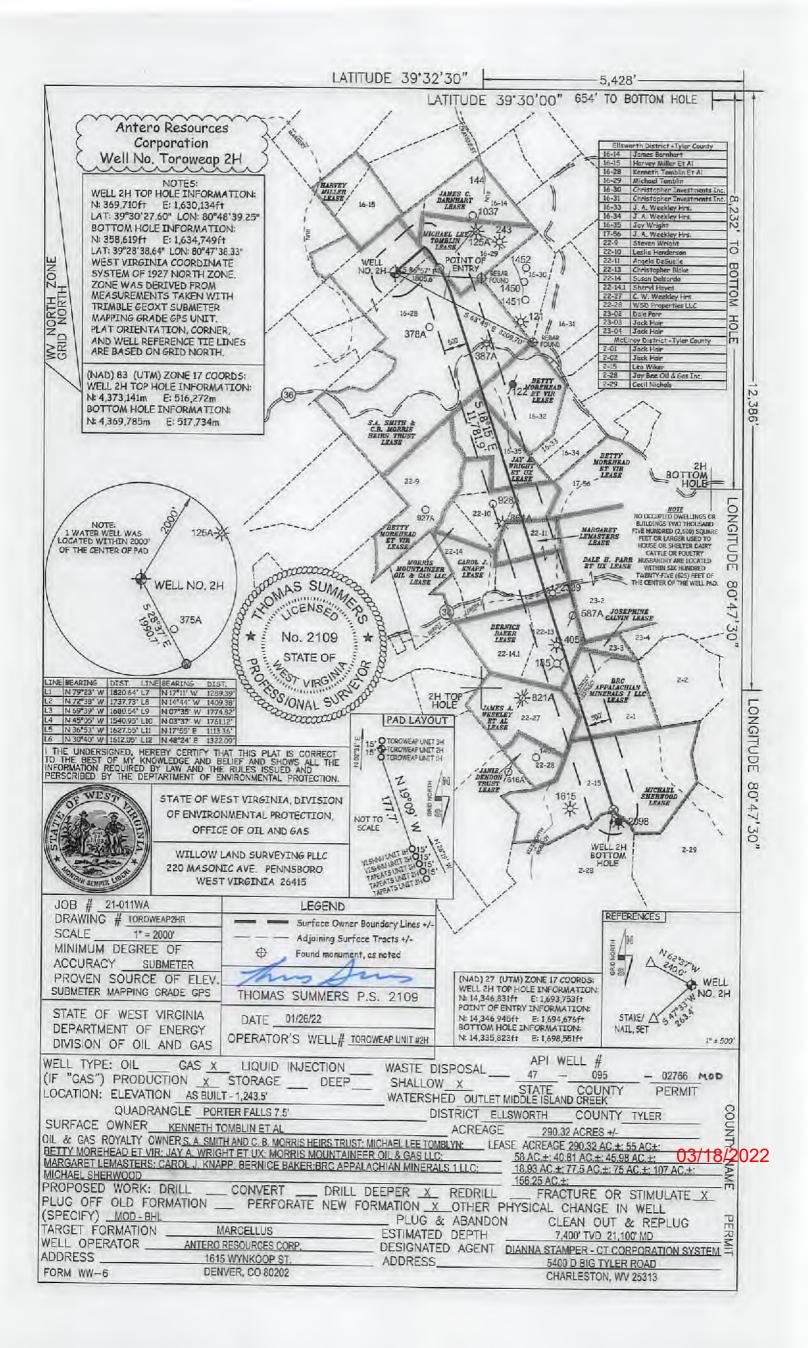
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WV Department of Environmental Protection





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

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

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

Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
Michael Sherwood Lease				
	Michael Sherwood	JB Exploration I LLC	1/8+	398/342
	JB Exploration LLC	Antero Resources Corporation	Assignment	134/700

*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				
Its:	VP of Land				

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Operator's Well Number Toroweap Unit 2H MOD

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Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Pag
S.A. Smith and C. B Morris Heirs Trust			
Lease			
S.A. Smith and C. Burke Morris Heirs Trust	Antero Resources Corporation	1/8+	0022/0268
Michael Lee Tomblin Lease			
Michael Lee Tomblin, a married man	Antero Resources Appalachian Corporation	1/8	0420/0497
Antero Resources Appalachian Corporation	Antero Resources Corporation	Assignment	0598/0358
S.A. Smith and C. B Morris Heirs Trust			
Lease			
S.A. Smith and C. Burke Morris Heirs Trust	Antero Resources Corporation	1/8+	0022/0268
Betty Morehead, et vir Lease			
Betty Morehead, et vir	Petroedge Energy, LLC	1/8	0389/0539
Petroedge Energy, LLC	Statoil USA Onshore Properties Inc	Assignment	0406/0147
Statoil USA Onshore Properties Inc	EQT Production Company	Assignment	0539/0239
EQT Production Company	Antero Resources Corporation	Assignment	0134/0172
Jay A Wright et ux Lease			
Jay A Wright et ux	Antero Resources Corporation	1/8+	489/26
Morris Mountaineer Oil & Gas LLC Lease			
Morris Mountaineer Oil & Gas LLC	Antero Resources Corporation	1/8+	84/428
Margaret Lemasters Lease			
Margaret Lemasters	Antero Resources Corporation	1/8+	85/279
Carol J Knapp Lease	and all a characterized to the		
Carol J Knapp	Jay-Bee Production Company	1/8	388/141
Jay-Bee Production Company Statoil USA Onshore Properties Inc	Statoil USA Onshore Properties Inc	Assignment	469/419
EQT Production Company	EQT Production Company Antero Resources Corporation	Assignment Assignment	539/239 663/1
i i i i i i i i i i i i i i i i i i i	intere resources corporation	Assignment	005/1
Bernice Baker Lease			RECEIVED
Bernice Baker	Jay-Bee Properties Company	1/8	Office of Oil and Gas 391/221
Jay-Bee Properties Company	Statoil USA Onshore Properties Inc	Assignment	4 2022 469/410
Statoil USA Onshore Properties Inc	EQT Production Company	Assignment	MAR 4 2022 539/239
EQT Production Company	Antero Resources Corporation	Assignment	663/1
BRC Appalachian Minerals I LLC Lease		E	WV Department of nvironmental Protection
BRC Appalachian Minerals I LLC	BRC Working Interest Company LLC	1/8	369/300
BRC Working Interest Company LLC	Chesapeake Appalachia LLC	Assignment	369/784
Chesapeake Appalachia LLC	Statoil USA Onshore Properties Inc	Assignment	378/764
Statoil USA Onshore Properties Inc	EQT Production Company	Assignment	539/239
EQT Production Company	Antero Resources Corporation	Assignment	663/1



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: Mr. Taylor Brewer 601 57th Street Charleston, WV 25304

Mr. Brewer:

February 28, 2022

Antero Resources Corporation (Antero) would like to submit the following permit modifications for approved well on the existing Grand Pad: Toroweap Unit 2H & 3H (47-095-02766, 47-095-02767) Expedited.

Attached you will find the following:

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

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MAR 4 2022

WV Department of Environmental Protection

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

Thank you in advance for your consideration.

Sincerely,

Mallory Stanton Permitting Supervisor Antero Resources Corporation

Enclosures

CVH4005394 Amts500 Date 2/24/22



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

Modification Horizontal H6A Well Work Permit API: 47-095-02766 & 47-095-02767)

1 message

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

Tue, Mar 15, 2022 at 11:10 AM To: Mallory Stanton <mstanton@anteroresources.com>, Diane Blair <dblair@anteroresources.com>, Dani DeVito <ddevito@shalepro.com>, Douglas Newlon <douglas.c.newlon@wv.gov>, ljackson@wvassessor.com

I have attached a copy of the newly issued well permit number. This will serve as your copy.

47-095-02766- CLUTTER UNIT 1H 47-095-02767- GREENWOOD UNIT 1H

If you have any questions, then please contact us here at the Office of Oil and Gas.

Thank you,

Wade A. Stansberry **Environmental Resource Specialist 3** West Virginia Department of Environmental Protection Office of Oil & Gas 601 57th St. SE Charleston, WV 25304 (304) 926-0499 ext. 41115 (304) 926-0452 fax Wade.A.Stansberry@wv.gov

2 attachments

47-095-02766 - mod.pdf 7-977K

47-095-02767 - mod.pdf 2 942K