

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

Monday, January 31, 2022 PERMIT MODIFICATION APPROVAL New Drill / Modification

ANTERO RESOURCES CORPORATION 1615 WYNKOOP STREET DENVER, CO 80202

Re: Permit Modification Approval for SANDY UNIT 1H 47-085-10417

Extending Lateral

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:SANDY UNIT 1HFarm Name:ANTERO RESOURCES CORPORATIONU.S. WELL NUMBER:47-085-10417New DrillModificationDate Modification Issued:01/31/2022

Promoting a healthy environment.

API NO. 47-085 - 0417 MOD

WW-6B (04/15)

OPERATOR WELL NO. Sandy Unit 1H Well Pad Name: Weekley West Pad

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

1) Well Opera	tor: Antero R	esources	Corporat	494507062	085-Ritchie	Union	Pullman/Oxford7
r) wen opera			· P · · · ·	Operator ID	County	District	Quadrangle
2) Operator's '	Well Number:	Sandy U	nit 1H	Well	Pad Name: Wee	kley West	Pad 🧹
3) Farm Name	/Surface Own	Antero Res	ources Corpo	pration Public F	Road Access: Co	Rd 22/3	
4) Elevation, c	urrent ground:	1,138'	El	evation, propos	ed post-construct	tion: 1,12	5' -
5) Well Type	(a) Gas X Other	:	_ Oil		nderground Stora		
	2.4	Shallow Horizontal	$\frac{X}{X}$	Deep			-0
6) Existing Pa	d: Yes or No	No	-		2.11.1		
					ss and Expected I Associated Pre		
8) Proposed To	otal Vertical D	epth: 7,00	10' <				
9) Formation a	at Total Vertica	l Depth:	Marcellu	IS			
10) Proposed	Fotal Measured	Depth:	23,500'	1			
11) Proposed I	Horizontal Leg	Length:	13,685'	-			
12) Approxim	ate Fresh Wate	r Strata De	pths:	258', 330',	478' 1		
13) Method to	Determine Fre	sh Water D	Depths: R	eference wells 08508569, 0	850858, 08508582 Depths hav	ve been adjusted acc	cording to surface elevations
14) Approxim	ate Saltwater D	Depths: 1,0)15' (refe	rence well 08	503139), 1,976	(referenc	e well 08507618)
15) Approxima	ate Coal Seam	Depths: 7	34' (refer	ence well 085	07618), 1,495'	(reference	well 08503139)
16) Approxima	ate Depth to Po	ossible Voi	d (coal mi	ne, karst, other	: None antici	ipated	
17) Does Prop directly overly	osed well locating or adjacent			ns Yes	N	o X	
(a) If Yes, pr	ovide Mine Int	fo: Name					
		Depth			REC	EIVED	
		Seam:	-		Office of C		
		Owner			JAN I	3 2022	
					WV Depa Environment	anment of Ial Protection	



API NO. 47- 085 - 0417 MOD OPERATOR WELL NO. Sandy Unit 1H Well Pad Name: Weekley West Pad

WW-6B (04/15)

18)

CASING AND TUBING PROGRAM

ТҮРЕ	<u>Size</u> (in)	<u>New</u> or <u>Used</u>	<u>Grade</u>	<u>Weight per ft.</u> (lb/ft)	<u>FOOTAGE: For</u> <u>Drilling (ft)</u>	INTERVALS: Left in Well (ft)	<u>CEMENT:</u> <u>Fill-up</u> (Cu. Ft.)/CTS	
Conductor	20"	New	H-40	94#	80	80	CTS, 77 Cu. Ft.	
Fresh Water	13-3/8	New	J/K-55	54.5#	528	528	CTS, 550Cu. 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#	23500	23500	CTS, 4994 Cu. Ft.	
Tubing	2-3/8	New	N-80	4.7#				
Liners								
	1	I	4 ,			Brya	n Harris 1	1/19/2:

TYPE	Size (in)	<u>Wellbore</u> Diameter (in)	<u>Wall</u> <u>Thickness</u> <u>(in)</u>	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	~1.18
Fresh Water	13-3/8	17-1/2"	0.380"	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	8-3/8"& 8-1/2"	0.415"	12,630	9300		
Tubing	2-3/8	4.778"	0.190"	11,200		Last-HPO2 & Tal-H	H/POZ-1.44 & H-1.8
Liners					RE	CEIVED	

Office of Oil and Gas

JAN 31 2022

PACKERS

WV Department of Environmental Protection

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

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 tha 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	EIVED Dilland Gas
21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 58.63 JAN 1	<u>3 2022</u>
22) Area to be disturbed for well pad only, less access road (acres): 8.23 WV Deparent Environments	rmencer <u>A Proteut</u> en
23) Describe centralizer placement for each casing string:	
Conductor: No centralizers. Surface Casing: One centralizer 10' above the float shoe and one every 4th joint spaced up the hole to surface. Intermediate Casing: One centralizer above float joint, one centralizer 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 Casing: Class A cement with 2-3% calcium chloride and 1/4 lb of flake. Intermediate Casing: Class A cement with 1/4 lb of flake, 5 gallons of clay treat. Production Casing 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 Casing Tail Cement: Class H + 45 PPS Calcium Carbonate + 1.0% Flake + 0.2% ACGB-47 + 0.05% ACSA-51 + 0.2% ACR-20.

25) Proposed borehole conditioning procedures:

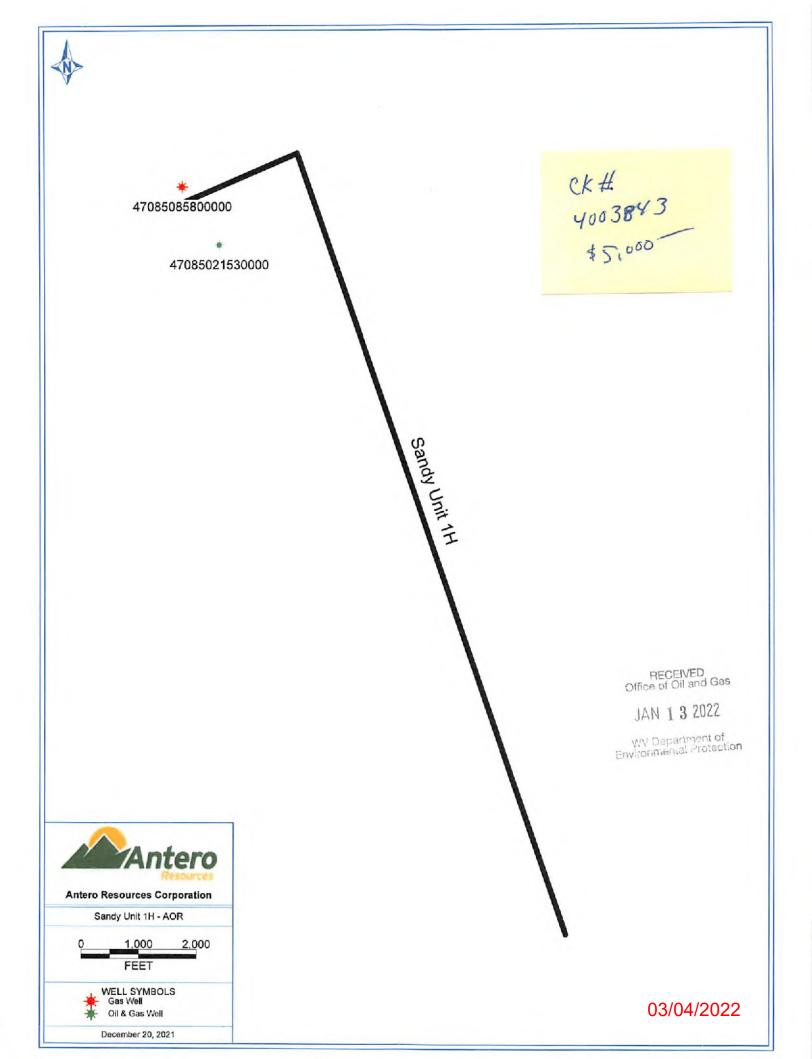
Conductor: blowhole clean with air, run casing, 10 bbls fresh water.

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.

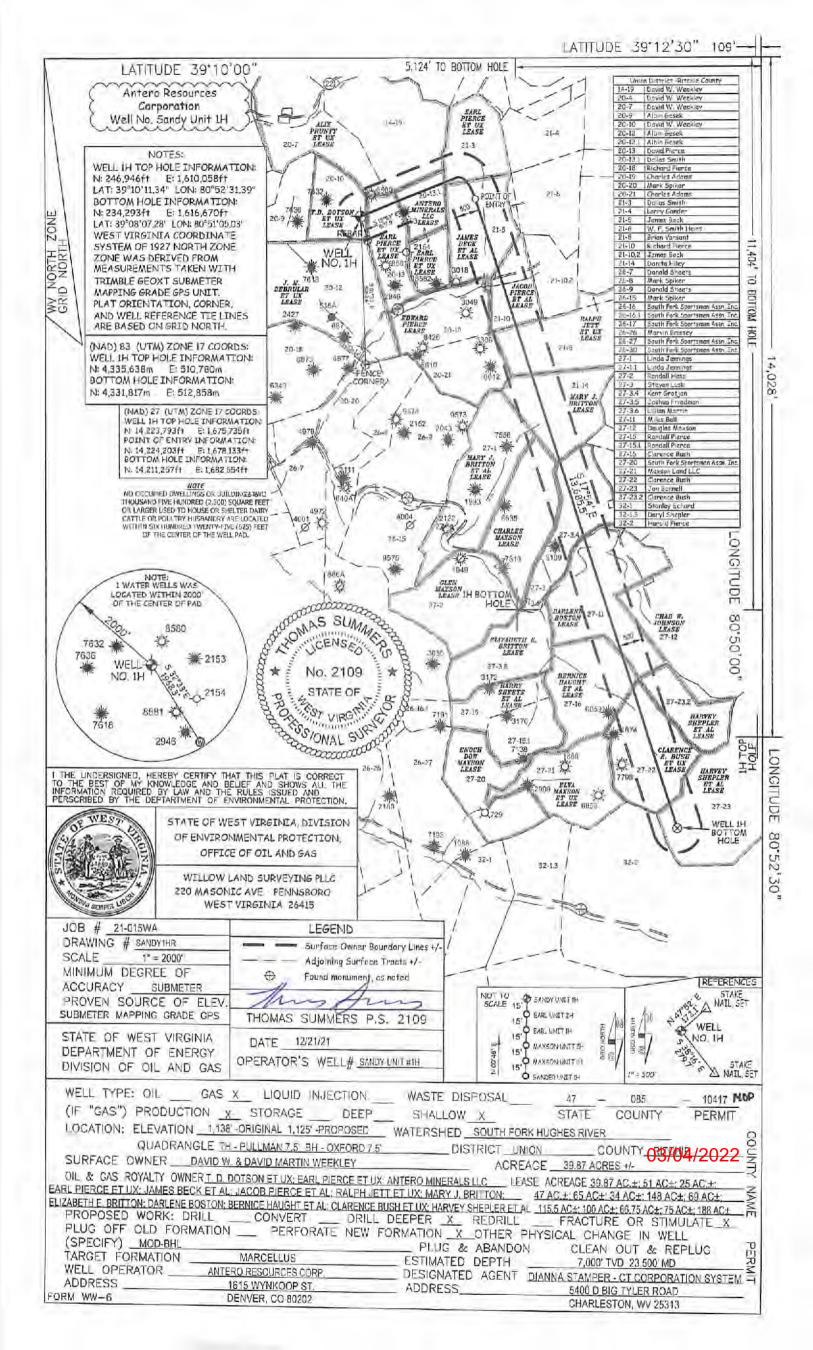
*Note: Attach additional sheets as needed.

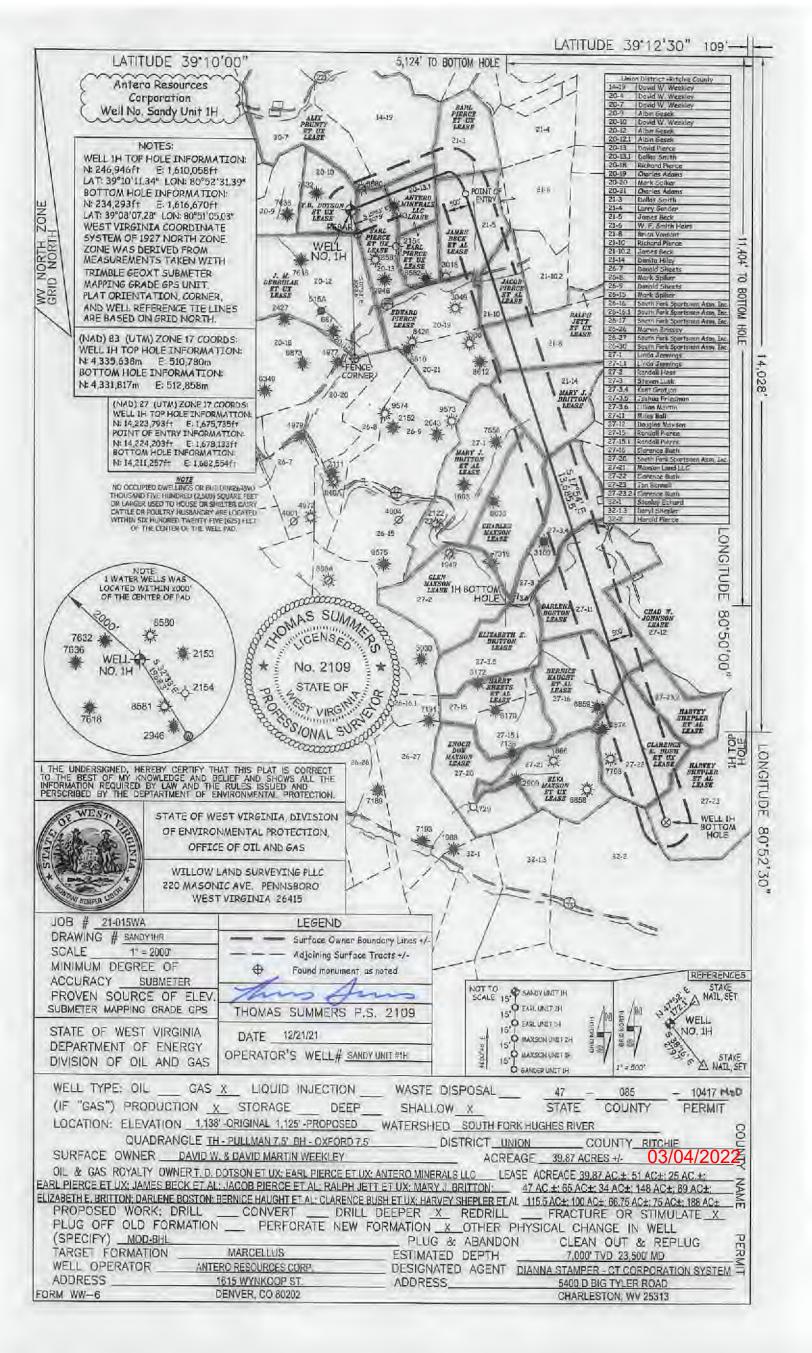


UWI (APINum)	Well Name	Well Number	Operator	Historical Operator	TD	Perforated Interval (shallowest, deepest)	Perforated Formation(s)	Producible Formation(s) not perf'd
47085085800000		1	KEY OIL CO	KEY OIL CO	5,438	3448 - 5250	Warren, Speechley, Balltown, Riley, Benson, Alexander	Gordon, Berea
47085021530000	EARL PIERCE	1	RITCHIE PET CORP	HEASTER PAUL ET AL	1,960		Big Injun	Gordon, Berea

WV Department of Environmental Protection

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 Operator's Well Number
 Sandy Unit 1H MOD
 RECEIVED Office of Oil and Gas

 INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE
 JAN 1 3 2022

 Chapter 22, Article 6A, Section 5(a)(5)
 VM Dependence of the section section

IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S) WV Department of Protection

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
T.D. Dotson, et ux Lease			
T.D. Dotson, et ux	J.T. Carter	1/8	0011/0297
J.T. Carter	The Carter Oil Company	Assignment	0011/0528
The Carter Oil Company	Hope Construction and Refining Company	Assignment	0052/0194
Hope Construction and Refining Company	Hope Natural Gas Company	Merger	0111/0520
Hope Natural Gas Company	Consolidation Gas Supply Corporation	Conveyance	0151/0436
Consolidation Gas Supply Corporation	Consolidation Gas Transmission Corporation	Assignment	0169/0756
Consolidation Gas Transmission Corporation	CNG Development Company	Assignment	0176/0601
CNG Development Company	CNG Producing Company	Name Change	WVSOS
CNG Producing Company	Dominion Exploration & Production, Inc.	Name Change	0058/0366
Dominion Exploration & Production, Inc.	Dominion Transmission, Inc.	Assignment	0251/0621
Dominion Transmission, Inc.	CONSOL Energy Holdings, LLC	Assignment	0251/0648
CONSOL Energy Holdings, LLC	Consol Gas Company	Merger	0006/0576
Consol Gas Company	CNX Gas Company, LLC	Merger	0006/0634
CNX Gas Company, LLC	Antero Resources Corporation	Assignment	0269/0429
<u>/Earl Pierce et ux Lease</u>			
Earl Pierce and Florence R Pierce his wife	Harry Haddox and Harrold Haddox	1/8	0101/0341
Harry Haddox and Harrold Haddox	George L Yaste dba Oil State Sales Company	Assignment	0102/0261
George L Yaste dba Oil State Sales Company	D L Y Inc	Assignment	0112/0302
D L Y Inc	Betty Jean Stalnaker & Rosalee Roberts dba R.&S. Gas Company	Assignment	0132/0565
Betty Jean Stainaker & Rosalee Roberts dba R.&S. Gas Company	R & S Gas Company, a partnership	Assignment	0147/0548
R & S Gas Company, a partnership	BET-RO Inc	Assignment	0147/0554
BET-RO Inc	Roberts Energy Corporation	Assignment	0240/0036
Roberts Energy Corporation	Antero Resources Corporation	Assignment	0329/0138
Antero Minerals LLC Lease			
Antero Minerals LLC	Antero Resources Corporation	1/8+	0328/0096
Earl Pierce et ux Lease			
Earl Pierce et ux	Harrold Haddox	1/8	0100/0205
Harrold Haddox	George L Yaste dba Oil State Sales Company	Assignment	0100/0510
George L Yaste dba Oil State Sales Company	D.L.Y. Inc	Assignment	0112/0302
D.L.Y. Inc	Betty Jean Stalnaker & Rosalee Roberts dba R.&S. Gas Company	Assignment .	0132/0565
Betty Jean Stainaker & Rosalee Roberts dba R.&S. Gas Company	BET-RO Inc	Assignment	0147/0554
BET-RO Inc	Roberts Energy Corporation	Assignment	0240/0036
Roberts Energy Corporation	Antero Resources Corporation	Assignment	0302/0741

Operator's Well Number Sandy Unit 1H MOD

03/04/2022

INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE JAN 1 3 2022 Chapter 22, Article 6A, Section 5(a)(5) IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S) W Department of

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Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Pag
James Beck, et al Lease			
James Beck, et al	George L Yaste dba Oil State Sales Company	1/8	0100/0516
George L Yaste dba Oil State Sales Company	D.L.Y. Inc	Assignment	0112/0302
D.L.Y. Inc	Betty Jean Stalnaker & Rosalee Roberts dba R.&S. Gas Company	Assignment	0132/0565
Betty Jean Stalnaker & Rosalee Roberts dba R.&S. Gas Company	R & S Gas Company, a partnership	Assignment	0147/0548
R & S Gas Company, a partnership	BET-RO Inc	Assignment	0147/0554
BET-RO Inc	Roberts Energy Corporation	Assignment	0240/0036
Roberts Energy Corporation	Antero Resources Corporation	Name Change	0329/0138
Jacob Pierce, et al Lease			
Jacob Pierce, et al	L.E. Mossor	1/8	0105/0210
L.E. Mossor	Francis Friestad	Assignment	0105/0353
· Francis Friestad	W.H. Thompson	Assignment	0106/0020
W.H. Thompson	Bet-Ro	Assignment	0222/0426
Bet-Ro	Key Oil Company	Assignment	0225/0382
Key Oil Company	Antero Resources Appalachian Corporation	Assignment	0255/0547
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	0015/0702
, Ralph Jett, et ux			
Ralph Jett, et ux	W. R. Development Co. Inc	1/8	0191/0378
W. R. Development Co. Inc	Whittle Corporation	Assignment	0254/0910
Whittle Corporation	Antero Resources Appalachian Corporation	Assignment	0255/0526
Antero Resources Appalachian Corporation	Antero Resources Corporation	Assignment	0015/0702
Mary J. Britton Lease			
Mary J. Britton	W.H. Mossor	1/8	0088/0331
W.H. Mossor	J&J Enterprises	Assignment	0133/0004
J&J Enterprises	Term Energy Corporation	Assignment	0172/0336
Term Energy Corporation	Kiedaisch & Summers Enterprises	Assignment	0263/0827
Kiedaisch & Summers Enterprises	Antero Resources Appalachian Corporation	Assignment	0329/0315
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	0015/0705
Elizabeth E. Britton Lease			
Elizabeth E. Britton	Pittsburgh & West Virginia Gas Co	1/8	51/501
Pittsburgh & West Virginia Gas Co	Equitable Gas Company	Assignment	126/473
Equitable Gas Company	Equitrans Inc	Assignment	201/253
Equitrans Inc	Equitable Production Eastern State Inc	Assignment	234/830
Equitable Production Eastern State Inc	Equitable Production Company	Assignment	WVSOS
Equitable Production Company EQT Production Company	EQT Production Company	Assignment	6/443
controduction company	Antero Resources Corporation	Assignment	282/175

Operator's Well Number Sandy Unit 1H MOD

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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Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
Darlene Boston Lease			
Darlene Boston	Antero Resources Corporation	1/8+	295/891
Bernice Haught et al Lease			
Bernice Haught et al	L.E Mossor	1/8	108/521
L.E Mossor	William Mossor AIF for Christine Mossor Widow	Will	217/843
William Mossor AIF for Christine Mossor Widow	Antero Resources Corporation	Assignment	295/972
Clarence E. Bush et ux Lease			
Clarence E. Bush et ux	L.E Mossor	1/8	107/447
L.E Mossor	Francis Friestad	Assignment	148/326
Francis Friestad	W.H Thomson	Assignment	198/705
W.H Thomson	BET-RO	Assignment	222/425
BET-RO	William K Stalnaker	Assignment	227/461
William K Stalnaker	Key Oil	Assignment	254/1086
Key Oil	Antero Resources Appalachian Corporation	Assignment	255/22
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	15/705

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JAN 1 3 2022

WV Department of Environmental Protection **WW-6A1** (5/13)

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 / Harvey Shepler et ux Lease

	LE Mossor 1/8 Francis Friestad Assignment W.H Thomson Assignment BET-RO Assignment William K Stalnaker Assignment Key Oil Assignment Antero Resources Appalachian Corp Assignment Name Char	198/705 222/426 227/461 254/1086 ent 255/22
--	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------

*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 ٠

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 Reso	Antero Resources Corporation				
By:	Tim Rady	(m. Veily				
Its:	VP of Land					

Page 1 of ____

03/04/2022

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JAN 1 3 2022

W Depariment of Environmental Protection



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

Expedited Horizontal H6A Well Work Permit API: 47-085-10414, 10415, 10417)

1 message

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

Wed, Feb 2, 2022 at 7:13 AM To: Mallory Stanton <mstanton@anteroresources.com>, Dani DeVito <ddevito@shalepro.com>, Scott Lemley <slemley@wvassessor.com>, "Harris, Bryan O"

harris@wv.gov>

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

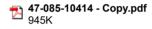
47-085-10414 - EARL UNIT 1H 47-085-10415 - EARL UNIT 2H 47-085-10417 - SANDY UNIT 1H

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

3 attachments



- **47-085-10415 Copy.pdf** 942K 7-
- **47-085-10417 Copy.pdf** 953K 7-