

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 EARL UNIT 2H

47-085-10415

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.

Operator's Well Number: EARL UNIT 2H

Farm Name: ANTERO RESOURCES CORPORATION

U.S. WELL NUMBER: 47-085-10415

New Drill Modification

Date Modification Issued: 01/31/2022

Promoting a healthy environment.

API NO. 47-085	_ 10415 MOD
OPERATOR W	/ELL NO. Earl Unit 2H
Well Pad Nar	no: Weekley West Pad

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

1) Well Operator:	Antero Resou	rces Corpor	494507062	085-Ritchie	Union	Pullman/Oxford7
-			Operator ID	County	District	Quadrangle
2) Operator's Well N	Number: Earl	Unit 2H	. Well I	Pad Name: Weel	kley West	Pad ·
3) Farm Name/Surfa	nce Owner: An	tero Resources Co	orporation Public R	oad Access: Co	Rd 22/3	
4) Elevation, current	ground: 1	138'	Elevation, propose	ed post-construct	ion: 1,12	5' *
5) Well Type (a) Othe		Oil _	Ur	nderground Stora	ge	
(b)I	f Gas Shalle		Deep	1		-
6) Existing Pad: Yes	or No No					
7) Proposed Target I Marcellus Shale			icipated Thicknes Thickness 55', A			0#
8) Proposed Total V	ertical Depth:	7,000'				
9) Formation at Tota		N.A.	llus			
10) Proposed Total	Measured Dep	th: 23,400	1			
11) Proposed Horizo		44.007	1			
12) Approximate Fr	esh Water Str	ata Depths:	258', 330', 4	478' ~		
13) Method to Deter	mine Fresh W	ater Depths:	Reference wells 08508569, 08	50858, 08508582 Depths have	e been adjusted acc	cording to surface elevations
14) Approximate Sa			eference well 085	503139), 1,976'	(reference	e well 08507618)
15) Approximate Co	oal Seam Dept	hs: 734' (ref	erence well 085	07618), 1,495' (reference	well 08503139)
16) Approximate De	epth to Possib	le Void (coal	mine, karst, other)	None antici	pated	
17) Does Proposed directly overlying or				No.	x <u>X</u>	
(a) If Yes, provide	Mine Info:	Name:				RECEIVED
		Depth:				Office of Oil and Gas
		Seam:				JAN 1 3 2022
		Owner:				WV Department of

API NO. 47- 085 _ 10415 MOD

OPERATOR WELL NO. Earl Unit 2H

Well Pad Name: Weekley West Pad

18)

CASING AND TUBING PROGRAM

ТҮРЕ	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/K-55	54.5#	528	528	CTS, 550 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#	23,400	23,400	CTS, 4969 Cu. Ft.
Tubing	2-3/8	New	N-80	4.7#			
Liners							

Bryan Harris 1/19/22

TYPE	Size (in)	Wellbore Diameter (in)	<u>Wall</u> <u>Thickness</u> (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"	0.380"	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		Lead-HPOZ & Tall-H	H/POZ-1.44 & H-1.8
Liners							

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PACKERS

JAN 31 2022

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

WW-6B	
(10/14)	

- 10415 MOD API NO. 47- 085 OPERATOR WELL NO. Earl Unit 2H

Well Pad Name: Weekley West 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

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21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 58.63

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- 22) Area to be disturbed for well pad only, less access road (acres): 8.23
- 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.



47085085800000

47085085820000

47085021530000

47085030180000

47085030490000 47085033060000

47085086120000

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1. 2

47085086350000

47085031090000

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CK# 4003842

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WV Department of Environmental Protection



Antero Resources Corporation

Earl Unit 2H - AOR



WELL SYMBOLS
Abandoned Oil and Gas Well
Gas Well

Oil & Gas Well

December 20, 2021

47085068590000 * 47085018740000 * 47085077980000

47085068580000

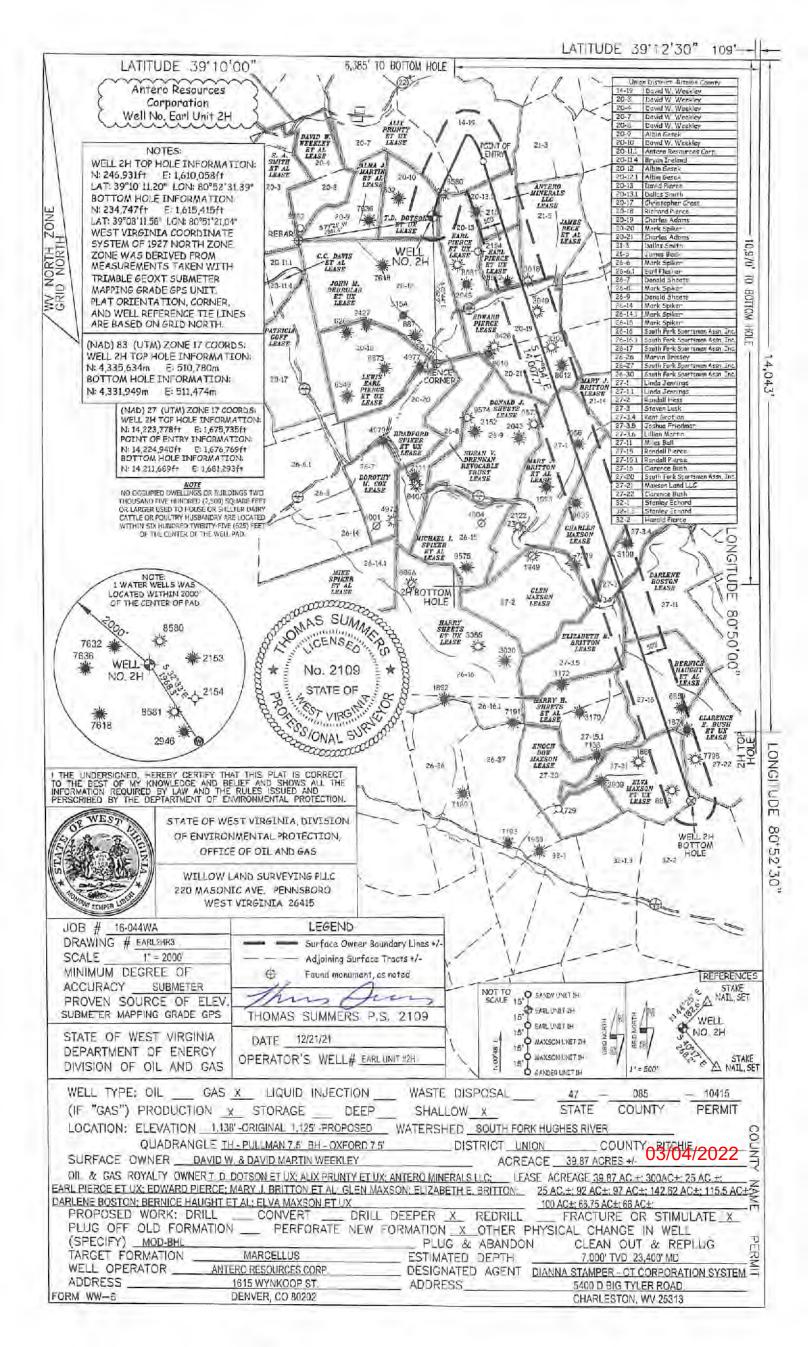
03/04/2022

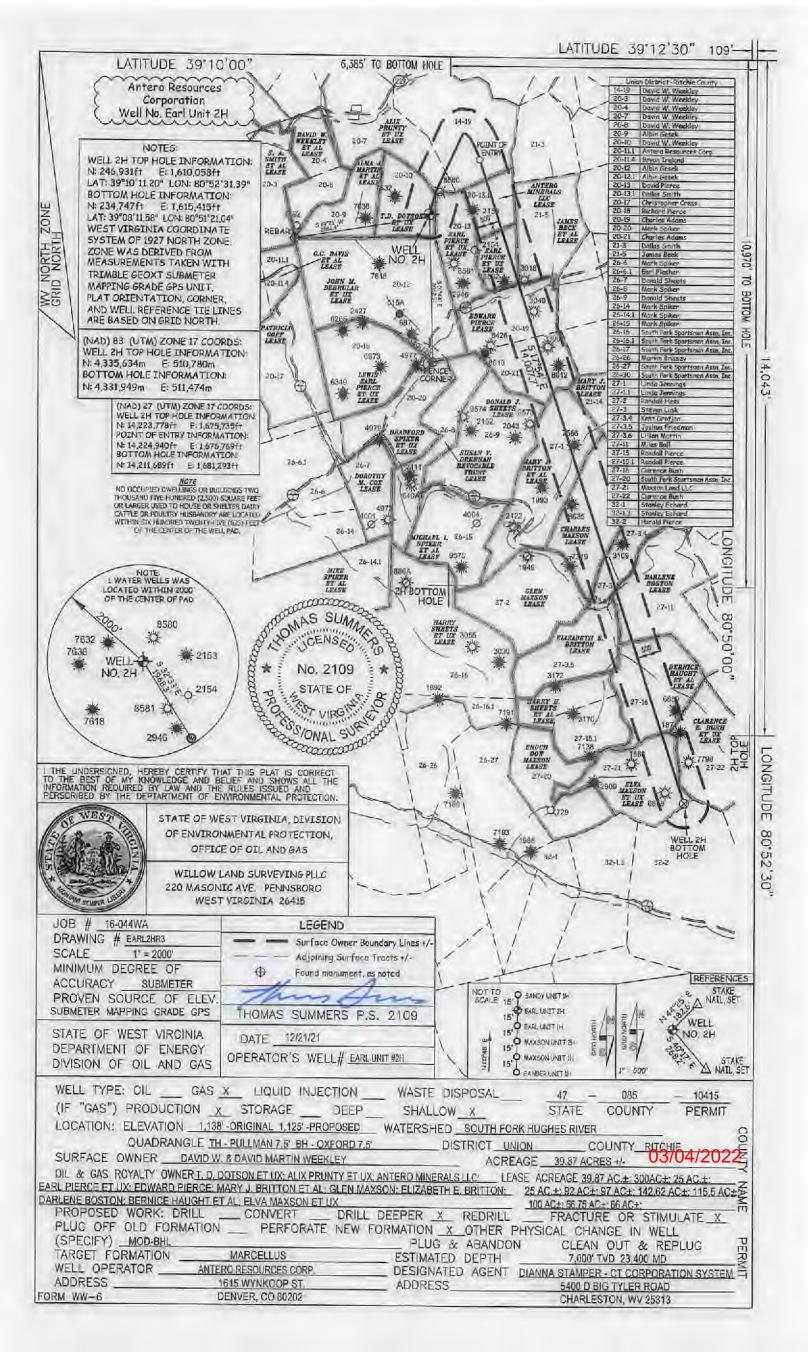
UWI (APINum)	Well Name	Well Number	Operator	Historical Operator	TD	Perforated Interval (shallowest, deepest)	Perforated Formation(s)	Producible Formation(s) not perf'd
47085018740000	E MAXSON	2 .	AMERICAN ENR HOLDING	ALLEGHENY LAND&MNRL	2,072			Gordon, Berea
47085021530000	EARL PIERCE	1	RITCHIE PET CORP	HEASTER PAUL ET AL	1,960		Big Injun	Warren, Speechly, Balltown, Riley, Alexander, Benson
47085030180000	EDWIN PIERCE	1	R & R OIL & GAS LLC	OIL STATES SALES	1,881		Big Injun	Gordon, Berea
47085030490000	EDWIN PIERCE	2	R & R OIL & GAS LLC	OIL STATES SALES	2,065		Big Injun	Gordon, Berea
47085031090000	G M BRITTON	1	FERRELL WILLARD E	FERRELL WILLARD E	1,888			Gordon, Berea
47085033060000	EDWIN PIERCE	1	R & R OIL & GAS LLC	HUNTER OIL CO	2,217		Big Injun	Warren, Speechly, Balltown, Riley, Alexander, Benson
47085068580000	MAXSON ELVA HEIRS	A-1365	MOUNTAIN VILLC	ALAMCO INC	5,500	4379 - 5200		Warren, Speechly, Balltown, Riley
47085068590000	MAXSON ELVA HEIRS	A-1540	MOUNTAIN VILLC	ALAMCO INC	5,508	3376 - 5164	Big Injun, Weir, Udev, Riley, Benson, Alexander	Warren, Speechly, Balltown, Riley, Alexander, Benson
47085075560000	BRITTON ROBERT J ET	2	HAUGHT ENERGY CORP	TERM ENERGY	2,300	2052 - 2154	Weir	Gordon, Berea
47085077980000	SHEPLER HARVEY	D-17	R & R OIL & GAS LLC	SHELDON & ASSOC	2,604	2113 - 2144	Big Injun	Gordon, Berea
47085085800000	PIERCE	1	KEY OIL CO	KEY OIL INC	5,438	3448 - 5250	Warren, Speechley, Balltown, Riley, Benson, Alexander	Gordon, Berea
47085085820000	PIERCE	3	KEY OIL CO	KEY OIL INC	5,068	3079 - 4890	Warren, Speechley, Balltown, Riley, Benson, Alexander	Gordon, Berea
47085086120000	PIERCE E	2	KEY OIL CO	KEY OIL INC	5,354	3366 - 5180	Warren, Speechley, Balltown, Riley, Benson, Alexander	Gordon, Berea
47085086350000	MAXSON	2	KEY OIL CO	KEY OIL CO	5,347	3233 - 5099	Warren, Speechley, Balltown, Riley, Benson, Alexander	Gordon, Berea

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INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE WV Department of Environmental Protection 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
T.D. Dotson, et ux Lease			
T.D. Dotson, et ux	J.T. Carter	1/8	0011/0297
J.T. Carter	Carter Oil Company	Assignment	0011/0528
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
CHA Gas Company, LLC	Antero Resources Corporation	Assignment	0205/0425
Alix Prunty et ux Lease			
Alix Prunty et ux	M.G. Zinn	1/8	0010/0422
M.G. Zinn	Carter Oil Company	Assignment	0012/0368
Carter Oil Company	Hope Construction and Refining Company	Assignment	0052/0194
Hope Construction and Refining Company	Consolidation Gas Supply Corporation	Conveyance	0151/0436
Consolidation Gas Supply Corporation	Consolidation Gas Transmission Corporation	Assignment	0169/0756
Consolidation Gas Transmission Corporation	CNG Transmission Corporation	Merger	wvsos
CNG Transmission Corporation	Antero Resources Appalachian Corporation	Assignment	0227/0130
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	0015/0705
Antero Minerals LLC			
Antero Minerals LLC	Antero Resources Corporation	1/8+	0328/0096
Earl Pierce et ux Lease			
Earl Pierce et ux	Harrold Haddox	1/8	101/341
Harrold Haddox	George L Yaste dba Oil State Sales Company	Assignment	102/261
George L Yaste dba Oil State Sales Company DLY Inc	DLY Inc	Assignment	112/302
Betty Jean Stainaker & Rosalee Roberts dba R. &	Betty Jean Stalnaker & Rosalee Roberts dba R.&S. Gas Company	Assignment	132/565
S. Gas Company	BET-Ro Inc	Assignment	147/554
BET-RO Inc	Roberts Energy Corporation	Assignment	240/36
Roberts Energy Corporation	Antero Resources Corporation	Assignment	329/138
James Beck et al Lease			
James Beck et al	George L Yaste dba Oil State Sales Company	1/8	100/516
George L Yaste dba Oil State Sales Company	DLY inc	Assignment	112/302
DLY Inc	Betty Jean Stalnaker & Rosalee Roberts dba R.&S.	Assignment	132/565
Betty Jean Stalnaker & Rosalee Roberts dba R. &	Gas Company	. •	
S. Gas Company BET-RO Inc	BET-Ro Inc Roberts Energy Corporation	Assignment	147/554
Roberts Energy Corporation	Antero Resources Corporation	Assignment Assignment	03/04/202 _{329/138}

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/Pag
Edward Pierce Lease		4.0	
Edward Pierce	Harry Haddox and Harrold Haddox	1/8	101/350
Harry Haddox and Harrold Haddox	George L Yaste dba Oil State Sales Company	Assignment	105/112
George L Yaste dba Oil State Sales Company	DLY Inc	Assignment	112/302
DLY Inc	Betty Jean Stainaker & Rosalee Roberts dba R.&S.	Assignment	132/565
Betty Jean Stalnaker & Rosalee Roberts dba R.&S.	Gas Company		215105
Gas Company	R.&S. Gas Company a partnership	Assignment	147/548
R.&S. Gas Company a partnership	BET-RO	Assignment	147/554
BET-RO Inc	Key Oil Company	Assignment	226/382
Key Oil Company	Antero Resources Appalachian Corporation	Assignment	255/547
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	15/705
Mary J Britton et al Lease			
Mary J Britton et al	W.H Mossor	1/8	88/291
W.H Mossor	BDL a partnership comprised of William R Mossor	Will	16/154
BDL a partnership compromised of William R			
Mossor	Term Energy Corporation	Assignment	256/391
Term Energy Corporation	Kiedash & Summers Enterprises LLC	Assignment	263/827
Kiedash & Summers Enterprises LLC	Antero Resources Appalachian Corporation	Assignment	263/827
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	15/705
Charles Maxson Lease			
Charles Maxson	Key Oil Company	1/8	228/397
Key Oil Company	Antero Resources Appalachian Corporation	Assignment	258/509
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	15/705
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	Assignment	6/443
EQT Production Company	Antero Resources Corporation	Assignment	282/175
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	Christine Mossor	Will	217/843
Christine Mossor	William R Mossor	Assignment	246/479
William R Mossor	Antero Resources Corporation	Assignment	295/972
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Earl Unit 2H 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
Clarence E. Bush et al Lease			
Clarence E Bush et al	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	222/426
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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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 Elva Maxson et ux Lease

Elva Maxson et ux **Hope Natural Gas Company** Allegheny Land and Mineral Plymouth Oil Company Allegheny Land and Mineral Alamo Inc Columbia Natural Resources LLC Chesapeake Appalachia LLC **SWN Production Company LLC Antero Exchange Properties LLC** **Hope Natural Gas Company** Allegheny Land and Mineral Plymouth Oil Company Allegheny Land and Mineral Alamo Inc Columbia Natural Resources LLC Chesapeake Appalachia LLC **SWN Production Company LLC Antero Exchange Properties LLC Antero Resources Corporation**

81/249 1/8 84/597 Assignment 86/39 Merger 87/183 Merger WV SOS Name Change 269/668 Merger 8/296 Merger 280/707 **Assignment** 301/114 Assignment 14/598 Merger

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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.

WV Department of **Environmental Protection**

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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 Tim Rady By: VP of Land Its:



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

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

