

### 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

Wednesday, December 18, 2024 PERMIT MODIFICATION APPROVAL Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION 1615 WYNKOOP STREET

DENVER, CO 80202

Re:

47-017-06973-00-00

Lateral Extension/ New Leases

### 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.

Permit Modification Approval for OSBORNE UNIT 2H

James A Martin

Chief

Operator's Well Number: OSBORNE UNIT 2H

Farm Name: ANTERO RESOURCES CORPORATION

U.S. WELL NUMBER: 47-017-06973-00-00

Horizontal 6A New Drill

Date Modification Issued: 12/18/2024

Promoting a healthy environment.

API NO. 47-017	_ 06973	
OPERATOR W	ELL NO.	Osbome Unit 2H MOD
Well Pad Na	me. Locke	Pad

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

1) Well Operate	or: Antero Res	sources Corpo	494507062	017 - Doddri	Southwei Oxford 7.5'
			Operator ID	County	District Quadrangle
2) Operator's V	Vell Number: 0	sborne Unit 2F	MOD Well Pad	Name: Locke	
3) Farm Name/	Surface Owner:	Antero Resources (	Corporation Public Road	d Access: Tayl	or Drain Road
4) Elevation, cu	irrent ground:	1100.5' - AS BUILT	Elevation, proposed 1	oost-construction	on:
5) Well Type	(a) Gas X Other	Oil	Unde		
	(b)If Gas Sha	allow X	Deep		
6) Existing Pad		rizontal Xs			
7) Proposed Tar	rget Formation(s	), Depth(s), An	ticipated Thickness anness- 55 feet, Associa	nd Expected Protected Protected Pressure- 28	essure(s): 850#
8) Proposed Tot	tal Vertical Dept	h: 7000' TVD			
9) Formation at	Total Vertical I	Depth: Marcell	us		
10) Proposed To	otal Measured D	epth: 22500'	MD		
11) Proposed H	orizontal Leg Le	ength: 13225'	*Open to modifica	tion at a later	date
12) Approximat	e Fresh Water S	trata Depths:	236', 260', 320',	326'	
<ul><li>13) Method to I</li><li>14) Approximat</li></ul>				0 Offset well records. Depth	s have been adjusted according to surface elevations.
15) Approximat	e Coal Seam De	pths: N/A			
16) Approximat	e Depth to Possi	ble Void (coal i	mine, karst, other): N	lone Anticipate	ed
17) Does Propos directly overlyin	sed well location ag or adjacent to	contain coal se an active mine		No	X
(a) If Yes, prov	vide Mine Info:	Name:			-
		Depth:			RECEIVED Office of Oil and Gas
CK# 4037219		Seam:			DEC 16 2024
\$ 7500.00		Owner:			WV Department of
12/5/2024					Environmental Protection

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Shuly 12-13-24 12/20/2024

API NO. 47- 017 \_ 06973

OPERATOR WELL NO. Osborne Unit 2H MOD
Well Pad Name: Locke Pad

18)

### **CASING AND TUBING PROGRAM**

TYPE		New					T
	Size	or	Grade	Weight per ft.	FOOTAGE: For	INTERVALS:	CEMENT:
	(in)	Used		<u>(lb/ft)</u>	Drilling (ft)	Left in Well	Fill-up
Conductor	2011		-			<u>(ft)</u>	(Cu. Ft.)/CTS
	20"	New	J-55	94#	100'	100'	CTS, 96 Cu. Ft.
Fresh Water	13-3/8"	New	J-55	54.5#	376'	376'	CTS, 392 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2750'	2750'	CTS, 1120 Cu. Ft.
Intermediate					-: • •	2100	013, 1120 Cd. Ft.
Production	5-1/2"	New	P110-ICY	23#	22500'	22500'	CTC 4742 C: 54
Tubing	2-3/8"	New	N-80	4.7#	22000	22300	CTS, 4742 Cu. Ft.
Liners				1			

ТҮРЕ	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"	0.375"	2250	50	Class A/L	~1.18
Fresh Water	13-3/8"	17-1/2"	0.38"	2730	1000	Class A/L	~1.18
Coal	9-5/8"	12-1/4"	0.352"	3520	1500	Class A/L	~1.18
Intermediate					1000	Old33 AVE	71.10
Production	5-1/2"	8-3/4" & 8-1/2"	0.415"	14,360	2500	Class G/H	~1.8
Tubing	2-3/8"	4.778"	0.19"	11,200	2000	Oldor Citt	1.0
Liners				11,200			

### **PACKERS**

Kind:	N/A	RECEIVED Office of Oil and Gas
Sizes:	N/A	DEC 16 2024
Depths Set:	N/A	WV Department of Environmental Protection

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5/2-/3-252/20/2024

API NO. 47- 017 - 06973

OPERATOR WELL NO. Osborne Unit 2H MOD

Well Pad Name: Locke Pad

19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

Drill a new horizontal shallow well into the 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

- 21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 27.54 acres
- 22) Area to be disturbed for well pad only, less access road (acres): 13.31 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

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/L cement.

Surface: Class A/L cement with 2-3% calcium chloride and 1/4 lb of flake Intermediate: Class A/L 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 G/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:

WV Department of Environmental Protection

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.

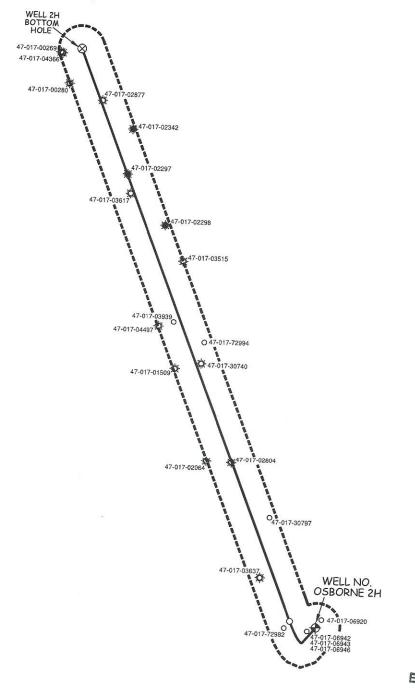
Production: circulate with 14 lb/gal NaCl mud, trip to middle of lateral, circulate, pump high viscosity sweep, trip to base of curve, pump high viscosity sweep, trip to top of curve, trip to bottom, circulate, pump high viscosity sweep, trip out, run casing, circulate 10 bbls fresh water, pump 48 bbls 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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Show King /2-/3- A2/20/2024

# LOCKE PAD ANTERO RESOURCES CORPORATION



Office of Oil and Gas

DEC 0 9 2024

WV Department of Environmental Protection

WILLOW LAND SURVEYING, PLLC P.O. BOX 17, PENNSBORO, WV 26415 (304) 659-1717

DATE: 12/5/2024 DR

DRAWN BY: D.L.P.

JOB #: 23-019WA
FILE: OSBORNE2HAOR.DWG

0'

SCALE: 1-INCH = 2000-FEET 2000' 4000'

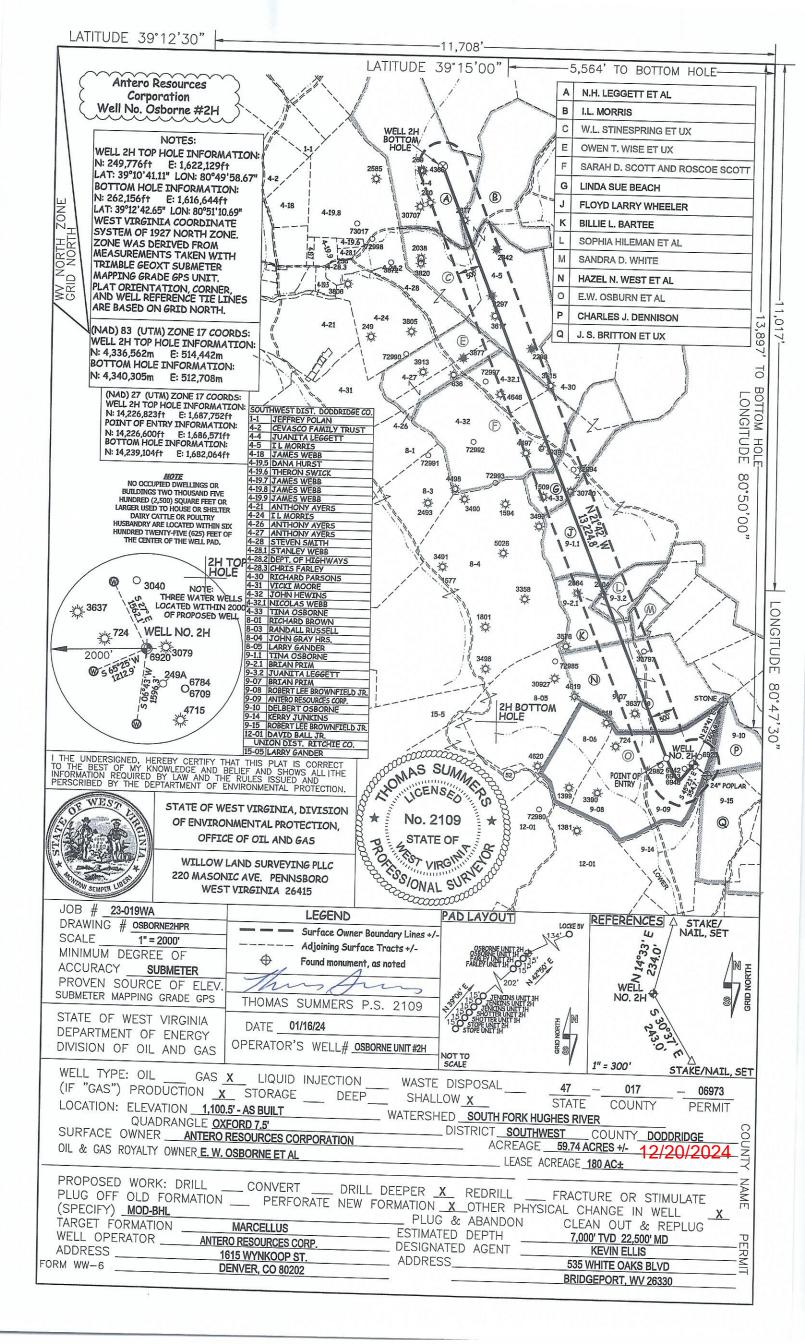
10/00/0004

6000'

UWI (APINum)	Well Name	Well Number	Operator	Historical Onesate	T T			
47017069200000		5V	ANTERO RESOURCES CORP	Historical Operator	TD	Perforated Interval (shallowest, deepest)	Porforated F-	
47017069420000	JENKINS UNIT	1H	ANTERO RESOURCES CORP	ANTERO RESOURCES CORP			Perforated Formation(s)	Producible Formation(s) not perf
47017069430000		2H	ANTERO RESOURCES CORP	ANTERO RESOURCES CORP	16,348	6937 - 16227	Marcelius	
47017069460000		2H	ANTERO RESOURCES CORP	ANTERO RESOURCES CORP	16,754	7122 - 16620	Marcellus	
47017729820000		1	UNKNOWN	ANTERO RESOURCES CORP	16,978	6926 - 16847	Marcellus	
47017036370000		1	TERM ENERGY	UNKNOWN			Ivial cellus	
47017307970000	A E WILSON	2	UNKNOWN	TERM ENERGY	5,139	4286 - 4997	Cord- Bit At	
47017020640000	MYRTLE R WILSON	4705	EQUITABLE GAS CO	UNKNOWN			Gordon, Riley, Alexander	Weir, Benson, Alexander
47017028040000	SOPHIA & HILEMAN	J-220	GREYLOCK CONVENTIONAL LLC	EQUITABLE GAS CO	2,101		Mark Division	y consort, Alexander
47017015090000		THE BUILDING	TARGA DEVELOPMENT INC	J & J ENTERPRISES	5,245	5017 - 5070	Maxton, Big Injun	Weir
7017307400000 A		4586	PITTSBURGH&W VA GAS	DILMUR OIL	2,060		Alexander	Weir, Benson
47017729940000 C			UNKNOWN	PITTSBURGH&W VA GAS	1,882		Big Injun	Weir, Benson, Alexander
47017044970000 S			KEY OIL	UNKNOWN	13000	NAME OF TAXABLE PARTY OF TAXABLE PARTY.	Maxton, Big Injun	Weir, Benson
17017039390000 R	OBERT SNYDER		TARGA DEVELOPMENT INC	KEYOIL	5,248	3211 - 5077		Tren, Benson
7017035150000 LI	EGGETT OTIS ET AL		LEGGETT OTIS ET AL	DILMUR OIL		3211-30//	Warren, Speechley, Balltown, Riley, Benson, Elk, Alexander	Weir
7017022980000 S	TINESPRING W S			HAUGHT ENERGY CORP	5,458	4052 5000		Well
7017036170000 S	TINESPRING W L		C & P OIL & GAS	C & P OIL & GAS	2,460	2000 2007	Benson, Alexander	Weir
7017022970000 ST			DIVERSIFIED PRODUCTION LLC	WACO O & G CO INC	6,640	0700	Big Injun, Weir	
7017023420000 M			P G OIL & GAS INC	C & P OIL & GAS INC	2,473	3766 - 6496	Riley, Benson, Alexander, Brillier	Benson, Alexander Weir
7017028770000 LE	GGETT N H ET AL		BETA HELIX ENERGY LLC	CHASE PETROLEUM CO	5,504	2720 5224	Big Injun, Weir	
7017002800000 N			BETA HELIX ENERGY LLC	CHASE PETROLEUM CO	5,435		Riley, Alexander	Benson, Alexander Weir
	GGETT ROY ET AL	4	DIVERSIFIED PRODUCTION LLC	HUNTER R J	1,952	4828 - 5216	Balltown, Riley, Benson, Alexander	
017002690000 N	HIEGGETT	1	DIVERSIFIED PRODUCTION LLC	DACCORP	5,292		Big Injun	Weir
	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	1	HUNTER R J	HUNTER R J	1,883	4155 - 5064	Riley, Alexander	Weir, Benson, Alexander
					1,063		Big Injun	Weir, Benson Weir, Benson, Alexander

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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)

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 –

- 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:

in the same of the	oxtract, produce or market the oil or g	gas are as follows:	willon the
Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Doub /D
O: E.W. Osbourne Et Al Lease E.W. Osbourne Et Al Hope Natural Gas Trio Oil and Gas Company Charter D. Stinespring, Paul B. Davis & G.W. Hill J & J Enterprises, Inc. Eastern American Energy Corporation Energy Corporation of America Antero Resources Appalachian Corporation  N: Hazel N. West Et Al Lease	Hope Natural Gas Trio Oil and Gas Company Charter D. Stinespring, Paul B. Davis & G.W. Hill J & J Enterprises, Inc. Eastern American Energy Corporation Energy Corporation of America Antero Resources Appalachian Corporation Antero Resources Corporation	1/8 Assignment Assignment Assignment Assignment Merger Assignment Name Change	0057/0132 0072/0496 0131/0687 0131/0762 0159/0139 0006/0450 0272/0307 0046/0523
Hazel N. West, Et Al Hugh Spencer Trustees of the Hugh K. Spencer Revocable Trust Spencer Enterprises, LLC Antero Resources Appalachian Corporation  K: Billie L. Bartee Lease Billie L. Bartee	Hugh Spencer Trustees of the Hugh K. Spencer Revocable Trust Spencer Enterprises, LLC Antero Resources Appalachian Corporation Antero Resources Corporation	1/8 Assignment Assignment Assignment Name Change	0128/0114 0032/0107 0199/0534 0264/0099 <b>0046/0523</b>
<u>/L: Sophia Hileman Et Al Lease</u>	Antero Resources Corporation	1/8+	0477/0021
Sophia Hileman, Et Al Hugh Spencer Trustees of the Hugh K. Spencer Revocable Trust Spencer Enterprises, LLC Antero Resources Appalachian Corporation  K: Billie L. Bartee Lease	Hugh Spencer Trustees of the Hugh K. Spencer Revocable Trust Spencer Enterprises, LLC Antero Resources Appalachian Corporation Antero Resources Corporation	1/8 Assignment Assignment Assignment Name Change	0091/0246 0032/0107 0199/0534 0264/0009 <b>0046/0523</b>
Billie L. Bartee  J: Floyd Larry Wheeler Lease	Antero Resources Corporation	1/8+	0477/0021
Floyd Larry Wheeler  G: Linda Sue Beach Lease	Antero Resources Corporation	1/8+	0521/0044
Linda Sue Beach	Antero Resources Corporation	1/8+	0519/0531

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	A Produce of Market the oil or ga	s are as follows:	
Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	B
F: Sarah D. Scott and Roscoe Scott Lease Sarah D. and Roscoe Scott E.E. Zinn, W.C. Broadwater, & E.M. Nutter	E.E. Zinn, W.C. Broadwater, & E.M. Nutter E.E. Zinn, Juna Broadwater, E.M. Nutter, L.R. Boyce, F. Zinn, P.M. Broadwater Rowena S Black, B.W. Foley, J.W. Dotson, Zana Nutter, N.H. Leggett, Charles Bee, O.P. Broadwater, F.B. Zinn, Reed A Zinn, O.O. Wise, Lee Prunty, Wllis Calhoun, Eli Nutter, Ocal Gray, R.J. Broadwater, E.O. Wilson, & Gary Zinn	1/8 Assignment	Book/Page 0040/0245 0001/0048
E.E. Zinn, Juna Broadwater, E.M. Nutter, L.R. Boyce, F. Zinn, P.M. Broadwater Rowena S Black, B.W. Foley, J.W. Dotson, Zana Nutter, N.H. Leggett, Charles Bee, O.P. Broadwater, F.B. Zinn, Reed A Zinn, O.O. Wise, Lee Prunty, Wllis Calhoun, Eli Nutter, Ocal Gray, R.J. Broadwater, E.O. Wilson, & Gary Zinn  E.E. Zinn & E.M. Nutter, as true and lawful Attorneys in Fact Murphy Oil Company Dilmur Oil Company Targa Development Inc Antero Resources Appalachian Corporation  C: W.L. Stinespring Et Ux Lease W.L. Stinespring, Et Ux Philadelphia Company of West Virginia Oil & Gas Pittsburgh & West Virginia Gas Company Equitable Gas Company Equitable Gas Company Equitable Production-Eastern States Inc. Equitable Production Company  EQT Production Company  B: I.L Morris Lease I.L. Morris	E.E. Zinn & E.M. Nutter, as true and lawful Attorneys in Fact  Murphy Oil Company Dilmur Oil Company Targa Development Inc Antero Resources Appalachian Corporation Antero Resources Corporation  Philadelphia Company of West Virginia Oil & Gas Pittsburgh & West Virginia Gas Company Equitable Gas Company Equitable Gas Company Equitans LP Equitable Production-Eastern States Inc. Equitable Production Company EQT Production Company Antero Resources Corporation	Assignment Assignment Assignment Assignment Assignment Name Change  1/8 Assignment Assignment Assignment Assignment Merger Assignment Merger Name Change Assignment	0001/0048  0047/0469 0091/0734 0165/0436 0257/0362 0046/0523  0026/0345 0032/0253 0121/0303 0154/0475 0329/0645 0192/0019 0281/0346 0281/0346 0281/0346
		1/8+	0348/0544

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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.

Co-tenancy utilization – Antero is utilizing the Co-tenancy Modernization and Majority Protection Act to proceed with development of certain 1909 owners' interests in this tract.

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- (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  A: N.H. Leggett Et Al Lease	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
	N.H. Leggett Et Al	Alton Skinner	1/8	0118/0330
	Alton Skinner	Chase Petroleum Inc.	Assignment	0123/0277
	Chase Petroleum Inc.	Antero Resources Appalachian Corporation	Assignment	0260/0117
	Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	<b>0046/0523</b>

<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.

\*Co-tenancy utilization - Antero is utilizing the Co-tenancy Modernization and Majority Protection Act to proceed with the development of certain royalty owners' interests in this tract.

\*\*Pooling/Unitization - Antero has filed a horizontal well unitization application with the West Virginia Oil and Gas Conservation Commission that seeks to pool certain owners in this tract.

### 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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The applicant further acknowledges that any Office of Oil and Gas permit in no way overrides of Protection of Prot nullifies the need for other permits/approvals that may be necessary and further affirms that all needed ection permits/approvals should be acquired from the appropriate authority before the affected activity is initiated.

Antero Resources Corporation
Tim Rady
Senior Vice President of Land

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