

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, February 24, 2025 PERMIT MODIFICATION APPROVAL Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION 1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit Modification Approval for Graden Unit 2H

47-103-03697-00-00

Extended Lateral Length

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: Graden Unit 2H

Farm Name: Dallison Lumber Company

U.S. WELL NUMBER: 47-103-03697-00-00

Horizontal 6A New Drill

Date Modification Issued: 2/24/2025

Promoting a healthy environment.

API NO. 47-103	03697	
OPERATOR WEL	L NO.	Graden Unit 2H MOD
Well Pad Name	: Cedar	Pad

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

1) Well Operato	or: Antero Re	esources C	orpora				tze	Pine Grove 7.5'
				Opera	ator ID	County	District	Quadrangle
2) Operator's W	Operator's Well Number: Graden Unit 2H MOD Well Pad Name: Cedar Pad							
3) Farm Name/	Surface Owner	: Dallison Lu	mber Cor	mpany	Public Roa	ad Access:	CR 52	
4) Elevation, cu	irrent ground:	As-Built - 1			_	post-constr		
5) Well Type	(a) Gas X Other		Oil		Und	erground St	orage	
	AND DESCRIPTION OF THE PARTY OF	hallow	X		Deep			
	` ,		X					-
6) Existing Pad						_		
7) Proposed Tar Marcellus Sh	rget Formation ale: 7200' TVD,			•		_		
8) Proposed To	tal Vertical De	pth: 7200	TVD					
9) Formation at	Total Vertical	Depth: M	arcellus					
10) Proposed To	otal Measured	Depth: 2	7200' MI	D				
11) Proposed H	orizontal Leg	Length: 10	861'	*Open	to modific	ation at a la	ater date	
12) Approxima	te Fresh Water	Strata Dep	ths:	612'				
13) Method to I			.ршs	71033089	70000 Offset we	ell records. Depths	s have been adjusted	according to surface elevations.
14) Approxima	te Saltwater De	epths: 219	3'					
15) Approxima	te Coal Seam I	Depths: 10	10'					
16) Approxima	te Depth to Pos	ssible Void	(coal mi	ne, kars	st, other):	None Antio	cipated	
	7) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes No _X							
(a) If Yes, pro	vide Mine Info	: Name:						
		Depth:						
		Seam:						
RF(CEIVED	Owner:						
Office of	Oil and Gas							

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Environmental Protection

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API	NO	47-	103	-	03697

OPERATOR WELL NO. Graden Unit 2H MOD
Well Pad Name: Cedar 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	J-55	94#	100'	100'	CTS, 96 Cu. Ft.
Fresh Water	13-3/8"	New	J-55	54.5#	662'	662'	CTS, 690 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	3200'	3200'	CTS, 1303 Cu. Ft.
Intermediate							
Production	5-1/2"	New	P110-ICY	23#	27200'	27200'	CTS, 5926 Cu. Ft.
Tubing	2-3/8"	New	N-80	4.7#			
Liners							

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							
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			
Liners							

PACKERS

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

Office of On and Gas

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API	NO.	47-	103	-	03697

OPERATOR WELL NO. Graden Unit 2H MOD

Well Pad Name: Cedar 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): 71.85 acres
- 22) Area to be disturbed for well pad only, less access road (acres): 18.45 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/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

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.

Office of Oil and Gas

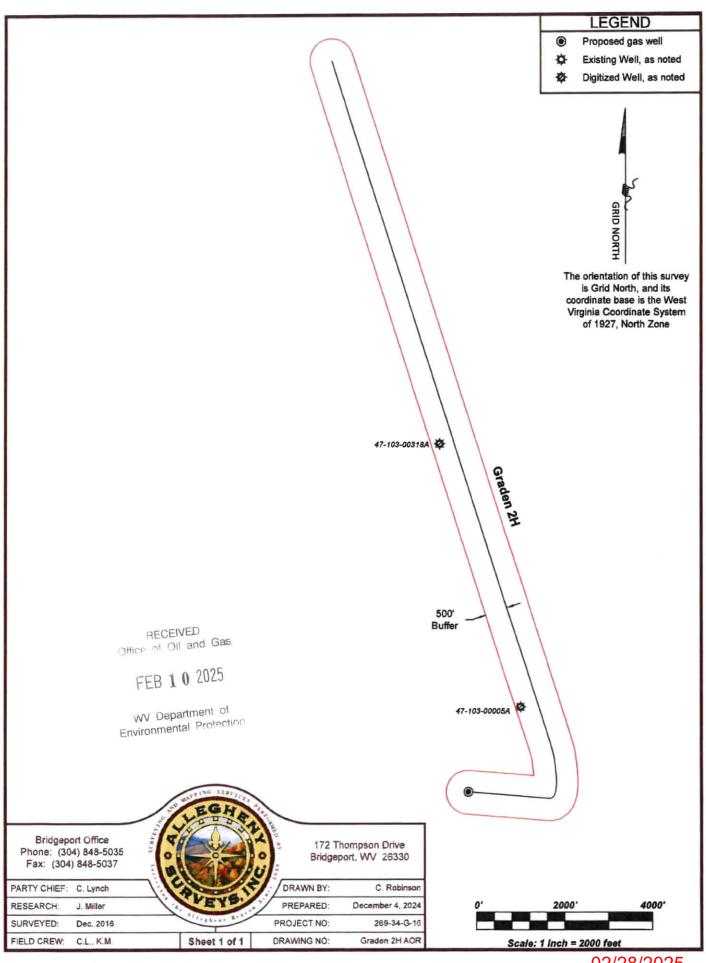
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Environmental Projection

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^{*}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
47103003180000			UNKNOWN	UNKNOWN	1,810		Big Injun	Weir, Benson, Alexander
47103000050000	S S MAIN HRS	3385	HORNER OIL & GAS PRODUCTION INC	MANUFACT LIGHT &HEAT	3,260		Gordon	Weir, Benson, Alexander

RECEIVED
Office of Oil and Gas

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Graden 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)

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
Y: Jenkins Miller Lease			
Jenkins Miller	Hope Natural Gas Company	1/8	0107/0056
Hope Natural Gas Company	Consolidated Gas Supply Corporation	Assignment	0233/0387
Consolidated Gas Supply Corporation	Consolidated Gas Transmission Corporation	Assignment	066A/0069
Consolidated Gas Transmission Corporation	Eastern States Oil & Gas Inc	Assignment	076A/0232
Eastern States Oil & Gas Inc	Blazer Energy Corp	Merger	0012/0253
Blazer Energy Corp	Eastern States Oil & Gas Inc	Name Change	0012/0259
Eastern States Oil & Gas Inc	Equitable Production- Eastern States INC	Name Change	wvsos
Equitable Production- Eastern States INC	Appalachian Natural Gas Trust	Assignment	079A/0244
Appalachian Natural Gas Trust	EQT Production Company	Merger	0096/0505
EQT Production Company	Antero Resources Corporation	Assignment	230A/0801
Z: Eddie D. Dallison Lease			
Eddie D. Dallison	Antero Resources Corporation	1/8+	307A/0447
AA: Chesapeake Appalachia, LLC Lease			
Chesapeake Appalachia, LLC	SWN Production Company LLC	1/8	157A/0640
SWN Production Company LLC	Antero Exchange Properties LLC	Assignment	177A/0533
Antero Exchange Properties LLC	Antero Resources Corporation	Merger	0013/0311
AD: WVDNR Lease			
WVDNR	Antero Resources Corporation	1/8+	323A/0541
AA: Chesapeake Appalachia, LLC Lease			
Chesapeake Appalachia, LLC	SWN Production Company LLC	1/8	157A/0640
SWN Production Company LLC	Antero Exchange Properties LLC	Assignment	177A/0533
Antero Exchange Properties LLC	Antero Resources Corporation	Merger	0013/0311
Z: Eddie D. Dallison Lease			
Eddle D. Dallison	Antero Resources Corporation	1/8+	307A/0447
X: James E. & Shawn L. Coen Lease			
James E. & Shawn L. Coen	Antero Resources Corporation	1/8+	268A/0779
V: Chesapeake Appalachia, LLC Lease			
Chesapeake Appalachia, LLC	SWN Production Company LLC	1/8	157A/0640
SWN Production Company LLC	Antero Exchange Properties LLC	Assignment	177A/0533
Antero Exchange Properties LLC	Antero Resources Corporation	Merger	0013/0311
U: Stephen H. Stocker Lease		1/0	2754 (2054
Stephen H. Stocker	Antero Resources Corporation	1/8+	376A/0864
T: Antero Minerals, LLC Lease		1/0	2504/2050
Antero Minerals, LLC	Antero Resources Corporation RECEIVED	1/8+	250A/0859
O: Bounty Minerals, LLC Lease	Office of Oil and (
Bounty Minerals, LLC	Antero Resources Corporation FEB 1 0 2021	1/8+	296A/0326
N: Richard D. Hombeck, et ux Lease	I ED 10 202		
Richard D. Hornbeck, et ux	Antero Resources Corporation WV Department	1/8+	302A/0298
	Environmental Protect		02/20/2025
		TOTAL STATE OF THE	02/28/2025

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Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
L: Marilee S. Morgan Lease Marilee S. Morgan	Antero Resources Corporation	1/8+	363A/0805
M: Terry Lee Cummings Lease Terry Lee Cummings	Antero Resources Corporation	1/8+	328A/0283
I: Venable Royalty, LTD, et al Lease Venable Royalty, LTD, et al	Antero Resources Corporation	1/8+	300A/0875
H: Venable Royalty, LTD, et al Lease Venable Royalty, LTD, et al	Antero Resources Corporation	1/8+	300A/0880
i: Venable Royalty, LTD, et al Lease Venable Royalty, LTD, et al	Antero Resources Corporation	1/8+	300A/0875
H: Venable Royalty, LTD, et al Lease Venable Royalty, LTD, et al	Antero Resources Corporation	1/8+	300A/0880
F: Richard D. Hornbeck, et ux Lease Richard D. Hornbeck, et ux	Antero Resources Corporation	1/8+	302A/0298
C: Debra Carol Miller Lease Debra Carol Miller TH Exploration	TH Exploration Antero Resources Corporation	1/8+ Assignment	195A/0327 254A/0933

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WV Department

**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.

^{*}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 royalty owners' interests in this tract.

WW-6A1 (5/13)

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Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
B: Deborah Carol Miller Lease				
	Deborah Carol Miller TH Exploration	TH Exploration Antero Resources Corporation	1/8+ Assignment	195A/0327 254A/0933

"Fooling/Unitization - Antero has filed a horizontal well unitization application with the West Virginia OII 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

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
RECEIVED	Its:	Senior Vice President of Land
Office of The Mas		

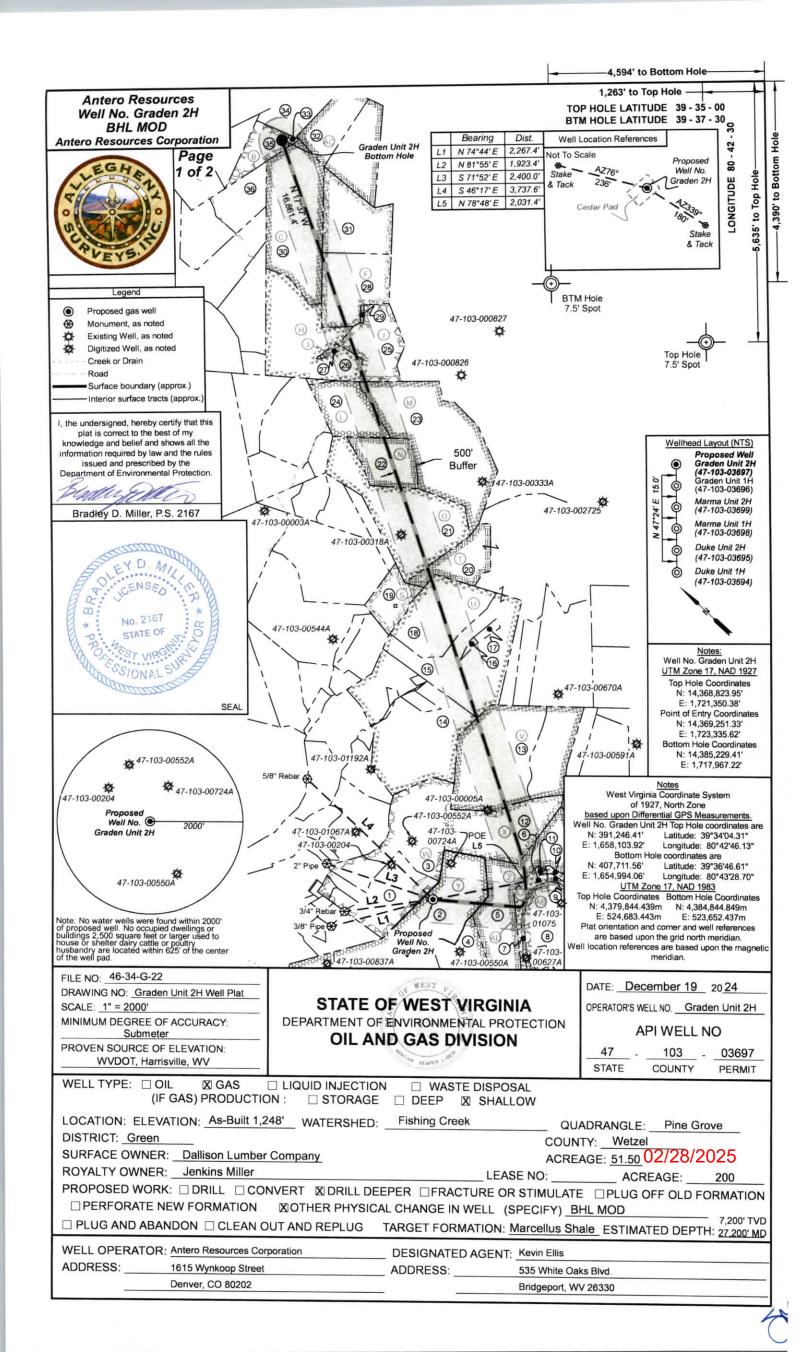
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^{*}Co-tenancy utilization - Antero is utilizing the Co-tenancy Modernization and Majority Protection Act to proceed with the development of certain royalty owners' interests in this tract.



Antero Resources Well No. Graden 2H BHL MOD Antero Resources Corporation

Pa 2 o



	Leases
в	Debra Carol Miller
_	
С	Debra Carol Miller
F	Richard D. Hornbeck, et ux
Н	Venable Royalty, LTD, et al
1	Venable Royalty, LTD, et al
J	John Timothy Taylor
L	Marilee S. Morgan
M	Terry Lee Cummings
N	Richard D. Hornbeck, et ux
0	Bounty Minerals, LLC
S	The Tracy Living Trust
T	Antero Minerals, LLC
U	Stephen H. Stocker
٧	Chesapeake Appalachia, LLC
W	Antero Minerals, LLC
X	James E. & Shawn L. Coen
Y	Jenkins Miller
Z	Eddie D. Dallison
AA	Chesapeake Appalachia, LLC
AB	Chesapeake Appalachia, LLC
AC	Deborah Carol Miller
AD	WVDNR

ID	TM-Par	Owner	Bk/Pg	Acres
1	13-40	Kenneth E. & Vicky A. Van Dyne	357/204	42.33
2	4-19	Dallison Lumber Company	53/205	51.50
3	13-26.7	John M. & Stanley D. Pittman	458/837	55.00
4	14-34	Thelma Deaton	493/482	41.00
5	14-20	Dallison Lumber Company	357/270	109.91
6	14-21	Dominion Gathering & Processing, Inc.	460/781	3.20
7		Big Fishing Creek		
8	14-36	Dominion Gathering & Processing, Inc.	460/781	57.41
9	14-22	Ren Realty, LLC	447/844	1.40
10	14-23	Ren Realty, LLC	447/844	1.30
11	14-69	Becky Ann & Charles Edward Moore	489/64	0.50
12	14-16	Antero Midstream, LLC	491/484	54.00
13	14-5	Donald L. & Myrna R. Mason	390/62	93.70
14	13-17	Laura Ann Slater	423/93	83.50
15	14-1	Kenneth & Vicky A. Van Dyne	339/427	69.39
16	9-62	Jason Kyle & Tamara Dawn Van Dyne	441/469	1.12
17	9-61	Jason Kyle & Tamara Dawn Van Dyne	441/469	2.49
18	9-52	WSD Properties, LLC	441/793	50.00
19	9-52.1	WSD Properties, LLC	441/793	25.00
20	9-44	Jerry L & Karen B. Mason	353/216	152.00
21	9-33	Thomas Rogers & Eliot Stearns	352/98	50.00
22	9-20	Richard David Hornbeck	372/423	29.30
23	9-21	Lawrence K. Mason	477/757	105.25
24	9-17	Donzel A. Hombeck	346/142	35.00
25	9-7.1	Francis D. Springer	501/773	33.22
26	9-1	Antero Resources Corporation	462/582	71.30
27	9-6	Ashland Cemetery	/	0.92
28	4-44	Richard D. Hornbeck	372/421	42.50
29	9-2	Richard D. Hornbeck	372/421	0.61
30	4-30	Debra C. Miller	A103/410	76.80
31	4-31	Richard D. Hornbeck	372/421	40.50
32	4-14	Debra C. Miller	A103/410	28.00
33	4-12	Debra C. Miller	A103/410	
34	4-13	Rick A. & Cathy Doty	402/512	35.00
35	4-11	Debra C. Miller	A103/410	16.80
36	4-29	Timothy S. Harrison	439/202	23.00

FILE NO:	46-34-G-22
DRAWING	NO: Graden Unit 2H Well Plat
SCALE: 1	" = 2000'
MINIMUM	DEGREE OF ACCURACY: Submeter
	SOURCE OF ELEVATION:

STATE OF WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION OIL AND GAS DIVISION

WEST

DATE: _[Dec	ember 19	9	2024
OPERATOR	'S W	ELL NO G	rade	en Unit 2H
	Α	PI WELI	LN	0
47		103	_,-	03697
STATE		COUNTY		PERMIT

WVDOT, Harrisville, WV	STATE STATES	STATE COUNTY PERMIT					
WELL TYPE: ☐ OIL ☒ GAS (IF GAS) PRODUCTIO	☐ LIQUID INJECTION ☐ WASTE DISPOS DN: ☐ STORAGE ☐ DEEP ☒ SHALL						
LOCATION: ELEVATION: As-Built 1,2 DISTRICT: Green	248' WATERSHED: Fishing Creek	QUADRANGLE: Pine Grove COUNTY: Wetzel					
SURFACE OWNER: Dallison Lumber Company ACREAGE: 51.50 02/28/2025 ROYALTY OWNER: Jenkins Miller LEASE NO: ACREAGE: 200							
PROPOSED WORK: DRILL CONVERT DRILL DEEPER FRACTURE OR STIMULATE PLUG OFF OLD FORMATION PERFORATE NEW FORMATION MOTHER PHYSICAL CHANGE IN WELL (SPECIFY) BHL MOD							
☐ PLUG AND ABANDON ☐ CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 27,200' MD							
WELL OPERATOR: Antero Resources Corporation DESIGNATED AGENT: Kevin Ellis							
ADDRESS: 1615 Wynkoop Street	ADDRESS:	535 White Oaks Blvd.					
Denver, CO 80202		Bridgeport, WV 26330					