

#### west virginia department of environmental protection

Office of Oil and Gas 601 57<sup>th</sup> Street, S.E. Charleston, WV 25304 (304) 926-0450 fax: (304) 926-0452

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

### Friday, March 12, 2021 PERMIT MODIFICATION APPROVAL Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION 1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit Modification Approval for MILLS UNIT 1H

47-095-02718-00-00

Lateral Length & Estimated Measured Depth

#### 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: MILLS UNIT 1H

Farm Name: ELIZABETH GORRELL

U.S. WELL NUMBER: 47-095-02718-00-00

Horizontal 6A New Drill

Date Modification Issued: March 12, 2021

Promoting a healthy environment.

WW-6B (04/15) API NO. 47-095 - 02718

OPERATOR WELL NO. Mills Unit 1H

Well Pad Name: Gorroll Pad

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

1) Well Operat	tor: Antero	Resources	Corporal	494507062	095 - Tyler	Union	Middlebourne 7.5'
				Operator ID	County	District	Quadrangle
2) Operator's \	Well Number	r: Mills Unit	1H	Well Pa	ad Name: Gorre	ell Pad	
3) Farm Name	/Surface Ow	ner: Elizabe	eth Gorrell	Public Ro	ad Access: Wic	k Rd.	
4) Elevation, c	urrent groun	d: 1045'	Ele	evation, proposed	l post-constructi	on:	
5) Well Type	(a) Gas Other	Х	Oil	Uno	lerground Stora	ge	
	(b)If Gas	Shallow	X	Deep			
		Horizontal	X				Dont
6) Existing Pad	i: Yes or No	Yes			_		Dart 3-10-21
				pated Thickness			3-10-21
Marcellus Sh	nale: 6700' T\	/D, Anticipate	d Thicknes	ss- 55 feet, Associ	iated Pressure- 2	2800#	
8) Proposed To	tal Vertical	Depth: 670	0' TVD				
9) Formation at	t Total Vertic	cal Depth:	Marcellus				
10) Proposed T	otal Measur	ed Depth:	20700' ME	)			
11) Proposed H	Iorizontal Le	g Length:	9637'				
12) Approxima	te Fresh Wa	ter Strata De	pths:	108', 505'			
13) Method to 1	Determine F	resh Water D	epths: 4	7-095-00338			
(4) Approxima	te Saltwater	Depths: 13	78',1544'				
15) Approxima	te Coal Sean	n Depths: N	one Identi	ified			
(6) Approxima	te Depth to I	Possible Void	l (coal min	e, karst, other):	None Anticipat	ed	
7) Does Propo directly overlying				Yes	No	x	
(a) If Yes, pro	vide Mine Ir	nfo: Name:					
		Depth:	8				
		Seam:					

MAR 1 0 2021

WV Department of Environmental Protection

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WW-6B (04/15) API NO. 47- 096 \_ 02718

OPERATOR WELL NO. Mills Unit 1H

Well Pad Name: Gorrell 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	H-40	65#	80	80	CTS, 218 Cu. Ft.
Fresh Water	13-3/8"	New	J-55	54.5#	560 *see #19	560 *see #19	CTS, 506 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2500	2500	CTS, 1018 Cu. Ft.
Intermediate							
Production	5-1/2°	New	P-110	23#	20700	20700	5284 Cu. Ft
Tubing	2-3/8"	New	N-80	4.7#			
Liners							

DMH 3-10-21

TYPE	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"	0.312"	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	
Intermediate					7,000	Olubo / C	1.10
Production	5-1/2"	8-3/4" & 8-1/2"	0.415"	12,630	2500	Lead-HIPOZ & Tall - H	H/POZ-1.44 & H-1.8
Tubing	2-3/8"	4.778"	0.19"	11,200			
Liners				,200			

### **PACKERS**

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

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MAR 1 0 2021

Page 2 of 3

WV Department of Environmental Protection WW-6B (10/14) API NO. 47- 095 - 02718

OPERATOR WELL NO. Mills Unit 1H Well Pad Name: Gorrell 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.

\*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

2-10-21

- 21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): Existing 41.22 acres
- 22) Area to be disturbed for well pad only, less access road (acres): Existing 11.91 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 cement.

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

Intermediate: Class A cement with 1/4 lb of flake, 5 gallons of day 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 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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Office of Oil and Gas

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WV Department of Environmental Protection



February 10, 2021

PERMIT MODIFICATION API # 47-095-02718



UWI (APINum)	Well Name	Well Number	Operator	Historical Operator	TD
17095004510000	WETZEL R E	1	LAUDERMAN OIL & GAS	LAUDERMAN OIL & GAS	1,682
47095007250000	SHEPHERD CHARLES O	1	TRIAD HUNTER LLC	LAUDERMAN OIL & GAS	3,000
17095006680000	LATHEY H C & G E	1	SECURITY G & O INC	SECURITY G & O INC	2,764

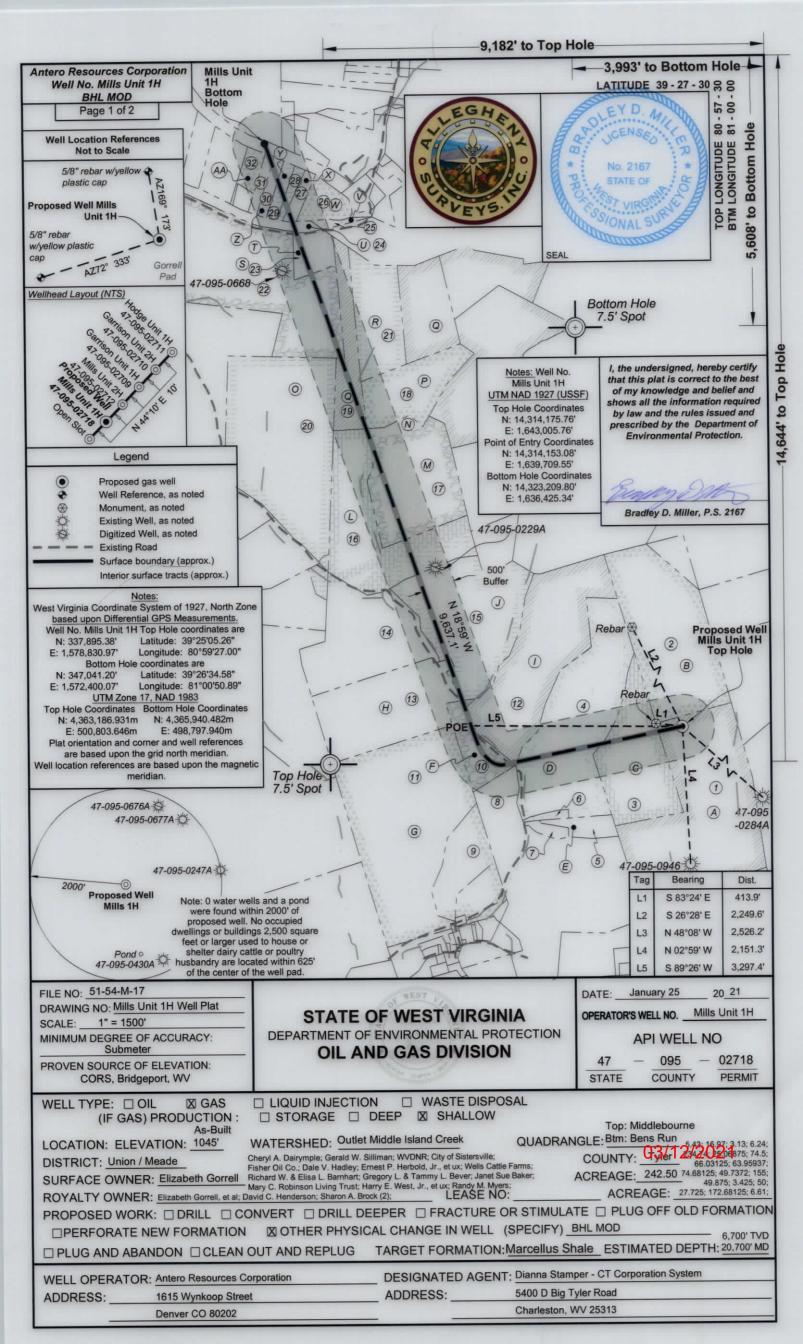
Office of Oil and Gas

FEB 2 2 2021

WV Department or Environmental Protection

Perforated Interval (shallowest, deepest)	Perforated Formation(s)	Producible Formation(s) not perf'd
1582 - 1592	Big Injun	Alexander, Weir
Unknown	Unknown	Alexander, Weir
2592 - 2598	Gordon	Alexander, Weir





Antero Resources Corporation Well No. Mills Unit 1H BHL MOD Page 2 of 2



ID	Lease
A	Elizabeth Gorrell, et al
В	Wilma Jane Benefield
C	Janet Sue Baker
D	Sharon A. Brock
E	Antero Minerals, LLC
F	David C. Henderson
G	Wilma Jane Benefiel
H	Mary C. Robinson Living Trust
1	Sharon A. Brock
J	Harry E. West, Jr. et ux
L	Richard W. & Elisa L. Barnhart
M	Gregory L. & Tammy L. Bever
N	Randy M. Myers
N O P Q R S T	J&N Management Enterprises, LLC
P	Fisher Oil Co.
Q	Dale V. Hadley
R	Ernest P. Herbold, Jr., et ux
S	Wells Cattle Farms
T	Ernest P. Herbold, Jr., et ux
U	WVDNR
V	Charles N. Grachanin
W	Waco Oil & Gas Co. Inc.
X	Cheryl A. Dairymple
Y	Gerald W. Silliman
Z	City of Sistersville
AA	BRC Appalachian Minerals I, LLC

No.	TM / Par	Owner	Bk/Pg	Ac.
1	7/15	Elizabeth Gorrell	321 / 360	242.50
2	7/5	Coastal Forest Resources Co.	301 / 131	74.30
3	7/14	Russell G. Smith & Ruth M. Smith Family Trust	541 / 608	50.00
4	7/9	Russell G. Smith & Ruth M. Smith Family Trust	541 / 608	66.85
5	7/13	Russell E. & Janice Smith	328 / 867	6.00
6	7/9.1	Russell E. & Janice Smith	332 / 234	1.65
7	7/13.1	Russell E. & Janice Smith	328 / 867	2.60
8	7/19	Darlene Henderson	W47 / 263	122.83
9	7/12.2	Gary W. Freeland	336 / 530	19.97
10	7/23	David Henderson & Sharley Shortridge	W47 / 263	16.07
11	7/12	Wilma Jane (Benefiel) Wagner	W35 / 225	110.30
12	7/4	Marcia A. Hill	506 / 479	74.50
13	7/8	John Wells	428 / 412	52.39
14	7/2	Paul R. Wells & Susie Cunningham	269/367	53.85
15	7/3	Harry Edward West, Jr. & Noreen Marie West	328 / 530	88.00
16	4/20.1	Richard W. Barnhart Jr.	213 / 162	49.74
17	4/26	Gregory L. & Tammy L. Bever	620 / 145	53.30
18	4/21	Lori C. Kemp & Ernest P. Herbold, et al	343 / 714	27.27
19	4/10	Lori C. Kemp & Ernest P. Herbold, et al	343 / 714	84.0
20	4/20	Cecil E. Jordan, Jr., et al	337 / 702	103.59
21	4/9	Lori C. Kemp & Ernest P. Herbold, et al	343 / 714	35.18
22	4/8	Wells Cattle Farm, Inc.	331 / 164	155.00
23	4/8.1	Lori C. Kemp & Ernest P. Herbold, et al	343 / 714	6.61
24	15/26	Jay L. Summers & Carla Summers	429 / 201	24.18
25	15/25	Charles & Marie Grachanin	344 / 722	1.25
26	15/24	Cheryl Dalrymple, et al	337 / 108A	8.79
27	15/23	Cheryl Dalrymple, et al	337 / 110A	3.13
28	15/22	Gerald Silliman, et al	180/215	2.86
29	15/21	Gerald Silliman, et al	180 / 215	3.38
30	15/20	Augusta Lauderman, et al	133 / 455	3.00
31	15/18.1	Amy & Howard D. Spurlock, II	380 / 796	2.43
32	15/18	Terry L. & Daphne R. Heinzman	356 / 472	15.25

FILE NO: 51-54-M-17	
DRAWING NO: Mills Unit 1H Well Plat	
SCALE: 1" = 1500'	
MINIMUM DEGREE OF ACCURACY: Submeter	
PROVEN SOURCE OF ELEVATION:	

CORS, Bridgeport, WV

Denver CO 80202

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

DATE: January 25 20\_21 OPERATOR'S WELL NO. Mills Unit 1H API WELL NO 47 095 - 02718 COUNTY STATE PERMIT

WELL TYPE: U OIL XI GAS	☐ LIQUID INJECTION	☐ WASTE DISPOSE	SAL		
(IF GAS) PRODUCTION:	☐ STORAGE ☐ DEEP	X SHALLOW			
As-Built		L. 0111111011	T	op: Middlebox	ırne
LOCATION: ELEVATION: 1045'	WATERSHED: Outlet Middle	Island Creek	QUADRANGLE: B	tm: Bens R	3/12/2021
DISTRICT: Union / Meade	Cheryl A. Dairymple; Gerald W. Silliman; W.	VDNR; City of Sistersville;	COLL	NTY: Tyler	234.74; 25.06875; 74.5;
SURFACE OWNER: Elizabeth Gorrell	Fisher Oil Co.; Dale V. Hadley; Ernest P. H Richard W. & Elisa L. Barnhart; Gregory L.	& Tammy L. Bever: Janet Sue	Baker: ACDE/		- 66.03125; 63.95937; 74.68125; 49.7372; 155;
ROYALTY OWNER: Elizabeth Gorrell, et al; [	Mary C. Robinson Living Trust; Harry E. W. David C. Henderson; Sharon A. Brock (2);	est, Jr., et ux; Randy M. Myers; LEASE NO:		The second second	49.875; 3.425; 50; 27.725; 172.68125; 6.61;
PROPOSED WORK: ☐ DRILL ☐ C	ONVERT   DRILL DEEPER	FRACTURE OF	R STIMULATE	PLUG OFF	OLD FORMATION
□PERFORATE NEW FORMATION	☑ OTHER PHYSICAL CH		SPECIFY) BHL MO		
☐ PLUG AND ABANDON ☐ CLEAN	OUT AND REPLUG TARG	100			6,700' TVD DEPTH: 20,700' MD
WELL OPERATOR: Antero Resources C	orporation DES	SIGNATED AGENT:	Dianna Stamper - CT	Corporation Sy	stem
ADDRESS: 1615 Wynkoop Street	et ADI	DRESS:	5400 D Big Tyler Road	d	

Charleston, WV 25313

Operator's Well Number

Mills Unit 1H

# 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
Elizabeth Gorrell et al Lease			
Elizabeth Gorrell et al	Marcellus Energy Consultants LLC	1/8+	0433/0045
Marcellus Energy Consultants LLC	Antero Resources Corporation	Assignment	0435/0415
Janet Sue Baker Lease			
Janet Sue Baker	Antero Resources Corporation	1/8+	0549/0702
Sharon A.Brock Lease (TM 7 PCL 9)			
Sharon A. Brock	Antero Resources Corporation	1/8+	0580/0433
David C. Henderson Lease			
David C. Henderson	Antero Resources Corporation	1/8+	0083/0667
Sharon A.Brock Lease (TM 7 PCL 9.1)			
Sharon A. Brock	Antero Resources Corporation	1/8+	0580/0433
Mary C. Robinson Living Trust Lease			
Mary C. Robinson Living Trust	Antero Resources Appalachian Corporation	1/8+	0437/0315
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
Harry E. West Jr. et ux Lease			
Harry E. West Jr. et ux	Antero Resources Corporation	1/8+	0046/0125
Gregory L. & Tammy L. Bever Lease			
Gregory L. & Tammy L. Bever	Antero Resources Corporation	1/8+	0565/0023
Randy M. Myers Lease			
Randy M. Myers	Antero Resources Corporation	1/8+	0557/0533
Richard W. & Elisa L. Barnhart Lease			
Richard W. & Elisa L. Barnhart	Antero Resources Corporation	1/8+	0397/0512
Fisher Oil Company Lease			
Fisher Oil Company	Antero Resources Corporation	1/8+ RECEIVED Office of Oil and Is	0475/0721
Dale V. Hadley Lease			
Dale V. Hadley	Antero Resources Corporation	1/8+ FEB 2 2 2021	0497/0721
Wells Cattle Farm Lease		/ Departme	
Wells Cattle Farm	Antero Resources Corporation	1/8+	0410/0647
Ernest P. Herbold Jr. et ux Lease			
Ernest P. Herbold Jr. et ux	Antero Resources Corporation	1/8+	0579/0305
			00.0,0000

<sup>\*</sup>Partial Assignments to Antero Resources Corporation include 100% rights to extract, produce and market the oil and gas from the O3/12/2021 Marcellus and any other formations completed with this well.

# 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
WVNDR WVNDR	Antero Resources Corporation	1/8+	0580/0100
Cheryl A. Dairymple Lease Cheryl A. Dairymple	Antero Resources Corporation	1/8+	0587/0810
<u>Gerald W. Silliman Lease</u> Gerald W. Silliman	Antero Resources Corporation	1/8+	0580/0100
<u>City of Sisterville Lease</u> City of Sisterville	Antero Resources Corporation	1/8+	0083/0664

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Office of Oil and Gas

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

)	perator	s	Well	No.	Mills	Unit	1H	

### 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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- (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
WVNDR Lease	WVNDR	Antero Resources Corporation	1/8+	0580/0100

\*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, beceived 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 a 2 2 2021

\*Co-tenancy utilization — At least 7 mineral owners in tract. At least 75% of the royalty owners have executed a lease on the tract. The interests of the remaining co-tenants were acquired pursuant to the Co-tenancy Modernization and Majority Protection Act

Well Operator:	Antero Resources	N Departm	
Ву:	Tim Rady	(m) ledy	L. wa onmental Pr
ts:	VP of Land		

Page 1 of 1

### Kees, Kelly L

From: Kees, Kelly L

**Sent:** Friday, March 12, 2021 11:17 AM

To: mstanton (mstanton@anteroresources.com); Dani Devito
Cc: Brewer, Charles T; Stansberry, Wade A; Haught, Derek M

**Subject:** Expedited Modification - Well Work Permit (API: 47-095-02718)

**Attachments:** 95-02718 mod.pdf

I have attached a copy of the newly issued expedited modification to number "MILLS UNIT 1H" (API 47-095-02718) This will serve as your copy. If you have any questions, then please contact us here at the Office of Oil and Gas.