



August 24, 2022

Antero Resources  
1615 Wynkoop Street  
Denver, CO 80202  
Office 303.357.7310  
Fax 303.357.7315

West Virginia Department of Environmental Protection  
Office of Oil and Gas  
Attn: Mr. Taylor Brewer  
601 57<sup>th</sup> Street  
Charleston, WV 25304

Mr. Brewer:

Antero Resources Corporation (Antero) would like to submit the following permit modifications for approved well on the existing Oxford 98 Pad; Aspen Unit 2H.

Attached you will find the following:

- Revised Form WW-6B
- Revised Form WW-6A1
- Revised Mylar Plat
- AOR

If you have any questions please feel free to contact me at (303) 357-7130.

Thank you in advance for your consideration.

Sincerely,

Diane Blair  
Permitting Agent  
Antero Resources Corporation

Enclosures

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### Expedited Permit Modification

Received date: 8/25/22

Expedited Final Date: 9/14/22

Operator: Amtero

Well Name: Aspen 2H

Pad Name: Oxford 98

API: 17-06927

	MODIFIED PERMIT	ORIGINAL PERMIT
TVD	6600	7200
TMD	26100	7200
HL	8470.2	645.4
FW	✓	123
SW	✓	1653
COAL	✓	120
CONDUCTOR	✓	80
FRESHWATER	✓	300
INTERMEDIATE 1	✓	2500
INTERMEDIATE 2	—	—
PRODUCTION	26100	7200

Notes: Francis ✓ Banker ✓ Michael S Francis  
Minnis ✓ Clement ✓  
H-R DE ✓  
Carino ✓  
Camp ✓  
Butler ✓  
Maxwell ✓  
Wolfe ✓  
Hepkin ✓

4701706927

09/02/2022

WW-6B  
(04/15)

Check# 4012078  
8/23/2022  
\$5,000.00

API NO. 47-017 - 06927  
OPERATOR WELL NO. Aspen Unit 2H MOD  
Well Pad Name: Oxford 98 Pad

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

1) Well Operator: Antero Resources Corporation Operator ID: 494507062 County: 017 - Doddridge District: West Union Quadrangle: West Union 7.5'

2) Operator's Well Number: Aspen Unit 2H MOD Well Pad Name: Oxford 98 Pad

3) Farm Name/Surface Owner: Michael R. Britton & Angela D. Pratt Public Road Access: CR 11/4

4) Elevation, current ground: 1120' AS-BUILT Elevation, proposed post-construction: \_\_\_\_\_

5) Well Type (a) Gas  Oil \_\_\_\_\_ Underground Storage \_\_\_\_\_  
Other \_\_\_\_\_

(b) If Gas Shallow  Deep \_\_\_\_\_  
Horizontal

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):  
Marcellus Shale: 6600' TVD, Anticipated Thickness- 55 feet, Associated Pressure- 2850#

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8) Proposed Total Vertical Depth: 6600' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 20100'

11) Proposed Horizontal Leg Length: 8470.2'

12) Approximate Fresh Water Strata Depths: 123'

13) Method to Determine Fresh Water Depths: 47-017-02837, 47-017-06326 Offset well records. Depths have been adjusted according to surface elevations.

14) Approximate Saltwater Depths: 1653'

15) Approximate Coal Seam Depths: 120'

16) Approximate Depth to Possible Void (coal mine, karst, other): None Anticipated

17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes \_\_\_\_\_ No

(a) If Yes, provide Mine Info: Name: \_\_\_\_\_  
Depth: \_\_\_\_\_  
Seam: \_\_\_\_\_  
Owner: \_\_\_\_\_

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18)

**CASING AND TUBING PROGRAM**

<b>TYPE</b>	<b>Size (in)</b>	<b>New or Used</b>	<b>Grade</b>	<b>Weight per ft. (lb/ft)</b>	<b>FOOTAGE: For Drilling (ft)</b>	<b>INTERVALS: Left in Well (ft)</b>	<b>CEMENT: Fill-up (Cu. Ft.)/CTS</b>
Conductor	20"	New	H-40	79#	80'	80'	CTS, 77 Cu. Ft.
Fresh Water	13-3/8"	New	J/K-55	54.5#	300'	300'	CTS, 313 Cu. Ft.
Coal	9-5/8"	New	J-/K55	36#	2500'	2500'	CTS, 1018 Cu. Ft.
Intermediate							
Production	5-1/2"	New	P-110CY	20#	20100'	20100'	CTS, 4147 Cu. Ft.
Tubing	2-3/8"	New	N-80	4.7#			
Liners							

<b>TYPE</b>	<b>Size (in)</b>	<b>Wellbore Diameter (in)</b>	<b>Wall Thickness (in)</b>	<b>Burst Pressure (psi)</b>	<b>Anticipated Max. Internal Pressure (psi)</b>	<b>Cement Type</b>	<b>Cement Yield (cu. ft./k)</b>
Conductor	20"	24"	0.375"	2250	50	Class A	~1.18
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	~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**

VOLD

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

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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

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21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 24.47 acres

22) Area to be disturbed for well pad only, less access road (acres): 5.73 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 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 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 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.

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\*Note: Attach additional sheets as needed.

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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 –

- (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
<b><u>Michael S. Francis, et al Lease</u></b>			
Michael S. Francis, et al	Key Oil Company	1/8	0106/0273
Key Oil Company	Columbia Gas Transmission Corporation	Assignment	0115/0436
Columbia Gas Transmission Corporation	Columbia Natural Resources Inc	Assignment	0161/0068
Columbia Natural Resources Inc	Columbia Natural Resources LLC	Name Change	0256/0588
Columbia Natural Resources LLC	Chesapeake Appalachia LLC	Merger	0264/0447
Chesapeake Appalachia LLC	CNX Gas Company	Assignment	0372/0585
CNX Gas Company	Antero Resources Corporation	Assignment	0387/0216
<b><u>Richard W. Minnis, et al Lease</u></b>			
Richard W. Minnis, et al	Consolidated Gas Supply Corporation	1/8	0095/0706
Consolidated Gas Supply Corporation	Consolidated Gas Transmission Corporation	Assignment	0135/0583
Consolidated Gas Transmission Corporation	CNG Development Company	Assignment	0139/0041
CNG Development Company	Dominion Exploration & Production Inc	Name Change	WV SOS
Dominion Exploration & Production Inc	Dominion Transmission Inc	Assignment	0244/0528
Dominion Transmission Inc	CONSOL Gas Company	Name Change	0292/0469
CONSOL Gas Company	CNX Gas Company, LLC	Name Change	0293/0252
CNX Gas Company	Antero Resources Corporation	Assignment	0325/0507
<b><u>Harrison-Ritchie Oil &amp; Gas Co. Lease</u></b>			
Harrison-Ritchie Oil & Gas Co.	Antero Resources Corporation	1/8+	0503/0456
<b><u>James P. Gaines, et al Lease</u></b>			
James P. Gaines, et al	CNG Development Company	1/8	0150/0491
CNG Development Company	CNG Producing Company	Name Change	WV SOS
CNG Producing Company	Dominion Exploration & Production, Inc	Name Change	0058/0366
Dominion Exploration & Production, Inc.	Dominion Transmission, Inc	Assignment	0244/0528
Dominion Transmission, Inc	CONSOL Energy Holdings	Assignment	0245/0001
CONSOL Energy Holdings	CONSOL Gas Company	Merger	0292/0469
CONSOL Gas Company	CNX Gas Company, LLC	Merger	0292/0469
CNX Gas Company, LLC	Antero Resources Corporation	Assignment	0387/0216
<b><u>James P. Gaines Lease</u></b>			
James P. Gaines	CNG Development Company	1/8	0151/0491
CNG Development Company	CNG Producing Company	Name Change	WV SOS
CNG Producing Company	Dominion Exploration & Production, Inc	Name Change	0058/0366
Dominion Exploration & Production, Inc.	Dominion Transmission, Inc	Assignment	0244/0528
Dominion Transmission, Inc	CONSOL Energy Holdings	Assignment	0245/0001
CONSOL Energy Holdings	CONSOL Gas Company	Merger	0292/0469
CONSOL Gas Company	CNX Gas Company, LLC	Merger	0292/0469
CNX Gas Company, LLC	Antero Resources Corporation	Assignment	0387/0216
<b><u>James P. Gaines, et ux Lease</u></b>			
James P. Gaines, et ux	Hope Natural Gas Company	1/8	

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Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
Hope Natural Gas Company	Consolidated Gas Supply Corporation	Assignment	0143/0345
Consolidated Gas Supply Corporation	Consolidated Gas Transmission Corporation	Assignment	0135/0583
Consolidated Gas Transmission Corporation	CNG Transmission Corporation	Assignment	0332/0563
CNG Transmission Corporation	Dominion Transmission Inc	Assignment	0332/0570
Dominion Transmission Inc	CNX Gas Company, LLC	Assignment	0325/0517
CNX Gas Company, LLC	<b>Antero Resources Corporation</b>	<b>Assignment</b>	<b>0628/0257</b>
<b>Franklin L. Butler Lease</b>			
Franklin L. Butler	Key Oil Company	1/8	0195/0445
Key Oil Company	Antero Resources Appalachian Corporation	Assignment	0256/0285
<b>Antero Resources Appalachian Corporation</b>	<b>Antero Resources Corporation</b>	<b>Name Change</b>	<b>0046/0523</b>
<b>Wm. Wolfe Lease</b>			
William J. Wolfe, single	Justin M. Henderson	1/8	0104/0287
Justin Henderson	W.B. Berry	Assignment	0110/0553
W.B. Berry	Benson Drilling Joint Venture No. 2	Assignment	0110/0061
Benson Drilling Joint Venture No. 2	J&J Enterprises, Inc	Agreement	0154/0001
J&J Enterprises, Inc	Eastern American Energy Corporation	Merger	0159/0139
Eastern American Energy Corporation	UMC Petroleum Corporation	Assignment	0166/0671
UMC Petroleum Corporation	Ashland Exploration, Inc	Assignment	0227/0252
Ashland Exploration, Inc	Ashland Exploration Holdings, Inc	Name Change	WV SOS
Ashland Exploration Holdings, Inc	Blazer Energy Corporation	Conveyance	0181/0421
Blazer Energy Corporation	Eastern States Oil & Gas	Name Change	0244/0149
Easter States Oil & Gas	Equitable Production-Eastern Sates	Name Change	WV SOS
Equitable Production-Eastern States	Equitable Production Company	Merger	WV SOS
Equitable Production Company	EQT Production Company	Name Change	0281/0346
<b>EQT Production Company</b>	<b>Antero Resources Corporation</b>	<b>Assignment</b>	<b>0388/0294</b>
<b>Benjamin F. Heflin, et ux Lease</b>			
Benjamin F. Heflin, et ux	C.H. Pigott	1/8	0042/0382
C.H. Pigott	Eastern American Energy Corporation	Assignment	0174/0070
Eastern American Energy Corporation	Energy Corporation of America	Assignment	0240/0498
Energy Corporation of America	Antero Resources Appalachian Corporation	Assignment	0272/0370
<b>Antero Resources Appalachian Corporation</b>	<b>Antero Resources Corporation</b>	<b>Name Change</b>	<b>0046/0523</b>
<b>Donald Barker, et al Lease</b>			
Donald G. Barker, et al	Justin M. Henderson	1/8	0104/0236
Justin Henderson	W.B. Berry	Assignment	0110/0553
W.B. Berry	Benson Drilling Joint Venture No. 2	Assignment	0110/0061
Benson Drilling Joint Venture No. 2	J&J Enterprises, Inc	Agreement	0154/0001
J&J Enterprises, Inc	Eastern American Energy Corporation	Merger	0159/0139
Eastern American Energy Corporation	UMC Petroleum Corporation	Assignment	0166/0671
UMC Petroleum Corporation	Ashland Exploration, Inc	Assignment	0227/0252
Ashland Exploration, Inc	Ashland Exploration Holdings, Inc	Name Change	WV SOS

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WW-6A1

Operator's Well Number Aspen Unit 2H MOD

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Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
Ashland Exploration Holdings, Inc	Blazer Energy Corporation	Conveyance	0181/0421
Blazer Energy Corporation	Eastern States Oil & Gas	Name Change	0244/0149
Easter States Oil & Gas	Equitable Production-Eastern Sates	Name Change	WV SOS
Equitable Production-Eastern States	Equitable Production Company	Merger	WV SOS
Equitable Production Company	EQT Production Company	Name Change	0281/0346
<b>EQT Production Company</b>	<b>Antero Resources Corporation</b>	<b>Assignment</b>	<b>0388/0294</b>

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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.

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

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**Modification Horizontal H6A Well Work Permits API: (47-017-06927)**

1 message

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

Tue, Aug 30, 2022 at 10:00 AM

To: Mallory Stanton <mstanton@anteroresources.com>, Diane Blair <dblair@anteroresources.com>, Dani DeVito <ddevito@shalepro.com>, "Blevins, Cragin" <cragin.blevins@wv.gov>, David Sponaugle <dsponaug@assessor.state.wv.us>, "Ward, Samuel D" <samuel.d.ward@wv.gov>

I have attached a copy of the newly issued well [permit](#) numbers:

**47-017-06927 - ASPEN 2H**

These will serve as your copy.

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](mailto:Wade.A.Stansberry@wv.gov)**

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 **47-017-06927 - Copy.pdf**  
1286K

09/02/2022