

#### 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, April 3, 2023 PERMIT MODIFICATION APPROVAL Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION 1615 WYNKOOP STREET

DENVER, CO 80202

Permit Modification Approval for SPILI UNIT 1H

47-095-02843-00-00

Lateral Extension

### 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

Chief

Operator's Well Number: SPILI UNIT 1H

Farm Name: EDWARD YOST ESTATE U.S. WELL NUMBER: 47-095-02843-00-00

Horizontal 6A New Drill

Date Modification Issued: 04/03/2023

Promoting a healthy environment.

API NO. 47-095 - 028	343
OPERATOR WELL N	IO. Spili Unit 1H MOD
Well Pad Name: Ed	

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

/
1) Well Operator: Antero Resources Corporat 494507062 095 - Tyler Ellsworth Porter Falls 7.5'
Operator ID County District Quadrangle  2) Operator's Well Number: Spili Unit 1H MOD Well Pad Name: Ed Yost
3) Farm Name/Surface Owner: Edward Yost Estate Public Road Access: CR 11
4) Elevation, current ground: 1233' - As Built Elevation, proposed post-construction:  5) Well Type (a) Gas X Oil Underground Storage
Other Other Underground Storage
(b)If Gas Shallow X Deep Horizontal X
6) Existing Pad: Yes or No Yes
7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s): Marcellus Shale: 7200' TVD, Anticipated Thickness- 55 feet, Associated Pressure- 2850#
8) Proposed Total Vertical Depth: 7200' TVD
9) Formation at Total Vertical Depth: Marcellus
10) Proposed Total Measured Depth: 28000' MD
11) Proposed Horizontal Leg Length: 19049'
12) Approximate Fresh Water Strata Depths: 70', 203'
13) Method to Determine Fresh Water Depths: 4709500165 Offset well records. Depths have been adjusted according to surface elevations.
14) Approximate Saltwater Depths: 1810'
15) Approximate Coal Seam Depths: None Anticipated
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 _X
(a) If Yes, provide Mine Info: Name:
Depth:
Seam:
Owner:
Dr. o.
Office
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API NO. 47- 095 - 02843

OPERATOR WELL NO. Spili Unit 1H MOD
Well Pad Name: Ed Yost

18)

# CASING AND TUBING PROGRAM

TYPE	T	Move	I			1	
	Size	New or	Grade	Weight per ft.	FOOTAGE: For	INTERVALS:	CEMENT:
	(in)	Used	Grade	<u>(lb/ft)</u>	Drilling (ft)	Left in Well	Fill-up
Conductor	20"	New	H-40	044		<u>(ft)</u>	(Cu. Ft.)/CTS
		14644	11-40	94#	100	100 /	CTS, 96 Cu. Ft.
Fresh Water	13-3/8"	New	J-55	54.5#	300	300	CTS, 313 Cu. Ft.
Coal	9-5/8"	New	J-55	36#			
Intermediate			000	<i>50</i> #	2500	2500 /	CTS, 1018 Cu. Ft.
Production	5-1/2"	New	D 440	00.0			
The state of the second	5-1/2	New	P-110	23#	28000	28000	6128 Cu. Ft
Tubing	2-3/8"	New	N-80	4.7#			
Liners			-				

TYPE			Wall		1		
	Size (in)	Wellbore Diameter (in)	Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	<u>Cement</u> <u>Yield</u>
Conductor	20"	24"	0.438"	1530	50	Class A/L	(cu. ft./k) ~1.18
Fresh Water	13-3/8"	17-1/2"	0.38"	2730	1000	Class A/L	
Coal	9-5/8"	12-1/4"	0.352"	3520	1500		~1.18
Intermediate				0020	1300	Class A/L	~1.18
Production	5-1/2"	8-3/4" & 8-1/2"	0.415"	12,630	2500	Lead-H/POZ & Tsil - H	U/DO7 4 44 8 11 4 6
Tubing	2-3/8"	4.778"	0.19"	11,200	2000	EUROPIN OF A IBI-11	H/POZ-1.44 & H-1.8
Liners				11,200			

## **PACKERS**

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

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M/2 3/24/23

OPERATOR WELL NO. Spili Unit 1H MOD Well Pad Name: Ed Yost

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

- 21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 81.82 acres
- 22) Area to be disturbed for well pad only, less access road (acres): 8.91 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/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 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.

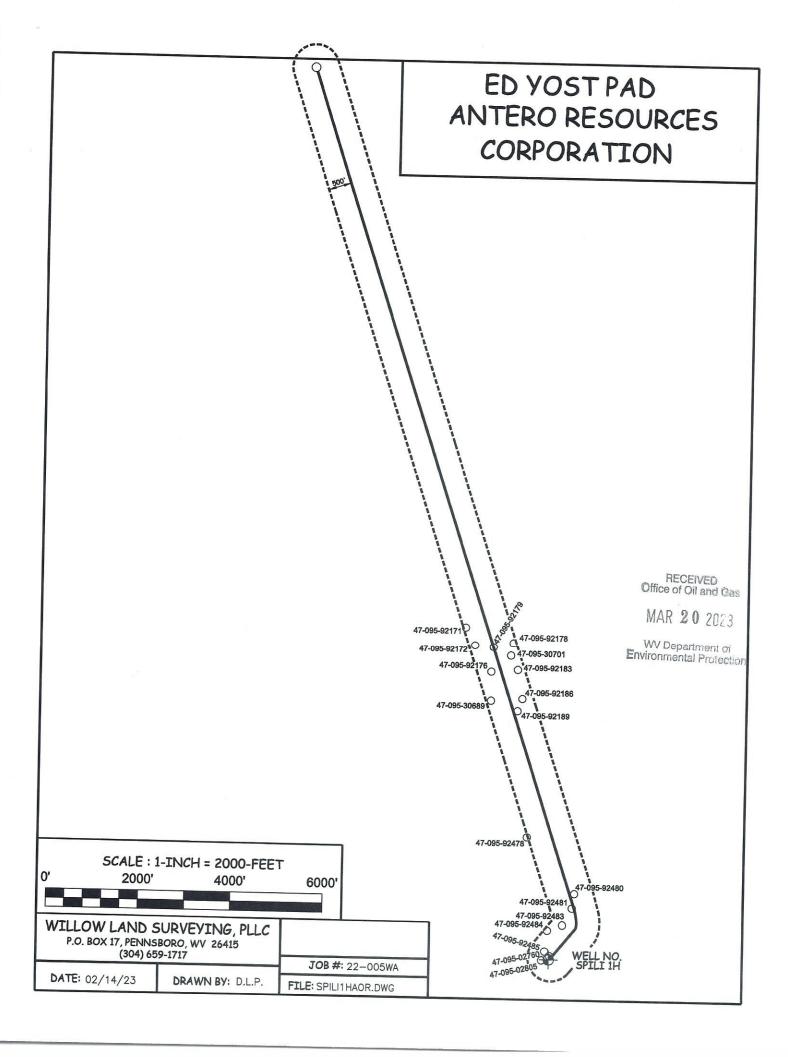
Intermediate: blowhole clean with air, trip to surface casing shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate 40 bbls brine water followed by 10 bbls fresh water and 25 bbls bentonite mud, pump 10 bbls fresh water. Production: circulate with 14 lb/gal NaCl mud, trip to 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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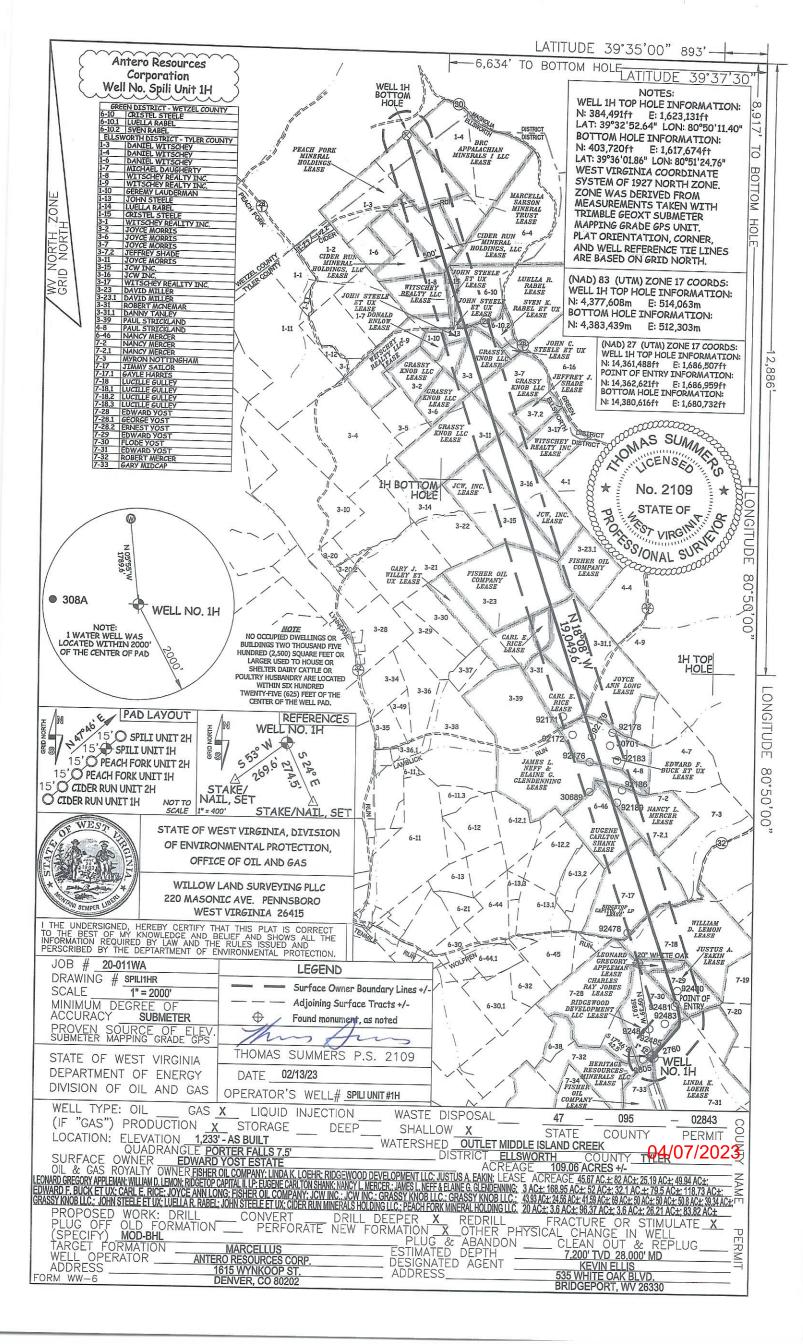


ANTERO RESOURCES CORP  VALLEY STEEL PROD CO  VALLEY STEEL PROD CO  1,935	UWI (APINum)	Well Name	Well Number	Operator	Historical Organia	-			
2 VALLEY STEEL PROD CO VALLEY	7095027600000	AR ED YOST UNIT 5H		ANTERO RESOLIBCES CORP	ANTERO PECOLIDERA OPEIATOR	2	Perforated Interval (shallowest, deepest)	Perforated Formation(s)	Producible Formation(s) and and
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5921710000 5921790000	5921720000								
5521790000	5921710000								
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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:

			gare and all follows.	
	Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
	Fisher Oil Company <u>Lease</u> Fisher Oil Company <u>Linda K. Loehr Lease</u>	Antero Resources Corporation	1/8+	19/535
٠	Linda K. Loehr	Antero Resources Corporation	1/8+	494/518
-	Ridgewood Development LLC Lease Ridgewood Development LLC	Antero Resources Corporation	1/8+	185/337
/	Justus A. Eakin Lease Justus A. Eakin  Leonard Gregory Appleman Lease	Antero Resources Corporation	1/8+	53/104
	Leonard Gregory Appleman	Antero Resources Corporation	1/8+	220/389
4	✓ <u>William D. Lemon Lease</u> William D. Lemon Antero Resources Appalachian Corporation	Antero Resources Appalachian Corporation Antero Resources Corporation	1/8+ Name Change	420/439 <b>557/430</b>
1	Ridgetop Capitol II, LP Lease Ridgetop Capitol II, LP	Antero Resources Corporation	1/8+	148/192
1	Eugene Carlton Shank Lease Eugen Carlton Shank	Antero Resources Corporation	1/8+	21/656
	Nancy L. Mercer Lease Nancy L. Mercer	Antero Resources Corporation	1/8+	190/415
	James L. Neff & Elaine G. Glendenning Lease James L. Neff & Elaine G. Glendenning	Antero Resources Corporation	1/8+	591/427
/	Edward F. Buck et ux Lease Edward F. Buck et ux	Antero Resources Corporation	1/8+	552/700
1	Joyce Ann Long Lease Joyce Ann Long	Antero Resources Corporation	1/8+	148/205
1	Carl E. Rice Lease Carl E. Rice	Antero Resources Corporation	Office of Oil and Gas  1/8+ MAR 20 2023	208/557
	Joyce Ann Long Lease Joyce Ann Long	Antero Resources Corporation	1/8+ WV Department of Environmental Protection	148/205
	<u>Carl E. Rice Lease</u> Carl E. Rice	Antero Resources Corporation	1/8+	208/557
	<u>Fisher Oil Company Lease</u> Fisher Oil Company	Antero Resources Corporation	1/8+	667/682

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	Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
1	JCW, Inc. Lease JCW, Inc.	Antero Resources Corporation	1/8+	208/547
1	JCW, Inc. Lease JCW, Inc.	Antero Resources Corporation	1/8+	208/547
1	Grassy Knob LLC Lease Grassy Knob LLC	Antero Resources Corporation	1/8+	177/207
1	Grassy Knob LLC Lease Grassy Knob LLC	Antero Resources Corporation	1/8+	177/207
4	Grassy Knob LLC Lease Grassy Knob LLC	Antero Resources Corporation	1/8+	177/207
1	John Steel et ux Lease John Steel et ux	Antero Resources Corporation	1/8+	177/198
1	Luella R. Rabel Lease Luella R. Rabel	Antero Resources Corporation	1/8+	177/222
/	John Steele et ux <u>Lease</u> John Steel et ux	Antero Resources Corporation	1/8+	177/198
/	<u>Cider Run Mineral Holdings, LLC Lease</u> Cider Run Mineral Holdings, LLC	Antero Resources Corporation	1/8+	177/165

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<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.

## 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 Number  Peach Fork Mineral Holdings Lease	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
	Peach Fork Mineral Holdings	Antero Resources Corporation	1/8+	0177/0184

\*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.

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, 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

Its: Senior Vice President of Land

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March 17, 2023

West Virginia Department of Environmental Protection Office of Oil and Gas Attn: Mr. Taylor Brewer 601 57<sup>th</sup> Street Charleston, WV 25304 Antero Resources 1615 Wynkoop Street Denver, CO 80202 Office 303.357.7310 Fax 303.357.7315

Mr. Brewer:

Antero Resources Corporation (Antero) would like to submit the following permit modification for approved well on the existing Ed Yost Pad: Spili Unit 1H (47-095-02843).

Attached you will find the following:

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

Check # 4617586 # 250000

If you have any questions please feel free to contact me at (303) 357-7182.

Thank you in advance for your consideration.

Sincerely,

Stefan Gaspar Permitting Agent

Antero Resources Corporation

Enclosures

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