



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

Austin Caperton, Cabinet Secretary
www.dep.wv.gov

Wednesday, March 14, 2018
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION
1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit Modification Approval for NORTHROP UNIT 1H
47-017-06791-00-00

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: NORTHROP UNIT 1H
Farm Name: MATTHEW W. ALEXANDER & LINDA M. MUHL
U.S. WELL NUMBER: 47-017-06791-00-00
Horizontal 6A New Drill
Date Modification Issued: 03/14/2018

Promoting a healthy environment.

03/16/2018

WW-6B
(04/15)

PERMIT MODIFICATION API# 47-017-06791

API NO. 47-017 - 06791
OPERATOR WELL NO. Northrop Unit 1H
Well Pad Name: Alexander 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: Northrop Unit 1H Well Pad Name: Alexander Pad

3) Farm Name/Surface Owner: Matthew W. Alexander & Linda M. Muhly Public Road Access: CR 28 (Nutter Fork)

4) Elevation, current ground: ~1193' Elevation, proposed post-construction: ~1181'

5) Well Type (a) Gas X Oil Underground Storage Other
(b) If Gas Shallow X Deep Horizontal X

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus Shale: 7500' TVD, Anticipated Thickness- 60 feet, Associated Pressure- 3100#

8) Proposed Total Vertical Depth: 7500' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 16900' MD

11) Proposed Horizontal Leg Length: 8676'

12) Approximate Fresh Water Strata Depths: 292', 297', 455'

13) Method to Determine Fresh Water Depths: Offset well records. Depths have been adjusted according to surface elevations.

14) Approximate Saltwater Depths: 1319', 1896', 2061'

15) Approximate Coal Seam Depths: 677', 839'

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:

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WW-6B
(04/15)

PERMIT MODIFICATION API# 47-017-06791

API NO. 47-017 - 06791

OPERATOR WELL NO. Northrop Unit 1H

Well Pad Name: Alexander 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	94#	40'	40'	CTS, 38 Cu. Ft.
Fresh Water	13-3/8"	New	J-55/H-40	48#	505' *see #19	505' *see #19	CTS, 702 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2450'	2450'	CTS, 998 Cu. Ft.
Intermediate							
Production	5-1/2"	New	P-110	20#	16900'	16900'	4255 Cu. Ft
Tubing	2-3/8"	New	N-80	4.7#		7100'	
Liners							

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	30"	24"	0.438"	1530	50	Class A	1.18
Fresh Water	13-3/8"	17-1/2"	0.38"/0.33"	2730/1730	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"	0.361"	12,630	2500	Lead-HPOZ & Tel - H	H/POZ-1.44 & 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			

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WW-6B
(10/14)

API NO. 47-017 - 06791

OPERATOR WELL NO. Northrop Unit 1H

Well Pad Name: Alexander 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

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 24.40 acres

22) Area to be disturbed for well pad only, less access road (acres): 6.1 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

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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.

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
<u>Larry Williams Lease</u>			
Larry Williams	Antero Resources Appalachian Corporation	1/8+	0267/0352
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>Charles Williams by Randy Williams, A.I.F. Lease</u>			
Charles Williams by Randy Williams, A.I.F.	Drilling Appalachian Corporation	1/8	LB0181/0615
Drilling Appalachian Corporation	Antero Resources Appalachian Corporation	Assignment	LB0262/0600
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>H. Ross Swiger, et ux Lease</u>			
H. Ross Swiger, Jr., et ux	Honor Resources Company	1/8	0295/0480
Honor Resources Company	EXCO Production Company, LLC; BG Production Company, LLC; EXCO Resources, LLC	Assignment	0299/0659
EXCO Production Company, LLC; BG Production Company, LLC; EXCO Resources, LLC	Antero Resources Appalachian Corporation	Assignment	0301/0551
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>Freeman P. Smith, et ux Lease</u>			
Freeman P. Smith, et ux	Clarence W. Mutschelknaus	1/8	0167/0687
Clarence W. Mutschelknaus	Drilling Appalachian Corporation	Assignment	0168/0050
Drilling Appalachian Corporation	Antero Resources Appalachian Corporation	Assignment	0278/0307
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>B.J. (Sally) Underwood Lease</u>			
B.J. (Sally) Underwood	Drilling Appalachian Corporation	1/8	LB0168/0053
Drilling Appalachian Corporation	Dominion Appalachian Development Properties, LLC	Assignment	LB0181/0667
Dominion Appalachian Development Properties, LLC	Consol Gas Appalachian Development Properties, LLC	Cert. of Amendment to the Cert. of Authority	DB0286/0101
Consol Gas Appalachian Development Properties, LLC	Consol Gas Reserves, Inc.	Certificate of Merger	DB0286/0121
Consol Gas Reserves, Inc.	Consol Gas Company, et al	Certificate of Merger	DB0286/0133
Consol Gas Company, et al	CNX Gas Company LLC	Name Change/Merger	DB0292/0469
CNX Gas Company, LLC; et al	Antero Resources Corporation	Partial Term Assignment	0317/0379
<u>Lois Jean Braun Lease</u>			
Lois Jean Braun	Antero Resources Corporation	1/8+	404/512

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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.

INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE
 Chapter 22, Article 6A, Section 5(a)(5)
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Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
<u>Joseph Freeman, et ux Lease</u>			
Joseph Freeman, et ux	G.H. & J.E. Trainer	1/8	LB0027/0233
G.H. & J.E. Trainer	W.W. Hepburn	Assignment	LB0034/0244
W.W. Hepburn	Eastern Petroleum Company	Assignment	LB0034/0256
Eastern Petroleum Company	Clifton Oil & Gas Company	Assignment	DB0081/0114
Clifton Oil & Gas Company	Quaker State Oil Refining Corporation	Assignment	0056/0165
Quaker State Oil Refining Corporation	Williston Oil Development	Assignment	DB0165/0502
Williston Oil Development	Gerald W. Lauderman DBA Lauderman Oil & Gas Drilling Company, et al	Assignment	LB0100/0003
Lauderman Oil & Gas Drilling Company, et al	Michael E. Heitz	Assignment	LB0140/0677
Michael E. Heitz	HND Oil & Gas Company	Assignment	LB0141/0379
HND Oil & Gas Company	Quaker State Oil Refining Corporation	Assignment	LB0145/0492
Quaker State Corporation FKA Quaker State Oil Refining Corporation	QSE&P, Inc.	Assignment	LB0159/0474
QSE&P, Inc., et al	Belden & Blake Corporation	Assignment	LB0175/0466
Belden & Blake Corporation	Peake Energy, Inc.	Assignment	LB0181/0114
Peake Energy, Inc.	North Coast Energy Eastern, Inc.	Name Change	DB0249/0343
North Coast Energy Eastern, Inc.	Exco-North Coast Energy Eastern, Inc.	Name Change	DB0277/0068
Exco-North Coast Energy Eastern, Inc.	EXCO Resources (WV), Inc.	Name Change	Exhibit 2
EXCO Resources (WV), Inc.	EXCO Resources (WV), LLC	Name Change	DB0285/0083
EXCO Resources (WV), LLC	EXCO Production Company (WV), LLC	Name Change	Exhibit 3
EXCO Production Company (WV), LLC	Antero Resources Appalachian Corporation	Assignment	LB0285/0084
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>Charles C. Smith, et al Lease</u>			
Charles C. Smith, et al	Duncan Sartain	1/8	LB0068/0463
Duncan Sartain	Walter F. Tucker	Assignment	74/473
Walter F. Tucker	Roscoe B. G. Cowper	Assignment	77/502
Roscoe B. G. Cowper	Lawrence H. Aberegg	Assignment	98/233
Lawrence H. Aberegg	Hugh Spencer	Assignment	98/237
Hugh Spencer	J&J Enterprises, Inc.	Assignment	111/390
J&J Enterprises, Inc.	Eastern American Energy Corporation	Assignment	LB0220/0602
Eastern American Energy Corporation	Energy Corporation of America	Assignment	LB0240/0498
Energy Corporation of America	Antero Resources Appalachian Corporation	Assignment	LB0272/0307
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>William Ashburn Heirs Lease</u>			
William Ashburn Heirs	J.C. Smith	1/8	LB0056/0249
J.C. Smith	John W. Casto, et al	List of Heirs	SF0008/0071
John W. Casto, et al	Antero Resources Corporation	Assignment	LB0333/0509

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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.

WW-6A1
(5/13)

Operator's Well No. Northrop Unit 1H

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Chapter 22, Article 6A, Section 5(a)(5)
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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
<u>William A. Farr Lease</u>	William A. Farr	Carolyn E. Farr Trust	1/8	LB0277/0644
	Clarence E. Sigley, Sr. Trustee for the Carolyn E. Farr Trust	Antero Resources Appalachian Corporation	Assignment	LB0281/0310
	Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1

*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, 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: Kevin Kilstrom
 Its: Senior VP Production

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**FORM WW-6A1
EXHIBIT 1**

FILED

JUN 10 2013

Natalie E. Tennant,
Secretary of State
1900 Kanawha Blvd E
Bldg 1, Suite 157-K
Charleston, WV 25305



Penney Barker, Manager
Corporations Division
Tel: (304) 558-8000
Fax: (304) 558-8381
Website: www.wvsof.com
E-mail: business@wvsof.com

**APPLICATION FOR
AMENDED CERTIFICATE
OF AUTHORITY**

Office Hours: Monday – Friday
8:30 a.m. – 5:00 p.m. ET

FILE ONE ORIGINAL
(Two if you want a filed
stamped copy returned to you)
FEE: \$25.00

**** In accordance with the provisions of the West Virginia Code, the undersigned corporation hereby ****
applies for an Amended Certificate of Authority and submits the following statement:

1. Name under which the corporation was authorized to transact business in WV: Antero Resources Appalachian Corporation
2. Date Certificate of Authority was issued in West Virginia: 6/25/2008
3. Corporate name has been changed to: Antero Resources Corporation
(Attach one Certified Copy of Name Change as filed in home State of Incorporation.)
4. Name the corporation elects to use in WV: Antero Resources Corporation
(due to home state name not being available)
5. Other amendments: _____
(attach additional pages if necessary)
6. Name and phone number of contact person. (This is optional, however, if there is a problem with the filing, listing a contact person and phone number may avoid having to return or reject the document.)
Alvyn A. Schopp (303) 357-7310
Contact Name Phone Number
7. Signature information (See below *Important Legal Notice Regarding Signature):
Print Name of Signer: Alvyn A. Schopp Title/Capacity: Authorized Person
Signature: [Handwritten Signature] Date: June 10, 2013

***Important Legal Notice Regarding Signature:** Per West Virginia Code §31D-1-129. Penalty for signing false document. Any person who signs a document he or she knows is false in any material respect and knows that the document is to be delivered to the secretary of state for filing is guilty of a misdemeanor and, upon conviction thereof, shall be fined not more than one thousand dollars or confined in the county or regional jail not more than one year, or both.

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03/16/2018



Certificate

*I, Natalie E. Tennant, Secretary of State of the
State of West Virginia, hereby certify that*

an Amended Certificate of Authority of

EXCO - NORTH COAST ENERGY EASTERN, INC.

was filed in my office as required by the provisions of the West Virginia Code and was found
to conform to law.

Therefore I issue this

CERTIFICATE OF AMENDMENT TO THE CERTIFICATE OF AUTHORITY

changing the name of the corporation to

EXCO RESOURCES (WV), INC.

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WV Department of
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*Given under my hand and the
Great Seal of the State of
West Virginia on this day of
December 2, 2009*

Natalie E. Tennant

Secretary of State

State of West Virginia



Certificate

I, Natalie E. Tennant, Secretary of State of the State of West Virginia, hereby certify that

by the provisions of the West Virginia Code, Articles of Merger were received and filed

MERGING EXCO RSOUCES (PA), LLC, A QUALIFIED TX ORGANIZATION WITH EXCO RESOURCES (WV), LLC, A QUALIFIED TX ORGANIZATION, AS SURVIVORS AND CREATING THE FOLLOWING NON-QUALIFIED TX ORGANIZATIONS: BG NATURAL GAS PRODUCTION COMPANY (PA), LLC, APPALACHIA MIDSTREAM, LLC, EXCO RSOUCES (XA), LLC, BG NATURAL GAS PRODUCTION COMPANY (WV), LLC AND EXCO PRODUCTION COMPANY (PA), LLC. IN THE MERGER EXCO RESOURCES (WV), LLC CHANGED ITS NAME TO EXCO PRODUCTION COMPANY (WV), LLC.

Therefore, I hereby issue this

CERTIFICATE OF MERGER

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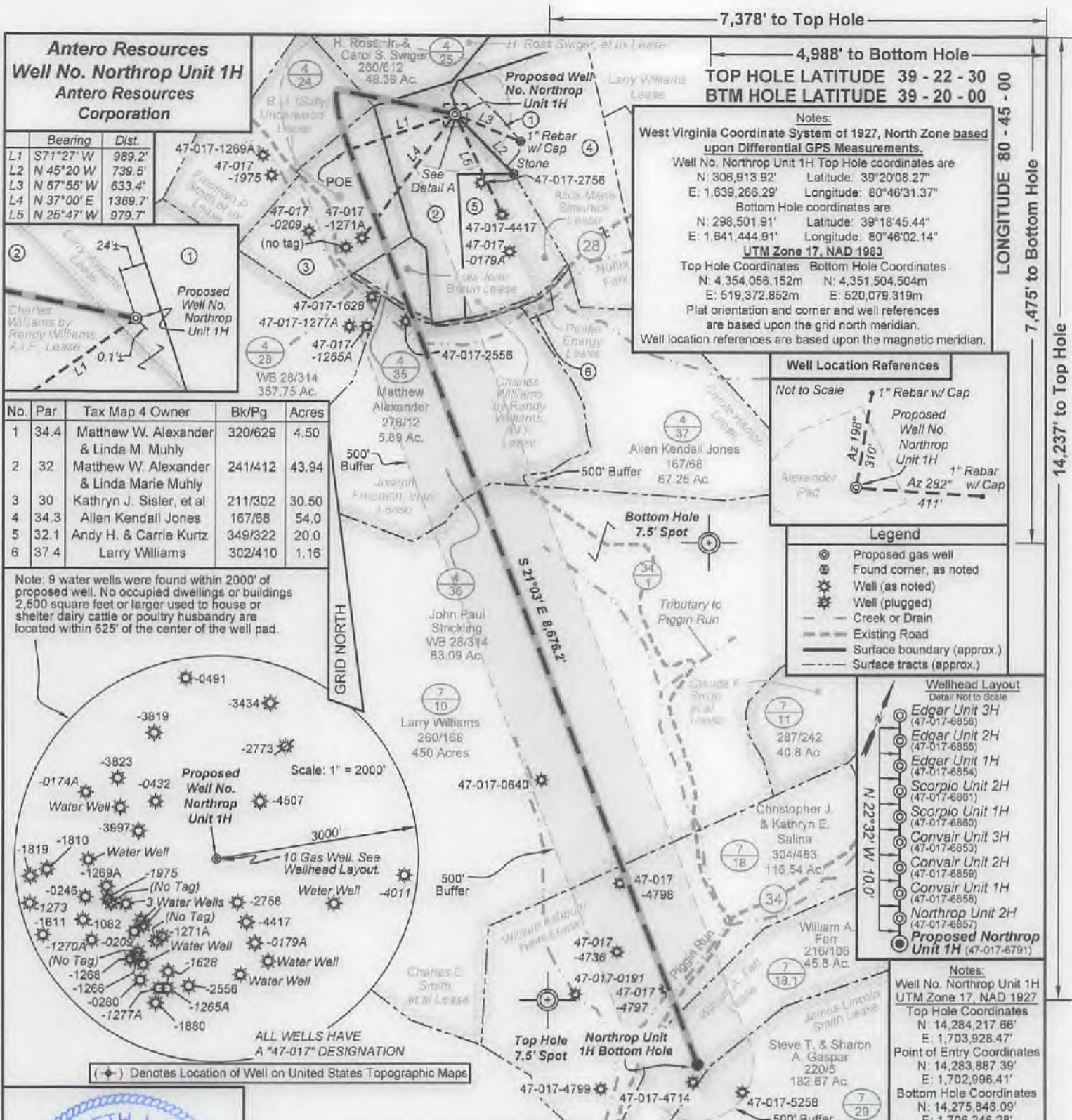


Given under my hand and the Great Seal of the State of West Virginia on

July 1, 2010

Natalie E. Tennant

Secretary of State

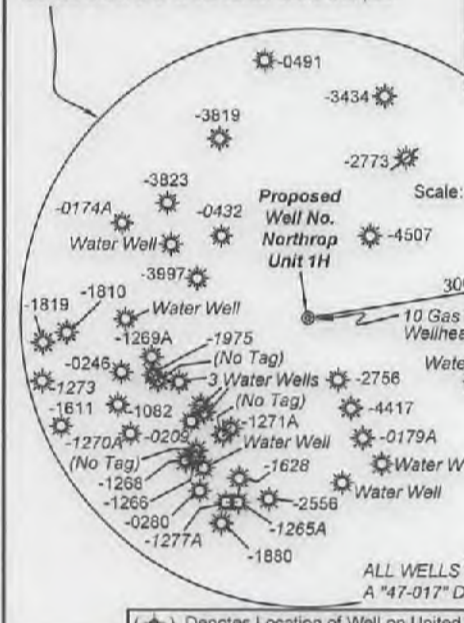


Antero Resources
Well No. Northrop Unit 1H
Antero Resources
Corporation

Bearing	Dist.	
L1 S71°27' W	989.2'	47-017-1269A
L2 N 45°20' W	739.5'	47-017-1975
L3 N 67°55' W	633.4'	
L4 N 37°00' E	1369.7'	
L5 N 25°47' W	979.7'	

No.	Par.	Tax Map 4 Owner	Bk/Pg	Acres
1	34.4	Matthew W. Alexander & Linda M. Muhly	320/629	4.50
2	32	Matthew W. Alexander & Linda Marie Muhly	241/412	43.94
3	30	Kathryn J. Sisler, et al	211/302	30.50
4	34.3	Allen Kendall Jones	167/68	54.0
5	32.1	Andy H. & Carrie Kurtz	349/322	20.0
6	37.4	Larry Williams	302/410	1.16

Note: 9 water wells were found within 2000' of proposed well. No occupied dwellings or buildings 2,500 square feet or larger used to house or shelter dairy cattle or poultry husbandry are located within 625' of the center of the well pad.



KENNETH J. PLUM
 LICENSED
 No. 2216
 STATE OF WEST VIRGINIA
 PROFESSIONAL SURVEYOR
 SEAL

I, the undersigned, hereby certify that this plat is correct to the best of my knowledge and belief and shows all the information required by law and the rules issued and prescribed by the Department of Environmental Protection.

Kenneth J. Plum
Kenneth J. Plum, P.S. 2216



FILE NO: 48-30-WU-14
 DRAWING NO: Northrop 1H Well Plat 11-16
 SCALE: 1" = 1200'
 MINIMUM DEGREE OF ACCURACY: Submeter
 PROVEN SOURCE OF ELEVATION: WVDOT, Harrisville, WV

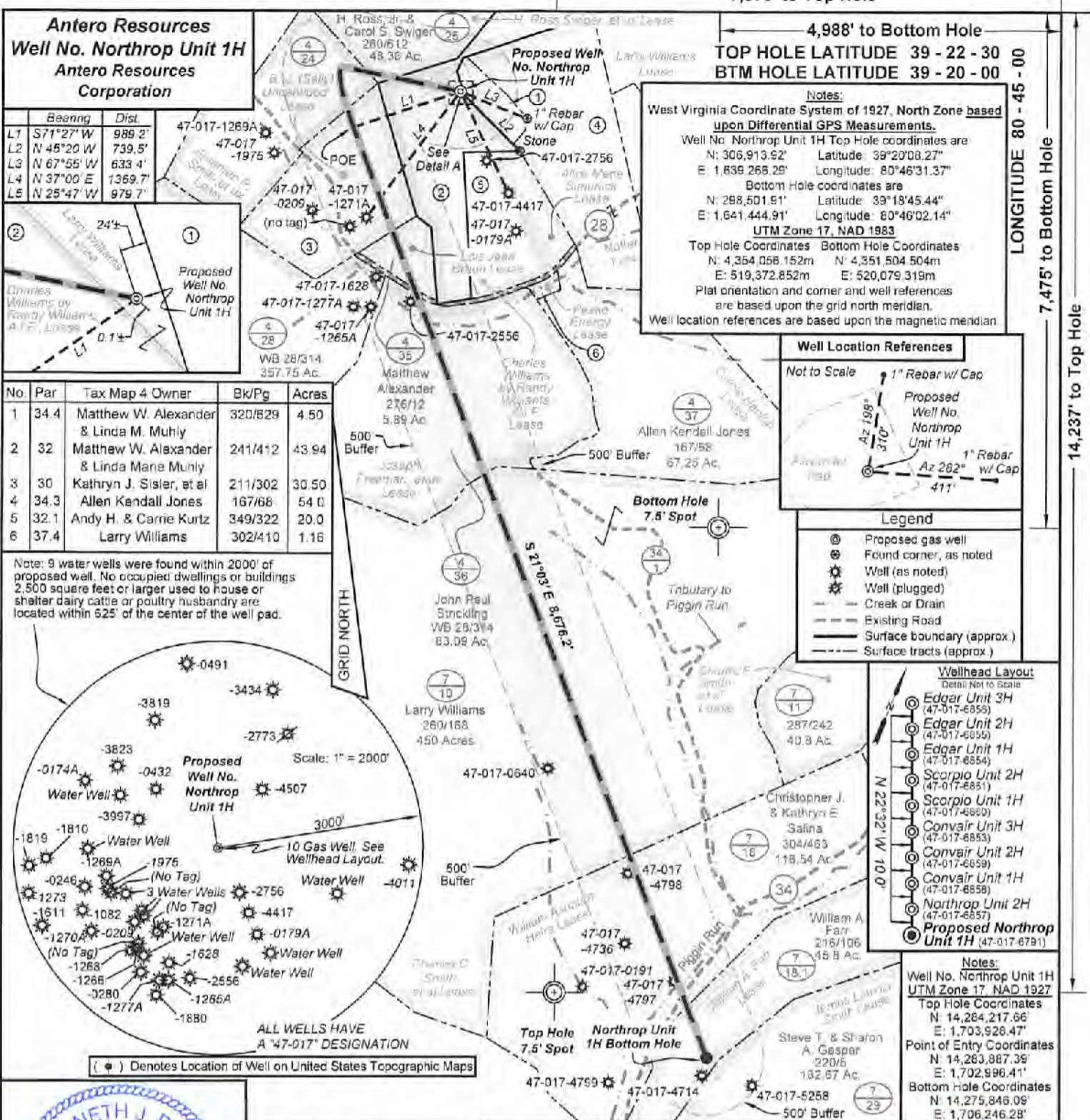
STATE OF WEST VIRGINIA
 DEPARTMENT OF ENVIRONMENTAL PROTECTION
OIL AND GAS DIVISION

DATE: November 15, 20 17
 Operator's Well No. Northrop Unit 1H
 API WELL NO
 47 - 017 - 06791
 STATE COUNTY PERMIT

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
 (IF GAS) PRODUCTION: STORAGE DEEP SHALLOW

LOCATION: ELEVATION: Existing Grade - 1193' Proposed Grade - 1181' WATERSHED: Headwaters Middle Island Creek QUADRANGLE: West Union
 DISTRICT: West Union COUNTY: Doddridge
 SURFACE OWNER: Matthew W. Alexander & Linda Marie Muhly FREEMAN P. SMITH, et ux; H. ROSS SWIGER, et ux; B. J. (SALLY) UNDERWOOD; LOIS JEAN BRAUN
 ROYALTY OWNER: William A. Farr, Charles Williams by Randy Williams, A.I.F.; Joseph Freeman, et ux LEASE NO: ACREAGE: 36; 450; 67; 600
 PROPOSED WORK: DRILL CONVERT DRILL DEEPER FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
 PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) Modification - Add Curve to POE
 PLUG AND ABANDON CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 7,500' TVD 16,900' MD

WELL OPERATOR: Antero Resources Corporation DESIGNATED AGENT: Dianna Stamper - CT Corporation System
 ADDRESS: 1615 Wynkoop Street ADDRESS: 5400 D Big Tyler Road
 Denver, CO 80202 Charleston, WV 25313

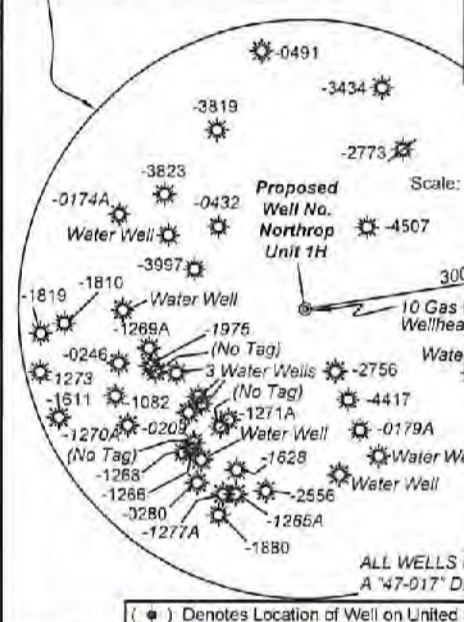


Antero Resources
Well No. Northrop Unit 1H
Antero Resources
Corporation

Beating	Dist.	
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6	37.4	Larry Williams	302/410	1.16

Note: 9 water wells were found within 2000' of proposed well. No occupied dwellings or buildings 2,500 square feet or larger used to house or shelter dairy cattle or poultry husbandry are located within 525' of the center of the well pad.



I, the undersigned, hereby certify that this plat is correct to the best of my knowledge and belief and shows all the information required by law and the rules issued and prescribed by the Department of Environmental Protection.

Kenneth J. Plum
Kenneth J. Plum, P.S. 2216



FILE NO: 48-30-WU-14
 DRAWING NO: Northrop 1H Well Plat 11-16
 SCALE: 1" = 1200'
 MINIMUM DEGREE OF ACCURACY: Submeter
 PROVEN SOURCE OF ELEVATION: WVDOT, Harrisville, WV

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

DATE: November 15, 20 17
 Operator's Well No. Northrop Unit 1H
 API WELL NO
 47 - 017 - 06791
 STATE COUNTY PERMIT

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
 (IF GAS) PRODUCTION: STORAGE DEEP SHALLOW

LOCATION: ELEVATION: Existing Grade - 1193' Proposed Grade - 1181' WATERSHED: Headwaters Middle Island Creek QUADRANGLE: West Union
 DISTRICT: West Union COUNTY: Doddrick
 SURFACE OWNER: Matthew W. Alexander & Linda Marie Muhly FREEMAN P. SMITH, et ux; H. ROSS SWIGER, et ux; B. J. (SALLY) UNDERWOOD; LOIS JEAN BRAUN
 ROYALTY OWNER: William A. Farr; Charles Williams by Randy Williams, A.I.F.; Joseph Freeman, et ux LEASE NO: _____ ACREAGE: 43.94 48.35; 5.25 45.8; 120; 31
 PROPOSED WORK: DRILL CONVERT DRILL DEEPER FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
 PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) Modification - Add Curve to POE
 PLUG AND ABANDON CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 7,500' TVD 15,900' MD

WELL OPERATOR: Antero Resources Corporation DESIGNATED AGENT: Dianna Stamper - CT Corporation System
 ADDRESS: 1615 Wynkoop Street ADDRESS: 5400 D Big Tyler Road
Denver, CO 80202 Charleston, WV 25313

03/16/2018