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west virginia department of environmental protection

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

Austin Caperton, Cabinet Secretary  
[www.dep.wv.gov](http://www.dep.wv.gov)

Tuesday, January 22, 2019  
PERMIT MODIFICATION APPROVAL  
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION  
1615 WYNKOOP STREET  
  
DENVER, CO 80202

Re: Permit Modification Approval for SARAHLENE UNIT 1H  
47-095-02518-00-00

**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: SARAHLENE UNIT 1H  
Farm Name: ROY A. MEREDITH  
U.S. WELL NUMBER: 47-095-02518-00-00  
Horizontal 6A New Drill  
Date Modification Issued: January 22, 2019

Promoting a healthy environment.

WW-6B  
(04/15)

API NO. 47-095 - 02518  
OPERATOR WELL NO. Sarahlene Unit 1H  
Well Pad Name: Meredith Pad

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

1) Well Operator: Antero Resources Corporation 494507062 095-Tyler Centerville West Union 7.5'  
Operator ID County District Quadrangle

2) Operator's Well Number: Sarahlene Unit 1H Well Pad Name: Meredith Pad

3) Farm Name/Surface Owner: Roy A. Meredith, et al Public Road Access: Haymond Road

4) Elevation, current ground: 1117' Elevation, proposed post-construction: ~1114'

5) Well Type (a) Gas  Oil  Underground Storage

Other \_\_\_\_\_

(b) If Gas Shallow  Deep

Horizontal  \_\_\_\_\_

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):  
Marcellus Shale: 7000' TVD, Anticipated Thickness- 75 feet, Associated Pressure- 2800#

8) Proposed Total Vertical Depth: 7000' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 16800' MD

11) Proposed Horizontal Leg Length: 8769'

12) Approximate Fresh Water Strata Depths: 463', 604', 683'

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

14) Approximate Saltwater Depths: 1521', 1567', 2109'

15) Approximate Coal Seam Depths: 63', 1239'

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

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

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

WW-6B  
(04/15)

API NO. 47-095 - 02518

OPERATOR WELL NO. Sarahlene Unit 1H

Well Pad Name: Meredith Pad

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	94#	93	93	CTS, 89 Cu. Ft.
Fresh Water	13-3/8"	New	J-55	54.5#	740 *see#19	740 *see#19	CTS, 1028 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#	16800	16800	CTS, 4212 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"	0.438"	1530	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"	12,630	2500	Lead-H/POZ & Tail - 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- 095 - 02518

OPERATOR WELL NO. Sarahlene Unit 1H

Well Pad Name: Meredith 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): 31.17 acres

22) Area to be disturbed for well pad only, less access road (acres): 7.09 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.

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\*Note: Attach additional sheets as needed.

WW-6A1

Operator's Well Number Sarahlene 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
<b><u>Roy A. Meredith, et ux Lease</u></b>			
Roy A. Meredith	J & J Enterprises	1/8	0257/0527
J & J Enterprises	Eastern American Energy Corp.	Assignment	0282/0296
Eastern American Energy Corporation	Energy Corporation of America	Assignment	0371/0528
Energy Corporation of America	Antero Resources Appalachian Corporation	Assignment	0398/0416
<b>Antero Resources Appalachian Corporation</b>	<b>Antero Resources Corporation</b>	<b>Name Change</b>	<b>Exhibit 1</b>
<b><u>Colleen Griffin Ash Lease</u></b>			
Colleen Griffin Ash	Antero Resources Appalachian Corporation	1/8+	0407/0657
<b>Antero Resources Appalachian Corporation</b>	<b>Antero Resources Corporation</b>	<b>Name Change</b>	<b>Exhibit 1</b>
<b><u>O.W. Griffin, et ux Lease</u></b>			
O.W. Griffin, et ux	R.W. Keener	1/8	0196/0234
R.W. Keener	Columbia Gas Transmission Corporation	Assignment	0196/0163
Columbia Gas Transmission Corporation	Columbia Natural Resources, Inc	Assignment	0286/0603
Columbia Natural Resources, Inc	Columbia Natural Resources, LLC	Name Change	0009/0001
Columbia Natural Resources, LLC	Chesapeake Appalachia, LLC	Merge	0349/0536
Chesapeake Appalachia, LLC	SWN Production Company	Assignment	0465/0463
SWN Production Company	Antero Exchange Properties	Assignment	0544/0242
<b>Antero Exchange Properties</b>	<b>Antero Resources Corporation</b>	<b>Merge</b>	<b>0552/0315</b>
<b><u>N.M. Welch Heirs Lease</u></b>			
N.M. Welch Heirs	Petroleum Services, Inc.	1/8	0229/0452
Petroleum Services, Inc.	J&J Enterprises	Assignment	0231/0301
J&J Enterprises	Eastern American Energy Corporation	Assignment	0282/0296
Eastern American Energy Corporation	Energy Corporation of America	Merger	0371/0528
Energy Corporation of America	Antero Resources Appalachian Corporation	Assignment	0398/0416
<b>Antero Resources Appalachian Corporation</b>	<b>Antero Resources Corporation</b>	<b>Name Change</b>	<b>Exhibit 1</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.

\*\*CONTINUED ON NEXT PAGE\*\*



INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE  
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Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
<b><u>Cammie Gatrell, et al Lease</u></b>			
Cammie Gatrell, et al	Exxon Corporation	1/8	0211/0104
Exxon Corporation	Petro-Enterprises Inc	Assignment	0249/0141
Petro-Enterprises Inc	J&J Enterprises	Assignment	0229/0518
J&J Enterprises	Eastern American Energy Corporation	Assignment	0282/0296
Eastern American Energy Corporation	Energy Corporation of America	Certificate of Merger	0371/0528
Energy Corporation of America	Antero Resources Appalachian Corporation	Assignment	0398/0416
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<b><u>Nathan Cain, et al Lease</u></b>			
Nathan Cain, et al	J.E. Trainer	1/8	0072/0216
J.E. Trainer	W.W. Hepburn	Assignment	0080/0346
W.W. Hepburn	Eastern Petroleum Company	Assignment	0080/0338
Eastern Petroleum Company	Clifton Oil & Gas Company	Assignment	0094/0061
Clifton Oil & Gas Company	Quaker State Oil Refining Corporation	Assignment	0270/0111
Quaker State Oil Refining Corporation	Quaker State Corporation	Name Change	Exhibit 2
Quaker State Corporation	Bolden & Blake Corporation	Assignment	0311/0584
Bolden & Blake Corporation	Peake Energy	Assignment	0321/0340
Peake Energy	North Coast Energy Eastern, Inc.	Name Change	0008/0702
North Coast Energy Eastern, Inc.	Exco-North Coast Energy Eastern, Inc.	Name Change	0009/0080
Exco-North Coast Energy Eastern, Inc.	EXCO Resources (WV) Inc.	Name Change	Exhibit 2
EXCO Resources (WV) Inc.	EXCO Production Company (WV) Inc.	Name Change	Exhibit 3
EXCO Production Company (WV) Inc.	EXCO Production Company (WV) LLC	Name Change	Exhibit 4
EXCO Production Company (WV) LLC	Antero Resources Appalachian Corporation	Assignment	0406/0195
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<b><u>Eugene R. Walton et al Lease</u></b>			
Eugene R. Walton et al	Eastern American Energy Corporation	1/8	0282/0033
Eastern American Energy Corporation	Energy Corporation of America	Certificate of Merger	0371/0528
Energy Corporation of America	Antero Resources Appalachian Corporation	Assignment	0398/0416
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1

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\*\*CONTINUED ON NEXT PAGE\*\*

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Nathan Cain, et al	J.E. Trainer	1/8	0072/0216
J.E. Trainer	W.W. Hepburn	Assignment	0080/0346
W.W. Hepburn	Eastern Petroleum Company	Assignment	0080/0338
Eastern Petroleum Company	Clifton Oil & Gas Company	Assignment	0094/0061
Clifton Oil & Gas Company	Quaker State Oil Refining Corporation	Assignment	0270/0111
Quaker State Oil Refining Corporation	Quaker State Corporation	Name Change	Exhibit 2
Quaker State Corporation	Bolden & Blake Corporation	Assignment	0311/0584
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EXCO Resources (WV) Inc.	EXCO Production Company (WV) Inc.	Name Change	Exhibit 3
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EXCO Production Company (WV) LLC	Antero Resources Appalachian Corporation	Assignment	0406/0195
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	0557/0430

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WW-6A1  
(5/13)

Operator's Well No. Sarahlene Unit 1H

**INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE  
Chapter 22, Article 6A, Section 5(a)(5)  
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Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
<u>Eugene R. Walton, et al Lease</u>	Eugene R. Walton, et al	Eastern American Energy Corporation	1/8	0282/033
	Eastern American Energy Corporation	Energy Corporation of America	Merger	0371/0528
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	<b>Antero Resources Appalachian Corporation</b>	<b>Antero Resources Corporation</b>	<b>Name Change</b>	<b>Exhibit 1</b>

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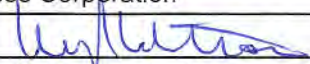
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**Acknowledgement of Possible Permitting/Approval  
In Addition to the Office of Oil and Gas**

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 Vice President - Production



**FILED**  
JUN 10 2013

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



Fenney Becker, Manager  
Corporations Division  
Tel: (304)558-8000  
Fax: (304)558-8381  
Webb: www.wvscot.com  
E-mail: business@wvscot.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:

- Name under which the corporation was authorized to transact business in WV: Antero Resources Appalachian Corporation
- Date Certificate of Authority was issued in West Virginia: 6/28/2008
- Corporate name has been changed to: Antero Resources Corporation  
(Attach one Certified Copy of Name Change as filed in home State of incorporation.)
- Name the corporation elects to use in WV: Antero Resources Corporation  
(due to home state name not being available)
- 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 (305) 367-7310  
Contact Name Phone Number

7. Signature information (See below *\*Important Legal Notice Regarding Signatures\**):  
Print Name of Signer: Alvyn A. Schopp Title/Capacity: Authorized Person  
Signature: [Handwritten Signature] Date: June 10, 2013

*\*Important Legal Notice Regarding Signatures\** For West Virginia Code §31D-1-12b. 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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FORM WW-6A1  
EXHIBIT 2



*I, Ken Heckler, Secretary of State of the State of West Virginia, hereby certify that originals of an application by*

**QUAKER STATE OIL REFINING CORPORATION**

for an amended certificate of authority to transact business in West Virginia are filed in my office, as required by the provisions of Chapter 31, Article 1, Sections 67 and 69 of the West Virginia Code and conform to law. Therefore, I issue this

**AMENDED CERTIFICATE OF AUTHORITY**

to transact business in West Virginia under the name of

**QUAKER STATE CORPORATION**

and I attach to this certificate a duplicate original of the application.

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

TWENTIETH day of  
JULY 19 87



*Ken Heckler*

Secretary of State.

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Environmental Protection



# 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 RSOOURCES (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 RSOOURCES (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*

State of West Virginia  
  
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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SEP 25 2018  
WV Department of  
Environmental Protection



*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*

**EXCO RESOURCES (WV), INC.**  
*(A Delaware Corporation)*

*filed Articles of Conversion 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 CONVERSION

*Converting the corporation to:*

**EXCO RESOURCES (WV), LLC**  
*(A Delaware Limited Liability Company)*

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Office of Oil and Gas  
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WV Department of  
Environmental Protection



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

July 7, 2010

*Natalie E. Tennant*

*Secretary of State*



SARAHLENE UNIT 1H



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Antero Resources Corporation

Sarahlene Unit 1H - AOR



WELL SYMBOLS  
Gas Well



Sarahlene Unit 1H - Permit Modification (API# 47-095-02518)

UWI (API#)	Well Name	Well Number	Operator	Hist Oper	TD	Perforated Interval (shallowest, deepest)	Perforated Formation(s)	Productible Formation(s) not perf'd
4709501250000	GRIFFIN	1	CONSOL GAS COMPANY	ANWIL OIL COMPANY	5,150	4518-5048	Riley, Benson	Big Injun, Speechley, Balktown, Bradford
4709500935000	WELCH N M	J-529	ENERGY CORP OF AMER	J & J ENTERPRISES	5,600	4697-5103	Riley, Benson	Big Injun, Speechley, Balktown, Bradford
4709500427000	WALTON	2	ENERGY CORP OF AMER	EASTERN AMERICAN ENR	5,511	4540-5253	Riley, Benson, Alexander	Big Injun, Speechley, Balktown, Bradford, Riley
4701706798000	BOULDER UNIT	1H	ANTERO RESOURCES CORPORATION	ANTERO RESOURCES CORPORATION	15,970	7427.16-15867.6	Marcellus Fm.	
4709501017000	GATRELL HEIRS	1-740	ENERGY CORP OF AMER	J & J ENTERPRISES	5,324	4328-4358	Riley	Big Injun, Speechley, Balktown, Bradford

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WV Department of  
Environmental Protection



LATITUDE 39°22'30"

10,347'

LATITUDE 39°20'00"

8,147' TO BOTTOM HOLE

3,218' TO BOTTOM HOLE - LONGITUDE 80°50'00"

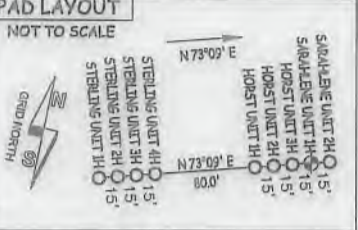
9,620'

LONGITUDE 80°50'00"

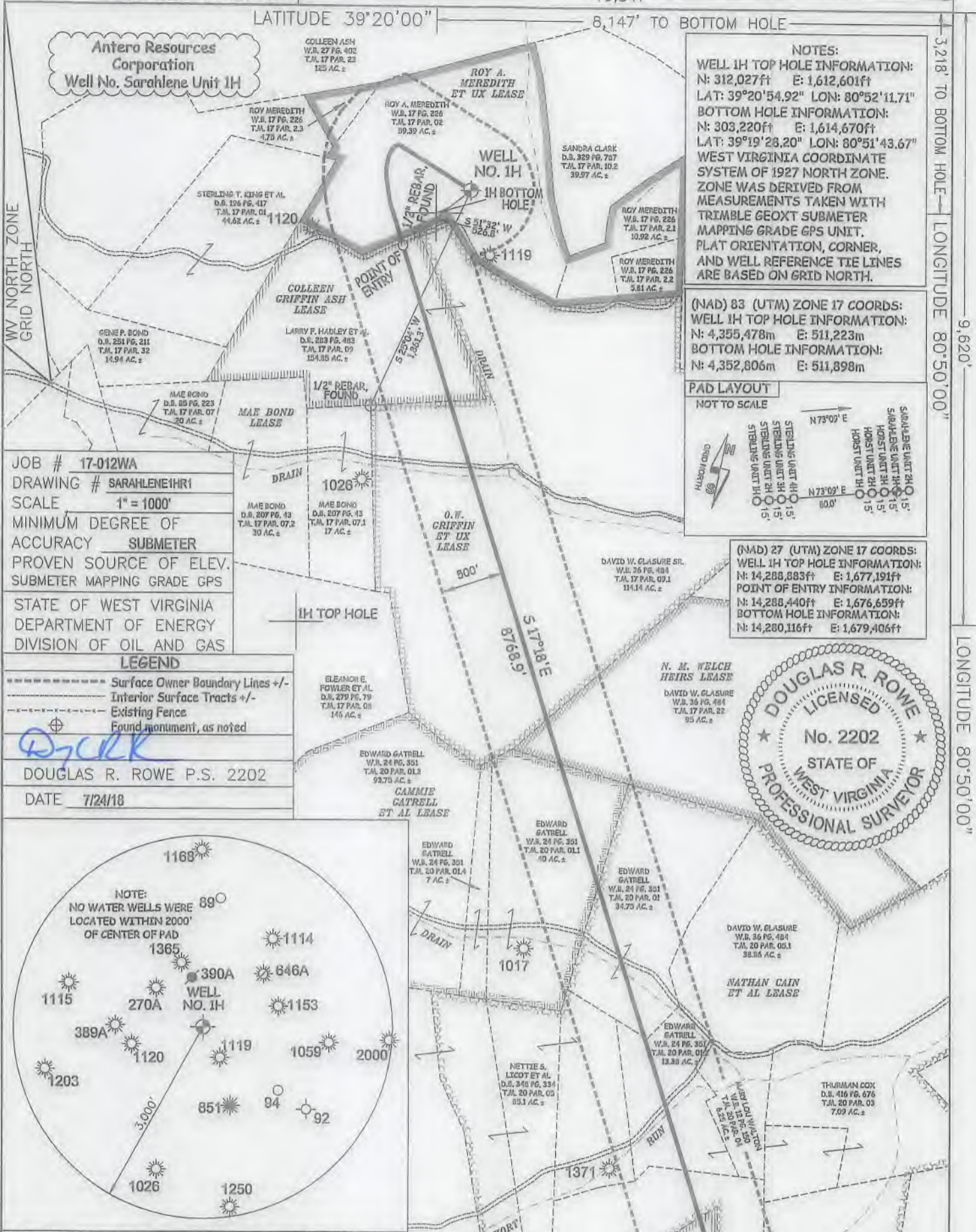
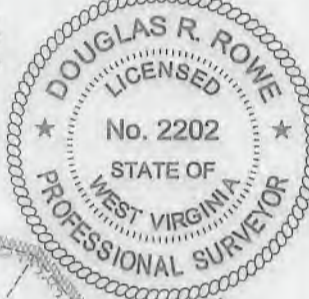
Antero Resources Corporation  
Well No. Sarahlene Unit 1H

NOTES:  
 WELL 1H TOP HOLE INFORMATION:  
 N: 312,027ft E: 1,612,601ft  
 LAT: 39°20'54.92" LON: 80°52'11.71"  
 BOTTOM HOLE INFORMATION:  
 N: 303,220ft E: 1,614,670ft  
 LAT: 39°19'28.20" LON: 80°51'43.67"  
 WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE. ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE GEOXT SUBMETER MAPPING GRADE GPS UNIT. PLAT ORIENTATION, CORNER, AND WELL REFERENCE TIE LINES ARE BASED ON GRID NORTH.

(NAD) 83 (UTM) ZONE 17 COORDS:  
 WELL 1H TOP HOLE INFORMATION:  
 N: 4,355,478m E: 511,223m  
 BOTTOM HOLE INFORMATION:  
 N: 4,352,806m E: 511,898m



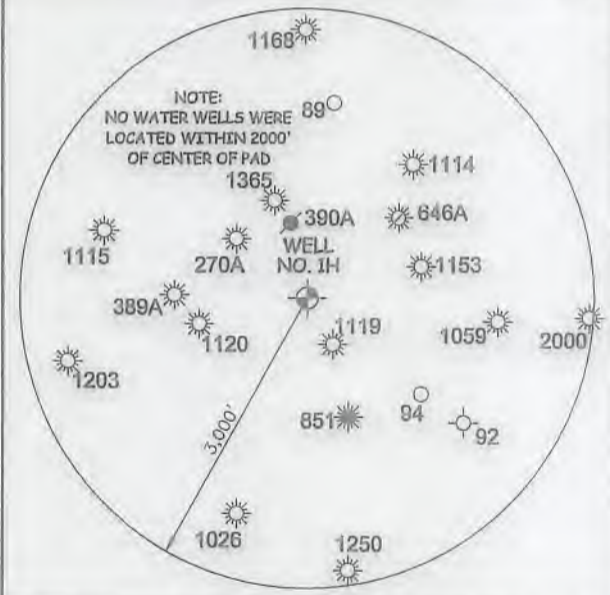
(NAD) 27 (UTM) ZONE 17 COORDS:  
 WELL 1H TOP HOLE INFORMATION:  
 N: 14,288,883ft E: 1,677,191ft  
 POINT OF ENTRY INFORMATION:  
 N: 14,288,440ft E: 1,676,659ft  
 BOTTOM HOLE INFORMATION:  
 N: 14,280,116ft E: 1,679,406ft



JOB # 17-012WA  
 DRAWING # SARAHLENE1HR1  
 SCALE 1" = 1000'  
 MINIMUM DEGREE OF ACCURACY SUBMETER  
 PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS  
 STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS

LEGEND  
 - - - - - Surface Owner Boundary Lines +/-  
 - - - - - Interior Surface Tracts +/-  
 - - - - - Existing Fence  
 ⊕ Found monument, as noted

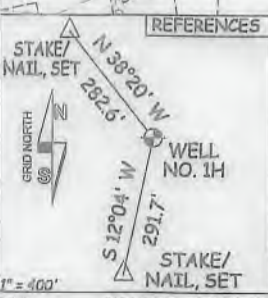
DOUGLAS R. ROWE P.S. 2202  
 DATE 7/24/18



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 PERSCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.



STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
 WILLOW LAND SURVEYING PLLC  
 220 MASONIC AVE. PENNSBORO WEST VIRGINIA 26415



WELL TYPE: OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL  OPERATOR'S WELL# SARAHLENE UNIT #1H  
 (IF "GAS") PRODUCTION  STORAGE  DEEP  SHALLOW  47 - 095 - 02518 COUNTY NAME  
 LOCATION: ELEVATION 1,117'-ORIGINAL 1,114'-PROPOSED WATERSHED HEADWATERS MIDDLE ISLAND CREEK STATE COUNTY PERMIT  
 QUADRANGLE WEST UNION 7.5' DISTRICT CENTERVILLE COUNTY TYLER  
 SURFACE OWNER ROY A. MEREDITH ACREAGE 59.39 ACRES +/-  
 OIL & GAS ROYALTY OWNER ROY E. MEREDITH ET UX; COLLEEN GRIFFIN ASH; O.W. GRIFFIN ET UX; LEASE ACREAGE 80 AC±; 44.187 AC±; 222 AC±; PERMIT  
 N. M. WELCH HEIRS; CAMMIE GATRELL ET AL; NATHAN CAIN ET AL; EUGENE R. WALTON ET AL 95 AC±; 139.75 AC±; 278 AC±; 137 AC±; COUNTY NAME  
 PROPOSED WORK: DRILL  CONVERT  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE   
 PLUG OFF OLD FORMATION  PERFORATE NEW FORMATION  OTHER PHYSICAL CHANGE IN WELL  
 (SPECIFY) MOD-BHL PLUG & ABANDON  CLEAN OUT & REPLUG   
 TARGET FORMATION MARCELLUS ESTIMATED DEPTH 7,000' TVD 16,800' MD PERMIT  
 WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM  
 ADDRESS 1615 WYNKOOP ST. ADDRESS 5400 D BIG TYLER ROAD  
 FORM WW-6 DENVER, CO 80202 CHARLESTON, WV 25313



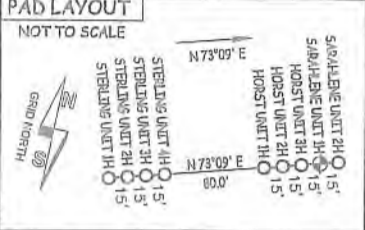
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 LATITUDE 39°20'00" 8,147' TO BOTTOM HOLE

3,218' TO BOTTOM HOLE  
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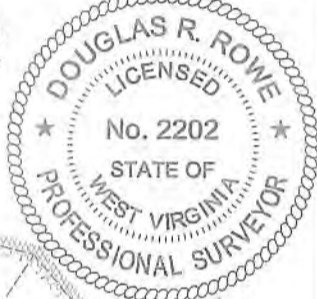
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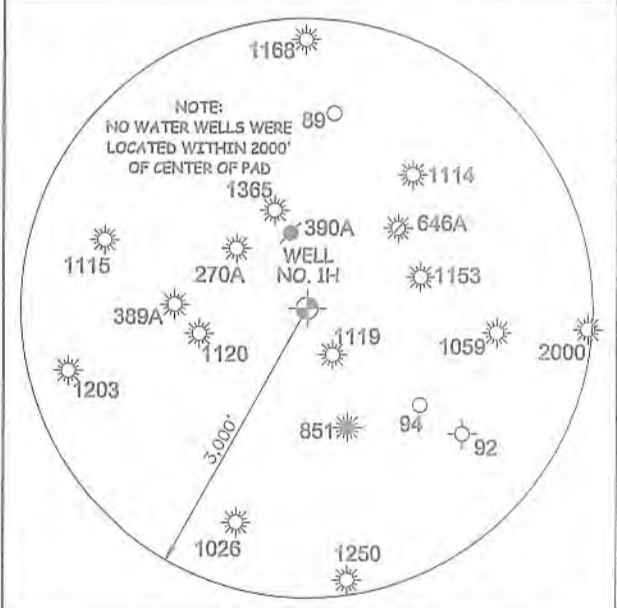
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**LEGEND**  
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 WILLOW LAND SURVEYING PLLC  
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**REFERENCES**  
 WELLS:  
 EDWARD GATRELL W.B. 24 PG. 351 T.M. 20 PAR. 01.1 40 AC.±  
 EDWARD GATRELL W.B. 24 PG. 351 T.M. 20 PAR. 01 24.75 AC.±  
 EDWARD GATRELL W.B. 24 PG. 351 T.M. 20 PAR. 01 13.38 AC.±  
 METTIE S. LICOT ET AL D.B. 340 PG. 334 T.M. 20 PAR. 03 55.1 AC.±  
 DAVID W. GLASURE SR. W.B. 36 PG. 484 T.M. 20 PAR. 09.1 11.14 AC.±  
 N. M. WELCH HEIRS LEASE W.B. 36 PG. 484 T.M. 17 PAR. 22 95 AC.±  
 DAVID W. GLASURE W.B. 36 PG. 484 T.M. 20 PAR. 05.1 38.05 AC.±  
 NATHAN CAIN ET AL LEASE  
 EDWARD GATRELL W.B. 24 PG. 351 T.M. 20 PAR. 01 13.38 AC.±  
 THURMAN COX D.B. 416 PG. 676 T.M. 20 PAR. 03 7.09 AC.±  
 MARY LOU WALTON D.B. 226 PG. 197 T.M. 20 PAR. 10.3 18 AC.±  
 MARY LOU WALTON D.B. 266 PG. 197 T.M. 20 PAR. 10.2 24 AC.±  
 EUGENE R. WALTON ET AL LEASE D.B. 266 PG. 197 T.M. 20 PAR. 10 137 AC.±  
 RICHARD MCCULLOUGH D.B. 259 PG. 327 T.M. 20 PAR. 01 28.75 AC.±

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 (IF "GAS") PRODUCTION  STORAGE  DEEP  SHALLOW   
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FORM WW-6

COUNTY NAME PERMIT