



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

Friday, August 31, 2018
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION
1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit Modification Approval for BEEM UNIT 3H
47-095-02474-00-00

Extend/move bottom hole

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: BEEM UNIT 3H
Farm Name: TYRONE L BEEM ET AL
U.S. WELL NUMBER: 47-095-02474-00-00
Horizontal 6A New Drill
Date Modification Issued: August 31, 2018

Promoting a healthy environment.

WW-6B
(04/15)

Permit Modification API # 47-095-02474

API NO. 47-095 - 02474

OPERATOR WELL NO. Beem Unit 3H

Well Pad Name: Pyle Run 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 Middlebourne 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: Beem Unit 3H Well Pad Name: Pyle Run Pad

3) Farm Name/Surface Owner: Tyrone L. Beem, et al Public Road Access: Bearsville-Mole Hole

4) Elevation, current ground: 1115' 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: 6800' TVD, Anticipated Thickness- 55 feet, Associated Pressure- 2800#

DMH
7-25-18
REP
7/25/2018

8) Proposed Total Vertical Depth: 6800' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 17500' MD

11) Proposed Horizontal Leg Length: 10448' ✓ *w/ plat*

12) Approximate Fresh Water Strata Depths: 301', 332' ✓

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

14) Approximate Saltwater Depths: 674', 1584' ✓

15) Approximate Coal Seam Depths: 811'

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: _____

Received

JUL 20 2018

WW-6B
(04/15)

Permit Modification API # 47-095-02474
 API NO. 47- 095 - 02474
 OPERATOR WELL NO. Beam Unit 3H
 Well Pad Name: Pyle Run 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#	80'	80' ✓	CTS, 218 Cu. Ft.
Fresh Water	13-3/8"	New	J-55	54.5#	385' *see #19	385' *see #19	CTS, 348 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2500'	2500' ✓	CTS, 1018 Cu. Ft.
Intermediate							
Production	5-1/2"	New	P-110	20#	17500'	17500'	4038 Cu. Ft.
Tubing	2-3/8"	New	N-80	4.7#		7100'	
Liners							

DH 7-25-18 JOB 7/25/2018

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"	0.438"	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	Low H/POZ & Tol-H	H/POZ-1.44 & H-1.6
Tubing	2-3/8"	4.778"	0.19"	11,200			
Liners							

PACKERS

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

Received

JUL 26 2018

WW-6B
(10/14)

Permit Modification API # 47-095-02474
API NO. 47- 095 - 02474
OPERATOR WELL NO. Beam Unit 3H
Well Pad Name: Pyle Run 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 freshwater 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

DMH 7-25-18 *geb 7/25/2018*

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 29.70 acres

22) Area to be disturbed for well pad only, less access road (acres): 10.67 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% AC5A-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.

Received

JUL 26 2018

Page 3 of 3



RECEIVED
Office of Oil and Gas

JUL 17 2018



WV Department of
Environmental Protection



Antero Resources Corporation

Beem Unit 3H - AOR



- WELL SYMBOLS
-  Dry Hole
 -  Waiting on Completion

UWI (API Num)	Well Name	Well Number	Operator	Historical Operator	TD	Perforated Interval (shallowest, deepest)	Perforated Formation(s)	Producible Formation(s) not perf'd
47095008250000	DELOE EARL L&AUDRA	J-296	J & J ENTERPRISES	J & J ENTERPRISES	5505	N/A	N/A	N/A
47095024490000	MIDGE UNIT	2H	ANTERO RESOURCES CORPORATION	ANTERO RESOURCES CORPORATION	15382	N/A	Marcellus Fm	N/A

RECEIVED
Office of Oil and Gas

JUL 17 2018

WV Department of
Environmental Protection

LATITUDE 39°25'00"

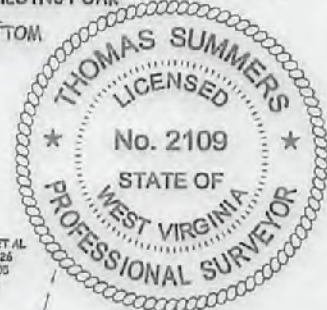
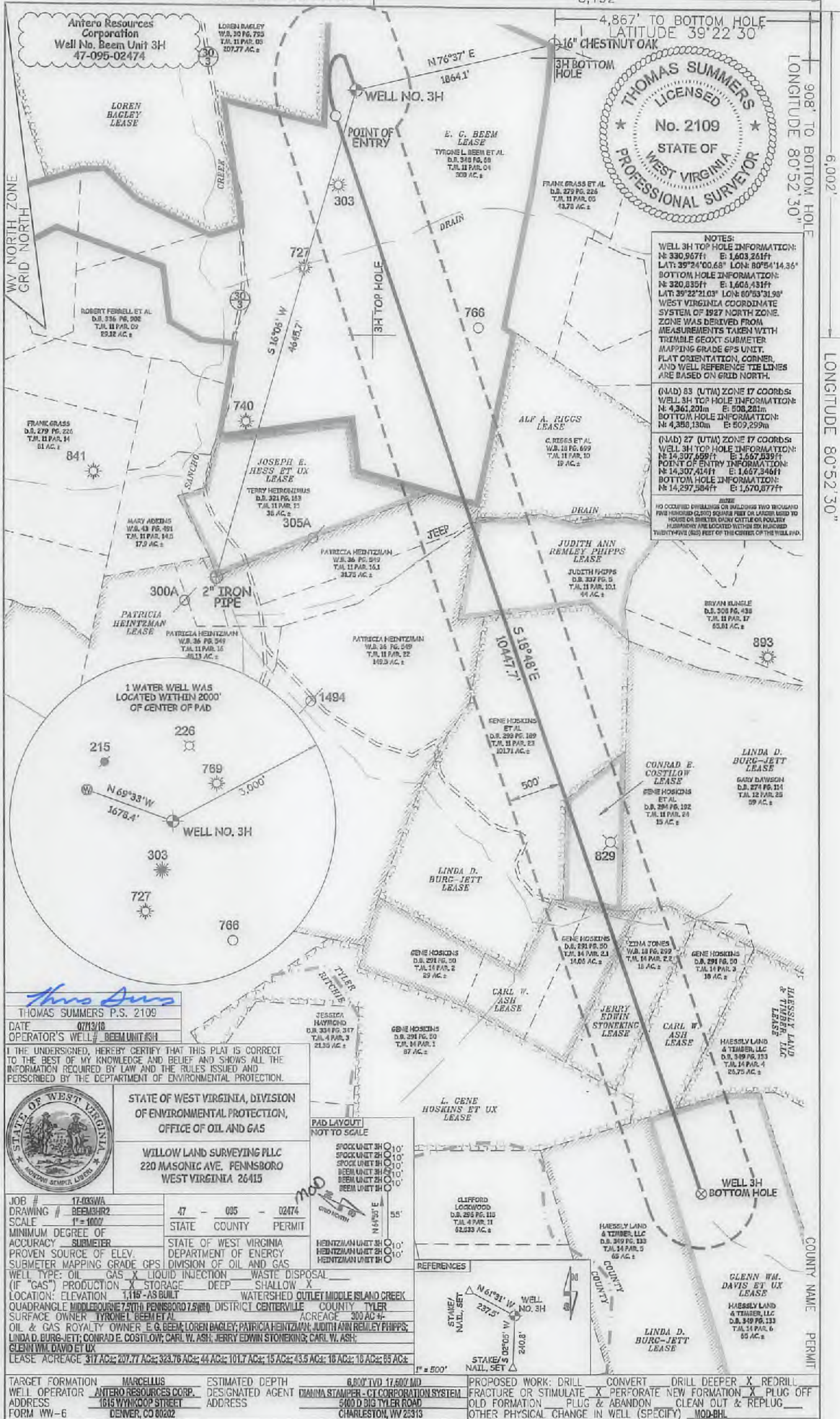
8,192'

4,867' TO BOTTOM HOLE
LATITUDE 39°22'30"

908' TO BOTTOM HOLE
LONGITUDE 80°52'30"

6,002'

LONGITUDE 80°52'30"



NOTES:

WELL 3H TOP HOLE INFORMATION:
N: 330,967ft E: 1,603,261ft
LAT: 39°24'00.68" LON: 80°54'14.36"

BOTTOM HOLE INFORMATION:
N: 320,835ft E: 1,605,431ft
LAT: 39°22'21.03" LON: 80°53'31.98"

WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE. ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TREMBLE GEOKIT SUBMETER. MAPPING GRADE 6PS UNIT. FLAT ORIENTATION, CORNER, AND WELL REFERENCE TIE LINES ARE BASED ON GRID NORTH.

(NAD) 83 (UTM) ZONE 17 COORDS:
WELL 3H TOP HOLE INFORMATION:
N: 4,361,201m E: 508,281m
BOTTOM HOLE INFORMATION:
N: 4,358,130m E: 509,299m

(NAD) 27 (UTM) ZONE 17 COORDS:
WELL 3H TOP HOLE INFORMATION:
N: 14,307,659ft E: 1,667,539ft
POINT OF ENTRY INFORMATION:
N: 14,307,414ft E: 1,667,346ft
BOTTOM HOLE INFORMATION:
N: 14,297,984ft E: 1,670,877ft

NOTE:
NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FEET HORIZONTAL (6200) SQUARE FEET OR LARGER USED TO HOUSE OR SHEDS, DRIVE, CATTLE OR POLYMER HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.

1 WATER WELL WAS LOCATED WITHIN 2000' OF CENTER OF PAD

Thomas Summers
THOMAS SUMMERS P.S. 2109

DATE 07/13/18
OPERATOR'S WELL# BEEM UNIT 3H

I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAN 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

JOB # 17-003WA
DRAWING # BEEM3HR2
SCALE 1" = 1000'

47 - 005 - 02474
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY SURMETER
PROVEN SOURCE OF ELEV. SURMETER MAPPING GRADE GPS

STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS

WELL TYPE: OIL GAS X LIQUID INJECTION WASTE DISPOSAL
(IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X
LOCATION: ELEVATION 1,115' AS BUILT WATERSHED OUTLET MIDDLE ISLAND CREEK
QUADRANGLE MIDDLEBORNE 7.5TH PENNSBORO 7.5TH DISTRICT CENTERVILLE COUNTY TYLER
SURFACE OWNER TYRONEL BEEM ET AL ACREAGE 300 AC +/-
OIL & GAS ROYALTY OWNER E. G. BEEM; LOREN BAGLEY; PATRICIA HEINTZMAN; JUDITH ANN REMLEY PHIPPS; LINDA D. BURG-JETT; CONRAD E. COSTILOW; CARL W. ASH; JERRY EDWIN STONEKING; CARL W. ASH;
GLENN WM. DAVID ET UX
LEASE ACREAGE 317 AC +/- 207.77 AC +/- 323.76 AC +/- 44 AC +/- 101.7 AC +/- 15 AC +/- 43.5 AC +/- 10 AC +/- 10 AC +/- 65 AC +/-

PAD LAYOUT NOT TO SCALE



REFERENCES

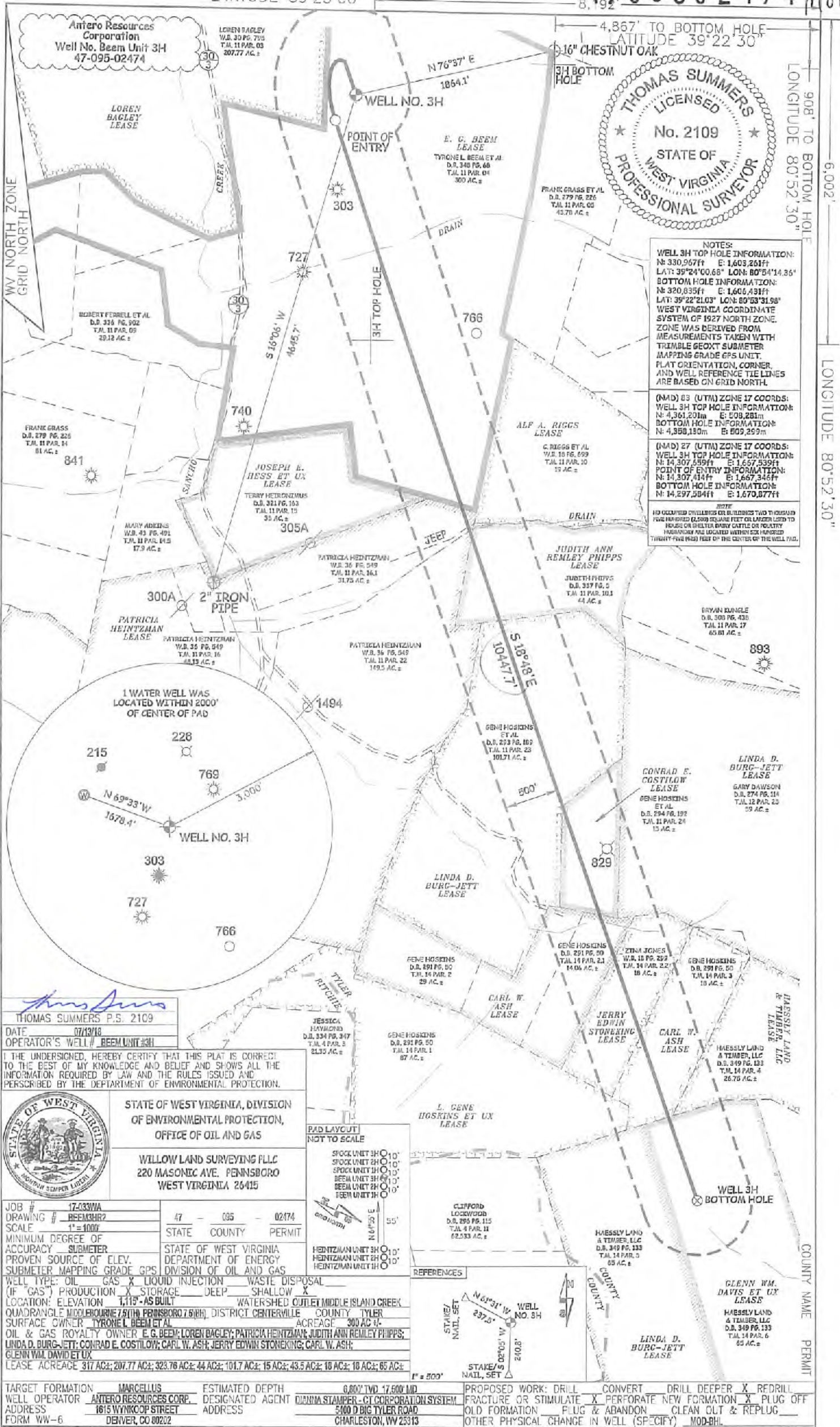


TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,800' TVD 17,600' MD PROPOSED WORK: DRILL CONVERT DRILL DEEPER X REDRILL
WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM FRACTURE OR STIMULATE X PERFORATE NEW FORMATION X PLUG OFF
ADDRESS 1615 WYKOOOP STREET ADDRESS 5100 D BIG TYLER ROAD OLD FORMATION PLUG & ABANDON PERFORATE NEW FORMATION X PLUG OFF
FORM WW-6 DENVER, CO 80202 CHARLESTON, WV 25313 OTHER PHYSICAL CHANGE IN WELL (SPECIFY) MOD-BH

LATITUDE 39°25'00"

4709502474

8.192



NOTES:
 WELL 3H TOP HOLE INFORMATION:
 N: 330,967ft E: 1,603,261ft
 LAT: 39°24'00.68" LON: 80°54'14.36"
 BOTTOM HOLE INFORMATION:
 N: 320,835ft E: 1,606,431ft
 LAT: 39°22'21.03" LON: 80°53'31.98"
 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 3H TOP HOLE INFORMATION:
 N: 4,361,201m E: 509,281m
 BOTTOM HOLE INFORMATION:
 N: 4,358,180m E: 509,259m

(NAD) 27 (UTM) ZONE 17 COORDS:
 WELL 3H TOP HOLE INFORMATION:
 N: 14,307,559ft E: 1,657,539ft
 POINT OF ENTRY INFORMATION:
 N: 14,307,414ft E: 1,667,346ft
 BOTTOM HOLE INFORMATION:
 N: 14,297,584ft E: 1,670,877ft

NOTE:
 NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FEET RADIUS (2,000 FEET) OR UNDEVELOPED TO HOUSE OR SHELTER BARNY CATTLE OR POULTRY HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.

Thomas Summers
 THOMAS SUMMERS P.S. 2109
 DATE: 07/19/18
 OPERATOR'S WELL # BEEM UNIT 3H

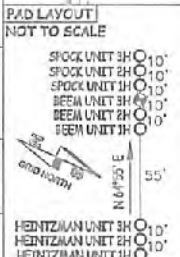
I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE RULES ISSUED AND PERSCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.



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

JOB # 17-0331VA
 DRAWING # BEEM3HR2
 SCALE 1"=1000'
 MINIMUM DEGREE OF ACCURACY SUBMETER
 PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS
 WELL TYPE: OIL GAS X LIQUID INJECTION WASTE DISPOSAL
 (IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X
 LOCATION: ELEVATION 1,119' AS BUILT WATERSHED OUTLET MIDDLE ISLAND CREEK
 QUADRANGLE MIDDLEBOURNE 7.5 (TH) PENNSBORO 7.5 (BH) DISTRICT CENTERVILLE COUNTY TYLER
 SURFACE OWNER TYRONE L. BEEM ET AL ACREAGE 300 AC +/-
 OIL & GAS ROYALTY OWNER E. G. BEEM; LOREN BAGLEY; PATRICIA HEINTZMAN; JUDITH ANN REMLEY PHIPPS; LINDA D. BURG-JETT; CONRAD E. COSTILOW; CARL W. ASH; JERRY EDWIN STONEKING; CARL W. ASH; GLENN WM. DAVID ET UX
 LEASE ACREAGE 317 AC±; 207.77 AC±; 323.76 AC±; 44 AC±; 101.7 AC±; 15 AC±; 43.5 AC±; 18 AC±; 18 AC±; 65 AC±

STATE COUNTY PERMIT
 STATE OF WEST VIRGINIA
 DEPARTMENT OF ENERGY
 DIVISION OF OIL AND GAS



TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,800' TWD 17,600' MD
 WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CI CORPORATION SYSTEM
 ADDRESS 1815 WYNKOOP STREET ADDRESS 5100 D BIG TYLER ROAD
 FORM WW-6 DENVER, CO 80202 CHARLESTON, WV 25313
 PROPOSED WORK: DRILL CONVERT DRILL DEEPER X REDRILL
 FRACTURE OR STIMULATE X PERFORATE NEW FORMATION X PLUG OFF
 OLD FORMATION PLUG & ABANDON CLEAN OUT & REPLUG
 OTHER PHYSICAL CHANGE IN WELL (SPECIFY) MOD-BHL

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>E.G. Beem Lease</u>			
E.G. Beem	Warren R. Haught	1/8	0213/0662
Warren R. Haught	Sancho Oil & Gas Corporation	Assignment	0369/0506
Sancho Oil & Gas Corporation	Antero Resources Corporation	Assignment	0436/0177
<u>Patricia Heintzman Lease</u>			
Patricia Heintzman	Antero Resources Appalachian Corporation	1/8+	0395/0314
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>Judith Ann Remley Phipps Lease</u>			
Judith Ann Remley Phipps	Antero Resources Corporation	1/8+	0470/0375
<u>Linda D. Burg-Jett Lease</u>			
Linda D. Burg-Jett	Antero Resources Corporation	1/8+	0401/0640
<u>Conrad E. Costilow Lease</u>			
Conrad E. Costilow	Antero Resources Corporation	1/8+	0500/0643
<u>Carl W. Ash Lease (TM 14 PCL 2.1)</u>			
Carl W. Ash	Antero Resources Corporation	1/8+	0507/0819
<u>Jerry Edwin Stoneking Lease</u>			
Jerry Edwin Stoneking	Antero Resources Corporation	1/8+	0548/0759
<u>Carl W. Ash Lease (TM 14 PCL 3)</u>			
Carl W. Ash	Antero Resources Corporation	1/8+	0507/0821

RECEIVED
Office of Oil and Gas

JUL 17 2018

WV Department of
Environmental Protection

*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. Beem Unit 3H

**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:

Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
<u>Glenn Wm. Davis, et ux Lease</u>	Glenn William Davis, et ux	Antero Resources Corporation	1/8+	0435/0102

*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 CorporationBy: Kevin KilstromIts: SR Vice President - ProductionRECEIVED
Office of Oil and Gas

JUL 17 2018

WV Department of
Environmental Protection

FILED

JUN 10 2013



IN THE OFFICE OF
PENNEY BARKER, Manager
Corporations Division
Tel: (304)558-8000
Fax: (304)558-8381
Website: www.wvssos.com
E-mail: business@wvssos.com

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

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: 6/25/2008
- 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.)

<u>Alvyn A. Schopp</u>	<u>(303) 367-7310</u>
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: *Alvyn A. Schopp* Date: June 10, 2013

***Important Legal Notice Regarding Signature:** Per West Virginia Code §31D-1-122, 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.

WW-6B
(04/15)

API NO. 47-095 - 02474
OPERATOR WELL NO. Beem Unit 3H
Well Pad Name: Pyle Run 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 Middlebourne 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: Beem Unit 3H Well Pad Name: Pyle Run Pad

3) Farm Name/Surface Owner: Tyrone L. Beem, et al Public Road Access: Bearsville-Mole Hole

4) Elevation, current ground: 1115' 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: 6800' TVD, Anticipated Thickness- 55 feet, Associated Pressure- 2800#

8) Proposed Total Vertical Depth: 6800' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 17500' MD

11) Proposed Horizontal Leg Length: 10448'

12) Approximate Fresh Water Strata Depths: 301', 332'

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

14) Approximate Saltwater Depths: 674', 1584'

15) Approximate Coal Seam Depths: 811'

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: _____

RECEIVED
Office of Oil and Gas

JUL 17 2018

WV Department of
Environmental Protection

WW-6B
(04/15)

API NO. 47-095 - 02474
OPERATOR WELL NO. Beam Unit 3H
Well Pad Name: Pyle Run Pad

18) **CASING AND TUBING PROGRAM**

TYPE	<u>Size (in)</u>	<u>New or Used</u>	<u>Grade</u>	<u>Weight per ft. (lb/ft)</u>	<u>FOOTAGE: For Drilling (ft)</u>	<u>INTERVALS: Left in Well (ft)</u>	<u>CEMENT: Fill-up (Cu. Ft.)/CTS</u>
Conductor	20"	New	H-40	94#	80'	80'	CTS, 218 Cu. Ft.
Fresh Water	13-3/8"	New	J-55	54.5#	385' *see #19	385' *see #19	CTS, 348 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2500'	2500'	CTS, 1018 Cu. Ft.
Intermediate							
Production	5-1/2"	New	P-110	20#	17500'	17500'	4038 Cu. Ft.
Tubing	2-3/8"	New	N-80	4.7#		7100'	
Liners							

TYPE	<u>Size (in)</u>	<u>Wellbore Diameter (in)</u>	<u>Wall Thickness (in)</u>	<u>Burst Pressure (psi)</u>	<u>Anticipated Max. Internal Pressure (psi)</u>	<u>Cement Type</u>	<u>Cement Yield (cu. ft./k)</u>
Conductor	20"	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	LeadHPOZ & 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			

RECEIVED
Office of Oil and Gas

JUL 17 2018

WV Department of
Environmental Protection

WW-6B
(10/14)

RECEIVED
Office of Oil and Gas

JUL 17 2018

WV Department of
Environmental Protection

Permit Modification API # 47-095-02474

API NO. 47-095 - 02474

OPERATOR WELL NO. Beem Unit 3H

Well Pad Name: Pyle Run 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 freshwater 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): 29.70 acres

22) Area to be disturbed for well pad only, less access road (acres): 10.67 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.

*Note: Attach additional sheets as needed.