



west virginia department of environmental protection

Office of Oil and Gas
601 57th Street SE
Charleston, WV 25304
(304) 926-0450
(304) 926-0452 fax

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

PERMIT MODIFICATION APPROVAL

December 10, 2015

ANTERO RESOURCES CORPORATION
1615 WYNKOOP STREET
DENVER, CO 80202

Re: Permit Modification Approval for API Number 1706416, Well #: HOSKINS UNIT 1H

Extending lateral

Oil and Gas Operator:

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.

Please call James Martin at 304-926-0499, extension 1654 if you have any questions.

Sincerely,

Gene Smith
807 Assistant Chief of Permitting
Office of Oil and Gas

Promoting a healthy environment.

12/11/2015

API# 47-017-06416 PERMIT MODIFICATION

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

1) Well Operator: Antero Resources Corporation 494488557 017-Doddridge Grant Smithburg 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: Hoskins Unit 1H Well Pad Name: Hamilton Pad

3) Farm Name/Surface Owner: Hamilton, Kenneth E., et al Public Road Access: CR 24

4) Elevation, current ground: 1157' Elevation, proposed post-construction: 1157'

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: 7200' TVD, Anticipated Thickness- 55 feet, Associated Pressure- 2950#

8) Proposed Total Vertical Depth: 7200' TVD

9) Formation at Total Vertical Depth: Marcellus Shale

10) Proposed Total Measured Depth: 17400' MD

11) Proposed Horizontal Leg Length: 9643'

12) Approximate Fresh Water Strata Depths: 220'

13) Method to Determine Fresh Water Depths: Gaskins Unit 1H (API# 47-017-06260) on same pad.

14) Approximate Saltwater Depths: 611'

15) Approximate Coal Seam Depths: 821'

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

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

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

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18)

CASING AND TUBING PROGRAM

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	54.5#/48#	406'	406'	CTS, 564 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2555'	2555'	CTS, 1040 Cu. Ft.
Intermediate							
Production	5-1/2"	New	P-110	20#	17400'	17400'	4360 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-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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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.

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): 27.12 Existing Acres

22) Area to be disturbed for well pad only, less access road (acres): 3.14 Existing 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

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.

WW-6A1

Operator's Well Number

Hoskins 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
Silas Ash Lease			
Silas Ash	The South Penn Oil Co.	Flat Rate	0007/0494
South Penn Oil Company	The Pennzoil Company, et al	Name Change	0201/0510
The Pennzoil Company, et al	Devon Energy Production Company L. P.	Name Change	0244/0399
Devon Energy Production Company L. P.	East Resources, Inc.	Assignment	0247/0337
East Resources, Inc.	Antero Resources Appalachian Corp.	*Partial Assignment of Oil and Gas Leases	0271/0155
Antero Resources Appalachian Corp.	Antero Resources Corp.	Name Change	Exhibit 1
Kenneth E. Hamilton et al Lease			
Kenneth E. Hamilton, et ux	Drilling Appalachian Corporation	1/8	0160/0007
Drilling Appalachian Corporation	Dominion Exploration & Production, Inc.	Assignment	0243/0397
Dominion E&P Inc., DTI, Inc. & DAD, LLC	Antero Resources Appalachian Corp.	Assignment	0230/0113
Antero Resources Appalachian Corp.	Antero Resources Corp.	Name Change	Exhibit 1
Angelina Duncan Lease			
Angelina B. Duncan	Stonewall Gas Company	1/8	0154/0594
Stonewall Gas Company	Drilling Appalachian Corp.	Assignment	0158/0304
Drilling Appalachian Corp.	Dominion Appalachian Development	Assignment	0181/0667
Dominion Appalachian Development, LLC, DEPI, & DTI, Inc.	Antero Resources Appalachian Corp.	*Partial Assignment of Oil and Gas Leases	0230/0113
Antero Resources Appalachian Corp.	Antero Resources Corp.	Name Change	Exhibit 1
Beulah Cayton et al Lease			
Beulah Cayton, et vir	C.E. Beck	1/8	0104/0488
C.E. Beck	Pennzoil Company	Assignment	0104/0573
Pennzoil Company	Pennzoil Products Company	Deed, Assignment & Conveyance	DB 0201/0510
Pennzoil Company	Pennzoil Products Company	Supplemental Deed, Assignment & Conveyance	DB 0203/0621
Pennzoil Products Company	Pennzoil Exploration & Production Company	Deed, Assignment & Conveyance	DB 0239/0355
Pennzoil Exploration & Production Company	Pennzenergy Exploration & Production, L.L.C.	Merger	DB 0240/0702
Pennzenergy Exploration & Production, L.L.C.	Devon Energy Production Company, L.P.	Merger	DB 0244/0399
Devon Energy Production Company, L.P.	East Resources, Inc.	Deed, Assignment & Bill of Sale	DB 0247/0337
East Resources, Inc.	Antero Resources Appalachian Corp.	*Partial Assignment of Oil and Gas Leases	0271/0155
Antero Resources Appalachian Corp.	Antero Resources Corp.	Name Change	Exhibit 1

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Office of Oil & Gas

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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

Operator's Well Number

Hoskins Unit 1H

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Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
<u>Maude Shrader et al Lease</u>			
Maude Shrader, et al	C.E. Beck	1/8	0104/0504
C.E. Beck	Pennzoil Company	Assignment	0104/0573
Pennzoil Company	Chesterfield Energy Corporation	Assignment	0166/0121
Chesterfield Energy Corporation	Dominion Appalachian Development, Inc.	Merger	Unrecorded Document
Dominion Appalachian Development, Inc.	Dominion Appalachian Development, LLC	Certificate of Conversion	Exhibit 2
Dominion Appalachian Development, LLC, DEPI, & DTI, Inc.	Antero Resources Appalachian Corp.	*Partial Assignment of Oil and Gas Leases	0230/0113
Antero Resources Appalachian Corp.	Antero Resources Corp.	Name Change	Exhibit 1
<u>David E. Bowyer Lease</u>			
David E. Bowyer	Antero Resources Appalachian Corp.	1/8+	0400/0513
Antero Resources Appalachian Corp.	Antero Resources Corp.	Name Change	Exhibit 1
<u>Robert T. Gille et al Lease</u>			
Robert T. Gille & Patricia C. McCarty, h/w	Antero Resources Appalachian Corp.	1/8+	0429/0551
Antero Resources Appalachian Corp.	Antero Resources Corp.	Name Change	Exhibit 1
<u>Dominion Appalachian Development, LLC Lease</u>			
Dominion Appalachian Development, LLC	Dominion Exploration & Production, Inc.	1/8	0230/0272
Dominion Exploration & Production, Inc., DTI, Inc. & DAD, LLC	Antero Resources Appalachian Corporation	Name Change	0231/0145
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1

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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
12/11/2015

**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>Edgar Hartley Lease</u>	Edgar B. Hartley	Antero Resources Corporation	1/8+	0498/0326

*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.

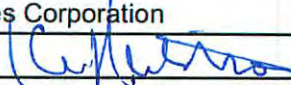
**Acknowledgement of Possible Permitting/Approval
In Addition to the Office of Oil and Gas**

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

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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: Kevin Kilstrom 
 Its: Vice President of Production

WW-60
(7-01)

API# 47-017-06416 PERMIT MODIFICATION

DATE: December 8, 20 15
OPERATOR'S
WELL NO. Hoskins Unit 1H

API NO: 47- 017 06416
State County Permit No.

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

A F F I D A V I T

State of Colorado

County of Denver

I, Brett Kuhn (the designated owner or operator, or authorized representative thereof), after being duly sworn, do declare that the undersigned is authorized by the owner of the working interest in the well permit application to which this affidavit is attached to state that (he, she, or it) shall tender to the owner of the oil and gas in place not less than one-eighth of the total amount paid to or received by or allowed to the owner of the working interest at the wellhead for the oil or gas so extracted, produced, or marketed before deducting the amount to be paid or set aside for the owner of the oil or gas in place, or all such oil or gas to be extracted, produced, or marketed from the well. West Virginia Code 22-6-8(e).

Signed: [Signature]

Taken, subscribed and sworn to before me this 8 day of December, 20 15.

[Signature]
Notary Public

My Commission expires: July 21, 2018

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Office of Oil & Gas
DEC 09 2015

KARA QUACKENBUSH
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20144028297
MY COMMISSION EXPIRES JULY 21, 2018

12/11/2015

**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.wvsos.com
E-mail: business@wvsos.com

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

**APPLICATION FOR
AMENDED CERTIFICATE
OF AUTHORITY**

**** 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)
- 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) 367-7310
Contact Name Phone Number
- 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 §311-1-129, 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.

Form CF-4

Issued by the Office of the Secretary of State

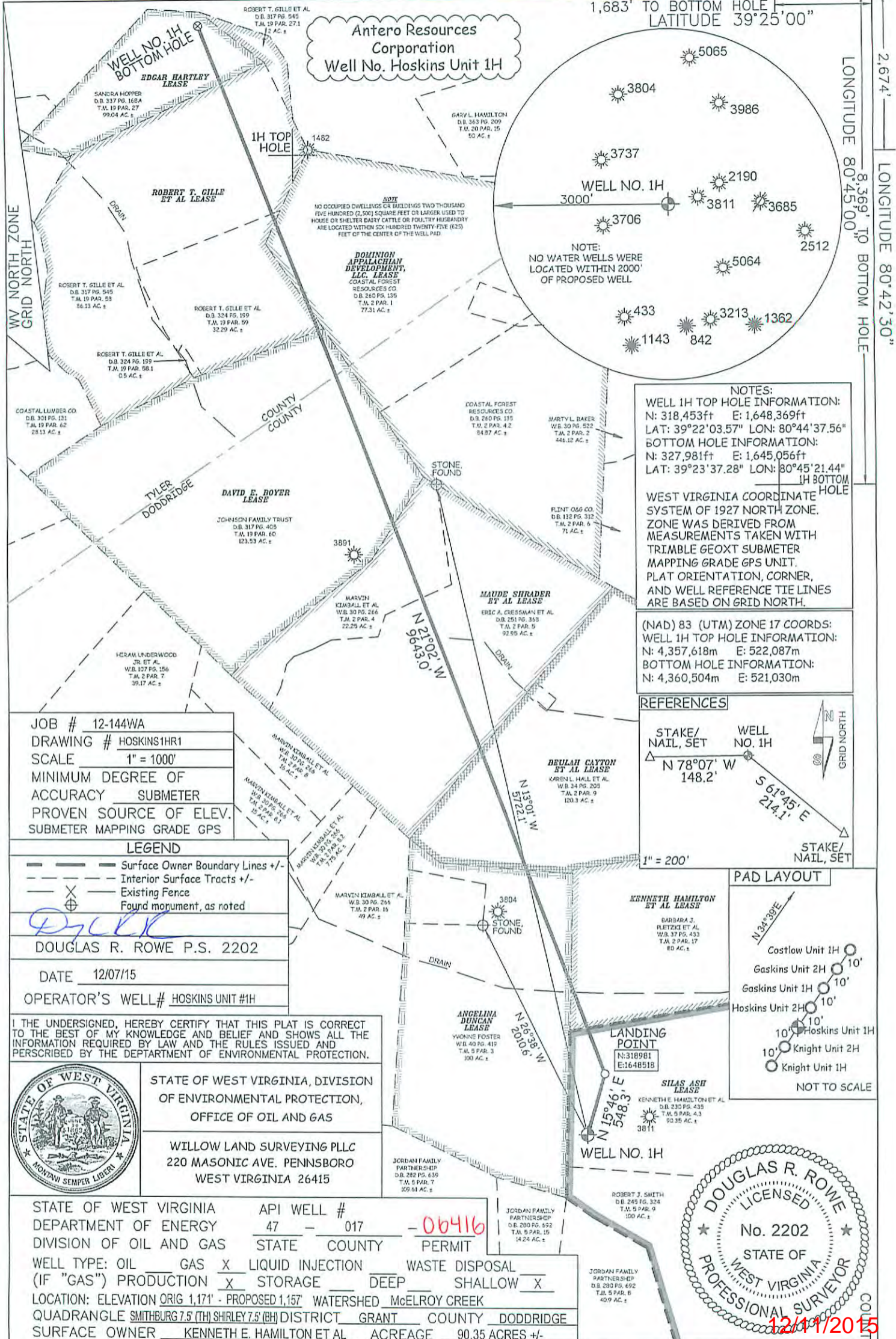
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Office of Oil & Gas
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LATITUDE 39°22'30"

10,018'

1,683' TO BOTTOM HOLE
LATITUDE 39°25'00"

LONGITUDE 80°45'00"
LONGITUDE 80°42'30"

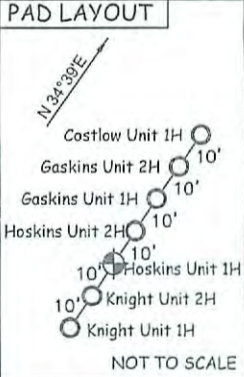
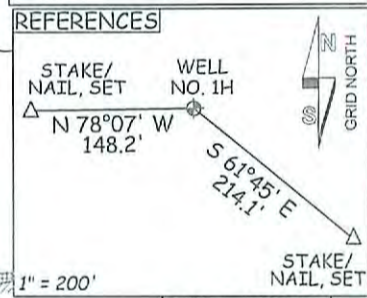


Antero Resources Corporation
Well No. Hoskins Unit 1H

NOTES:
WELL 1H TOP HOLE INFORMATION:
N: 318,453ft E: 1,648,369ft
LAT: 39°22'03.57" LON: 80°44'37.56"
BOTTOM HOLE INFORMATION:
N: 327,981ft E: 1,645,056ft
LAT: 39°23'37.28" LON: 80°45'21.44"
IH BOTTOM HOLE

WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE. ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE 6EOXT 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: 4,357,618m E: 522,087m
BOTTOM HOLE INFORMATION:
N: 4,360,504m E: 521,030m



JOB # 12-144WA
DRAWING # HOSKINS1HR1
SCALE 1" = 1000'
MINIMUM DEGREE OF ACCURACY SUBMETER
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

LEGEND

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

DOUGLAS R. ROWE P.S. 2202
DATE 12/07/15
OPERATOR'S WELL# HOSKINS UNIT #1H

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

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

API WELL # 47 - 017 - 06416

STATE COUNTY PERMIT

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

LOCATION: ELEVATION ORIG 1,171' - PROPOSED 1,157' WATERSHED McELROY CREEK

QUADRANGLE SMITHBURG 7.5 (TH) SHIRLEY 7.5 (BH) DISTRICT GRANT COUNTY DODDRIDGE

SURFACE OWNER KENNETH E. HAMILTON ET AL ACREAGE 90.35 ACRES +/-

OIL & GAS ROYALTY OWNER SILAS ASH; KENNETH HAMILTON ET AL; ANGELINA DUNCAN; BEULAH CAYTON ET AL; MAUDE SHRADER ET AL; DAVID E. BOYER; ROBERT T. GILIE ET AL; DOMINION APPALACHIAN DEVELOPMENT LLC; EDGAR HARTLEY

LEASE ACREAGE 120 ACRES±; 80 ACRES±; 100 ACRES±; 123.5 ACRES±; 114.5 ACRES±; 102.48 ACRES±; 120.92 ACRES±; 167.29 ACRES±; 30 ACRES±

PROPOSED WORK: DRILL ___ CONVERT ___ DRILL DEEPER X REDRILL ___ FRACTURE OR STIMULATE X
PLUG OFF OLD FORMATION ___ PERFORATE NEW FORMATION X OTHER PHYSICAL CHANGE IN WELL (SPECIFY) MOD-BHL

TARGET FORMATION MARCELLUS ESTIMATED DEPTH 7,200' TVD 17,400' MD

WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER
ADDRESS 1615 WYNKOOP STREET ADDRESS CT CORPORATION SYSTEM
FORM WW-6 DENVER, CO 80202 CHARLESTON, WV 25313



COUNTY NAME PERMIT

12/11/2015