



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, October 24, 2018
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION
1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit Modification Approval for MASTER UNIT 3H
47-085-10361-00-00

Modified lateral length 10871"

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: MASTER UNIT 3H
Farm Name: DANIEL M. HAYMOND IV, ET AL
U.S. WELL NUMBER: 47-085-10361-00-00
Horizontal 6A New Drill
Date Modification Issued: October 24, 2018

Promoting a healthy environment.

Mod

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

1) Well Operator: Antero Resources Corporation 494507062 085 - Ritchie Clay Pennsboro 7.5(TH)
Operator ID County District Quadrangle

2) Operator's Well Number: Master Unit 3H Well Pad Name: Lettie Pad

3) Farm Name/Surface Owner: Daniel M. Haymond IV, et al Public Road Access: Stull Hill Rd.

4) Elevation, current ground: 970' 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- 75 feet, Associated Pressure- 2800#

8) Proposed Total Vertical Depth: 6800' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 18600' MD

11) Proposed Horizontal Leg Length: 10871'

12) Approximate Fresh Water Strata Depths: 408'

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

14) Approximate Saltwater Depths: 1760'

15) Approximate Coal Seam Depths: 622'

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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JUL 23 2018

WW-6B
(04/15)

Permit Modification - API# 47-085-10361 MOD
 API NO. 47- 085 - 10361
 OPERATOR WELL NO. Master Unit 3H
 Well Pad Name: Lettie 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, 77 Cu. Ft.
Fresh Water	13-3/8"	New	J-55	54.5#	460' *see #19	460' *see #19	CTS, 639 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#	18600'	18600'	4707 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	20"	24"	0.438"	1530	50	Class A	~1.18
Fresh Water	13-3/8"	17-1/2"	0.38"/0.33"	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"	0.451"	14,530	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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WV Department of
Environmental Protection

WW-6B
(10/14)

Permit Modification - API# 47-085-10361 MOD
API NO. 47-085 - 10361
OPERATOR WELL NO. Master Unit 3H
Well Pad Name: Lettie 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): 14.68 Acres

22) Area to be disturbed for well pad only, less access road (acres): 6.86 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.

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*Note: Attach additional sheets as needed.

JUL 23 2018

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>Irene Nutter Haymond Trust Lease</u>			
Irene Nutter Haymond	DC Petroleum, Inc.	1/8+	0257/0085
DC Petroleum, Inc.	Antero Resources Appalachian Corporation	Assignment	0257/0763
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>Perkins Oil and Gas Co. Lease</u>			
Perkins Oil and Gas Co.	Antero Resources Corporation	1/8+	0311/0923
<u>Daniel M. Haymond et ux Lease</u>			
Daniel M. Haymond et ux	Alton Skinner	1/8	0137/0764
Alton Skinner	Chase Petroleum Inc	Assignment	0143/0076
Chase Petroleum Inc	Antero Resources Appalachian Corporation	Assignment	0254/0133
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>Alliance Petroleum Corporation Lease</u>			
Alliance Petroleum Corporation	Antero Resources Appalachian Corporation	1/8	0257/0753
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>Patricia A. Heintzman Lease (14-1.1)</u>			
Patricia A. Heintzman	Antero Resources Corporation	1/8+	0567/0299
<u>Patricia A. Heintzman Lease (11-19)</u>			
Patricia A. Heintzman	Antero Resources Appalachian Corporation	1/8+	0395/0314
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>Patricia L. McCullough Lease</u>			
Patricia L. McCullough	Antero Resources Appalachian Corporation	1/8+	0397/0494
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>Richard L. Barnard Lease</u>			
Richard L Barnard	Antero Resources Corporation	1/8+	0442/0079

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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.

Mod

WW-6A1
(5/13)

Operator's Well No. Master Unit 3H

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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>Frank Grass et al Lease</u>	Frank Grass et al Sancho Oil & Gas Corporation	Sancho Oil & Gas Corporation Antero Resources Corporation	1/8 Assignment	0335/0601 0436/0177

*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:

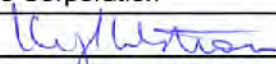
- WV Division of Water and Waste Management
- WV Division of Natural Resources WV Division of Highways
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- County Floodplain Coordinator

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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: Senior Vice President - Production

FORM WW-6A1
EXHIBIT 1

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

FILE ONE ORIGINAL
(We'll you want a filed
stamped copy returned to you)
FEE: \$25.00

**APPLICATION FOR
AMENDED CERTIFICATE
OF AUTHORITY**

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

*** 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) 367-7310
Phone Number

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

Important Legal Notice Regarding Signatures: Per West Virginia Code §21-1-12g, 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 CW-1 Issued by the Office of the Secretary of State - RECEIVED
Office of Oil and Gas

WV013 - 04/16/2012 Update X-1000/01/01
JUL 23 2018
WV Department of Environmental Protection

47 085 10361
MAP

LETTIE WELL PAD & WATER AS-BUILT EROSION CONTROL IMPROVEMENTS

LOCATION COORDINATES:

ACCESS ROAD ENTRANCE
LATITUDE: 39.265306 LONGITUDE: -80.912305 (NAD 83)
N 4357319.87 E 507554.43 (UTM ZONE 17 METERS)

CENTER OF TANK
LATITUDE: 39.265734 LONGITUDE: -80.912124 (NAD 83)
N 4357387.42 E 507569.98 (UTM ZONE 17 METERS)

CENTROID OF PAD
LATITUDE: 39.264936 LONGITUDE: -80.910350 (NAD 83)
N 4357278.99 E 507722.90 (UTM ZONE 17 METERS)

GENERAL DESCRIPTION:

THE ACCESS ROAD(S), WATER CONTAINMENT PAD, AND WELL PAD HAVE BEEN CONSTRUCTED TO AID IN THE DEVELOPMENT OF INDIVIDUAL MARCELLUS SHALE GAS WELLS.

FLOODPLAIN NOTES:

THE SITE IS LOCATED WITHIN FEMA FLOOD ZONE "X" PER FEMA FLOOD MAP #54085C0125C.

MISS UTILITY STATEMENT:

ANTERO RESOURCES CORPORATION HAS NOTIFIED MISS UTILITY OF WEST VIRGINIA FOR THE LOCATING OF UTILITIES PRIOR TO THIS PROJECT DESIGN; TICKET #1419246636. IN ADDITION, MISS UTILITY WAS CONTACTED BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION FOR THIS PROJECT.

ENTRANCE PERMIT:

ANTERO RESOURCES CORPORATION HAS OBTAINED AN ENCROACHMENT PERMIT (FORM MM-109) FROM THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS, PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.

ENVIRONMENTAL NOTES:

STREAM AND WETLAND DELINEATIONS WERE PERFORMED IN MAY 2014, JULY 2014, & OCTOBER 2016 BY K.C. HARVEY ENVIRONMENTAL, LLC TO REVIEW THE SITE FOR WATERS AND WETLANDS THAT ARE MOST LIKELY WITHIN THE REGULATORY PURVIEW OF THE U.S. ARMY CORPS OF ENGINEERS (USACE) AND/OR THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (WVDEP). THE OCTOBER 21, 2016 DESIGN OVERVIEW MAP WAS PREPARED BY K.C. HARVEY ENVIRONMENTAL, LLC AND SUMMARIZES THE RESULTS OF THE FIELD DELINEATION. THE MAP DOES NOT, IN ANY WAY, REPRESENT A JURISDICTIONAL DETERMINATION OF THE LANDWARD LIMITS OF WATERS AND WETLANDS WHICH MAY BE REGULATED BY THE USACE OR THE WVDEP.

GEOTECHNICAL NOTES:

A SUBSURFACE INVESTIGATION OF THE SITE WAS PERFORMED BY PENNSYLVANIA SOIL & ROCK, INC. BETWEEN FEBRUARY 11, 2015 & FEBRUARY 26, 2015. THE REPORT PREPARED BY PENNSYLVANIA SOIL & ROCK, INC. DATED MARCH 27, 2015 REVISED JANUARY 31, 2017, REFLECTS THE RESULTS OF THE SUBSURFACE INVESTIGATION. THE INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS REPORT WERE USED IN THE PREPARATION OF THESE PLANS. PLEASE REFER TO THE SUBSURFACE INVESTIGATION REPORT BY PENNSYLVANIA SOIL & ROCK, INC. FOR ADDITIONAL INFORMATION, AS NEEDED.

PROJECT CONTACTS:

OPERATOR:

ANTERO RESOURCES CORPORATION
505 WHITE OAKS BLVD.
BRIDGEPORT, WV 26330
PHONE: (304) 842-4100
FAX: (304) 842-4102

ELI WAGONER - ENVIRONMENTAL ENGINEER
OFFICE: (304) 842-4068 CELL: (304) 476-9770

JON MCEVERS - OPERATIONS SUPERINTENDENT
OFFICE: (303) 357-9799 CELL: (303) 808-2423

AARON KUNZLER - CONSTRUCTION SUPERVISOR
CELL: (405) 227-8344

ROBERT B. WIRKS - FIELD ENGINEER
OFFICE: (304) 842-4100 CELL: (304) 627-7405

CHARLES E. COMPTON, III - SURVEYING COORDINATOR
CELL: (304) 719-6449

RICHARD LYLES - LAND AGENT
CELL: (770) 378-6933

ENGINEER/SURVEYOR:

NAVITUS ENGINEERING, INC.
CYRUS S. KUMP, PE - PROJECT MANAGER/ENGINEER
OFFICE: (800) 962-4185 CELL: (540) 686-6747

ENVIRONMENTAL:

KC HARVEY ENVIRONMENTAL LLC
SHANNON THOMPSON - STAFF SCIENTIST
OFFICE: (740) 373-1970 CELL: (970) 396-8250

GEOTECHNICAL:

PENNSYLVANIA SOIL & ROCK, INC.
CHRISTOPHER W. SAMIOS - PROJECT ENGINEER
OFFICE: (412) 372-4000 CELL: (412) 589-0662

RESTRICTIONS NOTES:

1. THERE ARE NO LAKES, PONDS, OR RESERVOIRS WITHIN 100 FEET OF THE WELL PAD AND LOD. THERE ARE WETLANDS & PERENNIAL STREAMS ADJACENT TO THE STAGING AREA & WATER CONTAINMENT PAD THAT HAS REMAINED UNDISTURBED.
2. THERE ARE NO NATURALLY PRODUCING TROUT STREAMS WITHIN 300 FEET OF THE WELL PAD AND LOD.
3. THERE ARE NO GROUNDWATER INTAKE OR PUBLIC WATER SUPPLY FACILITIES WITHIN 1000 FEET OF THE WELL PAD AND LOD.
4. THERE ARE NO APPARENT EXISTING WATER WELLS OR DEVELOPED SPRINGS WITHIN 250 FEET OF THE WELL(S) BEING DRILLED.
5. THERE ARE NO OCCUPIED DWELLING STRUCTURES WITHIN 625 FEET OF THE CENTER OF THE WELL PAD.
6. THERE ARE NO AGRICULTURAL BUILDINGS LARGER THAN 2,500 SQUARE FEET WITHIN 625 FEET OF THE CENTER OF THE WELL PAD.

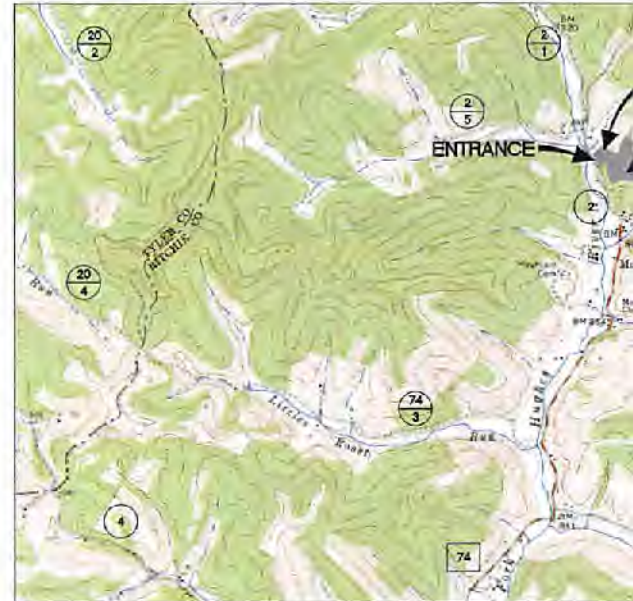
REPRODUCTION NOTE

THESE PLANS WERE CREATED TO BE PLOTTED ON 22"x34" (ANSI D) PAPER. HALF SCALE DRAWINGS ARE ON 11"x17" (ANSI B) PAPER.

THESE PLANS WERE CREATED FOR COLOR PLOTTING AND ANY REPRODUCTIONS IN GRAY SCALE OR COLOR MAY RESULT IN A LOSS OF INFORMATION AND SHOULD NOT BE USED FOR CONSTRUCTION PURPOSES

CLAY DISTRICT, RITCHIE COUNTY
CABIN RUN-NORTH FORK HUGHES

USGS 7.5 PENNSBORO G



2000 0 2000
SCALE: 1" = 2000'

WEST VIRGINIA COUNTY MAP



(NOT TO SCALE)

AS-BUILT CERTIFICATIONS:

THE DRAWINGS, CONSTRUCTION NOTES, AND REFERENCE DIAGRAMS ATTACHED HERETO HAVE BEEN PREPARED IN ACCORDANCE WITH THE WEST VIRGINIA CODE OF STATE RULES, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS CRS 35-8.

LEGEND

LEGEND		
EX. INDEX CONTOUR & CONTOUR LABEL		PR. INDEX CONT
EX. INTERMEDIATE CONTOUR		PR. INTERMEDIA
EX. PROPERTY LINE		PR. INTERMEDIA
EX. TOP OF BERM		PR. INDEX ROAL
EX. ROAD EDGE OF GRAVEL/DIRT		PR. INTERMEDIA
EX. ROAD EDGE OF PAVEMENT		PR. PADS/STOCI
EX. ROAD CENTERLINE		PERMITTED LMI
EX. GUARDRAIL		MODIFICATION LI
EX. BRIDGE		PR. ROAD/IMPOU
EX. DITCHLINE/DRAINAGE FEATURE		PR. ROAD CENTI
EX. RIP-RAP		PR. GUARDRAIL
EX. CULVERT		PR. ROCK CONST
EX. TREELINE		PR. AIR BRIDGE
EX. BUILDING		PR. CULVERT
EX. MISCELLANEOUS FEATURE		PR. DITCH
EX. 100 YR FEMA FLOODPLAIN		PR. RIP-RAP TR
EX. DELINEATED STREAM		PR. OUTLET PRO
EX. DELINEATED WETLAND/POND		PR. DIVERSION
100' WETLAND/STREAM BUFFER		PR. ROCK LEVEL
STREAM/WETLAND DELINEATION STUDY AREA		PR. COMPOST FI
EX. FENCELINE		PR. SUPER SILT
EX. GATE		PR. WELL HEAD
EX. PERIMETER SAFETY FENCE		PR. PAD DEWATI
EX. ACCESS GATE WITH EMERGENCY LIFELINE		PR. TOP OF PAL
EX. WELL HEAD ON DESIGNED PAD		PR. 220' X 320'
EX. GAS WELL		PR. SPOT SHOT
EX. PIPELINE		PR. PERIMETER S
EX. PIPELINE R/W		PR. ACCESS GATE
EX. PIPELINE METER		PR. PIPELINE
EX. PIPELINE VALVE		PR. PIPELINE R/
EX. PTT		PR. OVERHEAD U
EX. OVERHEAD UTILITY		PR. POWER POLE
EX. POWER POLE/GUY WIRE		PR. OVERHEAD U
EX. UNDERGROUND ELECTRIC		PR. WATERLINE
EX. UNDERGROUND TELEPHONE		BORING LOCATIO
EX. UNDERGROUND FIBER OPTIC		X-SECTION/PROI
EX. UTILITY R/W		X-SECTION/PROI
EX. WATERLINE		X-SECTION/PROI
EX. WATER WELL/EX. SPRING		X-SECTION/PROI
EX. COMPOST SOCK		X-SECTION/PROI
EX. SUPER SILT FENCE		X-SECTION/PROI
EX. SILT FENCE		MATCHLINE
APPROX. LOCATION OF SLIDE AREA		EX. METER
APPROX. LOCATION OF BORROW/ SPOIL AREA		EX. TANK
PR. TOE BENCH		EX. COMBUSTOR
EX. APPROX. SURFACE & SUB-SURFACE ELECTRIC LINE AREA		EX. GPU
EX. APPROX. SURFACE & SUB-SURFACE DUMP LINE AREA		EX. SEPARATOR
EX. APPROX. SURFACE & SUB-SURFACE WELL LINE AREA		EX. VRT
EX. APPROX. SURFACE & SUB-SURFACE SALES LINE AREA		EX. KNOCK-OUT

OVERALL PLAN SH



GRID NORTH AND PLATINGS
SHOWN HEREON WHEN
REPRODUCED BY SURVEY

TM 4-09
CHRISTOPHER A. HAYMOND

TM 4-15
DANIEL HAYMOND (LIFE)
& DANIEL M. HAYMOND
III & CHRISTOPHER K.
HAYMOND

TM 4-12
MICHAEL D. HAMMETT

TM 4-09
CHRISTOPHER K. HAYMOND

WATER
CONTAINMENT
PAD

STAGING
AREA

ACCESS
ROAD "B"

ACCESS
ROAD "A"

STOCKPILE
AREA "A"

WELL PAD

TM 4-13.1
HERBERT JONES, FLOYD HAYMOND,
WALTER PERKINS, HADSAI ROWE &
FRANK ASH TRUSTEES MOUNTAIN
COMMUNITY BUILDING

SHEET 4

TM 4-14
NORMA C. GREENE

TM 4-14
NORMA C. GREENE

TM 4-09
CHRISTOPHER K. HAYMOND

TM 4-14.3
ROCKY A. &
MARILYN E.
MCCLAIN

TM 4-18
CHARLES E. &
SANDRA K.
STULL

TM 4-27
PERKINS OIL & GAS INC

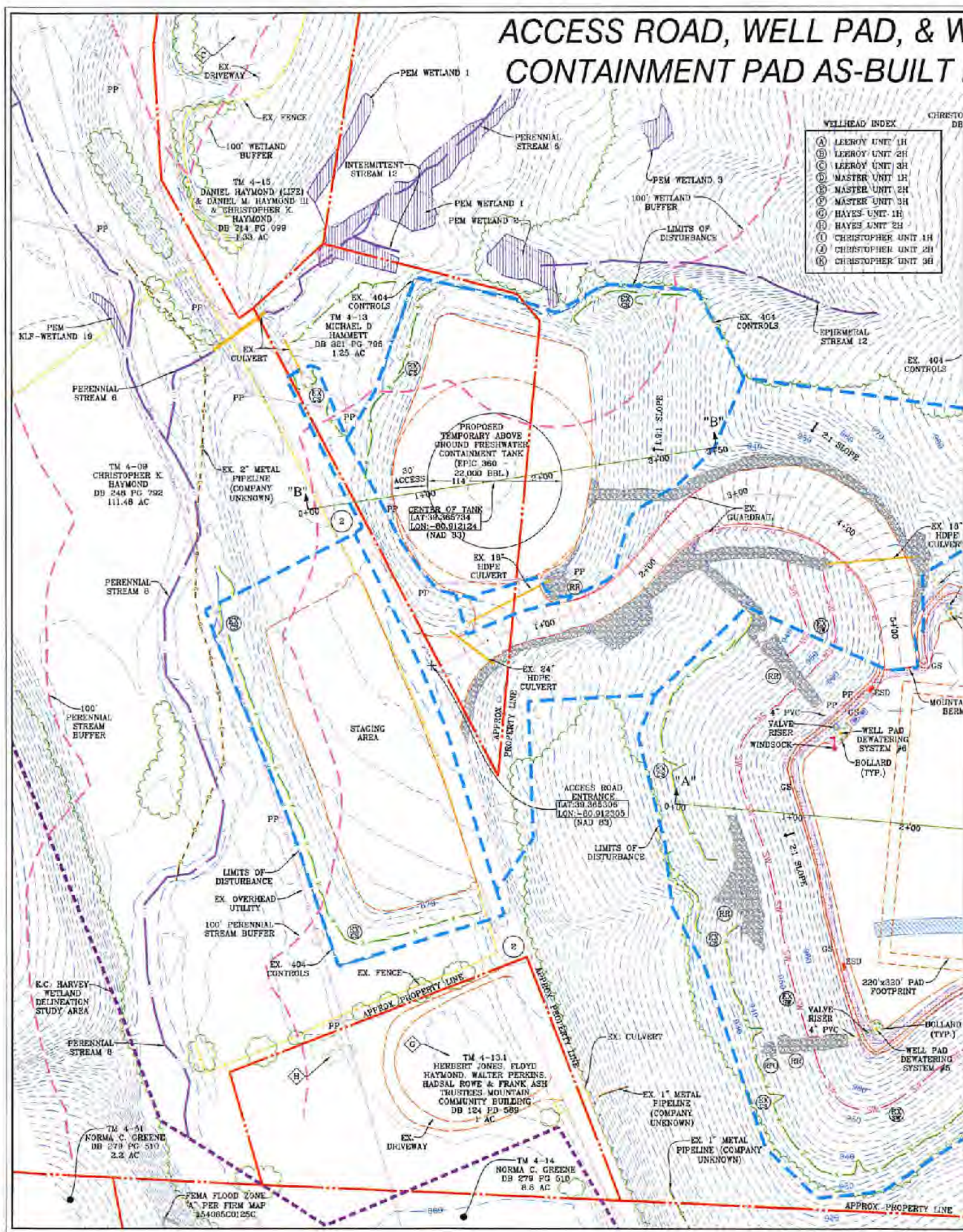


GRAPHIC SCALE (IN FEET)

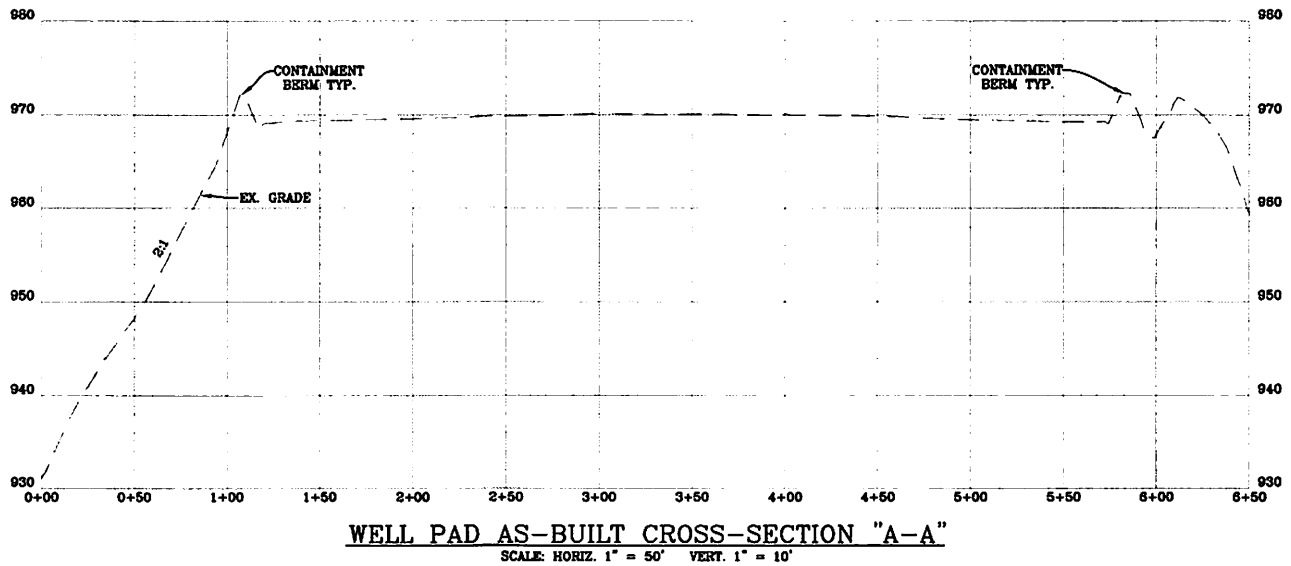
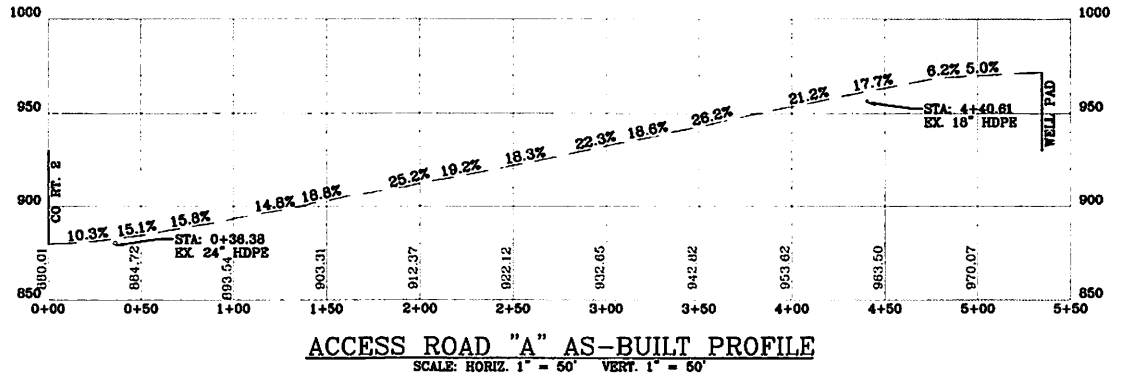
ACCESS ROAD, WELL PAD, & WETLAND CONTAINMENT PAD AS-BUILT

WELLHEAD INDEX

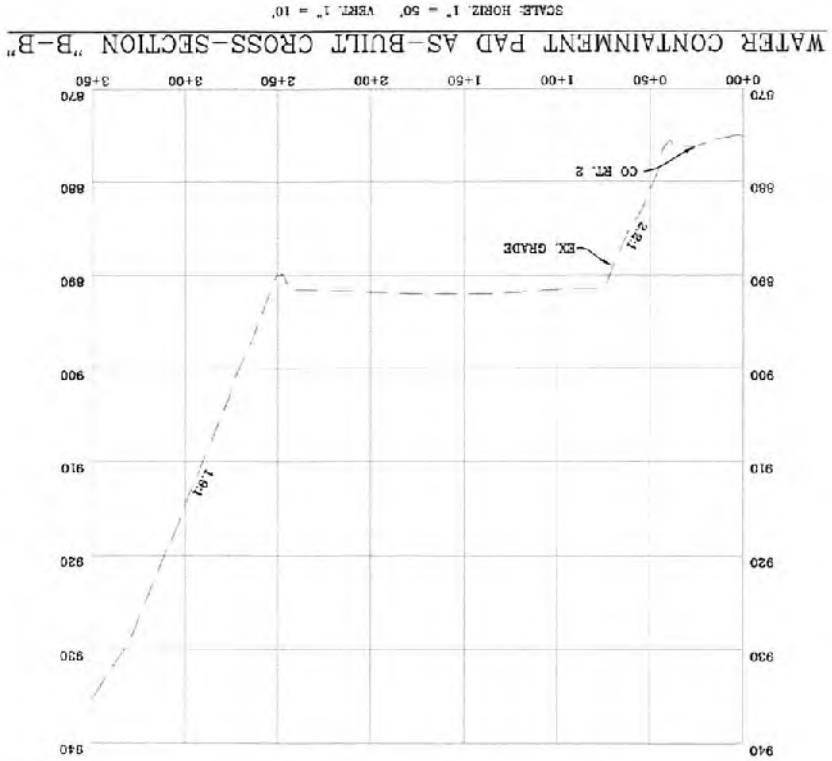
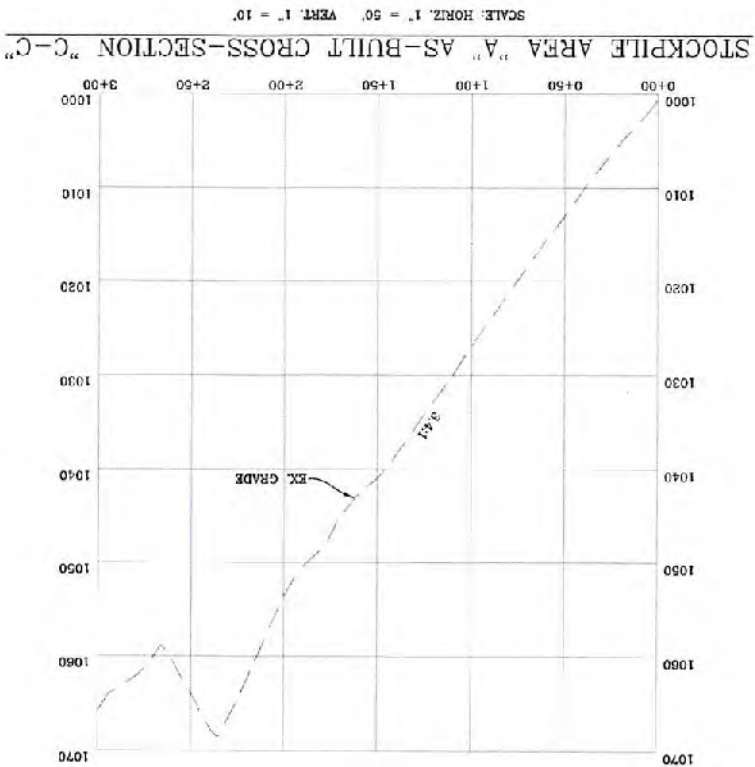
(A)	LEEROY UNIT 1H
(B)	LEEROY UNIT 2H
(C)	LEEROY UNIT 3H
(D)	MASTER UNIT 1H
(E)	MASTER UNIT 2H
(F)	MASTER UNIT 3H
(G)	HAYES UNIT 1H
(H)	HAYES UNIT 2H
(I)	CHRISTOPHER UNIT 1H
(J)	CHRISTOPHER UNIT 2H
(K)	CHRISTOPHER UNIT 3H



ACCESS ROAD AS-BUILT PROFILE CONTAINMENT PAD, & STOCKP



ILE, WELL PAD, WATER
LE AS-BUILT SECTIONS



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WAS PREPARED FOR:
ANTERO RESOURCES
CORPORATION

ACCESS ROAD AS-BUILT PROFILES, WELL PAD,
WCP, & STOCKPILE AS-BUILT SECTIONS
LETTIE
WELL PAD & WATER CONTAINMENT PAD
CLAY DISTRICT
RITCHIE COUNTY, WEST VIRGINIA



DATE: 03/26/2018
SCALE: AS SHOWN
SHEET 5 OF 5



47095024040000



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Antero Resources Corporation

Master Unit 3H - AOR



WELL SYMBOLS
Waiting on Completion

UWI (APINum)	Well Name	Well Number	Operator	Historical Operator	TD	Perforated Interval (shallowest, deepest)	Perforated Formation(s)	Producihle Formation(s) not perf'd
47095024040000	COPPER JOHN UNIT	1H	ANTERO RESOURCES CORPORATION	ANTERO RESOURCES CORPORATION	15165	N/A	Marcellus Fm	N/A

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LATITUDE 39°22'30"

10,035'

LATITUDE 39°25'00" 1,125' TO BOTTOM HOLE

3,700' 8,366' TO BOTTOM HOLE

LONGITUDE 80°52'30"

COUNTY NAME PERMIT

Antero Resources Corporation Well No. Master Unit 3H

MARY E. ADKINS D.S. 255 PG. 139 T.M. II PAR. 14.1 79.29 AC. ±

WELL 3H BOTTOM HOLE

FRANK GRASS ET AL LEASE

MARY E. ADKINS D.S. 255 PG. 139 T.M. II PAR. 05 79.7 AC. ±

MARY E. ADKINS ET AL D.S. 255 PG. 139 T.M. II PAR. 14 81 AC. ±

RICHARD L. BARNARD LEASE EARLY A. BARNARD D.S. 217 PG. 559 T.M. II PAR. 13 23.183 AC. ±

MARY E. ADKINS ET AL D.S. 255 PG. 139 T.M. II PAR. 14.5 21.33 AC. ±

NOTES: WELL 3H TOP HOLE INFORMATION: N: 318,124ft E: 1,601,220ft LAT: 39°21'53.43" LON: 80°54'37.78" BOTTOM HOLE INFORMATION: N: 328,677ft E: 1,598,516ft LAT: 39°23'37.31" LON: 80°55'14.33" 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: 4,357,278m E: 507,725m BOTTOM HOLE INFORMATION: N: 4,360,479m E: 506,848m



(NAD) 27 (UTM) ZONE 17 COORDS: WELL 3H TOP HOLE INFORMATION: N: 14,294,788ft E: 1,665,714ft POINT OF ENTRY INFORMATION: N: 14,295,044ft E: 1,666,510ft BOTTOM HOLE INFORMATION: N: 14,305,291ft E: 1,662,835ft

JOB # 17-015WA DRAWING # MASTER3HR 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 OPERATOR'S WELL # MASTER UNIT #3H 47 085 10361 STATE COUNTY PERMIT LEGEND DATE 07/18/18



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

WELL TYPE: OIL GAS X LIQUID INJECTION WASTE DISPOSAL (IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X LOCATION: ELEVATION 970' - AS BUILT WATERSHED NORTH FORK HUGHES RIVER QUADRANGLE PENNSBORO 7.5' (TH) - MIDDLEBOURNE 7.5' (BH) DISTRICT CLAY COUNTY RITCHIE ACREAGE 111.48 ACRES +/- OIL & GAS ROYALTY OWNER IRENE NUTTER HAYMOND TRUST; PERKINS OIL & GAS CO.; DANIEL M. HAYMOND ET UX; LEASE ACREAGE 375 AC. ±; 94 AC. ±; 375 AC. ±; ALLIANCE PETRO. CORP.; PATRICIA A. HEINTZMAN; PATRICIA A. HEINTZMAN; PATRICIA L. MCCULLOUGH; RICHARD L. BARNARD; FRANK GRASS ET AL 16.25 AC. ±; 60 AC. ±; 149.5 AC. ±; 50.5 AC. ±; 284 AC. ±; 431.23 AC. ±; 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 PLUG & ABANDON CLEAN OUT & REPLUG TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,800' TVD 18,600' MD WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM ADDRESS 1615 WYNKOOP ST. ADDRESS 5400 D BIG TYLER ROAD DENVER, CO 80202 CHARLESTON, WV 25313

