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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

Harold D. Ward, Cabinet Secretary  
[www.dep.wv.gov](http://www.dep.wv.gov)

Wednesday, September 29, 2021  
PERMIT MODIFICATION APPROVAL  
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION  
1615 WYNKOOP STREET  
DENVER, CO 80202

Re: Permit Modification Approval for GLAMDRING UNIT 2H  
47-095-02743-00-00

**Lateral Extension, Updated Lease Chain**

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.

A handwritten signature in blue ink, appearing to read 'James A. Martin', is positioned above the printed name.

James A. Martin  
Chief

Operator's Well Number: GLAMDRING UNIT 2H  
Farm Name: KAYLA LEEK  
U.S. WELL NUMBER: 47-095-02743-00-00  
Horizontal 6A New Drill  
Date Modification Issued: 09/29/2021

Promoting a healthy environment.

10/01/2021

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 Ellsworth Porter Falls 7.5'  
Operator ID County District Quadrangle

2) Operator's Well Number: Glamdring Unit 2H Well Pad Name: Margery Pad

3) Farm Name/Surface Owner: Kayla Leek Public Road Access: CR 11

4) Elevation, current ground: 1041' Elevation, proposed post-construction: \_\_\_\_\_

5) Well Type (a) Gas  Oil \_\_\_\_\_ Underground Storage \_\_\_\_\_

Other \_\_\_\_\_

(b) If Gas Shallow  Deep \_\_\_\_\_

Horizontal  \_\_\_\_\_

*DmH  
9-16-21*

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):  
Marcellus Shale: 7100' TVD, Anticipated Thickness- 55 feet, Associated Pressure- 2850#

8) Proposed Total Vertical Depth: 7100' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 26,100' MD

11) Proposed Horizontal Leg Length: 15,199'

12) Approximate Fresh Water Strata Depths: 103'

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

14) Approximate Saltwater Depths: 1998'

15) Approximate Coal Seam Depths: None Anticipated

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: \_\_\_\_\_

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#	90	90	CTS, 77 Cu. Ft.
Fresh Water	13-3/8"	New	J-55	54.5#	300	300	CTS, 417 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#	26100	26100	6784 Cu. Ft
Tubing	2-3/8"	New	N-80	4.7#			
Liners							

*DmH  
9-16-21*

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"	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	9300	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			



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

DmH  
9-16-21

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 51.65 acres

22) Area to be disturbed for well pad only, less access road (acres): 13.44 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

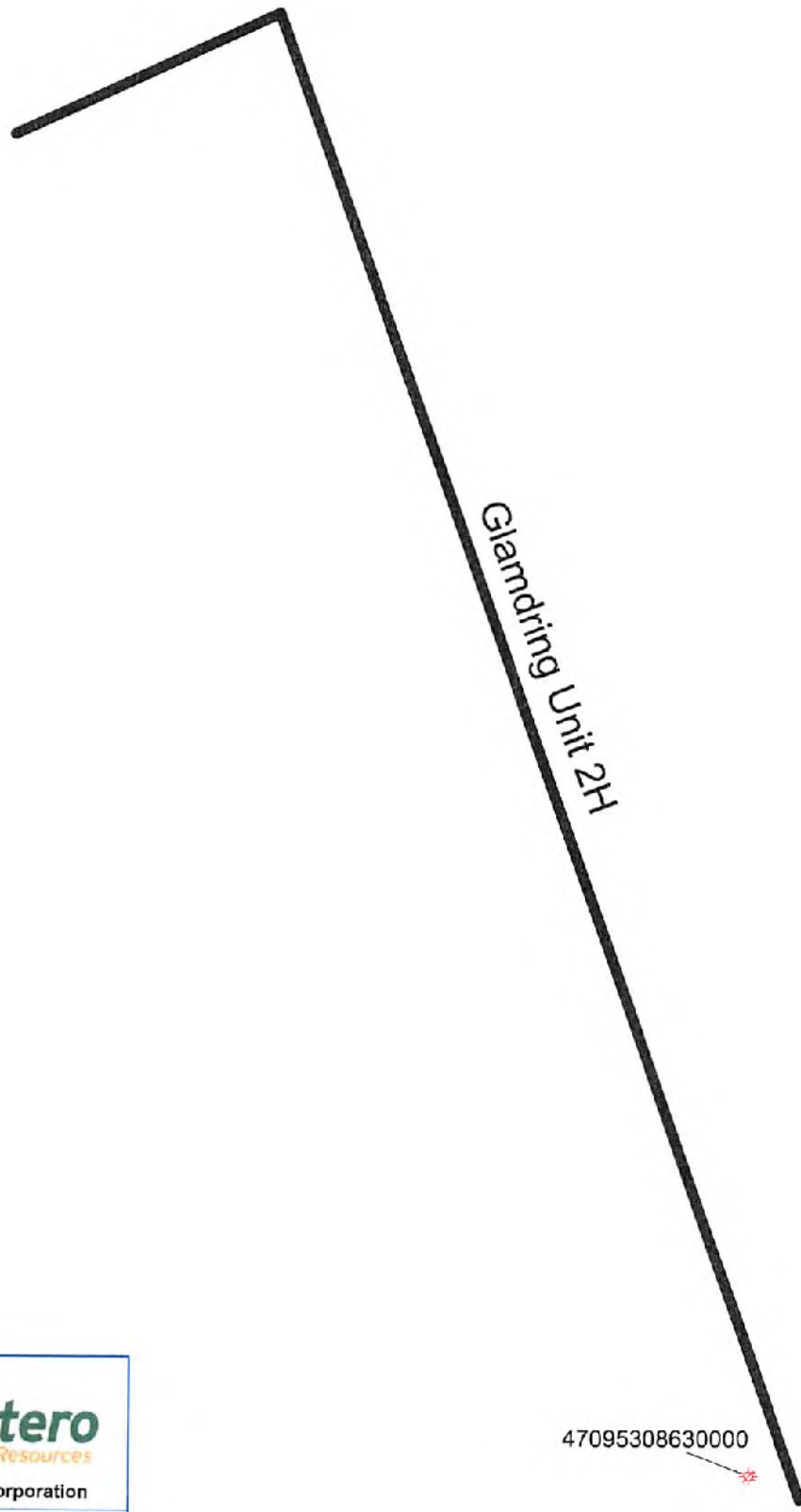
Production: Lead cement- 50/50 Class H/Poz + 1.5% salt + 1% C-45 + 0.5% C-16a + 0.2% C-12 + 0.45% C-20 + 0.05% C-51

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:

[Empty box for proposed borehole conditioning procedures]

\*Note: Attach additional sheets as needed.



Glamdring Unit 2H

47095308630000

47095308160000



Antero Resources Corporation

Glamdring Unit 2H - AOR



WELL SYMBOLS  
Plugged Gas Well

September 7, 2021

10/01/2021



LATITUDE 39°32'30"

10,535'

LATITUDE 39°30'00"

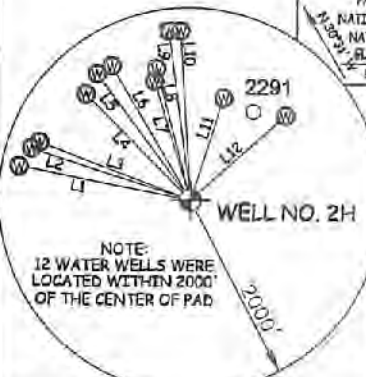
2,721' TO BOTTOM HOLE

### Antero Resources Corporation Well No. Glamdring Unit 2H

**NOTES:**  
**WELL 2H TOP HOLE INFORMATION:**  
 N: 373,372ft E: 1,625,079ft  
 LAT: 39°31'03.04" LON: 80°49'44.43"  
**BOTTOM HOLE INFORMATION:**  
 N: 359,675ft E: 1,632,697ft  
 LAT: 39°28'48.78" LON: 80°48'04.70"  
 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 2H TOP HOLE INFORMATION:**  
 N: 4,374,231m E: 514,713m  
**BOTTOM HOLE INFORMATION:**  
 N: 4,370,097m E: 517,103m

#### PAD LAYOUT NOT TO SCALE

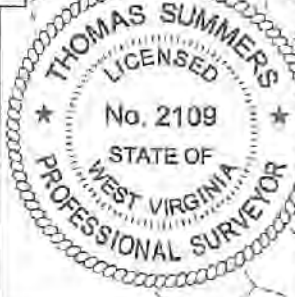


LINE	BEARING	DIST.	LINE	BEARING	DIST.
L1	N 79°23' W	1820.64' L7	L7	N 17°11' W	1289.39
L2	N 72°38' W	1737.73' L8	L8	N 14°44' W	1409.38
L3	N 69°39' W	1680.54' L9	L9	N 07°35' W	1774.82
L4	N 48°09' W	1540.95' L10	L10	N 03°37' W	1761.12
L5	N 36°53' W	1627.55' L11	L11	N 17°55' E	1113.36
L6	N 30°40' W	1612.05' L12	L12	N 48°24' E	1322.09

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



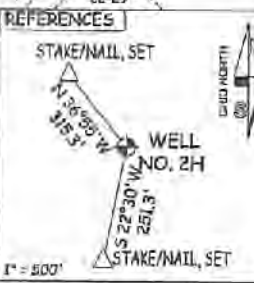
JOB # 21-008WA  
 DRAWING # GLAMDING2HR  
 SCALE 1" = 2000'  
 MINIMUM DEGREE OF ACCURACY SUBMETER  
 PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS  
 STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS

**LEGEND**  
 - - - Surface Owner Boundary Lines +/-  
 - - - Adjoining Surface Tracts +/-  
 ⊕ Found monument, as noted  
 THOMAS SUMMERS P.S., 2109  
 DATE 08/23/21  
 OPERATOR'S WELL# GLAMDING UNIT #2H

(NAD) 27 (UTM) ZONE 17 COORDS:  
**WELL 2H TOP HOLE INFORMATION:**  
 N: 14,350,407ft E: 1,688,640ft  
**POINT OF ENTRY INFORMATION:**  
 N: 14,351,167ft E: 1,691,412ft  
**BOTTOM HOLE INFORMATION:**  
 N: 14,336,844ft E: 1,696,482ft

Elsworth District - Tyler County	
21-51	Bear Knob Holdings LLC
16-9	David Leek
16-6.1	Richard Farrell
16-6	Kayla Leek
16-7	John Thomas
16-7.1	Lionie Wilson
16-8	Jean Neel Et Al
16-9	Bear Knob Holdings LLC
16-10	Jean Neel Et Al
16-11	Jean Neel Et Al
16-15	Harvey Miller Et Al
16-16	Harvey Miller Et Al
16-16.1	Barbara Kittle
16-17	Alfred Steele
16-18	Alfred Steele
16-19	Jean Neel Et Al
16-20	Jean Neel Et Al
16-21	Kayla Leek
16-24	James Eastham
16-25	Nancy Fewler
16-26	Barbara Kittle
16-27	Silbert Eddy
16-28	Kenneth Tomblin Et Al
16-36	George Karabatis
16-37	Rosella Murner
16-38	EQT Production Company
16-39	Richard Pyles
16-39.1	Leo Wilker
16-40	Gary Weekley
16-42	Richard Pyles
16-42.3	Richard Pyles
16-58	American Energy Works for Minerals LLC
22-6	EQT Production Company
22-7	Kenneth Baker
22-8	EQT Production Company
22-9	Steven Wright
22-10	Leslie Henderson
22-13	Debra Blake
22-14	Leslie Weekley
22-15	Lamie Wade Et Al
22-16	Darlene Stephens
22-16.1	Jonah McSwain
22-16.2	Sarah Bassett

**NOTE:**  
 NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY. HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.



WELL TYPE: OIL \_\_\_ GAS  LIQUID INJECTION \_\_\_ WASTE DISPOSAL \_\_\_ API WELL # 47 - 095 - 02743  
 (IF "GAS") PRODUCTION  STORAGE \_\_\_ DEEP \_\_\_ SHALLOW   
 LOCATION: ELEVATION AS BUILT - 1,041' WATERSHED OUTLET MIDDLE ISLAND CREEK STATE COUNTY PERMIT  
 QUADRANGLE PORTER FALLS 7.5' DISTRICT ELLSWORTH COUNTY TYLER  
 SURFACE OWNER KAYLA LEEK ACREAGE 69.06 ACRES +/-  
 OIL & GAS ROYALTY OWNER RIDGETOP CAPITAL LP; RIDGETOP CAPITAL IV LP; LEASE ACREAGE 69.06 AC. ±; 43.5 AC. ±;  
 RIDGETOP CAPITAL IV LP; NILE DEAN HARRIS; DOUGLAS SCOTT FUNK, SR.; ANTERO RESOURCES CORP.; JOHN E. VALENTOUR ET UX; 16.5 AC. ±; 53.75 AC. ±; 10 AC. ±; 40 AC. ±; 80 AC. ±;  
 HARVEY J. MILLER; ERC APPALACHIAN MINERALS LLC; S.A. SMITH & C.B. MORRIS HEIRS TRUST; COUNTY MINERALS LLC; BETTY MORHEAD ET VIR; 70 AC. ±; 55.13 AC. ±; 304.5 AC. ±; 92.15 AC. ±; 10,901.62 AC. ±;  
 MORRIS MOUNTAINEER OIL & GAS LLC; BRENDA CUIIC; CAROL J. KNAPP; BERNICE BAKER; JAMES A. WEEKLEY ET AL; JANIE DENON TRUST 45.98 AC. ±; 114 AC. ±; 77.5 AC. ±; 45 AC. ±; 58.5 AC. ±; 20 AC. ±;  
 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 7,100' TVD 26,100' MD  
 WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM  
 ADDRESS 1815 WYNKOOP ST. ADDRESS 5400 D BIG TYLER ROAD  
 FORM WW-6 DENVER, CO 80202 CHARLESTON, WV 25313

7,206' TO BOTTOM HOLE

LONGITUDE 80°47'30"

LONGITUDE 80°47'30"

8,798'



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>Ridgetop Capital LP Lease</u></b>			
Ridgetop Capital LP	Petroedge Energy LLC	1/8	0420/0643
Petroedge Energy LLC	Statoil USA Onshore Properties Inc.	Assignment	0436/0001
Statoil USA Onshore Properties Inc.	EQT Production Company	Assignment	0539/0239
EQT Production Company	Antero Resources Corporation	Assignment	0663/0001
<b><u>Ridgetop Capital IV, LP Lease</u></b>			
Ridgetop Capital IV, LP	Antero Resources Corporation	1/8+	0620/0605
<b><u>Ridgetop Capital IV, LP Lease</u></b>			
Ridgetop Capital IV, LP	Antero Resources Corporation	1/8+	0632/0442
<b><u>Nile Dean Harris Lease</u></b>			
Nile Dean Harris	EQT Production Company	1/8	0546/0539
EQT Production Company	Antero Resources Corporation	Assignment	0663/0001
<b><u>Antero Resources Corporation Lease</u></b>			
Antero Resources Corporation	Antero Resources Corporation	1/8	0067/0760
<b><u>Douglas Frank Funk, Sr. Lease</u></b>			
Douglas Frank Funk, Sr.	Antero Resources Corporation	1/8+	0651/0792
<b><u>John E Valentour et ux Lease</u></b>			
John E Valentour et ux	EQT Production Company	1/8	0624/0600
EQT Production Company	Antero Resources Corporation	Assignment	0663/0001
<b><u>Harvey Miller Lease</u></b>			
Harvey Miller	Antero Resources Corporation	1/8+	0070/0213
<b><u>S. A Smith and C. Burke Morris Heirs Trust Lease</u></b>			
S. A Smith and C. Burke Morris Heirs Trust	Antero Resources Corporation	1/8+	0022/0268
<b><u>Bounty Minerals, LLC Lease</u></b>			
Bounty Minerals, LLC	Antero Resources Corporation	1/8+	0555/0337
<b><u>Betty Morehead et vir Lease</u></b>			
Betty Morehead et vir	Antero Resources Corporation	1/8+	0498/0111
<b><u>Morris Mountaineer Oil and Gas, LLC Lease</u></b>			
Morris Mountaineer Oil and Gas, LLC	Antero Resources Corporation	1/8+	0084/0428
<b><u>Carol J. Knapp Lease</u></b>			

10/01/2021

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)

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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:

Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
Carol J. Knapp	Jay-Bee Production Company	1/8	0388/0141
Jay-Bee Production Company	Statoil USA Onshore Properties, Inc	Assignment	0469/0419
Statoil USA Onshore Properties	EQT Production Company	Assignment	0539/0239
EQT Production Company	Antero Resources Corporation	Assignment	0663/0001
<b><u>Bernice Baker Lease</u></b>			
Bernice Baker	Jay-Bee Production Company	1/8	0391/0221
Jay-Bee Production Company	Statoil USA Onshore Properties, Inc	Assignment	0469/0419
Statoil USA Onshore Properties, Inc	EQT Production Company	Assignment	0539/0239
EQT Production Company	Antero Resources Corporation	Assignment	0663/0001
<b><u>James A. Weekley, et al Lease</u></b>			
James A. Weekley, et al	South Penn Oil Company	1/8	0048/0464
South Penn Oil Company	Hope Natural Gas Company	Assignment	0072/0067
Hope Natural Gas Company	Consolidated Gas Supply Corporation	Conveyance	0169/0026
Consolidated Gas Supply Corporation	Consolidated Gas Transmission	Assignment	0249/0287
Consolidated Gas Transmission	CNG Development Company	Assignment	0253/0057
CNG Development Company	CNG Producing Company	Name Change	WVSOS
CNG Producing Company	Dominion Exploration & Production, Inc	Name Change	WVSOS
Dominion Exploration & Production, Inc	CONSOL Gas Company, LLC	Name Change	0009/0167
CONSOL Gas Company, LLC	CNX Gas Company, LLC	Merger	0009/0206
CNX Gas Company, LLC	Antero Resources Corporation	Assignment	0131/0592
<b><u>Brenda Cuic Lease</u></b>			
Brenda Cuic	JB Exploration I, LLC	1/8	0424/0431
JB Exporation I, LLC	Statoil USA Onshore Properties, LLC	Assignment	0509/0746
Statoil USA Onshore Properties, LLC	EQT Production Company	Assignment	0509/0746
EQT Production Company	Antero Resources Corporation	Assignment	0663/0001
<b><u>Janie Denoon Trust</u></b>			
Janie Denoon	Chesapeake Appalachia LLC	1/8	0413/0629
Chesapeake Appalachia LLC	Statoil USA Onshore Properties, Inc	Assignment	0443/0552
Statoil USA Onshore Properties, Inc	SWN Exchange Titleholder, LLC	Assignment	0470/0668
SWN Exchange Titleholder, LLC	SWN Production Company, LLC	Merger	0009/0404
SWN Production Company, LLC	Antero Exchange Properties	Assignment	0544/0242
Antero Exchange Properties	Antero Resources Corporation	Merger	0552/0315





Stansberry, Wade A <wade.a.stansberry@wv.gov>

## Expedited Modifications H6A Horizontal Well Work Permits Margery Pad

1 message

**Stansberry, Wade A** <wade.a.stansberry@wv.gov>

Wed, Sep 29, 2021 at 12:07 PM

To: Dani DeVito <ddevito@shalepro.com>, mhamsher@anteroresources.com, Derek Haught <derek.m.haught@wv.gov>, ljackson@wvassessor.com

I have attached permit copies for the Margery Pad for the following wells

- 95-02742
- 95-02743
- 95-02744
- 95-02745
- 95-02746

Thank you,

**Wade A. Stansberry**

**Environmental Resource Specialist 3**

**West Virginia Department of Environmental Protection**

**Office of Oil & Gas**

**601 57th St. SE**

**Charleston, WV 25304**






**(304) 926-0499 ext. 41115**

**(304) 926-0452 fax**

**[Wade.A.Stansberry@wv.gov](mailto:Wade.A.Stansberry@wv.gov)**

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### 5 attachments

-  **47-095-02744 - mod.pdf**  
631K
-  **47-095-02745 - mod.pdf**  
634K
-  **47-095-02746 - Copy.pdf**  
649K
-  **47-095-02743 - mod.pdf**  
660K
-  **47-095-02742 - mod.pdf**  
728K

10/01/2021