



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

Thursday, April 9, 2020
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION
1615 WYNKOOP STREET
DENVER, CO 80202

Re: Permit Modification Approval for FRALEY UNIT 1H
47-017-06896-00-00

Extend Lateral Length & Point of Entry. Extend Lateral Length 2469' to 8805'. Extend Measured Depth 10825' to 17550'. Updated Leases

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: FRALEY UNIT 1H
Farm Name: SAMUEL AND PEGGY SMITH
U.S. WELL NUMBER: 47-017-06896-00-00
Horizontal 6A New Drill
Date Modification Issued: 04/08/2020

Promoting a healthy environment.

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

1) Well Operator: Antero Resources Corporation 494507062 017 - Doddri West Uni Smithburg 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: Fraley Unit 1H Well Pad Name: Peggy June Pad

3) Farm Name/Surface Owner: Samuel & Peggy Smith Public Road Access: Smithton Rd (Old US-50)

4) Elevation, current ground: 1275' 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: 7400' TVD, Anticipated Thickness- 55 feet, Associated Pressure- 2950#

8) Proposed Total Vertical Depth: 7400' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 17550' MD ✓

11) Proposed Horizontal Leg Length: 8805' ✓

12) Approximate Fresh Water Strata Depths: 145', 215', 320' ✓

13) Method to Determine Fresh Water Depths: 4701708530, 4701705606, 4701701318

14) Approximate Saltwater Depths: 1603' ✓

15) Approximate Coal Seam Depths: 1601' ✓

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

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Office of Oil and Gas

(a) If Yes, provide Mine Info: Name: _____ MAR 27 2020

Depth: _____

Seam: _____ WV Department of Environmental Protection

Owner: _____

WW-6B
(04/15)

API NO. 47- 017 - 06896
 OPERATOR WELL NO. Fraley Unit 1H
 Well Pad Name: Peggy June 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/H-40	54.5#/48#	370 *see #19	370 *see #19 ✓	CTS, 514 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#	17550	17550 ✓	4418 Cu. Ft
Tubing	2-3/8"	New	N-80	4.7#			
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	Labo-H/POZ & Tai - H	H/POZ-1.44 & H-1.8
Tubing	2-3/8"	4.778"	0.19"	11,200			
Liners							

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MAR 27 2020

PACKERS

WV Department of
Environmental Protection

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

WW-6B
(10/14)

API NO. 47- 017 - 06896
OPERATOR WELL NO. Fraleigh Unit 1H
Well Pad Name: Peggy June 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): 40.52 Acres

22) Area to be disturbed for well pad only, less access road (acres): 8.89 Acres

23) Describe centralizer placement for each casing string:

Conductor: no centralizers
Surface Casing: one centralizer 10' above the float shoe, one on the insert float collar and one every 4th joint spaced up the hole to surface.
Intermediate Casing: one centralizer above float joint, one centralizer 5' above float collar and one every 4th collar to surface.
Production Casing: one centralizer at shoe joint and one every 3 joints to top of cement in intermediate casing.

24) Describe all cement additives associated with each cement type:

Conductor: no additives, Class A cement.
Surface: Class A cement with 2-3% calcium chloride and 1/4 lb of flake
Intermediate: Class A cement with 1/4 lb of flake, 5 gallons of clay treat
Production: Lead cement- 50/50 Class H/Poz + 1.5% salt + 1% C-45 + 0.5% C-16a + 0.2% C-12 + 0.45% C-20 + 0.05% C-51
Production: Tail cement- Class H + 45 PPS Calcium Carbonate + 1.0% FL-160 + 0.2% ACGB-47 + 0.05% ACSA-51 + 0.2% ACR-20

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MAR 27 2020
WV Department of
Environmental Protection

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.

Daniel A. Flack Digitally signed by Daniel A. Flack ✓
Date: 2020.03.24 13:05:36 -04'00'

FRALEY UNIT 1H (PEGGY JUNE PAD)- AREA OF REVIEW 35-8-5.11

PERMIT MODIFICATION API # 47-017-06896



47017066980000
47017066290000

47017048760000

47017033210000

47017050160000

Fraley Unit 1H

47017047840000

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Office of Oil and Gas

MAR 24 2020

WV Department of
Environmental Protection



Antero Resources Corporation

Fraley Unit 1H - AOR



WELL SYMBOLS
Gas Well

October 1, 2019

LATITUDE 39°20'00"

10,818'

2,109' TO BOTTOM HOLE
LATITUDE 39°20'00"

Antero Resources Corporation
Well No. Fraley Unit 1H

WELL NO. 1H
BOTTOM HOLE

NOTES:

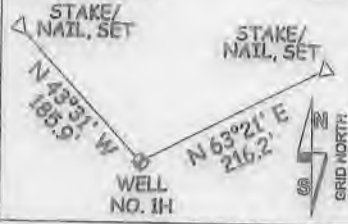
WELL 1H TOP HOLE INFORMATION:
N: 295,000ft E: 1,647,253ft
LAT: 39°18'11.63" LON: 80°44'47.63"
BOTTOM HOLE INFORMATION:
N: 303,360ft E: 1,644,288ft
LAT: 39°19'33.84" LON: 80°45'26.84"
WEST VIRGINIA COORDINATE

SYSTEM OF 1927 NORTH ZONE.
ZONE WAS DERIVED FROM
MEASUREMENTS TAKEN WITH
TRIMBLE GEOXT SUBMETER
MAPPING GRADE GPS UNIT.
PLAT ORIENTATION, CORNER,
AND WELL REFERENCE TIE LINES
ARE BASED ON GRID NORTH.

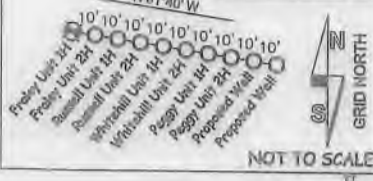
(NAD) 83 (UTM) ZONE 17 COORDS:
WELL 1H TOP HOLE INFORMATION:
N: 4,350,467m E: 521,867m
BOTTOM HOLE INFORMATION:
N: 4,352,999m E: 520,921m

(NAD) 27 (UTM) ZONE 17 COORDS:
WELL 1H TOP HOLE INFORMATION:
N: 14,272,443ft E: 1,712,110ft
POINT OF ENTRY INFORMATION:
N: 14,272,356ft E: 1,711,659ft
BOTTOM HOLE INFORMATION:
N: 14,280,749ft E: 1,709,007ft

REFERENCES



PAD LAYOUT



NO WATER WELL WERE
LOCATED WITHIN 2000'
OF CENTER OF PAD



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 # 17-024WA
DRAWING # FRALEY1HMOD
SCALE 1" = 1000'
MINIMUM DEGREE OF ACCURACY SUBMETER
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

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

LEGEND

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

THOMAS SUMMERS P.S. 2109

DATE 03/19/20

OPERATOR'S WELL# FRALEY UNIT #1H

WELL TYPE: OIL <input type="checkbox"/> GAS <input checked="" type="checkbox"/> LIQUID INJECTION <input type="checkbox"/> WASTE DISPOSAL <input type="checkbox"/>	API WELL #	47	017	06896
(IF "GAS") PRODUCTION <input checked="" type="checkbox"/> STORAGE <input type="checkbox"/> DEEP <input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/>	STATE	COUNTY	PERMIT	
LOCATION: ELEVATION 1275' AS BUILT	WATERSHED HEADWATERS MIDDLE ISLAND CREEK			
QUADRANGLE SH - SMITHBURG 7.5' BH - WEST UNION 7.5'	DISTRICT WEST UNION COUNTY DODDRIDGE			
SURFACE OWNER SAMUEL AND PEGGY SMITH	ACREAGE 28.958 ACRES +/-			
OIL & GAS ROYALTY OWNER ELAINE DEBOLT; CAROLYN ROBISON ET AL; DAVID E. SPONAUGLE ET UX;	LEASE ACREAGE 84.8 ACRES +/-; 26 ACRES +/-; 14.75 ACRES +/-;			
JIM SPENCER; SPENCER ENTERPRISES LLC; CAROLYN E. FARR TRUST; BETTY LOU CALHOUN; D.L. DOTSON ET UX;	20.16 ACRES +/-; 5 ACRES +/-; 0.54 ACRES +/-; 95.67 ACRES +/-; 58 ACRES +/-;			
ROBERT W. SPONAUGLE; LEONA STUTLER; GARY MORRIS; JANET FRALEY; CLARENCE W. MUTSCHELKNAUS ET UX	13 ACRES +/-; 26.183 ACRES +/-; 26 ACRES +/-; 41 ACRES +/-; 98 ACRES +/-;			
PROPOSED WORK: DRILL <input type="checkbox"/> CONVERT <input type="checkbox"/> DRILL DEEPER <input checked="" type="checkbox"/> REDRILL <input type="checkbox"/> FRACTURE OR STIMULATE <input checked="" type="checkbox"/>	PLUG OFF OLD FORMATION <input type="checkbox"/> PERFORATE NEW FORMATION <input checked="" type="checkbox"/> OTHER PHYSICAL CHANGE IN WELL			
(SPECIFY) MOD - BHL	PLUG & ABANDON <input type="checkbox"/> CLEAN OUT & REPLUG <input type="checkbox"/>			
TARGET FORMATION MARCELLUS	ESTIMATED DEPTH 7,400' TVD 17,550' MD			
WELL OPERATOR ANTERO RESOURCES CORP.	DESIGNATED AGENT DIANNA STAMPER			
ADDRESS 1815 WYNKOOP STREET	ADDRESS CT CORPORATION SYSTEM			
FORM WW-6 DENVER, CO 80202	CHARLESTON, WV 25313			

2,647' TO BOTTOM HOLE

10,965'

LONGITUDE 80°45'00"

LONGITUDE 80°42'30"

COUNTY NAME

PERMIT

LATITUDE 39°20'00"

10,818'

2,109' TO BOTTOM HOLE

LATITUDE 39°20'00"

2,647' TO BOTTOM HOLE

10,965'

LONGITUDE 80°45'00"

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Antero Resources Corporation
Well No. Fraley Unit 1H

WELL NO. 1H
BOTTOM HOLE

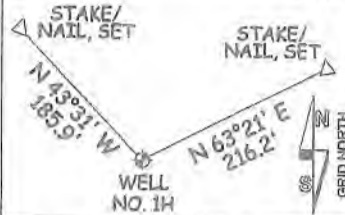
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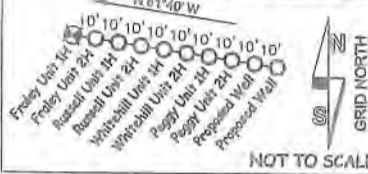
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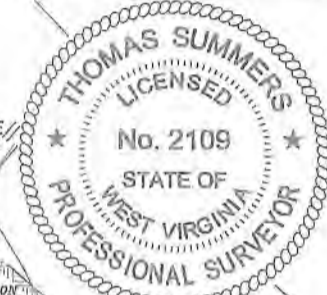
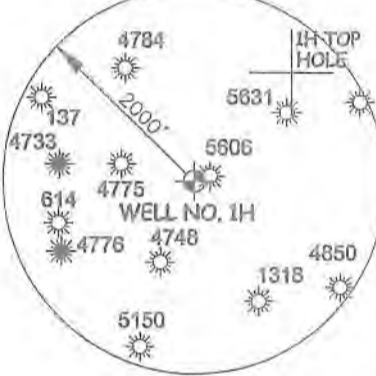
REFERENCES



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Office of Oil and Gas
MAR 24 2020
WV Department of
Environmental Protection

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OF ENVIRONMENTAL PROTECTION,
OFFICE OF OIL AND GAS

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220 MASONIC AVE. PENNSBORO
WEST VIRGINIA 26415

JOB # 17-024WA
DRAWING # FRALEY1HMOD
SCALE 1" = 1000'
MINIMUM DEGREE OF ACCURACY SUBMETER
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS
STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS

LEGEND
- - - Surface Owner Boundary Lines +/-
- - - Interior Surface Tracts +/-
X Existing Fence
Found monument, as noted
THOMAS SUMMERS P.S. 2109
DATE 03/19/20
OPERATOR'S WELL # FRALEY UNIT #1H

WELL TYPE: OIL GAS X LIQUID INJECTION WASTE DISPOSAL
(IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X
LOCATION: ELEVATION 1,275' -AS BUILT WATERSHED HEADWATERS MIDDLE ISLAND CREEK
QUADRANGLE SH - SMITHBURG 7.5' BH - WEST UNION 7.5' DISTRICT WEST UNION COUNTY DODDRIDGE
SURFACE OWNER SAMUEL AND PEGGY SMITH ACREAGE 28.956 ACRES +/-
OIL & GAS ROYALTY OWNER ELAINE DEBOLT; CAROLYN ROBISON ET AL; DAVID E. SPONAUGLE ET UX; LEASE ACREAGE 84.8 ACRES +/-; 26 ACRES +/-; 14.75 ACRES +/-
JIM SPENCER; SPENCER ENTERPRISES LLC; CAROLYN E. FARR TRUST; BETTY LOU CALHOUN; D.L. DOTSON ET UX; 20.16 ACRES +/-; 5 ACRES +/-; 0.54 ACRES +/-; 95.67 ACRES +/-; 58 ACRES +/-
ROBERT W. SPONAUGLE; LEONA STUTLER; GARY MORRIS; JANET FRALEY; CLARENCE W. MUTSCHELKNAUS ET UX; 13 ACRES +/-; 20.183 ACRES +/-; 26 ACRES +/-; 41 ACRES +/-; 96 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 PLUG & ABANDON CLEAN OUT & REPLUG
TARGET FORMATION MARCELLUS ESTIMATED DEPTH 7,400' TVD 17,550' 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

WW-6A1

Operator's Well Number

Fraley Unit 1H

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Office of Oil and Gas

INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE

MAR 24 2020

Chapter 22, Article 6A, Section 5(a)(5)

IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S)

WV Department of
Environmental Protection

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>Elaine Debolt Lease</u> Elaine Debolt	Antero Resources Corporation	1/8+	433/306
<u>Carolyn Robinson et al Lease</u> Carolyn Robinson et al Key Oil Company Antero Resources Appalachian Corporation	Key Oil Company Antero Resources Appalachian Corporation Antero Resources Corporation	1/8 Assignment Name Change	195/272 256/285 Exhibit 1
<u>Elaine Debolt Lease</u> Elaine Debolt	Antero Resources Corporation	1/8+	433/306
<u>David E. Sponaugle et ux Lease</u> David E. Sponaugle et ux Key Oil Company Antero Resources Appalachian Corporation	Key Oil Company Antero Resources Appalachian Corporation Antero Resources Corporation	1/8 Assignment Name Change	0195/0447 0276/0526 Exhibit 1
<u>Jim Spencer Lease</u> Jim Spencer	Antero Resources Corporation	1/8+	0368/0122
<u>Spencer Enterprises Lease</u> Spencer Enterprises	Antero Resources Corporation	1/8+	0378/0113
<u>Carolyn E. Farr Trust Lease</u> Carolyn E. Farr Trust Clarence E. Sigley	Clarence E. Sigley Antero Resources Corporation	1/8 Assignment	0387/0087 0419/0138
<u>Betty Lou Calhoun Lease</u> Betty Lou Calhan Key Oil Company Antero Resources Appalachian Corporation	Key Oil Company Antero Resources Appalachian Corporation Antero Resources Corporation	1/8 Assignment Name Change	0195/0462 0276/0526 Exhibit 1
<u>DL Dotson et ux Lease</u> DL Dotson et ux West Union Gas Company Pittsburgh & West Virginia Gas Company Pittsburgh & West Virginia Gas Company Equitable Gas Company EQT Production Company	West Union Gas Company Pittsburgh & West Virginia Gas Company Equitable Gas Company EQT Production Company Antero Resources Corporation	1/8 Conveyed Conveyed Name Change Assignment	0014/0359 0085/0390 0121/0257 0281/0346 0371/0270
<u>Robert W. Sponaugle Lease</u> Robert W. Sponaugle Key Oil Company Antero Resources Appalachian Corporation	Key Oil Company Antero Resources Appalachian Corporation Antero Resources Corporation	1/8 Assignment Name Change	0200/0159 0276/0526 Exhibit 1

*Partial Assignments to Antero Resources Corporation include 100% rights to extract, produce and market the oil and gas from the Marcellus and any other formations completed with this well.

CONTINUED ON NEXT PAGE

INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE
Chapter 22, Article 6A, Section 5(a)(5)
IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S) MAR 24 2020
WV Department of
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Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
√ Leona Stutler Lease			
Leona Stutler	Key Oil Company	1/8	0019/0174
Key Oil Company	Antero Resources Appalachian Corporation	Assignment	0276/0526
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
√ Gary Morris Lease			
Gary Morris	Key Oil Company	1/8	0199/0161
Key Oil Company	Antero Resources Appalachian Corporation	Assignment	0256/0285
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
√ Janet Fraley Lease			
Janet Fraley	Antero Resources Corporation	1/8+	0365/0452

WW-6A1
(5/13)

Operator's Well No. Fraley Unit 1H

RECEIVED
Office of Oil and Gas

MAR 24 2020

**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)**

WV Department of
Environmental Protection

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Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
✓ <u>Clarence Mutschelknaus Lease</u>	Clarence Mutschelknaus =	J&J Enterprises	1/8	0159/0662
	J&J Enterprises	Clarence Mutschelknaus	Assignment	0150/0658
	Clarence Mutschelknaus	Bluestone Energy Partners	Assignment	0249/343
	Bluestone Energy Partners	Antero Resources Appalachian Corporation	Merger	0288/0001
	Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1

*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 Corporation
 By: Tim Rady
 Its: VP of Land

**FORM WW-6A1
EXHIBIT 1**

FILED

JUN 10 2013

RECEIVED
Office of Oil and Gas

MAR 24 2020

WV Department of
Environmental Protection

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



IN THE OFFICE OF
SECRETARY OF STATE

Fenny Badger, Manager
Corporations Division
Tel: (304)558-8000
Fax: (304)558-8381
Website: www.wvsoed.com
E-mail: business@wvsoed.com

**APPLICATION FOR
AMENDED CERTIFICATE
OF AUTHORITY**

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

FILE ONE ORIGINAL
(Two if you want a filed
stamped copy returned to you)
FEE: \$25.00

*** In accordance with the provisions of the West Virginia Code, the undersigned corporation hereby ***
applies for an Amended Certificate of Authority and submits the following statement:

- Name under which the corporation was authorized to transact business in WV: Antero Resources Appalachia Corporation
- Date Certificate of Authority was issued in West Virginia: 6/26/2008
- 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.)
Alwyn A. Schopp (304) 367-7310
Contact Name Phone Number

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

Important Legal Notice Regarding Signatures For West Virginia Code §12D-1-12b. Penalty for signing false document. Any person who signs a document he or she knows is false in any material respect and knows that the document is to be delivered to the secretary of state for filing is guilty of a misdemeanor and, upon conviction thereof, shall be fined not more than one thousand dollars or confined in the county or regional jail not more than one year, or both.

17-06896 MOD1
17-06899 MOD1
17-06900 MOD1
17-06901 MOD1



March 23, 2020

Antero Resources
1615 Wynkoop Street
Denver, CO 80202
Office 303.357.7310
Fax 303.357.7315

West Virginia Department of Environmental Protection
Office of Oil and Gas
Attn: Ms. Laura Adkins
601 57th Street
Charleston, WV 25304

Ms. Laura Adkins:

Antero Resources Corporation (Antero) would like to submit the following permit modification for an approved well on the existing Peggy June Pad: Russell Unit 1H (API # 47-017-06900), Russell Unit 2H (API # 47-017-06901), Peggy Unit 2H (API # 47-017-06899) & Fraley Unit 1H (API # 47-017-06896).

Attached you will find the following documents:

- REVISED Form WW-6B, which shows the updated POE & Measured Depth
- REVISED Form WW-6A1, which shows the new leases we will be drilling into
- REVISED Mylar Plat, which shows the new Lateral Length & Estimated Measured Depth
- AOR & As-Built Design

If you have any questions please feel free to contact me at (303) 357-7223.

Thank you in advance for your consideration.

Sincerely,

A handwritten signature in black ink that appears to read "Megan Griffith". The signature is fluid and cursive.

Megan Griffith
Permitting Agent
Antero Resources Corporation

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WV Department of
Environmental Protection

Enclosures

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

1) Well Operator: Antero Resources Corporation 494507062 017 - Dodd West Uni Smithburg 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: Fraleley Unit 1H Well Pad Name: Peggy June Pad

3) Farm Name/Surface Owner: Samuel & Peggy Smith Public Road Access: Smithton Rd (Old US-50)

4) Elevation, current ground: 1275' 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: 7400' TVD, Anticipated Thickness- 55 feet, Associated Pressure- 2950#

8) Proposed Total Vertical Depth: 7400' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 17550' MD

11) Proposed Horizontal Leg Length: 8805'

12) Approximate Fresh Water Strata Depths: 145', 215', 320'

13) Method to Determine Fresh Water Depths: 4701708530000, 47017056060000, 47017013180000

14) Approximate Saltwater Depths: 1603'

15) Approximate Coal Seam Depths: 1601'

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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VOID

WW-6B
(04/15)

API NO. 47- 017 - 06896
OPERATOR WELL NO. Fraley Unit 1H
Well Pad Name: Peggy June 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, 77 Cu. Ft.
Fresh Water	13-3/8"	New	J-55/H-40	54.5#/48#	370 *see #19	370 *see #19	CTS, 514 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#	17550	17550	4418 Cu. Ft
Tubing	2-3/8"	New	N-80	4.7#			
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	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	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			RECEIVED Office of Oil and Gas
Sizes:	N/A			MAR 24 2020
Depths Set:	N/A			WV Department of Environmental Protection

WW-6B
(10/14)

API NO. 47-017 - 06896
OPERATOR WELL NO. Fraley Unit 1H
Well Pad Name: Peggy June 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): 40.52 Acres

22) Area to be disturbed for well pad only, less access road (acres): 8.89 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.

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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

WV Department of
Environmental Protection

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.

LATITUDE 39°20'00"

10,818'

2,109' TO BOTTOM HOLE
LATITUDE 39°20'00"

2,647' TO BOTTOM HOLE

10,965'
LONGITUDE 80°45'00"
LONGITUDE 80°42'30"

Antero Resources Corporation
Well No. Fraley Unit 1H

WELL NO. 1H
BOTTOM HOLE

NOTES:

WELL 1H TOP HOLE INFORMATION:
N: 295,000ft E: 1,647,253ft
LAT: 39°18'11.63" LON: 80°44'47.63"

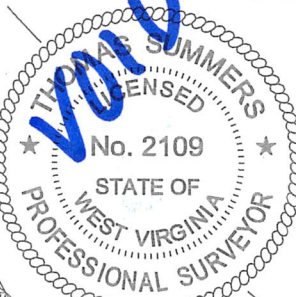
BOTTOM HOLE INFORMATION:
N: 303,360ft E: 1,644,288ft
LAT: 39°19'33.84" LON: 80°45'26.84"

WEST VIRGINIA COORDINATE

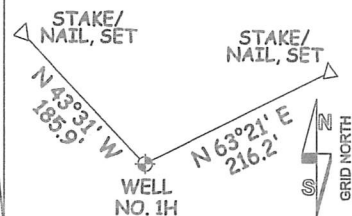
SYSTEM OF 1927 NORTH ZONE.
ZONE WAS DERIVED FROM
MEASUREMENTS TAKEN WITH
TRIMBLE GEOXT SUBMETER
MAPPING GRADE GPS UNIT.
PLAT ORIENTATION, CORNER,
AND WELL REFERENCE TIE LINES
ARE BASED ON GRID NORTH.

(NAD) 83 (UTM) ZONE 17 COORDS:
WELL 1H TOP HOLE INFORMATION:
N: 4,350,467m E: 521,867m
BOTTOM HOLE INFORMATION:
N: 4,352,999m E: 520,921m

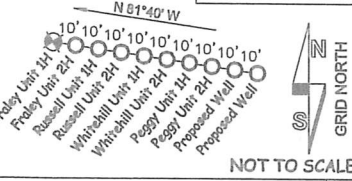
(NAD) 27 (UTM) ZONE 17 COORDS:
WELL 1H TOP HOLE INFORMATION:
N: 14,272,443ft E: 1,712,110ft
POINT OF ENTRY INFORMATION:
N: 14,272,356ft E: 1,711,659ft
BOTTOM HOLE INFORMATION:
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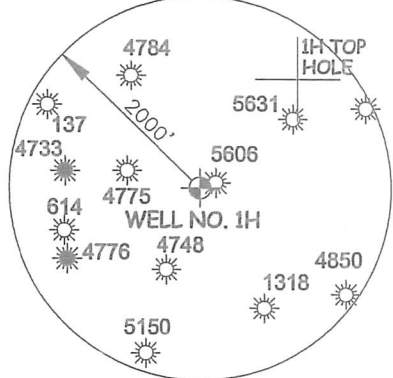
REFERENCES



PAD LAYOUT



NO WATER WELL WERE
LOCATED WITHIN 2000'
OF CENTER OF PAD



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 # 17-024WA
DRAWING # FRALEY1HMOD
SCALE 1" = 1000'
MINIMUM DEGREE OF ACCURACY SUBMETER
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

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

LEGEND

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

THOMAS SUMMERS P.S. 2109

DATE 03/19/20

OPERATOR'S WELL# FRALEY UNIT #1H

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

LOCATION: ELEVATION 1,275' - AS BUILT WATERSHED HEADWATERS MIDDLE ISLAND CREEK

QUADRANGLE SH - SMITHBURG 7.5' BH - WEST UNION 7.5' DISTRICT WEST UNION COUNTY DODDRIDGE

SURFACE OWNER SAMUEL AND PEGGY SMITH ACREAGE 28.956 ACRES +/-

OIL & GAS ROYALTY OWNER ELAINE DEBOLT; CAROLYN ROBISON ET AL; DAVID E. SPONAUGLE ET UX; LEASE ACREAGE 84.8 ACRES±; 26 ACRES±; 14.75 ACRES±;

JIM SPENCER; SPENCER ENTERPRISES LLC; CAROLYN E. FARR TRUST; BETTY LOU CALHOUN; D.L. DOTSON ET UX; 20.16 ACRES±; 5 ACRES±; 0.54 ACRES±; 95.67 ACRES±; 58 ACRES±;

ROBERT W. SPONAUGLE; LEONA STUTLER; GARY MORRIS; JANET FRALEY; CLARENCE W. MUTSCHELMKAUS ET UX 13 ACRES±; 26.183 ACRES±; 26 ACRES±; 41 ACRES±; 96 ACRES±

API WELL # 47 - 017 - 06896

STATE COUNTY PERMIT

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 7,400' TVD 17,550' 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

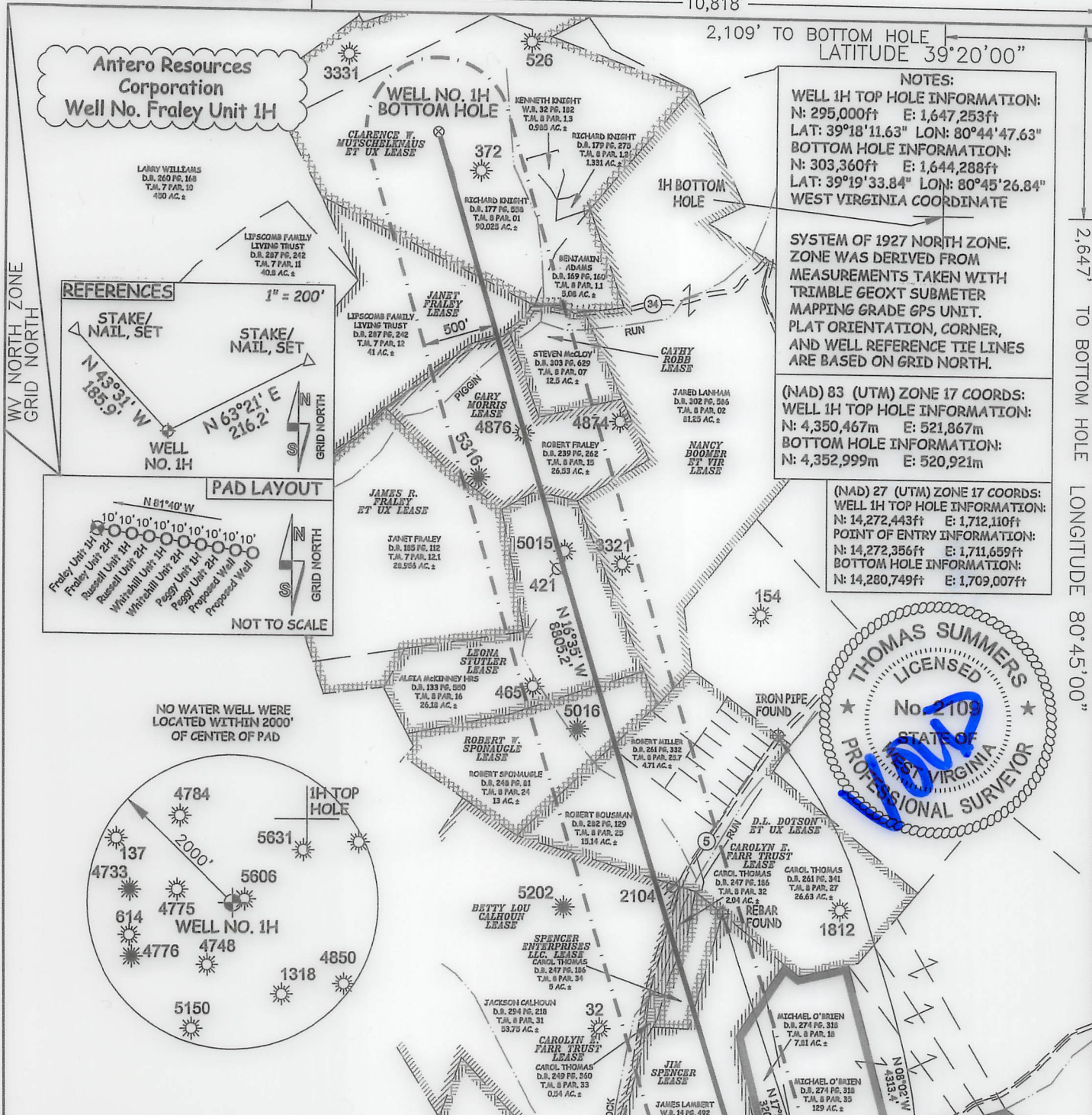
COUNTY NAME PERMIT

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10,818'

2,109' TO BOTTOM HOLE

LATITUDE 39°20'00"

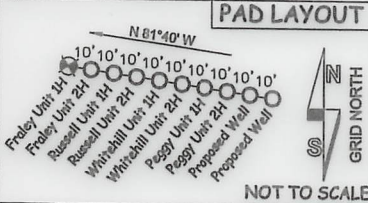
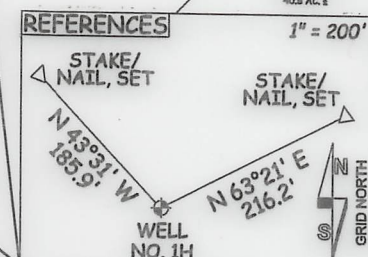
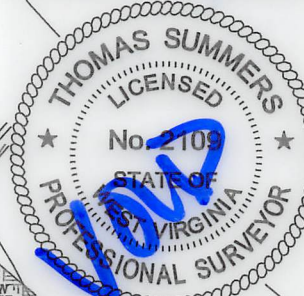


NOTES:
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 LAT: 39°18'11.63" LON: 80°44'47.63"
BOTTOM HOLE INFORMATION:
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 WEST VIRGINIA COORDINATE

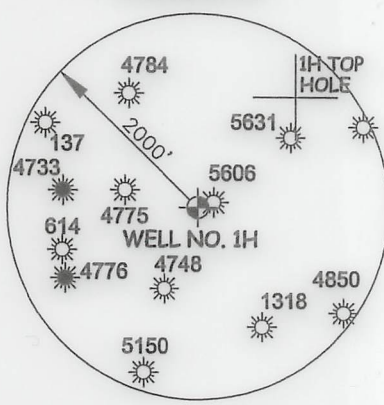
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NO WATER WELL WERE LOCATED WITHIN 2000' OF CENTER OF PAD



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WILLOW LAND SURVEYING PLLC
 220 MASONIC AVE. PENNSBORO
 WEST VIRGINIA 26415

JOB # 17-024WA
 DRAWING # FRALEY1HMOD
 SCALE 1" = 1000'
 MINIMUM DEGREE OF ACCURACY SUBMETER
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 STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS

LEGEND
 - - - Surface Owner Boundary Lines +/-
 - - - Interior Surface Tracts +/-
 X Existing Fence
 ⊕ Found monument, as noted
 THOMAS SUMMERS P.S. 2109
 DATE 03/19/20
 OPERATOR'S WELL# FRALEY UNIT #1H

WELL TYPE: OIL <input type="checkbox"/> GAS <input checked="" type="checkbox"/> LIQUID INJECTION <input type="checkbox"/> WASTE DISPOSAL <input type="checkbox"/>	API WELL #	47	017	06896
(IF "GAS") PRODUCTION <input type="checkbox"/> STORAGE <input type="checkbox"/> DEEP <input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/>	STATE	COUNTY	PERMIT	
LOCATION: ELEVATION 1275'-AS BUILT	WATERSHED HEADWATERS MIDDLE ISLAND CREEK			
QUADRANGLE SH - SMITHBURG 7.5' BH - WEST UNION 7.5' DISTRICT WEST UNION COUNTY DODDRIDGE				
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PROPOSED WORK: DRILL <input type="checkbox"/> CONVERT <input type="checkbox"/> DRILL DEEPER <input type="checkbox"/> REDRILL <input type="checkbox"/> FRACTURE OR STIMULATE <input checked="" type="checkbox"/>				
PLUG OFF OLD FORMATION <input type="checkbox"/> PERFORATE NEW FORMATION <input checked="" type="checkbox"/> OTHER PHYSICAL CHANGE IN WELL (SPECIFY) MOD - BHL	PLUG & ABANDON <input type="checkbox"/> CLEAN OUT & REPLUG <input type="checkbox"/>			
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2,647' TO BOTTOM HOLE

10,965'

LONGITUDE 80°45'00"

LONGITUDE 80°42'30"

COUNTY NAME

PERMIT

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.