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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

Austin Caperton, Cabinet Secretary  
[www.dep.wv.gov](http://www.dep.wv.gov)

Friday, January 25, 2019  
WELL WORK PERMIT  
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION  
1615 WYNKOOP STREET  
DENVER, CO 80202

Re: Permit approval for GALT UNIT 2H  
47-095-02562-00-00

This well work permit is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to any additional specific conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas Inspector.

Please be advised that form WR-35, Well Operators Report of Well Work is to be submitted to this office within 90 days of completion of permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

Per 35 CSR 4-5.2.g this permit will expire in two (2) years from the issue date unless 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: GALT UNIT 2H  
Farm Name: ANTERO MIDSTREAM, LLC  
U.S. WELL NUMBER: 47-095-02562-00-00  
Horizontal 6A New Drill  
Date Issued: 1/25/2019

**PERMIT CONDITIONS 4709502562**

West Virginia Code § 22-6A-8(d) allows the Office of Oil and Gas to place specific conditions upon this permit. Permit conditions have the same effect as law. Failure to adhere to the specified permit conditions may result in enforcement action.

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**CONDITIONS**

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1. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACE). Through this permit, you are hereby being advised to consult with USACE regarding this proposed activity.
2. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than one hundred (100) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.
3. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the moisture content of the fill material shall be within limits as determined by the Standard Proctor Density test of the actual soils used in specific engineered fill, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort, to achieve 95 % compaction of the optimum density. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.
4. Operator shall install signage per § 22-6A-8g (6) (B) at all source water locations included in their approved water management plan within 24 hours of water management plan activation.
5. Oil and gas water supply wells will be registered with the Office of Oil and Gas and all such wells will be constructed and plugged in accordance with the standards of the Bureau for Public Health set forth in its Legislative rule entitled *Water Well Regulations*, 64 C.S.R. 19. Operator is to contact the Bureau of Public Health regarding permit requirements. In lieu of plugging, the operator may transfer the well to the surface owner upon agreement of the parties. All drinking water wells within fifteen hundred feet of the water supply well shall be flow tested by the operator upon request of the drinking well owner prior to operating the water supply well.
6. Pursuant to the requirements pertaining to the sampling of domestic water supply wells/springs the operator shall, no later than thirty (30) days after receipt of analytical data provide a written copy to the Chief and any of the users who may have requested such analyses.
7. 24 hours prior to the initiation of the completion process the operator shall notify the Chief or his designee.
8. During the completion process the operator shall monitor annular pressures and report any anomaly noticed to the chief or his designee immediately.
9. If any explosion or other accident causing loss of life or serious personal injury occurs in or about a well or well work on a well, the well operator or its contractor shall give notice, stating the particulars of the explosion or accident, to the oil and gas inspector and the Chief, within 24 hours of said accident.
10. During the casing and cementing process, in the event cement does not return to the surface, the oil and gas inspector shall be notified within 24 hours.

**PERMIT CONDITIONS 4709502562**

11. The operator shall provide to the Office of Oil and Gas the dates of each of the following within 30 days of their occurrence: completion of construction of the well pad, commencement of drilling, cessation of drilling, completion of any other permitted well work, and completion of the well. Such notice shall be provided by sending an email to [DEPOOGNotify@wv.gov](mailto:DEPOOGNotify@wv.gov).

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

1) Well Operator: Antero Resources Corporation 494507062 Tyler Ellsworth Middlebourne 7.5'  
Operator ID County District Quadrangle

2) Operator's Well Number: Galt Unit 2H Well Pad Name: Ferrell Pad

3) Farm Name/Surface Owner: Glenn Austin Ferrell Public Road Access: CR 7

4) Elevation, current ground: 732' Elevation, proposed post-construction: ~731'

5) Well Type (a) Gas  Oil  Underground Storage

Other

(b) If Gas Shallow  Deep

Horizontal

*JCB  
11/28/2018*

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):  
Marcellus Shale: 6600' TVD, Anticipated Thickness- 55 feet, Associated Pressure- 2850#

8) Proposed Total Vertical Depth: 6600' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 17400' MD

11) Proposed Horizontal Leg Length: 8843'

12) Approximate Fresh Water Strata Depths: 194', 222', 243'

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

14) Approximate Saltwater Depths: 1224', 1347'

15) Approximate Coal Seam Depths: None Identified

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: \_\_\_\_\_

Depth: DEC 03 2018

Seam: \_\_\_\_\_

Owner: WV Department of Environmental Protection

WW-6B  
(04/15)

4709502562  
API NO. 47-095  
OPERATOR WELL NO. Galt Unit 2H  
Well Pad Name: Ferrell Pad

18)

**CASING AND TUBING PROGRAM**

<b>TYPE</b>	<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	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#	17400	17400	CTS, 4377 Cu. Ft.
Tubing	2-3/8"	New	N-80	4.7#			
Liners							

*JCB  
11/29/2018*

<b>TYPE</b>	<u>Size (in)</u>	<u>Wellbore Diameter (in)</u>	<u>Wall Thickness (in)</u>	<u>Burst Pressure (psi)</u>	<u>Anticipated Max. Internal Pressure (psi)</u>	<u>Cement Type</u>	<u>Cement Yield (cu. ft./k)</u>
Conductor	20"	24"	0.438"	1530	50	Class A	~1.18
Fresh Water	13-3/8"	17-1/2"	0.38"	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	2500	Lead-HI/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.

*JCB*  
11/28/2018

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): 38.20 acres

22) Area to be disturbed for well pad only, less access road (acres): 10.78 acres

23) Describe centralizer placement for each casing string:

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

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

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

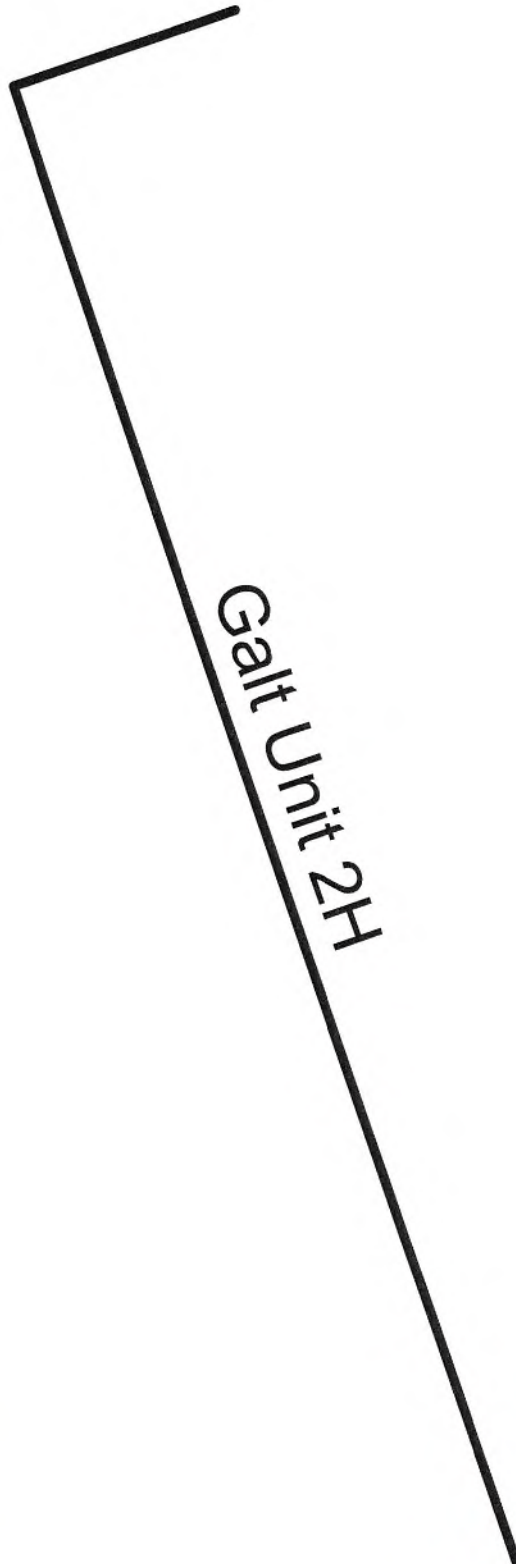
25) Proposed borehole conditioning procedures:

Conductor: blowhole clean with air, run casing, 10 bbls fresh water.  
Surface: blowhole clean with air, trip to conductor shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate pipe capacity + 40 bbls fresh water followed by 25 bbls bentonite mud, 10 bbls fresh water spacer.  
Intermediate: blowhole clean with air, trip to surface casing shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate 40 bbls brine water followed by 10 bbls fresh water and 25 bbls bentonite mud, pump 10 bbls fresh water.  
Production: circulate with 14 lb/gal NaCl mud, trip to middle of lateral, circulate, pump high viscosity sweep, trip to base of curve, pump high viscosity sweep, trip to top of curve, trip to bottom, circulate, pump high viscosity sweep, trip out, run casing, circulate 10 bbls fresh water, pump 48 bbls barite pill, pump 10 bbls fresh water followed by 48 bbls mud flush and 10 bbls water.

\*Note: Attach additional sheets as needed.



4709502562



Galt Unit 2H

4709502380000

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WV Department of  
Environmental Protection



Antero Resources Corporation

Galt Unit 2H



WELL SYMBOLS  
Gas Well

October 17, 2018

4709502562

UWI (API/Num)	Well Name	Well Number	Operator	Hist Oper	TD	Perforated Interval (shallowest, deepest)	Perforated Formation(s)	Producible Formation(s) not perf'd
4709502380000	SAN JUAN UNIT	1H	ANTERO RESOURCES CORPORATION		15,278	6799 - 15175	Marcellus	N/A

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Environmental Protection





4709502562

WW-9  
(4/16)

API Number 47 - 095 - \_\_\_\_\_  
Operator's Well No. Galt Unit 2H \_\_\_\_\_

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Antero Resources Corporation OP Code 494507062

Watershed (HUC 10) Outlet Middle Island Creek Quadrangle Middlebourne 7.5'

Do you anticipate using more than 5,000 bbls of water to complete the proposed well work? Yes  No

Will a pit be used? Yes  No

If so, please describe anticipated pit waste: No pit will be used at this site (Drilling and Flowback Fluids will be stored in tanks. Cuttings will be tanked and hauled off site.)

Will a synthetic liner be used in the pit? Yes  No  If so, what ml.? N/A

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection ( UIC Permit Number: \*UIC Permit # will be provided on Form WR-34 )
- Reuse (at API Number Future permitted well locations when applicable. API# will be provided on Form WR-34 )
- Off Site Disposal (Supply form WW-9 for disposal location) (Meadowfill Landfill Permit #SWF-1032-98)
- Other (Explain Northwestern Landfill Permit #SWF-1025/WV0109410)

*JOB 11/20/2018*

Will closed loop system be used? If so, describe: Yes, fluids stored in tanks, cuttings removed offsite and taken to landfill.

Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc.

Surface - Air/Freshwater, Intermediate - Dust/SWF Foam, Production - Water Based Mud

-If oil based, what type? Synthetic, petroleum, etc. Synthetic

Additives to be used in drilling medium? Please See Attachment

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. Drill cuttings stored in tanks, removed offsite and taken to landfill.

-If left in pit and plan to solidify what medium will be used? (cement, lime, sawdust) N/A

-Landfill or offsite name/permit number? Meadowfill Landfill (Permit #SWF-1032-98), Northwestern Landfill (Permit # SWF-1025/WV0109410)

Permittee shall provide written notice to the Office of Oil and Gas of any load of drill cuttings or associated waste rejected at any West Virginia solid waste facility. The notice shall be provided within 24 hours of rejection and the permittee shall also disclose where it was properly disposed.

I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on August 1, 2005, by the Office of Oil and Gas of the West Virginia Department of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations of any term or condition of the general permit and/or other applicable law or regulation can lead to enforcement action.

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment.

Company Official Signature Gretchen Kohler

Company Official (Typed Name) Gretchen Kohler

Company Official Title Senior Environmental & Regulatory Manager

Subscribed and sworn before me this 23rd day of October, 2018

*CF Meador*

Notary Public

My commission expires MARCH 13, 2022

MEGAN GRIFFITH  
NOTARY PUBLIC  
STATE OF COLORADO  
NOTARY ID 20184011666  
MY COMMISSION EXPIRES MARCH 13, 2022

Antero Resources Corporation

Proposed Revegetation Treatment: Acres Disturbed 38.20 acres Prevegetation pH \_\_\_\_\_

Lime 2-4 Tons/acre or to correct to pH 6.5

Fertilizer type Hay or straw or Wood Fiber (will be used where needed)

Fertilizer amount 500 lbs/acre

Mulch 2-3 Tons/acre

Access Road "A" (9.68 acres) + Access Road "B" (0.34 acres) + Access Road "C" (1.10) + Well Pad (10.78 acres) + Water Containment Pad (2.96 acres) + Production Equipment Pad (5.53 acres) + Excess/Topsoil Material Stockpiles (7.79 acres) = 38.20 Acres

Seed Mixtures

Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
Annual Ryegrass	40	Crownvetch	10-15
Field Bromegrass	40	Tall Fescue	30
See attached Table IV-3 for additional seed type (Ferrell Pad Design)		See attached Table IV-4A for additional seed type (Ferrell Pad Design)	

\*or type of grass seed requested by surface owner

\*or type of grass seed requested by surface owner

Attach:

Maps(s) of road, location, pit and proposed area for land application (unless engineered plans including this info have been provided). If water from the pit will be land applied, include dimensions (L x W x D) of the pit, and dimensions (L x W), and area in acreage, of the land application area.

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: J Craig Blewett

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Title: Oil & Gas Inspector Date: 11/29/2018

Field Reviewed? (  ) Yes (  ) No

**Form WW-9 Additives Attachment****SURFACE INTERVAL**

1. Fresh Water
2. Soap –Foamer AC
3. Air

**INTERMEDIATE INTERVAL*****STIFF FOAM RECIPE:***

- 1) 1 ppb Soda Ash / Sodium Carbonate-Alkalinity Control Agent
- 2) 1 ppb Conqor 404 ( 11.76 ppg) / Corrosion Inhibitor
- 3) 4 ppb KLA-Gard ( 9.17 ppg) / Amine Acid Complex-Shale Stabilizer
- 4) 1ppb Mil Pac R / Sodium Carboxymethylcellulose-Filtration Control Agent
- 5) 12 ppb KCL / Potassium Chloride-inorganic Salt
- 6) Fresh Water 80 bbls
- 7) Air

**PRODUCTION INTERVAL**

1. Alpha 1655  
Salt Inhibitor
2. Mil-Carb  
Calcium Carbonate
3. Cottonseed Hulls  
Cellulose-Cottonseed Pellets – LCM
4. Mil-Seal  
Vegetable, Cotton & Cellulose-Based Fiber Blend – LCM
5. Clay-Trol  
Amine Acid Complex – Shale Stabilizer
6. Xan-Plex  
Viscosifier For Water Based Muds
7. Mil-Pac (All Grades)  
Sodium Carboxymethylcellulose – Filtration Control Agent
8. New Drill  
Anionic Polyacrylamide Copolymer Emulsion – Shale Stabilizer
9. Caustic Soda  
Sodium Hydroxide – Alkalinity Control
10. Mil-Lime  
Calcium Hydroxide – Lime
11. LD-9  
Polyether Polyol – Drilling Fluid Defoamer
12. Mil Mica  
Hydro-Biotite Mica – LCM

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13. Escaid 110  
Drilling Fluid Solvent – Aliphatic Hydrocarbon
14. Ligco  
Highly Oxidized Leonardite – Filtration Control Agent
15. Super Sweep  
Polypropylene – Hole Cleaning Agent
16. Sulfatrol K  
Drilling Fluid Additive – Sulfonated Asphalt Residuum
17. Sodium Chloride, Anhydrous  
Inorganic Salt
18. D-D  
Drilling Detergent – Surfactant
19. Terra-Rate  
Organic Surfactant Blend
20. W.O. Defoam  
Alcohol-Based Defoamer
21. Perma-Lose HT  
Fluid Loss Reducer For Water-Based Muds
22. Xan-Plex D  
Polysaccharide Polymer – Drilling Fluid Viscosifier
23. Walnut Shells  
Ground Cellulosic Material – Ground Walnut Shells – LCM
24. Mil-Graphite  
Natural Graphite – LCM
25. Mil Bar  
Barite – Weighting Agent
26. X-Cide 102  
Biocide
27. Soda Ash  
Sodium Carbonate – Alkalinity Control Agent
28. Clay Trol  
Amine Acid complex – Shale Stabilizer
29. Sulfatrol  
Sulfonated Asphalt – Shale Control Additive
30. Xanvis  
Viscosifier For Water-Based Muds
31. Milstarch  
Starch – Fluid Loss Reducer For Water Based Muds
32. Mil-Lube  
Drilling Fluid Lubricant

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OCT 25 2018

WV Department of  
Environmental Protection



4709502562

911 Address

1476 Wick Rd.

Middlebourne, WV 26149

## Well Site Safety Plan

### Antero Resources

**Well Name:** Daniels Unit 1H-3H, Galt Unit 1H-3H,  
Guild Unit 1H-4H, Hennessy Unit 1H &  
2H, Remo Unit 1H & 2H

**Pad Location:** FERRELL PAD  
Tyler County/Ellsworth District

#### GPS Coordinates:

**Entrance** - Lat 39°28'23.51"/Long -80°54'24.45" (NAD83)

**Pad Center** - Lat 39°28'19.84"/Long -80°55'3.60" (NAD83)

#### Driving Directions:

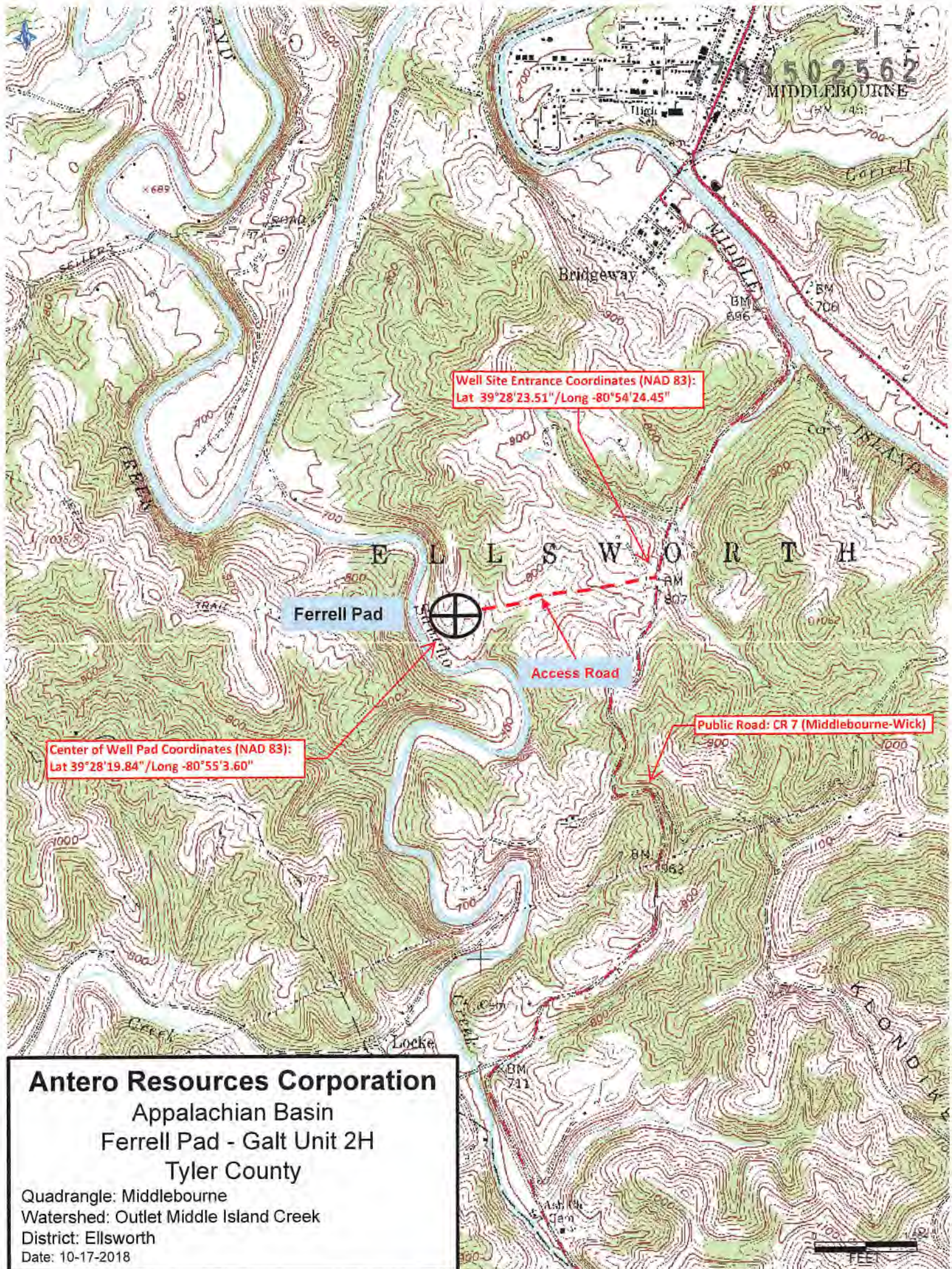
From the intersection of Broad St and Main St in the town of Middlebourne: Head southwest on WV-18 S/Main St toward Wilcox Ave for 0.3 miles. Turn right onto Bridgeway Rd for 0.1 miles. Turn left onto Middlebourne-Wick/Wick Rd for 1.3 miles. Access road will be on your right.

#### Alternate Route:

From the intersection of Highway 50 and WV-18 in West Union: Head west on WV-18 N for 0.6 miles. Turn left onto Davis St/Old U.S. 50 W for 0.4 miles. Turn right onto WV-18/Sisterville Pike for 25.4 miles. Turn left onto Bridgeway Rd for 0.1 miles. Turn left onto Middlebourne-Wick/Wick Rd for 1.3 miles. Access road will be on your right.

**EMERGENCY (24 HOUR) CONTACT 1-800-878-1373**

*JOB*  
11/28/2018



Well Site Entrance Coordinates (NAD 83):  
Lat 39°28'23.51"/Long -80°54'24.45"

Center of Well Pad Coordinates (NAD 83):  
Lat 39°28'19.84"/Long -80°55'3.60"

Public Road: CR 7 (Middlebourne-Wick)

**Antero Resources Corporation**  
Appalachian Basin  
Ferrell Pad - Galt Unit 2H  
Tyler County

Quadrangle: Middlebourne  
Watershed: Outlet Middle Island Creek  
District: Ellsworth  
Date: 10-17-2018

10,510' to Bottom Hole

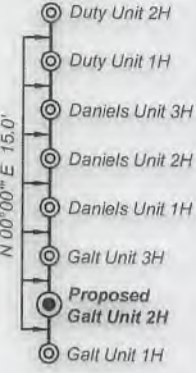
309' to Top Hole

TOP HOLE LATITUDE 39 - 30 - 00  
BTM HOLE LATITUDE 39 - 27 - 30

Antero Resources  
Well No. Galt Unit 2H  
Antero Resources  
Corporation

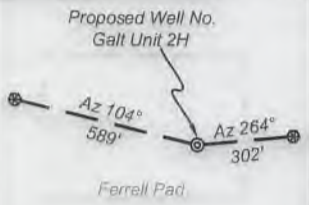
Wellhead Layout

Not to Scale

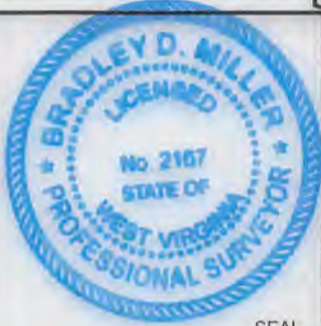


Well Location References

1" = 600'



Note: 1 spring was found within 2000' of proposed well. No occupied dwellings or buildings 2,500 square feet or larger used to house or shelter dairy cattle or poultry husbandry are located within 625' of the center of the well pad. There were no gas wells found or documented within 3000' of the proposed well.



SEAL

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 prescribed by the Department of Environmental Protection.

Bradley D. Miller, P.S. 2167

Bearing	Dist.
L1 S 40°27' W	2,767.1'
L2 N 56°44' W	2,273.4'
L3 N 46°50' W	1,207.3'
L4 S 89°32' E	2,252.0'
L5 S 83°58' W	1,411.2'

Notes:  
Well No. Galt Unit 2H  
UTM Zone 17, NAD 1927  
Top Hole Coordinates  
N: 14,333,810.42'  
E: 1,663,785.52'  
Point of Entry Coordinates  
N: 14,333,637.81'  
E: 1,662,385.43'  
Bottom Hole Coordinates  
N: 14,325,275.27'  
E: 1,665,250.33'

Notes:  
West Virginia Coordinate System of 1927, North Zone based upon Differential GPS Measurements.  
Well No. Galt Unit 2H Top Hole coordinates are  
N: 357,187.07' Latitude: 39°28'19.29"  
E: 1,599,942.91' Longitude: 80°55'01.89"  
Bottom Hole coordinates are  
N: 348,625.71' Latitude: 39°26'54.89"  
E: 1,601,265.50' Longitude: 80°54'43.31"  
UTM Zone 17, NAD 1983  
Top Hole Coordinates Bottom Hole Coordinates  
N: 4,369,171.768m N: 4,366,570.255m  
E: 507,137.305m E: 507,583.780m  
Plat orientation and corner and well references are based upon the grid north meridian.  
Well location references are based upon the magnetic meridian.

ID	TM/Par	Owner	Bk/Pg	Acres
1	26/4		312/330	16.200
2	26/5	Robert L. Keller	312/330	20.010
3	26/7		312/330	22.090
4	26/9.1		393/474	1.805
5	26/9.2		393/474	1.908
6	26/9.3	Alicia Moseley	393/474	1.915
7	26/9.4		393/474	1.871
8	26/9.5		393/474	1.917
9	26/9.6		327/789	1.885
10	26/9.9	Kathryn Clow	326/307	1.599
11	26/9.10		323/504	1.200
12	26/9.7		404/352	2.048
13	26/9.8		404/352	1.751
14	26/9.11	JB Exploration I, LLC	404/352	1.569
15	26/9		404/352	28.021
16	26/9.12		404/352	4.285
17	26/10	Robert L. Keller	312/330	12.25
18	26/15		312/330	15.14
19	26/30	Ronald E. Stevens	WB34/467	4.470
20	26/26.3	Charles & Donna Mead	351/550	10.106
21	26/26.2		347/516	13.262
22	26/29	Virginia Frazier	175/414	2.340
23	26/31	Edwin K. Livingston Sr.	269/1	13.430
24	26/32		WB14/50	3.100
25	26/33	Denver A. & Carolyn F. McMullen	176/548	0.750
26	3/6.1	Virgil R. & Janice E. McMullen	308/290	12.000
27	29/1		230/799	1.000
28	26/35	Ronald L. Stevens, et al	AR44/570	13.610
29	6/7.1		AR44/570	9.810
30	6/7	Patsy Jean & Baker Donald Fletcher	110/551	69.000
31	29/15	Carl & Charles L. Fairbee	344/317	41.000



Leases

- A. Kathryn T. Clow Lease
- B. Alice Moseley Lease
- C. Winifred Antalek Lease
- D. Edwin K. Livingston, Sr. Lease
- E. Clarence W. Mutschelknaus, Sr., et al Lease
- F. Susan E. Garnel Lease

Legend

- ⊙ Proposed gas well
- ⊛ Monument, as noted
- ⊙ Existing Well, as noted
- Creek or Drain
- Existing Road
- Surface boundary (approx.)
- Interior surface tracts (approx.)

FILE NO: 13-54-E-17  
DRAWING NO: Galt 2H Well Plat  
SCALE: 1" = 1200'  
MINIMUM DEGREE OF ACCURACY: Submeter  
PROVEN SOURCE OF ELEVATION: WVDOT, Harrisville, WV

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

DATE: October 22, 2018  
OPERATOR'S WELL NO. Galt Unit 2H  
API WELL NO. 47 - 095 - 02562  
STATE COUNTY PERMIT

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

LOCATION: ELEVATION: Proposed 731' Existing 732' WATERSHED: Outlet Middle Island Creek QUADRANGLE: Middlebourne  
DISTRICT: Ellsworth COUNTY: Tyler 118.63; 51.29; 173.29; 164.91; 63.4; 46.6425;

SURFACE OWNER: Antero Midstream, LLC Denver A. McMullen, et ux; Helen Reed, et al; Robert L. Keller; Clarence W. Mutschelknaus Sr., et al; ACREAGE: 203.59  
ROYALTY OWNER: Larry R. Henthorn, et ux; Richard L. Clark (2); Winifred Antalek; LEASE NO: ACREAGE: 61.71875; 63.02;

PROPOSED WORK:  DRILL  CONVERT  DRILL DEEPER  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION  
 PERFORATE NEW FORMATION  OTHER PHYSICAL CHANGE IN WELL (SPECIFY) 6,600' TVD  
 PLUG AND ABANDON  CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 17,400' MD

WELL OPERATOR: Antero Resources Corporation DESIGNATED AGENT: Dianna Stamper - CT Corporation System  
ADDRESS: 1615 Wynkoop Street ADDRESS: 5400 D Big Tyler Road  
Denver, CO 80202 Charleston, WV 25313

TOP HOLE LONGITUDE 80 - 55 - 00  
BTM HOLE LONGITUDE 80 - 52 - 30  
3,390' to Bottom Hole  
10,186' to Top Hole

WW-6A1

Operator's Well Number Galt Unit 2H

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>Larry R. Henthorn, et ux Lease</u>			
Larry R. Henthorn, et ux	Antero Resources Corporation	1/8+	0579/0847
<u>Richard L. Clark Lease (TM 26 PCL 3)</u>			
Richard L. Clark	Antero Resources Corporation	1/8+	0583/0544
<u>Richard L. Clark Lease (TM 26 PCL 2)</u>			
Richard L. Clark	Antero Resources Corporation	1/8+	0583/0544
<u>Winifred Antalek Lease</u>			
Winifred Antalek	Appleton Max LLC	1/8	0385/0133
Appleton Max LLC	JB Exploration I LLC	Assignment	0395/0506
JB Exploration I LLC	Jay-Bee Oil & Gas Company	Agreement	0439/0586
Jay-Bee Oil & Gas Company	Chesapeake Appalachia LLC	Assignment	0416/0656
Chesapeake Appalachia LLC	SWN Production Company LLC	Assignment	0465/0463
SWN Production Company LLC	Antero Exchange Properties LLC	Assignment	0544/0242
Antero Exchange Properties LLC	Antero Resources Corporation	Merger	0552/0315
<u>Robert L. Keller Lease</u>			
Robert L. Keller	Antero Resources Corporation	1/8+	0436/0412
<u>Clarence W. Mutschelknaus Sr. et al Lease</u>			
Clarence W. Mutschelknaus Sr. et al	Antero Resources Corporation	1/8+	0503/0802
<u>Denver A. McMullen et ux Lease</u>			
Denver A. McMullen et ux	TNG LLC	1/8	0382/0598
TNG LLC	JB Exploration I LLC	Assignment	0398/0506
JB Exploration I LLC	Jay Bee Oil & Gas Inc	Merger	0439/0586
Jay Bee Oil & Gas Inc	Statoil USA Onshore Properties LLC	Assignment	0416/0656
Statoil USA Onshore Properties LLC	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 LLC	Assignment	0544/0242
Antero Exchange Properties LLC	Antero Resources Corporation	Merger	0552/0315

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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\*\*



WW-6A1  
(5/13)

Operator's Well No. Galt Unit 2H

**INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE  
Chapter 22, Article 6A, Section 5(a)(5)  
IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S)**

Under the oath required to make the verification on page 1 of this Notice and Application, I depose and say that I am the person who signed the Notice and Application for the Applicant, and that –

- (1) the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;
- (2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
<u>Helen Reed et al Lease</u>	Helen Reed et al	TNG LLC	1/8	0389/0770
	TNG LLC	JB Exploration I LLC	Assignment	0398/0506
	JB Exploration I LLC	Jay-Bee Oil & Gas Company	Agreement	0439/0586
	Jay-Bee Oil & Gas Company	Chesapeake Appalachia LLC	Assignment	0416/0656
	Chesapeake Appalachia LLC	SWN Production Company LLC	Assignment	0465/0463
	SWN Production Company LLC	Antero Exchange Properties LLC	Assignment	0544/0242
	Antero Exchange Properties LLC	Antero Resources Corporation	Merger	0552/0315

\*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: Kevin Kilstrom

Its: Senior VP of Production

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OCT 25 2018  
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Environmental Protection

FORM WV-6A1  
EXHIBIT 1

FILED

JUN 10 2013

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

Penny Barber, Manager  
Corporations Division  
Tel: (304)558-8000  
Fax: (304)558-8381  
Website: www.wvscot.com  
E-mail: business@wvscot.com

FILE ONE ORIGINAL  
(Two if 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 Appalachia Corporation
- 2. Date Certificate of Authority was issued in West Virginia: 6/26/2008
- 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) 357-7310  
Contact Name Phone Number

7. Signature Information (See below *Important Legal Notice Regarding Signatures*):

Print Name of Signer: Alvyn A. Schopp Title/Capacity: Authorized Person

Signature: *Alvyn A. Schopp* Date: June 10, 2013

*Important Legal Notice Regarding Signatures* For West Virginia Code §11D-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.

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OCT 25 2018  
WV Department of  
Environmental Protection



October 23, 2018

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

West Virginia Department of Environmental Protection  
Chief, Office of Oil and Gas  
Attn: Mr. James Martin  
601 57<sup>th</sup> Street SE  
Charleston, WV 25304

RE: Galt Unit 2H  
Quadrangle: Middlebourne 7.5'  
Tyler County/Ellsworth District, West Virginia

Mr. Martin:

Antero Resources Corporation (Antero) is submitting the following application for a new well work permit for the Galt Unit 2H horizontal shallow well. As an authorized representative, I certify that Antero has the right to extract, produce or market the oil or gas for all leases through which the Galt Unit 2H horizontal lateral will drill through including any and all roads crossed under as identified on the attached survey plat.

Sincerely,

A handwritten signature in blue ink, appearing to read "Haley West", written in a cursive style.

Haley West  
Landman

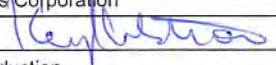
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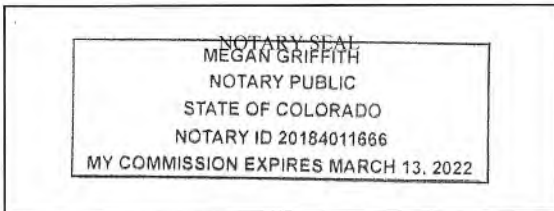


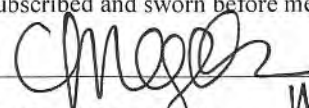
WW-6AC  
(1/12)

**Certification of Notice is hereby given:**

THEREFORE, I Kevin Kilstrom, have read and understand the notice requirements within West Virginia Code § 22-6A. I certify that as required under West Virginia Code § 22-6A, I have served the attached copies of the Notice Forms, identified above, to the required parties through personal service, by registered mail or by any method of delivery that requires a receipt or signature confirmation. I certify under penalty of law that I have personally examined and am familiar with the information submitted in this Notice Certification and all attachments, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Well Operator:	<u>Antero Resources Corporation</u>	Address:	<u>1615 Wynkoop Street</u>
By:	<u>Kevin Kilstrom</u> 		<u>Denver, CO 80202</u>
Its:	<u>Senior VP of Production</u>	Facsimile:	<u>303-357-7315</u>
Telephone:	<u>303-357-7310</u>	Email:	<u>mgriffith@anteroresources.com</u>



Subscribed and sworn before me this 23<sup>rd</sup> day of October 2018  
  
 \_\_\_\_\_ Notary Public  
 My Commission Expires MARCH 13, 2022

**Oil and Gas Privacy Notice:**

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at [depprivacyofficer@wv.gov](mailto:depprivacyofficer@wv.gov).

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Environmental Protection

WW-6A  
(9-13)

API NO. 47- 095 -  
OPERATOR WELL NO. Galt Unit 2H  
Well Pad Name: Ferrell Pad

**STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
NOTICE OF APPLICATION**

**Notice Time Requirement:** notice shall be provided no later than the **filing date of permit application.**

**Date of Notice:** 10/23/2018 **Date Permit Application Filed:** 10/23/2018

Notice of:

- PERMIT FOR ANY WELL WORK
- CERTIFICATE OF APPROVAL FOR THE CONSTRUCTION OF AN IMPOUNDMENT OR PIT

**Delivery method pursuant to West Virginia Code § 22-6A-10(b)**

- PERSONAL SERVICE
- REGISTERED MAIL
- METHOD OF DELIVERY THAT REQUIRES A RECEIPT OR SIGNATURE CONFIRMATION

Pursuant to W. Va. Code § 22-6A-10(b) no later than the filing date of the application, the applicant for a permit for any well work or for a certificate of approval for the construction of an impoundment or pit as required by this article shall deliver, by personal service or by registered mail or by any method of delivery that requires a receipt or signature confirmation, copies of the application, the erosion and sediment control plan required by section seven of this article, and the well plat to each of the following persons: (1) The owners of record of the surface of the tract on which the well is or is proposed to be located; (2) The owners of record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used for roads or other land disturbance as described in the erosion and sediment control plan submitted pursuant to subsection (c), section seven of this article; (3) The coal owner, operator or lessee, in the event the tract of land on which the well proposed to be drilled is located [sic] is known to be underlain by one or more coal seams; (4) The owners of record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used for the placement, construction, enlargement, alteration, repair, removal or abandonment of any impoundment or pit as described in section nine of this article; (5) Any surface owner or water purveyor who is known to the applicant to have a water well, spring or water supply source located within one thousand five hundred feet of the center of the well pad which is used to provide water for consumption by humans or domestic animals; and (6) The operator of any natural gas storage field within which the proposed well work activity is to take place. (c)(1) If more than three tenants in common or other co-owners of interests described in subsection (b) of this section hold interests in the lands, the applicant may serve the documents required upon the person described in the records of the sheriff required to be maintained pursuant to section eight, article one, chapter eleven-a of this code. (2) Notwithstanding any provision of this article to the contrary, notice to a lien holder is not notice to a landowner, unless the lien holder is the landowner. W. Va. Code R. § 35-8-5.7.a requires, in part, that the operator shall also provide the Well Site Safety Plan ("WSSP") to the surface owner and any water purveyor or surface owner subject to notice and water testing as provided in section 15 of this rule.

Application Notice  WSSP Notice  E&S Plan Notice  Well Plat Notice is hereby provided to:

SURFACE OWNER(s)  
Name: Antero Resources Midstream  
Address: 1615 Wynkoop Street  
Denver, CO 80202  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_

SURFACE OWNER(s) (Road and/or Other Disturbance)  
Name: Antero Resources Midstream  
Address: 1615 Wynkoop Street  
Denver, CO 80202  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_

SURFACE OWNER(s) (Impoundments or Pits)  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_

COAL OWNER OR LESSEE  
Name: NO DECLARATIONS ON RECORD WITH COUNTY  
Address: \_\_\_\_\_

COAL OPERATOR  
Name: NO DECLARATIONS ON RECORD WITH COUNTY  
Address: \_\_\_\_\_

WATER PURVEYOR(s)/OWNER(s) OF WATER WELL,  
\_SPRING OR OTHER WATER SUPPLY SOURCE  
Name: NO DECLARATIONS ON RECORD WITH COUNTY  
Address: \_\_\_\_\_

OPERATOR OF ANY NATURAL GAS STORAGE FIELD  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_

\*Please attach additional forms if necessary

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OCT 25 2018

WV Department of  
Environmental Protection

WW-6A  
(8-13)

API NO. 47- 095 -  
OPERATOR WELL NO. Galt Unit 2H  
Well Pad Name: Ferrell Pad

**Notice is hereby given:**

Pursuant to West Virginia Code § 22-6A-10(b), notice is hereby given that the undersigned well operator has applied for a permit for well work or for a certificate of approval for the construction of an impoundment or pit.

**This Notice Shall Include:**

Pursuant to W. Va. Code § 22-6A-10(b), this notice shall include: (1) copies of the application; (2) the erosion and sediment control plan required by section seven of this article; and (3) the well plat.

Pursuant to W. Va. Code § 22-6A-10(f), this notice shall include: (1) a statement of the time limits for filing written comments; (2) who may file written comments; (3) the name and address of the secretary for the purpose of filing the comments and obtaining additional information; and (4) a statement that the persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water.

Pursuant to W. Va. Code R. § 35-8-5.7.a, the operator shall provide the Well Site Safety Plan to the surface owner and any water purveyor or surface owner subject to notice and water testing as provided in section 15 of this rule.

Pursuant to W. Va. Code R. § 35-8-15.2.c, this notice shall: (1) contain a statement of the surface owner's and water purveyor's right to request sampling and analysis; (2) advise the surface owner and water purveyor of the rebuttable presumption for contamination or deprivation of a fresh water source or supply; advise the surface owner and water purveyor that refusal to allow the operator to conduct a pre-drilling water well test constitutes a method to rebut the presumption of liability; (3) advise the surface owner and water purveyor of his or her independent right to sample and analyze any water supply at his or her own expense; advise the surface owner and water purveyor whether or not the operator will utilize an independent laboratory to analyze any sample; and (4) advise the surface owner and or water purveyor that he or she can obtain from the Chief a list of water testing laboratories in the subject area capable of and qualified to test water supplies in accordance with standard acceptable methods.

Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57<sup>th</sup> Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting [www.dep.wv.gov/oil-and-gas/pages/default.aspx](http://www.dep.wv.gov/oil-and-gas/pages/default.aspx).

**Well Location Restrictions**

Pursuant to W. Va. Code § 22-6A-12, Wells may not be drilled within two hundred fifty feet measured horizontally from any existing water well or developed spring used for human or domestic animal consumption. The center of well pads may not be located within six hundred twenty-five feet of an occupied dwelling structure, or a building two thousand five hundred square feet or larger used to house or shelter dairy cattle or poultry husbandry. This limitation is applicable to those wells, developed springs, dwellings or agricultural buildings that existed on the date a notice to the surface owner of planned entry for surveying or staking as provided in section ten of this article or a notice of intent to drill a horizontal well as provided in subsection (b), section sixteen of this article was provided, whichever occurs first, and to any dwelling under construction prior to that date. This limitation may be waived by written consent of the surface owner transmitted to the department and recorded in the real property records maintained by the clerk of the county commission for the county in which such property is located. Furthermore, the well operator may be granted a variance by the secretary from these distance restrictions upon submission of a plan which identifies the sufficient measures, facilities or practices to be employed during well site construction, drilling and operations. The variance, if granted, shall include terms and conditions the department requires to ensure the safety and protection of affected persons and property. The terms and conditions may include insurance, bonding and indemnification, as well as technical requirements. (b) No well pad may be prepared or well drilled within one hundred feet measured horizontally from any perennial stream, natural or artificial lake, pond or reservoir, or a wetland, or within three hundred feet of a naturally reproducing trout stream. No well pad may be located within one thousand feet of a surface or ground water intake of a public water supply. The distance from the public water supply as identified by the department shall be measured as follows: (1) For a surface water intake on a lake or reservoir, the distance shall be measured from the boundary of the lake or reservoir. (2) For a surface water intake on a flowing stream, the distance shall be measured from a semicircular radius extending upstream of the surface water intake. (3) For a groundwater source, the distance shall be measured from the wellhead or spring. The department may, in its discretion, waive these distance restrictions upon submission of a plan identifying sufficient measures, facilities or practices to be employed during well site construction, drilling and operations to protect the waters of the state. A waiver, if granted, shall impose any permit conditions as the secretary considers necessary. (c) Notwithstanding the foregoing provisions of this section, nothing contained in this section prevents an operator from conducting the activities permitted or authorized by a Clean Water Act Section 404 permit or other approval from the United States Army Corps of Engineers within any waters of the state or within the restricted areas referenced in this section. (d) The well location restrictions set forth in this section shall not apply to any well on a multiple well pad if at least one of the wells was permitted prior to the effective date of this article. (e) The secretary shall, by December 31, 2012, report to the Legislature on the noise, light, dust and volatile organic compounds generated by the drilling of horizontal wells as they relate to the well location restrictions regarding occupied dwelling structures pursuant to this section. Upon a finding, if any, by the secretary that the well location restrictions regarding occupied dwelling structures are inadequate or otherwise require alteration to address the items

examined in the study required by this subsection, the secretary shall have the authority to propose for promulgation legislative rules establishing guidelines and procedures regarding reasonable levels of noise, light, dust and volatile organic compounds relating to drilling horizontal wells, including reasonable means of mitigating such factors, if necessary.

**Water Well Testing:**

Pursuant to West Virginia Code § 22-6A-10(d), notification shall be made, with respect to surface landowners identified in subsection (b) or water purveyors identified in subdivision (5), subsection (b) of this section, of the opportunity for testing their water well. The operator shall provide an analysis to such surface landowner or water purveyor at their request.

**Water Testing Laboratories:**

Pursuant to West Virginia Code § 22-6A-10(i), persons entitled to notice pursuant to subsection (b) of this section may contact the department to ascertain the names and locations of water testing laboratories in the subject area capable and qualified to test water supplies in accordance with standard accepted methods. In compiling that list of names the department shall consult with the state Bureau for Public Health and local health departments. A surface owner and water purveyor has an independent right to sample and analyze any water supply at his or her own expense. The laboratory utilized by the operator shall be approved by the agency as being certified and capable of performing sample analyses in accordance with this section.

**Rebuttable Presumption for Contamination or Deprivation of a Fresh Water Source or Supply:**

W. Va. Code § 22-6A-18 requires that (b) unless rebutted by one of the defenses established in subsection (c) of this section, in any action for contamination or deprivation of a fresh water source or supply within one thousand five hundred feet of the center of the well pad for horizontal well, there is a rebuttable presumption that the drilling and the oil or gas well or either was the proximate cause of the contamination or deprivation of the fresh water source or supply. (c) In order to rebut the presumption of liability established in subsection (b) of this section, the operator must prove by a preponderance of the evidence one of the following defenses: (1) The pollution existed prior to the drilling or alteration activity as determined by a predrilling or prealteration water well test. (2) The landowner or water purveyor refused to allow the operator access to the property to conduct a predrilling or prealteration water well test. (3) The water supply is not within one thousand five hundred feet of the well. (4) The pollution occurred more than six months after completion of drilling or alteration activities. (5) The pollution occurred as the result of some cause other than the drilling or alteration activity. (d) Any operator electing to preserve its defenses under subdivision (1), subsection (c) of this section shall retain the services of an independent certified laboratory to conduct the predrilling or prealteration water well test. A copy of the results of the test shall be submitted to the department and the surface owner or water purveyor in a manner prescribed by the secretary. (e) Any operator shall replace the water supply of an owner of interest in real property who obtains all or part of that owner's supply of water for domestic, agricultural, industrial or other legitimate use from an underground or surface source with a comparable water supply where the secretary determines that the water supply has been affected by contamination, diminution or interruption proximately caused by the oil or gas operation, unless waived in writing by that owner. (f) The secretary may order the operator conducting the oil or gas operation to: (1) Provide an emergency drinking water supply within twenty-four hours; (2) Provide temporary water supply within seventy-two hours; (3) Within thirty days begin activities to establish a permanent water supply or submit a proposal to the secretary outlining the measures and timetables to be used in establishing a permanent supply. The total time in providing a permanent water supply may not exceed two years. If the operator demonstrates that providing a permanent replacement water supply cannot be completed within two years, the secretary may extend the time frame on case-by-case basis; and (4) Pay all reasonable costs incurred by the real property owner in securing a water supply. (g) A person as described in subsection (b) of this section aggrieved under the provisions of subsections (b), (e) or (f) of this section may seek relief in court... (i) Notwithstanding the denial of the operator of responsibility for the damage to the real property owner's water supply or the status of any appeal on determination of liability for the damage to the real property owner's water supply, the operator may not discontinue providing the required water service until authorized to do so by the secretary or a court of competent jurisdiction.

**Written Comment:**

Pursuant to West Virginia Code § 22-6A-11(a), all persons described in subsection (b), section ten of this article may file written comments with the secretary as to the location or construction of the applicant's proposed well work within thirty days after the application is filed with the secretary. All persons described in West Virginia Code § 22-6A-10(b) may file written comments as to the location or construction of the applicant's proposed well work to the Secretary at:

Chief, Office of Oil and Gas  
Department of Environmental Protection  
601 57<sup>th</sup> St. SE  
Charleston, WV 25304  
(304) 926-0450

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Such persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water. **NOTE: YOU ARE NOT REQUIRED TO FILE ANY COMMENT.**



WW-6A  
(8-13)

API NO. 47- 095 -  
OPERATOR WELL NO. Galt Unit 2H  
Well Pad Name: Ferrell Pad

**Time Limits and Methods for Filing Comments.**

The law requires these materials to be served on or before the date the operator files its Application. You have **THIRTY (30) DAYS** after the filing date to file your comments. Comments must be filed in person or received in the mail by the Chief's office by the time stated above. You may call the Chief's office to be sure of the date. Check with your postmaster to ensure adequate delivery time or to arrange special expedited handling. If you have been contacted by the well operator and you have signed a "voluntary statement of no objection" to the planned work described in these materials, then the permit may be issued at any time.

Pursuant to West Virginia Code § 22-6A-11(c)(2), Any objections of the affected coal operators and coal seam owners and lessees shall be addressed through the processes and procedures that exist under sections fifteen, seventeen and forty, article six of this chapter, as applicable and as incorporated into this article by section five of this article. The written comments filed by the parties entitled to notice under subdivisions (1), (2), (4), (5) and (6), subsection (b), section ten of this article shall be considered by the secretary in the permit issuance process, but the parties are not entitled to participate in the processes and proceedings that exist under sections fifteen, seventeen or forty, article six of this chapter, as applicable and as incorporated into this article by section five of this article.

**Comment Requirements**

Your comments must be in writing and include your name, address and telephone number, the well operator's name and well number and the approximate location of the proposed well site including district and county from the application. You may add other documents, such as sketches, maps or photographs to support your comments.

Disclaimer: All comments received will be placed on our web site <http://www.dep.wv.gov/oil-and-gas/Horizontal-Permits/Pages/default.aspx> and the applicant will automatically be forwarded an email notice that such comments have been submitted. The applicant will be expected to provide a response to comments submitted by any surface owner, water purveyor or natural gas storage operator noticed within the application.

**Permit Denial or Condition**

The Chief has the power to deny or condition a well work permit. Pursuant to West Virginia Code § 22-6A-8(d), the permit may not be issued or be conditioned, including conditions with respect to the location of the well and access roads prior to issuance if the director determines that:

- (1) The proposed well work will constitute a hazard to the safety of persons;
- (2) The plan for soil erosion and sediment control is not adequate or effective;
- (3) Damage would occur to publicly owned lands or resources; or
- (4) The proposed well work fails to protect fresh water sources or supplies.

A permit may also be denied under West Virginia Code § 22-6A-7(k), the secretary shall deny the issuance of a permit if the secretary determines that the applicant has committed a substantial violation of a previously issued permit for a horizontal well, including the applicable erosion and sediment control plan associated with the previously issued permit, or a substantial violation of one or more of the rules promulgated under this article, and in each instance has failed to abate or seek review of the violation within the time prescribed by the secretary pursuant to the provisions of subdivisions (1) and (2), subsection (a), section five of this article and the rules promulgated hereunder, which time may not be unreasonable.

Pursuant to West Virginia Code § 22-6A-10(g), any person entitled to submit written comments to the secretary pursuant to subsection (a), section eleven of this article, shall also be entitled to receive from the secretary a copy of the permit as issued or a copy of the order modifying or denying the permit if the person requests receipt of them as a part of the written comments submitted concerning the permit application. Such persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water.

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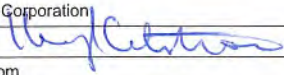
4709502562

WW-6A  
(8-13)

API NO. 47- 095 -  
OPERATOR WELL NO. Galt Unit 2H  
Well Pad Name: Ferrell Pad

**Notice is hereby given by:**

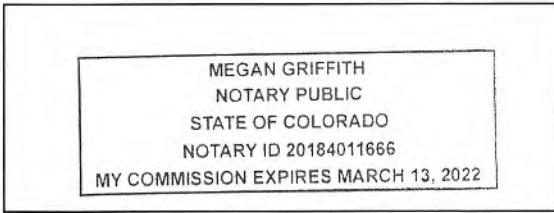
Well Operator: Antero Resources Corporation  
Telephone: (303) 357-7223  
Email: mgriffith@anteroresources.com



Address: 1615 Wynkoop Street  
Denver, CO 80202  
Facsimile: 303-357-7315

**Oil and Gas Privacy Notice:**

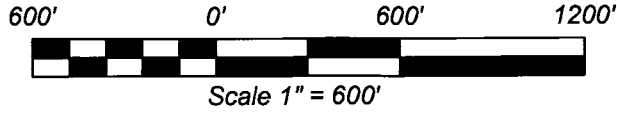
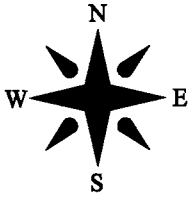
The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at [depprivacyofficer@wv.gov](mailto:depprivacyofficer@wv.gov).



Subscribed and sworn before me this 23<sup>rd</sup> day of October 2018  
Chavez Notary Public  
My Commission Expires MARCH 13, 2022

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**Ferrell Drill Pad  
Water Well & Spring Map**

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TM 20/83  
Larry S & Dianna L. Helmick

TM 20/83.4  
Thomas & Cynthia Hall

TM 20/98  
John P. L. Hennessy

LAT: 39°28'32.36"  
LON: 80°55'22.99"

Spring

TM 20/97  
Dennis J. &  
Connie S. Moore

Az-131°59' 1825.5'

2000'

Center of  
Proposed Wells

TM 20/102  
Glen Austin Ferrell

Ferrell Drill  
Pad

TM 26/3  
Dennis James  
Moore, et al

TM 26/2  
Larry G. & Betsy E. Moore

TM 26/4  
Robert L. Keller

TM 26/5  
Robert L. Keller

Sancho Creek

TM 26/7  
Robert L. Keller

TM 26/8  
Robert L. Keller

Parcel Owner Address  
John P. L. Hennessy - 2325 Bridgeway Run Rd. Middlebourne, WV 26149

**STATE OF WEST VIRGINIA**  
**DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS**  
**NOTICE OF INTENT TO DRILL**

Pursuant to W. Va. Code § 22-6A-16(b), the Notice of Intent to Drill is only required if the notice requirements of W. Va. Code § 22-6A-10(a) have NOT been met or if the Notice of Intent to Drill requirement has NOT been waived in writing by the surface owner.

**Notice Time Requirement:** Notice shall be provided at least **TEN (10)** days prior to filing a permit application.

**Date of Notice:** 08/30/2018 **Date Permit Application Filed:** 10/23/2018

**Delivery method pursuant to West Virginia Code § 22-6A-16(b)**

HAND DELIVERY       CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

Pursuant to W. Va. Code § 22-6A-16(b), at least ten days prior to filing a permit application, an operator shall, by certified mail return receipt requested or hand delivery, give the surface owner notice of its intent to enter upon the surface owner's land for the purpose of drilling a horizontal well: *Provided*, That notice given pursuant to subsection (a), section ten of this article satisfies the requirements of this subsection as of the date the notice was provided to the surface owner: *Provided, however*, That the notice requirements of this subsection may be waived in writing by the surface owner. The notice, if required, shall include the name, address, telephone number, and if available, facsimile number and electronic mail address of the operator and the operator's authorized representative.

**Notice is hereby provided to the SURFACE OWNER(s):**

Name: Antero Resources Midstream  
Address: 1615 Wynkoop Street  
Denver, CO 80202

Name: \_\_\_\_\_  
Address: \_\_\_\_\_

**Notice is hereby given:**

Pursuant to West Virginia Code § 22-6A-16(b), notice is hereby given that the undersigned well operator has an intent to enter upon the surface owner's land for the purpose of drilling a horizontal well on the tract of land as follows:

State:	<u>West Virginia</u>	UTM NAD 83	Easting:	<u>507041.52m</u>
County:	<u>Tyler</u>		Northing:	<u>4369209.94m</u>
District:	<u>Ellsworth</u>	Public Road Access:		<u>CR 7</u>
Quadrangle:	<u>Middlebourne 7.5'</u>	Generally used farm name:		<u>Glenn Austin Ferrell</u>
Watershed:	<u>Sancho Creek</u>			

**This Notice Shall Include:**

Pursuant to West Virginia Code § 22-6A-16(b), this notice shall include the name, address, telephone number, and if available, facsimile number and electronic mail address of the operator and the operator's authorized representative. Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57<sup>th</sup> Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting [www.dep.wv.gov/oil-and-gas/pages/default.aspx](http://www.dep.wv.gov/oil-and-gas/pages/default.aspx).

**Notice is hereby given by:**

Well Operator: Antero Resources Corporation  
Address: 1615 Wynkoop St.  
Denver, CO 80202  
Telephone: 303-357-7223  
Email: mgriffith@anteroresources.com  
Facsimile: 303-357-7315

Authorized Representative: Megan Griffith  
Address: 1615 Wynkoop St.  
Denver, CO 80202  
Telephone: 303-357-7223  
Email: mgriffith@anteroresources.com  
Facsimile: 303-357-7315

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**Oil and Gas Privacy Notice:**

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at [depprivacyofficer@wv.gov](mailto:depprivacyofficer@wv.gov).



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WW-6AW  
(1-12)

API NO. 47- 095  
OPERATOR WELL NO. Galt Unit 2H  
Well Pad Name: Ferrell Pad

STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
**VOLUNTARY STATEMENT OF NO OBJECTION**

**Instructions to Persons Named on Page WW-6A**

The well operator named on page WW-6A is applying for a permit from the State of West Virginia to conduct oil or gas well work. Well work permits are valid for twenty-four (24) months. Please contact the listed well operator and the Office of Oil and Gas if you do not own any interest in the listed surface tract.

**Comment and Waiver Provisions**

Pursuant to West Virginia Code § 22-6A-11(a), all persons described in subsection (b), section ten of this article may file written comments with the secretary as to the location or construction of the applicant's proposed well work within thirty days after the application is filed with the secretary.

Pursuant to West Virginia Code § 22-6A-8(b) No permit may be issued less than thirty days after the filing date of the application for any well work except plugging or replugging; and no permit for plugging or replugging may be issued less than five days after the filing date of the application except a permit for plugging or replugging a dry hole: *Provided*, That if the applicant certifies that all persons entitled to notice of the application under the provisions of subsection (b), section ten of this article have been served in person or by certified mail, return receipt requested, with a copy of the well work application, including the erosion and sediment control plan, if required, and the well plat, and further files written statements of no objection by all such persons, the secretary may issue the well work permit at any time.

**VOLUNTARY STATEMENT OF NO OBJECTION**

I, \_\_\_\_\_, hereby state that I have read the Instructions to Persons Named on Page WW-6A and the associated provisions listed above, and that I have received copies of a Notice of Application, an Application for a Well Work Permit on Form WW-6A and attachments consisting of pages one (1) through \_\_\_\_\_, including the erosion and sediment control plan, if required, and the well plat, all for proposed well work on the tract of land as follows:

State: West Virginia UTM NAD 83 Easting: 507137.305m  
County: Tyler Northing: 4369171.768m  
District: Ellsworth Public Road Access: CR 7  
Quadrangle: Middlebourne 7.5' Generally used farm name: Glenn Austin Ferrell  
Watershed: Outlet Middle Island Creek

I further state that I have no objection to the planned work described in these materials, and I have no objection to a permit being issued on those materials.

<p>*Please check the box that applies</p> <p><input type="checkbox"/> SURFACE OWNER</p> <p><input type="checkbox"/> SURFACE OWNER (Road and/or Other Disturbance)</p> <p><input type="checkbox"/> SURFACE OWNER (Impoundments/Pits)</p> <p><input type="checkbox"/> COAL OWNER OR LESSEE</p> <p><input type="checkbox"/> COAL OPERATOR</p> <p><input type="checkbox"/> WATER PURVEYOR</p> <p><input type="checkbox"/> OPERATOR OF ANY NATURAL GAS STORAGE FIELD</p>	<p><b>FOR EXECUTION BY A NATURAL PERSON</b></p> <p>Signature: _____</p> <p>Print Name: _____</p> <p>Date: _____</p>
	<p><b>FOR EXECUTION BY A CORPORATION, ETC.</b></p> <p>Company: <u>Amber Midsheg</u></p> <p>By: <u>[Signature]</u></p> <p>Its: _____</p> <p>Signature: _____</p> <p>Date: _____</p>

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**Oil and Gas Privacy Notice:**

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at [depprivacyofficer@wv.gov](mailto:depprivacyofficer@wv.gov).



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION  
**Division of Highways**

1900 Kanawha Boulevard East • Building Five • Room 110  
 Charleston, West Virginia 25305-0430 • (304) 558-3505

**Thomas J. Smith, P. E.**  
 Secretary of Transportation/  
 Commissioner of Highways

October 17, 2018

**Jill M. Newman**  
 Deputy Commissioner

James A. Martin, Chief  
 Office of Oil and Gas  
 Department of Environmental Protection  
 601 57<sup>th</sup> Street, SE  
 Charleston, WV 25304

Subject: DOH Permit for the Ferrell Pad, Tyler County  
 Galt Unit 2H Well site

Dear Mr. Martin,

This well site will be accessed from a DOH permit #06-2017-0072 which has been issued to Antero Resources Corporation for access to the State Road for a site located off of Tyler County Route 7 SLS.

The operator has signed a STATEWIDE OIL AND GAS ROAD MAINTENANCE BONDING AGREEMENT and provided the required Bond. This operator is currently in compliance with the DOH OIL AND GAS POLICY dated January 3, 2012.

Very Truly Yours,

Gary K. Clayton, P.E.  
 Regional Maintenance Engineer  
 Central Office O&G Coordinator

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Cc: Megan Griffith  
 Antero Resources Corporation  
 CH, OM, D-6  
 File

# List of Anticipated Additives Used for Fracturing or Stimulating Well

4709502562

Additives	Chemical Abstract Service Number (CAS #)
Fresh Water	7732-18-5
2 Phosphobutane 1,2,4 tricarboxylic acid	37971-36-1
Ammonium Persulfate	7727-54-0
Anionic copolymer	Proprietary
Anionic polymer	Proprietary
BTEX Free Hydrotreated Heavy Naphtha	64742-48-9
Cellulase enzyme	Proprietary
Demulsifier Base	Proprietary
Ethoxylated alcohol blend	Mixture
Ethoxylated Nonylphenol	68412-54-4
Ethoxylated oleylamine	26635-93-8
Ethylene Glycol	107-21-1
Glycol Ethers	111-76-2
Guar gum	9000-30-0
Hydrogen Chloride	7647-01-0
Hydrotreated light distillates, non-aromatic, BTEX free	64742-47-8
Isopropyl alcohol	67-63-0
liquid, 2,2-dibromo-3-nitrilopropionamide	10222-01-2
Microparticle	Proprietary
Petroleum Distillates (BTEX Below Detect)	64742-47-8
Polyacrylamide	57-55-6
Propargyl Alcohol	107-19-7
Propylene Glycol	57-55-6
Quartz	14808-60-7
Sillica, crystalline quartz	7631-86-9
Sodium Chloride	7647-14-5
Sodium Hydroxide	1310-73-2
Sugar	57-50-1
Surfactant	68439-51-0
Suspending agent (solid)	14808-60-7
Tar bases, quinoline derivs, benzyl chloride-quaternized	72480-70-7
Solvent Naphtha, petroleum, heavy aliph	64742-96-7
Soybean Oil, Me ester	67784-80-9
Copolymer of Maleic and Acrylic Acid	52255-49-9
DETA phosphonate	15827-60-8
Hexamethylene Triamine Penta	34690-00-1
Phosphino Carboxylic acid polymer	71050-62-9
Hexamethylene Diamine Tetra	23605-75-5
2-Propenoic acid, polymer with 2 propenamide	9003-06-9
Hexamethylene diamine penta (methylene phosphonic acid)	23605-74-5
Diethylene Glycol	111-46-6
Methenamine	100-97-0
Polyethylene polyamine	68603-67-8
Coco amine	61791-14-8
2-Propyn-1-olcompound with methyloxirane	38172-91-7

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**LOCATION COORDINATES:**  
**ACCESS ROAD "A" ENTRANCE**  
 LATITUDE: 36.473146 LONGITUDE: -80.808782 (NAD 83)  
 LATITUDE: 36.473148 LONGITUDE: -80.809082 (NAD 27)  
 N 4369293.92 E 508017.04 (UTM ZONE 17 METERS)  
**CENTER OF TANK**  
 LATITUDE: 36.472914 LONGITUDE: -80.814683 (NAD 83)  
 LATITUDE: 36.472836 LONGITUDE: -80.814663 (NAD 27)  
 N 4369293.92 E 507937.49 (UTM ZONE 17 METERS)  
**CENTROID OF PAD "A"**  
 LATITUDE: 36.472448 LONGITUDE: -80.818134 (NAD 83)  
 LATITUDE: 36.472370 LONGITUDE: -80.818035 (NAD 27)  
 N 4369209.94 E 507041.52 (UTM ZONE 17 METERS)  
**CENTROID OF PAD "B"**  
 LATITUDE: 36.472096 LONGITUDE: -80.816963 (NAD 83)  
 LATITUDE: 36.472009 LONGITUDE: -80.817154 (NAD 27)  
 N 4369199.84 E 507140.58 (UTM ZONE 17 METERS)

**APPROVED WVDEP OOG**  
 8/23 1/18/2018

# FERRELL WELL PAD & WATER CONTAINMENT PAD

## SITE DESIGN & CONSTRUCTION PLAN, EROSION & SEDIMENT CONTROL PLANS

ELLSWORTH DISTRICT, TYLER COUNTY, WEST VIRGINIA  
 SANCHO CREEK WATERSHED

**GENERAL DESCRIPTION:**

THE ACCESS ROADS, WATER CONTAINMENT PAD, AND WELL PADS ARE BEING CONSTRUCTED TO AID IN THE DEVELOPMENT OF INDIVIDUAL MARCELLUS SHALE GAS WELLS.

**FLOODPLAIN NOTES:**

THE PROPOSED SITE IS LOCATED IN FLOOD ZONES "X" PER FEMA MAP NUMBERS #340950C01C.

**MISS UTILITY STATEMENT:**

ANTERO RESOURCES CORPORATION WILL NOTIFY MISS UTILITY OF WEST VIRGINIA FOR THE LOCATING OF UTILITIES PRIOR TO THIS PROJECT DESIGN TICKET #1533363996. IN ADDITION, MISS UTILITY WILL BE CONTACTED BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION FOR THIS PROJECT.

**ENTRANCE PERMIT:**

ANTERO RESOURCES CORPORATION WILL OBTAIN AN ENCROACHMENT PERMIT (FORM MM-108) 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 SEPTEMBER & NOVEMBER, 2016 BY ALLSTAR ECOLOGY TO REVIEW THE SITE FOR WATERS AND WETLANDS THAT ARE MOST LIKELY WITHIN THE REGULATORY JURISDICTION OF THE U.S. ARMY CORPS OF ENGINEERS (USACE) AND/OR THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (WVDEP). THE NOVEMBER 10, 2016 STREAM AND WETLAND DELINEATION MAP WAS PREPARED BY ALLSTAR ECOLOGY AND SUMMARIZES THE RESULTS OF THE FIELD DELINEATION. THE MAP DOES NOT, IN ANY WAY, REPRESENT A JURISDICTIONAL DETERMINATION OF THE EXACT LIMITS OF WATERS AND WETLANDS WHICH MAY BE REGULATED BY THE USACE OR THE WVDEP. IT IS STRONGLY RECOMMENDED THAT THE AFORESAID AGENCIES BE CONSULTED IN AN EFFORT TO OBTAIN WRITTEN CONFIRMATION OF THE DELINEATION SHOWN ON THIS EXHIBIT PRIOR TO ENGAGING CONSTRUCTION ON THE PROPERTY DESCRIBED HEREIN. THE DEVELOPER SHALL OBTAIN THE APPROPRIATE PERMITS FROM THE FEDERAL AND/OR STATE REGULATORY AGENCIES PRIOR TO ANY PROPOSED IMPACTS TO WATERS OF THE U.S., INCLUDING WETLAND FILLS AND STREAM CROSSINGS.

Stream and Impact Cause	FERRELL EPHEMERAL STREAM IMPACT (LINEAR FEET)				Total Impact (LF)
	Culvert / Fill (LF)	Inlets/Outlets Structures (LF)	Temp. Impacts Cofferdam/E&S Controls (LF)	Temp. Disturb. Distance to L.O.D. (LF)	
S2 (Access Road "A")	0	0	14	0	14

Stream and Impact Cause	FERRELL INTERMITTENT STREAM IMPACT (LINEAR FEET)				Total Impact (LF)
	Culvert / Fill (LF)	Inlets/Outlets Structures (LF)	Temp. Impacts Cofferdam/E&S Controls (LF)	Temp. Disturb. Distance to L.O.D. (LF)	
S8 (Access Road "A")	83	27	0	26	136
S15 (Access Road "A")	83	26	0	5	89
S20 (Access Road "A")	78	27	0	19	105

**GEOTECHNICAL NOTES:**

A SUBSURFACE INVESTIGATION OF THE PROPOSED SITE WAS PERFORMED BY PENNSYLVANIA SOIL & ROCK, INC. ON JANUARY 31, & FEBRUARY 1-2, 2017. THE REPORT PREPARED BY PENNSYLVANIA SOIL & ROCK, INC. DATED MARCH 21, 2017, REVISED MARCH 28, 2018, 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  
 535 WHITE OAKS BLVD.  
 BRIDGEPORT, WV 26330  
 PHONE: (304) 842-4100  
 FAX: (304) 842-4192

**ELI WAGONER - ENVIRONMENTAL ENGINEER**  
 OFFICE: (304) 842-4058 CELL: (304) 478-9770

**JON McEVERS - OPERATIONS SUPERINTENDENT**  
 OFFICE: (303) 557-8799 CELL: (303) 808-0423

**AARON KUNZLER - CONSTRUCTION SUPERVISOR**  
 CELL: (608) 527-5344

**ROBERT H. WIKKS - FIELD ENGINEER**  
 OFFICE: (304) 842-4100 CELL: (304) 627-7405

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

**JIM WILSON - LAND AGENT**  
 OFFICE: (304) 842-4418 CELL: (304) 871-2708

**ENGINEER/SURVEYOR:**  
 NAVITUS ENGINEERING, INC.  
 CYNTHIA S. KEMP, PE - PROJECT MANAGER/ENGINEER  
 OFFICE: (688) 662-4195 CELL: (640) 686-8747

**ENVIRONMENTAL:**  
 ALLSTAR ECOLOGY, LLC  
 STEVEN L. WARD - ENVIRONMENTAL SCIENTIST  
 (866) 213-2686 CELL: (304) 893-7477

**GEOTECHNICAL:**  
 PENNSYLVANIA SOIL & ROCK, INC.  
 CHRISTOPHER W. SAMIOS - PROJECT ENGINEER  
 OFFICE: (412) 374-4000 CELL: (412) 689-0682

**RESTRICTIONS NOTES:**

- THERE ARE NO PERENNIAL STREAM, LAKES, OR RESERVOIRS WITHIN 100 FEET OF THE WELL PAD AND LOD. THERE IS A WETLAND AND A POND ADJACENT TO ACCESS ROAD "A" WHICH WILL REMAIN UNDISTURBED.
- THERE ARE NO NATURALLY PRODUCING TROUT STREAMS WITHIN 300 FEET OF THE WELL PAD AND LOD.
- THERE ARE NO GROUNDWATER INTAKE OR PUBLIC WATER SUPPLY FACILITIES WITHIN 1000 FEET OF THE WELL PAD AND LOD.
- THERE ARE NO APPARENT EXISTING WATER WELLS OR DEVELOPED SPRINGS WITHIN 250 FEET OF THE WELL(S) BEING DRILLED.
- THERE ARE NO OCCUPIED DWELLING STRUCTURES WITHIN 825 FEET OF THE CENTER OF THE WELL PAD.
- THERE ARE NO AGRICULTURAL BUILDINGS LARGER THAN 2,500 SQUARE FEET WITHIN 625 FEET OF THE CENTER OF THE WELL PAD.

USGS 7.5 MIDDLEBOURNE QUAD MAP



WEST VIRGINIA COUNTY MAP



(NOT TO SCALE)

WVDOH COUNTY ROAD MAP



MISS Utility of West Virginia  
 1-800-245-4848  
 West Virginia State Law  
 (Section XIV: Chapter 24-C)  
 Requires that you call two  
 business days before you dig in  
 the state of West Virginia.  
 IT'S THE LAW!!

**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.

**SHEET INDEX:**

- COVER SHEET
- CONSTRUCTION AND E&S CONTROL NOTES
- GENERAL NOTES
- MATERIAL QUANTITIES
- STORM DRAINAGE & E&S COMPUTATIONS
- EXISTING CONDITIONS
- EXISTING STRUCTURES & FEATURES
- OVERALL PLAN SHEET INDEX & VOLUMES
- ACCESS ROAD PLAN
- ACCESS ROAD & WATER CONTAINMENT PAD PLAN
- WELL PAD "A" GRADING PLAN
- WELL PAD "B" GRADING PLAN
- PRODUCTION EQUIPMENT PAD GRADING PLAN
- WATER CONTAINMENT PAD GRADING PLAN
- ACCESS ROAD PROFILES
- WATER CONTAINMENT PAD PROFILES
- WELL PAD SECTIONS
- WELL PAD SECTIONS
- WATER CONTAINMENT PAD & STOCKPILE SECTIONS
- STOCKPILE SECTIONS
- STREAM CROSSING "A" DETAILS
- STREAM CROSSING "B" DETAILS
- STREAM CROSSING "C" DETAILS
- STREAM CROSSING "D" DETAILS
- ACCESS ROAD RECLAMATION PLAN
- ACCESS ROAD & WATER CONTAINMENT PAD RECLAMATION PLAN
- ACCESS ROAD & WELL PAD RECLAMATION PLAN
- GEOSD-02500 - GEOTECHNICAL DETAILS

**FERRELL LIMITS OF DISTURBANCE AREA (AC)**

Item	Area (AC)
Total Site	9.68
Access Road "A" (3,255.6')	0.34
Access Road "B" (167.9')	0.34
Access Road "C" (630.4')	1.10
Well Pad	10.78
Water Containment Pad	2.96
Production Equipment Pad	5.55
Excess Topsoil Material Stockpiles	7.76
Total Affected Area	38.20
Total Wooded Acres Disturbed	16.71

**WELL PAD "A"**

Proposed Well Name	WV North NAD 27	WV North NAD 83	UTM (METERS) Zone 17	NAD 83 Lat & Long
Guid1	N 367345.47	N 367286.92	N 4369186.01	LAT 36-28-20-1059
Unit 4H	E 1569518.92	E 1569138.83	E 507208.12	LONG -80-55-05-9181
Guid1	N 367345.47	N 367286.92	N 4369186.01	LAT 36-28-20-2491
Unit 3H	E 1569518.92	E 1569138.83	E 507208.12	LONG -80-55-05-9192
Guid1	N 367345.47	N 367345.92	N 4369181.15	LAT 36-28-20-3874
Unit 2H	E 1569518.92	E 1569138.83	E 507208.12	LONG -80-55-05-9222
Guid1	N 367345.47	N 367345.92	N 4369059.72	LAT 36-28-20-5456
Unit 1H	E 1569518.92	E 1569138.83	E 507208.12	LONG -80-55-05-9282
Hennsey	N 367305.47	N 367345.92	N 4369059.29	LAT 36-28-20-8938
Unit 2H	E 1569518.92	E 1569138.83	E 507208.11	LONG -80-55-05-9289
Hennsey	N 367321.47	N 367365.92	N 4369213.98	LAT 36-28-20-8421
Unit 1H	E 1569518.92	E 1569138.83	E 507208.02	LONG -80-55-05-9312
Romo	N 367305.47	N 367345.92	N 4369219.43	LAT 36-28-20-9603
Unit 2H	E 1569518.92	E 1569138.83	E 507208.06	LONG -80-55-05-9343
Romp	N 367381.47	N 367385.92	N 4369223.02	LAT 36-28-21-1089
Unit 1H	E 1569518.92	E 1569138.84	E 507208.08	LONG -80-55-05-9372
Well Pad Elevation	751.0			

**WELL PAD "B"**

Proposed Well Name	WV North NAD 27	WV North NAD 83	UTM (METERS) Zone 17	NAD 83 Lat & Long
Gak1	N 367172.07	N 367205.93	N 4369187.20	LAT 36-28-19-4204
Unit 1H	E 1569482.91	E 1569051.83	E 507131.24	LONG -80-55-01-2128
Gak1	N 367172.07	N 367205.93	N 4369187.77	LAT 36-28-19-5700
Unit 2H	E 1569482.91	E 1569051.83	E 507131.30	LONG -80-55-01-2156
Catt	N 367202.07	N 367286.92	N 4369179.34	LAT 36-28-19-7189
Unit 3H	E 1569482.91	E 1569051.83	E 507131.23	LONG -80-55-01-2188
Daniela	N 367211.07	N 367281.93	N 4369184.21	LAT 36-28-19-8671
Unit 1H	E 1569482.91	E 1569051.83	E 507131.15	LONG -80-55-01-2217
Daniela	N 367202.07	N 367286.92	N 4369185.48	LAT 36-28-20-0163
Unit 2H	E 1569482.91	E 1569051.83	E 507131.07	LONG -80-55-01-2247
Daniela	N 367211.07	N 367281.93	N 4369187.53	LAT 36-28-20-9598
Unit 3H	E 1569482.91	E 1569051.83	E 507131.20	LONG -80-55-01-2287
Duly	N 367202.07	N 367205.93	N 4369184.02	LAT 36-28-20-3118
Unit 1H	E 1569482.91	E 1569051.83	E 507131.02	LONG -80-55-01-2307
Duly	N 367202.07	N 367311.93	N 4369188.19	LAT 36-28-20-4000
Unit 2H	E 1569482.91	E 1569051.83	E 507131.85	LONG -80-55-01-2337
Well Pad Elevation	751.0			

**NAVITUS ENERGY ENGINEERING**

**REVISION**

DATE	REVISION
10/24/2017	REVISED PER UPDATED LANDOWNER
11/04/2017	REVISED PER WSPR COMMENTS
01/17/2018	REVISED PER STORM
04/02/2018	REVISED PER SHOTS
04/18/2018	REVISED PER PAD REMARKING DESIGN
06/29/2018	REVISED WELL PAD GRADING
07/25/2018	REVISED PER WELLS



THIS DOCUMENT WAS PREPARED FOR ANTERO RESOURCES CORPORATION.

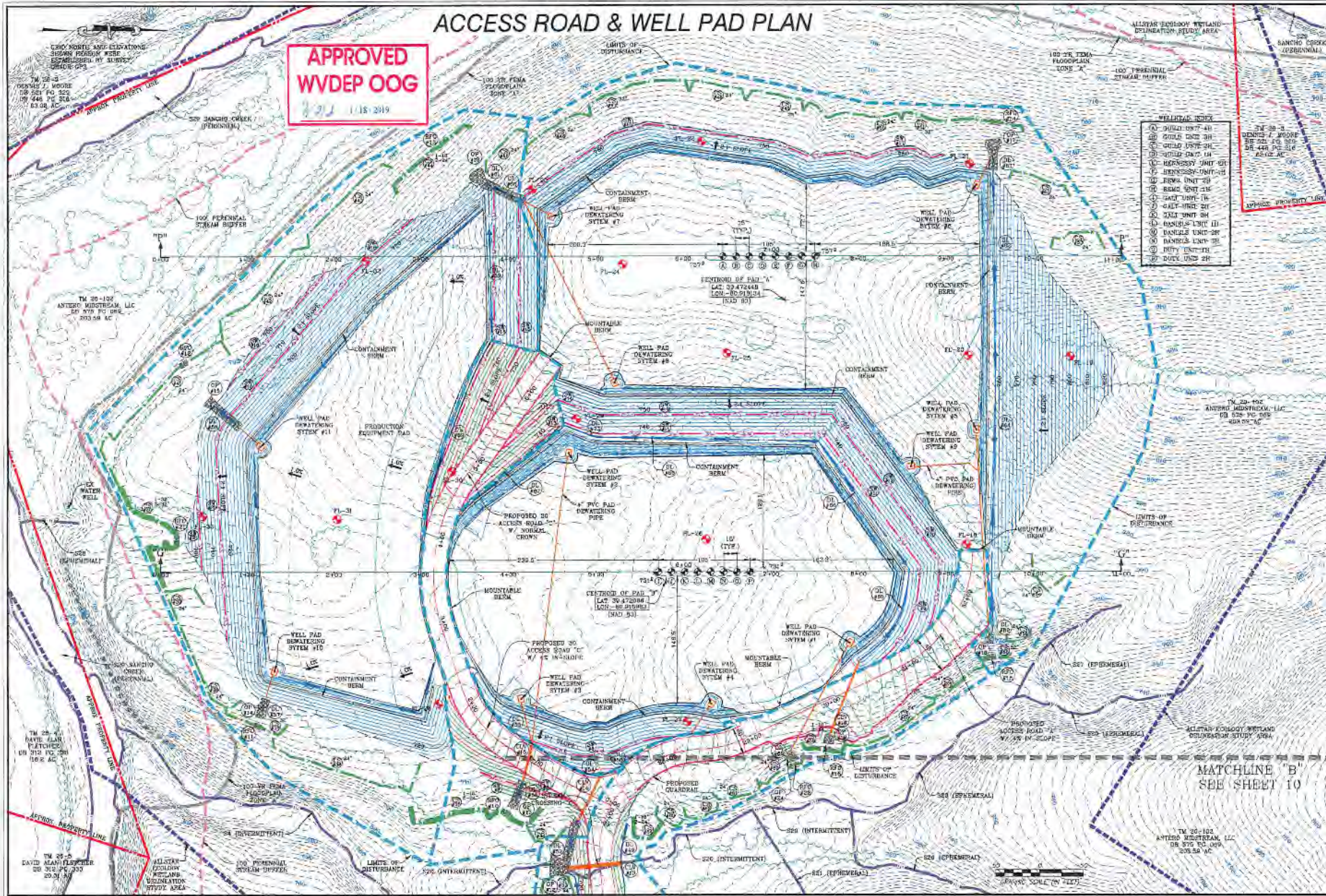
**FERRELL**  
 WELL PADS & WATER CONTAINMENT PAD  
 ELLSWORTH DISTRICT  
 TYLER COUNTY, WEST VIRGINIA



DATE: 04/04/2017  
 SCALE: AS SHOWN  
 SHEET 18 OF 41

# ACCESS ROAD & WELL PAD PLAN

**APPROVED**  
**WVDEP OOG**  
1/15/2019



**MATERIALS INDEX**

1) QUAIL UNIT 40
2) QUAIL UNIT 38
3) QUAIL UNIT 36
4) QUAIL UNIT 34
5) QUAIL UNIT 32
6) QUAIL UNIT 30
7) QUAIL UNIT 28
8) QUAIL UNIT 26
9) QUAIL UNIT 24
10) QUAIL UNIT 22
11) QUAIL UNIT 20
12) QUAIL UNIT 18
13) QUAIL UNIT 16
14) QUAIL UNIT 14
15) QUAIL UNIT 12
16) QUAIL UNIT 10
17) QUAIL UNIT 8
18) QUAIL UNIT 6
19) QUAIL UNIT 4
20) QUAIL UNIT 2



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DATE	REVISION
06/24/2019	REVISED PER UPDATED LANDOWNER
02/04/2017	REVISED PER WVDEP COMMENTS
01/27/2016	REVISED PER 30801A
01/06/2016	REVISED PER 30801A
01/01/2016	REVISED PER PAD DEWATERING DESIGN
05/25/2016	REVISED PER 30801A
07/22/2016	REVISED PER 30801A



THIS DOCUMENT WAS PREPARED FOR ANTERO RESOURCES CORPORATION

**FERRELL**  
WELL PADS & WATER CONTAINMENT PAD  
JACKSONVILLE DISTRICT  
TYLER COUNTY, WEST VIRGINIA



01/23/2018

DATE: 04/04/2017  
SCALE: 1" = 60'  
SHEET 11 OF 41